



## Using ArcExplorer™ - Java Edition

ArcExplorer™ 3



Copyright © 2000, 2001 ESRI  
All Rights Reserved.  
Printed in the United States of America.

The information contained in this document is the exclusive property of ESRI. This work is protected under United States copyright law and the copyright laws of the given countries of origin and applicable international laws, treaties, and/or conventions. No part of this work may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying or recording, or by any information storage or retrieval system, except as expressly permitted in writing by ESRI. All requests should be sent to Attention: Contracts Manager, ESRI, 380 New York Street, Redlands, CA 92373-8100, USA.

The information contained in this document is subject to change without notice.

#### **U. S. GOVERNMENT RESTRICTED/LIMITED RIGHTS**

Any software, documentation, and/or data delivered hereunder is subject to the terms of the License Agreement. In no event shall the U.S. Government acquire greater than RESTRICTED/LIMITED RIGHTS. At a minimum, use, duplication, or disclosure by the U.S. Government is subject to restrictions as set forth in FAR §52.227-14 Alternates I, II, and III (JUN 1987); FAR §52.227-19 (JUN 1987) and/or FAR §12.211/12.212 (Commercial Technical Data/Computer Software); and DFARS §252.227-7015 (NOV 1995) (Technical Data) and/or DFARS §227.7202 (Computer Software), as applicable. Contractor/Manufacturer is ESRI, 380 New York Street, Redlands, CA 92373-8100, USA.

ESRI, ArcIMS, ArcView, and MapObjects are trademarks of ESRI, registered in the United States and certain other countries; registration is pending in the European Community. ArcExplorer, ArcSDE, and the ArcGIS logo are trademarks and Geography Network and [www.geographynetwork.com](http://www.geographynetwork.com) are service marks of ESRI. Microsoft and the Windows logo are registered trademarks and the Microsoft Internet Explorer logo is a trademark of Microsoft Corporation. Other companies and products mentioned herein are trademarks or registered trademarks of their respective trademark owners.

# Contents

<b>1</b>	<b>Welcome to ArcExplorer 3.1</b>	<b>1</b>
	What you can do with ArcExplorer 3.1	2
	Installing ArcExplorer 3.1	3
	How to get help	7
<b>2</b>	<b>Adding data layers</b>	<b>9</b>
	Adding shapefiles	10
	Adding images	11
	Adding ArcSDE layers	13
	Viewing data in a MapService	14
	Viewing data on the Geography Network	15
	Viewing layers in an ArcView IMS service	15
	Viewing layers in a MapObjects IMS service	17
<b>3</b>	<b>Properties of the legend, overview map, and scale bar</b>	<b>19</b>
	Using the legend	20
	Adding an overview map	22
	Working with the scale bar	23
<b>4</b>	<b>Symbolizing layers</b>	<b>25</b>
	Getting general information about a layer	26
	Setting a layer's scale factors	27
	Drawing features with one symbol	28
	Making a graduated symbols map	29
	Making a unique symbols map	30
	Adding labels to a map	31
	Adding shields to line features	32

## **5 Getting and using the attributes of features 33**

- Identifying features 34
- Finding features 35
- Searching for features 36
- Building a query expression 37
- Selecting features 38
- Buffering features 39
- Displaying MapTips 40
- Measuring distances 41

## **6 Address matching 43**

- Locating an address 44

## **7 Printing, copying, and saving 45**

- Printing a map 46
- Copying a map to a file 47
- Saving a project 48

# Welcome to ArcExplorer 3.1

# 1

## IN THIS CHAPTER

- **What you can do with ArcExplorer 3.1**
- **Installing ArcExplorer 3.1**
- **How to get help**

Welcome to ArcExplorer™ 3.1—Java™ edition, a geographic data explorer developed by Environmental Systems Research Institute, Inc. (ESRI). You can use ArcExplorer 3.1 to view and query geographic data stored on your computer or on the Web.

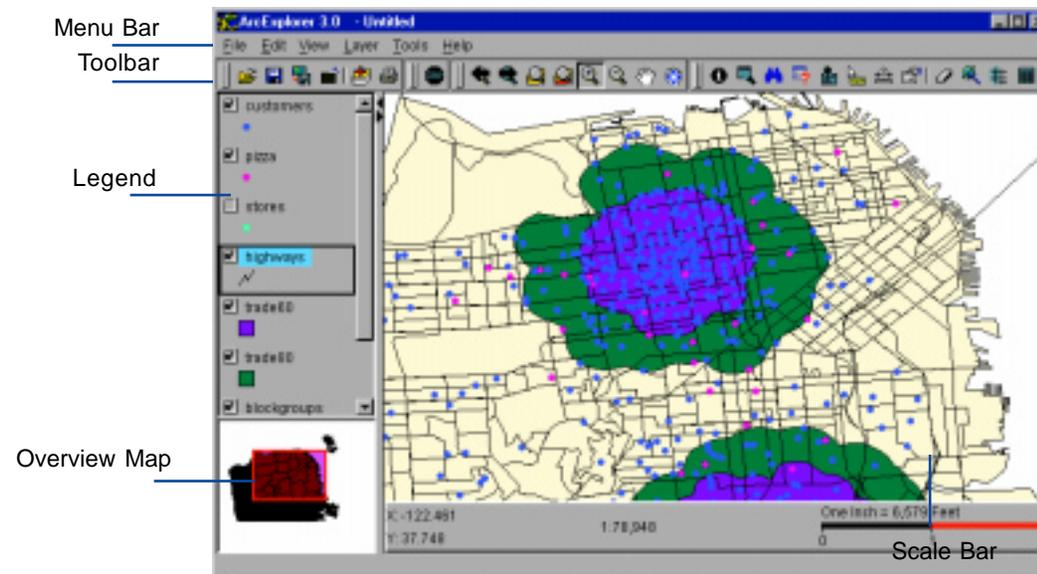
ArcExplorer offers tools for viewing and querying your spatial and attribute data, performing spatial analysis tasks such as selecting and buffering features, creating a variety of maps such as unique symbols and graduated symbols, and much more. You'll be amazed at the ease with which you can take advantage of these tools.

## What you can do with ArcExplorer 3.1

Using ArcExplorer 3.1, you can:

- Pan and zoom the map's extent.
- Query spatial and attribute data.
- Create a buffer around selected features.
- Measure distances on your map.
- Create one symbol, unique symbols, and graduated symbols map.
- Label map features with many options for effects.
- Locate an address.
- View data from the Geography Network<sup>SM</sup>.

ArcExplorer 3.1 also features legends, overview maps, saving and retrieving projects, and map printing.



# Installing ArcExplorer 3.1

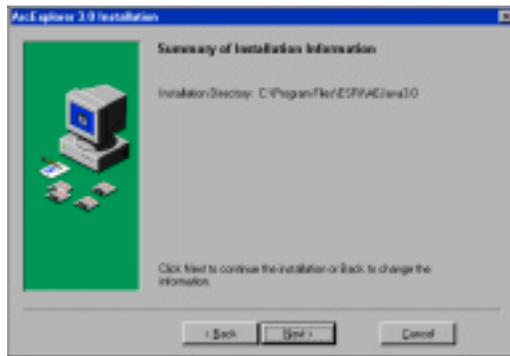
## What you need to install ArcExplorer 3.1

ArcExplorer 3.1 can be installed on a Windows® 2000, Windows NT®, Windows 98, or UNIX® operating system.

## How to install ArcExplorer 3.1 on a Windows operating system

### Installing the software

To begin installation, navigate to the AEJavaSetup.exe. This file is located on the ArcIMS installation CD or the directory where you downloaded it from the Web.



### Starting ArcExplorer 3.1

Double-click the AEJavaSetup.exe and follow the on-screen instructions.

After installation, click Start | Programs | ESRI | ArcExplorer 3.1 to open ArcExplorer 3.1.

## How to install ArcExplorer 3.1 on a Solaris operating system

### Installing the software from the ArcIMS CD

Solaris™ 2.x includes Volume Management™ software, which automatically mounts and provides immediate access to your CD-ROM. When using Volume Management software, place the ArcIMS® CD into your CD drive. At this point, the ArcIMS disk is mounted. Type the following command:

```
% cd /cdrom/cdrom0/solaris/ArcExplorer3.1
```

**Note:** For security reasons, don't install ArcExplorer 3.1 as root.

Make sure that the user's account that will install ArcExplorer 3.1 has write permissions to the installation directory.

The "install" command has five options:

```
Usage: install <-help | -load | -remove | -verify | -lmhostid>
```

Type "install -help" to read more about the installation procedure.

To start the ArcExplorer 3.1 installation, type the following command from anywhere on your system:

```
% cdrom/solaris/ArcExplorer3.1/install -load
```

This starts the dialog for the menu-driven ArcExplorer 3.1 software installation. Default selections are noted in brackets, [ ]. To obtain a list of options or Help, type "?" at any prompt. You can quit the installation procedure at any time by typing "quit" or "q". To return to a previous question, type the caret, "^".

### Installing the software from the web download

After downloading the ArcExplorer.tar.Z file, move it to the directory where you wish to install ArcExplorer 3.1. Use the uncompress command:

```
%uncompress ArcExplorer.tar.Z
```

and then tar:

```
%tar xvf ArcExplorer.tar
```

The “install” command has five options:

```
Usage: install <-help|-load|-remove|-verify|-lmhostid>
```

Type “install -help” to read more about the installation procedure.

To start the ArcExplorer 3.1 installation, type the following command in the directory where you downloaded the files on your system:

```
%. /install -load
```

This starts the dialog for the ArcExplorer 3.1 software installation procedure, which is menu driven.

Default selections are noted in brackets [ ]. To obtain a list of options or Help, type “?” at any prompt. You can quit the installation procedure at any time by typing quit or “q”. To return to a previous question, type the caret, “^”.

### **Setting up your account**

ESRI recommends that you execute ArcExplorer 3.1 from a C shell. The following instructions are for a C shell environment setup.

