

# **Electronic Field Study™**

## **User Guide**

**Version 2.7**

November 2011



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# Contents

## PART I — Getting Started With EFS

### Welcome .....xiii

Who should read this guide .....	xiii
How this guide is organized .....	xiii
Organization of parts .....	xiii
Organization of chapters.....	xiii
Part I: Getting Started with EFS.....	xiv
Part II: Using Measurement and Overlay Tools .....	xv
Part III: Using EFS with GIS Data.....	xvi
Part IV: Advanced EFS Topics .....	xvii
Part V: Reference .....	xviii
How to use this guide.....	xix
For new users .....	xix
Other EFS Documentation.....	xx
Conventions.....	xx
Two types of users.....	xxi
Your feedback is important to us .....	xxii

### What's New in Version 2.7.....xxiii

Selectable user interface .....	xxiii
PentaView — a five-way view.....	xxiii
Redesigned image icons .....	xxiii
Enhanced image navigation .....	xxiii
Grid Tool.....	xxiii
Enhanced tool data export.....	xxiv
Above-ground measuring and annotating improved .....	xxiv
Ability to overlay contour lines .....	xxiv
More options for GIS users.....	xxiv
Workspace enhancements .....	xxiv
Thumbnail sorting by warehouse .....	xxiv
COM/Plug-in interface enhancements .....	xxiv
Other tool enhancements .....	xxv
Updater — a new application for updating EFS .....	xxv

### Chapter 1 — Installing and Setting up EFS..... 1

Important distinctions between terms .....	1
Before installing .....	2
Resolution and settings .....	2
For best performance .....	2
What is an Image Library?.....	2
Getting your images.....	2
Installing EFS.....	3
The EFS installation program .....	3
Installation procedure .....	3
After Installing.....	9
Choices for screen layout .....	10
Licensing .....	13
Starting EFS for the first time.....	13
Re-installing and uninstalling EFS .....	18
Downloading updates .....	18
Installing a new release of EFS .....	18
Removing EFS .....	18

Linking to your Image Warehouse .....	19
Warehouse resides on a local hard drive or LAN .....	19
Warehouse resides on an NIW server.....	22
Address Search setup .....	24
Overview .....	24
Creating an Address Search profile.....	26
Two types of searches .....	26
Required fields vary with type of search .....	27
GIS data for address searching.....	27
Correlating GIS fields to EFS fields .....	27
Correlating parcel-based fields.....	28
Correlating range-based fields .....	29
Creating the profile .....	31
Exporting a profile to a PAX file.....	35
Importing a profile from a PAX file .....	35
Address Search toolbars .....	36
Address Search toolbar .....	36
Address Search Profile toolbar .....	37
Highlighting data for the land parcel .....	39
<b>Chapter 2 — Overview .....</b>	<b>41</b>
What is EFS? .....	41
EFS features .....	41
Search for images in various ways .....	41
View related images .....	41
Measure and annotate images .....	42
Overlay and query GIS data .....	42
Overlay grids .....	42
Overlay and view image polygons, sector maps, and contour lines .....	42
Export and import files and overlays .....	43
Organize a subset of images and related information .....	43
Annotate images with data from an ALOHA system.....	43
Customize EFS .....	43
Advanced User Mode .....	43
What is image resolution? .....	43
True Ground Sample Distance .....	44
Screen resolution .....	45
Zoom factor .....	45
Scales — formats for image resolution.....	45
What is an Image Library?.....	45
What does it contain? .....	45
The Image Warehouse.....	46
What kind of images are contained in a Library?.....	47
Overlays .....	51
<b>Chapter 3 — Starting EFS and Getting Oriented .....</b>	<b>55</b>
Starting EFS .....	55
Workspaces.....	56
Are workspaces required? .....	56
Opening a workspace from within EFS.....	56
Creating a workspace.....	56
The Electronic Field Study application.....	58
The Image window .....	59
Working with multiple open images .....	59
What else can be displayed in the Image window? .....	62
Menu Bar, toolbars, and Status Bar.....	63
Menu Bar.....	64
Toolbars .....	64
Status Bar .....	65
Context menus .....	67



Closing EFS.....	67
<b>Chapter 4 — EFS Application Windows.....</b>	<b>69</b>
Other EFS windows .....	69
The Workspace window .....	71
The Navigation window.....	71
The compass rosette .....	72
The Thumbnail window .....	72
The Output window .....	73
The Folder Info tab .....	74
The Tool Info tab .....	75
The Query Info tab.....	75
Showing and hiding EFS windows .....	76
<b>Chapter 5 — Putting EFS to Work .....</b>	<b>77</b>
Where to begin .....	77
Finding the images you need.....	77
Approaches for searching in EFS .....	77
How EFS is used .....	79
How will <i>you</i> use EFS? .....	80
<b>Chapter 6 — Searching For Images.....</b>	<b>83</b>
Overview.....	83
Terms .....	83
Different ways to search for images.....	84
Other actions initiate searches .....	85
What happens when you search.....	85
Searching for and opening images .....	88
Options for opening images.....	88
Clicking a point on a map or an image.....	90
Searching by entering GPS coordinates.....	91
Searching by address.....	92
GIS data for address searching .....	92
Searching for images by using text data in a GIS annotation layer.....	96
Opening images directly .....	96
Closing images .....	96
Image Tool properties.....	96
The Warehouse List tab .....	97
The Search and Sort tab .....	99
The Settings tab .....	102
Sorting search hits in the Thumbnail window .....	105
<b>Chapter 7 — Navigating Within and Between Images .....</b>	<b>111</b>
Navigation concepts .....	111
Two ways to look at it .....	111
Using navigation features .....	114
Opening adjacent images .....	114
Opening alternate views .....	115
Opening similar images .....	123
Centering the Navigation Point .....	124
Navigating a route .....	125
<b>Chapter 8 — Viewing Images .....</b>	<b>131</b>
Viewing images.....	131
What is Standard View? .....	131
What is PentaView?.....	132
PentaView vs. Standard View.....	133
Viewing images in PentaView.....	133
PentaView window arrangements.....	134

PentaView window sizes, shapes, and positions .....	136
PentaView color cones .....	136
Adding scroll bars in PentaView .....	138
Swapping images within PentaView .....	138
Opening a similar image in PentaView .....	138
Using PentaView with other EFS features .....	139
Making the most of PentaView .....	140
Ending a PentaView session .....	140
Scrolling, panning, and viewing the full screen .....	141
Scrolling .....	141
Panning .....	141
Viewing in Full Screen Mode .....	143
Magnifying images .....	144
Zooming in .....	144
Zooming out .....	145
Returning to the starting percentage (100%) .....	145
Displaying the entire image .....	146
Applying zoom to all open images .....	146
Adjusting brightness and contrast .....	147
Saving an adjusted image .....	149
Refreshing the active image .....	149
<b>Chapter 9 — Printing, Extracting, and Exporting Images .....</b>	<b>151</b>
Printing images .....	151
The Print dialog box .....	151
Printing the entire image .....	152
Printing the visible part of the Image window .....	154
Extracting and exporting images .....	155
Extracting vs. exporting .....	155
Choice of watermark .....	156
Extracting images .....	156
Exporting images .....	161
<b>Chapter 10 — Workspaces .....</b>	<b>169</b>
An overview of workspaces .....	169
What is a workspace? .....	169
What is a Pictometry Workspace File? .....	169
Are workspaces required? .....	169
Why create a workspace? .....	170
What's in a workspace? .....	170
You can have multiple workspaces .....	170
The Workspace window .....	171
The structure of a workspace .....	171
Using workspaces .....	174
Creating a workspace .....	174
Opening a workspace .....	176
Expanding and collapsing workspace items .....	176
Deleting items from a workspace .....	177
Saving a workspace .....	178
Hiding, showing, and closing a workspace .....	179

## PART II — Using Measurement and Overlay Tools

<b>Chapter 11 — Using Measurement Tools .....</b>	<b>183</b>
What are the measurement tools? .....	183
Before you measure .....	184

Changing units of measure .....	184
Changing the coordinate system .....	185
Changing tool properties.....	185
Including elevation in distance measurements .....	189
Working above ground level .....	192
Using measurement tools .....	198
Measuring distance.....	199
Measuring heights .....	201
Measuring area.....	203
Measuring elevation.....	205
Measuring bearing and angles .....	207
Viewing an object's coordinates.....	209
Viewing elevation contour lines.....	210

## **Chapter 12 — Creating Annotations.....213**

Overview.....	213
Annotations are overlays .....	213
Another way to annotate an image .....	213
Several kinds of annotations.....	213
Types of user-defined annotations.....	214
Annotation properties.....	215
Where are annotations stored? .....	215
Global and local annotations .....	215
Annotation layers .....	215
Annotation and annotation layer properties .....	216
Creating an annotation layer.....	218
Changing layer properties.....	220
Renaming an annotation or an annotation layer .....	221
Creating annotations.....	221
The Text Annotation Tool .....	222
Defining attributes for lines, points, and circles.....	223
The Line Annotation Tool.....	225
The Circle Annotation Tool .....	229
The Point Annotation Tool .....	230
The Icon Annotation Tool .....	232
The Link Annotation Tool.....	237

## **Chapter 13 — Working with Annotations.....241**

Hiding and viewing annotations .....	241
Changing annotations.....	243
Editing an annotation's properties.....	243
Selecting annotations in an image.....	244
Moving annotations.....	246
Moving a line's vertex .....	250
Moving and resizing circle annotations .....	251
Deleting annotations .....	252
Saving tool output as an annotation.....	253
Tools that generate output you can save.....	253
Tool output annotations must be in annotation layers.....	254
Saving tool output as annotations.....	254
Thresholds for viewing annotations.....	257
Max View and Min View thresholds .....	257
Units are selectable .....	257
Why use thresholds? .....	258
When you might use thresholds .....	259
View thresholds apply to layers only .....	259
Setting view thresholds.....	259
Scalable annotations .....	260
Three ways to scale.....	260
Overriding a layer's settings .....	263
Copying global annotations to other workspaces.....	264

Saving global annotations to a file .....	264
Importing saved annotation files .....	264
<b>Chapter 14 — Creating Grid Overlays .....</b>	<b>265</b>
What is a grid overlay? .....	265
The Grid Tool .....	266
Grids are saved in workspaces .....	266
Grids can store data .....	266
Importing and exporting .....	266
Types of grids .....	267
Setting Grid Tool properties .....	268
The Grid Tool Properties dialog box .....	268
Creating a grid .....	273
Creating a circular grid .....	273
Creating a rectangular grid .....	275
Creating a grid with the mouse .....	277
Renaming a grid layer .....	279
Importing a grid from a workspace .....	279
Viewing a grid on an image .....	281
Adding data to a grid .....	282
Where is the data saved? .....	282
Selecting a file in which to save grid data .....	282
Entering grid data .....	284
Exporting a grid .....	286
Exporting a grid to a shapefile .....	286
Exporting a grid to an SDE database .....	288
Changing a grid .....	290
Changing a grid's properties .....	290
Rotating a grid .....	291
Moving a grid .....	292
Changing grid data .....	292
Deleting a grid .....	293

## PART III — Using EFS with GIS Data

<b>Chapter 15 — GIS Concepts .....</b>	<b>297</b>
What is a GIS? .....	297
A GIS example .....	297
Vector and text data .....	299
Where to find GIS data .....	300
About shapefiles .....	300
About SDE feature classes .....	301
Using GIS data in EFS .....	301
<b>Chapter 16 — Adding a GIS Annotation Layer .....</b>	<b>303</b>
Before you add a GIS annotation layer .....	303
Sources for GIS data .....	303
Understanding layer properties .....	303
PDX index files for layers that use shapefile data .....	305
Adding the layer .....	306
Using shapefile data to add a GIS annotation layer .....	306
Using SDE data to add a GIS annotation layer .....	313
Viewing, hiding, and removing GIS annotation layers .....	314
Viewing and hiding GIS annotation layers .....	314
Removing GIS annotation layers .....	316
Refreshing GIS data .....	316
Global Refresh feature .....	316
Changing properties and renaming layers .....	317

Relocating shapefiles for GIS annotation layers .....	318
Topics for SDE users.....	318
Connecting to your SDE database.....	318
Refreshing SDE data .....	319
Managing your SDE tables .....	320

## **Chapter 17 — Working with GIS Annotation Layers .....325**

GIS Layer Search .....	325
Searching a GIS annotation layer .....	326
GIS Query Tool.....	330
Some typical examples.....	330
Querying a GIS annotation layer.....	331
Query layer setup .....	331
Query Tool setup .....	334
Querying the layer .....	337
Query results — some examples.....	338
Custom fields .....	340
An example.....	341
Maximizing system performance .....	342
What EFS does and what you can do.....	342
GIS utilities .....	344
DBF File Maintenance .....	344
Shapefile Maintenance .....	344
DBF File Maintenance utilities .....	344
Shapefile Maintenance utilities .....	348

## **Chapter 18 — GIS Images.....353**

What is a GIS Image?.....	353
Raster data = image data .....	353
Vector data = GIS data .....	353
What makes up a GIS Image?.....	353
Creating a new GIS Image in EFS.....	354
Adjusting a GIS Image.....	356
Adding a GIS Image to a workspace .....	357
Menu options for GIS Images .....	358
Changing layer associations.....	358
Relocating shapefiles for GIS Images.....	358
Viewing and changing GIS Image properties.....	358

# **PART IV — Advanced EFS Topics**

## **Chapter 19 — Exporting Data.....363**

Exporting measurement data .....	363
Overview.....	363
Exporting tool data to a text file .....	369
Exporting tool data to a shapefile .....	371
Exporting tool data to an SDE database.....	373
Exporting annotation layers to shapefiles .....	374
Why create a shapefile from an annotation layer?.....	374
Two options for exporting .....	374
Which types of annotations can be exported? .....	374
What data is exported?.....	376
Exporting a layer.....	376
Exporting image polygons.....	377
Why export image polygons?.....	377
Where are image polygons exported from? .....	378
Exported image polygons can be sorted.....	378
A summary .....	379

The export process.....	380
<b>Chapter 20 — Changing Scale and Units .....</b>	<b>385</b>
Understanding scale.....	385
From the ground to your screen .....	386
Choices for scale.....	388
Zoom/Scale box displays your choice .....	388
Summary of scale choices.....	390
Changing the scale and its display .....	390
Three ways to change zoom.....	391
Changing zoom by typing in the Zoom/Scale box.....	391
The math behind the scales .....	392
<b>Chapter 21 — Advanced Workspace Topics.....</b>	<b>395</b>
Adding images to a workspace.....	395
Adding a base map image.....	395
Adding an Ortho image .....	396
Adding an Oblique image .....	397
Adding a GIS Image.....	397
Adding open images to a workspace.....	397
Adding images automatically when opened.....	399
Adding all image search hits.....	400
Opening images from a workspace .....	400
Sharing workspaces .....	400
If you receive a workspace from someone .....	400
Fixing access to files from workspace items.....	401
Access information stored by a workspace .....	401
Why access fails .....	402
How do I know if the connection is broken? .....	402
Fixing a broken connection.....	403
Rearranging workspace items .....	407
Why is the order of workspace items important? .....	407
Using multiple workspaces .....	408
Viewing one workspace at a time .....	409
Viewing two workspaces simultaneously .....	409
Context menu options .....	409
Creating a warehouse from a workspace .....	410
<b>Chapter 22 — Customizing EFS.....</b>	<b>413</b>
Changing the appearance of EFS .....	413
EFS provides layout options.....	414
Showing and hiding EFS windows.....	415
Docking and undocking windows and toolbars .....	415
Hiding and showing toolbars .....	416
Customizing toolbars.....	416
Options for viewing the compass.....	418
Compass properties .....	419
Customizing the Status Bar .....	421
Creating custom Configurations (screen layouts) .....	421
What is a Configuration? .....	421
Creating a new Configuration .....	422
Activating a Configuration .....	422
Changing a Configuration.....	423
Deleting a Configuration.....	423
Configurations can be exported to PCF files .....	423
Creating custom tools.....	426
Command line arguments .....	427
Macro value formatting.....	429

## PART V — Reference

<b>Appendix A — EFS Toolbars.....</b>	<b>435</b>
Installed toolbar buttons.....	435
The Tools toolbar.....	435
The View toolbar.....	436
The Navigate toolbar .....	437
Other buttons you might add to toolbars.....	438
Buttons that change the appearance of the active image .....	438
Buttons that show and hide EFS windows.....	438
Buttons that limit image searching.....	439
Buttons for setting tool properties .....	439
Standard buttons .....	439
Buttons for viewing images in Standard View .....	439
Buttons for viewing scenes in PentaView .....	440
Workspace buttons.....	440
<b>Appendix B — Context Menus .....</b>	<b>441</b>
Image window context menu.....	441
Workspace window context menu.....	443
Output window context menu.....	446
Navigation window context menu.....	447
Status Bar context menu .....	447
Thumbnail window context menu.....	448
Toolbar context menu .....	448
<b>Appendix C — ALOHA Annotations .....</b>	<b>449</b>
Overview.....	449
What is ALOHA? .....	449
The parts of an ALOHA annotation.....	449
ALOHA annotations in EFS .....	450
Requirements .....	450
Using ALOHA and EFS together .....	450
Adding an ALOHA annotation.....	451
Changing an ALOHA annotation in EFS.....	455
Exporting your ALOHA layer .....	456
Removing ALOHA annotations.....	458
Relocating PAS files .....	459
<b>Appendix D — Advanced User Mode .....</b>	<b>461</b>
Setting Advanced User Mode.....	461
Advanced User Mode options.....	461
<b>Appendix E — InQuest OSGB-36 Coordinate System .....</b>	<b>463</b>
Installing Grid InQuest .....	463
<b>Appendix F — MGRS Coordinate Systems.....</b>	<b>465</b>
Using MGRS coordinates in EFS.....	465
The format of the MGRS coordinate.....	465
<b>Appendix G — Working with PGS Scripts .....</b>	<b>467</b>
GIS Images in the workspace .....	467
GIS annotation layers available to all images .....	467
Loading PGS Scripts and changing properties .....	468
Saving a GIS Image as a PGS file.....	469
<b>Appendix H — Getting Help .....</b>	<b>471</b>

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Try this first.....	471
Contacting Customer Service .....	471
Downloading updates to EFS .....	471
Downloading updates from the Pictometry website .....	471
Using Updater to update EFS.....	473
<b>Glossary .....</b>	<b>479</b>
<b>Index .....</b>	<b>493</b>



# Welcome

Welcome to Electronic Field Study™ (EFS), the easy-to-use software system developed by Pictometry® International Corporation so you can view and work with aerial images contained in a Pictometry Image Library or purchased online.

## Who should read this guide

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This user guide was written for both new and current users. It addresses the needs of all users, whether they've purchased one image or an entire library of images.

## How this guide is organized

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The *EFS User Guide* is comprised of five major "parts." Each part covers a different topic area of EFS and is a complete book. The chapter numbers in each part continue in sequence from the previous part.

### **The *EFS User Guide* contains ...**

- Table of Contents
- Welcome (this section)
- Part I – Getting Started with EFS
- Part II – Using Measurement and Overlay Tools
- Part III – Using EFS with GIS Data
- Part IV – Advanced EFS Topics
- Part V - Reference
- Glossary
- Index

### **Organization of parts**

Each part contains a title page that shows you that part's topics at a glance and one or more chapters.

### **Organization of chapters**

The chapters in this guide generally cover concepts about a topic or feature, followed by procedures for using that feature. Read or skim the conceptual sections to gain an understanding of how things work. You might scan the topic headings to see which procedures that chapter covers. You don't need to read the procedures until you're ready to follow them.

The page numbers in each chapter continue from the previous chapter. Here's a description of each part and the topics covered in each chapter.

## **Part I: Getting Started with EFS**

If you've never used EFS, you should look at Part I. It is designed to give users foundational concepts and procedures for getting started with EFS. If you're an experienced user, you may also find this part helpful for detailed explanations of specific features or as a reference for procedures you use less often.

### ***Chapter 1, "Installing and Setting up EFS"***

Chapter 1 contains instructions for installing EFS, a description of system requirements, tips about how to set up your system to optimize EFS performance, information about licensing, and information about first-time setup (including setup for searching by street address).

### ***Chapter 2, "Overview"***

If you'd like an overview of EFS features, GSD and image resolution, image types, Pictometry Image Libraries, and overlays, read Chapter 2.

### ***Chapter 3, "Starting EFS and Getting Oriented"***

In Chapter 3 you'll find procedures for starting EFS and information you need to start using it, such as descriptions of its menus and buttons, and information about the Image window—the window in which you'll view images.

### ***Chapter 4, "EFS Application Windows"***

Chapter 4 discusses the other EFS windows you can view—windows that show details about your images, about annotations you've created, about search hits, and about tool measurements, for example. Many users don't need to see those details; they work with the Image window only. However, when you need to see details these windows are available for you to view.

### ***Chapter 5, "Putting EFS to Work"***

This chapter discusses how you can use EFS in your particular work setting. It does not contain any procedures; it contains only ideas to help you determine the best way in which to work with EFS. Using some typical scenarios, it describes ways in which different a user might approach image searching given each scenario.

### ***Chapter 6, "Searching For Images"***

Chapter 6 describes how you'll use the Image Tool to search a set of images (called an Image Warehouse) or a workspace. You'll learn the different ways in which to search for and retrieve images and how those images are displayed. It also contains information about how the order in which search results are sorted in the Thumbnail window.

### *Chapter 7, “Navigating Within and Between Images”*

Looking at the items in an Oblique image can sometimes be disorienting. So Chapter 7 begins with an overview that describes how to keep your bearings as you look at images, move around in them, and view other related images (such as adjacent images or images showing an object from one of four compass directions or from directly above). In addition to concepts, this chapter includes procedures for using EFS navigation features such as the Navigate Tool and the Alternate View feature.

### *Chapter 8, “Viewing Images”*

EFS provides two different ways to view images: Standard View and PentaView. Standard View is the default viewing mode in EFS. It’s helpful for measuring and annotating images; and because one image can fill the entire image viewing area, you can see more of that image. PentaView lets you view the same area from five different directions simultaneously, which is helpful when you want to focus on certain details in an image. This chapter explains both ways of viewing images.

Chapter 8 also describes how to use the panning and scrolling features to see the parts of an image not in view; and how to change an image’s magnification, contrast, and brightness.

### *Chapter 9, “Printing, Extracting, and Exporting Images”*

Chapter 9 includes procedures for printing and for exporting all or part of an image. (Exporting part of an image is called “extracting.”)

### *Chapter 10, “Workspaces”*

In this chapter you’ll learn what workspaces are, why they’re helpful, what’s contained in them, and how to use them. This chapter includes procedures for creating, saving, and opening images, and for adding them to workspaces. (Advanced features of workspaces are covered in Chapter 21.)

## **Part II: Using Measurement and Overlay Tools**

After searching for and viewing images, most users typically use tools to measure, annotate, or overlay images. The chapters in Part II discuss the EFS tools for measuring, annotating, and creating grid overlays on images, and include procedures for using these tools. Like Part I, this part is helpful for new users and experienced users alike.

### *Chapter 11, “Using Measurement Tools”*

Chapter 11 contains instructions for using tools to measure distance, height, area, elevation, perimeter, bearing, and location. It also describes how to:

- change the units of measure and coordinate system in which your measurements are shown,
- offset the ground for greater accuracy in measurements and annotations that need to be placed off the ground in an image, and

- view elevation contour lines on your images.

Measurement tools have properties that affect the behavior of the tool and how measurement results are shown. Chapter 11 contains descriptions of the tool properties plus instructions for changing them.

### *Chapter 12, “Creating Annotations”*

In Chapter 12 you’ll find concepts about and procedures for using annotation tools to annotate images with text, lines, circles, points, icons, and links.

### *Chapter 13, “Working with Annotations”*

Chapter 13 builds upon the basic concepts covered in Chapter 12 with advanced concepts such as:

- how to change (move or resize) annotations, and
- how to save measurement tool output (lines and points) as annotations in your workspace.

It also discusses how to set thresholds for viewing annotations and how to scale annotations so that when you increase or decrease the magnification (zoom), the annotation is scaled along with the image. It’s helpful to become familiar with the content in Chapter 12 before looking at Chapter 13.

### *Chapter 14, “Grid Overlays”*

Chapter 14 discusses how to use the Grid Tool to create grid overlays for your images, how to enter data into a grid’s segments, and how to export data from a grid.

## **Part III: Using EFS with GIS Data**

The chapters in Part III discuss how to incorporate GIS data in EFS. Skip this part if you won’t be using GIS data.

### *Chapter 15, “GIS Concepts”*

This chapter provides a brief overview of Geographic Information Systems, their associated “GIS data,” and how GIS data is integrated with EFS.

### *Chapter 16, “Adding a GIS Annotation Layer”*

Chapter 16 describes GIS annotation layer properties and contains instructions for adding and managing GIS annotation layers.

### *Chapter 17, “Working with GIS Annotation Layers”*

Once GIS annotation layers have been added to a workspace, there are various things you can do with them. For example, with the GIS Layer Search feature, you can search a layer for text, and then using the coordinate data in the matching records, view the images associated with those records. With the GIS Query Tool, you can query a location and view GIS data associated with that location.

Chapter 17 discusses these features, plus utilities you can use with your GIS data, and how you can optimize EFS performance when viewing or searching for GIS data.

### *Chapter 18, “GIS Images”*

Chapter 18 includes concepts about special maps called “GIS Images” and procedures for creating and changing them.

## **Part IV: Advanced EFS Topics**

Part IV covers advanced, less-commonly used features of EFS. It discusses topics such as how to customize EFS, how to fix the stored location for files you access from a workspace, and how to export data. Data Administrators and experienced users will find Part IV very informative.

### *Chapter 19, “Exporting Data”*

This chapter describes how to export tool data to text files, shapefiles, and SDE databases. You can export annotations (vector and text data), annotation layers, image polygons, and measurements. (Exporting images is covered in Chapter 9.)

### *Chapter 20, “Changing Scale and Units”*

For users who want to learn more about scale and how it affects what you see on the computer screen, Chapter 20 provides a conceptual explanation of Ground Sample Distance (GSD), scale and units, along with a description of how EFS uses various scales to display images. In addition to the conceptual topics, this chapter contains procedures for changing the scale and the zoom.

### *Chapter 21, “Advanced Workspace Topics”*

You should look at this chapter if:

- You want to add an image to a workspace by navigating to its location in a directory.
- You want to share workspaces with other users.
- You have problems opening a workspace item or searching a warehouse. (You may have to fix the location information that EFS needs to access the files.)
- You want to explore other advanced topics, such as viewing the properties of workspace items, using multiple workspaces, and using workspace utilities.

### *Chapter 22, “Customizing EFS”*

This chapter describes how to customize EFS to suit your preferences. You can customize the appearance of the Electronic Field Study application in various ways. For example, you can show windows (to view the workspace or measurement details). You can also add (or remove) toolbar buttons, change the size of toolbar buttons, and change the font on the Status Bar.

You can also select one of the default layouts provided by EFS to accommodate users' varying needs.

If you share a computer with other users, you'll appreciate the EFS feature that lets you save your own custom configuration and load it whenever you want to work with EFS.

If you want to run external programs as tools within EFS, you'll want to read about creating custom tools.

## **Part V: Reference**

Part V contains appendixes, a glossary, and an index. The appendixes cover a wide range of topics. Some are helpful for all users and others are directed at specific users.

### *Appendix A, "EFS Toolbars"*

Appendix A is provided for quick reference. It describes the buttons available on the toolbars after EFS is installed and describes frequently used buttons you might want to add to a toolbar.

### *Appendix B, "Context Menus"*

Context menus are context-sensitive pop-up menus that appear when you click the right mouse button within the EFS application window.

Appendix B describes the options on each context menu that appears in EFS.

### *Appendix C, "ALOHA Annotations"*

This appendix is for ALOHA users only. It provides information about how to incorporate ALOHA annotations into your EFS images.

### *Appendix D, "Options Available with Advanced User Mode"*

Users who have the Advanced User Mode feature of EFS turned on will want to read this appendix. It discusses the menu options available when you enable Advanced User Mode. (Some of these options require a special license option.)

### *Appendix E, "InQuest OSGB-36 Coordinate System"*

This appendix is for users working in the British Isles with EFS and OSGB-36 British National Grid coordinates. It provides instructions for downloading and installing Grid InQuest.

### *Appendix F, "MGRS Coordinate Systems"*

Appendix F indicates what you need to know about using MGRS coordinates in EFS. It describes how EFS accommodates the MGRS coordinate format, and it includes a description of the format.

### *Appendix G, “Working with PGS Scripts”*

This appendix deals with a legacy GIS Image format called the PGS Script, created by the Pictometry GeoScript (PGS) software. Although the GeoScript software is no longer actively supported, you can still use PGS Scripts in EFS. This appendix discusses how EFS handles PGS Scripts, how you can modify them, and how you can save a GIS Image to a PGS file.

### *Appendix H, “Getting Help”*

Pictometry offers a variety of support options to help you through any problems you may encounter either installing or using EFS. This appendix describes available resources and how to contact Pictometry’s Customer Service Department. It also includes information about how to download EFS updates from the Pictometry Online web site and by using Updater—a utility program provided with EFS.

### *Glossary*

The glossary defines terms used in EFS and in this guide. The terms are in alphabetical order.

### *Index*

The index offers a comprehensive list of topics found throughout the guide..

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## **How to use this guide**

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This book was not intended to be read cover to cover. It is both a user guide and a reference guide. Use the Table of Contents and the index for quick access to pages that contain topics you are interested in.

### **For new users ...**

Although you don’t need to read this guide sequentially, new users will benefit from reading portions of the chapters in Part I, “Getting Started With EFS.”

Chapter 2 will help you gain an understanding of Pictometry images. To become familiar with the Electronic Field Study application, it’s helpful to start EFS and locate the parts of the application described in Chapter 3, “Starting EFS and Getting Oriented.”

When you’re comfortable with the interface, read a bit about workspaces and then create one. (You don’t need to read all of Chapter 10 to do this.) From there, check out Chapter 6, “Searching For Images.” When you’re just starting out with EFS, you can skip right to the topic called “Searching for and opening images.” Later on, you should look at the sections on “Image Tool properties,” “Limiting Image Search,” and “Limiting open images” for valuable information to help you optimize your image searches.

After this it’s up to you to determine what to look at next, depending on your needs and how you intend to use EFS.

## Other EFS Documentation

EFS includes the following documents in addition to this guide:

Document	Description
<i>EFS COM Interface Guide</i>	A reference guide for COM API developers. Includes information about creating plugin tools to EFS.
<i>EFS 2.7 Configuration Editor Guide</i>	For EFS System and Data Administrators, this document describes how to use the EFS 2.7 Configuration Editor to give your EFS application a customized appearance, thereby providing a common interface for your EFS users.
<i>EFS Version 2.7 Release Notes</i>	A document that provides information about each revision of EFS Version 2-7. The document describes software enhancements, defects corrected, and known defects with suggested workarounds.

In addition to the documents listed, EFS includes a Help system that you can use while EFS is open.

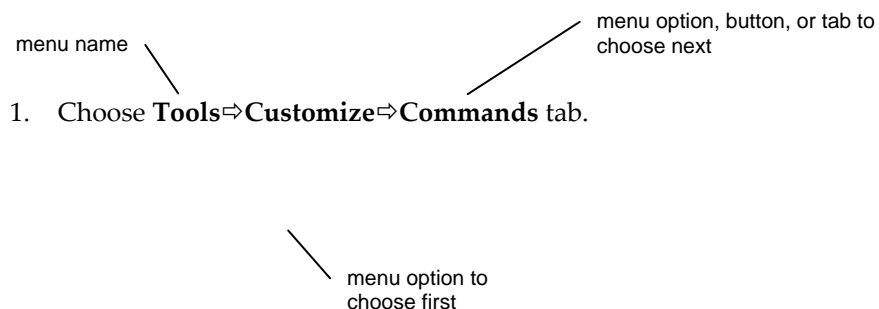
## Conventions

This guide uses standard Microsoft® Windows® terminology for mouse actions. For example,

The term ...	Means ...
Click	To position the mouse pointer on an object, then quickly press and release the <i>left</i> mouse button.
Double-click	To position the mouse pointer on an object, then quickly press and release the <i>left</i> mouse button twice in rapid succession.
Drag	To position the mouse pointer on an object, press and hold the <i>left</i> mouse button while moving the mouse to the desired position, then release the mouse button.
Right-click	To position the mouse pointer on an object, then quickly press and release the <i>right</i> mouse button.

The following conventions are used throughout this guide:

- Names of keyboard keys appear in uppercase, as in this example:  
Press **ENTER**.
- The word “Pictometry” refers to Pictometry International Corporation.
- The terms “warehouse” and “Image Warehouse” are used interchangeably.
- Menu options you choose are written in the format shown in the following example:





- Some procedures have steps in which you can choose between two or more options (often a toolbar button, a keyboard shortcut, and a menu option) that produce the same result. For example:



1. Do *one* of the following:
  - Click the **Tool Properties** button on the toolbar.
  - or —
  - Press **CTRL + P**.
  - or —
  - Choose **Tools⇒Properties**.

If your toolbars do not include the button described in the procedure, you can add that button to a toolbar or you can choose the EFS menu option shown in the procedure. (See “Adding and removing toolbar buttons” in Chapter 22.)

- Keys or buttons you click appear in bold type.
- Values you must supply or names that vary are shown in angle brackets (<>) as in the following examples:
  - Right-click the annotation to be edited, and select **Properties for <annotation name>** from the context menu.
- Important information is emphasized in this guide as shown in the following example:

**Important:** Use caution when deleting SDE tables. The Tables tab lets you delete a table from the SDE database. Do NOT use this feature to remove GIS annotation layers from your workspace.

- Tips and helpful information are emphasized in this guide as shown in these examples:

**Note:** If you exit EFS without saving a new or changed workspace, EFS prompts you to save the workspace. It's a good idea to save your workspace before exiting EFS.

**Tip:** Many users find it convenient to both start EFS and open a workspace by double-clicking a shortcut to a workspace. For more information on creating shortcuts, see “Shortcut” in Windows® Help.

Tips are sometimes found in the margin.

*For Pictometry  
Online users*

- Notes and sections of this guide that pertain to Pictometry Online™ users are highlighted by the margin note shown here.

## Two types of users

EFS serves the needs of various users, who can be categorized as either:

- warehouse users, or
- non-warehouse users.

In order to make important distinctions clear throughout this guide, we use the term **warehouse user** for any customer who purchased a *set of images* or wants to organize the images they've purchased into a set. We use the term **non-warehouse user** for any customer who bought images individually and wants to *use those images individually*.

## Your feedback is important to us

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If you find errors in this guide, or if you have comments about it, we'd like to know. Please email us at [documentation@pictometry.com](mailto:documentation@pictometry.com). Thank you.

# What's New in Version 2.7

Welcome to EFS Version 2.7! With this version, EFS has crossed new thresholds in efficiency and usability, based on valuable customer feedback. Here are some of the enhancements you'll see.

## Selectable user interface

A choice of five screen layouts, each carefully designed with a specific level of functionality for maximum efficiency and viewing space. You can easily switch between layouts and further customize any layout as desired. For descriptions of the layouts, see "Choices for screen layout" on page 10 and "EFS provides layout options" on page 414. To learn how to switch between layouts, see "Activating a Configuration" on page 422.

## PentaView — a five-way view

A new way to view multiple, related images. You can simultaneously view an area from four compass directions plus orthogonally. PentaView provides a powerful way in which to study a landscape from all sides at once. PentaView is described in "Viewing images," which starts on page 131.

## Redesigned image icons

Image icons in the workspace, on image title bars, and on Workbook Mode tabs are now color coded to reflect the orientations of the images they represent. The new image icons can be seen in figures that show the EFS application, such as Figure 3-1 on page 58.

## Enhanced image navigation

- Buttons that open images of other orientations also appear as clickable image overlays. See "What are Navigation Cameras?" on 119.
- New clickable on-image buttons open the next (or previous) similarly oriented search hit in the thumbnail list. See "Opening similar images" on page 123.

## Grid Tool

A new tool for creating rectangular and circular grid overlays containing equal-sized segments into which you can enter data. Grids can be saved in a workspace, and their data can be exported to a shapefile or to an SDE database. The Grid Tool is described in Chapter 14, "Creating Grid Overlays."

## Enhanced tool data export

When exporting tool data, you can now enter and export additional data into a template you select. See “Exporting measurement data,” which starts on page 363.

## Above-ground measuring and annotating improved

To guarantee accuracy in measuring and annotating image features that don't touch the ground, EFS now lets you establish a “ground plane offset” for working above ground level. See “Working above ground level” on page 192.

## Ability to overlay contour lines

Ability to overlay images with elevation contour lines—with or without elevation values labeling each line. See “Viewing elevation contour lines” on page 210.

## More options for GIS users

- GIS annotation layers can be labeled with the data from a text field you choose. See Figure 15-3 on page 298. To learn about the “Auto label” property, see “Auto label” in Chapter 16.
- Polygon GIS data can be displayed with fill color that now has a selectable level of opacity. See “Polygon opacity” in Chapter 16.
- The GIS Query Tool can be set up to “auto select” the layer to be queried. See “The Auto select layer feature” on page 334.
- SDE users can now use EFS with SDE version 9.

## Workspace enhancements

- GIS annotation layer names are shown in a color matching that of the on-image GIS data for that layer. You'll see this in figures showing workspaces that contain GIS annotation layers, such as Figure 16-1 on page 305.
- Annotation and GIS annotation layers now have a checkbox for viewing and hiding that layer. See “Checkboxes in the workspace” on pages 241 (for user-defined layers) and 314 (for GIS annotation layers).
- Workspace items for user-defined annotations now include distinctive icons to identify the types of annotations. See Figure 12-1 on page 216.

## Thumbnail sorting by warehouse

You can now sort your search hits by the warehouse from which they originated. See “Warehouse Order sort” on page 109.

## COM/Plug-in interface enhancements

For those who use EFS in concert with other software, interfaces have been redesigned for greater functionality. See the *EFS COM Interface Guide*.

### **Other tool enhancements**

- The Zoom Tool can now be used with a mouse wheel (roll one way to zoom in, the other to zoom out). See “Magnifying images” on page 144.
- Link annotations can link to Internet URLs. See “The Link Annotation Tool.”

### **Updater — a new application for updating EFS**

Along with EFS, you now have a new application—Updater.

Updater checks for, downloads, and installs updates to EFS and to itself.



# Part I

## Getting Started With EFS

To learn about ...	See ...
Installing EFS, system requirements, optimizing performance, licensing, and system setup	Chapter 1
EFS features and imaging concepts	Chapter 2
Starting EFS and getting familiar with the screen	Chapter 3
Other EFS windows you can view	Chapter 4
How to apply EFS to your particular needs	Chapter 5
Searching for images, viewing search hits, and sorting search hits in the Thumbnail window	Chapter 6
Viewing adjacent images, opening alternate views, and charting a path within and between images	Chapter 7
Viewing images in Standard View and in PentaView, scrolling, panning, and magnifying images	Chapter 8
Printing and exporting (all or portions of) images	Chapter 9
Workspaces	Chapter 10



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# Chapter 1 — Installing and Setting up EFS

This chapter contains procedures for installing EFS, information about licensing, procedures for indicating where your images reside (“linking”), and information about setting up an “Address Search profile” so users can search for images by address.

## Topics covered in this chapter ... page

Before installing.....	2
What is an Image Library? .....	2
Installing EFS .....	3
After Installing .....	9
Re-installing and uninstalling EFS.....	18
Linking to your Image Warehouse.....	19
Address Search setup .....	24
Creating an Address Search profile .....	26
Exporting a profile to a PAX file.....	35
Importing a profile from a PAX file.....	35
Address Search toolbars .....	36
Highlighting data for the land parcel.....	39

Before proceeding further, it’s important for you to understand some terms and the distinctions between them.

## Important distinctions between terms

*To learn more about Image Libraries, see page 2.*

**Image Warehouse**—refers only to the collection of image files.

**Image Library**—the term used to describe your images (in an Image Warehouse), together with their related files (such as GIS data files).

**EFS**—refers only to the software application, not to the images or to related files.

**Pictometry**—refers collectively to the EFS application, images, and related files.

## Before using EFS

Before you can use EFS, you must link the application to the data. That is you must tell EFS where the images reside on your computer. (The topic “Linking to your Image Warehouse” on page 19 describes how to do this.)

## Before installing

---

Before installing EFS, check the following system requirements for running EFS. Minimally, you must have:

- Microsoft® Windows® 2000 or higher
- 128 MB RAM
- A network server, if you plan on installing your data on a network
- 50MB of disk storage space for the EFS application

**Note:** Be sure you have enough hard drive storage space for your images.

### Resolution and settings

Although we support 800 x 600 resolution, we recommend that your screen's resolution be set to 1024 x 768 or higher. EFS toolbars may not show up correctly at a lower resolution. For the best view of EFS images and thumbnails, set the display color to 24-bit or higher.

### For best performance

For optimal performance while running EFS, we recommend you follow these guidelines:

*For tips on performance when working with GIS data, see "Maximizing system performance" in Part III, Chapter 17.*

- While EFS is running, keep the number of open programs to a minimum. The more memory that's used by other programs, the less memory there is available for EFS.
- Keep the number of images that are open at the same time to a minimum, since at least 18MB of memory is required for each open image.
- Make sure your computer has at least 256 MB of RAM, since memory helps performance.

## What is an Image Library?

---

An **Image Library** is a repository for images and related files organized in a structure that is easily accessed by EFS. An Image Library contains folders for the following: elevation files, maps and GIS files, image polygons, and the Image Warehouse—where the images are stored.

### Getting your images

Images you purchase from Pictometry Online are downloaded to your computer when you purchase them. Image Libraries you purchase from Pictometry International may be available on a CD, external hard drive, or a network server. (Pictometry's Customer Service will work with you to determine the delivery method.)

**Important:** To avoid accidental loss of data, your Image Library should reside in a directory that has read-only permissions assigned to it.

## Installing EFS

To use EFS for its intended purpose, you'll need the EFS software and images. Images generally come from an Image Library or are downloaded from Pictometry Online.

### The EFS installation program

The installation program installs the EFS application only; it does not copy images or other data to your computer.

Depending on your setup, you can install the EFS software from a CD, from your network, or from the Internet.

**Important:** For EFS to be available to all user accounts, you must be logged in with administrator permissions when you install it. Otherwise, EFS will be installed only for the user account that is currently logged in.

If you plan on selecting **Typical** for the setup type, you should have write permission to the Windows System32 directory (whether installing EFS for all users or just for your own account). Otherwise, you'll need to select **UserLevel** for the setup type.

### Installation procedure

Use the following procedure to install EFS on your computer.

*The installation process is the same whether you're installing EFS for the first time or upgrading from a previous version.*

#### ◆ To install EFS:

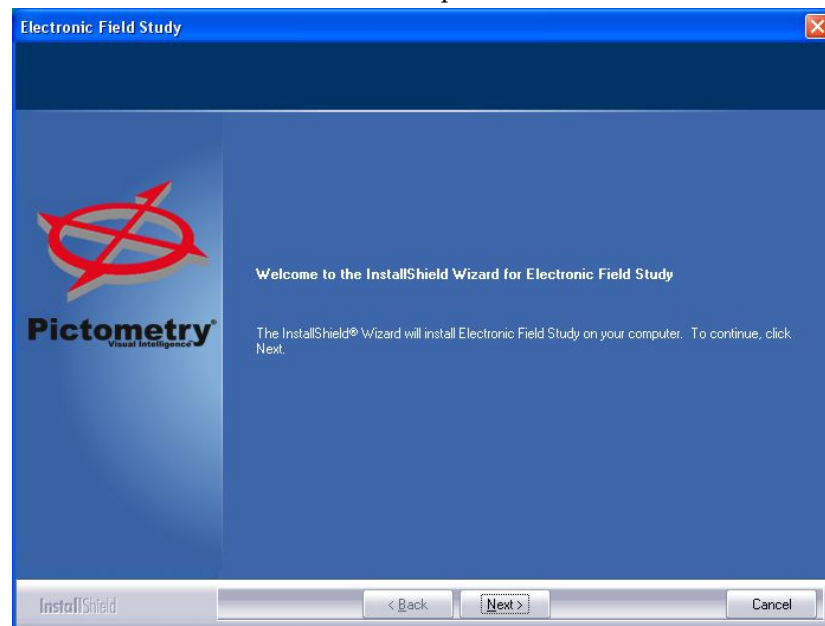
1. Do *one* of the following:
  - If you have an EFS CD, place it in the CD-ROM drive.
  - or —
  - If the installation program is available on your network or local hard drive, locate its executable file (setup.exe), and run it. (See your network administrator if you need assistance locating the installation program on your network.)
  - or —
  - If you're getting the installation program from the Internet,
    - a. Go to the website indicated in the email or letter you received from Pictometry.
    - b. Download the desired version of EFS from the list of "Available Electronic Field Study Downloads."
    - c. On the File Download dialog box, click either **Open** (to run the installation program from the website), or **Save** (to save the installation program on your PC so you can install EFS at a later time.)

Depending on your system setup, the installation program may start up automatically. If you're installing from a CD and it does not start automatically, open the CD in Windows Explorer and double-click **setup.exe**.

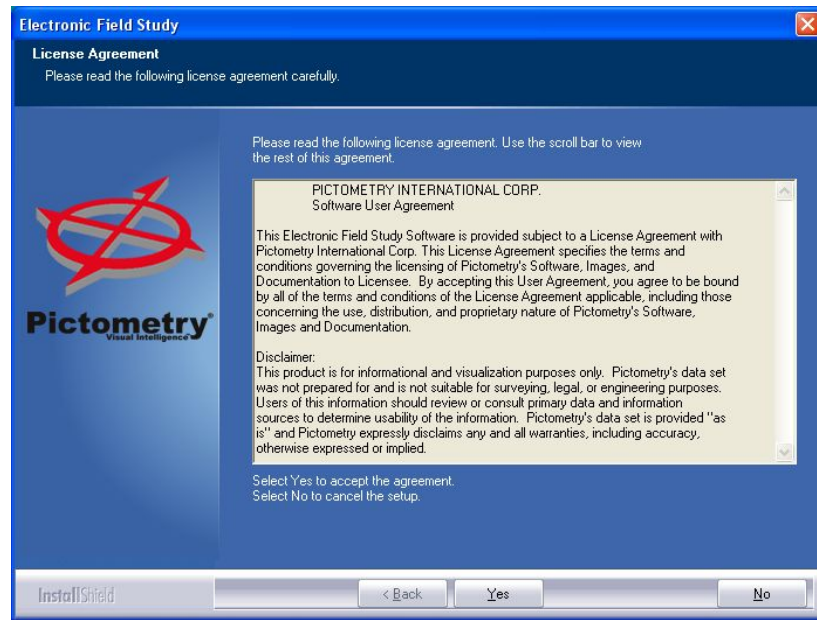
A few windows appear briefly as the InstallShield Wizard is prepared. When the wizard is ready, the following window opens.



2. Click **Next**. The Welcome window opens.



3. Click **Next**. The License Agreement window opens.

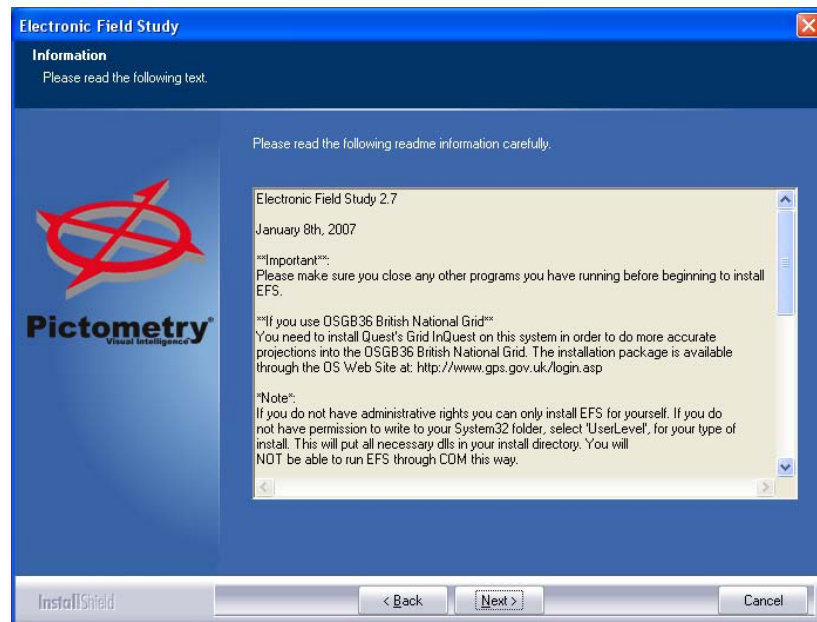


4. Read the Software User Agreement and click **Yes** if you agree to abide by the terms of the software license.

**Note:** You will not be able to continue the installation unless you accept the terms of the license agreement.

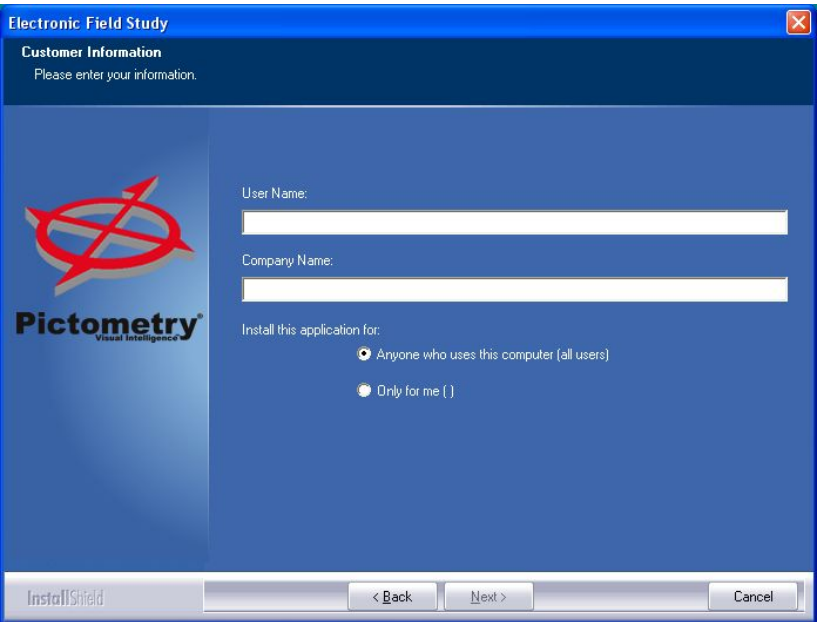
The Information window opens and shows important notes about this release of EFS.

*Please read the Release Notes carefully as this information might be updated for future releases.*



5. When you're done reading the Release Notes, click **Next**.  
The Customer Information window opens.

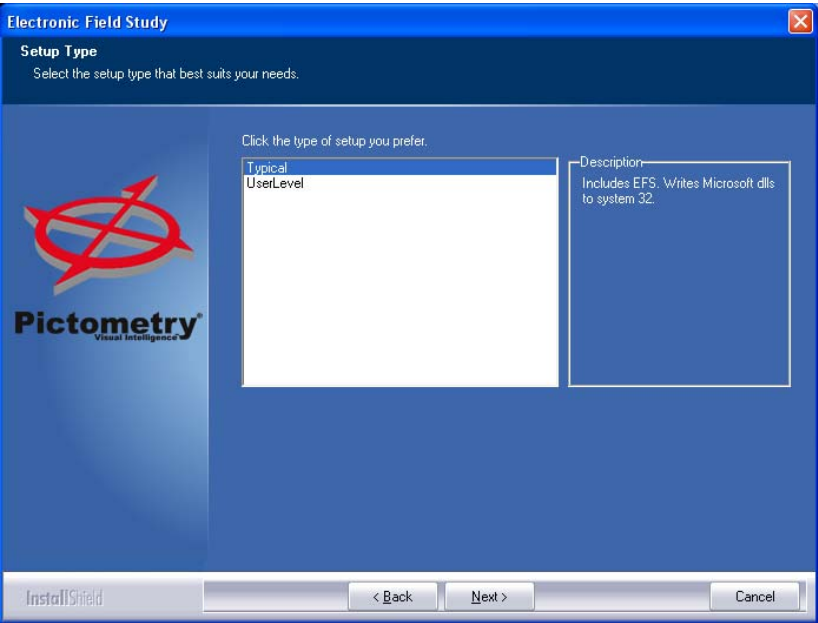
*If you didn't log in with administrator permissions, your window will not contain the "Install this application for" section. EFS will automatically be installed for you only.*



- 6. Type the User and Company names.
- 7. If you logged in with administrator permissions, under “Install this application for,” click the appropriate button as described below:

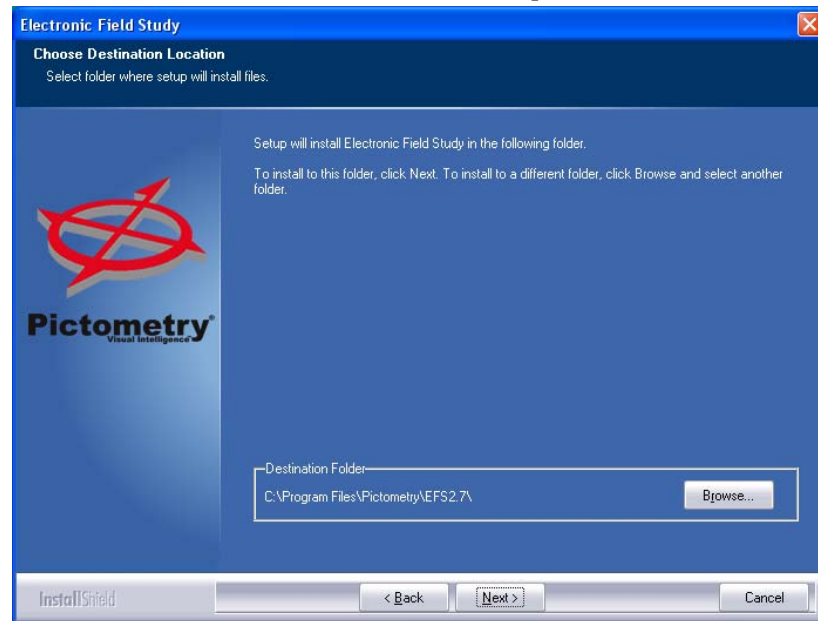
Click this button ...	To install EFS so that ...
Anyone who uses this computer (all users)	any user who uses the PC will have access to EFS.
Only for me (your name)	you are the only user who will have access to EFS.

- 8. Click **Next**. The Setup Type window opens.

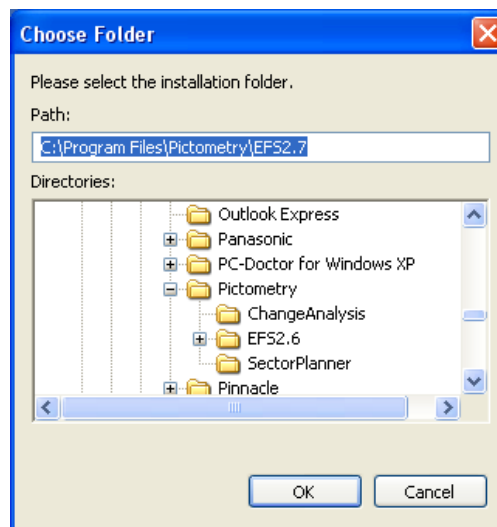


9. Select the desired type of installation. (Most users select Typical.) If you're uncertain which option to select, read the Description that appears as you highlight each setup type.) When ready, click **Next**.

The Choose Destination Location window opens.



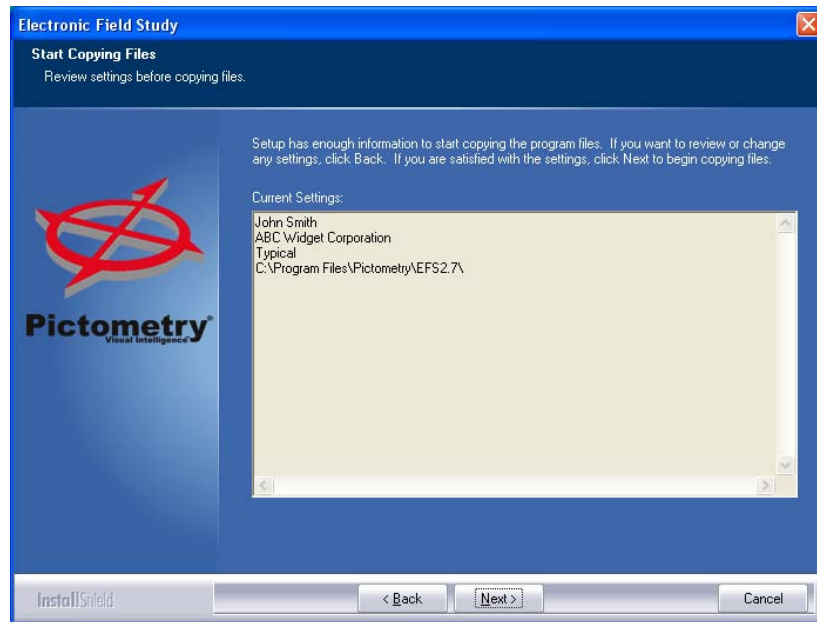
10. Do *one* of the following:
  - To install EFS in the default folder (C:\Program Files\Pictometry\EFS2.7\), click **Next**. The Start Copying Files window opens, showing your selections. *Skip to Step 11.*
  - or —
  - To install EFS in a folder other than the default folder,
    - a. Click **Browse**. The Choose Folder window opens.



- b. Browse for the folder in which you want to install EFS. As you navigate, the path to the folder appears in the Path box.

(If you want to create a new folder, type its name and path in the Path box, and the wizard will create it for you.)

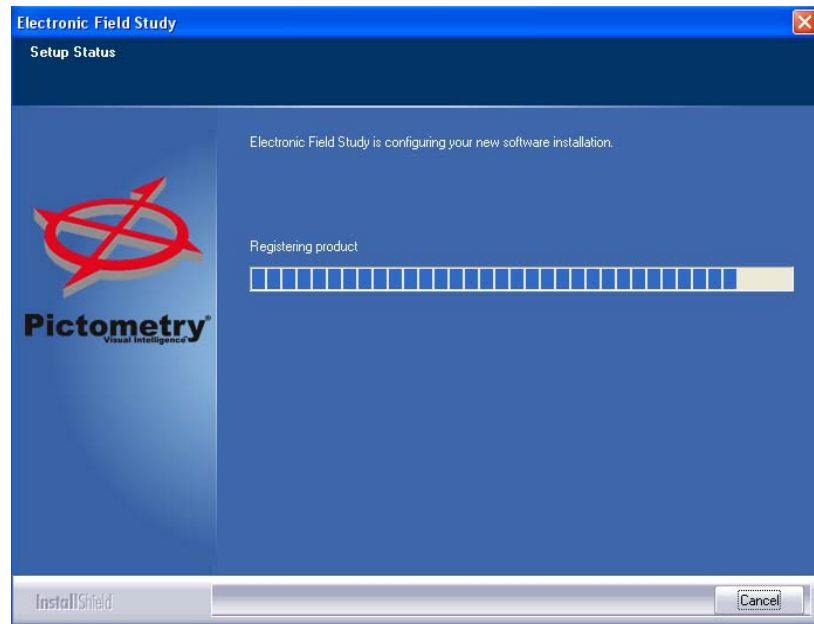
- c. Click **OK**. The Choose Destination Location window now shows the selected destination.
- d. Click **Next**. The Start Copying Files window opens, showing your selections. *Continue with Step 11.*



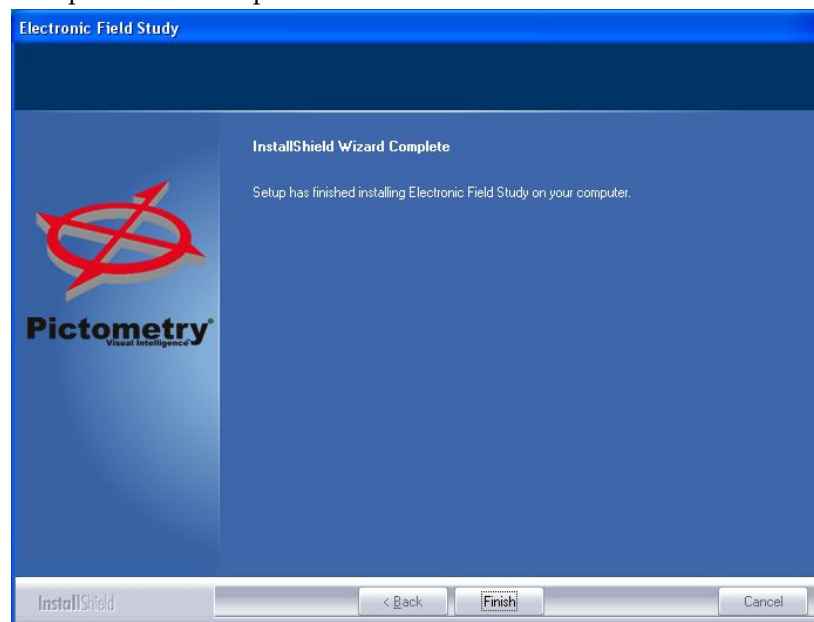
11. Review the selections and do *one* of the following.
  - To accept the selections, click **Next**.
  - or —
  - To change the selections, click **Back**, make the desired changes, then click **Next** until you get to this window again.

The Setup Status window opens, and installation begins. A progress bar shows the status of the installation as the wizard is copying new files.





When the Wizard is done copying files, the InstallShield Wizard Complete window opens.



12. Click **Finish** to complete the installation and close the InstallShield Wizard.

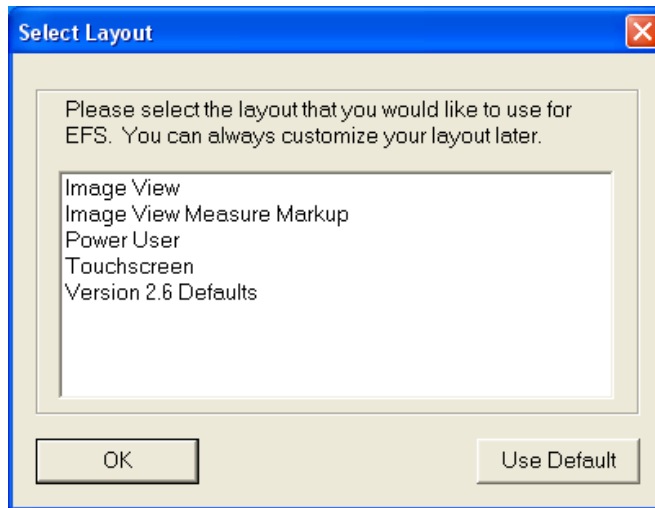
The installation program places a shortcut to EFS on your desktop.

## After Installing

After installing EFS, you'll need to select a screen layout and you may need to validate your license.

## Choices for screen layout

When you start EFS the first time after installation, you'll need to select a screen layout from the following dialog box.



**Figure 1-1:** The Select Layout dialog box.

The layout you choose determines the appearance of EFS and becomes the layout you'll see each time you start EFS (unless you customize it or later select a different layout). You can switch to a different default layout at any time. See “EFS provides layout options” in Part IV, Chapter 22.

**For existing EFS users:** If you are installing a new version of EFS, you can choose to keep the layout you already have or select one of the layouts EFS provides. To keep your existing layout, click the **Use Default** button when prompted to select a layout.

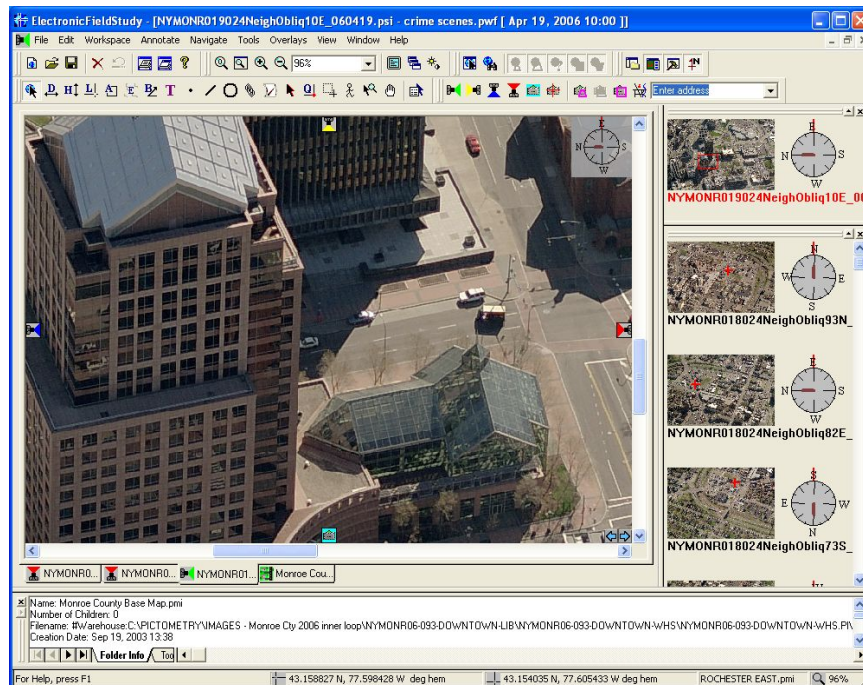
**Important:** If you choose this option, the PentaView and Plugins toolbars (new with Version 2.7) will not be automatically available. You'll need to create the new toolbars and add the appropriate buttons to them. See “Adding and removing toolbar buttons” in Part IV, Chapter 22.

EFS provides these screen layouts:

- Image View
- Image View Measure Markup
- Power User
- Touchscreen
- Version 2.6 Defaults

### *Version 2.6 Defaults layout*

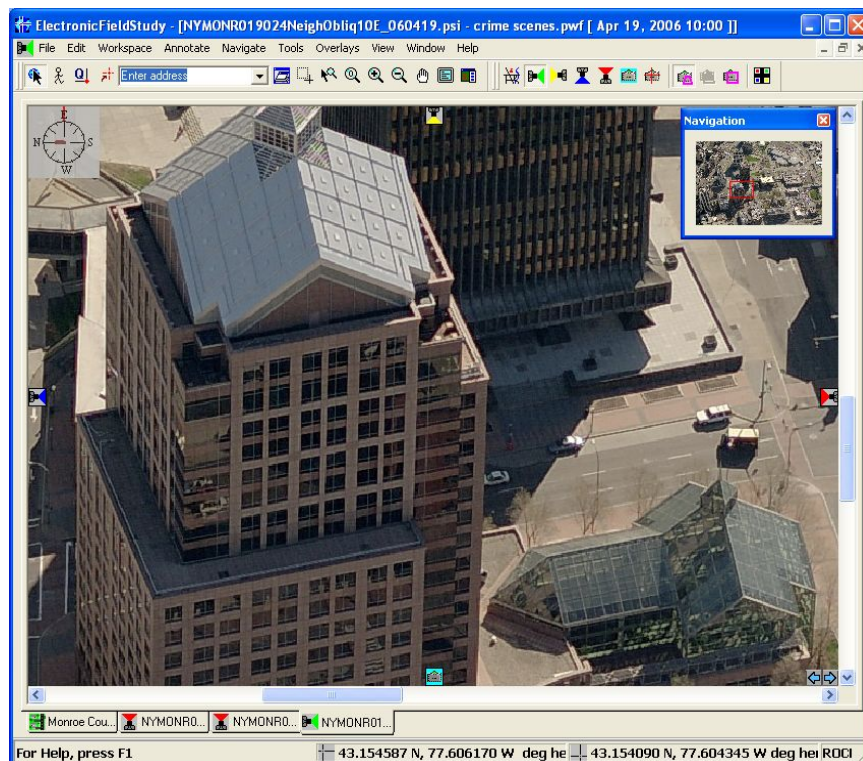
The Version 2.6 Defaults layout gives you all of the default settings and toolbar buttons that were found in EFS Version 2.6.



**Figure 1-2:** The Version 2.6 Defaults layout.

### Image View layout

If you'll be viewing images, but not measuring or annotating, you'll want to select the Image View layout (Figure 1-3).

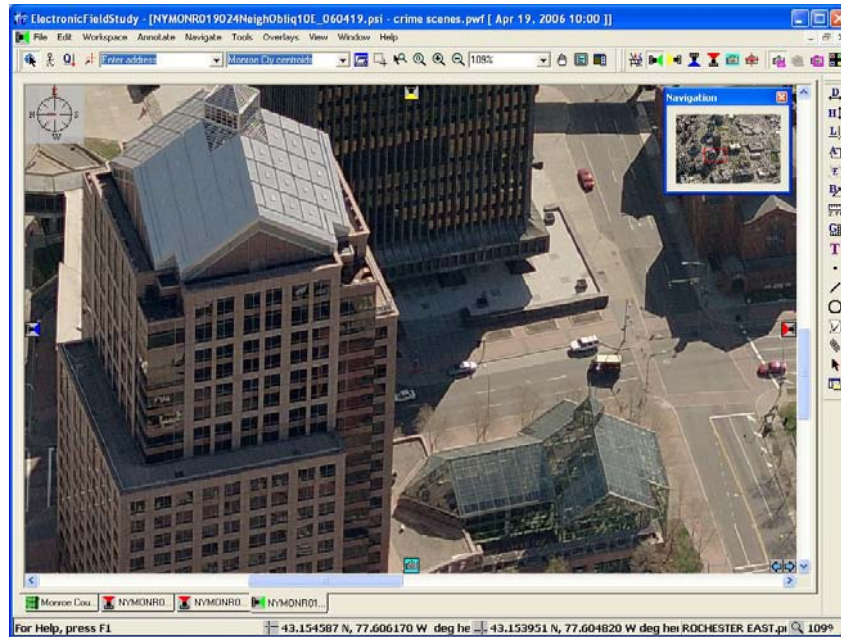


**Figure 1-3:** The Image View layout.



*Image View Measure Markup layout*

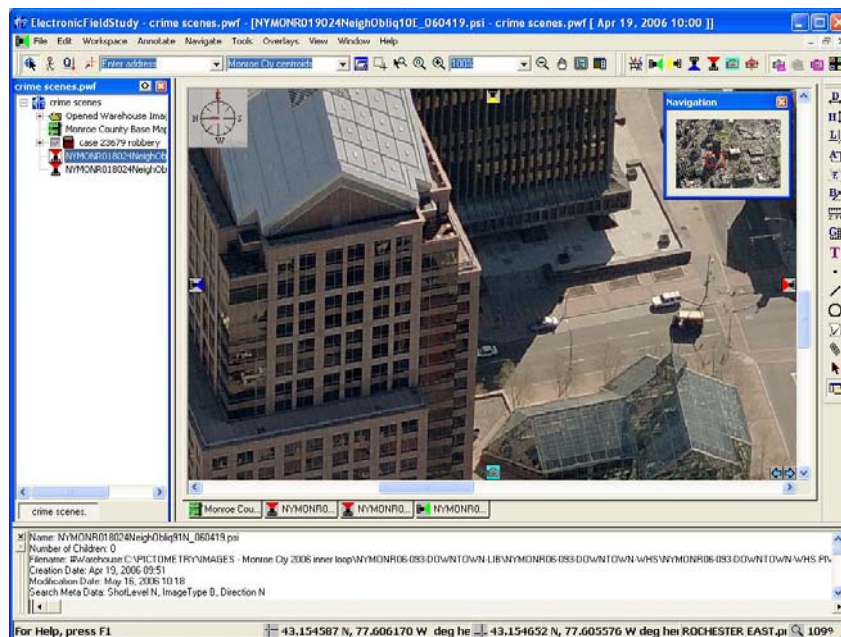
Users who expect to measure and annotate images should select the Image View Measure Markup layout (Figure 1-4).



**Figure 1-4:** The Image View Measure Markup layout.

*Power User layout*

If you expect to measure and annotate images, and you'll want to see your Workspace and Output windows, you'll want to select the Power User layout (Figure 1-5).



**Figure 1-5:** The Power User layout.

### Touchscreen layout

The Touchscreen layout gives you frequently used toolbar buttons for searching, navigating, and measuring in the large button size for touchscreen users (Figure 1-6).

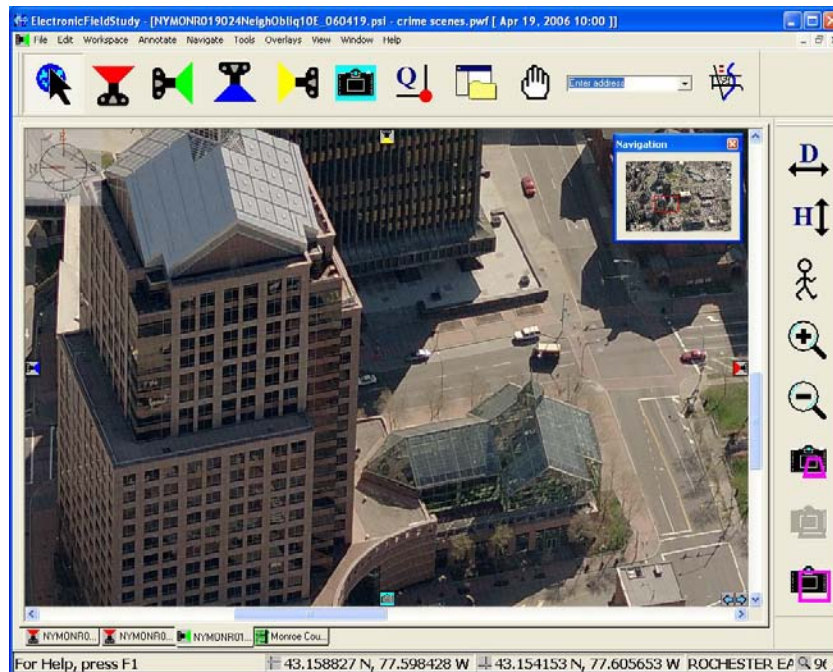


Figure 1-6: The Touchscreen layout.

## Licensing

After installing EFS, you may need to validate your license, or your license may load automatically without needing to be validated.

When you purchased EFS, you purchased either a **node-locked license** (locked to a specific machine) or a non-node-locked license. A node-locked license must be validated; a non-node-locked license doesn't require validation.

If you're not sure which type of license you purchased, you'll know after you start EFS and agree to the license agreement. (The following procedure will guide you.)

**Note:** A single seat EFS license is node-locked, meaning it allows you to use EFS on one computer only (although the software can be used by any number of users.) If you want to run EFS on additional computers, you'll need to purchase additional licenses.

## Starting EFS for the first time

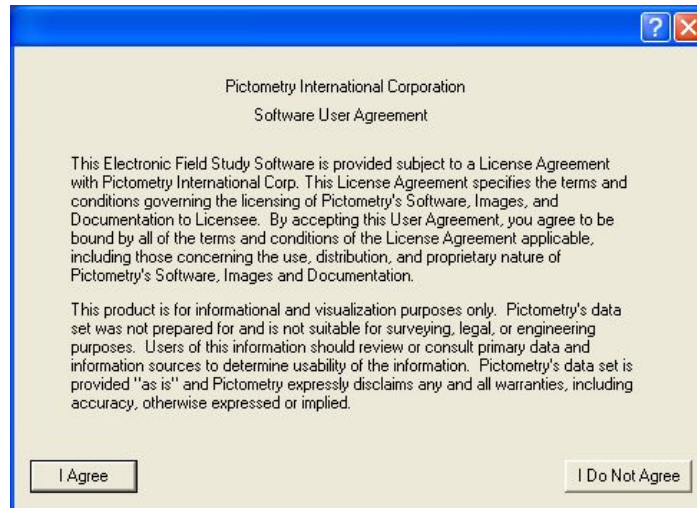
### ◆ To start EFS:

1. Do *one* of the following:
  - Double-click the EFS shortcut placed on the desktop by the installer.

– or –

- From the Windows Start menu, select  
**Programs⇒Pictometry⇒Electronic Field Study 2.7.**

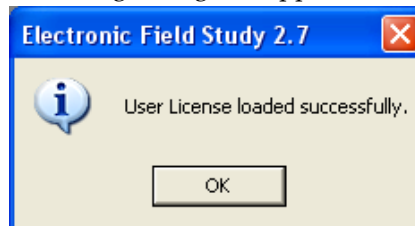
The Software User Agreement appears.



2. Read the Software User Agreement and click **I Agree** if you agree to abide by the terms of the software license. This screen appears only once for each user—the first time that user runs EFS.
3. EFS now attempts to find and check the your license (PLF) file. What happens next depends on the type of license you have. Check each case below in the order shown to see which case describes your situation. When you find the case that matches what you see on the screen, follow its instructions, and skip the other cases.

### CASE 1: EFS finds a license.

The following dialog box appears.



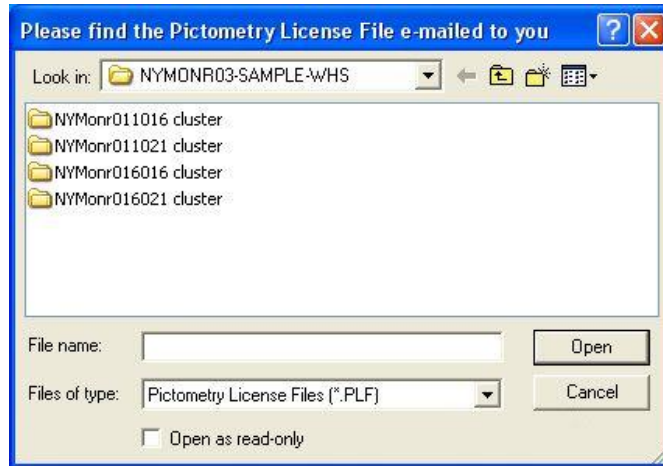
- a. Click **OK**. The Select Layout dialog box (Figure 1-1) opens.
- b. Select the desired screen layout, or to keep your existing layout, click the **Use Default** button.
- c. Click **OK**.  
EFS opens. Non-warehouse users can start using EFS right away. Warehouse users need to link to their Image Warehouse first. (See “Linking to your Image Warehouse” on page 19.)
- d. *Skip the rest of this procedure.*

See “Choices for screen layout” on page 10.

**CASE 2: EFS cannot find a license file.**

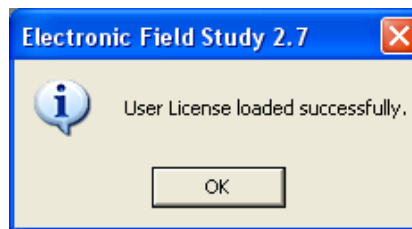
The following dialog box appears.

*Your screen will not look exactly like this one.*



- a. Browse for the file, select it, and click **Open**.

EFS checks the license. If it does not need to be validated, the following dialog box appears. If it *does* need to be validated (is node-locked), you will not see this screen and you should skip to Case 3.



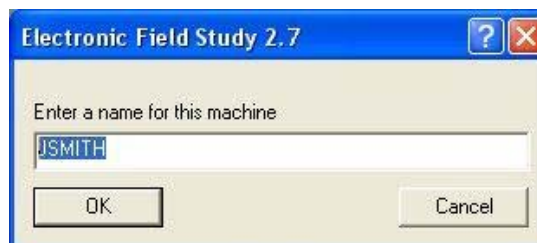
- b. Click **OK**. The Select Layout dialog box (Figure 1-1) opens.
- c. Select the desired screen layout, or to keep your existing layout, click the **Use Default** button.
- d. Click **OK**.

EFS opens. Non-warehouse users can start using EFS right away. Warehouse users need to link to their Image Warehouse first. (See “Linking to your Image Warehouse” on page 18.)

- e. *Skip the rest of this procedure.*

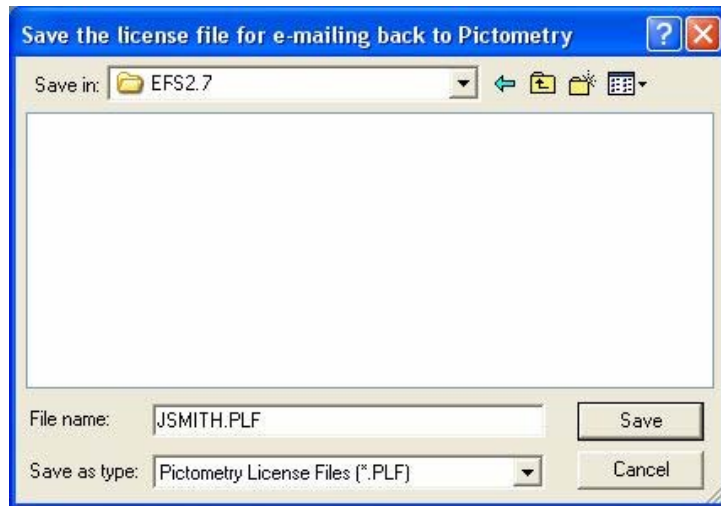
**CASE 3: Your license is node locked and needs to be validated.**

The following dialog box appears.





- a. Type the machine name or use the default name, and click **OK**.  
The following dialog box appears.

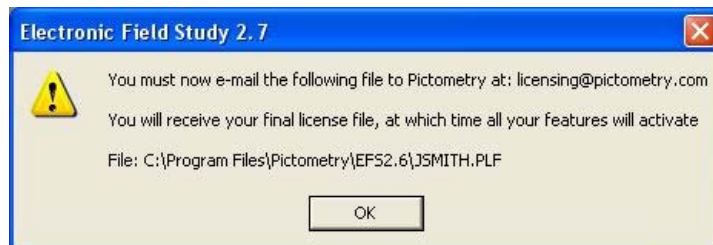


- b. Click **Save** to save the PLF file to the folder indicated, or browse for the folder to save it in, then click **Save**.

**Note:** We suggest that you save the PLF file in the installation folder ("C:\Program Files\Pictometry\EFS2.7" by default). If you save it to a different folder, note where you saved it, since you will need to email it to Pictometry.

The following dialog box appears.

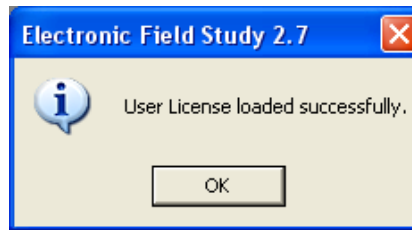
*The dialog box will show your PLF file's name and path.*



- c. Note where to email the PLF file ([licensing@pictometry.com](mailto:licensing@pictometry.com)), and click **OK**. EFS exits.
- d. Email the PLF file to Pictometry as an attachment. Pictometry International will validate your copy of EFS and email you an updated license (PLF file).
- e. Copy the new PLF file to the folder in which you installed EFS. If it asks if you want to replace the old copy, answer yes.
- f. Start EFS again.

*If a validated PLF file is now found for this machine, the following dialog box appears.*



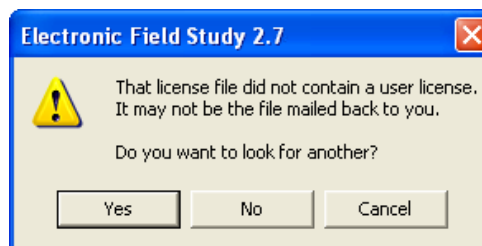


See "Choices for screen layout" on page 10.

- g. Click **OK**. The Select Layout dialog box (Figure 1-1) opens.
- h. Select the desired screen layout and click **OK**.  
EFS opens. Warehouse users need to link to their Image Warehouse. (See "Linking to your Image Warehouse" on page 19.)
- i. *Skip the rest of this procedure.*

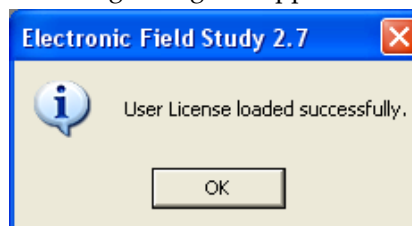
#### CASE 4: Your license is node locked, but not validated.

If the following dialog box appears, then you probably copied the new PLF file to a directory other than the installation directory (so it did not replace the original PLF file, which resides in the installation directory).



- a. Click **Yes**, browse for and select the PLF file that was emailed back to you from Pictometry.

If a validated PLF file is now found for this machine, the following dialog box appears.



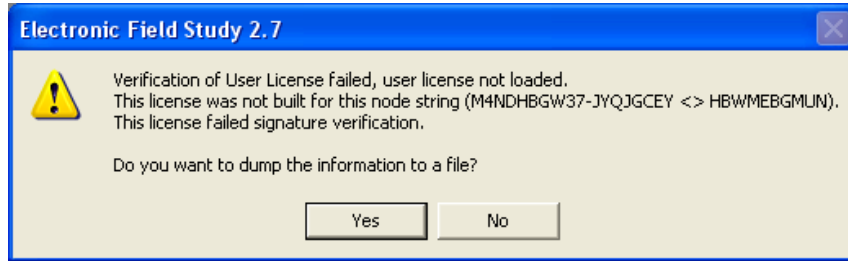
See "Choices for screen layout" on page 10.

- b. Click **OK**. The Select Layout dialog box (Figure 1-1) opens.
- c. Select the desired screen layout and click **OK**.  
EFS opens. Warehouse users need to link to their Image Warehouse. (See "Linking to your Image Warehouse" on page 18.)

If EFS still can't validate the license for this machine, read "Other possible reasons for license verification failure" below.

### Other possible reasons for license verification failure

If you still cannot start EFS, an error dialog box (similar to the following) appears. It provides information about why the license verification failed.



Check the message listed above the words “This license failed signature verification.” It indicates what the problem is.

If the message says “This license was not built for this node string” <node string>, you probably loaded the new PLF file (the one emailed back to you) on the wrong machine (not on the machine on which it was created). The PLF file name often includes the machine name you gave it.

If you can’t solve the problem from the description provided in this dialog box, click **Yes** to dump the error information to a file. Then email that file to [licensing@pictometry.com](mailto:licensing@pictometry.com).

## Re-installing and uninstalling EFS

### Downloading updates

See Appendix H, “Getting Help” for information about getting updates to EFS and EFS documentation.

### Installing a new release of EFS

When you install a new release of EFS, the installation program replaces the current EFS software (on your hard drive) with the new release. To install a new release of EFS, follow the procedure for installing EFS on page 3.

### Removing EFS

#### ◆ To completely remove EFS from a computer:

1. Use the *Add or Remove Programs* feature found in the Windows Control Panel. (**Start**⇒**Control Panel**⇒**Add or Remove Programs**)
2. When asked if you want EFS registry settings removed, click **Yes**. (All traces of EFS including the software license and warehouse paths will be removed from your machine.)

**Note:** If you think you might install EFS later on the same computer, click **No** when asked if you want registry settings removed. (Choosing “No” causes the software license and any warehouse paths to remain on this machine.)

3. When asked if you would like your EFS configuration and license files removed, click **Yes**. If you will be installing EFS again later, click **No**.
4. Follow the screen prompts as directed.

## Linking to your Image Warehouse

*For warehouse users*

This section is for warehouse users. (You purchased a set of images—called an Image Warehouse—or you’d like to create a warehouse from individual images.) *Non-warehouse users can skip this section.* If you’re not sure whether you’re a warehouse or a non-warehouse user, then read “The Image Warehouse” in Chapter 2 for more information.

An **Image Warehouse** is a set of Pictometry images, stored in the warehouse folder of the Image Library.

*The term “warehouse” is synonymous with “Image Warehouse.”*

Before you can view images, you must tell EFS where to find the images. Linking to the warehouse does exactly that. EFS uses the Image Tool to search the warehouse, so linking to your Image Warehouse actually involves specifying the warehouse as an Image Tool property.

You need to *link to the warehouse only once* after installing EFS the first time, or after re-installing it (if you’ve previously uninstalled it). You should not have to re-link after installing an EFS upgrade (unless you’ve previously uninstalled EFS).

The procedure for linking your Image Warehouse depends on where the Image Warehouse is located. An Image Warehouse can be stored on a PC’s local hard drive, on a Local Area Network (LAN), or on a server that has Pictometry’s Network Image Warehouse (NIW) server software installed on it.

Follow the appropriate procedure below, depending on where your Image Warehouse is stored. For most users, the Image Warehouse is stored on their PC’s hard drive or on their corporate LAN. See your company’s Area Expert for details.

**Note:** To facilitate sharing workspaces (a group of related images), we encourage you to use the Universal Naming Convention (UNC) for files.

The UNC format is: **\\servername\sharename** (where “servername” is the host-name of a network file server, and “sharename” is the name of a networked or shared directory).

### Warehouse resides on a local hard drive or LAN

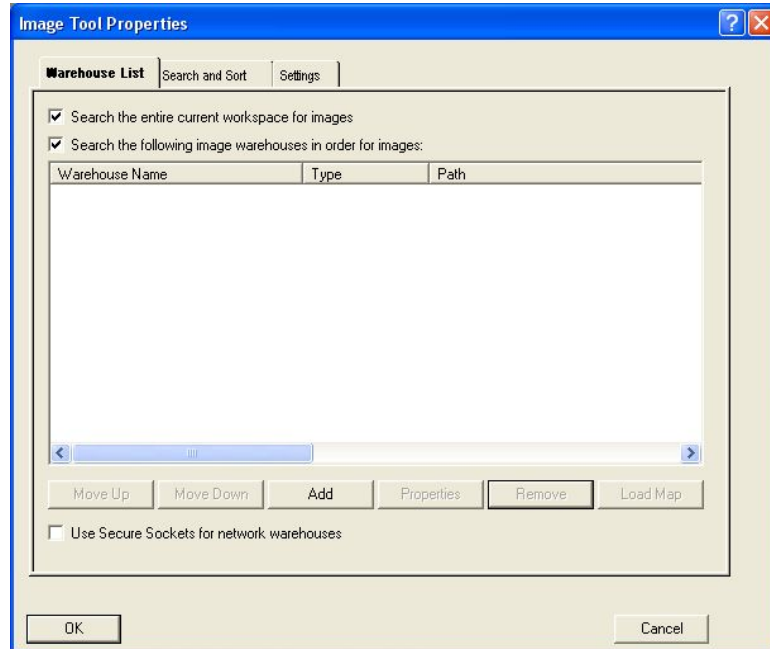
#### ◆ To link to an Image Warehouse on a local hard drive or LAN:

1. Do *one* of the following:
  - Click the **Image Tool Properties** button.
  - or —

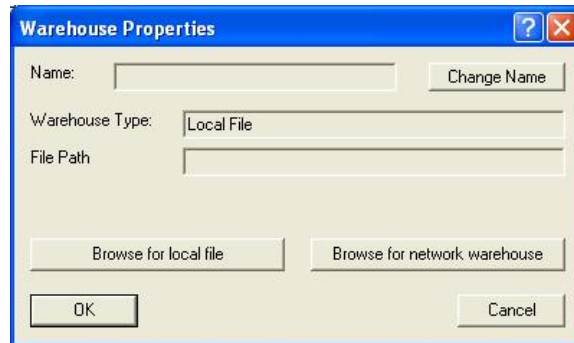


- Press **CTRL + W**.
- or —
- Choose **Navigate⇒Image Tool Properties**.

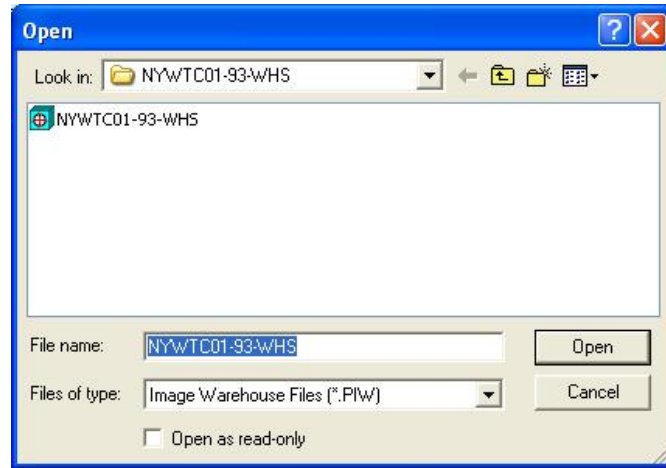
The Image Tool Properties dialog box opens to the Warehouse List tab.



2. Click **Add**. The Warehouse Properties dialog box opens.



3. Click **Browse for local file**. The Open dialog box appears.

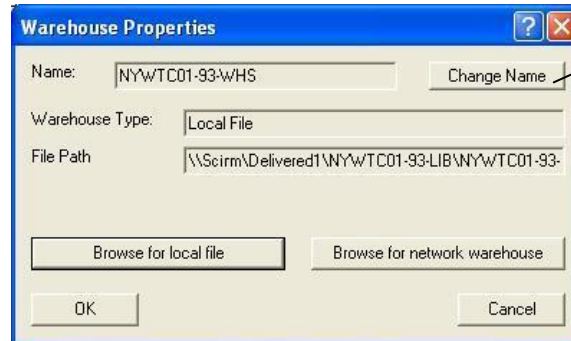


**Note:** If your Image Warehouse resides on an NIW server, you should follow the procedure in “Warehouse resides on an NIW server” on page 22, instead of this one.

4. If not already there, navigate to warehouse folder (folder name ends in “-WHS”). The warehouse folder is in the Image Library folder.
5. Select the file with the extension “piw” (Pictometry Image Warehouse). In most cases the name of this file will contain your county name or state name.

**Important:** Image Warehouses contain more than one PIW file, so be sure to pick the PIW file that resides in the warehouse folder (folder name ends in “-WHS”). It’s listed after the last cluster folder.

6. Click **Open**. The warehouse file name appears in the Name box of the Warehouse Properties dialog box.



Click to customize the warehouse name shown on the Warehouse List tab. (This does not change the warehouse’s name on the hard drive.)

**Note:** A user’s warehouse names must be unique.

7. Click **OK** on the Warehouse Properties dialog box. The warehouse name appears in warehouse list with a check mark to its left (on the Image Tool Properties dialog box).

**Note:** If you have more than one Image Warehouse, follow Steps 2 – 7 for each Image Warehouse you wish to connect to.

8. Click **OK** on the Image Tool Properties dialog box.  
The Image Tool Properties dialog box closes; and because the warehouse is now linked, EFS knows where to find the images.

Now that your Image Warehouse is linked, you can start using EFS as described in Chapter 3. (If you want to search for images by address, you'll need to perform the setup tasks described on page 24.)

## Warehouse resides on an NIW server

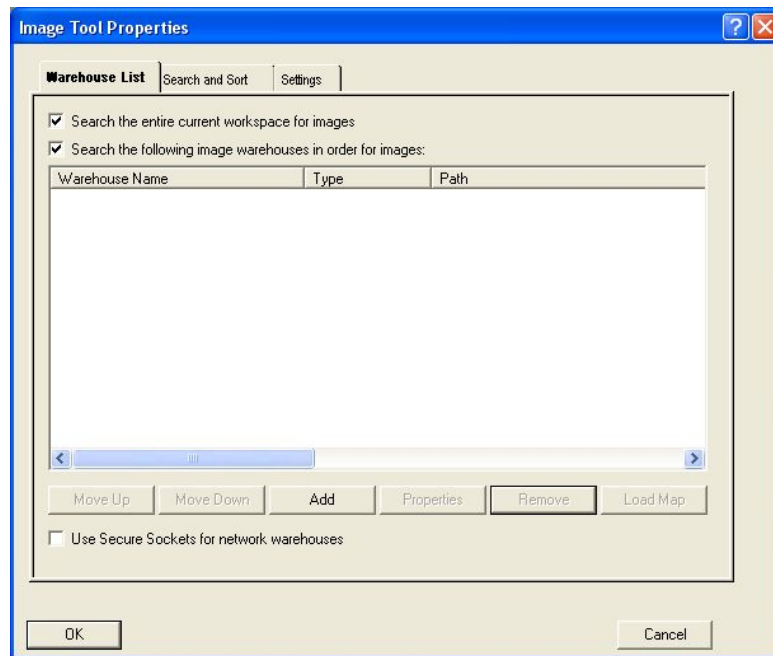
### ◆ To link to an Image Warehouse on an NIW server:

1. Do *one* of the following:

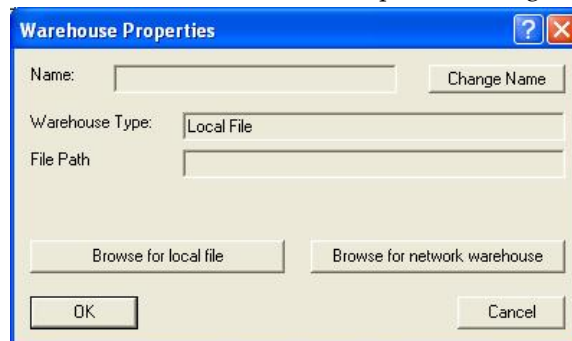


- Click the **Image Tool Properties** button.
- or —
- Press **CTRL + W**.
- or —
- Choose **Navigate**⇒**Image Tool Properties**.

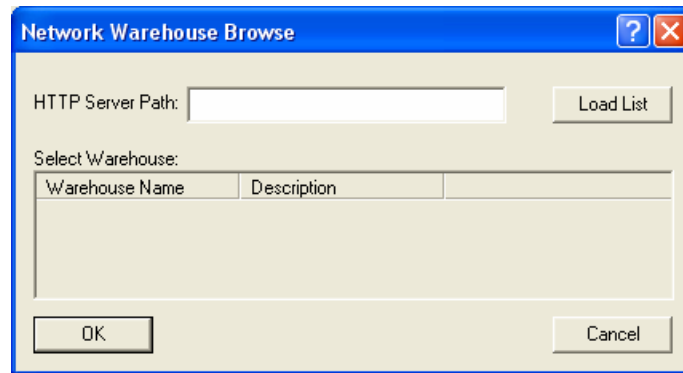
The Image Tool Properties dialog box opens to the Warehouse List tab.



2. Click **Add**. The Warehouse Properties dialog box opens.



3. Click **Browse for network warehouse**. The Network Warehouse Browse dialog box opens.



4. In the HTTP Server Path box, type the name of the URL for the NIW server on which the Image Warehouse resides. You can get this information from your company's Area Expert.

**Note:** If the server uses a port number other than the default value of 80, type a colon after the URL, followed by the port number the server uses.

5. Click **Load List**. The list of warehouses stored on the NIW server appears in the Select Warehouse list box.



6. Select the desired warehouse from the list and click **OK**.

The warehouse file name appears in the Name box of the Warehouse Properties dialog box.



Click to customize the warehouse name shown on the Warehouse List tab. (This does not change its name on the server.)

**Note:** A user's warehouse names must be unique.

7. Click **OK** on the Warehouse Properties dialog box. The warehouse name appears in warehouse list with a check mark to its left (on the Image Tool Properties dialog box).

**Note:** If you have more than one Image Warehouse, follow Steps 2 – 7 for each Image Warehouse you wish to connect to.

8. Click **OK** on the Image Tool Properties dialog box.

The Image Tool Properties dialog box closes; and because the warehouse is now linked, EFS knows where to find the images.

Now that your Image Warehouse is linked, you can start using EFS as described in Chapter 3. If you want to set up EFS to search for images by address, then read the next section first.

## Address Search setup

The Address Search feature gives you an easy way to find images containing a specific street address (as long as you have GIS data for your images). You simply type a street address, and EFS finds all images that show that address.

Address Search works for GIS data located in shapefiles or in SDE tables, as long as certain address fields are included in the GIS data.

Before you can use the Address Search feature, your EFS application must be set up to work with your GIS data.

The rest of this chapter gives information and procedures so Data Administrators and users can set up machines for address searches.

### Overview

*Address Search profiles are described in detail in the section “Creating an Address Search profile” on page 26.*

Address Search Setup involves giving EFS information about your GIS address data. This information is stored in an **Address Search profile**—a set of address-related database fields. EFS uses the Address Search profile to search for a land parcel by its street address.

Setting up EFS for the Address Search feature is typically a one-time task—performed once for multiple EFS machines or (at most) once for each machine.

**Note:** If EFS is re-installed, you do not need to repeat the address search setup unless you removed EFS configuration and license files when you un-installed EFS. (See Step 3 of the procedure titled “To completely remove EFS from a computer” on page 18).

### Different ways to set up Address Search

There are a few ways to set up EFS for address searches, depending on how many machines must be set up and whether or not certain files (“PAX files” or “PCF files”) were included with your installer.

- Use a **Pictometry Configuration File (PCF)**, *if you have one available*, to set up one or more machines.
- Use a **Pictometry Address eXchange (PAX)** file, *if you have one available*, to set up one or more machines.
- Set up one machine by creating an Address Search profile.



- Set up multiple machines by creating an Address Search profile and saving it as a PAX file.

### Which topics are for me?

The rest of this chapter gives detailed information and instructions for each setup scenario listed above.

The following table shows which of the remaining topics you should read for each of these scenarios. Not all topics apply to every scenario.

	For this setup scenario ...	Read <i>only</i> these topics ...	On page ...
“Address Search toolbars” and “Highlighting data for the land parcel” are optional topics.	Using a PCF file from the install folder to set up one or more machines	Using a PCF file from Pictometry	25
		Address Search toolbars	36
		Highlighting data for the land parcel	39
	Using a PAX file from the install folder (or from a web site) to set up one or more machines	Using a PAX file from Pictometry	25
		Importing a profile from a PAX file	35
		Address Search toolbars	36
		Highlighting data for the land parcel	39
	Setting up one machine (without pre-existing PAX or PCF files)	Setting up one machine	26
		Creating an Address Search profile	26
		Address Search toolbars	36
		Highlighting data for the land parcel	39
	Setting up multiple machines (without pre-existing PAX or PCF files)	Setting up multiple machines	26
		Creating an Address Search profile	26
		Exporting a profile to a PAX file	35
		Importing a profile from a PAX file	35
		Address Search toolbars	36
		Highlighting data for the land parcel	39

### Using a PCF file from Pictometry

A **PCF file** is a collection of various EFS settings (including an Address Search profile) loaded into EFS automatically at startup in order to configure EFS to a particular state. Using a PCF file allows multiple machines/users to have common user interfaces.

If you are using the full disk installer, (which has multiple files in an “install” folder), and a Pictometry Configuration File (PCF) is included in your install folder, then the required part of your setup is already done. The PCF file (and the Address Search profile it contains) will be automatically loaded into EFS during installation.

### Using a PAX file from Pictometry

A **PAX file** is an Address Search profile, exported as a file that can be imported to other machines. PAX files allow Address Search profiles to be shared amongst multiple users. If a Pictometry Address eXchange (PAX) file is included on your EFS install CD (or available on a web site), your setup is minimal. You’ll simply import the pre-made PAX file to each user machine running EFS. (See “Importing a profile from a PAX file” on page 35.)

## Setting up one machine

If you do not already have a PCF file or a PAX file, and you are setting up only one machine for address searches, you'll need to create an Address Search profile in EFS. (See "Creating an Address Search profile" on page 26.)

## Setting up multiple machines

If you do not already have a PCF file or a PAX file, and you are setting up multiple machines for address searches, you'll need to create an Address Search profile and copy it to other machines as follows:

1. *From any machine running EFS,*
  - a. Create an Address Search profile. (See next topic.)
  - b. Export the Address Search profile to a PAX file. (See page 35.)
2. Do *one* of the following:
  - *On each EFS machine to be set up,* import the PAX file. (See page 35.)  
All remaining topics in this chapter pertain to you.
  - or —
  - Create a PCF file and add the PAX file to it as follows:
    - a. Use the EFS Toolbar Configuration Editor to create a new PCF file that includes the PAX file you exported in Step 1b.
    - b. On each EFS machine to be set up, load the PCF file into EFS.
 All remaining topics in this chapter pertain to you *except* for "Importing a profile from a PAX file" on page 35.

*The EFS Toolbar Configuration Editor is an application used to create PCF files. See the EFS System Administrator Guide.*

## Creating an Address Search profile

As stated earlier, an Address Search profile is a set of address-related database fields that EFS uses to search for a land parcel by its street address. When you create the profile, you'll identify which fields in your GIS data correspond to the fields EFS uses. This is called "**correlating fields**." EFS searches the fields you correlate in order to find the associated images.

**Reminder:** If a PAX file or a PCF file was provided, you don't need to create an Address Search profile. (See "Using a PAX file from Pictometry" on page 25 or "Using a PCF file from Pictometry" on page 25.)

Each machine you set up needs an Address Search profile. You can have several profiles, but only one at a time can be the **active profile**—the profile to be used for address searches.

## Two types of searches

The Address Search feature has two different ways to find a land parcel. Within your GIS data, if each GIS object is associated with a land parcel ("parcel-based" data), EFS searches for the associated parcel directly and finds images showing that parcel. If each GIS object is associated with a *group* of neighboring land parcels ("range-based" data), EFS uses the data to

determine the approximate location of the particular address you request and finds images of that location.

## Required fields vary with type of search

When you create your profile, some GIS fields are required and others are optional. By including certain fields, you're telling EFS which way it should search. Depending on the type of GIS data you have, there are different sets of required fields to identify.

## GIS data for address searching

GIS data used for address searching can be parcel-based or range-based.

### Parcel-based data

Your GIS data may be “**parcel-based**” — that is, each record corresponds to a parcel, and may include fields that identify that parcel's coordinates, street name, house number, and in some cases a Parcel\_ID number. There are two types of parcel-based GIS data:

- **centroid data**—GIS point data in which each GIS object identifies a parcel's centroid (a location determined by the municipality)
- **perimeters**—GIS polygon data in which each GIS object identifies a parcel's perimeter

*Parcel-based data is located in **centroids** and **parcels** files (and SDE tables).*

### Range-based data

Your GIS data may be “**range-based**” — that is, each record corresponds to a group of adjacent parcels (a “street segment”), and includes fields that identify the street name, coordinates that identify the street segment, and house numbers for the first and last house on each side of the street segment.

*Range-based data is located in **TIGER** files and in **Street Centerline** files.*

## Correlating GIS fields to EFS fields

Correlating fields is simply identifying which fields in your GIS data correspond to the fields EFS uses. You'll correlate address search fields in Step 8 of the procedure “To create an Address Search profile” on page 31.

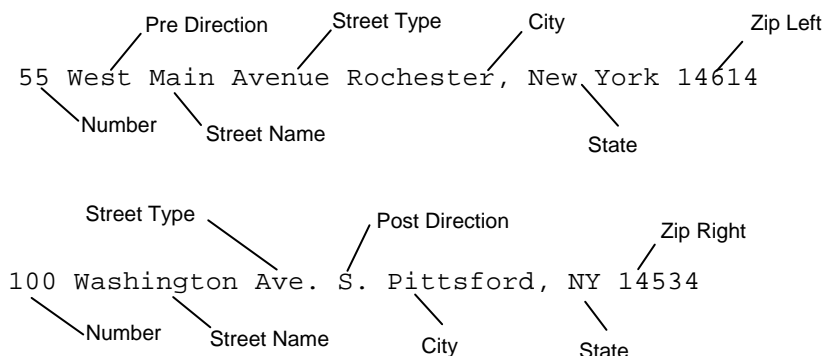
Table 1-1 lists the fields that you can use when searching by street address. For each field, it gives the EFS field name, the field name typically used in GIS data, and information about what that field represents.

**Table 1-1:** Fields used for searching by street address.

EFS field	Typical GIS field names*	What it represents
Number	FENUM, STNUM, PAR_NUM	the house or apartment number
Pre Direction	FEDIRP	a directional <i>prefix</i> to the street name
Street Name	FENAME, STNAME, PAR_NAME	the street name
Street Type	FETYPE	the type of street (road, avenue, etc.)
Post Direction	FEDIRS	a directional <i>suffix</i> to the street name
City		the city, town or village
State		the state
Zip Left	ZIPL	the zip code for the left side of the street
Zip Right	ZIPR	the zip code for the right side of the street

\*Your GIS data may name these fields differently.

The following examples show how these fields make up a street address.



## Correlating parcel-based fields

If your data is parcel-based, (centroid data or parcel data), you'll correlate the fields in one of two ways (so you can search for land parcels in one of two ways).

### Searching by street number and name

If you identify a parcel by its street address, you must correlate the following two fields shown in this table:

Correlate this <i>required</i> field from your GIS data	To this EFS field
a "street number" field	Number
a "street name" field	Street Name

### Searching by parcel ID

If you identify a parcel by its **parcel ID** (rather than its street address), you must correlate *only* the PARCEL\_ID field.

If your parcel IDs are numeric (such as "2349879"),

Correlate this <i>required</i> field from your GIS data	To this EFS field
PARCEL_ID	Number

**Tip:** To view your GIS fields, open the DBF file with Microsoft® Excel®.

**PARCEL\_ID** is a field in your GIS data that uniquely identifies a land parcel.

If your parcel IDs are *alphanumeric* (such as “123.324.34”),

Correlate this <i>required</i> field from your GIS data	To this EFS field
PARCEL_ID	Street Name

**Important:** If correlating PARCEL\_ID to Number, leave Street Name blank.  
If correlating PARCEL\_ID to Street Name, leave Number blank.

### Other fields you can correlate

In addition to the required address fields (Number and Street Name), you can correlate non-required fields, so that EFS includes them in the resulting list of search matches. Only the required fields are searched, but all correlated fields are displayed in the list of matches. You can correlate any of the fields listed in Table 1-1.

(If searching by parcel ID, remember to leave blank either the Number field or the Street Name field.)

### Correlating range-based fields

If your GIS data is range-based, it contains four additional fields that identify a street segment and must be correlated. Table 1-2 lists these fields. For each field, it gives the EFS field name, the field typically used in GIS data, and information about what that field represents.

**Table 1-2:** Fields used for searching range-based data by street address.

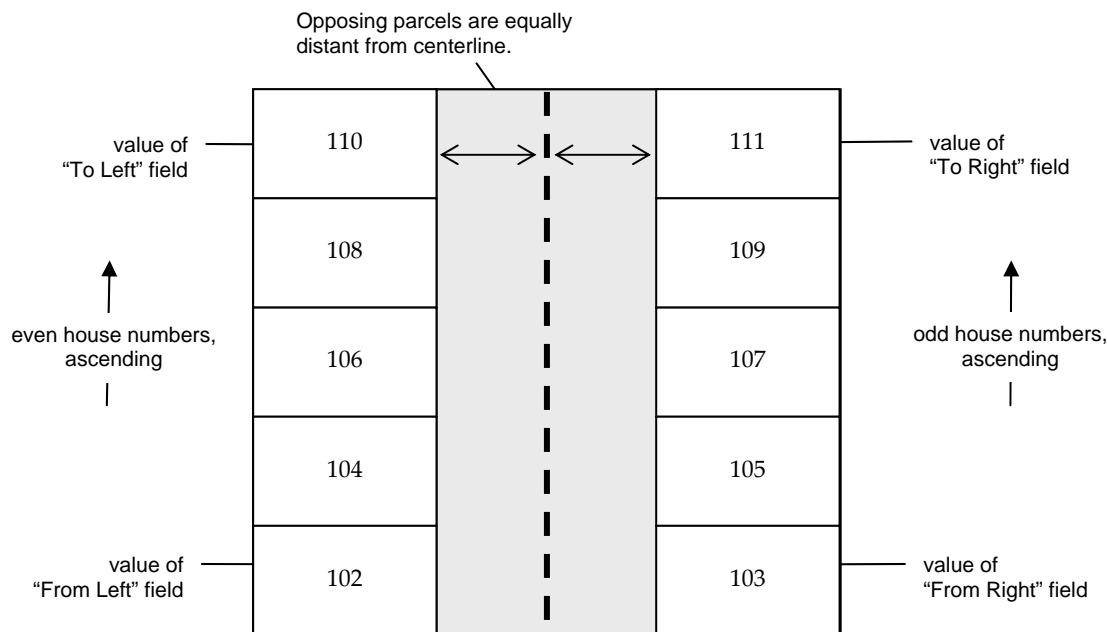
EFS field	Typical GIS field names*	What it represents
From Left	FRADDL	house number for first parcel on street's left side
To Left	TOADDL	house number for last parcel on street's left side
From Right	FRADDR	house number for first parcel on street's right side
To Right	TOADDR	house number for last parcel on street's right side

*These four fields are required.*

*These fields are typically found in TIGER and Street Centerline files.*

\*Your GIS data may name these fields differently.

The following diagram represents a street segment with ten parcels. Notice how the four address fields (From Left, To Left, From Right, To Right) can work together with the Street Name field to define a “street segment.”



**Figure 1-7:** Street segment example.

**Note:** Range-based GIS data also contain a field for the street segment's geographic coordinates (just as parcel-based GIS data contain coordinates for a parcel's centroid or its perimeter). This is how EFS knows which images to find.

### What to correlate

When correlating range-based address data, you must do the following:

- Leave blank the EFS field **Number**.
- Correlate the required EFS field **Street Name** (FENAME, STNAME).
- Correlate the four required fields shown in Table 1-2.

By using these five required fields, EFS can determine (with reasonable accuracy) the approximate location of the address you're looking for.

**About accuracy:** EFS assumes that house numbers are in order (either ascending or descending) and that odd and even house numbers are on opposing sides of the street. If your address data does not meet these two criteria, range-based address searching is not likely to be accurate.

Also, since EFS knows only the range of addresses, it must assume that the parcels along a street segment are evenly spaced. In some places, urban residential blocks for instance, this is true (or close enough) so that search results are correct. However, in many places, (for example, rural communities with a mix of farm and residential parcels), parcels have greatly varying street frontages, which can result in a misplaced address location.

### Other fields you can correlate

In addition to the five required fields, you can correlate non-required fields, so that EFS includes them in the resulting list of search matches. Only the

required fields are searched, but all correlated fields are displayed in the list of matches. You can correlate any of the fields listed in Table 1-1 except for “Number.”

## Creating the profile

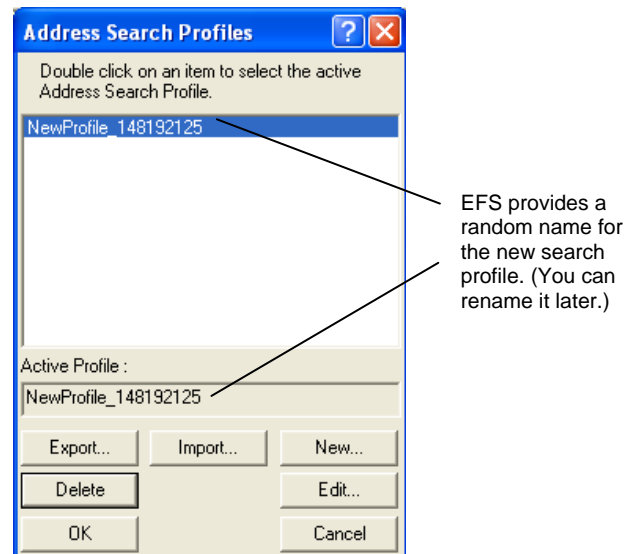
Use the following procedure to create and activate an Address Search profile in EFS.

**SDE users:** If you’re not already connected, you might now connect to SDE. If you see the Connect SDE dialog box at anytime during the following procedure, it’s because you didn’t connect, EFS couldn’t connect automatically, or the connection was lost. To connect to SDE, follow the procedure in “Connecting to your SDE database” in Part III, Chapter 16.

### ◆ To create an Address Search profile:

1. Choose **Navigate⇒Address Search Setup**.

The Address Search Profiles dialog box appears, showing any existing profiles.



2. Do *one* of the following:

To ...	Do this ...
Create a new profile	Click <b>New</b> . A Properties dialog box appears. Continue with <b>Step 3</b> of this procedure.
Use an existing profile	<i>Skip to Step 12.</i>
Modify and use an existing profile	Select a profile from the list and click <b>Edit</b> . A Properties dialog box appears. Change the properties as desired, and <i>skip to Step 11.</i>

3. If you’re using SDE-based data, *skip to Step 6.*

Otherwise, click **Shape** for the Database Type, then click **Browse**. The Open dialog box appears.

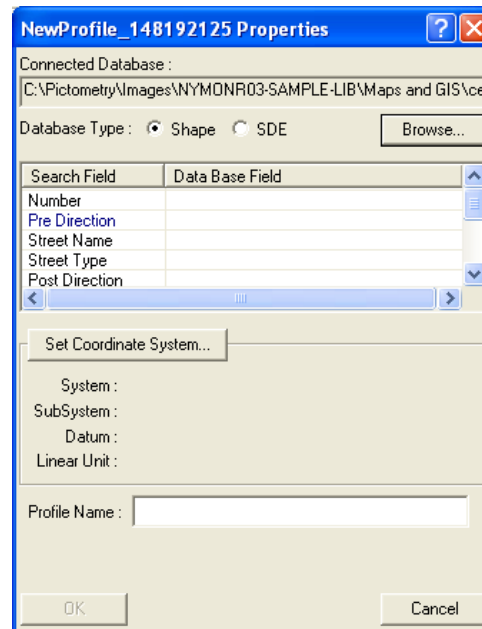
You’ll need to know which file to use and where it resides. Typically, your shapefiles are located in the Maps and GIS directory of your Image Library.

*The fields you need are found in centroids or parcels files (for parcel-based searching), a TIGER or Street Centerline file (for range-based searching).*

4. Navigate to the file that has your address data, select the file, and click **Open**.

The Open dialog box closes. On the Properties dialog box, the name of the file you chose is shown in the Connected Database box.

**Hint:** If the pathname to your database isn't fully in view, place your cursor anywhere in the Connected Database box and (on your keyboard) press **END** to see the end of the pathname (or **HOME** to see the beginning).



5. Skip to Step 8.
6. Click **SDE** for your Database Type, then click **Browse**.

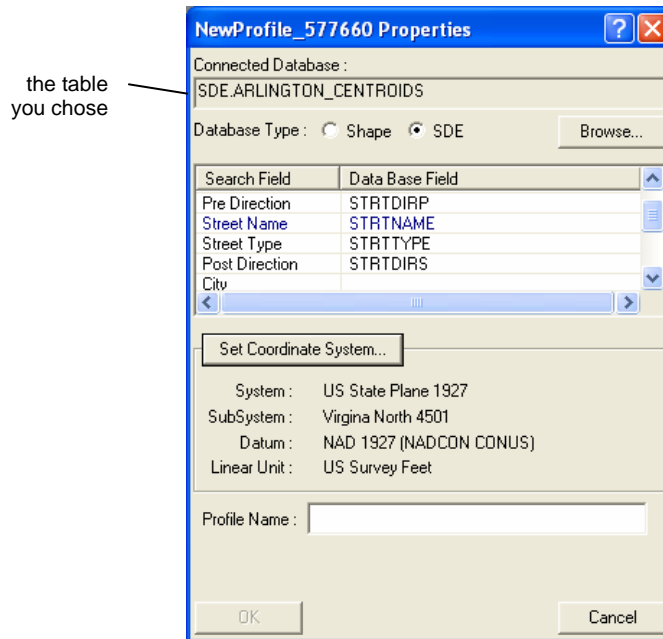
The Select SDE table dialog box appears. It lists all available SDE tables.

**Note:** If you are not currently connected to SDE, you will be prompted to connect at some point during the remainder of this procedure. See “Connecting to your SDE database” in Part III, Chapter 16.

7. Select the table that has the parcel information you need, and click **OK**.  
The Select SDE table dialog box closes.

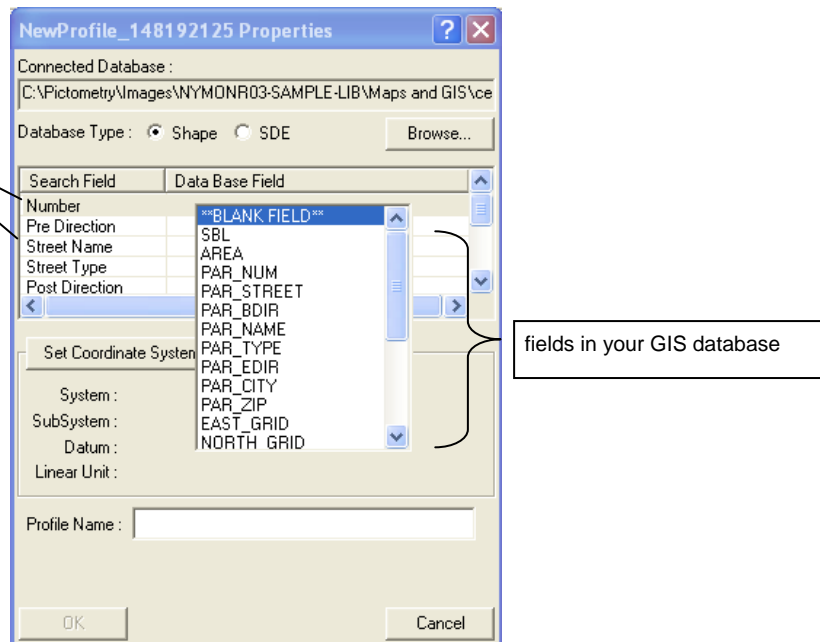
*You'll need to know which table to use. Centroids or parcels tables include the fields you need for a parcel-based search.*





8. Correlate GIS field names to EFS field names as follows:
  - a. Double-click the name of the field in the Search Field column. A pop-up lists the field names in your database.

For parcel-based searches,  
—If searching by street  
address, Number and  
Street Name are required  
fields.  
—If searching by Parcel ID,  
see page 28.  
For range-based searches,  
see page 29.

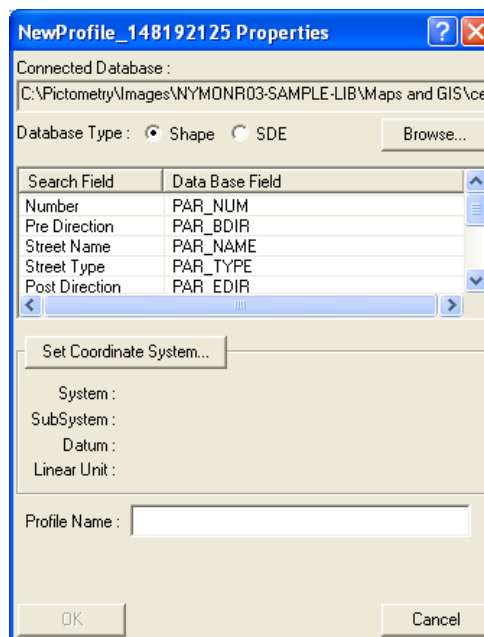


- b. Find and click the name of the corresponding field in your database. (See Table 1-1 on page 28.) The field name you clicked is copied to the Data Base Field column on the Properties dialog box.

**Tip:** For more specific searches, correlate as many of the non-required fields as are available. (Correlating a non-required field does not mean that users must include data for that field when searching.)

Tip: (*continued*) However, for parcel-based searches, *do not correlate* the following fields: From Right, From Left, To Right, To Left. For range-based searches, *do not correlate* Number.

- c. Repeat Steps 8a and 8b for each remaining field to correlate.



9. Click **Set Coordinate System**.

The Address Lookup Source Coordinate System dialog box appears.

10. From each of the drop-down lists, select the appropriate coordinate system information for your geographic area. Then click **OK**.

The coordinate system data you chose appears on the Properties dialog box.

11. In the Profile Name box, type a name for your profile, and click **OK**.

**Note:** If you're modifying an existing set, you can rename it or just click **OK**.

You'll see the message "Creating PDX file." (This may take a minute or two.) The Properties dialog box closes.

12. In the list of Address Search profiles, double-click the name of the profile you want to use.

The Active Profile box is updated to show the name of the profile you've chosen.

**Note:** If you want to save the profile as a PAX file, *skip to Step 3* of the procedure "To export a profile to a PAX file" (next topic). You do not have to return to this procedure.

13. Click **OK**.

The Address Search Profiles dialog box closes, and your profile is created. The active profile appears in the Address Search Profile toolbar (which may be present in your toolbar area, depending on the active EFS configuration).

## Exporting a profile to a PAX file

---

Once you've created an Address Search profile, you can share that profile with other EFS users. You simply export the profile to a Pictometry Address eXchange (PAX) file, which you can import to other machines running EFS.

**Tip:** Try using the Address Search feature with the new profile before exporting and importing to other machines, to be sure you have set things up as desired.

### ◆ To export a profile to a PAX file:

1. Choose **Navigate⇒Address Search Setup**.

The Address Search Profiles dialog box appears, showing any existing profiles.

2. Double-click the name of the profile you want to export.

The Active Profile box is updated to show the name of the profile you've chosen.

3. Click **Export** to export your profile to a PAX file.

The Export Address Profile dialog box opens, where you'll provide a path and name for the PAX file.

4. Navigate to a directory where you want the PAX file to be created, and type a file name in the File name box (or use the Address Search profile name, already shown). Then click **Save**.

The Export Address Profile dialog box closes.

5. On the Address Search Profiles dialog box, click **OK**.

The Address Search Profiles dialog box closes.

Your PAX file is created and is now ready to be shared with other EFS users.

The next section gives instructions for importing a PAX file to other EFS machines.

If you want to include the PAX file in a (new or existing) PCF file, you can use the EFS Toolbar Configuration Editor to create or edit the PCF file. See the *EFS System Administrator Guide* for more information about using the EFS Toolbar Configuration Editor and about loading PCF files into EFS.

Remember to return to this chapter if you want to add Address Search toolbars (page 36) or set up the highlighting feature (page 39).

## Importing a profile from a PAX file

---

If you've exported or acquired a PAX file, you can import that file to any EFS machine. You can then load the profile it contains, making it the active profile.

### ◆ To import and load a PAX file into EFS:

1. Choose **Navigate⇒Address Search Setup**.

The Address Search Profiles dialog box appears.

2. Click **Import**.

The Import Address Profile dialog box appears.

3. Navigate to the desired PAX file and do *one* of the following:
  - Select the name of the PAX file, and click **Open**.
  - or —
  - Double-click the name of the PAX file.

The Import Address Profile dialog box closes. The Address Search Profiles dialog box re-appears, showing the PAX file's profile in the list of existing profiles. (There may be no other profiles in the list.)

4. To load the profile, double-click its name in the list.

The profile's name is shown in the Active Profile box.

5. Click **OK**.

The Address Search Profiles dialog box closes.

The PAX file is loaded. EFS now has access to the address data needed to search by street address.

## Address Search toolbars

There are two toolbars you can use with the Address Search feature:

- The Address Search toolbar, and
- The Address Search Profile toolbar.

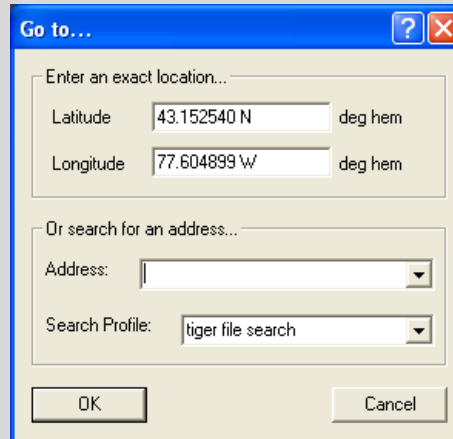
**Note:** These toolbars can be added before or after you've created an Address Search profile.

### Address Search toolbar



The **Address Search toolbar** is where you will enter a street address to search for. This toolbar may or may not be present when you install EFS. If it's not present, you can easily add it.

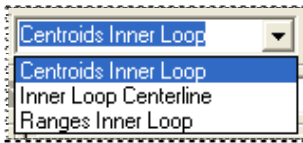
**Do I need the Address Search toolbar?** No. This toolbar is *not* absolutely necessary. You can enter an address on the Go to dialog box (Navigate⇒Go to location).



But if you search by street address frequently, you might appreciate being able to enter an address in the toolbar and save a step each time.

Also, by using the toolbar rather than the dialog box, EFS remembers previous searches, making it easy to revisit those searches later in your EFS session.

## Address Search Profile toolbar

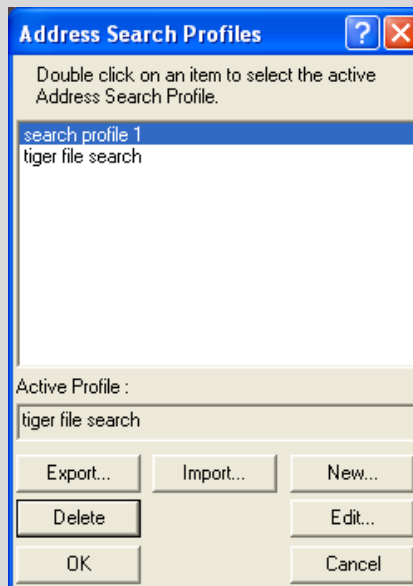


The **Address Search Profile toolbar** is a second box that can be added to a toolbar. Its purpose is to display the active profile and to provide a handy place where you can change the active profile.

The Address Search Profile toolbar is present on an EFS toolbar *only* if you add it.

**Do I need the Address Search Profile toolbar?** No, there are two other ways to change the active profile:

- Navigate⇒Go to location (“Go to” dialog box shown on page 37), and
- Navigate⇒Address Search Setup



Use the following procedure to add the Address Search and Address Search Profile toolbars. Repeat this procedure on each EFS machine that will be searching by street address.

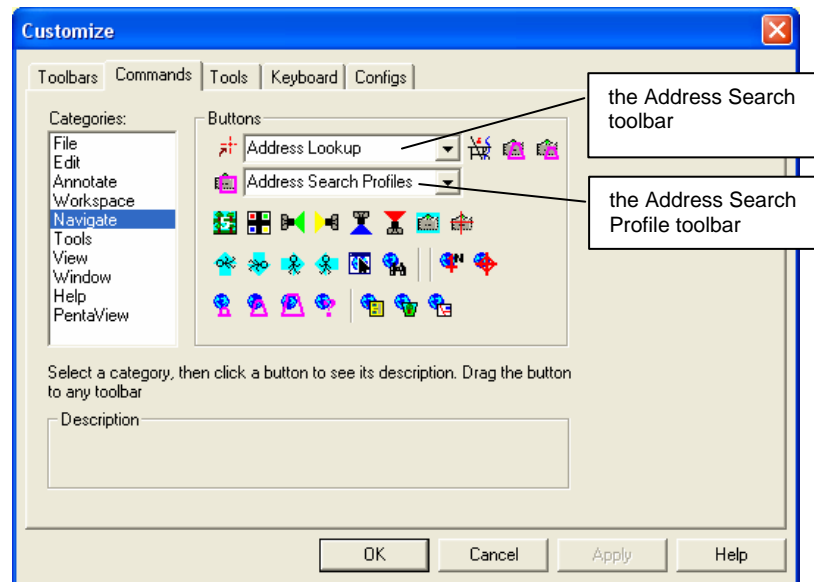
**Note:** The Address Search toolbar (“Address Lookup”) may already be there.

◆ **To add a toolbar for address searching:**

1. Do *one* of the following:
  - Right-click in the Image window, and select **Customize** from the context menu.
  - or —
  - Choose **Tools**⇒**Customize**.

The Customize dialog box appears.

2. Click the **Commands** tab, and from the Categories list, select **Navigate**.



3. Drag-and-drop the desired toolbar (“Address Lookup” or “Address Search Profiles”) to an available spot on a toolbar.

If you’ve added the “Address Search” toolbar, the text shown in its box changes (from the toolbar name “Address Lookup”) to “Enter address”.

If you’ve added the Address Search Profile toolbar, the text shown in its box changes (from the toolbar name “Address Search Profiles”) to the name of the profile that’s currently active. If you have not yet created a profile, the text disappears when you drop the toolbar.

**Hint:** To name the new toolbar, click the Toolbars tab on the Customize dialog box, select the toolbar to be named (“ToolBar n” where “n” is highest of the checked toolbar names), and type a new name in the Toolbar Name box.

4. Click **OK**.

5. (Optional) Dock your new toolbar by grabbing its left side and dragging it close to another toolbar. It will “connect” with the neighboring toolbar and dock into place.

The screen now has a new toolbar where you can type a search address.

## Highlighting data for the land parcel

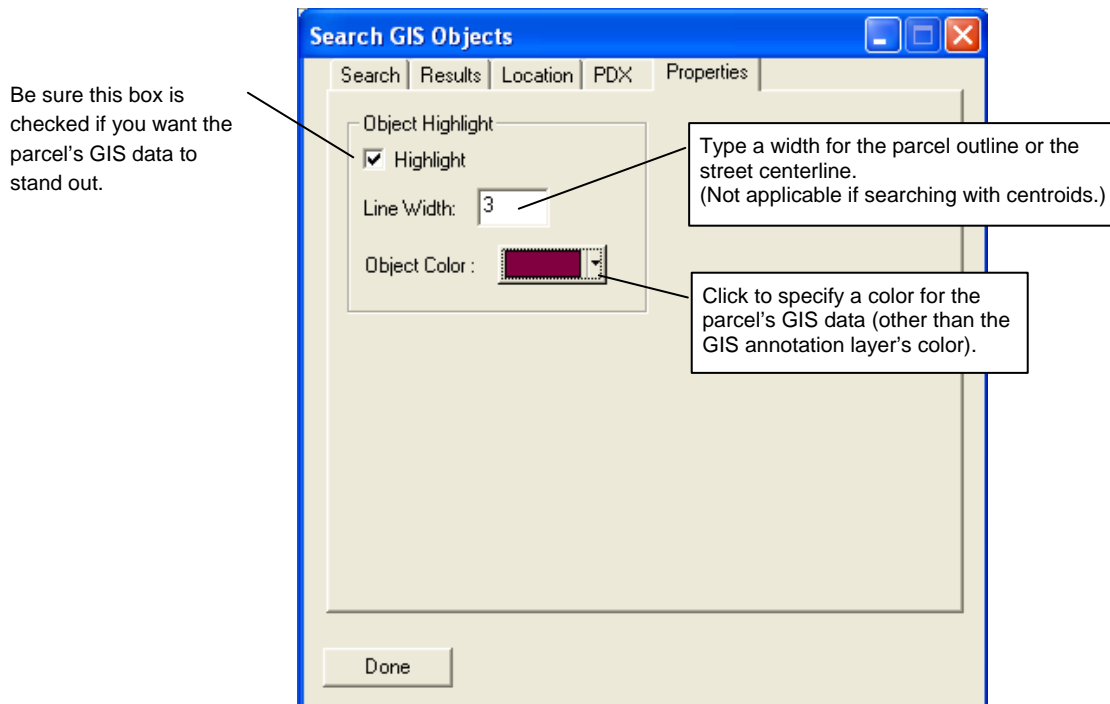
When setting up the Address Search feature, you might take advantage of the **Object Highlight** feature, which lets you highlight GIS vector data for the search parcel. Object Highlight lets you assign attributes (color, line width, etc.) to the search parcel. So when you view the search’s resulting images, the GIS object for the desired parcel stands out amongst the rest of the GIS vector data.

If the address search uses ...	Here’s what is highlighted ...
(parcel-based) point GIS data— a centroids file or SDE table	the parcel’s centroid.
(parcel-based) polygon GIS data— a parcels file or SDE table	the parcel’s perimeter.
(range-based) GIS data— a TIGER file or a Street Centerline file	the street segment’s “centerline.” <b>Note:</b> A centerline is just as it sounds, a line— painted or imaginary—running down a street’s center.

Use the following procedure to highlight GIS data for the search parcel. Repeat on each EFS machine that will be searching by street address.

### ◆ To highlight GIS data for the parcel found:

1. In the workspace, right-click the GIS annotation layer that corresponds to the DBF file (or the SDE table) that you specified for the Address Search profile.
2. From the context menu, select **Search <layer name>**.  
The Search GIS Objects dialog box appears.
3. Click the **Properties** tab, and in the Object Highlight area, specify attributes for the search addresses.



4. Click **Done** to close the dialog box.

When you search by street address and display resulting images, the GIS object (centroid, perimeter, or street centerline) for the parcel found will now have the attributes you've specified.



# Chapter 2 — Overview

This chapter contains important concepts about images and about EFS.

## Topics covered in this chapter ... page

What is EFS? .....	41
EFS features .....	41
Advanced User Mode.....	43
What is image resolution? .....	43
What is an Image Library? .....	45
Overlays.....	51

## What is EFS?

**Electronic Field Study (EFS)** is a software system that lets you view and work with the aerial images contained in your Pictometry® Image Library or purchased from Pictometry Online.

## EFS features

EFS provides features that meet the needs of a diverse group of users. This section summarizes what you can do with EFS features.

### Search for images in various ways

- Click a point on a map or image and view images that contain that point.
- Enter a location's geographic coordinates and view images that contain the coordinates you entered.
- If you have GIS data covering the same geographic area as the images in your Image Warehouse, you can enter a street address and find all images that show that address; and you can find images based on other text fields within the GIS data.

### View related images

- View an image that is geographically adjacent to the one you are viewing
- View the same area from a different "shot level" (altitude).
- View the same area from a different compass direction.
- View an area from five compass directions (N, S, E, W, and orthogonally) at the same time.

- Locate points of interest by moving along a path, within and between images. As you near an image's edge, EFS searches for (and seamlessly swaps in) the best available adjacent image.

### **Measure and annotate images**

- Measure the height, width, or length of items within an image in a unit of measure you specify.
- Measure the area of any part of an image in a unit of measure you specify.
- Accurately measure areas, heights, or lengths of items in your images—whether the items are on or above the ground.
- Click on any item in an image and view its coordinates.
- Click on any item in an image and view its elevation, or calculate differential elevation.
- Find out the bearing—the orientation from True North—of an object, such as a road. Find out the angle of two intersecting lines.
- Annotate an image with text, lines, circles, icons, points, or links to files (such as documents or spreadsheets). Annotate an image with measurements you've taken by using EFS measurement tools. The annotation can pertain to a single image or to all images that contain the same geographic coordinates.

### **Overlay and query GIS data**

- Overlay images with GIS data (contained in shapefiles and SDE databases).
- Overlay images with labeled GIS data. Choose a GIS text field that EFS will automatically display with each unit of GIS data.
- Query a location to view its GIS data.
- Search for GIS text data in shapefiles and SDE feature classes, and view the images associated with that data.

### **Overlay grids**

- Overlay an image with a circular or rectangular grid that you create by using a tool on an EFS toolbar.
- Enter and store data in grid segments.
- Import the format of a shapefile or an SDE database to use as a template for entry of data into grid segments.
- Export a grid and its data to a shapefile or to an SDE database.

### **Overlay and view image polygons, sector maps, and contour lines**

- Overlay images with image polygons that show the “footprints” of your other images.
- Overlay maps with sector maps, dividing the area into square-mile subdivisions.

- Overlay images with elevation contour lines.

### Export and import files and overlays

- Section off portions of images, crop as necessary, and export the results in various image file formats.
- Export images, image polygons, and measurements to files that can be imported into other applications or used by other EFS users.
- Import elevation files (if your images don't contain elevation data) so you can factor in elevation when analyzing a landscape.
- Import and export sector maps to share with other EFS users.

### Organize a subset of images and related information

- Save a related collection of images (called a workspace) with related annotations and files for later use.

### Annotate images with data from an ALOHA system

- If you use the ALOHA (Areal Locations of Hazardous Atmospheres) application, you can incorporate ALOHA annotations into your EFS images.

### Customize EFS

- Customize EFS toolbars, the placement of windows, the size of toolbar buttons, and how images are shown following an image search (as thumbnails or opened automatically).

## Advanced User Mode

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*See Appendix D for more information about Advanced User Mode.*

Advanced User Mode is an EFS feature that shields newer users from unnecessary extras. EFS uses a setting that lets you include or exclude those features that require a little more EFS expertise, such as viewing polygons as projections from the camera, creating ALOHA annotation layers, and creating a subset of an Image Library (a “sub-warehouse”) from images listed in a workspace.

Users who appreciate a streamlined version of EFS might choose not to work in Advanced User Mode.

## What is image resolution?

---

When EFS displays an image, it displays it at a certain “resolution.” **Image resolution** in EFS refers to the amount of ground represented by a pixel on your screen at any given time.

