

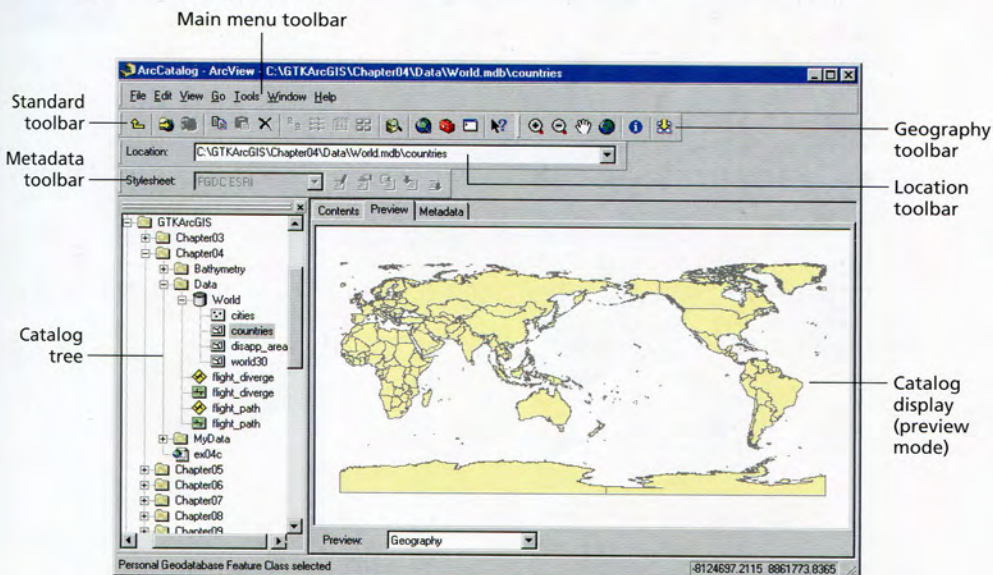
Exploring ArcCatalog

Browsing map data

Searching for map data

Adding data to ArcMap

ArcCatalog is an application for managing geographic data. You can copy, move, and delete data; search for data; look at data before deciding whether to add it to a map; and create new data. The ArcCatalog application window includes the catalog display for looking at spatial data, the catalog tree for browsing data, and several toolbars.



Spatial data comes in many different formats, including geodatabases, coverages, shapefiles, CAD files, rasters, and TINs. Each format is identified by its own icon in ArcCatalog. The shapefile icon, for example, is a green rectangle. Different patterns on the green rectangle distinguish point, line, and polygon shapefiles.

In this book, you'll use geodatabase, shapefile, and raster data. You'll also use layer files, which are not spatial data sets, but rather instructions for displaying spatial data sets with certain colors, symbol markers, line widths, and so on. Layer files, too, have their own ArcCatalog icon. You'll learn more about layer files and spatial data formats throughout this book.



Browsing map data

chapter

3
4

ArcCatalog gives you more information about spatial data than you can get from Windows Explorer or other file browsers. It can show you which folders contain spatial data and what kinds of spatial data they contain. It lets you preview features and attributes of data before you add the data to a map. It lets you examine and edit meta-data, which is information about your data, such as when and how it was created.

Exercise 4a

As the GIS manager of the aviation history foundation's Earhart project, you need to be familiar with its spatial data. You'll use ArcCatalog to look at this data and get information about it.

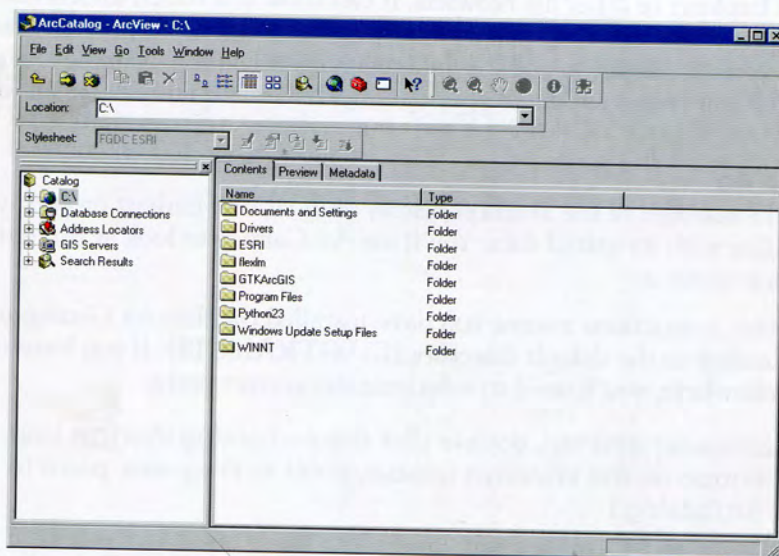
The exercise instructions assume you have installed the data for *Getting to Know ArcGIS Desktop* to the default directory (C:\GTKArcGIS). If you have installed the data elsewhere, you'll need to substitute the correct paths.

- 1 On your computer desktop, double-click the ArcCatalog shortcut icon. (Or, click the Start button on the Windows taskbar, point to Programs, point to ArcGIS, and click ArcCatalog.)



exercise 4a

The ArcCatalog application window opens. The catalog tree lists the data and services that ArcCatalog is connected to. By default, there is a connection to each local drive on your computer. Your application may look different from the following graphic depending on the drives you have.