To use ArcExplorer 3.1, add the following lines to your .login or .cshrc file:

```
setenv AEJHOME <path to ArcExplorer 3.1 installation directory>/aej31exe>
```

```
setenv LD_LIBRARY_PATH $AEJHOME/lib
```

Make sure that \$AEJHOME/bin is in the PATH.

```
set path = ( $path $AEJHOME/bin )
```

To enable the changes, type:

```
% source <.login or .cshrc>
```

### **Editing the \$HOME/aimsclient.properties file**

Update the value of the WebBrowser key in the aimsclient.properties file to point to the location of your default browser.

Update the value of the AEJavaHelp key in the aimsclient.properties file to point to the location of the ArcExplorer 3.1 online Help files.

### **Starting ArcExplorer 3.1**

With \$AEJHOME/bin included in your PATH, start ArcExplorer by typing:

```
aejava
```

## How to install ArcExplorer 3.1 on IBM AIX operating system

### Installing the software from the ArcIMS CD

To install ArcExplorer from the CD, become super user and put the ArcIMS CD into your CD-ROM drive:

```
% su
```

You will be prompted for your super user password. If you do not know this password, contact your systems administrator. If a */cdrom* directory does not exist, create one:

```
# mkdir /cdrom
```

Now mount the ArcIMS CD:

```
# mount -v 'cdrfs' -p'' -r'' /<dev> /cdrom
```

(or use smit)

where <dev> stands for the CD-ROM device.

At this point, the ArcIMS CD is mounted. Before installing ArcExplorer, exit super user mode:

```
# exit
```

To start the ArcExplorer 3.1 installation, type the following command from anywhere on your system:

```
% /cdrom/AIX/ArcExplorer3.1/install -load
```

This starts the dialog for the menu-driven ArcExplorer 3.1 software installation. Default selections are noted in brackets, [ ]. To obtain a list of options or Help, type “?” at any prompt. You can quit the installation procedure at any time by typing “quit” or “q”. To return to a previous question, type the caret, “^”.

After you finished installing ArcExplorer, take the ArcIMS CD out of the CD-ROM drive by unmounting it.

As super user, type:

```
# umount /<dev>
```

where <dev> stands for the CD-ROM device.

### Installing the software from the web download

After downloading the ArcExplorer.tar.Z file, move it to the directory where you wish to install ArcExplorer 3.1. Use the uncompress command:

```
% uncompress ArcExplorer.tar.Z
```

and then tar:

```
% tar xvf ArcExplorer.tar
```

The “install” command has five options:

```
Usage: install <-help|-load|-remove|-verify|-lmhostid>
```

Type “install -help” to read more about the installation procedure.

To start the ArcExplorer 3.1 installation, type the following command in the directory where you downloaded the files on your system:

```
% ./install -load
```

This starts the dialog for the ArcExplorer 3.1 software installation procedure, which is menu driven.

Default selections are noted in brackets [ ]. To obtain a list of options or Help, type “?” at any prompt. You can quit the installation procedure at any time by typing quit or “q”. To return to a previous question, type the caret, “^”.

### **Setting up your account**

ESRI recommends that you execute ArcExplorer 3.1 from a C shell. The following instructions are for a C shell environment setup.

To use ArcExplorer 3.1, add the following lines to your .login or .cshrc file:

```
setenv AEJHOME <path to ArcExplorer 3.1 installation directory>/aej31exe>
```

```
setenv LIBPATH $AEJHOME/lib
```

Make sure that \$AEJHOME/bin is in the PATH.

```
setenv PATH $AEJHOME/bin
```

To enable the changes, type:

```
% source <.login or .cshrc>
```

### **Editing the \$HOME/aimsclient.properties file**

Update the value of the WebBrowser key in the aimsclient.properties file to point to the location of your default browser.

Update the value of the AEJavaHelp key in the aimsclient.properties file to point to the location of the ArcExplorer 3.1 online Help files.

### **Starting ArcExplorer 3.1**

With \$AEJHOME/bin included in your PATH, start ArcExplorer by typing:

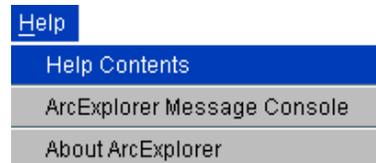
```
aejava
```

## How to get help

ArcExplorer 3.1 provides several ways for you to get help. In addition to this book, you can use ArcExplorer Help and ESRI on the Web to answer your questions.

### Getting online help

If you need more information about a specific option or procedure, use ArcExplorer Help.



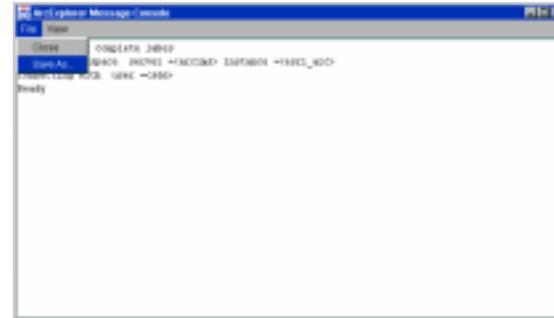
Click the Help menu and click Help Contents to open ArcExplorer Help.

### Message Console messages

When ArcExplorer 3.1 encounters an error with data or an operation, most often a message is posted in the status bar of the main window.

All messages generated by ArcExplorer 3.1 are posted to the ArcExplorer Message Console. You can open the Message Console by clicking the Help menu and clicking ArcExplorer Message Console.

The message level in the Message Console is set by clicking the View menu, clicking Message Level, and pointing to one of the



choices.

You can click the File menu and click Save As to save the messages to a text file.

### Visit ESRI on the Web

#### ESRI home page

ESRI's home page at [www.esri.com](http://www.esri.com) has up-to-date information on ESRI® software and services.

#### ArcExplorer home page

The ArcExplorer home page at [www.esri.com/arcexplorer](http://www.esri.com/arcexplorer) has

- The latest information about ArcExplorer
- Current frequently asked questions (FAQs)

Be sure to check this site often for all the latest information on ArcExplorer.

# Adding data layers

# 2

## IN THIS CHAPTER

- **Adding shapefiles**
- **Adding images**
- **Working with images**
- **Adding ArcSDE layers**
- **Viewing data in a MapService**
- **Viewing data on the Geography Network**
- **Viewing layers in an ArcView IMS service**
- **Viewing layers in a MapObjects IMS service**

This chapter shows you how to add data layers to ArcExplorer 3.1.

The key functionality of ArcExplorer 3.1 is the viewing of spatial data. This chapter shows you how to view data that is stored on your computer or published as an ArcIMS MapService or an ArcView® Internet Map Server (IMS) or MapObjects® Internet Map Server (IMS) service. You can also view data on the Geography Network. An ArcIMS MapService allows the content of a map configuration file to be published on the Internet by registering it to the ArcIMS Spatial Server and web server.

Data from local sources or the Internet, an ArcSDE™ server, or a MapService can be added to ArcExplorer 3.1.

## Adding shapefiles

You can add shapefiles to ArcExplorer 3.1 with the Catalog. The Catalog is opened with the Add Layers button.

### Tip

#### Refreshing the Catalog

Right-click on Local and click Refresh to see an updated listing of folders and mapped drives. Right-click on a folder and click Refresh to see an updated listing of files.

### Tip

#### Shapefiles with duplicate field names are not allowed

Shapefiles that contain duplicate field names cannot be drawn in ArcExplorer 3.1 and are thus not listed in the Catalog.

### Tip

#### Adding Favorites

Favorites is a list of shortcuts to commonly used folders. Right-click on a folder in the Catalog and click Add to Favorites.

1. Click the Add Layers button to open the Catalog.
2. Navigate to the folder that contains shapefiles.
3. Click a file to add.
4. Click the Add Layers button.  
Repeat steps 3 and 4 to add more shapefiles.
5. Click the Close button to close the Catalog.



Add Layers



## Adding images

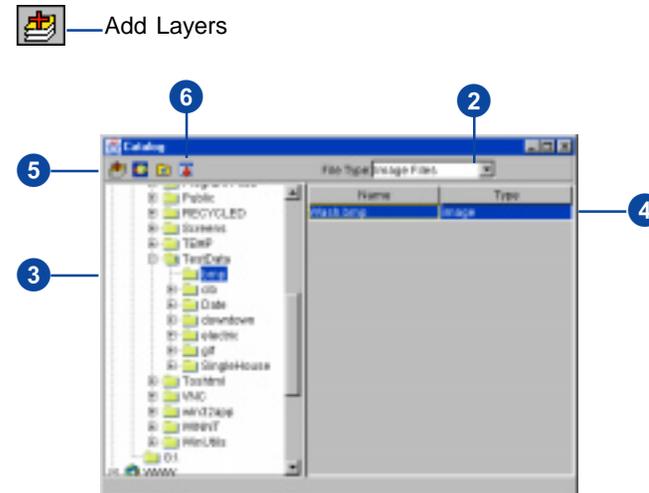
You can work with images in ArcExplorer by displaying them as a background layer in your map configuration file.

See the next pages for details on working with images and supported images formats.

You can set a transparency value on an image using the Layer Properties dialog. See Chapter 4, *Symbolizing Layers*, for more details.

### Adding a single image

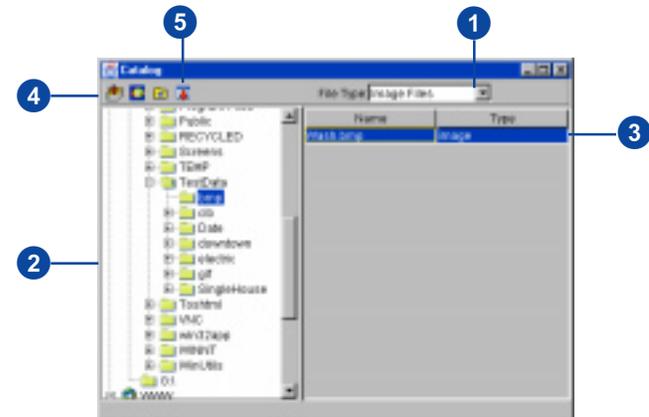
1. Click the Add Layers button to open the Catalog.
2. Click the File Type dropdown and choose Image Files.
3. Navigate to the folder that contains an image.
4. Click an image to add.
5. Click the Add Layers button.  
Repeat steps 4 and 5 to add more images.
6. Click the Close button to close the Catalog.