A few things factor in to this image resolution:

- true Ground Sample Distance
- screen resolution, and
- zooming in or out

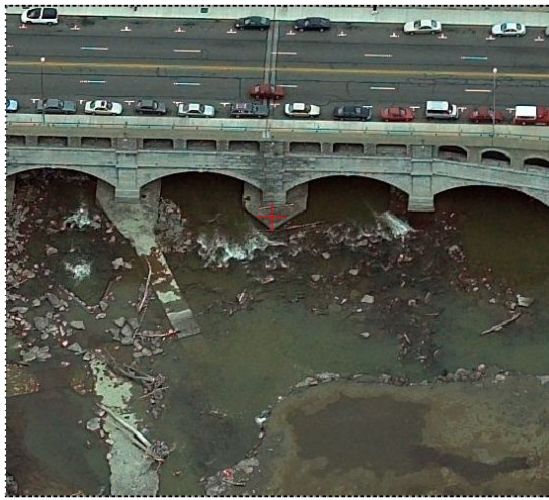
## True Ground Sample Distance

*Ground Sample Distance is sometimes referred to as “spot size.”*

An image’s true Ground Sample Distance (GSD) is based on the camera distance when the image was captured. **True Ground Sample Distance** refers to the length of the spot on the ground that is represented by one pixel in your image.

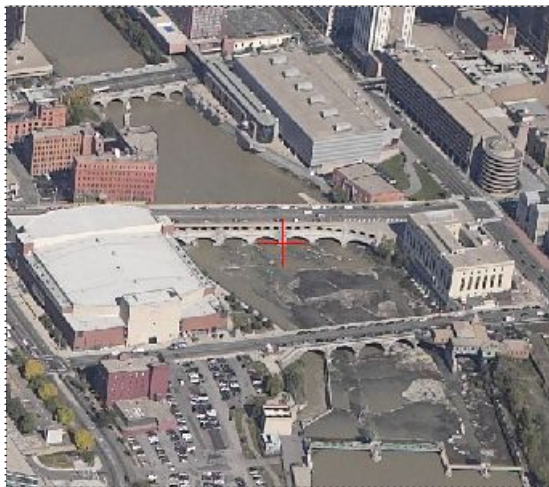
You can think of GSD as **how much ground is covered by an image**. For example, an image captured from a distance of 2000 feet covers less subject matter (“ground”) than an image captured from 4000 feet away.

**Note:** An image’s resolution in EFS is sometimes *called* GSD, but an image’s *true* GSD, the GSD at which the image was captured, never changes. When the image is viewed in EFS, your screen resolution plus any zooming you do affect the resulting image resolution.



*This image has a smaller (true) GSD, shows more detail, and objects in it appear closer than in the image in Figure 2-2.*

**Figure 2-1:** Image taken at 2000 feet.



*When compared with the image in Figure 2-1, this image has a larger GSD (covers more ground), shows less detail, and its objects appear farther away.*

*If this image were zoomed to the approximate resolution of the image in Figure 2-1 (to show only the same, smaller area), it would become grainy or blurry.*

**Figure 2-2:** Image (with same center point as image in Figure 2-1), taken at 4000 feet.

## Screen resolution

**Screen resolution** is the number of pixels your screen can display in one square inch. Your screen’s resolution impacts the image resolution.

## Zoom factor

Zooming in (increasing magnification) reduces the image resolution, and zooming out (decreasing magnification) increases the image resolution.

## Scales — formats for image resolution

*Scale is the proportion between two dimensions, such as the distance on a map and the corresponding actual distance.*

When EFS displays an image, it also shows the image’s resolution, which can be in one of the following three formats or **scales**. (You can choose which one you prefer working with, and you can switch between the various scales.) EFS uses the image resolution scale of your choice when magnifying images and when determining whether an annotation is within minimum and maximum thresholds you can set for viewing annotations.

Here are the three scales you can use to express image resolution in EFS.

scale	to determine the image resolution (expressed in this scale) ...
“GSD” in units per camera-pixel	EFS starts with the true GSD, then factors in any zooming you’ve done.
“GSD” in units per in or units per cm	EFS starts with the true GSD, then factors in the screen’s resolution plus any zooming you’ve done.
Absolute scale	This value is equal to “GSD in units per in or units per cm,” but converted in order to eliminate the inches or cm units. <b>Absolute scale</b> is the ratio of what you see on the screen to what you see in the real world, <i>independent of units</i> . (Its value remains the same for any units of linear measure—such as miles or meters).

**Hint:** To see an image’s true GSD, view the image at 100% magnification (with no zoom changes).

For an in-depth discussion of image resolution and these three scales, see Part IV, Chapter 20.

## What is an Image Library?

An **Image Library** is the term that collectively describes all of the data you’ll use with EFS. Because the largest part of the Image Library is the collection of images, users often refer to their images as the “Library.”

## What does it contain?

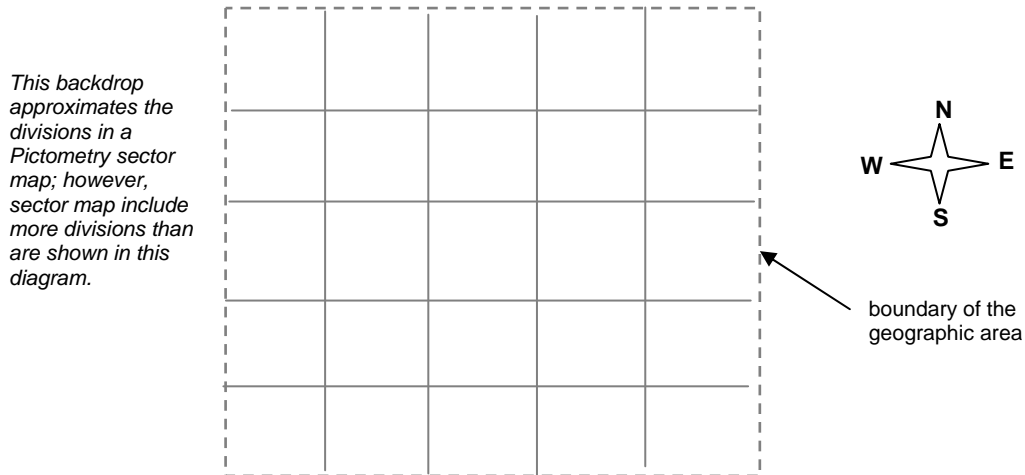
An Image Library contains Pictometry images of an area and related data for that same area. It can include maps, GIS data, workspace files, and image polygons. Some users also have elevation files and PAS files for ALOHA annotations.

The files are organized in a tree structure with the following folders:

- a folder for elevation files,
- a folder for maps and GIS files,
- a folder for image polygons, and

- a folder for the Image Warehouse (where the images are stored) with subfolders for clusters, sectors, and image files.

Everything contained in these folders (such as images, maps, and GIS data) is associated with the same geographic area (“**geo-referenced**” to the same area). Figure 2-3 shows the “backdrop” or geographic area an Image Warehouse represents. You can think of this as a map.



**Figure 2-3:** The geographic area of an Image Warehouse.

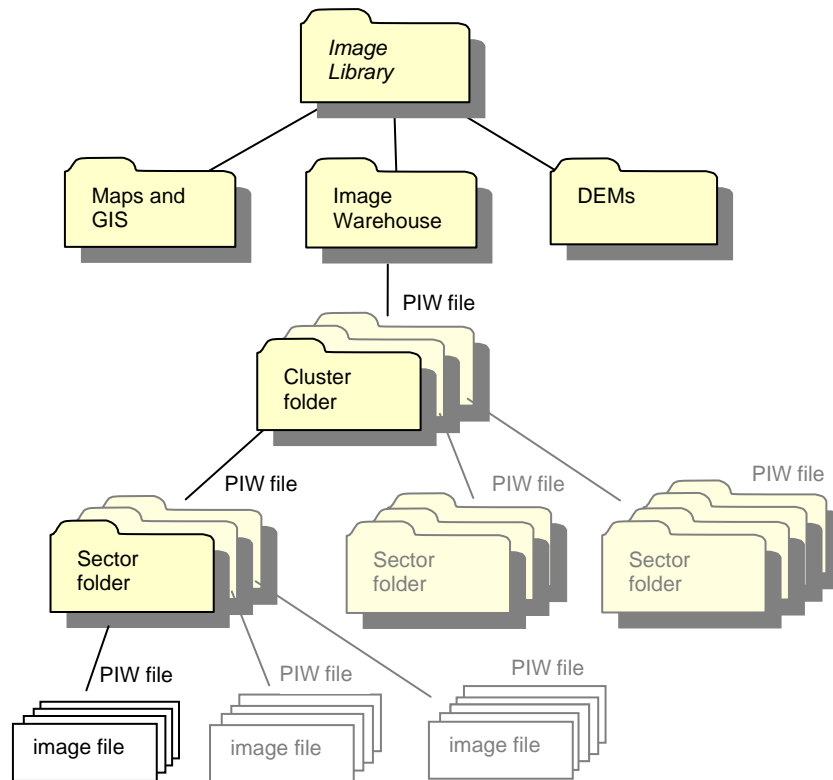
## The Image Warehouse

An **Image Warehouse** is that part of the Image Library that contains your images, typically of an entire town, county, or state. An Image Warehouse contains images taken at Community and Neighborhood shot levels at both Orthogonal and Oblique angles.

### The structure of an Image Warehouse

The Image Warehouse folder resides under the Image Library root. The images in an Image Warehouse are distributed in subfolders nested under the Image Warehouse folder.

The main Image Warehouse folder contains a PIW file that stores information about the entire warehouse, including location information about the images contained in the warehouse. Each subfolder also contains a PIW file that stores information about the images found in that part of the warehouse.



**Figure 2-4:** The structure of an Image Library.

**Note:** You don't need to be concerned with cluster and sector subfolders because you'll work with an Image Warehouse as a unit and EFS accesses the images in a warehouse seamlessly. However, you should be aware of the existence of lower-level PIW files, because you'll need to select the highest-level PIW when you link to your Image Warehouse and when you open an Image Warehouse to export image polygons.

### EFS handles multiple libraries

EFS can access multiple Image Libraries (and consequently, multiple Image Warehouses). This feature is helpful if you want to compare images taken at different times.

### For Pictometry Online users ...

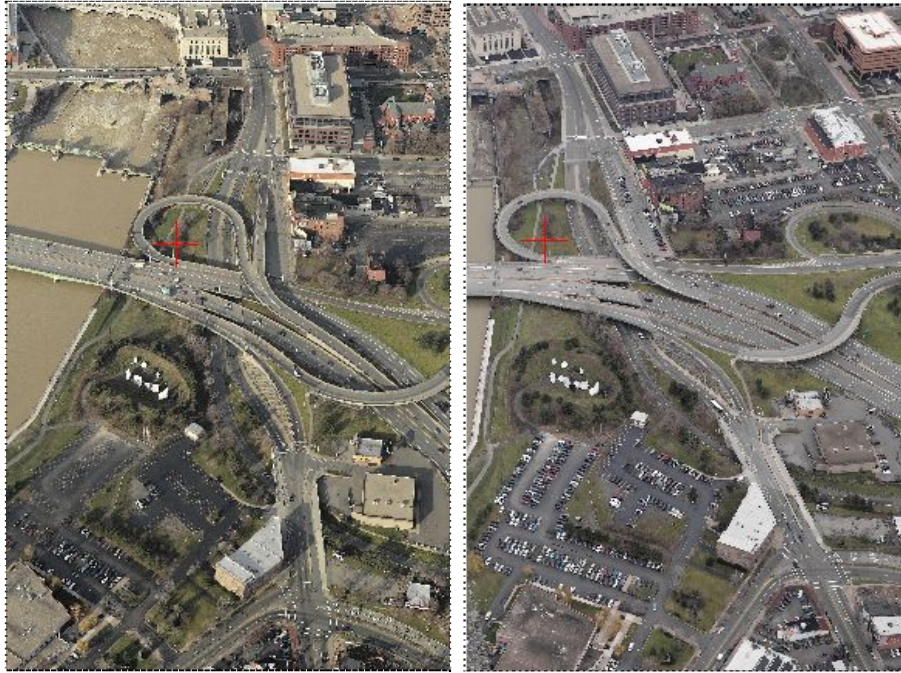
If you purchased images through Pictometry Online, you don't need to know about Image Warehouses unless you want to organize your images into a warehouse.

## What kind of images are contained in a Library?

The images contained in an Image Library are full color, high-resolution digital images, taken from at least three different views (and sometimes more than twelve views). The images are grouped by geographic regions (often counties or states), so they can be used individually or by region.

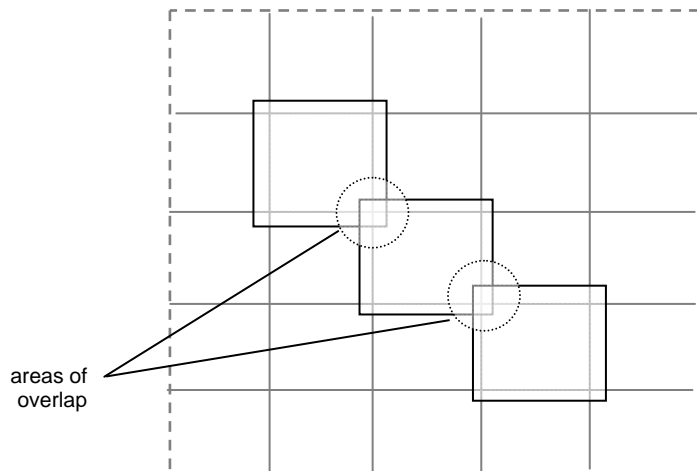
All Pictometry images are in the WGS1984 Lat/Lon coordinate system, unless an alternate coordinate system was specified by the customer.

Pictometry images are captured with some overlap, so a particular point is usually shown on more than one image. Notice the significant overlap in these two images.



**Figure 2-5:** Two Pictometry images that cover some of the same ground.

Figure 2-6 shows the warehouse backdrop and the “footprints” of three Pictometry images on that backdrop.



**Figure 2-6:** Pictometry image footprints showing overlap.



### Image types

Pictometry includes the following image types:

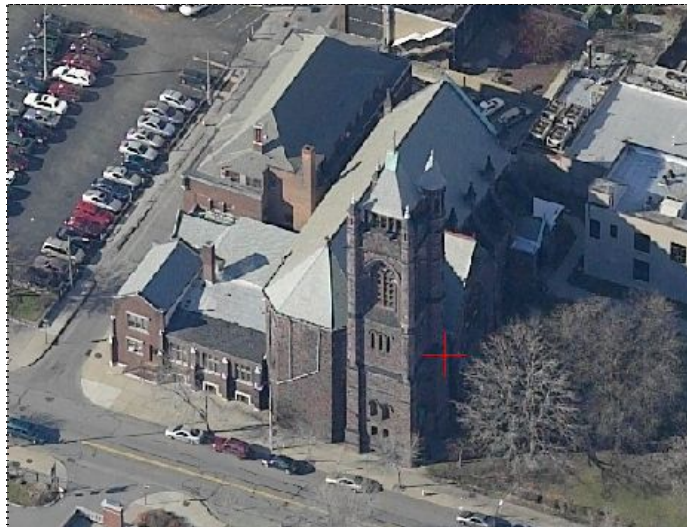
- Orthogonal images
- Oblique images

**Orthogonal images** are taken straight down. North is always the top of the image. (This perspective is also referred to as “north up.”)



**Figure 2-7:** Orthogonal image showing a building.

**Oblique images** are taken at an angle. Oblique images let you see the details of the objects in an image, making them easier to identify.



**Figure 2-8:** Oblique image of the same building shown in Figure 2-7.

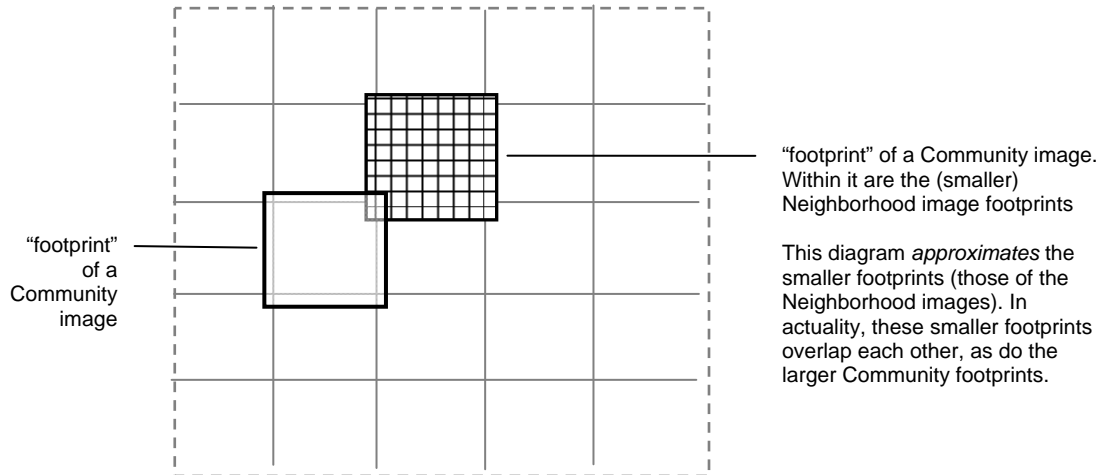
### Shot levels

Pictometry images are taken at the following shot levels:

- Community
- Neighborhood

A **Community** image typically shows an entire community and is shot from a higher altitude than a Neighborhood image. Community images are helpful for locating points of interest. Both Orthogonal and Oblique images are taken at the Community shot level.

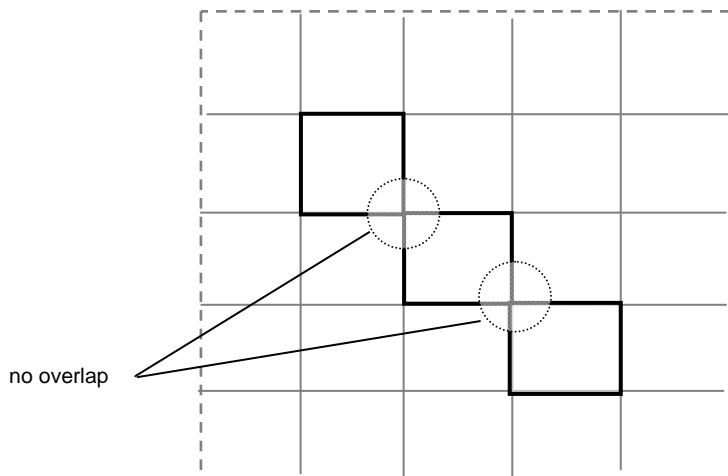
A **Neighborhood** image is shot from a lower altitude than a Community image and therefore shows more detail. On Neighborhood Oblique images, you can focus in on details, such as the location of fire hydrants or the heights of buildings. Both Orthogonal and Oblique images are taken at the Neighborhood shot level.



**Figure 2-9:** Neighborhood and Community image footprints.

### Special images

**Ortho Sector Tiles** are special images manufactured from Orthogonal images. They do not overlap each other, and they each cover one square mile.



**Figure 2-10:** Ortho Sector Tile footprints.

**Rural** images are typically used for less populated, rural areas and are shot at a level that's equal to or higher than Community images.

EFS uses the image type "Other" to represent any type of image other than Community, Neighborhood, and Ortho Sector Tile. This shot level category is typically used for customer-added images.

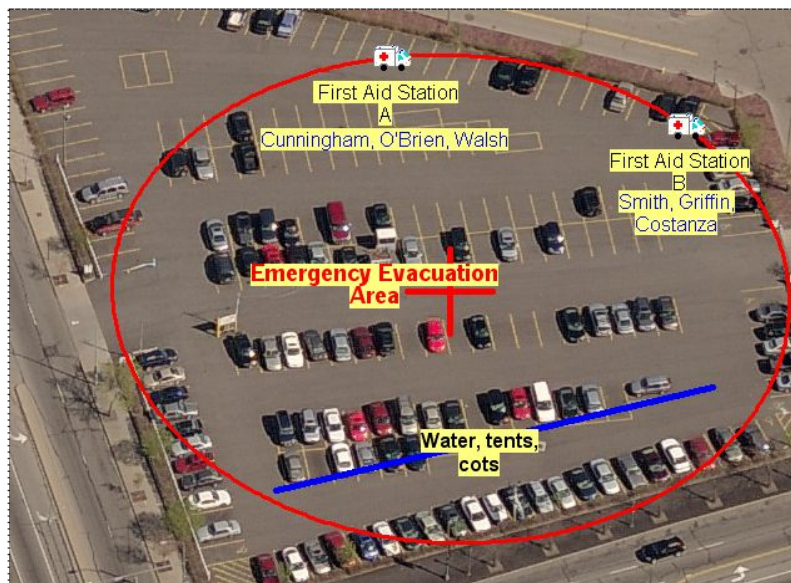
## Overlays

Overlays are graphics and data that can be displayed on top of images. EFS lets you place various types of overlays over an image.

### Annotations

*User-defined annotations are covered in Part II, Chapters 12 and 13.*

An **annotation** is an overlay that you draw or place over an image. Annotations such as text, lines, circles, points, icons, and links that you create by using one of the EFS annotation tools are called "user-defined" annotations.



**Figure 2-11:** User-defined annotations displayed on an Oblique image.

*GIS Annotations are described in Part III.*

**GIS annotation** data encompasses existing geo-referenced (covering the same ground) vector and alphanumeric data from shapefiles and SDE databases that you can add to your EFS workspace as an overlay.



**Figure 2-12:** A GIS annotation layer of parcel data displayed on an Oblique image.

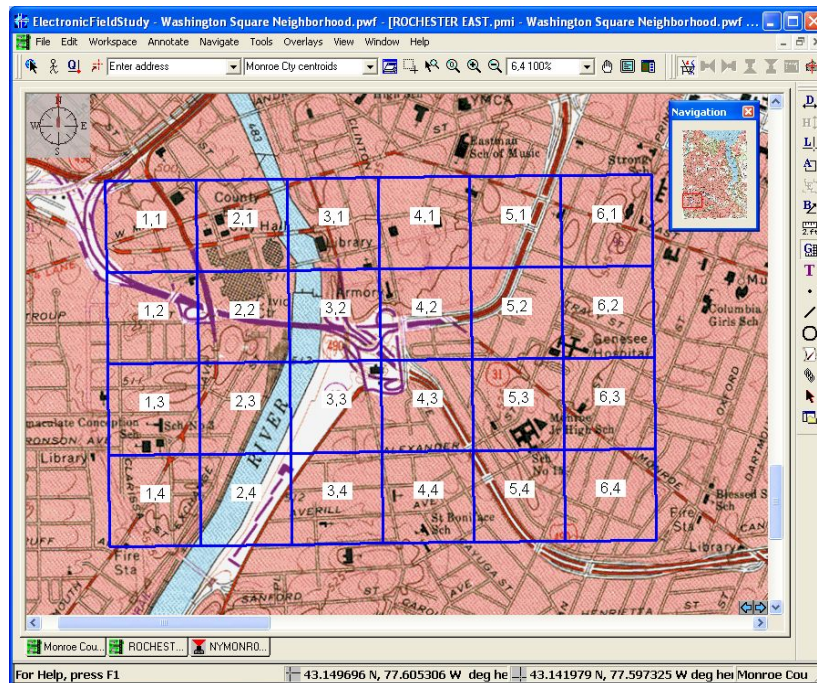
ALOHA  
annotations are  
described in  
Appendix C.

An **ALOHA annotation** is a special graphic depicting how hazardous gases might disperse in the atmosphere following a chemical spill. ALOHA annotations are created from data that comes from the ALOHA application.

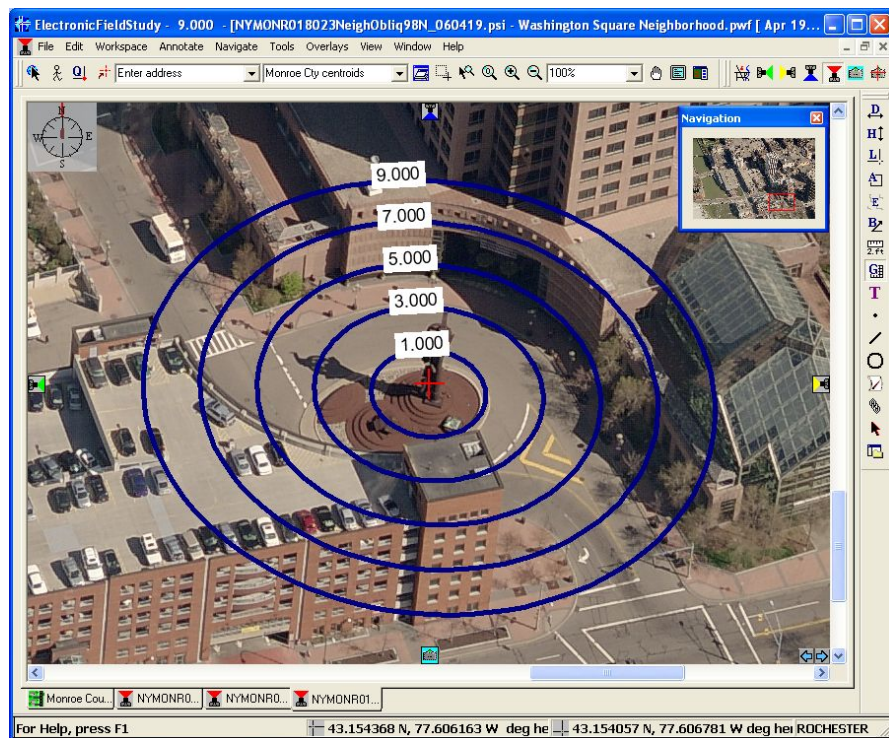
### Grids

A **grid** is an overlay that you create and place over an image by using the Grid Tool. EFS supports two types of grids: rectangular and circular. Grids contain equal-sized segments into which you can enter data. You can also export a grid and its data to a shapefile or to an SDE database.





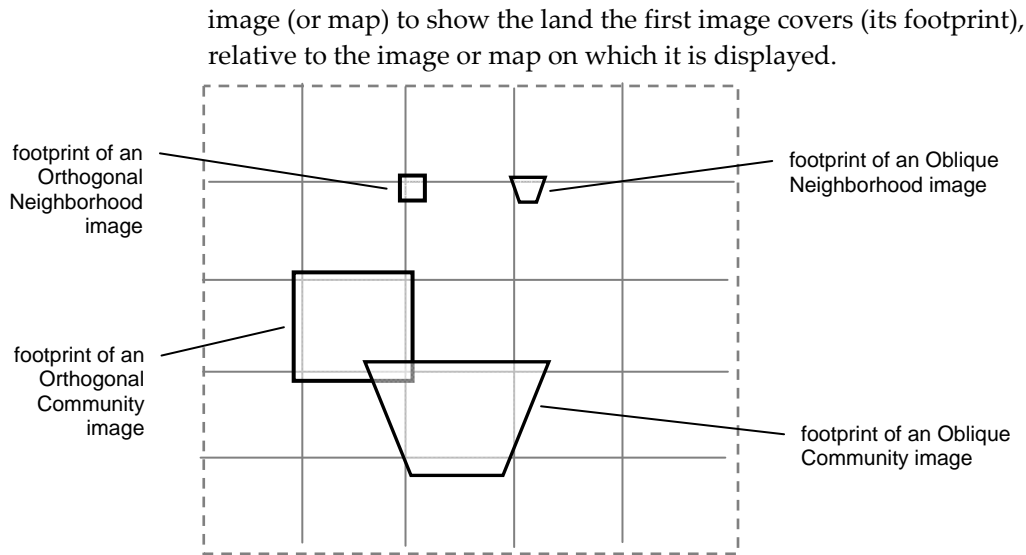
**Figure 2-13:** A rectangular grid shown on a map.



**Figure 2-14:** A circular grid shown on an Oblique image.

### Image Polygons

An **image polygon** is an overlay that represents the footprint of an image. Every Pictometry image has an overlay that can be displayed on any other



**Figure 2-15:** Four image polygon examples.

### *Elevation bounding boxes*

**Elevation bounding** boxes are boxes that identify different ground elevation areas on a map. This type of overlay is available if you have elevation data available for your images.

### *Elevation contour lines*

**Contour lines** are a kind of topographical map feature indicating zones of elevation. This type of overlay is available if you have elevation data available for your images.

### *Sector maps*

**Sector maps** are overlays that are displayed over **base maps**. The sector map divides the base map into one-mile sections.

The backdrops depicted in Figures 2-3, 2-6, 2-9, 2-10 and 2-15 approximate sector maps. (However, actual Pictometry sector maps have more divisions than are shown in these diagrams.)

*A base map is the map or Orthogonal image upon which a workspace is based. It is typically a map of a county.*

# Chapter 3 — Starting EFS and Getting Oriented

If you haven't yet installed EFS, see Chapter 1, "Installing and Setting up EFS" for installation instructions. Once EFS is installed, use this chapter to start EFS and become familiar with the parts of the application such as menus and toolbar buttons.

## Topics covered in this chapter ... page

Starting EFS.....	55
Workspaces .....	56
The Electronic Field Study application .....	58
The Image window .....	59
Menu Bar, toolbars, and Status Bar .....	63
Context menus .....	67
Closing EFS .....	67

## Starting EFS

If you are starting EFS for the first time after installation, see "Starting EFS for the first time" in Chapter 1.

### ◆ To start EFS:

Do *one* of the following:

- From the Windows Start menu, select  
**Programs⇒Pictometry⇒Electronic Field Study 2.7**
- or —
- Double-click the default EFS shortcut placed on the desktop by the installer.
- or —
- Double-click any saved workspace (PWF file) or shortcut to a workspace.

The Electronic Field Study application opens. If you opened EFS from a shortcut that also opened a workspace, the base map image opens in the Image window. Otherwise, no images are open.

If you don't already have a workspace, see "Creating a workspace" on page 56.

**Tip:** Many users find it convenient to both start EFS and open a workspace by double-clicking a shortcut to a workspace. For more information on creating shortcuts, see “Shortcut” in Windows Help.

## Workspaces

A **workspace** is a mechanism for organizing images and their related annotations and files. It is also a starting point for working with EFS.

### Are workspaces required?

*For an in-depth discussion of workspaces, see Chapter 10.*

You don’t need a workspace to work in EFS, but it’s the fastest and most common way to get started searching for images.

**Note:** You *must* have a workspace to annotate images, to view GIS annotations, or to load elevation files.

The advantage of using a workspace is that you can organize images and related data for fast access. Whether you need access to GIS data for queries, want to create annotations, or need to save “bookmarks” to images, workspaces are the answer.

### Opening a workspace from within EFS

If you already have a workspace, use the following procedure to open it.

#### ◆ To open a workspace:



1. Do *one* of the following:
  - Click the **Open** button.
  - or —
  - Choose **File**⇒**Open**.

The Open dialog box opens.

2. Navigate to the directory that contains the workspace you wish to open, select the desired workspace, and click **Open**. (Workspace files have the extension “pwf.”)

The workspace opens and it becomes the active workspace. If the Workspace window is in view, the workspace you opened appears in the Workspace window. When you open a workspace, the Image Tool is automatically activated and the base map image opens in the Image window.

### Creating a workspace

If you don’t already have a workspace, use the following procedure to create one.

**Note:** For your convenience, your Image Library may already contain one or more “starter” workspaces. If so, skip this procedure and see the previous topic, “Opening a workspace from within EFS.”



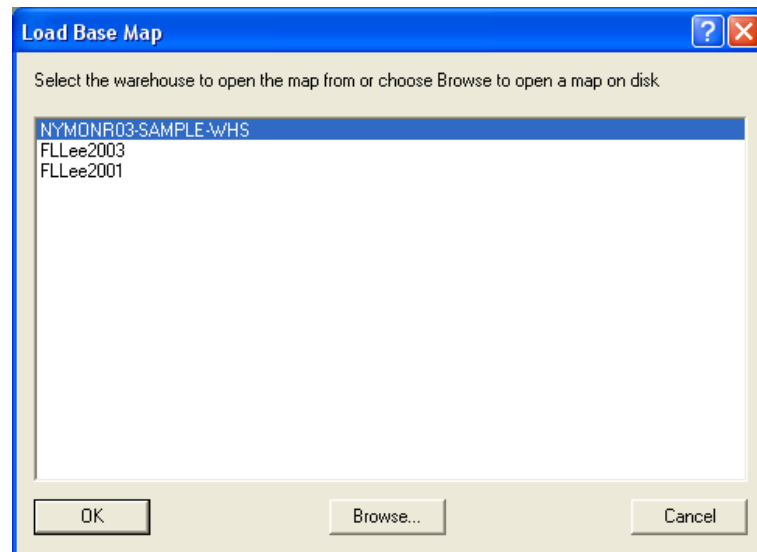
◆ **To create a workspace:**

1. Do *one* of the following:
  - Click the **New Workspace** button (if available on a toolbar).
  - or —
  - Choose **File⇒New Workspace**.

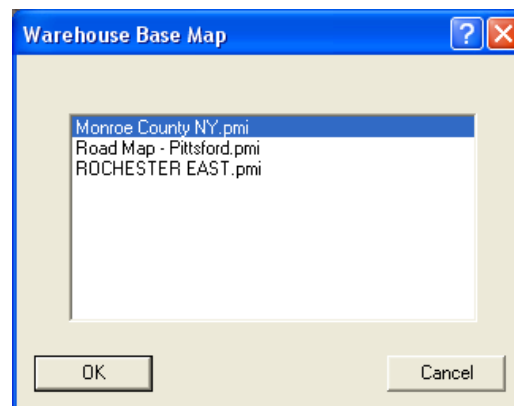


The Load Base Map dialog box opens.

*If you don't see this dialog box, be sure you have linked to a warehouse. See "Linking to your Image Warehouse" in Chapter 1.*



2. From the list of warehouses, select the warehouse that you want to work with.
3. Click **OK**. The Warehouse Base Map dialog box opens.



4. Select a base map (a file with the extension ".pmi"), and click **OK**.

Your workspace is now created (but not saved), the base map you selected appears in the Image window, and the Image Tool is active. A temporary workspace name, "Workspace n," appears in the Workspace window. ("n" is the n<sup>th</sup> workspace added in this EFS session.)

**Note:** Before exiting EFS, it's a good idea to save the new workspace so you don't have to create a new one each time you use EFS. See "Saving a workspace" in Chapter 10.

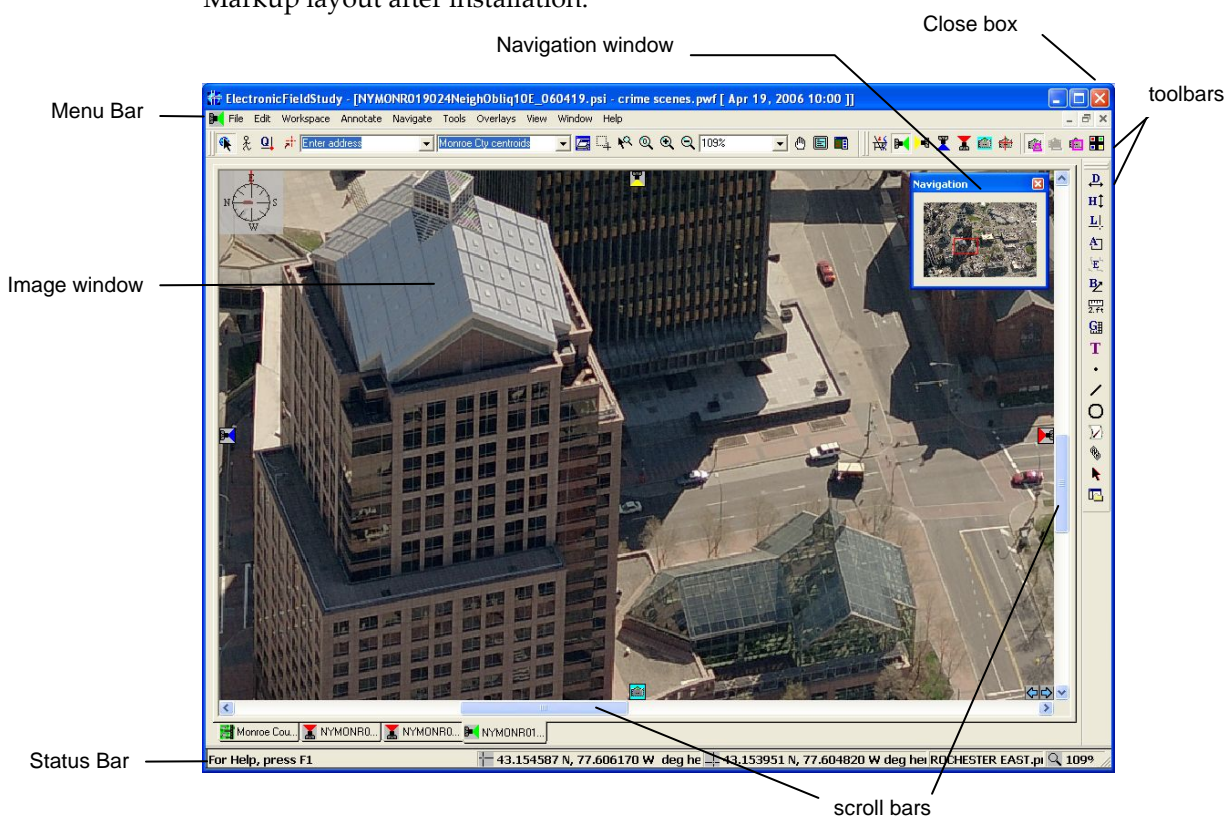
## The Electronic Field Study application

For more information about customizing EFS, see Part IV, Chapter 22.

The Electronic Field Study application contains menus, toolbar icons, and windows (described in the following sections). When you start EFS, you might see a base map (which is sometimes an Orthogonal image), another image, or no images at all.

Because EFS serves a user population with diverse needs, it has been designed to be quite customizable. For example, EFS provides built-in screen layouts with different levels of functionality. You chose one of these layouts when you started EFS the first time after installing it. You can also customize EFS at any time.

Here's what EFS might look like if you selected the Image View Measure Markup layout after installation:



**Figure 3-1:** The parts of the Electronic Field Study application.

The EFS application contains the parts described in Table 3-1, plus other windows you have the option of viewing. (Optional windows are described in Chapter 4.)

**Table 3-1:** *The parts of the Electronic Field Study application.*

Section	Description
Menu Bar	Contains pull-down menus for EFS features. Menu options are dim when not applicable to the current task.
toolbars	Contain buttons for quick access to EFS features. Buttons are dim when not applicable.
Image window	Shows open images (up to a limit you specify). See “The Image window” on page 59 for more information.
Navigation window	<p>Contains a thumbnail of the active image in the Image window. The thumbnail represents the entire active image and the red rectangle represents the visible portion of the active image. You can pan the active image by dragging the red rectangle.</p> <p>Also contains a compass that indicates the geographic orientation of the active image.</p> <p>The bottom of the compass is the point from which the picture was taken. It corresponds to the part of the image closest to the bottom of the Image window.</p> <p>The line at the top of the compass (outside the circle) indicates the direction in which you’d be looking if you took the photo. The line inside the compass always points north.</p> <p><b>Note:</b> For most maps, north is the top of the image and south is the bottom of the image.</p>
Status Bar	Shows various measurements and locations, such as the latitude and longitude of the area pointed to by the Image Tool, the results of measurements, and the percentage of magnification of the active image.

## The Image window

The Image window is located in the center of the screen. When you first open a workspace, the Image window typically shows the base map image. After a search, you’ll open images to view in the Image window. The location you searched for is highlighted by a red crosshair, known as the **Navigation Point**.

You can open more than one image in the Image window, however, only one image at a time can be active. If more than one image is visible in the Image window, clicking an image’s title bar makes it the **active image**. When you click the title bar, it turns a brighter shade of blue.

### Working with multiple open images

Because it is often helpful to view more than one image of the same area, (possibly from a different direction or of a different shot level), EFS lets you open multiple images in the Image window. There are two ways to do this:

- Standard View, and
- PentaView.

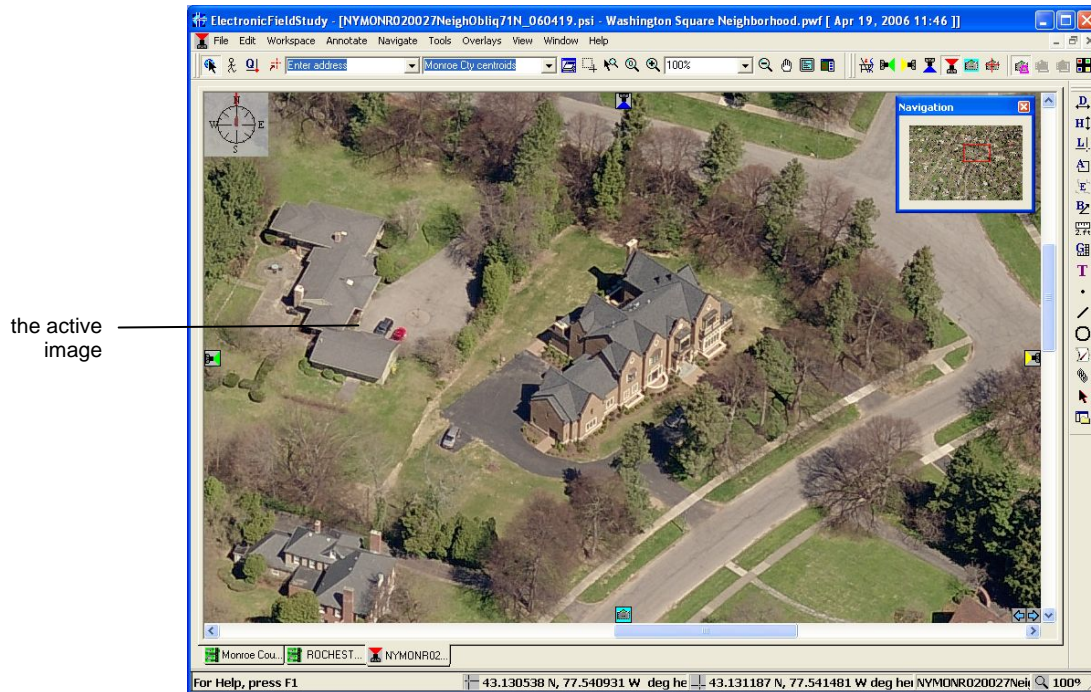
#### Standard View

In Standard View is the default mode for viewing images in EFS, in which one image opens at a time. In Standard View, when you choose images to open (by clicking a thumbnail, an Alternate View button, or the GetNext

**Note:** Although it wasn’t called as such, Standard View was the only viewing mode in prior versions of EFS.

button), each image appears in its own window within the Image window. The individual windows can be minimized, closed, resized, tiled, or cascaded.

As you open images in the Image window, you'll notice that they open on top of the previously opened image. The image opened most recently becomes the active image.



**Figure 3-2:** An Image window showing the active image in Standard View.

### *Cascading and tiling windows*

The cascade and tiling features of EFS provide the ability to view open images simultaneously when you're viewing images in Standard View. Images in the Image window can be tiled horizontally, tiled vertically, or cascaded, for easier use.

#### ◆ **To cascade open images:**

Do *one* of the following:

- Click the **Cascade** button.
- or —
- Choose Window⇒Cascade.



The image windows are shown in an overlapped fashion and the active image is on top. (See Figure 3-3.)



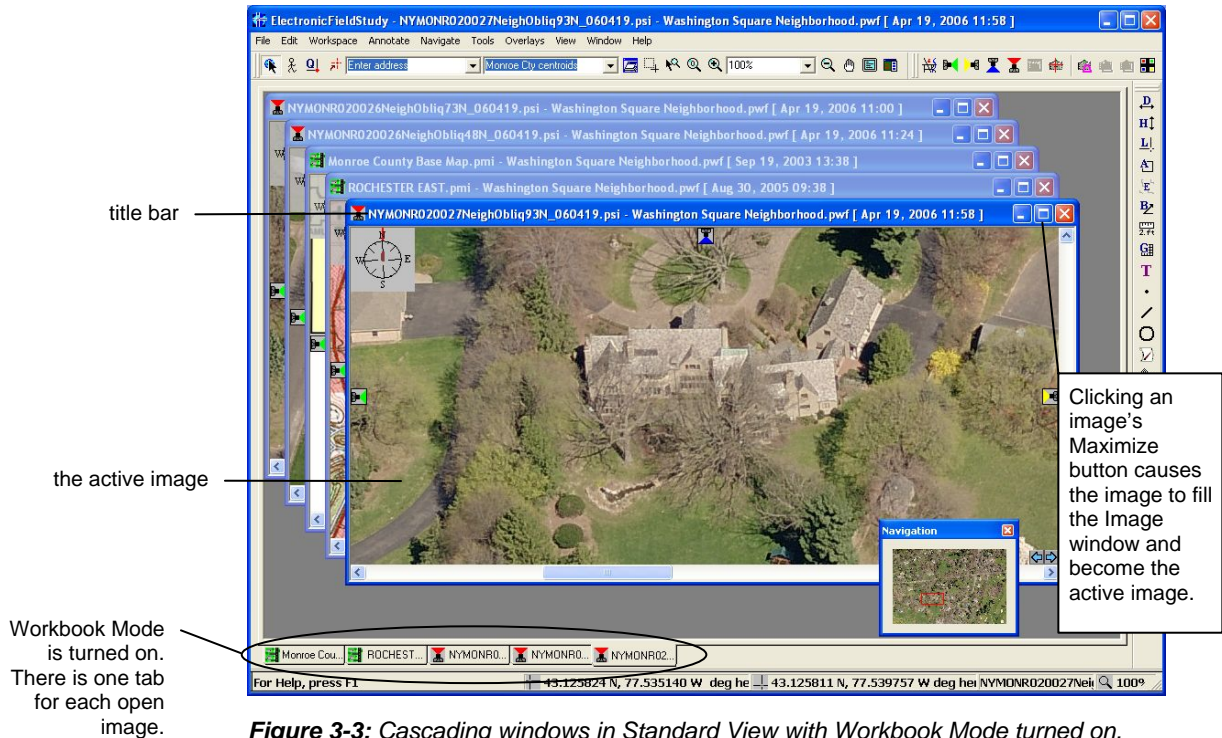
*You can see the parts of the active image that are not in view by using the scroll bars, the Pan Tool, or the Navigation window rectangle. See Chapter 8.*

#### ◆ To tile open images:

- Choose **Window⇒Tile Horizontally** or **Tile Vertically**.

The title bar of the active image is always highlighted (whether you chose to tile or cascade). To make a different image active, click its title bar.

**Note:** To add the Tile Windows (Horiz), the Tile Windows (Vert), and the Cascade Windows buttons to a toolbar, see “Adding and removing toolbar buttons” in Part IV, Chapter 22.



**Figure 3-3:** Cascading windows in Standard View with Workbook Mode turned on.

#### Workbook Mode

Workbook Mode is a feature that lets you quickly switch between open images. If Workbook Mode is turned on, you'll see a tab for each image open in the Image window (Figure 3-3). Simply click the tab for the image you want to view.

#### ◆ To turn on Workbook Mode:

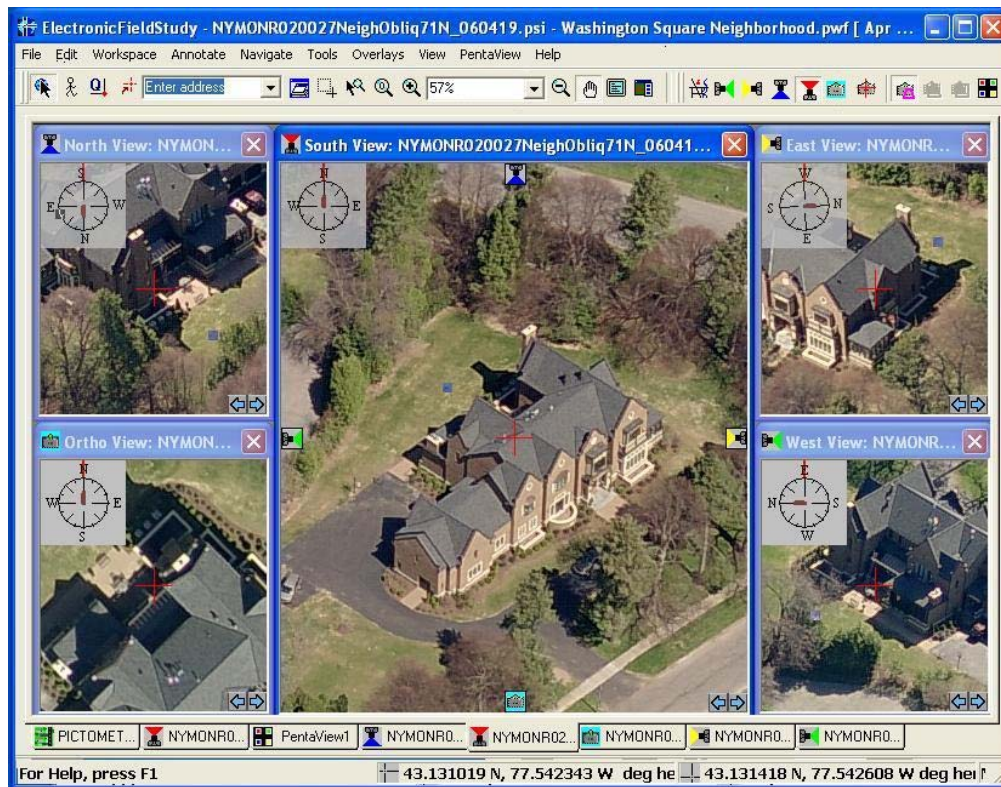
- Choose **View⇒Workbook Mode** and check the option if not already checked. (If Workbook Mode is checked, then it is turned on.)

**Tip:** To add the Workbook Mode button to a toolbar, see “Adding and removing toolbar buttons” in Chapter 22.

#### PentaView

PentaView is a viewing mode in which you can simultaneously view a set of five images of the same location—each from a different angle or direction (N, S, E, W, Orthogonal).

There are five arrangements for the PentaView images, and you can switch between them simply by clicking the corresponding button on the PentaView toolbar.



**Figure 3-4:** An Image window showing the active image in PentaView.

### Optimizing performance by limiting open images

Address Search Setup involves giving EFS information about your GIS. To optimize performance, EFS lets you limit the number of open images in the Image window. If you open more than the limit, the image that was least recently active will close automatically. The images most recently viewed will stay open. (The map or image designated as the base map image always stays open.)

#### Notes:

By default, you can open a maximum of five images at a time. However, you can change this limit by choosing **Navigate**⇒**Image Tool Properties**⇒**Settings** tab. If you increase the limit, keep in mind that 18 MB or more of memory is needed for each open image.

While in PentaView, EFS ignores any limit you've set for the number of open images.

For more information, see "Limiting the number of open images" in Chapter 6.

### What else can be displayed in the Image window?

In addition to opening images, you can use the Image window to display the Thumbnail Gallery.

### Thumbnail Gallery

The Thumbnail Gallery is a way to view thumbnails (small lower-resolution images) of all the images that are part of a workspace. You might view a thumbnail gallery if you want to open images from the workspace, and prefer to select the image from a photo rather than from a file name.

When you select the option for viewing a Thumbnail Gallery, a new image window opens, showing thumbnails for all the images in the *current* workspace, whether or not they are associated with the active image.

An image file name that is red means the image file is currently open. A blue background around the image file name identifies the active image.

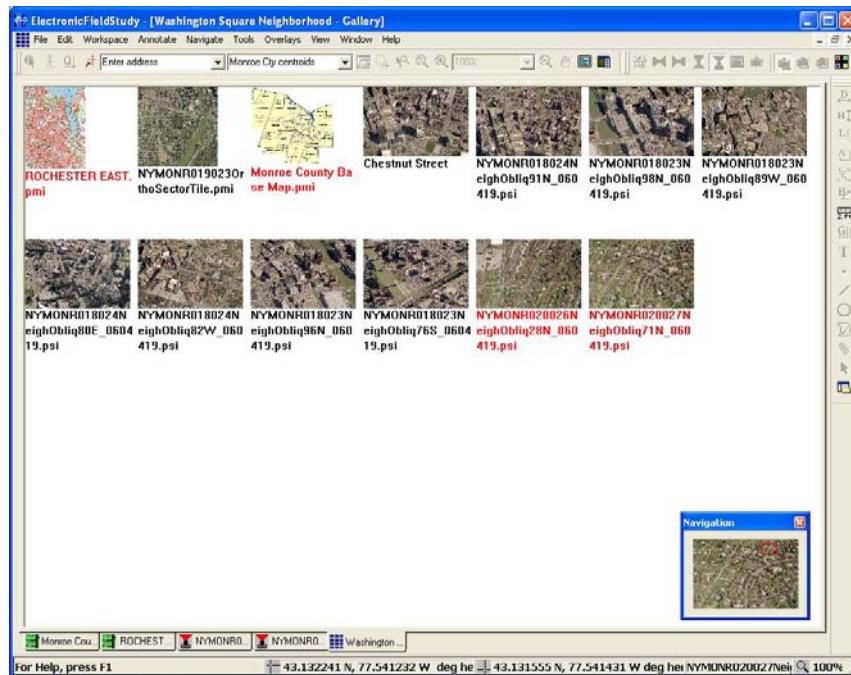


Figure 3-5: A Thumbnail Gallery.

**Tip:** To add the View Gallery button to a toolbar, see “Adding and removing toolbar buttons” in Chapter 22.

- ◆ **To view the Thumbnail Gallery:**
  - Choose **View⇒Gallery**.
- ◆ **To open an image from the Gallery:**
  - Double-click the desired thumbnail in the gallery. The image opens in the Image window.

## Menu Bar, toolbars, and Status Bar

The Menu Bar is located across the top of the screen and the Status Bar is found in the lower portion of the screen. The toolbars may reside under the Menu Bar and possibly along the side of your screen (depending on the screen layout you’ve chosen.) (See Figure 3-1.)

## Menu Bar

As in other Windows applications, the Menu Bar contains pull-down menus that let you access the application's features.

Some menus are always present, but others are present only when applicable. For example, the Workspace menu is shown only when a workspace is open.

### Some menu options may be dim

Menu options are present but are dim (gray) when they aren't applicable. For example, if there is an open image, image-related menu options are available, otherwise they are dim. If there's no open workspace, then workspace options are dim.

## Toolbars

The toolbars contain icons, which are buttons you can click for access to EFS features.

*For a description of the tools found on the toolbars after installation, see Appendix A.*

### Toolbar buttons

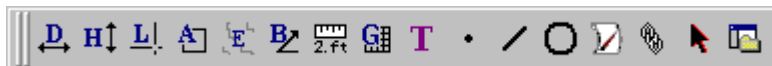
Toolbar buttons offer a faster alternative to selecting pull-down menu options. Some of the toolbar buttons activate tools that are used to measure or annotate images. Most of the tools have options—called tool properties—that affect the way they work. For more information about setting tool properties, see “Changing tool properties” in Chapter 11. Image Tool properties are covered in Chapter 6.

Toolbar buttons are dim when not applicable.

### Buttons are grouped

EFS toolbars are actually individual groups of related buttons. You can customize the toolbars to suit your preferences. You can move a toolbar to a different place on the screen and you can add or remove toolbar buttons. See “Customizing toolbars” in Part IV, Chapter 22.

The following figures show the toolbars used most often.

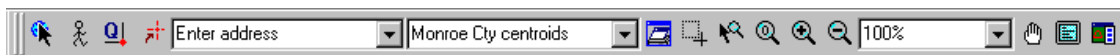


**Figure 3-6:** The Tools toolbar.



**Figure 3-7:** The Navigate toolbar.

*Depending on the screen layout you've chosen, your View toolbar may not look exactly like this one.*

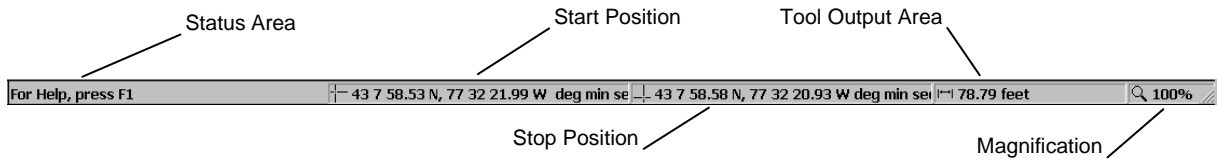


**Figure 3-8:** The View toolbar (Image View Measure Markup layout).



## Status Bar

The Status Bar shows information pertinent to the action being performed. For example, it shows the results of measurements (like distance or area), the coordinates at which the Image Tool cursor is positioned, the starting and ending locations of measurements, and the percentage of magnification of the active image. This information is shown in five resizable panes.



**Figure 3-9:** The Status Bar.

### Status Area

The Status Area pane provides general instructions for getting help, descriptions of menu options as you move the mouse over those options, and descriptions of toolbar buttons as you move the mouse over those buttons.

*The GIS Query Tool is covered in Part III, Chapter 17.*

This pane can also show (one at a time) the names of the GIS annotation layers contained in your workspace, so you can choose a layer to use with the Query Tool.

### Start Position

The Start Position pane shows the starting coordinates for various field tool operations.

For the ...	This pane shows the coordinates of ...
Area, Bearing, Distance, and Line Annotation Tools	The line's starting point.
Circle Annotation Tool	The starting point of the line you draw for the circle's radius. This point becomes the center of the circle.
Elevation and Location Tools	The point you click in the image.
Height Tool	The starting point of a height measurement (a point on the ground).
Image and Select Tools	<i>not applicable</i>
Link and Text Annotation Tools	The point you click in order to enter a text annotation or select a file to be linked. (Shows the same coordinates as the Stop Location pane.)
Navigate Tool	The point you clicked just before the point most recently clicked. The point is designated by a yellow crosshair.
Point and Icon Annotation Tools	The point you click in the image.

## Stop Position

The Stop Position pane shows the stopping coordinates for various tool operations.

For the ...	This pane shows the coordinates of ...
Area, Bearing, Distance, and Line Annotation Tools	The line's stopping point.
Circle Annotation Tool	The stopping point of the line you draw for the circle's radius. The point is on the circumference of the circle.
Elevation and Location Tools	<i>not applicable</i>
Height tool	<i>not applicable</i>
Image and Select Tools	The point in the image over which the Image Tool or Select Tool is currently positioned. The coordinates change as you move the tool.
Link and Text Annotation Tools	The point you click in order to enter a text annotation or select a file to be linked. (Shows the same coordinates as the Start Location pane.)
Navigate Tool	The point you clicked most recently, which is designated by a red crosshair.
Point and Icon Annotation Tools	<i>not applicable</i>

## Tool Output Area

The Tool Output Area pane shows the results of distance, perimeter, area, and height calculations, the elevation or differential elevation (when using the Elevation Tool), and the cumulative distance (when using the Navigation Tool).

## Magnification

The Magnification pane shows the percent of magnification of the active image.

## Copying the contents of the Status Bar

You can copy the contents of any Status Bar pane to the Paste Buffer (the Windows Clipboard). Simply right-click on the desired pane, and select Copy to Paste Buffer.

## Customizing the Status Bar

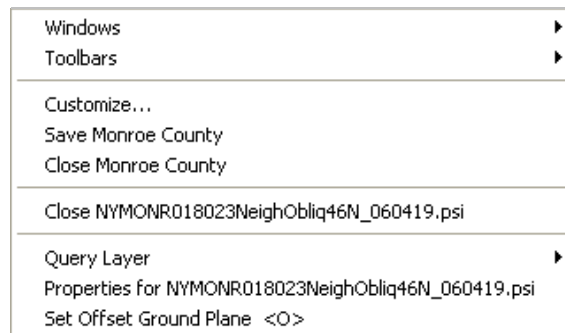
You can customize your Status Bar in various ways. For example, you can change the font, hide a pane, or resize a pane. For more information about customizing the Status Bar, see Part IV, Chapter 22.

## Context menus

*Appendix B describes the options found on each context menu.*

Context menus are context-sensitive pop-up menus that appear when you click the right mouse button. The information in the menu varies depending on which item you click and in which part of the application window you click. Some options appear in more than one context menu. The menu options are appropriate for the context in which you clicked.

Context menus are available for the Image window, the Workspace window, the Output window, the Thumbnail window, the Navigation window, the toolbars, and the Status Bar. Many of the options in the context menus are also available on the pull-down menus.



**Figure 3-10:** A context menu that appears when the Image window is right-clicked.

## Closing EFS

**Note:** If you exit EFS without saving a new or changed workspace, EFS prompts you to save the workspace. It's a good idea to save your workspace before exiting EFS.

### ◆ To close EFS:

1. Do *one* of the following:
  - Click the Close box in the right upper corner of the Electronic Field Study application window. (See Figure 3-1 on page 58.)
  - or —
  - Choose **File**⇒**Exit**.
2. If you changed the workspace during this session, you'll be asked if you want to save the workspace changes. Click **Yes** or **No** as desired.

If there were no changes or if you clicked **Yes**, the Electronic Field Study application closes, as do all open images, thumbnails, and workspaces.



# Chapter 4 — EFS Application Windows

Chapter 3 discussed the Image window—the window you’ll use to view images. However, EFS contains other windows also—windows that show details about your images, about annotations you’ve created, about search hits, and about tool measurements (to name a few). For day-to-day use, most users don’t need to see those details; they work with the Image window only. For that reason and to give you more room for viewing images, EFS provides built-in layouts that hide these other windows. However, there are times when it’s helpful to see the details, so EFS makes these windows available for you to view whenever you wish. (A pull-down menu option for each window allows you to show or hide that window.)

Chapter 4 discusses these ancillary EFS windows and describes how to view them (page 76). Even if you choose not to view these windows, it’s a good idea to review the brief descriptions in Table 4-1 so you are familiar with the windows.

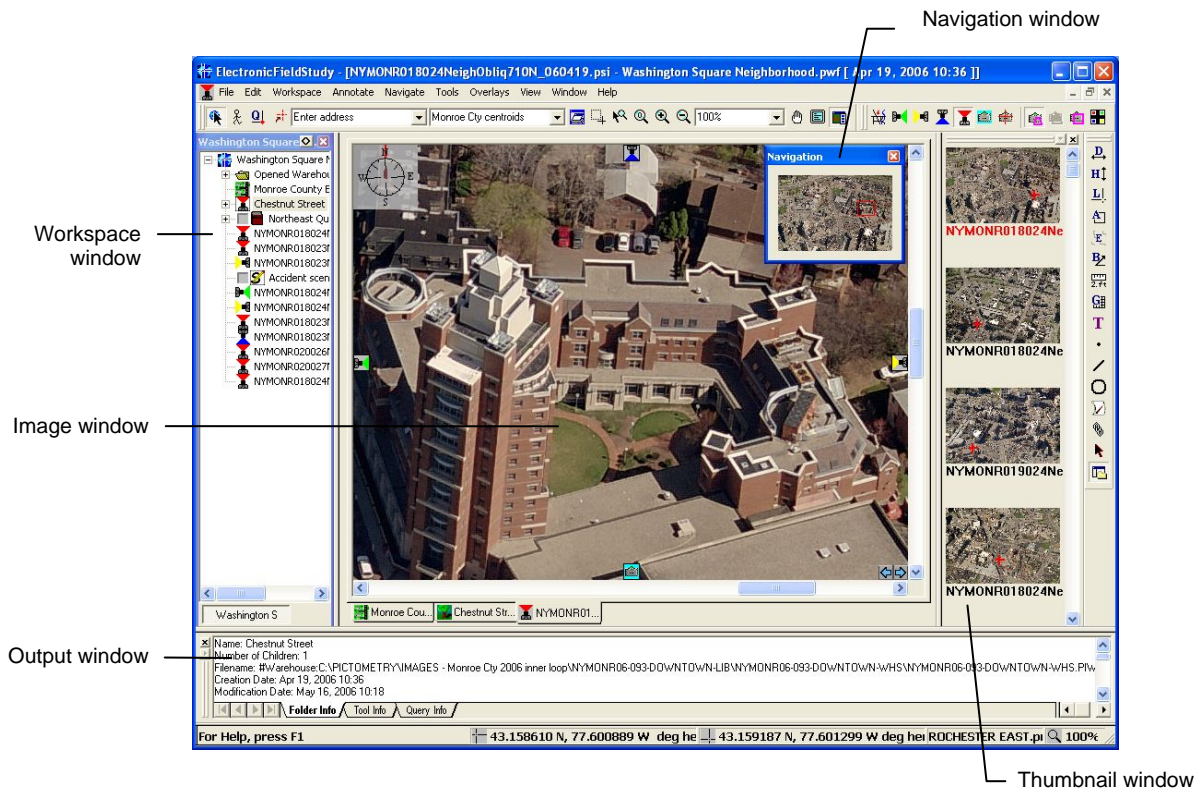
Topics covered in this chapter ...	page
Other EFS windows.....	69
The Workspace window .....	71
The Navigation window .....	71
The Thumbnail window .....	72
The Output window .....	73
Showing and hiding EFS windows.....	76

## Other EFS windows

The Electronic Field Study application contains the following windows:

- Image window (covered in Chapter 3)
- Navigation window
- Output window
- Thumbnail window
- Workspace window

EFS, with all of its windows in view, looks like this.



**Figure 4-1:** EFS with all of its windows in view.

The following table describes each window.

**Table 4-1:** EFS windows.

Window	Description
Workspace window	<p>Lists the names of images, maps, annotation layers, annotations, and any other files associated with the workspace that's currently open.</p> <p>The list is in a hierarchical format similar to Windows Explorer with the name of the workspace appearing at the top of the hierarchy. Click the plus [+] sign to the left of an item name to expand it and see its contents. Click the minus [-] sign to collapse and hide an item's contents from view.</p>
Thumbnail window	<p>Contains thumbnails (small lower-resolution images) of images from the warehouse. Thumbnails appear in this window after you do an image search (if this window is open or if you've set up the Image Tool to open it after searching). Double-clicking a thumbnail opens its image in the Image window.</p>
Navigation window	<p>Contains a thumbnail of the active image (in the Image window). The thumbnail represents the entire active image and the red rectangle represents the visible portion of the active image. You can pan the active image by dragging the red rectangle.</p> <p>Also contains a compass that indicates the geographic orientation of the active image.</p> <p>The bottom of the compass is the point from which the picture was taken. It corresponds to the part of the image closest to the bottom of the Image window.</p> <p>The line at the top of the compass (outside the circle) indicates the direction in which you'd be looking if you took the photo. The line inside the compass always points north.</p> <p><b>Note:</b> For most maps, north is the top of the image and south is the bottom of the image.</p>

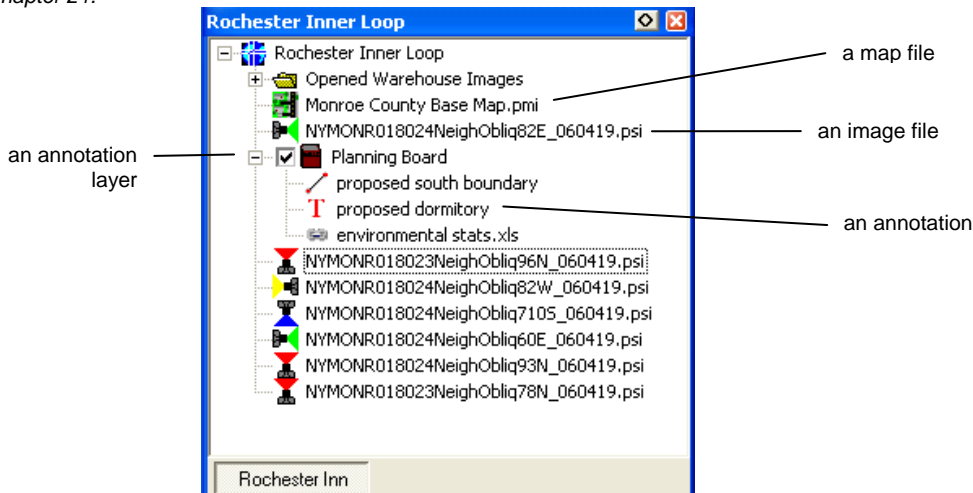
**Table 4-1:** EFS windows. (continued)

Window	Description
Output window	<p>Contains three tabs:</p> <ul style="list-style-type: none"> <li>▪ The Folder Info tab displays information about the currently selected item in the Workspace window.</li> <li>▪ The Tool Info tab shows the results of various actions such as the number of open thumbnails and the results of measurements.</li> <li>▪ The Query Info tab shows the full database record or table entry for the matching GIS object following a query. (See “GIS Query Tool” in Part III, Chapter 17)</li> </ul>

## The Workspace window

*Workspaces are covered in Chapter 10. Advanced workspace topics are covered in Chapter 21.*

The Workspace window lists the names of images, maps, GIS annotation layers, annotation layers, annotations, and any other files associated with the workspace that’s currently open. The list is in a hierarchical format with the name of the workspace appearing at the top of the hierarchy. Clicking the plus sign [+] to the left of an item expands the item and displays its contents.

**Figure 4-2:** The Workspace window.

If in view, the Workspace window occupies the left side of the screen, but you can change its position. See “Changing the appearance of EFS” in Part IV, Chapter 22.

## The Navigation window

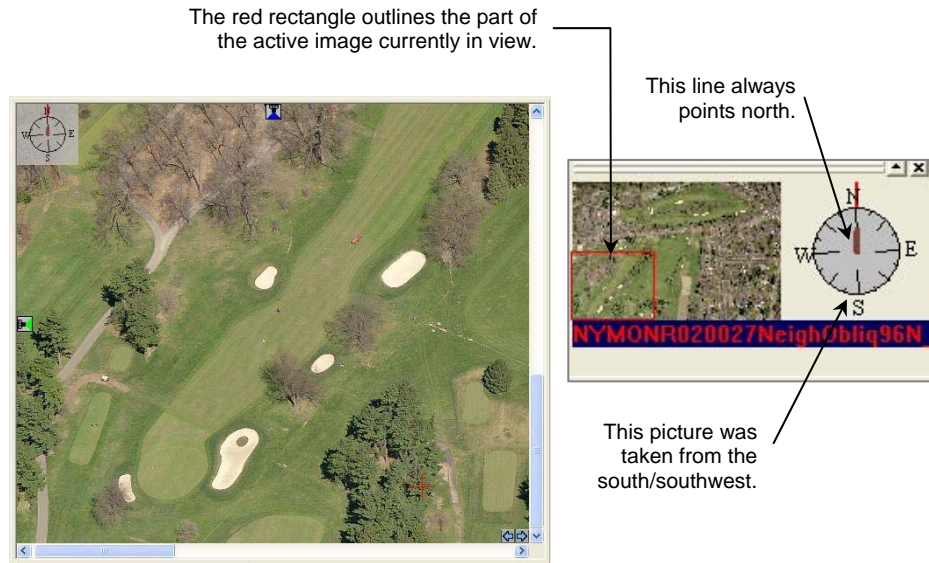
*A thumbnail is a miniature, low-resolution version of an image.*

The Navigation window contains a thumbnail of the active image and a compass showing the image’s orientation. The thumbnail represents the entire active image (even if the image is only partially in view in the Image window because of its magnification level).

The thumbnail is overlaid with a rectangle that shows which part of the active image is currently in view in the Image window. At a glance, you can see just where you are in your image.

The thumbnail's red rectangle can be dragged so you can pan ("navigate") the active image in the Image window. The Navigation window can be hidden, undocked, and moved.

**Tip:** You can use the rectangle to navigate the active image in Image window. Simply drag the rectangle within the thumbnail and the Image window shows what is within the rectangle.



**Figure 4-3:** An image in the Image window and its corresponding Navigation window.

After installation, the Navigation window is floating in the upper right corner of the screen. (See Figure 4-1.) However, there are various options for customizing your view of the Navigation window and of the compass rosette. For detailed information on these options, see "Options for viewing the compass" and "Compass properties" in Part IV, Chapter 22.

### The compass rosette

The compass rosette indicates the geographic orientation of the active image. The bottom of the compass is the point from which the picture was taken. It corresponds to the part of the image closest to the bottom of the Image window. The line *outside* the compass indicates the direction in which you'd be looking if you took the photo. The line *inside* the compass always points north.

**Note:** For maps, north is the top of the image and south is the bottom of the image.

## The Thumbnail window

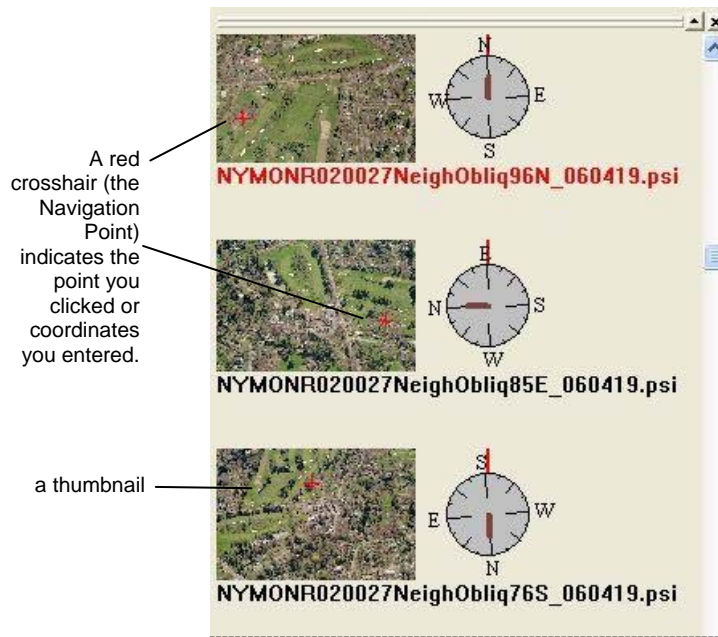
The Thumbnail window shows thumbnails (small lower-resolution images) of all search hits following an image search, such as a search initiated by using the Image Tool. You can open an image by double-clicking its thumbnail.



For more information on customizing Image Tool properties, see Chapter 6.

Although the Thumbnail window is hidden by default, it automatically appears after a search if you *uncheck* the Image Tool property “Automatically open the first image returned from search.” (Most users leave this property checked.)

A red crosshair appears on the **Navigation Point**—the last point searched—in each thumbnail, and a compass rosette shows the orientation of the image.



**Figure 4-4:** The Thumbnail window.

When you double-click a thumbnail, its image opens in the Image window. When you single-click a thumbnail, the image polygon (footprint) is shown on the active image or map.

To change a window's position, see “Changing the appearance of EFS” in Part IV, Chapter 22.

If the Thumbnail window is in view, it shows new search hits each time you do an image search.

If in view, the Thumbnail window is located in the lower right corner of the screen. However, you can change its position.

## The Output window

The Output window shows information, such as the results of measurements, the data from a query, and information about items in the Workspace window.

If in view, the Output window occupies the lower left portion of the screen. However, you can change its position.

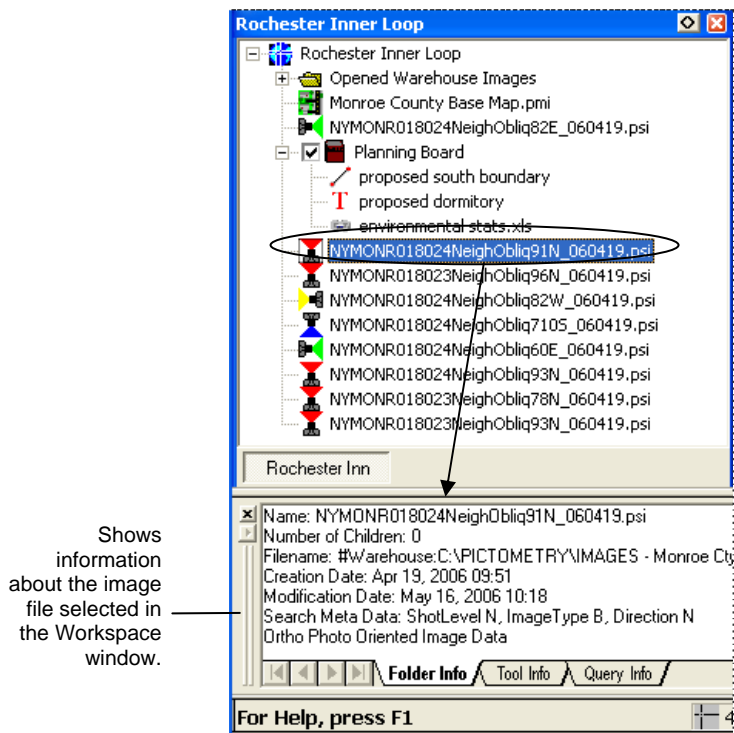
The Output window contains three tabs:

- Folder Info
- Tool Info
- Query Info

## The Folder Info tab

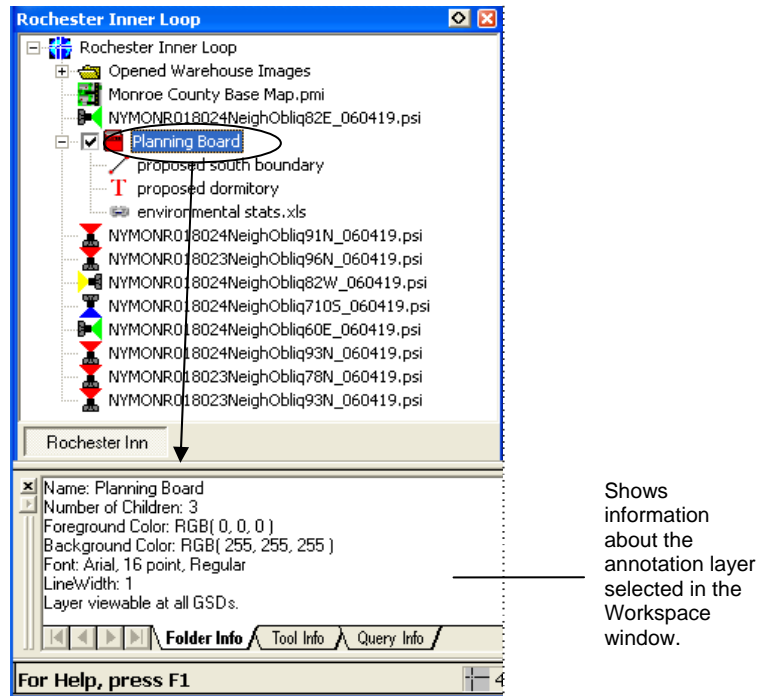
The Folder Info tab displays information about the item currently selected in the Workspace window. The item could be an image, a user-defined annotation layer, an annotation, a map, a GIS annotation layer, or a folder.

For image files, this tab shows information such as the name and size of the image, the date the shot was taken, and specific information compiled when the picture was taken such as coordinates, altitude, pitch, and bearing.



**Figure 4-5:** The Folder Info tab when an image file is selected in the Workspace window.

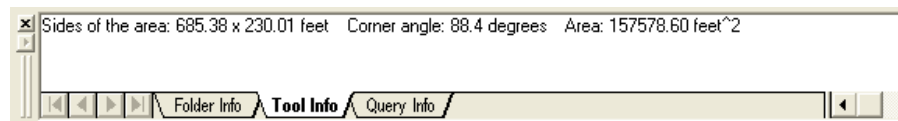
For annotation and annotation layers, this tab shows attributes such as the color, font, and line width.



**Figure 4-6:** The Folder Info tab when an annotation layer is selected in the Workspace window.

## The Tool Info tab

The Tool Info tab shows the results of measurements for the Distance, Area, and Navigate Tools and the number of search hits (thumbnails) following a search. It shows additional information not shown on the Status Bar.



**Figure 4-7:** The Tool Info tab showing the results after using the Area Tool.

## The Query Info tab

The Query Info tab shows the full database record or table entry for the matching GIS object following a query.



**Figure 4-8:** The Query Info tab after using the GIS Query Tool.

## Showing and hiding EFS windows

---

Use the following procedure to toggle off or on the visibility of the Output, Thumbnail, Workspace, or Navigation windows.

◆ **To show or hide an EFS window:**

- Click the desired button as indicated by the following table or choose the corresponding View menu option:



Shows and hides the Output window.



Shows and hides the Navigation window.



Shows and hides the Thumbnail window.



Shows and hides the (Pictometry) Workspace window.  
Does not close the workspace.

# Chapter 5 — Putting EFS to Work

This chapter discusses how you can use EFS in your particular work setting. You will not find any procedures for working with the software in this chapter. It contains only ideas to help you determine the best way in which to work with EFS. Procedures for using EFS features are found in the rest of this book.

**Is this chapter for me?** If you already know how to apply EFS functionality to your job situation, you might skip this chapter. This chapter was written for users who might need ideas about how to proceed with using EFS.

## Topics covered in this chapter ... page

Where to begin.....	77
Finding the images you need .....	77
How EFS is used.....	79
How will you use EFS?.....	80

## Where to begin

Now that you've become somewhat familiar with the basics of EFS, you're ready to decide how you can use EFS in your everyday work. Because EFS supports people with diverse job needs; it is versatile, flexible, and rich in features. The most basic EFS task is searching for images. (You'll generally do this before you do anything else.) Once you've found the images you need, you'll be able to do other tasks such as measuring image features and annotating the images with text.

The next topic discusses several ways to approach searching for images based on the information you have available. After that, you'll find a list of some typical types of EFS users and the job tasks for which they use EFS. The last part of this chapter poses some questions you might ask yourself before deciding which EFS features you will use.

## Finding the images you need

Searching is perhaps the most commonly used EFS feature; it's also the feature with the most variations.

### Approaches for searching in EFS

There are several ways to search for the images you need. The way you choose to search for images will depend on your needs and on the images and information that you have to work with.

## The information you have

The information you have impacts how you will use EFS. You might have the street address of a building you want to locate and view. You might have GIS data (such as parcel boundaries) for your images. You might have other landmark information that provides clues about the location of the desired image. Let's look at a few user scenarios and how a user might approach image searching in each scenario.

### *Case 1 — User knows street address or Parcel\_ID for desired location*

*Some municipalities use a Parcel\_ID field to uniquely identify a land parcel.*

In the first scenario, the user knows the street address or the Parcel\_ID of the desired land parcel. If this user already has had GIS address or Parcel\_ID data provided by their organization, they can take advantage of the **Address Search feature**. By typing the street address (or part of it) or the Parcel\_ID into a box in the EFS toolbar, the user can retrieve a list of "hits" — one or more locations that match what was typed. The user can then double-click the desired hit to go directly to an image showing the parcel located at the corresponding location.

This is perhaps the fastest way to find a specific image. However, not every user has address data, and not every geographic location contains a parcel identified by a street address.

### *Case 2 — User knows identifying GIS data for the desired location*

In Case 2, the user has GIS data (such as polygons that define property boundaries within the land covered by the Image Warehouse), including text information that is associated with each land parcel in the area.

This user would create a GIS annotation layer for each type (polygon, point, line) of GIS data. Suppose this user added a layer called "parcels" from GIS polygon data, and that the text field "Owner\_name" (land owner's name) is an attribute of that polygon data. If the user knew the land owner's name, and used the **GIS Layer Search feature** to search all Owner\_names for that name, EFS would produce a list of search hits for all GIS records representing property owned by that land owner. Double-clicking the desired hit would open an image showing the corresponding land parcel.

As you can see from this example, knowing something about a property (such as the owner's name or the type of structure) can help you find images of that property.

### *Case 3 — User has landmark information (or other clues) to help find the desired location*

In the third scenario, the user doesn't know the street address and doesn't have GIS data that will identify the desired location, but *does* have clues to help find that location. The user might start by opening an image that shows a known location, then based on the clues, navigate to the desired location.

Clues may include things such as the destination’s general direction and approximate distance, relative to the known location.

One approach is to start with any street address, relative to the desired location. For example, suppose a 911 center receives a call from someone who witnessed an accident from his or her car, and the caller is on route 490 westbound, near the Monroe Avenue exit. The operator or the police officer dispatched might first use the Address Search feature to find “Monroe Ave,” then might use navigation features to navigate to the scene of the accident.

Or perhaps a caller has witnessed a crime, but doesn’t know their location, only that they see a brick church with a pointy steeple and that there’s a McDonalds® one block away. With knowledge of the area and its landmarks, the emergency responder might navigate to an image of a church suspected to be the one the caller sees, and then have the caller confirm the location by asking additional questions such as, “Is there also a 7-Eleven® next to the McDonalds?”

#### *Case 4 — User knows GPS coordinates of desired location*

In this scenario, the user has access to the GPS coordinates of the desired location. Suppose a crime victim or person in need of emergency assistance places a 911 call. If someone in the field can provide GPS coordinates (for example, a rescue worker with a hand-held GPS receiver), the 911 Call Operator can use the **Go to location** feature to enter GPS coordinates and go directly to an image showing either the exact location of the caller or a nearby location. The location entered is highlighted by a red crosshair.

#### *Summary*

**Table 5-1:** *EFS features to use in each search scenario.*

Case	Available Information	Use this search feature	See ...
1	User knows street address or Parcel_ID for desired location	Address Search *	Part I, Chapter 6
2	User knows identifying GIS data for desired location	GIS Layer Search *	Part III, Chapter 17
3	User has landmark information (or other clues to help find the desired location)	Address Search, then navigation features *	Part I, Chapter 6 Part I, Chapter 7
4	User knows GPS coordinates of desired location	Go to location	Part I, Chapter 6

\* Requires user access to certain GIS data

## How EFS is used

Here are some typical types of EFS users and the job tasks for which they might use EFS:

- public safety workers (911 operators, police, and firefighters) — scoping out a crime scene before arrival, learning the lay of the land, dispatching help, monitoring a chase or a standoff, responding to a victim as quickly as possible

- municipal employees — preparing reports for applications and permits, maintaining inventory of visible assets, supporting planning efforts
- assessors and appraisers — analyzing properties and property values, reviewing appraisals
- civil engineers, transportation or utility worker — planning construction projects (roadway and building)
- others (just about anyone who needs to see what is actually at a location without having to physically go there)

## How will *you* use EFS?

As you can see, not all users use EFS in exactly the same way. The way you'll use EFS will depend on your individual circumstances.

### Think about the demands of your job

- Do you need to access images instantaneously? Will you be using EFS in emergency situations in which every second counts?
- Will you also use EFS in less time-critical conditions to devise plans for emergency preparedness?

### Consider the types of data you have

- Do you have GIS data?
- Do you have street address or parcel data?
- Do you have GPS coordinates?
- Do you currently use maps?
- Do you currently use orthogonal images?

### Decide which EFS features will be important in your job

Do you need to measure buildings, roadways, structures of any kind? The various EFS measurement tools will be handy. (See Part II, Chapter 11.)

What about marking up images with text? Do you need to draw on an image for planning or presentation purposes? If so, you'll be interested in annotations. (See Part II, Chapters 12 and 13.)

If you are a GIS user, you'll be interested adding and working with GIS annotation layers. (See Part III, Chapters 15 – 18.)

Most users find EFS features handy for the following job tasks:

- Searching for images by street address or Parcel\_ID. (See “Searching by address” in Chapter 6.)

**Note:** You need GIS data to search for images by street address or Parcel\_ID.

- Searching for images by clicking a location on a map or image. (See “Clicking a point on a map or an image” in Chapter 6.)

*You might try using the features found in EFS before deciding which ones you need.*



- Searching for images by coordinates. (See “Searching by entering GPS coordinates” in Chapter 6.)
- Navigating the landscape. (See “Using navigation features” in Chapter 7.)
- Planning a route. (See “Navigating a route” in Chapter 7.)
- Viewing images. (See Chapter 8.)
- Printing, zooming, and exporting images. (See Chapter 9.)
- Grouping related images, layers, and annotations as a workspace. (See Part I, Chapter 10 and Part IV, Chapter 21.)
- Importing and exporting data. (See Part IV, Chapter 19.)

### **Use the screen to your best advantage**

Once you’re comfortable with EFS, you may want to customize your EFS application depending on your personal preferences. You can:

- Work in Full Screen Mode in order to maximize the imagery in view.
- Work with or without a workspace in view.
- Hide any of the other windows (Navigation, Thumbnail, and Output) to maximize your Image window.
- Use Workbook Mode to switch between open images.
- Cascade your open images, or Tile them (horizontally or vertically) to view them simultaneously.
- Customize the compass in various ways. For example, you can display a single compass in the Navigation window or multiple compasses—one overlaid on each open image.
- Customize your toolbar and Status Bar.

See Part IV, Chapter 22 to learn how to customize EFS.



# Chapter 6 — Searching For Images

At the heart of EFS is its ability to search a warehouse of images and let you view the images on the screen. This chapter shows you how to use EFS to search for images, sort them based on criteria you select, and open them in the Image window. It also discusses options for searching for and sorting images, and how to set those options.

This chapter starts with concepts about searching. Instructions for searching begin on page 88.

Topics covered in this chapter ...	page
Overview .....	83
Searching for and opening images.....	88
Closing images.....	96
Image Tool properties .....	96
Sorting search hits in the Thumbnail window .....	105

## Overview

EFS lets you search for images in an Image Warehouse, in the active workspace, or in both at the same time.

There are different ways to search depending on what information you have available. For example, if you have GIS data (such as a street address), you can search for images by using the GIS data as search criteria. If you have location information (such as coordinates), or if you can visually locate an area, you can search by location. Your circumstances will determine how you go about searching for images.

This overview discusses the various ways to search for images. It also discusses which actions initiate an image search and what happens with a search.

Before proceeding further, here are some terms you should be familiar with.

### Terms

- Image Tool** — the EFS tool (located on a toolbar) used to search Image Warehouses and workspaces by using the coordinates of the point you click in the active image or by using the coordinates you enter. Using the Image Tool changes the Navigation Point.
- Navigation Point** — the location at which the last search was done. The Navigation Point is identified by a red crosshair. Immediately following a

*The Alternate View feature and the Navigate Tool are covered in detail in Chapter 7.*

search, crosshairs appear on open images that contain the searched location (the Navigation Point) and on thumbnail images.

**Alternate View** feature — provides a quick way to see the same scene—shot from a different direction, from directly overhead, or at a different shot level. You can also view the base map or an Ortho Sector Tile of the same area.

**PentaView** feature — provides a quick way to simultaneously see various views of the same area—shot from a different direction or from directly overhead.

**Navigate Tool** —tool used to stroll, plan, and measure a route—whether that route is within a single image or spanning multiple images.

## Different ways to search for images

There are various ways to search for images. You can:

- Click a location in a (Pictometry-supported) map or image. EFS searches for images containing the point you clicked.
- Enter the coordinates of a location and view images that contain those coordinates.
- Search a GIS annotation layer containing address data and view corresponding images.
- Search a GIS annotation layer for text data and view images that correspond to that data.

### Search by clicking a location

You can search for images by clicking a location (a point) in the base map or any other image (supported by Pictometry) that contains embedded geographic data. EFS uses the coordinates of the point you clicked to find all images containing that point. This feature is helpful when you don't know the address or coordinates, but you can pinpoint the general area of interest.



You'll use the Image Tool for this type of searching, and it must be active before you click the point.

**Note:** You can activate the Image Tool by simply clicking its button, by choosing Tools⇒Image Tool, or by opening a workspace.

*The procedure for searching by clicking a location is on page 90.*

*The procedure for searching by coordinates is on page 91.*

Image Tool properties determine where EFS looks for images when you click a map or image. When you link Image Warehouses (covered in Chapter 1), you are setting the Image Tool properties that tell EFS which warehouses you want searched and where they are located. You can also set an Image Tool property that causes EFS to search the active workspace. (See Table 6-1 on page 98.)

## Search by entering a location's coordinates

If you know the coordinates of the point you're interested in, you can enter those coordinates to search for images that contain that point. EFS finds the images that contain the coordinates you entered. You do not have to open an image or a workspace or activate the Image Tool to use this feature. (However, Image Tool properties do affect the image search.)

## Search by using GIS data as criteria

You can find images by searching the text data contained in a GIS annotation layer in your workspace. You'll enter text data as search criteria, and you'll then be able to view images associated with the search results. Two EFS features let you search for images in this way—Address Search and GIS Layer Search.

### *Searching with address data*

You can use the Address Search feature to find images that show the parcel of land at a particular street address. (The procedure starts on page 92.)

### *GIS Layer Search*

The GIS Layer Search feature is like the Address Search because it uses text data to find images.

When you use the GIS Layer Search feature, you'll enter search criteria for the text data you want to search for. You can enter values for up to two text fields. EFS finds the GIS objects that match your criteria, and you can select the one that is the best match. Because the GIS object has geographic coordinates associated with it, EFS can find the images that contain the coordinates for the GIS object you chose.

You might use this feature to search for a data such as a street name or a Parcel ID.

*The procedure for searching by GIS data is in Part III, Chapter 16.*

## Other actions initiate searches

In addition to the searches you initiate (by clicking a point, entering coordinates, entering address data, or searching a GIS annotation layer), there are searches that happen when you use other EFS features. For example, when you use the Navigate Tool (discussed in Chapter 7) to chart a path through your images, EFS searches for and displays the best image each time you "step off" the current image. Searches that EFS initiates are discussed in this guide under the topics to which they apply.

## What happens when you search

Each time you search, EFS does the following:

- looks for images in the specified warehouses and possibly in the active workspace. It finds the images that contain the location searched for (or the location associated with certain GIS data) and determines which ones to choose as search hits.

- makes the search hits available for viewing in the Image window in various ways. (See “Search hits are available” on page 86.)
- resets the Navigation Point.

EFS chooses search hits

Besides finding images that match your search criteria (location or GIS data), EFS uses additional criteria to determine which images to make available as search hits. For example, when you click a point in an image (and the Hit Quality sort is on), EFS finds the highest “quality” image for that point. (See “Hit Quality sort” on page 106 to learn how EFS determines the quality of search hits.)

Search hits are available

EFS makes search hits available in various ways.

Which search hits	How EFS makes them available
Top hit	EFS opens the top hit in the Image window if before searching, the Image Tool option “Automatically open the first image returned from search” was <i>checked</i> .
All hits	<div>The Thumbnail window shows thumbnail images for all hits:<ul style="list-style-type: none"><li>■ If the Thumbnail window was already in view before searching – or –</li><li>■ If before searching, the Image Tool option “Automatically open the first image returned from search” was <i>unchecked</i>.</li></ul></div> <div><b>Note:</b> If thumbnails are shown in the Thumbnail window, the order is determined by Image Tool settings.</div>
Specific hits	<div>Search hits showing alternate views of the Navigation Point are available:<ul style="list-style-type: none"><li>■ automatically if PentaView is enabled, or</li><li>■ (whether PentaView is enabled or not) by clicking the Alternate View toolbar buttons, or equivalent menu options. (See “Additional views available” on page 87.)</li></ul></div>

**Note:** See “Options for opening images” on page 88.

Resets the Navigation Point

The Navigation Point is the location at which the last search was done. It is identified by a red crosshair on the image. Each time you search, EFS resets the Navigation Point to the location of your search (point clicked, coordinates entered, location of street address entered, or location associated with GIS search criteria) and crosshairs appear on open images that contain the searched location (the Navigation Point) and on thumbnail images. Each open image is re-positioned so the crosshair is as close as possible to the window’s center.

**Note:** If you’ve scrolled or panned the image, the Navigation Point may not be visible in the Image window.

*The Navigation Point marks the starting point of the path for the Navigate Tool.*

### *Centering the Navigation Point*

You can use the **Center Navigation** feature as a means of searching for images. Using this feature causes EFS to do a search using the point in the center of the Image window without you having to click that point. You simply position the image as desired in the Image window by scrolling or by panning, then use the Center Navigation feature to search the location at the center of the image.

To use the Center Navigation feature, you can either click the Center Navigation toolbar button (if available on your toolbar) or choose the Navigate menu option Set view center as navigation point.

**Tip:** You might use the Center Navigation feature when you've scrolled away from the Navigation Point and you want new Alternate Views.

### **Additional views available**

When you search, EFS finds the best images that show the Navigation Point. EFS finds images in all types, shot levels, and compass directions—making them available for viewing (by using the Alternate View or PentaView features). This means faster access to the best images.

The Alternate View feature provides a quick way to see a scene photographed from a different direction or at a different shot level. You can also use this feature to view the area from directly overhead (orthogonally), to view the base map, or to view an Ortho Sector Tile of the same area.

By using the Alternate View feature, you can easily see more views of an area without having to search the warehouse again or scan the Thumbnail window for additional views.

**Tip:** If you hide the Thumbnail window and set the Image Tool option to **Automatically open the first image returned from search**, you'll have more room to view images. (See “Options for opening images” on page 88.)

The Alternate View buttons are updated with new images each time you search—whether you initiate the search directly or indirectly (by using another EFS feature such as the Navigate Tool).

### *Some views may not be available*

There are a few reasons why some views may not be available:

- Depending on the images you purchased for your Image Library, some views might not exist in your Image Warehouse.
- If you limit shot levels or shot types with the Image Tool Properties dialog box or with the Limit Image Search buttons (described on page 100), some views may be excluded. (Be sure to include the views you want *before* doing a search.)
- If you haven't yet done a search since starting EFS, the Alternate View feature will not have images available.

When a view is not available, the button or menu option for that view is dim.

*The Alternate View feature is described in detail in Chapter 7.*

*Your Image Library may not contain all views.*

## Searching for and opening images

This section describes how to search for and open images.

### Before searching ...

Before searching for images, make sure you've linked to the warehouses you want to search. (Follow the procedure for linking an Image Warehouse in Chapter 1.)

If you want to search the active workspace for images, you'll need to check that option on the Warehouse List tab of the Image Tool Properties dialog box. (See "The Warehouse List tab" on page 97.)

### Ways to search

As stated earlier, there are multiple ways to search for images in an Image Warehouse or a workspace. You can do any of the following:

- Click a point (or drag a rectangle) on a map or an image (while the Image Tool is active).
- Enter a set of coordinates.
- Enter a street address.
- Enter search criteria to search data in a GIS annotation layer.

The first three types of searches are covered in this chapter beginning on page 90. Searching a GIS annotation layer is covered in Part III, Chapter 17. See "GIS Layer Search."

You can also open an image directly (by navigating to the image file instead of using EFS search features to find it). See "Opening images directly" on page 96.



**Note:** You can search an active workspace for images. Simply click the **Image Tool Properties** button. On the Warehouse List tab, check **Search the entire current workspace for images**.

### Options for opening images

There are different options for opening search hits after searching by coordinates or after clicking a point with the Image Tool. You can:

- Have EFS automatically open the first search hit in the Image window, or
- Double-click the desired thumbnail in the Thumbnail window to open its image in the Image window.

**Tip:** To be sure the first hit is the best hit, make sure the Hit Quality sort and Cardinal sort options are checked on the Settings tab of the Image Tool Properties dialog box.

### Automatically open the first search hit

If the "Automatically open the first image returned from search" option is set before you search, EFS automatically opens the top search hit. This means you'll view the top search hit faster than if you double-click its thumbnail.



Another benefit of checking this option is that you can hide the Thumbnail window to make more room for viewing images. Hiding the Thumbnail window does not affect your ability to access multiple views of a location. Simply use the Alternate View feature to switch views. (See “Opening alternate views” in Chapter 7.)

◆ **To automatically open the first search hit:**

1. Do *one* of the following:



- Click the **Image Tool Properties** button (if its available on a toolbar), then click the **Settings** tab.

— or —



- Click the **Image Tool**, then choose **Tools**⇒**Properties**⇒**Settings** tab.

— or —

- Choose **Navigate**⇒**Image Tool Properties**⇒**Settings** tab.

2. Check **Automatically open the first image returned from search**, and click **OK**.

With this option *checked*, whenever you use the Image Tool to search for images, the first search hit returned will open automatically.

**Note:** This option does not cause the Thumbnail window to be shown or hidden from view. However, if the Thumbnail window was in view prior to your search, it will show thumbnails of search hits.

### Show thumbnails

The Thumbnail window shows thumbnail images of search hits if either:

- The Thumbnail window is in view when you search, or
- The Image Tool *is not set up* to automatically open the first image returned from a search.

After a search, you can scroll the Thumbnail window and double-click the thumbnail of the image you want to open. You might prefer this method if you want to see and scroll through more than the top few search hits.

◆ **To view thumbnails in the Thumbnail window:**

Do *one* of the following:

- Make sure the Thumbnail window is in view.

— or —

- Follow the procedure for opening the first search hit (page 89) and make sure that **Automatically open the first image returned from search** is *unchecked*, then click **OK**.

If this option is *unchecked*, EFS will show thumbnails even if you’ve hidden the Thumbnail window.

## Clicking a point on a map or an image

You can search a warehouse for images by clicking a point in the base map or any other geo-referenced image supported by Pictometry. This feature is helpful when you don't have an address or GPS coordinates, but you can pinpoint the general area of interest.

### ◆ To search by clicking a point:

1. Open a workspace (if you haven't already opened one).

If the workspace contains a base map, the base map opens automatically.

**Note:** If your workspace does not have a base map, you can choose one now by selecting one of the following options from the Workspace menu:

<b>Add Base Map Image</b>	}	(See Part IV, Chapter 21.)
<b>Add Orthogonal Image</b>		
<b>Add Oblique Image</b>		
<b>Add GIS Image</b>		(See Part III, Chapter 18.)



2. Click the **Image Tool** (if it's not already active).
3. If you want to search from an image that isn't your base map, open the desired image.
4. Click a point in the map or image.

A crosshair appears at the point clicked and the warehouse (and possibly the current workspace) is searched.

Depending on how you've chosen to display search hits (as described in "Options for opening images" on page 88),

*Either ...*

The first search hit opens in the Image window and the point clicked appears on the image as a red crosshair. If the Thumbnail window is in view, it shows thumbnails of search hits. Otherwise, it remains hidden.

*Or ...*

Thumbnails of all search hits appear in the Thumbnail window and the point clicked appears on each thumbnail as a red crosshair. Hits are sorted according to which sort options are active. (See "Sorting search hits in the Thumbnail window" on page 105.)

5. *If the Thumbnail window is open*, you can double-click any thumbnail, causing its full-sized image to open in the Image window.

With the Image Tool active, every time you click on a point in an image, a new search is done.

**Variation:** You can also search by dragging a rectangle on an image. Search hits that contain points in the rectangle appear in the Thumbnail window. (See Table 6-4 on page 103 for a description of the "Region selection includes partial image polygons" setting, associated with this method of searching.)

**Variation:** (continued) Use caution with this method (especially when clicking on a base map) as it can produce many hits, which may take several minutes to load (depending on the search limit you've set on the Image Tool Properties dialog box).

## Searching by entering GPS coordinates

If you know the coordinates of the point you're interested in, you can search one or more warehouses (or the active workspace) for images that contain that point by entering its coordinates. You do not have to open an image or a workspace to use this feature.

**Note:** If you want to change the coordinate system and its format, you should do so before searching. Choose **Edit**⇒**Change Units**.

### ◆ To search by GPS coordinates:

1. Do *one* of the following:
  - Press **CTRL+ G**.
  - or —
  - Choose **Navigate**⇒**Go to location**.

The Go to dialog box opens.

**Tip:** To add the Go To button to a toolbar, see “Adding and removing toolbar buttons” in Part IV, Chapter 22.

The coordinates of the current Navigation Point

**Note:** This dialog box is also used to search for images by address. See “Searching by address” (the next topic).

2. Delete any existing coordinates and type the coordinates of the point to search for.
3. Click **OK**.

EFS searches the Image Warehouses (those checked on the Image Tool Properties dialog box) and possibly the current workspace for all images that contain the point you entered.

Depending on how you've chosen to display search hits (as described in “Options for opening images” on page 88),

*Either ...*

The first search hit is opened in the Image window and the point entered appears on the image as a red crosshair. The Thumbnail window *is not automatically opened*. (If it is already open, it remains open.)

Or ...

The Thumbnail window opens, thumbnails of search hits (images that contain the coordinates you entered) appear in the Thumbnail window, and the point entered appears on each thumbnail as a red crosshair. Hits are sorted according to which sort options are active. (See “Sorting search hits in the Thumbnail window” on page 105.)

**Note:** If the point you entered is contained in an image that was active before your search, a crosshair appears in the image at the coordinates you entered, and the image is repositioned in the Image window so that you can view the part of the image that contains those coordinates.

## Searching by address

If your Data Administrator or you have completed the setup for this feature, you’ll be able to search for images by entering a street address (or a Parcel ID if you’re set up for this). You do not have to open an image or a workspace to use this feature.

*Instructions for setting up address data are found in Chapter 1.*

You may have more than one “Search profile.” If you need help changing the Active Search profile, see “Address Search Profile toolbar” in Chapter 1, or contact your Data Administrator.

## GIS data for address searching

GIS data used for address searching can be parcel-based or range-based.

### Parcel-based data

Your GIS data may be “**parcel-based**”—that is, each record corresponds to a parcel, and may include fields that identify that parcel’s coordinates, street name, house number, and in some cases a Parcel\_ID number. There are two types of parcel-based GIS data:

- **centroid data**—GIS point data in which each GIS object identifies a parcel’s centroid (a location determined by the municipality)
- **perimeters**—GIS polygon data in which each GIS object identifies a parcel’s perimeter

### Range-based data

Your GIS data may be “**range-based**”—that is, each record corresponds to a group of adjacent parcels (a “street segment”), and include fields that identify the street name, coordinates that identify the street segment, and house numbers for the first and last house on each side of the street segment.

### ◆ To search by address or Parcel ID:

#### 1. Do *one* of the following:

*When typing the address, you can enter a partial address, such as “100 Park” EFS will find:*

*100 Park Ave,  
100 Park Lane,  
100 Park Road, etc.*

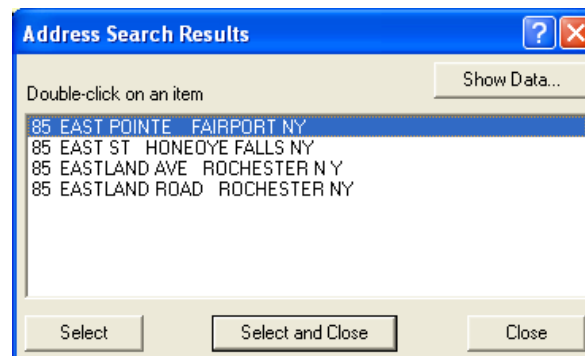
*(if those addresses exist in your data).*

*Less data in your search address returns more results (a broader search). More data returns fewer results (a narrower, more specific search).*

- In the Address Search box on your toolbar, type the address (or the Parcel ID if you are set up to search by Parcel IDs) you want to search for, then press **ENTER**.
- or —
- Press **CTRL+ G**, enter the address (or Parcel ID) there, and click **OK**.
- or —
- Choose **Navigate⇒Go to location**, enter the address (or Parcel ID) there, and click **OK**.

**Note:** “Navigate⇒Go to location” is handy if you don’t have an Address Search box on your toolbar.

The Address Search Results dialog box appears, listing search hits.



#### 2. Do *one* of the following:

- If you know which hit you want, select that hit, then click **Select and Close**. (The image opens and the dialog box closes.)
- or —
- If you’re not sure which hit you want, select a hit, then click **Select**. (The image opens, but the dialog box remains open so you can select and view other hits.)
- or —
- If you *don’t* see what you want, (perhaps there were no hits), click **Close** and try searching again. If searching by street address, check the spelling of the street name or expand the search by specifying less detail. (For example, just type the street name with no house number.)

Unless you chose Close, *the image that best shows the parcel* at the address (or with the Parcel ID) you entered is displayed in the Image window. A red crosshair is shown at the parcel’s centroid or at one of its corners—depending on the GIS data you are set up to search.

EFS retrieves an image that “best” shows that location. See “Hit Quality sort” on page 106 to learn how EFS chooses search hits.

How does EFS pinpoint the location of your search?	
If your search is based on ...	EFS does this ...
centroid GIS data (a point)	Uses the coordinates from the GIS data for the point (search parcel's centroid).
parcel GIS data (a polygon)	Uses the first corner listed in the GIS data for the polygon that defines the search parcel's outline.
range GIS data (a street segment)	Finds the street segment containing the address and (assuming uniformity of parcel size along the segment) "interpolates" a distance along this segment—to predict the location of the house number.

### About the accuracy of range-based searches

When you search by street address with range-based GIS data, EFS assumes the following:

- house numbers are in order (either ascending or descending), and
- odd and even house numbers are on opposing sides of the street.

These two criteria must be met in order for range-based address searching to be accurate.

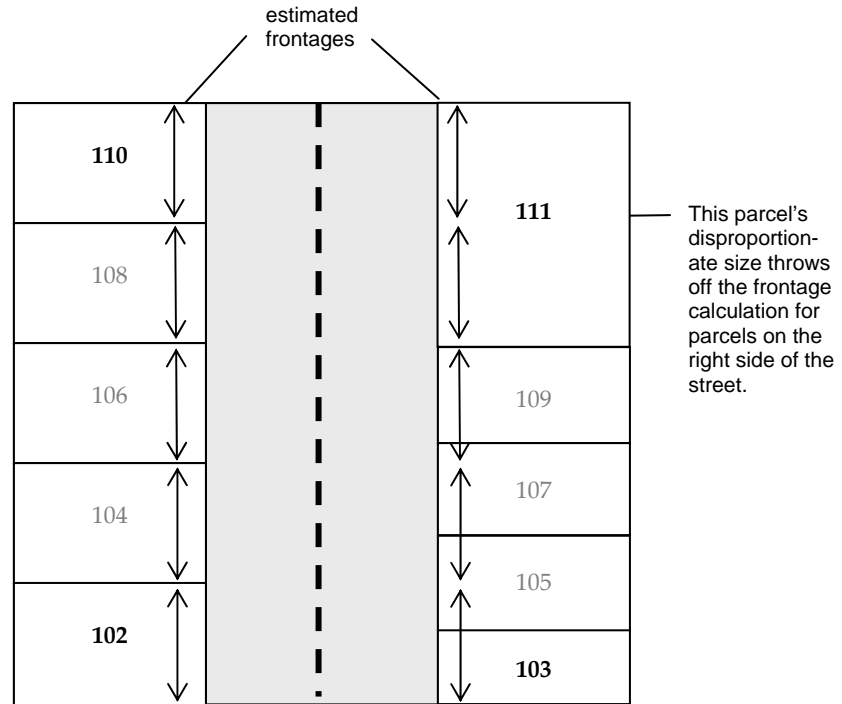
#### *Parcel spacing matters*

Also, since EFS knows only the range of addresses, it must assume that the parcels along a street segment are somewhat evenly spaced. In some places, urban residential blocks for instance, this is true—or close enough so that search results are correct.

However, in many places, (such as rural communities with a mix of farm and residential parcels), parcels have greatly varying street frontages, which can result in a misplaced address location. In the street segment shown in Figure 6-1, EFS would find images of parcels with even house numbers, but may not accurately pinpoint the location of parcels with odd house numbers (especially 109, 107, and 105).

#### *EFS estimates the parcel frontage*

Using the first and last house numbers on each side of the segment and location data for each of those four parcels, EFS determines an estimated frontage for all parcels in the segment.



**Figure 6-1:** Street segment with parcels that vary in size.

### Verifying the results

When doing a range-based search in an area of greatly varying frontages, you may want to use the GIS Query Tool (discussed in Part III, Chapter 17) to verify that a resulting image shows the parcel you need.

**Tip:** If the resulting image does not show the desired search parcel, you can use the **Adjacent Image** feature (discussed in Chapter 7) to find imagery for a nearby parcel.

### Repeating an address search

After you use the Address Search toolbar to search for a parcel, you can easily repeat that same search *without* re-entering the search criteria (address or Parcel ID).

#### ◆ To repeat an address search:

1. Click the down-arrow at the right of the Address Search toolbar.  
You'll see a list of addresses you've entered during this EFS session.
2. Select the search criteria from the list.  
EFS repeats the search. The Address Search Results dialog box appears, showing hits for the search.
3. Continue from Step 2 of the previous procedure ("To search by address or Parcel ID").

## Searching for images by using text data in a GIS annotation layer

*The GIS Layer Search is detailed in Part III, Chapter 16.*

You can use the GIS Layer Search to search a specific GIS annotation layer for text data. The GIS Layer Search lets you enter values for up to two text fields. It finds database records that match your criteria, and based on coordinate data, lets you view the images associated with those records. You can access a GIS annotation layer through the workspace (right-click the GIS annotation layer name).

## Opening images directly

At times you may want to open an Orthogonal or an Oblique image directly—with or without opening a workspace.

### ◆ To open a single image file:



1. Do *one* of the following:
  - Click the **Open** button (if available on a toolbar).
  - or —
  - Choose **File⇒Open**.

The Open dialog box opens.
2. Select the desired file type from the Files of Type list box.
3. Navigate to the folder that contains the desired file.
4. Select the file and click **Open**. The image appears in the Image window area.

## Closing images

Use the following procedure to close the active image.

### ◆ To close the active image:

- Do *one* of the following:
  - Right-click the image, and select **Close <image name>** from the context menu.
  - or —
  - Choose **File⇒Close Image**.

The active image closes.

## Image Tool properties

The Image Tool has various properties that affect searching, sorting, and viewing images. For example, you can limit the types of images you search for. (See “Limiting the image search” on page 100.) You can also limit the number of images you open in the Image window. (See “Limiting the number of open images” on page 104.)

These properties are located on the Image Tool Properties dialog box.



◆ **To open the Image Tool Properties dialog box:**

Do *one* of the following:



- Click the **Image Tool Properties** button (if available on a toolbar).

— or —



- Click the **Image Tool**, then press **CTRL+ P** or choose **Tools⇒Properties**.

— or —

- Choose **Navigate⇒Image Tool Properties**.

The Image Tool Properties dialog box opens to the Warehouse List tab.

The Image Tool Properties dialog box has three tabs.

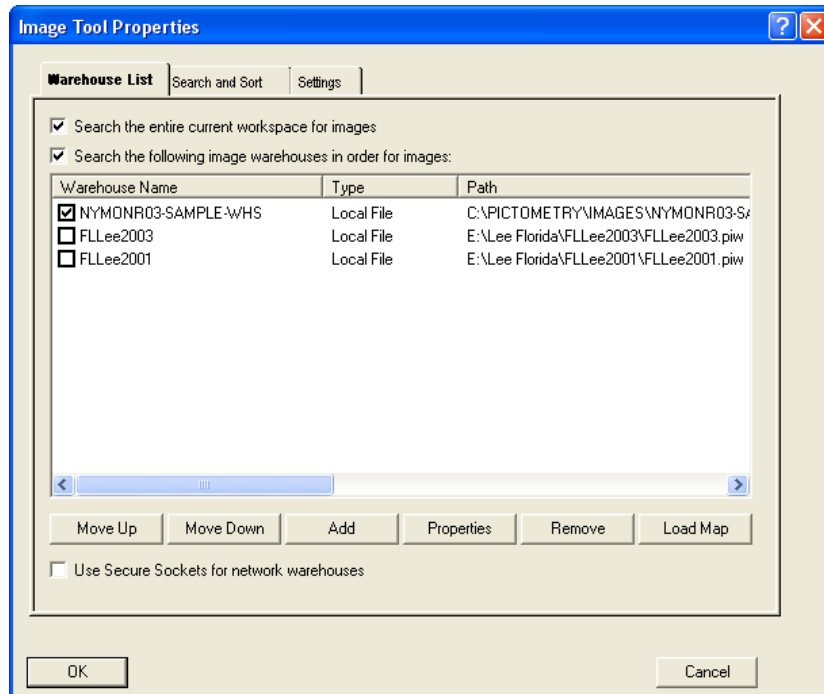
- Warehouse List tab
- Search and Sort tab
- Settings tab

## The Warehouse List tab

The Warehouse List tab contains options that let you specify where to search for images. You can search one or more warehouses and you can search the active workspace. The settings on this tab apply to all types of searches (clicking a point, entering coordinates, entering a street address, and using the Navigate Tool).

**Tip:** To quickly open the Warehouse List tab, press **CTRL + W**.

*If you've chosen Warehouse Order sort on the Search and Sort tab, search hits will be ordered by warehouse, as listed on the Warehouse List tab. See "Warehouse Order sort" (page 109).*



**Figure 6-2:** The Image Tool Properties dialog box showing the Warehouse List tab.

The Warehouse List tab contains the following options and buttons.

**Table 6-1:** Contents of the Warehouse List tab.

Property	Description
Search the entire current workspace for images	Check this option if you want EFS to search the active workspace for images that match the search criteria.
Search the following image warehouses in order for images	Check this option if you want EFS to search for images in the warehouses listed (and checked). The warehouses are searched in the order in which they are listed.
Warehouse Name, Type, Path	Shows the name, type, and path of each warehouse you've added to the list. Only those warehouses that are checked will be searched.  <b>Note:</b> "Type" indicates if a warehouse is stored on your local hard drive or LAN (a "Local File") or is stored on an NIW server ("Network Server").
Move Up	Click this button to move a warehouse up in the list.
Move Down	Click this button to move a warehouse down in the list.
Add	Click this button to link a warehouse (add it to the list with a checkmark). See "Linking to your Image Warehouse" in Chapter 1.
Properties	Click this button to open the Warehouse Properties dialog box in order to change a warehouse name or path.  <b>Note:</b> You can change the name of the warehouse as it appears in the warehouse list only. You cannot change the name of the warehouse in your Image Library.
Remove	Click this button to remove a warehouse from the list.
Load Map	After selecting a warehouse in the list, click this button if you want to create a new workspace.  The Warehouse Base Map dialog box opens so you can select and open a base map. (same as choosing File⇒New Workspace.)
Use Secure Sockets for network warehouses	Check this option so EFS will use a Secure Socket Layer (SSL) when communicating with a Network Warehouse.  <b>Note:</b> The server needs to be set up properly in order for this to work.

## Searching the current workspace

EFS gives you the ability to search the active workspace for images. You might use this feature if you don't use image warehouses. Whether you use warehouses or not, you might use this feature to find a particular image or type of image in a workspace that is very large.

### ◆ To search the current workspace for images:

1. Do *one* of the following:



- Click the **Image Tool Properties** button (if available on a toolbar).

— or —

- Press **CTRL + W**.

— or —



- Click the **Image Tool** and choose **Tools⇒Properties**.

— or —

- Choose **Navigate**⇒**Image Tool Properties**.

The Image Tool Properties dialog box opens to the Warehouse List tab. (Figure 6-2.)

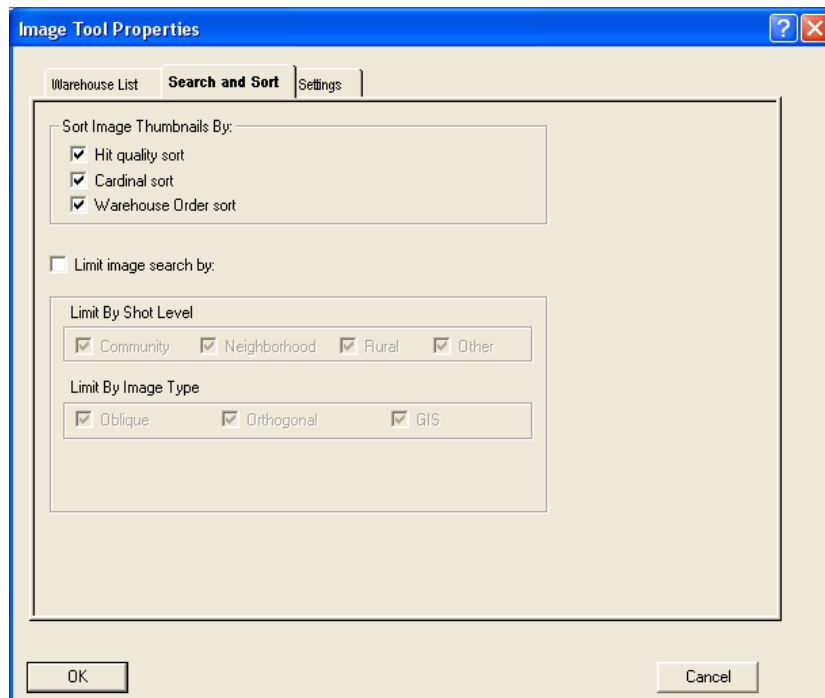
2. Make sure that **Search the entire current workspace for images** is *checked*, and click **OK**.

## The Search and Sort tab

You can also limit the number of images that can be open at one time. See "Limiting the number of open images" on page 104.

The Search and Sort tab contains options for limiting an image search (to selected image types and shot levels), and for sorting thumbnails of search hits in the Thumbnail window.

The rest of this topic covers options for limiting an image search. See page 105 for detailed information about sorting search hits.



**Figure 6-3:** The Image Tool Properties dialog box showing the Search and Sort tab.

The Search and Sort tab contains the following options and buttons.

**Table 6-2:** Contents of the Search and Sort tab.

Property	Description
Hit quality sort	Check this option to turn on the Hit Quality sort, which sorts search hits by shot level and image type. (See page 105.)
Cardinal sort	Check this option to turn on the Cardinal sort, which sorts the top four search hits by the four compass directions. (north up first, followed by east up, south up, and west up). (See page 105.)
Warehouse Order sort	Check this option to turn on the Warehouse Order sort, which sorts search hits by warehouse. The order in which the search hits are shown matches the order in which the warehouses are listed in the Warehouse List tab of the Image Tool Properties dialog box. (See page 105.)

**Table 6-2:** *Contents of the Search and Sort tab. (continued)*

Property	Description
Limit image search by:	Check this option to limit image searching by shot level and image type. Clicking this button causes the "Limit By Shot Level" and "Limit By Image Type" checkboxes to be available.
Limit By Shot Level	Check the shot levels you want <i>included</i> in an image search.
Limit By Image Type	Check the image types you want <i>included</i> in an image search.

A shot level of "Other" is anything not designated as Neighborhood, Community, or Rural, (such as base maps and Ortho Sector Tiles).

**Limiting the image search**

Search operations take less time if you limit the search results. To shorten the search time (and the list of thumbnail hits in the Thumbnail window), you can select options that let you limit the image search. You can limit it in the following ways:

- by shot level (Neighborhood, Community, Rural, Other)
- by image type (Oblique, Orthogonal, GIS)
- by entering a maximum number of search hits to return following a search

The search will return only those images that match the image types and shot levels you’ve checked, up to the maximum number you’ve specified.

**Note:** Warehouses can be searched for Oblique and Orthogonal image types only. The active workspace can be searched for all three image types.

You can limit an image search by using toolbar buttons or by using the Image Tool Properties dialog box.

*Alternate views affected*

Excluding image types or shot levels means that alternate views of those image types or shot levels will not be available after a search. For example, assume you want to exclude Orthos from the search. To exclude them, you’ll either uncheck the Orthogonal checkbox (on the Search and Sort tab) or you’ll turn off the Image Search Includes Orthos toolbar button (if available on a toolbar). Following a search, there will be no Ortho image to view when you click the View From Ortho button (or select the corresponding menu option).

*Thumbnail window affected*

Limiting the image search affects which images are shown as thumbnails in the Thumbnail window. It also affects how many thumbnails are shown.

*What is not affected by limiting the image search?*

The Limit Image Search feature does *not* affect the Navigate Tool, nor does it affect the four options for viewing adjacent images (Navigate⇒Move one image to the North/South/East/West).

### Toolbar buttons for limiting searches






If desired, you can add toolbar buttons that let you quickly limit a search by shot level or by image type. (See “Adding and removing toolbar buttons” in Part IV, Chapter 22.)



If you do add these buttons to a toolbar, you’ll need to add the Limit Image Search button as well. When it’s *on*, you can click the other search buttons to limit the search.

You can use these buttons to either include or exclude shot levels and image types. Click the appropriate button as described in the following table.

**Table 6-3:** toolbar buttons for limiting image search.

Toolbar button		Description
	Image Search Includes Communities	When <i>on</i> , Community images will be included as search hits; when <i>off</i> , they will be excluded.
	Image Search Includes Neighborhoods	When <i>on</i> , Neighborhood images will be included as search hits; when <i>off</i> , they will be excluded.
	Image Search Includes Oblique	When <i>on</i> , Oblique images will be included as search hits; when <i>off</i> , they will be excluded.
	Image Search Includes Orthos	When <i>on</i> , Orthogonal images will be included as search hits; when <i>off</i> , they will be excluded.
	Image Search Includes Others	When <i>on</i> , base maps and any images that are not Community, Neighborhood, or Rural will be included as search hits; when <i>off</i> , they will be excluded.

### ◆ To limit the image search:

- Do *one* of the following:
  - Click the desired toolbar button (as pictured in Table 6-3.). If the button is dim, you’ll need to click the Limit Image Search button first. *Skip the rest of this procedure.*
  - or –
  - Open the Image Tool Properties dialog box by using any of the methods listed in the procedure on page 97.
- Click the **Search and Sort** tab.
- If not already checked, check **Limit Image Search by**. The Limit By Shot Level and Limit By Image Type options become available.
- On the Search and Sort tab, *check* all shot levels and image types you want to *include* in a search.
- Click **OK**.

All future searches will be limited to the options you selected until you change them.

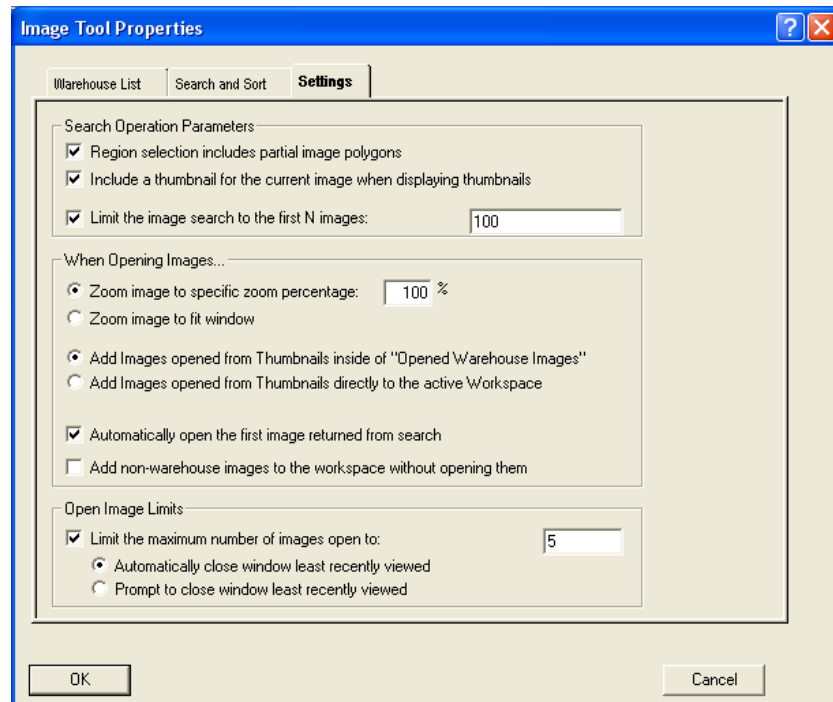
◆ **To limit the number of search hits returned:**

1. Open the Image Tool Properties dialog box by using any of the methods listed in the procedure on page 97.
2. Click the **Settings** tab.
3. If not already checked, check **Limit the image search to the first N images**.
4. Enter a number for the limit in the box to the right of the Limit the image search to the first N images option.
5. Click **OK**.

Each future search will return up to N results until you change this setting.

## The Settings tab

The Settings tab has settings that affect search hits, the Thumbnail window, and opening images in the Image window.



**Figure 6-4:** The Image Tool Properties dialog box showing the Settings tab.

The Settings tab contains the following options and buttons.

**Table 6-4:** Contents of the Settings tab.

Property	Description
Region selection includes partial image polygons	<p>Check this option if you want search hits to include images that partially extend outside the search region when you've dragged a rectangle with the Image Tool in order to search an area.</p> <p>If this option is <i>unchecked</i>, the search hits list includes only images in which the entire footprint of the image is inside the rectangular search region.</p>
Include a thumbnail for the current image when displaying thumbnails	Check this option if you want a thumbnail for the active image included in the Thumbnail window when you search the warehouse for a point in the active image.
Limit the image search to the first N images:	<p>Check this option if you want to enter a value for the maximum number of search hits to return following a search.</p> <p>When the limit you enter is reached, EFS stops searching the Image Warehouses for more hits.</p>
Zoom image to specific zoom percentage	Click this button if you want images you open in the Image window to be zoomed to the percentage you enter in the box to the right of this button.
Zoom image to fit window	Click this button if you want images you open in the Image window to be zoomed to fit the window size.
Add Images opened from Thumbnails inside of "Opened Warehouse Images"	Click this button if you want every image you open from the Thumbnail window to be listed in the Opened Warehouse Images folder, but not automatically added to the workspace.
Add Images opened from Thumbnails directly to the active Workspace	Click this button if you want every image you open from the Thumbnail window to be automatically added to the workspace and saved when you save the workspace.
Automatically open the first image returned from search	<p>Check this option to automatically open the top search hit in the Image window each time you search.</p> <p>See "Automatically open the first search hit" on page 88.</p>
Add non-warehouse images to the workspace without opening them	<p>Check this option to add non-warehouse images residing on your PC to the active workspace, without first opening them (without displaying them in the Image window). The images do not go into the Opened Warehouse Images folder, but directly into your active workspace.</p> <p><b>Note:</b> You might use this feature if you are gathering images to create a new Image Warehouse (Workspace⇒Create Warehouse from Workspace).</p>
Limit the maximum number of images open to:	<p>Check this option to enter a value for the maximum number of images that can be open at the same time in the Image window. (See "Limiting the number of open images"—the next topic. )</p> <p>Checking this option makes the following options available. You'll need to choose <i>one</i> of these two options.</p>
Automatically close window least recently viewed	Click this button if you want EFS to <i>automatically</i> close the image least recently viewed, when you open an image and you've already reached the limit for open images.
Prompt to close window least recently viewed	<p>Click this button if you want to be prompted to close the window least recently viewed. The prompt notifies you when you open one image over the limit.</p> <p>See "When opening an image, if you exceed the limit ..." on page 104.</p>

*For tips on memory and performance when working with GIS data, see “Maximizing system performance” in Part III, Chapter 17.*

## Limiting the number of open images

Limiting the number of images that can be open in the Image window at the same time is important because images use at least 18 MB of memory each. The limit you set with the “Limit the maximum number of images open” option on the Settings tab depends on how much memory your system has, how large your images are, and how much memory is used for other programs running at the same time as EFS.

As you’re opening images, EFS attempts to limit the number of open images to the number you’ve specified. When you open one image over the limit, it tries to close the image that was least-recently viewed.

You can set up EFS so that you have to authorize the closing of an image (See “Setting the limit” below.)

### Exceptions to the limit

*A **base map** is the image at the top of the workspace.*

*A **GIS Image** is considered to be a kind of base map.*

Base maps and GIS Images will never be closed as a result of opening a new image and exceeding the limit. In addition, opening a GIS Image will not cause another image to close.

**Note:** While in PentaView, EFS ignores any limit you’ve set for the number of open images.

### Setting the limit

#### ◆ To limit the number of open images:

1. Open the Image Tool Properties dialog box by using any of the methods listed in the procedure on page 97.
2. Click the **Settings** tab.
3. If not already checked, check **Limit the maximum number of images open to**, and type a value for the limit in the box to the right of the option.
4. Choose between **Automatically close window least recently viewed** and **Prompt to close window least-recently viewed**.
5. Click **OK**.

### When opening an image, if you exceed the limit ...

If you chose “Automatically close window least recently viewed” when you set the limit, and you subsequently open one image more than the limit, EFS automatically closes the window least-recently viewed.

If you chose “Prompt to close window least-recently viewed,” then a dialog box appears, indicating which image EFS has selected to close. Respond as follows:

If you click ...	This happens ...
<b>Yes</b>	The image EFS selected is closed, and the new image is opened.
<b>No</b>	The image EFS selected isn’t closed. EFS tries to find another image to close.
<b>Cancel</b>	The new image is not opened.



**Note:** If you click “No” for every image EFS offers to close, then no image is closed, and the new image is opened—even if this means the open image limit is exceeded. Unless you click “Cancel,” the new image will open regardless of whether an image was closed.

## Sorting search hits in the Thumbnail window

When you use the Image Tool or enter coordinates to search for images, search hits (thumbnail images) are sorted in the Thumbnail window.

The order in which search hit thumbnails are shown depends on the sort options selected on the Search and Sort tab of the Image Tool Properties dialog box. (Figure 6-3 on page 99.) The procedure for opening the Image Tool Properties dialog box begins on page 97.

### Sort options

There are three sort options:

- Cardinal sort
- Hit Quality sort
- Warehouse Order sort

These options can be used separately or in combination. (See Table 6-5, Table 6-6, and Table 6-7.)

### Cardinal sort



When the Cardinal sort is *on* (and Hit Quality sort is *off*), search hits are sorted by shot level and image type, but within the Neighborhood Oblique and Community Oblique categories, the top four search hits are sorted by the four cardinal compass points in the following order:

- north up
- east up
- south up
- west up

**Note:** If some of these views are missing from Thumbnail window, they do not exist in your warehouse or they were excluded by the Limit Image Search and companion buttons.

**Note:** Rather than being selected for quality, the four top hits are the ones in which the top of the image is the closest to the true compass direction. So the compass rose for the best north-up image would have the needle pointing as close to True North as possible, not northeast or northwest.

The following table shows how thumbnails are sorted in the Thumbnail window following a search in which *only* the Cardinal sort is on.

**Table 6-5:** How search hits are sorted when only the Cardinal sort is on.

Quality	Shot level	Image type	Orientation
<b>Neighborhood Oblique images</b>			
not applicable	Neighborhood	Oblique	truest north up
not applicable	Neighborhood	Oblique	truest east up
not applicable	Neighborhood	Oblique	truest south up
not applicable	Neighborhood	Oblique	truest west up
<i>Remaining Neighborhood Oblique hits listed in no particular order.</i>			
<b>Community Oblique images</b>			
not applicable	Community	Oblique	truest north up
not applicable	Community	Oblique	truest east up
not applicable	Community	Oblique	truest south up
not applicable	Community	Oblique	truest west up
<i>Remaining Community Oblique hits listed in no particular order.</i>			
<b>Neighborhood Orthogonal images</b>			
<i>All Neighborhood Ortho hits listed in no particular order. *</i>			
<b>Community Orthogonal images</b>			
<i>All Community Ortho hits listed in no particular order. *</i>			
<b>Other image types</b>			
<i>All "Other" hits such as Rurals or non-Pictometry images listed in no particular order.</i>			

\* Although Orthogonal images have no true top and bottom, (the camera lens does not face any compass direction), they are always displayed "north up" in EFS.

### Hit Quality sort



If Hit Quality sort is *on* when searching (and Cardinal sort is *off*), search hits are sorted by shot level and image type, but within the Neighborhood Oblique and Community Oblique categories, search hits are sorted by their quality. To determine a hit's quality, EFS considers the location of the sweet spot, the proximity of an image's edge to the clicked point, and (for Oblique images) the vertical location of the clicked point in the image.

The **sweet spot** is generally the center of an Orthogonal image and the middle lower portion of an Oblique image (slightly below center).

### What makes an image a “quality” hit?

An image is considered a quality hit if:

- it’s sweet spot is close to the Navigation Point, and
- the Navigation Point is not too close to the any of it’s edges, and
- (for Oblique images), the Navigation Point is in the lower third of the image.

#### About Perspective and Oblique Imagery



When capturing Oblique images, the camera angle causes perspective. Objects toward the top of the image appear smaller than those toward the bottom. When EFS determines the quality of a search hit, it considers how low the Navigation Point is in the Oblique image, that is, how far the point is into the background (where things appear smaller) than into the foreground of the image.

This applies to the following search features:

- Thumbnail Hit Quality sort
- Alternate View feature
- Navigate Tool (when switching images)
- Address Search
- GIS Layer Search
- Go to location

The following table shows how thumbnails are sorted in the Thumbnail window following a search in which *only* the Hit Quality sort is on.

**Table 6-6:** How search hits are sorted when only the Hit Quality sort is on.

Quality	Shot level	Image type	Orientation
<b>Neighborhood Oblique images</b>			
highest quality	Neighborhood	Oblique	any orientation
<div style="text-align: center;">              Remaining Neighborhood Oblique hits listed in order of quality.         </div>			
lowest quality	Neighborhood	Oblique	any orientation
<b>Community Oblique images</b>			
highest quality	Community	Oblique	any orientation
<div style="text-align: center;">              Remaining Community Oblique hits listed in order of quality.         </div>			
lowest quality	Community	Oblique	any orientation
<b>Neighborhood Orthogonal images</b>			
All Neighborhood Ortho hits are listed in no particular order.*			
<b>Community Orthogonal images</b>			
All Community Ortho hits are listed in no particular order.*			
<b>Other image types</b>			
All “Other” hits such as Rurals or non-Pictometry images are listed in no particular order.*			

\* Although Orthogonal images have no true top and bottom, (the camera lens does not face any compass direction), they are always displayed “north up” in EFS.

See “What makes an image a “quality” hit?” on page 107.

### Using the Cardinal and Hit Quality sorts together

When *both* the Cardinal sort and Hit Quality sort are on, search hits are sorted by shot level / image type first, then by direction and quality combined. Within each shot level / image type category, hits are sorted by quality.

**Table 6-7:** How hits are sorted when both Hit Quality and Cardinal sorts are on.

top of Thumbnail window

Quality	Shot level	Image type	Orientation
<b>Neighborhood Oblique images</b>			
highest quality	Neighborhood	Oblique	north up
highest quality	Neighborhood	Oblique	east up
highest quality	Neighborhood	Oblique	south up
highest quality	Neighborhood	Oblique	west up
next highest quality	Neighborhood	Oblique	any orientation
<div> <div></div> <div>Remaining Neighborhood Oblique hits listed in order of quality.</div> <div></div> </div>			
lowest quality	Neighborhood	Oblique	any orientation
<b>Community Oblique images</b>			
highest quality	Community	Oblique	north up
highest quality	Community	Oblique	east up
highest quality	Community	Oblique	south up
highest quality	Community	Oblique	west up
next highest quality	Community	Oblique	any orientation
<div> <div></div> <div>Remaining Community Oblique hits are listed in order of quality.</div> <div></div> </div>			
lowest quality	Community	Oblique	any orientation
<b>Neighborhood Orthogonal images</b>			
highest quality	Neighborhood	Orthogonal	not applicable
<div> <div></div> <div>All Neighborhood Ortho hits are listed in order of quality.</div> <div></div> </div>			
lowest quality	Neighborhood	Orthogonal	not applicable
<b>Community Orthogonal images</b>			
highest quality	Community	Orthogonal	not applicable
<div> <div></div> <div>All Community Ortho hits listed in order of quality.</div> <div></div> </div>			
lowest quality	Community	Orthogonal	not applicable
<b>Other image types</b>			
<div> <div></div> <div>All “Other” hits such as Rurals or non-Pictometry images are listed in order of quality.</div> <div></div> </div>			

bottom of Thumbnail window

*If not in view, you can view the Thumbnail window by choosing View⇒Thumbnail Window.*

### **Warehouse Order sort**

When you turn on the Warehouse Order sort and then search for images, search hits are shown in the Thumbnail window by warehouse. The order in which the search hits are shown matches the order in which the warehouses are listed in the Warehouse List tab of the Image Tool Properties dialog box. (For more information about the warehouse list, see “The Warehouse List tab” on page 97.)

You might use this feature if you want to search two or more warehouses at the same time and want thumbnails of the results separated in the Thumbnail window.

### **Using the all three sorts together**

If all three sorts are turned on (Cardinal, Hit Quality, and Warehouse Order), search hits are sorted by warehouse first, then within warehouse by shot level / image type, then by quality.



# Chapter 7 — Navigating Within and Between Images

This chapter provides concepts and procedures about navigating your images in EFS. Specifically, it discusses how to do the following:

- view images that are adjacent to an image
- view a scene from a different orientation such as north, east, south, west, and orthogonally
- view images of different shot types and shot levels
- view other images of the same orientation
- navigate within and between images while charting a path

## Topics covered in this chapter ... page

Navigation concepts.....	111
Two ways to look at it.....	111
Using navigation features.....	114
Opening adjacent images.....	114
Opening alternate views.....	115
Opening similar images.....	123
Centering the Navigation Point.....	124
Navigating a route.....	125

## Navigation concepts

Before using EFS navigation features, it's helpful to have some background about image orientation, so you don't lose your direction as you navigate.

### Two ways to look at it

There are two ways to describe an object or scene's orientation—by the direction the viewer is looking/facing (“user-centric”), and by the direction the object or scene faces (“object-centric”), which is the *opposing* direction.

### The user-centric point of view

To understand what is meant by user-centric, picture yourself as the photographer, and imagine that you're at a fixed location. You can look around, rotating your viewpoint a full 360 degrees. If you were to take a picture in each direction, there will be minimal overlap in the images, and viewing these images—one at a time—can be disorienting. See Figure 7-1.