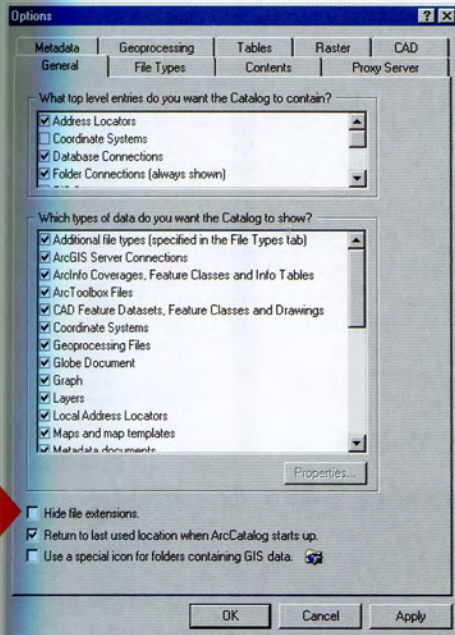
You can also connect to subdirectories, network drives, databases, Internet servers, and other services.

Once you connect to a folder, you can access the data it contains. In this exercise, it will be helpful to see the file extensions of different spatial data sets, so you will make sure that ArcCatalog is set to display these extensions.

- 2 Click the Tools menu and click Options. In the Options dialog, click the General tab.

The Options dialog lets you specify the types of data ArcCatalog displays and the information it shows about them (file name, file size, date modified, and so on). You can distinguish folders containing spatial data from those that don't, and make many other customizations to the way data is displayed.

- 3 If necessary, uncheck Hide file extensions, then click OK.



To access the spatial data in the GTKArcGIS folder more quickly, you'll create a connection to it.

- 4 On the Standard toolbar, click the Connect To Folder button.



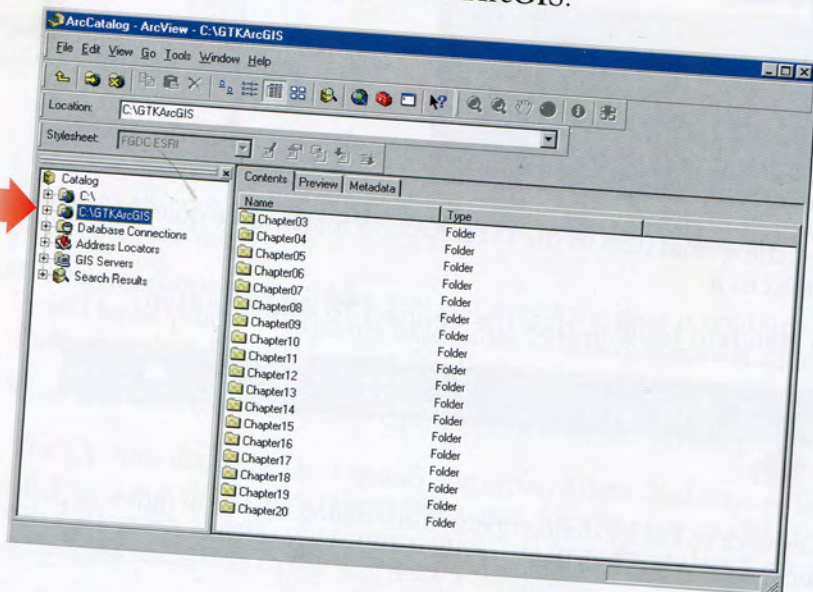
The Connect to Folder dialog opens. Your dialog may look different depending on your local and network drives.



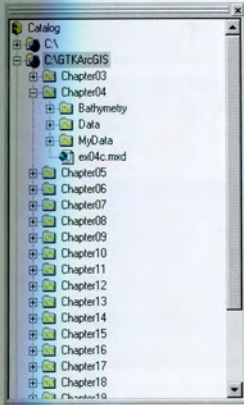
- 5 In the Connect to Folder dialog, click the plus sign (+) next to the (C:) drive to view its contents. Click on the GTKArcGIS folder, as shown in the following graphic, then click OK.



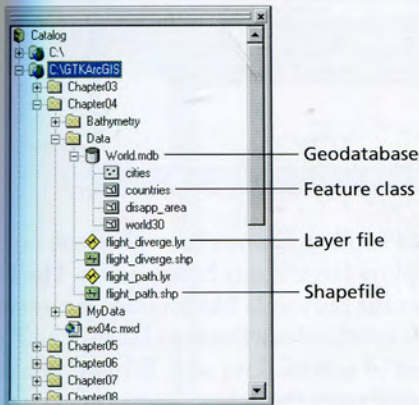
A connection is made to C:\GTKArcGIS.



- 6 In the catalog tree, click the plus sign next to C:\GTKArcGIS. Click the plus sign next to the Chapter04 folder. It contains three folders, Bathymetry, Data, and MyData, and one map document, ex04c.mxd.



- 7 Click the plus sign next to the Data folder. It contains a geodatabase (World.mdb), two shapefiles, and two layer files. Click the plus sign next to World.mdb.