### Adding an ImageDirectory

In the Catalog:

1. Click the File Type dropdown and choose Image Files.
2. Navigate to the folder that contains more than one image.
3. Click the \*ImageDirectory entry in the Catalog.
4. Click the Add Layers button.  
All the images in that folder are added.
5. Click the Close button to close the Catalog.



## Working with images

You can work with images in ArcExplorer by displaying them as a background layer in your map configuration file.

You can add JPEG, TIF, GIF, BMP, or PNG files to ArcExplorer.

### **World files are required**

A world file contains parameters to transform raster rows and columns into real-world coordinates.

Many image formats require world files. The world file must use a three-letter extension, and it can't have scientific notation.

### **Displaying an ArcIMS Image Directory**

An ArcIMS Image Directory is simply a directory containing several image files. When you choose the Image Directory from the catalog window, all images are added into the map.

### **Setting image transparency**

Making an image transparent allows you to view overlapping images in a single map. You can set the transparency of an image or ImageMapService with the Layer Properties dialog. From the Layer Properties dialog, click the General tab to set a transparency value.

## Adding ArcSDE layers

ArcExplorer allows you to use ArcSDE and ArcSDE for Coverages layers once you've added an ArcSDE connection.

Type port:<port number> in the Instance input box. If necessary, your ArcSDE administrator will provide you with the ArcSDE instance information. The instance should be listed in your system's Services file.

Consult your ArcSDE administrator if you are not sure if your system is set up to connect to an ArcSDE database.

See *Understanding ArcSDE*, *ArcSDE Administration Guide*, and *ArcSDE for Coverages Administration Guide* for more information.

### Tips

#### Disconnecting from ArcSDE

Disconnect from an ArcSDE database by right-clicking on the ArcSDE server in the left panel of the Catalog and clicking Disconnect.

#### Connection errors

If your connection to ArcSDE failed, you can use the Message Console to see detailed error messages. To open the ArcExplorer Message Console, click the Help menu and click Message Console.

### ADDING DATA LAYERS

## Connecting to ArcSDE

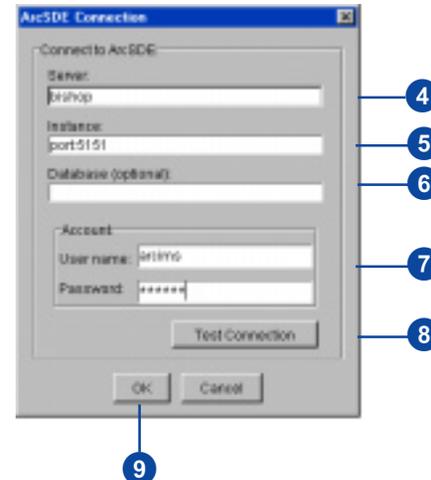
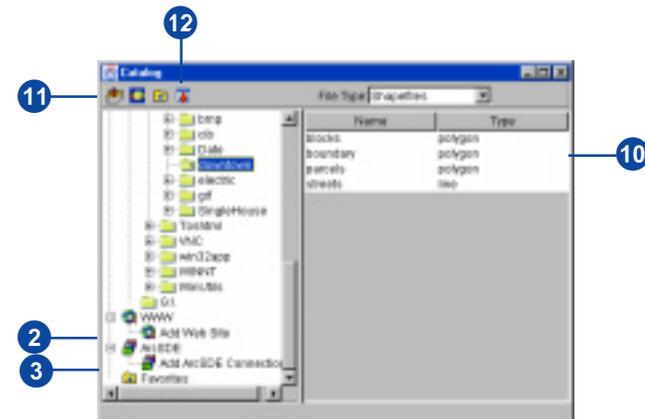
1. Click the Add Layers button to open the Catalog.
2. Double-click ArcSDE.
3. Double-click Add ArcSDE Connection.
4. Type the name of the Server.
5. Type port:<port number> for the ArcSDE instance.
6. If necessary, type a Database name.
7. Type your User name and Password.
8. Click Test Connection (optional). If the connection succeeds, continue. If the connection fails, use the error message to correct the failure.
9. Click OK to connect.

The ArcSDE database is now listed in the Catalog.

## Adding ArcSDE layers

10. Click a layer to add.
11. Click the Add Layers button.
- Repeat steps 10 and 11 to add more layers.
12. Click the Close button to close the Catalog.

 Add Layers



## Viewing data in a MapService

An ArcIMS Spatial Server can serve a Feature MapService or an Image MapService. You can use ArcExplorer to view a MapService.

A Feature MapService uses the Spatial Server's feature streaming capabilities. The server bundles data and streams it to the requesting client. Requests are sent to the server only when additional data is needed.

Image MapServices use the Spatial Server image rendering capabilities. When a request is received, a map is generated on the server, and the response is sent back as an image. A new map image is generated each time a client requests new information.

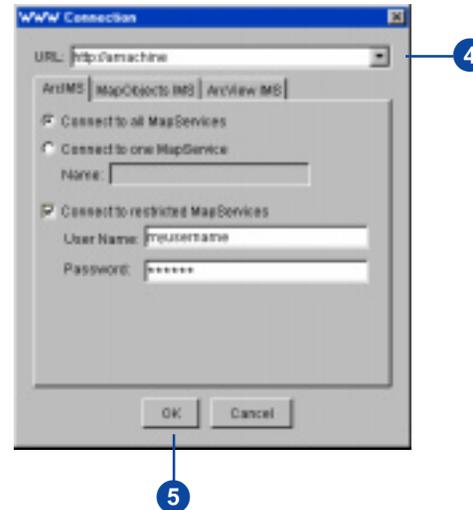
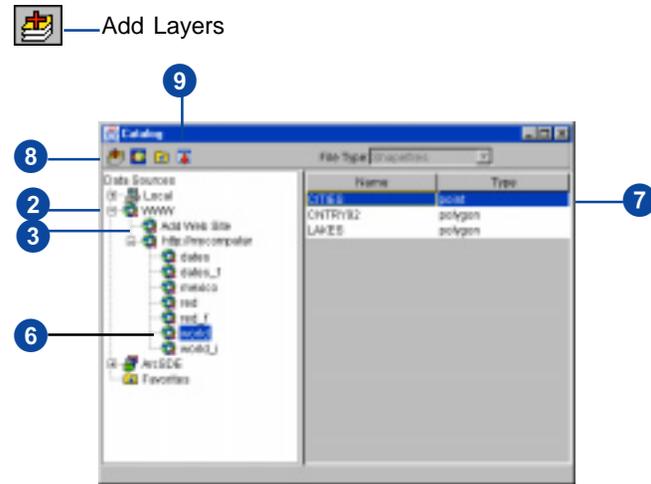
Typing a MapService name on the WWW Connection dialog box is optional. If you do not specify a MapService name, you will be connected to all the MapServices.

### Tip

#### List of MapServices

*You must disconnect and reconnect from the Spatial Server to see an updated list of MapServices. Right-click on the machine name and click Remove and then connect again.*

1. Click the Add Layers button to open the Catalog.
2. Double-click the WWW icon.
3. Double-click Add Web Site to open the WWW Connection dialog.
4. Type the hostname.
5. Click OK to connect.  
The web site's MapServices appear in your catalog.
6. Click a MapService.
7. Click a layer in the Feature MapService or the Image MapService to add.
8. Click the Add Layers button.  
Repeat steps 6 and 7 to add more layers.
9. Click the Close button to close the Catalog.



## Viewing data on the Geography Network

The Geography Network is a global network of geographic information. It provides the infrastructure needed to facilitate the sharing of geographic information between data providers, service providers, and users around the world. You can use ArcExplorer to access the Geography Network and discover a wide variety of geographic content.

You can click the Geography Network button to open a web browser to the Geography Network. Once you have found data, you can click Add to ArcExplorer to add that data to ArcExplorer. Saving the project will allow you to save a reference to the data on the Geography Network.

Learn more about the Geography Network at [www.geographynetwork.com](http://www.geographynetwork.com).

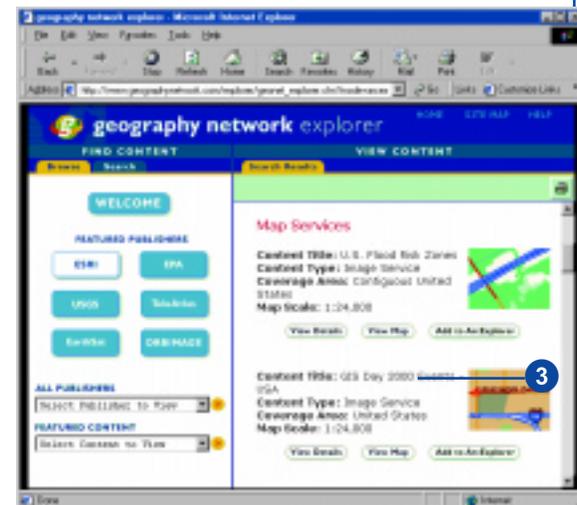
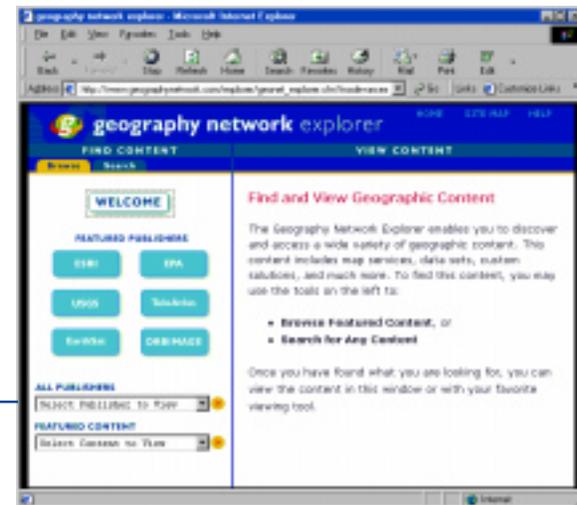
### See Also

See Chapter 4, *Symbolizing Layers*, for details on how to set the transparency of an Image MapService.