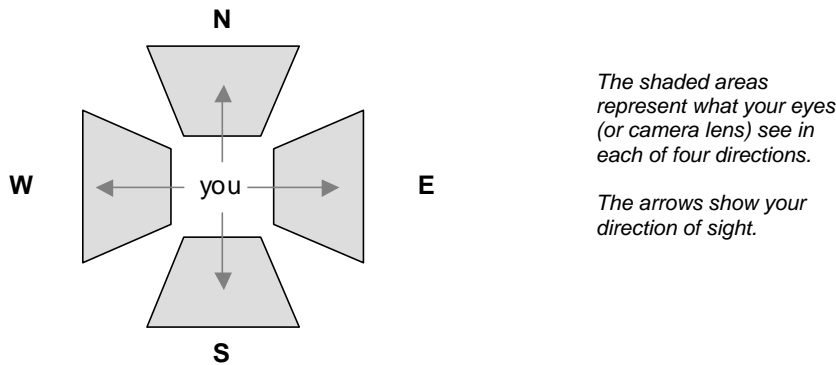


Figure 7-1: User-centric point of view.

The object-centric point of view

Now imagine that you can move around, and that you’re interested in viewing and photographing a fixed object. You might walk a circle around the object and view it from each of its four sides. From an airplane, looking straight down, you could view or photograph the object orthogonally. This is the object-centric point of view (see Figure 7-2). Again, the shaded areas represent what your eyes (or camera lens) see in each of five directions, and the arrows show your direction of sight.

EFS features help you navigate based on objects in your images.

For example, the object-centric “Alternate View” feature gives quick access to various views of the same location.

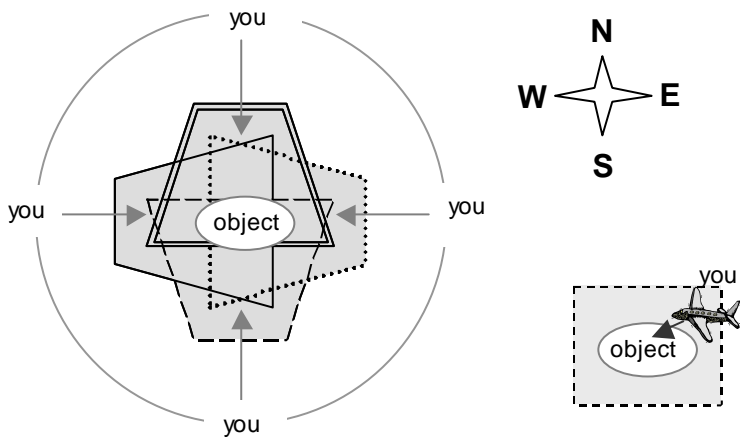


Figure 7-2: Object-centric point of view.

Translating this to the screen ...

Look again at Figure 7-2. Let’s say you were to photograph the object from each of four sides and then view the images in EFS. You’d easily keep your bearings when switching from one image to another, because in each view, the object and some of the same neighboring items would appear.

The following table, based on Figure 7-2, shows how an image’s orientation (in EFS) and your orientation (the direction in which you’re looking)



change as you view an object from each direction. It also shows which side of an object you are seeing as you move your vantage point.

**Table 7-1:** User and image orientations for the vantage points shown in Figure 7-2.

Your vantage point in Figure 7-2	You're viewing from ...	In object-centric terms, you're viewing the ...	In user-centric terms, you're looking ...	Image orientation in EFS is ...
top of circle	the north	north side of object	south	south up
right side of circle	the east	east side of object	west	west up
bottom of circle	the south	south side of object	north	north up
left side of circle	the west	west side of object	east	east up
airplane	orthogonally	top of object	—	north up *

\* Although Orthogonal images have no true top and bottom, (the camera lens does not face any compass direction), they (like maps) are always displayed “north up” in EFS.

Imagine that you want to see (in object-centric terms), “the north side of a building.” You’d view it *from the north*, facing the opposite way—south. (In user-centric terms, you’d “look south.”) You always face the direction opposite of the side of an object you’re viewing. In Figure 7-2, you’d be viewing the object from the top of the circle (north), looking down (south).

To view an object *from the north in EFS*, you’d view a south-up image. The object’s north side will be closer (than it’s south side) to the bottom of your Image window. See Figure 7-3.



**Figure 7-3:** View from the north (looking south at a south-up image).




**To keep your bearings in EFS ...**

We are used to looking at maps and geographic images with the north side up. To keep your bearings when working in EFS with images captured in various directions, it may be helpful to **picture yourself at the bottom of the Image window, looking toward the top of the Image window**. The direction in which you are looking is the direction at the top of the compass in the Navigation window.

The following sections describe EFS navigation features.

**Using navigation features**

EFS includes the following features for navigating within and between images:

EFS feature	See ...
Adjacent Image	page 114
Alternate View	page 115
 Center Navigation	page 121
 Get Prev/Next Image	page 123
 Navigate Tool	page 125

**Opening adjacent images**

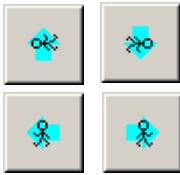
You'll use the **Adjacent Image feature** to open images that are adjacent to the one you're currently viewing (the active image). You can "Move One Image to the ..." north, south, east, or west. As you change images, EFS maintains the same image type (and GSD depending on the Navigate Tool's Navigate Zoom setting). EFS also maintains the orientation for Oblique images.

◆ **To view an image adjacent to the active image:**

With an image in view in the Image window,

- Choose **Navigate**⇨(then choose the option you want):  
**Move one image to the north,**  
**Move one image to the south,**  
**Move one image to the east, or**  
**Move one image to the west.**

If the adjacent image you requested exists in the same shot level, image type, and orientation as the active image, it opens in the Image window. *Otherwise*, you'll hear a beep, and what's in the Image window stays the same.



**Tip:** If you find yourself using this feature frequently, you might consider adding the Move North, Move South, Move East, and Move West buttons to your toolbar. EFS provides these buttons as an alternative to using the Navigate menu. (To add these buttons, see “Adding and removing toolbar buttons” in Part IV, Chapter 22.)

## Opening alternate views

*Procedures for using the feature begin on page 120.*

You can use the **Alternate View feature** to open other views of the same area you are viewing in the Image window. Alternate views are actually search hits that show the location you searched for from different directions and from different shot levels.

### When are alternate views available?

You can open an area’s alternate view if *all* of the following are true:






- If the desired alternate view of the area exists in your warehouse.
- If you haven’t excluded the alternate view before searching. (See “Limiting the image search” in Chapter 6.)
- If the active image was opened as a result of your last image search. (An image search would include clicking a point with the Image Tool, searching by address, searching by coordinates, clicking the Center Navigation button, or using the Navigate Tool.)

### How to open alternate views

There are a few ways to open alternate views of the location in the active image. To see alternate views, you’ll do one of the following:





- Click the desired Alternate View button (the on-image button or the toolbar button) or use its corresponding Navigate menu option.
- Click the PentaView button to open all five “camera views.” For more information about PentaView, see Chapter 8.

**Table 7-2:** The Alternate View buttons and corresponding menu options.

Toolbar button		Corresponding Navigate menu option
Also called "Navigation Cameras."		View From North View the scene from the north
		View From South View the scene from the south
		View From East View the scene from the east
		View From West View the scene from the west
		View From Ortho View the scene orthogonally

**Note:** EFS retrieves the best (highest-resolution) views available (except when the Hit Quality sort is not on.) See “Hit Quality sort” in Chapter 6.

**Table7-2:** *The Alternate View buttons and corresponding menu options. (continued)*

Toolbar button	Corresponding Navigate menu option
 View Community	View corresponding Community Image
 View Neighborhood	View corresponding Neighborhood Image
 View Map	Return to Map Window
 View Ortho Sector Tile	(no menu option)

**Hover to see image name**

You can hover your mouse over any Alternate View button to see the name of the button followed by the file name for the image currently associated with the alternate view. Here is an example:

**View from North: NYMONR016020NeighNSObliq305\_011207.psi**

If you haven’t yet done an image search (such as when you first launch EFS), the Alternate View buttons are dim and you’ll see a message similar to the following when you hover over a button

**View from North: You must first do an image search.**

**An example**

Suppose you are viewing a house from the east and you want to see its west side. Assuming that the active image was opened after the last search, and that your warehouse contains a view from the west covering the same area, you can click the View From West button, and an image showing the house’s west side opens in the Image window.

**Alternate views updated with each image search**

Each time you search, if EFS finds alternate views of the location on which you searched, it updates the Alternate View buttons (and corresponding menu options) with new search hits.

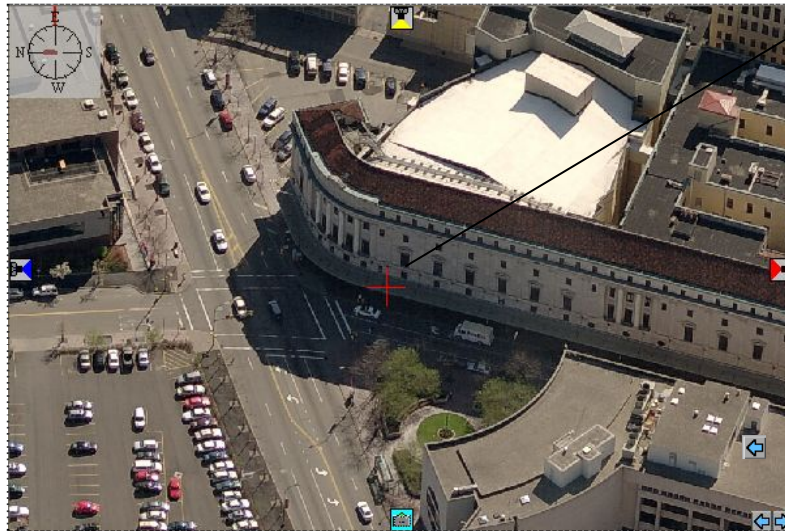
When you click an Alternate View button (or select a corresponding menu option), EFS opens an image found during your last search. EFS keeps these images accessible so you can quickly switch between them.

**Note:** If you limit the types or levels of images returned by an image search, you may not find a particular image even though it is in the warehouse. (See “Limiting the image search” in Chapter 6.)

## Alternate views based on the Navigation Point

Just like *all* search hits, alternate views are based on the Navigation Point, which is denoted by the red crosshair.

**Tip:** To make the center of the Image window the Navigation Point, use the Center Navigation button.



The red crosshair marks the Navigation Point.

*If you don't see the red crosshair, you may have scrolled or panned it out of view.*

**Figure 7-4:** The red crosshair showing the Navigation Point.

The image opened when you use the Alternate View feature is based on this location—the location of the last search.

## Many combinations of image characteristics

The alternate views include (if available) images with various combinations of the following characteristics:

Image characteristic	Can be any of these ...	
Shot level	<ul style="list-style-type: none"> <li>• Neighborhood</li> <li>• Community</li> </ul>	<ul style="list-style-type: none"> <li>• Ortho Sector Tile</li> <li>• Other</li> </ul>
Image Type	<ul style="list-style-type: none"> <li>• Oblique</li> <li>• Orthogonal</li> </ul>	<ul style="list-style-type: none"> <li>• GIS Image</li> </ul>
Orientation	<ul style="list-style-type: none"> <li>• N (north up)</li> <li>• S (south up)</li> </ul>	<ul style="list-style-type: none"> <li>• E (east up)</li> <li>• W (west up)</li> </ul>






*Orientation applies only to Oblique images.*

## Which image characteristics for which views?

The following tables describe the images each Alternate View button and menu option returns.





**Table 7-3:** Characteristics of images returned by the View From buttons (and corresponding menu options).

			Characteristics of image returned		
	Button	Menu option	Shot level	Image type	Orientation
	View From North	Navigate⇒View the scene from the north	same as active image *	Oblique	S (south-up)
	View From South	Navigate⇒View the scene from the south	same as active image *	Oblique	N (north-up)
	View From East	Navigate⇒View the scene from the east	same as active image *	Oblique	W (west-up)
	View From West	Navigate⇒View the scene from the west	same as active image *	Oblique	E (east-up)
	View From Ortho	Navigate⇒View the scene orthogonally	same as active image *	Orthogonal	N (north-up)


\* If the active image is not a Community or a Neighborhood image, EFS retrieves the “best” (based on various factors) available Community or Neighborhood image.

**Table 7-4:** Characteristics of images returned by the View Community and View Neighborhood buttons (and corresponding menu options).


			Characteristics of image returned		
	Button	Menu option	Shot level	Image type	Orientation
	View Community	Navigate⇒View corresponding Community Image	Community	same as active image *	same as active image
	View Neighborhood	Navigate⇒View corresponding Neighborhood Image	Neighborhood	same as active image *	same as active image

\* If the active image is not a Community or a Neighborhood image, EFS retrieves a corresponding *Orthogonal* image. If unavailable, it retrieves a corresponding *Oblique* N image (north-up).

**Table 7-5:** The image returned by the View Map button and its corresponding menu option.

Button	Menu option	The image returned
	Navigate⇒Return to map window	raster map (image type=Ortho, shot level=Other) —or— base map

**Note:** Listed first in a workspace, a base map is the map loaded when you create a workspace or any image added to the workspace later by using Workspace⇒Add Base Map Image.

**Table 7-6:** *The image returned by the View Ortho Sector Tile button.*


Button	The image returned
View Ortho Sector Tile	Orthogonal Sector Tile

**Note:** Ortho Sector Tiles cover one square mile each and do not overlap. (See Chapter 2 for more information about these images.)

### Image characteristics maintained

When you use the Alternate View feature to change views, EFS maintains as many image characteristics as possible, for a smooth transition that is not disorienting.

For example, when you click the View From North button, EFS switches images, but maintains the shot level and image type. When you click the View Community button or the View Neighborhood button to change shot levels, EFS switches images, but maintains the image type (Oblique, Orthogonal, or Other) and the orientation (for Oblique images).

### Options for managing the zoom level

When you choose an Alternate View button (or menu option) that doesn't change the shot level, the zoom factor is adjusted to keep the Ground Sample Distance (GSD) constant as you go from one image to another.

If you want the zoom level kept constant instead of the GSD, you can change the Navigate Tool's Navigate Zoom property. Then when you change to a different shot level, the zoom level (instead of GSD) is constant. (See "Two options for managing magnification" on page 128.)

### What are Navigation Cameras?

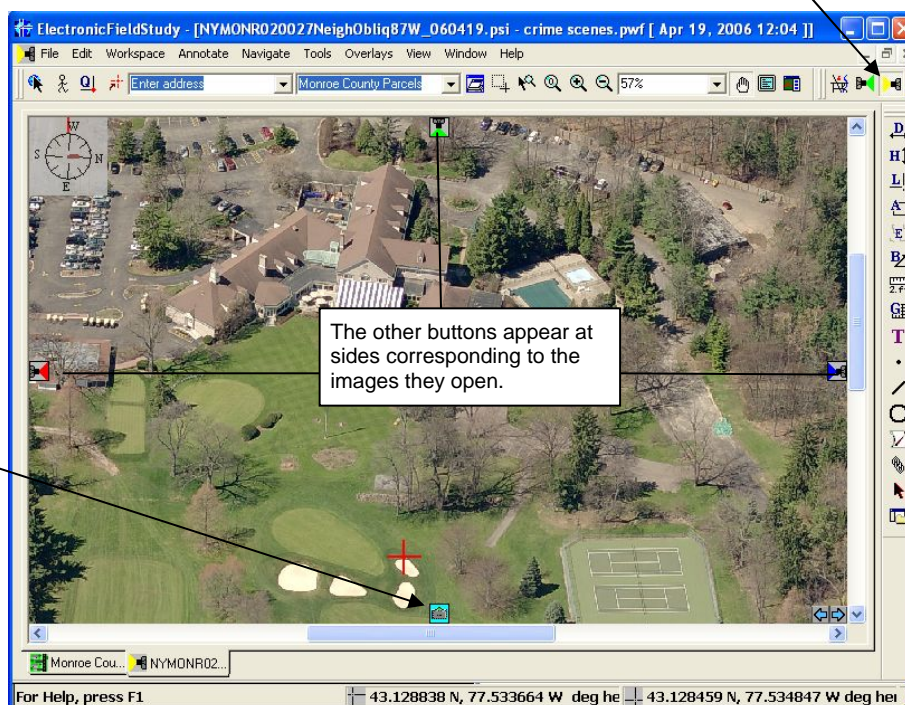
**Navigation Cameras** are Alternate View buttons used to open images from different camera directions (N, S, E, W, and Orthogonal).

#### *Navigation Cameras also on images*

Navigation Camera buttons appear in two places—on the navigation toolbar and on your open images. The buttons on the image represent the four alternate camera directions, and they are located near the sides of each image open in the Image window. (The active image was taken from the fifth camera direction.)

Each navigation camera is placed on the side of the image that corresponds to the alternate camera view it represents. (For example, the View From West camera is placed on the west side of the image.) The View From Ortho "camera" button is placed on the side of the image that represents the direction of the active image.

The View From East button is down, showing this image's orientation. The View From Ortho button appears at the east side/edge of the Image window.



**Figure 7-5:** The location of Navigation Cameras in the Image window.

To use the Navigation Camera buttons, see the procedure “To see an alternate view for a location” on page 121.

The positions of the Navigation Cameras are not fixed; they depend on the orientation of the active image.

### Removing Navigation Cameras

If you prefer not to have Navigation Camera buttons on your open images, remove them as follows:

#### ◆ To remove Navigation Cameras from the Image window:

- Choose **View⇒Navigation Cameras**.

The checkmark disappears from the menu option and the buttons disappear from the Image window.

*To view Navigation Cameras, simply check the option in the View menu.*

**Note:** You cannot remove Navigation Camera buttons in PentaView; they always appear in the main PentaView window. Their function is slightly different in PentaView because the alternate views are already open. See Chapter 8 to learn more about using these buttons while in PentaView.

### Using the Alternate View feature

Use the following procedure to open any alternate view (except a map view). To view a map, see “Activating map images” starting on page 121.



◆ **To see an alternate view for a location:**

1. (If you haven't performed a search since launching EFS, or if you want to change the Navigation Point), perform an image search using any of the methods described in Chapter 6.

*The Navigation Point does not have to be in view when you use the Alternate View feature. You can scroll around the image. EFS remembers the location of the red crosshair, even if you don't see it.*

**Note:** A dim button or menu option indicates that no image is available for that view. Perhaps you've limited search hits. (See "Limiting the image search" in Chapter 6.)

A red crosshair appears at the point you searched.

2. Do *one* of the following:
  - Click the button (from the toolbar or an on-image Navigation Camera) for the view you want to see.
  - or —
  - Choose **Navigate**⇒(then choose the view option you want):
    - View the scene from the north,**
    - View the scene from the south,**
    - View the scene from the east,**
    - View the scene from the west,**
    - View the scene orthogonally,**
    - View the corresponding Community image, or**
    - View the corresponding Neighborhood image.**

*The View Ortho Sector Tile button does not have a corresponding menu option.*

EFS activates the "best" search hit corresponding to the button you clicked. (However, if the Hit Quality sort was not on, the image retrieved may not be the "best" hit.)

**How does EFS choose which image to display?** EFS looks for the highest resolution image with the point you clicked closest to its sweet spot. It also considers several other factors when choosing the image. (See "Hit Quality sort" in Chapter 6.)

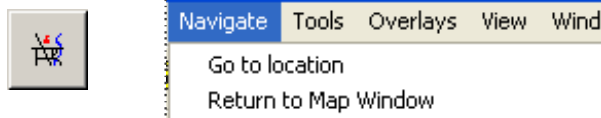
## Activating map images

*USGS stands for the United States Geological Survey.*

The View Map button and its corresponding menu option (Return to Map Window) can be toggled to activate either a base map or other available map. This feature is helpful for viewing high-detail maps, such as USGS DRG (Digital Raster Graphic) maps.

When the View Map button is in its up position, the Return to Map Window menu option is *unchecked*, and EFS is ready to open a high-detail map.

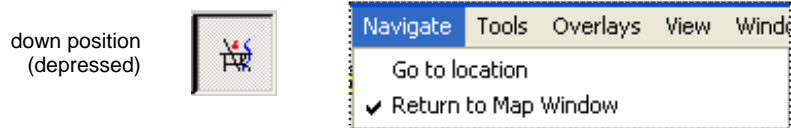
up position  
(raised)



**Figure 7-6:** The View Map button in up position and its corresponding menu option.

**Note:** If "Cool Look" is checked (Tools⇒Customize⇒Toolbars tab), then the button appears raised only when you hover your mouse over it.

When the View Map button is in its *down* position, the Return to Map Window menu option is *checked*, and EFS is ready to open a base map.



**Figure 7-7:** The View Map button in down position and its corresponding menu option.

#### Notes:

The View Map button is:

- *up* immediately after an image search and when a base map is active.
- *down* when a high-detail map is active.

If the View Map button is gray, then no maps are available for the Navigation Point.

#### Activating a high-detail map

##### ◆ To activate a high-detail map:

- With the View Map button in the *up* position (the Return to Map Window menu option is *unchecked*), do *one* of the following:
  - Click the **View Map** button.
  - or –
  - Choose **Navigate⇒Return to Map Window**.

A high-detail map (if available) becomes the active image, the View Map button moves to the down position, and a checkmark appears next to the Return to Map Window menu option. The map is zoomed to the same resolution as the previously displayed image. A no high-detail map is available, the base map becomes (or remains) the active image.

#### Toggling between maps

Use the following procedure to toggle between your high-detail map and your base map.

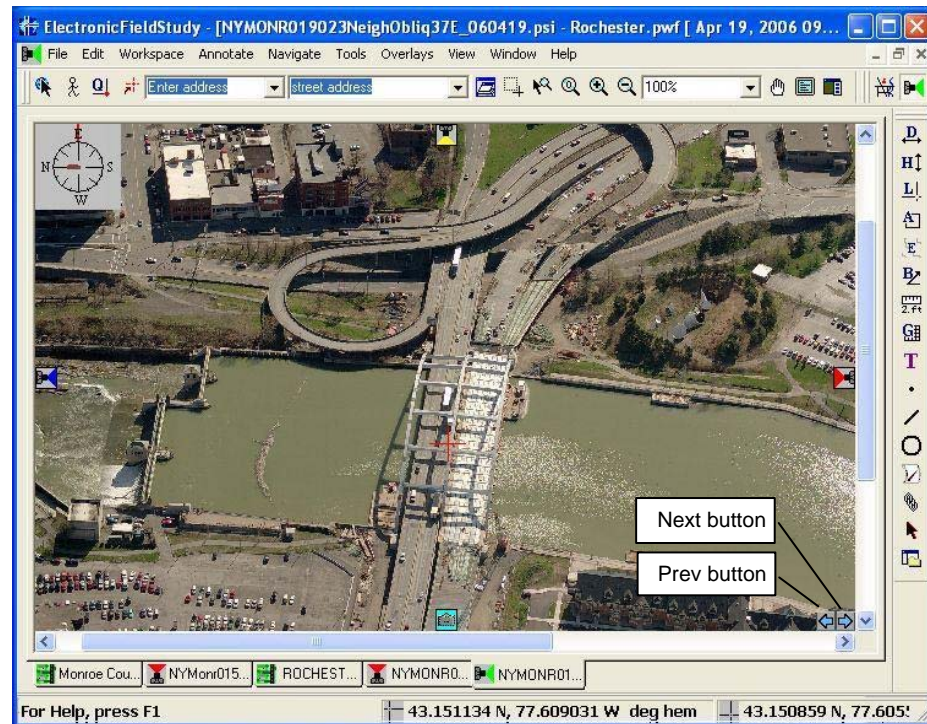
##### ◆ To toggle between maps:

- Do *one* of the following:
  - Click the **View Map** button.
  - or –
  - Choose **Navigate⇒Return to Map Window**.

EFS activates the inactive map (base map or high-detail map) and either depresses or raises the View Map button—depending on its previous state. The Return to Map Window menu option is either checked or unchecked—depending on its previous state.

## Opening similar images

The Next and Prev buttons let you open the next (or previous) search hit taken from the same direction as the active image. These buttons appear in the lower right corner of the each open image.



**Figure 7-8:** The Next and Prev buttons.

You can click the Next button to open the next similarly oriented image (whether Neighborhood or Community) in the thumbnail list (or click the Prev button to open the previous similarly oriented image). For Orthogonal images, these buttons open the next (or previous) Ortho image—Neighborhood, Community, map, or Ortho Sector Tile—in the list.

### ◆ To open the next image of the same type:

- Do *one* of the following:
  - Click the **Next** button in the lower right corner of the active image.
  - or —
  - Choose **Navigate**⇒**Get Next Image**.
  - or —
  - On your keyboard, press the right arrow ( → ) key.



EFS activates the next similarly oriented image from the thumbnail list. The image previously active remains open (but not active) in the **Image** window.

**Note:** If the image to be replaced was the *last* one in the thumbnail list, EFS loops around to the beginning of the list, opening the *first* similarly oriented image in the list.

◆ **To open the *previous* image of the same type:**



- Do *one* of the following:
  - Click the **Prev** button in the lower right corner of the active image.
  - or —
  - Choose **Navigate⇒Get Previous Image**.
  - or —
  - On your keyboard, press the left arrow (←) key.

EFS activates the next similarly oriented image from the thumbnail list. The image previously active remains open (but not active) in the **Image** window.

**Note:** If the image to be replaced was the *last* one in the thumbnail list, EFS loops around to the beginning of the list, opening the *first* similarly oriented image in the list.

*To replace Next/Prev, simply check the option in the View menu.*

### Removing the Next and Prev buttons

If you prefer not to have the Next/Prev buttons appear on your images, use the following procedure to remove them.

◆ **To remove the Next/Prev buttons from your open images:**

- Choose **View⇒Next/Prev buttons**

The Next and Prev buttons are removed from each open image.

### Centering the Navigation Point

The **Center Navigation feature** allows you to reset the Navigation Point to the center of the view currently in the Image window. When you use the Center Navigation feature, EFS also searches for images at new Navigation Point.

You might use this feature to refresh the Alternate View feature with new images that best show the area in the center of the active image.

◆ **To center the Navigation Point**

1. Position the active image so the point you want to become the new Navigation Point is in the center of the Image window. (To do so, use the Pan Tool, the scroll bars, or the rectangle on the Navigation window's thumbnail.)
2. Do *one* of the following:
  - Click **Center Navigation**.
  - or —
  - Choose **Navigate⇒Set view center as navigation point**.

The point currently in the center of the Image window is now the Navigation Point. The red crosshair moves to that point, a new search is done using that point, and the point's coordinates are shown on the Status Bar.

**Note:** Do not confuse this feature with View⇒Center Image, which moves the image within the Image window so that its center is aligned with the center of the window. View⇒Center Image does not initiate an image search. (View⇒Center Image is discussed in Chapter 8.)

## Navigating a route



The **Navigate Tool** is a handy way to stroll, plan, and measure a route—whether that route is within a single image or spanning multiple images. The route may be a single straight line or a series of connected line segments. You can click in the direction of travel, for easy navigation through your Image Warehouse. As you approach the edge of an image, EFS seamlessly transitions to an adjacent image. It opens the *best* adjacent image in the direction of travel, so you can continue drawing your route.

When changing from one image to another, the image type, orientation, and GSD remain the same (depending on the Navigate Tool's zoom setting). EFS draws (on the image) the path traveled and reports (on the Status Bar) the total distance traveled.

**Note:** The Navigate Tool is *not* affected by the Limit Image Search buttons. To continue a route, EFS must have access to shots of same image type and shot level. If those shots were excluded because of the Limit Image Search buttons, the Navigate Tool would not work as expected. (See “Limiting the image search” in Chapter 6.)

Here's how to use the Navigate Tool to plan a route. You must first be viewing an image or a map in the Image window.

### ◆ To plan a route:



1. Click the **Navigate Tool**.

The cursor changes to a walking figure (matching the Navigate Tool's button).

**Note:** The route begins at the Navigation Point (point last searched). If you wish to start elsewhere, you can choose a new starting point (in Step 2).

2. (*Optional*) To choose a new starting point, do *one* of the following:

- Click the **Image Tool**, then click the desired starting point.

The Navigation Point is reset. Depending on Image Tool settings, thumbnails may appear and an image may open showing the red crosshair at the new Navigation Point.

— or —

- Double-click the desired starting point.

A red crosshair appears at that point, and the new starting point image is centered in the Image window. The thumbnails remain unchanged.

3. Click on the image in the direction you wish to travel.



The red crosshair at the starting point changes to yellow, and a new red crosshair appears at the point you just clicked. EFS draws a line connecting these two points.

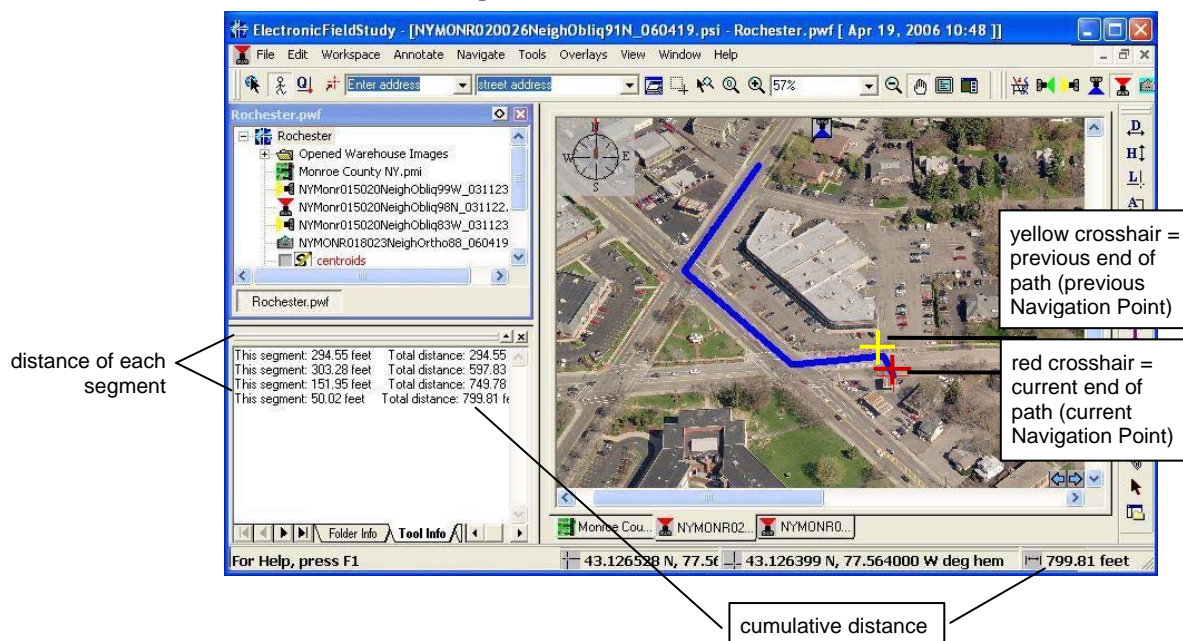
**If you're viewing an Ortho Sector Tile image...**

Unlike other images, Ortho Sector Tiles do not overlap. So when you get to the edge, it won't switch to the next image. To switch to the next image, you must click beyond the edge of the current tile.

To do this, click in the image and hold the mouse button down, move beyond the edge of the image and release the button. This will open the tile that's adjacent on that side of the current tile.

**Note:** This click-and-drag method works for all images, but is only necessary with Ortho Sector Tiles.

4. Continue to click points along the path you wish to travel, until the route is complete.



With each click, the red crosshair becomes yellow and a new red crosshair appears at the point just clicked. A new line is drawn to connect these two points. There will always be two crosshairs—a red crosshair for the current Navigation Point and a yellow crosshair for the previous Navigation Point.

The Output window's Tool Info tab lists each segment of the journey on a new line. Each line shows the segment's distance and the cumulative distance thus far. The Status Bar shows the current cumulative distance.

5. To finish the route, do *one* of the following:

- Double-click anywhere in the image (while the Navigate Tool is active).
- or —
- Use the Center Navigation feature or the **Image Tool** to perform a new image search.

The route is complete. The path is erased, and a red crosshair appears where you clicked. The red crosshair appears as the new Navigation Point, which is aligned in the center of the Image window. You can now begin a new route.

### Changing the path

If you wish to change or correct a path you've just drawn with the Navigate Tool, you can move backwards along the path (any number of segments) and click a new point to continue in that new direction. Here's how you can move back and forth along the path you've already traveled.

The following table shows how you can navigate within the route you are traveling while using the Navigate Tool.

To move ...	Press this key on your keyboard ...
Back one segment	<b>PAGE UP</b> key
Forward one segment (when you've already moved backwards)	<b>PAGE DOWN</b> key
Back to the starting point	<b>HOME</b> key
Forward to the current endpoint	<b>END</b> key

#### *When you click the new point ...*

The previous line segment is erased, the segment is removed from the Output window's Tool Info tab, and the cumulative distance in the Status Bar adjusts accordingly.

### Why is the Navigate Tool zig-zagging?

If you find that the Navigate Tool is not behaving as you'd expect, particularly at the edge of an image; it's likely that you've run out of images of the same image type, shot level, and orientation as the one on which you started. Read the next section to learn more about Navigate Tool's limits.

### When the Navigate Tool stops unexpectedly

The Navigate Tool was designed to be used with *contiguous images of the same shot level*. In theory, its route could continue forever. But in reality, the tool is limited to the area that your Image Warehouse covers.

Here are some times when the Navigate Tool may not be able to proceed to the next image.

- When trying to proceed to an image with a different shot level, image type, or orientation than the active image. (This sometimes happens when the Navigate Tool tries to move to the outermost images in your library .)

*To complete a route, the Image Warehouse must contain images of the same shot level, image type, and orientation—for the entire route.*

- When you're using an older image library with perpendicular two-way Community Obliques. (Newer image libraries with opposing two-way Community Obliques or four-way Community Obliques are not limited in this way.)
- When you're viewing an Ortho Sector Tile. (See the note "If you're viewing an Ortho Sector Tile image," on page 126.)

### Setting the Navigate Tool's properties

You can customize the Navigate Tool by changing a few settings.

#### *Drawing lines and associated text*

As with other EFS tools, you can choose whether output is drawn on the image. You can choose Draw Temporary Lines to have EFS draw a line for each leg of the path. You can also choose Draw Associated Text to display the distance of each leg next to its line. (The Status Bar always displays the distance of the current leg.) Unlike other EFS tools, you can't choose Draw Permanent Lines; however, after using the Navigate Tool, you can save the output by choosing Navigate⇒Add Tool Annotations to Workspace.

To set these properties, follow the procedure "To change a tool's output format." (See "Changing tool properties" in Part II, Chapter 11.)

**Reminder:** Your properties dialog box will not have as many choices as the one shown in Part II, Chapter 11.

#### *Two options for managing magnification*

Another property you can customize is the Navigate Tool's zoom setting (Navigate Zoom). There are two choices for managing the magnification when the Navigate Tool moves from one image to another.

- Maintain current Ground Sample Distance—EFS adjusts the level of magnification to compensate for changing GSDs.
- Maintain current percent zoom factor (%)—EFS keeps the level of magnification unchanged.

#### *Maintain current Ground Sample Distance*

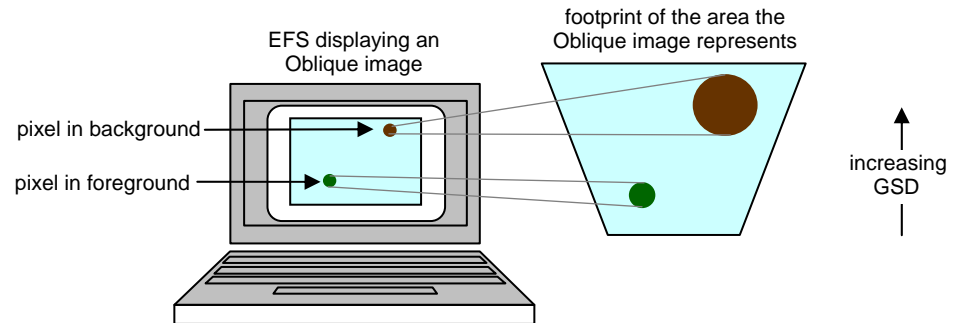
The Navigate Tool can make the transition from one image to another appear seamless, in part because of the Maintain current Ground Sample Distance setting. Maintaining current GSD means that when your path crosses from one image to an adjacent one, the zoom factor might change so that objects in the first image (parked cars, for example) appear the same size as similar items in the next image.

With Oblique images, there's significant variability in the GSD between the top and bottom of the image. That is, a pixel used to capture part of a scene's background covers more distance than one used to capture part of a scene's foreground.

*The Navigate Zoom property affects other navigation features (such as Alternate View).*

*GSD stands for Ground Sample Distance.*





**Figure 7-9:** An Oblique image and its footprint.



**Figure 7-10:** Oblique image showing perspective.

Notice in Figure 7-10 how much smaller cars in the background appear when compared with cars in the foreground. This difference is most noticeable when the Navigate Tool travels vertically in a Community Oblique image. When the walking figure approaches the top of that image, EFS transitions to the bottom of another Community Oblique image—from an area of very high GSD to an area of very low GSD.

*Maintain current percent zoom factor*

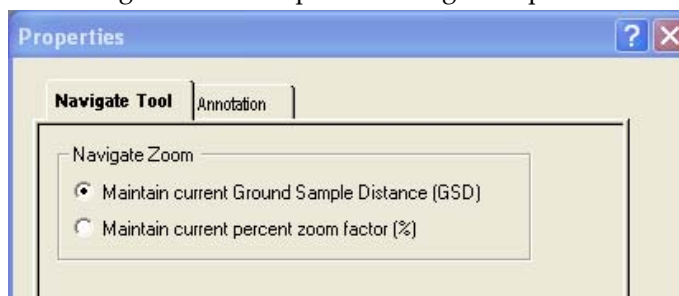
Perhaps you prefer not to view images along the path at similar GSDs, but rather, to always see things at maximum clarity. If so, you can choose the Maintain current percent zoom factor (%) option.



◆ **To change how the Navigate Tool zooms:**

1. Click the **Navigate Tool** in the toolbar.
2. Do *one* of the following:
  - Click the **Tool Properties** button on the toolbar.
  - or —
  - Press **CTRL + P**.
  - or —
  - Choose **Tools⇨Properties**.

The Navigate Tool's Properties dialog box opens.



3. Click the desired zoom setting as follows:

To maintain ...	Click this setting ...	Result
Magnification level	Maintain current percent zoom factor (%)	As you switch views, the zoom factor is kept the same.
GSD	Maintain current Ground Sample Distance	As you switch views, the zoom factor is automatically adjusted to keep GSD constant.

4. Click **OK**.

The Properties dialog box closes and your setting remains until you change it again.

### **The Navigate Tool's zoom setting affects other features**

The Navigate Tool's Navigate Zoom setting also affects the following EFS features and tool:

- The Image Tool
- The Alternate View feature
- The Center Navigation feature
- The Adjacent Image feature

# Chapter 8 — Viewing Images

EFS contains various features for viewing and altering the appearance of an image in the Image window. This chapter describes these features, such as the ability to:

- open several views of a location at the same time,
- scroll or pan to bring a different part of an image into view,
- increase or decrease an image's magnification, and
- change an image's contrast or brightness.

## Topics covered in this chapter ... page

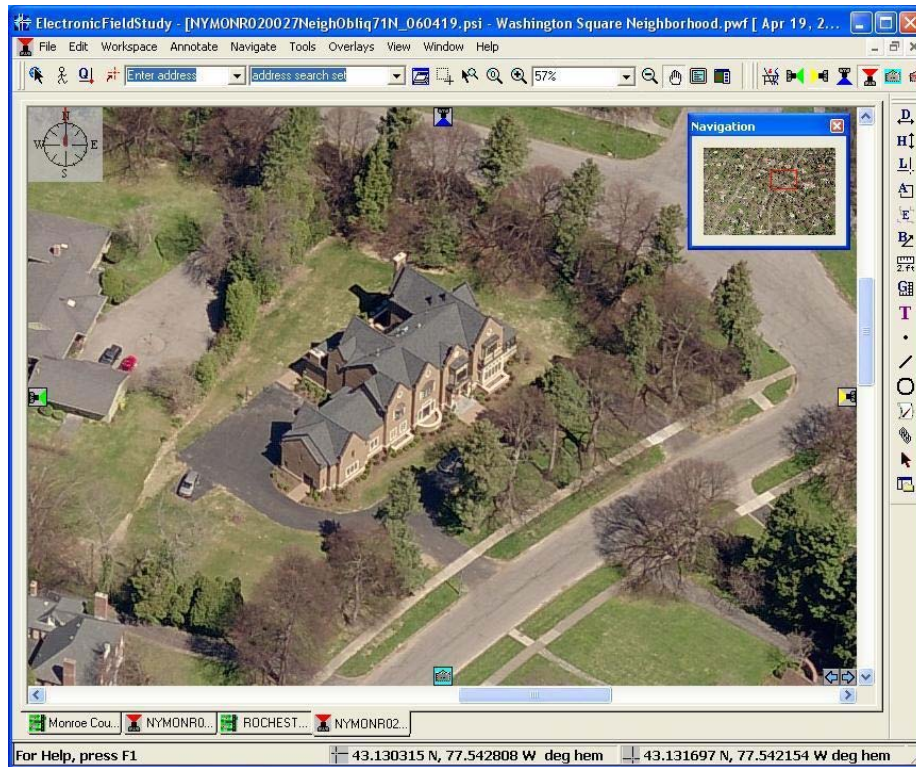
Viewing images .....	131
Scrolling, panning, and viewing the full screen.....	141
Magnifying images .....	144
Adjusting brightness and contrast .....	147
Refreshing the active image.....	149

## Viewing images

Although EFS provides numerous choices for setting up your screen (for example, with and without various windows in view), there are two distinct ways to view an image—Standard View and PentaView.

### What is Standard View?

**Standard View** is the default mode for viewing images in EFS, in which one image opens at a time. An open image can be minimized, closed, or resized. It can also be tiled or cascaded with other open images. Whenever you open an image, (if you're not already viewing images in PentaView), the image opens in Standard View.



**Figure 8-1:** An image in Standard View.

## What is PentaView?

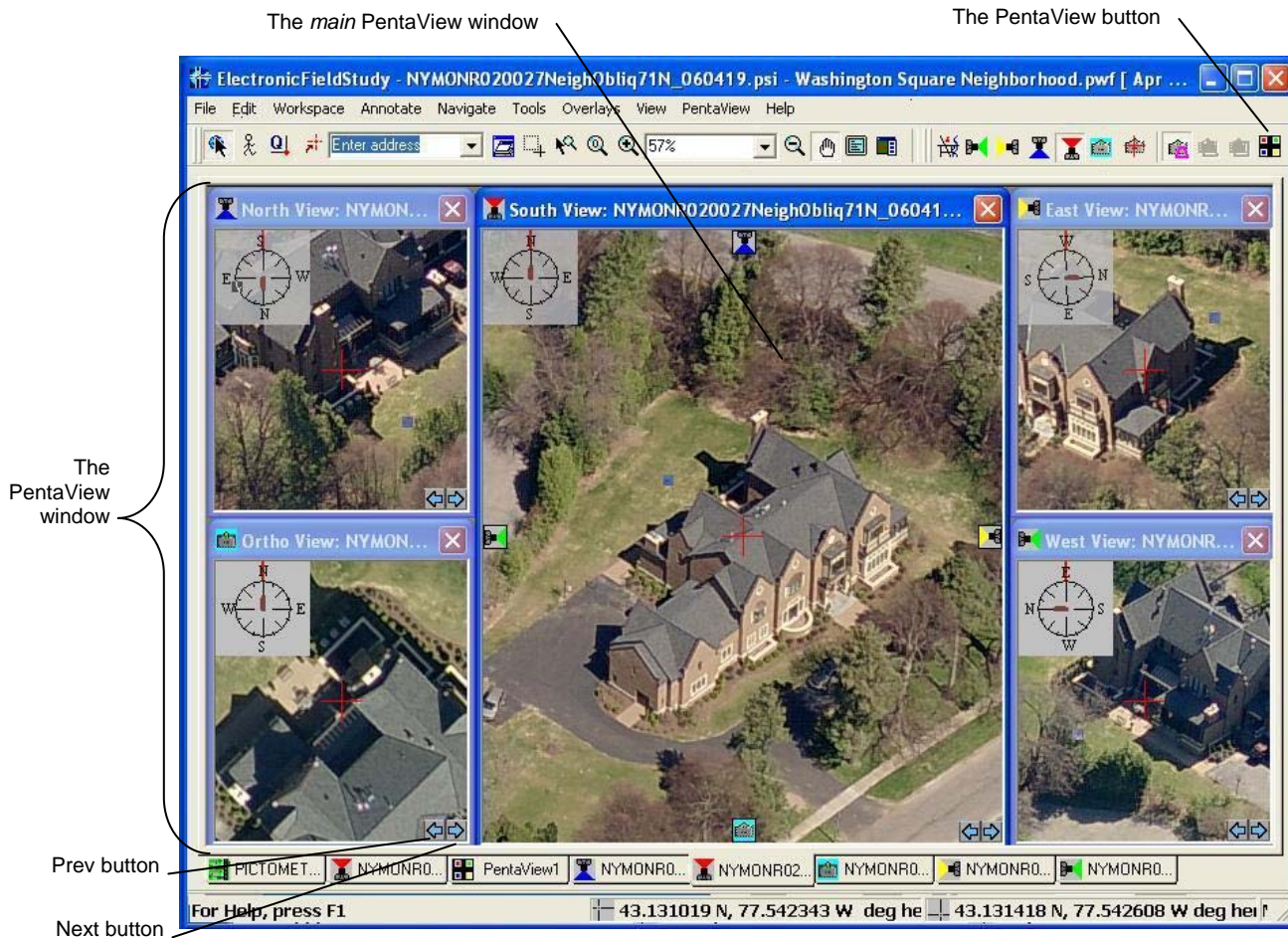
**PentaView** is a viewing mode in which you can simultaneously view a set of five images of the same location—each from a different angle or direction (N, S, E, W, Orthogonal). To view images in PentaView, you'll first open an image in Standard View, then you'll activate PentaView, causing EFS to open four alternate views of the active image.

While you're viewing a set of images in PentaView, if you open another image, the new image (along with its four alternate views) will replace those you were just viewing in the PentaView window.

Figure 8-2 shows the “Penta View” (or five-way view) of the image featured in Figure 8-1.

Notice that each of the five images has its own window and title bar. The title bar identifies the specific view (East View, West View, North View, South View, Ortho View) and displays the image's name.





**Figure 8-2:** The image from Figure 8-1, shown in PentaView.

## PentaView vs. Standard View

You can choose between PentaView and Standard View depending on your needs, and you can easily switch between the two. You might choose PentaView if you need to study a small area in great detail; Standard View to view a larger area and its surroundings.

## Viewing images in PentaView

**Important:** To run PentaView, you need 100 MB of RAM in addition to the 256 MB required to run EFS.

Use the following procedure to start a PentaView session for the active image.

### ◆ To start PentaView:



1. Activate the search hit you wish to view in PentaView.

**Note:** If you start PentaView from an active image that did not result from an image search (for example, from an image that was saved in your workspace), your PentaView session will be missing the four alternate views.

2. Click the **PentaView** button.

The PentaView windows open in the Image window. Here's what you can expect to see:

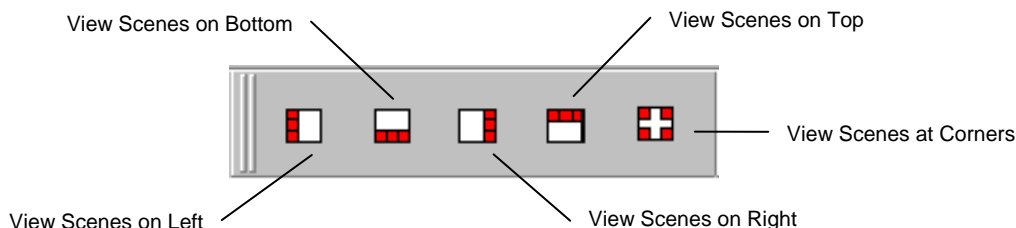
In the ...	EFS does this ...
Image window	<p>Opens a second copy of the active image in a PentaView “scenes at corners” arrangement, with that image residing in the main PentaView window. On each side, it shows (if available) two alternate views—the “best” shot of each orientation—of the same location. The result is five open images (North, South, East, West, and Orthogonal views). The four alternate views are centered on the Navigation Point.</p> <p><b>How does EFS choose the Ortho View?</b>            If the active image is Oblique, the Orthogonal view that's opened can be a map (of various types) or an Orthogonal image. EFS chooses the Orthogonal view in the following descending order of preference:</p> <ol style="list-style-type: none"> <li>1. Community Ortho (if the active image is a Community) or Neighborhood Ortho (if the active image is a Neighborhood)</li> <li>2. DRG map</li> <li>3. base map</li> <li>4. GIS Image</li> <li>5. Ortho Sector Tile</li> </ol>
Main PentaView window	Places a Navigation Camera button at each side of the image—one for each of the remaining four views.
Workspace's Opened Warehouse Images folder	Adds an item for each of the five images.
Five PentaView windows	<p>Opens the “best” image for each of the four alternate views. Activates the Pan Tool. Notice in each window a small contrasting square that moves as you move your cursor. It shows (dynamically in each image) the geographic location represented by the current position of your cursor.</p> <p><b>Note:</b> If you click with the Pan Tool, the small squares become stationary so you can see the corresponding location in all images.</p>
Toolbar area	Adds the PentaView pull-down menu.
<b>Note:</b> While in PentaView, EFS ignores the limit for the number of open images.	

## PentaView window arrangements

There are five arrangements for the PentaView images, and you can switch between them simply by choosing the corresponding menu option (or by clicking one of five buttons on the PentaView toolbar, which you can add to your EFS application).

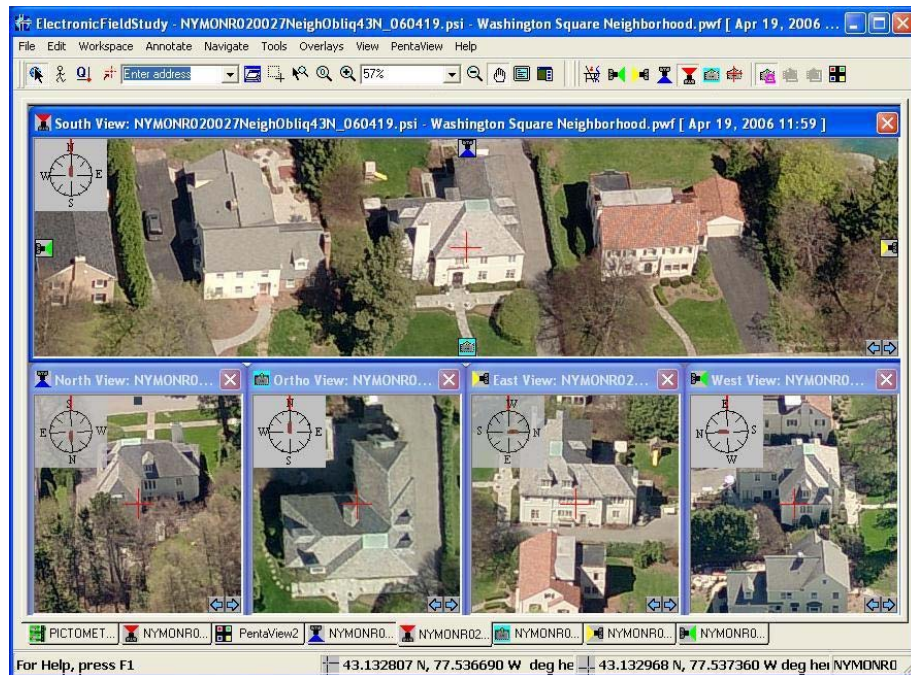
### The PentaView toolbar:

Figure 8-3 shows the PentaView toolbar. This toolbar duplicates five PentaView menu options. To add this toolbar to your EFS application, see Chapter 22, “Customizing EFS.”



**Figure 8-3:** The PentaView toolbar.

The “View Scenes at Corners” arrangement (shown in Figure 8-2) is the window arrangement you’ll see when you first activate PentaView. Figure 8-4 shows a different PentaView window arrangement—View Scenes on Bottom.



**Figure 8-4:** PentaView with ancillary views along the bottom of the main view.

◆ **To change the PentaView window arrangement:**

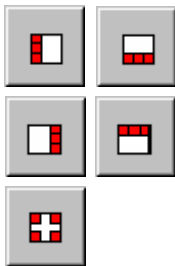
- Click the PentaView toolbar that corresponds with the desired window arrangement:

**View Scenes on Left,  
View Scenes on Bottom,  
View Scenes on Right,  
View Scenes on Top, or  
View Scenes at Corners.**

— or —

- Choose **PentaView**⇒(then choose the option you want):  
**Scenes on Top,  
Scenes on Bottom,  
Scenes at Corners,  
Scenes on Left, or  
Scenes on Right.**

EFS rearranges the PentaView windows accordingly.



## PentaView window sizes, shapes, and positions

If you're the type of user who resizes and rearranges windows, you may notice that you can resize and reshape any of the five PentaView windows, and you can move them around within the Image window.

Use the following procedure to restore your PentaView windows to their default sizes and shapes, and to the positions that correspond to the PentaView window arrangement they were last in (Scenes at Corners, Scenes on Right, etc).

### ◆ To restore the PentaView windows' sizes, shapes, and positions:

- Choose **PentaView**⇒**Restore PentaView windows**.

The PentaView windows return to their default sizes and shapes, and to the positions they occupied prior to having been manually moved.

## PentaView color cones

To help you keep your bearings in PentaView, when you roll your mouse over one of the four ancillary images (or over a Navigation Camera), EFS displays a transparent color-coded shape to represent the line of sight (that is, the field of view) for that particular image orientation or view.

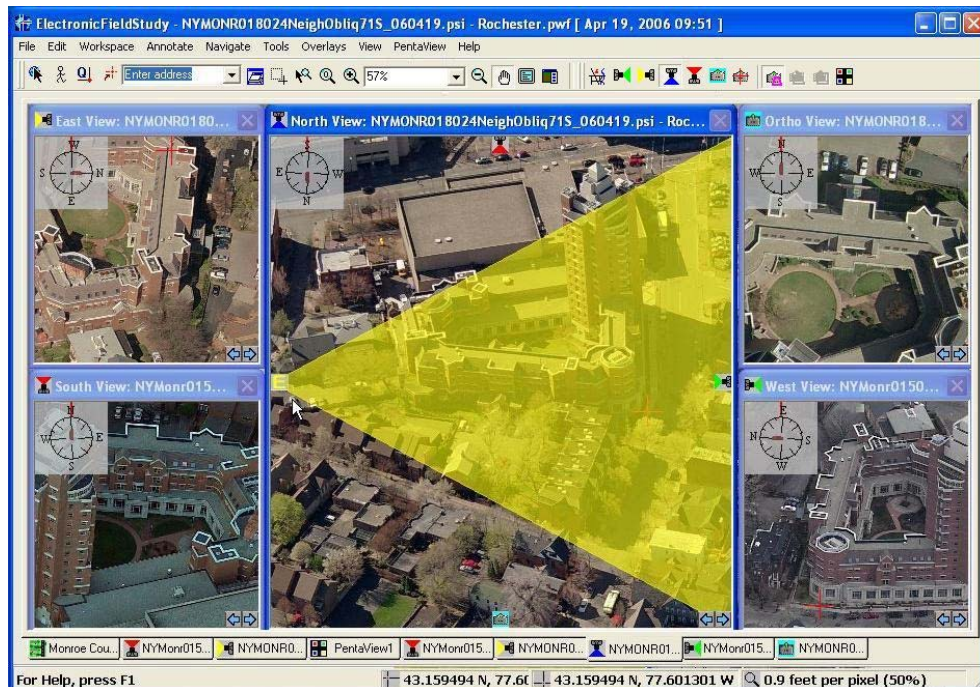
*For Oblique images*, a cone is shown extending from the Navigation Camera corresponding to that ancillary image. *For Orthogonal images*, a turquoise circle appears in the center of the main image. The circle (which represents the far end of a cone) signifies the line of sight from the overhead camera that shot that image.

EFS also displays the corresponding color cone (or circle) when your cursor is over a Navigation Camera button in the PentaView window.

Here is an example.

*The color of each cone matches the color of its corresponding Navigation Camera.*





**Figure 8-5:** The yellow (East View) color cone in PentaView.

Figure 8-5 shows the PentaView window for an Orthogonal image and its four alternate views. This figure shows the screen when the mouse is over the East View image.

### Using color cones

Use the following two procedures to use color cones—the first to make the color cones available in PentaView; the second to view a color cone.

#### ◆ To turn color cones on:

- Choose **PentaView⇒Show color cones**.

Color cones are turned on, and a checkmark appears next to the Show color cones menu option. The cones will remain available unless you choose this menu option again to turn them off.

#### ◆ To view a color cone in PentaView:

- With your mouse, hover over an ancillary image or a Navigation Camera button that's on the image in the main PentaView window.

In the main PentaView window, the Navigation Camera your mouse is over (or the camera button corresponding to the ancillary image your mouse is over) "projects" a colored shape over the image, showing the line of sight for the ancillary image corresponding to that Navigation Camera.

## Adding scroll bars in PentaView

You may notice that PentaView windows do not include scroll bars. PentaView was designed to provide the maximum space for your images, in part, by excluding scroll bars from the screen.

Scroll bars are not the only means of moving around within the active image. You can scroll the image by using the mouse wheel, and you can pan the image by using the Pan Tool or the Navigation window's red rectangle.

If you prefer to have horizontal and vertical scroll bars around each of the five windows, use the following procedure to add them.

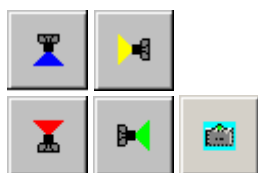
### ◆ To add scroll bars to your PentaView windows:

- Choose **PentaView**⇒**Show scroll bars**.

Scroll bars are added to your PentaView windows, and a checkmark appears next to the menu option. Scroll bars appear whenever you use PentaView, unless you choose this menu option again to turn them off.

## Swapping images within PentaView

While in PentaView, you may want to view one of the ancillary images in the main window (which is larger). EFS lets you swap any of the four alternate views with the main view.



### ◆ To change image positions in PentaView:

- From the main PentaView window, click the Navigation Camera button that corresponds with the image you wish to view (in the main PentaView window)
- or —
- Choose **PentaView**⇒(then choose the option you want):  
**North View,**  
**South View,**  
**Ortho View,**  
**West View,** or  
**East View.**

EFS swaps the main PentaView image with the image corresponding to the button or menu option you chose.

## Opening other images while in PentaView

While in PentaView, if you open another image, it opens in the main PentaView window. It is swapped in as the new main image and the previous main image closes.

## Opening a similar image in PentaView

*Together, the five sets of Next/Prev buttons let you customize your combination of PentaView images.*

Each of the five PentaView images is superimposed with Next and Prev buttons in its lower right corner. You can use these buttons to open the next

*For Orthogonal images, the Next/Prev buttons also open maps and Ortho Sector Tiles.*

(or previous) search hit of the same orientation (North View, South View, East View, West View, Ortho View).

You'll click an image's Next button to replace that image with the next similarly oriented image in the thumbnail list. (You'll click the Prev button to replace it with the previous similarly oriented image in the list.) With subsequent clicks, you can cycle through all similarly oriented images in the thumbnail list (both Neighborhood and Community).

**Note:** If the image to be replaced was the *last* one in the thumbnail list, EFS loops around to the beginning of the list, opening the *first* similarly oriented image in the list.

#### ◆ To open the *next* image of the same type:



- Do *one* of the following:
  - Click the **Next** button in the lower right corner of the active image.
  - or —
  - Choose **PentaView**⇒(then choose the option you want)
    - Get Next North,**
    - Get Next South,**
    - Get Next Ortho,**
    - Get Next West,** or
    - Get Next East.**
  - or —
  - On your keyboard, press the right arrow ( → ) key.

EFS closes the image whose button you clicked, and in its place, opens the next similarly oriented image (if one is available) in the thumbnail list.

#### ◆ To open the *previous* image of the same type:



- Do one of the following:
  - Click the **Prev** button in the lower right corner of the active image.
  - or —
  - Choose **PentaView**⇒(then choose the option you want)
    - Get Prev North,**
    - Get Prev South,**
    - Get Prev Ortho,**
    - Get Prev West,** or
    - Get Prev East.**
  - or —
  - On your keyboard, press the left arrow ( ← ) key.

EFS closes the image whose button you clicked, and in its place, opens the previous similarly oriented image (if one is available) in the thumbnail list.

### Using PentaView with other EFS features

When viewing images in PentaView, you can use any EFS feature just as you would when viewing in Standard View. However, due to the large quantity

of image data being displayed in PentaView, performance may be slower than desired. If so, you might consider using the feature in Standard View.

### Panning, scrolling, and zooming in PentaView

When you pan or scroll an image in PentaView, EFS pans the other four images along with it, so that all five images display a common geographical location at their centers.

**Note:** When panning or scrolling images in PentaView, if you've centered an item (such as a building) in one window and another PentaView window does not show that item at its center, it's possible that:

- The item is too close to an image edge (in the second window). That is, EFS can't physically bring the item to the center of the second window, or
- The item is not on the ground. Remember that EFS deals primarily with the **ground plane**. Think of the buildings in your images as transparent. When you identify the location at the top of a tall building (in an Oblique image), you're really identifying a location on the ground behind the building. For example, If you center the top of a building in your North View window, you've really centered a location on the ground behind the building.

*The ground plane is simply the surface of the Earth, with all its irregularities—hills and valleys however small.*

Similarly, when you use the Zoom Tool in PentaView, EFS magnifies all five windows to the same level.

If you want to zoom only a single PentaView image, you can do so by using the Zoom/Scale box. You'll first need to add this box to your toolbar area. (Chapter 22 tells how to add the box, and Chapter 20 tells how to use the box to change the zoom level.)

### Printing from PentaView

Printing images in PentaView is similar to printing in Standard View—you can choose File⇒Print Window or File⇒Print Image.

File⇒Print Window causes the entire contents of the Image window (all five images as they appear on your screen) to be printed.

File⇒Print Image causes a single image to be printed in its entirety. The image that is printed is the one in the active PentaView window. If no PentaView window appears to be active (no image title bar is darker than any other), then the main PentaView window is considered to be active.

### Making the most of PentaView

To maximize the size of your images in PentaView, you might try using Full Screen Mode (described on page 143) or hiding other windows (such as the Workspace, Output, Navigation, and Thumbnail windows).

### Ending a PentaView session

Use the following procedure to end a PentaView session.

◆ **To end a PentaView session:**

- Do *one* of the following:
  - Click the **Close** button in the upper right corner of the PentaView title bar.
  - or —
  - Choose **PentaView⇒Close active PentaView**.

The active PentaView window closes, ending the PentaView session.

Your EFS session returns to Standard View, that is, any image you now open will open in a single window within the Image window, without its four alternate views.

## Scrolling, panning, and viewing the full screen

The scroll and pan features of EFS let you view the parts of an image that are not currently in view in the Image window.

### Scrolling

◆ **To scroll an image with scroll bars:**

- Drag the scroll bars to move the image horizontally or vertically in the window.

◆ **To scroll an image with the mouse thumbwheel:**

- Roll the mouse thumbwheel to move the image up or down in the window.

**Notes:**

Roll the wheel away from you to move the image down (same as moving the scroll bar up); toward you to move the image up (same as moving the scroll bar down).

For the mouse wheel to scroll the image rather than through the workspace contents, you might need to click an Image window scroll bar before using the mouse wheel.

◆ **To center the image in the Image window:**

- Choose **View⇒Center Image**. The center of the image is positioned in the center of the Image window.

**Note:** Do not confuse this feature with **Navigate⇒Set view center as navigation point**, which resets the Navigation Point to the center of the view currently in the Image window and also searches for images at new Navigation Point.

### Panning

You can pan an image by using the Pan Tool or by using the red rectangle found on the thumbnail in the Navigation window. You can pan all open images together (or only the active image).

*A reticule is a symbol that helps you align a focal point when viewing a scene. It's often associated with optical equipment such as a scope.*

**Note:** In PentaView, you'll always pan the five images together, maintaining a common center point for all windows.

You can also display a **reticule** (alignment symbol) in the center of the window as you drag the mouse, helping you align an object in the window's center. See Figure 8-6.



**Figure 8-6:** The Pan Tool's "Center Reticule," aligned at the base of a statue.

### Panning the active image



#### ◆ To pan an image with the Pan Tool:

1. Click the **Pan Tool**.
2. Click and hold the left mouse button.
3. Drag the image up, down, left, or right within the window.

**Note:** You might see an image trail as the image moves, but once the image is stationary, the trail disappears.

#### ◆ To pan an image with the Navigation window:

1. Press and hold the left mouse button inside the red rectangle of the Navigation window thumbnail.
2. Drag the rectangle up, down, left, or right within the window.

The image in the Image window is repositioned so that the part of the image shown in the Image window is the same part that is shown in the red rectangle. (If in PentaView, all five images are repositioned.)

**Note:** When you zoom out or zoom in, the Navigation window rectangle changes size so it always indicates which portion of the entire image is in view in the Image window. When you zoom out, the rectangle gets bigger because you are viewing more of the entire image; when you zoom in, the rectangle gets smaller.

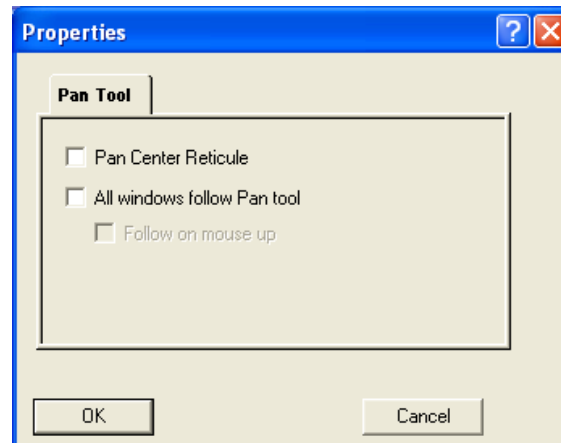
## Setting Pan Tool properties

### ◆ To change the Pan Tool's properties:



1. Click the **Pan Tool**.
2. Do *one* of the following:
  - Click the **Tool Properties** button on the toolbar.
  - or —
  - Press **CTRL + P**.
  - or —
  - Choose **Tools⇒Properties**.

The Pan Tool's Properties dialog box opens.



3. Use the following table to choose properties for the Pan Tool.

If you want ...	Do this ...
To display a reticule (alignment symbol) at the center of the visible part of the active image (as you pan).	Check the <b>Pan Center Reticule</b> box.
All open images to pan along with the active image.	Check <b>All windows follow Pan tool</b> .
All open images to pan with the active image, but adjust only as you release the mouse button.	Check <b>Follow on mouse up</b> .

4. Click **OK**.

The Properties dialog box closes, and the Pan Tool's properties are set.

## Viewing in Full Screen Mode

You can view more of an image by using Full Screen Mode.

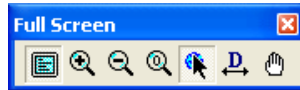


### ◆ To view an image in Full Screen Mode:

1. Do *one* of the following:
  - Click the **Full Screen** button on the toolbar.
  - or —
  - Choose **View⇒Full Screen**.



The Menu Bar, toolbars, Status Bar, and all windows (except the Image window) are hidden from view and the active image fills the screen. The Full Screen toolbar is available on the image so you can easily return to viewing the smaller image.



2. To return to the smaller view, click **Full Screen** button again or press **ESC**.

## Magnifying images

*Additional options for zooming are discussed in Part IV, Chapter 20.*

*The lower right corner of the Status Bar always shows the current percentage of magnification.*

When you first open an image in the Image window, its magnification level is 100% (or 1:1, which means that one pixel in the image equates to one pixel on the screen).

**Note:** If you've changed the Image Tool Properties settings, the magnification level may not be 1:1 (the default). See Table 6-4 in the topic called "The Settings tab" in Chapter 6, to learn more about setting the zoom options used when opening images.

With EFS you can zoom in for more detail or zoom out for more context information. Simply change the image's magnification by using the zoom buttons on the toolbar. At any time you can return the image back to its starting percentage of 100%.

The zoom options apply to whichever image is currently active. When viewing images in PentaView, they apply to all five images.

### Zooming in

You can use either the Zoom In button or the Zoom Tool to increase the magnification of one or more images. The difference between them is that the Zoom In button magnifies the area around the current center of the image, while the Zoom Tool allows you to click a point and then magnifies the area around the point you clicked. The Zoom Tool also re-positions the image so that the point you click is at or closer to the center of the window. You can also drag a rectangle with the Zoom Tool; EFS magnifies the area within the rectangle.

#### ◆ To zoom in on the current center of the image:



1. Do *one* of the following:
  - Click the **Zoom In** button on the toolbar.
  - or —
  - Choose **View**⇨**Zoom In**.


The magnification percentage is doubled. (The part of the image that was centered in the Image window remains in the center.)

2. Continue clicking the button (or selecting the menu option) until you reach the desired amount of magnification.





◆ **To zoom in on a point or area you select:**

1. Click the **Zoom Tool** on the toolbar. The cursor changes to a magnifying glass and the Zoom Tool is turned on. 
2. Do *one* of the following:
  - Click the point or drag a rectangle around the area you want magnified.
  - or —
  - Roll the mouse wheel *away from you to zoom in* to the location at the center of the image.

The image is magnified, and EFS re-positions the image so that the point you clicked is at or closer to the center of the Image window.

**Note:** If you click a point, the magnification percentage is doubled. If you drag a rectangle to zoom in on an area, the area will be magnified until it fills the Image window without changing the image's aspect ratio.

3. Repeat Step 2 until you reach the desired amount of magnification.

## Zooming out

◆ **To zoom out:**



1. Do *one* of the following:
  - Click the **Zoom Out** button on the toolbar.
  - or —
  - Choose **View**⇒**Zoom Out**.
  - or —
  - Click the **Zoom Tool**, then roll the mouse wheel *toward you to zoom out* from the location at the center image.



The magnification is reduced by half.

2. Repeat Step 1 until you've zoomed out the desired amount.

**Tip:** You can also zoom out by clicking the Zoom Tool and then pressing the **SHIFT** key while clicking on the image.

## Returning to the starting percentage (100%)

Use the Zoom 100% button to return an image back to its starting percentage of 1:1 (one pixel in the image equates to one pixel on the screen). The Zoom 100% button does not change the point currently in the center of the Image window. That is, the current center is unchanged after the zoom percentage is returned to 100.

◆ **To return to the starting percentage:**

- Do *one* of the following:
  - Hold down the **CTRL** key and click the mouse. (This affects only the image you click, even if you've chosen to apply zoom to all images. See "Applying zoom to all open images" on page 146.)



- or –
- Click the **Zoom 100%** button.
- or –
- Choose **View⇒Zoom 100%**.

The active image returns to 100% magnification.

## Displaying the entire image



### ◆ To display the entire image in the Image window:

- Do *one* of the following:
  - Click the **Zoom Home** button.
  - or –
  - Choose **View⇒Zoom Home**.

The active image is scaled to fit within the Image window.

## Applying zoom to all open images

Use the following procedure to change the Zoom Tool's settings if you want the tool to affect all open images (rather than the active image only).

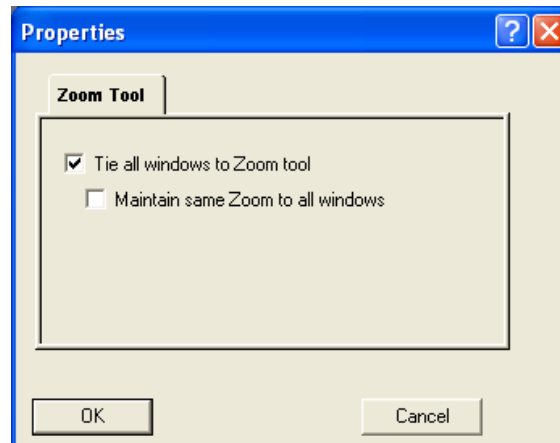
**Note:** Using the **CTRL** key + mouse click to zoom 100% affects only the image you click, even if you've chosen to apply zoom to all images.

### ◆ To apply zoom to all open images:



1. Do *one* of the following:
  - Click the **Zoom Tool** button.
  - or –
  - Choose **Tools⇒Zoom Tool**.
2. Do *one* of the following:
  - Click the **Tool Properties** button on the toolbar.
  - or –
  - Press **CTRL + P**.
  - or –
  - Choose **Tools⇒Properties**.

The Zoom Tool's Properties dialog box opens.



3. Use the following table to choose properties for the Zoom Tool.

Check ...	If you want ...
<b>Tie all windows to Zoom tool</b>	<p>All open images to zoom when you use the Zoom Tool. (If unchecked, only the active image will zoom.)</p> <p>The magnification level for each image will be double its <i>current</i> magnification level (unless you also check the "Maintain same Zoom to all windows" option.)</p> <p>For example, when you use the Zoom Tool (with this option checked but "Maintain same Zoom to all windows" unchecked), if the active image is at 100% magnification, and another open image is at 40%, the active image magnifies to 200% and the other image magnifies to 80%.</p>
<b>Maintain same Zoom to all windows</b>	<p>All open images to zoom to the <i>exact same</i> magnification level as the active image when you use the Zoom Tool.</p> <p>Using the same example as above, if the active image is zoomed at 100% and another open image is zoomed at 40%, both the active image and the other image zoom to 200%.</p>

**Note:** You must check "Tie all windows to Zoom tool" in order to check the second option "Maintain same Zoom to all windows."

4. Click OK.

The Properties dialog box closes and the Zoom Tool's properties are set.

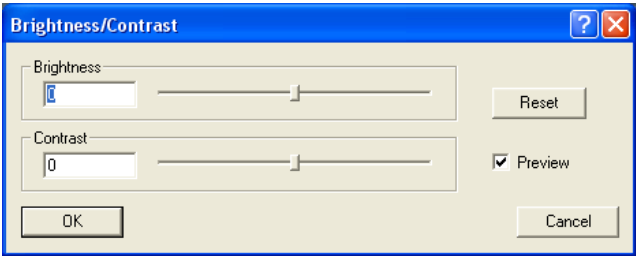
## Adjusting brightness and contrast



Use the Brightness and Contrast button on the toolbar to adjust the brightness and contrast of the *active* image.

### ◆ To adjust brightness and contrast:

- Do *one* of the following:
  - Click the **Brightness and Contrast** button.
  - or —
  - Choose **Edit**⇒**Adjust Image Brightness and Contrast**. The Brightness/Contrast dialog box opens.



2. To adjust the brightness and contrast use the sliders and buttons as described below:

Dialog box item	Description
Brightness slider	Move the slider to the right to brighten the image and to the left darken it. <b>Note:</b> Moving the brightness slider to the right helps bring out detail in darker areas of the image, such as shadows.
Contrast slider	Move the slider to the right to increase the contrast and to the left to decrease it. <b>Note:</b> Moving the contrast slider to the right helps bring out the details in parts of an image that are lower in contrast.
Preview	Check this box to see the results of your changes in the Image window as you move the sliders. Lets you adjust the brightness and contrast the desired amount before clicking OK to close the dialog box.
Reset	Click this button to reset the brightness and contrast to their starting points.

3. When you’re satisfied with the brightness and contrast of the image, click **OK**. The dialog box closes.

Clicking the **Cancel** button closes the *Brightness/Contrast* dialog box and returns the image to its original appearance.

Your changes are reflected in the active image until you either close the image or close EFS. (Clicking **OK** does not save your changes. To save your changes, see the next topic “Saving an adjusted image.”)

**Changes are cumulative:** Changes you make to the active image are cumulative. For example, if you change the contrast and click **OK**, and then change the contrast again, the second contrast adjustment is applied to the image you’ve already adjusted, not to the original image.

**Important:** To avoid accidental loss of data, your Image Library should reside in a directory that has read-only permissions assigned to it.

If you wish to save a copy of the adjusted image, follow the procedure “To save and adjusted image” in the next section.

If you close an adjusted image that has not been saved, EFS asks if you want to save the image. Be sure to click **No** to discard the changes so that you don’t overwrite the original image in your Image Library.

**Note:** Adjustments to brightness and contrast do not change the image file, only how the image looks in the Image window. However, **you can save a copy of the adjusted image on your hard drive.** (See the next topic.)

## Saving an adjusted image

Use the following procedure to save a copy of an open image to your hard drive after changing the image's brightness and contrast.

### ◆ To save an adjusted image:

1. Make sure the image to be saved is the active image.
2. Choose **File⇒Save Image As**. The Save As dialog box opens.
3. If desired, navigate to the directory in which to save the image.
4. If you wish to enter a new file name, enter the name in the File name box.
5. Click **Save**. A copy of the image is saved on your hard drive with an extension of "psi" (for an oblique image), or "pmi" (for an orthogonal image).

**Note:** In most cases, if you try to save an adjusted image in your Image Library, the Save As dialog box appears so you can save a *copy* of the image in the location of your choice. To protect the integrity of the original images, images in the Image Library should not be overwritten.

## Refreshing the active image



The **Global Refresh feature** refreshes your view of the active image along with any annotations or annotation layers displayed in the Image window. You'll want to refresh the screen if you are working with data that is dynamic, such as GIS data in an SDE database.

If you don't see the Refresh button on your toolbar, you can add it. (See "Adding and removing toolbar buttons" in Part IV, Chapter 22.)

### ◆ To use the Refresh button:

**Tip:** To add the Refresh button to a toolbar, see "Adding and removing toolbar buttons" in Part IV, Chapter 22.

1. Click anywhere in the Image window. (The refresh will not occur if you omit this step.)
2. Do *one* of the following:
  - Click the **Refresh** button.
  - or —
  - Choose **View⇒Refresh**.

EFS re-draws the active image. It also re-reads all GIS data from various source shapefiles and SDE tables, updating all GIS annotation layers, and re-drawing GIS annotations currently showing in the Image window.

**Note:** When you click the Refresh button, all GIS annotation layers are refreshed even if they're not currently visible in the Image window.



# Chapter 9 — Printing, Extracting, and Exporting Images

This chapter describes the various ways to print or export all or part of an image.

Printing images .....	151
Extracting and exporting images .....	155

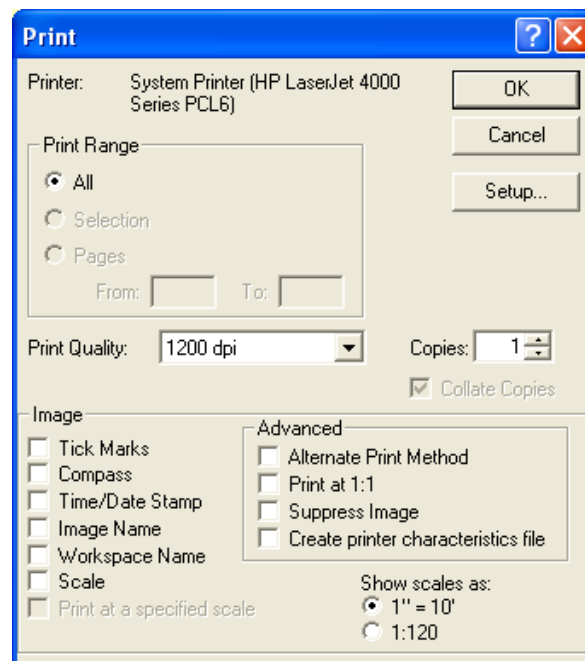
## Printing images

You can print the active image, either in its entirety or just the part that is visible in the Image window. In either case, you'll use the Print dialog box. Any annotations shown on the screen will also be printed along with the image.

You can print images while in Standard View or in PentaView.

### The Print dialog box

The Print dialog box appears when you select either the Print Image or Print Window options from the File menu.



**Figure 9-1:** The Print dialog box.

**Table 9-1:** Contents of the Print dialog box.

Dialog box item	Description
<i>Print Range section</i>	
All	<p>“All” is the only Print Range option used to print images. (“Selection” and “Pages” do not apply to printing images, only to printing multi-page reports.)</p> <p><b>Note:</b> The “All” option does not indicate how much of the image will be printed.</p>
Print Quality	From the drop-down list, select the print resolution in dots per inch that matches your printer.
Copies	Click the up or down arrows to indicate how many copies to print.
<i>Image section</i>	
Tick Marks	Check this option to print short lines (tick marks) along the edge of the printed image. The distance between the tick marks will be indicated at the bottom of the page.
Compass	Check this option to print a compass rosette at the top of the page indicating the orientation of the printed image.
Time/Date Stamp	Check this option to print the image creation date and any modification dates at the bottom of the page.
Image Name	Check this option to print the name of the image at the top of the page.
Workspace Name	Check this option to print the name of the workspace at the top of the page.
Scale	Check this option to print a key indicating the image scale at the bottom of the page (in the format selected for “Show scales as”).
Print at a specified scale	Check this option to print the visible part of the window at the scale you enter. (This option does not apply to printing the entire image.)
<i>Advanced section</i>	
Alternate Print Method	Check this option if you are experiencing printing difficulty. This forces the software to use alternative print characteristics that may be more compatible with your printer.
Print at 1:1	<p>Check this option if your printer has auto-scaling capability, which will scale images to the size of the printable area on the paper.</p> <p>If you <i>uncheck</i> this option, EFS adjusts image magnification to fit the size of the printable area on the paper.</p>
Suppress Image	Check this option to print any annotations associated with an image without printing the image itself.
Create printer characteristics file	Check this option to create a file ( <i>EFS_Print.txt</i> ) you can send to Pictometry for analysis if you have difficulty printing and need assistance. The file contains data relevant to your printer.
Show Scales as:	<p>Click the 1”=10’ button to print the scale <b>in this format</b>.</p> <p>Click the 1:120 button to print the scale <b>in this format</b>.</p> <p><b>Note:</b> This button sets the notation used to represent the scale, not the scale of the printed image itself.</p>

## Printing the entire image

You’ll use the Print Image option of the File menu to print the entire image that is currently in view.

If PentaView is open, the image that is printed is the one in the active PentaView window. If no PentaView window appears to be active (no image title bar is darker than any other), then the main PentaView window is considered to be active.



◆ **To print the entire image:**

1. Do *one* of the following:

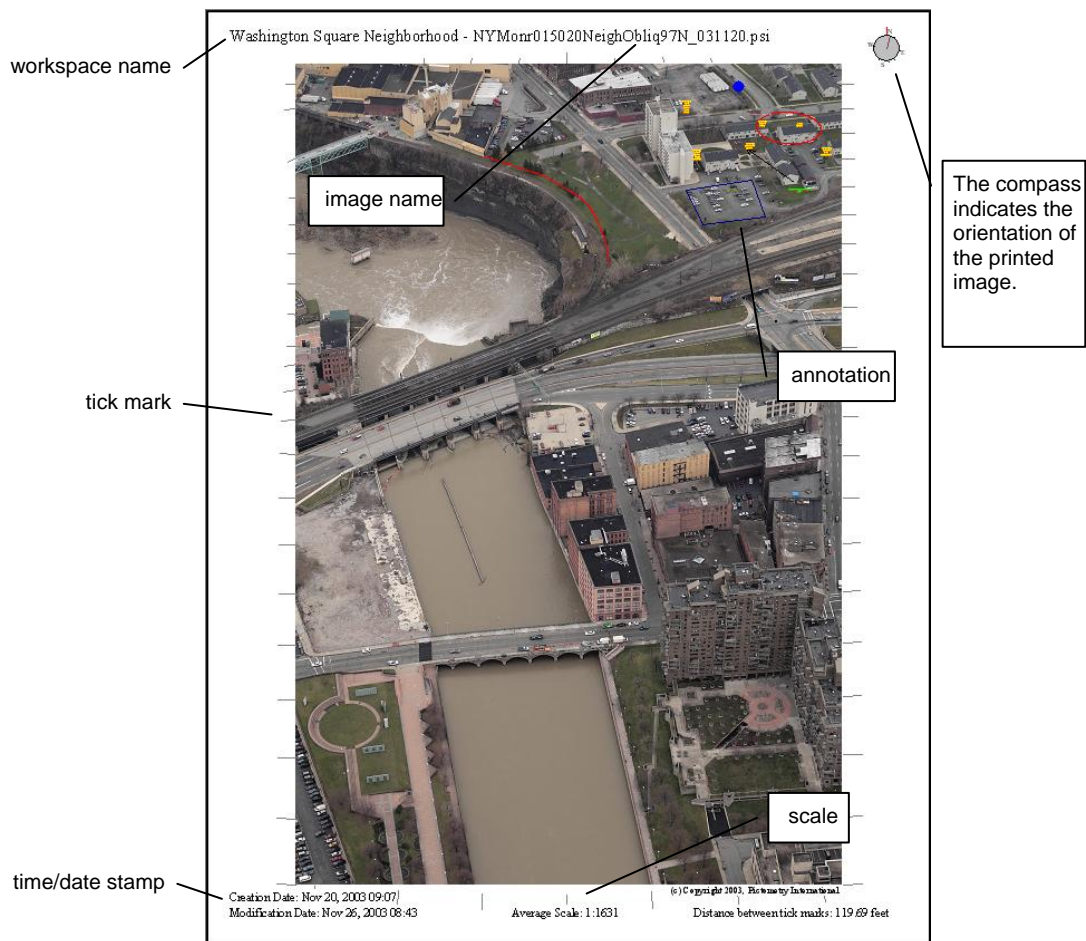
- Click the **Print Preview** button, and after you're done previewing the image, click **Print**.
- or —
- Choose **File**⇒**Print Image**.



**Note:** Although the Print Preview option closely approximates the final print appearance, the limitations imposed by the printer and current paper selection may cause the final print to vary.

The Print dialog box opens. (Figure 9-1).

2. Select or check the desired options. Use Table 9-1 on page 152 as a guide.
3. Click **OK**. The entire image is printed. (See Figure 9-2.)



**Figure 9-2:** A sample printout of an entire image.

## Printing the visible part of the Image window

You'll use the Print Window option of the File menu to print the portion of the image that is currently in view.

If PentaView is open, the entire contents of the Image window (all five images as they appear on your screen) are printed.

Before printing, scroll or pan the image so that the portion you wish to print is visible within the Image window frame. When the image is printed, the viewable portion of the image is scaled to fill as much of the printed page as possible without distorting the image's aspect ratio.

### ◆ To print the visible part of the image:



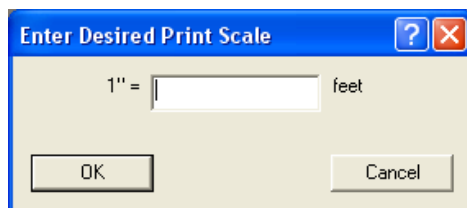
1. Do *one* of the following:
  - Click the **Print Window Preview** button, and after you're done previewing the image, click **Print**.
  - or —
  - Choose **File**⇒**Print Window**.

**Note:** Although the Print Window Preview option closely approximates the final print appearance, the limitations imposed by the printer and current paper selection may cause the final print to vary.

The Print dialog box opens. (Figure 9-1).

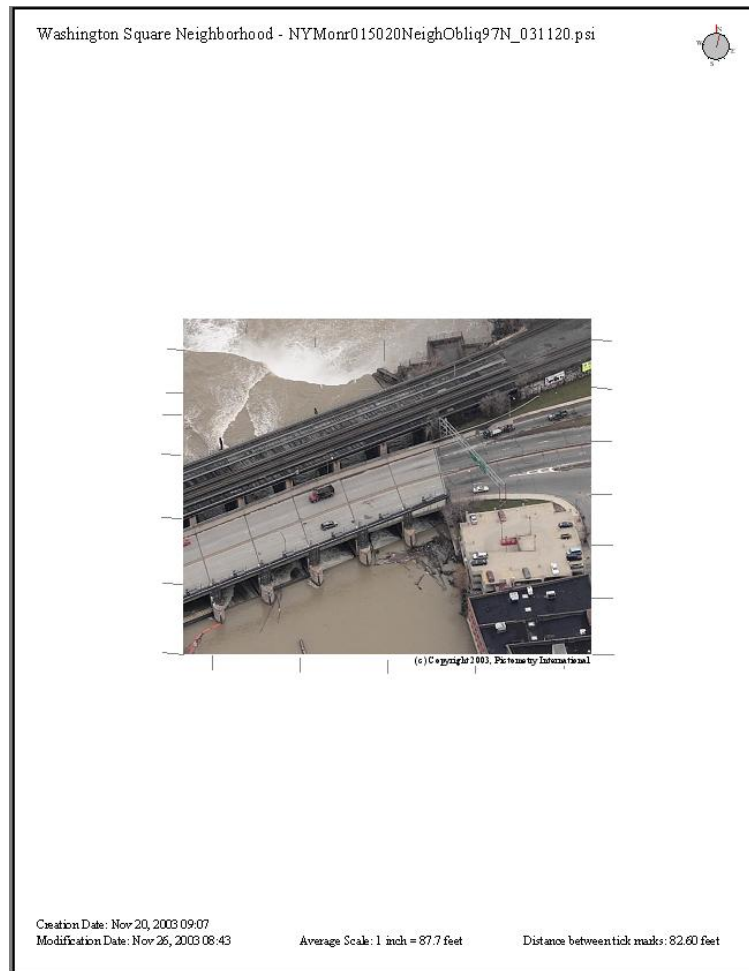
2. Select or check the desired options. Use Table 9-1 on page 152 as a guide.
3. (*Optional*) To print the window at a specific scale:
  - a. Make sure that **Print at a specified scale** is checked.
  - b. In the Show scales as section, click either **1" = 10'** or **1:120**.
  - c. Click **OK**. The Enter Desired Print Scale dialog box opens.

*This screen will look slightly different if you selected the 1:120 scale format.*



- d. Enter a value in feet or at the specified scale and click **OK**.
4. On the Print dialog box, click **OK**.

The visible part of the image (or images if PentaView) is printed. If the visible part of the image does not fit on the page because of the type of paper selected, then the center of the visible part of the image is centered on the printed page and the image is cropped to fit the page.



**Figure 9-3:** A sample printout of the visible part of an Image window with a scale of 1" = 100.'

## Extracting and exporting images

This section describes how you can export all of an image or extract part of an image to a file in one of the following formats:

- JFIF (JPEG File Image Format)
- DIB (Windows Device-Independent Bitmap)
- GIF (Graphic Interchange Format)
- TIFF (Tagged Image File Format)

### Extracting vs. exporting

Exporting is the process of saving images or data (in a format such as JPEG or TIFF) to a file external to EFS. This chapter discusses exporting images only. (For information about exporting data, see Part IV, Chapter 19.)

When referring to images, EFS uses the term “exporting” to refer to the process of exporting the *entire image*. It uses the term “extracting” to refer to the process of exporting *a portion of an image*.

Depending on your license, a watermark may be applied to the extracted or exported image. Also, exported images will have a Pictometry logo copyright in the lower right corner. Extracted portions of images will not contain this copyright.

## Choice of watermark

EFS lets you choose the level of watermark used for exported and extracted images. The minimum level of watermark you can choose is set by an option in your user license.

You can be licensed for any or all of the following watermarking options:

- None (no watermark at all)
- Light visibility (most translucent)
- Medium visibility (somewhat translucent)
- Strong visibility (slightly translucent)

**Note:** If none of these options are included in your user license, your exported images and extracts will be watermarked with a “dark” (slightly translucent) watermark.

## Extracting images



The Extract Tool provides many ways to section off part of an image and export it in one of the file formats discussed above.

### Four ways to extract

There are four ways to select the portion of the image to extract:

- Freestyle selection
- Shown portion of image
- Single click selection
- Select using GIS annotation layer

#### *Freestyle selection*

To extract by using freestyle selection, you’ll simply “click and drag,” to draw a rectangle around an area, starting in one of the rectangle’s corners. Freestyle selection is the default.

#### *Shown portion*

Extracting the shown portion means copying out the entire contents of the Image window (not necessarily the entire image).

*Single click selection*

With single click selection, you'll click a center point around which a square area is extracted. You'll specify the size of the square by entering the shortest distance from the center to a side.

Alternately, you can click and drag a square around your clicked point, causing the Extract Tool to use your drawn square instead of calculating a square based on the radius you entered.

*Select using GIS annotation layer*

You can determine what to extract based on one or more GIS objects that you identify. The GIS object can be a point, one or more lines, or a polygon.

**If you select a layer of ...**

point data	<p>The process is similar to single click selection. You'll click on or near the point you want used as the center point of the square to be extracted, and you'll specify the size of the square by entering the shortest distance from the center to each side.</p> <p>You can click and drag the square around the GIS object closest to your clicked point, causing the Extract Tool to use your drawn square instead of calculating a square based on the radius you entered.</p>
line data	EFS centers a rectangle around the line or lines you select.
polygon data	EFS centers a rectangle around the polygon you select.

**Specifying the selection method**

If you want to use any method other than freestyle selection, you must specify the selection method.

**◆ To specify the selection method for the Extract Tool:**

1. Do *one* of the following:

- Click the **Extract Tool** button.
- or —
- Choose **Tools**⇒**Extract Tool**.

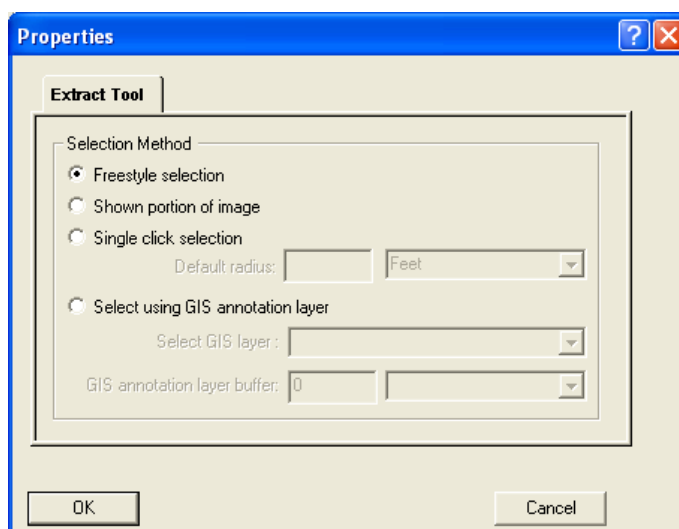
The cursor changes to a black crosshair and scissors.

2. Do *one* of the following:

- Click the **Tool Properties** button.
- or —
- Choose **Tools**⇒**Properties**.

The Properties dialog box appears with the Extract Tool tab active.





3. In the Selection Method area, click the method you want.
4. If you chose “Single click selection,” enter a default radius, select the units from the drop-down box, and click **OK**.

If you chose either “Shown portion of image” or “Freestyle selection,” simply click **OK**.

5. If you chose “Select using GIS annotation layer,”
  - a. From the Select GIS layer box, select the GIS annotation layer you’ll use to identify the area to extract.
  - b. Enter a radius in the “GIS annotation layer buffer” box.
  - c. Select the units from the drop-down box and click **OK**.

The Properties dialog box closes. You can now use the Extract Tool.

### Using the Extract Tool

Here’s how you can use the Extract Tool to define a portion of your image and save it as a JPEG (or other raster image format file).

**Note:** If you want to use any method other than Freestyle selection (the default) to extract an image, follow the procedure for specifying the selection method (page 157) before using the Extract Tool.

#### ◆ To use the Extract Tool:

1. Navigate to the image you want to extract a portion of.
2. Do *one* of the following:
  - Click the **Extract Tool**.
  - or —
  - Choose **Tools**⇒**Extract Tool**.



The cursor changes to a black crosshair and scissors.

3. When you specified the selection method (page 157), if you chose: “Shown portion,” click anywhere on the image.

“Freestyle selection” (or if you made no selection), click and drag (holding the mouse button down) from one corner of the rectangle to be extracted, diagonally to the opposite corner. Release the mouse button. This defines the rectangle to be extracted.

“Single click selection,” click the center point of the square to be extracted. Or click the center point and drag to define the square.

“Select using GIS annotation layer,” do the following:

- a. (Optional) Turn visibility on for the GIS annotation layer. (Right-click the desired layer in the workspace and select **Show Layer.**)

**Hint:** It's helpful to use the Query Tool in concert with the Extract Tool. The Query Tool can help you find a particular GIS object, based on corresponding text data. It can also show the extent of the GIS object.

Simply click the Query Tool, then click the Extract Tool again when you're done with your query. (The topic “GIS Query Tool,” in Part III, Chapter 17 describes how to set up and use the Query Tool.)

- b. If you specified a layer of *point* data, click on or near the point you want used as the square's center point. If you click and hold, you can drag to define the square. Otherwise, the radius you specified on the Properties dialog box is used to calculate the square.

If you specified a layer of *line* data, click on or near the line segment you want the rectangle to enclose.

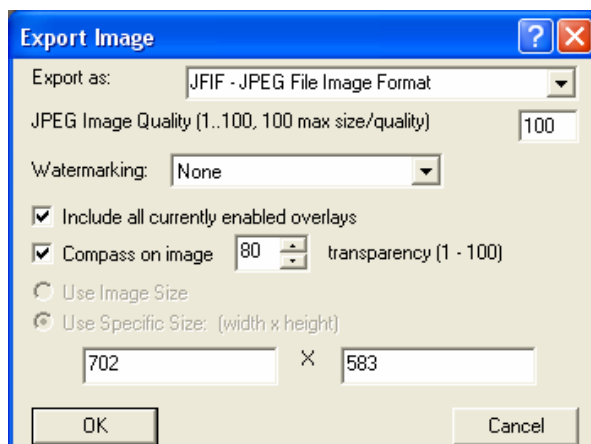
**Note:** You can enclose multiple segments within the rectangle, by holding the **CTRL** key while clicking on line segments. Before clicking to enclose the final segment of your selection, release the **CTRL** key.

If you specified a layer of *polygon* data, click anywhere within the polygon.

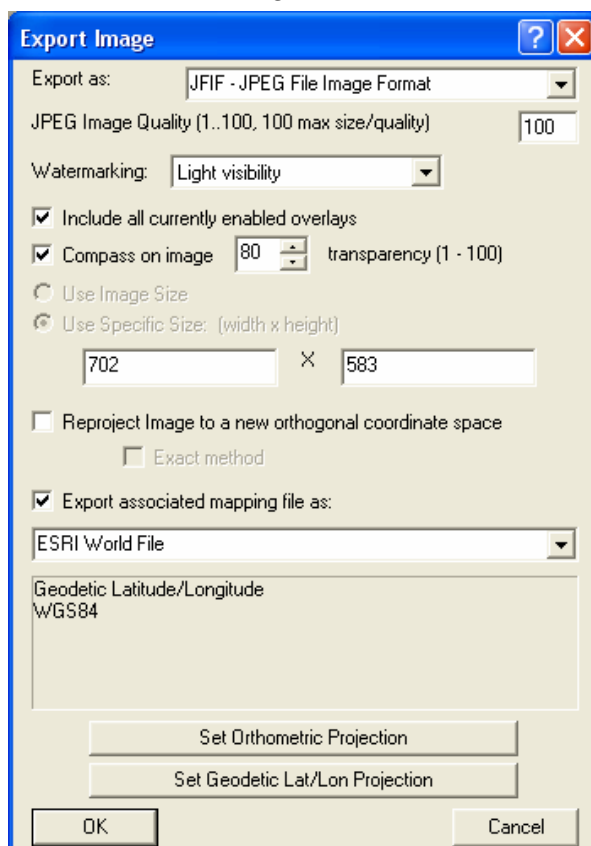
The Export Image dialog box appears.

*Line data is actually “polyline” data. A polyline (or segment) is one or more contiguous lines. It can have corners.*

If the image is Oblique, here's how it will look.



If the image is Orthogonal, the Export Image dialog box includes some additional settings:



4. Select a file format from the drop-down list. If you select JPEG, you can type a value between 1 and 100 for JPEG image quality (or accept the default of 100).
5. Select the degree of watermarking from the drop-down list. (See “Choice of watermark” on page 156.)
6. If you want the extracted image to include all overlays that are currently visible, check **Include all currently enabled overlays**.



*An ESRI World File is a text file that contains coordinate information about the projection of the image.*

7. (*Orthogonal images only*) To reproject the image to a different coordinate system,
  - a. Check **Reproject Image to a new orthogonal coordinate space**.
  - b. If you want to export an associated mapping file (ESRI World File), check **Export Associated mapping file as (ESRI World File)**.
  - c. To choose the orthometric coordinate system,
    - 1.) Click **Set Orthometric Projection**. The Select the projection to use when exporting dialog box appears.



- 2.) Select the Coordinate Group and associated data from the drop-down lists and click **OK**. Your selections appear on the Export Image dialog box.
- 3.) If you are exporting a Lat/Lon Orthogonal image, decide whether to check the Exact method checkbox. (See “Reprojecting an image with the “Exact method” option” on page 162.)
- d. (*Optional*) To choose a Geodetic Lat/Lon coordinate system, click **Set Geodetic Lat/Lon Projection**.

The Export Image dialog box shows the coordinate system you selected.

8. Click **OK**. The Select the name of the exported image dialog box appears. Navigate to the directory in which to store the file, type a name for the extract file, and click **Save**.

The file is saved in the location you specified.

## Exporting images

*The procedures for exporting images start on page 163.*

EFS has the ability to export whole images. You can export the active image, multiple images from the active workspace, or multiple images from an open Image Warehouse.

When exporting multiple images, you can export all images in the workspace (or the warehouse) or you can export only the orthogonal images.

## Options for exporting images

There are various options for exporting images. The following sections describe these options.

**Note:** The ability to choose the level of watermark that is shown on the exported image pertains to both extracting and exporting. (See page 156.)

### *Reprojecting an image with the “Exact method” option*

Exact method is an option you’ll see when you export an Orthogonal image and project it in an orthometric coordinate system.

*If you do not choose Exact method*, EFS will speed up the projection process by approximating Cartesian coordinates for the Lat/Lon image. To save time when exporting Community and Neighborhood Orthogonal images, do not choose Exact method.

*If you choose Exact method*, the projection process is slower but more accurate.

**Important:** Always choose Exact method when exporting a Lat/Lon map. (The approximation of Cartesian coordinates is accurate for images covering less ground, such as Neighborhood and Community images, but should not be used for maps.)

**Tip:** Use the Exact method option to convert a Lat/Lon base map to a projected orthometric system before adding GIS annotation layers to a workspace that contains that map. (EFS alerts you when you attempt to add projected GIS data to a workspace that contains a Lat/Lon base map.)

When you later import and open the (now) projected base map in EFS and add the GIS data, the GIS objects align more accurately with the projected base map because you used the Exact method option.

### *Visible annotations included*

When you export an image (or an image extract), EFS can include annotations. To include them, they must be visible and the “Include all currently enabled overlays” option in the Export Image dialog box must be checked.

Additionally, you can selectively include or exclude annotation layers. *To selectively include annotation layers*, first choose **Overlays**⇒**Annotation Layer Visibility** to select the layers you want included (and deselect those you want excluded). Then, in the Export Image dialog box, check **Include all currently enabled overlays**. What you see in the Image window (or the extract rectangle) is what your exported image will look like.

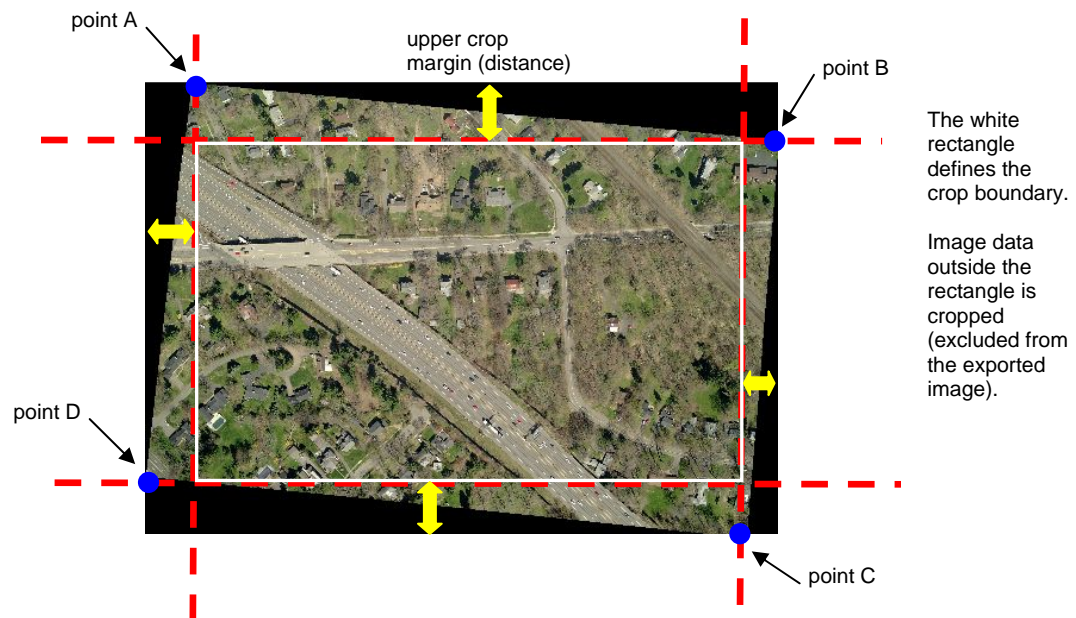
*To exclude all annotations*, do not check **Include all currently enabled overlays** in the Export Image dialog box.

### *Cropping Orthogonal images*

When exporting an Orthogonal Pictometry image, you can choose to crop the image—eliminating or reducing the black triangular areas that border the skewed, captured image.

Figure 9-4 shows how EFS crops an Orthogonal Pictometry image. Notice that the Pictometry image contains a skewed image (what was captured by the camera) as well as some black triangular borders.

Imagine two vertical and two horizontal lines drawn through the image. Each line is drawn where a corner of the skewed, captured image touches the edge of the Pictometry image. (See points A, B, C, and D, in Figure 9-4.) The resulting rectangle defines the crop boundary. Only what is inside the rectangle is included in the exported image.



**Figure 9-4:** Cropping an Orthogonal Pictometry image.

**Note:** You can change the crop margins (shown as dashed lines in Figure 9-4) by clicking **Adjust Crop** on the Export Image dialog box and entering new distances.

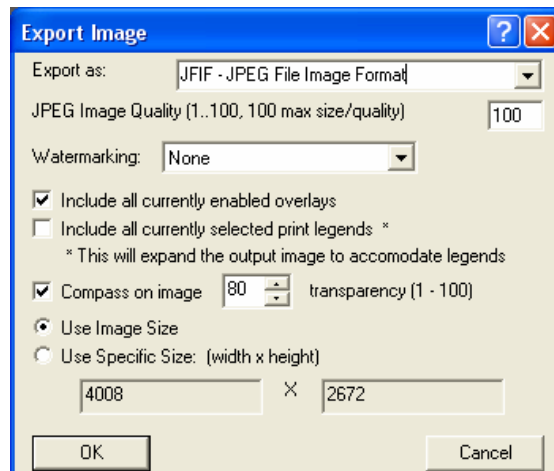
### Exporting a single image

#### ◆ To export a single image:

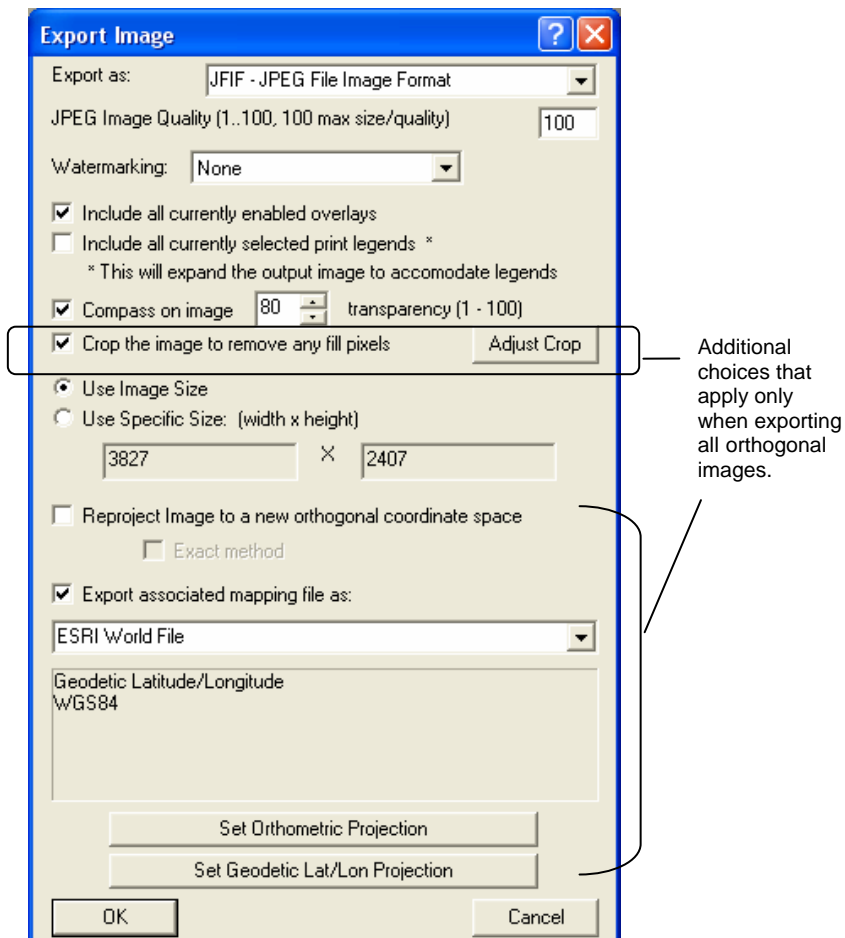
1. Open the image you want to export.
2. Choose **File**⇒**Export Image**.

The Export Image dialog box appears. If the image is Oblique, here's how it will look.

**Tip:** To add the Export Image button to a toolbar, see "Adding and removing toolbar buttons" in Part IV, Chapter 22.



If the image is Orthogonal, the Export Image dialog box includes some additional settings:

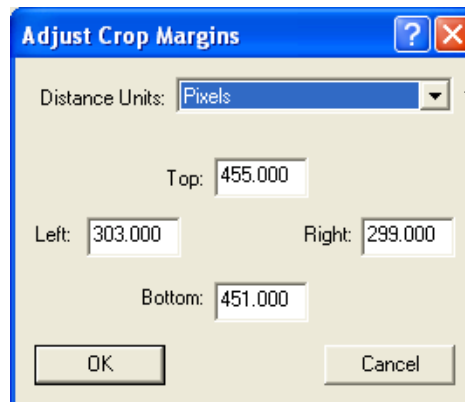


3. Select a file format from the drop-down list. If you select JPEG, you can type a value between 1 and 100 for JPEG image quality (or accept the default of 100).
4. Select the degree of watermarking from the drop-down list. (See “Choice of watermark” on page 156.)
5. If you want the exported image to include all overlays that are currently visible, check **Include all currently enabled overlays**.
6. If you want the exported image to include tick marks, a compass, a time or date stamp, an image name, a workspace name, or a scale notation, check **Include all currently selected print legends**. Checking this box causes options selected on the Print Setup dialog box to be included in the exported image.
7. Click **Use Image Size** to export the image the same size as the original, or check **Use Specific Size** if you want specify the width and height of the exported image. If you chose “Use Specific Size,” type the size in the width and height in the appropriate boxes.
8. (*Orthogonal images only*) If you chose “Use Image Size” in Step 7, and you want to crop the image, check **Crop the image to remove any fill pixels**.

See “Cropping Orthogonal images” on page 162.

EFS automatically crops the image to remove black fill pixels as shown in Figure 9-4, but if you want to change the crop margins,

- a. Click **Adjust Crop**. The Adjust Crop Margins dialog box appears.



You can change the units to meters, kilometers, centimeters, or feet.

Shows the current crop distances (in pixels) for each of the image's four edges (or sides).

See Figure 9-4 for help with cropping.

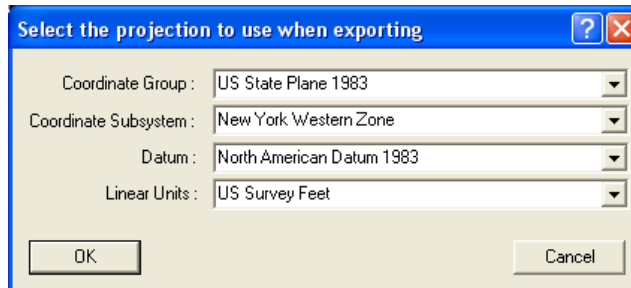
- b. Select the **Distance Units**. For each crop margin you want to change, enter the new crop distance (distance from edge of the Pictometry image), then click **OK**. (The crop boundary for the exported image changes accordingly.)

**Note:** Cropping an exported image does not affect the original image.

9. (*Orthogonal images only*) To reproject the image to a different coordinate system,
  - a. Check **Reproject Image to a new orthogonal coordinate space**.

*An ESRI World File is a text file that contains coordinate information about the projection of the image.*

- b. If you want to export an associated mapping file (ESRI World File), check **Export Associated mapping file as (ESRI World File)**.
- c. To choose the orthometric coordinate system,
  - 1.) Click **Set Orthometric Projection**. The Select the projection to use when exporting dialog box appears.



- 2.) Select the Coordinate Group and associated data from the drop-down lists and click **OK**. Your selections appear on the Export Image dialog box.
- 3.) If you are exporting a Lat/Lon Orthogonal image, decide whether to check the Exact method checkbox. (See “Reprojecting an image with the “Exact method” option” on page 162.)
- d. To choose a Geodetic Lat/Lon coordinate system, click **Set Geodetic Lat/Lon Projection**.

The Export Image dialog box shows the coordinate system you selected.

10. Click **OK**. The Select the name of the exported image dialog box appears.
11. Navigate to the directory in which to store the file, type a name for the export file, and click **Save**.

EFS saves the exported file(s) in the location you specified. If you exported an orthogonal image and reprojected it to a different coordinate system, EFS exports both a PMI image and a raster image (such as JPG). If you checked “Export Associated mapping file as (ESRI World File),” EFS also exports a World File (with an extension of jgw).

After viewing your exported image file, if you need to export the image again to remove any black fill pixels still present from reprojection, simply complete the procedure again and click **Adjust Crop** in Step 8.

### Exporting all images from a workspace or an Image Warehouse

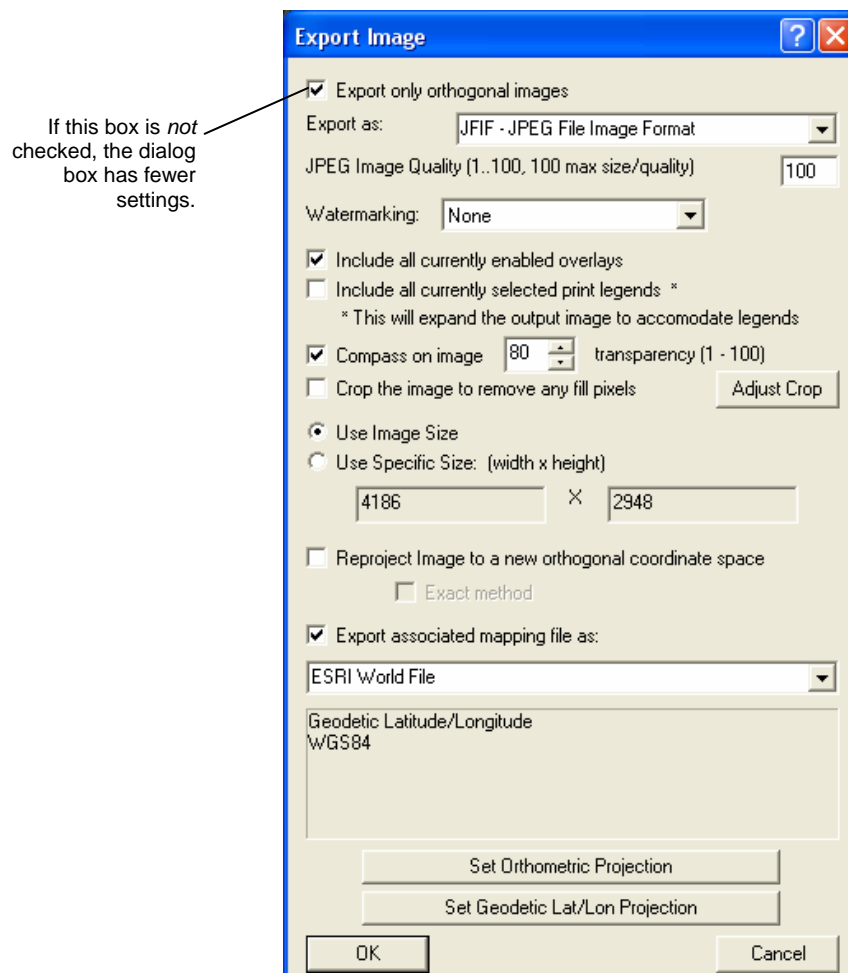
**Workspace**⇒**Export All Images** is an EFS option that lets you export all images (or all Orthogonal images) from an open *workspace*.

**Edit**⇒**Export All Images** lets you export all images (or all Orthogonal images) from an open *Image Warehouse*.

◆ **To export all images:**

1. Do *one* of the following:
  - Open the Image Warehouse you want to export, making it active in the Image window. (See “Opening an Image Warehouse,” in Part IV, Chapter 19.)
  - or —
  - Open the workspace that contains the images you want to export.
2. To export from the workspace, choose **Workspace⇒Export All Images**.  
To export from an Image Warehouse, choose **Edit⇒Export All Images**.

The Export Image dialog box appears.



3. Check or uncheck the **Export only orthogonal images** checkbox.

**Note:** If Export only orthogonal images is unchecked, all images (in the workspace or warehouse)—orthogonal and oblique—will be exported.

4. The rest of this procedure is identical to the procedure for exporting a single image. Follow Steps 3 – 12 of the procedure “To export a single image,” which begins on page 163.

**Note:** If you choose to export *only* orthogonal images, any cropping and reprojection settings you select are applied to all of the images.

EFS will export a copy of every image (or every Orthogonal image) in the Image Warehouse (or the workspace, if no Image Warehouse is open), to the directory you've designated.

If you exported only orthogonal images and projected them to a different coordinate system, EFS exports both a PMI image and a raster image (such as TIF or JPG) for every orthogonal image in the workspace or warehouse. If you checked "Export Associated mapping file as (ESRI World File)," EFS also exports a World File (with extensions such as tfw and jgw) for every orthogonal image.

**Reminder:** To close an open Image Warehouse, see "Closing an Image Warehouse" in Part IV, Chapter 19.



# Chapter 10 — Workspaces

Chapter 3 introduced the concept of workspaces and described how to create one. In this chapter you'll learn more about workspaces, including why they are helpful when working with EFS. Besides concepts, this chapter includes procedures for the workspace features you'll use most often. If you're interested in finding out about more advanced workspace features, see Part IV, Chapter 21.

## Topics covered in this chapter ... page

An overview of workspaces .....	169
The Workspace window .....	171
The structure of a workspace .....	171
Using workspaces .....	174

## An overview of workspaces

### What is a workspace?

*A workspace does not contain the actual images. It contains links to images or to an Image Warehouse.*

A workspace is both a “launching pad” for working with EFS and a way of organizing images along with related annotations, GIS data, maps, and sometimes elevation files. Once you create and save a workspace, you can open it and work with its contents whenever you choose. You can add, change, or delete contents at any time. Workspaces allow you to access your collection of images and related information quickly and easily and are especially helpful for “bookmarking” the images you want to quickly locate and use again.

The images bookmarked in a workspace generally come from an Image Warehouse, although they don't have to come from a warehouse to be organized in a workspace. You decide what information to collect into a workspace.

### What is a Pictometry Workspace File?

All of the information organized into a single workspace is stored in a file called a Pictometry Workspace File, which has an extension of “.pwf.” You can create as many workspaces (and consequently, workspace files) as you wish.

### Are workspaces required?

You don't need a workspace to work in EFS. Technically, you can open images and search a warehouse without ever creating or opening a workspace. But, when you create or open an existing workspace, the Image

Tool is available for searching immediately. Thus, opening an existing workspace is the fastest way to search for images. Once opened, you can ignore the workspace unless you want to annotate images, view GIS annotations, or load elevation files.

You must create a workspace if you want to annotate images because annotations are stored in workspaces. If you only want to view images, a workspace is not required.

Most users find workspaces to be a helpful in doing their work. The next few topics tell you why.

## Why create a workspace?

Typically, a workspace becomes the starting point for working in EFS and the central point through which most work is done.

Some users group related images in a workspace and annotate them with notes for presentations or for future reference. Other users create a workspace that contains specific images they wish to have others look at. They can then pass a copy of their workspace to other users for analysis and review. And others use workspaces as a means of saving their work, especially emergency plans and project plans. When you find the images that contain the best views of a building, landscape, or structure, you'll want to save them in a workspace so you don't have to search your warehouse to find them the next time you need them.

Once you start using workspaces, you'll see how helpful it is to have a way to collect and organize your work for fast future reference.

## What's in a workspace?

A workspace typically contains one or more maps, GIS annotation layers, images, annotations, and elevation files. It's your choice which images (if any) to put in a workspace. You might group images based on their relationship to each other and on how you'll use those images. For example, you might create a workspace that contains various images of a particular site so you can plan a construction project involving that site. Most workspaces contain a **base map image** (usually a map), which can be used as a starting point when searching for warehouse images.

## You can have multiple workspaces

*For more information about multiple workspaces, see Part IV, Chapter 21.*

You can create as many different workspaces as you like. You can even open more than one at a time, but only one can be active. The **active workspace** is the one that appears in the Workspace window (or if you have more than one workspace visible at a time, it's the one that has a bright blue title bar).

**Note:** Although you can open and work with multiple workspaces, we recommend that you open and work with only one at a time.

## The Workspace window

EFS displays the contents of a workspace file in the Workspace window. Figure 10-1 below shows the default location of the Workspace window.

**Note:** You can move the Workspace window to a different part of the screen, or hide it from view. To hide it, see “Hiding, showing, and closing a workspace” on page 179; to move it, see “Docking and undocking windows and toolbars” in Part IV, Chapter 22.

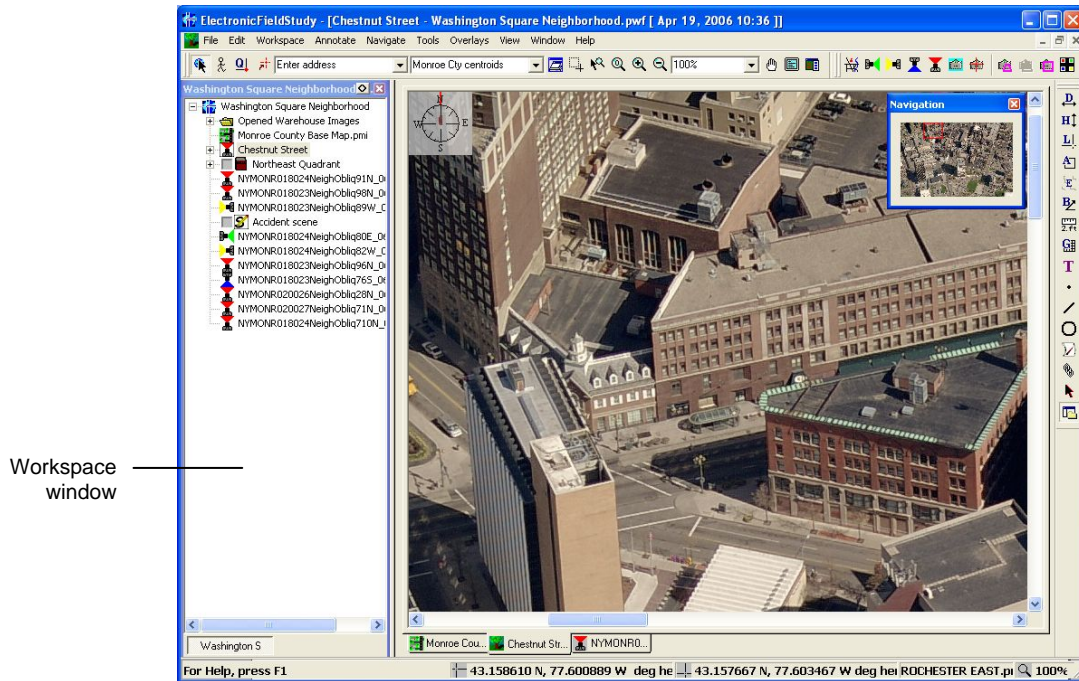


Figure 10-1: The default location of the Workspace window.

## The structure of a workspace

The Workspace window displays the contents of the workspace (stored in a Pictometry Workspace File) as a set of nested folders and files in a tree structure.

When you first create it, a workspace contains only:

- a Workspace Root,
- the Opened Warehouse Images folder, and
- the base map image (if you selected one when you created the workspace).

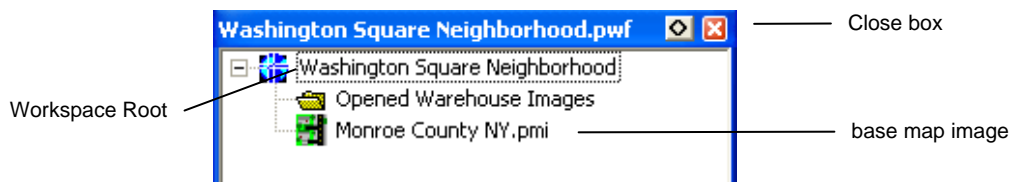
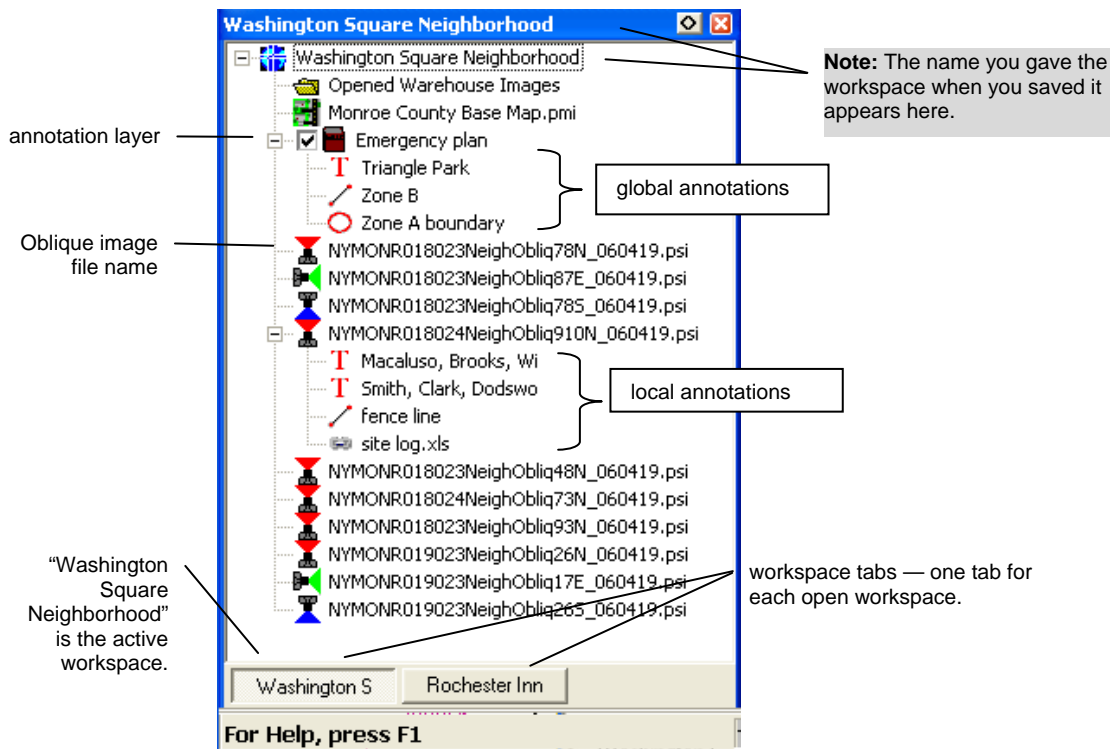


Figure 10-2: A Workspace just after being created (and not yet saved).

Later as you open images and annotate them, the workspace will contain many more items.



**Figure 10-3:** A Workspace that contains annotation layers, annotations, and image file names.

A workspace typically contains the following parts:

## Workspace Root

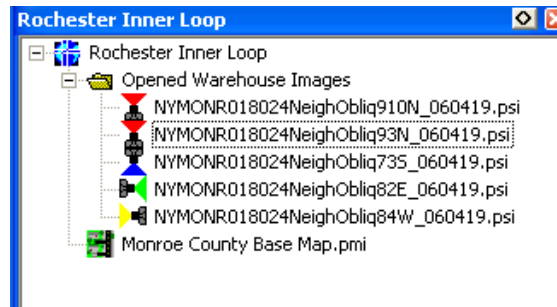
The Workspace Root is always at the top of the workspace tree and displays the workspace name.

## Opened Warehouse Images folder

The Opened Warehouse Images folder keeps track of every image you open from the Thumbnail window during an EFS session, if the image was found in an Image Warehouse when you searched.

Images you open do not go into the Opened Warehouse Images folder in the following circumstances:

- when you open the image from the Workspace window, or when
- you open a search hit that resulted from searching a workspace.



**Figure 10-4:** An example showing the contents of the Opened Warehouse Images folder.

The Opened Warehouse Images folder is a temporary holding area, from which you can selectively add images to the workspace. The contents of the Opened Warehouse Images folder are not saved when the workspace is saved. You can change this default setting so that every image you open is automatically added to the active workspace. (See “Adding images automatically when opened” in Part IV, Chapter 21.)

### Base map image

The third item listed in the Workspace window is typically the base map image, identified by a map icon.

### Images

Oblique images are identified by an icon representing the direction in which the image was captured and have the extension “psi.” Base maps and Orthogonal images have the extension “pmi.” Individual images may have local annotations associated with them. (An image’s local annotations are listed under its name in the workspace.)

### Annotation layers (user-defined)

User-defined annotation layers are represented by book icons. Global annotations reside under annotation layers.

### Annotations

Annotations are identified by distinctive icons. Annotations listed under an annotation layer are global annotations and will be displayed on any open image containing the point they are associated with. Annotations listed under images in the workspace are local to the image they are listed under, that is, they will be displayed only on that image.

### GIS annotation layers

GIS Annotation layers are identified by the pencil drawing icon with an ‘S.’

### Grid layers

Grid layers are identified by a grid icon with a ‘G.’

## GIS Images

GIS Images are represented by a map icon.

For more information about ALOHA annotations, see Appendix C.

## ALOHA annotations

An ALOHA icon is used to represent an ALOHA annotation layer. Each ALOHA annotation layer contains one ALOHA annotation.

## Elevation files

If the workspace contains elevation files, they are indicated by an icon that contains contour lines as found on a topographic map.

# Using workspaces

This section contains various procedures for using workspaces.

## Creating a workspace

When you create a workspace, you'll select a base map image (usually a map) from the Image Library and assign it to the workspace.

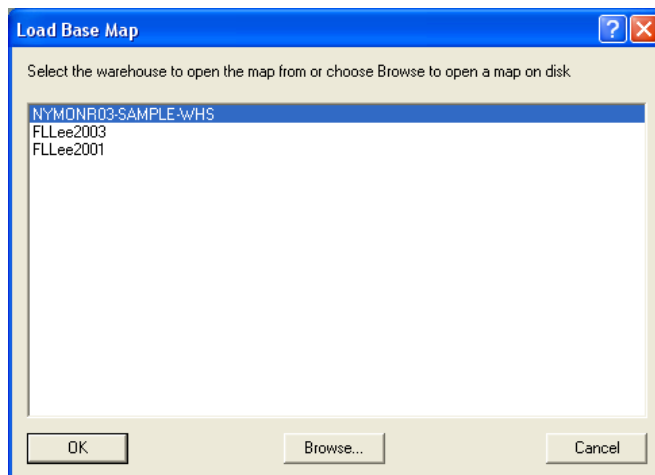
**Note:** For your convenience, your Image Library may already contain one or more “starter” workspaces. If so, skip this procedure and see the next topic, “Opening a workspace.”

### ◆ To create a workspace:

1. Do *one* of the following:
  - Click the **New Workspace** button.
  - or —
  - Choose **File**⇒**New Workspace**.



The Load Base Map dialog box opens.



If you don't see this dialog box, be sure you have linked to a warehouse. See “Linking to your Image Warehouse” in Chapter 1.

2. Do *one* of the following:
  - From the list of warehouses, select the warehouse that you want to work with. *Continue with Step 3.*

– or –

- Click **Browse** to look for a different map or image to use as a base map image. The Open dialog box opens.
  - a. From the Open dialog box, navigate to the folder that contains the desired image.

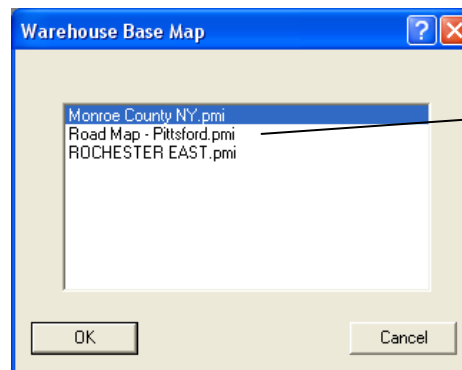
**Note:** The file you select will usually have an extension of “pmi”.

- b. Select the desired image and click **Open**.

The selected image appears in the Image window, your workspace is now created (but not saved), and a temporary workspace name, “Workspace n,” appears in the Workspace window. (“n” is the n<sup>th</sup> workspace added in this EFS session.) If you selected a base map, it appears in the Image window.

*Skip the rest of this procedure.*

3. Click **OK**. The Warehouse Base Map dialog box opens.



The PMI files listed here come from the “Maps and GIS” folder of the warehouse you selected in Step 2.

You can pick a map to designate as a base map image for this workspace, either now, or later, or not at all. (Most users pick a map for a base map image.)

4. Do *one* of the following:
  - Select a base map (a Pictometry Map Image file with the extension “pmi”), and click **OK**.
  - or –
  - Click **Cancel** if you don’t want to pick a base map.

**Note:** You can pick a base map (or image) later by choosing Workspace⇒Add Base Map Image. (See “Adding a base map image” in Part IV, Chapter 21.) You can also create your own vector map to use as a base map image instead of the map supplied by Pictometry. (See “Creating a new GIS Image in EFS” in Part III, Chapter 18.)

Your workspace is now created (but not saved) and the Image Tool is automatically the active (selected) tool. A temporary workspace name, “Workspace n,” appears in the Workspace window. (“n” is the n<sup>th</sup> workspace added in this EFS session.) If you selected a base map, it appears in the Image window.

When you create a workspace, it becomes the active workspace.

## Opening a workspace

**Tip:** Double-clicking a saved workspace file (PWF) will both launch EFS and open that workspace.

Use this procedure to open a saved workspace when you want to view or work with its contents. Workspace files have “pwf” as their extensions.

**Note:** Although you can open and work with multiple workspaces, we recommend that you open and work with only one at a time.

### ◆ To open a workspace from within EFS:

1. Do *one* of the following:
  - Click the **Open** button (if available on a toolbar).
  - or —
  - Choose **File⇒Open**.

The Open dialog box opens.

2. Navigate to the directory that contains the workspace you wish to open, select the desired workspace, and click **Open**.

The workspace opens, it becomes the active workspace, and its name appears in the Workspace window. When you open a workspace, the Image Tool is automatically the active tool and the base map image opens in the Image window.

**Note:** In the Workspace window, clicking the plus sign to the left of the workspace name expands the tree structure to show its contents (discussed in the next topic).

**Tip:** EFS keeps track of the most recently used workspaces. You can easily access them again by choosing **File⇒Recent Workspaces**.

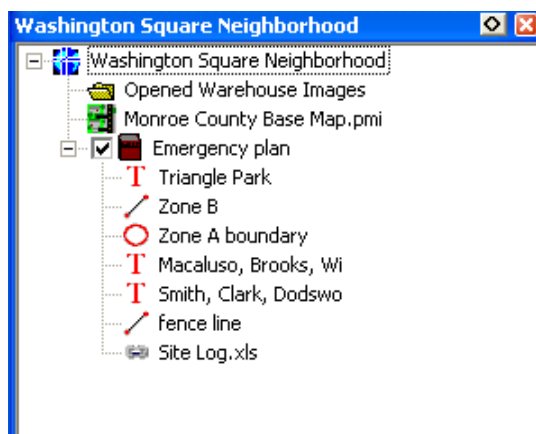


## Expanding and collapsing workspace items

A plus sign next to an item in the workspace indicates that the item contains subordinate items. A minus sign next to an item indicates that the item is expanded and its contents are visible.

### ◆ To expand an item:

- Click the plus sign next to the icon. The plus changes to a minus and the subordinate items appear.

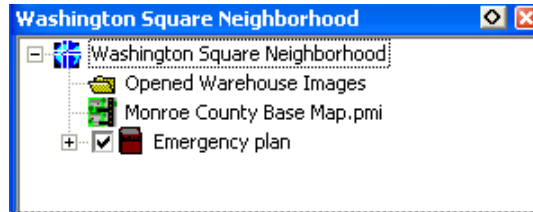


**Figure 10-5:** The “Emergency plan” annotation layer expanded.



◆ **To collapse an item:**

- Click the minus sign next to the icon. The item collapses, the minus changes to a plus, and the subordinate items disappear from view.



**Figure 10-6:** The “Emergency plan” annotation layer collapsed.

## Deleting items from a workspace

You can delete any item from the workspace except the Workspace Root and the Opened Warehouse Images folder. You can also delete multiple items simultaneously.

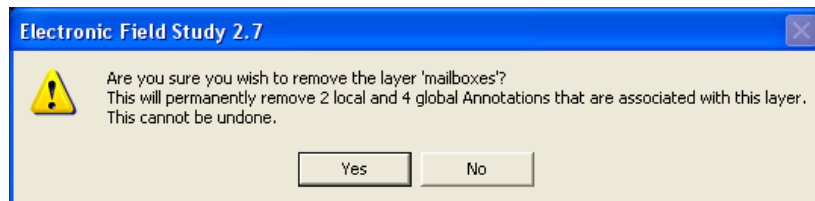
◆ **To delete an item from a workspace:**

1. Do *one* of the following:
  - Right-click the item to be deleted in the Workspace window, and select **Delete <item name>** from the context menu.
  - or —
  - Select the item you want to delete from the workspace, and do *one* of the following:
    - Click the **Delete** button (if available on a toolbar).
    - or —
    - Choose **Edit⇒Delete**.



**Tip:** You can select the item you want to delete from either the Image window or from the Workspace window.

A dialog box appears asking you to confirm the deletion.



2. Click **Yes** to delete the item. The item is deleted from the workspace.

◆ **To delete multiple items from a workspace:**

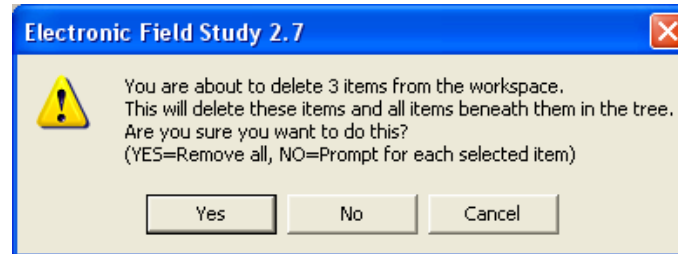
1. Select the items you want to delete from the workspace.

**Tip:** To select contiguous items in the list, click the first item, hold down the **SHIFT** key, then click the last item to be selected. To select non-contiguous items, hold down the **CTRL** key while selecting the items.



2. Do *one* of the following:
  - Click the **Delete** button (if available on a toolbar).
  - or —
  - Choose **Edit**⇒**Delete**.

A dialog box appears asking you to confirm the deletion.



3. Do *one* of the following:
  - Click **Yes** to delete all selected items. The items are deleted from the workspace.
  - or —
  - Click **No** to be prompted for each selected item. For each item a dialog box appears asking you to confirm the deletion.
  - or —
  - Click **Cancel** to cancel the delete. The items will not be deleted.