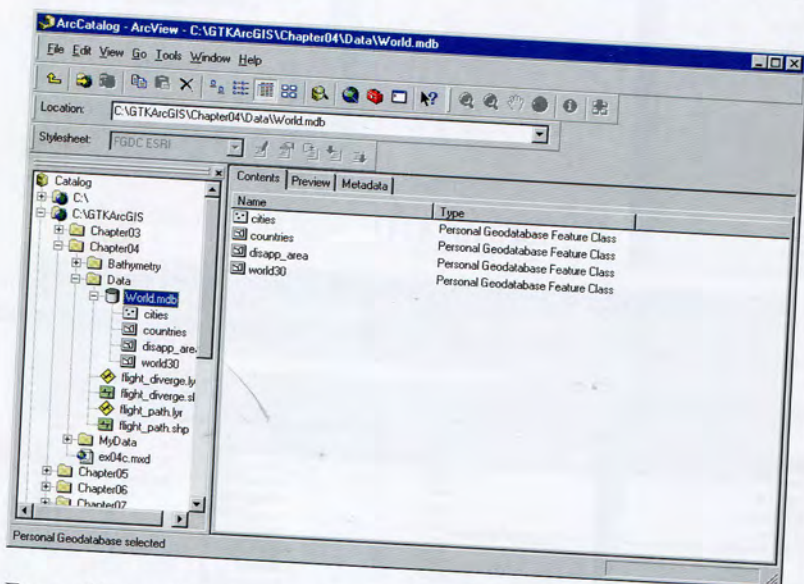
The geodatabase contains four feature classes. A feature class is a group of points, lines, or polygons representing geographic objects of the same kind. The cities feature class contains point features, the other three contain polygon features. This data was used to make the map of Earhart's flight in the previous chapter. For a more detailed explanation of feature classes, see the introduction to chapter 14.

exercise 4a

- 8 On the Standard toolbar, make sure the Details button is selected.



- 9 In the catalog tree, click on **World.mdb**. In the catalog display, make sure the Contents tab is active.

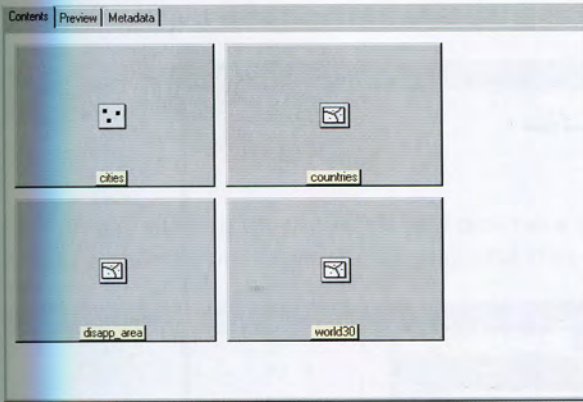


Four adjacent buttons on the Standard toolbar change how files look on the Contents tab. The Large Icons button displays large icons horizontally. The List button displays small icons vertically. The Details button is like the List button except it also shows the file type—in this case, geodatabase feature classes. The Thumbnails button allows you to view small images of spatial data sets. Whenever a folder or geodatabase is highlighted in the catalog tree, these four buttons are enabled.

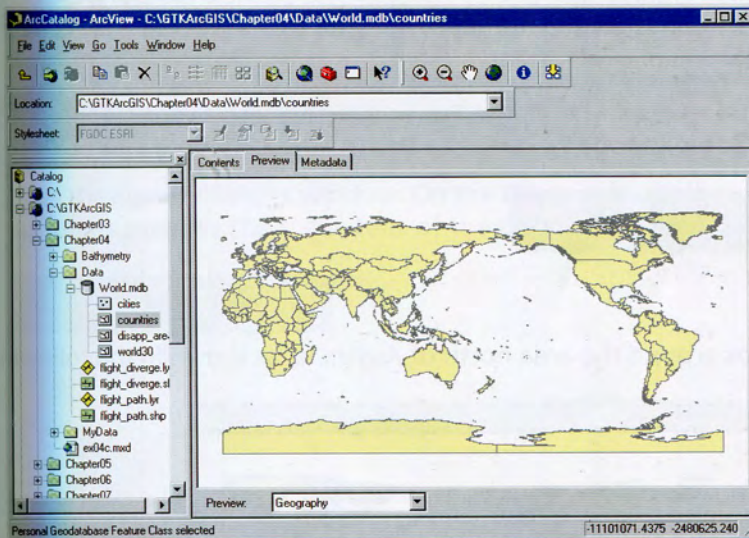
- 10 On the Standard toolbar, click the Thumbnails button.



The display changes to show thumbnail images for each file. At the moment, the thumbnails are simply larger versions of the icons. A thumbnail that shows an image of a data set can help you decide quickly if you want to use the data or not. You'll create a thumbnail for the countries feature class.



- 11 In the catalog tree, click on the **countries** feature class in the World geodatabase. In the catalog display, click the Preview tab. The geographic data for countries displays in pale yellow.



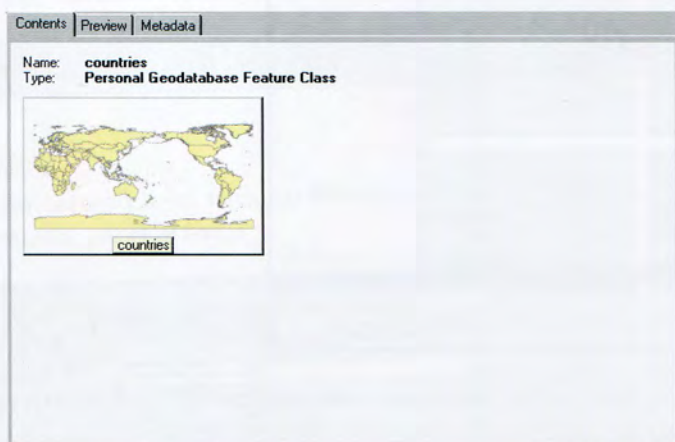
- 12 On the Geography toolbar, click the Create Thumbnail button.