1. Click the Geography Network button to open a web browser to the Geography Network.
2. Use the Geography Network Explorer to find data.
3. Click Add to ArcExplorer to add that data to the ArcExplorer map and legend.
4. Close the web browser.

The data from the Geography Network is now listed in the legend.

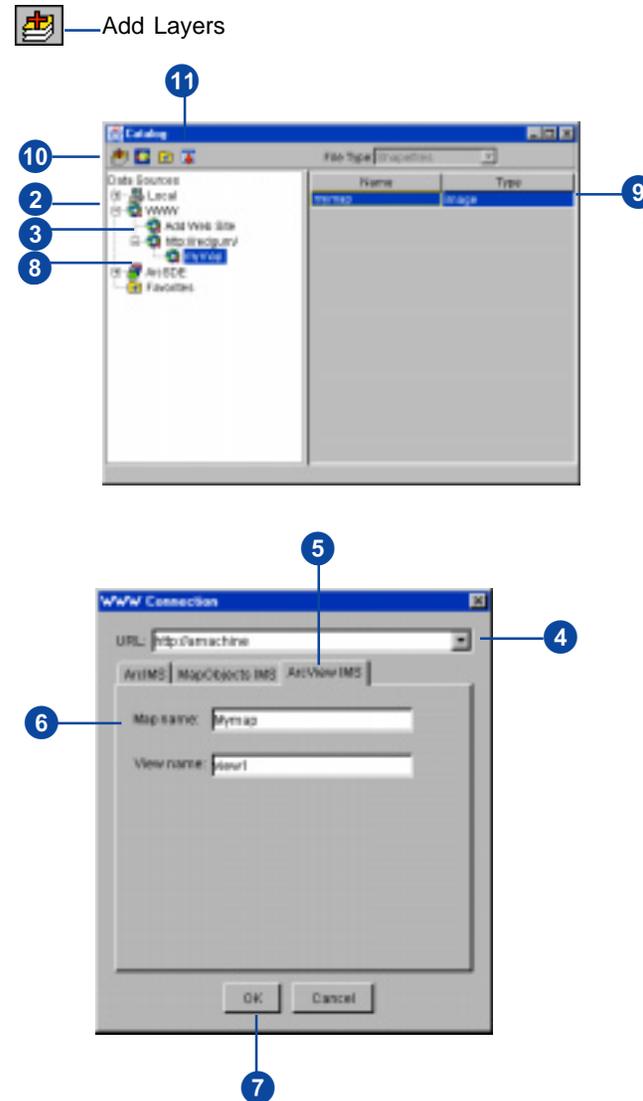
 — Geography Network



## Viewing layers in an ArcView IMS service

From ArcExplorer 3.1, you can view data on a web site served with ArcView IMS.

1. Click the Add Layers button to open the Catalog.
2. Double-click the WWW icon.
3. Double-click Add Web Site to open the WWW Connection dialog box.
4. Type the hostname.
5. Click the ArcView IMS tab.
6. Type a map name and view name.
7. Click OK to connect.
8. The web site's MapServices appear in your catalog.
9. Click a MapService.
10. Click the Add Layers button to add the layer.
11. Click the Close button to close the Catalog.

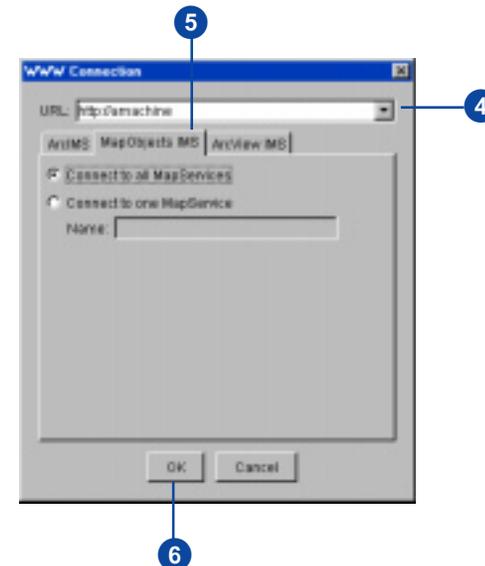
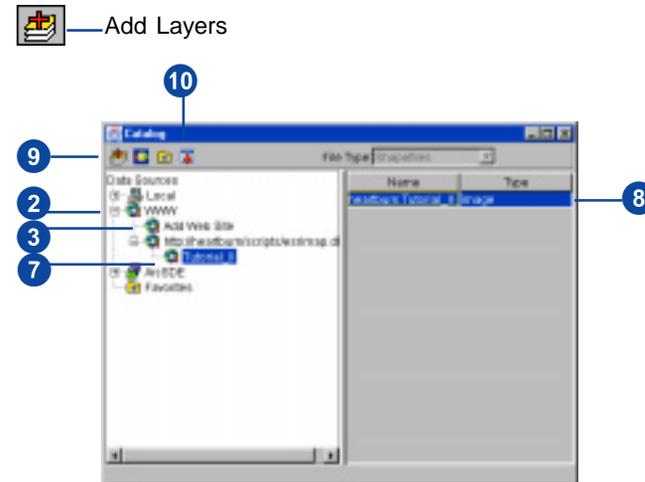


## Viewing layers in a MapObjects IMS service

From ArcExplorer 3.1, you can view data on a web site served with MapObjects IMS.

Entering a service name to a MapObjects IMS server on the WWW Connection dialog box is optional. If you do not specify a service name, you will be connected to all the services.

1. Click the Add Layers button to open the Catalog.
2. Double-click the WWW icon.
3. Double-click Add Web Site to open the WWW Connection dialog box.
4. Type the hostname as http://<HOSTNAME>/scripts/esrimap.dll.
5. Click the MapObjects IMS tab.
6. Click OK to connect.
7. Click a MapService.
8. Click an Image MapService in the right panel.
9. Click the Add Layers button to add the layer.
10. Click the Close button to close the Catalog.



# Properties of the legend, overview map, and scale bar

# 3

## IN THIS CHAPTER

- **Using the legend**
- **Adding an overview map**
- **Working with the scale bar**

This chapter introduces the ArcExplorer 3.1 interface. You will learn how to set up and use the legend, overview map, and scale bar.

Terms used throughout this book in referring to the interface are defined in this chapter.

## Using the legend

All layers in a map are listed to the left of the map in the legend. The legend shows the layer name and the symbol used to draw each layer. The check box next to each layer indicates whether it is currently turned on or off in the map, that is, whether it is currently drawn on the map or not.

The order in which the layers are listed in the legend is also important. The layers at the top of the legend are drawn on top of those below it. Layers that form the background of your map are listed at the bottom of the legend. To change the order a layer is drawn in, drag the layer up or down in the legend. The Move Layer choice on a layer's right-click menu gives options for moving the layer.

You can change the width of the legend by dragging the border between the legend and the map either left or right. This is useful if you want to increase the width of the legend so that you can see long layer names.

You can turn the legend off by clicking the View menu and unchecking the Legend choice.

Click the check box to the left of each layer's name to make the layer draw in the map. Clicking again will turn the layer off.

Make a layer active by clicking on its name in the legend. Many operations work only on active layers. When a layer is active, it appears raised in the legend.



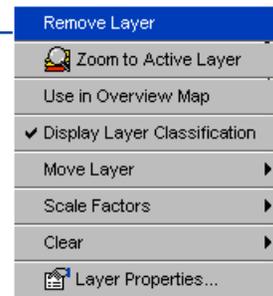
Use these arrows to maximize or minimize the width of the legend.



Double-click a layer to open the Layer Properties dialog box.



Right-click a layer to open a menu of choices for the layer.



## Adding an overview map

The overview map displays the full or partial extent of a layer with a red box outlining the current extent of the map. A full or partial extent is displayed depending on how far you have zoomed in.

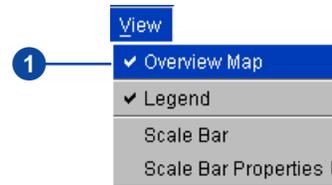
### Tip

#### Using the overview map when zoomed in

*Zooming in very close to a feature will result in a zoomed in map that may not have a red outline.*

## Opening an overview map

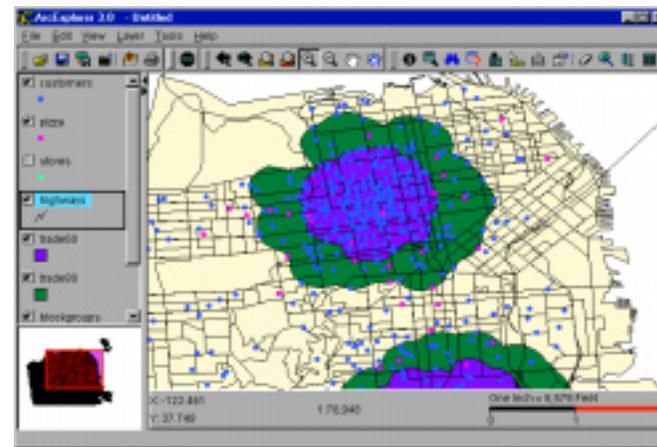
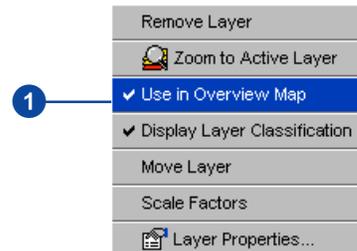
1. Click the View menu and check Overview Map to add an overview map panel.



## Adding a layer to the overview map

1. Right-click on a layer listed in the legend and click Use in Overview Map.

To remove the layer, repeat step 1 to uncheck Use in Overview Map.