## Saving a workspace

If you wish to save the workspace you've created or changed, you should do so before closing it or exiting EFS.

Use the following procedure to save a new workspace or to save a workspace with a new name.

### ◆ To save a new workspace:



1. Do *one* of the following:
  - Click the **Save** button (if available on a toolbar).
  - or —
  - Choose **File** ⇒ **Save Workspace**.

The Save As dialog box opens.

2. In the File name box, type a name for the workspace. Make sure the extension is "pwf".
3. Click **Save**.

The workspace is saved and its name appears in the Workspace window.

### ◆ To save a changed workspace:

Do *one* of the following:



- Click the **Save** button (if available on a toolbar).
- or —
- Choose **File** ⇒ **Save Workspace**.

**Note:** Another way to save a workspace is to right-click in either the Workspace or Image windows, and select **Save <workspace name>**. It's the same as choosing **File** ⇒ **Save Workspace**.

### ◆ To save a workspace with a new name:

**Tip:** Saving a workspace with a new name preserves the previous version of the workspace.

1. Choose **File** ⇒ **Save Workspace As**.  
The Save As dialog box opens.
2. In the File name box, type a name for the workspace. Make sure the extension is “.pwt”.
3. Click **Save**.

The workspace is saved and its name appears in the Workspace window.

## Hiding, showing, and closing a workspace

Some users prefer to hide the Workspace window from view so they have more space on the screen for images. Hiding the Workspace window simply removes it from view. The workspace remains open and active while hidden, so you can continue to add items to it.

Closing a workspace makes it inactive, closes the Workspace File, and closes all open images.

### ◆ To hide or show the Workspace window:

Do *one* of the following:



- Click the **View Pictometry Workspace** button.
- or —
- Click the **View** menu and *check* **Workspace Window** to show the Workspace window or *uncheck* it to hide the Workspace window.

**Tip:** Yet another way to hide the Workspace window is to click the **Close** box in the right upper corner of the window, and select **Hide** from the popup. (See Figure 10-2 on page 171.)

### ◆ To close the workspace:

1. Do *one* of the following:
  - Choose **File** ⇒ **Close Workspace**.
  - or —
  - Click the **Close** box in the right upper corner of the window, and select **Close** from the popup. (See Figure 10-2 on page 171.)

2. *If you changed the workspace during this session*, you'll be asked if you want to save the changes. Click **Yes** or **No** as desired.

**What causes a workspace to change?** EFS prompts you to save a workspace any time you've added something (images, layers, annotations, files) to a workspace, changed workspace contents (such as the location of annotations or files, annotation attributes, or the order of items). However, the following actions *do not* change your workspace:

- searching a warehouse or workspace
- navigating an image in the Image window
- using the Navigate Tool
- exporting or extracting an image
- hiding or displaying EFS windows

The current workspace is saved (if you changed it and clicked Yes in response to the prompt) and then closes.

# Part II

## Using Measurement and Overlay Tools

To learn about ...	See ...
The tools used to measure images	Chapter 11
Creating annotations to images	Chapter 12
Changing, deleting, and scaling annotations, creating annotations from tool output, and copying annotations to other workspaces	Chapter 13
Creating grid overlays for images, entering data into grids, and exporting data from a grid	Chapter 14

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# Chapter 11 — Using Measurement Tools

EFS offers various tools for measuring objects visible in images. For example, you can measure the distance between two points, the elevation of the terrain, building heights, bearing, area, perimeter, and the coordinates of a point.

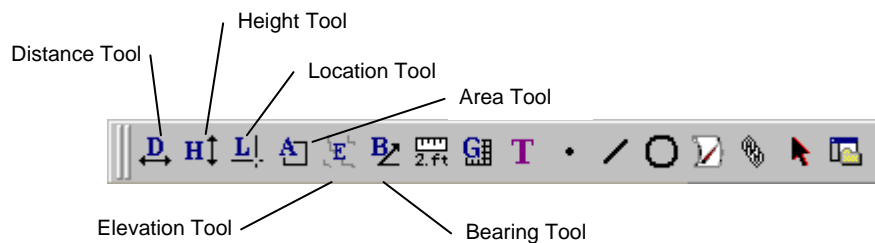
This chapter describes how to use these measurement tools, how to change the coordinate system and units of measure, and how to change a tool's properties. It also describes how to accurately measure and annotate items that are above ground level, by using a "ground plane offset." The chapter's final topic describes how to view elevation contour lines on your images and how to change the lines' properties.

## Topics covered in this chapter ... page

What are the measurement tools? .....	183
Before you measure.....	184
Using measurement tools.....	198
Viewing elevation contour lines .....	210

## What are the measurement tools?

The measurement tools are buttons found on the toolbar. (See Figure 11-1.)



**Figure 11-1:** The measurement tools on the toolbar.

When you click a measurement tool, the cursor changes to the symbol for that tool. The cursor's look always tells you which tool is currently active.

For a quick reference to these tools plus other toolbar buttons, see Appendix A or see the *EFS Quick Reference Guide*.

## Before you measure

Before you use a measurement tool, there are a few things you might want to do:

- change the units of measure
- change the coordinate system and its format
- change the tool properties
- include or exclude elevation in distance measurements (by using the Walk the Earth feature)
- offset the ground plane

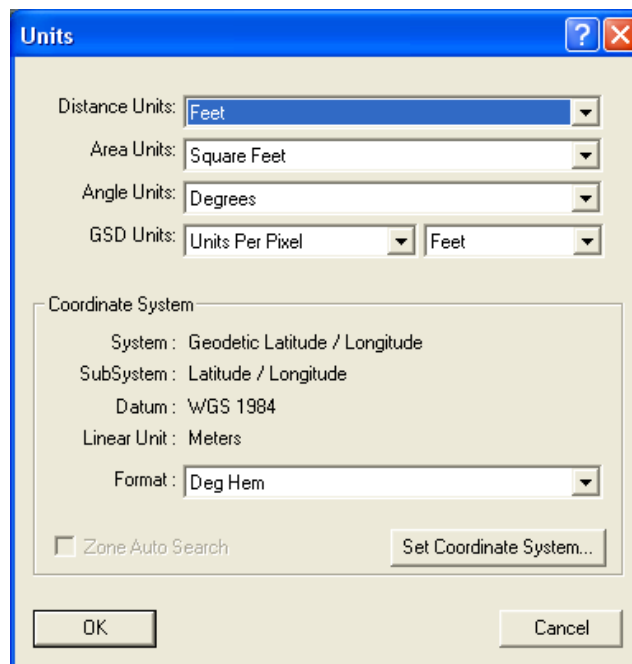
### Changing units of measure

*For more information about image resolution scale, see Part IV, Chapter 20.*

You can change the units of measure used in distance, area, or angle measurements. To change the image resolution scale, change the GSD Units. Changes to these settings stay in effect until you change them again.

#### ◆ To change units of measure:

1. Choose **Edit**⇒**Change Units**. The Units dialog box opens.



**Tip:** To add the Change Units button to a toolbar, see “Adding and removing toolbar buttons” in Part IV, Chapter 22.

2. From the drop-down list boxes, select the desired units for Distance, Area, Angle, and GSD.

**Note:** For more information about using the GSD Units drop-down list to change the format in which the active image's resolution is shown, see “Changing the scale and its display” in Chapter 20.

3. Click **OK**.

Your changes remain in effect until you change units again.

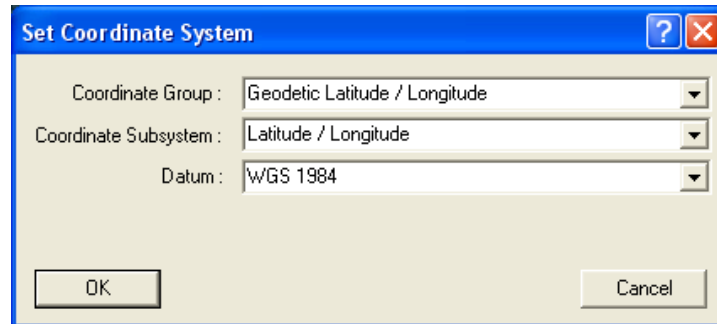


## Changing the coordinate system

EFS lets you to choose from over forty different coordinate systems.

### ◆ To change coordinate systems:

1. Choose **Edit⇒Change Units**. The Units dialog box opens.
2. Click **Set Coordinate System**. The following dialog box opens.



3. Select the desired Coordinate Group. The Coordinate Subsystem and Datum are changed to match the Coordinate Group you selected. An additional field called Linear Units will appear if applicable to the coordinate group you select.
4. If desired, change the Coordinate Subsystem, Datum, and Linear Units from their drop-down lists.
5. Click **OK**. The Set Coordinate System dialog box closes and your coordinate system selections are shown on the Units dialog box.
6. (Optional) If you are using the Universal Transverse Mercator (UTM) coordinate system, check the **Zone Auto Search** box. This causes the Status Bar to show the change in zone whenever you move the cursor from one zone into another.
7. Click **OK**. The Units dialog box closes.

**Note:** System response time may be slower with Zone Auto Search turned on.

The coordinate system is now set and remains as you set it until you change it again.

## Changing tool properties

All of the measurement tools have defaults for their properties. Change them as desired using the following procedure.

### ◆ To change a tool's properties:

1. Click the tool whose properties you want to change.
2. Do *one* of the following:
  - Click the **Tool Properties** button on the toolbar.
  - or —
  - Press **CTRL + P**.
  - or —
  - Choose **Tools⇒Properties**.



The Properties dialog box for the selected tool opens. (The options vary depending on the tool selected.)

3. Click the appropriate tab (if there are more than one), change the properties as desired, and click **OK**.

The properties remain as you set them until you change them again.

### Choices for drawing tool output

Most tools have an Annotation tab that contains options for controlling what is displayed when the tool is used. There are three options for drawing output (lines or points) on an image when you use the Distance, Elevation, Height, Bearing, Location, and Area Tools:

- Do Not Draw—The tool's output disappears as you release the mouse.
- Draw Temporary Lines/Points—The tool's output remains until you use a tool again or close the workspace.
- Draw Permanent Lines/Points—The tool's output becomes an annotation in the workspace. (It does not disappear the next time a tool is used.)

These options are set individually for each tool.

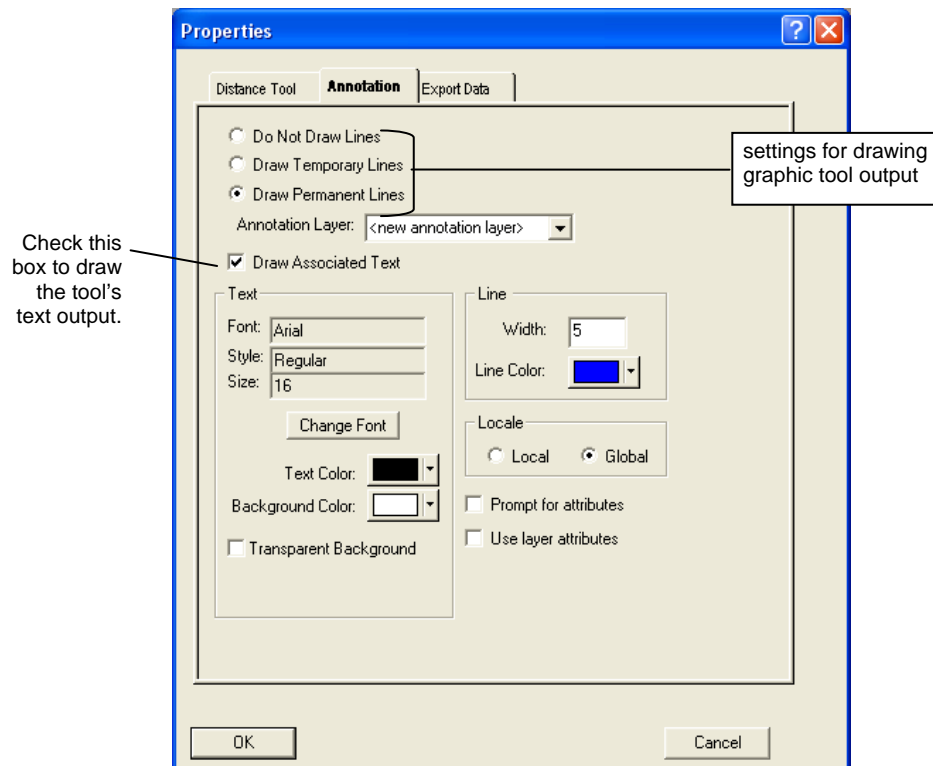
**Note:** The topic “Saving tool output as an annotation” in Chapter 13, tells how to save output *after* using a tool.

When you choose Permanent or Temporary output, you can define attributes for the annotations.

Each of the tools listed above has annotation properties that you can set by choosing the tool, then choosing Tools⇒Properties⇒Annotation tab.

*The Query Tool offers Temporary and Permanent output.*

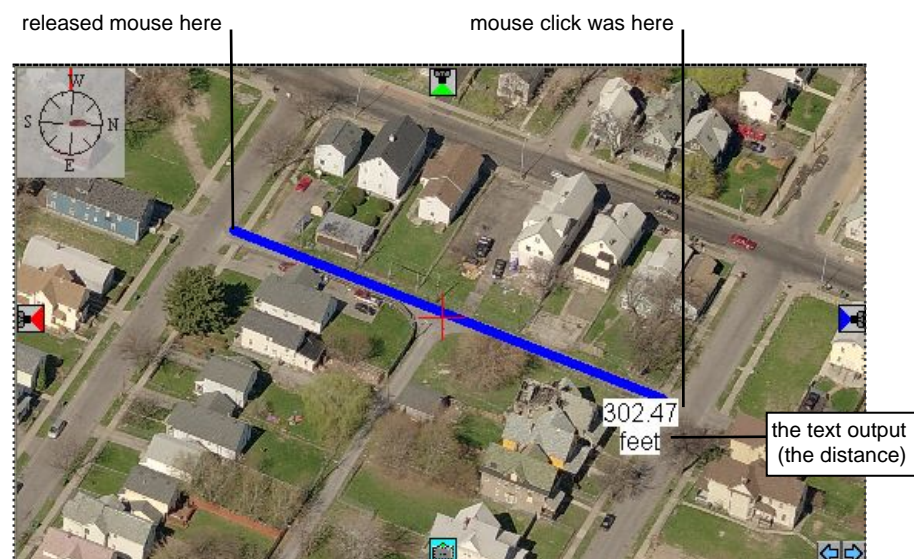
*The Navigate Tool offers Do Not Draw and Temporary options.*



**Figure 11-2:** The Distance Tool's Properties dialog box.

### Draw Associated Text

If you choose Temporary or Permanent lines, you can also opt to have the numeric output appear next to the line, as in the following Distance Tool example:



**Figure 11-3:** Text output shown on the image.

To view annotations, be sure that **Overlays** ⇒ **View Annotations** is checked.

### Draw Permanent Lines/Points

If you choose Permanent (lines or points), the line or point will become an annotation in your active workspace (and you can select which annotation layer it should reside in). If no annotation layer exists in your workspace, then as soon as you've used the tool, the Annotation Layer Properties box appears so you can define a new layer for the tool output.

**Note:** If you've chosen Draw Associated Text, the associated text will also be saved as an annotation in that same layer. Its name will be the actual text of the annotation.

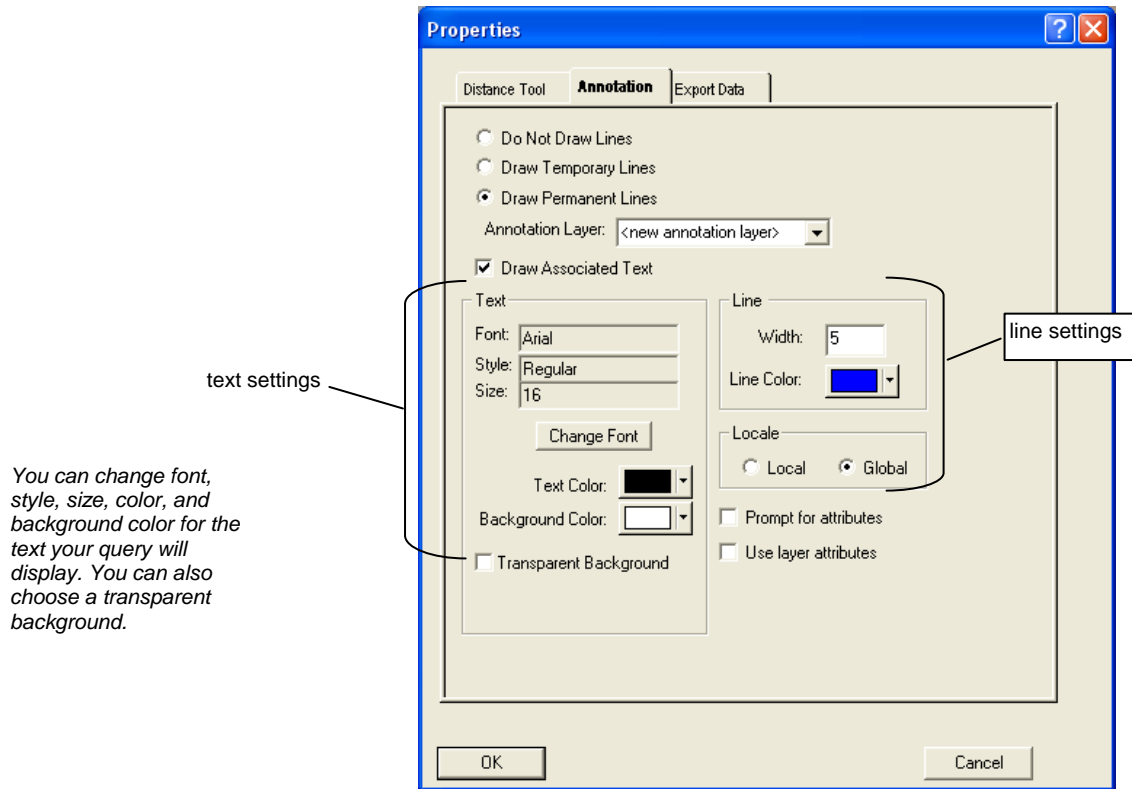
#### ◆ To change a tool's output format:

1. Click the tool on the toolbar.
2. Do *one* of the following:
  - Click the **Tool Properties** button on the toolbar, then click the **Annotation** tab.
  - or —
  - Choose **Tools** ⇒ **Properties** ⇒ **Annotation** tab.
3. Click the desired setting for drawing lines or points.
4. If you chose Draw Temporary Lines or Draw Permanent Lines, and you want EFS to draw the numeric tool output near the graphic (line or point) output, check **Draw Associated Text**.
5. If you chose Draw Permanent Lines, do the following:
  - a. Choose the parent layer. Do *one* of the following:
    - Select an existing layer from the Annotation Layer drop-down list.
    - or —
    - Create a new annotation layer by selecting **<new annotation layer>** (You'll be prompted to define the new layer's attributes the next time you use the tool).
  - b. Choose how to define the annotation attributes. Do *one* of the following:
    - To be prompted for the annotation's attributes every time you use the tool, check **Prompt for attributes**.
    - or —
    - To use the attributes of the annotation layer shown, check **Use layer attributes**.
    - or —
    - From the current dialog box,
      - 1.) Define a set of attributes to be applied to all graphic annotation output from this tool. The attributes to be defined are: Line (or Point) Width, Line (or Point) Color, and Locale (Global and Local). (For more information



about Locale, see “Global and local annotations” in Chapter 12.)

- 2.) If you chose *Draw Associated Text* in Step 4, define settings for the text annotation. The settings are: Font, Style, Size, Text Color, Background Color, and Transparent Background.



6. If you chose *Draw Temporary Lines*, you can do the following:
  - a. (Optional) Select a Line/Point Color and a type a value for the Width for all graphic annotations from this tool's output.
  - b. (Optional) If you chose *Draw Associated Text* (in Step 4), define settings for the text annotation as desired.
7. Click **OK**.

The Properties dialog box closes and your settings for that tool will remain until you change them again.

## Including elevation in distance measurements

When using the Distance Tool, you can take the elevation of the land into consideration. This feature gives you greater accuracy when measuring any terrain whose elevation varies.

To consider elevation changes in distance calculations, you'll use the **Walk the Earth** feature of EFS.

**Note:** The Walk the Earth feature is also available when drawing line annotations. See “The Line Annotation Tool” in Chapter 12.

To set up the Distance Tool, see “Choices for drawing tool output” on page 186.

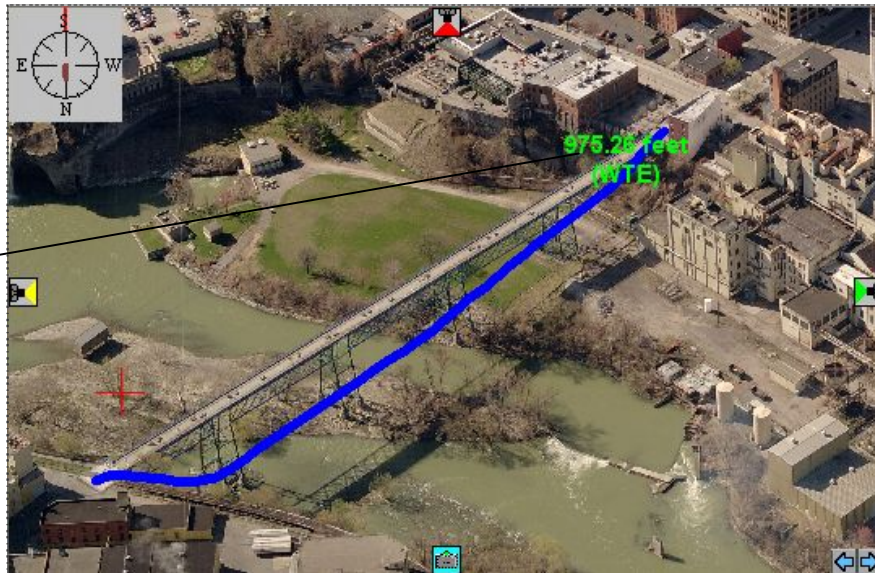
### What is Walk the Earth?

**Walk the Earth** is the EFS feature that lets you measure the Earth as if you were walking it, that is, it measures the surface of the Earth as the elevation changes, rather than the flat-line distance between the endpoints. If the Distance Tool is set up to “Draw Temporary Lines” or to “Draw Permanent Lines,” you can view the line representing the distance you are measuring. You’ll notice that the line conforms to the contour of the Earth. (See Figure 11-4.)

Because the Walk the Earth feature is a property of the Distance Tool, it can be used with any measurement involving this tool (including distances that span images and perimeter measurements). You can use this feature when measuring objects in both Oblique and Ortho images.

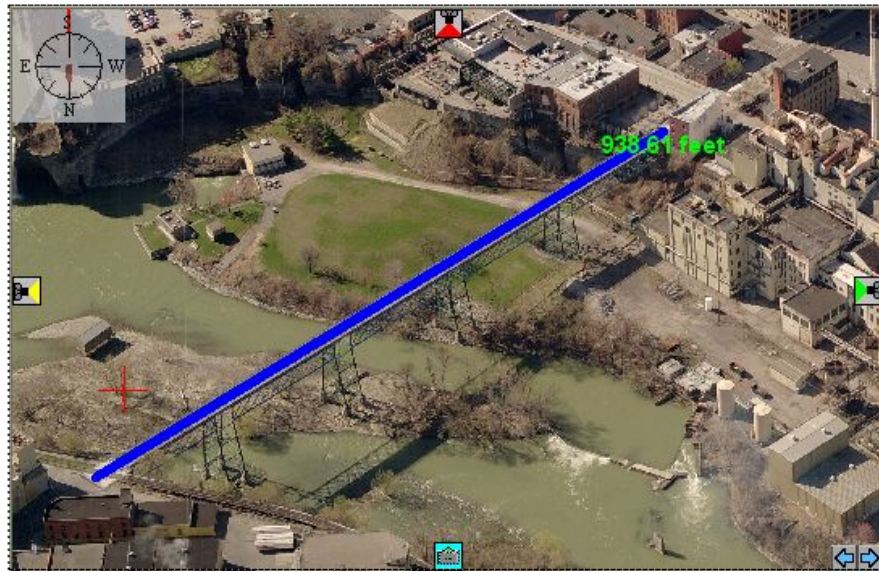
The Walk the Earth feature can be turned on or off. With Walk the Earth turned on, distance measurements more accurately measure the land’s surface than with it turned off. Note the difference in distance measurements between Figures 11-4 and 11-5.

The distance measured is greater with Walk the Earth turned on than with it turned off.



**Figure 11-4:** A distance measurement with Walk the Earth turned on.





**Figure 11-5:** The same distance measurement with Walk the Earth turned off.

### Where does the elevation data come from?

Newer Pictometry images include elevation data as part of the image. You do not have to load elevation files to use the elevation data in newer images.

For images that do not contain elevation data, you'll need to add Pictometry Elevation files (pef extension) to your workspace to use either Walk the Earth or the Elevation Tool. (Be sure to add the PEF files that cover your area.)

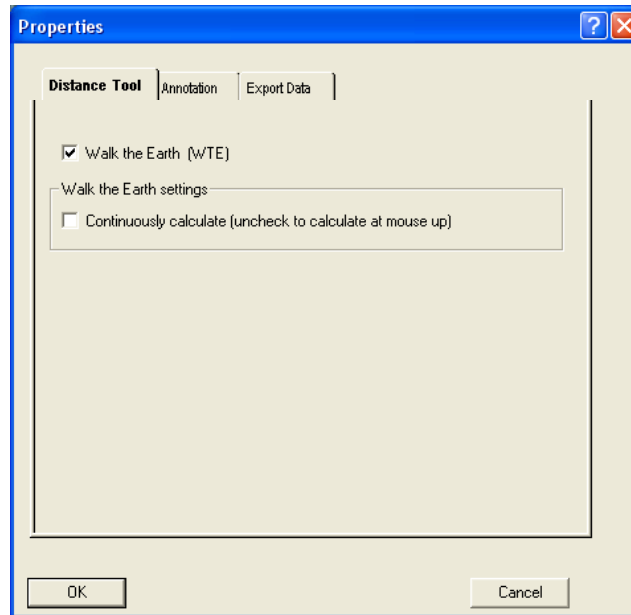
*The procedure for loading PEF files starts on page 206.*

#### ◆ To turn on Walk the Earth:

1. Click the **Distance Tool**.
2. Do *one* of the following:
  - Click the **Tool Properties** button.
  - or —
  - Press **CTRL + P**.
  - or —
  - Choose **Tools⇒Properties**.

The Properties dialog box opens with the Distance Tool tab active.
3. Check the **Walk the Earth (WTE)** box. The Walk the Earth settings area becomes available.





With the Walk the Earth (WTE) box checked, when you use the Distance Tool, the WTE distance appears:

- in the Output window's Tool Info tab,
  - on the Status Bar, and
  - on the image (if the Draw Associated Text option on the Annotation tab is enabled).
4. Check the **Continuously calculate** box if you want the Status Bar to show *WTE distance* as you move the mouse to measure distance. Otherwise, the Status Bar shows *flat-line distance* until you release the mouse button. When you release the mouse button, the Status Bar is updated to show the WTE distance.
  5. Click **OK**. The Properties dialog box closes.

You can now measure distance as you normally would. (See the procedures for measuring distance, starting on page 199.)

## Working above ground level

To be sure your EFS distance measurements (distance, area, height) are accurate, there will be times when you'll need to offset your measurements from the ground (or "ground plane").

EFS also lets you create annotations above the ground plane (at the top of a building, for example).

## What is the ground plane?

The **ground plane** is simply the surface of the Earth, with all its irregularities—hills and valleys (however small). The ground plane's irregularities are accounted for by elevation data.



**Why offset from the ground plane?**

To measure accurately (and place annotations accurately) above the ground in Oblique images, you must use a ground plane offset.

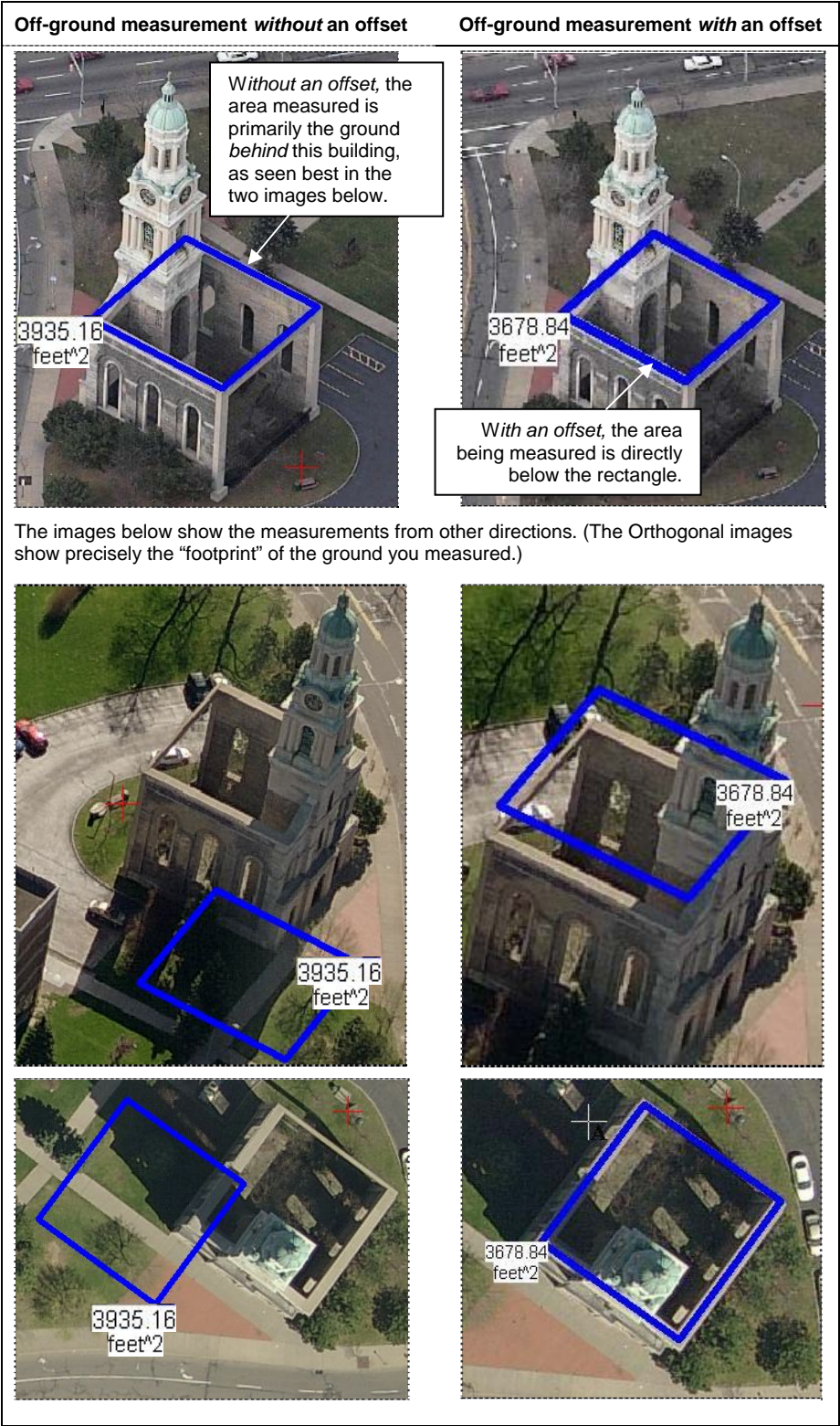
Otherwise, when measuring above ground level in Oblique images, you are really measuring the ground *behind* the item you wish to measure—and factoring in elevation for that nearby ground rather than elevation for the desired area.

Similarly (with no offset), when placing an annotation above ground level in Oblique images, (such as atop an elevated item like a building or tree), you're really placing the annotation on the ground behind the elevated item.

If you measure or annotate above the ground without an offset, and you then view the scene from a different direction, it becomes clear that the measurement (or annotation) was not placed as intended. The outlined measurement (or annotation) seems to have moved. The following example illustrates this problem.

***Example—a raised measurement (with no offset)***

Figure 11-6 shows how you might use the Area Tool (with and without an offset) to measure the area that a flat roof would occupy for a structure.



**Figure 11-6:** An off-ground area measurement with and without an offset.

Just as the measurement appears to move when viewed from different directions, an *annotation* placed above ground without an offset also appears to move.

### Which measurement tools require an offset?

To ensure accuracy, (and so tool output does not appear to move when opening different views), be sure to establish an offset from the ground plane when you use any of the following measurement tools above ground level in an Oblique image:

- Area Tool
- Distance Tool
- Height Tool

### Other tools you can use with a ground plane offset

EFS also lets you create annotations above ground level. By using an offset, you can create an annotation at the top of a building or a tree in an Oblique image, without having that annotation “move” when you view the scene from a different direction.

You can annotate Oblique images above ground level by using an offset with any EFS annotation tool:

- Text Annotation Tool
- Point Annotation Tool
- Line Annotation Tool
- Circle Annotation Tool
- Link Annotation Tool
- Icon Annotation Tool

**Tip:** Another way to place annotations above ground level (so they don't “move”) is to place them on an Ortho image.

### Setting up a ground plane offset

EFS provides an “Offset mode,” during which time you can take accurate measurements (and accurately place annotations) in Oblique images *at a particular distance above the ground*.

When you establish an offset, it's as though you've raised the ground plane up off the ground by the length of the offset. You'll be able to measure and annotate in that raised plane, taking into account the elevation data that corresponds to the location at which you're measuring.

Use the following procedure to establish an offset from the ground plane:

#### ◆ To enter Offset mode:

1. Activate an Oblique view of the desired location. (You can use a Navigation Camera button or a Navigation menu option to do this.)
2. *If not already active*, activate the measurement tool you intend to use. (Click the toolbar button or choose the tool from the Tools menu.)
3. Do *one* of the following:

- On your keyboard, press the “O” key (the letter “O” for “offset”).

**Hint:** You can press the “O” key with or without **CAPS LOCK** or **SHIFT**, but it must be the “O” and not the zero (“0”).

— or —

- Right-click in the Image window, then (from the context menu) select **Set Offset Ground Plane**.

**Note:** If you are already in Offset mode and wish to enter a different offset, select **Set New Offset Ground Plane**.

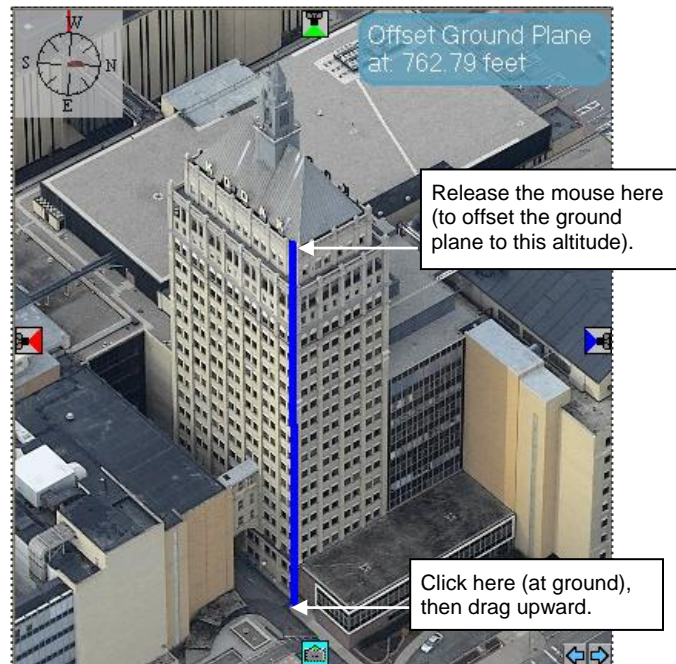
An offset indicator (a blue text bubble) appears in an upper corner of the image, and the cursor changes to the “Offset cursor.”

*The position of the indicator depends on whether the compass is in view.*



4. (As if measuring height), establish an offset by clicking at the ground plane and dragging a line to the altitude at which you want to work.





*While in Offset mode, if you activate a tool that does not require an offset, the indicator (bubble) disappears. It reappears when you activate a tool requiring the offset.*

You can now measure and annotate as you normally would. You can take as many measurements (and create as many annotations) as you like, and you can switch between various measurement and annotation tools. EFS assumes all measurements and annotations are at the height of the line you drew. (Imagine you've raised the ground plane to that level.)

**Hint:** For maximum precision in measuring, switch to an Ortho view of the location where you'll measure. Then if desired, switch back to view your measurement on an Oblique image.

The following image shows an area measurement taken at an offset of 762.79 feet.



When viewing this scene from an Oblique angle, the measurement stays aligned with respect to the top of the building.

### When you are done with the offset ...

When you are done working at the offset altitude, do one of the following:

- To establish a different altitude, repeat the procedure “To enter Offset mode” on page 195.
- or —
- To remove the offset, exit Offset mode. (See the next topic.)

### Removing a ground plane offset

When you’re done measuring and annotating above ground level, exit Offset mode as follows.

#### ◆ To exit Offset mode:

1. If a measurement tool is not already active, activate one.  
The offset indicator appears in the Image window.
2. Do *one* of the following:
  - On your keyboard, press the “G” key.
  - or —
  - Right-click in the Image window, then (from the context menu) select **Turn Off Offset Ground Plane**.

The offset indicator disappears from the Image window. Now all measuring and annotating is assumed to be at ground level.

## Using measurement tools

This section contains procedures for the following:

- using EFS measurement tools.

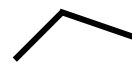
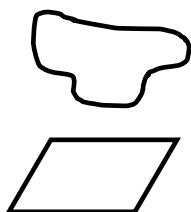
**Tip:** To change the unit of measure in which the result is shown, choose **Edit⇒Change Units**, and select the desired unit of measure. (See page 184 for more detailed instructions.)

- loading elevation files, which is necessary *only* if you have older Pictometry images, non-Pictometry images or maps, or other images that don’t contain elevation data.
- viewing elevation contour lines.

### Options for drawing lines

EFS takes advantage of several keyboard keys that you can use when drawing lines with the Distance and Area Tools. You can:

- Hold down the **ALT** key to draw a freeform line.
- Press (and release) the **V** key to add a vertex (or corner) to your line.
- Hold down the **CTRL** key to draw bounded boxes.



As you follow the procedures described in the next sections of this guide, keep in mind that you can use more than one keyboard key when drawing a line, thus creating a line that is part freeform, part straight, and part angular.

## Measuring distance

Use the Distance Tool to measure any of the following:

- the distance between two points connected by a straight line
- the distance between two points connected by a freeform line
- the cumulative distance of a group of disconnected lines
- the distance between two points when the points are in separate images
- the perimeter of any parallelogram

**Note:** To measure the perimeter of a shape that is not a parallelogram, use the Area Tool first, then the Distance Tool.

**Important:** To accurately measure distance in an Oblique image, you must use a ground plane offset or measure along the ground (along the base of a building rather than along its roofline). To learn about ground plane offsets, see page 192.

### ◆ To measure distance along a straight line:



1. Click the **Distance Tool**.
2. Press and hold the left mouse button on the starting point.

**Note:** To insert a vertex (corner), press (and release) the **V** key.

3. Drag to an ending point and release the mouse button.

The measurement appears on the Status Bar, and a line and text may appear on the image. (See “Choices for drawing tool output” on page 186.)

### ◆ To measure distance along a freeform line:



1. Click the **Distance Tool**.
2. Press and hold the left mouse button on the starting point.
3. *While still depressing the mouse button*, hold down the **ALT** key and drag the mouse pointer along the path you want to measure. (You’ll be able to drag the mouse in any direction.)
4. Release the mouse button at the desired ending point.

The measurement appears on the Status Bar, and a line and text may appear on the image. (See “Choices for drawing tool output” on page 186.)

### ◆ To measure cumulative distance:



1. Click the **Distance Tool**.
2. Press and hold the left mouse button on a line’s starting point.

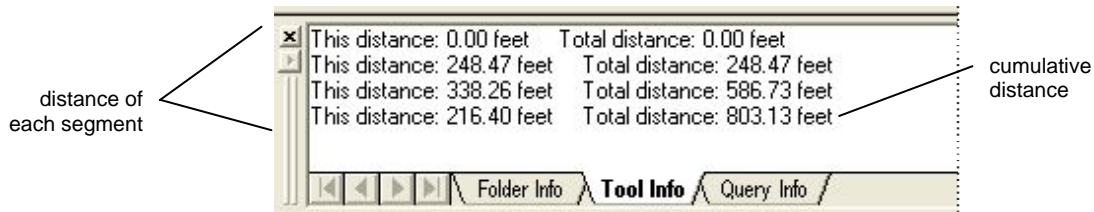
**Note:** To insert a vertex (corner), press (and release) the **V** key. To create a freeform line segment, hold down the **ALT** key.

3. At the end of the line, release the mouse button.
4. Press and hold the **SHIFT** key. This causes EFS to keep track of the total distance.

**Important:** You must keep the **SHIFT** key down through this entire procedure.

5. Repeat Steps 2 and 3 for each line to be measured.
6. When you've reached the end of the last line, release the mouse button and the **SHIFT** key.

The distance of the last line measured appears on the Status Bar. The distance of each line and the cumulative distance appear in the Output window on the Tool Info tab.



Lines and text may appear on the image. (See “Choices for drawing tool output” on page 186.)

### Measuring distances that span images

Use the following procedure to measure the distance between points in separate images.

**Note:** For better performance, turn off the Walk the Earth feature before measuring distances that span images.

#### ◆ To measure distance between points in separate images:

1. Make sure that both images—the one you want to start measuring from and the one you want to stop measuring at—are open in the Image window.
2. Do *one* of the following:
  - If not already on, turn on Workbook Mode. (Choose **View**⇒**Workbook Mode**.)
  - or —
  - Tile the two windows so both are visible at the same time. (Choose **Windows**⇒**Tile Horizontally** or **Tile Vertically**.)
3. Click the **Distance Tool**.
4. In the first image, click the point to start measuring from.
5. (If *Workbook Mode* is turned on), click the tab for the second image. The second image is now in view.
6. Hold down the **P** key and click the ending point on the second image.

**Tip:** To add the Workbook Mode, or Tile Windows (Horiz or Vert) buttons to a toolbar, see “Adding and removing toolbar buttons” in Part IV, Chapter 22.





The measurement appears on the Status Bar, and a line and text may appear on the image. (See “Choices for drawing tool output” on page 186.)

### Measuring perimeter

Use the Distance Tool to measure perimeter—the distance around the outside edge of an object. You can measure the perimeter of any straight-sided shape or any freeform shape.

To measure the perimeter of an object that resembles a parallelogram, you’ll use the Distance Tool and the CTRL key to draw a parallelogram over the object.

To measure the perimeter of a freeform shape or any straight-sided shape *other than a parallelogram*, you’ll use the Distance Tool after using the Area Tool. (Because the Area Tool always closes the shape, you’ll get the most accurate result by using it to outline the perimeter.)

#### ◆ To measure perimeter by using a parallelogram:



1. Click the **Distance Tool**.
2. Starting with one corner of the object, press and hold the left mouse button, then drag a line across one side of the shape. *Don’t release the mouse button.*
3. Press and hold the **CTRL** key, and drag the mouse along an adjacent side. The outline of a parallelogram appears as you drag the mouse.
4. When the parallelogram surrounds the shape you are measuring, release both the **CTRL** key and the mouse button.

The measurement appears on the Status Bar, and a parallelogram and text may appear on the image. (See “Choices for drawing tool output” on page 186.).

#### ◆ To measure the perimeter of a shape other than a parallelogram:



1. Measure the area by using one of the methods described in the topic titled “Measuring area” on page 203.
2. Click the **Distance Tool**.

The perimeter measurement replaces the area measurement on the Status Bar.

### Measuring heights

Use the Height Tool to measure the height of an object in an Oblique image or the area of a building’s facade. Because Orthogonal images are captured straight down, the Height Tool doesn’t apply to them.

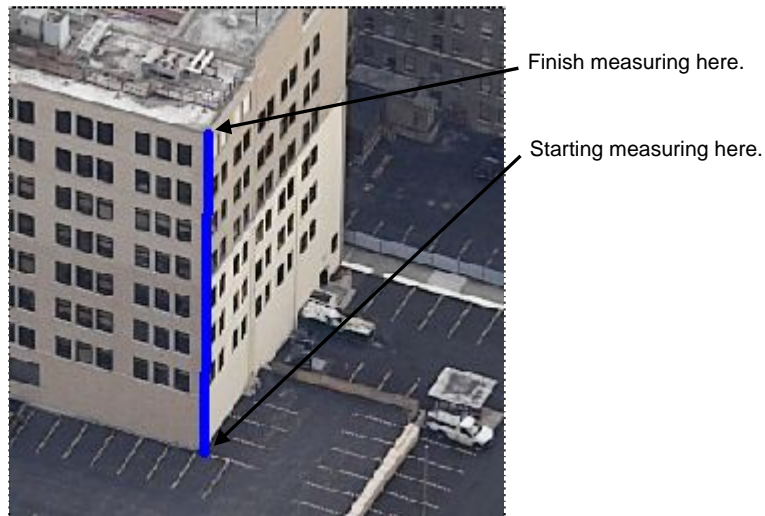
#### ◆ To measure the height of an object:



1. Click the **Height Tool**.
2. Press and hold the left mouse button on a point at the base (where it meets the ground) of the object you want to measure the height of.

EFS draws a plumb line—a true vertical (perpendicular to the ground), which remains plumb if you waver left or right as you drag the mouse.

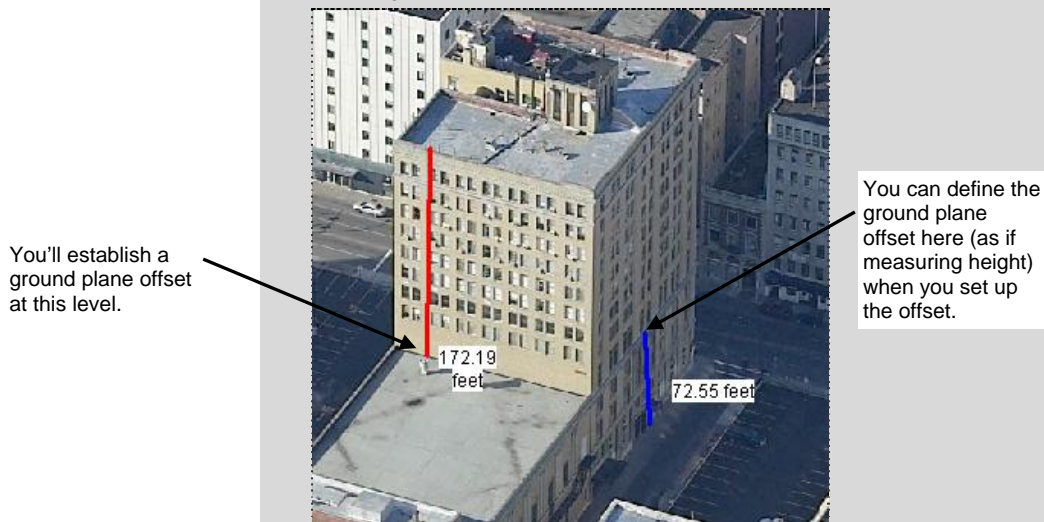
3. Drag the mouse upwards and release it at the ending point.



The measurement appears on the Status Bar, and a line and text may appear on the image. (See “Choices for drawing tool output” on page 186.)

**Important:** If you're not using a ground plane offset, be sure to measure height by *starting at ground level* and moving *upwards*. If you cannot see the ground level starting point, you must estimate its location.

**Tip:** To measure a portion of a building's height when that portion doesn't touch the ground, establish a ground plane offset at the bottom of the portion you wish to measure, then use the Height Tool to measure the height, starting from that point and working up to the roofline. See “Working above ground level” on page 192.





◆ **To measure the area of a building's facade:**

1. Click the **Height Tool**.
2. Press and hold the left mouse button on a point at one corner of the base of the building whose facade you want to measure.
3. Drag the mouse upwards to the building's roof.
4. Press and hold the **CTRL** key, and drag the mouse across the adjacent side (along the roofline). The outline of a parallelogram appears as you drag the mouse.
5. When the parallelogram surrounds the facade you wish to measure, release both the **CTRL** key and the mouse.

The measurement appears on the Status Bar, and a parallelogram and text may appear on the image. (See "Choices for drawing tool output" on page 186.)

**Important:** Unless you've set up a ground plane offset, you must measure facade starting with the base of an object just as if you were measuring the building's height (except that you must start at a corner). Measuring from the top of an object down will not give an accurate result.

## Measuring area

Use the Area Tool to measure the area of an object in an image. You can measure the area of any shape, whether it has curved or straight sides.



◆ **To measure area by using a parallelogram:**

1. Click the **Area Tool**.
2. Starting with one of the corners of the object, press and hold the left mouse button, then drag a line across one side of the shape. *Don't release the mouse button.*
3. Press and hold the **CTRL** key, and drag the mouse along an adjacent side. The outline of a parallelogram appears as you drag the mouse.
4. When the parallelogram surrounds the shape to measure the area of, release both the **CTRL** key and the mouse button.

The measurement appears on the Status Bar, and a parallelogram and text may appear on the image. (See "Choices for drawing tool output" on page 186.)

**Note:** The Tool Info tab of the Output window shows additional measurements.

◆ **To measure the area of any freeform shape:**



1. Click the **Area Tool**.
2. At the desired starting point, press and hold the mouse button and drag the mouse along the outline of the area you wish to measure. Use the following keys to outline the area:
  - To draw any part of the shape that is freeform, press and hold the **ALT** key while dragging the mouse.

- To create a vertex (corner), press (and release) the **V** key, then drag the mouse in the new direction.

**Note:** The results will not be accurate if you cross over your path.

3. When you've outlined the entire area, drag the mouse pointer to meet the starting point, then release the mouse button. The Area Tool automatically completes the polygon, even if you release the mouse button before you return to your starting point.

The measurement appears on the Status Bar, and an outline and text may appear on the image. (See "Choices for drawing tool output" on page 186.)

When Draw Associated Text is checked on the tool's Properties dialog box, the resulting measurement is shown on the image.



**Note:** The Tool Info tab of the Output window shows additional measurements.



◆ **To measure the area of any straight-sided shape:**

1. Click the **Area Tool**.
2. At the desired starting point, press and hold the mouse button and drag a straight line.
3. Press (and release) the **V** key to create a vertex (corner) and drag the next leg.
4. Repeat Step 3 to continue outlining the shape to be measured.
5. When you've outlined the entire perimeter, release the mouse. The Area Tool automatically completes the polygon, even if you release the mouse button before you return to your starting point.

The calculation appears on the Status Bar, and an outline and text may appear on the image. (See "Choices for drawing tool output" on page 186.)

## Measuring elevation

Use the Elevation Tool to measure the elevation (height above sea level) of a point in an image or to measure the difference in elevation between two points.

**Note:** Some images and maps may not contain elevation data. If not, then you must add the associated elevation files to the workspace to be able to measure elevation. See “Loading elevation files” on page 206.

### ◆ To measure the elevation of a point:



- Click the **Elevation Tool**, then click the point you want to measure.

The measurement appears on the Status Bar, and a point and text may appear on the image. (See “Choices for drawing tool output” on page 186.)

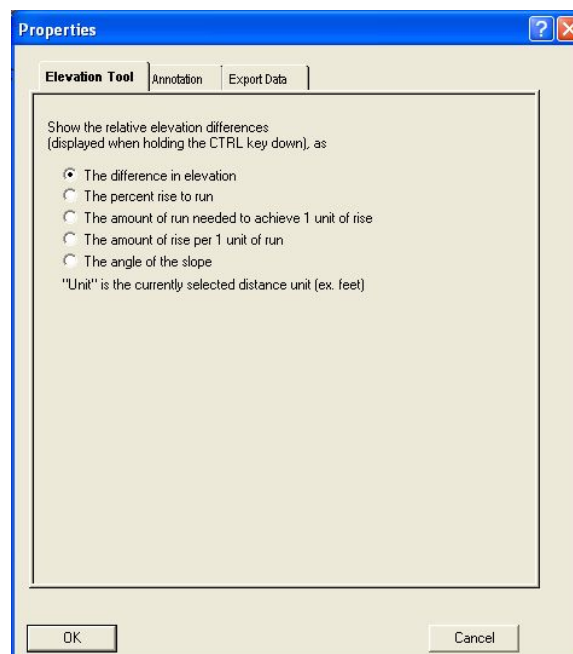
Use the following procedure to measure the difference in elevation between two points, as well as various other differential elevation calculations, such as the angle of the slope and percent rise to run.

### ◆ To measure the differential elevation:



- Click the **Elevation Tool**.
- Do *one* of the following:
  - Click the **Tool Properties** button.
  - or —
  - Press **CTRL + P**.
  - or —
  - Choose **Tools**⇒**Properties**.

The Properties dialog box opens with the Elevation Tool tab active.



3. Click the button that indicates which calculation you want shown in the Status Bar, then click **OK**.
  4. Press and hold the left mouse button on the starting point.
- Note:** If your starting point has a higher elevation than your ending point, the difference will be negative.
5. While still holding the mouse button, hold down the **CTRL** key and drag to the ending point.
  6. Release the mouse button at the desired ending point, then release the **CTRL** key.

The measurement appears on the Status Bar, and a point and text may appear on the image. (See “Choices for drawing tool output” on page 186.)

### Loading elevation files

*You don't need to load PEF files for newer Orthogonal images, which have elevation data integrated as part of the image, in the form of an “elevation trailer.”*

If you have images or maps without elevation data, you need to load Pictometry Elevation files (PEF files) into your workspace in order to use the Elevation Tool and the Walk the Earth feature.

You can load and use the following types of elevation data files in EFS:

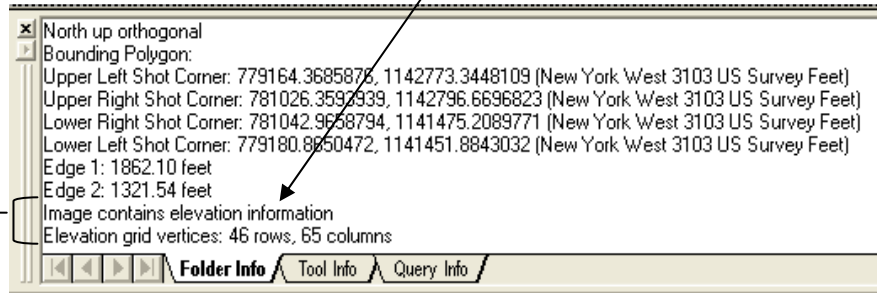
- USGS Digital Elevation Files (DEM files)
- Pictometry Elevation Files (PEF files)

**Note:** To increase search speed, DEM files are converted to PEF files when they are loaded. It takes several minutes to load a DEM file.

### How do I know if my images and maps have elevation data?

To see if an image or map has elevation data, you'll need to look for an elevation trailer. Open the image, then view its properties in the Folder Info tab of the Output window. If the image has an elevation trailer, you'll see two lines that look something like this within the image property data:

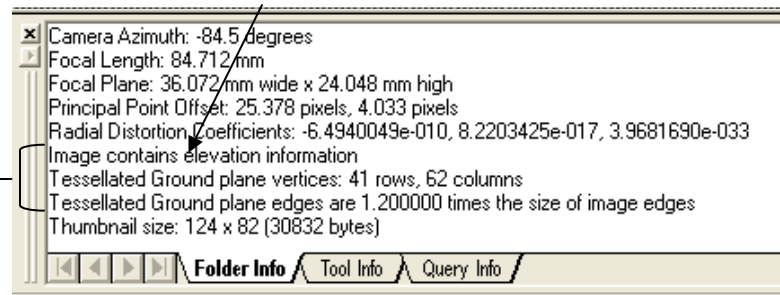
Indicates that this map image has elevation data.





Use the same method to check whether an Oblique image has elevation data. For Oblique images, elevation data is in the form of a TGP (Tessellated Ground Plane). Within the image property data, you'll see three lines that look something like this:

Indicates that this Oblique image has elevation data.



#### ◆ To load elevation files:

1. Choose **Workspace**⇒**Add Entire Directory of Data**. The Open dialog box opens.

**Note:** Elevation files are found in the DEMs folder of the Image Library.

2. From the Open dialog box, navigate to the DEMs folder.
3. In the Files of Type box, select **Elevation Files (\*.PEF)**. (The file you select must have an extension of “pef”.)
4. Select the first PEF file listed.
5. Click **Open**. All of the elevation files are now loaded into your workspace.

## Measuring bearing and angles

You can use the Bearing Tool to measure either:

- the bearing of an object (typically a road) relative to True North, or
- the angle formed by any object in an image.

#### ◆ To measure bearing:



1. Click the **Bearing Tool**.
2. Press and hold the left mouse button on the starting point. (See “Where you start drawing the line is important.”)

**Tip:** The starting point and ending point are important when measuring bearing. The illustrations in Figures 11-7 and 11-8 below show why.

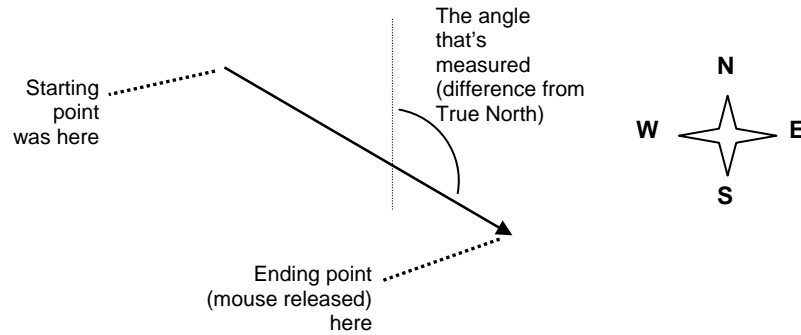
3. Drag the mouse pointer to an ending point in the direction you want to measure the bearing of. Then release the mouse button.

The measurement appears on the Status Bar, and a line and text may appear on the image. (See “Choices for drawing tool output” on page 186.)

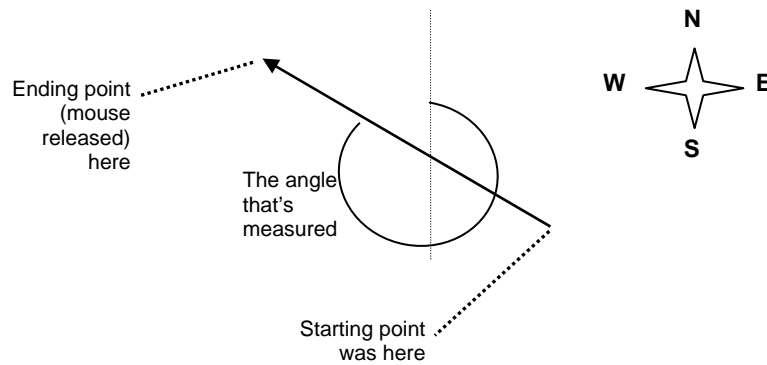
### Where you start drawing the line is important

When measuring the bearing of an object, the direction in which you drag the mouse affects the bearing. Start drawing the line and drag

the mouse in the direction for which you want to measure bearing. See Figures 11-7 and 11-8.



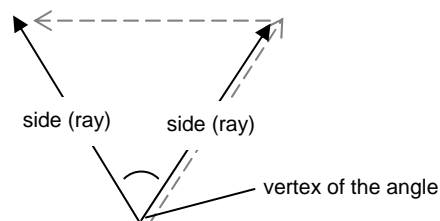
**Figure 11-7:** The line in this example has a different bearing than the line in Figure 11-8.



**Figure 11-8:** The line in this example has a different bearing than the line in Figure 11-7.

### Measuring angles

You can use the Bearing Tool to measure the angle of an object. When using the Bearing Tool to measure an angle, you'll start at the vertex, "tracing" one side of the angle. Then you'll press and hold the CTRL key while moving toward the "arrow end" of the other side.



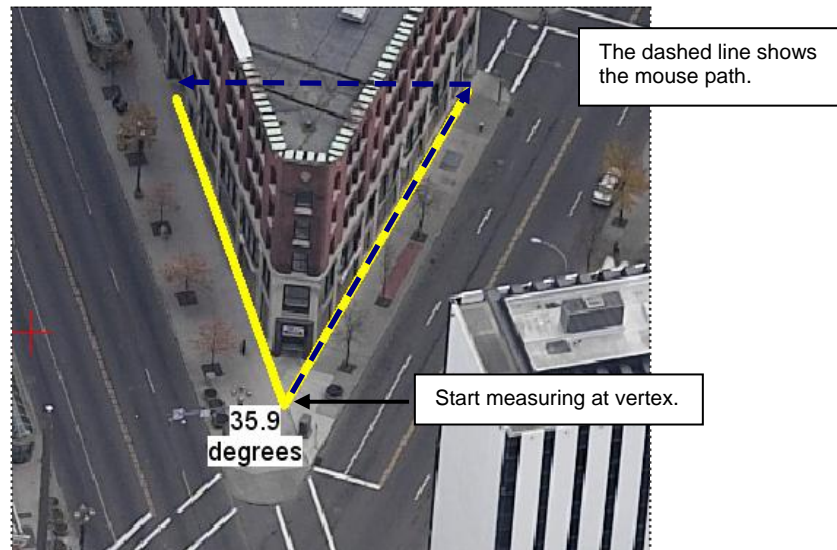
**Figure 11-9:** The path for measuring angles in EFS.



◆ **To determine the angle of an object:**



1. Click the **Bearing Tool**.
2. Press and hold the left mouse button on the point you want to be the vertex of the angle. Drag a line from the vertex along one side (ray) of the angle.
3. Press and hold the **CTRL** key, then drag the mouse pointer away from the first side to place the second side (ray) of the angle. Release the mouse button and the **CTRL** key.



The measurement appears on the Status Bar, and the angle and text may appear on the image. (See “Choices for drawing tool output” on page 186.)

## Viewing an object's coordinates

Use the Location Tool to determine the location (the coordinates of) of an object in an image.

◆ **To determine the location of an object:**



1. Click the **Location Tool**.
2. Click the desired location on the map or image.

The point's coordinates appear in the Status Bar, and a point and text may appear on the image.

### Notes & Tips:

For Oblique images, remember to click near the base of buildings for more accurate coordinates.

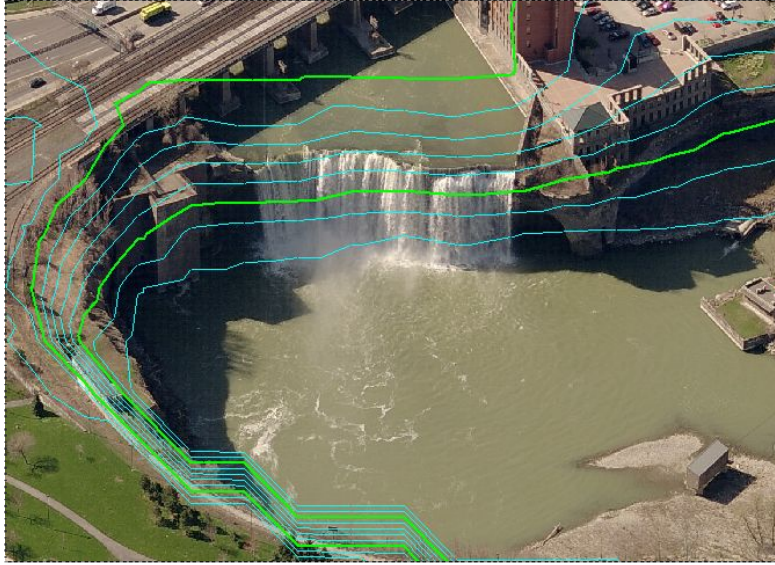
To change the coordinate system, see “Changing the coordinate system” on page 185.

To locate an object using its coordinates, see “Searching by entering GPS coordinates” in Part I, Chapter 6.

## Viewing elevation contour lines

EFS lets you overlay Neighborhood and Community images with topographical maps, or “contour lines,” which indicate zones of elevation.

Figure 11-10 shows an image with contour lines.



**Figure 11-10:** Elevation contour lines displayed on an image.

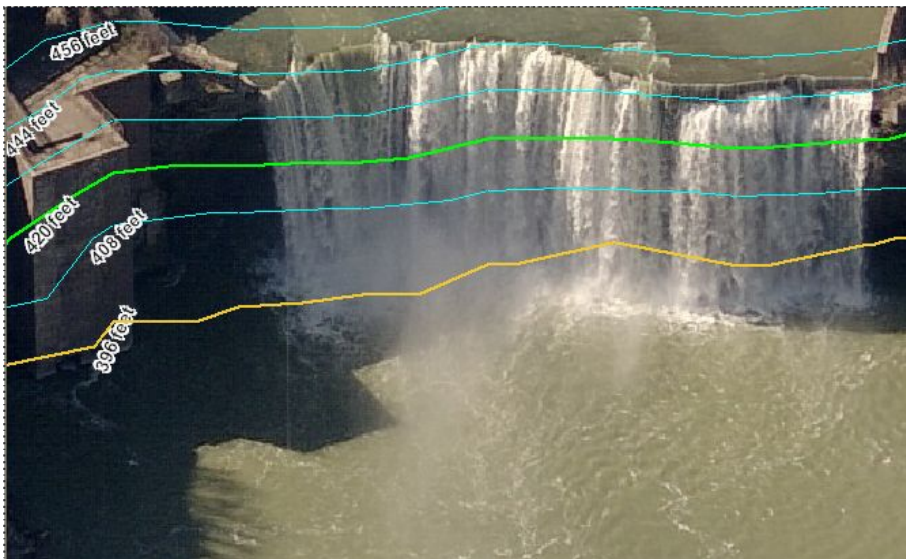
### Viewing contour lines on the active image

Contour lines are available if the active image contains elevation data or if the workspace contains PEF files.

#### ◆ To view contour lines:

- Choose **Overlays**⇒**View Contour Lines**.

Contour lines appear on the active image.

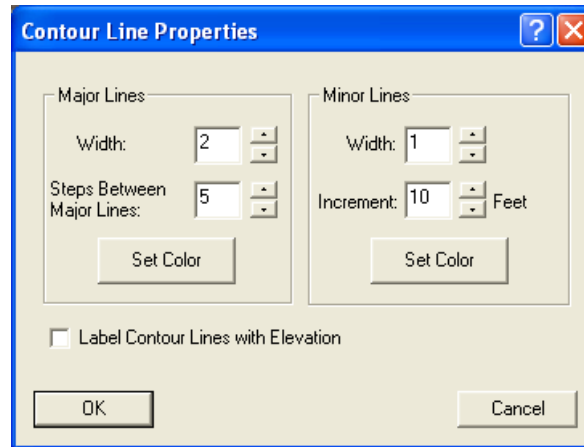


## Changing contour line properties

### ◆ To change contour line properties:

1. Choose **Overlays**⇒**Contour Line Properties**.

The Contour Line Properties dialog box opens.



2. Select the desired properties according to the following table:

Property ...	Description ...
(major line) Width	The width (in points) of the major contour lines.
Steps Between Major Lines	The number of minor lines that appear between major lines.
(major line) Color	The color of the major contour lines. Click <b>Set Color</b> to choose a Basic color or to create a Custom color.
(minor line) Width	The width (in points) of the minor contour lines.
Increment	The difference in elevation from one line to the next.
(minor line) Color	The color of the minor contour lines. Click <b>Set Color</b> to choose a Basic color or to create a Custom color.
Label Contour Lines with Elevation	A checkbox that indicates whether an elevation value should be displayed on each contour line.

3. When you are done changing properties, click **OK**.

The Contour Line Properties dialog box closes and the contour lines are redrawn with their new properties.

## Using the Select Tool while viewing contour lines

While viewing contour lines, if you want to know the elevation associated with a specific line, you can use the Select Tool, as follows:

### ◆ To view a contour line's elevation:

1. (While viewing contour line), click the **Select Tool**.

The Select Tool becomes active.

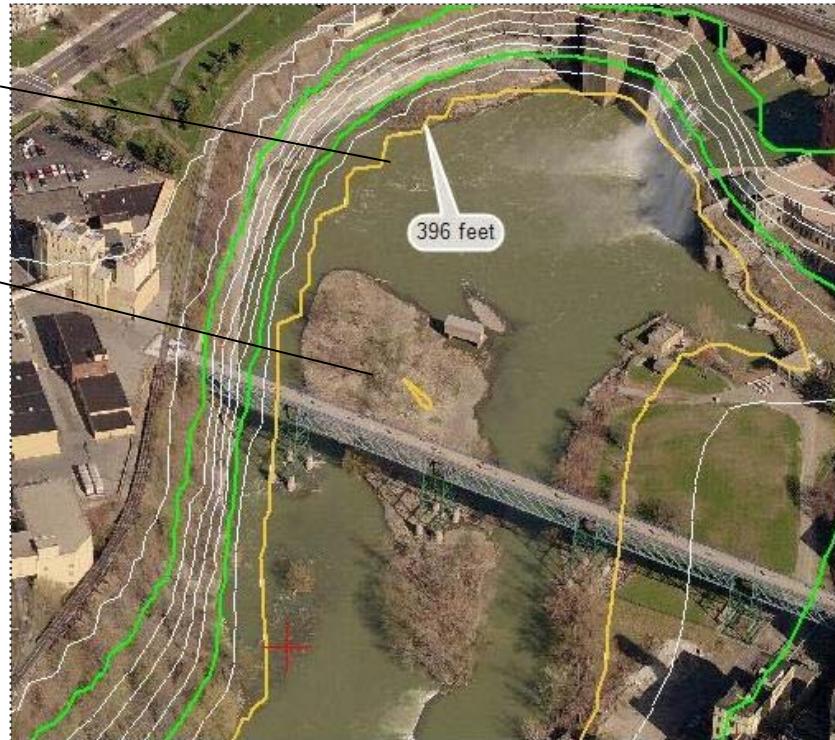
2. Click near any contour line whose elevation value you want to see.

*The Elevation Tool lets you view elevation values anywhere on the active image.*



The contour line you clicked is highlighted and labeled with elevation.

Another contour line at the same elevation is also highlighted.



The contour line is highlighted in yellow (along with any other contour line that has the same elevation), and its elevation is displayed on the image, at the point you clicked.

# Chapter 12 — Creating Annotations

Often when you are working with images, especially for planning or reporting, it is helpful to mark up (annotate) the images. This chapter introduces the annotation features of EFS and describes how to create different kinds of annotations on your images.

## Topics covered in this chapter ... page

Overview .....	213
Annotation layers .....	215
Creating annotations .....	221

## Overview

EFS lets you annotate images with text, lines, circles, points, links, or icons. You might use annotations to identify a staging area for emergency planning and management, or to describe the parts of an image for presentation purposes.

### Annotations are overlays

Annotations don't change the images themselves; they simply overlay them. Because you use the mouse to indicate where on the image the annotation should be placed, EFS can store that location as part of the annotation. You then have the option of viewing the annotation on any image that contains the same location. (See "Global and local annotations" on page 215.)

**Note:** Annotations can be placed on the ground or above the ground. In Oblique images, if you place them above the ground (the roof of a building, for example), you should use the offset ground plane feature, so an annotation's coordinates accurately reflect the location of the ground directly beneath it. See "Working above ground level" in Chapter 11 for more information about offsetting the ground plane.

You'll use the annotation tools on the toolbar to create annotations.

### Another way to annotate an image

In addition to creating annotations with annotations tools, when you use a measurement tool like the Distance Tool, you can save the resulting lines or points as an annotation. In this guide, the name used for the lines and points that result from the use of a tool is "Tool Output."

### Several kinds of annotations

EFS can display several kinds of annotations:



- **GIS annotations** — geo-referenced vector and alphanumeric data from GIS systems.
- **ALOHA (Areal Locations of Hazardous Atmospheres) annotations** — a specific type of annotation created by the ALOHA program and used by emergency personnel.
- **User-defined annotations** — the text, lines, circles, points, icons, and links you draw or place on images.

This chapter covers only user-defined annotations. GIS annotations are covered in Part III, “Using EFS with GIS Data.” ALOHA annotations are covered in Appendix C.

This guide uses the term “annotations” to refer to user-defined annotations only.

## Types of user-defined annotations

You can annotate an image in various ways. You can add text, lines, circles, points, icons, or links.

### *Text*

You might use *Text* when you want to add comments or when words are the best way to label something in an image. (See “The Text Annotation Tool” on page 222.)

### *Lines*

*Lines* are good for outlining areas, highlighting roads, pointing at objects, designating paths or routes, or pointing to an object to which a text note might apply. To draw lines, you simply drag the mouse over the image. (See “The Line Annotation Tool” on page 225.)

### *Circles*

*Circles* are also used for outlining areas. To draw a circle you click the image where the center of the circle should be and drag the mouse to indicate the circle’s radius. (See “The Circle Annotation Tool” on page 229.)

### *Points*

When you need to mark specific spots in an image (such as the location of lampposts, fire hydrants, or locations where trees should be planted), you can use the *Point* annotation feature to do it. You simply click on every location you need to mark, and a colored dot appears where you clicked. (See “The Point Annotation Tool” on page 230.)

### *Icons*

Sometimes pictures are the easiest way to communicate something. If so, you might use *icons* as an alternative to text. As with Point annotations, you simply click a point in an image at which to place the icon. (See “The Icon Annotation Tool” on page 232.)

### Links

If you have a file (document, spreadsheet, or any viewable file) that contains information related to something in an image, you can link that file to a point in an image with the *Link* annotation feature. When you create a link annotation, EFS places an icon representing the linked file on the image at the point you specified. Because EFS stores the path to the file, you can double-click the icon to open the linked file. (See “The Link Annotation Tool” on page 237.)

## Annotation properties

Annotations have characteristics—called “properties” or “attributes” in EFS. Properties specify characteristics such as the font type, color, size, and location. Annotation properties are covered on page 216.

## Where are annotations stored?

Annotations are stored in workspaces. All of the information needed to display the annotation on an image (its properties, its coordinates, the path to linked files for link annotations) is saved as part of the annotation. When you create annotations, EFS automatically puts them into the active workspace.

**Note:** You must save the active workspace in order to save any new or changed annotations.

## Global and local annotations

All annotations are categorized as either global or local. You designate a user-defined annotation as global or local when you create the annotation. (Global is the default.)

A **local annotation** is associated with and is shown on only one image (the one that is active when you create the annotation).

A **global annotation** is shown on every image in the Image Warehouse that contains the same coordinates as the annotation.

*GIS and ALOHA annotations are always global.*

## Annotation layers

*The words “characteristics,” “properties,” and “attributes” are used interchangeably when referring to annotations and annotation layers.*

A user-defined **annotation layer** is a set of annotation characteristics (such as font size, line width, and line color) and the associated collection of annotations.

When you create an annotation, you can select a layer from which that annotation will “inherit” its characteristics. (If you don’t have any layers to select, EFS creates a default layer for you.) Associating annotations with layers allows you to define a set of common characteristics for a group of annotations, and it saves you the trouble of defining those characteristics each time you create an annotation. By changing a layer’s characteristics, you can quickly change the appearance of all annotations associated with that layer.

**Note:** You can customize one or more of an annotation's attributes, thus overriding the automatic inheritance of characteristics for those attributes. The method of overriding a layer's attributes is covered in each of the procedures for creating annotations. See "Creating annotations" on page 221.

All user-defined annotations (including local annotations) are associated with an annotation layer.

You can add annotation layers to a workspace when it is active.

**Note:** If you have no layers in your active workspace when you create an annotation, EFS creates a default layer for you.

Annotations and annotation layers can be changed, deleted, or exported to shapefiles. See Part IV, Chapter 19.

### The Workspace window lists annotations and layers

The names of annotations and layers are listed in the Workspace window. Global annotations are listed under the annotation layer from which they inherit their characteristics. Local annotations are listed under the image file to which they pertain.

**Tip:** You can easily find out which annotation layer a local annotation is associated with by right-clicking the annotation and choosing **Properties for <annotation name>** from the context menu. On the annotation's Properties dialog box (Adv. Attributes tab), the Layer field shows which layer the annotation inherits characteristics from.

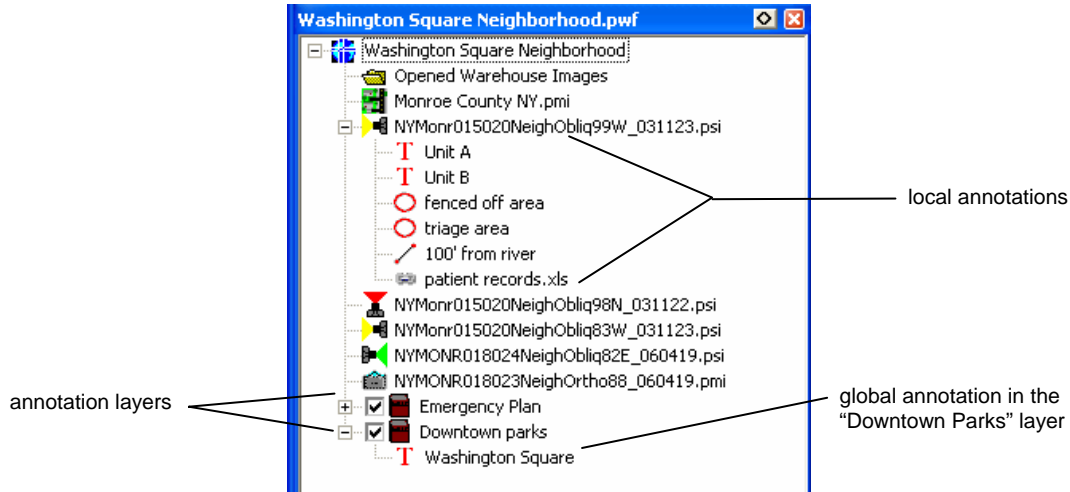


Figure 12-1: The Workspace window showing annotations.

### Annotation and annotation layer properties

As stated earlier, annotations and the layers they are associated with each have properties. Properties control the appearance of the annotations, criteria for viewing them, and whether they can be viewed on only one image or all related images.



Annotation and layer properties have default values, which you can change when you create or edit the annotation or layer. You change them on the annotation's or layer's properties dialog box. (See "Changing layer properties" on page 220, and "Changing annotations" in Chapter 13.)

Table 12-1 lists the properties that can be set when you create an annotation layer. The properties for the layer pertain to all annotations associated with that layer.

**Table 12-1:** Annotation layer properties (also apply to annotations).

Annotations contain additional properties not shown here.

Property	Description
Font (font, style, size)	The typeface, style (bold, italics, regular), and font size for text annotations. <i>Applies only to text annotations.</i>
Lines	<p>Line Width — The line width for lines and circles. Two, three, or four are good choices for width.</p> <p>Walk the Earth — When this option is checked, the lines you draw depict differences in elevation (if you have elevation data).</p>
Locale	<p>For annotations, you choose only one of the following options.</p> <p>Local — When this option is selected, the annotation applies to the active image only.</p> <p>Global — When this option is selected, the annotation applies to all images in the warehouse with the same geographic coordinates as the annotation.</p> <p><i>This property is not available when creating an annotation layer.</i></p>
Scaling of Line Width or Font Size	<p>Indicates how an annotation should be scaled when you change the magnification of the image. You choose only one option.</p> <ul style="list-style-type: none"> <li>Don't Scale – don't scale the line width and font size when changing the magnification of an image.</li> <li>Scale by Zoom Factor – scale the line width and font size to the same magnification percentage as the image.</li> <li>Scale by GSD – scale the line width and font size to the same ground sample distance as the image. This option is recommended.</li> </ul> <p><i>Applies to text, line, circle, and icon annotations only. See "Scalable annotations" in Chapter 13.</i></p>
Colors	If you want to select a color for text and graphic annotations, click the arrow to open a drop-down color chart.
Background: Transparent Background	<p>Check Transparent Background if you want the text background to be transparent for annotations in this layer.</p> <p>Keep Transparent Background <i>unchecked</i> if you want the text annotation to have a colored background when placed over the image.</p> <p>If you want a background color other than the default (white), select the color from the drop-down color chart.</p> <p><i>Applies to text annotations only.</i></p>
Max View GSD	<p>If you chose Scale by GSD, enter the maximum GSD at which annotations should become visible on the screen when changing the magnification. When you <i>zoom out</i> above the maximum, annotations in this layer disappear from view.</p> <p><i>This property is not available when creating an annotation. See "Max View and Min View thresholds" in Chapter 13.</i></p>
Min View GSD	<p>If you chose Scale by GSD, enter the minimum GSD at which annotations should become visible on the screen when changing the magnification. When you <i>zoom in</i> below the minimum, annotations in this layer disappear from view.</p> <p><i>This property is not available when creating an annotation.</i></p>

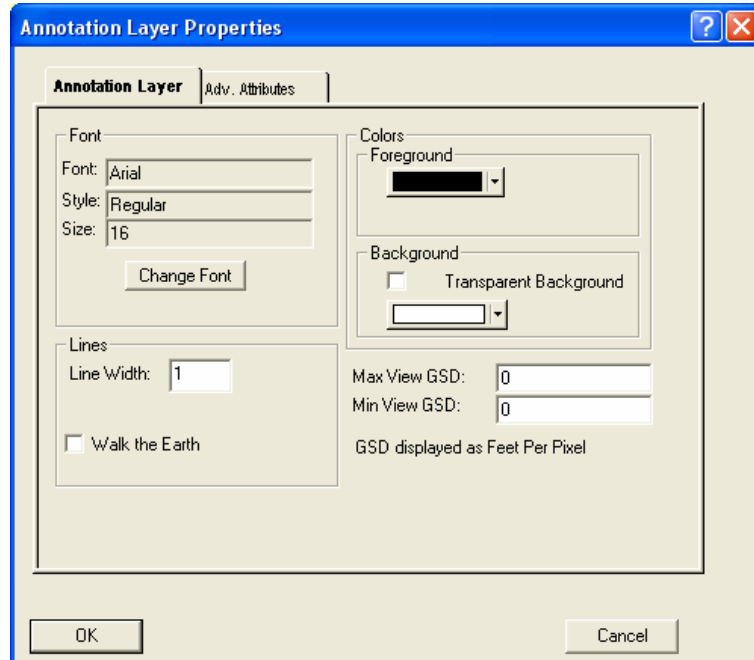
## Creating an annotation layer

Use the following procedure to create an annotation layer if you prefer to set up the layer's attributes *before* creating annotations.

◆ **To create an annotation layer:**

1. Choose **Annotate**⇒**Create New Annotation Layer**. The Annotation Layer Properties dialog box opens.

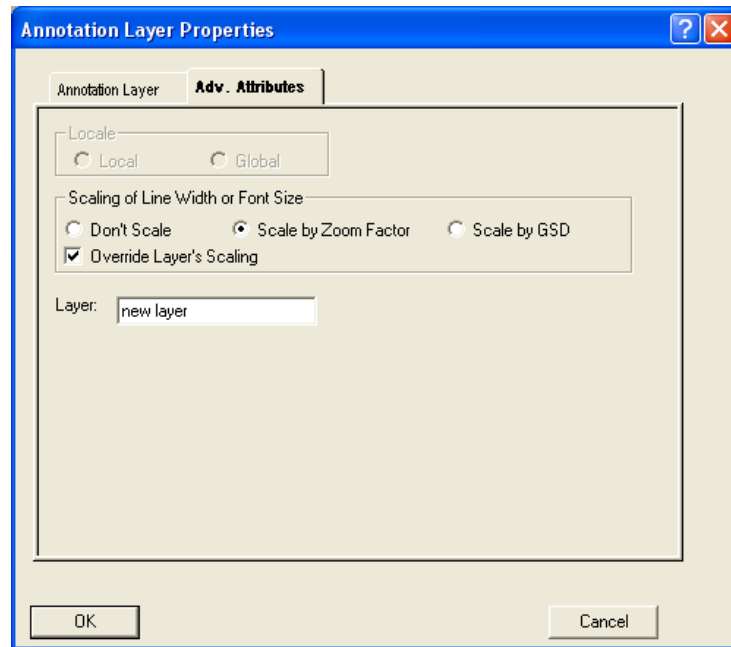
To add the Create Annotation Layer button to a toolbar, see "Adding and removing toolbar buttons" in Part IV, Chapter 22.



2. Change any options as desired, using Table 12-1 as a guide. (Users typically customize the font, colors, line width, and background and accept the defaults for other options.)

**Note:** For more information about Max View and Min View GSD options, see "Thresholds for viewing annotations," in Chapter 13.

3. Click the **Adv. Attributes** tab.



4. In the Layer box, type a name for the annotation layer. If desired, change the Line Width or Font Size scaling. (Use Table 12-1 as a guide.)

**Note:** For more information about scaling annotations, see “Three ways to scale” in Chapter 13.

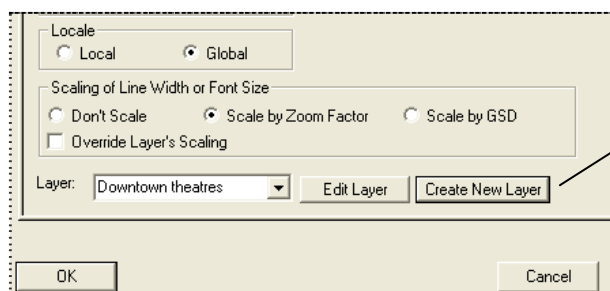
5. Click **OK**. The layer name appears in the Workspace window.

### Creating a layer when creating an annotation

If you are using an annotation tool that is set to “Prompt for attributes,” you can create a new annotation layer while creating an annotation. You might do this if you don’t want to use an existing layer. (See “Defining attributes for lines, points, and circles,” on page 223.)

#### ◆ To create a layer when creating an annotation:

1. Click the desired annotation tool, and begin creating your annotation. The properties dialog box appears.
2. Click the **Adv. Attributes** tab.



3. Click **Create New Layer**. The Annotation Layer Properties dialog box opens.

4. Assign the attributes for the layer as described in Steps 2 – 4 of the procedure for creating an annotation layer (on page 218).
5. On the Annotation Layer Properties dialog box, click **OK**. The layer name appears in the Workspace window and in the Layer box on the Adv. Attributes tab of the annotation's properties dialog box.  
Your annotation will be assigned to the new layer you just created.
6. Continue creating the annotation.

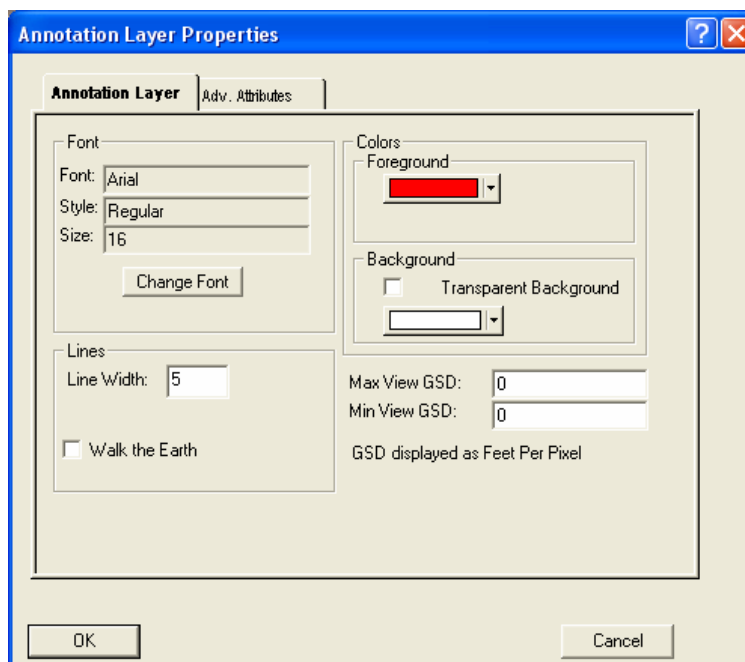
## Changing layer properties

You can change an annotation layer at any time. Your changes affect all annotations that are associated with that layer. (If you're changing only the layer's name, use the procedure on page 221.)

### ◆ To change a layer's properties:

1. Do *one* of the following:
  - In the Workspace window, double-click the annotation layer to be edited.
  - or —
  - In the Workspace window, right-click the layer to be edited, and select **Properties for <annotation name>** from the context menu.
  - or —
  - Select the layer in the Workspace window, and choose **Edit⇒Edit Properties**.

The Annotation Layer Properties dialog box opens.



*You may have to click the Adv. Attributes tab to change some of the attributes.*

2. Change the layer's attributes as desired.

**Note:** You can also change the layer's name. (Click the **Adv. Attributes** tab.)

3. Click **OK**.

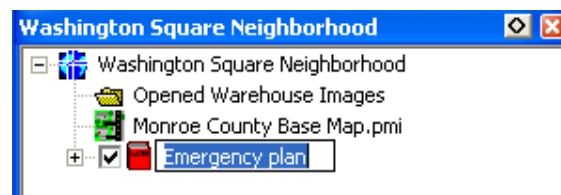
The Annotation Layer Properties dialog box closes and the changes you made are visible on any annotation that uses the changed layer's properties.

## Renaming an annotation or an annotation layer

Use the following procedure to rename an annotation or annotation layer by typing a new name in the Workspace window.

### ◆ To rename an annotation or an annotation layer:

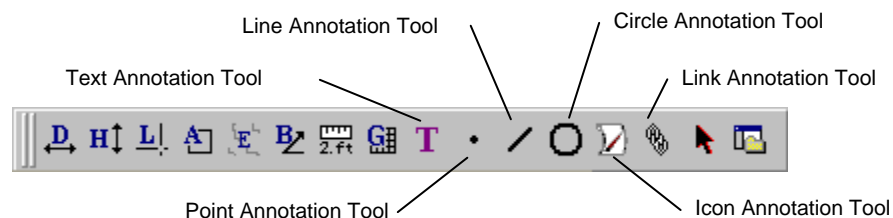
1. Select the name of the annotation or layer in the workspace.
2. Select it again. (Do not double-click the annotation or layer name.)  
The name is surrounded by a black box and a blinking cursor appears at the end of the name.



3. Type the new name or change the name as desired.
4. Press **ENTER** or click somewhere other than on the name of the annotation.

## Creating annotations

To create annotations you'll use the annotation tools found on the toolbar.



**Figure 12-2:** The annotation tools on the toolbar.

**For annotations placed above ground:** Annotations can be placed on the ground or above the ground. In Oblique images, if you place them above the ground (the roof of a building, for example), you should use the offset ground plane feature, so an annotation's coordinates accurately reflect the location of the ground directly beneath it. See "Working above ground level" in Chapter 11 for more information about offsetting the ground plane.

## The Text Annotation Tool

The Text Annotation Tool places text on the image in the format you choose (normal or balloon). You'll choose the format when you create the annotation.



**Figure 12-3:** Text in normal format (on the left) and balloon format (right).

### ◆ To annotate an image with text:



1. Click the **Text Annotation Tool**.
2. Click the point on the image where you want to add text. The Text Annotation Properties dialog box opens to the Text Annotation tab.

3. In the Text box, type the text you want to add.
4. (Optional) Change the options for Text Alignment, Show as, and Location.
5. (Optional) Click the **Attributes** tab and change attributes as desired. The Override box is automatically checked for any attribute you change. (The default attributes come from the annotation layer whose name appears in the Layer box on the Adv. Attributes tab.)

**Note:** The Layer box shows the last layer used, or if you have no layers in your workspace, it shows the Default Layer that EFS creates for you.

6. (Optional) To use an existing layer other than the one shown, click the **Adv. Attributes** tab, open the Layer drop-down list, and select a different annotation layer. The attributes change accordingly.
7. (Optional) To create a new layer to assign this annotation to, click **Create New Layer**, assign the layer's attributes as described in Steps 2 – 4 of the procedure on page 218, and click **OK**.
8. Click the desired Locale:
  - **Local** – to apply the annotation to the active image only,
  - or –
  - **Global** – to apply the annotation to all images in the warehouse with the same geographic coordinates as the annotation.
9. Click **OK**. The annotation is placed on the image in the appropriate location and its name appears in your workspace.

**Note:** If you want to save a *local* annotation, you must add the image it annotates to the workspace, then save the workspace. (See “Adding images to a workspace” in Part IV, Chapter 21.) To save *any* annotation, whether global or local, you must save the workspace.

## Defining attributes for lines, points, and circles

Annotation properties are listed in Table 12-1 on page 217.

The annotation properties users change most often are the color, line or point width, and locale (global vs. local). EFS provides three methods for assigning these and other properties to line, point, and circle annotations. You can:

- be prompted to specify the attributes,
- use the attributes from an annotation layer, or
- define the attributes on a per-tool basis.

The first option lets you choose properties each time you create an annotation; the last two options may save time when creating annotations. These options apply *only* to the Line, Point, and Circle Annotation Tools. You can select the options for each tool independently.

**Note:** For text, icon, and link annotations you must be prompted to specify the attributes when creating the annotation because they have properties you need to select or enter (such as text when creating a text annotation).

Before using the Line, Point, or Circle Annotation Tools, you might want to set up the tool with your preferences.

### Prompt for attributes

If a tool is set with this option, each time you use the tool, EFS prompts you for attributes.

### Use layer attributes

If you choose this option for a tool, any annotation you create with that tool inherits its properties from the layer to which it belongs. When you create an annotation, the Properties dialog box won't appear, thus saving you time.

### Define attributes on a per-tool basis

You can define the color, width, and locale for the Line, Point, or Circle Annotation Tools individually. Your choices will be used every time you use the tool.

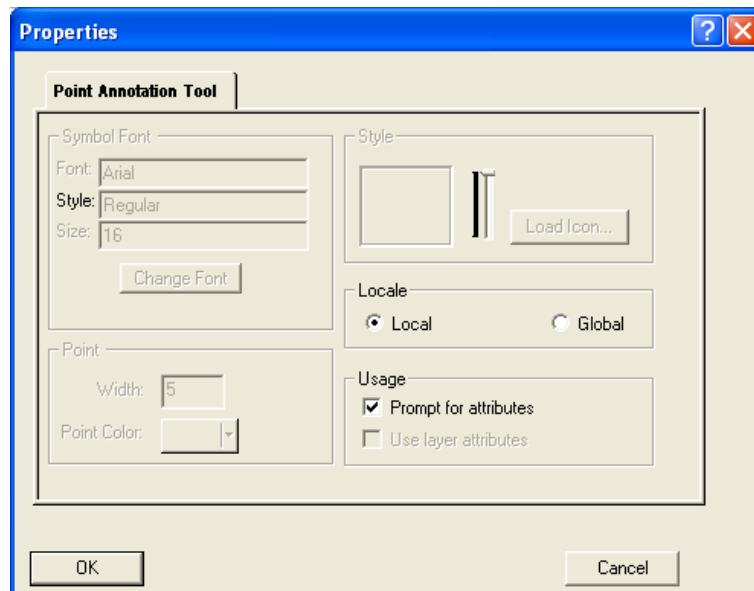
#### ◆ To choose a method for assigning attributes:

1. Click the annotation tool (**Point**, **Line**, or **Circle**) you want to set up.
2. Do *one* of the following:
  - Click the **Tool Properties** button.
  - or —
  - Choose **Tools**⇒**Properties**.



The Properties dialog box appears.

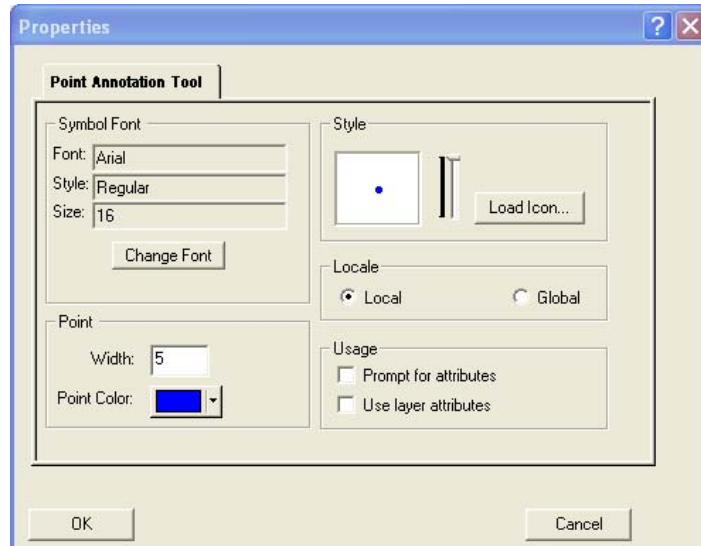
*This example shows the Properties dialog box for the Point Annotation Tool. The dialog boxes for the Line and Circle Annotation Tools will vary slightly.*



3. (for the Line Annotation Tool only) Click the **Attributes** tab.
4. Decide how to define attributes for the annotation. Do *one* of the following:
  - To be prompted for the annotation's attributes every time you use the tool, check **Prompt for attributes**.
  - or —



- To use the attributes from an existing annotation layer, *uncheck Prompt for attributes*, and check **Use layer attributes**.
- or —
- To define the color, width, and locale to be applied to all annotations for this tool:
  - Make sure that *both Use layer attributes and Prompt for attributes* are *unchecked*.



- Enter a (line or point) width. (2, 3, and 4 are good choices.)
- Select a color from the drop-down color chart.
- (for the *Point Annotation Tool* only) To annotate with font symbols, use the **Style** slider to choose a symbol, and click **Change Font** to choose different font fields.
- (for the *Point Annotation Tool* only) To annotate with icons, use the **Style** slider to choose an icon (or click **Load Icon** for additional icon choices.
- Choose a Locale. Check **Local** if you want annotations to apply only to the active image, or **Global** if you want annotations to apply to all images in the warehouse with the same geographic coordinates.

5. Click **OK**.

The Properties dialog box closes, and the method you selected or the properties you assigned will remain until you change them again. If you assigned attributes (color, width, locale), they will be used each time you use the annotation tool.

## The Line Annotation Tool



You'll use the Line Annotation Tool to add lines to your images. Line annotations can be helpful for outlining areas, highlighting roads, pointing at objects, designating paths or routes, or pointing to an object to which a

text note might apply. Lines can be straight or freeform, can contain vertices, and can contain many straight or freeform segments.



**Figure 12-4:** A freeform line, a straight line, and a line with 2 vertices and 3 segments.

### Options for drawing lines

EFS takes advantage of several keyboard keys that you can use when drawing lines with the Line Annotation Tool. You can:

- Hold down the **ALT** key to draw a freeform line.
- Press (and release) the **V** key to add a vertex (or corner) to your line.
- Hold down the **CTRL** key to draw bounded boxes.

As you follow the procedure described in the next section, keep in mind that you can use more than one keyboard key when drawing a line, thus creating a line that is part freeform, part straight, and part angular.

### Optimizing freestyle drawing

When you draw freestyle lines in EFS, the more you draw, and the more bends and turns you add, the slower the mouse pointer tends to move. EFS optimizes freestyle drawing so that it does not become noticeably slower as you go, but there are times when you might want to turn off this optimization.

**Why turn off optimization?** Optimization involves reducing the total number of points in a freeform line. If you want your drawing to have more discrete points, you can disable the optimization. However, performance will degrade as the number of points increases.

**To turn off freestyle optimization:** Click the **Line Annotation Tool**, click the **Tool Properties** button, then click the **Line Annotation Tool** tab. Uncheck **Optimize Free Form Drawing Points**, and click **OK**.

## Showing elevation changes in line annotations

The lines you draw with the Line Annotation Tool can depict elevation changes in the Earth's surface when you use the Walk the Earth feature of EFS. You can turn the Walk the Earth feature on or off with a checkbox found on the Line Annotations Properties dialog box. (For more information about Walk the Earth, see "What is Walk the Earth?" in Chapter 11.)

## Using the Line Annotation Tool

Before you use the Line Annotation Tool, you might want to define attributes for line annotations, to avoid being prompted every time you use the tool. See "Defining attributes for lines, points, and circles" on page 223.



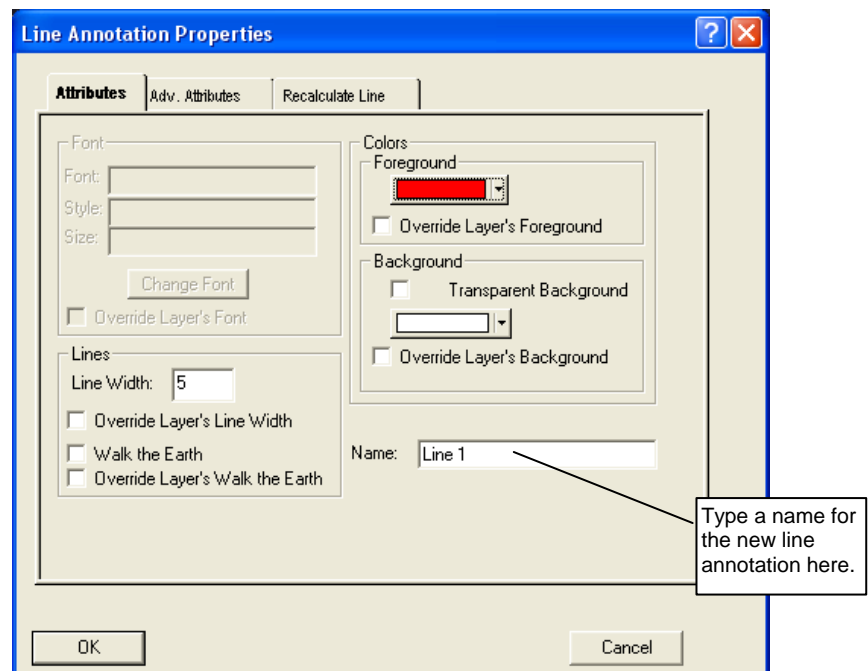
### ◆ To draw a line annotation:

1. Click the **Line Annotation Tool**.
2. Press and hold the mouse on the point in the image where you want the line to start, then drag to the ending point and release the mouse button.

**Note:** To draw a freeform line, hold down the **ALT** key. To draw an angle (and change the line's direction), press the **V** key.

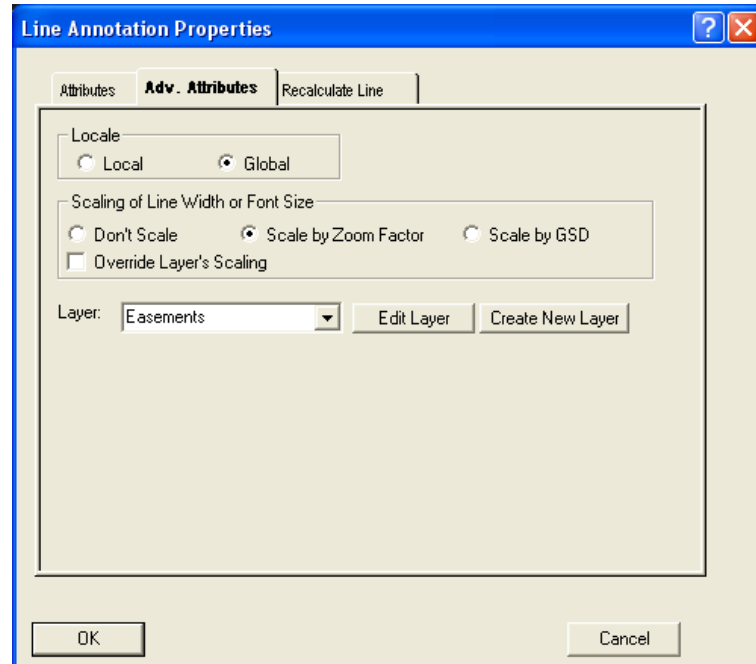
*If the Line Annotation Properties dialog box does not appear* (Prompt for attributes is unchecked for the tool's properties), the line is drawn and added to the workspace as "Line n," the n<sup>th</sup> line added to the workspace in this session of EFS. *Ignore the rest of this procedure.*

*Otherwise,* the Line Annotation Properties dialog box opens to the Attributes tab. It shows the default attributes (unless overridden), which come from the annotation layer whose name appears in the Layer box (on the Adv. Attributes tab). *Proceed to the next step.*



3. (Optional) Change attributes as desired. The Override box is automatically checked for any attribute you change.
4. (Optional) To use the attributes from a different annotation layer, click the **Adv. Attributes** tab, open the Layer drop-down list, and select a different annotation layer. The attributes change accordingly.

**Note:** The Layer box shows the last layer used, or if you have no layers in your workspace, it shows the Default Layer that EFS creates for you.



5. (Optional) To create a new layer to assign this annotation to, click **Create New Layer**, assign the layer's attributes as described in Steps 2 – 4 of the procedure on page 218, and click **OK**.
6. Click the desired Locale:
  - **Local** – to apply the annotation to the active image only,
  - or –
  - **Global** – to apply the annotation to all images in the warehouse with the same geographic coordinates as the annotation.
7. Click **OK**. The annotation is placed on the image in the appropriate location.

The line is drawn and its name appears in your workspace. If you did not name the annotation, it will appear as "Line n," the n<sup>th</sup> line added to the workspace in this EFS session.

**Note:** If you want to save a *local* annotation, you must add the image it annotates to the workspace, then save the workspace. (See "Adding images to a workspace" in Part IV, Chapter 21.) To save *any* annotation, whether global or local, you must save the workspace.

## The Circle Annotation Tool

Before you use the Circle Annotation Tool, you might want to define attributes for circle annotations, to avoid being prompted every time you use the tool. See “Defining attributes for lines, points, and circles” on page 223.

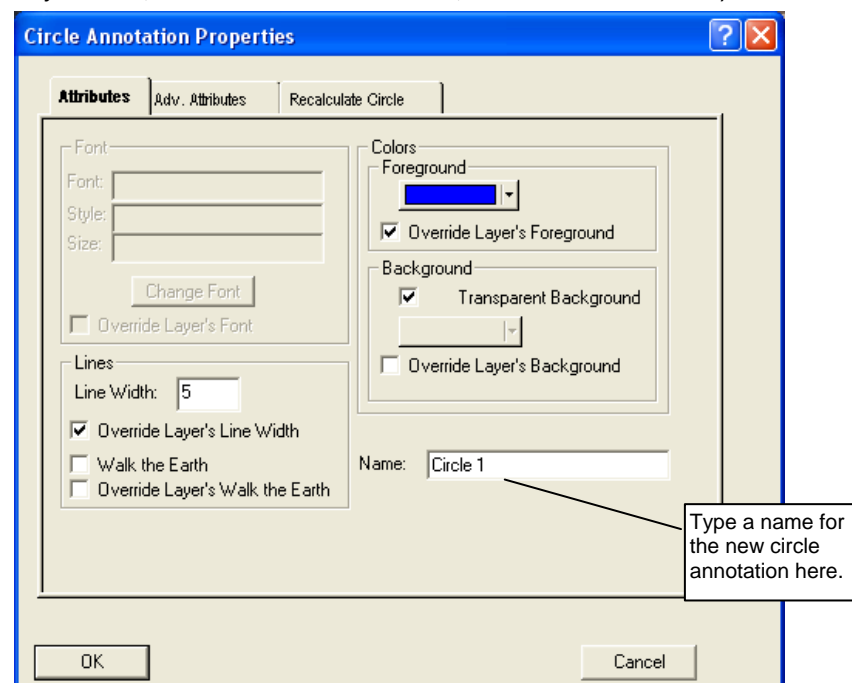
### ◆ To draw a circle annotation:



1. Click the **Circle Annotation Tool**.
2. Press and hold the mouse on the point in the image where you want the center of the circle to be. Drag from the center to the outside of the circle to create the circle’s radius. Then release the mouse button.

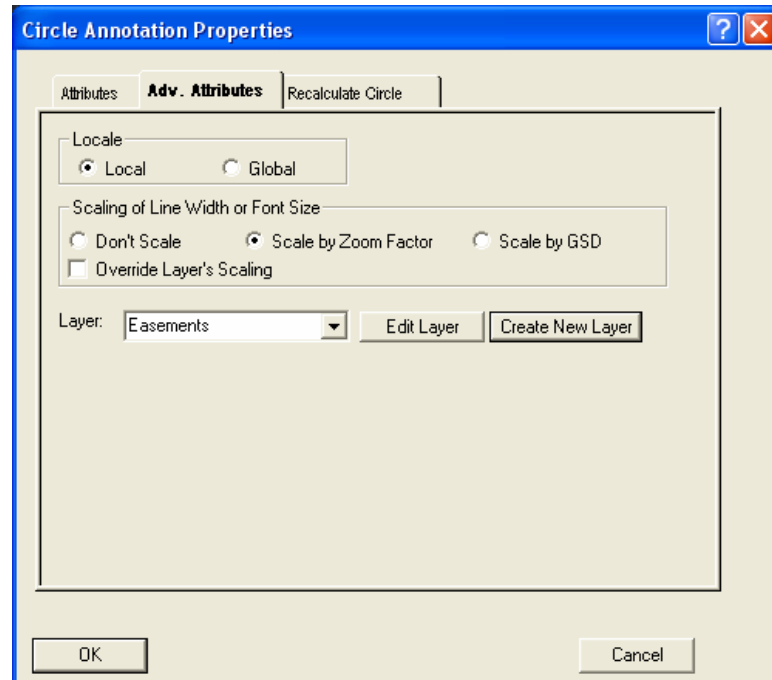
*If the Circle Annotation Properties dialog box does not appear (Prompt for attributes is unchecked for the tool’s properties), the circle is drawn and added to the workspace as “Circle n,” the n<sup>th</sup> circle added to the workspace in this session of EFS. Ignore the rest of this procedure.*

*Otherwise, the Circle Annotation Properties dialog box opens to the Attributes tab. It shows the default attributes (unless overridden), which come from the annotation layer whose name appears in the Layer box (on the Adv. Attributes tab). Proceed to the next step.*



3. (Optional) Change attributes as desired. The Override box is automatically checked for any attribute you change.
4. (Optional) To use the attributes from a different annotation layer, click the **Adv. Attributes** tab, open the Layer drop-down list, and select a different annotation layer. The attributes change accordingly.

**Note:** The Layer box shows the last layer used, or if you have no layers in your workspace, it shows the Default Layer that EFS creates for you.



5. (Optional) To create a new layer to assign this annotation to, click **Create New Layer**, assign the layer's attributes as described in Steps 2 – 4 of the procedure on page 218, and click **OK**.
6. Click the desired Locale:
  - **Local** – to apply the annotation to the active image only,
  - or –
  - **Global** – to apply the annotation to all images in the warehouse with the same geographic coordinates as the annotation.
7. Click **OK**. The annotation is placed over the image in the appropriate location.

The circle is drawn and its name appears in your workspace. If you did not name the annotation, it will appear as “Circle n,” the  $n^{\text{th}}$  circle added to the workspace in this EFS session.

**Note:** If you want to save a *local* annotation, you must add the image it annotates to the workspace, then save the workspace. (See “Adding images to a workspace” in Part IV, Chapter 21.) To save *any* annotation, whether global or local, you must save the workspace.

## The Point Annotation Tool



Much like the other annotation tools EFS offers, the Point Annotation Tool lets you highlight a location in your images. Perhaps you want to propose locations for planting trees or for installing streetlights. You might use this tool to define those locations (based on the surroundings), and then go back later to take some measurements. EFS makes it easy for you to leave a “popcorn trail” showing where you’ve been, so you can revisit those points in the future.

## Point and symbols

When placing a point annotation, you can choose to place a simple point, a large point, or one of many font or icon symbols.

**Note:** You can use the Point and Icon Annotation Tools somewhat interchangeably. You can convert points to icons and vice versa before actually placing the annotation.

## Using the Point Annotation Tool

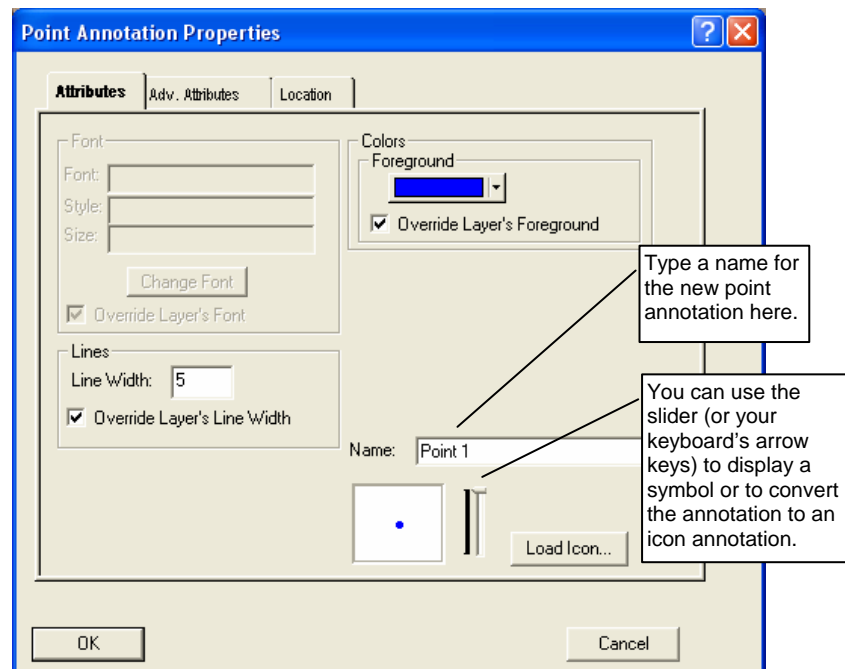
Before you use the Point Annotation Tool, you might want to define attributes for point annotations, to avoid being prompted every time you use the tool. See “Defining attributes for lines, points, and circles” on page 223.

### ◆ To draw a point on an image:

1. Click the **Point Annotation Tool**.
2. Click a location on the image where you want to draw a point.

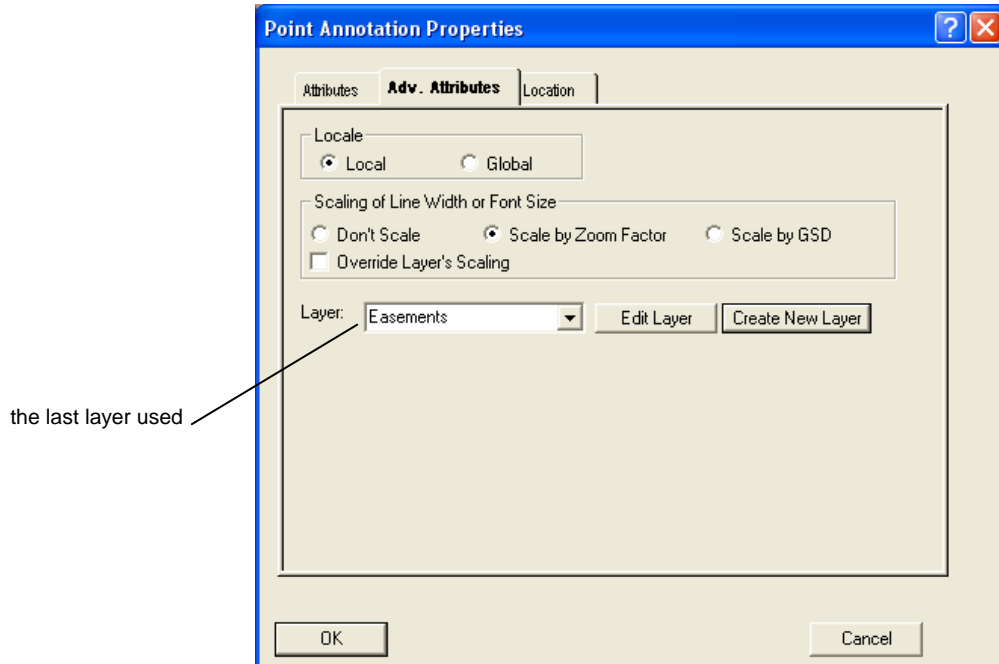
*If the Point Annotation Properties dialog box does not appear (Prompt for attributes is unchecked for the tool’s properties), the point is drawn and added to the workspace as “Point n,” the n<sup>th</sup> point added to the workspace in this session of EFS. Ignore the rest of this procedure.*

*Otherwise, the Point Annotation Properties dialog box opens to the Attributes tab. It shows the default attributes (unless overridden), which come from the annotation layer whose name appears in the Layer box (on the Adv. Attributes tab). Proceed to the next step.*



3. (Optional) Change attributes as desired. The Override box is automatically checked for any attribute you change.
4. (Optional) To use the attributes from a different annotation layer, click the **Adv. Attributes** tab, open the Layer drop-down list, and select a different annotation layer. The attributes change accordingly.

**Note:** The Layer box shows the last layer used, or if you have no layers in your workspace, it shows the Default Layer that EFS creates for you.



5. (Optional) To create a new layer to assign this annotation to, click **Create New Layer**, assign the layer's attributes as described in Steps 2 – 4 of the procedure on page 218, and click **OK**.
6. Click the desired Locale:
  - **Local** – to apply the annotation to the active image only,
  - or –
  - **Global** – to apply the annotation to all images in the warehouse with the same geographic coordinates as the annotation.
7. Click **OK**.

The point is drawn and its name appears in your workspace. If you did not name the annotation, it will appear as "Point n," the  $n^{\text{th}}$  point added to the workspace in this EFS session.

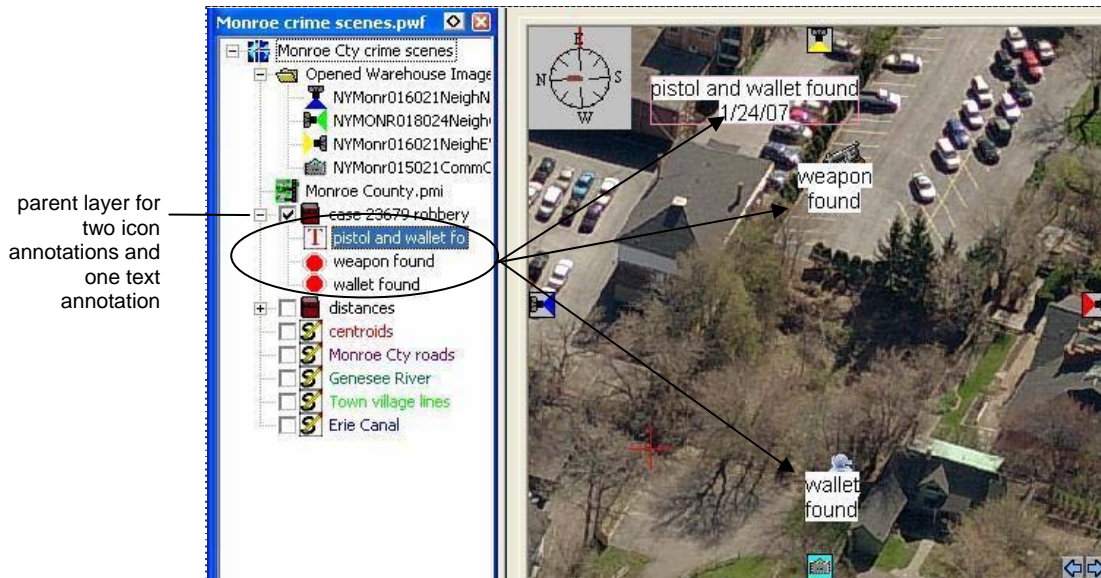
**Note:** If you want to save a *local* annotation, you must add the image it annotates to the workspace, then save the workspace. (See "Adding images to a workspace" in Part IV, Chapter 21.) To save *any* annotation, whether global or local, you must save the workspace.

## The Icon Annotation Tool



The Icon Annotation Tool lets you place icons on your images and maps. Icons let you attach meaning to various locations in your images. Icons are easily recognized and language-independent.





**Figure 12-5:** Icon annotations listed in the Workspace window and shown in the Image window.

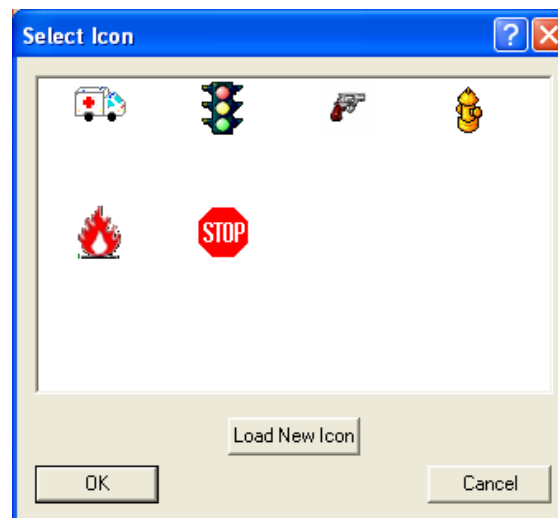
## Using the Icon Annotation Tool

### ◆ To add an icon to an image:



1. Click the **Icon Annotation Tool**.
2. Click a location on the image where you want to place an icon.

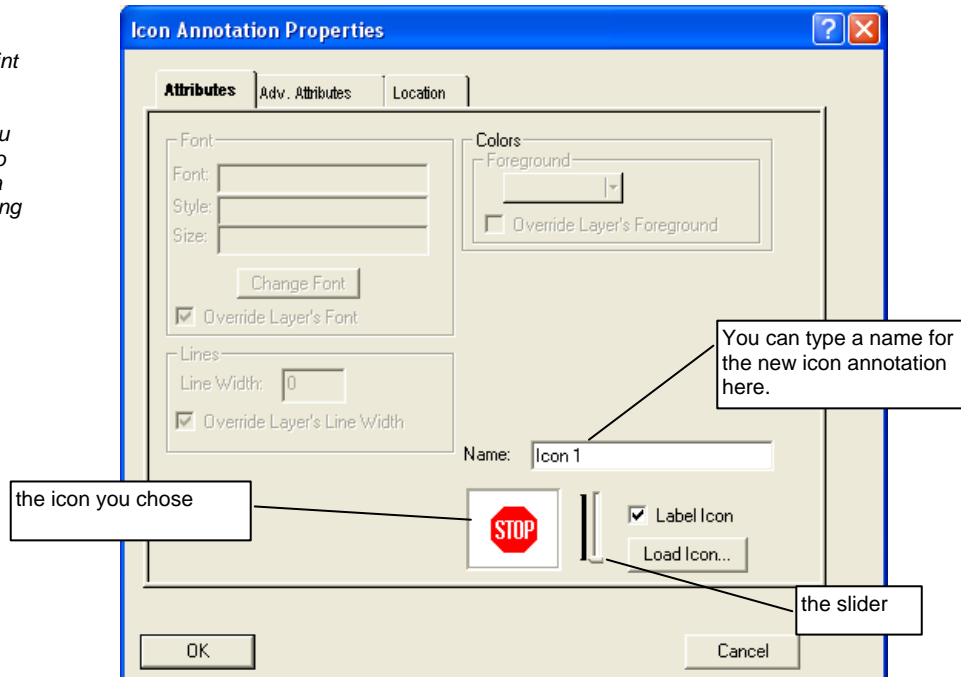
The Select Icon dialog box appears. The icon you last used during this EFS session is selected.



3. If the dialog box is empty (no icons are showing), click **Load New Icon** and follow Steps 2 – 3 of the procedure “To load an icon to a workspace,” on page 237. The icon you loaded appears on the Select Icon dialog box.
4. If you wish to use a different icon than the one already selected, click the desired icon, then click **OK**.

The Icon Annotation Properties dialog box opens and shows the icon you chose.

*You can use the Point and Icon Annotation Tools somewhat interchangeably. You can convert points to icons and vice versa before actually placing the annotation.*



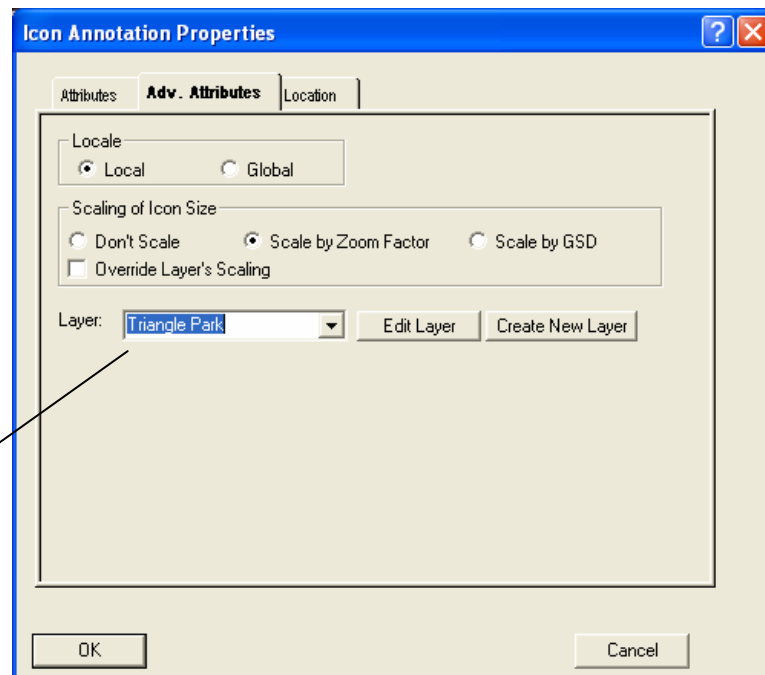
**Tip:** You can use the slider (or your keyboard's arrow keys) to choose a different icon, symbol, or point. (If you choose a symbol or a point, the annotation becomes a point annotation. Some fields in this dialog box, such as Line Width, apply only to point annotations.)

5. (Optional) Change attributes as desired. The Override box is automatically checked for any attribute you change.
6. (Optional) To use the attributes from a different annotation layer than the one shown, click the **Adv. Attributes** tab, open the Layer drop-down list, and select a different annotation layer. The attributes change accordingly.

**Note:** The Layer box shows the last layer used, or if you have no layers in your workspace, it shows the Default Layer that EFS creates for you.

7. (Optional) Uncheck the Label Icon box if you don't want the icon's name to appear on the image next to the icon symbol.

the last layer used  
(Its attributes are  
shown on the two  
attributes tabs.)



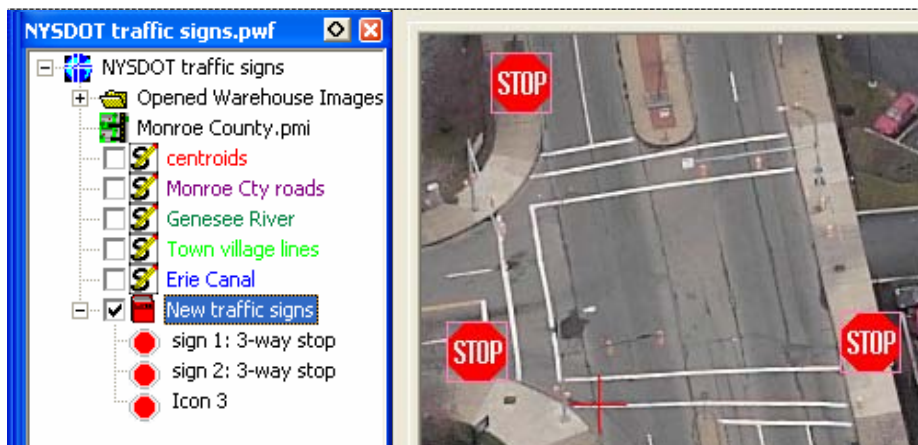
8. (Optional) To create a new layer to assign this annotation to, click **Create New Layer**, assign the layer's attributes as described in Steps 2 – 4 of the procedure on page 218, and click **OK**.

#### About Scaling:

When choosing the scaling setting, consider whether you'll be changing shot levels and if so, whether the icon will then obstruct too much of the image. "Don't Scale" will give you the most trouble when changing shot levels, but the icon will remain the same size as when you placed it (and therefore quite visible). With "Scale by Zoom Factor," the icon will change size somewhat, and may still obstruct too much of an image (when changing shot levels), but remains somewhat easy to see. With "Scale by GSD," the icon always covers the same footprint, but may become hard to see in Community shots.

9. Click the desired Locale:
  - **Local** – to apply the annotation to the active image only,
  - or –
  - **Global** – to apply the annotation to all images in the warehouse with the same geographic coordinates as the annotation.
10. Click **OK**.

The icon is drawn and its name appears in your workspace and on the image (if you checked “Label Icon”). If you did not name the annotation, it will appear as “Icon n,” the  $n^{\text{th}}$  icon added to the workspace in this EFS session.



**Figure 12-6:** An example showing three unlabeled icon annotations—two named and one yet to be named.

**Note:** If you want to save a *local* annotation, you must add the image it annotates to the workspace, then save the workspace. (See “Adding images to a workspace” in Part IV, Chapter 21.) To save *any* annotation, whether global or local, you must save the workspace.

## Loading Icons to your workspace

When you use icons in EFS, they are associated with (and saved with) a workspace. Icons must be loaded to your workspace before you can use them.

### Three ways to load icons

There are three opportunities to load icons to a workspace:

- Choose **Annotate**⇒**Load Icons** from the main menu.
- When using the Icon Annotation Tool, from the Select Icon dialog box, click **Load New Icon** and follow Steps 2-3 of the procedure “To load an icon to a workspace.”
- When using the Icon Annotation Tool, from the Icon Annotation Properties dialog box, click **Load Icon** and follow Steps 2-3 of the procedure “To load an icon to a workspace.”

### Three types of icon files

There are three types of files that can be used:

File type	Description
Icon Library File (.icl)	contains a group of icons
Icon File (.ico)	contains a single icon
Executable File (.exe)	has a set of icons associated with it

**◆ To load an icon to a workspace:**

1. Choose **Annotate⇒Load Icons**.

The Load New Icon dialog box opens.

2. If no Icon Library File is shown, click the “...” button, browse to the icon file, and open it.

**Note:** Pictometry provides a starter icon file (PictometryExample.icl). The first time you see the Load New Icon dialog box, it will contain the path to this file.

The Icon Library File you chose is now shown. Icons contained in that file are displayed in the white box.

3. Click the icon you want to load, then click **OK**.

The Load New Icon dialog box closes and the icon you chose is now available for use in the active workspace.

**Cleaning up icons**

Each icon used by EFS is stored with the workspace that uses it.

This allows for easy sharing of workspaces without the hassle of remembering to include icon files. It also increases the size of your workspaces, so EFS provides a way you can remove unused icons from your workspace.

When you choose **Annotate⇒Clean Up Icons**, EFS removes all icons that are currently unused by any annotations or GIS Annotation layers in your workspace.

**The Link Annotation Tool**

Link annotations allow you to associate files, directories, or website addresses with a point on an image. For example, you might link complete directories of photos, blue prints, incident reports, or spreadsheets listing tenants in a building. You can keep this information in its original location, link it to an image, and open it by double-clicking the link icon on the image.

**Note:** If you link to a website, the website is opened in Internet Explorer®, regardless of your default browser. Internet Explorer is the only browser that is currently supported.

If you create a link annotation and the linked file is deleted or moved to a different directory, EFS displays a question mark where the icon was displayed. (If the file moved, you can specify its new location. See “Fixing access to files from workspace items” in Part IV, Chapter 21.)



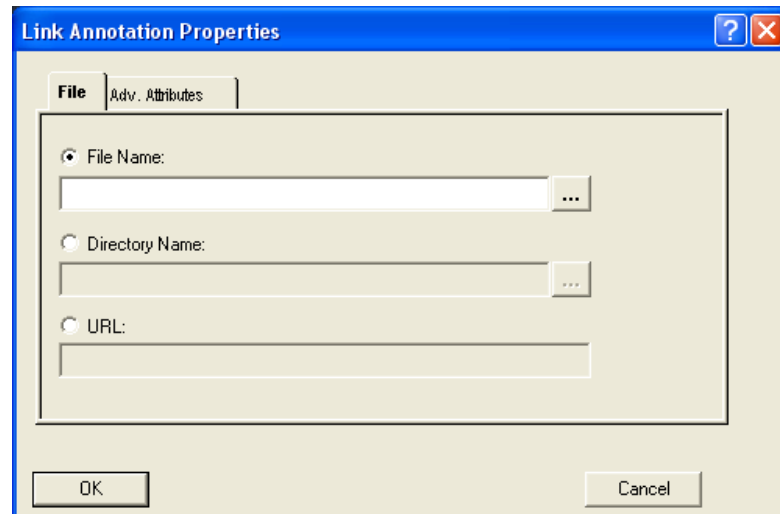
**Figure 12-7:** Link annotations.

◆ **To draw a link annotation:**



1. Click the **Link Annotation Tool**.
2. Click on the point in the image where you want the link annotation to appear.

The Link Annotation Properties dialog box opens to the File tab.



3. Do *one* of the following:
 

*To link a file,*

  - a. If not already clicked, click the **File Name** button.
  - b. Click the “**Browse**” button (to the right of the File Name box). The Open dialog box appears.
  - c. Navigate to the directory that contains the file you wish to link, select the file, and click **Open**. The name of the file appears in the File Name box on the Link Annotation Properties dialog box. *Continue with Step 4.*

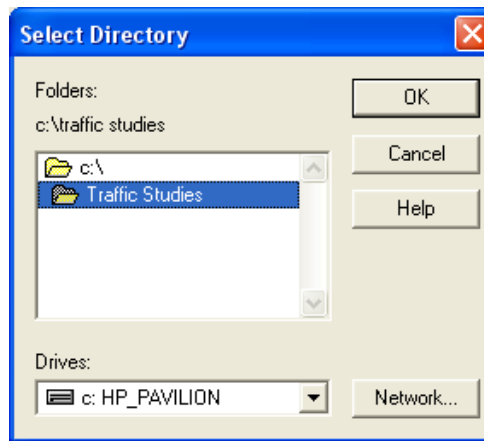


– or –

To link a directory,



- a. If not already clicked, click the **Directory Name** button.
- b. Click the “**Browse**” button (to the right of the Directory Name box). The Select Directory dialog box appears.

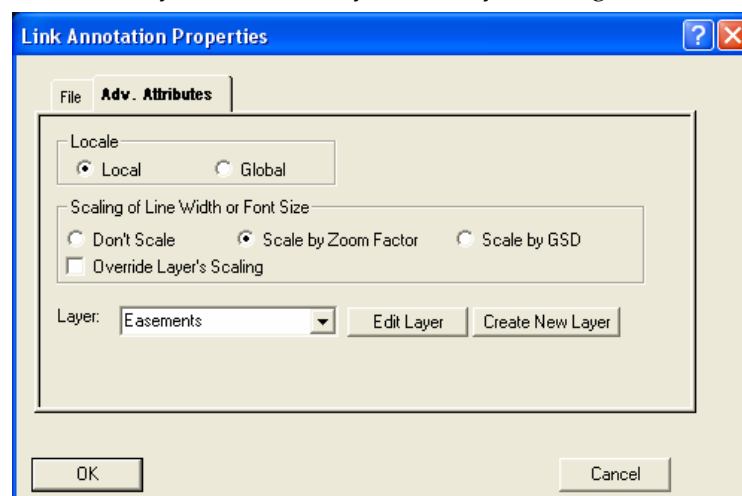


- c. Navigate to the directory you wish to link, select the directory, and click **OK**. The name of the directory appears in the Directory Name box on the Link Annotation Properties dialog box. *Continue with Step 4.*

– or –

To link a website,

- a. If not already clicked, click the **URL** button.
  - b. Type the **URL** (Uniform Resource Locator) of the website address you wish to link. *Continue with Step 4.*
4. (Optional) To change the annotation’s attributes, click the **Adv. Attributes** tab and change attributes as desired. The Override box is automatically checked for any attribute you change.



5. (Optional) To use the attributes from a different annotation layer than the one shown, open the Layer drop-down list, and select a different annotation layer. The attributes change accordingly.

**Note:** The Layer box shows the last layer used, or if you have no layers in your workspace, it shows the Default Layer that EFS creates for you.

6. (Optional) To create a new layer to assign this annotation to, click **Create New Layer**, assign the layer's attributes as described in Steps 2 – 4 of the procedure on page 218, and click **OK**.
7. Click the desired Locale:
  - **Local** – to apply the annotation to the active image only,
  - or –
  - **Global** – to apply the annotation to all images in the warehouse with the same geographic coordinates as the annotation.
8. Click **OK**.

An icon representing the link is placed over the image in the appropriate location. If the item you linked was a file or directory, its name appears in the workspace. If the item you linked was a website, the website's URL is shown in your workspace.

◆ **To open the linked file:**



1. Click the **Select Tool**.
2. Double-click the linked file's link annotation in the image or workspace.

For linked folders, a list of the folder's contents is shown in a separate window.

**Note:** If you want to save a *local* annotation, you must add the image it annotates to the workspace, then save the workspace. (See "Adding images to a workspace" in Part IV, Chapter 21.) To save *any* annotation, whether global or local, you must save the workspace.



# Chapter 13 — Working with Annotations

This chapter describes how to change or delete annotations. It also includes instructions for creating annotations from the lines or points that are displayed when you use the measurement tools (such as the Distance Tool).

If you prefer to view images without the annotations, EFS lets you hide annotations from view or set a threshold so the annotations are hidden only when you zoom in or out to a desired magnification. This topic is also covered in this chapter.

**Note:** This chapter covers working with user-defined annotations only. GIS annotations are covered in Part III, Chapter 16. For information about ALOHA annotations, see Appendix C.

## Topics covered in this chapter ... page

Hiding and viewing annotations.....	241
Changing annotations .....	243
Moving annotations .....	246
Deleting annotations .....	252
Saving tool output as an annotation .....	253
Thresholds for viewing annotations .....	257
Scalable annotations .....	260
Copying global annotations to other workspaces .....	264

## Hiding and viewing annotations

*Hiding and viewing GIS annotations are covered in Part III, Chapter 16.*

After creating an annotation, you can show it on the image or hide it from view. You can hide all annotations (local and global), or you can hide a specific annotation layer, which causes all of the annotations associated with that layer to be hidden.

### Checkboxes in the workspace

*To view your workspace, simply choose **View⇒Pictometry Workspace**.*

EFS provides a checkbox next to each layer in a workspace. When your workspace is in view, you can easily change which annotation layers are hidden and which are visible. You'll check a layer's box to make that layer visible and uncheck it to hide that layer.



**Figure 13-1:** Annotation layer checkboxes in the workspace.

If you hide all layers as a group (uncheck **Overlays**⇒**View Annotations**), the checkboxes become gray, and you cannot check or uncheck the specific layers.



**Figure 13-2:** Gray checkboxes, indicating that all layers are hidden as a group.

The following procedures describe the various ways you can view and hide annotations.

#### ◆ To hide or view all annotations:

Do *one* of the following:

- Choose **Overlays**⇒**View Annotations** and check or uncheck the option as desired. (Check the option to view annotations, uncheck it to hide them.)
- or —
- Right-click any annotation or annotation layer in the workspace and select **View Annotations** or **Hide Annotations** from the context menu. (If annotations are currently hidden, “View Annotations” appears in the menu; if they’re currently visible, “Hide Annotations” appears.)

If you chose View Annotations, all annotations whose visibility has not been suppressed (with the annotation layer visibility feature) are shown on the image. If you chose Hide Annotations, all annotations are hidden.

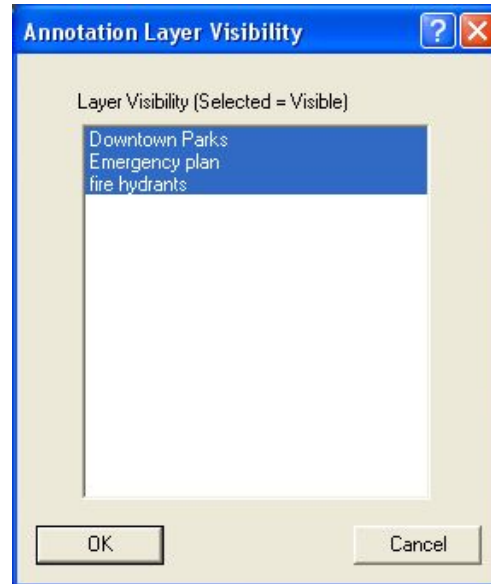
#### ◆ To hide or view specific annotation layers:

Do *one* of the following:

- In the Workspace window, check the checkboxes of the annotation layers you wish to view and uncheck the checkboxes of the annotation layers you wish to hide.
- or —
- Press **CTRL+ L**.
- or —

- In the Workspace window, right-click the annotation layer to hide or view and select **View Layer <layer name>** or **Hide Layer <layer name>** as appropriate from the context menu.

The Annotation Layer Visibility dialog box appears with the list of annotation layers (user-defined, GIS, and grid).



- Select or deselect the annotation layers, as desired. (If the layer is highlighted, it is visible.)
- Click **OK**.