An image of the data shown on the Preview tab is saved as a thumbnail graphic.

Exercise 4a

- 13 In the catalog display, click the Contents tab to see the thumbnail.

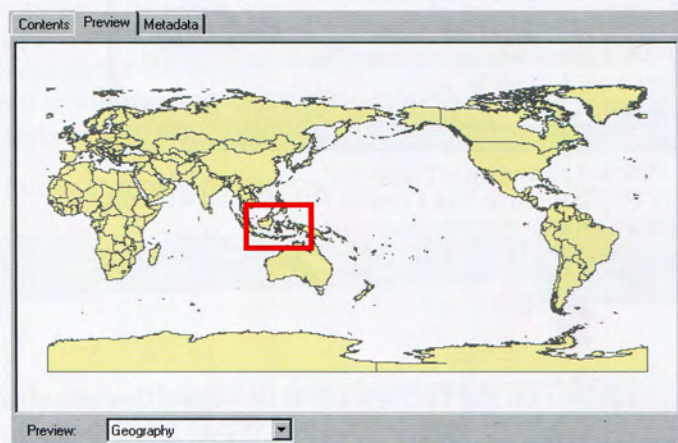


A thumbnail graphic may not be enough. The preview tab and the tools on the Geography toolbar let you further investigate a data set before deciding if you want to use it in a map.

- 14 In the catalog display, click the Preview tab again. On the Geography toolbar, click the Zoom In tool.



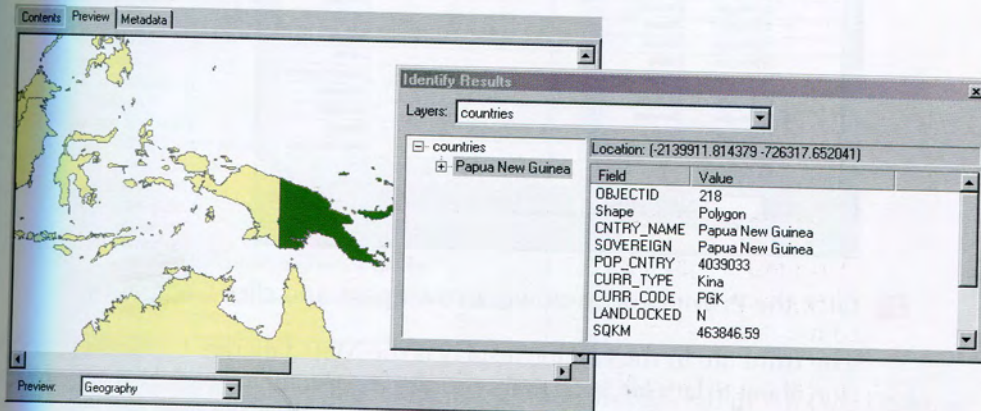
- 15 Drag a box around the area north of Australia, as shown in the following



- 16 On the Geography toolbar, click the Identify tool.



- 17 Click on a feature to identify it. If you don't see it flash green, move the Identify Results window away from the display and click the feature again.



- 18 Close the Identify Results window. On the Geography toolbar, click the Full Extent button to zoom to the full extent of the data.



exercise 4a

You can preview the attributes of a data set as well as its geography.

- 19** At the bottom of the catalog display, click the Preview drop-down arrow and click Table. The display shows you the attribute table of the countries feature class.

Contents Preview Metadata			
OBJECTID	Shape	CNTRY_NAME	
1	Polygon	Russia	Russia
2	Polygon	Svalbard	Norway
3	Polygon	Greenland	Denmark
4	Polygon	Jan Mayen	Norway
5	Polygon	Iceland	Iceland
6	Polygon	Faroe Is.	Denmark
7	Polygon	Finland	Finland
8	Polygon	Estonia	Estonia
9	Polygon	Latvia	Latvia
10	Polygon	United Kingdom	United Kingdom
11	Polygon	Lithuania	Lithuania
12	Polygon	Denmark	Denmark
13	Polygon	Belarus	Belarus
14	Polygon	Isle of Man	United Kingdom

Record: 1 Show: All Selected Records (of 252) Op

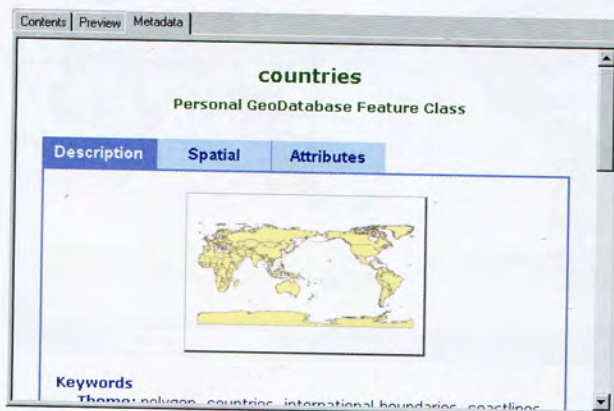
Preview: Table

- 20** Click the Preview drop-down arrow again and click Geography.