## Working with the scale bar

Each time you zoom in, zoom out, or resize the map, the scale changes. These changes are reported on the scale bar.

The scale bar consists of a representative fraction (RF) (1:24,000), a ruler with distance markers, and an equation (one inch = 40 miles). The fraction (RF scale) is a common way to present scale in cartography and can be read as “one inch on the screen is equal to 24,000 inches on the ground.” The equation (sometimes referred to as a “verbal scale”) presents the same information but translates the single unit (an inch in this example) into a unit you’d use when getting around in the real world (e.g., miles).

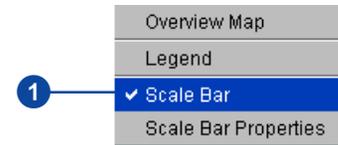
### Tip

#### Right-click on scale bar to set properties

*You can also right-click on the scale bar to open the scale bar properties menus.*

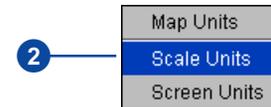
## Adding a scale bar

1. Click the View menu and click Scale Bar.



## Setting scale bar properties

1. Click the View menu and click Scale Bar Properties.
2. Point to Map Units, Scale Units, and Screen Units to set the appropriate units.



### Map units

Map units are the units in which geographic data is stored (data source units). You can set the map units as decimal degrees, feet, or meters.

### Scale units

Scale units display in the scale bar itself and in the right side of the verbal scale equation (1 centimeter = 200 kilometers). You can set the scale units as miles, feet, meters, or kilometers.

### Screen units

Screen units correspond to the actual display on your computer monitor and are presented on the left side of the verbal scale equation (e.g., 1 inch = 40 miles). You can set the screen units as either inches or centimeters.

# 4

## Symbolizing layers

### IN THIS CHAPTER

- **Getting general information about a layer**
- **Setting a layer's scale factors**
- **Drawing features with one symbol**
- **Making a graduated symbols map**
- **Making a unique symbols map**
- **Adding labels to a map**
- **Adding shields to line features**

You can communicate complex geographic information more effectively using maps than with tables or lists because maps take advantage of our natural abilities to distinguish and interpret colors, patterns, and spatial relationships. When you display your data on a map, you'll see distributions, relationships, and trends that you couldn't see before.

Choosing how to represent your data on a map may well be your most important mapmaking decision. Symbolizing your data involves choosing colors and styles that will represent features. It also involves grouping or classifying features according to their attribute values.

This chapter shows you how to create attractive maps and use symbolization as a powerful tool for exploring, understanding, and analyzing your data.

## Getting general information about a layer

How a layer is displayed can be changed using the Layer Properties dialog box.

The General tab allows you to change the name of the layer as it appears in the legend and provides information about the datafile.

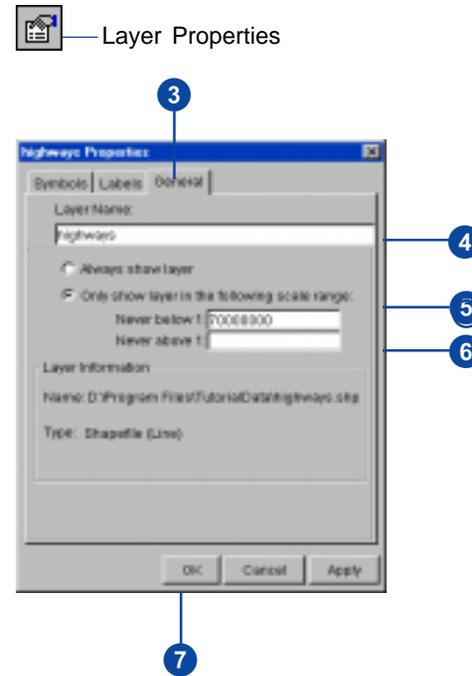
The General tab can be used to set a scale factor for a layer.

For images and Image MapServices, use the General tab to set a transparency value. Setting the transparency, allows two overlapping images or Image MapServices to be viewed in one map.

### See Also

*See the next section, 'Setting a layer's scale factors', for more details on setting scale factors.*

1. Click a layer in the legend to make it active.
2. Click the Layer Properties button.
3. Click the General tab.
4. Type a new name in the Layer Name box to change the layer's name.
5. Click the Only show layer in the following scale range button to set scale factors.
6. Type a scale to never show the layer above or below.
7. Click OK to close the dialog box and see the changes.



## Setting a layer's scale factors

You can control the scale at which a layer displays by setting its scale threshold. For example, you could set a U.S. state boundaries layer to turn off after you zoom past a certain point and set the county boundaries to turn on at the same scale. Setting up scale factors can help keep the map display clean and focused on relevant data.

When a scale factor has been set on a layer, the layer will not appear in the legend once you go outside the specified scale range.

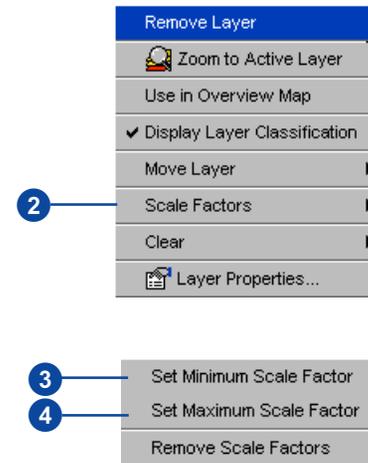
### Tip

#### Setting scale factors on the General tab

*You can also set scale factors on the General tab of the Layer Properties dialog box.*

## Adding scale factors

1. Use the zoom tools to set an extent for your display.
2. Right-click the layer's name and click Scale Factors.
3. Click Set Minimum Scale Factor if you want the layer to turn off if you zoom in any closer.
4. Click Set Maximum Scale Factor if you want the layer to turn off if you zoom further out.



## Removing scale factors

1. Right-click the layer's name, click Scale Factors, and point to Remove Scale Factors. The map will refresh to show the layer.

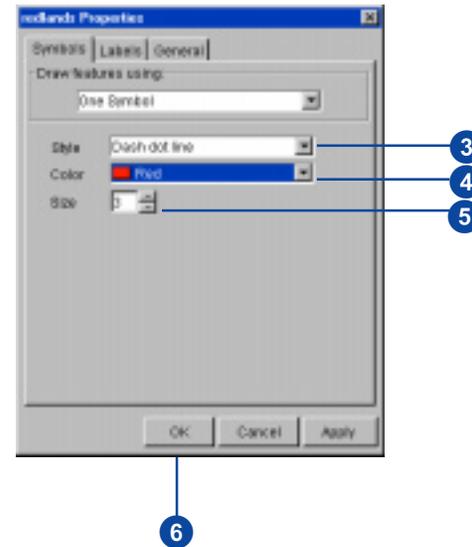


## Drawing features with one symbol

The One Symbol classification displays all the features in a layer with the same color and style. When you add a layer to ArcExplorer 3.1, it is displayed as One Symbol maps.

Using the Layer Properties dialog, you can change the color, size, or style of the one symbol map.

1. Click a layer in the legend to make it active.
2. Click the Layer Properties button.
3. Click the Style box to apply a new style to the layer.
4. Click the Color box to choose a color.
5. Click the Size box to apply a new size to the layer.
6. Click OK to close the dialog box and see the changes.



## Making a graduated symbols map

You can create a graduated symbols map using the Layer Properties dialog box.

A graduated symbols map uses equal-interval classification to create graduated color and/or size maps.

Using the equal-interval classification method, the range of attribute values is divided into equal-sized subranges; the features are then classified based on those subranges.

### Tip

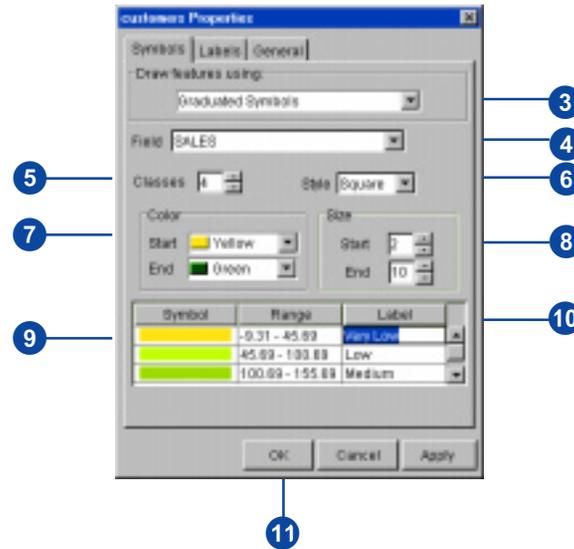
#### Changing the value's label

*For a graduated symbols map, you can change the label of each value by typing a new value in the Label column. Be sure to press Enter after adding each new value.*

1. Click a layer in the legend to make it active.
2. Click the Layer Properties button.
3. Click Graduated Symbols.
4. Click a Field.
5. Click a number of Classes.
6. Click a Style.
7. Click a Start and End Color.
8. Click a Start and End Size.
9. Click an entry in the Symbol column to change its color.
10. Double-click a value in the Label column to select it. Enter a new value.
11. Click OK to close the dialog box and see the changes.



Layer Properties



## Making a unique symbols map

You can create a unique symbols map using the Layer Properties dialog.

The Unique Values classification displays features by applying a different color to each unique value for a specified field.