The Annotation Layer Visibility dialog box closes and any layers that were not highlighted disappear from view.

## Changing annotations

This section describes how to change an annotation's properties (such as text size, line width, color, or the layer to which it belongs.)

You can also rename an annotation (change its name in the Workspace window). The procedure for renaming an annotation is the same as the procedure for renaming an annotation layer. (See "Renaming an annotation or an annotation layer" in Chapter 12.)

### Editing an annotation's properties

Use the following procedure to edit (or view) the properties of a user-defined annotation.

#### ◆ To edit an annotation's properties:

- Do *one* of the following:
  - (For all except link annotations) In the Workspace window, double-click the icon of the annotation to be edited.

**Note:** Double-clicking a link annotation in the Workspace window opens the file that is linked.

– or –

- In either the Image or Workspace windows, right-click the annotation to be edited, and select **Properties for <annotation name>** from the context menu.

– or –

- Select the annotation in the Workspace window, and choose **Edit⇒Properties**.

The annotation's properties dialog box opens.

2. (*For text annotations only*) The Text Annotation tab is active. On this tab you can change the text, its alignment, the annotation's location, and whether the text appears in a Balloon or Normal text box. When done, click the **Attributes** tab.
3. On the Attributes tab, change the attributes as desired.

**Note:** You can change an annotation's Locale from local to global, but not from global to local.

4. (*Optional — for line annotations only*) To enter a new starting point, stopping point, line length, or bearing, click the **Recalculate Line** tab, enter the new values, then click **Recalculate**.
5. (*Optional — for circle annotations only*) To change the size of a circle by entering a new center point and radius, click the **Recalculate Circle** tab, then enter the new values.
6. Click **OK**.

The Properties dialog box closes and the change you made will be visible on any image covering the same geographic area whenever that annotation is in view.

## Selecting annotations in an image



The Select Tool allows you to select annotations in an image so you can move or delete them. You can also use the Select Tool to resize a circle.

### ◆ To select a single item:

- Click the **Select Tool** and click the item.

### ◆ To select items inside an area:

1. Click the **Select Tool**.
2. Click a point and drag the mouse to outline the area containing the items you want to select.

All items within the area are selected and each selected item is highlighted in the workspace.

**Note:** To restrict and control the objects to be selected, read the next topic, "Changing Select Tool properties."

## Changing Select Tool properties

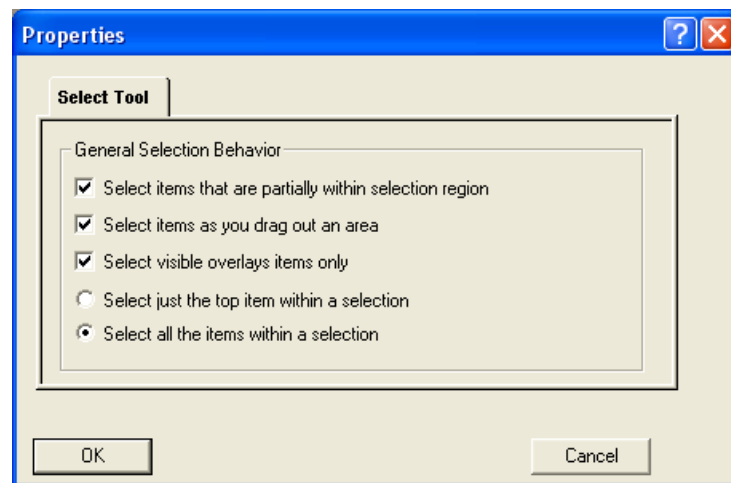
The Select Tool has properties for controlling how objects are selected when you select items inside an area. The options vary based on the type of image you are viewing.

### ◆ To change the Select Tool's properties:



1. Click the **Select Tool**.
2. Do *one* of the following:
  - Click the **Tool Properties** button.
  - or —
  - Choose **Tools**⇒**Properties**.

The Properties dialog box opens.



3. Select the desired options, using the following chart as a guide:

Option	Description
Select items that are partially within selection region	<p>If this option is <i>checked</i>, any objects that fall within the selection region are selected, even when only part of the object is within the selection region.</p> <p>If this option is <i>unchecked</i>, only those items falling completely within the selection region are selected.</p>
Select items as you drag out an area	<p>If this option is <i>checked</i>, objects are highlighted while you select the region.</p> <p>If this option is <i>unchecked</i>, objects are highlighted after the region is selected and the mouse button is released. (Leaving this option unchecked prevents the screen from being redrawn and flashing while you are selecting a region.)</p>
Select visible overlays items only	<p>If this option is <i>checked</i>, only visible annotations can be selected. (If <b>Overlays</b>⇒<b>View Annotations</b> is unchecked, no annotations can be selected.) If a particular annotation layer is turned off, no annotations from that layer can be selected.</p> <p>If this option is <i>unchecked</i>, all annotations can be selected regardless of their current visibility.</p>

Option	Description
Select just the top item within a selection	When this button is turned on and you drag the mouse to select a region, only the last item drawn in the Image window is selected.
– or –	
Select all the items within a selection	When this button is turned on and you drag the mouse to select a region, all items are selected, even if other items partially or completely cover them.

**Note:** The item listed at the bottom of the workspace tree is drawn last, and therefore, appears on top of other annotations in the Image window.

4. Click **OK**.

## Moving annotations

This section describes the various ways in which you can move annotations. You can:

- Move the entire annotation to a new location (assign it different coordinates)
- Move a line's endpoint only
- Resize circles
- Move a line's vertex

Which method you choose to move an annotation depends on how exact the location needs to be. You can use the mouse to move all annotations, and in most cases, this is sufficient. However, if you need to place an annotation at an exact location, then the properties dialog box for that annotation is your best choice.

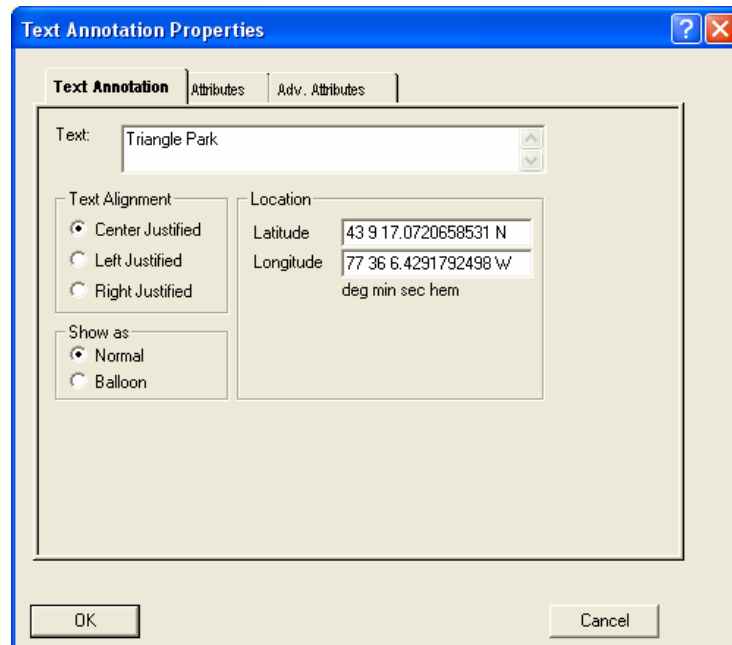
**Note:** If you move an annotation by entering a location that is not within the area shown in the Image window, the annotation will no longer appear on the part of the image currently in view.

### ◆ To move a text annotation:

Do *one* of the following:



- Click the **Select Tool**, drag the annotation to a new location in the Image window, and release the mouse button.
- or –
- If you know the coordinates at which to place the text,
  - a. Open the **Text Annotation Properties** dialog box (using any of the methods described on page 243 in Step 1 of the procedure for editing an annotation).



- b. Enter the new coordinates for the annotation's location.
- c. Click **OK**.

The annotation moves to its new location.

◆ **To move a link or icon annotation:**



- Click the **Select Tool**, drag the annotation to a new location in the Image window, and release the mouse button. The annotation moves to its new location.

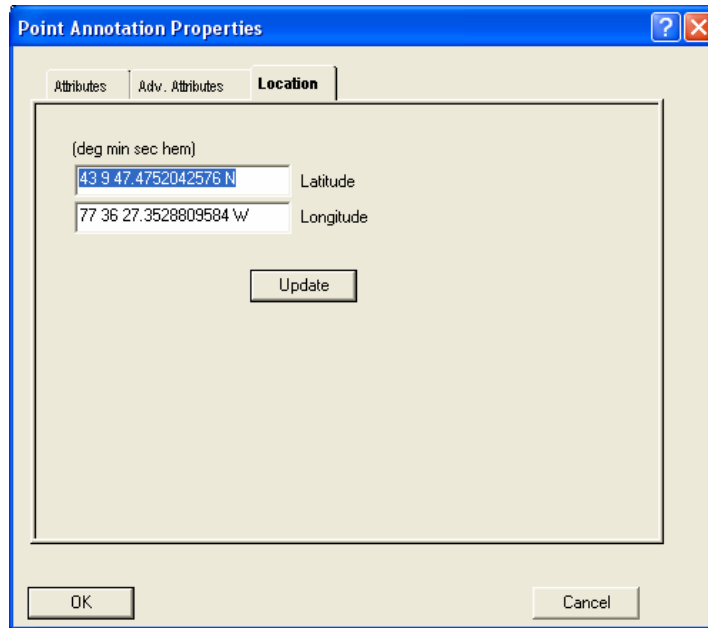
◆ **To move a point annotation:**

Do *one* of the following:

- Click the **Select Tool**, drag the point to a new location in the Image window, and release the mouse button. The annotation moves to its new location.
- or —
- If you know the coordinates at which to place the point,
  - a. Open the **Point Annotation Properties** dialog box. (Right-click the annotation to be edited, and select **Properties for <annotation name>** from the context menu.)

**Tip:** To reverse the move, click **Undo** (if available on a toolbar.)





- b. Enter the new coordinates, click **Update**, then click **OK**.

The dialog box closes and the point moves to the location you entered.

◆ **To move an entire line annotation with the mouse:**

Use this procedure when you want to move an entire line annotation, whether it is a single-segment or multi-segment line annotation.



- Click the **Select Tool**, select the annotation, drag the *middle* of any line to a new location, and release the mouse button. The entire annotation moves to its new location.

◆ **To move a line's endpoint with the mouse:**

Use this procedure when you want to move one of the endpoints of a single-segment or multi-segment line annotation.

1. Click the **Select Tool**, select the line, and drag the end of the line to a new location.

**Tip:** To reverse the move, click **Undo** (if available on a toolbar).



**Note:** Before dragging the line, grab it in the area that is closest to the end you want to move. If you grab too close to the center of the line, the entire line will move.

2. Release the mouse button.

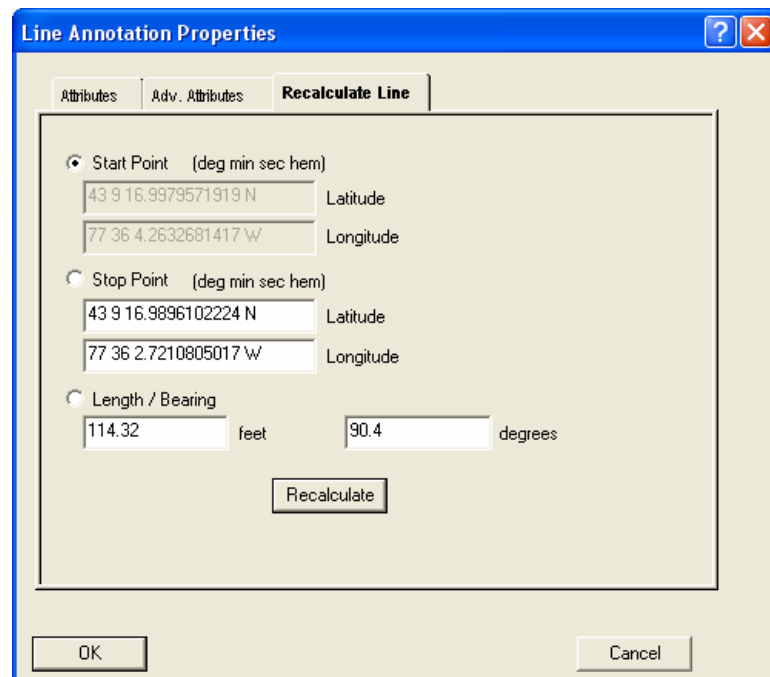
The end you dragged moves to its new location and the line's bearing changes.

◆ **To move a line annotation by entering coordinates:**

1. Open the **Line Annotation Properties** dialog box (using any of the methods described on page 243 in Step 1 of the procedure for editing an annotation.)
2. Click the **Recalculate Line** tab.



Click **Stop Point** to make the **Start Point** coordinates available, and vice versa. Click **Length/Bearing** to make both **Start** and **Stop Point** fields available for you to change.



The dialog box is titled "Line Annotation Properties" and has three tabs: "Attributes", "Adv. Attributes", and "Recalculate Line". The "Recalculate Line" tab is selected. It contains three radio button options: "Start Point (deg min sec hem)", "Stop Point (deg min sec hem)", and "Length / Bearing". The "Start Point" option is selected. Below it are two text fields: "Latitude" with the value "43 9 16.9979571919 N" and "Longitude" with the value "77 36 4.2632681417 W". The "Stop Point" option is also visible with similar fields. The "Length / Bearing" option has two text fields: "Length" with the value "114.32" and "Bearing" with the value "90.4". A "Recalculate" button is located below these fields. At the bottom of the dialog are "OK" and "Cancel" buttons.

3. Do one of the following:

- To change a line's starting point, make sure either the **Stop Point** button or the **Length/Bearing** button is clicked so the **Start Point** field is available. Enter the coordinates for the new start point in the **Start Point** field. *Continue with Step 4.*

**Hint:** You can also change a line's start point by entering new **Stop** coordinates while keeping the length and bearing the same.

— or —

- To change a line's stopping point, make sure either the **Start Point** button or the **Length/Bearing** button is clicked so the **Stop Point** field is available. Enter the coordinates for the new stop point in the **Stop Point** field. *Continue with Step 4.*

**Hint:** You can also change a line's stop point by entering new **Start** coordinates while keeping the length and bearing the same.

— or —

- To change a line's length, make sure either the **Start Point** button or the **Stop Point** button is clicked so the **Length/Bearing** field is available. Enter a new line length in the **Length/Bearing** field. *Continue with Step 4.*

**Hint:** You can also change a line's length by entering new **Start** or **Stop** coordinates.

— or —

- To change a line's bearing, make sure either the **Start Point** button or the **Stop Point** button is clicked so the **Length/Bearing** field is

available. Enter a new bearing in the Length/Bearing field.

*Continue with Step 4.*

**Hint:** You can also change a line's bearing by entering new Start or Stop coordinates.

4. Click **Recalculate**.

The Start Point, Stop Point, Length, or Bearing values are revised as necessary to reflect the changes you made and the new values are shown on the Line Annotation Properties dialog box.

5. Click **OK**.

The annotation moves to reflect its new endpoint(s), length, or bearing—depending on the action you chose in Step 3.

## Moving a line's vertex

Use the following procedure to move the vertex of a multi-segment line annotation (a line annotation that has more than one line connected by a vertex).

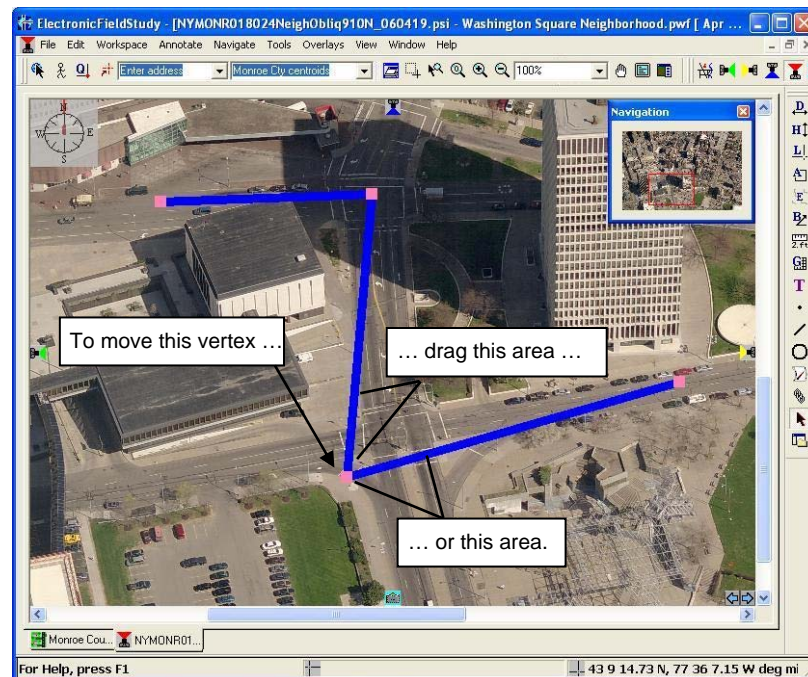
**Note:** Moving a vertex does not cause the annotation itself to move.

◆ **To move a line's vertex:**

1. Click the **Select Tool**. All of the line's vertices are highlighted.
2. Grab the vertex by holding down the mouse button on the line nearest the vertex.

**Note:** Be sure to grab the line itself, not the marks that highlight the line when it is selected. Also, you must grab anywhere on the line in the area within the quarter of the line segment's length that is closest to the vertex.

**Tip:** To reverse the move, click **Undo** (if available on a toolbar).



3. Drag the vertex to another spot and release the mouse.

The vertex moves to the point at which you released the mouse, but the annotation itself does not move.

## Moving and resizing circle annotations

You can move or resize a circle annotation by using a mouse or by entering coordinates on the Circle Annotation Properties dialog box.

### Moving or resizing a circle with the mouse

#### ◆ To move a circle annotation with the mouse:



1. Click the **Select Tool**.
2. Click the center of the circle. A thick cross appears in the circle's center.



**Tip:** To reverse the move, click **Undo** (if available on a toolbar).



3. Drag the cross to the new location. Release the mouse button. The circle moves to the point where you released the mouse.

#### ◆ To resize a circle annotation with the mouse:

1. Click the **Select Tool**.
2. Click the center or outside edge of the circle. A thick cross appears in the center of the circle.

**Tip:** You don't have to click the exact center of the circle. You can click anywhere in the area covered by the crosshair.

3. Click and drag the edge of the circle to increase or decrease the circle's radius. Release the mouse button. The circle is resized (and redrawn) so that the edge of the circle falls on the point where you released the mouse.

### Moving or resizing a circle by entering coordinates

*To change the coordinate system or its format, choose **Edit⇒Change Units** before starting this procedure.*

#### ◆ To move or resize a circle annotation:

1. Open the **Circle Annotation Properties** dialog box (using any of the methods listed on page 243 in Step 1 of the procedure for editing an annotation.)
2. Click the **Recalculate Circle** tab.

**Tip:** To reverse the move, click **Undo** (if available on a toolbar).



3. Enter the new location for the center of the circle.
4. If you want to make the circle larger or smaller, enter a different radius. (You can also resize the circle by using the mouse. See page 251.)
5. Click **OK**.

## Deleting annotations

Use the following procedure to delete any user-defined annotation (text, line, circle, link, point, or icon).

### ◆ To delete an annotation:

1. Do *one* of the following:
  - In the Workspace window, right-click the name of the annotation to be deleted, and select **Delete <annotation name>** from the context menu.
  - or —
  - In the Image window, right-click the annotation to be deleted, and select **Delete <annotation name>** from the context menu.
  - or —
  - Select the annotation (either by clicking it in the Workspace window or by clicking the **Select Tool** and then clicking the annotation in the Image window).

Either click the **Delete** button (if available on a toolbar) or choose **Edit⇒Delete**.

**Tip:** When you select an annotation with the Select Tool, its name is highlighted in the Workspace window.

Before deleting an annotation, you might verify that you are deleting the correct one by checking to see that its name is highlighted.

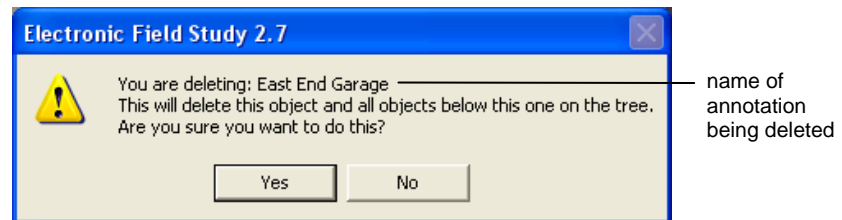


Select Tool



Delete button

The following dialog box appears:



2. Click **Yes** to delete the annotation.

The annotation is deleted and its name disappears from the Workspace window. It also disappears from the image in the Image window.

## Saving tool output as an annotation

When using EFS measurement tools, you may choose to save your lines and shapes as annotations. You may also save any graphic (as well as text) output from the Query Tool.

Once you've saved your tool output as a permanent annotation, you'll be able to right-click the annotation's name in the workspace and choose any of the following actions:

- Go to the annotation in the Image window
- Turn on or off all annotations
- Change the annotation's properties
- Delete the annotation

**Tip:** "Choices for drawing tool output" in Chapter 11, describes how you can save tool output automatically (*before* using the tool).

### Tools that generate output you can save

You can save output from any of the following tools:

- Distance Tool
- Height Tool
- Area Tool
- Bearing Tool
- Navigate Tool
- GIS Query Tool

**Note:** Saving output from the GIS Query Tool involves a few extra steps, because the Query Tool has both graphic and text output.

## Tool output annotations must be in annotation layers

Just like annotations created with annotation tools, permanent annotations created from tool output must reside in annotation layers.

When you add tool output annotations to a layer (to make them permanent), you'll either select the layer to assign it to or create a new layer to assign it to. You can also change any of the annotation's attributes as well as its parent layer's attributes. (See "Annotation and annotation layer properties" in Chapter 12.)

## Saving tool output as annotations

There are few ways to save tool annotation output to an annotation layer.

- Create an annotation layer for a tool's output before using that tool.
- Create an annotation layer for a tool's output after using that tool.
- Add a tool's output to an existing annotation layer.

To create an annotation layer, see "Creating an annotation layer" in Chapter 12.

## Two opportunities to save tool output

There are two times when you can save tool output as an annotation:

- Immediately *after* using a tool, you can choose **Annotate⇒Add Tool Annotations to Workspace**.
- *Before* using a tool, you can set the tool's properties. (To learn how to set a tool's properties ahead of time, see "Choices for drawing tool output" in Chapter 11.)

The rest of this section describes how to save a tool's output after using the tool.

### ◆ To save tool output after using a tool:

1. Immediately after using the tool, do *one* of the following:

- Choose **Annotate⇒Add Tool Annotations to Workspace**.

**Note:** If this option is gray, you may not have the tool set up to draw lines. To change this, choose **Tools⇒Properties⇒Annotation** tab; then click **Draw Temporary Lines**.

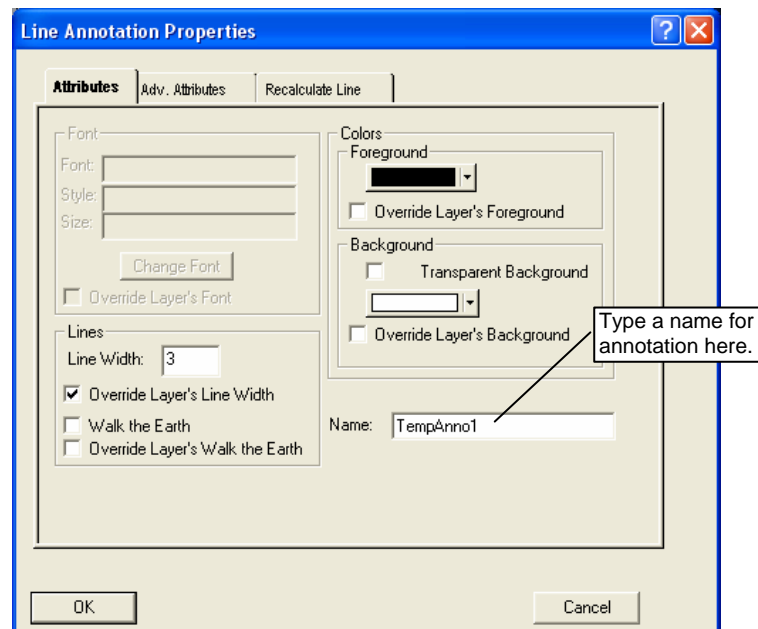
— or —

- Right-click on the line, and select **Add To Workspace** from the context menu.

2. *If your workspace contains no annotation layers*, the Annotation Layer Properties dialog box opens so you can create a new layer. Follow Steps 2 - 5 of "To create an annotation layer" in Chapter 12. When you are done, a Properties (either Line or Point Annotation) dialog box opens. *Continue with Step 3 of this procedure.*

**Tip:** To add the Add Tool Annotations to Workspace button to a toolbar, see "Adding and removing toolbar buttons" in Part IV, Chapter 22.

Otherwise (your workspace already contains an annotation layer), and a Properties dialog box for the annotation being saved opens immediately.



3. (Optional) Change attributes as desired. The Override box is automatically checked for any attribute you change.
4. (Optional) To use the attributes from a different annotation layer, click the **Adv. Attributes** tab, open the Layer list, and select a different annotation layer. The attributes change accordingly.

**Note:** To create a new layer, click **Create New Layer**, follow Steps 2 - 5 of the procedure “To create an annotation layer” in Chapter 12. Then continue with Step 4 of this procedure.

5. (Optional) On the Adv. Attributes tab, change attributes as desired.
6. (Optional) On the Attributes tab, in the Name box, type a name for the new annotation.
7. Click **OK**.

*You'll have multiple GIS objects if you held the SHIFT key to save output from more than one query, or if you checked Highlight Similar Objects to display GIS objects linked with the one you queried.*

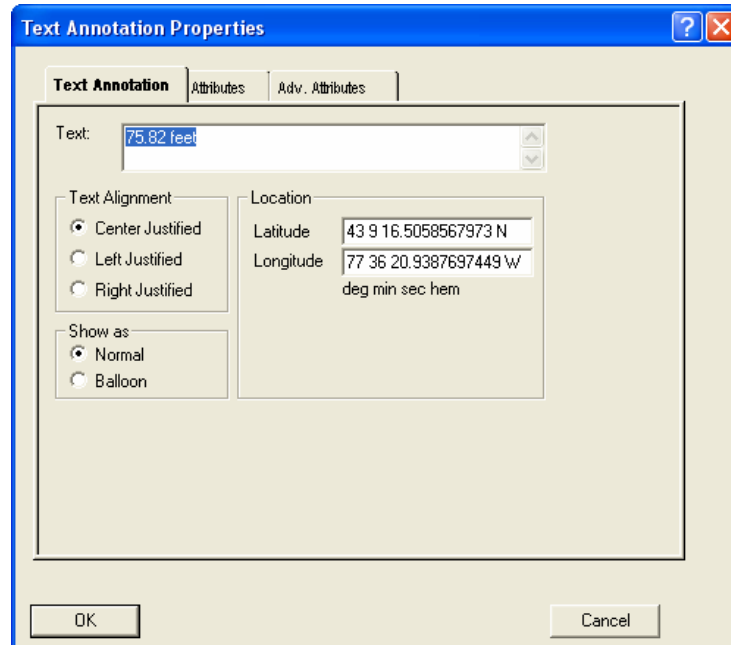
*If you're saving output from the Distance, Height, Area, Bearing, or Navigate Tools, skip the rest of this procedure.*

The tool output is now a permanent annotation, and its name appears in the Workspace window. It's the last annotation listed under the layer you chose.

8. (If you're saving output from the Query Tool),
  - a. *If your query results include multiple GIS objects, a separate Properties dialog box appears for each GIS object. Select properties for the annotation as desired. Repeat Steps 3 – 8a for each GIS object.*

- b. *If Draw Associated Text was checked for the Query Tool,*  
the Text Annotation Properties dialog box opens and the query's associated text is shown in the Text box. (If your query results include multiple GIS objects, the Text Annotation Properties dialog box that opens corresponds to the first query.)

*Otherwise, skip the rest of this procedure.*



- c. *(Optional)* Change the annotation's text, its alignment, or both.
- d. *(Optional)* If you want a *second copy* of the annotation to appear at different coordinates, enter the new coordinates.
- e. *(Optional)* Click the **Attributes** tab to see attributes for the text part of the annotation. If desired, change the text attributes. (Refer to the table shown in "Annotation and annotation layer properties" in Chapter 12.)  
The Override box is automatically checked for any attribute you change.
- f. Click **OK**.
- g. *If your query results include multiple GIS objects, and if Draw Associated Text was checked for the Query Tool, then repeat Steps 8b – 8g until you've assigned properties for the text associated with every GIS object you queried.*

The Query Tool's output data—graphic and text (with any attribute changes you made) are now a permanent annotation. The annotation name appears in the Workspace window. It's the last annotation listed under the layer you chose.



The annotation is redrawn on your screen with any changes you made. If you saved a second copy of the annotation at different coordinates (in Step 6d), that annotation is drawn at the coordinates you specified.

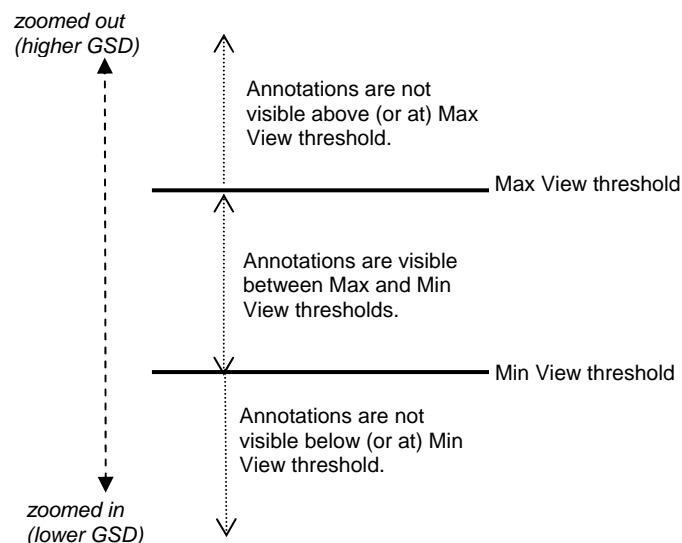
**Hint:** If your second copy isn't in the current view, right-click its name in the workspace, and select "Go to <annotation name>" from the context menu.

## Thresholds for viewing annotations

### Max View and Min View thresholds

**Reminder:** These thresholds also pertain to GIS and ALOHA annotation layers.

All annotation layers have minimum and maximum image resolution thresholds for viewing annotations. This means you can "turn off" (hide) the annotations when the resolution or scale of the active image is outside a certain range. On the Annotation Layer Properties dialog box, you can set Max View and Min View thresholds so annotation layers are displayed only when the zoom level or the scale is in a range corresponding to the thresholds you specify. See Figure 13-3.



**Figure 13-3:** Annotation Max View and Min View thresholds.

### Units are selectable

**Tip:** To add the Change Units button to a toolbar, see "Adding and removing toolbar buttons" in Part IV, Chapter 22.

You'll specify values for the Max View and Min View thresholds in terms of the scale that is currently selected. You can change the scale by choosing Edit⇒Change Units. Here's how you specify these values for the various units of image resolution:

- If you're working in absolute scale (1:n), specify 'n' (for each threshold).
- If you're working in GSD ('n' units per inch or cm), specify 'n' where 1 inch or cm = 'n' units.
- If you're working in GSD (units per pixel), the default, specify the units per pixel.

To learn more about scales for image resolution and how to change them, see Part IV, Chapter 20.

### Why use thresholds?

You may want to use view thresholds so you can limit when annotations are drawn, in order to improve performance in EFS. By reducing what EFS needs to draw and re-draw (when a screen refresh is triggered), you can cause EFS to respond faster.

Also, by limiting the annotations that are drawn, you can reduce how much the images are covered and cluttered by annotations.



**Figure 13-4:** Image with annotations at 100% zoom level.



**Figure 13-5:** Same image at 25% zoom level is obstructed by the annotations.

## When you might use thresholds

You might use Max View and Min View thresholds:

- When you have very large data sets.

**Note:** Be sure to assign a low value to the Max View threshold when working with very large GIS annotation layers (those dense with GIS objects).

- When you have many small annotations cluttering a map.
- When you have annotated a map and you don't want the annotations to appear on the images (and cover up some of the image features).

## View thresholds apply to layers only

The Max View and Min View thresholds apply only to the annotation *layer*, and are not selectable on an individual annotation basis.

## Setting view thresholds

You can enter values for Max View and Min View thresholds when you first add your layer to the workspace. Or you can enter (or change) them later. Here's how you can change these values *after* the layer has been added.

### ◆ To set view thresholds for an existing annotation layer:

1. In your workspace, right-click on the annotation layer (or GIS or ALOHA annotation layer) you want to view.
2. From the context menu, select **Properties for <layer name>**.

The Annotation Layer dialog box appears. Its Attributes tab is active. (Or the GIS Annotation Layer dialog box appears, with its GIS data properties tab active. Or the ALOHA Annotation Layer dialog box appears, with its ALOHA annotation properties tab active.)

3. Enter values for Max View GSD and Min View GSD, and click **OK**.

**What if I enter a zero?** A Min View GSD of zero indicates no minimum value for annotation visibility. A Max View GSD of zero indicates no maximum value for annotation visibility. If both values are zero, the layer is always displayed.

4. For GIS and ALOHA layers, click **Done** to exit the dialog box. For user-created annotation layers, click **OK** to exit the dialog box.

All annotations in the layer you changed will now appear only when the resolution of the active image is *between* the two values you've specified. If it's greater than or equal to the Max View threshold, or if it's less than or equal to the Min View threshold, the annotations are not displayed.

*For GIS layers, Max View GSD and Min View GSD boxes are in the Drawing Attributes area.*

*For ALOHA layers, they are in the Visibility area. The scale and units (if applicable) are shown near the two boxes.*

## Scalable annotations

Annotations can change in size—font size for text data, thickness for vector (graphic) data—as you change image magnification by using any of the zoom buttons, and as you change GSD by switching between images. This makes your annotations more useful as you work in various magnifications and with various images.

**Note:** Temporary annotations such as output from the GIS Query Tool and other tools are not scaled.

### Three ways to scale

The Annotation Layer Properties dialog box has three settings for annotation scaling (Scaling of Line Width or Font Size). These settings are described in the following sections. You'll need to determine which setting works best for you, depending on what you'll be doing in EFS.

#### Scale by GSD

With Scale by GSD, as you zoom and as you change images, **the annotation continues to cover the same area (footprint) on the ground**. Scale by GSD is absolute, and therefore predictable.

Suppose you drew an annotation on a Community image that has a GSD of 1.5 feet/pixel. (See Figure 13-6.)



**Figure 13-6:** Community Oblique image with annotation.

Then you viewed that same annotation on a Neighborhood image that has a GSD of four inches/pixel (Figure 13-7).



**Figure 13-7:** Neighborhood Oblique image with same annotation.

Scale by GSD is recommended if you'll be switching between images of similar shot levels; it may not be the best choice if you'll be switching between a base map and Neighborhood or Community level images. The difference in GSD between base maps and other shot level images is very large. So when you click on a Neighborhood or Community image, an annotation created on a base map and scaled by GSD will scale so large that it's likely to cover "too much" of the image. If you create the annotation on the Neighborhood or Community image (scaled by GSD) and swap between those two shot levels, the annotation is less likely to cover "too much" of the image.

**Hint:** By using a transparent background for your annotation, you may be able to lessen the problem of annotations covering things you want to see in your images. (You can choose a transparent background on the Attributes tab of the Text Annotations Properties dialog box.)

### Scale by Zoom Factor

With scale by zoom factor, the annotation grows (or shrinks) in direct proportion to the zoom factor; **it does not cover the same area (footprint) on the ground.** When scaling an annotation by zoom factor, the annotation size is relative to the GSD of the image it was initially "drawn on."

For example, an annotation drawn on a Neighborhood image at 100% zoom appears the same on a Community image at 100% zoom and the same still on a base map at 100% zoom. All three of these images have different GSDs, and the annotation will cover different footprints in each case.





**Figure 13-8:** Annotation drawn on a Neighborhood image at 100% zoom.



**Figure 13-9:** Annotation shown on a Community image at 100% zoom.



**Figure 13-10:** Same annotation shown on a base map image at 100% zoom.

Scale by zoom factor is recommended if you'll be switching back and forth between images and a base map.

**Will my annotations disappear if I continue to zoom out?** A line annotation will not disappear as it scales smaller and smaller. Once it shrinks to a hairline thickness (1 point), it remains that size, even if the zoom factor decreases further or if images of smaller GSDs become active.

### Don't scale

You can also choose not to scale annotations at all, as in past versions of EFS. In this case, annotations remain the same size as when you created them, regardless of a changing zoom factor or GSD variations between images.

## Overriding a layer's settings

You can choose a scale setting for an entire layer of annotations (the individual annotations “inherit” the setting from the “parent” layer). Or if you want different settings for different annotations within the same layer, you can choose to override the layer's setting for one or more particular annotations.

### ◆ To specify a scale setting for an annotation layer:

1. In your workspace, right-click the desired annotation layer.
2. From the context menu, select **Properties for <layer name>**.  
The Annotation Layer Properties dialog box appears.
3. In the Scaling of Line Width or Font Size section, click the button for the setting you want, and click **OK**.

All annotations for this layer will scale according to the setting you chose, unless you explicitly override the layer's setting.

### ◆ To specify a scale setting for an individual annotation:

1. In your workspace, right-click the desired annotation.
2. From the context menu, select **Properties for <annotation name>**.  
The annotation's properties dialog box appears. Click the **Attributes** tab if it isn't already active.
3. In the Scaling of Line Width or Font Size area, click the setting you want, and click **OK**.

The Override Layer's Scaling box is automatically checked and the annotation will scale according to the setting you chose, even if it contradicts the layer's setting.

## Copying global annotations to other workspaces

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If you would like to copy global annotations from one workspace to another, you can export a layer along with its global annotations to a file. You can then import that file into other workspaces. The annotations are saved in the **Pictometry Attribute File (PAF)** file format.

### Saving global annotations to a file

First, save the desired annotation layer to a PAF file.

◆ **To save global annotations to a file:**

1. With the workspace open and in view, select the desired annotation layer in the Workspace window.
2. Choose **Annotate⇒Store Annotation Layer To File**. The Save As dialog box appears.
3. Navigate to the directory to store the file in, and type a file name in the File name box.
4. Click **Save**. The PAF file is now ready to import into another workspace.

### Importing saved annotation files

Once an annotation layer has been exported, it can be imported into a different workspace.

◆ **To load an annotation file:**

1. Open the workspace you want to import the global annotations to.
2. Choose **Annotate⇒Load Annotation Layer from File**. The Open dialog box appears.
3. Navigate to the directory that contains the annotation file you wish to load, select the file, and click **Open**.
4. Choose **File⇒Save Workspace**. The workspace is saved with the annotation layer you just imported.

The annotation layer and its global annotations are listed in the Workspace window.



# Chapter 14 — Creating Grid Overlays

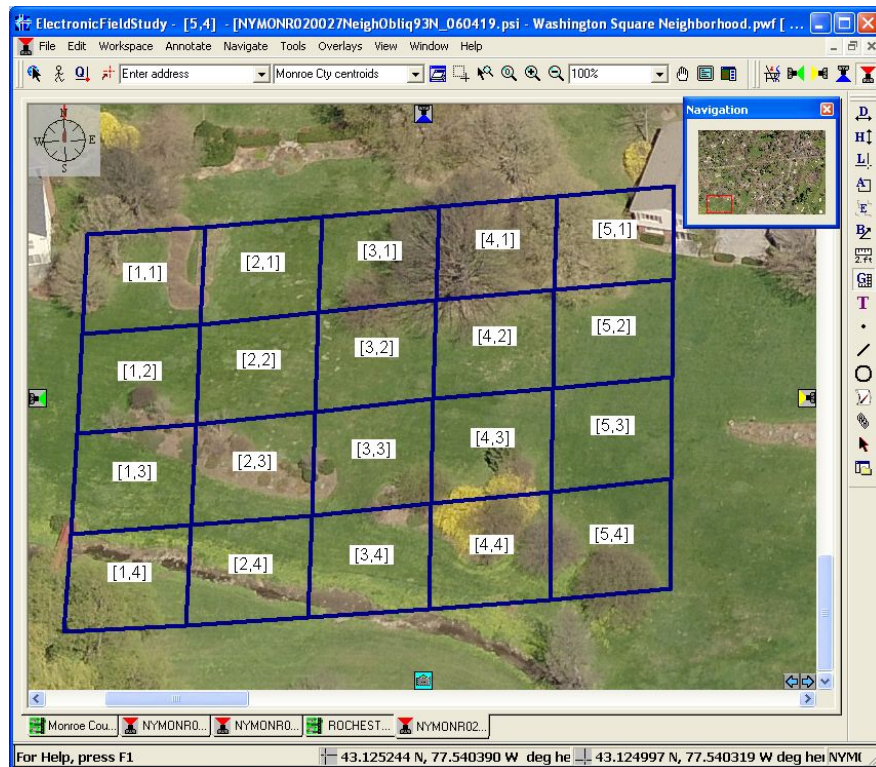
This chapter discusses how you can use the Grid Tool to create grid overlays for your images, how you can enter alphanumeric data into a grid, and how you can export data from a grid.

## Topics covered in this chapter ... page

What is a grid overlay? .....	265
Setting Grid Tool properties .....	268
Creating a grid.....	273
Importing a grid from a workspace .....	279
Viewing a grid on an image .....	281
Adding data to a grid .....	282
Exporting a grid.....	286
Changing a grid.....	290
Deleting a grid.....	293

## What is a grid overlay?

A grid is a type of user-created image overlay that contains equal-sized segments into which you can store data.



**Figure 14-1:** Example of a rectangular grid.

## The Grid Tool

You'll use the Grid Tool to create a grid overlay. You'll select the type of grid, specify its size and appearance, and possibly select a data-entry template. The selections you make are stored as Grid Tool properties.

## Grids are saved in workspaces

When you place a grid on an image, it is automatically saved as a layer in the active workspace. A grid's properties and its data-entry template are saved.

## Grids can store data

You can enter and store alphanumeric data within each grid segment by simply clicking inside the grid segment and then typing the data into a template. You can change the data by the same method.

### Select a template

You can select a template in which to enter data into your grid. The template can be created from a shapefile, from a user-created DBF file, or from an SDE database. If you don't select a template, you can use a standard template provided by EFS.

## Importing and exporting

EFS provides import and export capability.

### Export grid data

After entering data into a grid, you can export that data to a shapefile or to an SDE database.

### Import a grid's properties

EFS provides a time-saving feature for creating a grid that is similar to one you've already created.

Here's an example. Assume that you've created a grid and selected a data-entry template for it. Assume that you need to create another grid whose characteristics are identical or similar. Rather than start from the beginning, you can import the grid layer's properties into the Grid Tool Properties dialog box. Once the properties are imported, you can place the new grid in the Image window at the desired location.

### *What is imported?*

When you import a grid from a workspace, the Grid Tool properties are overwritten with the characteristics of the grid layer you imported.

**Important:** Only a grid's properties are imported, not its data.

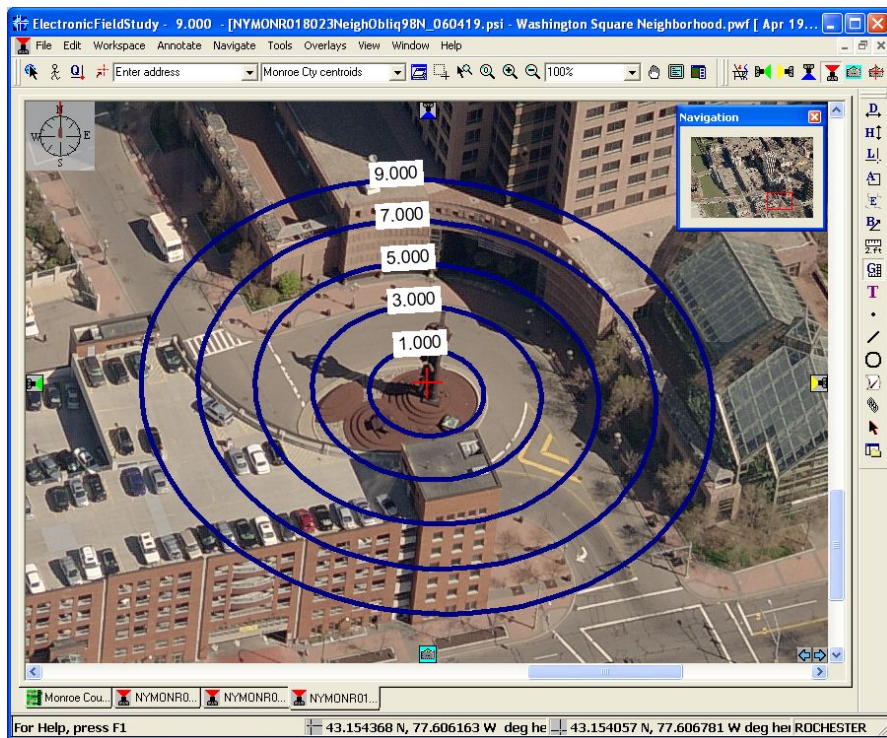
These properties *are* imported:

- Type
- Bearing
- Grid segment size, Total grid size, Number of grid segments, and Units
- label properties
- Line Width, Line Color, Highlight
- Font, Style, Size, Text Color and Background Color
- location information (Origin, X and Y coordinates)

## Types of grids

There are two types of grid overlays:

- rectangular grid (Figure 14-1)
- circular grid (Figure 14-2)



**Figure 14-2** Example of a circular grid with precision labeling.

## Grid characteristics

There are various options that affect the appearance of a grid. You'll use the Grid Tool Properties dialog box to choose which kind of grid to create and how it will look on the image. For example, you can:

- Label the sections of your grid with sequence numbers and with alphanumeric prefixes or suffixes. You can display the number portion as an integer or with decimal positions (for greater precision), and you can choose

For more details, see "Setting Grid Tool properties" on page 268.



the number's format ([x,y] for example).

- Rotate rectangular grids by entering the angle of rotation (or by using a mouse).
- Choose the grid's total size and the size of its sections in the unit of measurement you choose.
- Choose the value by which to increment the grid sections.
- Choose the font and colors for text labels and the line width and colors for grid lines.

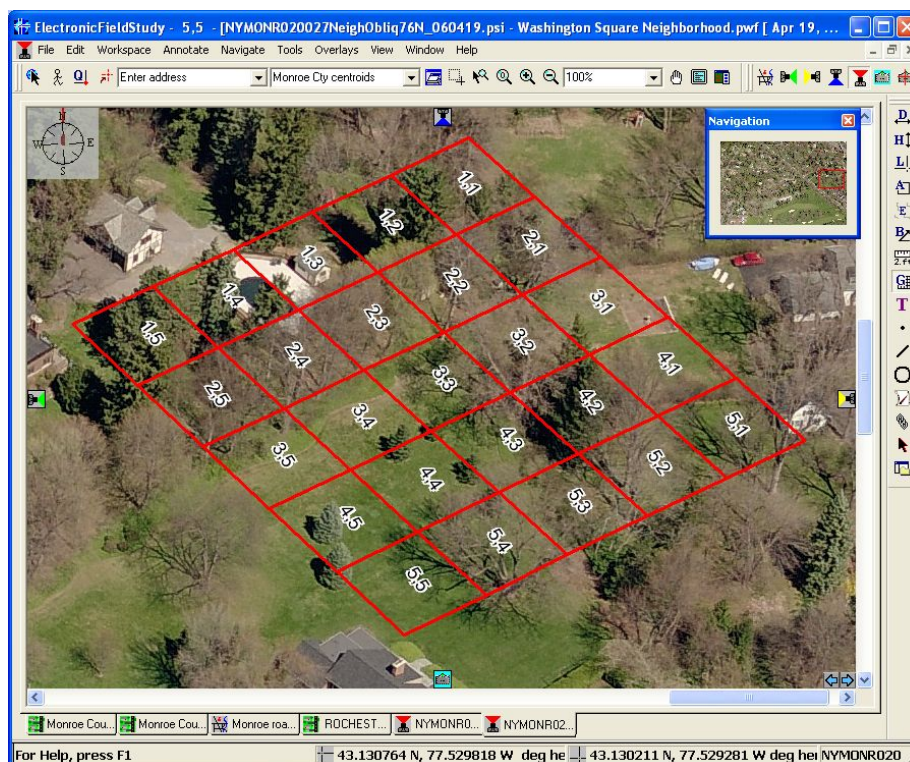


Figure 14-3: Example of a rotated grid.

## Setting Grid Tool properties

The first step in creating a grid is to specify the grid's properties. You'll select these properties on the Grid Tool Properties dialog box.

### The Grid Tool Properties dialog box



#### ◆ To open the Grid Tool Properties dialog box:

- Click the **Grid Tool** and choose **Tools**⇒**Properties**.

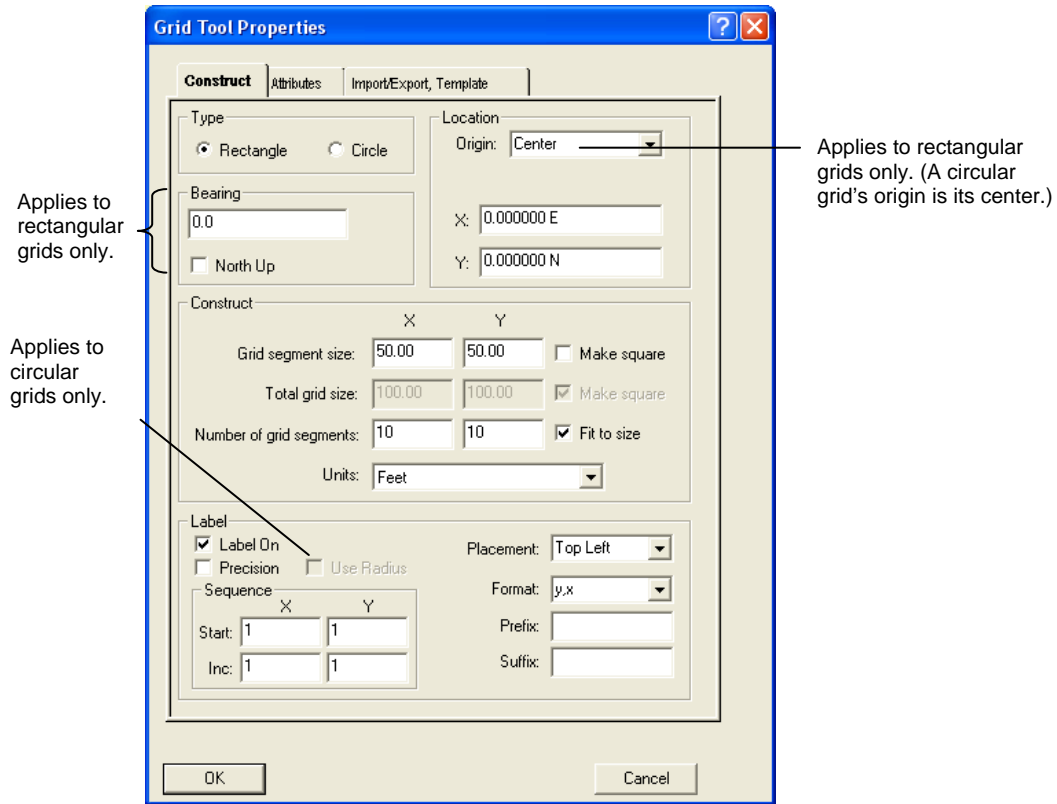
The Grid Tool Properties dialog box opens to the Construct tab (Figure 14-4.)

The Grid Tool Properties dialog box has three tabs.

- Construct tab
- Attributes tab
- Import/Export, Template tab

### The Construct tab

The Construct tab contains options that let you select which type of grid to create and how to construct it (its size, location, label options).



**Figure 14-4** The Construct tab of the Grid Tool Properties dialog box.

The Construct tab contains the following options and buttons.

**Table 14-1:** Contents of the Construct tab.

Field or button	Description
Rectangle	Click this button if you want to create a rectangular grid (a matrix of rectangles).
Circle	Click this button if you want to create a circular grid (concentric circles resembling a "bulls-eye").
Bearing	<i>(Applies only to rectangular grids)</i> Type the angle in degrees by which to rotate the grid.
North Up	Check this box if you want to force the grid matrix to be north up (Bearing of 0.0 degrees). With this field checked, the grid cannot be rotated (the value in Bearing is ignored and you cannot rotate the grid with the mouse and keyboard.)

**Table 14-1:** Contents of the Construct tab. (continued)

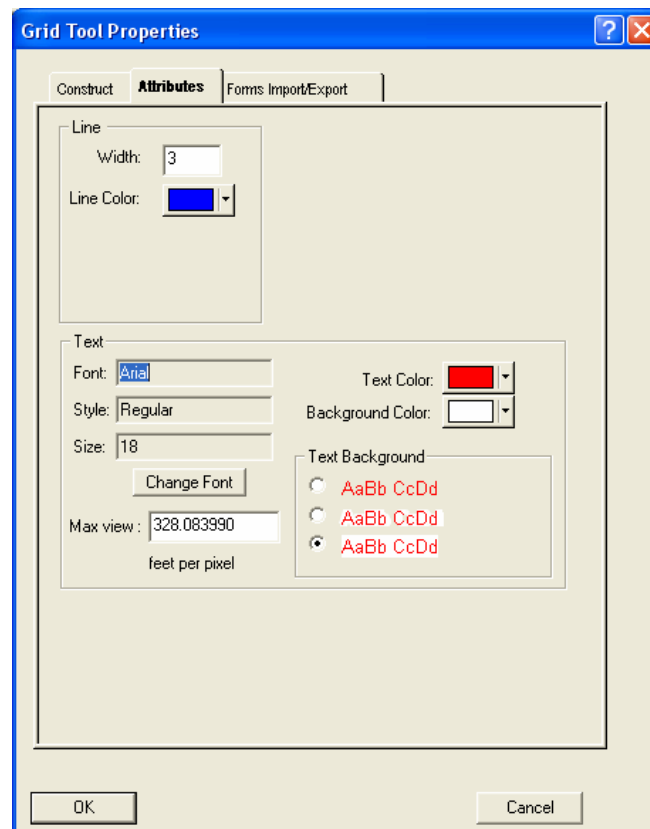
Field or button	Description
<i>Location section</i> (This section determines where the grid is placed.)	
Origin	(Applies only to Rectangle type) Select the position you wish to designate as the grid's origin (for example, Top Left, Center, Lower Right). EFS uses the origin as a starting point for drawing the grid and as an axis for rotating the grid. <b>Note:</b> The origin of a circular grid is always its center.
X	Type the value of the X coordinate (in the current coordinate system) at which to place the origin.
Y	Type the value of the Y coordinate (in the current coordinate system) at which to place the origin.
<i>Construct section</i> (This section determines how the grid is constructed.)	
Grid segment size	Type the values for the X and Y dimensions in the desired units of measure for each segment in the grid. (The units of measure are set in the Units field.) <b>Note:</b> The Y field is dim if Make square is checked. For circular grids, the X dimension represents the distance between each circle, and the Y dimension is not applicable.
Make square (Grid segment size)	Check this option if you want to make each grid segment in the matrix a square. If checked, EFS sets the Y dimension to the same value as the X dimension for each grid in the matrix. <i>Applies to rectangular grids only.</i>
Total grid size	Type the dimensions (X and Y) of the entire grid. <b>Note:</b> This value may be adjusted to create a grid that contains the number of segments entered in Number of grid segments, with segments sized according to the X and Y values entered in Grid segment size. If you use the mouse and draw a line to create a grid, this field will be calculated based on the distance of the line you drew and the size of the grid segments. For circular grids, only the X dimension applies. It represents the radius of the circle.
Make square (Total grid size)	Check this option if you want to make the grid a square (make X and Y dimensions equal). <i>Applies to rectangular grids only.</i>
Number of grid segments	Type the exact number of grids segments (the number of concentric circles if Circle is chosen for the type) you want to be included in the grid. <b>Note:</b> If you enter values for Number of grid segments, your grid will be constructed by using these values plus the values in Grid segment size, and the values in Total grid size will be ignored.
Fit to size	Check this option if you want to force the X and Y Grid segment size dimensions to be multiples of the Total grid size.
Units	Select the units to be used for the dimensions entered in Grid segment size or Total grid size.
<i>Label section</i> (This section affects the appearance of labels.)	
Label On	Check this option if you want to view labels on the grid. (Uncheck to turn off label viewing.)
Precision	Check this option if you want labels to be shown as precision numbers (with a decimal point) instead of as integers. This is helpful for circular grids to label each circle with the distance from the center point.
Use Radius	(Applies only to circular grids) Check this option if you want to use the circle's radius (grid segment size) as the value by which to increment segment labels instead of using sequence numbers.
Sequence Start	The starting number of the label for each X and Y dimension.

**Table 14-1:** Contents of the Construct tab. (continued)

Field or button	Description
Sequence Inc.	The number by which to increment each label for each X and Y dimension.
Placement	Select the location within each grid or circle in which to place the label.
Format	Select the label format from the drop-down list.
Prefix	Type the text you want to precede each label.
Suffix	Type the text you want to append to the end of each label.

## The Attributes tab

The Attributes tab contains options for choosing attributes such as the color of the grid lines and the appearance of labels.

**Figure 14-5** The Attributes tab of the Grid Tool Properties dialog box.

The Attributes tab contains the following options and buttons.

**Table 14-2:** Contents of the Attributes tab.

Field or button	Description
Line Width	Enter a value for the width of the grid lines. (2, 3, or 4 are good choices for width.)
Line Color	Select a color for the grid lines.

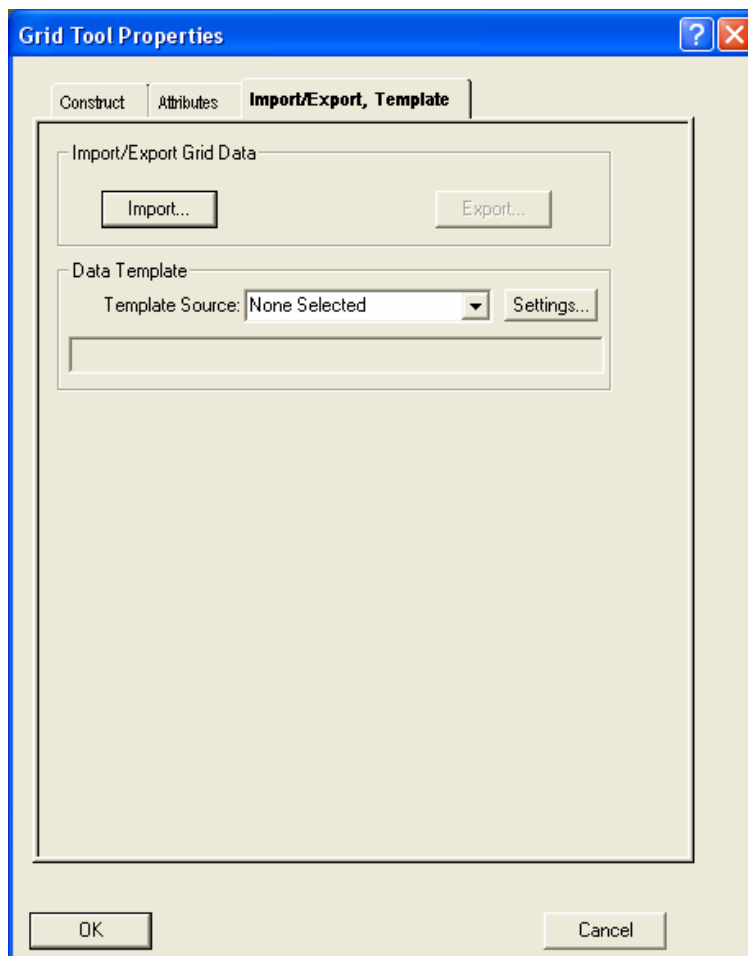
**Table 14-2:** *Contents of the Attributes tab. (continued)*

Field or button	Description
Text (Font, Style, Size)	The typeface, style (bold, italics, regular), and font size for grid labels. Click Change Font to change these options.
Change Font	Click this button to change the Font, Style, and Size of the font in which labels are shown.
Max view	Enter the maximum GSD at which the grid should become visible on the screen when changing the magnification. When you zoom out above the maximum, your grid will disappear from view.
Text Color	Select a color for the text.
Background Color	Select a color for the text background.
Text Background	Click the option that shows how you want text background to appear.

### The Import/Export, Template tab

The Import/Export, Template tab contains options for:

- Importing a grid layer from a workspace
- Selecting a data-entry template

**Figure 14-6** *The Import/Export, Template tab of the Grid Tool Properties dialog box.*



The Import/Export, Template tab contains the following options and buttons.

**Table 14-3:** Contents of the Import/Export, Template tab.

Field or button	Description
Import	Click this button to import properties from a grid in the active workspace. The grid's properties and data-entry template overwrite the properties associated with the Grid Tool.
Export	<i>This button is dim when creating a grid. (It's available on the Import/Export, Data Storage tab of the Grid Properties dialog box, accessible from a grid layer in a workspace.)</i>
Template Source	If you want to use a template to enter grid data, select the file type from the list. When you later click in a grid segment, that template will appear for you to enter data.  <b>Note:</b> When you select an existing file to use as a template (a DBF file for example), only its data fields and their types are actually used. None of the file's data is used.
Settings	Click this button to navigate to the directory that contains the file you want to use as a template.

#### What is the Import/Export, Data Storage tab?

After creating a grid, if you right-click its layer in the workspace and select **Properties for <grid name>** from the context menu, you'll see a tab called "Import/Export, Data Storage" on the Grid Properties dialog box. Although the tab's contents are not Grid Tool properties, the tab will look quite similar to the Import/Export, Template tab.

## Creating a grid

Creating a grid involves the following steps:

1. Selecting the grid type, specifying the grid's characteristics, and selecting a data-entry template (an optional step). You'll make these choices on the Grid Tool Properties dialog box. You can do this step at any time. Because these choices are properties of the Grid Tool, they remain as you set them.
2. Placing the grid at a location in the active image in the Image window (with the Grid Tool active).

**Important:** Before you add data to a grid, you can change *any* of the grid's properties (color, type, and size, for example); but after you've entered data, you can change *only* the line color and text properties.

### Creating a circular grid

Use the following two procedures to create a circular grid.

#### Setting up a circular grid

Use the following procedure to set up a circular grid.

**Tip:** To shortcut the setup process, you can import an existing grid's properties. See the procedure "To import a grid layer from a workspace" on page 280.



The Construct tab is pictured on page 269.

If you're not sure about the grid's location, you can move it later. See "Moving a grid" on page 292.

#### ◆ To set up a circular grid:

1. Click the **Grid Tool** and choose **Tools⇒Properties**.  
The Grid Tool Properties dialog box opens to the Construct tab (Figure 14-4.)
2. Click **Circle** for the Type.
3. In the Construct section, type the desired Grid segment size and Number of grid segments, then select the units of measure from the Units list.
4. (Optional) In the Label section, check **Label On**, then choose or enter the desired options for displaying labels (Precision, Use Radius or Sequence, Placement, Format, Prefix, Suffix).

**Note:** If you check "Use Radius," the circle's radius (grid segment size) is used as the value by which to increment segment labels.

5. (Optional) To place the grid's origin at a location other than the point you clicked or the point at which you starting dragging the mouse, type new X and Y coordinates for the origin in the Location section.
6. (Optional) To change the appearance (colors, font, line width) of the grid lines or grid labels, click the **Attributes** tab and change properties as desired.
7. (Optional) To select a data-entry template, do the following:
  - a. Click the **Import/Export, Template** tab. (See Figure 14-6.)
  - b. From the Template Source list, select the type of file to use as a template.

**Note:** To use a DBF file as a template (whether part of a shapefile set or not), select **Shapefile** for the Template Source.

- c. Click **Settings**. The Open dialog box opens.
- d. Navigate to the directory that contains the template source, select the file, and click **Open**. The Open dialog box closes.

**Note:** You can select a template from a file that *does* or *does not* contain data. EFS uses only the format of the file (the fields and their types); it does not import the file's data and it does not maintain a link to the file.

*If you don't want a template, select None Selected.*

8. Click **OK**. The Grid Tool Properties dialog box closes.

You are now ready to place the grid on an image in the Image window.

### Placing the grid in the Image window

Use the following procedure after setting up the grid's specifications (the previous procedure).

◆ **To place a circular grid on an image:**

1. If it's not already active, click the **Grid Tool**.
2. Do *one* of the following:
  - Press and hold the mouse on the point in the image where you want the center of the circular grid to be. Drag from the center to the outside of the circle to create the circle's radius. Then release the mouse button.

**Note:** The number of concentric circles is determined by the Number of grid segments.

— or —

- Click the point in the image where you want the center of the grid to be.

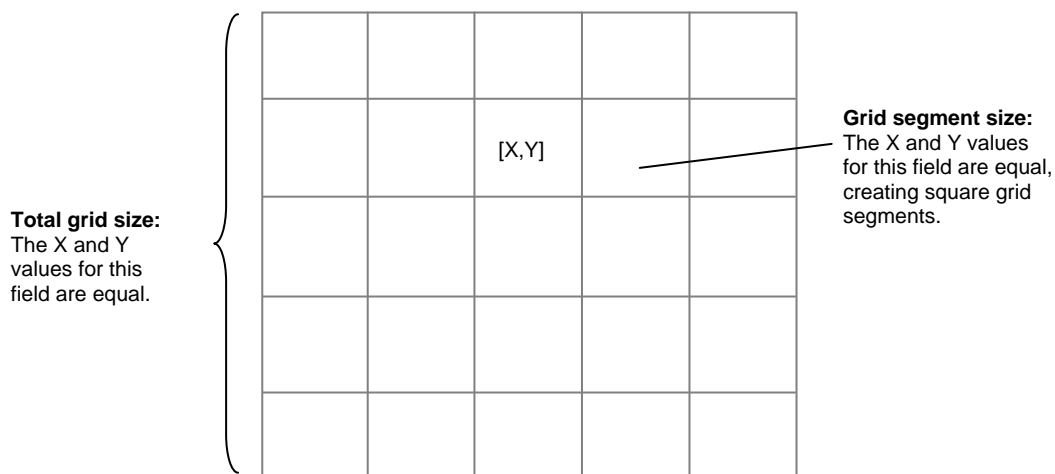
*You can easily change a grid's name later. See "Renaming a grid layer."*

The grid is added to the workspace as a layer and given the name Grid n, (where n is a number assigned by EFS). The layer name appears in the workspace in colored text, matching the color you've chosen for the grid.

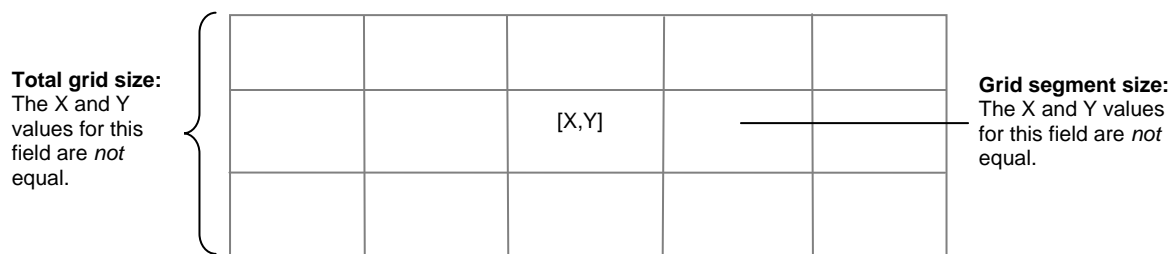
The grid appears on the active image (if Overlays⇒View GIS Annotations is checked). Its origin (center) is the point you clicked or the point in which you started dragging the mouse.

## Creating a rectangular grid

A rectangular grid is a matrix of individual grids, each identified by an [X,Y] pair representing that grid's location within the matrix, and labeled sequentially using an increment value you specify. The X and Y dimensions of the grids can be equal (creating a matrix of square grids) or unequal (creating a matrix of non-square grids).



**Figure 14-7:** A square matrix with square grid segments.



**Figure 14-8:** A non-square matrix with non-square grid segments.

Use the following two procedures to create a rectangular grid.

### Setting up a rectangular grid

**Tip:** To shortcut the setup process, you can import an existing grid's properties. See the procedure "To import a grid layer from a workspace" on page 280.

Use the following procedure to set up a rectangular grid.

#### ◆ To set up a rectangular grid:



The Construct tab is pictured on page 269.

For more information about the options found on the Construct tab, see Table 14-1 on page 269.

1. Click the **Grid Tool** and choose **Tools⇒Properties**.  
The Grid Tool Properties dialog box opens to the Construct tab. (Figure 14-4.)
2. Click **Rectangle** for the Type.
3. (Optional) If you want to rotate the grid, then in the Bearing field, type the value of the angle in degrees by which the grid should be rotated.
4. (Optional) If you want to force the grid to be north up, check the **North Up** box. This prevents the grid from being rotated by any means.
5. In the Construct section, type X and Y values for Grid segment size and Number of grid segments, then select the units of measure from the Units list.

**Note:** If you want the X and Y dimensions of the grid segments to be the same, enter the same X and Y values for Grid segment size, or check **Make square** (to the right of Grid segment size).

6. If you checked "Fit to Size," type X and Y values for Number of grid segments, otherwise, type X and Y values for Total grid size.
7. (Optional) In the Label section, check **Label On**, then choose or enter the desired options for displaying labels for each grid segment.
8. (Optional) To place the grid's origin at a location other than the point you clicked or the point at which you starting dragging the mouse, type new X and Y coordinates for the origin in the Location section.

If you're not sure about the grid's location, you can move it later. See "Moving a grid" on page 292.

9. (Optional) To change the appearance (colors, font, line width) of the grid lines or grid labels, click the **Attributes** tab and change properties as desired.
10. (Optional) To select a data-entry template, do the following:
  - a. Click the **Import/Export, Template** tab. (See Figure 14-6.)
  - b. From the Template Source list, select the type of file to use as a template.

**Note:** To use a DBF file as a template (whether part of a shapefile set or not), select **Shapefile** for the Template Source.

- c. Click **Settings**. The Open dialog box opens.
- d. Navigate to the directory that contains the template source, select the file, and click **Open**. The Open dialog box closes.

**Note:** You can select a template from a file that *does* or *does not* contain data. EFS uses only the format of the file (the fields and their types); it does not import the file's data and it does not maintain a link to the file.

*If you don't want a template, select **None Selected**.*

11. Click **OK**. The Grid Tool Properties dialog box closes.

You are now ready to place the grid on an image in the Image window.

### Placing the grid in the Image window

Use the following procedure after setting up the grid's specifications (the previous procedure).

#### ◆ To place a rectangular grid on an image:

1. If not already active, click the **Grid Tool**.
2. Click the point in the image where you want the center of the grid to be.

The grid is added to the workspace as a layer and given the name Grid n, (where n is a number assigned by EFS). The layer name appears in the workspace in colored text, matching the color you've chosen for the grid.

The grid appears on the active image (if Overlays⇌View GIS Annotations is checked). Its origin (center) is the point you clicked.

*You can easily change a grid's name later. See "Renaming a grid layer."*

### Creating a grid with the mouse

Another way to create a grid overlay is to use the mouse. With this method, you don't need to enter grid dimensions on the Grid Tool Properties dialog box prior to placing your grid. However, you *do* need to select the grid type on the Grid Tool Properties dialog box before drawing the grid.

The mouse provides a faster way to create a grid when your grid dimensions and number of segments don't need to be exact, and if you can approximate the grid's size by drawing the circle or rectangle on the image.

### Creating a circular grid with a mouse

To create a circular grid with the mouse, see the procedure “To place a circular grid on an image” on page 275.

### Creating a rectangular grid with equal X and Y dimensions

#### ◆ To create a square grid:



1. Click the **Grid Tool**.
2. Choose **Tools⇒Properties**. The Grid Tool Properties dialog box opens to the Construct tab (Figure 14-4). If not already selected, click Rectangle for the Type, and click **OK**.
3. Press and hold the left mouse button on the starting point (the point you want to be the upper left corner of the grid).
4. Drag to an ending point and release the mouse button.

**Tip:** If you want to create a rotated grid, drag at an angle. (Grid labels will also be rotated.)

The grid is drawn on the image and the line you drew becomes the top of the grid.

#### How does EFS determine the grid's angle, the grid's total size, and the number of grid segments?

The grid's angle is the same as the angle between the starting and stopping points of the line you dragged.

The grid's total size is calculated using the length of the line you dragged, which becomes the X and Y dimensions for Total grid size.

The Number of grid segments is calculated using the X and Y dimensions and the current value of the Grid segment size field on the Grid Tool Properties dialog box. (The Number of grid segments is equal to the distance you dragged divided by the distance in the Grid segment size field.)

### Creating a rectangular grid with different X and Y dimensions

#### ◆ To create a rectangular grid with different X and Y dimensions:



1. Click the **Grid Tool**.
2. Choose **Tools⇒Properties**. The Grid Tool Properties dialog box opens to the Construct tab (Figure 14-4). If not already selected, click Rectangle for the Type.
3. Press and hold the left mouse button on the starting point (the point you want to be the upper left corner of the grid). Drag the mouse to the right to create the X dimension. *Don't release the mouse button.*
4. Press and hold the **CTRL** key, and drag the mouse down to create the Y dimension. The outline of a parallelogram appears as you drag the mouse.

**Tip:** If you want to create a rotated grid, drag the X dimension at an angle, or drag up after creating the X dimension. (Grid labels will also be rotated.)

5. When the Y dimension is the desired size, release both the **CTRL** key and the mouse button.

The grid is drawn on the image and the line you drew becomes the top of the grid.

#### How does EFS determine the grid's angle, the grid's total size, and the number of grid segments?

The grid's angle is the same as the angle between the starting and stopping points.

The grid's total size is calculated using the length of the lines you dragged. The first line becomes the X dimension and the second line becomes the Y dimension for Total grid size.

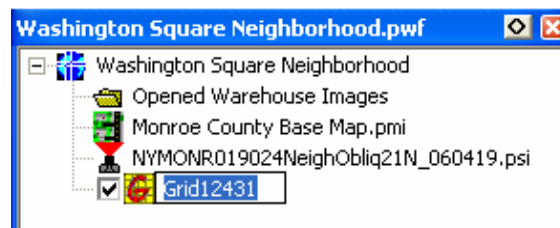
The Number of grid segments is calculated using the X and Y dimensions and the current value of the Grid segment size field on the Grid Tool Properties dialog box. (The Number of grid segments for X is equal to the distance of the first line you dragged divided by the X distance in the Grid segment size field. The Number of grid segments for Y is equal to the distance of the second line you dragged divided by the Y distance in the Grid segment size field.)

## Renaming a grid layer

Use the following procedure to rename a grid in the Workspace window.

### ◆ To rename a grid:

1. Select the name of the grid in the workspace.
2. Select it again. (Do not double-click the grid layer name.) The name is surrounded by a black box and a blinking cursor appears at the end of the name.



3. Type the new name or change the name as desired.
4. Press **ENTER** or click somewhere other than on the grid name.

## Importing a grid from a workspace

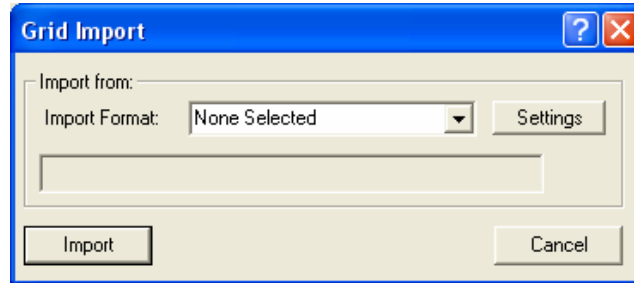
EFS provides a feature that helps shortcut the grid setup process. EFS lets you import the properties of a grid layer from your workspace into the Grid Tool Properties dialog box so you can create a grid that's similar to it, without having to make the same choices again. The grid's template (the fields and their types) is also imported, but not the grid's data.

**Note:** EFS does not maintain a link to the file whose format you imported as a template.

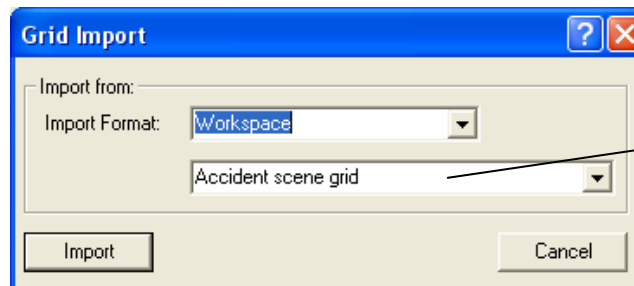
◆ **To import a grid layer from a workspace:**



1. Click the **Grid Tool**.
2. Choose **Tools⇒Properties**. The Grid Tool Properties dialog box opens.
3. Click the **Import/Export, Template** tab (Figure 14-6).
4. Click **Import**. The Grid Import dialog box opens.



5. Select **Workspace** for the Import Format. A drop-down list appears on the dialog box.



Select the grid layer from this list.

6. From the drop-down list, select the grid layer you wish to import, and click **Import**. The Grid Tool properties change to the properties of the grid you imported.
7. When you're finished creating a working grid based on the grid layer you imported, you can export the working grid to a workspace.
8. When you're done, close the Grid Tool Properties dialog box by clicking **OK**. The properties in the Grid Tool Properties dialog box are overwritten by the properties of the grid layer you imported.
9. Place the grid in the image by clicking the point in the image where you want the center of the grid to be.

The grid is added to the workspace as a layer and given the name Grid n, (where n is a number assigned by EFS). The layer name appears in the workspace in colored text, matching the color you've chosen for the grid.

The grid appears on the active image (if Overlays⇒View GIS Annotations is checked). Its origin (center) is the point you clicked.

*You can easily change a grid's name later. See "Renaming a grid layer."*



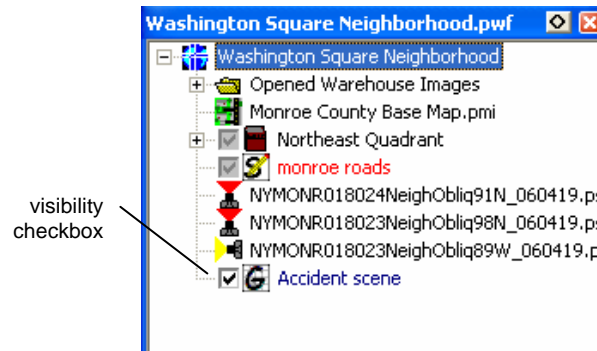
## Viewing a grid on an image

You can view your grid in the Image window or hide it from view. Like other workspace layers, EFS lets you turn on or off the visibility of each grid layer individually.

### ◆ To hide or view a specific grid layer:

Do *one* of the following:

- In the Workspace window, check or uncheck the visibility checkbox, which is to the left of the grid layer name. (Check to show the layer; uncheck to hide it.) The layer appears or disappears from view.



— or —

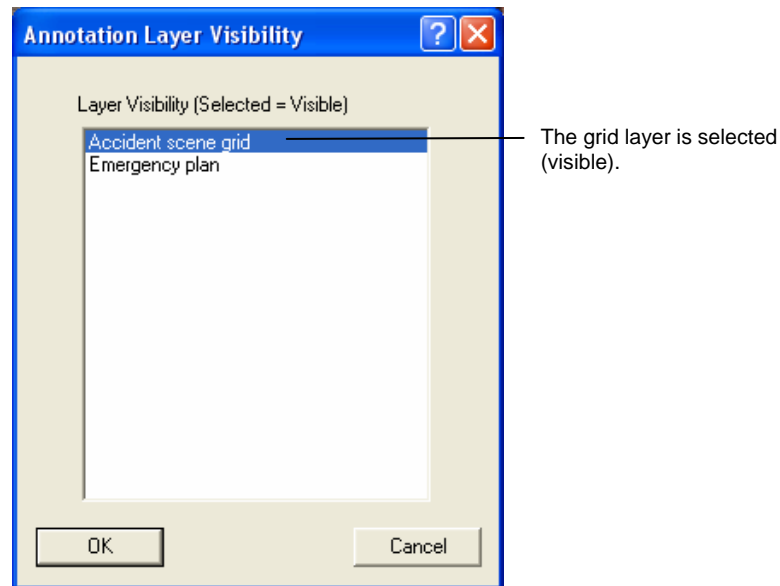
- In the Workspace window, right-click the grid layer and select **View Layer <grid layer name>** or **Hide Layer <grid layer name>** as desired from the context menu.

The layer appears or disappears from view depending on whether it was hidden or in view when you right-clicked it.

— or —

- Choose **Overlays** ⇒ **Annotation Layer Visibility**.

The Annotation Layer Visibility dialog box appears with the list of annotation layers (user-defined, GIS, and grid).



- c. Select or deselect the annotation layers, as desired. (If the layer is highlighted, it will be visible.)
- d. Click **OK**.

The Annotation Layer Visibility dialog box closes and un-highlighted layers disappear from view.

## Adding data to a grid

You can enter alphanumeric data into a grid by typing the data into a template you selected, or, if you didn't select a template, into a standard template provided by EFS.

If you have not yet selected a template and wish to do so, see "Changing a grid's properties" on page 290. After selecting the template, return here for instructions about entering data into a grid.

### Where is the data saved?

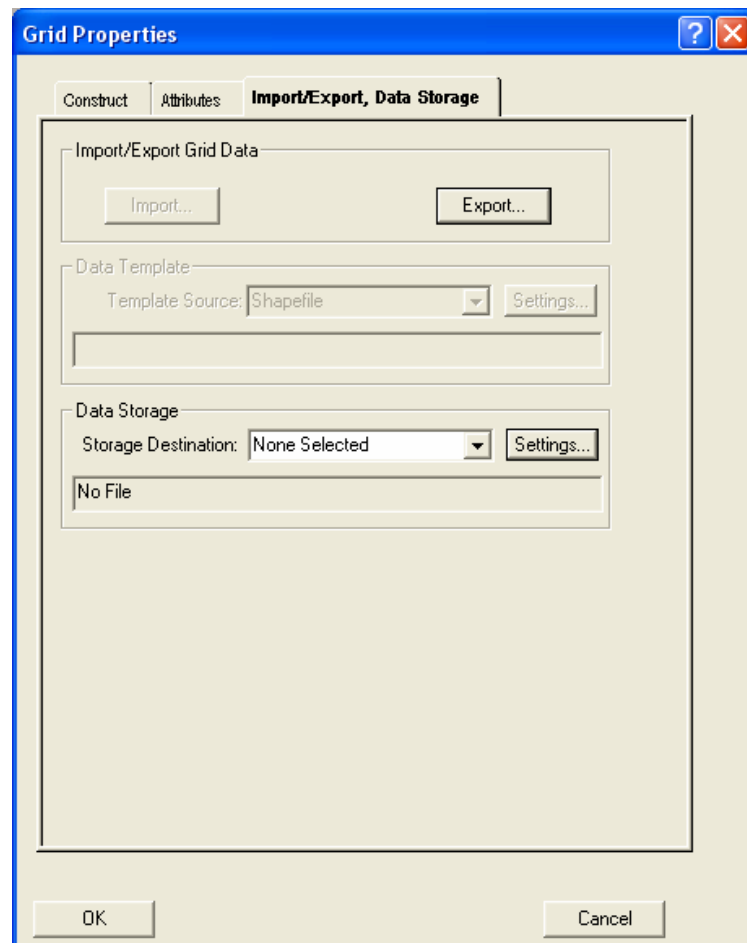
The data you enter can be saved to a shapefile or to an SDE database. You can specify the file in which to store the data before entering any data or immediately after entering data into a segment.

### Selecting a file in which to save grid data

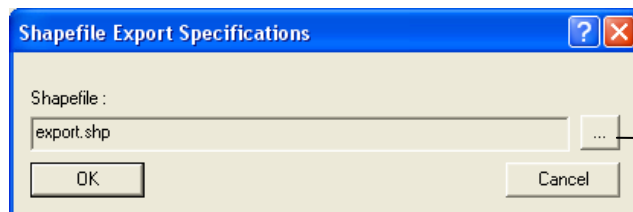
If you have not yet entered grid data, use the following procedure to select a file in which to save a grid layer's data.

#### ◆ To select a file in which to save grid data:

1. In the Workspace window, right-click the desired grid and select **Properties for <grid name>** from the context menu. The Grid Properties dialog box opens.
2. Click the **Import/Export, Data Storage** tab.



3. In the Data Storage section, select **Shapefile** or **SDE Database** for the Storage Destination, then click **Settings**.
4. *If you selected "Shapefile,"* the following dialog box opens:

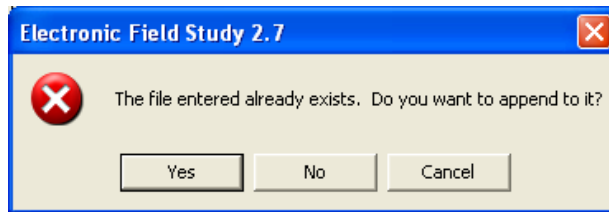


The "Browse" button



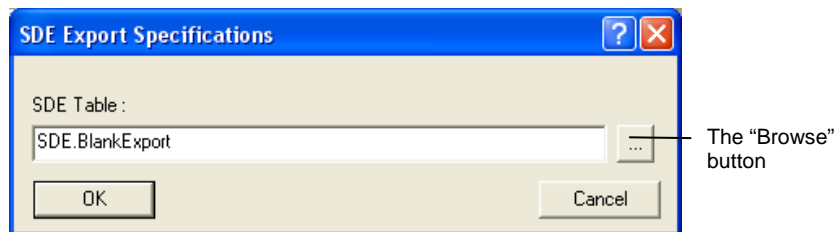
- a. Click the **"Browse"** button. The Save As dialog box opens.
- b. Navigate to the directory in which to save the export file, type or change the file name, and click **Save**. (The file name must have an extension of ".shp".) The Save As dialog box closes.
- c. On the Shapefile Export Specifications dialog box, click **OK**.

If you chose an existing file name, the following message appears:



- If you want to append the data to this file, click **Yes**.
- If you clicked **No**, the Shapefile Export Specifications dialog box reopens. Repeat Steps 4a – 4c and choose a different file.

Otherwise, if you selected “SDE Database,” the following dialog box opens:



- a. Do *one* of the following:
    - To specify a new file name, type the name in the SDE Table box.
    - or –
    - To select an existing file, click the “**Browse**” button. The Select SDE table dialog box opens listing all existing SDE tables. Select the table to which you want to export data.
  - b. Click **OK**. The SDE Export Specifications dialog box closes.
5. (On the Grid Properties dialog box) click **OK**. When you enter data into this grid layer, the data will be saved to the file you selected in this procedure.



## Entering grid data

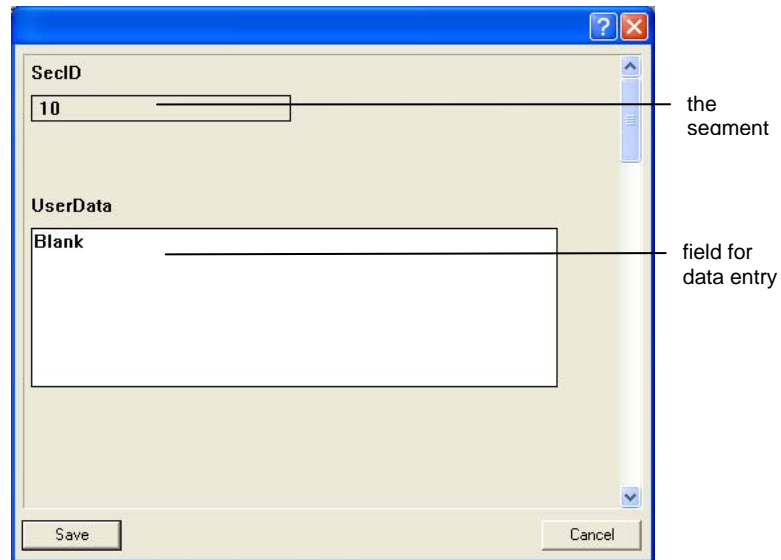
Use the following procedure to enter data into a grid. (If you have not yet selected a file in which to save the data, you’ll be prompted to select one during this procedure.)

### ◆ To enter data into a grid:

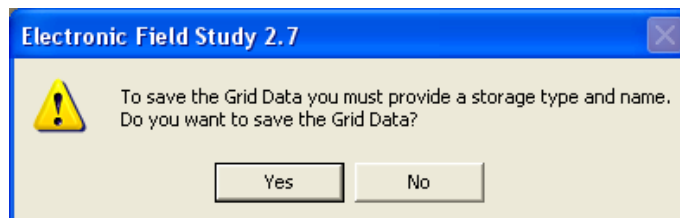
1. Make sure your grid is visible in the Image window.
2. Click the **Grid Tool**.
3. Click inside the grid segment in which you want to enter data.



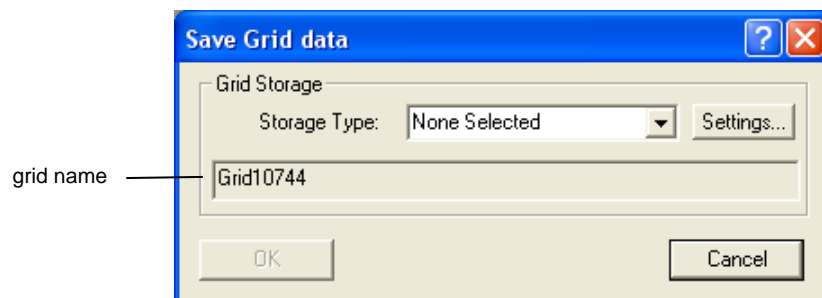
If you selected a template for your grid, the template is shown in a dialog box, otherwise the following default template appears.



4. Type data into each field in which you want to store information, then click **Save**. (The default template has one data entry field.)
5. If you've already selected a file in which to store the grid data, EFS stores the data you entered for that segment and closes the template. Repeat Steps 3 – 4 for each grid segment you want to enter data into and skip the rest of this procedure.
6. If you have not yet selected a file in which to store the grid data, the following message appears:



- a. Click **Yes** to specify a file. The following dialog box appears:



- b. Select **Shapefile** or **SDE Database** for the Storage Type, then click **Settings**.
- c. Follow Step 4 of the procedure "To select a file in which to save grid data." Step 4 is found on page 283.

- d. Click **OK**.

EFS stores the data you entered for that segment and closes the template.

7. Repeat Steps 3 – 4 for each grid segment you want to enter data into.

## Exporting a grid

---

When you export a grid, both its vector and text data are exported. EFS exports not only the grid's structure (such as its type, size, characteristics, and labels), but it also exports any alphanumeric data contained in the grid's segments. You can export a grid to a shapefile or to an SDE database.

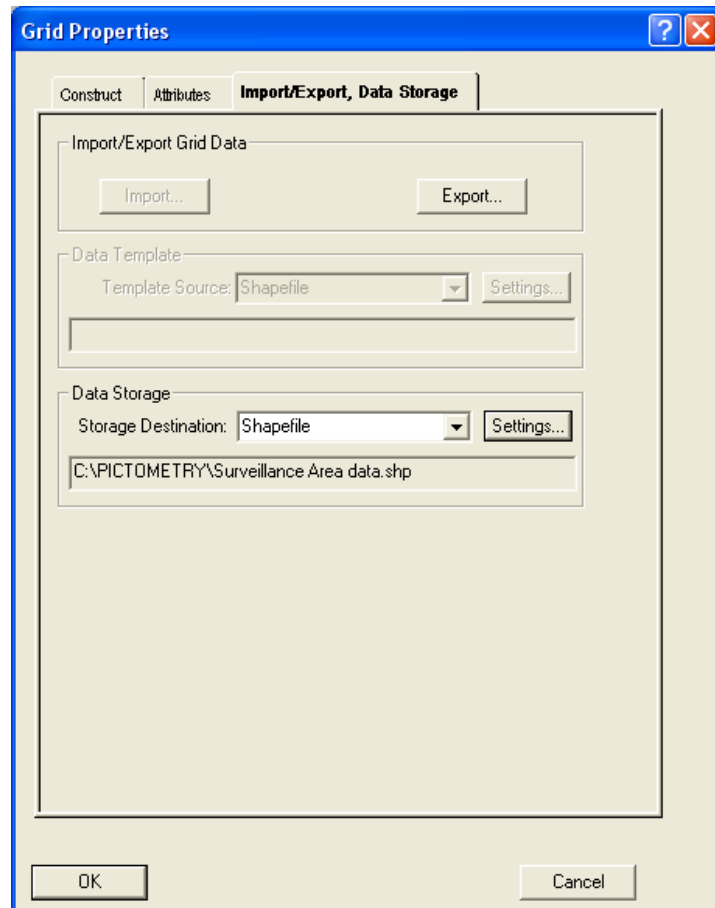
### Exporting a grid to a shapefile

#### ◆ To export a grid to a shapefile:

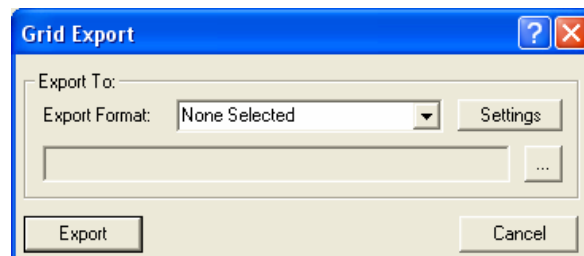
1. Do *one* of the following:
  - In the Workspace window, double-click the grid to be exported.  
— or —
  - In the Workspace window, right-click the grid to be exported, and select **Properties for <grid name>** from the context menu.  
— or —
  - Select the grid layer in the Workspace window, and choose **Edit⇒Properties**.

The Grid Properties dialog box opens.

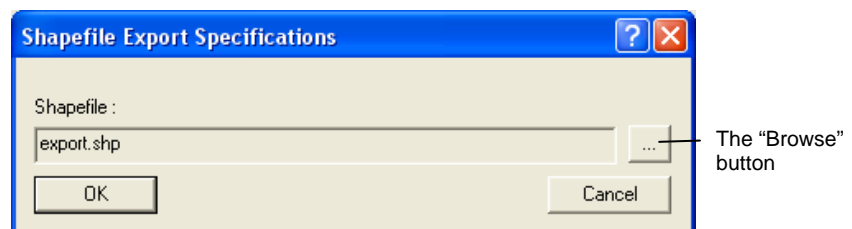
2. Click the **Import/Export, Data Storage** tab.



3. Click **Export**. The Grid Export dialog box opens.

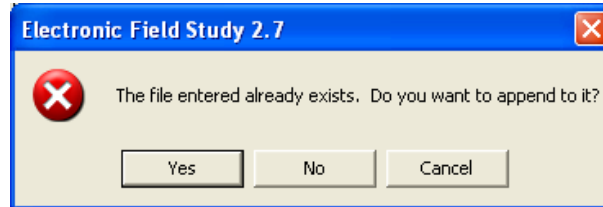


4. Select **Shapefile** for the Export Format.
5. Click **Settings**. The Shapefile Export Specifications dialog box opens.



6. Click the **"Browse"** button. The Save As dialog box opens.
7. Navigate to the directory in which to save the export file, type or change the file name, and click **Save**. (The file name must have an extension of ".shp".) The Save As dialog box closes.

8. Click **OK**. The Shapefile Export Specifications dialog box closes.
9. If you chose an existing file name, the following message appears:



If you want to append the data to this file, click **Yes**, otherwise, click **No**.

If you clicked **No**, the Shapefile Export Specifications dialog box reopens. Repeat Steps 6 – 8 to choose a different file.

10. On the Grid Export dialog box, click **Export**.
11. (On the Grid Properties dialog box) click **OK**.

The data is exported to the file you chose.

## Exporting a grid to an SDE database

Before you can export tool data to an SDE database, you must connect to your SDE database. (You must be connected before starting the following procedure. If you are unfamiliar with how to connect to SDE, see “Connecting to your SDE database” in Part III, Chapter 16.)

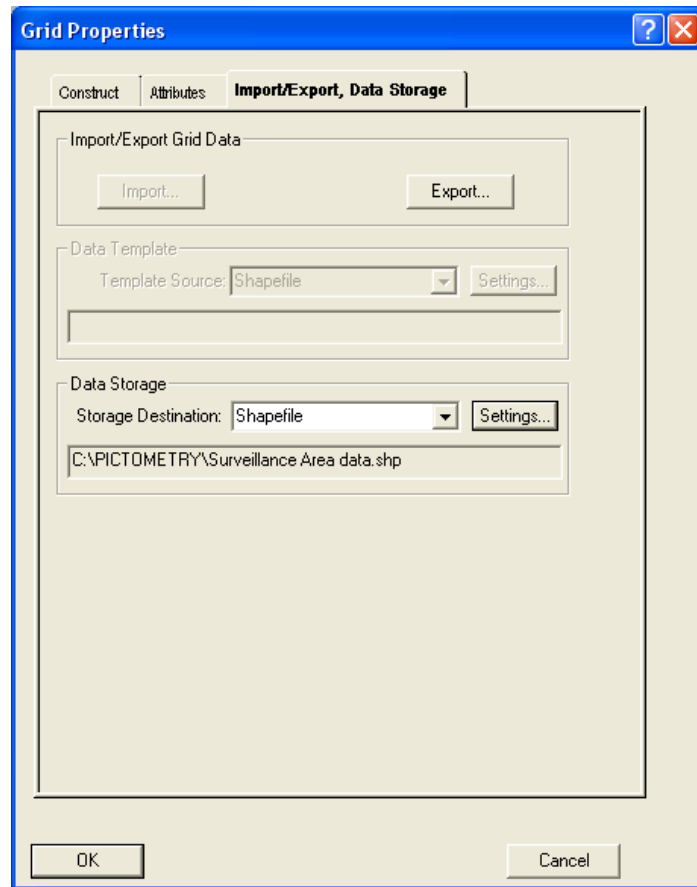
### ◆ To export a grid to an SDE database:

1. Do *one* of the following:
  - In the Workspace window, double-click the grid to be exported.
  - or —
  - In the Workspace window, right-click the grid to be exported, and select **Properties for <grid name>** from the context menu.
  - or —
  - Select the grid layer in the Workspace window, and choose **Edit⇒Properties**.

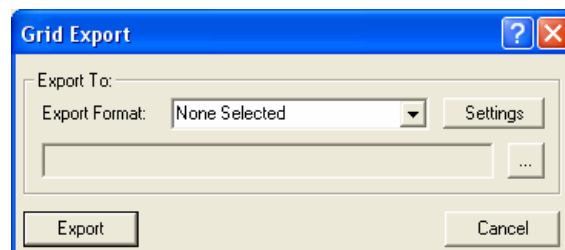
The Grid Properties dialog box opens.

2. Click the **Import/Export, Data Storage** tab.

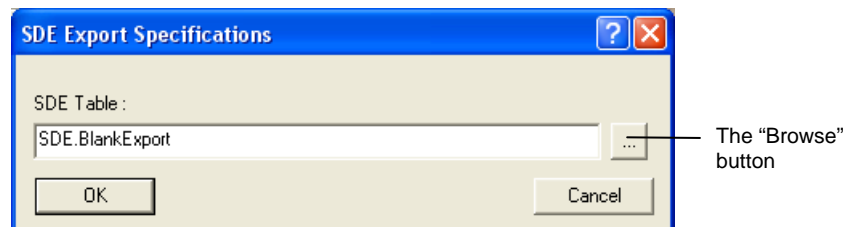




3. Click **Export**. The Grid Export dialog box opens.



4. Select **SDE Database** for the Export Format.
5. Click **Settings**. The SDE Export Specifications dialog box opens.



6. Do *one* of the following:
  - To specify a new file name, type the name in the SDE Table box.
  - or —



- To select an existing file, click the “**Browse**” button. The Select SDE table dialog box opens listing all existing SDE tables. Select the table to which you want to export data.
  - 7. Click **OK**. The SDE Export Specifications dialog box closes.
  - 8. On the Grid Export dialog box, click **Export**.
  - 9. (On the Grid Properties dialog box) click **OK**.
- The data is exported to the file you chose.

## Changing a grid

You can change any of the following:

- a grid’s appearance (for example, its size, its colors, its placement, its labeling, and its rotation)
- a grid’s location
- the data-entry template
- the data stored within a grid

### Changing a grid’s properties

You can change *all* of a grid’s properties before entering data into its segments; you can change only *some* of a grid’s properties after entering data.

For example, before entering data into a grid, you can change the grid type, the grid size, the X and Y values by which to increment each grid section, the label placement, and the data-entry template. You can also select a file in which to store grid data.

After entering data into a grid, you can change properties such as line color or width, but you cannot change the type of grid, its size, or the data-entry template.

#### ◆ To change grid properties:

1. Do *one* of the following:
  - In the Workspace window, double-click the grid to be changed.
  - or —
  - In the Workspace window, right-click the grid to be edited, and select **Properties for <grid name>** from the context menu.
  - or —
  - Select the grid layer in the Workspace window, and choose **Edit⇒Properties**.

The Grid Properties dialog box opens.

2. Change the grid’s properties as desired. (Fields that are dim are not changeable.)

**Tip:** To change the grid's size, change the X and Y fields for the Grid segment size or the Total grid size.

3. If you have not yet entered data into the grid, you can select a data-entry template as follows:
  - a. Click the **Import/Export, Data Storage** tab.
  - b. From the Template Source list, select the type of file to use as a template.

**Note:** To use a DBF file as a template (whether part of a shapefile set or not), select **Shapefile** for the Template Source.

- c. Click **Settings**. The Open dialog box opens.
  - d. Navigate to the directory that contains the template source, select the file, and click **Open**. The Open dialog box closes.

**Note:** You can select a template from a file that *does* or *does not* contain data. EFS uses only the format of the file (the fields and their types); it does not import the file's data and it does not maintain a link to the file.

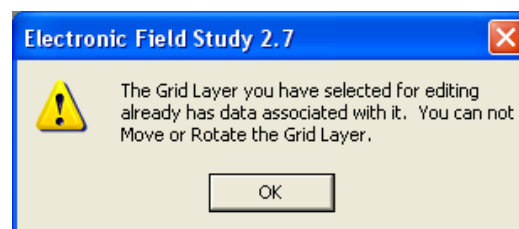
4. Click **OK**.

The Grid Properties dialog box closes and the changes you made are visible.

**Tip:** If you want to create a new grid from one contained in a workspace, you can create a duplicate copy of the grid by importing it from the workspace into the Grid Tool Properties dialog box. The grid's characteristics and data structure will be imported, but not the grid's data. See "Importing a grid from a workspace" on page 279.

## Rotating a grid

You can rotate a grid before entering data into it. If you try to rotate a grid after entering data into its segments, you'll see the following message:



Use the following procedure to rotate a rectangular grid. (This feature applies to rectangular grids only.)

### ◆ To rotate a grid

- Do *one* of the following:
  - Open the Grid Properties dialog box using any of the methods described in Step 1 of the procedure "To change grid properties" on page 290. In the Bearing field, type a value for the angle of rotation.

*You might notice a brief delay as the grid is re-drawn in its new position.*

– or –

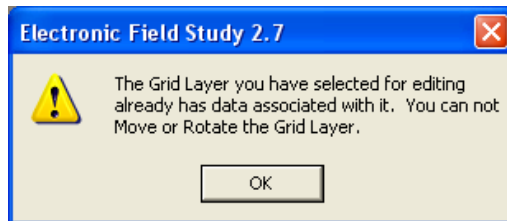
- In the workspace, select the grid layer you wish to rotate. Then press **CTRL + R** and drag the mouse in the X direction. At the desired angle, release the mouse button.

The grid is rotated around its origin. If you entered a value in the Bearing field, the grid is rotated by the angle entered. If you rotated the grid by using a mouse, the grid's rotation is fixed when you release the mouse button.

**Note:** To disable rotation, check **North Up** on the Construct tab.

## Moving a grid

You can move a grid before entering data into it. If you try to move a grid after entering data into its segments, you'll see the following message:



Use the following procedure to rotate a rectangular grid.

### ◆ To move a grid

1. Click the **Grid Tool**.
2. In the workspace, select the grid layer you wish to move.
3. Press and hold both the **CTRL** and **X** keys.
4. Do *one* of the following:
  - Click the location you want to move the grid's origin to
  - or –
  - Drag the mouse to the location in which to move the grid's origin.

*You might notice a brief delay as the grid is re-drawn in its new position.*

The grid moves and its origin is placed at the location in which you released the mouse button.

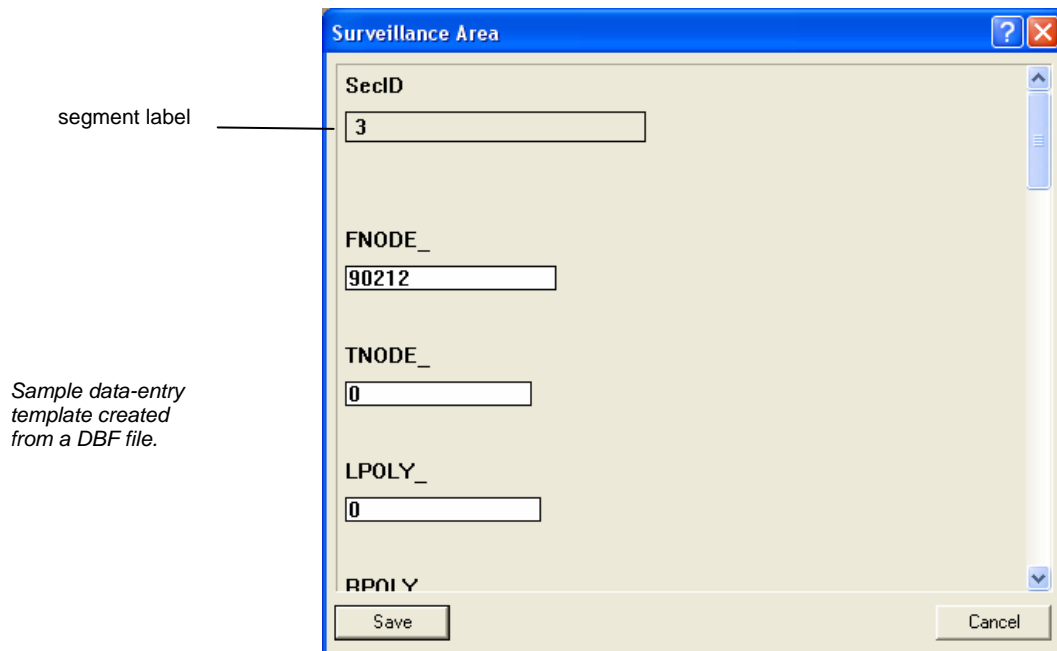
**Tip:** If you know the exact coordinates of the location in which to move the origin, you can enter those coordinates in the X and Y fields of the Location section on the Grid Properties dialog box.

## Changing grid data



### ◆ To change the data in a grid

1. Click the **Grid Tool**.
2. Click inside the grid segment that contains the data you want to change. The data template appears (the default template or the one you previously selected).



3. Change the data as desired and click **Save**. The data-entry template closes and the data is saved (to the file you previously specified on the Import/Export, Data Storage tab of the Grid Properties dialog box).

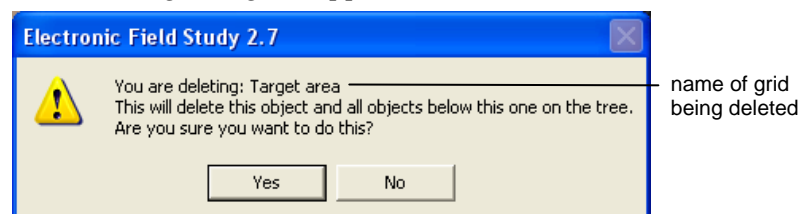
## Deleting a grid

The procedure for deleting a grid from a workspace is similar to deleting other workspace items.

### ◆ To delete a grid from a workspace:

1. Do *one* of the following:
  - In the Workspace window, right-click the name of the grid to be deleted, and select **Delete <grid name>** from the context menu.
  - or —
  - Select the name of the grid in the Workspace window, and choose **Edit⇒Delete**.

The following dialog box appears:



2. Click **Yes** to delete the grid.

The grid layer is deleted and its name disappears from the Workspace window. The grid disappears from the Image window.



# Part III

## Using EFS with GIS Data

To learn about ...	See ...
General concepts of GIS data	Chapter 15
Adding, viewing, hiding, changing, and removing GIS annotation layers	Chapter 16
Connecting to an SDE database and managing your SDE data	Chapter 16
Searching and querying GIS annotations and using GIS utilities	Chapter 17
GIS Images	Chapter 18

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# Chapter 15 — GIS Concepts

This chapter provides a brief introduction to the concept of a Geographic Information System (GIS) and its associated data—**GIS data**.

You can import layers of GIS data into EFS in order to overlay that data on your images, highlighting meaningful structures and features. Each GIS layer you import becomes a “GIS annotation layer,” an item in your EFS workspace.

## Topics covered in this chapter ... page

What is a GIS? .....	297
Vector and text data .....	299
Where to find GIS data .....	300
Using GIS data in EFS .....	301

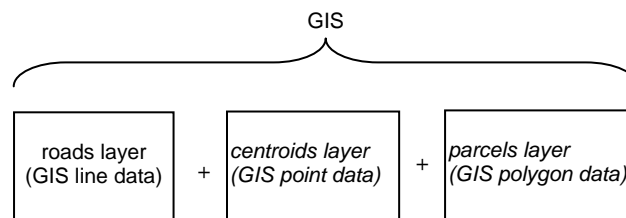
## What is a GIS?

A **Geographic Information System (GIS)** is a system that can capture, store, analyze, and display data associated with a particular geographic area. It typically includes maps that are comprised of many GIS layers—each containing a different type of GIS vector data (point, line, or polygon), as well as text data.

Within a GIS layer, each unit of vector data along with its corresponding text data is called a **GIS object**.

### A GIS example

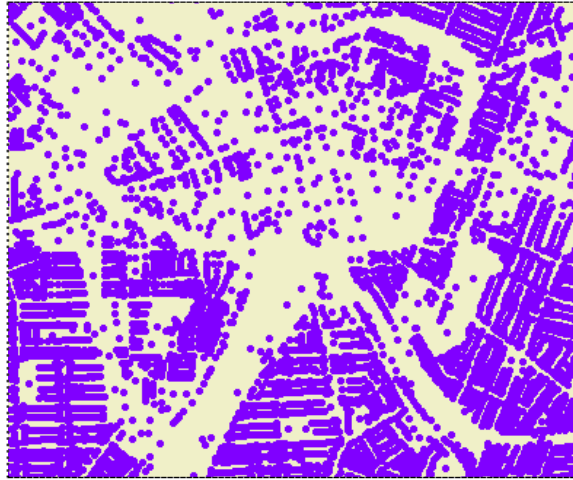
For example, the GIS for a particular geographic area may include a roads layer, a centroids layer, and a parcels layer.



**Figure 15-1:** A GIS is comprised of one or more GIS layers.



Layers dense with GIS data (such as this developed downtown area) can appear to have solid masses of color where the data is most dense.



**Figure 15-4:** A portion of a centroids layer in EFS.

### Parcels layer

A parcels layer is a collection of GIS polygon data. Each polygon represents a land parcel in the geographic area the layer covers. Figure 15-5 shows a portion of a parcels layer (displayed in EFS).



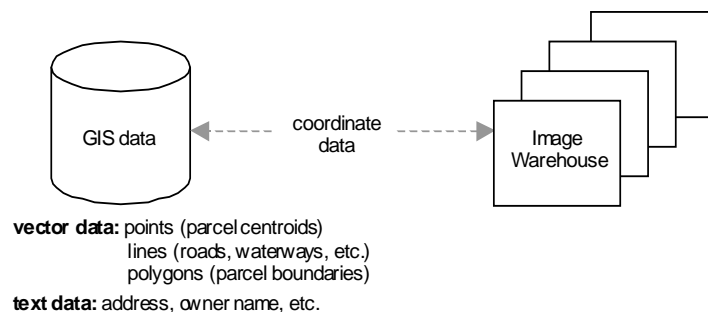
**Figure 15-5:** A portion of a parcels layer in EFS.

## Vector and text data

GIS data is comprised of two kinds of data—vector and text—for each distinct geographic location, such as a street segment, the centroid that identifies a parcel of land, or any set of coordinates.

**Vector data** consists of a series of coordinates that can be graphed or connected to make a drawing or shape. These shapes may be points, lines, or polygons that represent geographic features or manmade structures of interest, such as a parcels, roads, buildings, and waterways.

Figure 15-6 gives a high-level look at GIS data and how it is linked to your images by coordinate data.



**Figure 15-6:** A high-level look at GIS data.

Look again at the example GIS shown in Figures 15-2 through 15-5. For each layer in the example, the following table tells what the GIS objects represent. It also lists the type of GIS vector data and describes the associated text data.

**Table 15-1:** More about the example GIS annotation layers.

Layer	GIS object represents	Vector GIS data	Associated text data
roads	segment of road	a line that defines the segment	text fields pertaining to the road segment (such as street name, zip code, and house numbers at each end and side of the street)
centroids	centroid	a point that represents the centroid	text fields pertaining to the land parcel (for example, owner name, street name, house number, city, zip code)
parcels	land parcel	a polygon that defines the parcel's outline	text fields pertaining to the land parcel (for example, owner name, street name, house number, city, zip code)

## Where to find GIS data

The GIS data you'll use with EFS (the "GIS layer") may be located in a shapefile or (for SDE databases) in an SDE feature class. Shapefiles and feature classes are functionally the same, but different in structure and in the way they're accessed.

### About shapefiles

A **shapefile** is a GIS file format produced by ERSI's ArcView or ArcInfo. Although referred to as a single entity, a shapefile is actually a set of files. EFS uses the following three shapefile components:

- SHP file—contains the coordinates of the vector data (points, lines, or polygons).
- DBF file—a "database file" that contains the text (alphanumeric) data.
- SHX file—an index to the variable-sized shape objects in the SHP file.

A shapefile contains a “record” for each GIS object.

### About SDE feature classes

An **SDE feature class** is a database that contains a table entry for each GIS object. You can add GIS data from an SDE database to EFS in the form of a GIS annotation layer.

*ESRI is the  
Environmental  
Standards  
Research  
Institute.*

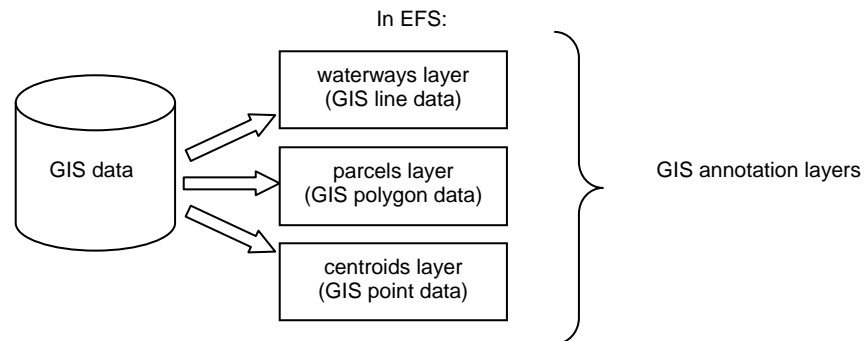
EFS supports GIS data stored in an ArcSDE® feature class. ArcSDE, or SDE, is ESRI’s Spatial Database Engine database software—an application server that lets you store and manage spatial data in a DBMS (Database Management System).

An SDE database contains a table entry for each GIS object.

## Using GIS data in EFS

GIS data is always organized in GIS layers. Each GIS layer represents one type of map element (roads or waterways, for example) and has vector data that lends itself to the map element it represents. See Figure 15-7.

To use GIS data in EFS, you’ll add a GIS layer to your workspace (creating a **GIS annotation layer**).



**Figure 15-7:** GIS annotation layers in EFS.

EFS provides some exciting ways to find and display meaningful information from your GIS annotation layers. The following two chapters tell how to add GIS layers to your EFS workspace and what you can do once you’ve added them.



# Chapter 16 — Adding a GIS Annotation Layer

This chapter describes GIS annotation layer properties. It also provides procedures for adding GIS annotation layers to your workspace and procedures for other basic GIS-related tasks.

## Topics covered in this chapter ... page

Before you add a GIS annotation layer .....	303
Adding the layer .....	306
Viewing, hiding, and removing GIS annotation layers .....	314
Refreshing GIS data.....	316
Changing properties and renaming layers.....	317
Relocating shapefiles for GIS annotation layers.....	318
Topics for SDE users .....	318

## Before you add a GIS annotation layer

Before adding a GIS annotation layer to your workspace, it may be helpful to read the following sections, which introduce the various GIS data sources, the GIS annotation layer properties, and some important index files you should create to maximize system performance if you use shapefiles.

### Sources for GIS data

A GIS annotation layer (or “GIS layer”) is based on GIS data. That GIS data can be located in a shapefile or in an SDE feature class (sometimes referred to as an SDE database).

#### If the layer is based on a shapefile ...

When you add a GIS annotation layer from a shapefile, you’ll give EFS the path to the shapefile.

#### If the layer is based on an SDE feature class ...

When you add a GIS annotation layer from an SDE feature class, EFS initiates a connection to the SDE database in order to access the data. This connection is used every time EFS accesses the GIS data in this layer. SDE topics such as “Connecting to your SDE database” begin on page 318.

### Understanding layer properties









Like a user-created annotation layer (one that contains lines, circles, or points, that you draw; text you type; or custom links), each GIS annotation layer has a set of properties. These properties let you show GIS data in various ways.

For example, lines may be shown as solid or as one of several dashed or dotted styles. (Color and thickness choices are available for all GIS data.)

You can choose these properties when you first create the GIS annotation layer. You can also change them after the layer has been created. (See “Changing properties and renaming layers” on page 317.)

### The look of GIS point data

You can define the look GIS point data in EFS. You’ll choose one of the following to represent *all points* in the layer:

- a point such as  (you choose the color and size)
- a font symbol such as , , , , , 
- an icon such as 

You’ll choose the look of your point data on a layer-by-layer basis. All GIS points in the layer will take on the characteristics you choose for that layer.

### Max View and Min View thresholds

As with user-created annotation layers, you can make the visibility of GIS annotation layers dependent on the resolution of the active image. In a GIS annotation layer’s “properties” dialog box, you can set the maximum and minimum view resolutions, so that GIS annotation layers are displayed only when the zoom level is within a desired range.

For more information about Max View and Min View thresholds, see “Max View and Min View thresholds” in Part II, Chapter 13.

### Clip to View

The Clip to View option causes GIS data to be drawn only on the portion of the image that’s currently in view in the Image window.

### Clip to Image

Clip to Image is handy when you are zoomed out so the entire image is displayed in the Image window and is surrounded by a white border. EFS displays GIS objects that lie entirely within the image and those that extend beyond the image’s edge onto the white border.

### Auto label

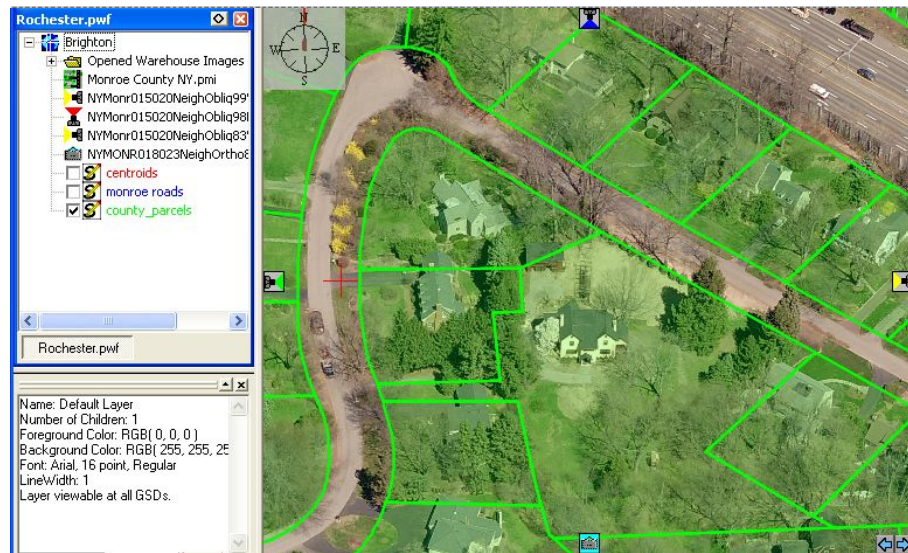
With Auto label, you can have EFS automatically display a corresponding text field near each GIS object (as space allows). EFS provides many options for the text such as color, font, size, and orientation.

### Polygon opacity

When your GIS annotation layer contains polygon data, EFS lets you fill the polygons with patterns or with solid color (and you can set the transparency level that meets your needs).

*You can choose Auto label and polygon opacity when you create a GIS annotation layer. See “To add a GIS annotation layer from a shapefile” on page 306.*





**Figure 16-1:** A layer of polygons filled with minimal opacity.

## PDX index files for layers that use shapefile data ...

*PDX files do not apply to SDE-based GIS annotation layers.*

Before you work in EFS with your GIS annotation layer, which you added from a shapefile, it is highly recommended for optimal system performance that you create special index files called PDX files.

You should create the following files:

- a “Search PDX file” for every DBF field you’ll search.
- a “Display PDX file” for every shapefile-based GIS annotation layer in your workspace that you’ll view. (Creating this PDX file is especially important if the shapefile contains a large amount of data.)

### What are PDX files?

*A PDX file is a Pictometry Data index file.*

**PDX files** are special index files that help EFS to run faster. EFS uses Search PDX files when searching a shapefile for GIS text data (when using the Address Search, the “GIS Layer Search,” and the GIS Query Tool), and Display PDX files when drawing GIS vector data in the Image window. A Search PDX file indexes a particular field or column in a shapefile’s DBF file. A Display PDX file indexes the shapefile’s SHP file.

### When to create a Search PDX file

*GIS Layer Search and maintenance utilities for shapefiles and DBF files are described in Chapter 17.*

You can create a Search PDX file just before searching a GIS annotation layer, or you can create it later by using the Annotate menu’s DBF Maintenance utility. (See “Search PDX utility” in Chapter 17.)

**Note:** EFS creates PDX files for Address Searches *automatically* as part of your Address Search setup.

*When to create a Display PDX file*

You can create a Display PDX file anytime after you've added your GIS Annotation Layer. There are two ways to create a Display PDX file:

- by using the Annotate menu's Shapefile Maintenance utility. (See "Display PDX utility" in Chapter 17.)
- or –
- by using the layer's properties dialog box (you'll right-click the layer name in the workspace and select Properties for <layer name>), click the PDX tab, and follow Steps 4 – 6 of "To create or update a Display PDX file" in Chapter 17.

**Important:** PDX files must be created in writeable directories. See next topic before creating a PDX file.

**PDX directory must not be read-only**

PDX files must be created in directories that are not read-only.

**Hint:** When you create a PDX file, EFS puts it in the directory where the shapefile is located. So shapefile data should always be located in writeable directories.

To be sure that your PDX file is created in a writeable directory, take one of the following actions. (They are listed in order of decreasing preference.)

1. Ask your Data Administrator to create the PDX file for you. (Your Data Administrator should have write permissions for the directory.)
2. Ask your Data Administrator to give you write permissions for the directory. Then create the PDX file and proceed with the layer search.
3. Move the shapefile to a directory that's not read-only. Remove the GIS annotation layer, and re-create the layer. Then create the PDX file and proceed with the layer search.

## Adding the layer

You can add (to your open workspace) a GIS annotation layer from a shapefile or from an SDE database.

**Note:** To change a layer's properties, see "Changing properties and renaming layers" on page 317.

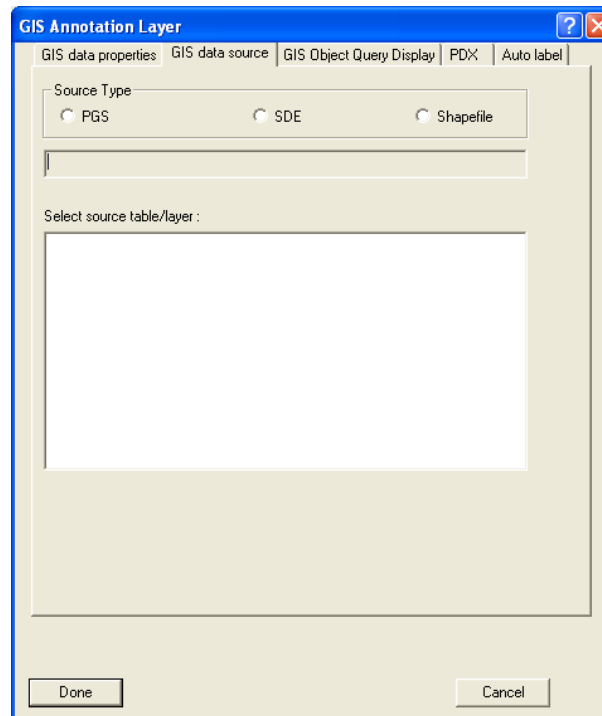
**Using shapefile data to add a GIS annotation layer**

**Note:** Shapefiles must be in the Lat/Lon WGS84 Meters coordinate system.

◆ **To add a GIS annotation layer from a shapefile:**

1. Choose **Annotate**⇒**Create GIS Annotation Layer**.

The GIS Annotation Layer dialog box opens.



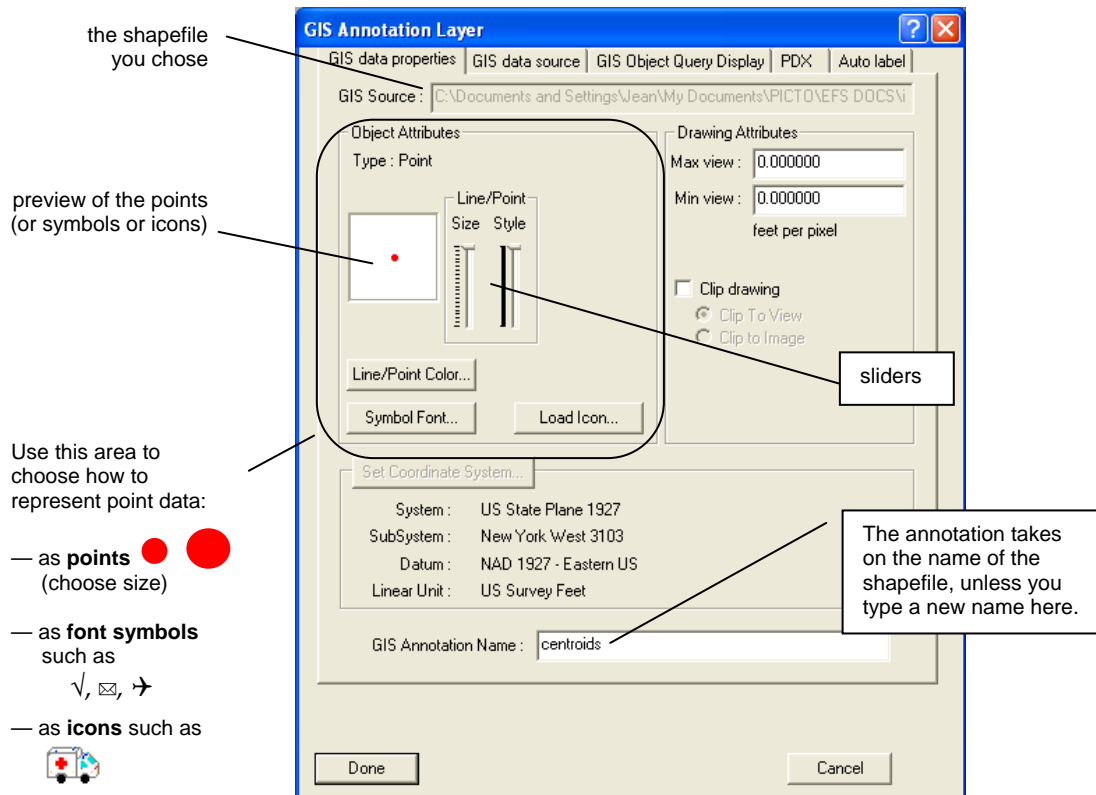
2. Choose **Shapefile** for the Source Type and click **Browse**.
3. Browse to the directory that contains the desired shapefile.
4. Do *one* of the following:
  - Double-click the name of the shapefile.
  - or —
  - Click the name of the shapefile, then click **Open**.

The shapefile's name and path are shown on the dialog box.

5. Click the **GIS data properties** tab.

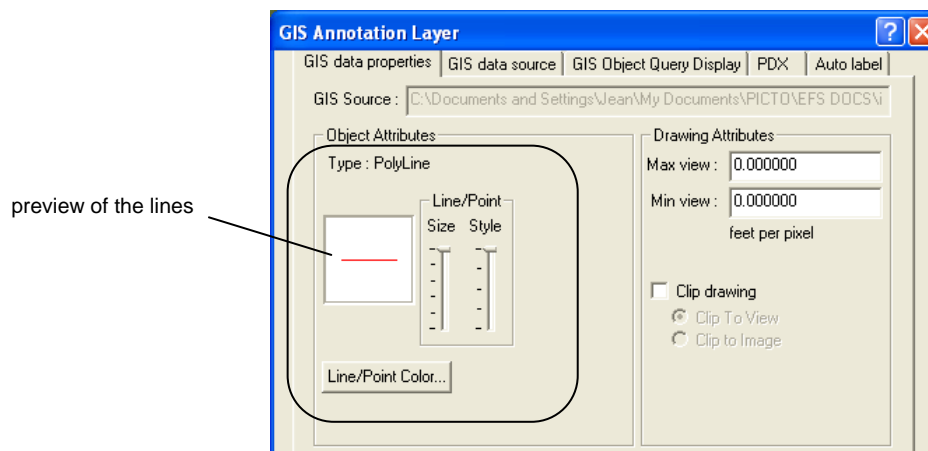
The GIS Annotation Layer dialog box opens. Its content varies depending on the type of GIS data in your shapefile.

Here's what you'll see if your shapefile contains *point* data:

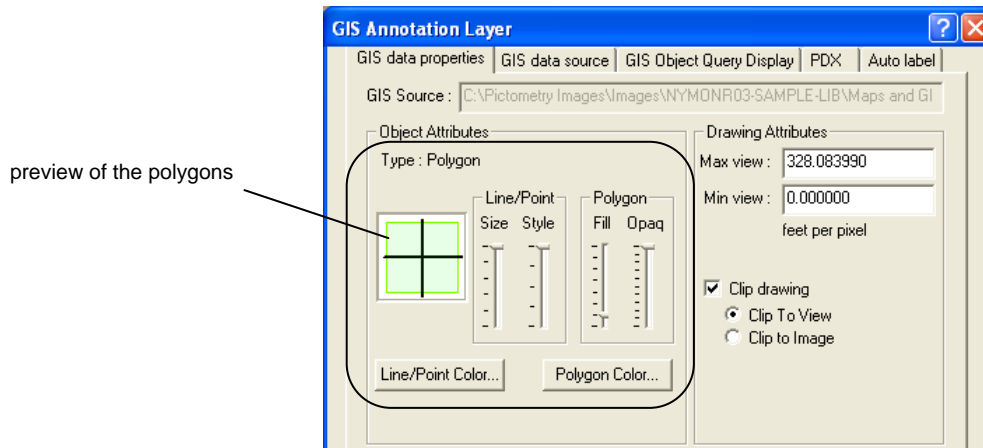


**Using the vertical sliders:** Click and slide the **Style** slider to see all point, symbol, and icon choices. Operate the sliders quickly by dragging with the mouse. Or for a more controlled operation, use your keyboard's up-arrow and down-arrow keys.

Here's what you'll see if your shapefile contains *line* data:



Here's what you'll see if your shapefile contains *polygon* data:



6. (Optional) If your layer is point-based, choose how to display the data:

To display point data as ...	Do this ...
Points larger than the one shown on the dialog box	<p>a. Be sure the <b>Line/Point Style</b> slider is in its uppermost position.</p> <p><b>Note:</b> For point data, Size choices are only available when the Style slider is at its uppermost position.</p> <p>b. Click the <b>Line/Point Size</b> slider and drag it until the point shown is the desired size.</p>
Symbols or icons shown on the dialog box	Click the <b>Line/Point Style</b> slider and drag it until the white box shows the desired symbol or icon.
Font symbols other than the one shown on the dialog box	<p>a. Click <b>Symbol Font</b>.</p> <p>b. From the Font dialog box, select the desired font settings (Font, Font style, Size, and Script); and click <b>OK</b>.</p> <p>The symbol shown in the display box is updated to reflect your changes.</p>
Icons other than the one shown on the dialog box	<p>a. Click <b>Load Icon</b>.</p> <p>b. In the Load New Icon dialog box, click the desired icon and click <b>OK</b>. (If no icons are shown, you need to load icons to the current workspace. See Steps 2 – 3 of the procedure “To load an icon to a workspace,” in Part II, Chapter 12.)</p> <p>Drag the <b>Style</b> slider to its lowest position to view the newly added icon.</p>

7. (Optional) In the Object Attributes area, select any remaining applicable settings for the vector (non-text) GIS data.

To set ...	Do this ...
line thickness	Move the <b>Line/Point Size</b> slider to choose a thickness.
line style	Move the <b>Line/Point Style</b> slider to choose a style.
	<b>Note:</b> For line data, Style choices are available only when Line Size = 1 point (the uppermost tick mark).

To set ...	Do this ...
line and point color	Click the <b>Line/Point Color</b> button. From the Color dialog box, choose a color or create a custom color, then click <b>OK</b> .  The point or symbol shown in the display box changes to the color you chose.
(for polygon data only) polygon fill color	Click the <b>Polygon Color</b> button. From the Color dialog box, choose a color or create a custom color, then click <b>OK</b> .  The polygon outline shown in the display box changes to the color you chose.
(for polygon data only) polygon fill	Move the <b>Polygon Fill</b> slider to choose no fill, solid (or transparent) fill, or a specific fill pattern.
(for polygon data only) polygon opacity	With the <b>Polygon Fill</b> slider at the second tick mark from the bottom, move the <b>Polygon Opac</b> slider to choose the desired opacity (transparency level). See "Polygon opacity."

8. If the coordinate system values shown are not correct for your GIS data, click **Set Coordinate System**, enter the correct coordinate values, then click **OK**.

**Important:** If you do not enter the correct coordinate system data for the GIS data, the layer will not be created.

9. (Optional) In the Drawing Attributes area, enter values for Max View and Min View thresholds.

To set ...	Do this ...
Max view	Enter the maximum GSD at which annotations should become visible on the screen when changing the magnification. When you <i>zoom out</i> above the maximum, annotations in the layer disappear from view.
Min view	Enter the minimum GSD at which annotations should become visible on the screen when changing the magnification. When you <i>zoom in</i> below the minimum, annotations in the layer disappear from view.

**Note:** For information about Max View and Min View thresholds, see "Max View and Min View thresholds" in Part II, Chapter 13.

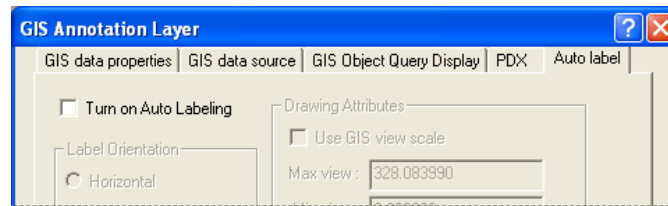
When the zoom or scale is within the range you've entered, the GIS data will be visible on your screen.

10. (Optional) To have the GIS data drawn only on the portion of the image that's shown in the Image window, check **Clip drawing**. Then click **Clip to View** if not already selected.

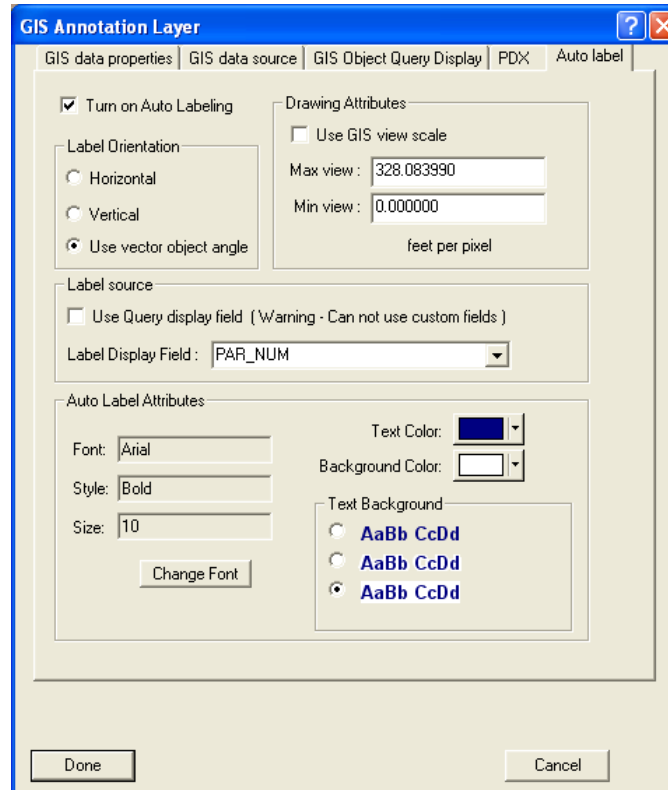
To have GIS data drawn only on the image and not on the white border surrounding it, check **Clip drawing**. Then click **Clip to Image** if not already selected.

**Note:** If Clip drawing is unchecked, the entire GIS annotation layer will be drawn. For more information about Clip drawing, see "Clip to View" and "Clip to Image," on page 304.

11. (Optional) To designate a text field to be displayed with each GIS object (as space allows), do the following:
  - a. Click the **Auto label** tab.



b. Check **Turn on Auto Labeling**.



c. Choose label properties according to the following chart:

To set ...	Do this ...
Label Orientation	Click <b>Horizontal</b> or <b>Vertical</b> , or if you want labels to align with their GIS Objects, click <b>Use vector object angle</b> .
Max view and Min view	<p>For Max view, enter the maximum GSD at which labels should become visible on the screen when changing the magnification. When you <i>zoom out</i> above the maximum, labels disappear from view.</p> <p>For Min view, enter the minimum GSD at which labels should become visible on the screen when changing the magnification. When you <i>zoom in</i> below the minimum, labels disappear from view.</p> <p>— or —</p> <p>If you want to use the layer's Max view and Min view, check <b>Use GIS view scale</b>.</p>



To set ...	Do this ...
Label source	If available, check <b>Use Query display field</b> to always use the field selected for displaying Query Tool output. (This option is unavailable whenever a custom field is selected for Query Tool output.)  <b>Note:</b> When the layer is created, the first field listed in the database will become the query display field. You can change this field at any time via the layer's properties dialog box (GIS Object Query Display tab).
Label Display Field	Click the drop-down arrow and select the text field you wish to be displayed.
Font, Style, and Size	To change the label attributes shown, click <b>Change Font</b> , and from Font dialog box, then select the desired attributes (font, text style, and font size), then click <b>OK</b> .
Text Color, and Text Background	Click the drop-down arrow and select colors for the text and the text background.
Text Background (the background style)	Select a style for the background shading of the text label. You can choose a shaded rectangle, shading that shadows the letters, or no shaded background at all.