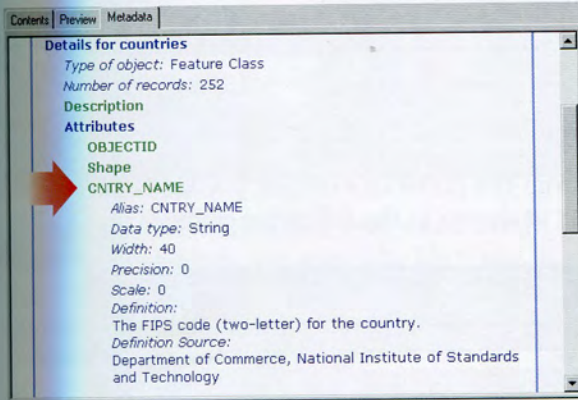
The third tab in the catalog display is the Metadata tab. Metadata provides information about a data set, such as its coordinate system, its spatial extent, and descriptions of its attributes. It may also explain how and when the data was created, what standards of accuracy it meets, and what its appropriate uses are.

A great deal of metadata is maintained automatically by ArcCatalog; some, however, must be maintained by the people who use and manage the data. ArcCatalog doesn't require you to maintain metadata, but you should.

- 21** In the catalog display, click the Metadata tab. You see the name of the countries feature class, the thumbnail you created, and three blue tabs. The Description tab is highlighted. (If your metadata looks different from the graphic, click the Stylesheet drop-down arrow on the Metadata toolbar and click FGDC ESRI.)

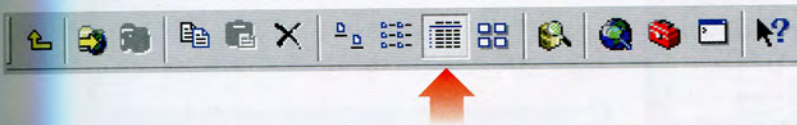


- 22 Scroll down. Clickable green text headings give you access to general information about the data. Scroll up to the top.
- 23 Click the Spatial tab to see the map projection and coordinate system that the data uses. (You will work with projections and coordinate systems in chapter 13.)
- 24 Click the Attributes tab. Click on a green attribute name to learn more about it.



For more information about metadata, click the Contents tab in ArcGIS Desktop Help (not the Contents tab in ArcCatalog) and navigate to *ArcCatalog > Working with metadata*.

- 25 In the catalog display, click the Contents tab. In the catalog tree, click on **World.mdb**. On the Standard toolbar, click the Details button.



The display is restored to its initial state.

- 26 If you are continuing with the next exercise, leave ArcCatalog open. Otherwise, click the File menu and click Exit.

Searching for map data

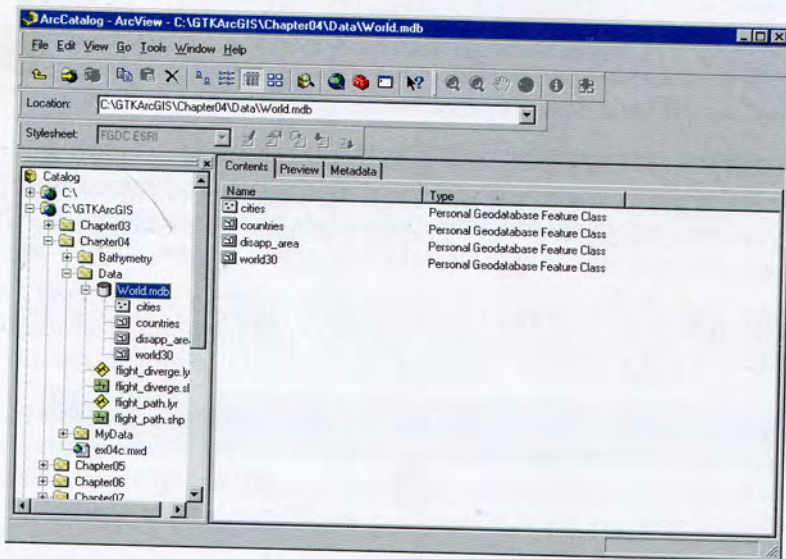
With ArcCatalog, you can search for geographic data on disk or across a network. You can search by name, file type, geographic location, creation date, or by other properties stored in the metadata.

Exercise 4b

In this exercise, you will search ArcCatalog for more data that may be useful to Earhart project.

- 1 If necessary, start ArcCatalog.

If ArcCatalog is open from the previous exercise, you are connected to the C:\GTKArcGIS folder, as shown in the following graphic.

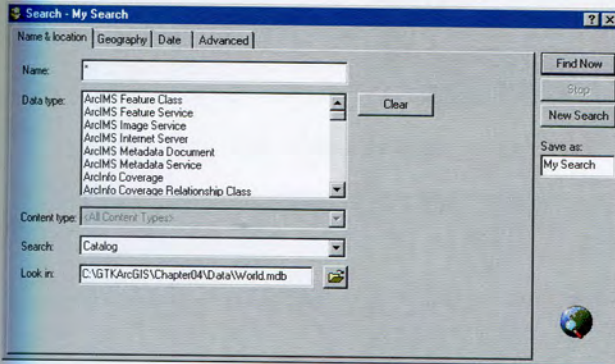


If you started a new ArcCatalog session, you are connected to the C:\ folder and your catalog tree looks slightly different. Either way is fine.