### Tip

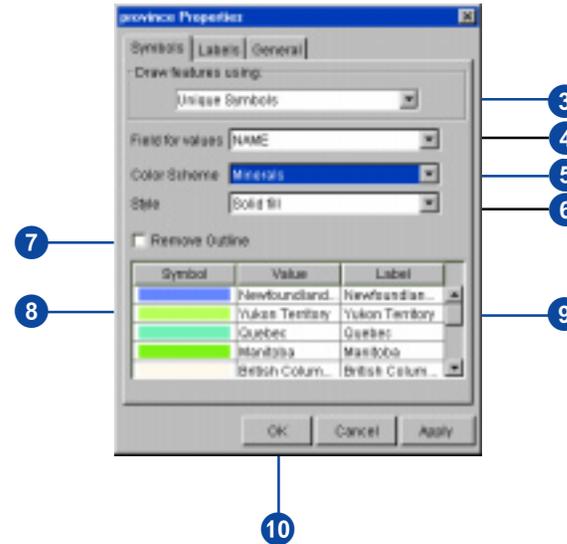
#### Changing the value's label

*For a unique symbols map, you can change the label of each value by typing a new value in the Label column. Be sure to press Enter after adding each new value.*

1. Click a layer in the legend to make it active.
2. Click the Layer Properties button.
3. Click Unique Symbols.
4. Click a Field.
5. Click a Color Scheme.
6. Click a Style.
7. Check Remove Outline to remove the outline on features.
8. Click an entry in the Symbol column to change its color.
9. Double-click a value in the Label column to select it. Enter a new value.
10. Click OK to close the dialog box and see the changes.



Layer Properties



## Adding labels to a map

Add labels to features with the Labels tab of the Layer Properties dialog box.

The example on this page shows the label placement functionality for point features. Label placement for lines offers above-, on-, or below-the-line options.

### Tip

#### Using highest text quality

The check box for using the highest text quality is also referred to as antialiasing.

When lines are drawn at an angle, they may appear jagged due to the number of pixels available to display them. Antialiasing allows the line to be smooth by coloring adjacent pixels in such a way as to give the edge of the line a more gradual fade to the background color.

### Tip

#### Clearing labels

You can also clear labels by right-clicking on a layer in the legend, clicking Clear, and pointing to Clear Labels.

### Tip

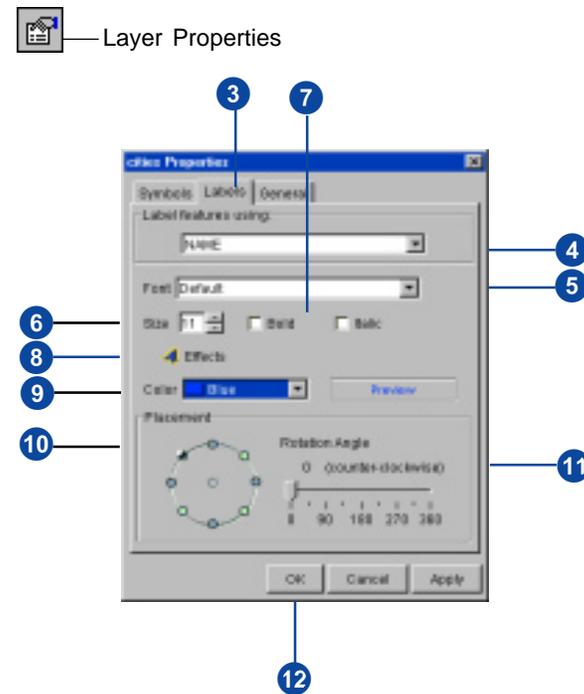
#### Labeling in bold

If you want your labels in bold, use one of the following fonts for best text quality: Dialog, Default, Serif, and Sans Serif.

## SYMBOLIZING LAYERS

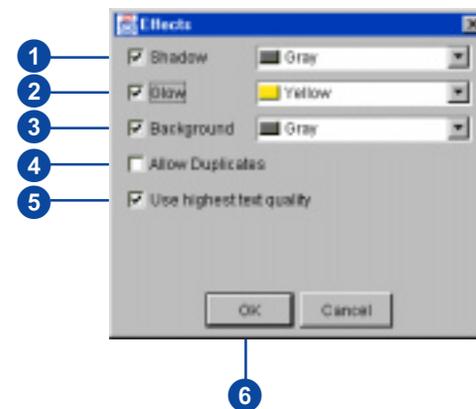
## Adding labels

1. Click a layer in the legend to make it active.
2. Click the Layer Properties button.
3. Click the Labels tab.
4. Click a field for labels.
5. Click a Font.
6. Click a Size.
7. Check the Bold or Italic boxes to change the text.
8. Click the Effects button for more options on changing the appearance of labels.
9. Click a Color.
10. Click a label Placement.
11. Click an angle of rotation for the labels.
12. Click OK to close the dialog box and see the changes.



## Adding effects to labels

1. Check Shadow to add a three-dimensional effect.
2. Check Glow to add a color around the label.
3. Check Background to add a colored box under the label.
4. Check Allow Duplicates to allow all labels to display.
5. Check Use highest text quality to apply antialiasing.
6. Click OK.



## Adding shields to line features

You can add highway shields to line features using the Labels tab of the Layer Properties dialog box.

### Adding shields

1. Click a line layer in the legend to make it active.
2. Click the Layer Properties button.
3. Click the Labels tab.
4. Click a field for labels.
5. Click a Font.
6. Click a Size.
7. Click a Color.
8. Check the Use Shields box.
9. Click Shields to open the Shield Properties dialog box.

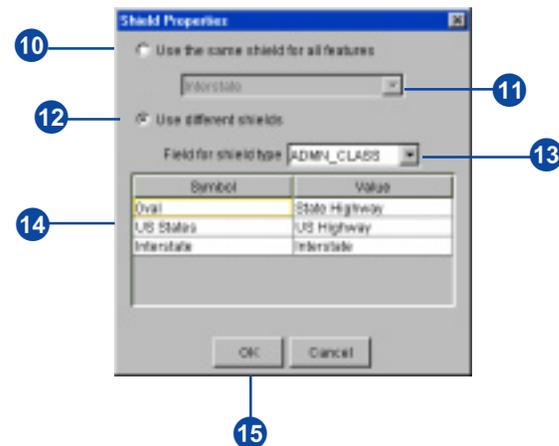
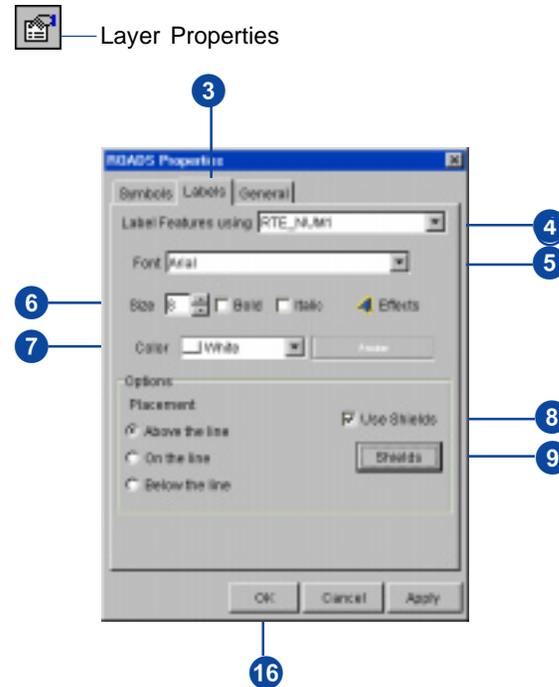
### Using the same shield for all features

10. Click the Use the same shield for all features option.
11. Click a shield type from the dropdown list.

Skip to Step 15.

### Using different shields

12. Click the Use different shields option.
13. Click a Field to specify each shield type.
14. Click each Symbol to set the shield type for each value.
15. Click OK.
16. Click OK to close the dialog box and see the changes.



# Getting and using the attributes of features

# 5

## IN THIS CHAPTER

- **Identifying features**
- **Finding features**
- **Searching for features**
- **Building a query expression**
- **Selecting features**
- **Buffering features**
- **Displaying MapTips**
- **Measuring distances**

This chapter describes how to use ArcExplorer 3.1 to get information about the features of your data. You can perform queries in ArcExplorer 3.1 by pointing at features on a map to identify them (spatial queries) or finding which features meet certain criteria (attribute queries).

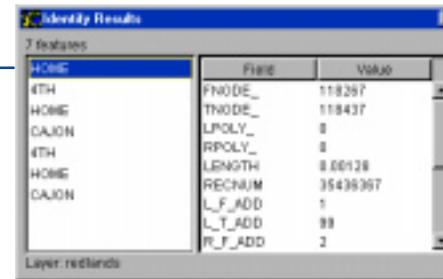
## Identifying features

Suppose you are looking at a map of the world and you want to get information about a particular city. To get information about one of the features on your map, use the Identify tool. When you click a feature with this tool, ArcExplorer 3.1 displays the attributes of the feature in a dialog.

1. Click a layer in the legend to make it active.
2. Click the Identify button.
3. Click a feature on the map.
4. The results of the Identify are shown in the Identify Results dialog.
5. If more than one feature is found, the features are listed in the Features panel. Click each feature to see its Identify results.
6. Close the dialog box when done viewing results.



Identify



## Finding features

You can use the Find tool to locate particular features from the layers in your map. Find works by searching the layer or layers you specify for features with the value you specified. Only fields that have been defined as text strings, as opposed to numeric values, are searched.

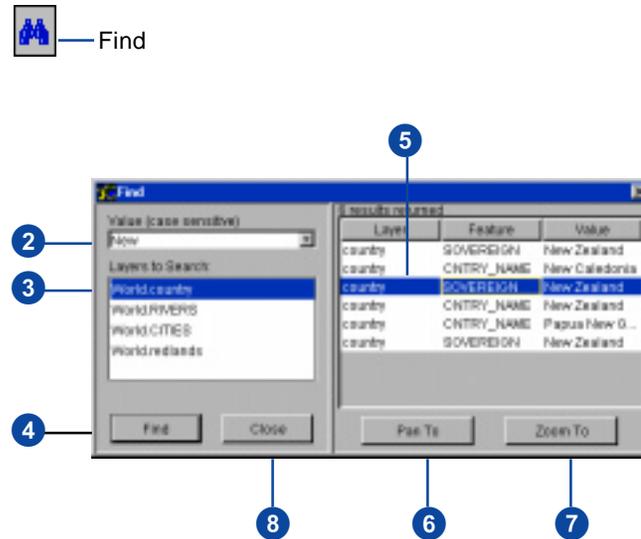
To search for features based on a numeric value, use the Query Builder tool described in the 'Building a query expression' section.