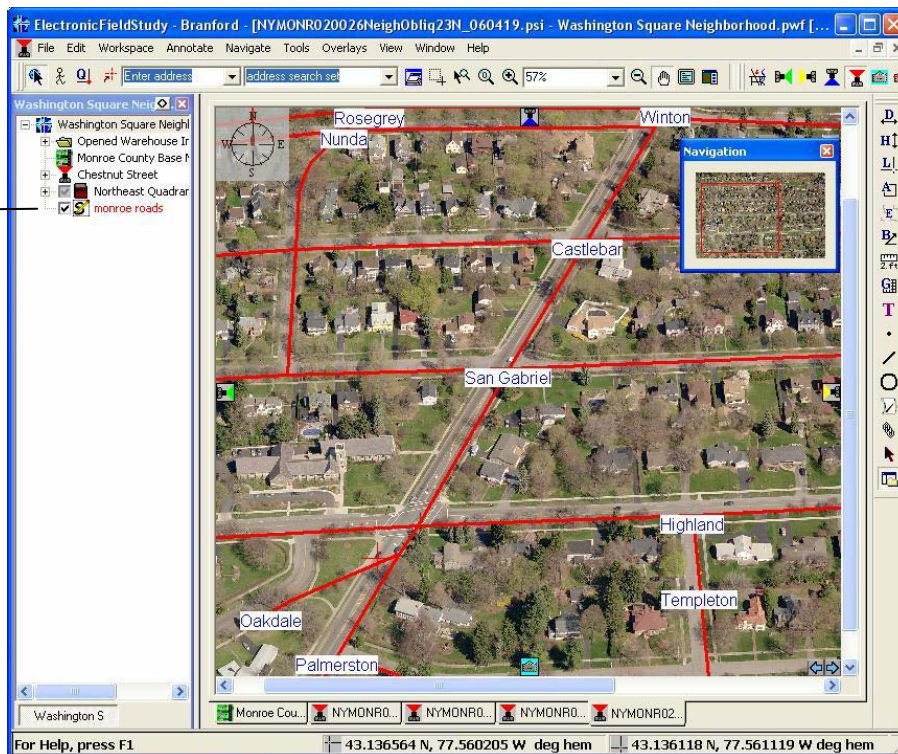
d. Click **Done**.

If a Search PDX file does not already exist for the field you are displaying, EFS creates the file.

12. If you've skipped Step 11, click **Done** to create the layer.

The new GIS annotation layer is added to the workspace and may appear on the active image. The layer name appears in the workspace in colored text, matching the color you've chosen for that layer's GIS data.

the new layer





If you don't see the GIS annotation layer, check the following:

- **GIS visibility. Overlays**⇒**View GIS Annotations** should be checked. (GIS annotation layer checkboxes in the workspace should *not* be gray.)
- **Layer visibility.** The layer's workspace checkbox should be checked. (If you're working with a hidden workspace, press **CTRL + L** or choose **Overlays**⇒**Annotation Layer Visibility** to check visibility of the individual layer.)
- **Zoom level.** (It should be within the Max View and Min View thresholds.)
- **Coordinate system.** (If you haven't matched the layer's coordinate data with that of the source GIS data, the annotation layer will not appear, and you'll need to repeat the procedure for adding the layer.)

**Performance tip:** It is highly recommended for optimal system performance that you create a Display PDX file for the shapefile your layer is based on. See "When to create a Display PDX file" on page 306.

## Using SDE data to add a GIS annotation layer

You can add a GIS annotation layer from an SDE database to your open workspace. The procedure you'll follow is very similar to the procedure used for adding a GIS annotation layer from a shapefile.

**Connecting to SDE:** You can connect to SDE before starting this procedure. (Follow the procedure in "Connecting to your SDE database" on page 318.)

If you are not connected to SDE when you complete Step 2 of the following procedure, EFS initiates the connection and the SDE dialog box appears. Follow Steps 2 – 5 of the procedure "To connect to your SDE database," on page 318.

### ◆ To add a GIS annotation layer from SDE data:

1. Choose **Annotate**⇒**Create GIS Annotation Layer**.

The GIS Annotation Layer dialog box opens to its GIS data source tab. (This dialog box is pictured on page 307.)

2. Click **SDE** for the Source Type, then click **Browse**.

The SDE dialog box opens.

**Note:** If you're not connected, the SDE dialog box opens to the Connection tab (so you may first connect); otherwise, it opens to the Tables tab. When done connecting, click the **Tables** tab.

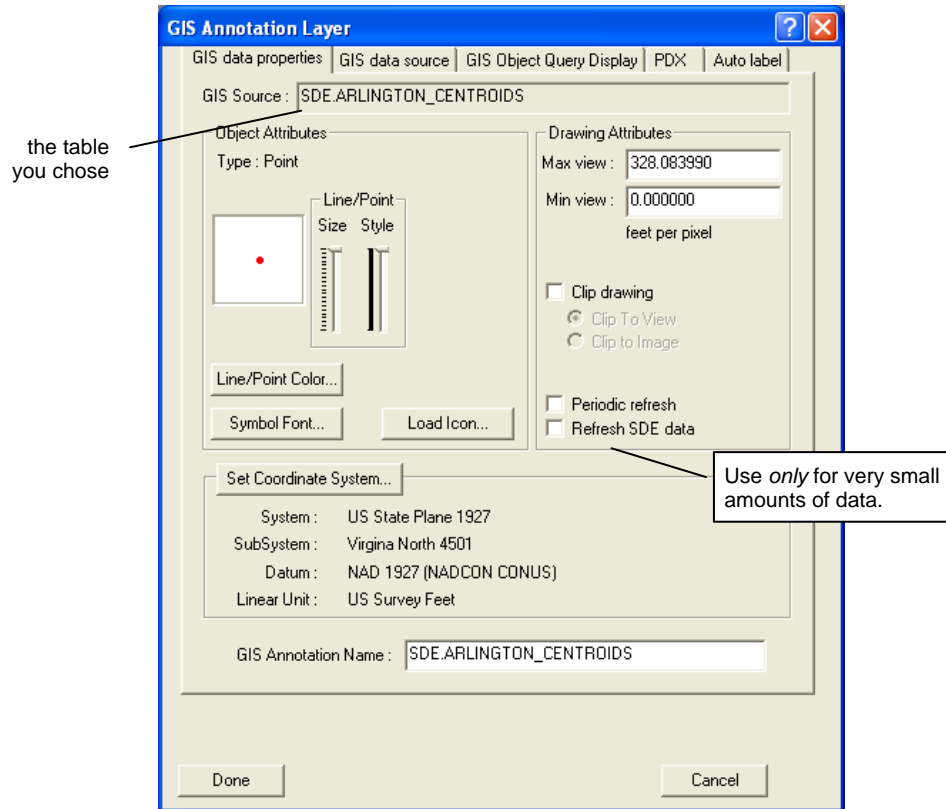
The Tables tab lists all available SDE tables.

3. Select the table containing the GIS data you want to add to your workspace, and click **Done**.

The table name is shown in the box below the Source Type area.

4. Click the **GIS data properties** tab.

**Tip:** To add the Add GIS Layer button to a toolbar, see "Adding and removing toolbar buttons" in Part IV, Chapter 22.



5. (Optional) If you want SDE to periodically refresh the layer's GIS data, check **Periodic refresh**. (Use the Periodic refresh *only* for very small amounts of data.)

The remainder of this procedure is identical to Steps 6 – 12 of the procedure for adding a GIS annotation layer from a shapefile. See “To add a GIS annotation layer from a shapefile.” (Step 6 begins on page 309.) Ignore any references to PDX files; they do not apply to SDE-based layers.

## Viewing, hiding, and removing GIS annotation layers

Once you've created a GIS annotation layer, you can choose whether to display the layer on your images. The following topics describe how to hide, show, and remove GIS annotation layers.

### Viewing and hiding GIS annotation layers

EFS lets you hide or show any or all GIS annotation layers in your open workspace.

**Note:** You can hide or show each GIS annotation layer, but you can *neither* hide nor show individual GIS objects within the layer. However, you can highlight individual GIS objects by using the GIS Query Tool. (See “GIS Query Tool” in Chapter 17.)

### Checkboxes in the workspace

EFS provides a checkbox next to each layer in a workspace. When your workspace is in view, you can easily change which GIS annotation layers

To view the workspace, choose **View ⇨ Workspace Window**.

are hidden and which are visible. You'll check a layer's box to make that layer visible or uncheck it to hide that layer.



**Figure 16-2:** GIS annotation layer checkboxes in the workspace.

If you hide all GIS layers as a group (uncheck **Overlays**⇒**View GIS Annotations**), the checkboxes become gray, and you cannot check or uncheck the specific layers.



**Figure 16-3:** Grey checkboxes, indicating that GIS annotation layers are hidden as a group.

The following procedures describe the various ways you can view and hide GIS annotation layers.

#### ◆ To show or hide *all* GIS annotation layers:

Do *one* of the following:

- Choose **Overlays**⇒**View GIS Annotations**, and check or uncheck the option as desired. (Checked means all GIS annotation layers in the active workspace are visible, unchecked means they're hidden.)
- or —
- Right-click any GIS annotation layer in the workspace. From the context menu, select as desired: **View GIS Annotations** or **Hide GIS Annotations**.

EFS redraws the active image showing (or hiding) all GIS annotation layers in your workspace. If you've hidden the layers, their workspace checkboxes all become gray. If you're made them visible, checkboxes for all GIS annotation layers are checked.

**Note:** GIS annotation layers may also be hidden on a layer basis. If an individual layer is hidden, it will not be drawn.

#### ◆ To show or hide a GIS annotation layer:

**Note:** Before using this procedure, be sure *all* GIS annotation layers are not hidden (use the previous procedure).

Do *one* of the following:

- With the workspace in view, check (or uncheck) the box next to the layer you wish to show (or hide).
- or —
- Press **CTRL + L**, or choose **Overlays**⇒**Annotation Layer Visibility**. Then on the Annotation Layer Visibility dialog box, select any

layers you want to make visible, and deselect any layers you want to hide.

– or –

- Right-click the desired GIS annotation layer in the workspace. Then from the context menu, select as desired: **Show Layer <annotation layer name>** or **Hide Layer <annotation layer name>**.

EFS removes all GIS data from the Image window, then redraws only the layers you’ve chosen to show. Checkboxes in the workspace are updated to show which layers are visible.

## Removing GIS annotation layers

Use the following procedure to remove a GIS annotation layer from your workspace.

### ◆ To remove a GIS annotation layer:

1. Do *one* of the following:
  - In the workspace, right-click the GIS annotation layer to be deleted, and select **Delete <layer name>** from the context menu.
  - or –
  - In the workspace, click the GIS annotation layer to be deleted (to highlight the layer’s name), then
    - Click the **Delete** tool on the toolbar.
    - or –
    - Choose **Edit⇒Delete**.



The GIS annotation layer is removed from the workspace and (if showing) disappears from the Image window.

## Refreshing GIS data

If you anticipate changes to your GIS data during the EFS session, you may want to “refresh” the GIS data, that is, re-read the data (from shapefiles or SDE databases) and redraw the data in the Image window.

There are a few ways to refresh GIS data:

- Global Refresh feature—described in the following section.
- Periodic SDE layer refresh—(for SDE data only), see page 319.
- One-time SDE layer refresh—(for SDE data only), see page 320.

**Note:** To learn how EFS optimizes the refresh process, saving you time, see “EFS refreshes faster with the image cache” in Chapter 17.

### Global Refresh feature



You can use the **Global Refresh feature** to refresh *all* GIS data (shapefile-based and SDE-based).

When you use this feature, EFS redraws the active image, re-reads all GIS data from the corresponding shapefiles and SDE tables, updates all GIS annotation layers, and redraws all GIS annotations, labels, and user-defined annotations in view in the Image window. It refreshes not only the image and layer displayed in the Image window, but also all annotation layers—GIS and user-defined in the active workspace.

The Global Refresh procedure is covered in Part I, Chapter 8. See “Refreshing the active image.”

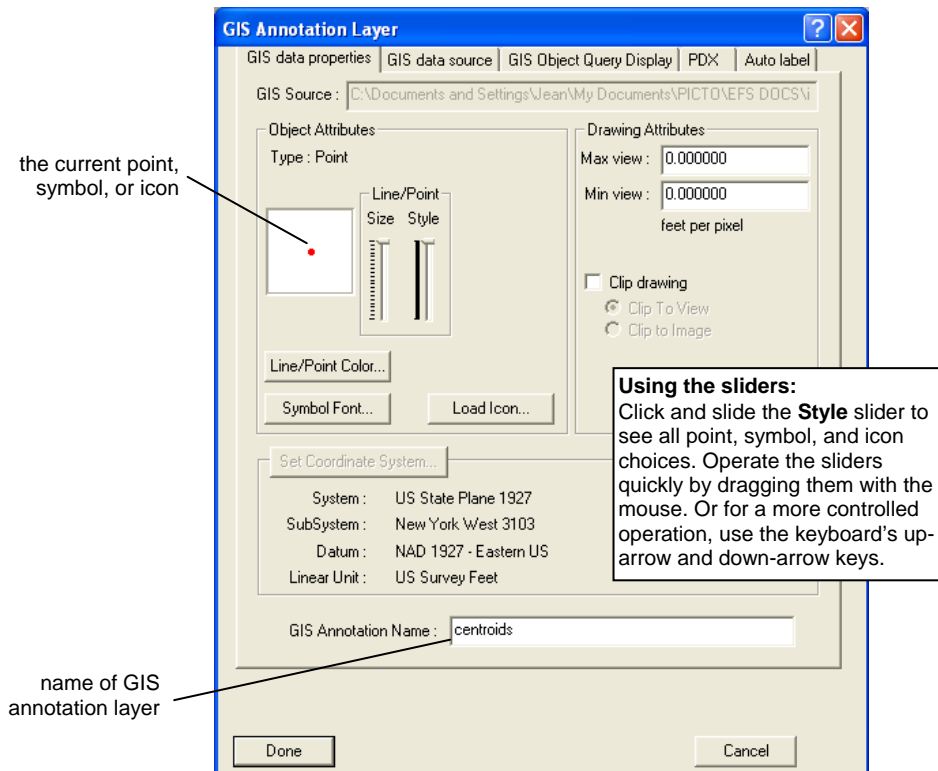
## Changing properties and renaming layers

You can change the properties of any GIS annotation layer. Because a GIS annotation layer’s name is considered one of its properties, you can also use this procedure to rename a GIS annotation layer. GIS annotation layer properties are discussed on page 303.

### ◆ To change a GIS annotation layer’s properties:

1. Right-click the desired GIS annotation layer in the workspace.
2. From the context menu, select **Properties for <layer name>**.

The GIS Annotation Layer dialog box opens, and its GIS data properties tab is active.



To redefine your layer’s properties, follow Steps 6 – 12 of the procedure “To add a GIS annotation layer from a shapefile,” which begins on page 306 and (for SDE-based layers) Step 5 of “To add a GIS annotation layer from SDE data” on page 313.

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## Relocating shapefiles for GIS annotation layers

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The Relocate File context menu option prevents you from having to recreate a shapefile-based GIS annotation layer when the shapefile it needs has moved to a new location. You can tell EFS where to find the shapefile by using the procedure “To fix the path for non-warehouse files.” See “Fixing access to files from workspace items” in Chapter 21.

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## Topics for SDE users

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The remainder of this chapter includes the following topics, which apply to SDE users only:

- Connecting to your SDE database
- Refreshing SDE data
- Managing your SDE tables

### Connecting to your SDE database

Anytime you use GIS data from an SDE database, you must be connected to the database. However, you’ll need to initiate this connection and enter parameters only once. After that, EFS remembers your SDE parameters and connects for you as needed (when you seek access to your SDE data).

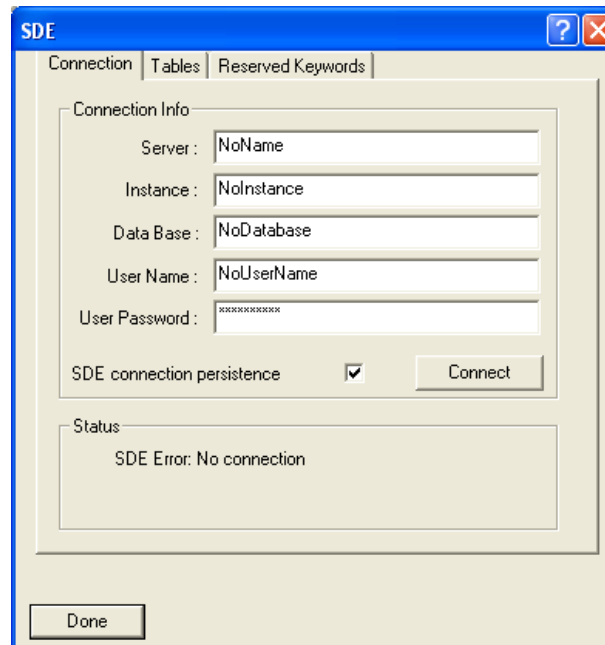
◆ **To connect to your SDE database:**

1. Choose **Annotate⇒SDE Connection**. The SDE dialog box opens to its Connection tab.

*If there is no active connection, the Status area shows “SDE Error. No connection.”*

*Otherwise (you are already connected) click **Done**, and skip the rest of this procedure.*

**Tip:** To add the SDE Connection button to a toolbar, see “Adding and removing toolbar buttons” in Part IV, Chapter 22.



See your Data Administrator if you need help with Connection Info or related settings.

2. Enter the Connection Info (Server, Instance, Data Base, User Name, User Password).
3. (Optional) If you want EFS to connect and disconnect to SDE as needed, and *only for the duration of the task* needing the connection, **uncheck SDE connection persistence**.

**Hint:** Keep this option checked to optimally manage your available ArcSDE connections.

If you want the connection to remain throughout each EFS session, (eliminating unnecessary extra wait times for multiple connections and disconnections), **check SDE connection persistence**.

4. Click **Connect**.  
The Status area shows “SDE Connection: Connected.”
5. Click **Done**. The SDE dialog box closes.

## Refreshing SDE data

When your SDE database changes, you may want to update (“refresh”) the associated GIS annotation layers. There are three ways to refresh SDE data.

### Periodic SDE layer refresh

EFS lets you set up an automatic periodic refresh for your SDE-based GIS annotation layers. You might use this feature if your data is dynamic in nature, such as the location of a moving car. EFS keeps track of the time and re-reads the layer’s data from the connected database once every 20 seconds.

You can set up a periodic refresh when you add the GIS annotation layer, or you can set it up later by using the following procedure.

*Use the Periodic Refresh feature only for very small amounts of data.*

◆ **To set up a periodic refresh:**

1. Right-click the GIS annotation layer you want to refresh.
2. From the context menu, select **Properties for <layer name>**.  
The GIS Annotation Layer dialog box opens to its GIS data properties tab.
3. Check the **Periodic refresh** box and click **Done**.

The GIS Annotation Layer dialog box closes and the first refresh happens immediately. EFS re-reads GIS data for the layer and redraws any GIS annotation data (including text labels if Auto label is on) currently showing for that layer. EFS repeats the refresh every 20 seconds for the duration of the session and in subsequent EFS sessions.

### One-time SDE layer refresh

Use the following procedure to refresh an SDE-based GIS annotation layer at any time.

◆ **To refresh an SDE-based GIS annotation layer:**

1. Right-click the GIS annotation layer you want to refresh.
2. From the context menu, select **Properties for <layer name>**.  
The GIS Annotation Layer dialog box opens to its GIS data properties tab.
3. Check **Refresh SDE data** and click **Done**.

The GIS Annotation Layer dialog box closes. EFS re-reads GIS data for the layer and redraws any GIS annotation data currently showing for that layer.

### Global Refresh

The Global Refresh feature refreshes *all* GIS data (shapefile-based and SDE-based) and redraws the active image. It refreshes not only the image and layer displayed in the Image window, but also all annotation layers—GIS and user-defined in the active workspace. See “Global Refresh feature” on page 316.

## Managing your SDE tables

The SDE dialog box contains two tabs—the Tables tab and the Reserved Keywords tab. These tabs provide options for managing your SDE tables. You can use the Tables tab to do the following:

- View your list of available SDE tables
- Refresh your list of SDE tables
- View an SDE table’s column names and characteristics (You can think of a table’s column as a “field.”)
- Delete a table from an SDE database



**Important:** Use caution when deleting SDE tables. The Tables tab lets you delete a table from the SDE database. Do NOT use this feature to remove GIS annotation layers from your workspace.

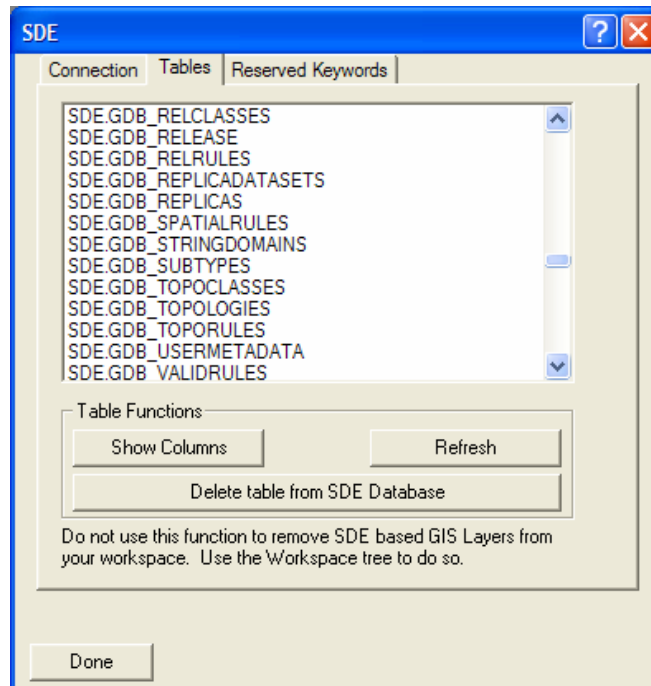
You'll use the Reserved Keywords tab to view the list of reserved keywords.

◆ **To view and refresh your list of SDE tables:**

1. Choose **Annotate**⇒**SDE Connection**⇒**Tables** tab.

The SDE dialog box opens, and its Tables tab lists your available SDE tables.

**Tip:** To add the SDE Connection button to a toolbar, see "Adding and removing toolbar buttons" in Part IV, Chapter 22.



2. Click the **Refresh** button.  
The list is updated to show the SDE tables currently available.
3. Click **Done** to close the SDE dialog box.

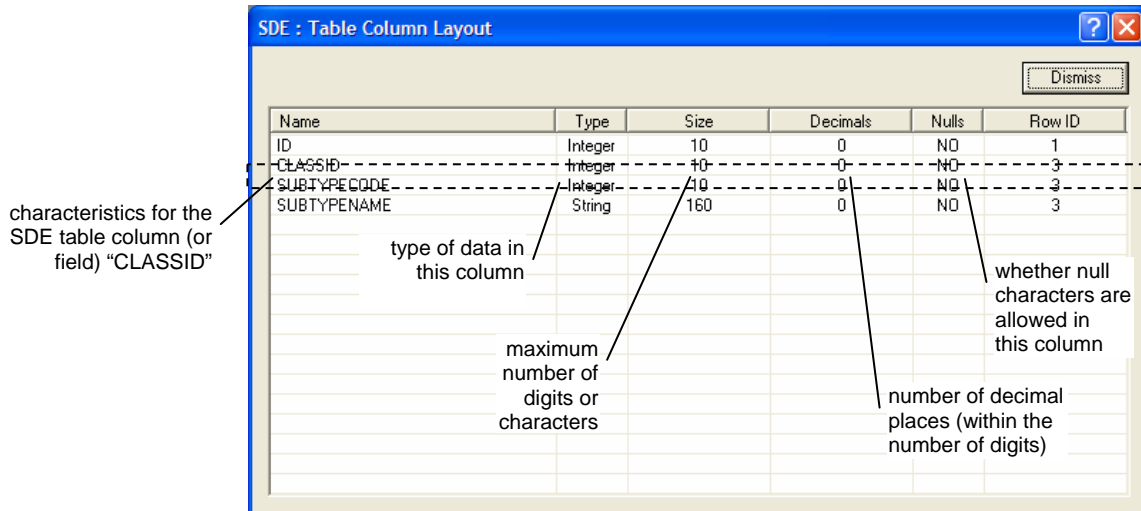
◆ **To view a table's column layout:**

1. Choose **Annotate**⇒**SDE Connection**⇒**Tables** tab.

The SDE dialog box opens to its Tables tab.

2. Select the desired table, then click **Show Columns**.

The SDE: Table Column Layout dialog box appears.



- When done viewing column characteristics, click **Dismiss** to close the dialog box.

#### ◆ To delete a table from an SDE database:

**Important:** Use caution when deleting SDE tables. The Tables tab lets you delete a table from the SDE database. Do NOT use this feature to remove GIS annotation layers from your workspace.

- Choose **Annotate**⇒**SDE Connection**⇒**Tables** tab.  
The SDE dialog box opens to its Tables tab.
- Select one or more tables to be deleted, then click **Delete table from SDE Database**.
- If you're certain that you want to delete the table(s), confirm in the pop-up that this is what you want to do.

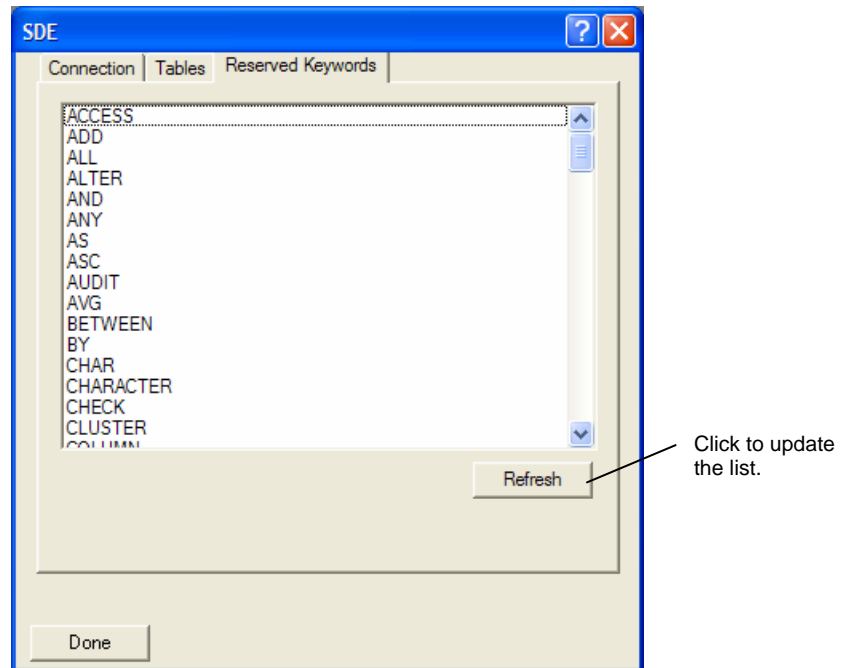
The table(s) are *permanently deleted* from the SDE database.

#### Viewing reserved keywords

The Reserved Keywords tab shows the list of special keywords that cannot be used within SDE table names or column names.

#### ◆ To view the list of SDE Reserved Keywords:

- Choose **Annotate**⇒**SDE Connection**⇒**Reserved Keywords** tab.  
The SDE dialog box opens to its Reserved Keywords tab.



2. When you are done viewing the Reserved Keywords, click **Done**.



# Chapter 17 — Working with GIS Annotation Layers

This chapter describes the EFS features and utilities you can use with your GIS annotation layers. It also discusses how to optimize EFS performance when working with GIS annotation layers.

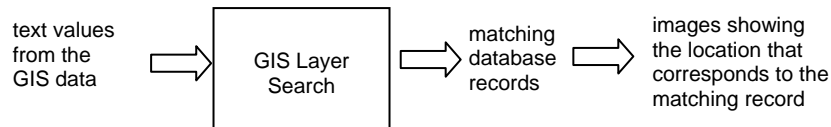
## Topics covered in this chapter ... page

GIS Layer Search.....	325
Searching a GIS annotation layer .....	326
GIS Query Tool .....	330
Querying a GIS annotation layer .....	331
Custom fields .....	340
Maximizing system performance.....	342
GIS utilities.....	344

## GIS Layer Search

*For Advanced  
GIS Users*

The **GIS Layer Search** feature is a sophisticated search for text data associated with a GIS annotation layer. This feature lets you enter search criteria for up to two text fields, finds database records that match your criteria, and (based on coordinate data) lets you view the images associated with those records.



**Figure 17-1:** Workflow for the GIS Layer Search.

The GIS Layer Search is similar to the Address Search feature, but is more powerful and robust. You can use it to:

- Search for any text field in your GIS data. Search a single field or supply a qualifier field (a second search field) to narrow the hit list.

**Note:** Either (or both) of your search fields can be a composite field you can create by combining fields from your database. (See “Custom fields” on page 340.)

- Search a GIS annotation layer added from a shapefile or from an SDE feature class.
- Select a search hit and view the best corresponding image.

- Display one text field on a corresponding image. The field can be a composite field you created by combining text fields from your database. (See “Custom fields” on page 340.)
- Create index files (called Search PDX files) to speed up searches of shapefile-based GIS annotation layers.

**Note:** PDX files do not apply to SDE-based GIS annotation layers.

## Searching a GIS annotation layer

If your active workspace contains a GIS annotation layer, you can use the GIS Layer Search to search the layer for specific text data. (To add a GIS annotation layer, see Chapter 16.)

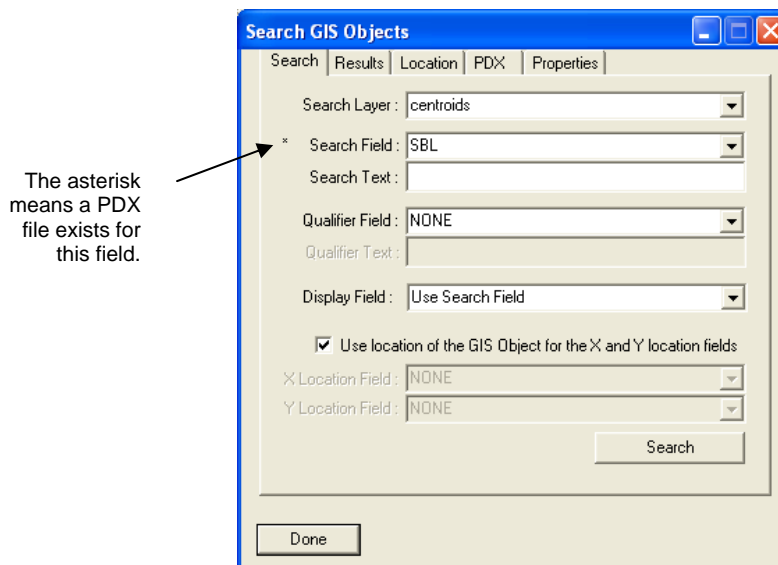
In the following procedure, you will:

- Select a GIS annotation layer to search, enter search criteria, and select a display field.
- If desired, create PDX files to optimize searching (for shapefile-based layers only).
- If desired, assign display properties (such as color and width) for the GIS object that matches your search.
- Perform the search.
- View results and corresponding images.

### ◆ To search a GIS annotation layer:

1. In your Workspace window, right-click the GIS annotation layer you want to search. A context menu appears.
2. From the context menu, select **Search <GIS annotation layer name>**.

The Search GIS Objects dialog box appears, the Search tab is active, and the GIS annotation layer you right-clicked is shown as the Search Layer.



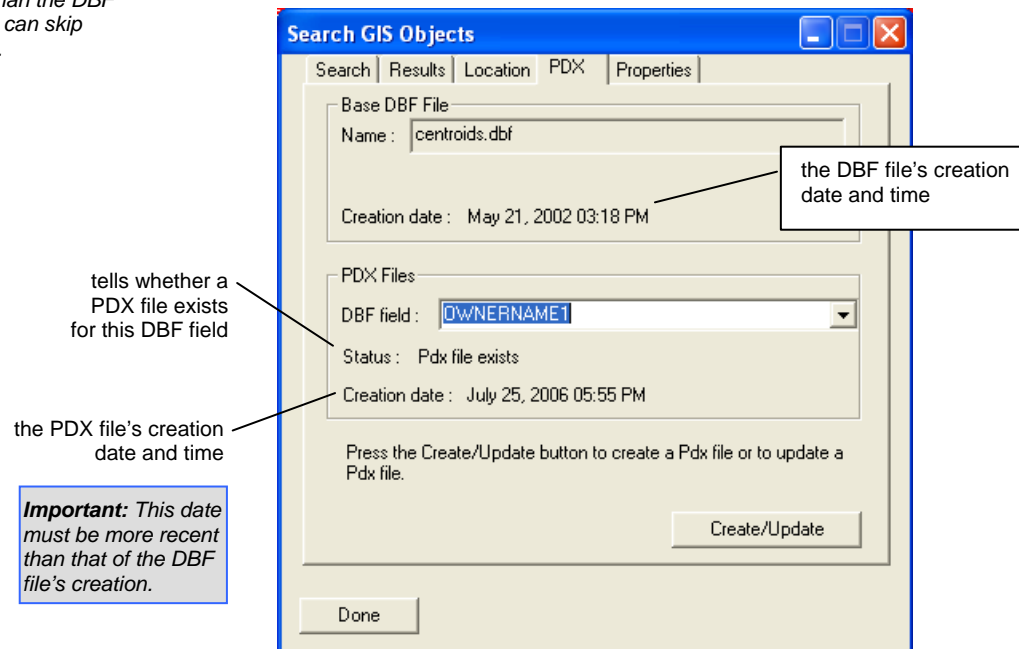
3. Enter the following search data:

For the ...	Do this ...
Search Field	Select the field you wish to search. (The first field in the database is shown. Use the drop-down list to select a different field.) <b>Note:</b> To create a custom field, see the procedure on page 341.
Search Text	Type the text you wish to search this field for.
Qualifier Field	(Optional) Select a second field to search.
Qualifier Text	Type the text you wish to search the second field for.
Display Field	Select a field to be displayed: — a field associated with the search hit, or — a custom field you create (see procedure on page 341), or — the search field (select “Use Search Field”). <b>Note:</b> A Display Field other than the Search Field or the Qualifier Field generally gives more meaningful results.

When entering the Search Text and Qualifier Text, if unsure of a spelling or a number, add a wildcard character (\*) to the end of the portion you're sure of.

4. SDE users, skip to Step 6.
5. (Optional) This step is highly recommended if your layer is based on a shapefile. Having a current PDX file for each Search Field and Qualifier Field speeds up the layer search.
- a. Click the **PDX** tab.

Your System Administrator may have already created a PDX file. If the PDX file is current (newer than the DBF file), you can skip this step.



- b. From the DBF field box, select the Search Field you selected in Step 3.
- c. Check the Status and Creation date to see if a current PDX file (for the DBF field shown) exists.
- d. Repeat Steps 5 b and 5 c for the Qualifier Field, if you selected one in Step 3.
- e. If after following Steps 5 c and 5 d, you find that you do not need to create or update PDX files, skip to Step 6.

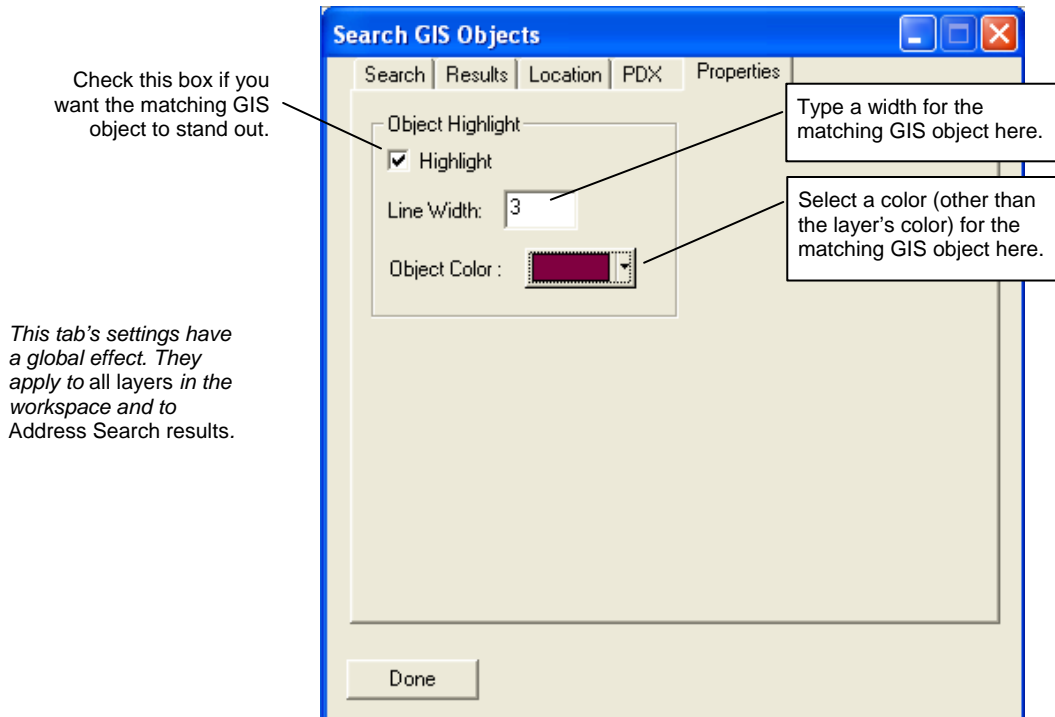
**Reminder:** PDX files must not be created in read-only directories.

- f. For each PDX file to be created (or updated), select the field name from the DBF field drop-down list and click **Create/Update**.

*PDX file creation can take a long time if the DBF file is large.*

The dialog box reports “Loading for sorting...” and the hourglass appears. You’ll hear a tone when the PDX file is complete. The Status and Creation date are updated for the new PDX file.

6. (Optional) Click the **Properties** tab to choose display properties for the GIS object you’re searching for.



*This tab's settings have a global effect. They apply to all layers in the workspace and to Address Search results.*

7. Click the **Search** tab.
8. (Optional) To select an [x,y] location at which to display the matching GIS object, **uncheck Use location of GIS Object for the X and Y location fields**, and (from the X Location Field and Y Location Field drop-down lists) select fields that give coordinate data.

*See screen pictured in Step 2.*

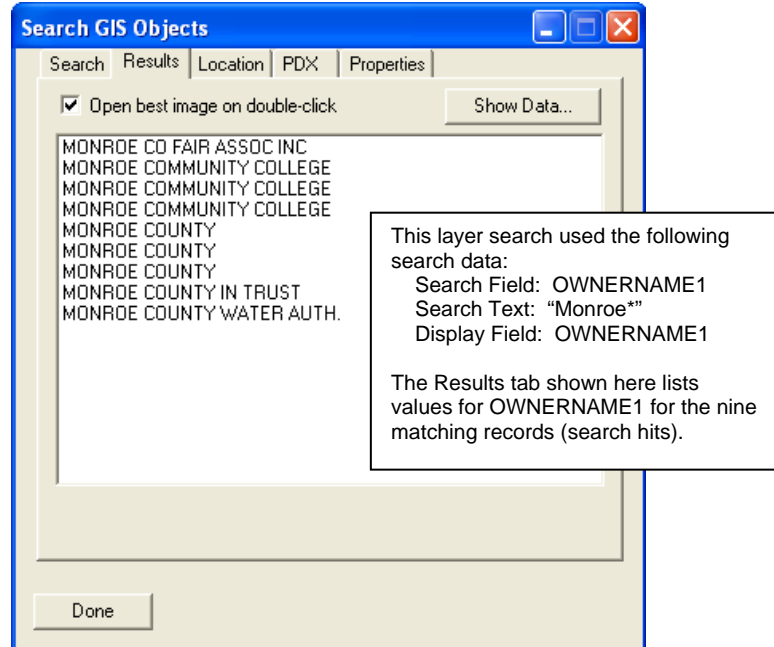
**If you omit this step:** EFS determines the [x,y] location at which to display the matching GIS object. GIS objects (other than point data) have multiple [x,y] pairs, each representing a corner. When EFS displays the image and matching GIS object, it centers the object on one of these corners.

**Why use an [x,y] other than the GIS object's?** Your data may have additional, preferable [x,y] pairs associated with each GIS object. For example, in a parcels layer—each parcel (or rectangle) has four [x,y] pairs, each representing a corner. There may also be an [x,y] field that gives the location of the geometric center of the parcel. You may prefer that EFS centers the GIS object (and image) at the object's center, rather than on a corner.

9. Click the **Search** button. The bottom of the Search tab shows the word “Searching,” then gives the number of items found.

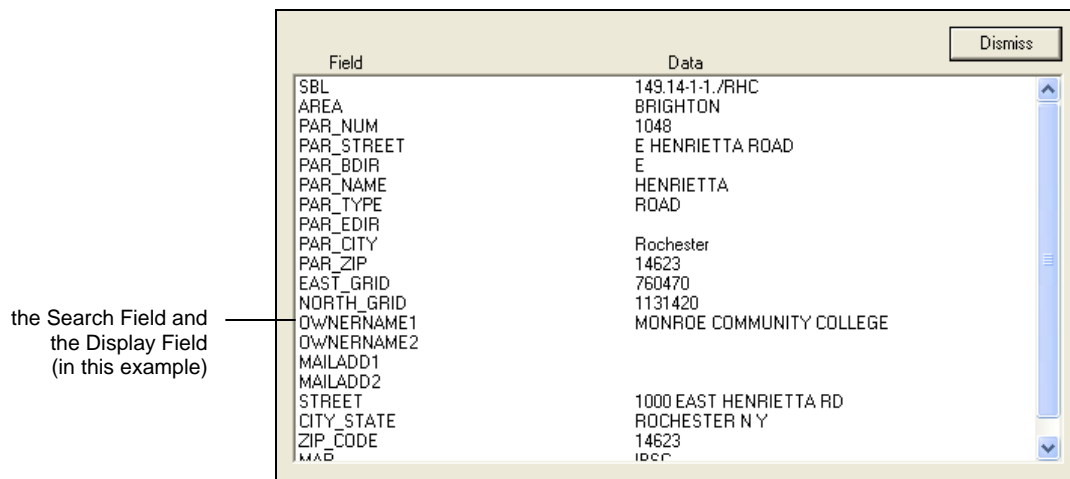


10. To view results, click the **Results** tab. The Results tab lists the Display Field value for each record that matches your search criteria.



11. (Optional) To view an entire record, select the desired search hit, then click **Show Data**.

A pop-up shows the matching record. The Field column lists field names, and the Data column lists the corresponding field values. Click **Dismiss** when you're done viewing the record.



To learn how EFS chooses the image to open, see "Hit Quality sort," in Part I, Chapter 6.

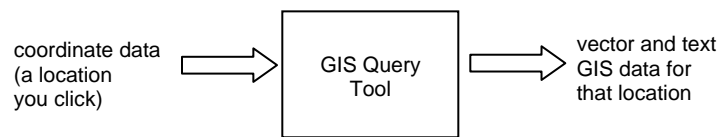
12. On the Results tab, double-click the search hit for the desired record in order to see the corresponding image that best shows the matching GIS object.
- EFS opens the corresponding image with a sweet spot best matching the [x,y] coordinates you entered (or the [x,y] coordinates of the GIS object found, if you selected an [x,y] field in Step 8).
13. When finished, click **Done** to close the dialog box.

## GIS Query Tool

The **GIS Query Tool** uses coordinates from a location you click to find and display GIS vector data for the nearest GIS object. A corresponding text field of your choice can also be displayed.

With the GIS Query Tool you can:

- Select a GIS annotation layer of points, lines, or polygons (centroids, streets, or parcels, for example) or have EFS select the layer based on the location of your mouse click.
- Display the GIS object on any Pictometry image.
- Highlight the GIS object in the layer by assigning distinctive display properties to the object.
- Highlight *similar* GIS objects in the layer by assigning distinctive display properties to the objects.
- Save the GIS object (and text field) as permanent annotations in your active workspace.



**Figure 17-2:** Workflow for the GIS Query Tool.

### Some typical examples

For example, you might want to see the lot lines for a certain parcel. If you have parcel data for your images and you add that data as a GIS annotation layer, you can query the layer by clicking (an open image) on or near the parcel. EFS shows the outline of the parcel nearest to your click and displays data from a corresponding text field of your choice.

Or perhaps you are viewing an image and you want to know the names of some streets you see in the image. You can query a layer of street data so that EFS highlights the street nearest your click and displays its name.

Figure 17-3 shows output from two consecutive queries—one of a parcels layer (with the house number as the display field), another of a roads layer (with the street name as the display field).



**Figure 17-3:** Output from querying two different layers.

## Querying a GIS annotation layer

**Note:** Before using the GIS Query Tool, be sure your active workspace contains the GIS annotation layer you want to query. (To add a layer, see Chapter 16.)

To use the GIS Query Tool, you'll typically:

1. Select a GIS annotation layer and the settings for querying that layer. (See "Query layer setup," discussed next.)
2. Select settings for the tool. (See "Query Tool setup," on page 334.)
3. Activate the tool and perform the query. (See "Querying the layer," on page 337.)

### Query layer setup

In the following procedure, you can select a layer to query and a text field to display next to your GIS object.

**Note:** If you don't select a layer to query (and you don't use the Auto select layer feature), EFS queries the first layer listed in the workspace.

You can also change layer properties and create PDX files (for layers based on shapefiles) to optimize performance.

**Touch-screen users and users working with a hidden workspace:** Use the following procedure *only* if you want to select a layer. (Skip this procedure if you plan to use the Auto select layer feature or to let EFS query the first layer listed in the active workspace.)

**All other users:** Skip this procedure if you plan to use Auto select layer (or to let EFS query the first layer in the workspace), *and* you don't need to display a text field, *and* you don't need to create or update PDX files.

**Important:** If you skip this procedure and your data is shapefile-based, be sure to create or update the PDX file for the layer you'll query. (See "To create or update a Display PDX file" on page 350.)

◆ **To set up a layer for queries:**

1. *If you are a touch-screen user OR if your workspace is hidden,* select a layer to query as follows:



- a. Do *one* of the following:
  - Click the **GIS Query Tool**.
  - or —
  - Choose **Tools**⇒**GIS Query**.

The cursor changes to the Query Tool cursor.

- b. Click one of the Image window's scroll bars, then press the **PAGE UP** or **PAGE DOWN** key repeatedly, until the name of the layer you want to query is shown on the Status Bar's leftmost pane.

*Skip the rest of this procedure. (Your layer selection is complete.)*

2. To select a layer to query and set properties for querying that layer (such as the name of a text field to be displayed), *skip to Step 3.*

To simply select a layer to query (and keep its query properties unchanged), do *one* of the following:

- In the Workspace window, select the GIS annotation layer that you want to query.
- or —
- Right-click any workspace item (or anywhere in the Image window), and from the context menu, select **Query Layer**, then select the name of the layer you want to query.

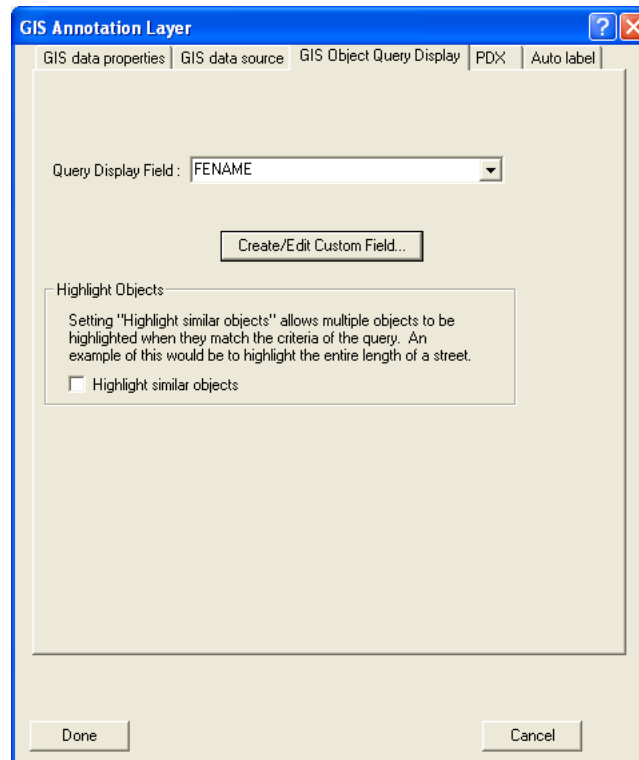
*Skip the rest of this procedure. (Your layer selection is complete.)*

3. In your workspace, right-click the GIS annotation layer that you want to query. From the context menu, select **Properties for <GIS annotation layer name>**.

The GIS Annotation Layer dialog box appears.

4. Click the **GIS data properties** tab. Change attributes for the vector (non-text) GIS data as desired. (Setting these attributes is described in the procedure "To add a GIS annotation layer from a shapefile," in Chapter 16.)
5. Click the **GIS Object Query Display** tab.

*If you don't select a layer to query (and you don't use Auto select layer), EFS queries the first layer listed in the workspace.*



6. (Optional) From the Query Display Field box, select the text field you want to display.

**Note:** To create a custom field, follow Steps 4 - 11 of the procedure “To create a custom field in your GIS annotation layer” on page 341.

7. (Optional) If you want multiple GIS objects to be displayed, check the **Highlight similar objects** box. (This causes EFS to display every GIS object that has a Query Display Field matching that of the GIS object closest to your click.)

**Hint:** The “Highlight similar objects” box is handy for streets. They are treated as segments. You may want to see an entire street (and not just the segment closest to your click). This option will, however, cause searches to take a little longer. See “Highlighting similar objects” on page 338.

8. (Optional but highly recommended if your layer is based on a shapefile) To create or update a Display PDX file in order to speed up the Query display, click the **PDX** tab. Follow Steps 4 - 7 of the procedure “To create or update a Display PDX file” on page 350. (Because you’re accessing the utility from a different dialog box, the screens will look slightly different than those pictured in that procedure.)
9. Click **Done** to close the dialog box.
10. (Optional but highly recommended if your layer is based on a shapefile) To create or update a Search PDX file in order to speed up the Query search, follow the procedure “To create or update a Search PDX file” on page 347. It’s recommended that you create a PDX file for any text field you intend to display when you query this layer.

The layer is now set up for queries. (Next, you can change the tool's properties if desired. Then you'll be ready to query the layer.)

**Note:** To save the layer properties that you set in Steps 3 – 7, be sure to save your workspace.

## Query Tool setup

Before you use the GIS Query Tool, you may want to change its properties. You can change properties such as whether to display a text field, the text field's font and color, whether and how to “auto select” the query layer, distinctive properties for the GIS object, and settings for saving query output as annotations.

### The Auto select layer feature

EFS provides the Auto select layer feature so you can set up the GIS Query Tool to work *without any GIS annotation layer being selected in the workspace*. The Query Tool determines which layer to query, based on the location of your click and which GIS objects are closest to that location. You can query two or more layers consecutively and repeatedly, without having to change layer selection every time you switch from one layer to another. There are three ways to use this feature. You can have EFS query the:

- layer of *any* kind (that is closest to your click),
- layer of *lines or points* (that is closest to your click), or
- layer of *polygons* (that is closest to your click).

**Hint:** EFS treats a polygon as three or more attached line segments. If you're having trouble querying a polygon, click where you'd expect one of its sides to be (rather than at the polygon's center).

### Setting up Query Tool properties

*The following procedure is optional.* Use this procedure if you want to set up the Auto select layer feature or any other GIS Query Tool properties:

#### ◆ To set up Query Tool properties:

1. If the GIS Query Tool is not already active, do *one* of the following:

- Click the **GIS Query Tool**.
- or —
- Choose **Tools**⇒**GIS Query**.

The cursor changes to the Query Tool cursor.

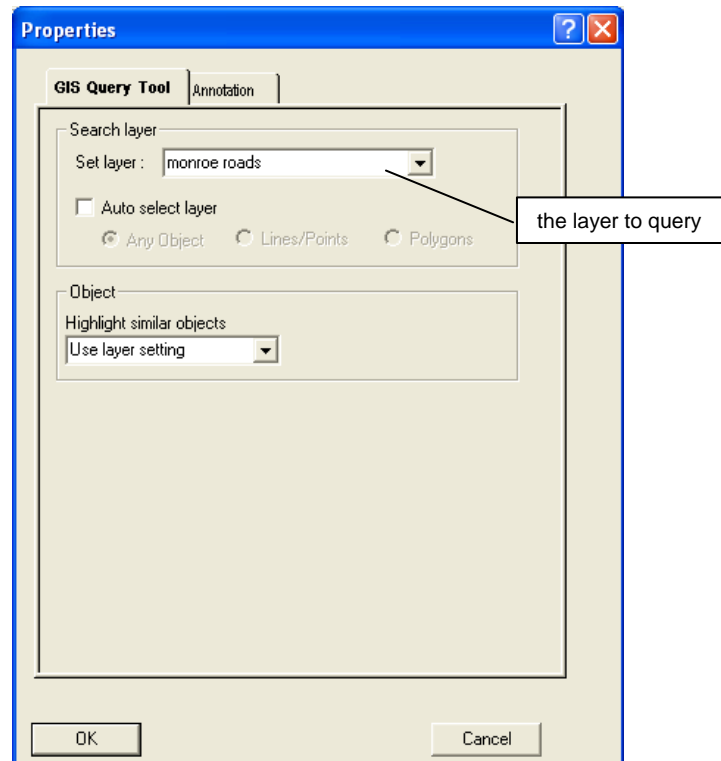
2. Do *one* of the following:

- Click the **Tool Properties** button on the toolbar.
- or —
- Press **CTRL + P**.
- or —



- Choose **Tools**⇒**Properties**.

The Properties dialog box for the GIS Query Tool appears.



3. (Optional) To have EFS select a query layer, do the following:
  - a. Check **Auto select layer**.

**Note:** The Auto select layer feature is described on page 334.

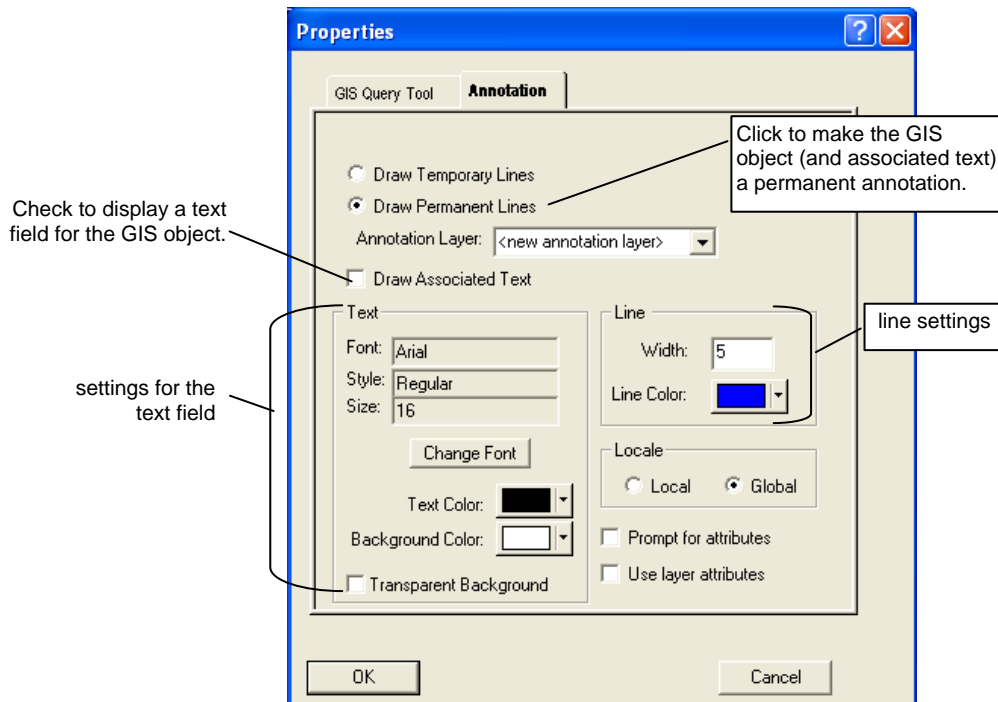
- b. Click the desired setting as described in the following table:

Click this ...	To query the closest (to mouse click) layer of this type ...
Any Object	any GIS annotation layer
Lines/Points	line or point layer only
Polygons	polygon layer only

4. (Optional) To select a highlight setting other than the one shown, select the desired setting from the “Highlight similar objects” box.

**Note:** This setting overrides the layer’s setting, which was selected when the layer was set up for queries.

5. Click the **Annotation** tab.



6. Click the desired setting for drawing the GIS object. (Click **Draw Temporary Lines**, or to save the query output as a permanent annotation, click **Draw Permanent Lines**.)
7. (Optional) If you want EFS to display a text field associated with the GIS object, check **Draw Associated Text**. (The field to be displayed is the Query Display Field you may have selected in Step 6 of the procedure “To set up a layer for queries” on page 332.)
8. If you clicked *Draw Temporary Lines* in Step 6, do the following:
  - a. (Optional) Define Line settings (Width and Line Color) to be applied to all GIS objects drawn by the Query Tool.
  - b. (Optional) If you checked **Draw Associated Text** in Step 6, define Text settings (Font, Style, Size, Text Color, Background Color, Transparent Background) for all associated text displayed by the Query Tool.
9. If you clicked *Draw Permanent Lines* in Step 5, do the following:
  - a. To select the parent layer from the **Annotation Layer** list, do *one* of the following:
    - Select an existing layer
    - or —
    - Create a new layer by selecting **<new annotation layer>**. (You’ll be prompted to define the new layer’s attributes the next time you use the tool.)
  - b. To choose how you’ll define the annotation attributes, do *one* of the following:



*If the properties you supply conflict with those of the layer (shown on the dialog box), the tool's properties override the layer's properties.*

- Check **Prompt for attributes** to be prompted every time you use the tool.
  - or —
  - Check **Use layer attributes** to use the attributes of the layer shown on the dialog box.
  - or —
  - Define attributes for Query Tool output.
    - 1) Be sure both **Prompt for attributes** and **Use layer attributes** are *unchecked*.
    - 2) (Optional) Define attributes for all GIS objects to be drawn by the Query Tool—Line Color, Line Width, and Locale (Local or Global).
    - 3) (Optional) If you checked Draw Associated Text in Step 6, select settings for the text annotation, then click **OK**.
10. Click **OK** to save the changes you made to the Query Tool's properties. Changes you made will stay in effect until you change them again.

## Querying the layer

Once the layer and tool are set up, you can use this procedure repeatedly, (without having to repeat the setup).

**Hint:** You can use the GIS Query Tool while in Full Screen Mode if you first add the GIS Query Tool to the Full Screen toolbar. See “Adding and removing toolbar buttons” in Part IV, Chapter 22.

### ◆ To query a GIS annotation layer for GIS data:



1. If the GIS Query Tool is not already active, do *one* of the following:
  - Click the **GIS Query Tool**.
  - or —
  - Choose **Tools**⇒**GIS Query**.

The cursor changes to the Query Tool cursor.

2. Be sure the image you want to query is open and active in the Image window.
3. In your active image, click the location that you'd like to query.

**Hint:** The GIS object may be hard to see if its color is similar to colors in the image. Change Line Color and Width and repeat the query.

A GIS object from the layer selected in your workspace—the GIS object nearest your click—is displayed on the active image. If you chose to include a text field, that text is also displayed.

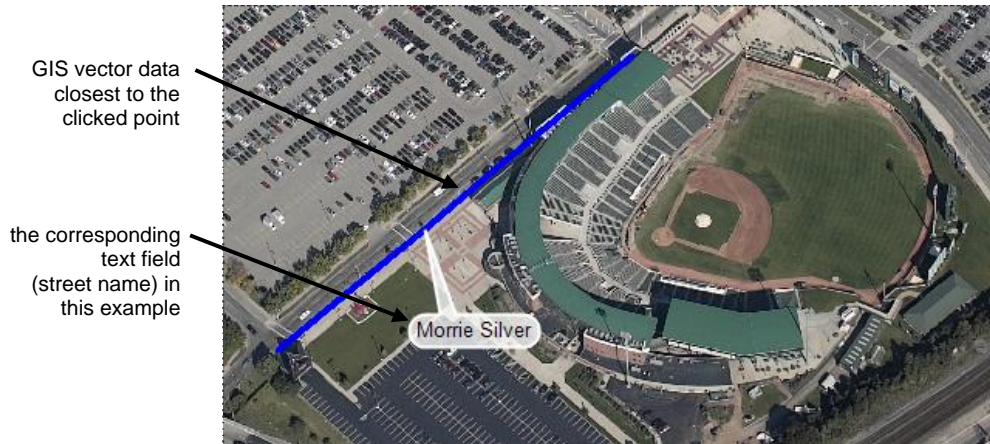
After your first query, you can query other locations in the layer by simply clicking them. To view output from successive queries simultaneously, see “Viewing results from multiple queries” on page 339.

## Query results — some examples

Here are some examples showing output from various queries.

### GIS object on the image

The example in Figure 17-4 shows the Image window's contents after a roads layer was queried.



**Figure 17-4:** Image window after a query.

### Full database record shown

Figure 17-5 shows the Output window's Query Info tab after a query. This tab lists the full database record or table entry for the matching GIS object.

SBL	106.77-1-38
AREA	ROCHESTER
PAR_NUM	1
PAR_STREET	MORRIE SILVER WAY
PAR_BDIR	
PAR_NAME	MORRIE SILVER
PAR_TYPE	WAY
PAR_EDIR	
PAR_CITY	Rochester
PAR_ZIP	14608
EAST_GRID	756957
NORTH_GRID	1152080
OWNERNAME1	COUNTY OF MONROE
OWNERNAME2	
MAILADD1	% FRONTIER FIELD
MAILADD2	
STREET	1 MORRIE SILVER WAY
CITY_STATE	ROCHESTER NY
ZIP_CODE	14608
MAP	RPWD - 9

**Figure 17-5:** Output window's Query Info tab after a query.

### Highlighting similar objects

The following examples show the same query with and without the Highlight similar objects setting. In both cases, the roads layer is displayed with thin red lines and the query object is displayed with a wide blue line.

Figure 17-6 shows results for a query with Highlight similar objects turned off. Only one GIS object (one line segment) is displayed as query output.



**Figure 17-6:** Query results with *Highlight similar objects* turned off (and layer showing).

For Figure 17-7, the same query was performed except *Highlight similar objects* was on. The GIS object (line segment) at the location of the query is displayed as query output along with other GIS “similar” objects (in this case, other segments with street name “I-490 West”).



**Figure 17-7:** Query results with *Highlight similar objects* turned on (and layer showing).

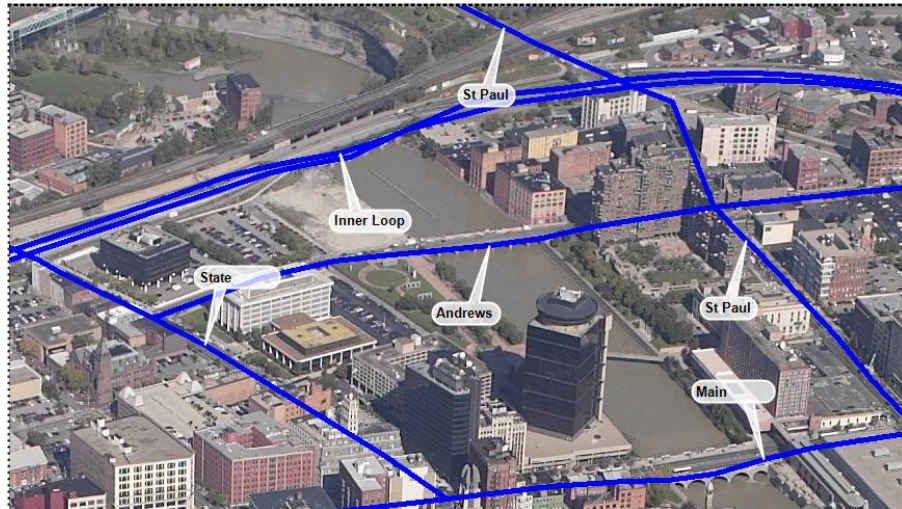
### Viewing results from multiple queries

You can view the results from multiple queries simultaneously. After the first query, simply hold down the **CTRL** key while you click on subsequent locations. (Without holding **CTRL**, you’ll see results from one query at a time.) Here’s an example showing results from five queries.



*“Highlight similar objects” was on for these queries.*

*So for each location clicked, EFS displayed the closest segment and all other segments for the same street.*



**Figure 17-8:** Image showing results of multiple queries.

### Query Tool output persistence

Query Tool output (whether from a single query or multiple queries with the **CTRL** key) remains on the screen until you use the Query Tool without the **CTRL** key, or until you use another measurement tool, the Navigate Tool, or the Image Tool (or until you close the workspace).

If you pan, zoom, scroll, or click a Navigation Camera or other Alternate View button, the output remains on the screen.

**Reminder:** If you want to save the output from a query (or from multiple queries performed with the **CTRL** key), you can set up the Query Tool's properties with the Draw Permanent Lines setting, or you can use the tool, then choose **Annotate** → **Add Tool Annotations to Workspace**.

### Deleting Query Tool output

If you wish to remove the Query Tool output from the screen without using another tool or closing the workspace, use the following procedure:

#### ◆ To delete temporary Query Tool output:

- Hold down the **DELETE** key as you click on or near the tool output.

The Query Tool output disappears from the screen.

## Custom fields

A **custom field** is a composite of one or more fields in your GIS data. EFS lets you create custom fields for your GIS annotation layers so you can search more than two fields or display more than one field, when you query or search a GIS annotation layer.

**Note:** Custom fields can't be used with the GIS annotation layer's Auto label feature.

## An example

For example, you could create a field called “full address” that includes a house number, full street name (such as Main Street South), city, state, and zip code. You can then search the layer for a particular full address (in effect, creating a search on more than two fields). Or maybe you simply want to display the full address after having searched only the street name field or after having queried the location of a house in an image.

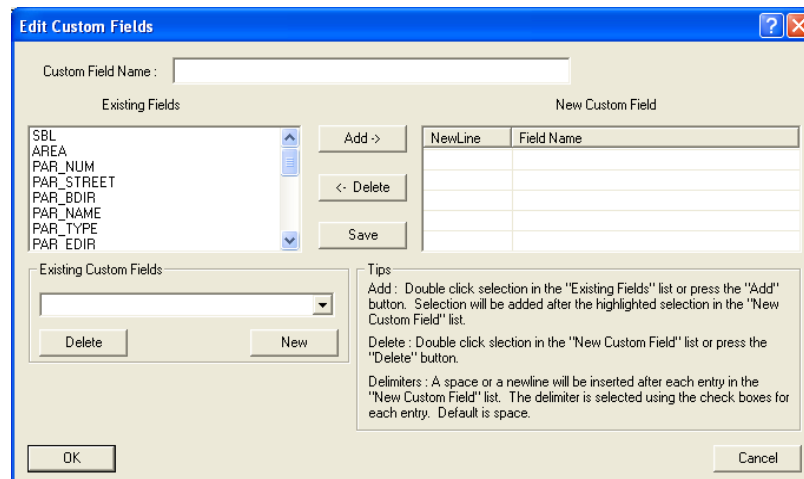
### ◆ To create a custom field in your GIS annotation layer:

1. Right-click the GIS annotation layer you plan to search or to query.
2. From the context menu, select the option **Properties for <GIS annotation layer name>**.

The GIS Annotation Layer dialog box appears.

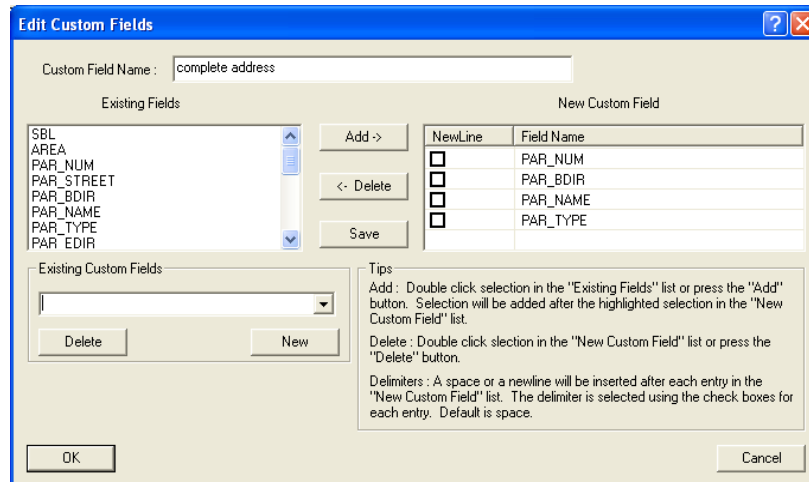
3. Click the **GIS Object Query Display** tab.
4. Click **Create/Edit Custom Field**.

The Edit Custom Fields dialog box appears.



5. In the Custom Field Name box, type a name for the custom field.
6. In the Existing Fields box, double-click the name of a field you want to add to the custom field, or select the field name and click **Add**. (The field is added to the New Custom Field list.)
7. Repeat Step 6 for each field you want to add to the custom field.
8. (Optional) If you want the custom field to appear on more than one line, check the **NewLine** box to the left of the name of each field that should end with a Carriage Return.

*You can also use this dialog box to delete fields from your custom field and to delete entire custom fields.*



9. When you are done adding fields, click **Save**. (The name you typed in Step 5 appears in the Existing Custom Fields box.)
10. (Optional) To create another custom field, repeat Steps 5 – 9.
11. When you're done building (or deleting) custom fields, click **OK** to close the Edit Custom Fields dialog box.
12. Click **Done** to close the GIS Annotation Layer dialog box.

The custom field(s) are added to your GIS annotation layer and are available for use with the GIS Query Tool and the GIS Layer Search feature.

A custom field is available *only* to the layer to which it was added (and in the workspace in which that layer exists).

## Maximizing system performance

Working with dense GIS annotation layers and multiple open images can affect system performance. There are some things EFS does and some things you can do to maximize performance and minimize wait time.

### What EFS does and what you can do

EFS is optimized for speed in many ways, as described in the following sections. To take full advantage of opportunities to improve performance, look for the **Performance tips** in the gray boxes in the following sections.

#### EFS optimizes with timing and coordination

The timing of screen refreshes is optimized and coordinated with other things happening behind the scenes.

#### EFS doesn't draw on "hidden" images

EFS does not draw GIS data on open images that are hidden behind the active image.

**Performance tip:** To make the most of this EFS optimization, work with images maximized (rather than tiled or cascaded) whenever you have multiple open GIS-annotated images—in effect, “hiding” all but the active image, so only the active image needs to be redrawn. (Otherwise, there’s more GIS data for EFS to re-draw every time you zoom, resize the Image window, scroll, or change an annotation property.) Even if your images are cascaded, exposing only small portions of all but one image, EFS must redraw each entire image (and its annotations), as well as the image that’s fully in view.

Alternately, you can resize your cascaded images in order to hide the images that are behind the active image, exposing only their blue bars. As long as you can’t see any image data, EFS considers those images to be hidden.

### EFS refreshes faster with the image cache

Another optimization is the image cache. When one or more GIS annotation layers are visible, all open images are “cached” along with their annotations, so that refreshes can happen much faster. The **image cache** provides a way of temporarily saving annotated images so they can be refreshed on the screen without being redrawn.

#### *Disabling the image cache*

If you are *not* using shapefile-based GIS data (especially if you’re running EFS with less than the recommended memory), then you may want to disable the image cache in order to use less memory. To disable image caching, choose **File⇒System Setup⇒System** tab, and check **Disable Image Cache**. However, without using the image cache, GIS data will take longer to be drawn and refreshed.

*SDE-based GIS data is drawn much faster than shapefile-based GIS data.*

### EFS approximates Cartesian coordinates

The Cartesian approximation is an optimization that eliminates the need to convert Cartesian GIS data (shapefiles or SDE tables) to Lat/Lon in order to add the data to your EFS workspace as a GIS annotation layer.

EFS can approximate Cartesian coordinates for a Lat/Lon image, giving you great performance gains when you work with GIS data.

*A Cartesian system uses State Plane or Universal Transverse Mercator (UTM) [x,y] points—rather than Lat/Lon angles.*

**Performance tip for users with Lat/Lon base maps:** Convert Lat/Lon (raster) base maps to a Cartesian system (State Plane or UTM) before using them with Cartesian GIS data. You can convert a map to Cartesian by exporting it. (You’ll use the File menu’s Export Image option. See Part I, Chapter 9. )

### EFS uses PDX files when searching and drawing

EFS gives you the ability to create PDX index files that reduce your wait time in the following situations:

- when EFS is searching shapefile-based GIS data
- when EFS is drawing shapefile-based GIS data in the Image window

**Performance tip:** It's *highly recommended* that you create a Search PDX file for every DBF field you'll search and a Display PDX file for every shapefile you use in your workspace (especially if the shapefile contains large amounts of data). PDX files are introduced in Chapter 16 (see "PDX index files for layers that use shapefile data ..."). "GIS utilities" (on page 344) gives instructions for creating PDX files by using utilities provided on the DBF Maintenance and Shapefile Maintenance dialog boxes.

### EFS helps you trim DBF files

EFS provides a utility—the DBF Converter—that lets you rename, create, and omit columns within a shapefile's DataBase File (DBF), in order to improve both storage and searching efficiency.

**Performance tip:** Use the DBF Converter to streamline your DBF files so they include only the necessary fields. This utility is discussed in the following section.

## GIS utilities

EFS includes several utilities for working with GIS data. There are two options on the Annotate menu that provide GIS utilities.

### DBF File Maintenance

The DBF File Maintenance option provides the following utilities:

Utility ...	What it does ...
DBF Converter	Creates a new DBF file from part or all of an existing one, in order to improve storage and searching efficiency.
Search PDX	Creates files that optimize speed for shapefile-based GIS layer searches and queries.

### Shapefile Maintenance

The Shapefile Maintenance option provides the following utilities:

Utility ...	What it does ...
Shapefile Converter	Creates a new shapefile from an old one, in order to change to a different coordinate system.
Display PDX	Creates files that optimize speed when EFS draws shapefile-based GIS vector data.
Shapefile Diagnostics	Gives Data Administrators a tool that will detect and repair problems with a shapefile.

### DBF File Maintenance utilities

The following sections describe each DBF File Maintenance utility.

#### DBF Converter

The DBF Converter creates a new DBF file from an existing one. (It does not change the existing source DBF file.) You can use the DBF Converter to do the following:

- Omit unneeded columns (fields), in order to save space and increase speed when searching.



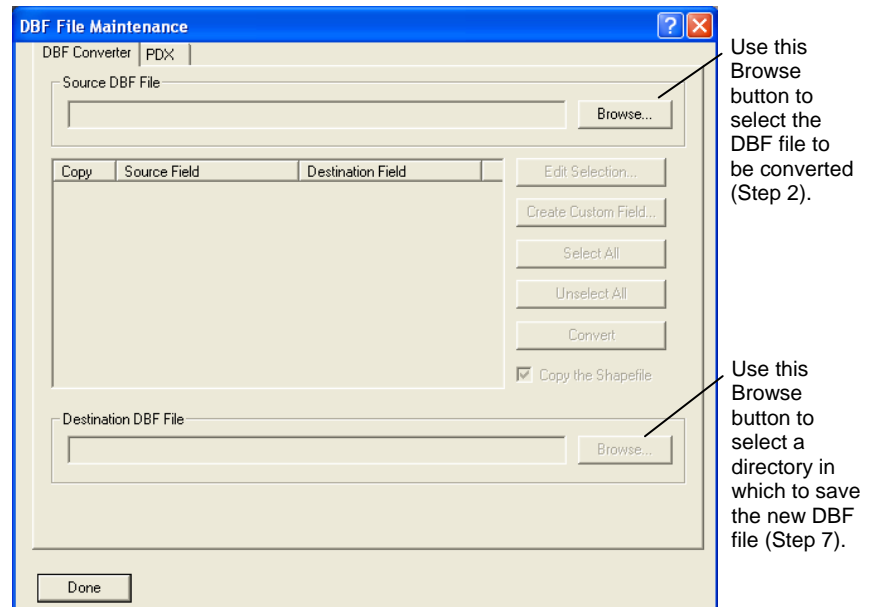
- Rename columns so they are meaningful.
- Create custom fields. (See also “Custom fields” on page 340.)

◆ **To create a new DBF file from an existing one:**

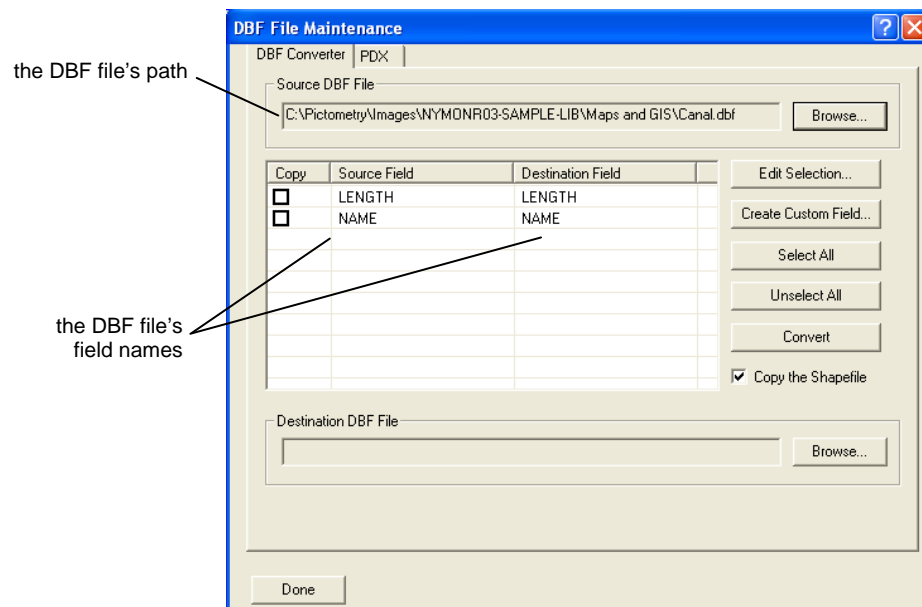
1. Choose **Annotate⇒DBF File Maintenance**.

The DBF File Maintenance dialog box opens to the DBF Converter tab.

**Note:** The dialog box has two Browse buttons.



2. Click the **Browse** button located to the right of the Source DBF File box. The Open dialog box appears.
3. Navigate to the DBF file you want to create a subset of and double-click its name to open it. (The Open dialog box closes, and the DBF file's path and fields are shown on the DBF File Maintenance dialog box.)



*By choosing only the fields you need, you can optimize your work with GIS data.*

4. In the Copy column, check each field you want included in the new DBF file.
5. (Optional) To rename a field,
  - a. Double-click the field name in the Destination Field column.
  - b. Type a new name (up to 11 characters) in the pop-up.
  - c. Click **OK**. EFS updates the field name in the Destination Field column to match what you've entered.
6. (Optional) To create a custom field,
  - a. Click **Create Custom Field**.  
The Edit Custom Fields dialog box appears.
  - b. Follow Steps 5 – 11 of the procedure “To create a custom field in your GIS annotation layer,” which starts on page 341.  
The new custom field is shown at the bottom of the Destination Field column, and it is already checked (to be included in the new DBF file).
7. When you're done selecting and renaming your fields, click the **Browse** button (located to the right of the Destination DBF File box). The Save As dialog box opens.
8. Navigate to the directory in which to save the new DBF file, type a name for the file, then click **Save**.
9. Click **Convert**.  
You'll see a progress message “Converting... \_\_% done.” An hourglass appears. When the conversion is done, you'll see the message “Conversion Complete.”
10. Click **Done** to close the dialog box.

The new DBF file is saved in the directory you chose and can be added to a workspace as a GIS annotation layer at any time.

### Search PDX utility

You or your Data Administrator can use the Search PDX utility to create or update Search PDX files (or to check for existing PDX files), which optimize speed when you use shapefile-based layers with the GIS Layer Search, the Address Search, or the GIS Query Tool. (You can also create a Search PDX file when setting up a GIS Layer Search.)

**Note:** You do not need to create PDX files in order to use the Address Search feature. EFS creates them *automatically* during Address Search setup.

The **Search PDX file** indexes a particular field (or column) in the DBF file. You can create a Search PDX file for any field in a DBF file. EFS uses this PDX file when searching that field in the DBF file for text data.

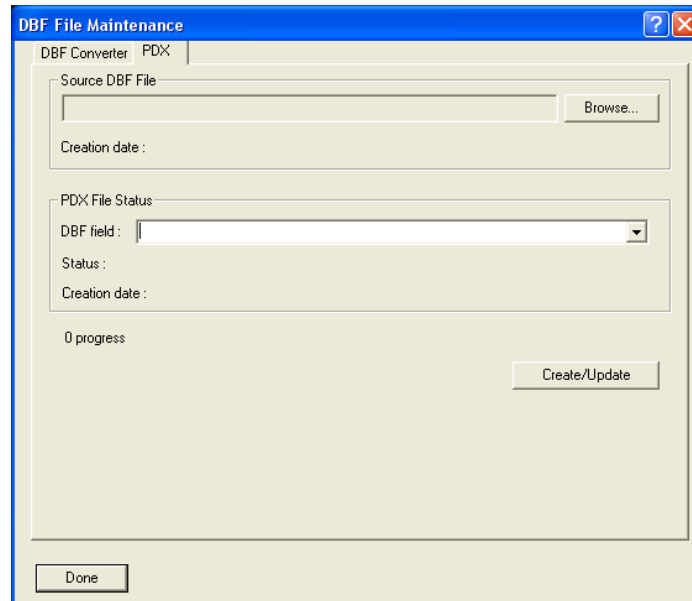
**Important:** PDX files must be created in directories that are not read-only. See “PDX directory must not be read-only” in Chapter 16.

*The Search PDX file should not be confused with the Display PDX file.*

*A PDX file is a Pictometry Data index file.*

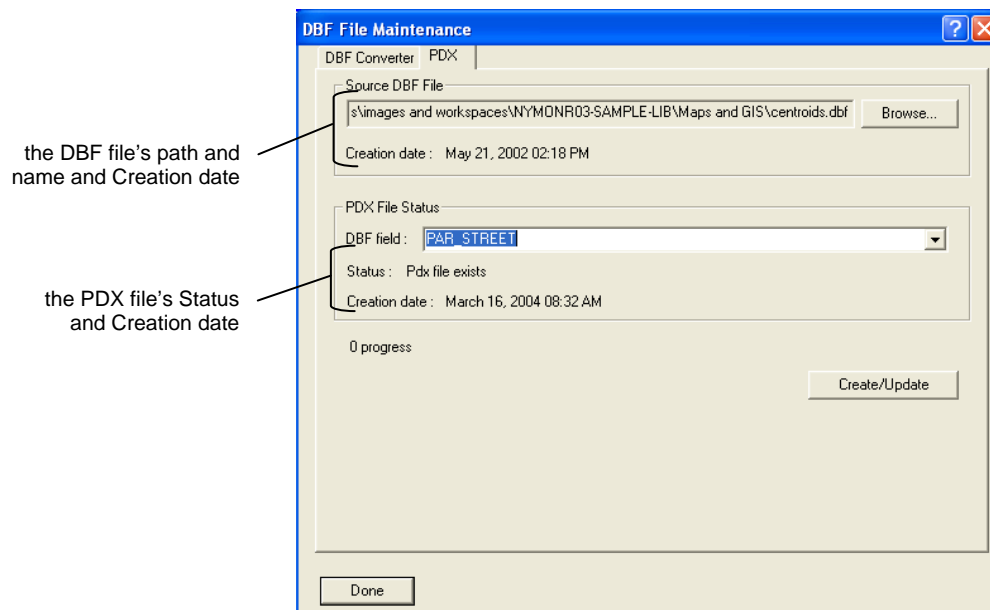
◆ **To create or update a Search PDX file:**

1. Choose **Annotate**⇒**DBF File Maintenance**⇒**PDX** tab. The DBF File Maintenance dialog box opens to its PDX tab.



2. Click **Browse**. The Open dialog box appears.
3. Navigate to the directory that contains the DBF file, and double-click the name of the DBF file. The Open dialog box closes and the DBF file's path, name, and creation date appear on the dialog box.
4. From the DBF field's drop-down list, select the field you want to create a PDX for.

The Status line tells whether a PDX file already exists for this DBF field, and if so, its Creation date is also shown.



*PDX file creation can take a long time if the DBF file is large.*

5. If the Status line indicates that no PDX file exists for this field, or if you need to update an older PDX file, click **Create/Update**. The PDX file is created and the PDX File Status area is updated to reflect the newly created PDX file.
6. Click **Done**.

The new PDX file is saved (or the existing one updated) in the directory where the DBF file is located. EFS will use this PDX file when searching the Source DBF File for a value in the DBF field for which you created the PDX file.

## Shapefile Maintenance utilities

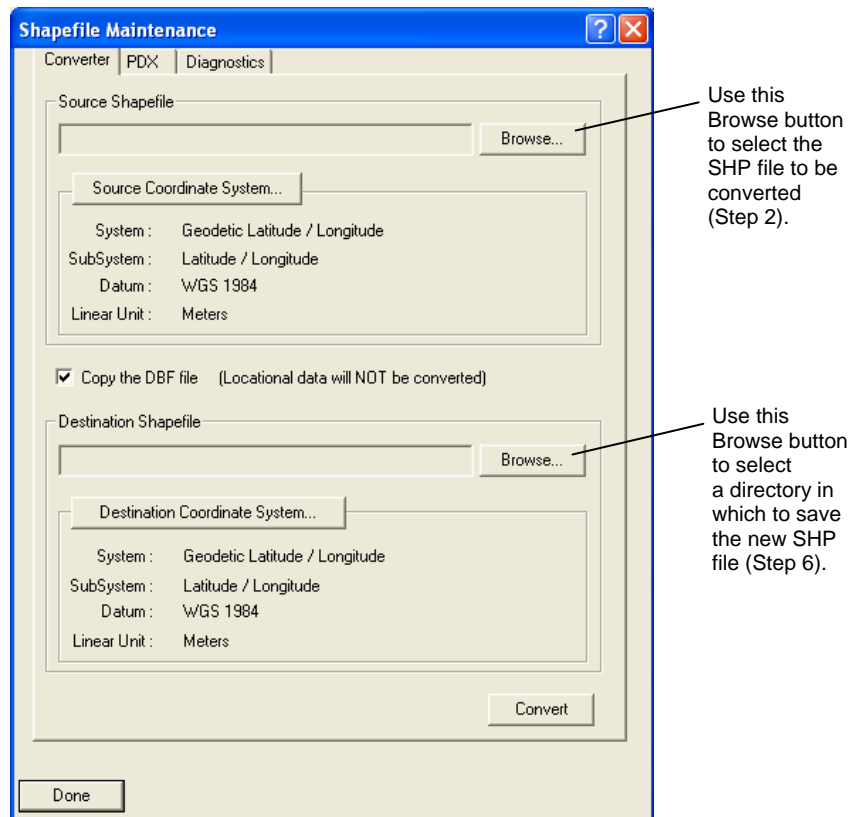
The following sections describe each Shapefile Maintenance utility.

### Shapefile Converter

The Shapefile Converter creates a new SHP file from an existing one, in order to change to the coordinate system. (The original SHP file is unchanged.)

#### ◆ To copy a shapefile and change its coordinate system:

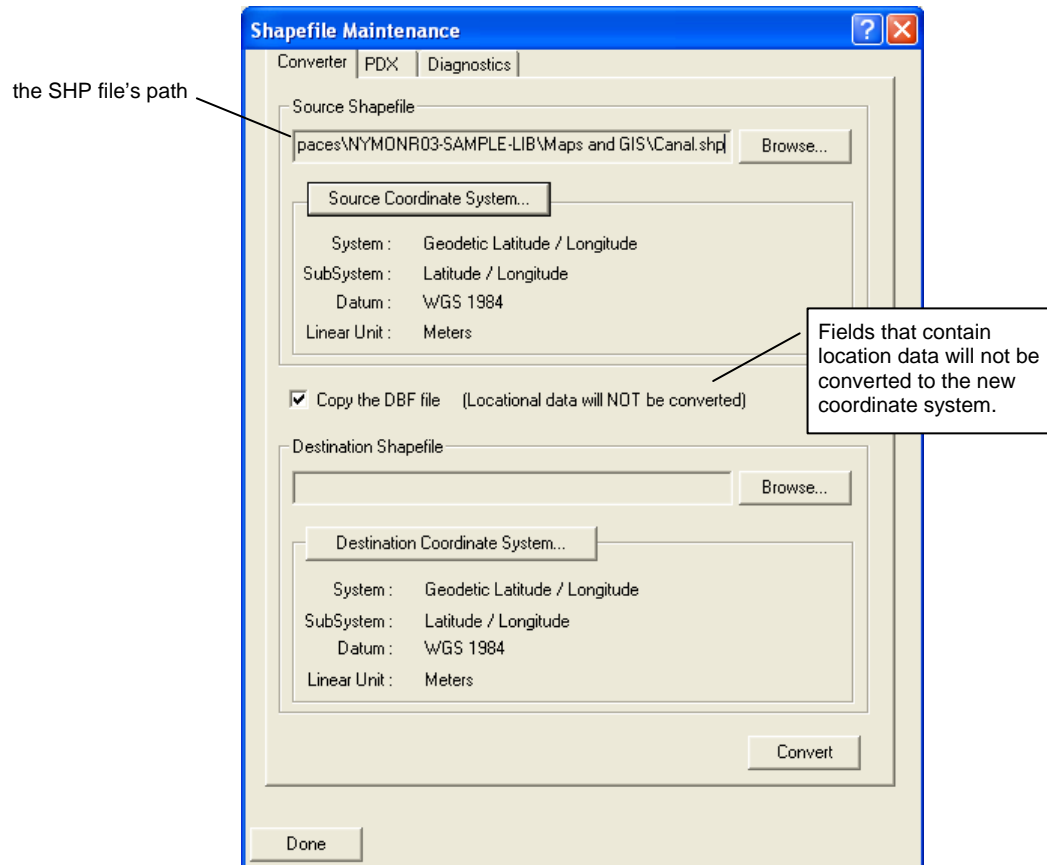
1. Choose **Annotate⇒Shapefile Maintenance**. The Shapefile Maintenance dialog box opens to its Converter tab. (To add the Shapefile Maintenance button to a toolbar, see “Adding and removing toolbar buttons” in Part IV, Chapter 22.)



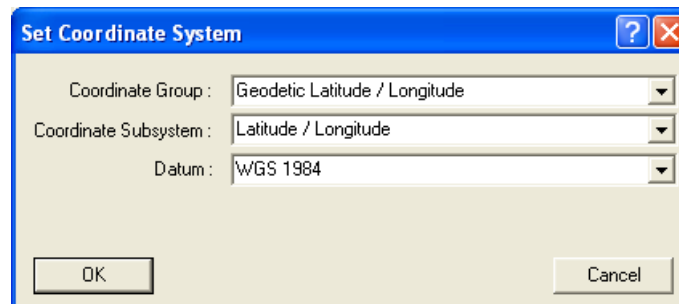
**Note:** The dialog box has two Browse buttons.

2. Click the **Browse** button located to the right of the Source Shapefile box. The Open dialog box appears.

3. Navigate to the desired SHP file and double-click its name to open it. The Open dialog box closes and the SHP file's path appears in the Source Shapefile box.



4. Click **Source Coordinate System**. The Set Coordinate System dialog box appears.



5. Select the coordinate data for the Source Shapefile (the SHP file), and click **OK**. (Your selections are shown on the dialog box.)
6. Click the **Browse** button (located to the right of the Destination Shapefile box). The Save As dialog box opens.
7. Navigate to the directory in which to save the new SHP file, type a name for the file, then click **Save**.
8. Click **Destination Coordinate System**. The Set Coordinate System dialog box appears.

9. Select coordinate data for the coordinate system you want to convert to, and click **OK**. Your selections are shown on the dialog box.
10. (Optional) To make an identical copy of the source SHP file's corresponding DBF file, check **Copy the DBF file**.

**Note:** The content of the DBF file is untouched. The DBF file may contain fields with geographic/location data (coordinates). Those fields are not converted by this utility.

11. Click **Convert**. You'll see a percent progress message, an hourglass, and when the conversion is done, the message "Conversion complete."
12. Click **Done**.

The converted SHP file is saved in the directory you chose and can be added to a workspace as a GIS annotation layer at any time.

### Display PDX utility

*The Display PDX file should not be confused with the Search PDX file.*

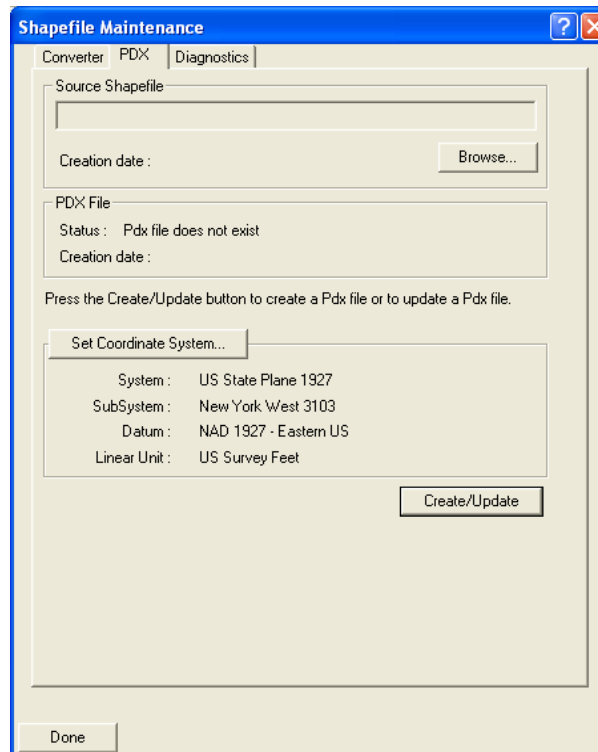
You or your Data Administrator can use the Display PDX utility to create or update **Display PDX files**, which optimize speed when EFS draws shapefile-based GIS data.

**Important:** PDX files must be created in directories that are not read-only. See "PDX directory must not be read-only" in Chapter 16.

#### ◆ To create or update a Display PDX file:

1. Choose **Annotate⇒Shapefile Maintenance⇒PDX** tab.

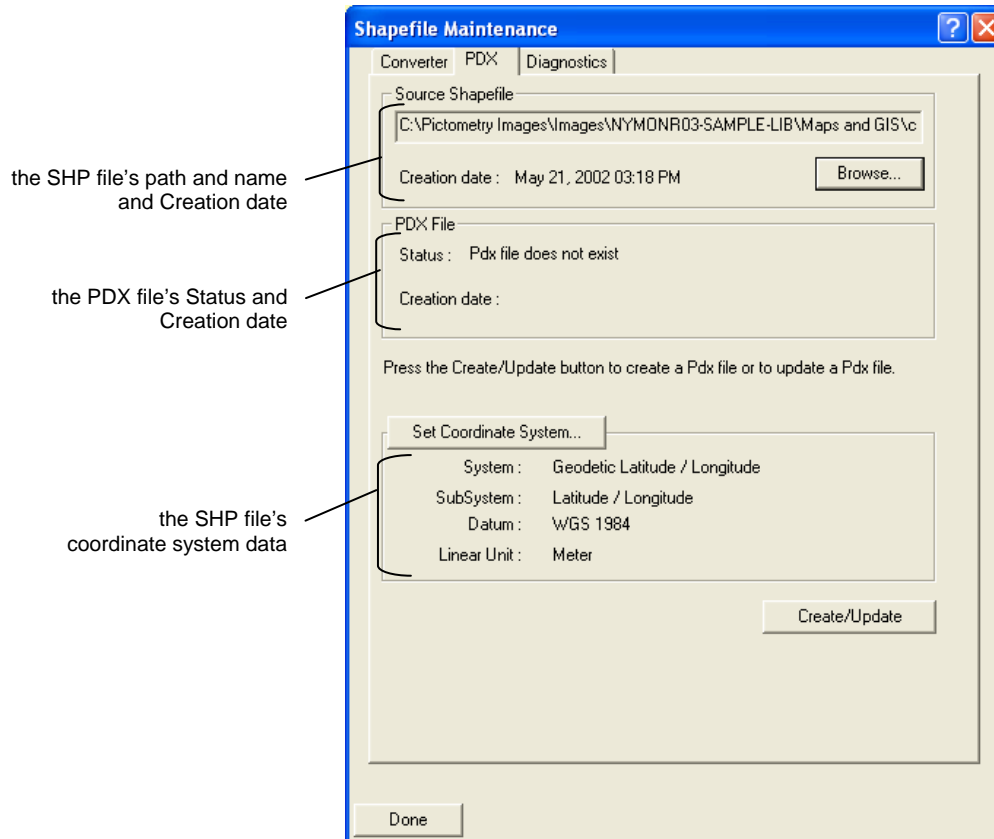
The Shapefile Maintenance dialog box opens to its PDX tab.



2. Click **Browse**. The Open dialog box opens.
3. Navigate to the directory that contains the shapefile for which you're creating a PDX file, and double-click the SHP file's name.

The Open dialog box closes, and the Shapefile Maintenance dialog box (PDX tab) shows the following:

- the SHP file's path, name, and creation date
- the PDX file's Status (whether a PDX file already exists for this SHP file) and if so, its Creation date is also shown.
- the SHP file's coordinate system data



4. If the Status line and (PDX File's) Creation date indicate that a current PDX file exists (if you discover that you do *not* need to create or update a PDX file), *skip to Step 7*.
5. If the Coordinate System values shown are not correct for your images, click **Set Coordinate System**. Then on the Set Coordinate System dialog box, enter the correct coordinate system values, and click **OK**.  
The dialog box displays the coordinate data you entered.
6. Click **Create/Update**. The PDX File area is updated to reflect the newly created PDX file.
7. Click **Done**.

*PDX file creation can take a long time if the SHP file is large.*

The new PDX file is saved (or existing file updated) in the directory where the SHP file is located. EFS will use this PDX file to speed up drawing (and refreshing) of GIS annotation layers created from that SHP file.

### Shapefile Diagnostics utility

The Shapefile Diagnostics utility gives Data Administrators a tool that will detect and repair a shapefile's problems (such as missing information).

*For Data Administrators*

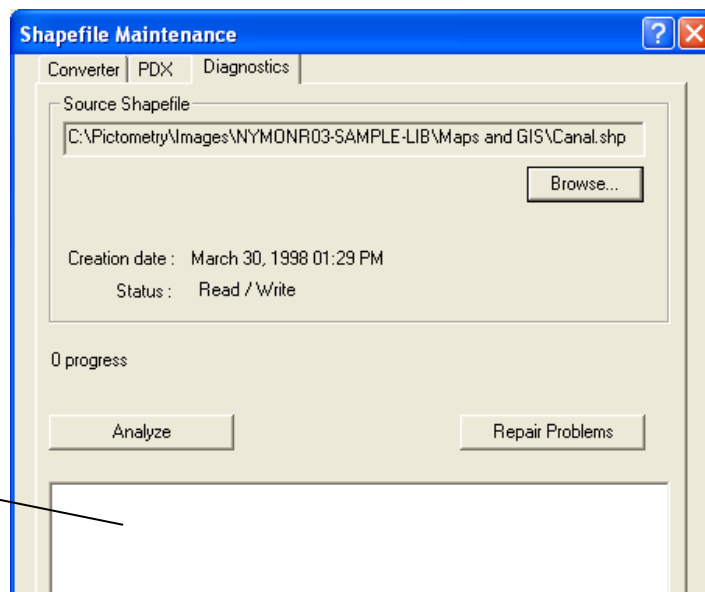
**Tip:** To add the Shapefile Maintenance button to a toolbar, see "Adding and removing toolbar buttons" in Part IV, Chapter 22.

#### ◆ To use the shapefile diagnostic utility:

1. Choose **Annotate⇒Shapefile Maintenance⇒Diagnostics** tab. The Shapefile Maintenance dialog box appears.
2. Click **Browse**, navigate to the directory containing the SHP file, and double-click the name of the SHP file.

The Open dialog box closes. The SHP file's name, path, and creation date appear on the dialog box along with the "Status" of the file's directory (Read/Write or Read Only).

Results from diagnostic analysis will be shown here.



3. Click **Analyze**.  
Results are displayed in the white box.
4. If the diagnostic analysis indicates that problems were found, click **Repair Problems**. On the dialog box, a "Problems fixed" counter is updated as repairs are completed.
5. Click **Done** to close the dialog box.



# Chapter 18 — GIS Images

This chapter introduces GIS Images and gives procedures for creating them in EFS. It also lists the EFS context menu options for GIS Images and gives procedures using two of those options (those involving multiple steps).

## Topics covered in this chapter ... page

What is a GIS Image? .....	353
Creating a new GIS Image in EFS .....	354
Adding a GIS Image to a workspace .....	357
Menu options for GIS Images.....	358

## What is a GIS Image?

A **GIS Image** is simply a colored background, with associated GIS annotation layers. It contains two types of data—raster data and vector data.

### Raster data = image data

Raster data, or **pixels** (picture elements), are what make up an image. (An image is a rectangular, pixilated area with an associated bitmap. The bitmap contains data for each pixel.)

### A special raster image

A GIS Image is a *special* case of a raster image. It has *no bitmap*.

### Vector data = GIS data

A GIS object (or shape object) is comprised of **vector data**, a series of coordinates that can be graphed or connected to make a drawing or shape (the GIS object). These shapes may be points, lines, or polygons that represent geographic features or manmade structures of interest, such as a parcels, roads, buildings, and waterways. The layers associated with a GIS Image, (GIS annotation layers), contain vector data.

### What makes up a GIS Image?

A GIS Image is comprised of the following parts:

- background of raster data (pixels)
- a bounded coordinate system
- one or more “associated” GIS annotation layers
- an “Initial GSD”

*The same solid color is associated with each pixel in a GIS Image.*

### Associated GIS annotation layers

When you create a GIS Image, you'll tell EFS which layer or layers in your active workspace should be "associated" with the GIS Image. Associated layers are displayed with a GIS Image as if they are part of the GIS Image, but they are independent workspace items.

A GIS annotation layer can be associated with more than one GIS Image, so any changes you make to a GIS annotation layer will affect all GIS Images the layer is associated with.

### Initial GSD

When you create a GIS Image, you'll tell EFS what its GSD should be initially and should return to when you click the Zoom 100% button.

## Creating a new GIS Image in EFS

See Chapter 16 to learn how to add a GIS annotation layer.

Before you create a GIS Image, you may want to add GIS annotation layers to your workspace, so you can associate them with the GIS Image you'll create. Alternately, you can add a GIS annotation layer when you create your new GIS Image as described in Step 2 of the following procedure.

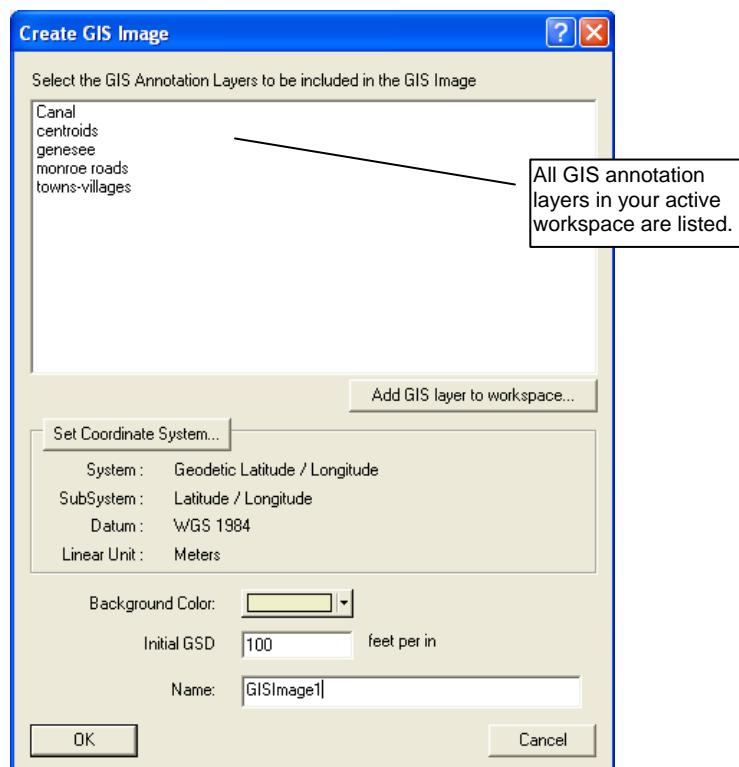
You can create a GIS Image as long as you have at least one GIS annotation layer to associate with the GIS Image.

#### ◆ To create a GIS Image in your workspace:

1. Choose **Workspace**⇒**Create New GIS Image**.

The Create GIS Image dialog box appears.

**Tip:** This box lets you select multiple items. Click an unselected item to select it. Click a selected item to de-select it.



*It is easy to change later which layers are associated with a GIS Image. See “Changing layer associations” on page 358.*

2. (Optional) To add a GIS annotation layer to the list, click **Add GIS Layer to workspace**, and see Chapter 16. Follow Steps 2 - 12 of “To add a GIS annotation layer from a shapefile” (if adding from a shapefile), or “To add a GIS annotation layer from SDE data” (if adding from SDE). Each added layer appears in the Create GIS Image dialog box and in the workspace.

3. Select GIS annotation layers to associate with the new GIS Image.

**Important:** You must select at least one GIS annotation layer, otherwise the GIS Image will not be created.

4. Do *one* of the following:

- Manually set the coordinate system as follows:

- a. Click **Set Coordinate System**.
- b. On the “Select the coordinate system for the GIS Image” dialog box, select values for the desired coordinate system, then click **OK**. (The dialog box displays the new data.)

— or —

- Let EFS use the coordinate system of the last layer you clicked (to select or deselect) in the dialog box. Click the GIS annotation layer that has the desired coordinate system *just before you click OK* to exit the dialog box.

The dialog box displays the coordinate data from the clicked layer.

— or —

- Use the coordinate system from one of the layers shown in the dialog box as follows:
  - a. Click (to select or deselect) the GIS annotation layer that has the desired coordinate system.
  - b. Click **Set Coordinate System**.
  - c. On the “Select the coordinate system for the GIS Image” dialog box, click **OK**.

The dialog box displays coordinate data from the selected layer.

5. From the Background Color box, select the background color for your GIS Image. (Be sure it contrasts with the layers you have included.)
6. In the Initial GSD box, type the GSD the GIS Image should return to when zoomed to 100%.

**Choosing an Initial GSD:** When choosing an Initial GSD, consider the size of the area you’re mapping. The default 100 feet per pixel works well for a geographic area just under 20 by 20 miles. If mapping a larger area, you’ll need a larger GSD. For a smaller area, use a smaller GSD.

7. In the Name box, type a name for the GIS Image.
8. Click **OK**.

*This “locks in” (sets) a coordinate system so that selecting layers in the workspace will not change the coordinate system for the new GIS Image.*

## What happens next ...

After the Create GIS Image dialog box closes, EFS does the following:

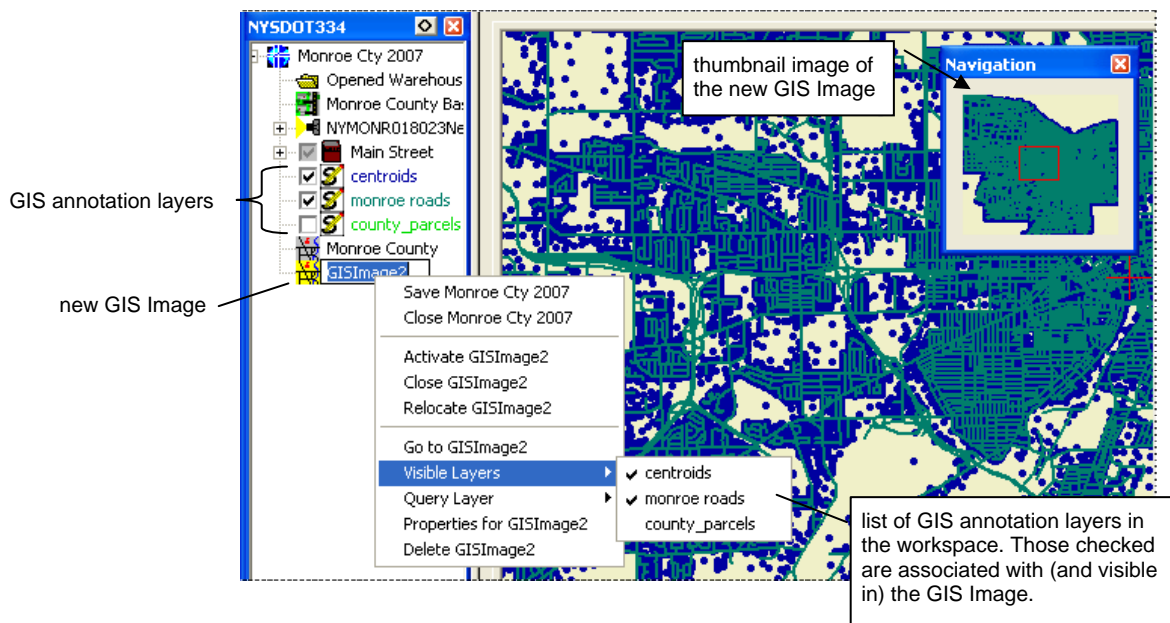
- Determines the edges (boundaries) for the new GIS image by finding the geographic extent of all GIS annotation layers you selected and sets this as the **bounding image polygon**.
- Calculates the image size based on the bounding image polygon and the Initial GSD.
- Adds the name of new GIS Image to the active workspace.
- Displays the new GIS Image in the Image window with all of its layers.

**Note:** Visibility is on for each added layer, regardless of whether it was on in the source layer.

- Displays a thumbnail of the new GIS Image in the Navigation window.

To save your GIS Image, you must save your workspace before exiting EFS.

*A GIS Image's bounding image polygon is the smallest rectangle that completely encompasses all GIS data contained in the associated layers.*



## Adjusting a GIS Image

After creating a GIS Image, you may want to correct its GSD or rebuild its thumbnail. If the Initial GSD you specified for your new GIS Image isn't quite right (its GIS objects are more spread out or more concentrated than you'd like), correct it by using the following procedure.

### ◆ To correct a GIS Image's GSD:

1. Use the zoom buttons to fit the image to the Image window.
2. If the Zoom/Scale box does not show the Units Per Pixel, choose **Edit⇒Change Units**, select **Units Per Pixel** for the GSD Units, and click OK.

3. Follow the procedure, “To change the properties of a GIS Image,” on page 358, to replace the Initial GSD with the value shown in the Zoom/Scale box.

### If the thumbnail looks too sparse

If the thumbnail looks too sparse, it could be that you have a Max View threshold for one or more layers associated with the GIS Image, causing those layers to be excluded from the thumbnail image. (To change the Max View threshold, see “Changing properties and renaming layers” in Chapter 16.)

### If the thumbnail looks too dense

If you’ve *not* set a Max View threshold, and you’ve included many layers of dense GIS data, your GIS Image’s thumbnail may be so densely annotated that the graphics can’t be recognized.

#### ◆ To rebuild your GIS Image’s thumbnail:

1. Modify your GIS annotation layers as desired. (See “Changing properties and renaming layers” in Chapter 16.)
2. While the GIS Image is the active image, choose **Edit⇒Regenerate Thumbnail**.

EFS rebuilds a new thumbnail image for your GIS Image and displays it in the Navigation window.

## Adding a GIS Image to a workspace

You can add a GIS Image to your active workspace. There are two ways in which you can add the GIS Image.

- You can add a GIS Image to your workspace *without opening it*. (Use the first of the following two procedures.)
- You can open a GIS Image that’s not in your active workspace, then add it to your workspace. (Use the second of the following two procedures.)

**Tip:** To add the Add GIS Image button to a toolbar, see “Adding and removing toolbar buttons” in Part IV, Chapter 22.

#### ◆ To add a GIS Image to your workspace:

1. Choose **Workspace⇒Add GIS Image**. (The Open dialog box appears.)
2. Browse to the desired GIS Image file (extension .pgs), and double-click the file to open it.

The GIS Image is added to your workspace and is opened in the Image window.

#### ◆ To add a GIS Image to your workspace by opening it first

1. Choose **File⇒Open**. The Open dialog box appears.
2. In the “Files of type” box, select **GIS Script File (\*.PGS)**.
3. Browse to the desired GIS Image file (extension .pgs) and double-click the file to open it. The GIS Image opens in the Image window.

#### 4. Choose **Workspace**⇒**Add Current Image to Workspace**.

The GIS Image is added to your workspace.

## Menu options for GIS Images

*The context menu appears when you right-click the GIS Image in the workspace.*

Once you've created a GIS Image, you can use its context menu for various options related to that GIS Image. These options include the following: Open, Close, Activate, Relocate, Go to, Properties for, Delete, and Visible Layers.

The "Visible Layers," "Relocate," and "Properties for" options are described next. To learn about the remaining context menu options, see Part V, Appendix B, Table B-1 and Table B-2.

### Changing layer associations

The Visible Layers context menu option is only for GIS Images. You can use this option to change which of the GIS annotation layers in your workspace are associated with your GIS Image (thus changing which layers are currently "visible" in the image).

### Relocating shapefiles for GIS Images

The Relocate File context menu option prevents you from having to recreate a GIS Image if any shapefiles the GIS Image needs should move to a new location. You can tell EFS where to find the shapefiles it needs by using the procedure "To fix the path for non-warehouse files." See "Fixing access to files from workspace items" in Chapter 21.

### Viewing and changing GIS Image properties

Use the following procedure to view and change the properties of a GIS Image (by using the "Properties for" context menu option).

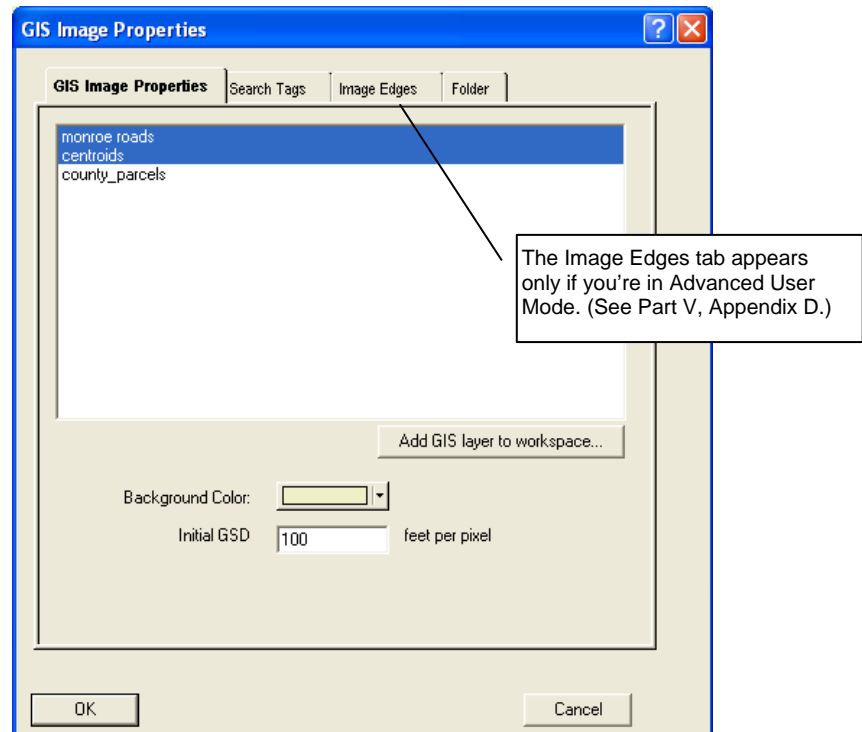
**Note:** You can also change the properties of any layer associated with a GIS Image (just as you'd change properties for any GIS annotation layer). Keep in mind that a GIS annotation layer may be associated with more than one GIS Image, so changing its properties may affect other GIS Images. See "Changing properties and renaming layers" in Chapter 16.

#### ◆ To change the properties of a GIS Image:

1. In your workspace, right-click the GIS Image you want to change. From the context menu, select **Properties for <GIS Image name>**.

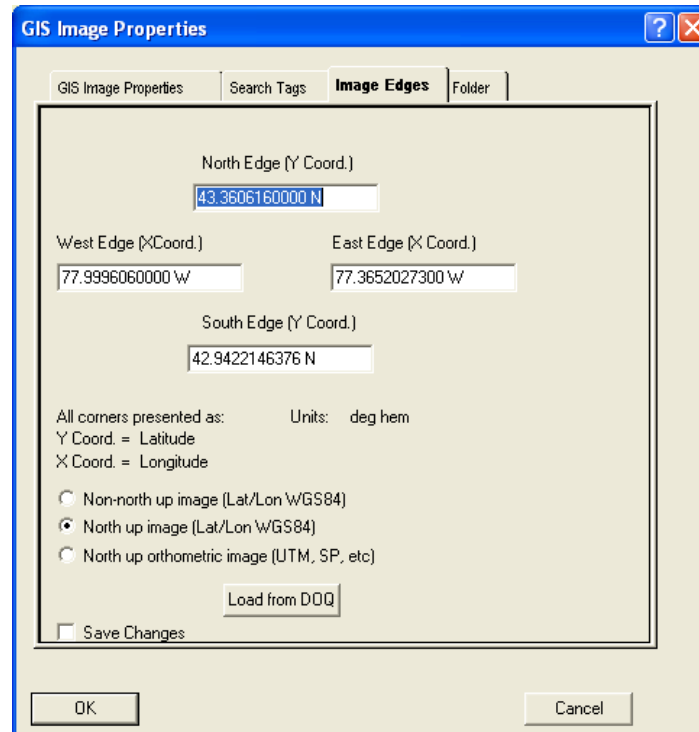
The GIS Image Properties dialog box opens to its GIS Image Properties tab.

**Note:** GIS Image properties are described in the procedure "To create a GIS Image in your workspace" on page 354.



2. (Optional) Change the properties (Background Color and Initial GSD) as desired, and click **OK**.
3. (Optional) Select any additional GIS annotation layers you want to associate with your GIS Image. Deselect any selected GIS annotation layers you want to disassociate from your GIS Image.
  - (Optional) To add a layer to the list, click **Add GIS Layer to workspace**, and see Chapter 16. Follow Steps 2 - 12 of “To add a GIS annotation layer from a shapefile” (if adding from a shapefile), or “To add a GIS annotation layer from SDE data” (if adding from SDE). Each added layer appears in the GIS Image Properties dialog box and in the workspace.
4. (Optional) To change the image edges (boundaries) or the coordinate system, click the **Image Edges** tab.

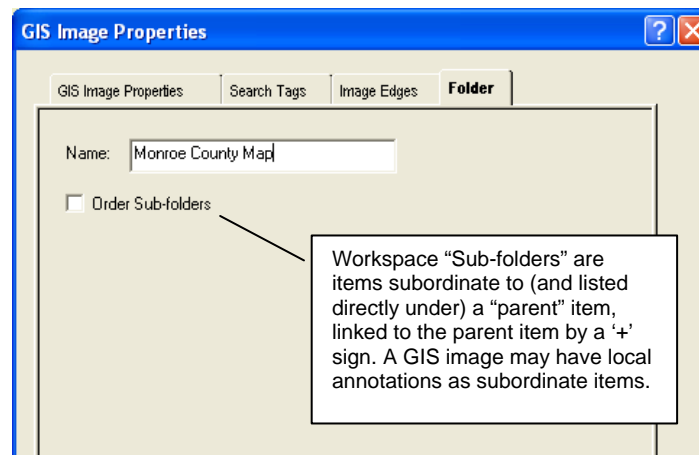
*You must be licensed with the “Modify Data” option, in order to change image boundaries.*



*If you expand the edges, the GIS Image will have a border with no GIS (vector) data.*

*If you bring the edges closer to the image's center, the GIS data will no longer fit within the new edges and will be clipped.*

- a. (Optional) Change the image edges by typing the new coordinates for the GIS Image's edges.
- b. Propagate any boundary changes you've made on this tab to the GIS Image Properties tab (and update the GSD value), by checking **Save Changes**.
5. (Optional) To change the name of the GIS Image or to alphabetize any workspace folders subordinate to the GIS Image, click the **Folder** tab, and make the desired changes.



6. When you're through making changes (on all three tabs), click **OK**.

The GIS Image is updated. When you save your workspace, the changes become permanent.



# Part IV

## Advanced EFS Topics

To learn about ...	See ...
Exporting measurement data, annotation layers, and image polygons	Chapter 19
Scale and units	Chapter 20
Advanced workspaces features	Chapter 21
Customizing EFS	Chapter 22

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# Chapter 19 — Exporting Data

This chapter describes how to export the following types of data from EFS:

- the measurement data that results from using EFS tools.
- user-defined annotations
- image polygons

Measurement data can be exported to text files, to shapefiles, or to SDE databases. User-defined annotations can be exported only to shapefiles. Image polygons can be exported to shapefiles or to SDE databases.

**Note:** Exporting “tool data” is different than saving “tool output” (the lines and shapes that result from using a tool) as an annotation. See Part II, Chapter 13 for information about saving tool output as an annotation.

## Topics covered in this chapter ... page

Exporting measurement data .....	363
Exporting annotation layers to shapefiles .....	374
Exporting image polygons .....	377

## Exporting measurement data

EFS lets you export data from the following EFS tools.

- Location Tool
- Distance Tool
- Height Tool
- Area Tool
- Bearing Tool
- Elevation Tool

### Overview

The following topics discuss what functionality EFS provides for exporting measurement data and why it can be helpful to export it.

### Why export measurement data?

Exporting measurement and location data after using a measurement tool allows you to keep an inventory of various features in images, such as fire hydrants, stop signs, the distance between objects, or the location of a crime scene.

Suppose you want to keep an inventory showing the locations of all the fire hydrants within your jurisdiction. You would set up the Location Tool to export data. Then you'd use the Location Tool to mark each fire hydrant.

**Tip:** You might also save the tool's graphic output as an annotation, so you have a graphic overlay showing fire hydrants in addition to the list of locations for inventory purposes. See "Saving tool output as an annotation" in Part II, Chapter 13.

### What data can be exported?

The data exported are specific to the tool you are exporting from. For example, when you use the Distance Tool, you'll export line coordinates; when you use the Area Tool, you'll export polygon coordinates. You can also include a text comment in your exported data.

#### *You can enter data to export*

When you export measurement data, EFS also lets you enter additional data to include with your tool measurements. Before you can do this, you'll need to select a template, which will provide the fields into which you type the data. You can select a shapefile or an SDE table to use as a data entry template, or you can create your own custom template.

**Note:** When you select a template, EFS uses only the format of the file (the fields and their types) as a template; it does not use the file's data.

After using the tool, you'll type data directly into your template, and that data will be written to the export file along with the tool's measurement data.

#### *Export data field names*

When exporting tool data, to avoid any potential conflicts in field names between the measurement data EFS exports and the data you enter into a template, EFS appends the prefix "P\_" to all *measurement* fields it exports (but not to your data entry fields). For example, distance measurements are exported to a field called "P\_Dist" and a stop position is exported to "P\_StopX."

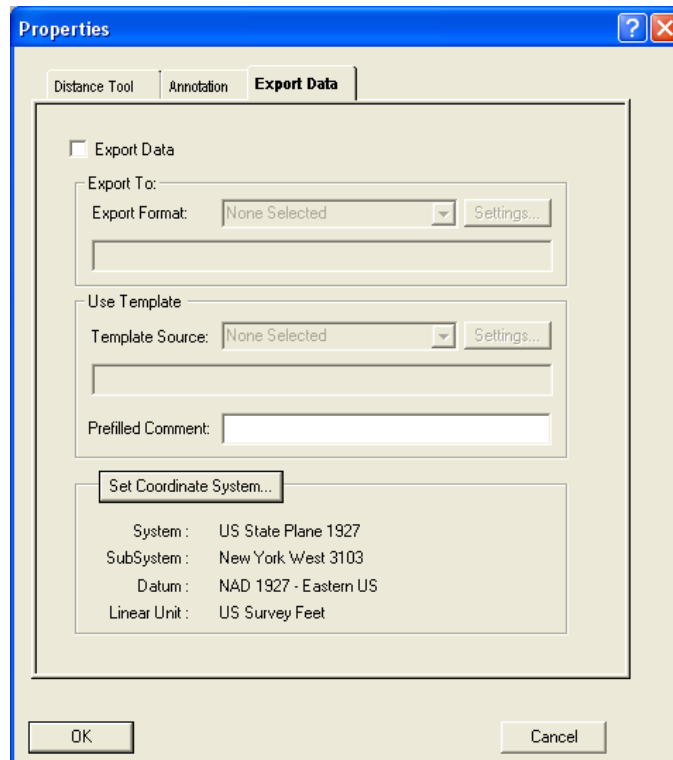
### Setting up a tool for export

If you want to export data from a tool, you must set up the tool before you use it. You'll set up a tool from its Properties dialog box.

The procedures for setting up tool data export begin on pages 369 (for text files), 371 (for shapefiles), and 373 (for SDE databases).

The tabs will vary depending on the tool you are using. In this example, we used the Distance Tool.

If you previously exported data from this tool, this dialog box shows the export specifications you last used.



**Figure 19-1:** The Export Data tab of the Distance Tool Properties dialog box.

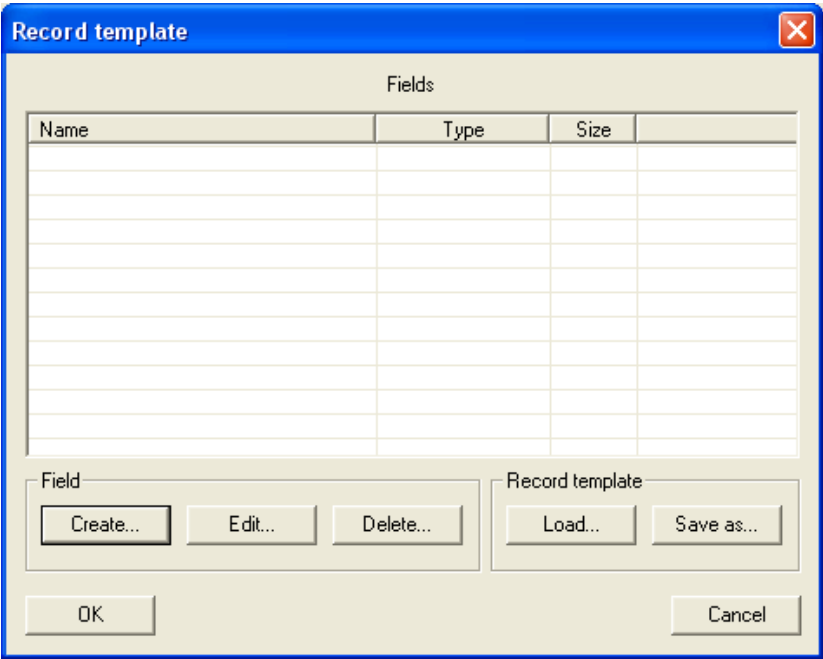
When you set up the tool, you'll do the following:

- Turn on the export function (called “the Exporter” in EFS) *for that tool*. The Exporter remains turned on for that tool until you turn it off again. Consequently, every time you use that tool, its data is exported until you turn off exporting. (See “Activating and deactivating the Exporter” on page 368.)
- Select the type of file to export data to, specify a location in which to store the file, and either type a file name or navigate to a directory and select the file.
- Select the name of the file to use as a data entry template (if you want to enter data to include in the export), or create your own custom template. See “Creating a user template” (the next topic).
- Enter a comment to export with the data (optional).

When you later use the tool you set up, the tool's measurements plus any data you enter are exported.

### *Creating a user template*

When you are setting up a tool for export, you can create a custom user template for data entry.



**Figure 19-2:** The Record Template dialog box.

The Record Template dialog box contains the following buttons:

**Table 19-1:** The buttons on the Record Template dialog box.

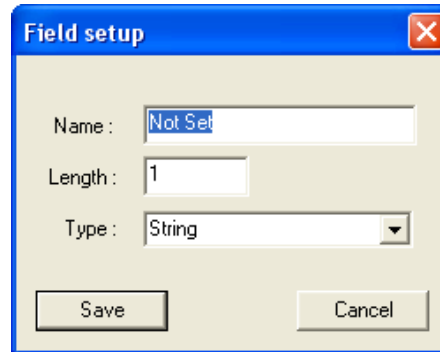
Button	Description
Create	Opens the Field setup dialog box so you can create a template field. You'll type a field name and select the field's length and type. Clicking Save saves the field definition. If the field already exists, you'll be prompted to rename the field.
Edit	Opens the Field setup dialog box so you can change a field's name, type or length. (You can also double-click the field to change its definition.)
Delete	Deletes the selected field. (You'll be prompted to confirm the deletion.)
Load	Allows you to navigate to and open a template from an existing DBF file.
Save As	Opens the Save As dialog box so you can save your template to a DBF file. The characters "_TEMPLATE" are appended to the end of the file name you enter.

Use the following procedure to create a new user template or to change an existing user template.

◆ **To create a custom user template:**

1. Click the measurement tool you want to set up for export, then choose **Tools⇒Properties⇒Export Data** tab. The Export Data tab appears. (Figure 19-1.)
2. If not already checked, check **Export Data** to activate the Exporter.
3. Select **User** from the Template Source list.
4. Click **Settings**. The Record Template dialog box opens. (Figure 19-2.)

5. (Optional) To open an existing template, click **Load**, navigate the directory that contains the template you wish to open, select the file, and click **Open**.
6. To add a field description to your template, click **Create**. The following dialog box opens.

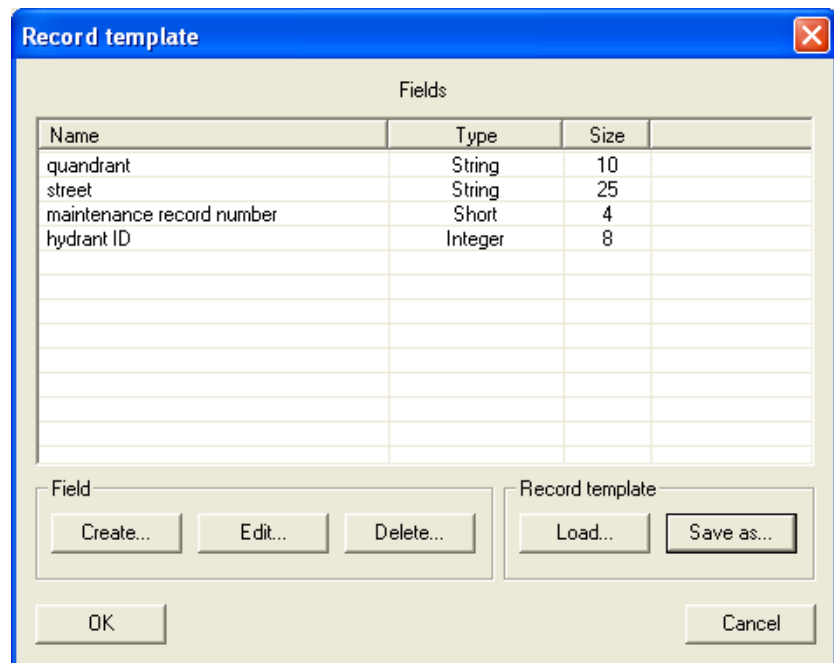


The 'Field setup' dialog box has a blue title bar with a close button. It contains three input fields: 'Name' with the text 'Not Set', 'Length' with the value '1', and 'Type' with a dropdown menu showing 'String'. At the bottom are 'Save' and 'Cancel' buttons.

7. Type a Name and Length for the field you are adding, select a field Type from the list, and click **Save**.

**Note:** The Length field should contain the maximum number of characters or digits you can enter when you type data into the template.

After adding a few fields, your will look something like this:



The 'Record template' dialog box has a blue title bar with a close button. It features a table titled 'Fields' with columns 'Name', 'Type', and 'Size'. The table contains four rows of data. Below the table are two groups of buttons: 'Field' (Create..., Edit..., Delete...) and 'Record template' (Load..., Save as...). At the bottom are 'OK' and 'Cancel' buttons.

Name	Type	Size
quadrant	String	10
street	String	25
maintenance record number	Short	4
hydrant ID	Integer	8

8. To change a field, double-click its name (or select it and click **Edit**), change the Field setup dialog box as desired, then click **Save**.
9. To delete a field, select the field in the Name column, click **Delete**. You'll be prompted to confirm the deletion. Click **Yes** in response to the prompt.
10. When you are done adding fields to the template or changing fields, click **Save as** to save your template. The Save as dialog box opens.

11. Navigate to the directory in which to save the template, type a name for the file or select an existing name, and click **Save**.
12. Click **OK** to close the Record template dialog box.

The template is now defined and can be selected when you are setting up a tool for export.

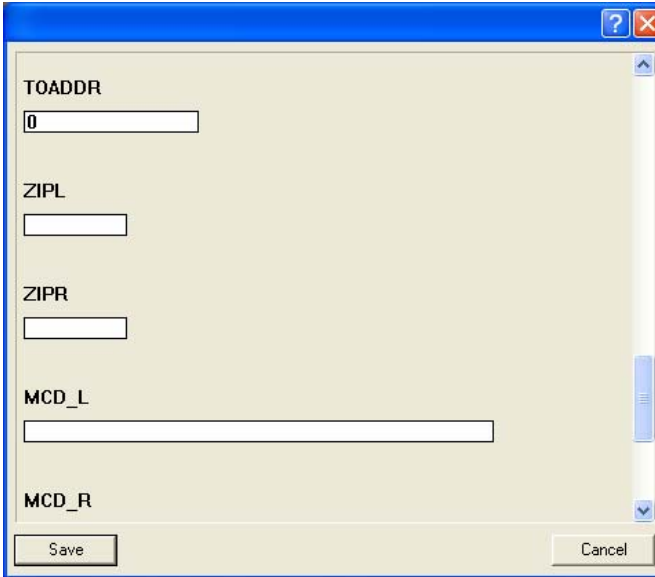
### What happens when you use the tool?

When you use a tool that you've set up for exporting, the resulting measurement data is exported automatically to the file you previously chose.

### What if you've chosen a template for data entry?

If you selected a template for data entry or created a user template, a dialog box appears each time you use the tool. The dialog box contents depend on the Template Source you selected.

(In Figure 19-3, we selected shapefile for the source, so the shapefile's fields are used as a template.) You'll enter data into the fields on the dialog box and click **Save**.

A screenshot of a data entry template dialog box. The dialog has a blue title bar with a question mark icon and a close button. The main area is light beige and contains five text input fields, each with a label to its left: 'TOADDR' (with '0' entered), 'ZIPL', 'ZIPR', 'MCD\_L', and 'MCD\_R'. At the bottom, there are two buttons: 'Save' on the left and 'Cancel' on the right. A vertical scrollbar is visible on the right side of the input fields.

**Figure 19-3:** A sample data entry template created from a shapefile.

### Activating and deactivating the Exporter

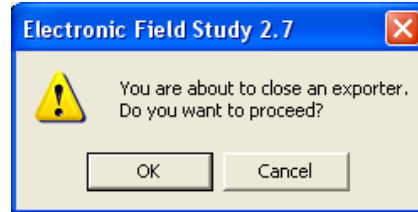
When you set up a tool for exporting, you'll check an option (the Export Data box on the Export Data tab of the tool's Properties dialog box) to enable that tool to export data. This activates the Exporter *for that tool* so that each time you use the tool, the resulting data is exported. When you're done exporting data, you should deactivate the Exporter for that tool to prevent it from continuing to export.

**Note:** The Exporter is tool-specific. It can be active for one tool and inactive for others.



◆ **To deactivate the Exporter for a tool:**

1. Click the measurement tool for which you want to turn off the Exporter, then choose **Tools⇒Properties⇒Export Data** tab.
2. Uncheck **Export Data**. If an export file has previously been selected (its name is shown on the dialog box), the following message appears:



3. Click **OK** to deactivate the Exporter for this tool.
4. Click **OK**. The Properties dialog box for this tool closes and the Exporter is no longer active for this tool.

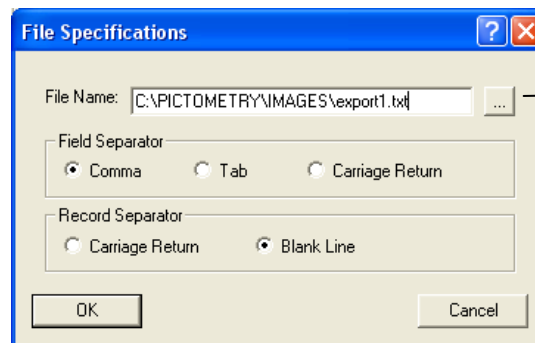
## Exporting tool data to a text file

Use the following procedure to set up a tool to export to a text file.

**Note:** When exporting Distance Tool measurements to a text file, you can export only the starting and ending points.

◆ **To set up tool data export to a text file:**

1. Click the measurement tool you want to set up for export, then choose **Tools⇒Properties⇒Export Data** tab. The Export Data tab appears. (See Figure 19-1.)
2. If not already checked, check **Export Data** to activate the Exporter.
3. Select **File** for the Export Format.
4. Click **Settings**. The File Specifications dialog box opens.



The "Browse" button

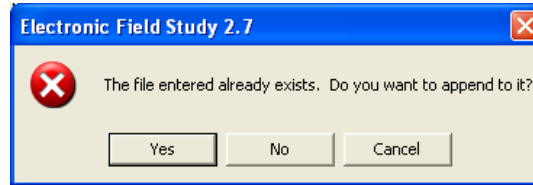


5. Click the **"Browse"** button. The Save As dialog box opens.
6. Navigate to the directory in which to store the export file, type or change the file name, and click **Save**. (The file name must have an extension of ".txt".)

The Save As dialog box closes.

*Each use of the tool creates one record in your text file.*

7. Choose a Field Separator—the character to use between fields. (Comma, Tab, or Carriage Return.) Choose a Record Separator—the character to use between records. (Carriage Return or Blank Line.)
8. Click **OK**. The File Specifications dialog box closes.
9. *If you chose an existing file name, the following message appears:*



If you want to append the data to this file, click **Yes**, otherwise, click **No**.

If you clicked **No**, the File Specifications dialog box re-opens. Repeat Steps 5 – 8 to choose a different file.

**Note:** If you append to an existing file, the Template Source field displays the text “Appending” and you cannot select a new Template Source.

10. *If you want to use a data entry template to enter additional export data, do the following:*

*To select an existing file as a template:*

- a. Select the file type from the Template Source list.
- b. Click **Settings**. The Open dialog box opens.
- c. Navigate to the directory that contains the file to use as a template, select the file, and click **Open**. The Open dialog box closes.

*To select or create a custom template:*

- a. Follow the procedure “Creating a user template” on page 365.
- b. *Complete the rest of this procedure.*

*If you do not want to select a template, select **None Selected**.*

11. (Optional) Type a comment in the Prefilled Comment box. This comment will fill the comment field each time you use the selected tool.
12. (Optional) To change the coordinate system in which the data is exported, click **Set Coordinate System**. The Set Exporter Coordinate System dialog box opens.
  - a. Select values for the Coordinate Group, Coordinate Subsystem, Datum, and Linear Units.
  - b. Click **OK**.
13. Click **OK**. The tool’s Properties dialog box closes.

Now, each time you use the tool, the measurements are appended as a record to the text file automatically. (You may be prompted to enter data, depending on the choices you made for data entry).

**Note:** The Exporter remains active until you *uncheck* the Export Data checkbox on the Export Data tab of the tool's Properties dialog box.

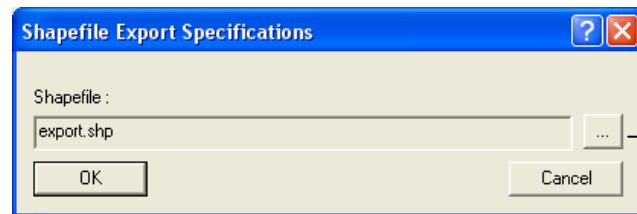
## Exporting tool data to a shapefile

EFS lets you export tool data to a shapefile. The export process creates and exports data to the three files that comprise the shapefile—the SHP, the DBF and the SHX files. Vector data (the coordinates of the location) are written to the SHP file, and any text being exported is written to the DBF file.

Use the following procedure to set up a tool to export to a shapefile.

### ◆ To set up tool data export to a shapefile:

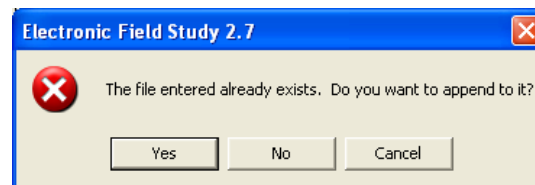
1. Click the measurement tool you want to set up for export, then choose **Tools**⇒**Properties**⇒**Export Data** tab. The Export Data tab appears. (See Figure 19-1.)
2. If not already checked, check **Export Data** to activate the Exporter.
3. Select **Shapefile** for the Export Format.
4. Click **Settings**. The Shapefile Export Specifications dialog box opens.