- 2 On the Standard toolbar, click the Search button.



The Search dialog opens with the Name & location tab active.

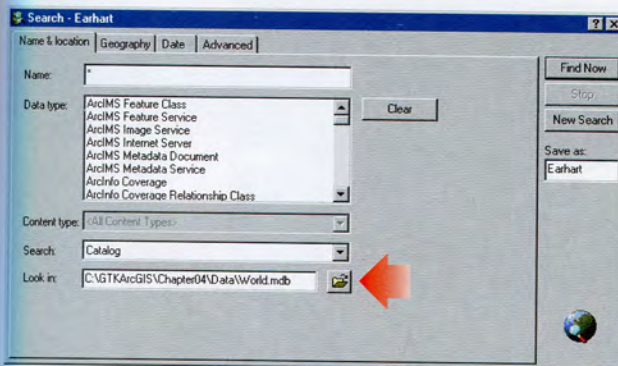


The tabs on the Search dialog give you different ways to search for data. On the Name & location tab, you search by file name or type. On the Geography tab, you search by geographic location. On the Date tab, you search by the date files were last accessed or by other dates in the metadata. On the Advanced tab, you search for keywords or other metadata text.

ArcCatalog gives each search a name and saves the results to a Search Results folder. As you will see in a moment, it doesn't actually copy or move any data into this folder. (That would be inefficient.) Instead, it creates shortcuts, or pointers, to the data it finds.

You will change the default search name (My Search) to something more descriptive. You will also restrict the search to the contents of the Chapter04 folder. This spares ArcCatalog the trouble of looking for data in unlikely places.

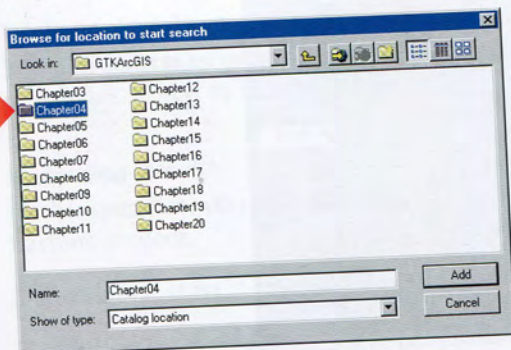
- 3 In the Save as box, highlight the name My Search and replace it with **Earhart**. Then click the Browse button next to the Look in box.



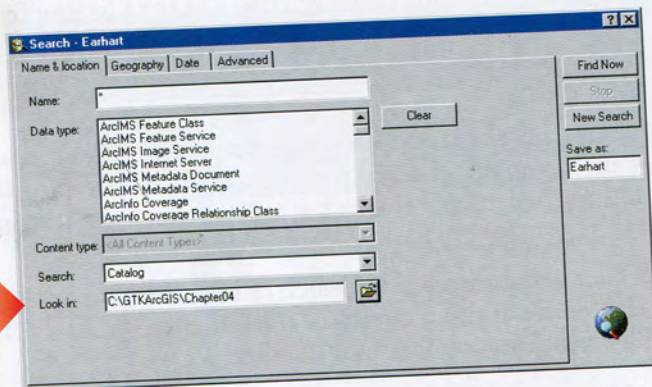
The Browse for location to start search dialog opens.

exercise 4b

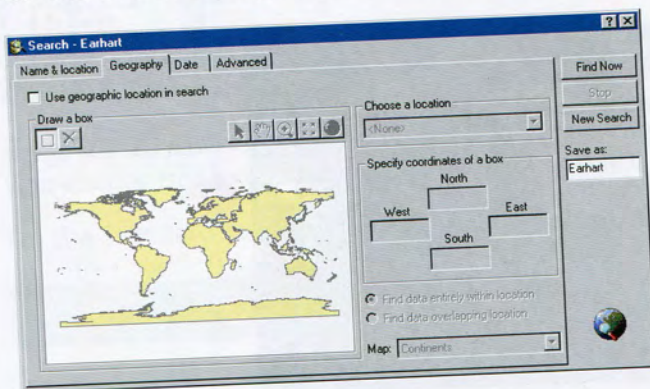
- 4 In the Browse dialog, navigate to C:\GTKArcGIS. Click on the **Chapter04** folder as shown in the following graphic, then click Add.



The search is now limited to the contents of the Chapter04 folder.

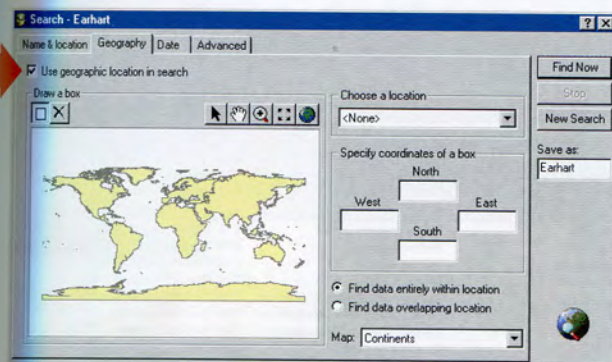


- 5 On the Search dialog, click the Geography tab.



You will concentrate your search for data on the area where Earhart disappeared. Geographical searches use latitude and longitude coordinates to find data; specifically, they check the bounding coordinates stored in a data set's spatial metadata to see if these lie within the latitude–longitude values of the search area. If they do, the data set is returned in the search results.

- 6 On the Geography tab, check Use geographic location in search.