### Tip

#### Image MapService notation

In the Find dialog box shown on this page, the Find is performed on an Image MapService. The Image MapService notation shows the name of the Image MapService and the Image MapService's sublayer separated by a period. In this example, the Image MapService is named World, and the sublayer used to find features is named country.

1. Click the Find button.
2. Type any part of a word you want to find. (Do not use quotes around the search string.)
3. Click the layer or layers you would like to search.
4. Click Find to execute the search.
5. Click one of the results in the right panel to make it active.
6. Click Pan To to pan the view to the selected feature.
7. Click Zoom To to zoom the view to the selected feature.
8. Click Close when you are done finding features.



## Searching for features

The Search tool is enabled if you open a project or MapService that has been created with stored queries.

Once a stored query has been created, the Search tool allows you to type only a value to search for rather than a full query expression.

### See Also

*You can create stored queries using the Author component of ArcIMS. See the Using ArcIMS book for details.*

1. Click a layer in the legend that has stored queries to make it active.
2. Click the Search button.
3. In the Search by list, click the stored query you would like to use.
4. The Query Expression is updated as you click a stored query.
5. Type a search string.
6. Click Search.
7. Click a result in the lower panel.  
The feature is highlighted on the map.
8. Click Pan To or Zoom To to locate the result on the map.
9. Click Close to change the dialog.



Search

Search

Search by: Name

Query Expression is: NAME like [%var%]%

WW

Search

10 results returned

NAME	COUNTRY	POPULATION	CAP
Warsaw	Poland	2323000	Y
Wroclaw	Poland	640200	N
Winnipeg	Canada	625304	N
Washington ...	US	3221400	Y
Wuhan	China	3490000	N
Wadi Halfa	Sudan	-99	N
Whitehorse	Canada	15199	N
Walvis Bay	South Africa	16607	N

Pan To Zoom To Close

8

## Building a query expression

A query expression is a precise definition of what you want to select. Building a query expression is a powerful way to select features because an expression can include multiple attributes, operators, and calculations.

Remember to include single quotes around values in your expression that are text strings. If you choose a value from the Values box, the single quotes are added for you.

You can generate a simple set of statistics on a field by clicking Statistics. On the Select a field to get statistics dialog box, you can click the Use Query Results? check box to only calculate statistics on the selected records.

The results of a query can be saved to a text file using the Save button. In the Save dialog box, type the name of the file with a .txt extension.

### Tip

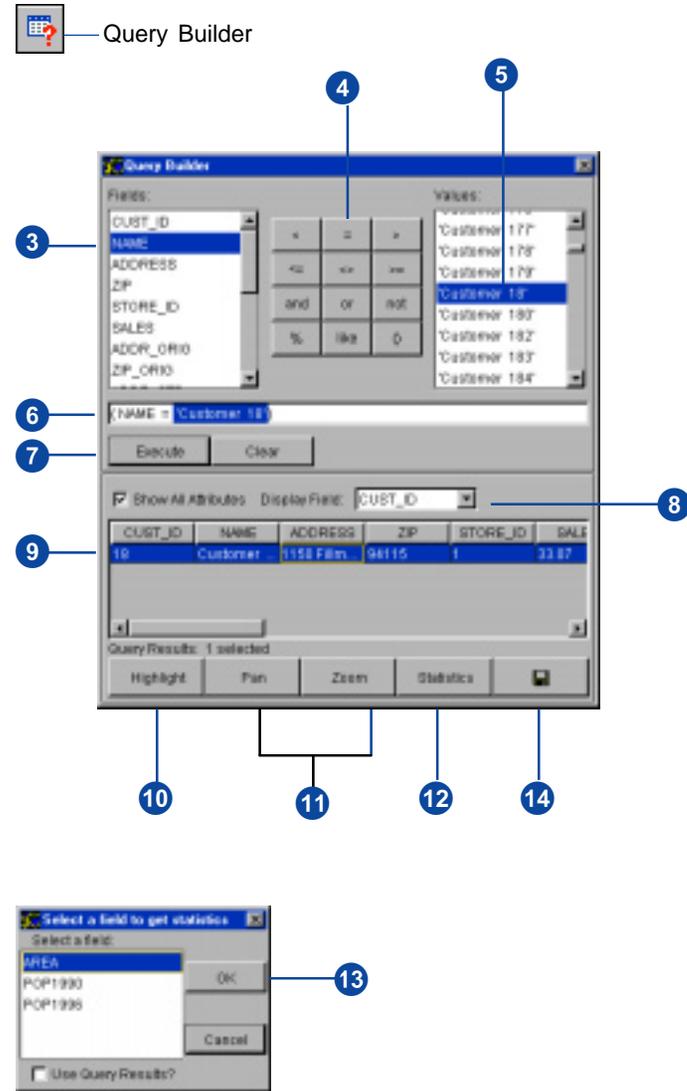
#### Working with query results

*The results of a query can be saved to a comma-delimited text file. The text file can then be used in another program, such as Microsoft® Excel, to create a spreadsheet.*

1. Click a layer in the legend to make it active.
2. Click the Query Builder button.
3. Click a field to query.
4. Click an operator to be used in the expression.
5. Click a sample value or type a value for the expression.
6. Verify that the query expression is correct.
7. Click Execute to perform the query.
8. Click a field in the Display Field dropdown to only show one field in the panel.
 

The results appear in the lower panel.
9. Click to select a value or values from the query results panel.
10. Click Highlight to make the selected feature(s) highlighted on the map.
11. Click Pan or Zoom to pan or zoom to the selected features.
12. Click Statistics.
13. Click a field to be used for statistics and click OK.
 

The statistics are shown in a separate dialog.
14. Click the Save button to save the query results to a text file.



## Selecting features

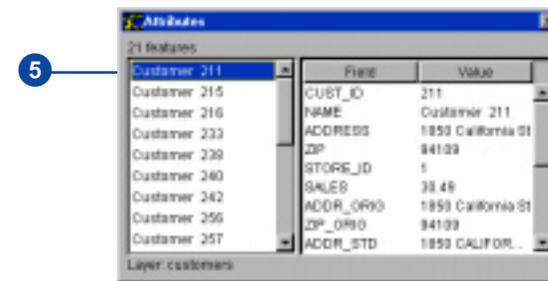
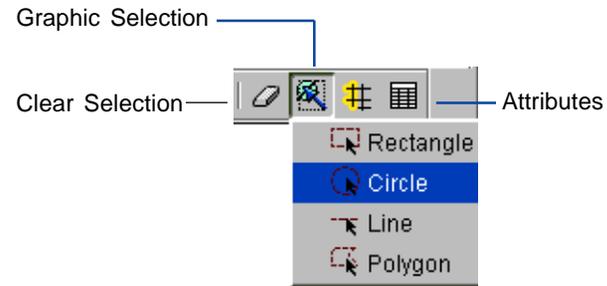
Use the Graphic Selection button to select features and then view their attribute values using the Attributes button.

The Clear All Selection button clears the selected features in all layers. To clear the selection of a particular layer, right-click it in the legend, click Clear, and point to Clear Selection.

1. Click a layer in the legend to make it active.
2. Click the Graphic Selection button and click either Rectangle, Circle, Polygon, or Line.
3. Click and drag to create a shape for selecting features.
4. Click the Attributes button to see the values for the selected feature or features.

If multiple features were selected, they are listed in the left panel.

5. Click each feature to see its attributes.



## Buffering features

You can create a buffer around selected features. Once a buffer has been applied, you can use the buffer to select features from another layer. Selecting features of one layer with the features of another layer's buffer can be applied to solve many problems. A project to widen roads may involve buffering the road features and then selecting features from a parcels layer that overlaps the buffer.

The map units must be set in order to create a buffer. The map units are the units your data is stored in. You can set the map units by clicking the View menu, clicking Scale Bar properties, and pointing to Map Units.

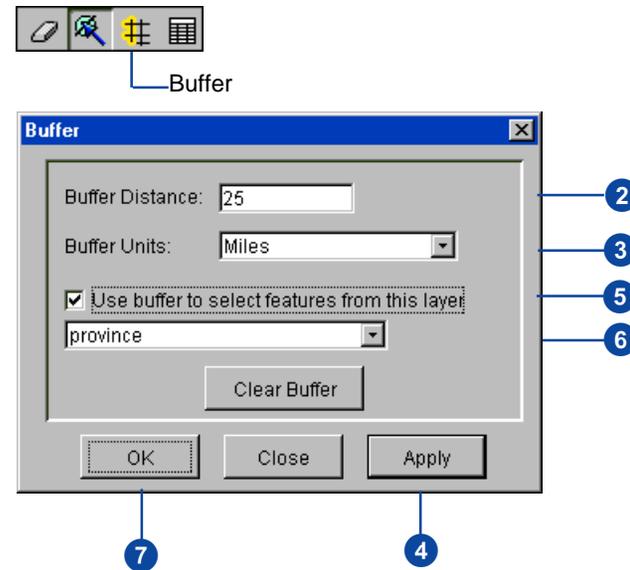
### Tip

#### Check map units if buffer seems incorrect

*If the buffer is generating unexpected results, verify that the map units are set appropriately. You can set the map units by clicking the View menu, clicking Scale Bar Properties, pointing to Map Units, and then clicking the appropriate unit.*

1. Click the Buffer button.
2. Type a distance for buffering the feature.
3. Click miles, meters, kilometers, or feet for the Buffer Units.
4. Click Apply to see the buffer.
5. Check the box to select features from another layer.
6. Click a layer to select features from.
7. Click OK to see the selection and close the dialog box.

Note: You can view attributes for any layer on your map including the one you've selected features from with your buffer. To do this, make the layer active in the legend.



## Displaying MapTips

MapTips are small popups that display data for a field you specify.

You can only display one MapTip per layer.