The "Browse" button



5. Click the **"Browse"** button. The Save As dialog box opens.
  6. Navigate to the directory in which to store the export file, type or change the file name, and click **Save**. (The file name must have an extension of "shp".)
- The Save As dialog box closes.
7. Then click **OK**. The Shapefile Export Specifications dialog box closes.
  8. *If you choose an existing file name, the following message appears:*



If you want to append the data to this file, click **Yes**, otherwise, click **No**.

If you clicked **No**, the File Specifications dialog box re-opens. Repeat Steps 5 – 7 to choose a different file.

**Note:** If you chose Yes, the Template Source field displays the text “Appending” and you cannot select a new Template Source. (*Skip Step 9.*)

9. *If you’re not appending to an existing file, and you want to select a template for entry of additional export data, do the following:*
  - a. Select the file type from the Template Source list.
  - b. Click **Settings**. The Open dialog box opens.
  - c. Navigate to the directory that contains the file to use as a data entry template, select the file, and click **Open**. The Open dialog box closes.

*Otherwise, select **None Selected**.*

10. *If you’re not appending to an existing file, and you want to use a template to enter additional export data, do the following:*

*To select an existing file as a template:*

- a. Select the file type from the Template Source list.
- b. Click **Settings**. The Open dialog box opens.
- c. Navigate to the directory that contains the file to use as a template, select the file, and click **Open**. The Open dialog box closes.

*To select or create a custom template:*

- a. Follow the procedure “Creating a user template” on page 365.
- b. *Complete the rest of this procedure.*

*If you do not want to select a template, select **None Selected**.*

11. (*Optional*) Type a comment in the Prefilled Comment box. This comment will fill the comment field each time you use the selected tool.
12. (*Optional*) To change the coordinate system in which the data is exported, click **Set Coordinate System**. The Set Exporter Coordinate System dialog box opens.
  - a. Select values for the Coordinate Group, Coordinate Subsystem, Datum, and Linear Units.
  - b. Click **OK**.
13. Click **OK**. The tool’s Properties dialog box closes.

Now, each time you use the tool, the measurements are exported to a shapefile automatically. (You may be prompted to enter data, depending on the choices you made for data entry).

**Note:** The Exporter remains active until you *uncheck* the Export Data checkbox on the Export Data tab of the tool’s Properties dialog box.

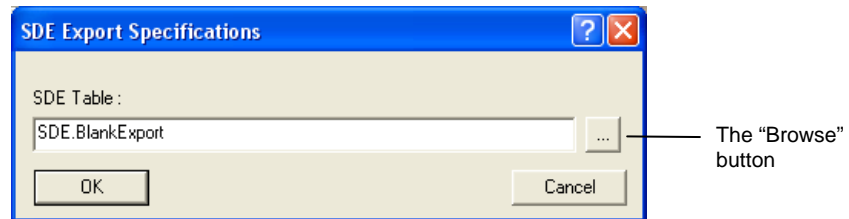
## Exporting tool data to an SDE database

Before you can export tool data to an SDE database, you must connect to your SDE database. (You must be connected before starting the following procedure. If you are unfamiliar with how to connect to SDE, see “Connecting to your SDE database” in Part III, Chapter 16.)

Use the following procedure to set up a tool to export to an SDE database.

### ◆ To set up tool data export to an SDE database:

1. Click the measurement tool you want to set up for export, then choose **Tools⇒Properties⇒Export Data** tab. The Export Data tab appears. (See Figure 19-1.)
2. If not already checked, check **Export Data** to activate the Exporter.
3. Select **SDE Database** for the Export Format.
4. Click **Settings**. The SDE Export Specifications dialog box opens.



5. Do *one* of the following:
  - To specify a new file name, type the name in the SDE Table box.
  - or —
  - To select an existing file, click the “**Browse**” button. The Select SDE table dialog box opens listing all existing SDE tables. Select the table to which you want to export data.



**Note:** If you append to an existing table, the Template Source field displays the text “Appending” and you cannot select a new Template Source.

6. Click **OK**. The SDE Export Specifications dialog box closes.
7. *If you want to use a template to enter additional export data, do the following:*

*To select an existing file as a template:*

  - a. Select the file type from the Template Source list.
  - b. Click **Settings**. The Open dialog box opens.
  - c. Navigate to the directory that contains the file to use as a template, select the file, and click **Open**. The Open dialog box closes.

*To select or create a custom template:*

  - a. Follow the procedure “Creating a user template” on page 365.
  - b. *Complete the rest of this procedure.*

*If you do not want to select a template, select **None Selected**.*

8. (Optional) Type a comment in the Prefilled Comment box. This comment will fill the comment field each time you use the selected tool.
9. (Optional) To change the coordinate system in which the data is exported, click **Set Coordinate System**. The Set Exporter Coordinate System dialog box opens.
  - a. Select values for the Coordinate Group, Coordinate Subsystem, Datum, and Linear Units.
  - b. Click **OK**.
10. Click **OK**. The tool's Properties dialog box closes.

Now, each time you use the tool, the measurements are exported to the SDE database automatically. (You may be prompted to enter data, depending on the choices you made for data entry).

**Note:** The Exporter remains active until you *uncheck* the Export Data checkbox on the Export Data tab of the tool's Properties dialog box.

## Exporting annotation layers to shapefiles

You can use the EFS export feature to export any user-defined annotation layer to a shapefile. When you export a layer, the annotations that are associated with the selected layer (both global and local) are exported.

### Why create a shapefile from an annotation layer?

You might create a shapefile from an annotation layer so you can use it in a different GIS system or mapping package.

### Two options for exporting

You have two options for exporting annotation layers. You can either:

- *Select the annotations to export* prior to starting the export procedure. (You can use the SHIFT and CTRL keys to select multiple annotations.)
- or –
- Export *all* of a layer's annotations (if they are all of the same type). You can choose this option during the export procedure. (See Step 4 in the export procedure, which begins on page 376.)

### Which types of annotations can be exported?

You can export text, point, icon, line, symbols, and circle annotations. You cannot export link annotations.

### Export one type of annotation at a time

Whether you choose to export individual annotations or an entire layer, you must export only a single type (or compatible types) at the same time. For

example, you can select all text annotations, all point annotations, or a combination of line and circle annotations.

If a layer contains multiple types, you should export each type separately. To export only one type of annotation, you'll select only annotations of that type before starting the export procedure. (See "Two options for exporting" on page 374.)

**Note:** Exporting a layer of mixed types is not recommended. It will give you unexpected results.

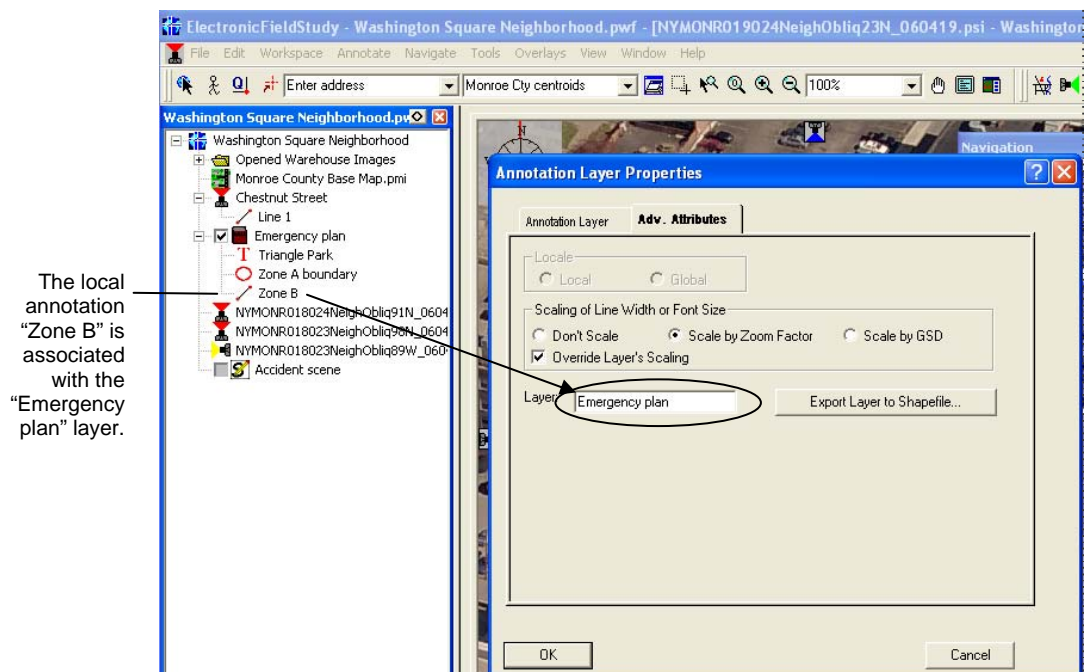
### Exceptions

You can export circles and lines together. (EFS considers circle annotations to be a type of line.) You can also export icons, symbols, and points together. (Points, icons, and symbols are considered to be the same type.)

### Can local annotations be exported?

Yes, local annotations can be exported, but only by exporting the layer to which they are associated. (*All* annotations, whether global or local, are associated with an annotation layer. Even though local annotations aren't shown under a layer in the Workspace window, they are still associated with a layer. See Figure 19-4.)

Global and local annotations of the same type (point, line, or circle) that are associated with the same layer will be exported together when you export that layer.



**Figure 19-4:** A local line annotation's Properties dialog box showing the layer the annotation is associated with.

## What data is exported?

When you export a user-defined annotation layer to a shapefile, the vector data (annotations' coordinates) are exported to the SHP file and the annotations names are exported to the DBF file as text fields. If you select text annotations, they are exported to a DBF file.

**Tip:** If you later create a GIS annotation layer from the exported shapefile, the exported text fields (text annotations and annotation names) can be used in queries and layer searches.

## Exporting a layer

If a layer contains multiple types, you should export each type separately. To export only one type of annotation, you'll select only annotations of that type before starting the export procedure.

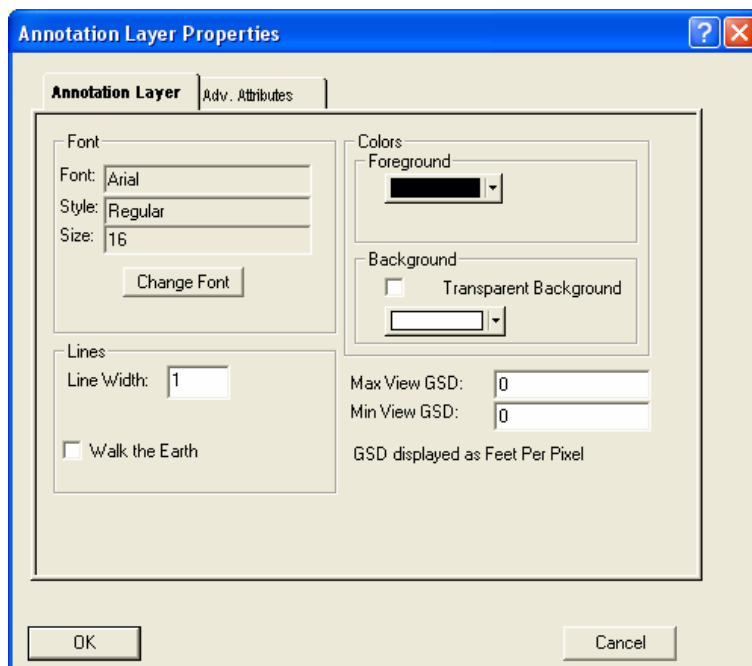
**Note:** You can export compatible types together. For example, you can select all text annotations, all point annotations, or a combination of line and circle annotations.

Use the following procedure to export *all* of a user-defined layer's annotations or the ones you selected.

### ◆ To export an annotation layer and its annotations:

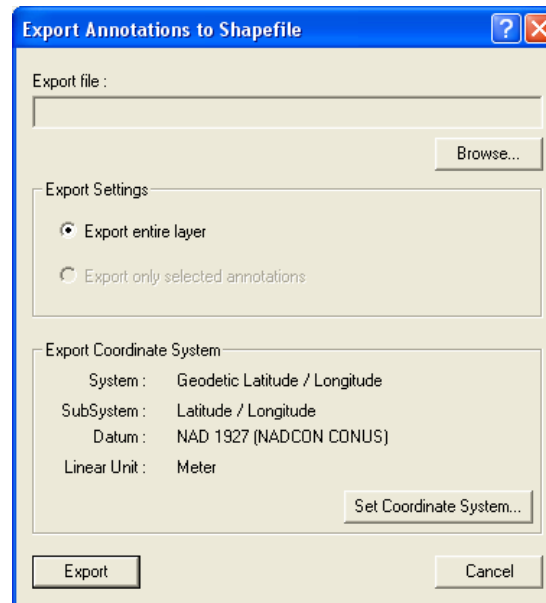
1. In the Workspace window, right-click the annotation layer you want to export, and select **Properties for <layer name>** from the context menu. The Annotation Layer Properties dialog box opens for that layer.

*If you don't want to export the entire layer, select the annotations to be exported before starting this procedure.*



2. Click the **Adv. Attributes** tab.
3. Click **Export Layer to Shapefile**. The Export Annotations to Shapefile dialog box opens.



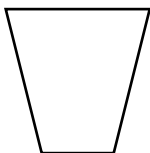


4. Click **Browse**. The Save As dialog box opens. Navigate to the directory in which to store the export file, type a file name, and click **Save**.

**Note:** The file must have an extension of “shp.”

5. Choose an Export Setting by checking either **Export entire layer** or **Export only selected annotations**. (To export only selected annotations, you must have selected the annotations prior to starting this procedure.)
6. (Optional) If you want to change the Coordinate System, click **Set Coordinate System**, select values for the Coordinate Group, Coordinate Subsystem, Datum, and Linear Units, and click **OK**.
7. Click **Export**. The Export Annotations to Shapefile dialog box closes.
8. Click **OK**. The annotation layer and its associated global annotations are exported to the specified shapefile.

## Exporting image polygons



An image polygon is a trapezoid that represents the “footprint” of a geo-referenced image (an image associated with a geographic area). The polygon contains coordinates that associated it with the same geographic area as the image it represents.

Image polygons in EFS can be exported and saved as vector data to shapefiles or to SDE databases.

### Why export image polygons?

Exporting image polygons might be handy if you want to view the coverage of an area in another GIS or mapping system or if you want a list of the coordinates that represent an images’ vertices.

## Where are image polygons exported from?

Image polygons can be exported from a workspace or from an Image Warehouse depending on your settings and your license. If Advanced User Mode is *on* or if you have the Warehouse Build license option, you can export polygons from an Image Warehouse. Otherwise, you can export image polygons only from a workspace.

## Exported image polygons can be sorted

When you export image polygons, you can choose to have them sorted into files (or tables, if exporting to SDE) by image type and shot level. If you choose to sort them, a separate export file is created for each image type / shot level combination.

### Export file names

If sorted, each output shapefile or SDE table name is appended with one of the suffixes shown in the following table.

**Table 19-2:** Suffixes added to the file name if you sort exported image polygons.

Suffix	Description
NOB	Neighborhood Oblique
COB	Community Oblique
SOR	Sector Ortho Tile
NOR	Neighborhood Orthogonal
COR	Community Orthogonal
OTHER	Other types (usually DRGs)

### SDE export files

If you export sorted image polygons to SDE, the names of the exported files are appended with the prefix “SDE” in addition to the suffix that corresponds to the image type / shot level combination.

**Table 19-3:** Prefixes and suffixes added to table name when sorting polygons.

Output table	Contains polygons from ...
SDE.<table name>_NOB	Neighborhood Oblique images
SDE.<table name>_COB	Community Oblique images
SDE.<table name>_SOR	Sector Ortho Tile images
SDE.<table name>_NOR	Neighborhood Orthogonal images
SDE.<table name>_COR	Community Orthogonal images
SDE.<table name>_OTHER	Other images (usually DRGs)

If you export unsorted image polygons to SDE, one export file is created and its name is appended with the prefix “SDE,” but contains *no* suffix to distinguish the shot levels or image types. This one SDE table will contain all exported polygons.

**Table 19-4:** SDE export table name when NOT sorting polygons.

Output table	Contains polygons from ...
SDE.<table name>	all selected images

### A shapefile example

We'll follow the same example with and without sorted output to see the difference.

Suppose you are exporting polygons from a workspace that contains only Neighborhood Oblique and Community Oblique images, and you are exporting them to a shapefile.

Here is the same example, first with sorted image polygons and second, without sorting.

#### With sorting

If you chose to sort the image polygons, the export procedure would create six files (three for Community Oblique polygons and three for Neighborhood Oblique polygons).

The resulting output file names would look like this:

Exported files from our sorted example	
<file name>NOB.dbf	Exported files contain <i>only</i> Neighborhood Oblique files.
<file name>NOB.shp	
<file name>NOB.shx	
<file name>COB.dbf	Exported files contain <i>only</i> Community Oblique files.
<file name>COB.shp	
<file name>COB.shx	

#### Without sorting

If you chose not to sort the image polygons, no suffix is added, and the polygons are exported to a single shapefile (comprised of three files).

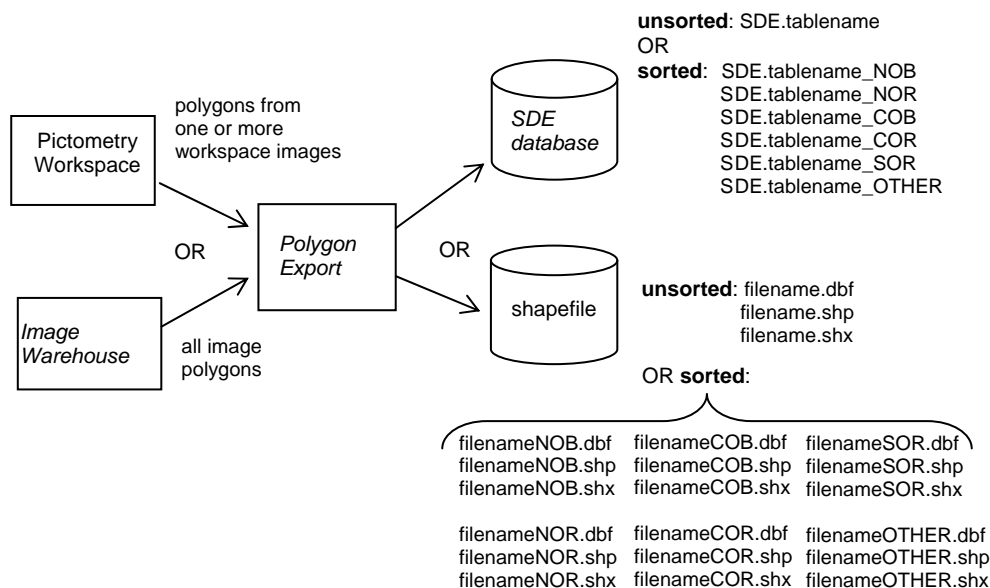
The resulting output file names would look like this:

Exported files from our unsorted example	
<file name>.dbf	Exported files contain <i>both</i> Neighborhood and Community Oblique files.
<file name>.shp	
<file name>.shx	

### A summary

A *shapefile* is a set of files (usually SHX, DBF, and SHP) that contain vector and text data for your images.

The following figure shows the various sources and destinations for image polygons being exported.



**Figure 19-5:** Choices for Image Polygon Export.

## The export process

The process you'll follow to export image polygons depends on whether Advanced User Mode is on or off and whether you have the Warehouse Build license option.

**If Advanced User Mode is on *or* you have the Warehouse Build license option, you'll do the following:**

1. Open the Image Warehouse. (Follow the procedure “To open an Image Warehouse”—the next topic.)
2. Export the polygons. (Follow the procedure “To export image polygons” on page 381.)
3. Close the Image Warehouse. (Follow the procedure “To close an Image Warehouse” on page 384.)

If **Advanced User Mode** is **off**, you can export image polygons from a workspace, but not from an Image Warehouse. You can skip the procedures for opening and closing a warehouse and follow only the procedure “To export image polygons” on page 381.

## Opening an Image Warehouse

◆ To open an Image Warehouse:

1. Do *one* of the following:
  - Click the **Open** button (if available on a toolbar).
  - or –
  - Choose **File**⇒**Open**.



**Reminder:** You must be in Advanced User Mode or have the Warehouse Build license option.

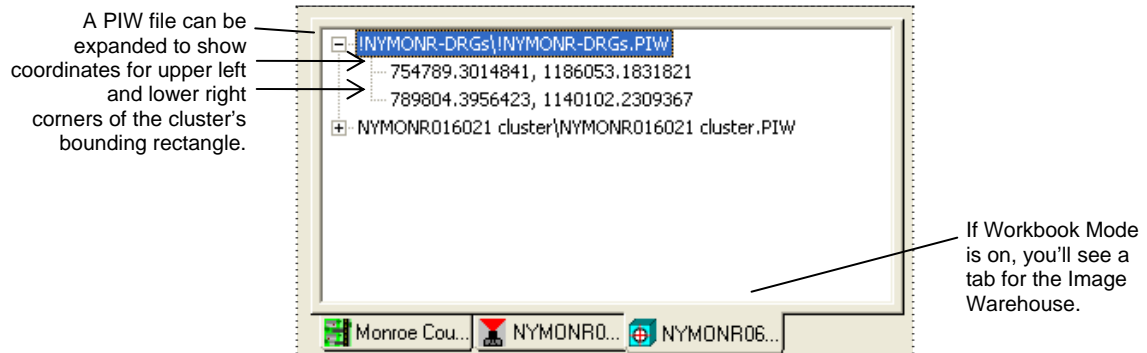
The Open dialog box opens.

2. In the “Files of type” box, select **Image Warehouses (\*.PIW)**.
3. If not already there, navigate to the warehouse from which you want to export polygons. (The warehouse folder is in the Image Library folder and its name ends in “-WHS”.)
4. Select the file with the extension “piw.” In most cases the name of this file will contain your county name or state name.

**Important:** Image Warehouses contain more than one PIW file, so be sure to pick the PIW file that resides in the warehouse folder. It is listed after the last cluster folder.

5. Do *one* of the following:
  - Double-click the file name of the warehouse to export from.
  - or —
  - Click the warehouse’s file name, and click **Open**.

The Open dialog box closes, and the Image Warehouse opens in the Image window. Lower-level PIW files are listed in the Image window.



Now you're ready to export image polygons from your warehouse.

## Export procedure

If you are exporting from an Image Warehouse, before starting this procedure, make sure you have opened the Image Warehouse you wish to export from. (See the previous topic.)

### ◆ To export image polygons:

1. If you're exporting to an SDE database and aren't connected to the database, follow the procedure in “Connecting to your SDE database” in Part III, Chapter 16.
2. *If you are exporting from an open workspace,*
  - a. (Optional) To export polygons for *only some* workspace images, select those images in the workspace. (If you don't select images, polygons for *all* workspace images will be exported.)
  - b. Choose **Annotate**⇒**Export Image Polygons**.

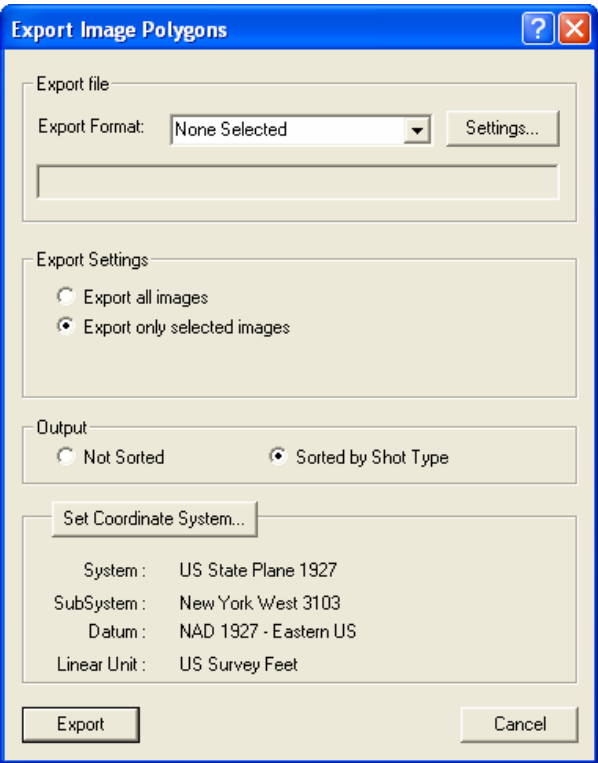
**Tip:** To add the Export Image Polygons button to a toolbar, see “Adding and removing toolbar buttons” in Chapter 22.

**Hint:** Use the **SHIFT** and **CTRL** keys to select multiple image files.

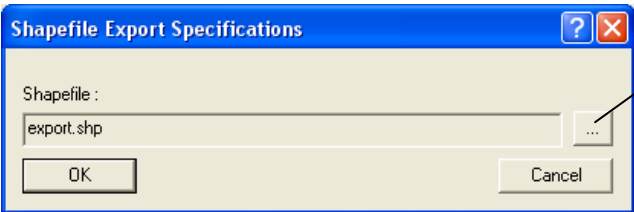
Otherwise, (you are exporting from an Image Warehouse), choose as follows:

If exporting to ...	Choose this ...
a shapefile	Edit⇒Export Image Polygons⇒to Shapefile
an SDE database	Edit⇒Export Image Polygons⇒to SDE

The Export Image Polygons dialog box appears.



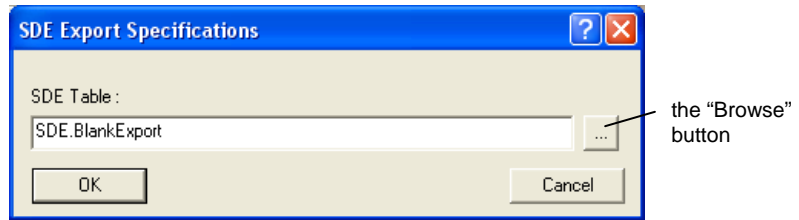
- 3. If you are exporting to a shapefile,
  - a. Select **Shapefile** for the Export Format.
  - b. Click **Settings**. The Shapefile Export Specifications dialog box opens.



- c. Click the **“Browse”** button. The Save As dialog box opens.
  - d. Navigate to the directory in which to store the export file, type or change the file name, and click **Save**. (The file name must have an extension of “shp”.) The Save As dialog box closes.
  - e. Then click **OK**. The Shapefile Export Specifications dialog box closes. On the Export Image Polygons dialog box, the Export file text box shows the path and file name you specified.

Otherwise (you are exporting to an SDE database),

- a. Select **SDE Database** for the Export Format.
- b. Click **Settings**. The SDE Export Specifications dialog box opens.



- c. Do *one* of the following:
  - To specify a new file name, type the name in the SDE Table box.
  - or —
  - To select an existing file, click the “Browse” button. The Select SDE table dialog box opens listing all existing SDE tables. Select the table to which you want to export data.
- d. Click **OK**. The SDE Export Specifications dialog box closes.



4. Choose settings as follows.

*Export Settings  
apply only when  
exporting from  
a workspace.*

In the section ...	Click or check this option ...	If you want to export ...
Export Settings	<b>Export all images</b>	polygons for <i>all</i> images in the workspace
	– or – <b>Export only selected images</b>	polygons for the <i>selected</i> images
Output	<b>Not Sorted</b>	one set of unsorted output files (or tables)
	– or – <b>Sorted by Shot Type</b>	output files (or tables) sorted by shot level and image type

\* These options appear when you are exporting from an Image Warehouse only.

5. (Optional) To specify a different coordinate system for output files (or tables), click **Set Coordinate System**, enter the settings, then click **OK**.
6. Click **Export**.

The Export Image Polygons dialog box closes and output files that contain the image polygons are created. For SDE tables, the prefix “SDE” is added to the table names. For both shapefiles and SDE tables, if you chose sorted output, the file or table name you specified is used in the name of each output file and the file name suffix is appended. (See “Export file names” on page 378.)

**Tip for SDE users:** To view the list of SDE tables, see “Managing your SDE tables” in Part III, Chapter 16.

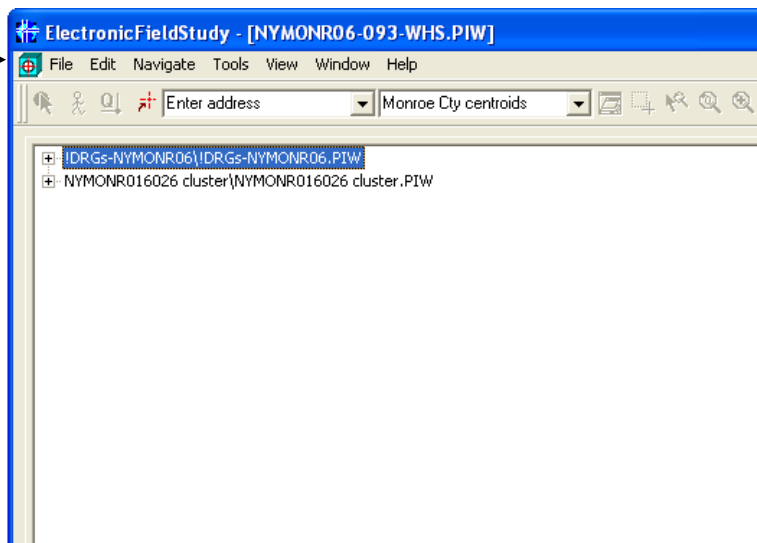
## Closing an Image Warehouse

Use the following procedure to close an Image Warehouse after exporting image polygons from it.

### ◆ To close an Image Warehouse:

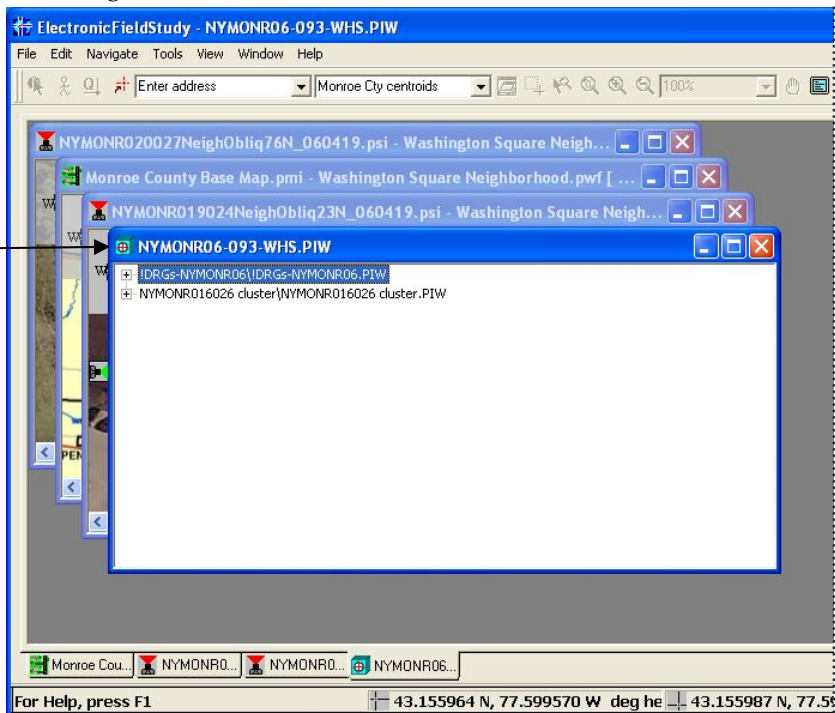
- Choose **Close** from the menu to the left of the File menu.

Click here.



If the Image window contents are cascaded rather than maximized, this menu is located on the window's (blue) title bar, as shown in the following screen.

Click here.





# Chapter 20 — Changing Scale and Units

This chapter discusses image resolution scale and how it applies to EFS. It also gives procedures for changing the image resolution scale.

## Topics covered in this chapter ... page

Understanding scale .....	385
Choices for scale.....	388
Changing the scale and its display .....	390
Three ways to change zoom .....	391
Changing zoom by typing in the Zoom/Scale box .....	391
The math behind the scales .....	392

The next few pages provide some background information that will help explain what the various image resolution scales and units represent. After that, you'll find a summary of the options for displaying zoom and scale and procedures for changing scale, zoom, and other units. This chapter ends with mathematical equations that explain each of the image resolution scales.

Before reading further, be sure you've read the sections in Part I, Chapter 2 that introduce image resolution, true ground sample distance, and scales. Then come back here and read the following sections if you want to delve further into these topics.

To skip this background information, continue with the topic "Choices for scale" on page 388.

## Understanding scale

Webster defines **scale** as "an indication of the relationship between the distances on a map and the corresponding actual distances," and as "a proportion between two sets of dimensions (as between those of a drawing and its original)."

In EFS, the **image resolution scale** is a way of expressing the relationship between what you see on the screen to what it represents in real life.

## From the ground to your screen ...

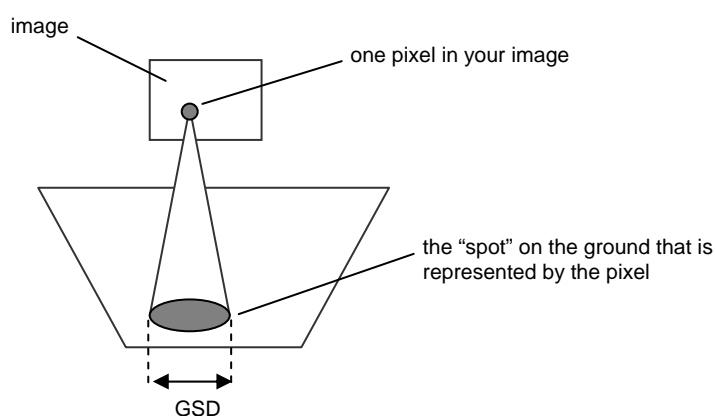
To understand what you see on your screen and translate that into real, usable numbers, it may be helpful to learn how a spot on the ground is represented in an image, and then on the screen with various levels of magnification.

### Image capture — representing the ground in an image

**GSD:**

$$\frac{\text{units}}{1 \text{ image pixel}}$$

**Ground Sample Distance (GSD)**, also known as **spot size**, refers to the size of the spot on the ground that is represented by one pixel in your image. See Figure 20-1. This number is determined by how the image is captured, and it remains constant for that image. GSD is expressed in units per pixel. For example, a Community Orthogonal image is approximately 2 feet per pixel. Smaller GSDs give higher quality images.



**Figure 20-1:** One image pixel representing some “ground.”

### True GSD

This document sometimes calls GSD “True GSD” to clearly refer to the image’s GSD at the time of image capture. An image’s resolution in EFS at any given time is sometimes referred to as its GSD, but an image’s *true GSD* never changes. When an image is viewed in EFS, your screen resolution plus any zooming you do affect the resulting image resolution (so that it no longer equals its true GSD).

**Note:** An image’s true GSD is constant, but not necessarily the same across an entire image. Oblique images have GSDs that vary from the front to the back of the image (bottom of the screen to the top). This is due to perspective, caused by the angle at which these images were shot.

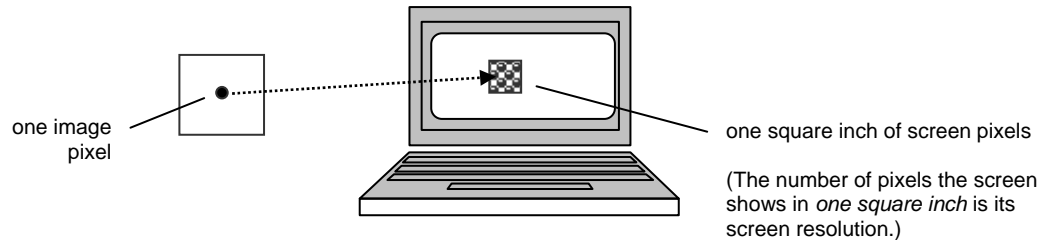
When EFS needs to know the GSD for an Oblique image, it uses the GSD at the image’s “sweet spot,” about one-third up from the bottom. For example, if you’ve set Max View and Min View GSD thresholds for viewing annotations, EFS uses the GSD at the sweet spot to determine whether or not to show annotations.

**screen  
resolution:**  
$$\frac{\text{screen pixels}}{1 \text{ inch (or cm)}}$$

### Displaying the image on your screen

Viewing an image on a computer introduces another factor—**screen resolution**—the number of pixels that can be displayed in one square inch of the screen. Screen resolution is expressed in dpi, or dots (screen pixels) per inch. In EFS, you can use a scale that takes screen resolution into account (thus the image resolution tells what *one inch of screen pixels* represent). Alternately, you can use a scale that does *not* take screen resolution into account (the image resolution tells what *one screen pixel* represents).

With no magnification applied (at 100% zoom), one pixel in your image maps to one pixel on the screen.



**Figure 20-2:** One square inch of screen showing some pixels.

However, when you apply zoom to the image, one pixel in your image maps to more than one pixel on your screen. (And if you decrease the zoom, one screen pixel maps to more than one image pixel.)

**zoom factor:**  
$$\frac{\text{image pixels}}{1 \text{ screen pixel}}$$

### Adding a zoom factor

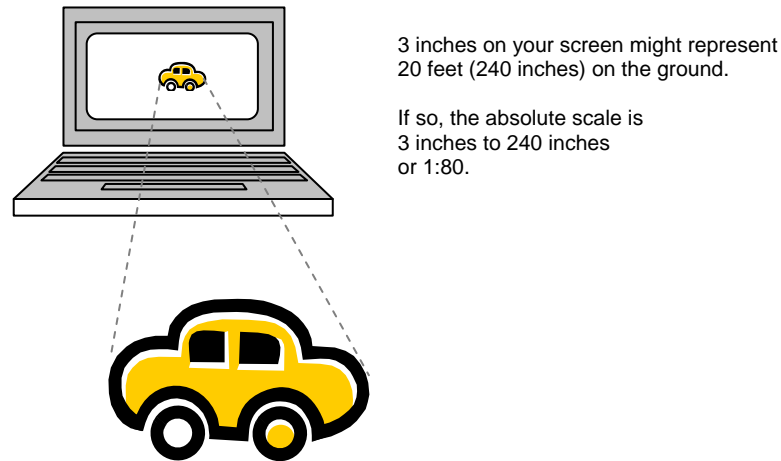
**Zoom factor** is the ratio of the number of image pixels displayed in one screen pixel. The default zoom factor is 100%, which means that each image pixel is represented by one screen pixel. If you double the zoom factor to 200% (increase the magnification in order to zoom in closer for greater detail), you'll have one image pixel represented by two screen pixels (in each direction).

**conversion  
factor for  
absolute scale:**  
$$\frac{\text{inches (or cm)}}{\text{units}}$$

### Absolute scale

**Absolute scale** is the ratio of what you see on the screen to what you see in the real world, independent of units. Its value is the same for any units of linear measure.

For example, a car that's 20 feet (240 inches) long might appear three inches long on your screen. That means 3 inches of your screen is representing 240 inches of car, for a scale of 3 to 240 (3:240) or 1:80. If you measured in centimeters the car and its length on the screen, the ratio would be the same. It would reduce to 1:80 (just as it would if inches were used). The image resolution scale is the same whether you use inches or centimeters or any other unit of linear measure. Absolute scale is always expressed as **1:n** (one to n).



**Figure 20-3:** Absolute scale, the ratio of screen length to ground length.

## Choices for scale

*Units can be Centimeters, Feet, Feet Inches, Inches, Kilometers, Meters, Miles, Nautical Miles, or Yards.*

EFS lets you work in any of the following image resolution scales:

- GSD in units per screen pixel
- GSD in units per inch (or units per cm) of screen
- Absolute scale

The scale you select will be used for all EFS calculations that require a scale. For example, EFS uses the scale when determining whether an annotation is within the Max View and Min View GSD thresholds you set for viewing annotations.

### Zoom/Scale box displays your choice

**Tip:** To add the Zoom/Scale box, see “Adding and removing toolbar buttons” in Part IV, Chapter 22.

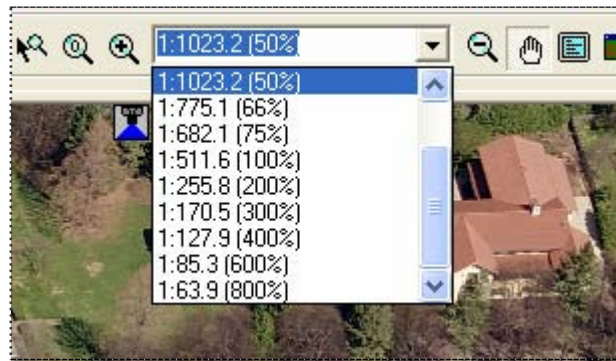
If you’ve added the Zoom/Scale box to your EFS application, that’s where you’ll see the current image resolution in terms of the current scale. It offers the following four formats:

- image resolution in absolute scale zoom percentage (in parentheses)
- image resolution in GSD in units per inch (or units per cm) zoom percentage (in parentheses)
- image resolution in GSD in units per screen pixel zoom percentage (in parentheses)
- zoom percentage only

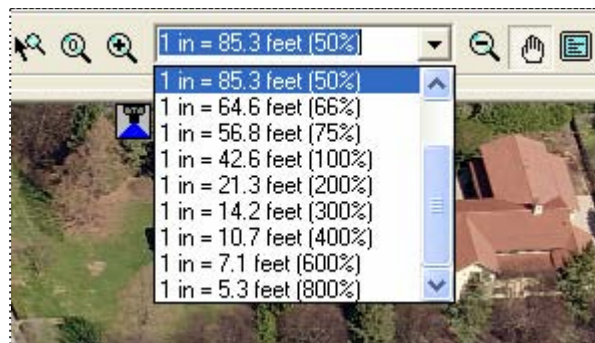
**Note:** When the “zoom percentage only” format is selected, the image resolution scale is “GSD in units per pixel.”

### Zoom/Scale box examples

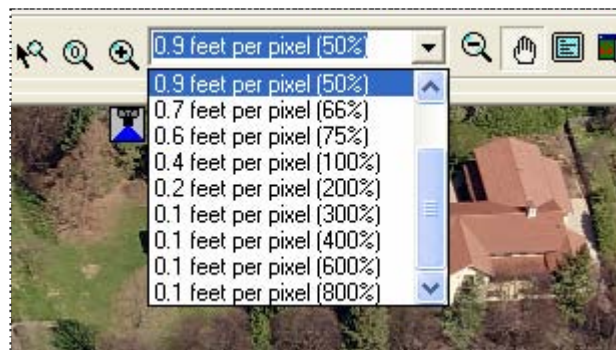
Figures 20-4 through 20-7 each show the Zoom/Scale box after a different display option was selected. Notice that the Zoom/Scale box includes a drop-down list of choices for changing the zoom level (thus changing the current image resolution). See “Three ways to change zoom” on page 391.



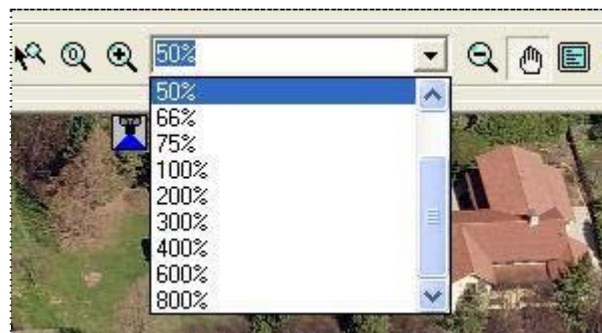
**Figure 20-4:** Zoom/Scale box when “Absolute Scale” is selected.



**Figure 20-5:** Zoom/Scale box when “Units Per Inch/cm” is selected.



**Figure 20-6:** Zoom/Scale box when “Units Per Pixel” is selected.



**Figure 20-7:** Zoom/Scale box when “Zoom % (Units Per Pixel)” (the default) is selected.

## Summary of scale choices

Here's what you can display in the Zoom/Scale box, the format of what's displayed, and the scale that's represented:

Shown in Zoom/Scale box	Image resolution scale
image resolution in absolute scale <b>format:</b> 1:n (zoom %)	absolute scale (has screen resolution and zoom factored in)
image resolution in units per inch/cm of screen <b>format:</b> 1 in/cm = n units (zoom %)	GSD in units per inch/cm (has screen resolution and zoom factored in)
image resolution in units per screen pixel <b>format:</b> n units per pixel (zoom %)	GSD in units per pixel (has zoom factored in)
zoom percentage only <b>format:</b> zoom %	GSD in units per pixel (has zoom factored in)

For some of these scales, you'll need to specify units of measure. You can select from the following units:

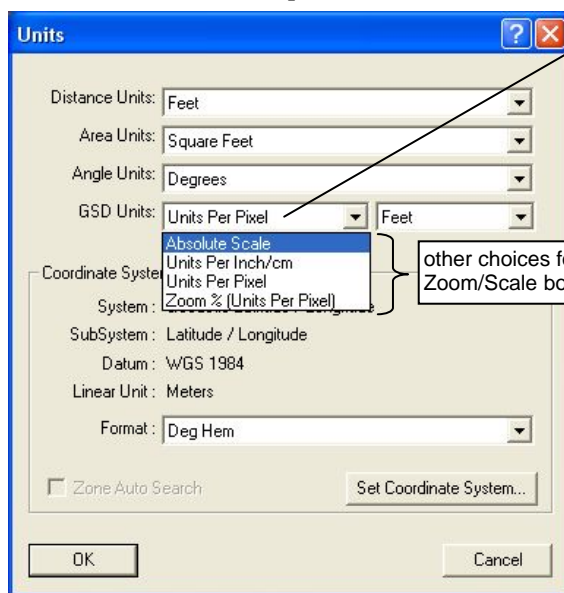
Distance Units				
Centimeters	Meters	Feet	Kilometer	Yards
Feet	Miles	Feet Inches	Nautical Miles	

## Changing the scale and its display

Use the following procedure to change what's shown in the Zoom/Scale box, (which often changes the image resolution scale as well).

### ◆ To change the scale and Zoom/Scale display:

1. Choose **Edit⇒Change Units**. The Units dialog box opens. (To add the Change Units button to a toolbar, see "Adding and removing toolbar buttons" in Chapter 22.)



Units Per Pixel is the current scale for image resolution (used in calculations and shown in the Zoom/Scale box).

other choices for Zoom/Scale box

**Tip:** You can also change distance, area, and angle units from this dialog box.

To change the coordinate system, see Part II, Chapter 11.

2. From the GSD Units drop down list, select the format you want the active image's resolution shown in.

**Reminder:** If you select Absolute Scale, Units Per Inch/cm, or Units Per Pixel, the Zoom/Scale box shows the scale *and* the zoom percentage.

If you select Zoom % (Units Per Pixel), the Zoom/Scale box shows *only* the zoom percentage, but the scale will be Units Per Pixel.

3. If your choice requires that you specify units, select the units from the drop down list on the right.
4. Click **OK**.

The Units dialog box closes. The resolution of the active image is recalculated in the scale you've selected. The Zoom/Scale box shows the image resolution in terms of the new scale. If you click its drop-down list, you'll see the incremental choices for zooming (in the new scale).

**Hint:** To widen the Zoom/Scale box, do the following:

1. Choose **Tools**⇒**Customize**.
2. Click the Zoom/Scale box. (It will become outlined.)
3. Click the right edge of the box, and drag to the desired size.
4. Click **OK** to close the Customize dialog box.

## Three ways to change zoom

There are three ways to use the Zoom/Scale box to change the active image's zoom level. You can:

- Simply select a value from the Zoom/Scale box's drop-down list.
- Type a value directly into the Zoom/Scale box.
- Type (in the Zoom/Scale box) a value in terms of any of the other scales, by using a "shortcut" — a symbol or word before or after the value. The shortcut tells EFS which scale your new value is expressed in. EFS changes the zoom according to the value you type. It also shows the new zoom level in the Zoom/Scale box in terms of the current scale.

**Note:** Zoom/Scale shortcuts are listed on page 392 (in Step 2 of the procedure).

The following procedure covers the latter two ways to change zoom.

## Changing zoom by typing in the Zoom/Scale box

To change the active image's zoom level, you can type a zoom percentage directly into the box. You can enter a value such as 5, to zoom in terms of the current scale. Or you can use a "shortcut" to enter a value in terms of any of the other scales (however, the value is shown in terms of the current scale).

### ◆ To change magnification by typing in the Zoom/Scale box:

1. Click anywhere in the Zoom/Scale box, to select (highlight) it.  
(If clicking does not highlight the entire contents of the box, then drag your mouse over the contents.)
2. *To use a value in terms of the current scale,*

- If only zoom percentage is showing in the Zoom/Scale box, type the percentage value you wish to zoom to.
- If absolute scale is the current scale, type a value for ‘n’ where 1:n is the desired image resolution.
- If GSD with screen resolution is the current scale, type a value for ‘n’ where 1 in/cm = n is the desired image resolution.
- If GSD without screen resolution is the current scale, type a value for ‘n’ where n is the desired units per pixel.

To use a value in terms of a scale other than the current scale (without changing the format shown in the Zoom/Scale box),

- Type (in the Zoom/Scale box) a value for ‘n’ or ‘z’ and a shortcut, as shown in the following chart:

The scale you want to use	Its screen format	The shortcut you type
Absolute Scale	1:n	:n
Units Per Inch/cm	1 in/cm = n units	=n
Units Per Pixel	n units per pixel	n per
Zoom % (Units Per Pixel)	z%	z%

3. Press **ENTER**.

The zoom level changes to the level you’ve entered. The Zoom/Scale box shows the new image resolution in terms of the current scale.

## The math behind the scales

Here is the math that shows what factors into each of the image resolution scales. Each formula starts with the image’s true GSD, then factors in one or more of the following: zoom, screen resolution, and conversion.

Notice that many units cancel, leaving only the units that the particular scale uses to express image resolution.

### GSD without screen resolution

units

1 ~~image pixel~~

×

~~image pixels~~

1 screen pixel

=

“units per (screen) pixel”

GSD

zoom factor

When you change GSD units to “Units Per Pixel,” the scale you’ve selected is GSD without screen resolution. GSD without screen resolution gives you what one screen pixel represents (rather than what an inch of screen pixels represents). It does not take into account the screen’s capacity for displaying pixels (the screen resolution).

### GSD with screen resolution

units

1 ~~image pixel~~

×

~~image pixels~~

1 screen pixel

×

~~screen pixels~~

1 inch (or cm)

=

“1 inch (or cm) = n units”



GSD

zoom factor

screen  
resolution

When you change GSD units to “Units Per Inch/cm,” the scale you’ve selected is GSD with screen resolution. GSD with screen resolution gives you what an inch of the screen represents.

### Absolute scale

$$\frac{\text{units}}{1 \text{ image pixel}} \times \frac{\text{image pixels}}{1 \text{ screen pixel}} \times \frac{\text{screen pixels}}{1 \text{ inch (or cm)}} \times \frac{\text{inches (or cm)}}{\text{units}} = \text{“1:n”}$$

GSD
zoom factor
screen resolution
conversion factor

When you change GSD units to “Absolute Scale,” you’ve selected a scale in the truest sense. It expresses image resolution *not* relative to an inch of the screen or to a pixel on the screen, but rather as a simple ratio of what you see on the screen to what it represents in real life.



# Chapter 21 — Advanced Workspace Topics

This chapter covers features of workspaces that go beyond the basics. Although you might not use these features very often, you'll find them handy when you do need them.

## Topics covered in this chapter ... page

Adding images to a workspace .....	395
Opening images from a workspace .....	400
Sharing workspaces .....	400
Fixing access to files from workspace items .....	401
Rearranging workspace items .....	407
Using multiple workspaces .....	408
Creating a warehouse from a workspace .....	410

## Adding images to a workspace

There are many reasons why you might want to add images to a workspace. For example, you might annotate a specific image with local annotations. Or, you might create a warehouse subset by using the images you've collected in a workspace. Many users simply add images to workspaces so they can easily find those images at a later time.

You can add any of the following to the active workspace:

- a base map image
- Orthogonal images
- Oblique images
- GIS Images (covered in Part III, Chapter 18, see "Adding a GIS Image to a workspace.")
- the active image
- any or all warehouse images opened during the current EFS session
- non-warehouse images that are not open
- all search hits

### Adding a base map image

The Add Base Map Image option lets you add an image to your active workspace and tag it as a base map. You might use this feature if you want a different base map, such as a custom base map, or if you didn't select a base map when you set up the workspace.

◆ **To add a base map image to your workspace:**

- 1. Choose **Workspace⇒Add Base Map Image**.

**Tip:** To add the Add Base Map Image button to a toolbar, see “Adding and removing toolbar buttons” in Chapter 22.

The Load Base Map dialog box opens and lists available Image Warehouses.

- 2. Do *one* of the following:

To choose ...	Do this ...
The base map associated with an Image Warehouse in the list.	Select the Image Warehouse from the list, and click <b>OK</b> . <i>Skip Step 3.</i>
An image or map that’s not associated with an Image Warehouse in the list.	Click <b>Browse</b> . (The Open dialog box opens.)

- 3. Navigate to the image you want to add and select the image you want for a base map.

**Note:** The image you add should have an extension of “pmi” or “pgs.” (For more information about PGS files, see Part V, Appendix G.)

- 4. Click **Open**.

The image is displayed in the Image window, and its file name is added to the bottom of your active workspace.

- 5. To make the image the base map, move the image to the top of the workspace tree by selecting its file name and choosing **Workspace⇒Move to Top of Tree**.

The image is added to top of the workspace as the workspace’s base map image. (If you save and close your workspace, then open it later, you’ll notice that the image resides just below the Opened Warehouse Images folder, and the image opens as a base map.)

**Notes:**

- Be sure to save your workspace if you want the new base map saved for a future EFS session.
- The image you’ve added will not be closed when the open image limit is reached. (See “Limiting the number of open images,” in Part I, Chapter 6).

*A workspace’s base map always resides just below the Opened Warehouse Images folder.*

**Adding an Ortho image**

Use the following procedure to open an Orthogonal image (PMI file) and add it to the active workspace. You can add Ortho images purchased through Pictometry Online or you can add individual images from a warehouse.

**Tip:** To add the Add Ortho Image and Add Oblique Image buttons to a toolbar, see “Adding and removing toolbar buttons” in Part IV, Chapter 22.

◆ **To add an Ortho image to a workspace:**

- 1. Choose **Workspace⇒Add Orthogonal Image**. The Open dialog box opens.
- 2. From the Open dialog box, navigate to the folder that contains the desired image.

**Note:** The file you select must have an extension of “pmi,” “jpg,” or “tif.”

3. Select the desired image and click **Open**. The selected image appears in the Image window and its name is listed at the bottom of the workspace.

## Adding an Oblique image

Use the following procedure to open an Oblique image (PSI file) and add it to the active workspace. You can add Pictometry Oblique images purchased through Pictometry Online or you can add individual images from a warehouse.

This procedure is handy if you want to work with only a few images from a warehouse, not with an entire Image Library.

### ◆ To add an Oblique image to a workspace:

1. Choose **Workspace⇒Add Oblique Image**. The Open dialog box opens.
2. From the Open dialog box, navigate to the folder that contains the desired image.

**Note:** The file you select must have an extension of “psi.”

3. Select the desired image and click **Open**. The selected image appears in the Image window and its name is listed at the bottom of the workspace.

## Adding a GIS Image

GIS Images are covered in detail in Chapter 18. (See “Adding a GIS Image to a workspace” in Part III, Chapter 18.)

## Adding open images to a workspace

When you open images in the Image window, the Opened Warehouse Images folder keeps a list of the images you’ve opened during the current EFS session.

Although you can see the file names in the Workspace window, the images in the Opened Warehouse Images folder are not considered to be part of the workspace. (They are not saved when the workspace is saved.) The list of files is temporary—only lasting for the duration of your work session. When you close the workspace, the folder is emptied.

Because the list is temporary, you should add to your workspace any images you want to use in subsequent sessions. When you add an opened image to the workspace, EFS removes the image name from the Opened Warehouse Images folder and makes it a “permanent” item in the workspace.

**Note:** If you have more than one workspace open, the image will be added to the workspace that was active when you opened the image you are adding, even if that workspace is not currently active.

### Adding the active image

Use the following procedure to add the active image to a workspace (the workspace that was active when you opened the image).

#### ◆ To add the active image to a workspace:

- Right-click the image in the Image window, and select **Add <image file name> to workspace**.

The image name is added to the bottom of the workspace and removed from the Opened Warehouse Images folder. (Be sure to save your workspace after adding images to it.)

### Adding an open image that's not active

An image that is open but not active can be also added to a workspace (the workspace that was active when you opened the image).

When you add the image to a workspace, its name is moved from the Opened Warehouse Images folder to the bottom of the workspace.

#### ◆ To add an open image to a workspace:

Do *one* of the following:

- Double-click the name of the image to activate it, then follow the procedure for adding an active image on page 398.
- or —
- Expand the Opened Warehouse Images folder, select the name of the image you want to move to your workspace, and choose **Workspace⇒Add Current Image to Workspace**.

The image name is added to the bottom of the workspace and removed from the Opened Warehouse Images folder. (Be sure to save your workspace after adding images to it.)

### Adding images previously opened

If you open an image and then close it, you can still add the image to the active workspace as long as the image name is still listed in the Opened Warehouse Images folder (which means you haven't yet exited EFS). The image does not have to be active or even open in the Image window. Follow the procedure for adding an open image (the previous topic).

### Adding *all* opened warehouse images

EFS has a menu option that lets you move *all* image names from the Opened Warehouse Images folder to the main part of the workspace in one step.

#### ◆ To add all opened images to your workspace:

- Choose **Workspace⇒Add Opened Warehouse Images to Workspace**.

**Tip:** To add the Add Opened Warehouse Images button to a toolbar, see "Adding and removing toolbar buttons" in Chapter 22.

All file names in the Opened Warehouse Images folder appear as new entries at the bottom of the workspace, and the Opened Warehouse Images folder is emptied.

### Adding images automatically when opened

Instead of using the Opened Warehouse Images folder as a temporary holding area, you can add images to the workspace automatically as you open the images.

Use the following procedure *to set an option* so that every image you open will be automatically added to the active workspace.

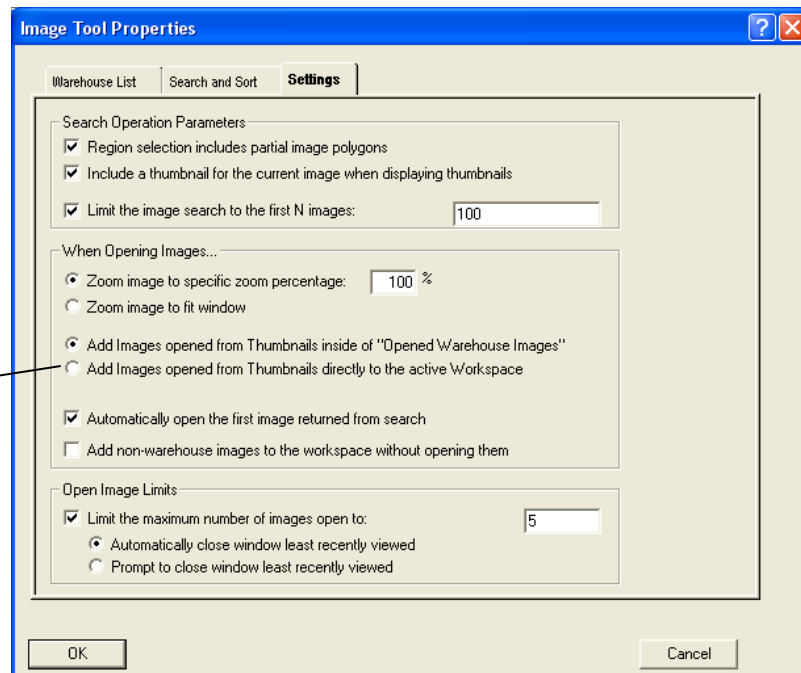
**Note:** With this option selected, the workspace may get cluttered, and you will have to individually remove any files you don't want to save.

#### ◆ To automatically add opened images to your active workspace:



1. Click the **Image Tool Properties** button. The Image Tool Properties dialog box opens.
2. Click the **Settings** tab.

Click here.



**Tip:** To revert to not saving opened images automatically, simply click the opposite option: **Add Images opened from Thumbnails inside of "Opened Warehouse Images"**

3. Click **Add Images opened from Thumbnails directly to the active Workspace**, then click **OK**.

The Image Tool Properties dialog box closes. As long as this option remains selected, every image you open will be added to the active workspace automatically. Images will be added to the bottom of the workspace, and the Opened Warehouse Images folder will remain empty.

## Adding all image search hits

The Workspace menu contains an option that lets you add to the active workspace *all* search hits from your last search.

**Note:** This feature *does not* set an option to automatically add search hits. Follow this procedure *each time* you want all search hits added.

**Tip:** To add the Add All Warehouse Image Hits button to a toolbar, see “Adding and removing toolbar buttons” in Chapter 22.

### ◆ To add search hits to your workspace:

1. Perform an image search. (You can search by address, by clicking a point, or by entering coordinates.)

The search hit list is updated to reflect your new search. (If the Thumbnail window is in view, search hits are shown as thumbnail images.)

2. Choose **Workspace**⇒**Add All Warehouse Image Hits to Workspace**.

EFS adds the image file names for all search hits to the bottom of your active workspace. They are added in the order in which they are sorted—based on the sort order specified on the Search and Sort tab of the Image Tool Properties dialog box. (See “The Search and Sort tab” in Part I, Chapter 6.)

## Opening images from a workspace

Use the following procedure to open an image from the Workspace window.

### ◆ To open an image from a workspace:

Do *one* of the following:

- Double-click the desired image name in the Workspace window.
- or —
- Right-click the desired image name in the Workspace window, and select **Open <image file name>** from the context menu.

The image opens in the Image window.

## Sharing workspaces

There are times when it’s handy to share your workspace with another user. To share a workspace with another user, simply give the user a copy of the Pictometry Workspace File for the workspace you wish to share. The file will have the following format:

<workspace name>.pwf

### If you receive a workspace from someone ...

If you receive a Workspace File from another user, copy it to any directory you choose. After starting EFS, open the workspace by choosing **File**⇒**Open**. Then browse to the location in which you copied the workspace. If your images are stored in a different path than that of the user you received the



workspace from, you may need to “relocate” (fix access information for) workspace files. (See the next topic.)

## Fixing access to files from workspace items

---

Before describing how to fix access to files from workspace items, this section describes what access information is stored for which types of workspace items.

### Access information stored by a workspace

For some types of workspace items, your workspace stores information it needs in order to access that item on your local hard drive or network server.

The access information forms a connection to the file stored on your local hard drive or network server, allowing EFS to open an image or a linked file when you double-click its name in the workspace.

### For which items does EFS store access information?

EFS stores access information for the following items when you add them to a workspace:

- Ortho and Oblique images
- Base map images
- Link annotations
- GIS annotation layers
- Elevation files
- ALOHA annotations

*ALOHA annotations are covered in Appendix C.*

**Note:** User-defined annotation layers and text, circle, line, icon, and point annotations do not need to access files on your local hard drive or network server.

### *If you add a search hit ...*

If you search an Image Warehouse, open a resulting search hit, and add the search hit to your workspace, that image is associated with the Image Warehouse you searched. Consequently, EFS stores the name and location of the warehouse the image came from. When you later open the image from the workspace, EFS finds it in the warehouse and opens it.

### *If you use the Workspace menu “Add” options ...*

If you add an image to the workspace by choosing one of the “Add” options from the Workspace menu, navigating to the image, and selecting it, EFS stores the name and path of the image you selected.

### *If you create a link annotation ...*

If you create a link annotation, EFS stores the name and path of the file that is linked to the annotation.

## Why access fails ...

If you have trouble with any of the following:

- opening an image from a workspace,
- opening the file linked by a link annotation,
- viewing a GIS annotation layer, or
- including elevation in your measurements,

then the workspace might not have the updated name and path to the file it needs to access. The “connection might be broken” and might need updating.

## When sharing workspaces

Paths and file names might need updating when users share workspaces, particularly when either of the following situations occurs:

- The shared workspace references a file whose location is specified by drive mapping, and the two users (the one who distributed the workspace and the one who received it) each use different drive letters to map to the directory the file resides in.

**Note:** If you use the Universal Naming Convention (UNC) when you link to a warehouse or add a file to a workspace, then a workspace recipient should not have an access problem.

- The shared workspace points to a file on the first user’s local hard drive or home directory, and the second user either doesn’t have the file on their hard drive, has it in a different location, or named it differently. In each case, EFS cannot find the file.

When sharing workspaces, the problem occurs only for the person receiving the workspace (not from the sender).

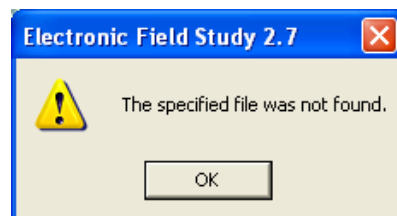
## Other circumstances that cause access to fail ...

Access can fail even when you don’t share workspaces. Typically, this happens when the file referenced is renamed (on the hard drive, not in the workspace) or is moved to another directory, making the access information stored by the workspace inaccurate.

## How do I know if the connection is broken?

You’ll know that the connection is broken if any of the following occur:

- You see the following error message when trying to open a workspace item:



- You try to open an image from the workspace and nothing happens (the image doesn't open in the Image window).
- You perform a warehouse search and no images are returned.

**Hint:** If no images are returned from a search, before assuming that you have a broken connection, check the Image Tool's properties to be sure the desired warehouse is linked. (See "Linking to your Image Warehouse" in Chapter 1.)

- Your GIS annotation layer is not visible in the Image window even though the layer's visibility is turned on and View GIS Annotations is checked in the Overlays menu.
- You have images without elevation data and your workspace contains the related elevation files, but you don't get elevation measurements when you use the Elevation Tool or turn on Walk the Earth.

## Fixing a broken connection

This section contains procedures for fixing broken connections. There is a procedure for fixing:

- the location of the referenced warehouse for warehouse search hits
- the path, drive mapping, or file name (or all three) for non-warehouse items (such as link annotations, GIS annotation layers, images added by selecting one of the options on the Workspace menu, and elevation files.)

These procedures are covered in the following topics.

### Fixing warehouse search hits

If you cannot open an image from your workspace, and the image was a search hit that was added to your workspace, you can use the Relocate menu option to re-select the warehouse in which the search hit resides.

Use the following procedure to re-select the warehouse and fix the path or drive mapping.

**Important:** Make sure you select the correct file when fixing a broken connection. Selecting a different image or data file can have unexpected results.

#### ◆ To relocate a warehouse search hit:

1. To be sure the Image Tool has the correct location for the warehouse, follow the procedure for "Linking to your Image Warehouse" in Chapter 1, substituting the following instruction for Step 2.

"Select the warehouse from the list and click **Properties**."

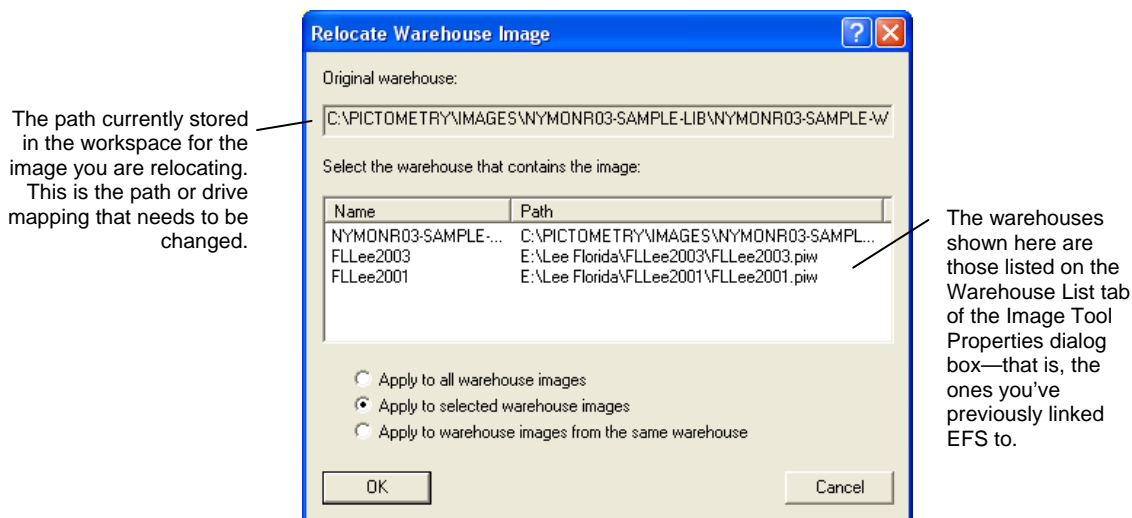
**Note:** Chapter 1 contains two procedures for linking to your warehouse: one for warehouses that reside on a local hard drive or LAN, and one for warehouses that reside on an NIW server. Be sure to follow the correct procedure for your installation.

2. Do *one* of the following:
  - In the Workspace window, right-click the name of the image to be relocated. From the context menu, select **Relocate <file name>**.

– or –

- Select the image in the workspace, then choose **Edit⇒Relocate File**. (Use **CTRL** or **SHIFT** to select multiple images.)

The Relocate Warehouse Image dialog box appears.



3. From the list of warehouses, select the warehouse that contains the image whose connection has been broken.
4. Do *one* of the following:

Click ...	To apply the new location to ...
<b>Apply to all warehouse images</b>	<i>all</i> workspace images added as search hits (regardless of the warehouse they're from).
<b>Apply to selected images</b>	the workspace image you right-clicked, plus any other images you selected.
<b>Apply to warehouse images from the same warehouse</b>	<i>all</i> workspace images <i>from the same warehouse</i> as the image you right-clicked (or selected).

5. Click **OK**.
6. Save the workspace. (Choose **File⇒Save Workspace** or click the **Save** button, if available on a toolbar.)

The Relocate Warehouse Image dialog box closes. EFS now knows where to find the Image Warehouse the selected images are linked to.

### Fixing non-warehouse workspace items

This topic describes how to fix access for the following types of workspace items:

- link annotations,
- Ortho and Oblique images added to the workspace by means of a Workspace menu “Add” option,
- GIS annotation layers, and
- elevation files.

EFS provides two menu options for fixing non-warehouse workspace items:

- Relocate, and
- Edit Filename.

### *The Relocate menu option*

Use the Relocate menu option to fix the path or drive mapping only. If a file name has changed (even if the path or drive mapping has also changed), you should use the Edit Filename option instead. Relocate does not update the file name.

### *The Edit Filename menu option*

Use the Edit Filename menu option to fix access when the name of the file has changed on your hard drive or network server. Edit Filename will also fix the path or drive mapping.

### *If you don't know which option to use*

If you're not sure if you have a file name problem or a location problem, use the Edit Filename option. It will fix both problems.

Both Relocate and Edit Filename also let you update the paths of other files within the workspace that have the same drive mapping or path as the file you are fixing.

The following table summarizes which option to use in which situation.

**Table 21-1:** Options for fixing the path and name for non-warehouse items.

If you need to fix ...	Use this menu option ...
Only the path/drive mapping	either <b>Edit⇒Relocate File</b> or <b>Edit⇒Edit Filename</b>
Only the file name	<b>Edit⇒Edit Filename</b>
Both the path/drive mapping and file name	<b>Edit⇒Edit Filename</b>

### *Fixing only the path*

Use the following procedure to fix *only* an item's path or drive mapping, but not its file name.

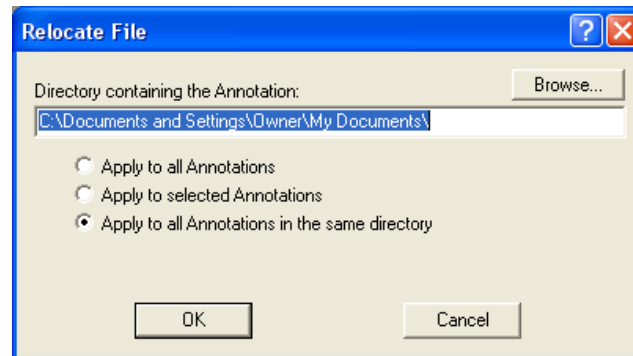
#### ◆ To fix the path for non-warehouse files:

1. Do *one* of the following:
  - In the Workspace window, right-click workspace item you wish to relocate. From the context menu, select **Relocate <file name>**.
  - or —
  - Select the workspace item you wish to relocate, and choose **Edit⇒Relocate File**. (Use **CTRL** or **SHIFT** to select multiple items.)

**Important:** Make sure you select the correct item. Selecting a different item can have unexpected results.

The Relocate File dialog box appears.

*The dialog box you see may be different from the one pictured here. The workspace item you select determines if the dialog box refers to “Annotations,” “Picto Images,” “GIS Annotations,” “Elevations,” or ALOHA Annotations.”*



2. Click **Browse**. The Open dialog box appears.
3. Navigate to the directory where the file resides, select the file, and click **Open**. The new path is shown on the Relocate file dialog box.
4. Do *one* of the following:

Click ...	To apply the new location to...
<b>Apply to all Annotations</b> (or <b>Picto Images</b> , or <b>GIS Annotations</b> , or <b>Elevations</b> , or <b>ALOHA Annotations</b> )	<i>all</i> workspace items <i>of the same type</i> (link annotation, image, GIS annotation, elevation file, or ALOHA Annotation) as the item you right-clicked (or selected).
<b>Apply to selected Annotations</b> (or <b>Picto Images</b> , or <b>GIS Annotations</b> , or <b>Elevations</b> , or <b>ALOHA Annotations</b> )	the workspace item you right-clicked, plus any other items <i>of the same type</i> that you selected.
<b>Apply to all Annotations</b> (or <b>Picto Images</b> , or <b>GIS Annotations</b> , or <b>Elevations</b> , or <b>ALOHA Annotations</b> ) <b>in the same directory</b>	<i>all</i> workspace items <i>of the same type</i> (link annotation, image, GIS annotation, elevation file, or ALOHA Annotation) and that have the <i>same path</i> as the item you right-clicked (or selected).

5. Click **OK**. The path is now fixed and the files are now linked to the correct directory.
6. Save the workspace. (Choose **File**⇒**Save Workspace** or click the **Save** button, if available on a toolbar.)

### Fixing a file name

You will not be able to open a workspace item if its file name is different than the name the workspace recognizes. This discrepancy could happen if you change the item’s file name on your hard drive or server, or if another user gave you the workspace and named the file differently. In either case you’ll need to fix the file name in your workspace so EFS can locate the file.

Use the following procedure to fix the file name. This procedure also fixes the path or drive mapping.

◆ **To fix a file name:**

1. In the Workspace window, select the workspace item whose name has changed.
2. Choose **Edit⇒Edit Filename**. The Open dialog box appears.
3. Navigate to the directory where the file resides, select the file, and click **Open**.
4. Save the workspace. (Choose **File⇒Save Workspace** or click the **Save** button, if available on a toolbar.)

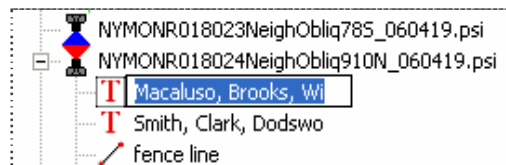
EFS now has the correct name stored along with its path, so it can find the file when you open it.

**Note:** This procedure does not change the name you see in the Workspace window. To change the name visible in the Workspace window, use the following procedure.

*This procedure changes only the item name you see in the Workspace window. It does not affect the ability of EFS to locate the item on a hard drive or a network server, that is, it will not fix an access problem.*

◆ **To change the item name shown in the Workspace window:**

1. Select the item in the workspace.
2. Select the item again. (Do not double-click its name.) The name is highlighted and surrounded by a black box. A blinking cursor appears at the end of the name.



3. Type the new name or change the name as desired.
4. Press **ENTER**.
5. Save the workspace. (Choose **File⇒Save Workspace** or click the **Save** button, if available on a toolbar.)

## Rearranging workspace items

As you add items (images, annotation layers, annotations, GIS annotation layers, for example) to a workspace, EFS places the items in the workspace tree in a specific order. (See “The structure of a workspace” in Part I, Chapter 10.) After the Workspace Root folder, the Opened Warehouse Images folder, and the base map image, other workspace items are listed in the order in which they were added.

You may not need to change the order of the items in a workspace. However, most of the items can be rearranged if necessary.

### Why is the order of workspace items important?

Here are some circumstances in which the order of workspace items is important:

- The first image listed in the tree has special significance because EFS uses it as the base map. When you first open a workspace, the base map is

opened automatically. Also, clicking the View Map button in its down position brings up the base map image. Therefore, you should always make sure that the first image listed is the image you want to be the base map. (If you select a base map when you create the workspace, it will automatically be listed first.)

- When annotations overlay an image, their order in the workspace tree dictates which annotation appears on the top. Those listed at the bottom of the tree are drawn last and will be drawn over those listed first. This affects all annotations, whether user-defined, GIS, or ALOHA.

Use the following procedure to rearrange items in a workspace tree.

**Note:** You can rearrange all items in the workspace except for the Workspace Root folder.

◆ **To rearrange items within a workspace:**

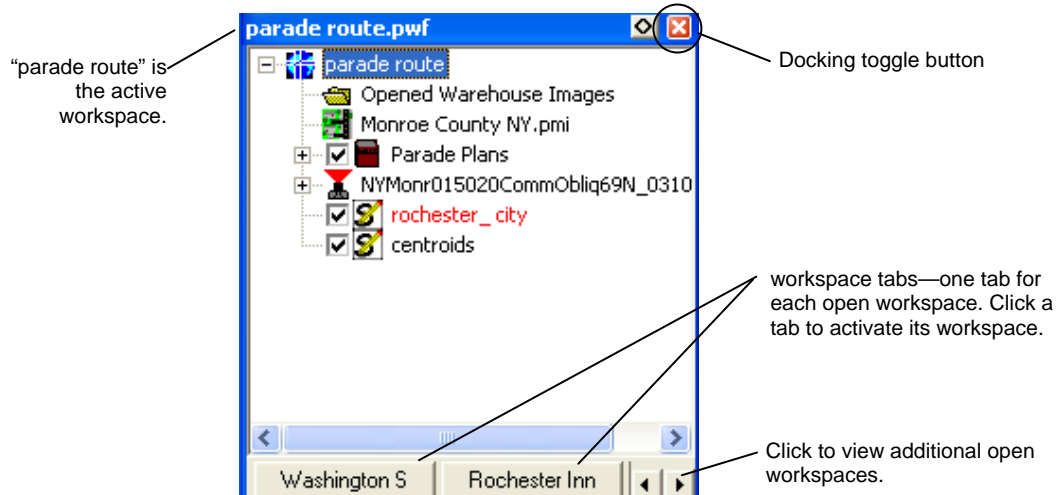
1. Select the workspace item you want to reposition.
2. Choose **Workspace**, then choose one of the following:
  - **Move Up in Tree**
  - **Move Down in Tree**
  - **Move To Top of Tree**
  - **Move To Bottom of Tree**

**Tip:** To add toolbar buttons for these options, see “Adding and removing toolbar buttons” in Part IV, Chapter 22.

## Using multiple workspaces

**Note:** Although EFS does let you open multiple workspaces, we recommend that you work with *only one* workspace at a time.

You can have multiple workspaces open at the same time, however, only one can be active at a time. Typically, the active workspace is shown in the Workspace window (positioned by default on the left side of the Electronic Field Study application). A tab appears for each opened workspace.



**Figure 21-1:** An active workspace in the Workspace window.



## Viewing one workspace at a time

One way to switch between open workspaces (without closing any) is to activate the one you want to work with, which de-activates the one previously active. Use this method when you don't need to view more than one workspace at the same time, but simply wish to switch between workspaces.

### ◆ To activate a workspace:

- Click the tab at the bottom of the Workspace window for the workspace you want to view.

The workspace activates and appears in the Workspace window, and the de-activated one disappears from view.

## Viewing two workspaces simultaneously

Another way to work with more than one workspace is to open one or more workspaces in the Image window. By opening a workspace in the Image window, you can view more than one at the same time, however, only one can be active at a time. This is handy if you need to compare the contents of two or more workspaces.

Once opened in the Image window, the workspace can be minimized, maximized, tiled, or cascaded, just as any other image window.

Be sure to open both workspaces before starting the following procedure.

### ◆ To open a workspace in the Image window:

1. Make sure the workspace is visible in the Workspace window.
2. Click the Workspace window's Docking toggle button.

The workspace opens in the Image window and becomes active. Another inactive workspace appears in the Workspace window.

**Note:** When a workspace is shown in the Image window, clicking its Docking toggle button moves the workspace back to the Workspace window. Therefore, the Docking toggle button toggles the workspace between two locations: the Image window and the Workspace window.

(You may have to cascade the windows in the Image window in order to click the workspace's Docking toggle button.)

## Context menu options

The Workspace window title bar has its own context menu, specific to the window as an entity, not pertaining to the workspace contents.

### Docking and floating the Workspace window

A quick way to float or re-dock the Workspace window is to use the context menu that appears when you right-click the workspace title bar. (See Figure 21-2.)

MDI is an acronym for “Multiple Document Interface”



Clicking this option is the same as clicking the Docking toggle button.

Clicking one of these options is like clicking the Docking toggle button except that the window is also automatically minimized, maximized, or restored (cascaded), depending on your choice.

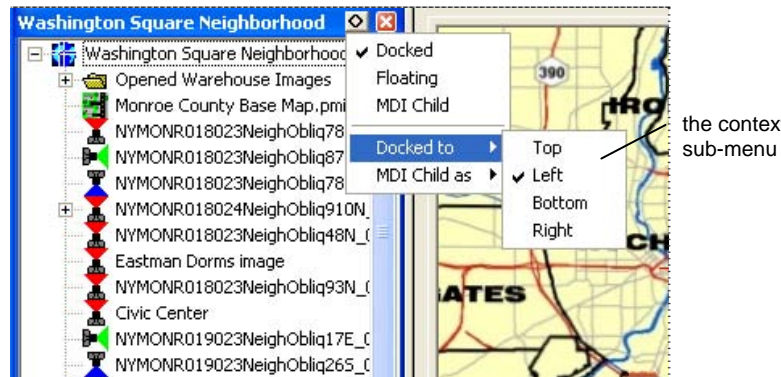
**Figure 21-2:** Context menu options that appear when you right-click the Workspace window's title bar.

◆ **To float a workspace:**

- Right-click the workspace title bar, and select **Floating**.

◆ **To move and re-dock a workspace:**

- Right-click the workspace title bar, select **Docked to**, then select the new position from the context sub-menu.



## Creating a warehouse from a workspace

Advanced User  
Mode required  
(File⇒System  
Setup⇒System)

The **Create Warehouse from Workspace** feature creates a subset of your Image Warehouse, copying out images from your open workspace. It creates a copy of the images and it creates a warehouse file (PIW file) in your destination folder. This feature is handy if you need to work where there's no access to your server. You can create a subset of your Image Warehouse on your laptop, then undock and go.

Before creating the warehouse, you must collect the desired images by adding them to a workspace. (You can use any of the methods described earlier in this chapter. See “Adding images to a workspace” on page 395.)

**Note:** This procedure does not create an entire Image Library structure.

◆ **To create a new warehouse from your workspace:**

1. Make sure that the workspace containing the images to be warehoused is active.
2. Click in the Workspace window.

**Tip:** To add the Create Warehouse button to a toolbar, see “Adding and removing toolbar buttons” in Part IV, Chapter 22.

3. Choose **Workspace⇒Create Warehouse from Workspace**.

The Save As dialog box opens. The Save as type box shows “Image Warehouses [\*.PIW],” to indicate that your current workspace should be saved as a Pictometry Image Warehouse.

4. Navigate to the directory where you want the new Image Warehouse to reside.

**Important:** Any image files (PMI and PSI) already in the directory you specify will be included in your new warehouse. If you want the new warehouse to include only the images in your workspace, specify a directory that contains no PMI files and no PSI files.

5. In the File name box, type a file name for your new Image Warehouse, and click **Save**.

A pop-up asks “Do you want to change the workspace to point to the newly created images?”

6. Click **Yes**.

**Important:** You must answer “**Yes**” in order for the active workspace to access images in their new location. Do *not* undock your laptop before this step is complete!

The pop-up and Save As dialog box close. The hourglass appears while EFS copies your images and PIW file to the new warehouse, at the path you specified. The Image window lists the files in your new Image Warehouse.



The Output window's Folder Info tab shows the file name for the new Image Warehouse.

**Tip:** To keep your workspace uncluttered, add the new warehouse to the warehouse list on the Image Tool Properties dialog box. Then you can search the new warehouse without having to add all new warehouse images to your workspace. To add the warehouse to the list, see “Linking to your Image Warehouse” in Chapter 1.



# Chapter 22 — Customizing EFS

EFS can be customized in various ways. This chapter describes the features you'll use to customize EFS to suit your preferences. You can:

- Change the appearance of the Electronic Field Study application.
- After changing the appearance, you can save the customized layout to a file that can be imported to another machine. (This feature is called "Custom Configurations.")
- Create your own custom tools and add them to the Tools menu and to a toolbar.

## Topics covered in this chapter ... page

Changing the appearance of EFS .....	413
Creating custom Configurations (screen layouts) .....	421
Creating custom tools .....	426

## Changing the appearance of EFS

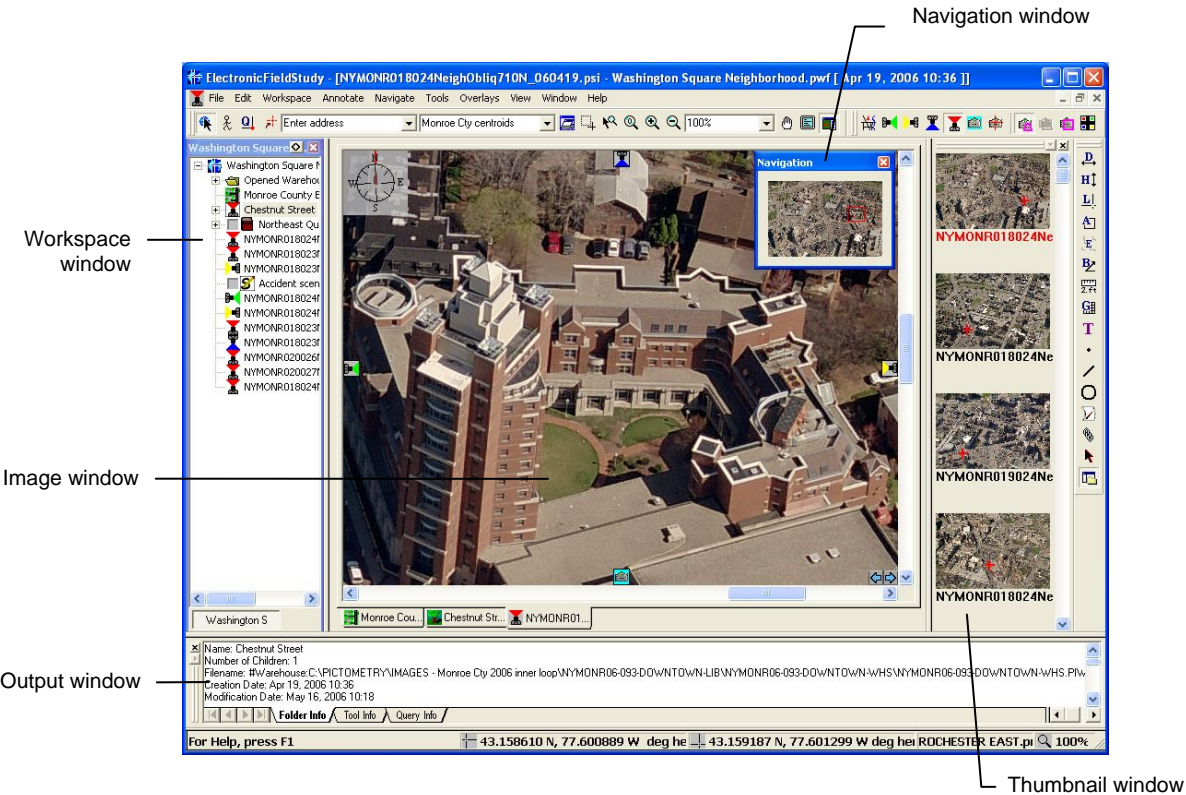
Users typically customize the appearance of EFS because they want to see information in windows not generally visible and because they want to add toolbar buttons they use frequently, or remove those they don't use. To accommodate individual needs and preferences, EFS lets you customize the appearance of the Electronic Field Study application.

You can do the following things:

- Show (or hide) the Output, Navigation, Thumbnail, and Workspace windows.
- Hide (or show) toolbars.
- **Undock** windows and toolbars so they float over images. You can leave them undocked or you can move them and **dock** (attach) them in a new position. (See "Docking and undocking windows and toolbars" on page 415.)
- Set an option that prevents the Thumbnail window from opening automatically following a search. (See "Options for opening images" in Part I, Chapter 6.)
- Customize the toolbars by adding buttons for fast access to features not already available with a toolbar button, by removing toolbar buttons you don't use, and by changing the size of toolbar buttons.
- Customize the Full Screen toolbar by adding and removing buttons.
- Change compass properties.

- Customize the Status Bar. For example, you might resize or hide a pane. You can also hide or show the Status Bar.

Figure 22-1 shows what the Electronic Field Study application might look like with all of its windows in view.



**Figure 22-1:** The EFS application with the Output, Thumbnail, Image, Navigation, and Workspace windows in view.

EFS provides layout options

These Configurations are pictured in Chapter 1. See "Choices for screen layout."

If you don't want to customize the layout yourself, you can take advantage of the four screen layouts (called "Configurations") that EFS provides. Each Configuration provides a different level of functionality (different tools and windows). You selected one of these Configurations when you ran EFS the first time after installing it.

**Table 22-1:** Configurations provided by EFS.

Configuration	Description
Version 2.6 Defaults	Provides the default settings and toolbar buttons that were found in EFS Version 2.6.
Image View	Shows the Image window, the View toolbar, and the Navigate toolbar.
Image View Measure Markup	Shows the Image window, the View toolbar, the Navigate toolbar, and the Tools toolbar.
Power User	Shows the Image, Workspace, and Output windows, plus the View, Navigate, and Tools toolbars.
Touchscreen	Shows the Image window and makes toolbar buttons large. Toolbar buttons are arranged in a special layout for touch-screen users.

To switch to one of these Configurations, see “Activating a Configuration” on page 422.

## Showing and hiding EFS windows

Use the following procedure to toggle off or on the visibility of the Output, Thumbnail, Workspace, or Navigation windows.

### ◆ To show or hide an EFS window:

- Click the desired button as indicated by the following table or choose the corresponding View menu option:



Shows and hides the Output window.



Shows and hides the Navigation window.



Shows and hides the Thumbnail window.



Shows and hides the (Pictometry) Workspace window.  
Does not close the workspace.

## Docking and undocking windows and toolbars

Toolbars and windows can be undocked so they float on the Image window. EFS groups buttons into toolbars. Each toolbar can be docked or undocked.

### ◆ To undock a window or a toolbar:

- With the mouse pointer, grab the left side of the toolbar or the top edge of the window, and drag it to another spot on the screen *within* the Image window. (Be sure the mouse pointer looks like an arrow before you drag.)

*You'll grab the toolbar or the window on a "striped" area.*



**Note:** If you move the undocked window or toolbar to an area outside the Image window, it will attach (dock) to a spot outside the Image window. (Holding down the **CTRL** key prevents the window or toolbar from docking anywhere.)

- Release the mouse button. The window or toolbar floats on the image in the Image window, and you can resize it and move it around within the Image window.

### ◆ To dock a window or a toolbar:

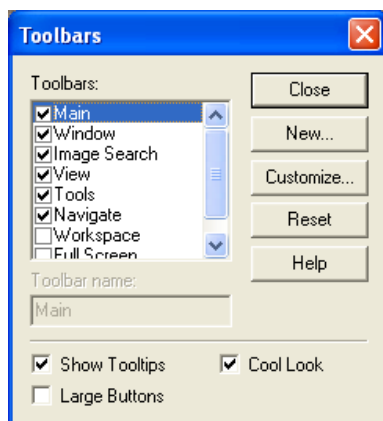
- With the mouse pointer, grab the left side of the toolbar or the top edge of the window, and drag it to another spot *outside* the Image window. (Be sure the mouse pointer looks like an arrow before you drag.)
- Release the mouse button. The toolbar or window snaps into place.



## Hiding and showing toolbars

### ◆ To hide or show toolbars:

1. Choose **View⇒Toolbars**. The Toolbars dialog box opens.



2. Check (to show) or uncheck (to hide) the desired toolbars, then click **Close**.

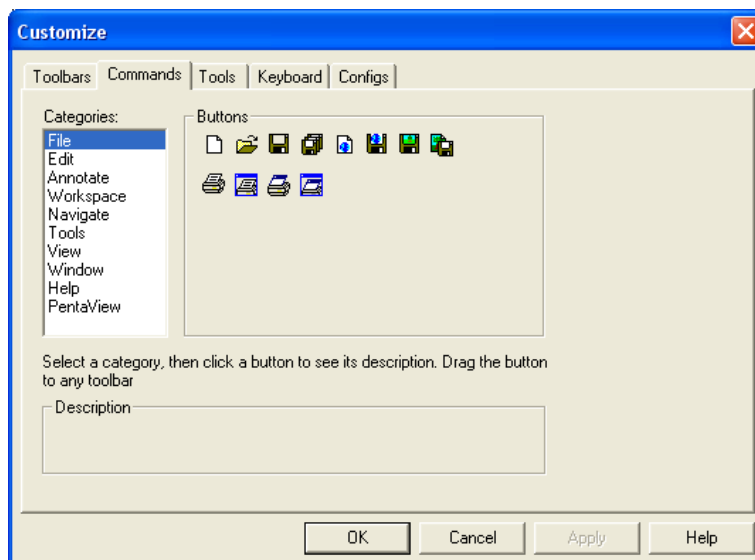
## Customizing toolbars

### Adding and removing toolbar buttons

EFS toolbars contain the tools and buttons used most often. However, EFS provides additional buttons that you can place on toolbars.

### ◆ To add a button to a toolbar:

1. Choose **Tools⇒Customize⇒Commands** tab.



**Note:** If medium or large toolbar buttons are selected, you may not see all available buttons on this tab. To select small buttons, click the **Toolbars** tab, click **Small Buttons**, then click the **Commands** tab and resume this procedure.



2. Select the category that contains the button you wish to add.
3. Use the mouse to grab the button and drag it to the desired toolbar. Release the mouse button and click **OK**.

The button is added to a toolbar or is added as a new toolbar (“Toolbar n” where “n” is one more than the number of the last toolbar you added), depending on where you drag it.

4. (Optional) Dock the tool by grabbing its left side and dragging it close to another toolbar. It will “connect” with the neighboring toolbar and dock into place.

#### ◆ To remove a button from a toolbar:

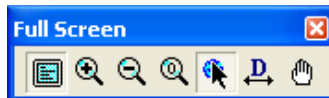
1. Choose **Tools**⇒**Customize**. The Customize dialog box opens.
2. Use the mouse to grab the button you wish to remove. Drag the button anywhere *within* the Image window, but not over the Customize dialog box. Release the mouse button and click **OK**.

### Customizing the Full Screen toolbar

EFS displays a special toolbar when you’re working in Full Screen Mode.

#### ◆ To add a button to the Full Screen toolbar:

1. Choose **Tools**⇒**Customize**⇒**Toolbars** tab. The Customize dialog box opens and the Toolbars tab appears.
2. In the Toolbars list, check **Full Screen**. The Full Screen toolbar appears.



3. Click the **Commands** tab.
4. Follow Steps 2 and 3 (on page 416) of the procedure “To add a button to a toolbar,” dragging the new button to the *Full Screen* toolbar.
5. Click **OK**. The Customize dialog box closes.
6. (Optional) To close the Full Screen toolbar, click its close box

The button you added will appear on the Full Screen toolbar every time it opens until you later remove the button.

**To remove a button from the Full Screen toolbar**, follow the procedure “To remove a button from a toolbar” on page 417.

### Changing toolbar button size

*For touch-screen users*

The Customize option on the Tools menu lets you select large toolbar buttons. There are three options for toolbar button size—small, medium, and large. The large toolbar buttons were designed with touch-screen users in mind.

## Options for viewing the compass

EFS provides the following options for viewing the compass. You can:

- View the active image's compass in the Navigation window,
- View compasses for all open images on those images in the Image window, or

*Your system may already be set up to include one or more of these options.*

**Note:** You can also choose whether to show the compass on an open image always or only when the mouse pointer hovers over the compass position in the Image window.

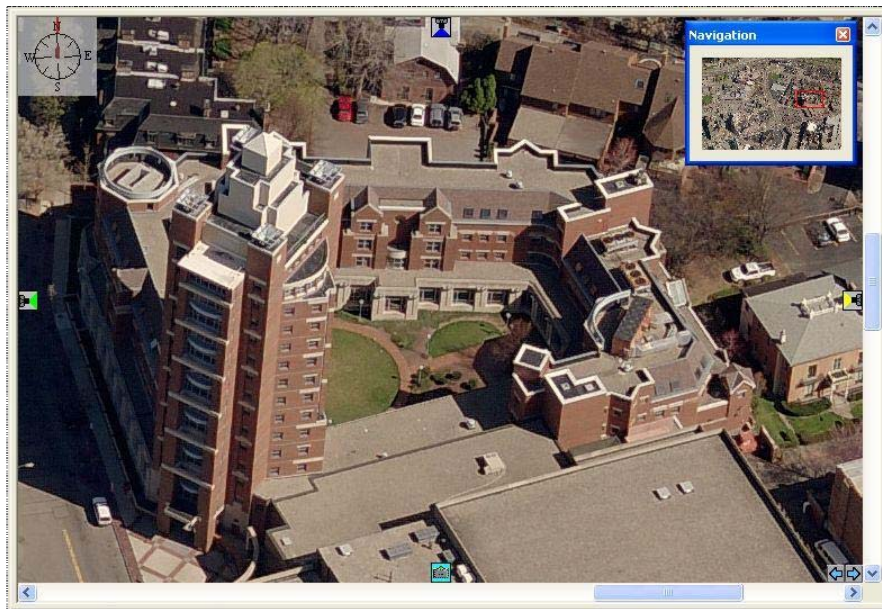
- Float the Navigation window anywhere on the screen. This allows you to see the thumbnail and compass, while maximizing space for the image. (See Figure 22-1 on page 414.)

### Viewing the compass in the Navigation window

If not already in view, you can view the compass for the active image in the Navigation window by choosing **View**⇒**Navigation window**. The compass shown in the Navigation window is for the active image only.

### Viewing compasses on images

EFS gives you the option of viewing an image's compass directly over the image. (Your system may show the compass on image by default.) This allows you to hide or shrink the Navigation window without losing the orientation of the active image. Hiding or shrinking the Navigation window gives you more screen space for your images.



**Figure 22-2:** The compass in the Image window.

**Note:** In addition to having a compass on an image, you can view the thumbnail in the Navigation window. If you choose this option, be sure that **“Fit floating Navigation Window to thumbnail”** is checked on the Navigation Properties dialog box so the window takes the least amount of screen space. See “Floating the Navigation window” on page 419.

### *Affects all open images*

With the View Compass on Image option, a compass appears on each open image.

#### ◆ **To view compasses in the Image window:**

Do *one* of the following:

- Right-click anywhere in the Image window, then choose **Windows⇒View Compass on Image**.
- or —
- Choose **View⇒Compass on Image**.

Each open image is overlaid with its compass. (Depending on how your windows are arranged—tiled or cascaded—you may see the compass for the active image only.)

### **Floating the Navigation window**

If your Navigation window is docked, you can maximize screen space by floating (undocking) it. (See Figure 22-1 on page 414.) To float the Navigation window, follow the procedure for undocking a window on page 415.

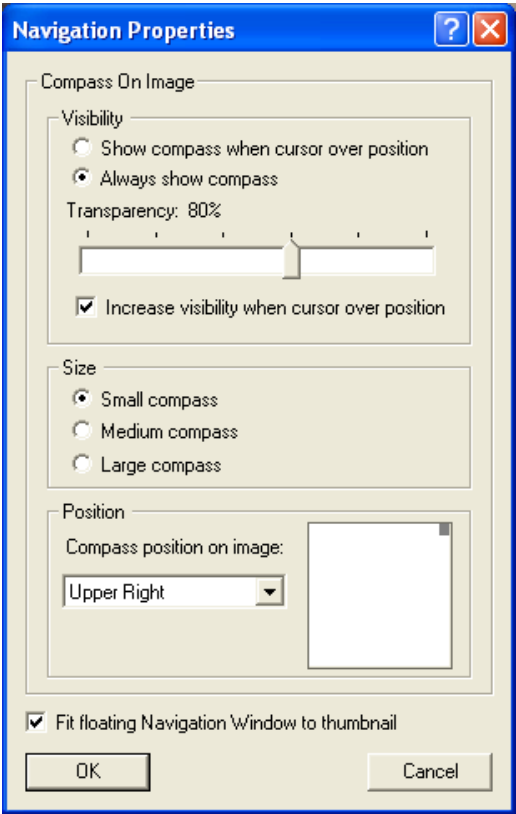
**Note:** To float the Navigation window outside of the Image window, *uncheck* **“Allow Docking”** from the Navigation window’s context menu before floating it.

## **Compass properties**

Use the following procedure to change the properties that define the position, transparency, and behavior of the compass in the Image window.

#### ◆ **To change compass properties:**

1. Choose **View⇒Navigation Properties**. The Navigation Properties dialog box opens.



2. Change the compass properties as desired, using the following table as a guide.

Dialog box item	Description
Visibility	<p>Click <b>Show compass when cursor over position</b> to have the compass appear only when the cursor hovers over the designated position.</p> <p>Click <b>Always show compass</b> to have the compass appear all the time.</p>
Transparency slider	Move the slider to the left for a more transparent compass, or to the right for a less transparent compass.
Increase visibility when cursor over position	Check this box to make the compass easier to see (less transparent) when the cursor is on it.
Size	Click the option corresponding to the desired compass size.
Compass position on image	<p>From the drop-down list, select the position in which you want the compass to appear on the image.</p> <p>– or –</p> <p>In the box to the right of the list, click the desired location.</p> <p><b>Note:</b> There are eight possible locations for the compass (the four corners, plus the center of each side).</p>
Fit floating Navigation Window to thumbnail	Check this box if you want EFS to resize the floating Navigation window to fit its thumbnail each time you change images. (You would then need to widen the window to view the compass.)

3. Click **OK**.

## Customizing the Status Bar

You can customize the Status Bar in the following ways:

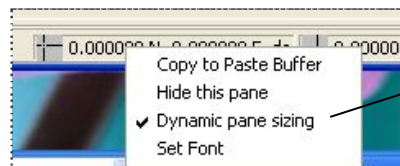
- Hide or show the Status Bar
- Hide a pane (except the Status Area pane)
- Show a hidden pane
- Customize a pane's font
- Resize a pane

### ◆ To hide or show the Status Bar:

- Choose **View**⇒**Status Bar** and check or uncheck the option as desired. (Check the option to view the Status Bar, uncheck it to hide it.)

### ◆ To customize the Status Bar:

1. Right-click the pane you want to change.
2. From the context menu, choose the desired option.



This option causes EFS to dynamically resize the panes in order to best accommodate its variable data.

### ◆ To resize a pane:

1. Click-and-hold the left edge of the pane to be resized. (A double headed arrow appears.).
2. Drag the pane left to widen it or right to narrow it.

Except for the Status Area, which has a minimum size, panes may be overlapped so only their gray icons show. There is a finite amount of space available for the panes. When resizing a pane, any panes to the left maintain their sizes. Panes to the right will shrink and possibly scroll off the window and disappear as they approach the right edge of the window. You might find resizing panes tricky at first, but you'll quickly get the hang of it with a little practice.

## Creating custom Configurations (screen layouts)

*EFS provides default Configurations.*

Because people often work with the same software in different ways, EFS allows you to create multiple versions of the EFS application's appearance. You can customize your EFS application and toolbars, and save the result as a "Configuration." You can define many different Configurations, then switch back and forth between them as desired.

### What is a Configuration?

A Configuration is a stored record of the visibility, size, and placement of the EFS toolbars and windows, as well as your Status Bar and compass preferences.

You can have multiple Configurations and switch between them as desired. Only one Configuration can be active at a time.

## Creating a new Configuration

### ◆ To create a new Configuration:

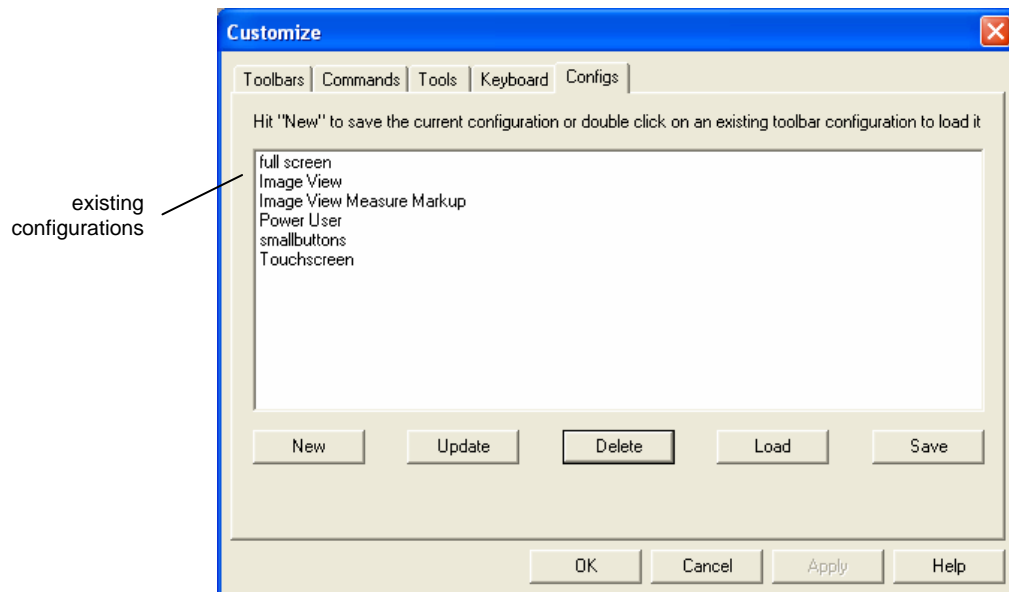
1. Customize the EFS screen as desired.

#### Some things you might change:

- Resize the various windows
- Position any floating window
- Show, hide, or float the Thumbnail and Navigation windows
- Remove the compass from the Image window or change its transparency
- Customize the Full Screen toolbar or any toolbar
- Customize the Status Bar
- Change the look and size of the toolbar buttons

2. Choose **Tools**⇒**Customize**⇒**Configs** tab.

The Customize dialog box opens and its Configs tab appears.



3. Click **New**, type a name for the screen layout you've configured, and click **OK**. The Configuration name is listed in the dialog box.

**Note:** Your Configuration is saved automatically. (You do not need to save your workspace to save the new Configuration.)

4. Click **OK**. The Customize dialog box closes.

## Activating a Configuration

You can activate a Configuration that you've previously defined and saved, or one of the default Configurations provided by EFS.

### ◆ To activate a Configuration:

1. Choose **Tools**⇒**Customize**⇒**Configs** tab.

**Hint:** If you want to save the *current* Configuration for later use, be sure to save it before starting Step 2.

2. Double-click the name of the Configuration you wish to activate. The Configuration changes immediately.
3. Click **OK**. The Customize dialog box closes.

**Note:** Clicking **Cancel** causes the layout to revert to the previous Configuration.

The Configuration you selected will now appear each time you start EFS, unless you customize it or select a different layout.

## Changing a Configuration

### ◆ To change a Configuration:

1. Choose **Tools**⇒**Customize**⇒**Configs** tab.
2. Double-click the Configuration you wish to change. It becomes the active Configuration.
3. Click **OK** to exit the Customize dialog box.
4. Make the desired changes to EFS.
5. Choose **Tools**⇒**Customize**⇒**Configs** tab.
6. Select the Configuration you wish to change.
7. Click **Update**, then click **OK**.

## Deleting a Configuration

### ◆ To delete a Configuration:

1. Choose **Tools**⇒**Customize**⇒**Configs** tab.
2. Select the Configuration to be deleted, and click **Delete**.  
You'll be prompted to confirm the deletion.
3. Click **Yes** in response to the prompt.
4. Click **OK**. The Customize dialog box closes.

**Hint:** To return to the EFS Configuration that was loaded at startup, choose **Toolbars**⇒**Reset All**.

## Configurations can be exported to PCF files

### What is a PCF file?

A Configuration can be saved *internally* in EFS (as described in “Creating a new Configuration” on page 422), but it can also be saved *externally*—exported to a file—a Pictometry Configuration File (or PCF file). Creating a PCF file allows you to distribute Configurations to other machines.

*For System  
Administrators*

## Two ways to create a PCF file

There are two ways to create a PCF file:

- By using the EFS application, or
- By using the EFS Toolbar Configuration Editor (a separate program).

If you create a PCF file from within EFS, the file *will contain only one EFS Configuration* and can be loaded back into EFS (or to someone else's machine running EFS). See "Loading a Configuration from a PCF file created in EFS," on page 425.

If you create a PCF file by using the EFS Toolbar Configuration Editor, the file *can contain multiple EFS Configurations and various other EFS settings and information*.

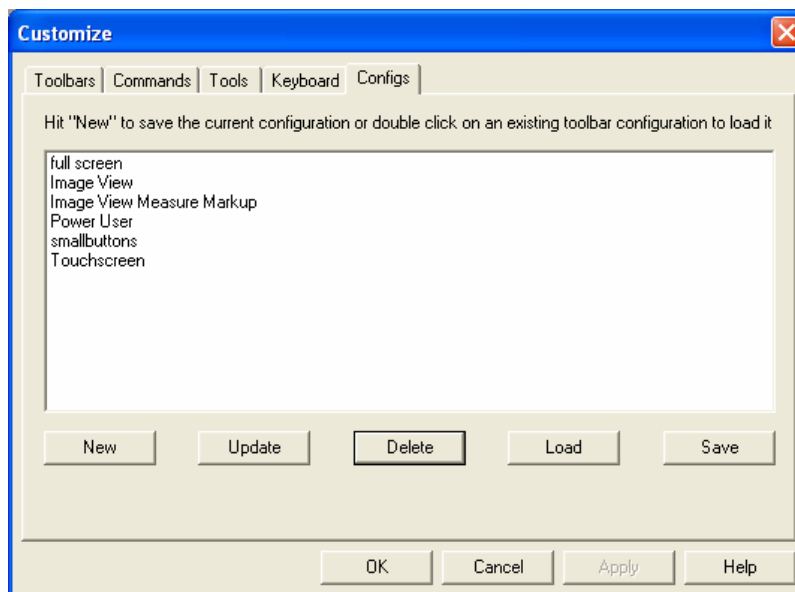
The first method is discussed in the following topic; the second is covered in the *EFS System Administrator Guide*.

## Using EFS to save a Configuration to a PCF file

### ◆ To save a Configuration to a PCF file:

1. Create the Configuration you want to save as a PCF file. (Follow the procedure described in "Creating a new Configuration" on page 422.)
2. Choose **Tools**⇒**Customize**⇒**Configs** tab.

The Customize dialog box opens. Its Configs tab is active.

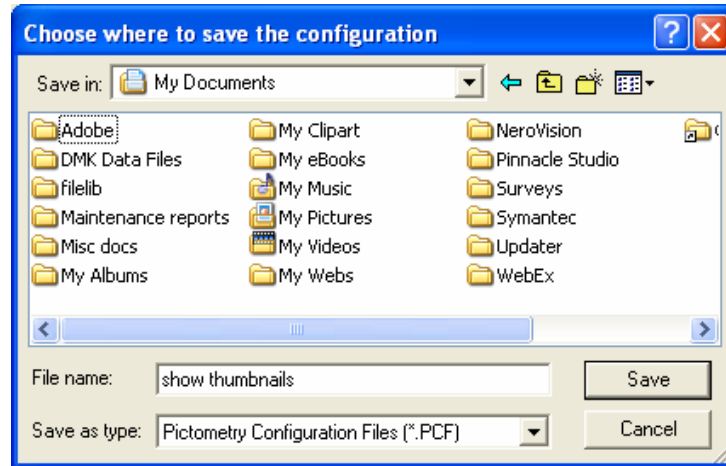


3. Select the Configuration to be saved to a PCF file, and click **Save**. The following dialog box appears.



**Reminder:** Some directories may be read-only. Navigate to a directory for which you have write permissions.

*Your screen may not look exactly like this one.*



4. Type a name for the PCF file (or overwrite an existing one if you wish to change a previously saved PCF file). Then click **Save**.
5. Click **OK**. The Customize dialog box closes and the PCF file is saved in the directory you chose.

### Loading a Configuration from a PCF file created in EFS

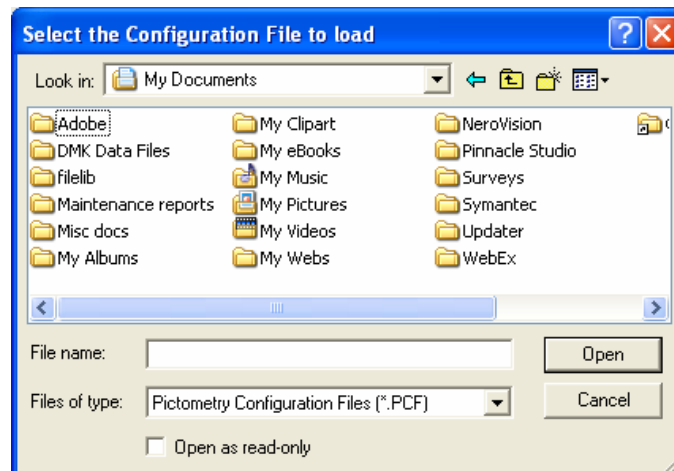
Use the following procedure to load a Configuration from a PCF file that was created in EFS. Loading a Configuration adds it to the list of stored Configurations; it *does not make the Configuration active*.

**Important:** This method is recommended for PCF files that were created in EFS, but will *not* work for PCF files created by using the EFS Toolbar Configuration Editor.

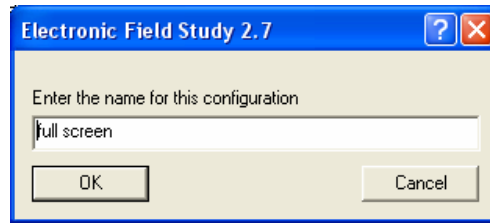
#### ◆ To load a Configuration from a PCF created with EFS:

1. Click **Tools**⇒**Customize**⇒**Configs** tab. The Customize dialog box opens.
2. Click **Load**. A dialog box opens.

*Your screen may not look exactly like this one.*



3. Navigate to the directory that contains the PCF file you wish to load, select the PCF file, and click **Open**. A dialog box opens.



The dialog box shows the name of the Configuration stored in the PCF file you are loading (which may be different from the PCF file name).

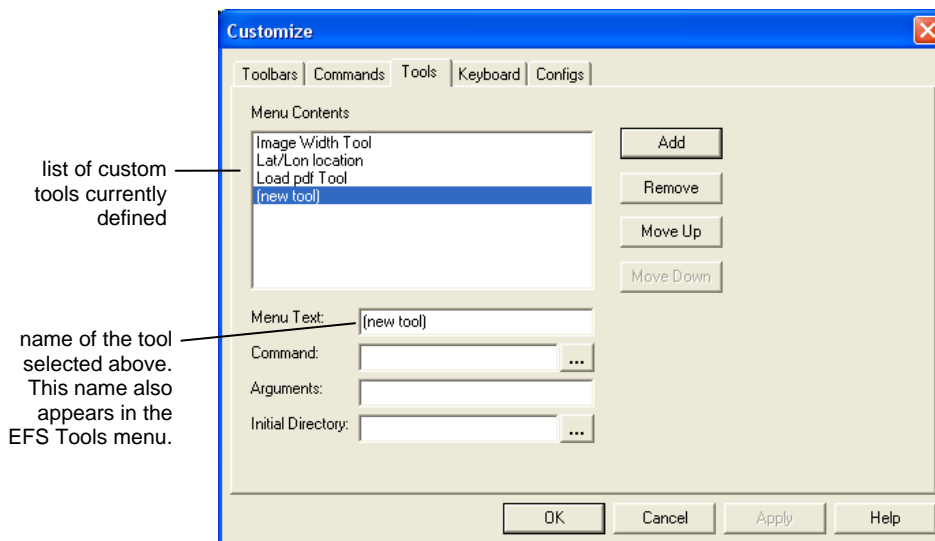
4. If you wish to give the Configuration a different name than the one shown, type a new name.
5. Click **OK**. The dialog box closes and the Configuration is added to the list of existing Configurations.
6. Click **OK**. The Customize dialog box closes.

The PCF file is loaded into EFS. Its name is added to the list of Configurations. (To activate this Configuration, you must double-click its name in the list.)

## Creating custom tools

In addition to providing various tools, EFS lets you create your own custom tools and add them to the Tools menu and to a toolbar. You can use this feature as way to run external programs within EFS.

You'll use the Customize dialog box to define your custom tools.



**Figure 22-3:** The Customize dialog box with the Tools tab open.

**Note:** The procedure for creating a custom tool begins on page 430.

## Command line arguments

Custom tools can include command line arguments, which you specify when you define the tool. Arguments can be plain text or macros that are expanded before the custom tool is called.

### Plain text arguments

Plain text arguments are passed to the custom tool “as is.” No changes are made to plain text arguments.

### Macro arguments

A macro argument is converted to the value it represents before the custom tool is called. A macro argument can have plain text directly before and after it.

For example:

macro argument
plain text argument

/outfilename=%FILENAME%.out

EFS evaluates a macro argument from left to right.

If EFS can’t retrieve the value a macro argument represents, it passes the argument verbatim (without any conversions) to the custom tool.

If there is white space in the value of a macro, the value is enclosed in double quotes.

There are two types of macro arguments—direct (those requiring user input) and indirect (those *not* requiring user input).

### Direct macro arguments

The following table lists and describes direct macro arguments.

**Table 22-2:** Direct macro arguments.

Direct macro argument	Description
%WORKSPACENAME%	name of the loaded, active workspace
%FILENAME%	name of the active image file
%NAME%	name of folder associated with the active image
%CREATIONDATE%	creation date for the active image
%MODIFICATIONDATE%	modification date for the active image
%IMAGESIZEPIXEL%	size of the active image in pixels <i>format: &lt;width&gt;x&lt;height&gt;.</i>
%IMAGEWIDTHPIXEL%	width of the active image in pixels
%IMAGEHEIGHTPIXEL%	height of the active image in pixels
%IMAGECENTERPIXEL%	center of the active image in pixels <i>format: &lt;X center&gt;:&lt;Y center&gt;</i>

*EFS interprets measurements in the units currently defined. (See and change units via **Edit**⇨**Change Units**.)*

**Table 22-2:** Direct macro arguments. (continued)

Direct macro argument	Description
%IMAGECENTERLOC%	center of the active image in Lat/Lon coordinates <i>format: &lt;longitude&gt;:&lt;latitude&gt;</i>
%IMAGERECTANGLELOC%	bounding corners of the active image in Lat/Lon coordinates. <i>format for each corner: &lt;longitude&gt;:&lt;latitude&gt;</i> <i>format for argument: &lt;upper left corner&gt;:&lt;upper right corner&gt;:&lt;lower left corner&gt;:&lt;lower right corner&gt;</i>
%IMAGEUPPERLEFTLOC%	upper left corner of the image in Lat/Lon coordinates <i>format: &lt;longitude&gt;:&lt;latitude&gt;</i>
%IMAGEUPPERRIGHTLOC%	upper right corner of the image in Lat/Lon coordinates <i>format: &lt;longitude&gt;:&lt;latitude&gt;</i>
%IMAGELOWERLEFTLOC%	lower left corner of the image in Lat/Lon coordinates <i>format: &lt;longitude&gt;:&lt;latitude&gt;</i>
%IMAGELOWERRIGHTLOC%	lower right corner of the image in Lat/Lon coordinates <i>format: &lt;longitude&gt;:&lt;latitude&gt;</i>
%CROSSHAIRLOC%	current crosshair position in Lat/Lon coordinates <i>format: &lt;longitude&gt;:&lt;latitude&gt;</i>
%NORTHANGLE%	degrees off True North of the active image "up" direction
%BASEELEVATION%	base elevation of the active image.
%IMAGETYPE%	image type of the active image. Can be "Oblique", "Ortho", or "Other".
%PERPIXELRESOLUTION%	per-pixel resolution of the active image

### Indirect macro arguments

If you use an indirect macro argument, then when you use the new tool, you'll click somewhere on the active image. EFS will determine the argument's value, based on where you clicked.

**Table 22-3:** Indirect macro arguments.

Indirect macro argument	Description
%CLICKPIXEL%	location you clicked in the active image, in pixels <i>format: &lt;X position&gt;:&lt;Y position &gt;</i>
%CLICKLOC%	location you clicked in the active image, in Lat/Lon <i>format: &lt;longitude&gt;:&lt;latitude&gt;</i>
%ANNO:<folder name>:<field name>%	field value of the indicated annotation folder at the selected location on the currently active image <i>Format depends on the value of the field.</i>

The following dialog box appears to help you decide where to click:

**Customized Tool Lat/Lon location**

Please select location to send to Lat/Lon location tool.

Current Position  
43.155600 N, 77.606495 W deg hem  
1666, 676 image position

Selected Position

☐ Use this location for all parameters

OK

name of your new tool

When you click a point, the Selected Position is filled in:

*You can click more than once. The Selected Position is updated each time.*

**Customized Tool Lat/Lon location**

Please select location to send to Lat/Lon location tool.

Current Position  
43.155791 N, 77.604867 W deg hem  
1554, 270 image position

Selected Position  
43.155552 N, 77.606469 W deg hem  
1698, 671 image position

☐ Use this location for all parameters

OK

Check this box to use the location you clicked for all indirect macro arguments. (Otherwise, this dialog box appears for every indirect macro argument you specify.)

## Macro value formatting

You can specify the format and placement of values for the following macro arguments:

- %CROSSHAIRLOC%
- %CLICKPIXEL%
- %CLICKLOC%

## Specifying a format

You'll specify the format directly after the macro name and before the closing percent sign. The format is preceded by a colon (:), and can contain text and argument positions. You don't need to specify all argument positions.

The text can consist of any character, with the exception of the equal sign (=). Argument positions are indicated by an ampersand (&), followed immediately by the numeric position of the argument in the original format. For example, the first parameter is indicated by "&1", the second by "&2", and so on.

The following can be used as an argument to "iexplore.exe," causing Map Quest to come up and show the clicked Lat/Lon position at zoom level 8.

```
http://www.mapquest.com/maps/map.adp?zoom=8&latlongtype=decimal&latitude=%CLICKLOC:&2%&longitude=%CLICKLOC:&1%
```

As you can see from the example, you might need to click twice if you forget to check "Use this location for all parameters" when you selected the location.

Also from the example, the %CLICKLOC:&2% command is replaced with the second value of the %CLICKLOC% macro, and the first value is discarded. Likewise, the %CLICKLOC:&1% command is replaced with the first value of the macro, and the second value is discarded.

### Procedure for creating a custom tool

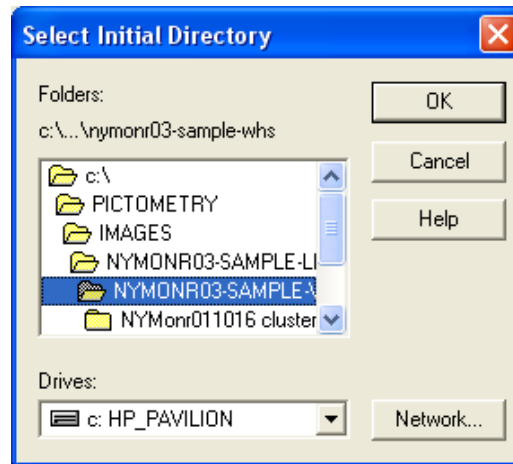
Use the following procedure to create a custom tool.

**Note:** Your custom tool can run a program that is external to EFS.

#### ◆ To create a custom tool:

1. Click **Tools**⇒**Customize**⇒**Tools** tab. The Customize dialog box opens and the **Tools** tab is active. (See Figure 22-3 on page 426.)
2. Click **Add**. The text "(new tool)" appears in the Menu Contents and Menu Text boxes.
3. In the Menu Text box, type a name for the custom tool. This is the name that will appear on the Tools menu.
4. Click the **"Browse"** button to the right of the Command box. Navigate to the directory that contains the program you want this custom tool to run.
5. (Optional) In the Arguments box, type an argument. (See "Command line arguments" on page 427.)
6. Click the **"Browse"** button to the right of the Initial Directory box. The Select Initial Directory dialog box opens.





**Note:** When EFS is running, the last folder EFS accessed may not be the location your custom tool needs. Therefore, you should set the Initial Directory to the directory that the tool needs to access when it's started.

- a. (Optional) Click **Network** if you wish to map a network drive from which to select the Initial Directory. The mapped drive is added to the list of drives.
  - b. Select the drive that contains the directory you want to set as the Initial Directory.
  - c. Click **OK**. The Select Initial Directory dialog box closes.
7. Click **OK**. The Customize dialog box closes.

You can now use the custom tool you created.

### Using a custom tool

Once your custom tool is created, you can access it in the following ways:

- by choosing **Tools**⇒<custom tool name>, or
- by adding it to an EFS toolbar as a “user-defined” tool and then clicking the tool on the toolbar when you want to use it.

### Adding a user-defined tool to a toolbar

The procedure for adding a user-defined tool to a toolbar is similar to the procedure for adding an EFS tool to a toolbar.

#### ◆ To add a user-defined tool to a toolbar:

1. Choose **Tools**⇒**Customize**⇒**Commands** tab.
2. In the list of Categories, select **Tools**.
3. Use the mouse to grab “**User-Tool n**” (where “n” is a number from 1 to 4 corresponding to the order in which you added custom tools)
4. Drag the tool icon to the desired toolbar, release the mouse button, and click **OK**.



The button is added to a toolbar or is added as a new toolbar, (Toolbar “n” where “n” is one more than the number of the last toolbar you added), depending on where you drag it.

5. (*Optional*) Dock the tool by grabbing its left side and dragging it close to another toolbar. It will “connect” with the neighboring toolbar and dock into place.



# Part V

## Reference

For information about ...	See ...
Tools found on toolbars	Appendix A
Context menus	Appendix B
ALOHA annotations	Appendix C
Features available with Advanced User Mode	Appendix D
InQuest OSGB-36 Coordinate System	Appendix E
MGRS Coordinate System	Appendix F
PGS Scripts	Appendix G
Getting technical support and downloading updates from the web	Appendix H
Terms	Glossary
Where to find a topic in the <i>EFS User Guide</i>	Index

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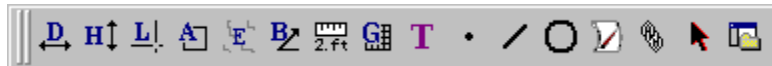
# Appendix A — EFS Toolbars

This appendix is organized into two parts. The first part describes toolbar buttons that may be visible after you install EFS (depending on the default screen layout you chose after installation). The second part describes other frequently used buttons that you might consider adding to a toolbar.







## Installed toolbar buttons

After installation, the following toolbars may be available on your screen.

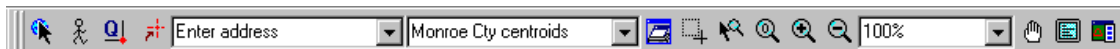
### The Tools toolbar









	Distance Tool	Measures three different things, depending on how you use the tool: 1) the distance between two points in an image, 2) the cumulative distance along a series of straight-line segments, or 3) the distance between points that are on different images.
	Height Tool	Measures two different things, depending on how you use the tool: 1) the height of an object, or 2) the facade of a building in an image.
	Location Tool	Gives the geographic coordinates for a point you click in an image.
	Area Tool	Calculates the area of any part of an image.
	Elevation Tool	Gives the elevation of the point (or differential elevation of the points) you click in an image after activating the Elevation Tool.
	Bearing Tool	Measures the bearing (the orientation from True North) of an angle you outline in the active image. Also measures the angle formed by any object in an image.
	Change Units	Opens the Units dialog box so you can change units of measure and coordinate systems.
	Grid Tool	Lets you place a rectangular or circular grid overlay on an image in the Image window and enter data in the grid's segments. Prior to placing the grid, you'll specify the type of overlay and its characteristics on the Grid Tool Properties dialog box.
	Text Annotation Tool	Lets you add text annotations to the active image or to all images in the warehouse that contain the same geographic coordinates as the annotation.
	Point Annotation Tool	Lets you place a point, symbol, or icon on the active image or on all images in the warehouse that contain the same geographic coordinates as the point.

	Line Annotation Tool	Lets you place a line on the active image or on all images in the warehouse that contain the same geographic coordinates as the annotation.
	Circle Annotation Tool	Lets you place a circle on the active image or on all images in the warehouse that contain the same geographic coordinates as the annotation.
	Icon Annotation Tool	Lets you place an icon on the active image or on all images in the warehouse that contain the same geographic coordinates as the annotation.
	Link Annotation Tool	Lets you link a file (such as a document, spreadsheet, or any viewable file) with a location in the active image or in all images in the warehouse that contain the same geographic coordinates as the link annotation. A link icon appears at the location (a point you click). Double-clicking the icon opens the file.
	Select Tool	<p>Lets you move an annotation (text, circle, line, link, point, icon) or a group of annotations in the active image. Double-clicking an annotation after activating the Select Tool opens the annotation's Properties dialog box so you can view and change the annotation's attributes.</p> <p>Also lets you click an elevation contour line to see the elevation at the level represented by that line. Highlights the line as well as any other contour line associated with that elevation.</p>
	View Pictometry Workspace	Shows or hides the Pictometry Workspace window. Does not close the workspace.








## The View toolbar



**Note:** Depending on the screen layout you've chosen, your View toolbar may not look exactly like this one.







	Image Tool	Searches for images containing the geographic point you clicked. You can search Image Warehouses, the current workspace, or both. Also used to select a point in an image to be magnified with the Zoom In or Zoom Out buttons.
	Navigate Tool	Lets you "walk" around in one or more images to locate a point of interest or plan a route. Calculates the distance of the route "walked."
<b>Note:</b> Is not the same as "Walk the Earth."		
	GIS Query Tool	Lets you query GIS data in an image by clicking a point in the image to view the GIS data associated with that point (if you have imported GIS data covering the same geographic area as the point you clicked).
	Go To	Opens the Go to dialog box so you can search for images by coordinates or by street address.
	Print Window Preview	Shows a print preview of the contents of the Image window as it appears on your screen.
	Extract Tool	Trims a copy of the image in the Image window to fit the rectangle you draw (or specify numerically) and exports the new image to a file.






**Note:** The following Zoom buttons change how the image is displayed in the Image window; they don't change the image itself.

	Zoom Tool	If you click a point, doubles in size and repositions the active image so that the point is at or closer to the center of the Image window. If you drag a rectangle, magnifies and repositions that area to fill the Image window.  May affect <i>all</i> open images, depending on how Zoom Tool properties are set. See “Applying zoom to all open images” in Part I, Chapter 8.
	Zoom 100%	Returns the image back to its starting size of 100%. This is sometimes designated as 1:1, meaning one pixel in the image is shown as one pixel on the screen.
	Zoom In	Doubles the magnification of the active image.
	Zoom Out	Reduces the magnification of the active image by half.
	Pan Tool	Scrolls the image around in the Image window.
	Full Screen	Expands the contents of the Image window to fill your screen. Press <b>ESC</b> to change back from Full Screen Mode to viewing windows.
	View Thumbnails	Shows or hides the Thumbnail window.

## The Navigate toolbar



	View Map	Opens either a high-detail map or a base map depending on the button's position and the available maps.
	View From West	Displays an image captured from the west showing the same geographic area as the image currently in the Image window.
	View From East	Displays an image captured from the east showing the same geographic area as the image currently in the Image window.
	View From North	Displays an image captured from the north showing the same geographic area as the image currently in the Image window.
	View From South	Displays an image captured from the south showing the same geographic area as the image currently in the Image window.
	View From Ortho	Displays an Orthogonal (straight down) image that most closely covers the same geographic area as the Oblique image currently in the Image window.



	Center Navigation	Places the Navigation Point (red crosshair) at the center of the image in the Image window. Useful for setting a starting point when using the Navigate Tool.
	View Neighborhood	Displays a Neighborhood shot level image of the same geographic area as the image currently in the Image window.
	View Community	Displays a Community shot level image of the same geographic area as the image currently in the Image window.
	View Ortho Sector Tile	Displays the Ortho Sector Tile of the same geographic area as the image currently in the Image window.
	PentaView	Opens a second copy of the active image in PentaView “mode” and opens up to five scenes of the same location—each from a different angle or direction (N, S, E, W, Orthogonal)—in a “view scenes at corners” arrangement. The active image is placed in the main PentaView window (in the center of the Image window).

## Other buttons you might add to toolbars



The following buttons are not on the toolbars following installation. However, if you’re using them often, you might consider adding them to a toolbar. (For more information about adding buttons to the toolbars, see “Customizing toolbars” in Part IV, Chapter 22.)

### Buttons that change the appearance of the active image







**Note:** These options change how the image is displayed in the Image window; they don’t change the image itself.

	Brightness and Contrast	Lets you adjust the brightness and contrast of the active image.
	Zoom Home	Changes the size of the image so the entire image fits in the Image window.



### Buttons that show and hide EFS windows

	View Navigation Window	Shows or hides the Navigation window.
	View Output Window	Shows or hides the Output window.




## Buttons that limit image searching

	Limit Image Search	When turned <i>on</i> , lets you click the other search buttons to limit the search by shot level (Community or Neighborhood) or by image type (Oblique, Orthogonal, or Rural, Other, GIS Images).
	Image Search Includes Communities	When <i>on</i> , Community images will be included in the search hits shown in the Thumbnail window whenever the warehouse is searched. (When <i>off</i> , Community images will be excluded.)
	Image Search Includes Neighborhoods	When <i>on</i> , Neighborhood images will be included in the search hits shown in the Thumbnail window whenever the warehouse is searched. (When <i>off</i> , Neighborhood images will be excluded.)
	Image Search Includes Oblique	When <i>on</i> , Oblique images will be included in the search hits shown in the Thumbnail window whenever the warehouse is searched. (When <i>off</i> , Oblique images will be excluded.)
	Image Search Includes Orthos	When <i>on</i> , Orthogonal images will be included in the search hits shown in the Thumbnail window whenever the warehouse is searched. (When <i>off</i> , Orthogonal images will be excluded.)
	Image Search Includes Others	When <i>on</i> , “other” images—base maps and any images that are not Community, Neighborhood, or Rural—will be included in the search hits shown in the Thumbnail window whenever the warehouse is searched. (When <i>off</i> , “other” images will be excluded.)


## Buttons for setting tool properties

	Image Tool Properties	Opens the Warehouse List tab of the Properties dialog box so you can set or change various options for searching an Image Warehouse and displaying the search results.
	Tool Properties	Opens the Properties dialog box for the tool currently active so you can set or change its attributes.

## Standard buttons

	Help Topics	Provides online help.
	Print Preview	Shows a print preview of the entire active image.
	Undo	Reverses the previous action.

## Buttons for viewing images in Standard View

	Cascade Windows	Displays open images in an overlapping fashion in the Image window.
---	-----------------	---

## Buttons for viewing scenes in PentaView



View Scenes at Corners

In PentaView, displays the four scenes in the corners of the Image window and the Main PentaView image in the center.



View Scenes On Bottom

In PentaView, displays the four scenes underneath the Main PentaView image in the Image window.



View Scenes On Left

In PentaView, displays the four scenes to the left of the Main PentaView image in the Image window.



View Scenes On Right

In PentaView, displays the four scenes to the right of the Main PentaView image in the Image window.



View Scenes On Top

In PentaView, displays the four scenes on top of the Main PentaView image in the Image window.

## Workspace buttons



Cut

Deletes an item from the workspace (not from the Image Warehouse) and places it on the clipboard.



Delete

Removes an item (image, map, annotation, annotation layer, or folder plus its contents) from the workspace.



Open

Opens an existing workspace, an image, or a warehouse.



New Workspace

Creates a new workspace.



Save

Saves any changes to the open workspace.



# Appendix B — Context Menus

Context menus are context-sensitive pop-up menus that appear when you click the right mouse button within the EFS Application window.

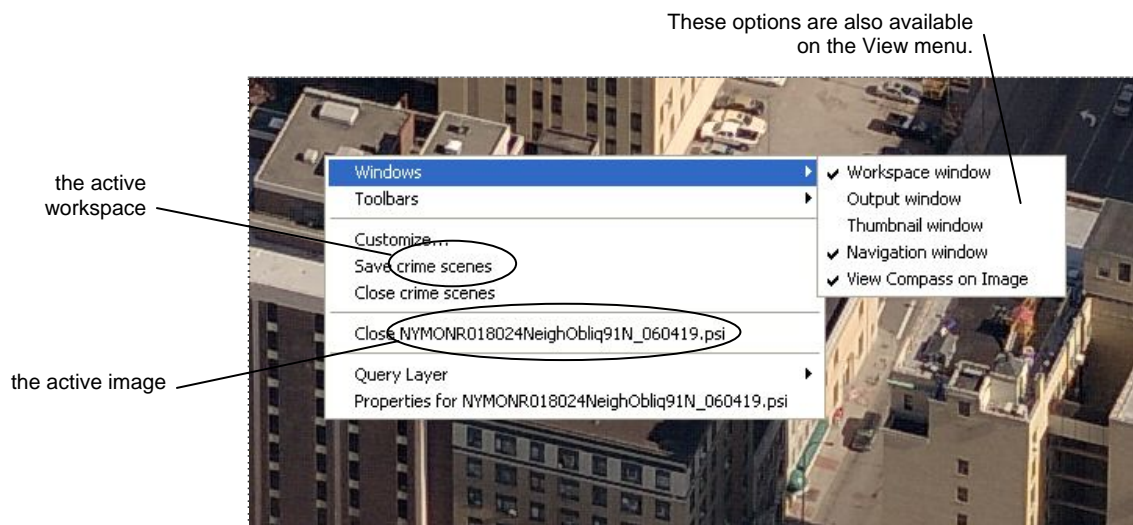
This appendix describes the EFS context menus. The menu options vary depending on what you click and in which window you click. Some options appear in more than one context menu.

## Image window context menu

The context menu that appears when you right-click inside the Image window provides quick access to commonly used functions such as closing the active image, selecting a layer to query, saving the active workspace, and closing the active workspace. It also provides a way to hide or show windows and toolbars.

The Customize option lets you customize EFS toolbars, and is the same as the Customize option on the Tools pull-down menu.

Some options, such as “Delete” and “Go to” appear only when you right-click an annotation in the Image window.



**Figure B-1:** The context menus that appear when the Image window is right-clicked and the Windows option is selected.

**Table B-1:** Options on the Image window context menu.

Menu option	Description
Add <image name> to workspace	Adds the active image to the workspace.
Close <image name>	Closes the active image.
Close <workspace name>	Closes the active workspace.
Customize	Opens the Customize dialog box so you can customize EFS. (This option is the same as the Customize option on the Tools pull-down menu. See Part IV, Chapter 22.)
Delete <annotation>	Removes an annotation from the workspace. Before it is deleted, a dialog box appears asking you to confirm the deletion. Appears when you right-click an annotation in the Image window.
Go to <annotation>	This option does one of the following: <ul style="list-style-type: none"> <li>If any images are open, it does a warehouse search (based on the Image Tool's search criteria), opens the best image that shows the location of the annotation, and places the crosshair on the annotation's coordinates.</li> <li>If only a map is open, it moves the red crosshair on the map to the coordinates of the annotation.</li> </ul> Appears when you right-click an annotation in the Image window. <i>Applies only to user-defined annotations.</i>
Hide Annotations	Hides all user-defined annotations whose visibility has not been suppressed (with the annotation layer visibility feature). See "Hiding and viewing annotations" on page 445 and in Part II, Chapter 13. <b>Tip:</b> To view all user-defined annotations, choose <b>Overlays⇒View Annotations</b> . Appears when you right-click <i>any</i> user-defined annotation in the Image window.
Properties for <item>	This option opens a properties dialog box for the item you right-clicked in the Image window so you can view and change the item's properties.
Query Layer	Opens a list of GIS annotation layers in your workspace so you can select a layer to query the next time you use the GIS Query Tool. (See Part III, Chapter 17 for more information about the Query Tool.)
Save <workspace name>	Saves the active workspace.
Set Offset Ground Plane	Turns on Offset Ground Plane mode, which allows you to offset the ground and use that offset when measuring with the Distance, Area, and Height Tools, and when creating annotations. (See Part II, Chapter 11 for more information.)
Set New Offset Ground Plane	If you are already in Offset Ground Plane mode, allows you to define a new ground offset.
Turn Off Offset Ground Plane	Turns off Offset Ground Plane mode and returns the offset to zero.
Toolbars	Opens a sub-menu from which you can choose to hide or show toolbars (check to show, uncheck to hide).
Visible Layers	Opens a sub-menu from which you can select GIS annotation layers to associate with the GIS Image. (Check to associate; uncheck to disassociate.) This option appears <i>only</i> when the active image is a GIS Image.
Windows	Opens a sub-menu from which you can choose to hide or show windows (check to show, uncheck to hide) or check/uncheck the View Compass on Image option.