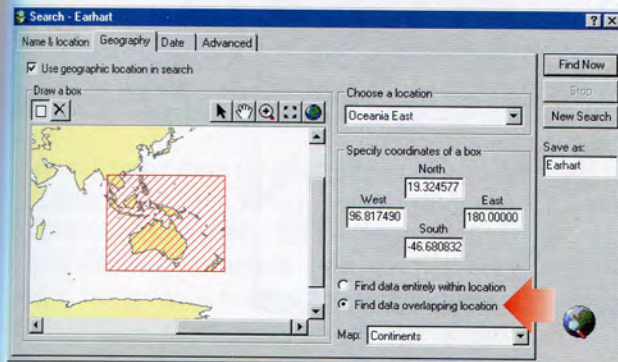


You can search for data by drawing a box on the map, by choosing a part of the world, or by entering latitude and longitude coordinates.

- 7 Click the Choose a location drop-down arrow and click Oceania East.

This is the part of the world where Earhart disappeared. The map zooms in and a shaded rectangle covers the search area.

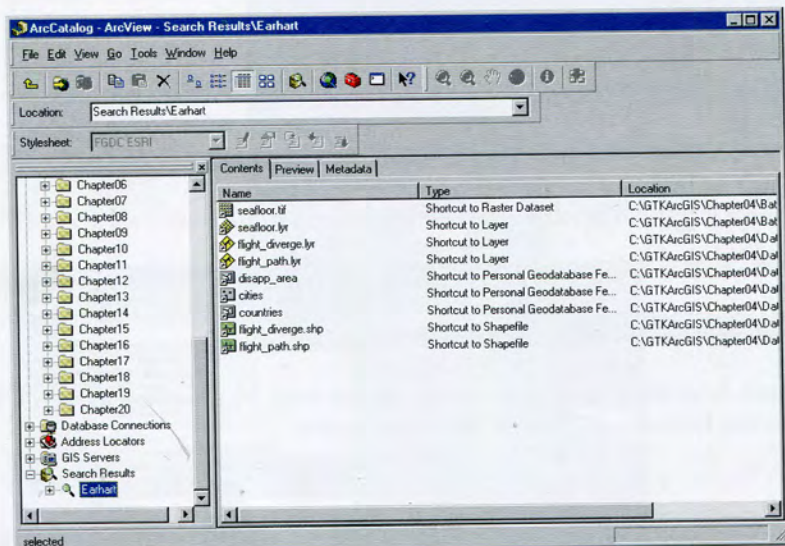
- 8 Near the bottom of the dialog, click the Find data overlapping location option. ArcCatalog will find any spatial data that falls at least partly within the rectangle. Make sure that the dialog matches the following graphic, then click Find Now.



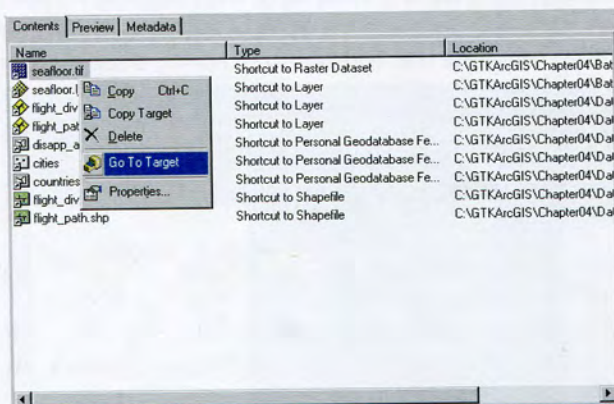
When all data sets have been found, the ArcCatalog status bar at the bottom of the application window displays the message, "Catalog search finished."

9 Close the Search dialog.

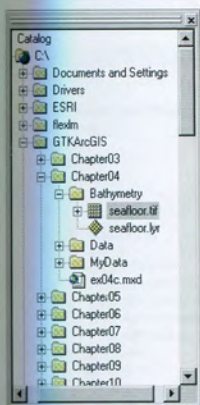
Earhart is added under Search Results in the catalog tree. The display lists shortcuts to the data sets that were found. You have already seen most of them, but there is a raster data set called *seafloor.tif* that you haven't seen before.



10 In the catalog display, right-click on *seafloor.tif* and click Go To Target.



The catalog tree opens to the location of the data. Scroll to the top of the table of contents.



The seafloor raster data set is in the Bathymetry folder under Chapter04, along with a layer file called seafloor.lyr.

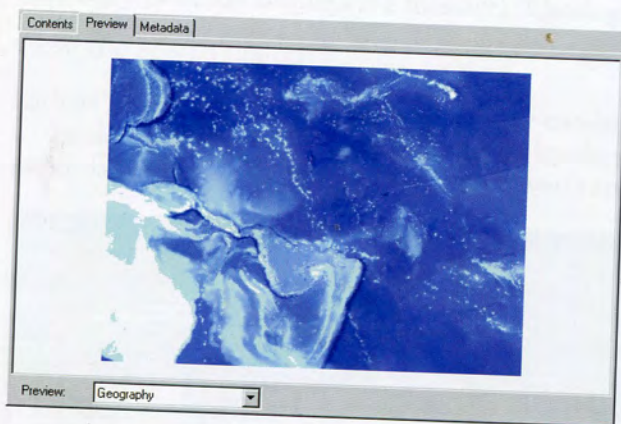
- 11 In the catalog tree, make sure that seafloor.tif is highlighted. In the catalog display, click the Preview tab.