### Tip

#### Clearing MapTips

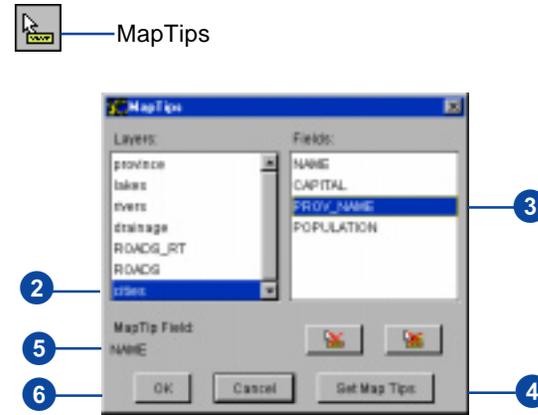
You can clear a layer's MapTips by right-clicking on the layer in the legend, clicking *Clear*, and pointing to *Clear MapTips*.

## Adding MapTips

1. Click the MapTips button to open the MapTips dialog.
2. Click a layer for MapTips.
3. Click the field you would like to display in the MapTips.
4. Click Set Map Tips field.
5. The MapTip Field will update with the field you choose.

Repeat the process for each layer you would like to display with MapTips.

6. Click OK to close the dialog box and begin using MapTips.



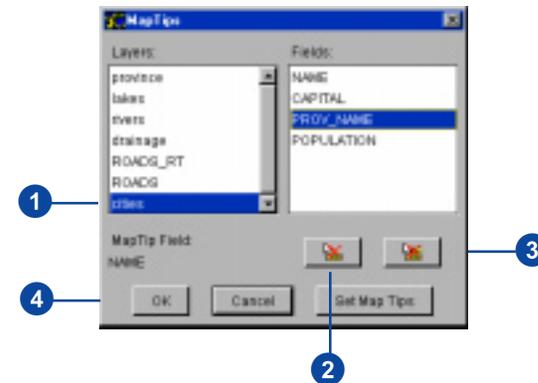
## Removing MapTips

### Removing MapTips from the selected layer

1. Click a layer to select it.
2. Click the Clear Selected MapTips Field button.

### Removing all MapTips

3. Click the Clear All MapTips Fields button.
4. Click OK to close the dialog.



## Measuring distances

Use the Measure button to measure distances on your map. Use the measure tool to specify a measurement unit. You can measure distances on your map in feet (ft), miles (mi), meters (m), or kilometers (km).

The map units must be set appropriately in order to get accurate measure results. The map units are the units your data is stored in. By default, ArcExplorer 3.1 sets the map units to decimal degrees.

### Tip

#### Check map units if measure results seem incorrect

*If the measure results seem incorrect, verify that the map units are set appropriately. You can set the map units by clicking the View menu, clicking Scale Bar Properties, pointing to Map Units, and then clicking the appropriate unit.*

#### Clearing measure totals

*You can clear the measure totals by clicking the Measure button and clicking Clear Measure Totals.*

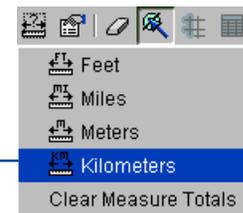
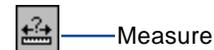
### See Also

*See the 'Working with the scale bar' section in Chapter 3 to learn more about setting the map units.*

## Measuring a distance

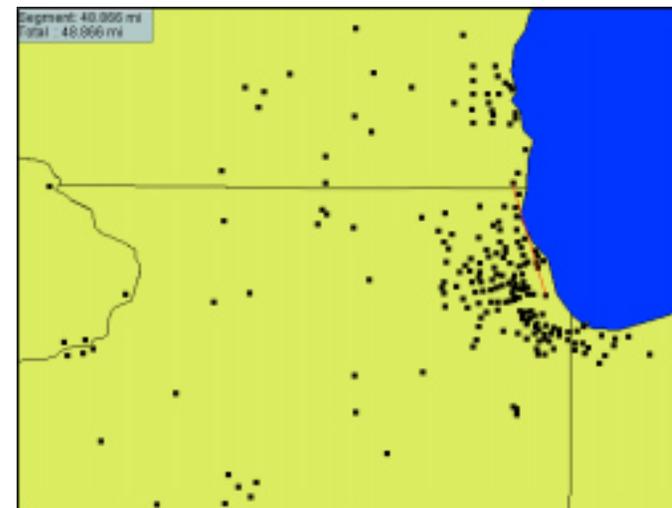
1. Click the Measure button.
2. Point to one of the measure units.
3. Click and drag a line defining the distance you would like to measure.

The segment and total measurements appear in the upper left corner of the map.



## Clearing the measure totals

1. Double-click on the map to clear the measure totals and end measuring.



# 6

## Address matching

### IN THIS CHAPTER

- **Locating an address**

Addresses are probably the most commonly used form of geographic data. Geocoding is the process by which you add point locations defined by street addresses, or other address information, to your map. It's the computer equivalent of pushing pins into a street map on your wall. Address matching is a type of geocoding. You can do single record address matching on Image or Feature MapServices using ArcExplorer 3.1.

## Locating an address

The Locate Address button performs an address match: the locating of a point based on a text string of address values.

The Locate Address button is enabled on viewers that have MapServices created with geocoding properties set up.

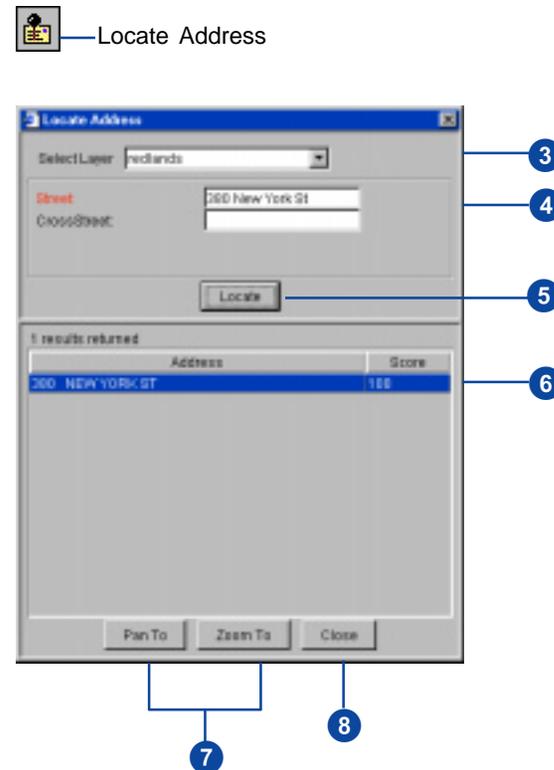
As more than one layer in a service could have geocoding properties set, use the Select Layer dropdown box to select the layer you would like to use to locate an address.

After locating an address, use the Clear Selection button to clear the point and label from the map.

### See Also

*You can set a MapService's geocoding properties using the Author component of ArcIMS. See Using ArcIMS for more details.*

1. Add a layer from an Image or Feature MapService that has geocoding properties set.
2. Click the Locate Address button.
3. Click the layer that you would like to locate an address from.
4. Type the values of the address. The more information entered, the more accurate your results will be.
5. Click Locate.
6. The results of the address match appear in the lower panel. Also, a point and a label are placed on the map.
7. Click Pan To or Zoom To to locate the result on the map.
8. Click Close to close the dialog box.



# Printing, copying, and saving

# 7

## IN THIS CHAPTER

- **Printing a map**
- **Copying a map to a file**
- **Saving a project**

You've displayed your data in a map. You've chosen the symbols you want to use. This chapter outlines how to print a map; copy your map to an image; and save your work as a project (.axl file), also referred to as a map configuration file.

## Printing a map

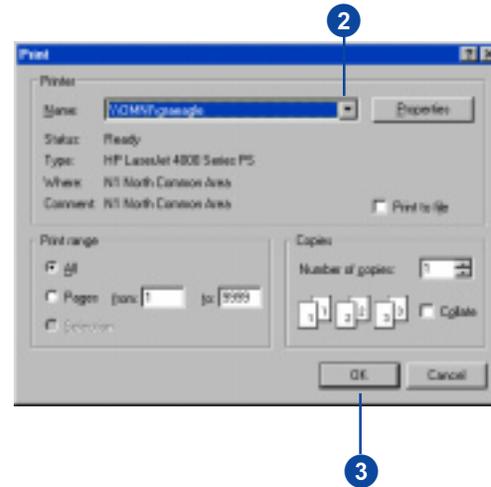
Use the steps outlined in Chapter 4, ‘Symbolizing layers’, of this book to symbolize your data. Then use the Pan and Zoom tools so that the display in the map looks the way you want it to look on paper.

ArcExplorer 3.1 provides a simple, 8 1/2” x 11”-size map layout in landscape (horizontal) format.

### See Also

*See the ‘Copying a map to a file’ section in this chapter for details on how you can save your map image to a JPEG file. Once the map is saved as an image, you can use it to design your own print layouts.*

1. Click the Print button.
2. If necessary, change the printer settings.
3. Click OK.



## Copying a map to a file

Use the steps outlined in Chapter 4, 'Symbolizing layers', of this book to symbolize your data. Then use the Pan and Zoom tools so that the display in the map looks the way you want it to look on paper.

You may want to copy the image of a map for use in another application. ArcExplorer 3.1 makes it easy to create a graphic image of your map.

1. Click the Copy Map Image to File button.
2. Navigate to a folder.
3. Type a name for the image.
4. Click Save.

A JPEG of your map has been saved to the selected folder.



Copy Map Image to File



## Saving a project

ArcExplorer 3.1 saves projects in files with an .axl extension. The paths to the data, whether layers are turned on or off, the map extent, any classification or labels applied to layers, and any scale factors you may have set are saved. When you create a project or map configuration file, you're not changing or altering the base data in any way.

### Tip

#### Moving data

*When opening a project, ArcExplorer 3.1 will not prompt you for any data that may have moved since you last saved the project. Instead, it will warn you with a message that the data cannot be found.*

1. Click the Save Project button.
2. Navigate to a folder.
3. Type a name for the project.
4. Click Save.

Projects can be opened in ArcExplorer 3.1 by clicking the Open Project button and using the Open dialog to navigate to a project.