## Workspace window context menu

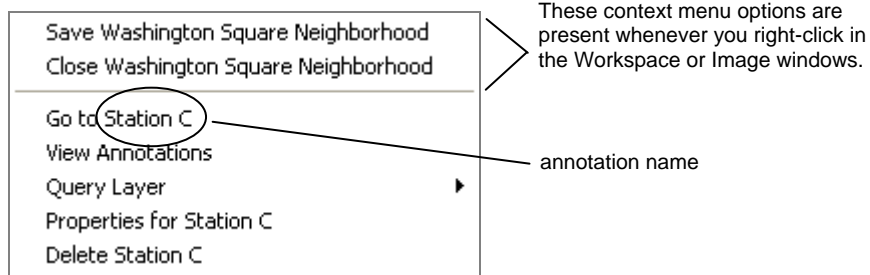
A context menu appears in the Workspace window when you right-click an item or the space next to that item.

The context menu that appears varies depending on where in the Workspace window you right-click. For example, if you right-click in the Workspace window, but not on (or next to) an item, the following context menu appears:



**Figure B-2:** A context menu that appears when the Workspace window is right-clicked.

However, if you right-click an annotation, the context menu also contains options relevant to that annotation.



**Figure B-3:** A context menu that appears when an annotation is right-clicked.

You can right-click any workspace item, including images.

**Table B-2:** Options on the Workspace window context menu.

Menu option	Description
Activate <image name>	Makes the image whose name you right-clicked the active image. This option appears when you right-click the name of an image that is currently open, but not active.
Close <image name>	Closes the image whose name you right-clicked.
Close <workspace name>	Closes the active workspace.
Delete <item>	Removes the item from the workspace. Before the item is deleted, a dialog box appears asking you to confirm the deletion.

**Table B-2:** Options on the Workspace window context menu. (continued)

Menu option	Description
Go to <item>	<p>If the workspace item you right-click is a user-defined annotation, this option does one of the following:</p> <ul style="list-style-type: none"> <li>• If any images are open, it does a warehouse search (based on the Image Tool's search criteria), opens the best image that shows the location of the annotation, and places the crosshair on the annotation's coordinates. This is a fast way to find an annotation without having to scroll or pan an image to look it.</li> <li>• If only a map is open, it moves the red crosshair on the map to the coordinates of the annotation.</li> </ul> <p>If the workspace item you right-click is an image, this option does one of the following:</p> <ul style="list-style-type: none"> <li>• If any images are open, it does a warehouse search (based on the Image Tool's search criteria), and opens the best image of the same type that is currently active. For example, if a Neighborhood image is active, it opens the best Neighborhood image.</li> <li>• If only a map is open, it moves the red crosshair on the map to the same coordinates as the image.</li> </ul>
Hide Annotations	<p>Hides all user-defined annotations whose visibility has not been suppressed (with the annotation layer visibility feature). See "Hiding and viewing annotations" on page 445.</p> <p>This option appears when you right-click the name of an annotation or an annotation layer.</p>
Hide GIS Annotations	<p>Hides all GIS annotation layers for which visibility has not been suppressed (with the annotation layer visibility feature). See "Hiding and viewing annotations" on page 445.</p> <p>This option appears when you right-click the name of a GIS annotation layer.</p>
Hide Layer <layer name>	Hides the annotation layer you right-clicked. See "Viewing or hiding an annotation layer" on page 445.
Open <image name>	Opens the image whose name you right-clicked. (This option appears only if the image is not already open.)
Properties for <item>	This option opens a properties dialog box for the item you right-clicked in the Image window so you can view and change the item's properties.
Query Layer	Opens a list of GIS annotation layers in your workspace so you can select a layer to query the next time you use the GIS Query Tool. (See Part III, Chapter 17 for more information about the GIS Query Tool.)
Reload Layer <ALOHA annotation name> Data	Updates the ALOHA annotation in the Image window by reloading its data from the ALOHA application. See "Changing an ALOHA annotation in EFS" in Appendix C.
Relocate <item name>	<p>Opens a dialog box so you can re-specify the location of the file the item needs to access. The item you right-click can be a link annotation, an image, an elevation file, a (shapefile-based) GIS annotation layer, or an ALOHA annotation.</p> <p>For more information about relocating GIS annotation layers, see "Relocating shapefiles for GIS annotation layers" in Part III, Chapter 16. For ALOHA annotation layers, see "Relocating PAS files" in Appendix C. For all other workspace items, see "Fixing access to files from workspace items" in Part IV, Chapter 21.</p>
Save <workspace name>	Saves the active workspace.
Search <GIS annotation layer name>	Opens the Search GIS Objects dialog box so you can search the GIS annotation layer for text data. (For more information, see "GIS Layer Search" in Part III, Chapter 17.)

**Table B-2:** Options on the Workspace window context menu. (continued)

Menu option	Description
Show Layer <layer name>	Shows the annotation layer you right-clicked. See “Viewing or hiding an annotation layer” on page 445.
View Annotations	Shows all user-defined annotations whose visibility has not been suppressed (with the annotation layer visibility feature). See “Hiding and viewing annotations” on page 445.  This option appears when you right-click the name of an annotation or annotation layer.
View GIS Annotations	Shows all GIS annotation layers for which visibility has not been suppressed (with the annotation layer visibility feature). See “Hiding and viewing annotations” on page 445.  This option appears when you right-click the name of a GIS annotation layer.
Visible Layers	Opens a sub-menu from which you can select GIS annotation layers to associate with the GIS Image. (Check to associate; uncheck to disassociate.)  This option appears <i>only</i> when the active image is a GIS Image.

## Hiding and viewing annotations

The context menu option Hide Annotations lets you hide all user-defined (non-GIS, non-ALOHA) annotations. Similarly, the context menu option Hide GIS Annotations lets you hide all GIS annotations.

The context menu option View Annotations lets you view all user-defined annotation layers that are not suppressed by the layer’s individual visibility setting (Overlays⇒Annotation Layer Visibility). The context menu View GIS Annotations lets you view all GIS annotation layers that are not suppressed by the GIS annotation layer’s individual visibility setting.

**Note:** Context menu options View Annotations and Hide Annotations function the same as Overlays⇒View Annotations.

The context menu options View GIS Annotations and Hide GIS Annotations function the same as Overlays⇒View GIS Annotations.

## Viewing or hiding an annotation layer

When you right-click an annotation layer in the Workspace window, you’ll see an option called either Show Layer <layer name> or Hide Layer <layer name> (depending on whether or not the layer is currently hidden or in view). Selecting this option for a layer hides or shows all of that layer’s annotations, but does not affect annotations that belong to other layers.

**Note:** An annotation layer can be associated with both local and global annotations. Global annotations are listed under the layer name; local annotations are listed under the image to which they pertain. If you hide a layer, all annotations (both local and global) associated with that layer are hidden.

For more information about layer visibility, see Part II, Chapter 13.

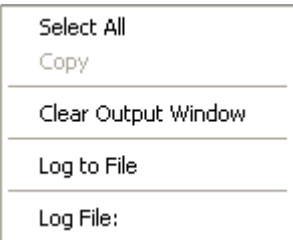
**Tip:** You can also view or hide an annotation layer by pressing CTRL + L or by choosing Overlays⇒Annotation Layer Visibility.

## Output window context menu

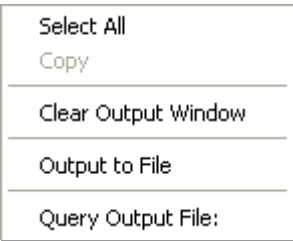
A context menu appears when you right-click in the Output window. The menu options vary depending on which Output window tab is active.



**Figure B-4:** A context menu that appears when the Folder Info tab is active.



**Figure B-5:** A context menu that appears when the Tool Info tab is active.



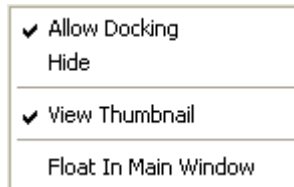
**Figure B-6:** A context menu that appears when the Query Info tab is active.

**Table B-3:** Options on the Output window context menus.

Menu option	Description
Clear Output Window	Clears the contents of the Output window.
Copy	Copies the selected text to the Windows Clipboard so you can paste it into a different software application. (This option is dim until text is selected.)
Log File:	Opens the Save As dialog box so you can specify (or change) the name and path of the file in which to save your tool results.
Log to File	Check this option before using a measurement tool to save tool results to an output (log) file.  If you haven't already specified a file in which to save the tool results, this option opens the Save As dialog box so you can specify a file and path name.
Output to File	Check this option before using the Query Tool to save query results to an output (log) file.  If you haven't already specified a file in which to save the query output, this option opens the Save As dialog box so you can specify a file and path name.
Query Output File:	Opens the Save As dialog box so you can specify (or change) the name and path of the file in which to save your query results.
Select All	Selects all contents of the Output window (helpful when you want to copy all text shown in the window).

## Navigation window context menu

A context menu appears in the Navigation window when you right-click in the window.



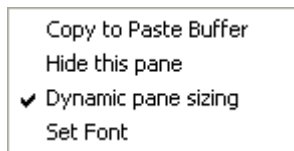
**Figure B-7:** A context menu that appears when the Navigation window is right-clicked.

**Table B-4:** Options on the Navigation window context menu.

Menu option	Description
Allow Docking	When <i>checked</i> , the Navigation window can be docked. When <i>unchecked</i> , the Navigation window floats and cannot be docked.
Hide	Hides the Navigation window from view. (To re-display the Navigation window, choose <b>View</b> ⇒ <b>Navigation Window</b> .)
View Thumbnail	When <i>checked</i> , a thumbnail of the active image appears in the Navigation window.
Float In Main Window	When <i>checked</i> , the Navigation window contents are shown in the Image window. If your open images are maximized, the floating Navigation window will also be maximized (appearing to be docked rather than floating). The floating Navigation window can then be cascaded or tiled with the other open images (by using the View menu).  When <i>unchecked</i> , the Navigation window is separate from the Image window and can be docked or undocked.

## Status Bar context menu

A context menu appears when you right-click the Status Bar. The menu may vary depending on the pane in which you right-click. All panes (except Status Area) include the options shown in Figure B-8.



**Figure B-8:** A context menu that appears when the Status Bar is right-clicked.

**Table B-5:** Options on the Status Bar context menu.

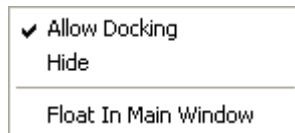
Menu option	Description
Add pane to Status Bar	Lets you select a hidden pane to re-display.
Copy to Paste Buffer	Copies the contents of the Status Bar pane you right-clicked to the Windows Clipboard so you can paste it into a different software application.
Dynamic pane sizing	Causes EFS to resize the panes as necessary to accommodate data to be displayed on the Status Bar.

**Table B-5:** Options on the Status Bar context menu. (continued)

Menu option	Description
Hide this pane	Hides the pane you right-clicked. <b>Note:</b> This option is not present on the Status Area pane context menu because the Status Area pane cannot be hidden.
Set Font	Opens the Font dialog box so you can customize the font in which Status Bar contents are shown.

## Thumbnail window context menu

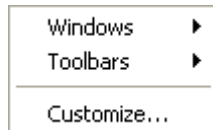
A context menu appears when you right-click in the Thumbnail window.

**Figure B-9:** A context menu that appears when the Thumbnail window is right-clicked.**Table B-6:** Options on the Thumbnail window context menu.

Menu option	Description
Allow Docking	When <i>checked</i> , the Thumbnail window can be docked. When <i>unchecked</i> , the Thumbnail window floats and cannot be docked.
Float In Main Window	When <i>checked</i> , the Thumbnail window contents are shown in the Image window. The Thumbnail window can be cascaded or tiled with other open images. When <i>unchecked</i> , the Thumbnail window is separate from the Image window and can be docked or undocked.
Hide	Hides the Thumbnail window from view. (To re-display the Thumbnail window, choose <b>View⇒Thumbnail Window</b> .)

## Toolbar context menu

A context menu appears when you right-click anywhere on a toolbar.

**Figure B-10:** A context menu that appears when a toolbar is right-clicked.**Table B-7:** Options on the toolbar context menu.

Menu option	Description
Customize	Opens the Customize dialog box so you can customize EFS.
Toolbars	Lets you select a toolbar to hide or display.
Windows	Lets you select a window to hide or display. The View Compass on Image option lets you place the Navigation window's compass on the image in the Image window.



# Appendix C — ALOHA Annotations

This appendix provides information about ALOHA, ALOHA annotations, and how you can incorporate ALOHA annotations into your EFS images.

## Overview

Here's what you should know before importing ALOHA annotations into EFS.

### What is ALOHA?

**ALOHA**—Areal Locations Of Hazardous Atmospheres—is a program used for emergency planning. It predicts how a hazardous gas cloud might disperse in the atmosphere after an accidental chemical release. ALOHA models the resulting plume (gaseous cloud), given factors such as wind speed and direction. The model is referred to as an ALOHA annotation or footprint.

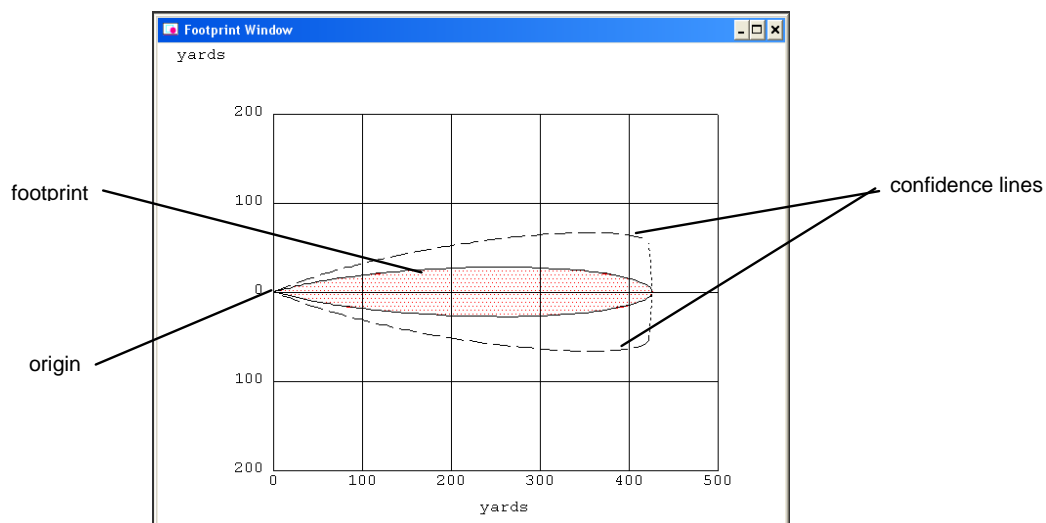
**Note:** ALOHA is typically used in conjunction with the US Environmental Protection Agency's CAMEO® program (Computer-Aided Management of Emergency Operations).

### The parts of an ALOHA annotation

An ALOHA annotation is comprised of the following parts:

Part	Description
plume's origin	the location where the leak or spill began
footprint	a shape that represents the plume resulting from a vaporous chemical spill
confidence lines	lines that encompass the footprint and some additional area (the area that may be affected by the spill, but to a lesser degree)

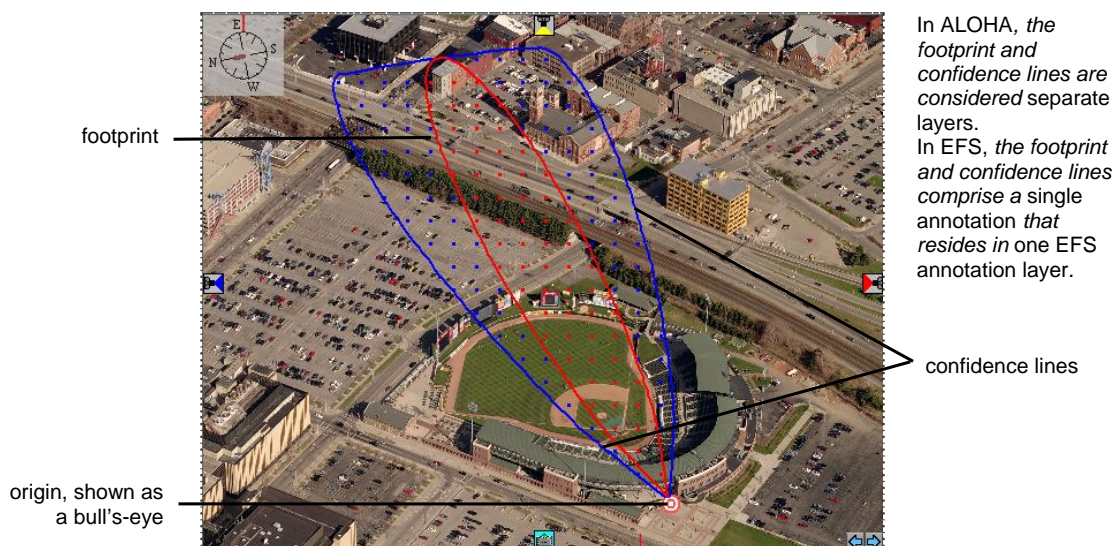
Here's how an ALOHA annotation may look in the ALOHA application.



**Figure C-1:** An ALOHA annotation.

## ALOHA annotations in EFS

ALOHA annotations can be imported into EFS. Here's how an ALOHA annotation may appear in EFS.



**Figure C-2:** An ALOHA annotation in EFS.

EFS provides the following features related to ALOHA annotations. You can:

- Add (import) the ALOHA annotation to your workspace.
- Re-load a newly added ALOHA annotation (after making changes to the parameters in the ALOHA application).
- Reposition an ALOHA annotation on an image in EFS.
- Change an ALOHA annotation layer's properties.
- Export ALOHA layers to a shapefile.
- Remove an ALOHA layer.
- Relocate PAS files in EFS.

Procedures for these tasks begin on page 451.

## Requirements

In order to import ALOHA annotations into EFS, you'll need the Import ALOHA Files license option. Without this license option, your menus and dialog boxes will not have ALOHA-related features.

If you plan to export ALOHA annotation layers as shapefiles, you'll need a second license option—Export ALOHA Files As Shapes.

## Using ALOHA and EFS together

By using both ALOHA and EFS, you can view an ALOHA annotation on images in EFS that show the area in which a spill occurred.

Here's an overview of how to view an ALOHA annotation on an image in EFS:

1. First you'll run the ALOHA application to create an ALOHA annotation, which models a plume. ALOHA automatically creates a **PAS** file—a file that contains the ALOHA annotation's geometric data.
2. Then in EFS, you'll add the ALOHA annotation to your workspace, positioning it on an open image. (Or you can position the ALOHA annotation later, after you open the image you want to annotate.)

### **ALOHA annotations can be updated**

After using ALOHA to analyze the effects of different wind speeds (and other variables) on the plume, you might want to see the updated annotation on EFS images. While your ALOHA application is still running, you can easily change the ALOHA annotation in EFS. Simply change the parameters in ALOHA and display the new footprint. (ALOHA updates the PAS file automatically.) Then “re-load” the annotation into EFS.

**Note:** Both EFS and ALOHA must remain open in order to update the ALOHA annotation in EFS.

### **PAS files and viewing your EFS ALOHA annotation**

As stated earlier, a PAS file contains the geometric data needed to display an ALOHA annotation. It is a temporary file that ALOHA creates when you model a plume and display its footprint in ALOHA. This temporary file is located in the same directory as the ALOHA executable file. When you close ALOHA, the PAS file is deleted.

Once you've displayed a footprint in ALOHA, you may want to save the PAS file to another directory (or rename it in the ALOHA directory). This allows you to view the ALOHA annotation in EFS after ALOHA is closed.

**Note:** Saving or renaming the PAS file can be done before or after importing the annotation to EFS, but must be done before closing ALOHA.

*For you to view an ALOHA annotation on an image, the annotation's PAS file must be accessible to EFS.*

There are three situations in which you can view an ALOHA annotation in EFS.

- after creating the annotation, while ALOHA is still running.
- after creating the annotation, renaming its PAS file to a temporary name before exiting ALOHA, and renaming the PAS file to its original (default) name.

**Caution:** If you then launch ALOHA and create a second annotation, a new PAS file with the same name will be created and will overwrite the original PAS file.

- after creating the annotation, copying its PAS file to a different directory before exiting ALOHA, then “relocating” the PAS file in EFS to its new location. (See “Relocating PAS files” on page 459.)

## **Adding an ALOHA annotation**

Adding an ALOHA annotation to your workspace involves creating a layer and then placing the ALOHA annotation on an image in EFS.

◆ **To add an ALOHA annotation:**

*Advanced User Mode is required. (File⇒System Setup⇒System)*

*For more information about Advanced User Mode, see Chapter 2.*

1. (Optional) Open the image you want to annotate.

**If you omit this step**, you will not be able to place the ALOHA annotation on an image in Step 14, but you can place it later. See “To reposition an ALOHA annotation by using the ALOHA cursor,” on page 456.

2. Use the ALOHA application to create an ALOHA annotation that models the chemical spill.

**Tip:** In order for ALOHA to create a PAS file for the annotation, you must first display the footprint. Choose **Footprint** from ALOHA's **Display** menu.

ALOHA puts a temporary PAS file in the directory where the ALOHA application is installed.

3. (Optional) To save a permanent copy of the PAS file, copy it from the directory where ALOHA is installed to another directory on your PC, *while ALOHA is still running*. (Or rename the PAS file.)

**Why copy the PAS file?** Saving the PAS file in a different location (or with a different name) lets you access the ALOHA annotation in EFS at a later time. *If you don't need to save the ALOHA annotation for later use, you can skip this step and let EFS access the PAS file in its current location while the ALOHA application is running.*

**Tip:** To add the Add ALOHA Layer button to a toolbar, see “Adding and removing toolbar buttons” in Part IV, Chapter 22.

4. In EFS, choose **Annotate⇒Create ALOHA Annotation Layer**.

The ALOHA Annotation Layer dialog box opens to its ALOHA annotation properties tab.

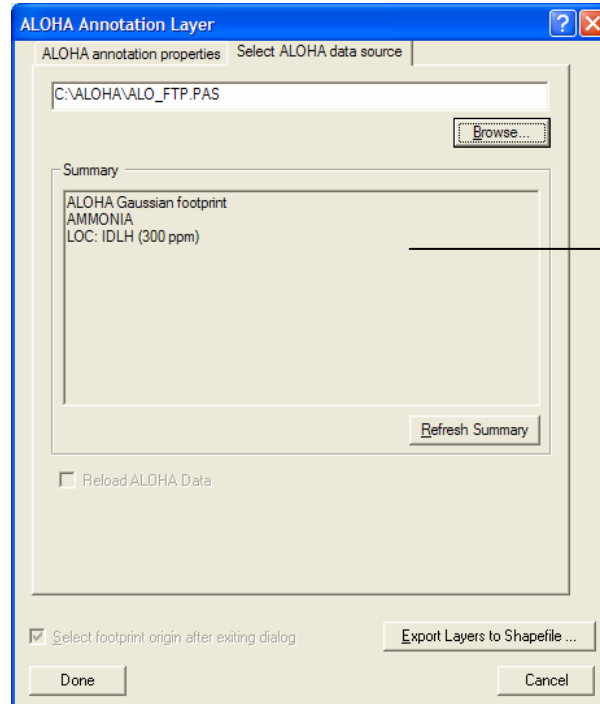
5. (Optional) To limit when the ALOHA annotation appears on the image, based on the image's GSD or its zoom factor, enter threshold values in the Max view GSD and Min view GSD boxes.

For information about Max View and Min View thresholds, see Part II, Chapter 12.

**Tip:** If you haven't copied the PAS file to another directory, look for the file alo\_ftp.pas in the ALOHA installation directory. (Remember, when you close the ALOHA application, the PAS file will be deleted from the installation directory.)

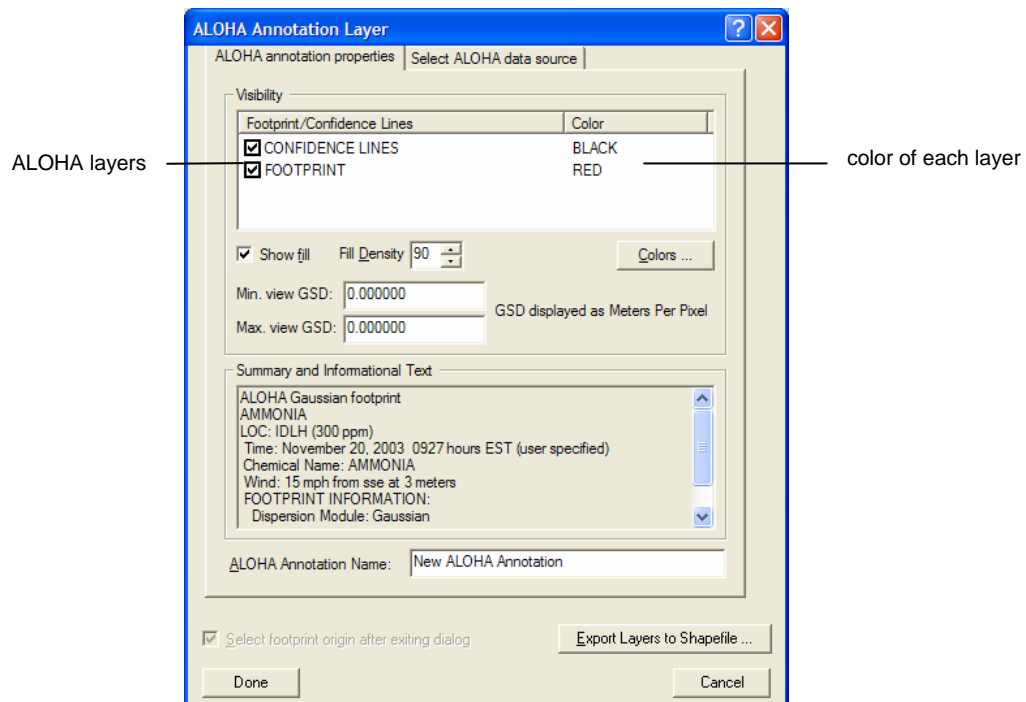
6. To load an ALOHA file, click the **Select ALOHA data source** tab.
7. Click **Browse** to find the file, then double-click its name (or select the file name and click **Open**).

The Open dialog box closes. The path and name of the PAS file is shown on the ALOHA Annotation Layer dialog box, and the ALOHA annotation's data summary is shown in the Summary box.



The Summary area shows annotation-related information such as the parameters that were used to create the ALOHA annotation.

8. Click the **ALOHA annotation properties** tab.



ALOHA layers

color of each layer

9. If you want to change Confidence Line or Footprint colors, click **Colors**. Otherwise, *skip to Step 11*.

The Footprint/Confidence Colors dialog box appears. It lets you choose a color or specify a custom color.

10. To change a color, select **CONFIDENCE LINES** or **FOOTPRINT** from the list and select a color from the Colors list. Then click **OK**.

The color you selected is shown in the list, and the Footprint / Confidence Colors dialog box closes.

11. (Optional) Make changes according to the following chart:

Section	Description
Visibility (of ALOHA layers)	<p>To view Confidence Lines, select <b>CONFIDENCE LINES</b> or check the box to its left.</p> <p>To view the Footprint, select <b>FOOTPRINT</b> or check the box to its left.</p> <p>Any unchecked "layer" will exist in the annotation, but will not appear when you view the annotation.</p> <p><b>Note:</b> The plume's origin (the bulls-eye) is always visible.</p>
Show fill	Check this box to fill the annotation with a dotted pattern.
Fill Density	<p>Click the up or down arrows to increase or decrease the density. The higher the number, the denser the fill pattern (the less space there is between the dots of the fill pattern).</p> <p><b>Note:</b> Fill point spacing is the same regardless of the image's GSD or zoom level. That is, fill density is the same when viewing Neighborhood images at 200% zoom or Community images at 50% zoom.</p>

When you choose a higher (denser) fill value, EFS will take longer to draw the annotation.

12. In the ALOHA Annotation Name box, type a name for the new ALOHA annotation layer, then click **Done**.

The ALOHA Annotation Layer dialog box closes, your ALOHA annotation layer has been created, and you can now annotate an image with the ALOHA annotation.

A pop-up appears: "Please choose a location for the footprint origin."



13. Click **OK**. The ALOHA cursor appears.

14. If you are not ready to place the annotation (perhaps you did not yet open the image you want to place it on), simply click another tool in the toolbar. (When you are ready to place the annotation, follow the procedure "To reposition an ALOHA annotation by using the ALOHA cursor," on page 456.)

If you *are* ready to place the annotation in the active image, click a location for the plume's origin.

The annotation is placed with its origin in the location you clicked. The cursor is restored to the tool used prior to placing the annotation.

**Hint:** If you don't see the newly-placed ALOHA annotation, right-click the layer in the workspace, and select **View Layer <layer name>** from the context menu. You may need to right-click a second time, to check **View GIS Annotations**. (If GIS annotation visibility is off, ALOHA annotation visibility will also be off.)

## Changing an ALOHA annotation in EFS

You can change an ALOHA annotation in EFS in several ways:

- Change parameters (such as wind speed and direction) in an ALOHA application, and re-load the annotation into EFS.
- Reposition an annotation.
- Change the properties (such as colors, fill, name, view thresholds) of an ALOHA annotation.

If you didn't exit ALOHA after placing the annotation in EFS, you can change ALOHA parameters and re-load the annotation. In the Image window, EFS replaces the ALOHA annotation with the newer one.

### ◆ To re-load an ALOHA annotation:

1. In the ALOHA application, make the desired parameter changes. ALOHA updates the PAS file.
2. In your EFS workspace, right-click the name of the ALOHA annotation layer you want to update.
3. From the context menu, do *one* of the following:
  - Select **Reload Layer <layer name>** to re-load the new annotation immediately.
  - or —
  - Select **Properties for <layer name>** to re-load the new annotation after viewing the summary.

If you selected the first option, the ALOHA annotation is updated.  
(Skip the remaining step.)

If you selected the second option, the ALOHA Annotations Layer dialog box opens to its ALOHA annotation properties tab. You can view your changes in the Summary and Informational Text box.

**Note:** If you change parameters in ALOHA while the ALOHA Annotations Layer dialog box is open, you can click the Refresh Summary button (on the "Select ALOHA data source" tab) to refresh the summary.

4. Click the **Select ALOHA data source** tab, and check the **Reload ALOHA Data** box. Then click **Done**.

The updated ALOHA annotation appears in the Image window.

### ◆ To reposition an ALOHA annotation by using the Select Tool:



1. Click the **Select Tool**.
2. Drag-and-drop a confidence line or the origin (the bull's-eye) to another location.



The ALOHA annotation moves, but its orientation remains the same.

**Tip:** To reverse the move, click **Undo** (if available on your toolbar) or choose **Edit⇒Undo**.



◆ **To reposition an ALOHA annotation by using the ALOHA cursor:**

1. In your workspace, right-click the name of layer for the ALOHA annotation you want to reposition.
2. From the context menu, select **Properties for <layer name>**.  
The ALOHA Annotation Layer dialog box opens to its ALOHA annotation properties tab.
3. Check **Select footprint origin after exiting dialog**, then click **Done**. A pop-up appears: “Please choose a location for the footprint origin.”
4. Click **OK**. The ALOHA cursor appears.
5. Click the new location for the plume’s origin.



The annotation moves, but its orientation remains the same. The annotation is placed with its origin in the location you clicked. The cursor is restored to the tool used prior to placing the annotation.

◆ **To change an ALOHA annotation layer’s properties:**

1. In your workspace, right-click the name of the ALOHA annotation layer you want to change.
2. From the context menu, select **Properties for <layer name>**.  
The ALOHA Annotation Layer dialog box opens to its ALOHA annotation properties tab.
3. Make the desired changes. (See Steps 5 and 9 - 12 in the procedure “To add an ALOHA annotation,” which starts on page 452.) Then click **Done**.

The ALOHA annotation is redrawn with its new properties. When you save your workspace, the changes will become permanent.

## Exporting your ALOHA layer

If you’re licensed with the EFS option “Export ALOHA Files As Shapes,” you can export your ALOHA layers to a shapefile.

◆ **To export one or all ALOHA layers to a shapefile:**

1. In the workspace, select the ALOHA layer or layers you want to export, then right-click any of the selected layers (as described in the following chart):

If you want to export ...	Do this ...
One layer only	Click that layer to select it, then right-click the layer.
All layers in the current workspace	Right-click any ALOHA layer (no need to select anything).
Some layers in the current workspace	Select the desired layers (by holding down <b>CTRL</b> or <b>SHIFT</b> while you click). Then right-click any of the selected layers.

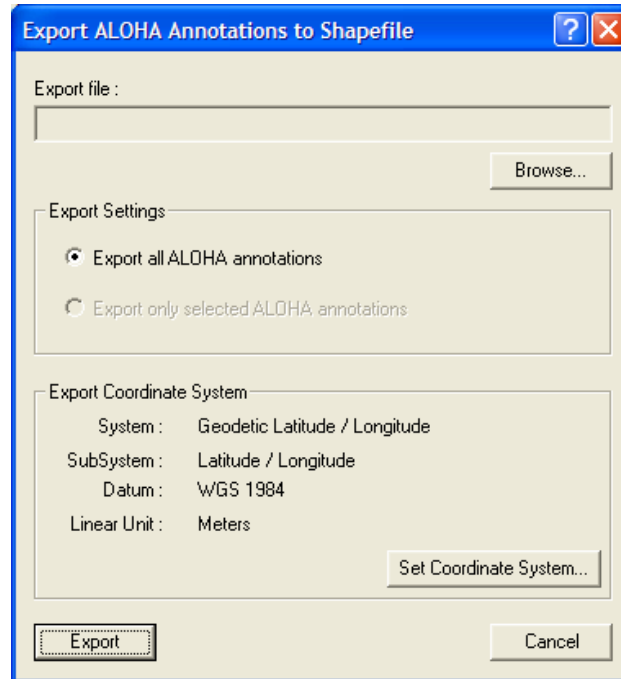
A context menu appears.

2. From the context menu, select **Properties for <layer name>**.



The ALOHA Annotation Layer dialog box appears.

- Click the **Export layers to Shapefile** button. The Export ALOHA Annotations to Shapefile dialog box appears.



- If you selected ALOHA layers in your workspace, click **Export only selected ALOHA annotations**. (Otherwise, you'll export all ALOHA annotations.)
- Click **Browse**, to specify a path and file name for the export shapefile. Navigate to the directory you wish to save the file to. Type a file name and click **Save**.

The file name you entered appears in the Export file box.

- To specify the coordinate system to use when exporting shape data, click **Set Coordinate System** and enter the coordinate data in the Set Shapefile Coordinate System dialog box. Then click **OK**.
- Click **Export**.  
A shapefile (DBF, SHP, and SHX files) is created with the file and path name you specified.
- Click **Done**. The ALOHA Annotations Layer dialog box closes.

### Creating a GIS annotation from the shapefile you've exported

You can create a new GIS annotation layer from the shapefile you've exported. (Follow the procedure in Part III, Chapter 16. See "Using shapefile data to add a GIS annotation layer.") The new layer will show the same plume, but its confidence lines will take on the color of the footprint and there will be no fill pattern. The plume, as with all shape data, will be tied to a geographic location (the location where you've placed it), and can no longer be re-positioned.

**Hint:** The ALOHA annotation may be superimposed on the new GIS annotation. To see the new GIS annotation, reposition the ALOHA annotation. (See the procedures for repositioning the annotation, starting on page 455.)

## Removing ALOHA annotations

Use the procedure below to delete ALOHA annotations from your workspace.

**If removing *only one annotation*,** simply right-click the annotation in the workspace, then select **Delete <ALOHA annotation name>** from the context menu.

Or follow the procedure below, selecting only one annotation.

### ◆ To remove ALOHA annotations:

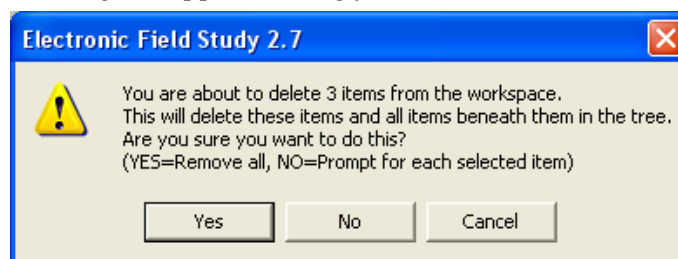
1. In the workspace, select the ALOHA layers you want to remove.

**Tip:** If listed contiguously, click the first and last items while holding **SHIFT**; otherwise, click each item while holding **CTRL**.



2. Do *one* of the following:
  - Click the **Delete** button.
  - or —
  - Choose **Edit⇒Delete**.

A dialog box appears asking you to confirm the deletion.



3. Do *one* of the following:
  - To confirm removal of all selected annotations, click **Yes**.
  - or —
  - To cancel removal of the annotations, click **Cancel**.
  - or —
  - To separately confirm removal of each annotation, click **No**.

A separate pop-up appears for each annotation to confirm. Click **Yes** to confirm each deletion.

The ALOHA annotations are removed from your workspace. If the annotations were in view in the Image window, you'll see them disappear from the screen.

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## Relocating PAS files

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EFS provides a feature that prevents you from having to recreate ALOHA annotations, should your PAS files move to a new location. You can relocate more than one PAS file at a time as long as you're relocating them to the same directory. You can tell EFS where to find the PAS files it needs by using the procedure "To fix the path for non-warehouse files." See "Fixing access to files from workspace items" in Chapter 21.

**Tip:** Use this procedure to tell EFS where you've copied the PAS file for a newly-added ALOHA annotation.



# Appendix D — Advanced User Mode

This appendix tells how to set Advanced User Mode and lists the EFS features that are available only in Advanced User Mode.

## Setting Advanced User Mode

Use the following procedure to turn on (or off) Advanced User Mode.

### ◆ To change the Advanced User Mode setting:

1. Choose **File⇒System Setup⇒System** tab.  
The System Setup Page dialog box opens to its System tab.
2. To enter Advanced User Mode, check the **Advanced User Mode** box. (To exit, uncheck the box.)
3. Click **OK**.

The dialog box closes and the EFS feature set changes accordingly. Your Advanced User Mode setting remains until you change it again.

## Advanced User Mode options

The following tables list EFS features (menu options, settings and tabs, and additional image data) that appear *only when you're running in Advanced User Mode*. The tables also any show license options required for each feature.

**Table D-1:** Menu options available only in Advanced User Mode.

Menu option	Special license option also required
Overlays⇒View Image Polygons	none
Overlays⇒View Polygons as Projections from Camera	none
Overlays⇒Fill Image Polygons	none
Overlays⇒View Selected Overlays Only	none
File⇒New	none
Overlays⇒View Fiducial Marks	Surveyor
Workspace⇒Create Warehouse from Workspace	Warehouse Build
Annotate⇒Create ALOHA Annotation Layer	Import ALOHA Files

**Table D-2:** Settings and tabs available only in Advanced User Mode.

Setting	Location of Setting	Special license option also required
Add non-warehouse images to the workspace without opening them	Image Tool Properties dialog box, Settings tab (Tools⇒Image Tool then Tools⇒Properties⇒Settings tab)	none
Ortho Image tab	Orthogonal Image Properties dialog box (Edit⇒Properties)	Load New Maps
Picto Image tab	Pictometric Image Properties dialog box (Edit⇒Properties)	Load New Images
Image Edges tab	GIS Image Properties dialog box (Edit⇒Properties)	none

**Table D-3:** Data available only in Advanced User Mode.

Data	Location of Data	Special license option also required
extended image data	Output window (when an image folder is selected in the workspace)	Extended Image Data

# Appendix E — InQuest OSGB-36 Coordinate System

If you are working in the British Isles with EFS and OSGB-36 British National Grid coordinates, you should be using Grid InQuest® software. Otherwise, coordinate conversions will be done using Blue Marble™ GeoCalc™ and will produce inaccurate results.

## Installing Grid InQuest

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If you don't have Grid InQuest, you can download and install it as follows:

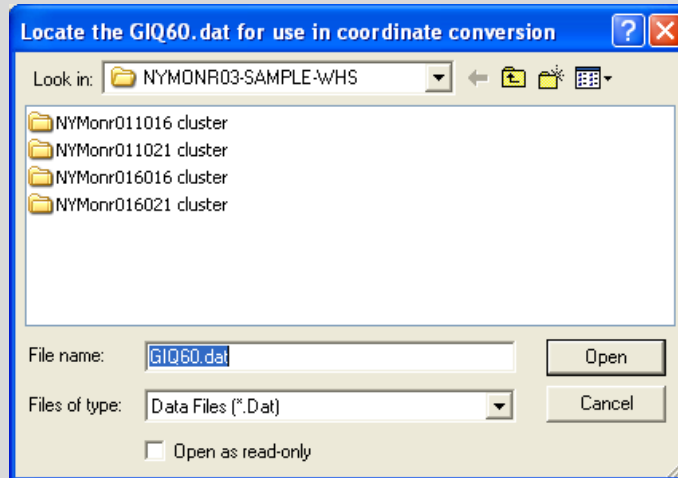
◆ **To download and install Grid InQuest:**

1. Go to the Quest® GeoSolutions Ltd. user registration page, and follow the directions to register as a user:  
[http://www.qgsl.com/login/register\\_user.php](http://www.qgsl.com/login/register_user.php)
2. Create and enter a username and other basic required information such as your email address, then wait for a password to arrive via e-mail. (Generally, the password arrives in minutes.)
3. After you receive your password, in the upper left corner, click ►**Login**.
4. On the login page, enter your username and password, then click **GO**.
5. Click **Download**, then download the full version of Grid InQuest. (You'll download a zip file, so location isn't critical.)
6. Exit the Quest web site, then unzip your files (using virus protection).
7. Run **Setup.exe**.

**Note:** When asked where to install the software, use the default path and click the **Everyone** button, so you don't have to repeat the installation for multiple users.

Grid InQuest is now installed on your machine.

**Note:** If the following dialog box appears when you set the coordinate system to OSGB-36, then EFS cannot find the GIQ60.dat file.



You'll need to navigate to the GIQ60.dat file. Here is the path to the directory where it was installed:

C:\Documents and Settings\All Users\Application Data\Quest\GIQ60.

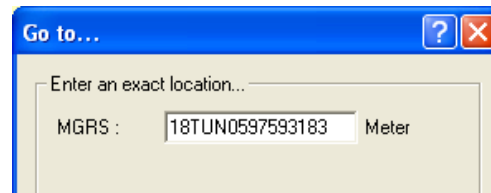


# Appendix F — MGRS Coordinate Systems

When working with Military Grid Reference System (MGRS) coordinates, you'll need the latest version of Blue Marble Geographics software and of the file geocalc.dat. (If you do not have these, you'll see a pop-up telling you which versions you have and need, then EFS will close.)

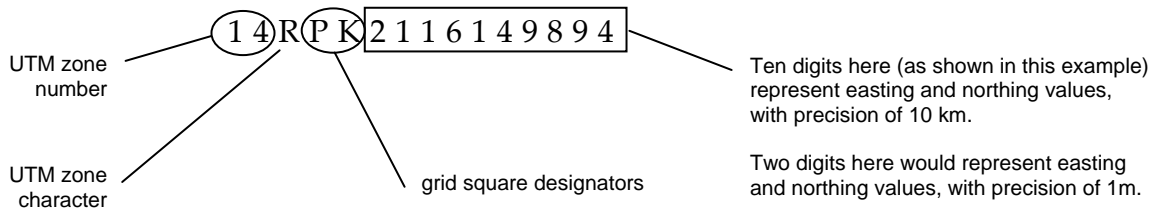
## Using MGRS coordinates in EFS

Using MGRS coordinates in EFS is not much different than using other coordinate systems. EFS dialog boxes dealing with coordinates will adapt to accommodate the MGRS format (the [x,y] boxes will change to one box, where you'll enter the MGRS coordinate):



### The format of the MGRS coordinate

Here is an example of an MGRS coordinate:





# Appendix G — Working with PGS Scripts

*A **PGS Script** is a GIS Image format created by using **PGS software**. To learn about GIS Images, see Part III, Chapter 18.*

This appendix is for users of previous versions of EFS that included **PGS (Pictometry GeoScript) software**, which allowed users to create **PGS Scripts**. Newer users can skip this appendix.

The PGS software is no longer actively supported by Pictometry, but you can still import and export PGS Scripts to and from EFS. PGS Scripts that have been imported into EFS are called “GIS Images.” You can also create new GIS Images in EFS. (See Part III, Chapter 18.)

This appendix discusses the following topics:

- How a PGS-created GIS Image is represented in the workspace.
- How to import (“load”) a PGS Script into EFS and change its properties.
- How to export a GIS Image (save it as a PGS file).

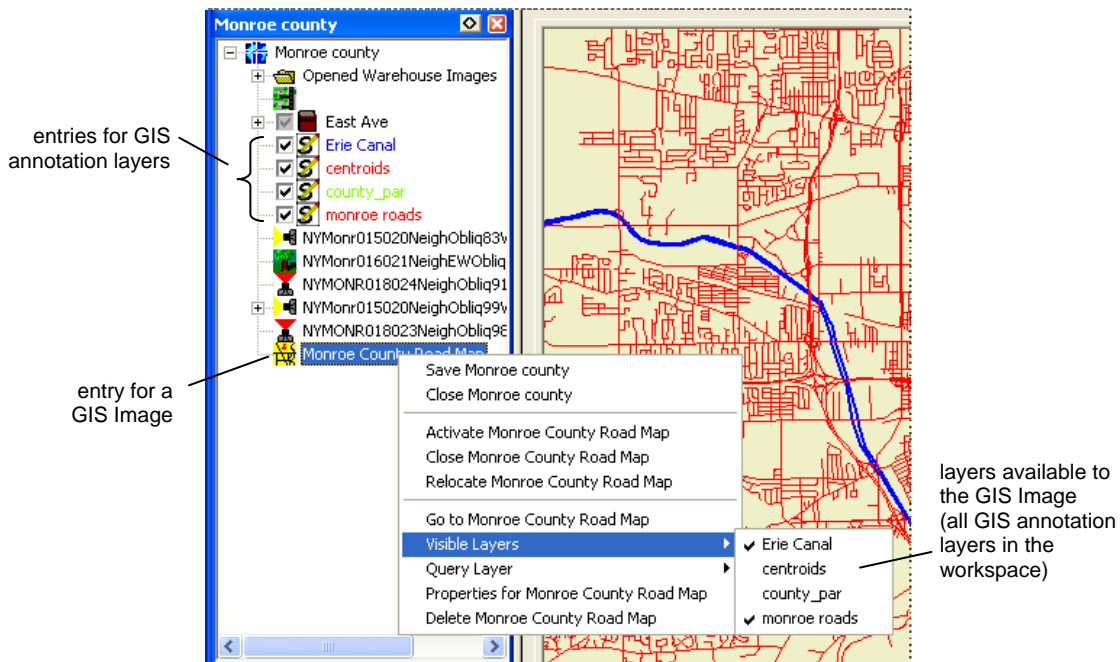
## GIS Images in the workspace

---

The way GIS Images are represented in the workspace is different than the way PGS Scripts were represented in prior versions of EFS. In prior versions, GIS annotation layers imported as part of a PGS Script were local to (and embedded in) the GIS Image. You would see the GIS Image’s entry in the workspace, but have no access to its layers.

### GIS annotation layers available to all images

In newer versions of EFS (Version 2.6 and newer), the GIS annotation layers associated with a GIS Image have separate workspace entries (and therefore are available to all images in the workspace).



**Figure G-1:** Workspace entries for a GIS Image and its layers.

A GIS Image's context menu contains a Visible Layers option, which shows checkmarks for layers currently associated with the GIS Image.

## Loading PGS Scripts and changing properties

Here's how you can import (load) a PGS Script into EFS and change its properties:

### ◆ To load and change an existing PGS Script:

1. Do *one* of the following:
  - Click the **Open** button on the toolbar.
  - or —
  - Choose **File⇒Open**.



The Open dialog box appears.

2. In the Files of type box, select **GIS Script File (\*.PGS)**, and navigate to the desired PGS file.
3. Double-click the name of the PGS file.

The PGS file opens as a GIS Image in the Image window. Its layers appear as items in the main part of the workspace, and the file name appears in the Opened Warehouse Images folder. (You may need to expand and collapse the Opened Warehouse Images folder in order to see the filename and layers.)

**Note:** EFS activates the Image Tool automatically.

4. (Optional) Change the properties of any associated GIS annotation layer as desired. (See "Changing properties and renaming layers" in Part III, Chapter 16.)

**Reminder:** Modified PGS Scripts cannot be used with any version of EFS that predates Version 2.6.

**Important:** Each GIS Image layer may be associated with more than one GIS Image, so changing a layer's properties may affect other GIS Images.

You can also change which layers are associated with the GIS Image, if desired.

5. (Optional) Change the GIS Image as desired. (See “Viewing and changing GIS Image properties” in Part III, Chapter 18.)
6. (Optional) Save the modified GIS Image back to the original PGS file by choosing **File⇒Save Image**.

The updated PGS Script is saved in its original location, overwriting the original version.

## Saving a GIS Image as a PGS file

Whether imported from a PGS Script or created in EFS, you can export a GIS Image (save it as a PGS file). You might do this in order to share the GIS Image with another user or to save a copy outside of EFS.

### ◆ To save a GIS Image as a PGS file:

1. In the workspace, select the name of the GIS Image to be saved as a PGS file.
2. Choose **File⇒Save Image As**. The Save As dialog box appears.
3. Navigate to the location in which to save the file.

**Important:** The PGS file must be saved in the directory containing the shapefiles for all layers associated with the GIS Image being exported.

4. In the File name box, type a name for the PGS file. Be sure to use the extension “pgs.”
5. Click **Save**.

The Save As dialog box closes, and the GIS Image is saved as a PGS file in the location you specified.



# Appendix H — Getting Help

## Try this first

---

There are various options for getting help if you have a problem either installing or using EFS. Before contacting Pictometry's Customer Service, try to solve the problem by checking the following resources:

- Use the Help system that is part of EFS.
- Check the documentation provided with EFS.
- (If your company has one), ask your company's "Area Expert," who has taken in-depth EFS training classes from Pictometry International.

If you still need help after consulting these resources, contact our Customer Service Department.

## Contacting Customer Service

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By phone: 1-888-771-9714

Or by email: [customersupport@pictometry.com](mailto:customersupport@pictometry.com)

Our Customer Service Department is available from 8:30 a.m. to 5:00 p.m. Monday to Friday, Eastern time.

## Downloading updates to EFS

---

There are two ways to download updates to EFS:

- You can download updates to EFS and its documentation by accessing the web page (called "Pictometry Online"), or
- You can use the Updater to check for and download updates.

**Note:** Updater can be set up to check automatically for updates and notify you when an update is available.

### Downloading updates from the Pictometry website

#### ◆ To download updates from the web:

1. Start EFS (if not already open).
2. Choose **Help**⇒**Pictometry on the Web**⇒**Online Updates**. EFS uses your Internet browser to access the Pictometry website for downloading updates.

A description of your license appears here.

The name of your contact person appears here.

drop-down list of software titles.

Description	Version	Build	File Size	Last Modified	Download
<b>EFS Release</b> - Application Only, No Documentation <i>Works <b>Only</b> on Windows NT, 2000, or XP.</i>	2.6 Release 3.2	2.6.23.200	23019266	August 25, 2005	<a href="#">Click Here</a>
<b>EFS Documentation Release</b> - Complete EFS Documentation Set. <i>Works <b>Only</b> on Windows NT, 2000, or XP.</i>	2.6 Release 3.2	2.6.23.200	27284761	August 4, 2005	<a href="#">Click Here</a>
<b>EFS Release</b> - Application Only, No Documentation. This zip file contains the full non-compressed installer for EFS. This is recommended <b>ONLY</b> for admins who want access to the .msi file. <i>Works <b>Only</b> on Windows NT, 2000, or XP.</i>	2.6 Release 3.2	2.6.23.200	20098361	August 25, 2005	<a href="#">Click Here</a>
<b>EFS Documentation Release</b> - Complete EFS Documentation Set					

3. From the list of software titles, select **Electronic Field Study**.
4. In the **Download** column, click the desired **Click Here** link to begin the download process. (The first two choices download an “.exe” file; the second two choices download a zip file.)

The Pictometry Download Information Page dialog box appears.

Please provide some information.

Please enter your name:\*

Please enter your organization/department:\*

Please enter your email address:

Download Mode: HTTP ☒ FTP ☐

Submit

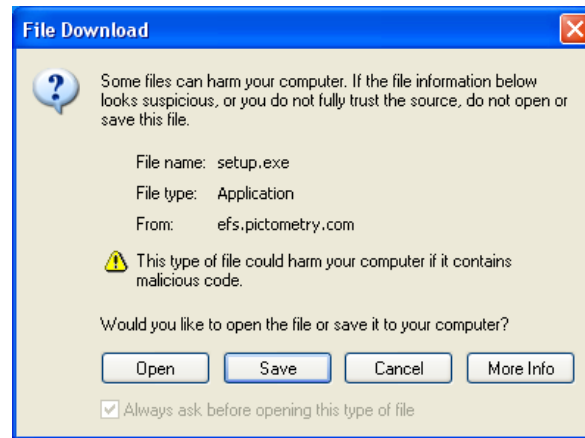
\* Required Fields

5. Type the requested information and choose a mode for file transmission (click **HTTP** or **FTP**). Then click **Submit**.

**Note:** You should choose a mode based on which protocol is available in your environment. For example, to use FTP, you'll need the appropriate file transfer software on your computer. If you are unsure of which mode to choose, see your System Administrator.



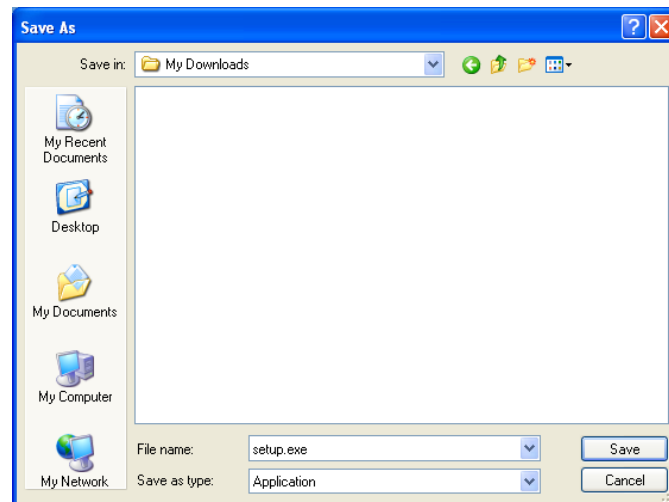
The File Download dialog box appears.



6. Click **Save**. The Save As dialog box appears.

**Note:** Because you cannot update EFS while it is open, you must save the download file to a hard drive and run it after exiting EFS. You should not click Open.

*Your screen may not look exactly like this one.*



7. Navigate to the directory in which to save the file, then click **Save**. The file is saved in the directory you chose.
8. Exit EFS if you want to install the update right away.

After exiting EFS, you can run the downloaded file at any time to install the EFS updates. After opening the file, follow the instructions in Chapter 1 for installing EFS.

## Using Updater to update EFS

Updater is a utility program that checks for, downloads, and installs updates to EFS and to itself. Updater is provided free of charge with EFS.

You can have Updater run automatically, or you can run it from the EFS Help menu whenever you want. (If you run it yourself, you can check for updates immediately by clicking a button.)

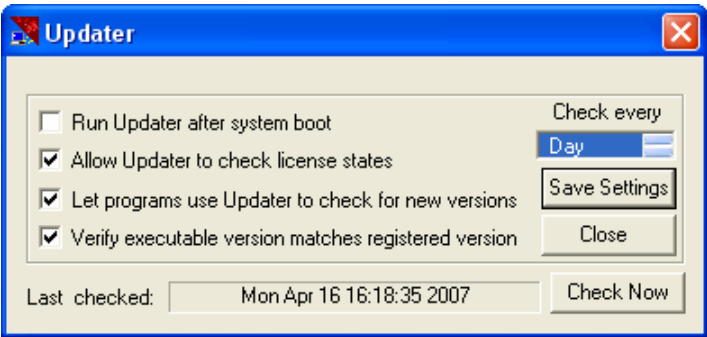


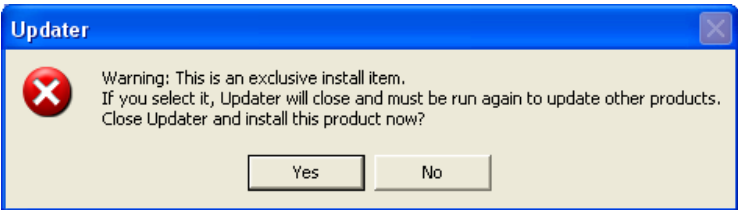
Figure H-1: The Updater dialog box.

Table H-1: The options on the Updater dialog box.

Field or button	Description
Run Updater after system boot	If this option is checked, Updater runs each time you boot your computer.
Allow Updater to check license states	If this option is checked, Updater checks the status of your software licenses to be sure they are valid and have not expired.  We recommend that you keep this option checked.
Let programs use Updater to check for new versions	If this option is checked, EFS will use Updater to check if new versions are available for EFS and for Updater.
Verify executable version matches registered version	An advanced option that indicates how Updater determines that updates are available.  We recommend that you keep this option checked.
Check every	Determines how often Updater checks for software updates. (Click the bar to the right of the field to change the frequency in which Updater checks for updates.)

Exclusive installation

Regardless of how Updater is run (automatically or not), some products require exclusive installation, that is, they must be installed separately from other products. If you choose to update a product that requires exclusive installation, Updater will warn you with the following message:



If you click “Yes,” Updater downloads and installs only the exclusive product, then closes. (You’ll need to restart Updater later to update other products.) If you click “No,” Updater cancels the installation and does not close.

The Updater dialog box is pictured on page 474.

### Updater runs automatically ...

- Each time you start EFS, if the “Let programs use Updater to check for new versions” option (on the Updater dialog box) is checked.
- Each time you boot your computer, if the “Run Updater after system boot” option (on the Updater dialog box) is checked.

When Updater runs, it checks for updates once a day, once a week, every two weeks, or not at all, depending on the choice you made on the Updater dialog box.

**Important:** Updater lets you know if more recent versions of EFS and of Updater are available, but it *does not automatically install updates* on your computer. You must click a button to install the updates.

### Setting up Updater to run automatically

Use the following procedure to set up Updater to run automatically. (To check for updates immediately, see the procedure “To check for updates immediately” on page 476.)

#### ◆ To set up Updater to run automatically:

1. Choose **Help⇒Check for Updates**. Updater opens and the Updater dialog box appears. (Figure H-1.)
2. Set options as desired, using Table H-1 on page 474 as a guide.
3. To save your changes, click **Save Settings** (otherwise changes are not saved).
4. Click **Close** or **Cancel** to close Updater.

Updater will check for updates according to the frequency you selected (every day, week, 2 weeks, or never). Depending on the settings you chose, these checks will occur after booting your system or after launching EFS.

### What happens when Updater runs automatically?

When Updater runs automatically (after a system boot or launch of EFS), it does the following:

- Prompts you before connecting to the Internet.

**Note:** You can disable this prompt so that it will not appear again.

- Attempts to connect to the Internet and check for updates.
- Install updates.

**Note:** Installation occurs only if you click a button. (You can choose to install at a later time.)

Use the following procedure to respond to Updater when it runs automatically.

◆ **To handle automatic Updater pop-ups:**

- Follow Steps 3 – 10 of the following procedure “To check for updates immediately.”

**Running Updater immediately**

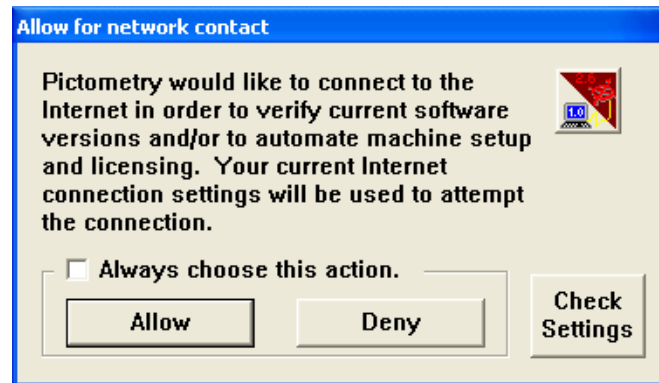
Use the following procedure to run Updater immediately.

◆ **To check for updates immediately:**

1. Open Updater by choosing **Help⇒Check for Updates**.

**Note:** You can also change Updater's settings. Use Table H-1 on page 474 as a guide. To save your changes, click **Save Settings**.

2. Click **Check Now**. The following screen appears (even if you've previously checked “Always choose this action”):



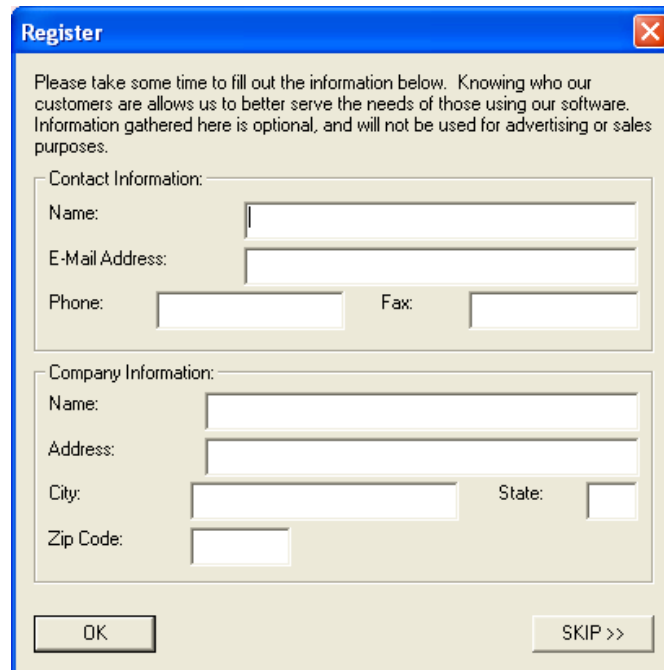
3. (Optional) To change Updater settings, click **Check Settings**, change settings as desired on the Updater dialog box, then click **Check Now** again.
4. If you don't want to be prompted with this dialog box each time Updater *automatically* attempts to check for updates, then check “**Always choose this action.**”

**Important:** If you check this box, the button you click next (Allow or Deny) determines whether Updater will check for updates when it runs automatically. (Even if this box is checked, you can check for updates manually by clicking the Check Now button on the Updater dialog box.)

5. Click **Allow** to permit Updater to access the Pictometry website to check for updates now.
6. If you see the following dialog box, please complete the requested information.

*Some fields may already be filled in.*

*To keep your information secure, Pictometry uses a Secure Socket Layer (SSL) to transfer data.*



**Register**

Please take some time to fill out the information below. Knowing who our customers are allows us to better serve the needs of those using our software. Information gathered here is optional, and will not be used for advertising or sales purposes.

Contact Information:

Name:

E-Mail Address:

Phone:  Fax:

Company Information:

Name:

Address:

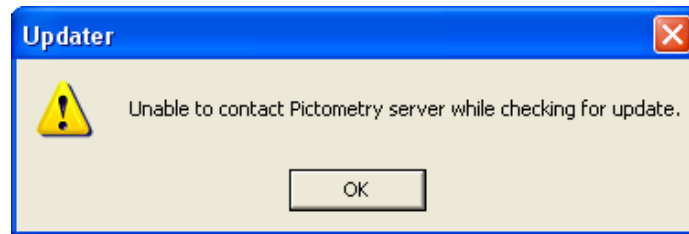
City:  State:

Zip Code:

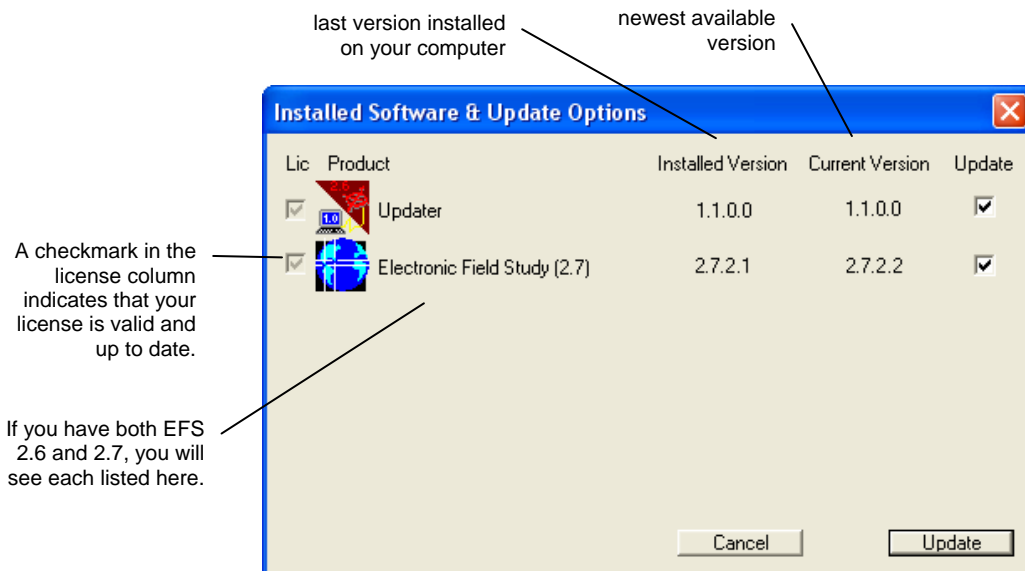
OK SKIP >>

- Z After completing the Register form, click **OK**. (If you click **SKIP**, a similar dialog box will appear.)

*If Updater cannot access the Pictometry website, the following message appears:*



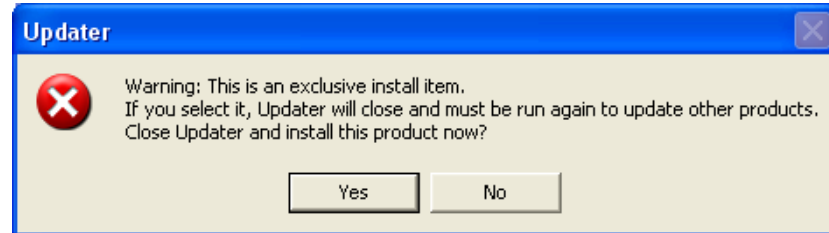
*Otherwise a dialog box similar to the following appears:*



**Note:** A checkbox appears in the Update column if updates (that you haven't already installed) are available for the product listed to its left.

8. (Optional) In the Update column, check any product you want updated, and uncheck any product you do not want updated. Keep in mind that some products must be installed separately. (See "Exclusive installation" on page 474.)

*If you checked an exclusive product, the following message appears:*



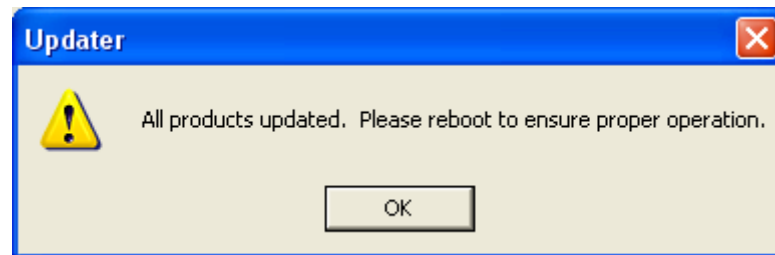
- Click **Yes** to continue with installation, or **No** to cancel the installation and return to the Installed Software & Update Options dialog box.

If you clicked "Yes," Updater begins the download and installation immediately, ignores all other checkmarks, and closes. (You'll need to restart Updater later to update other products.)

If you clicked "No," continue from the beginning of Step 8.

*If you **did not** check an exclusive product, continue with Step 9.*

9. To update products that are checked, click the **Update** button.
10. If Updater is still open, click **Close** to exit the application.
11. If EFS has been updated, you may see the following dialog box.



# Glossary

**Absolute scale**

The ratio of what you see on the screen to what you see in the real world, independent of units.

**Active image**

The image currently selected in the Image window. If more than one image is open and visible in the Image window, the active image is the one that has a brighter title bar.

**Active profile**

The Address Search profile that is currently selected. The active profile is the one used for address searches. *See also* Address Search profile.

**Active workspace**

Typically, the workspace that's currently shown in the Workspace window. However, if you have more than one workspace visible at a time, the active workspace is the one that has a bright blue title bar.

**Address Search profile**

A set of address-related database fields used to search for a land parcel by its street address. You can create multiple Address Search profiles, but only one at a time can be the active profile.

**Advanced User Mode**

An EFS setting that enables or disables advanced features, such as creating a subset of an Image Warehouse from images listed in a workspace.

**ALOHA (Areal Locations Of Hazardous Atmospheres)**

A program used by emergency planners to predict how a hazardous gas cloud (plume) might disperse in the atmosphere after a chemical spill.

**ALOHA annotation**

An annotation created by the ALOHA application. It visually models the results of a chemical spill, given factors such as wind speed and direction. An ALOHA annotation can be added to an EFS workspace in an ALOHA annotation layer.

**Alternate View feature**

The EFS buttons and menu options that open other views of the same area you are viewing in the Image window. Alternate views are actually search hits that show the location you searched for from different directions and from different shot levels.

**Annotation**

A type of image overlay that you create or import. There are three types of annotations in EFS: annotations you create (“user-defined annotations”), annotations you import from GIS layers, and annotations you import from ALOHA. Annotations are stored in a workspace. *See also* User-defined annotation, GIS annotation layer, and ALOHA annotation.

**Annotation layer**

A collection of annotations that share a common theme (for example, streets) and a set of common characteristics. User-defined annotations inherit characteristics from an annotation layer, which is identified by a book icon in the workspace. *See also* GIS annotation layer.

**Annotation properties**

Color, size, line width, and other characteristics of annotations and annotation layers that affect the appearance of the annotation or of the layer’s annotations. Also called “attributes.”

**Base map image**

The map or Orthogonal image upon which a workspace is based. It is listed immediately after the Opened Warehouse Images folder in the workspace.

**Bearing**

The degree of the angle formed by an object in relation to True North.

**Cardinal sort**

An EFS feature that sorts search hits shown in the Thumbnail window so that Neighborhood Obliques appear first, then Community Obliques, Neighborhood Orthos, and Community Orthos. Within each category, the first four thumbnails are shown in the following order: north-up, south-up, east-up, and west-up (depending on available views).

**Centroid**

A pre-determined point on a parcel of land. It may or may not be the geometric center of the parcel.

**Community image**

A Pictometry image taken from a higher altitude than a Neighborhood image. A Community image typically shows an entire community. There are two types of Community images: Community Orthogonal and Community Oblique.



**Community Oblique image**

An Oblique image taken at the Community shot level.

**Community Orthogonal image**

An Orthogonal image taken at the Community shot level.

**Config Editor**

*See* EFS Config Editor.

**Configuration**

A stored record of the visibility, size, and placement of the EFS toolbars and windows and of your Status Bar and compass preferences. This information can be saved to a PCF file and loaded on other machines to provide common user interfaces. *See also* PCF.

**Context menus**

Context-sensitive pop-up menus that appear when you click the right mouse button in the toolbar area, the Status Bar, or in any of the windows.

**Contour lines**

A type of topographical map feature indicating zones of elevation. This type of overlay is available if you have elevation data available for your images.

**Correlating fields**

When creating an Address Search profile, the process of identifying which fields in your GIS data correspond to the fields EFS uses to search for images by street address.

**DBF file (“DataBase File”)**

The part of a shapefile that contains the (alphanumeric) text. A DBF file has an extension of “.dbf.” *See also* Shapefile.

**Digital Elevation Model (DEM) file**

A type of elevation file that can be added to a workspace so you can use elevation in distance measurements (if your images do not already contain integrated elevation data). If you have them, DEM files are contained in the DEMs folder of the Image Library.

**Display PDX file**

A file that indexes the shapefile’s SHP file in order to speed up the display of a shapefile-based GIS annotation layer. You create this file by using the Display PDX utility. *See also* PDX (Pictometry Data Index) file and Display PDX utility.

**Display PDX utility**

The EFS utility that creates a Display PDX file. *See also* PDX (Pictometry Data Index) file.

**Docked**

The state in which a window or a toolbar is stationary within the EFS application window.

**EFS Toolbar Configuration Editor**

An application (separate from EFS) that is used to create Configuration (PCF) files. The EFS Toolbar Configuration Editor is discussed in the *EFS System Administrator Guide*. *See also* PCF (Pictometry Configuration File).

**Electronic Field Study (EFS)**

The Pictometry software system that lets you view and work with aerial images contained in a Pictometry Image Library or purchased from Pictometry Online.

**Elevation bounding boxes**

Rectangles that overlay images in order to identify different elevation areas on a map. Elevation bounding boxes are available if you have elevation data for your images.

**Elevation files**

Files that contain elevation data integrated with location data. If you have images or maps without integrated elevation data, you need to load elevation files (PEF files) into your workspace in order to use the Elevation Tool and the Walk the Earth feature. (Newer Orthogonal images don't require elevation files.) *See also* PEF (Pictometry Elevation Files).

**ESRI**

The Environmental Standards Research Institute, creators of GIS products such as ArcGIS.

**ESRI World File**

A text file that contains coordinate information about the projection of an image. EFS can export an ESRI World File along with an orthogonal image when you export (or extract part of) an image. An ESRI World File has an extension of "jgw."

**Export**

The process of saving images or data (in a format such as JPEG or TIFF) to a file external to EFS.

**Extract**

The process of saving a portion of an image (in a format such as JPEG or TIFF) to a file external to EFS.

**Folder Info tab**

The Output window tab that displays detailed information about the item currently selected in the Workspace window. For images, it shows information such as the name and size of the image, the date the image was captured, and its coordinates. For annotations and layers, it shows attributes such as color and line width.

**Geographic Information System (GIS)**

An organized collection of computer hardware, software, and geographic data—designed to efficiently capture, store, update, manipulate, analyze, and display all forms of geographically referenced information.

**GIS annotation layer**

A type of overlay created from GIS data and saved as part of a workspace. GIS annotation layers typically highlight geographic features (such as waterways) and manmade structures (such as roadways, municipal boundaries, and parcels).

**GIS data**

Vector data—points, lines, and polygons—associated with a geographic location and contained in a Geographic Information System. It typically includes maps that are comprised of many GIS layers—each containing a different type of GIS data.

**GIS Image**

A type of a raster image that has *no bitmap*. It has a solid-color background overlaid with one or more associated GIS annotation layers.

**GIS object**

Within a GIS annotation layer, a unit of vector data along with its corresponding text data.

**Global annotation**

An annotation that can be viewed on any warehouse image that covers the same geographic area as the annotation. (GIS and ALOHA annotations are always global.)

**grid layer**

A type of overlay created by using the Grid Tool and saved as part of a workspace. You can enter data into each segment of a grid layer by using a template you imported from a shapefile or from an SDE database. *See also* grid overlay.

**grid overlay**

A type of image overlay that contains equal-sized segments. You can label the segments and you can save the grid to a workspace as a grid layer. There are two types of grids: circular and rectangular. You'll use the Grid Tool to create a grid overlay. *See also* grid layer.

**Ground Sample Distance (GSD)**

The amount of ground covered by one pixel of a digital camera image. An image with a smaller GSD has a higher resolution than an image with a larger GSD. Neighborhood images have smaller GSDs and higher resolutions than do Community images.

**Hit Quality sort**

An EFS feature that sorts the search hits shown in the Thumbnail window so that Neighborhood Obliques appear first, then Community Obliques, Neighborhood Orthos, and Community Orthos. Within each category, the best quality search hits (with the sweet spot closest to the location searched) appear first.

**Image caching**

A method of temporarily saving annotated images so they can be refreshed quickly on the screen.

**Image Library**

A repository for images and files covering a related geographic area. An Image Library is organized in a tree structure and contains folders for images, elevation files, maps and GIS files, and image polygons. *See also* Image Warehouse.

**Image polygon**

A type of overlay that represents the footprint of an image. An image's polygon can be displayed on any other image to show the land it covers (its footprint).

**Image resolution**

The amount of ground represented by a pixel on your screen at any given time.

**Image resolution scale**

The proportional relationship between what you see on the screen to what it represents in real life. *See also* Image resolution.

**Image Tool**

The EFS tool used to search Image Warehouses and workspaces by using the coordinates of the point you click in the active image or by using the coordinates you enter. Using the Image Tool changes the Navigation Point. *See also* Navigation Point.

**Image types**

In EFS, the term used to describe the angle from which shot was taken, either Oblique or Orthogonal.

**Image Warehouse**

That part of an Image Library that contains a collection of Pictometry images—high-quality digital images, typically of an entire county or town. The images contain geographic reference information mapping them to a specific geographic area. EFS stores information about an Image Warehouse in PIW files. *See also* Image Library and PIW (Pictometry Image Warehouse) file.

**Image window**

The area in the center of the screen, where open images are displayed. (An open warehouse and the Thumbnail Gallery can also be shown in the Image window.)

**Limit Image Search buttons**

Buttons that you can add to a toolbar to quickly limit a search by shot level or by image type.

**Local annotation**

A user-defined annotation associated with (and shown on) only one image—the one that is active when you create the annotation.

**Menu Bar**

The area at the top of the screen that contains pull-down menus with options that allow you to use EFS features.

**MGRS (Military Grid Reference System)**

A coordinate system used by the US military.

**Navigation Point**

The location—identified by a red crosshair (plus sign)—of the last image search. Immediately following a search, crosshairs appear on open images that contain the searched location (the Navigation Point) and on thumbnail images.

**Navigation Cameras**

The Alternate View buttons used to open images from different camera directions (N, S, E, W, and Orthogonal). EFS places Navigation Camera buttons for the four alternate camera angles near the sides of the active image. (The active image shows the fifth camera angle.)

**Navigation window**

The window (typically floating in the upper right part of the screen) that shows a thumbnail representing the entire active image. The thumbnail's red rectangle represents the part of the active image that's in view in the Image window. You can drag the red rectangle to pan ("navigate") the active image. The Navigation window can be hidden, docked, and moved. *See also* Thumbnail image.

**Neighborhood image**

A Pictometry image taken at a lower altitude than Community images to show more detail. There are two types of Neighborhood images: Neighborhood Orthogonal and Neighborhood Oblique.

**Neighborhood Oblique image**

An Oblique image taken at the Neighborhood shot level.

**Neighborhood Orthogonal image**

An Orthogonal image taken at the Neighborhood shot level.

**North Pointer**

Another term for a compass rosette.

**Oblique image**

An image taken at an angle, so that it appears three-dimensional and its features are more easily recognized. Also called “Pictometric image.”

**Opened Warehouse Images**

A workspace folder that EFS uses to keep track of every image you open during an EFS session. You can move images from this folder to the active workspace to save them as part of the workspace. The contents of the Opened Warehouse Images folder are not saved when the workspace is saved or when you exit EFS.

**Ortho Sector Tile**

An image that is created by seamlessly combining multiple adjacent Orthogonal images into a single mosaic image, such that one square mile is represented as a single photographic image with no overlap between the images.

**Orthogonal image**

An image taken with the camera looking straight down, lens parallel to the Earth, resulting in a two-dimensional capture, much like a map. Also called an Ortho.

**OSGB-36**

A coordinate system used in Great Britain.

**Output window**

The area (typically at the bottom of the screen) where workspace folder information, query results, and tool results are shown. *See also* Folder Info tab, Query Info tab, and Tool Info tab.

**Overlay**

Graphic or text information displayed on top of an image without modifying the original image. *See also* Annotation, Elevation bounding boxes, Grid overlay, Image polygon, and Sector map.

**Parcel-based data**

GIS data in which each record corresponds to a parcel and may include fields that identify that parcel's coordinates, street name, house number, and in some cases a Parcel\_ID.

**PAF (Pictometry Attribute File)**

A file used to export global annotations from one workspace (and import them) to another. A PAF file contains a global annotation layer along with its global annotations and has an extension of "paf."

**PAS file**

A file created automatically by the ALOHA software when you model a plume, and used by EFS to add the annotation to a workspace. A PAS file contains an ALOHA annotation's geometric data and has an extension of "pas."

**PAX (Pictometry Address eXchange) file**

An Address Search profile, exported as a file that can be imported to other machines. Its file name extension is "pax." PAX files allow Address Search profiles to be shared amongst multiple users. *See also* Address Search profile.

**PCF (Pictometry Configuration File)**

A file that contains Configurations, paths of Image Warehouses, paths to workspace files, and various other settings. When loaded, a PCF file configures EFS to a particular state. It can be loaded automatically at startup. A PCF file has an extension of "pcf." *See also* Configuration.

**PDX (Pictometry Data index) file**

An index file that you create to speed up searches or drawing of a shapefile-based GIS annotation layer. A PDX file has an extension of "pdx." *See also* Search PDX file and Display PDX file.

**PEF (Pictometry Elevation Files)**

Files containing elevation data that can be used with images in EFS. If you have images without integrated elevation data, you'll need to load PEF files into your workspace in order to use the Elevation Tool and the Walk the Earth feature. A PEF file has an extension of "pef."

**PentaView**

The viewing mode in which you simultaneously view a set of five images of the same location—each from a different angle or direction (N, S, E, W, Orthogonal). When you click the PentaView button, EFS opens the other views automatically, with the active image in the center and the four additional views in corners around it. You can easily switch between this window arrangement and four other arrangements. *See also* Standard View.

**PGS (Pictometry Geo Script) software**

A Pictometry software application that creates PGS Scripts. Although no longer actively supported by Pictometry, GIS Images created in this format can still be used in EFS.

**PGS Script**

A GIS Image format created by using the PGS software. Files have the extension “pgs.” *See also* PGS (Pictometry Geo Script) software.

**Pictometric image**

*See* Oblique image.

**Pictometry**

The Pictometry International product consisting of digital aerial Oblique and Orthogonal images and the Electronic Field Study (EFS) software. *See also* Electronic Field Study.

**PIW (Pictometry Image Warehouse) file**

A file that contains links to images contained in an Image Warehouse. An Image Library contains multiple PIW files (one in the warehouse folder, plus one in each cluster and sector folder.) A Pictometry Image Warehouse file has an extension of “piw.”

**PLF (Pictometry License File)**

A file that contains your EFS software license options. Your PLF file must be loaded into EFS in order for you to use EFS tools. A PLF file has an extension of “plf.”

**PMI (Pictometry Map Image) file**

A Pictometry map image or other Pictometry Orthogonal image, identified by an extension of “pmi.”

**Polyline**

An annotation that consists of one or more contiguous lines. (A polyline can have corners.)



## Properties

See Tool properties and Annotation properties.

## PSI (Pictometry Shot Image) file

A Pictometry Oblique image file. *See also* Oblique image.

## Query Info tab

The tab in the Output window that shows the full database record or table entry for the matching GIS object following a query.

## Range-based data

GIS address data in which each record corresponds to a group of adjacent parcels (a “street segment”) and includes fields that identify the street name, coordinates that identify the street segment, and house numbers for the first and last house on each side of the street. Range-based address data is located in a TIGER file or in a Street Centerline file.

## Rural images

Images typically used for rural areas and consequently shot at a level that’s equal to or higher than Community shots.

## Scale

A proportion between two sets of dimensions. In EFS, scale refers to the relationship between the distances on a map and the corresponding actual distances.

## Screen resolution

The number of pixels your screen can display in one square inch. Screen resolution is expressed in dpi, or “dots” (screen pixels) per inch.

## SDE

Spatial Database Engine database software—an ESRI database application that lets you store and manage spatial data. Also called ArcSDE®. *See also* SDE feature class.

## SDE feature class

An SDE database that contains a table entry for each GIS object. You can add GIS data from an SDE database to EFS in the form of a GIS annotation layer. Also called an ArcSDE® feature class. *See also* SDE.

## Search hits

The images or database records that match your search criteria after searching an Image Warehouse or a database.

**Search PDX file**

A file that indexes a field in a shapefile's DBF file in order to speed up searches of a shapefile-based GIS annotation layer. You'll create this file by using the Search PDX utility. *See also* PDX (Pictometry Data Index) file and Search PDX utility.

**Search PDX utility**

The EFS utility that creates a Search PDX file. *See also* PDX (Pictometry Data Index) file.

**Sector map**

A grid overlay displayed over a base map. A sector map divides the base map into one-mile sections called sectors.

**Shapefile**

A GIS file format, produced by ERSI's ArcView or ArcInfo, in which information is stored in multiple files. The SHP file (extension ".shp") contains vector data, the DBF file (extension ".dbf") contains text fields, and the SHX file (extension ".shx") contains an index to the SHP file.

**Shot level**

A Pictometry term that distinguishes images taken at different altitudes. EFS recognizes Community, Neighborhood, Rural, and Other shot levels.

**Standard View**

The viewing mode in which you can open one image at a time. When you open an image, it appears on top of the previously opened image, and it becomes the active image. The individual image windows can be minimized, closed, resized, tiled, or cascaded. (Although it wasn't called as such, Standard View was the only viewing mode in prior versions of EFS.) *See also* PentaView.

**Status Bar**

The area across the lower portion of the EFS application that shows information pertaining to the action being performed. For example, it shows measurement results, the coordinates of the Navigation Point, and the percentage of magnification of the active image.

**Street Centerline file**

A type of file that stores range-based GIS data used for searching by street address and displaying street information. *See also* Range-based data.

**Sub-warehouse**

A subset of an entire Image Library, created for use by a municipality or other specific group.

**Sweet spot**

The ideal placement for an object of interest within an image. The sweet spot is generally the center of an Orthogonal image, and the center of the lower portion of an Oblique image.

**Thumbnail image**

A miniature, low-resolution version of an image. Thumbnail images are shown in the Thumbnail window, Thumbnail Gallery, and Navigation window. The Navigation window's thumbnail corresponds to the active image.

**Thumbnail Gallery**

A way to view thumbnails of all images that are part of the active workspace, (including those listed in the Opened Warehouse Images folder). The thumbnails are shown in the Image window.

**Thumbnail window**

The window (typically on the right of the screen) that shows search hits in the form of thumbnail images. Can be moved, shown, or hidden from view.

**TIGER file**

A type of file that stores range-based GIS data, which can be used for searching by street address. *See also* Range-based data.

**Tool Info tab**

The tab in the Output window that shows detailed calculations resulting from your use of the Distance, Area, and Navigate tools.

**Tool properties**

Various settings (such as color, font, line width) that affect the way in which an EFS tool works. You can view or change a tool's properties by choosing that tool from the toolbar and then choosing Properties from the Tools menu.

**Toolbars**

Contain buttons for fast access to frequently used functions. Toolbars can be customized.

**UNC (Universal Naming Convention)**

A format for specifying the location of files on a LAN. The UNC format is:  
`\\servername\sharename\path\file name` (where "servername" is the hostname of a network file server, "sharename" is the name of a networked or shared directory, and "path" can be zero or more folder or subfolder names).

**Undocked**

The state in which a window or a toolbar can be moved around freely within the EFS application window.

**User-defined annotation**

An annotation you create using tools found on a toolbar. You can annotate an image with lines, circles, text, points, icons, or links to files.

**Vector data**

A series of coordinates that can be graphed or connected to make a drawing or shape. GIS vector data is organized in layers of points, lines, or polygons, which are used to highlight image features.

**Warehouse Order sort**

An EFS feature that sorts search hits shown in the Thumbnail window by warehouse. Search hits are sorted according to the order in which the warehouses are listed in the Warehouse List tab of the Image Tool Properties dialog box.

**Workbook Mode**

A feature that lets you quickly switch between open images by clicking the desired image's tab at the bottom of the Image window.

**Workspace**

A mechanism for organizing images and their related annotations and files. The Workspace window lists workspace contents for fast and easy access. *See also* Workspace window.

**Workspace Root**

The first item listed in a workspace tree, the Workspace Root always displays the workspace name.

**Workspace window**

The window (typically on the left of the screen), where the active workspace is represented in a tree-structured format.

# Index

## A

- above ground measurements, [192-98](#)
- absolute scale, [388](#)
  - defined, [45](#), [387](#), [479](#)
  - example depicting, [387](#)
- accuracy
  - of measurements, [192](#)
- actions that initiate searches, [85](#)
- activating
  - a Configuration, [422](#)
  - high-detail map, [122](#)
  - maps, [121](#)
  - PentaView, [133](#)
- active Configuration, [422](#)
- active image
  - closing, [96](#)
  - defined, [59](#), [479](#)
- active profile, defined, [26](#), [479](#)
- active workspace, [170](#), [176](#)
  - defined, [170](#), [479](#)
- adding
  - Configuration from a PCF file, [425](#)
  - custom tool to a toolbar, [431](#)
  - custom tools, [426-32](#)
    - procedure for, [430](#)
  - data to a grid, [282-86](#)
  - GIS annotation layer
    - from a shapefile, [306](#)
    - from SDE data, [313](#)
  - images to a workspace
    - all search hits, [400](#)
    - automatically, [399](#)
    - base map, [395](#)
    - GIS Image, [357](#)
    - Oblique image, [397](#)
    - open images, [397-99](#)
    - Orthogonal image, [396](#)
    - reasons for, [395](#)
  - toolbar buttons, [416](#)
- Address Search, [92](#)
  - adding toolbars, [38](#)
  - fields used for, [28](#), [29](#), [31](#)
  - files used for, [24](#)
  - highlighting vector data, [39](#)
  - optimizing, [305](#)
  - procedure for, [92](#)
  - repeating, [95](#)
- Address Search (*continued*)
  - required fields, [27](#)
  - setting up, [24](#)
    - multiple machines, [26](#)
    - one machine, [26](#)
  - toolbars, [36](#)
- Address Search profile
  - defined, [24](#), [479](#)
  - overview, [26-31](#)
  - procedure for creating, [31](#)
- adjacent images
  - viewing, [114](#)
- adjusting brightness and contrast, [147](#)
- Advanced User Mode
  - defined, [479](#)
  - described, [43](#)
  - options available with, [461](#)
  - setting, [461](#)
- ALOHA, [449](#)
  - defined, [479](#)
  - using with EFS, [450](#)
- ALOHA annotation, [52](#), [174](#), [449](#)
  - adding, [450](#), [451](#)
  - changing, [451](#), [455](#)
  - defined, [479](#)
  - exporting as shapefile, [450](#), [456](#)
  - footprint, [449](#)
  - importing. *See* adding
  - licensing requirements, [450](#)
  - origin of plume, [449](#)
  - parts of, [449](#)
  - relocating, [459](#)
  - removing, [458](#)
- ALT key, [198](#), [226](#)
- Alternate View buttons, [86](#), [119](#)
  - pictured, [115](#)
  - why dim, [87](#)
- Alternate View feature, [84](#), [87](#), [115-22](#)
  - defined, [480](#)
  - procedure for using, [120](#)
- alternate views
  - images returned, [117](#)
  - menu options for, [115](#)
  - opening, [115](#)
  - reasons for unavailable views, [87](#), [100](#)
  - relationship to Navigation Point, [117](#)

alternate views (*continued*)  
     when available, [115](#)  
     when updated, [87](#), [116](#), [124](#)

annotating images with  
     circles, [229](#)  
     icons, [232](#)  
     lines, [226](#)  
     links, [237](#)  
     points, [230](#)  
     symbols, [231](#)

annotating images, overview of, [213](#)

annotation  
     defined, [480](#)  
     properties  
         changing, [243](#)  
         defined, [480](#)

annotation layer  
     defined, [480](#)  
     hiding, [445](#)  
     viewing, [445](#)

annotation layer (user-defined), [173](#)  
     changing properties of, [220](#)  
     creating  
         by itself, [218](#)  
         with an annotation, [219](#)  
     defined, [215](#)  
     exporting to a shapefile, [374-77](#)  
     properties, [216](#)  
     renaming, [221](#)

annotation tools  
     and ground plane offset, [195](#)

annotations, [51](#), [173](#), [213](#)  
     ALOHA, [174](#), [449](#)  
     attributes, [215](#)  
     changing, [243](#)  
     changing properties of, [243](#)  
     circle, [214](#)  
     creating, [221](#)  
     global, [215](#)  
     hiding, [241](#), [445](#)  
     icon, [214](#)  
     line, [214](#)  
     link, [215](#)  
     local, [215](#)  
     moving, [246](#)  
     overview of types, [213](#)  
     placing above the ground, [192](#), [221](#)  
     point, [214](#)  
     properties, [215](#), [216](#)  
     selecting, [244](#)  
     text, [214](#)  
     types of user-defined, [214](#)  
     user-defined, [214](#)

annotations (*continued*)  
     viewing, [241](#), [445](#)  
     where stored, [215](#)

approaches to searching for images, [77](#)

ArcSDE, [301](#)  
     feature class, [301](#)

Area Tool, [203](#)

arguments, command line, [427](#)

associated GIS annotation layers, [354](#)

associated text data, [300](#)

attributes  
     defining for lines, points, and circles, [223](#)  
     of annotations, [216](#)

Attributes tab  
     fields and buttons, [271](#)  
     pictured, [271](#)

Auto label, [304](#), [310](#), [311](#)

Auto select layer feature, [334](#)  
     setting up, [334](#)

## B

base map, [171](#), [173](#)  
     adding to a workspace, [395](#)  
     defined, [480](#)

base map image. *See* base map

bearing  
     defined, [480](#)  
     measuring, [207-9](#)

Bearing Tool, [207](#)

Blue Marble GeoCalc, [463](#)

Blue Marble Geographics, [465](#)

Brightness and Contrast button, [147](#)

## C

CAMEO, [449](#)

Cardinal sort, [105](#)  
     defined, [480](#)  
     option on the Image Tool Properties dialog  
         box, [99](#)  
     order in Thumbnail window, [105](#)  
     turning on and off, [99](#)

Cartesian data, and Lat/Lon base map, [343](#)

cascading windows, [60](#)

Center Reticule, [142](#), [143](#)

centering  
     an image, [141](#)  
     the Navigation Point, [124](#)

Centerline file. *See* Street Centerline file

centroid data  
     and address searching, [27](#), [92](#)  
     centroid, defined, [480](#)

changing  
     Address Search profiles, [37](#)

- changing (*continued*)
  - annotation layer properties, [220](#)
  - annotation properties, [243](#)
  - annotations, [243](#)
  - compass properties, [419](#)
  - Configurations, [423](#)
  - coordinate systems, [185](#)
  - elevation contour line properties, [211](#)
  - file name in Workspace window, [407](#)
  - format of scale in Zoom/Scale box, [390](#)
  - GIS annotation layer properties, [317](#)
  - GIS Image, [356](#), [358](#)
  - grids, [290](#)
    - data in, [292](#)
    - properties of, [290](#)
  - image magnification, [391](#)
  - layers associated with a GIS Image, [358](#)
  - order of workspace items, [407](#)
  - PGS Script properties, [468](#)
  - scale, [257](#), [390](#)
  - Select Tool properties, [245](#)
  - tool properties, [185](#)
  - toolbar button size, [417](#)
  - units of measure, [184](#)
  - window arrangements in PentaView, [135](#)
- choices for
  - drawing tool output, [186](#)
  - image resolution scale, [388](#)
- circle annotation
  - creating, [229](#)
  - moving, [251](#)
  - resizing, [251](#)
- Circle Annotation Tool, [229](#)
- circles
  - defining attributes for, [223](#)
- circular grid
  - pictured, [267](#)
- cleaning up icons, [237](#)
- Clip to Image, [304](#)
- Clip to View, [304](#)
- closing
  - active image, [96](#)
  - EFS, [67](#)
  - Image Warehouse, [384](#)
  - PentaView, [140](#)
- color cones, [136](#)
  - turning on, [137](#)
  - viewing, [137](#)
- command line arguments, [427](#)
- Community image, defined, [50](#), [480](#)
- Community Oblique image, defined, [481](#)
- Community Orthogonal image, defined, [481](#)
- compass, [72](#)
  - options for viewing, [418](#)
  - properties, changing, [419](#)
  - viewing in Navigation window, [418](#)
  - viewing on images, [418](#)
- composite fields. *See* custom fields
- confidence lines. *See* ALOHA annotations
- Config Editor. *See* EFS Toolbar Configuration Editor
- Configuration
  - activating, [422](#)
  - active, [422](#)
  - changing, [423](#)
  - choices for default, [10](#), [414](#)
  - defined, [421](#), [481](#)
  - deleting, [423](#)
  - saving to a PCF file, [424](#)
- connecting to an SDE database, [318](#)
- Construct tab
  - fields and buttons, [269](#)
  - pictured, [269](#)
- context menu
  - defined, [67](#), [441](#), [481](#)
  - Image window, [441](#)
  - Navigation window, [447](#)
  - Output window, [446](#)
  - Status Bar, [447](#)
  - Thumbnail window, [448](#)
  - toolbar, [448](#)
  - Workspace window, [443](#)
- contour lines, [210-12](#), *See also* elevation contour lines
  - defined, [481](#)
- conventions, *xx*
- Converter
  - DBF. *See* DBF Converter utility
  - shapefile. *See* Shapefile Converter
- coordinate systems
  - Cartesian data, and Lat/Lon base map, [343](#)
  - changing, [185](#)
  - MGRS, [465](#)
  - OSGB-36, [463](#)
- copying
  - global annotations to other workspaces, [264](#)
  - Status Bar contents, [66](#)
- correlating fields
  - defined, [26](#), [481](#)
  - descriptions of fields, [27](#)
  - parcel-based, [28](#)
  - range-based, [29](#), [30](#)
- creating
  - a warehouse, [410](#)

- creating (*continued*)
    - annotations, [221](#)
      - circle, [229](#)
      - icon, [232](#), [233](#)
      - line, [227](#)
      - link, [238](#)
      - point, [231](#)
      - text, [222](#)
    - custom
      - Configurations, [421](#)
      - fields for GIS annotation layer, [340](#)
      - tools, [426-32](#)
        - procedure for, [430](#)
    - GIS annotation layer. *See* adding GIS annotation layer
    - grids
      - circle, [273-75](#)
      - overview, [273](#)
      - rectangle, [275-77](#)
      - with a mouse, [277](#)
    - PCF file from EFS, [424](#)
    - template for tool data export, [365](#)
    - user-defined annotation layer, [218](#)
  - cropping orthogonal images, [162](#)
  - CTRL key, [198](#), [226](#)
  - custom Configurations, [421](#)
    - procedure for creating, [422](#)
  - custom fields, [340](#)
  - custom tools
    - adding to a toolbar, [431](#)
    - creating, [426-32](#)
    - procedure for creating, [430](#)
  - Customer Service, [471](#)
  - customizing
    - appearance of EFS, [413](#)
    - Full Screen toolbar, [417](#)
    - Status Bar, [421](#)
    - toolbars, [416](#)
- D**
- DBF Converter utility, [344](#)
  - DBF file, [376](#)
    - associated text data, [300](#)
    - creating with DBF Converter, [344](#)
    - defined, [300](#), [481](#)
    - exporting measurement data to, [371](#)
  - DBF file maintenance utilities, [344](#)
  - default layouts, choices for, [10](#), [414](#)
  - deleting
    - a Configuration, [423](#)
    - an annotation, [252](#)
    - GIS annotation layers, [316](#)
    - grids, [293](#)
  - deleting (*continued*)
    - multiple items from a workspace, [177](#)
    - Query Tool output, [340](#)
    - SDE tables, [322](#)
  - DEM file
    - defined, [481](#)
    - loading, [207](#)
    - when needed, [206](#)
  - diagnostics. *See* Shapefile Diagnostics utility
  - Display PDX
    - file, [305](#), [350](#)
      - defined, [481](#)
      - when to create, [306](#)
    - utility, defined, [350](#), [482](#)
  - displaying
    - Alternate Views, [115](#)
    - similar images, [123](#), [139](#)
    - tool output, [187](#)
  - Distance Tool, [189](#), [190](#), [199](#)
  - docked, defined, [482](#)
  - docking
    - a window or toolbar, [415](#)
  - documentation
    - conventions, [xx](#)
    - feedback, [xxii](#)
    - organization of, [xiii-xix](#)
  - downloading updates to EFS, [471](#)
  - Draw Associated Text, [187](#), [188](#)
  - drawing
    - angled lines
      - Distance and Area Tools, [198](#)
      - Line Annotation Tool, [226](#)
    - freeform lines
      - Distance and Area Tools, [198](#)
      - Line Annotation Tool, [226](#)
  - DRG map, viewing, [121](#)
  - drive mapping
    - fixing for search hits added to workspace, [403](#)
    - fixing for workspace items, [404](#)
- E**
- EFS
    - closing, [67](#)
    - customizing, [413](#)
    - downloading updates to, [471](#)
    - how circumstances effect the use of, [80-81](#)
    - installing, [3](#)
    - list of features, [41](#)
    - memory requirements, [2](#), [133](#)
    - navigation features, [114](#)
    - procedure for installing, [3](#)
    - screen contents, [58](#), [70](#)
    - starting, [13](#), [55](#)



- EFS (*continued*)
    - uninstalling, [18](#)
    - windows, [58](#), [70](#)
  - EFS Toolbar Configuration Editor
    - defined, [482](#)
    - for address search setup, [26](#)
  - EFS users, description of, [79](#)
  - Electronic Field Study application, pictured, [58](#)
    - with all windows open, [69](#)
  - Electronic Field Study, defined, [41](#), [482](#)
  - elevation
    - unexpected results, [402](#)
    - using in distance measurements, [189-92](#)
  - elevation bounding boxes, defined, [54](#), [482](#)
  - elevation contour lines. *See also* contour lines
    - changing properties of, [211](#)
    - defined, [54](#)
    - viewing, [210-12](#)
    - viewing a line's elevation, [211](#)
  - elevation data
    - source of, [191](#)
  - elevation files
    - defined, [482](#)
    - loading, [206](#)
    - workspace icon for, [174](#)
  - Elevation Tool, [205](#)
  - ending
    - a PentaView session, [140](#)
  - ESRI World File
    - defined, [482](#)
    - exporting, [161](#), [166](#)
  - ESRI, defined, [301](#), [482](#)
  - Exact method option, [162](#)
  - exiting EFS, [67](#)
  - export, defined, [482](#)
  - Exporter
    - activating and deactivating, [368](#)
  - exporting
    - Address Search profile to PAX, [35](#)
    - all images
      - from a warehouse, [166](#)
      - from a workspace, [166](#)
    - GIS Image as a PGS file, [469](#)
    - grid data, [286](#)
      - to a shapefile, [286](#)
      - to an SDE database, [288](#)
    - image polygons, [377-84](#)
    - images, [161-68](#)
      - with Exact method option, [162](#)
    - measurement data, [363-68](#)
    - tool data
      - creating a user template, [365](#)
      - field names, [364](#)
  - exporting tool data(*continued*)
    - to a shapefile, [371](#)
    - to a text file, [369](#)
    - to SDE, [373](#)
    - user-defined annotation layers to shapefiles, [374-77](#)
  - extract file formats, [155](#)
  - Extract Tool, [156-61](#)
    - properties
      - Freestyle selection, [156](#)
      - Select using GIS annotation layer, [157](#)
      - Shown portion of image, [156](#)
      - Single click selection, [157](#)
  - extract, defined, [482](#)
  - extracting images, [156](#)
    - overview, [155](#)
  - extracting vs. exporting, [156](#)
- F**
- failure
    - loading license, [18](#)
  - feature class. *See* SDE feature class
  - fields used for address searching, [28](#), [29](#), [31](#)
  - file name
    - changing what appears in Workspace window, [407](#)
    - fixing for workspace items, [405](#), [406](#)
  - files used for address searching, [24](#), [25](#)
  - fixing
    - access to files, [401-7](#)
    - file name of workspace items, [405](#), [406](#)
    - location of workspace items, [403](#), [404](#)
  - floating
    - a window or toolbar, [415](#)
  - Folder Info tab
    - defined, [74](#), [483](#)
    - pictured, [74](#)
  - footprint. *See also* image polygon
    - ALOHA annotation, [449](#)
    - image, [48](#), [54](#)
  - Full Screen Mode, [143](#)
    - using with Query Tool, [337](#)
  - Full Screen toolbar
    - customizing, [417](#)
    - using in Full Screen Mode, [144](#)
- G**
- GeoCalc, [463](#)
  - geocalc.dat, [465](#)
  - Geographic Information System (GIS), defined, [297](#), [483](#)
  - geo-referenced, defined, [46](#)

- getting
  - help, [471](#)
  - updated documentation, [471](#)
  - updates to EFS, [471](#)
- GIS annotation layer, [173](#), [301](#)
  - adding
    - from a shapefile, [306](#)
    - from SDE data, [313](#)
  - Auto label option, [304](#), [310](#), [311](#)
  - based on SDE feature class, [303](#)
  - based on shapefile, [303](#)
  - changing properties of, [317](#)
  - Clip to Image option, [304](#)
  - Clip to View option, [304](#)
  - custom fields for, [340](#)
  - defined, [483](#)
  - deleting, [316](#)
  - Display PDX file, [305](#), [350](#)
  - optimizing
    - searching, [305](#)
    - the display of, [305](#), [350](#)
  - pictured, [298](#), [299](#)
  - point data, appearance of, [304](#)
  - problems viewing, [313](#), [318](#), [402](#)
  - properties, [304](#)
  - querying, [330-40](#), [337](#)
  - refreshing, [316](#)
  - relocating shapefiles for, [318](#)
  - renaming, [317](#)
  - Search PDX file, [305](#)
  - searching, [325-29](#)
  - setup for querying, [331](#)
  - shapefile data
    - optimizing performance, [305](#)
  - showing polygons with patterns/color, [304](#), [310](#)
  - thresholds for viewing, [304](#)
  - viewing and hiding, [314](#)
- GIS Annotation Layer dialog box, [308](#)
- GIS annotations, [51](#), [173](#)
- GIS data, [299](#). *See also* GIS annotation layer
  - defined, [297](#), [483](#)
  - refreshing, [316](#), [319-20](#)
  - sources of, [303](#)
  - types of, [297-300](#), *See also* vector data
- GIS Image, [467](#)
  - adding to a workspace, [357](#)
  - changing layer associations, [358](#)
  - changing properties, [358](#)
  - correcting thumbnail and GSD, [356](#)
  - defined, [353](#), [483](#)
  - layers, [354](#), [467](#)
  - procedure for creating, [354](#)
- GIS Image (*continued*)
  - relocating shapefiles, [358](#)
  - saving as a PGS file, [469](#)
  - what to do before creating, [354](#)
  - workspace icon, [174](#)
- GIS layer, [297](#). *See also* GIS annotation layer
- GIS Layer Search, [85](#), [325-29](#)
  - files that optimize searching, [305](#)
- GIS object. *See also* GIS data
  - associated text, [300](#)
  - defined, [297](#), [483](#)
  - highlighting similar, [333](#), [335](#), [338](#)
- GIS Query Tool, [330-40](#)
  - files that optimize querying, [305](#)
  - output
    - deleting, [340](#)
    - remaining on screen, [340](#)
  - selecting a layer automatically, [334](#)
  - setup
    - layer properties, [331](#)
    - tool properties, [334](#)
- GIS system, [297](#)
- GIS utilities, [344-52](#)
- global annotation, defined, [215](#), [483](#)
- Global Refresh feature
  - and GIS data, [316](#)
  - procedure for using, [149](#)
- Grid InQuest, [463](#)
  - installing, [463](#)
- grid layer
  - defined, [483](#)
  - renaming, [279](#)
- grid layers, [173](#)
- grid overlay. *See also* grids
  - defined, [483](#)
- Grid Tool, [266](#)
  - properties, [268](#)
- Grid Tool Properties dialog box, [268](#)
  - Attributes tab, [271](#)
  - Construct tab, [269](#)
  - Import/Export. Template tab, [272](#)
  - opening, [268](#)
- grids, [52](#), [265](#)
  - adding data to, [282-86](#)
  - and workspaces, [266](#)
  - changing, [290](#)
    - data, [292](#)
    - properties, [290](#)
  - creating
    - circular, [273-75](#)
    - overview of, [273](#)
    - rectangular, [275-77](#)
    - with a mouse, [277](#)

grids (*continued*)

- data stored in, [266](#)
  - deleting, [293](#)
  - exporting
    - data, [286](#)
    - to a shapefile, [286](#)
    - to an SDE database, [288](#)
  - files exported to, [266](#)
  - importing, [266](#), [279](#)
  - moving, [292](#)
  - placing on an image
    - procedure for circle grid, [274](#)
    - procedure for rectangle grid, [277](#)
  - properties of, [267](#)
  - rotating, [291](#)
  - saving data, [282](#)
  - setting up
    - circular, [273](#)
    - rectangular, [276](#)
  - templates for, [266](#), [274](#), [277](#), [291](#)
  - types of, [267](#)
- ground plane
- defined, [192](#)
  - measuring above, [192-98](#)
- Ground Sample Distance. *See* GSD
- GSD
- defined, [44](#), [484](#)
  - example depicting, [386](#)
  - explained, [386](#)
- GSD in units per inch or cm, [388](#)
- GSD in units per screen pixel, [388](#)

**H**

- Height Tool, [201](#), [203](#)
- measuring area of facade, [203](#)
- hiding
- annotation layer, [445](#)
  - annotations, [241](#), [445](#)
  - EFS windows, [76](#), [415](#)
  - GIS annotation layers, [314](#)
  - Status Bar, [421](#)
  - toolbars, [416](#)
- high-detail map
- activating, [122](#)
- highlighting similar GIS objects, [333](#), [335](#), [338](#)
- hit quality criteria, [107](#)
- Hit Quality sort, [106](#)
- defined, [484](#)
  - option on the Image Tool Properties dialog box, [99](#)
  - order in Thumbnail window, [107](#)
  - turning on and off, [99](#)

**I**

- icon annotation
- creating, [232](#), [233](#)
  - moving, [247](#)
- Icon Annotation Tool, [232](#), [233](#)
- cleaning up icons, [237](#)
- icon files, [236](#)
- icons
- loading to a workspace, [236](#)
  - removing unused, [237](#)
- image cache
- disabling, [343](#)
  - effect on performance, [343](#)
- image caching, defined, [484](#)
- Image Library
- defined, [2](#), [45](#), [484](#)
  - description of images contained in, [47](#)
  - folders contained in, [45](#)
  - relationship to Image Warehouse, [19](#)
  - structure of, [47](#)
- image magnification. *See also* zoom
- changing, [391](#)
- image polygon
- defined, [54](#), [484](#)
- image polygons
- exporting, [377-84](#)
- image resolution scale
- choices in EFS, [45](#), [388](#)
  - defined, [385](#), [484](#)
- image resolution, defined, [43](#), [484](#)
- image searching, [83-87](#)
- Image Tool, [19](#), [83](#), [84](#)
- activating, [84](#)
  - defined, [484](#)
  - properties, [84](#), [96](#)
- Image Tool Properties dialog box
- opening, [96](#)
  - Search and Sort tab, [99](#)
  - Settings tab, [102](#)
  - Warehouse List tab, [97](#)
- image types
- defined, [484](#)
  - included in Pictometry, [49](#)
- Image Warehouse, [19](#), [46](#)
- closing, [384](#)
  - creating, [410](#)
  - defined, [485](#)
  - exporting image polygons from, [378](#)
  - linking to EFS, [19](#)
  - opening, [380](#)
  - searching, [83-87](#)
  - sorting search hits by, [99](#), [109](#)

- Image Warehouse (*continued*)
  - structure of, [46](#)
- Image window, [59](#)
  - after opening a workspace, [56](#)
  - cascading windows, [60](#)
  - context menu options, [442](#)
  - defined, [485](#)
  - opening an Image Warehouse in, [381](#)
  - pictured, [58](#)
  - tiling windows, [61](#)
  - viewing multiple images, [59](#), [61](#)
  - viewing the Thumbnail Gallery, [62](#)
- images. *See also* image types
  - adding to a workspace, [395](#)
    - all search hits, [400](#)
    - automatically, [399](#)
    - base map, [395](#)
    - GIS image, [357](#)
    - Oblique image, [397](#)
    - open images, [397-99](#)
    - Orthogonal image, [396](#)
  - opening from a workspace, [400](#)
- Import/Export, Data Storage tab, [273](#), [282](#)
- Import/Export, Template tab
  - fields and buttons, [273](#)
  - pictured, [272](#)
- importing
  - Address Search profile from PAX, [35](#)
  - global annotations from a PAF file, [264](#)
  - grid layer from a workspace, [279](#)
  - PGS Scripts, [468](#)
- installation
  - setup types, [3](#)
- installing
  - EFS, [3](#)
  - Grid InQuest, [463](#)
  - new EFS release, [18](#)
  - with Updater, [473-78](#)
- L**
- Lat/Lon base map, and Cartesian data, [343](#)
- layer search. *See* GIS Layer Search
- layout. *See* screen layout
- license
  - node-locked, [13](#)
  - non-node-locked, [13](#)
  - reasons for failure, [18](#)
  - validating, [13](#)
- license options
  - watermarks, [156](#)
- Limit Image Search buttons
  - defined, [485](#)
  - described, [101](#)
- limiting image search, [99](#), [100](#)
  - by image type or shot level, [101](#)
  - search hits returned, [102](#)
  - toolbar buttons for, [101](#)
- limiting open images, [62](#), [104](#)
  - exceptions, [104](#)
- line annotation
  - creating, [227](#)
  - moving, [248](#)
- Line Annotation Tool, [226](#), [227](#)
- lines
  - defining attributes for, [223](#)
- link annotation
  - can't open linked file, [402](#)
  - creating, [238](#)
  - moving, [247](#)
- Link Annotation Tool, [237](#), [238](#)
- linking an Image Warehouse, [19](#)
  - on a LAN, [19](#)
  - on an NIW server, [22](#)
- loading
  - global annotations from a PAF file, [264](#)
- loading icons to a workspace, [236](#)
- local annotation, defined, [215](#), [485](#)
- Location Tool, [209](#)
- M**
- macro arguments, [427-30](#)
- magnification. *See also* zoom
  - applying zoom to all open images, [146](#)
  - changing, [391](#)
  - decreasing, [145](#)
  - displaying entire image, [146](#)
  - increasing, [144](#)
  - returning to starting percentage, [145](#)
- magnifying images, [144-47](#)
- Main PentaView window, [134](#)
- Maintain current Ground Sample Distance, [128](#)
- Maintain current percent zoom factor, [130](#)
- mathematical formulas for scale, [392](#)
- Max View threshold, [257-59](#), [259](#)
  - and GIS annotation layers, [304](#)
  - and GIS Image thumbnail, [357](#)
- measurement data
  - exporting, [363-68](#)
    - to a shapefile, [371](#)
    - to a text file, [369](#)
    - to SDE, [373](#)
- measurement tools, [183](#)
  - before using, [184](#)
  - displaying tool output, [186](#)
  - that use a ground plane offset, [195](#)

measuring  
  above the ground, [192-98](#)  
  area, [203-4](#)  
  area of facade, [203](#)  
  bearing and angles, [207-9](#)  
  distance, [199-201](#)  
  elevation, [205-7](#)  
  height, [201](#)  
  location, [209](#)  
  perimeter, [201](#)  
memory requirements, [2](#)  
  PentaView, [133](#)  
Menu Bar  
  defined, [64, 485](#)  
  when options dim, [64](#)  
MGRS coordinate system, [465](#)  
MGRS, defined, [485](#)  
Military Grid Reference System. *See* MGRS  
  coordinate system  
Min View threshold, [257-59, 259](#)  
  and GIS annotation layers, [304](#)  
moving  
  annotations, overview, [246](#)  
  circle annotation, [251](#)  
  grids, [292](#)  
  icon annotation, [247](#)  
  line annotation, [248](#)  
  link annotation, [247](#)  
  point annotation, [247](#)  
  text annotation, [246](#)  
  vertex, [250](#)  
  workspace items, [407](#)  
multiple queries, [339](#)

## N

Navigate Tool, [84, 125-30](#)  
  and limit image search, [125](#)  
  changing the path, [127](#)  
  managing magnification, [128](#)  
  properties, [128](#)  
  unexpected behaviors, [127](#)  
  using with Ortho Sector Tiles, [126](#)  
  zoom settings, [130](#)  
Navigate toolbar, pictured, [64](#)  
navigating  
  a route, [125](#)  
  an image  
    by using red rectangle, [72](#)  
    within and between images, [114](#)  
Navigation Cameras  
  appearance in Image window, [119](#)  
  defined, [119, 485](#)  
  in PentaView, [120](#)

Navigation Cameras (*continued*)  
  pictured, [120](#)  
  removing from view, [120](#)  
  viewing, [120](#)  
navigation features, [114](#)  
Navigation Point, [59, 73, 84, 86](#)  
  centering, [87, 124](#)  
  defined, [485](#)  
Navigation window  
  context menu options, [447](#)  
  defined, [71, 485](#)  
  orientation of the compass, [114](#)  
  pictured, [72](#)  
  red rectangle, [71, 142](#)  
  using to navigate, [142](#)  
Neighborhood image, defined, [50, 486](#)  
Neighborhood Oblique image, defined, [486](#)  
Neighborhood Orthogonal image, defined, [486](#)  
Network Image Warehouse server software, [19](#)  
Next button  
  described, [123](#)  
  removing from view, [124](#)  
  using with PentaView, [139](#)  
  viewing, [124](#)  
next image  
  opening, [139](#)  
North Pointer window. *See* Navigation window  
North Pointer, defined, [486](#)

## O

object-centric orientation, [112](#)  
Oblique image  
  adding to a workspace, [397](#)  
  defined, [49, 486](#)  
offset ground plane, [192](#)  
  and annotation tools, [195](#)  
  and annotations, [221](#)  
  measurement tools affected by, [195](#)  
Offset mode, [195](#)  
  activating, [195](#)  
  exiting, [198](#)  
opacity of polygon data, [304, 310](#)  
Opened Warehouse Images folder  
  after creating a workspace, [171](#)  
  defined, [172, 486](#)  
  permanence of, [177](#)  
opening  
  adjacent images, [114](#)  
  Alternate Views, [115](#)  
  EFS, [55](#)  
  Grid Tool Properties dialog box, [268](#)  
  Image Tool Properties dialog box, [96](#)

- opening (*continued*)
    - images
      - automatically open first search hit, [88](#)
      - directly, [96](#)
      - from a workspace, [400](#)
      - options for, [88](#)
    - maps, [121](#)
    - multiple workspaces, [408-10](#)
    - next image, [123](#), [139](#)
    - previous image, [123](#), [139](#)
  - optimizing performance, [62](#)
    - with GIS annotation layers, [342-44](#)
  - origin of plume. *See* ALOHA annotations
  - Ortho image. *See* Orthogonal image
  - Ortho Sector Tile, defined, [50](#), [486](#)
  - Orthogonal image
    - adding to a workspace, [396](#)
    - defined, [49](#), [486](#)
  - OSGB-36
    - and coordinate conversions, [463](#)
    - defined, [486](#)
  - other EFS documentation, [xx](#)
  - Other images, [51](#)
  - Output window
    - context menu options, [446](#)
    - defined, [73](#), [486](#)
    - tabs, [74](#)
  - overlays
    - ALOHA annotations, [52](#)
    - annotations, [51](#)
    - defined, [51](#), [487](#)
    - elevation bounding boxes, [54](#)
    - elevation contour lines, [54](#)
    - grid. *See* grid
    - image polygons, [54](#)
    - sector maps, [54](#)
- P**
- PAF file
    - defined, [487](#)
    - loading global annotations from, [264](#)
    - saving global annotations to, [264](#)
  - Pan Tool, [141](#)
    - Center Reticule, [142](#), [143](#)
    - properties, [143](#)
  - panning an image, [141](#)
    - in PentaView, [140](#)
  - parcel-based data, [27](#), [92](#)
    - correlating for address searching, [28](#)
    - defined, [487](#)
  - PAS file
    - defined, [487](#)
    - relocating, [459](#)
  - PAS file (*continued*)
    - to add ALOHA annotation to EFS, [451](#)
  - path
    - fixing for search hits added to workspace, [403](#)
    - fixing for workspace items, [404](#)
  - PAX file, [24](#)
    - defined, [487](#)
    - exporting an Address Search profile to, [35](#)
    - using to set up address searching, [25](#)
  - PCF file, [24](#)
    - creating in EFS, [424](#)
    - creating with EFS Toolbar Configuration Editor. *See* the *EFS System Administrator Guide*
    - defined, [487](#)
    - loading, [425](#)
    - using to export a Configuration, [423](#)
    - using to set up address searching, [25](#)
    - ways to create, [424](#)
  - PDX file. *See also* Display PDX file and Search PDX file
    - defined, [305](#), [487](#)
  - PDX utilities, [344-52](#)
  - PEF file
    - defined, [487](#)
    - loading, [206](#)
    - when needed, [191](#)
  - PentaView, [132-41](#)
    - activating, [133](#)
    - color cones, [136](#)
      - turning on, [137](#)
    - viewing, [137](#)
    - defined, [61](#), [132](#), [488](#)
    - ending a session, [140](#)
    - panning images, [140](#)
    - performance tips, [140](#)
    - printing from, [140](#)
    - scrolling in, [140](#)
    - showing scroll bars, [138](#)
    - starting, [133](#)
    - toolbar, [134](#)
    - using with other EFS features, [140](#)
    - viewing images in the main window, [138](#)
    - window arrangements, [134](#)
      - changing, [135](#)
      - restoring, [136](#)
  - PentaView feature, [84](#)
  - PentaView window, pictured, [133](#)
  - performance tips, [342-44](#)
    - PentaView, [140](#)
  - PGS, [467](#)
  - PGS file, saving GIS Image as, [469](#)

- PGS Script, [467](#)
    - changing properties of, [468](#)
    - defined, [488](#)
    - importing, [468](#)
  - Pictometric image. *See* Oblique image
  - Pictometry Address eXchange file. *See* PAX file
  - Pictometry Attribute File. *See* PAF file
  - Pictometry Configuration File. *See* PCF file
  - Pictometry Elevation file. *See* PEF file
  - Pictometry Geo Script application, defined, [488](#)
  - Pictometry Image Warehouse file. *See* PIW file
  - Pictometry license. *See also* PLF file
    - node-locked, [13](#)
    - non-node-locked, [13](#)
    - PLF file, [14](#)
    - reasons for failure, [18](#)
    - validating, [13](#)
  - Pictometry License File. *See* PLF file
  - Pictometry Workspace File. *See* PWF file
  - Pictometry, defined, [488](#)
  - PIW file
    - and Image Warehouse structure, [46](#)
    - defined, [488](#)
    - selecting when exporting image polygons, [381](#)
    - selecting when linking a warehouse, [21](#)
  - placing
    - circular grid on an image, [274](#)
    - rectangular grid on an image, [277](#)
  - plain text arguments, [427](#)
  - PLF file
    - defined, [488](#)
    - loading the first time, [14](#)
  - PMI file, defined, [488](#)
  - point annotation
    - creating, [231](#)
    - moving, [247](#)
  - Point Annotation Tool, [230](#), [231](#)
  - points
    - defining attributes for, [223](#)
  - polygons
    - overlying with patterns or color, [304](#), [310](#)
  - polyline, defined, [488](#)
  - Prev button
    - described, [123](#)
    - removing from view, [124](#)
    - using with PentaView, [139](#)
    - viewing, [124](#)
  - previous image
    - opening, [139](#)
  - Print dialog box, [151](#)
  - printing
    - an image in PentaView, [140](#)
    - entire image, [152](#)
  - printing (*continued*)
    - images, [151](#)
      - in PentaView, [152](#), [154](#)
      - the PentaView window, [140](#)
      - visible part of image, [154](#)
  - prompt for attributes, [224](#)
  - properties
    - defined, [489](#)
    - defining for lines, points, and circles, [223](#)
  - properties of
    - annotation layers, [216](#)
    - annotations, [216](#)
    - elevation contour lines, [211](#)
    - GIS annotation layers, [304](#)
    - GIS Images, [358](#)
    - grids, [267](#)
    - tools, [185](#)
      - defined, [491](#)
  - PSI file, defined, [489](#)
  - PWF file, [169](#)
- ## Q
- Quality sort. *See* Hit Quality sort
  - Query Info tab
    - defined, [489](#)
    - defined and pictured, [75](#)
  - Query Tool. *See* GIS Query Tool
  - querying a GIS annotation layer, [330-40](#), [337](#)
    - highlighting similar GIS objects, [333](#), [335](#), [338](#)
    - results, [338](#)
    - viewing multiple queries, [339](#)
- ## R
- range-based data, [27](#), [92](#)
    - correlating for address searching, [29](#)
    - defined, [489](#)
  - range-based searches
    - accuracy of, [94](#)
  - raster data, [353](#)
  - raster map, viewing, [121](#)
  - rearranging
    - workspace items, [407](#)
  - rectangular grid
    - pictured, [265](#)
  - red crosshair, [86](#)
  - Refresh button, [149](#)
  - refreshing
    - Alternate Views, [87](#), [124](#)
    - GIS annotation layers, [316](#)
    - SDE data, [319-20](#), [321](#)
    - the active image and all annotations, [149](#)



- relocating
    - PAS file, [459](#)
    - search hits added to workspace, [403](#)
    - shapefiles, [318](#)
    - workspace items, [404](#)
  - removing. *See also* deleting
    - from view
      - Navigation Cameras, [120](#)
      - Next/Prev buttons, [124](#)
    - toolbar buttons, [417](#)
    - unused icons from a workspace, [237](#)
  - renaming
    - annotation layer, [221](#)
    - GIS annotation layer, [317](#)
    - grid layer, [279](#)
  - repairing a shapefile, [352](#)
  - reprojecting image when exporting, [162](#)
  - resizing
    - circle annotation, [251](#)
    - Status Bar pane, [421](#)
  - Reticule, [142](#), [143](#)
  - Return to Map Window option, [121](#)
  - rotated grid
    - pictured, [268](#)
  - rotating grids, [291](#)
  - Rural images, defined, [51](#), [489](#)
- S**
- saving
    - a workspace, [178](#)
    - Configuration to a PCF file, [424](#)
    - GIS Image as a PGS file, [469](#)
    - global annotations to a PAF file, [264](#)
    - grid data, [282](#)
    - tool output as an annotation, [253-57](#)
  - scale
    - changing, [390](#)
    - defined, [385](#), [489](#)
    - formats for image resolution, [45](#), [388](#)
    - how calculated, [392](#)
  - scaling annotations, [260](#)
    - no scale, [263](#)
    - Scale by GSD, [260](#)
    - Scale by Zoom Factor, [261](#)
  - screen layout
    - choices for, [10](#), [414](#)
    - Classic View, [414](#)
    - customizing. *See* custom Configurations
    - Image View, [11](#), [414](#)
      - pictured, [11](#)
    - Image View Measure Markup, [12](#), [414](#)
      - pictured, [12](#)
    - keeping existing, [10](#)
    - screen layout (*continued*)
      - Power User, [12](#), [414](#)
        - pictured, [12](#)
      - Touchscreen, [13](#), [414](#)
        - pictured, [13](#)
      - Version 2.6 Defaults, [10](#)
        - pictured, [11](#)
    - screen resolution, [45](#), [387](#)
      - defined, [489](#)
      - effect of zoom on, [387](#)
      - effect on image resolution, [386](#)
      - recommended for EFS, [2](#)
    - scroll bars
      - using in PentaView, [138](#)
    - scrolling an image, [141](#)
    - scrolling PentaView images, [140](#)
    - SDE, [301](#)
      - connecting to a database, [318](#)
      - data, [320](#)
        - refreshing, [319-20](#)
      - defined, [489](#)
      - feature class, defined, [301](#), [489](#)
      - tables, [320](#)
        - deleting, [322](#)
        - reserved keywords, [322](#)
        - viewing a column, [321](#)
        - viewing and refreshing, [321](#)
    - Search and Sort tab
      - fields and buttons, [99](#)
      - pictured, [99](#)
    - search hits
      - accessing, [86](#)
      - criteria for selecting, [86](#)
      - defined, [489](#)
      - in the Thumbnail window, [86](#)
      - sorting, [105](#)
      - viewing thumbnails, [89](#)
    - Search PDX
      - file, [305](#)
        - defined, [490](#)
        - when to create, [305](#)
      - utility, defined, [490](#)
    - search process, described, [85](#)
    - searching
      - a GIS annotation layer, [325-29](#)
      - by Parcel-ID
        - procedure for, [92](#)
      - by street address
        - overview, [24](#)
        - procedure for, [92](#)
        - setting up, [24](#)



searching (*continued*)

- for images, [83-87](#)
  - actions that initiate, [85](#)
  - by clicking a point, [84](#), [90](#)
  - by entering coordinates, [85](#), [91](#)
  - by street address, [85](#), [92](#)
  - by using GIS text data as criteria, [85](#), [96](#)
  - example scenarios, [77-79](#)
  - in Image Warehouse, [90](#), [91](#), [92](#)
  - in the active workspace, [88](#), [98](#)
  - limiting, [100](#)
  - various methods of, [84](#), [88](#)
  - what to do before searching, [88](#)
- the center of an image, [87](#)
- sector map, defined, [54](#), [490](#)
- Select Layout dialog box, pictured, [10](#)
- Select Tool, [244](#)
  - changing properties of, [245](#)
- selecting
  - annotations, [244](#)
  - GIS annotation layer automatically, [334](#)
  - templates for data entry, [274](#)
  - templates for grid data entry, [277](#), [291](#)
  - warehouses to search, [19](#)
- setting the open image limit, [104](#)
- setting up
  - address search, [24](#)
  - circular grid, [273](#)
  - GIS annotation layer for querying, [331](#)
  - GIS Query Tool properties, [334](#)
  - rectangular grid, [276](#)
- settings for annotation scaling, [260](#)
- Settings tab
  - fields and buttons, [103](#)
  - pictured, [102](#)
- shapefile
  - defined, [300](#), [490](#)
  - parts of, [300](#)
- Shapefile Converter, [348](#)
- shapefile data
  - optimizing performance, [305](#)
- Shapefile Diagnostics, [352](#)
- shapefile maintenance utilities, [344](#), [348](#), [352](#)
- sharing
  - a workspace, [400](#)
  - problems accessing contents, [402](#)
- shot level, [49](#)
  - Community, [50](#)
  - defined, [490](#)
  - Neighborhood, [50](#)
  - Other, [51](#)
  - Rural, [51](#)

showing. *See also* viewing

- EFS windows, [76](#), [415](#)
- Status Bar, [421](#)
- toolbars, [416](#)
- SHP file, [300](#), [371](#), [376](#)
  - creating with Shapefile Converter, [348](#)
- SHX file, [300](#), [371](#)
- sorting search hits, [105](#)
- Spatial Database Engine database software. *See* SDE
- Standard View, [133](#)
  - defined, [60](#), [131](#), [490](#)
- starting
  - a PentaView session, [133](#)
  - EFS, [55](#)
- Status Bar, [65](#)
  - context menu options, [447](#), [448](#)
  - copying contents of, [66](#)
  - customizing, [66](#), [421](#)
  - defined, [490](#)
  - hiding and showing, [421](#)
  - Magnification pane, [66](#)
  - pictured, [65](#)
  - Start Position pane, [65](#)
  - Status Area pane, [65](#)
  - Stop Position pane, [66](#)
  - Tool Output Area pane, [66](#)
- Status Bar pane
  - resizing, [421](#)
- Street Centerline file
  - defined, [490](#)
  - fields typically found in, [29](#)
  - for address searching, [27](#)
- sub-warehouse, defined, [490](#)
- sweet spot
  - and GSD, [386](#)
  - defined, [491](#)
- system performance, [2](#)
  - and GIS annotation layers, [342-44](#)
- system requirements, [2](#)

**T**

- technical support, [471](#)
- template
  - creating, [365](#)
- text annotation
  - balloon format, [222](#)
  - creating, [222](#)
  - moving, [246](#)
- Text Annotation Tool, [222](#)
- text balloon
  - and user-defined annotations, [222](#)
- thresholds for viewing images, [45](#)

- Thumbnail Gallery
    - defined, [491](#)
    - described, [63](#)
    - pictured, [63](#)
    - viewing, [63](#)
  - thumbnail image
    - defined, [491](#)
  - Thumbnail window
    - context menu options, [448](#)
    - defined, [491](#)
    - described, [72](#)
    - limiting search hits, [100](#)
    - order of search hits, [105](#)
    - pictured, [73](#)
  - TIGER file
    - defined, [491](#)
    - files typically found in, [29](#)
    - for address searching, [27](#)
  - tiling windows, [61](#)
  - tool data
    - creating a user template for export, [365](#)
    - exporting, [363-68](#)
      - to a shapefile, [371](#)
      - to a text file, [369](#)
      - to SDE, [373](#)
  - Tool Info tab
    - defined, [491](#)
    - defined and pictured, [75](#)
  - tool output
    - choices for drawing, [186](#)
    - Do Not Draw, [186](#)
    - Permanent, [186, 188](#)
    - saving as an annotation, [253-57](#)
    - Temporary, [186](#)
  - tool properties
    - changing, [185](#)
    - defined, [491](#)
  - toolbar
    - context menu options, [448](#)
    - defined, [491](#)
    - for changing Address Search profile, [37](#)
    - for entering address, [36](#)
    - PentaView, [134](#)
    - reference, [435](#)
  - toolbars, [64](#)
    - adding buttons to, [416](#)
    - adding custom tools to, [431](#)
    - changing button size, [417](#)
    - customizing, [416](#)
    - docking, [415](#)
    - for address searching, [36](#)
    - hiding, [416](#)
    - removing buttons from, [417](#)
  - toolbars (*continued*)
    - showing, [416](#)
    - undocking, [415](#)
  - Tools toolbar, pictured, [64](#)
  - troubleshooting
    - problems with workspace items, [402](#)
  - true Ground Sample Distance, [44, 386](#)
  - types of address searches, [27](#)
- ## U
- UNC
    - defined, [491](#)
    - effect on workspace sharing, [402](#)
    - format of, [19](#)
  - undocked
    - defined, [492](#)
  - undocking
    - a window or toolbar, [415](#)
  - uninstalling EFS, [18](#)
  - units of measure
    - changing, [184](#)
  - Universal Naming Convention. *See* UNC
  - Updater, [471, 473-78](#)
    - exclusive installation, [474](#)
    - running automatically, [475](#)
  - URL
    - linking to images, [237](#)
  - use layer attributes, [224](#)
  - user template
    - creating, [365](#)
  - user-centric orientation, [111](#)
  - user-defined annotation
    - creating. *See* annotations, creating
    - defined, [214, 492](#)
  - using all sort options together, [109](#)
  - using Cardinal and Hit Quality sorts together, [108](#)
  - utilities
    - converting SHP file's coordinate system, [348](#)
    - creating a new DBF file, [344](#)
    - creating a PDX file
      - to optimize GIS layer display, [350](#)
    - repairing a shapefile, [352](#)
- ## V
- V key, [198, 226](#)
  - validating, Pictometry license, [13](#). *See also* PLF file
  - vector data
    - and GIS layers, [297, 300](#)
    - defined, [299, 353, 492](#)
  - View Map button, [121](#)
  - View toolbar, pictured, [64](#)

viewing  
  adjacent images, [114](#)  
  annotation layer, [445](#)  
  annotations, [241](#), [445](#)  
    thresholds for, [257](#)  
  compass in Navigation window, [418](#)  
  compasses on images, [418](#)  
  coordinates, [209](#)  
  EFS windows, [76](#), [415](#)  
  elevation contour lines, [210-12](#)  
  full screen, [143](#)  
  GIS annotation layers, [314](#)  
  GIS Image properties, [358](#)  
  images, [131](#)  
    in PentaView, [132](#)  
    in Standard View, [131](#)  
    in the main PentaView window, [138](#)  
  multiple images, [59](#)  
    in PentaView, [61](#)  
    simultaneously, [133](#)  
  multiple queries, [339](#)  
  Navigation Cameras on image, [120](#)  
  next image, [139](#)  
  next or previous images, [123](#)  
  Next/Prev buttons on image, [124](#)  
  previous image, [139](#)  
  SDE tables, [321](#)  
  Standard View, [133](#)  
  Thumbnail Gallery, [63](#)  
visibility  
  of annotations and layers, [445](#)

**W**

Walk the Earth, [184](#), [189](#), [190](#)  
  and elevation data, [191](#)  
  and elevation files, [206](#)  
  effect on performance, [200](#)  
  turning on and off, [191](#)

Walking Man. *See* Navigate Tool

warehouse. *See* Image Warehouse

warehouse file. *See* PIW file

Warehouse List tab  
  fields and buttons, [98](#)  
  pictured, [97](#)

Warehouse Order sort, [109](#)  
  defined, [492](#)  
  option on the Image Tool Properties dialog  
    box, [99](#)  
  turning on and off, [99](#)

watermarks, [156](#)

website  
  linking to images, [237](#)

window  
  docking, [415](#)  
  floating, [415](#)  
  positions in PentaView, [134](#)  
  undocking, [415](#)

Workbook Mode  
  defined, [492](#)  
  turning on and off, [61](#)

workspace, [56](#)  
  adding  
    a base map to, [395](#)  
    all search hits, [400](#)  
    an Oblique image to, [397](#)  
    an Orthogonal image to, [396](#)  
    images to automatically, [399](#)  
    open images to, [397-99](#)  
  benefits of, [56](#), [170](#)  
  can't open an image from, [402](#)  
  closing, [179](#)  
  collapsing an item, [177](#)  
  creating, [56](#), [174](#)  
  defined, [492](#)  
  deleting  
    multiple items from, [177](#)  
    one item from, [177](#)  
  fixing access to files, [401-7](#)  
  items, changing the order of, [407](#)  
  loading icons to, [236](#)  
  opening, [56](#), [176](#)  
  opening images from, [400](#)  
  overview of, [169](#)  
  recently used, [176](#)  
  relocating contents, [404](#)  
  relocating search hits, [403](#)  
  removing unused icons from, [237](#)  
  saving, [178](#)  
  sharing, [400](#)  
    problems accessing contents, [402](#)  
  structure of, [171](#)  
  tree, [171](#)  
  using multiple, [408-10](#)

Workspace Root  
  defined, [172](#), [492](#)  
  permanence of, [177](#)

Workspace window, [71](#)  
  closing, [179](#)  
  context menu options, [443](#), [444](#), [445](#)  
  defined, [492](#)  
  hiding, [179](#)  
  pictured, [71](#)  
  pictured with annotations and annotation  
    layers, [216](#)  
  showing, [179](#)

**Z**

## zoom

- applying to all open images, [146](#)

- changing, [391](#)

Zoom 100% button, [145](#)zoom factor, [45](#)

- defined, [387](#)

Zoom Home button, [146](#)Zoom In button, [144](#)Zoom Out button, [145](#)Zoom Tool, [144](#), [145](#)Zoom/Scale box, [388](#)

- changing what's shown in, [390](#)

- examples pictured, [388](#)

- formats, [388](#), [390](#)

- using to change image magnification, [391](#)

- widening, [391](#)

## zooming

- effect on image resolution, [386](#)

- effect on screen resolution, [387](#)