You see a raster data set of seafloor elevation in East Oceania. The data may be useful in a map of the area where Earhart disappeared. For example, you could zoom in on Nikumaroro Island and find out how deep the water around it is. This information might affect operations to find and recover plane wreckage. The black-and-white image, however, is not easy to interpret as seafloor elevation. The seafloor layer file displays the elevation data in shades of blue.

exercise 4b

- 12 In the catalog tree, click on **seafloor.lyr**.



In the layer file, the depth of the water is indicated by the shade of blue; darker is deeper. White areas are land.

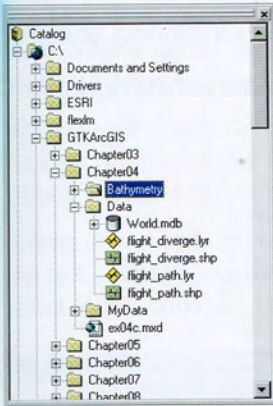
- 13 On the Geography toolbar, click the Identify tool.



- 14 Click on a few locations to identify elevation values (described as pixel values in the Identify Results window). The values are in meters. If you click on a spot of land, you should get the value No Data.

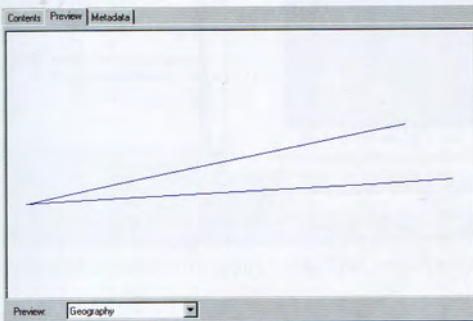


- 15 Close the Identify Results window. In the catalog tree, click the minus sign next to the Bathymetry folder to collapse it. If necessary, click the plus sign next to the Data folder to expand it.

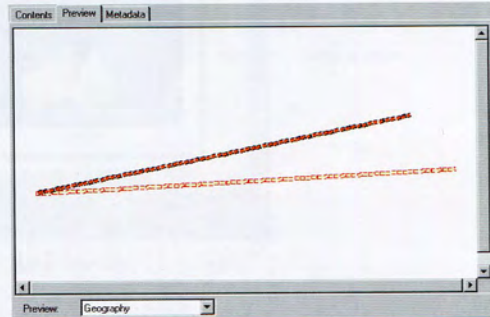


Besides the World geodatabase, the Data folder contains shapefiles and layer files for the Earhart flight paths.

- 16 Make sure the Preview tab is active in the display. Click on the flight_diverge shapefile (green square icon) to preview it. Next, click on the flight_diverge layer file (yellow diamond) and preview it.



flight_diverge shapefile



flight_diverge layer file

The shapefile displays as two blue lines. The layer file shows the thick dotted lines that you saw in the previous chapter.

exercise 4b

Layer files allow you to store symbology information—the colors, shapes, and sizes that you choose for features—so you never have to recreate it. Every layer file is associated with and depends on a spatial data set. The `flight_diverge` layer file will not display in ArcMap unless the `flight_diverge` shapefile is accessible on disk.

In the next exercise, you will add data and layer files from ArcCatalog to ArcMap.

- 17** If you are continuing with the next exercise, leave ArcCatalog open. Otherwise, click the File menu and click Exit.

Adding data to ArcMap

chapter

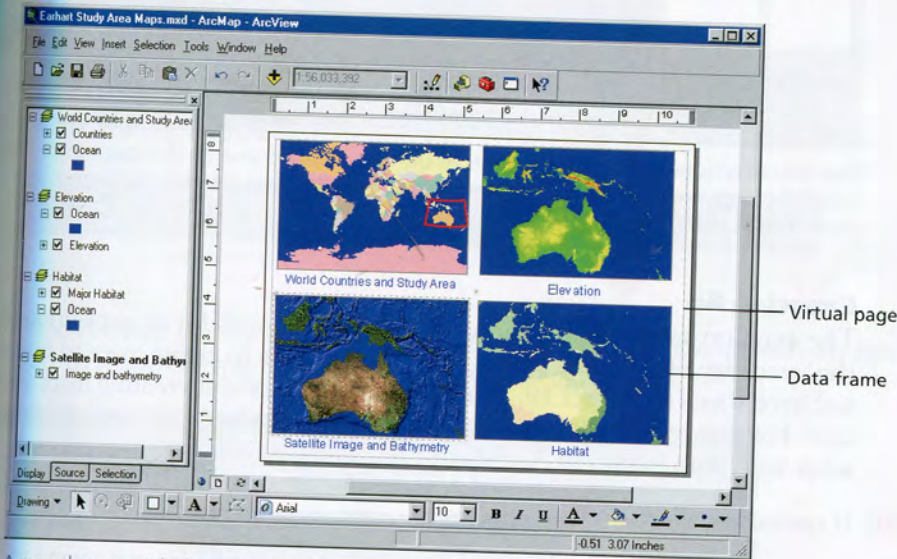
3

4

One way to add data to ArcMap is to drag it from ArcCatalog. Once it's there, you can look at it, as you did in the previous chapter, as a map display and table of contents. This is called data view. You can also look at it as if it were on a page that you send to a printer. This is called layout view.

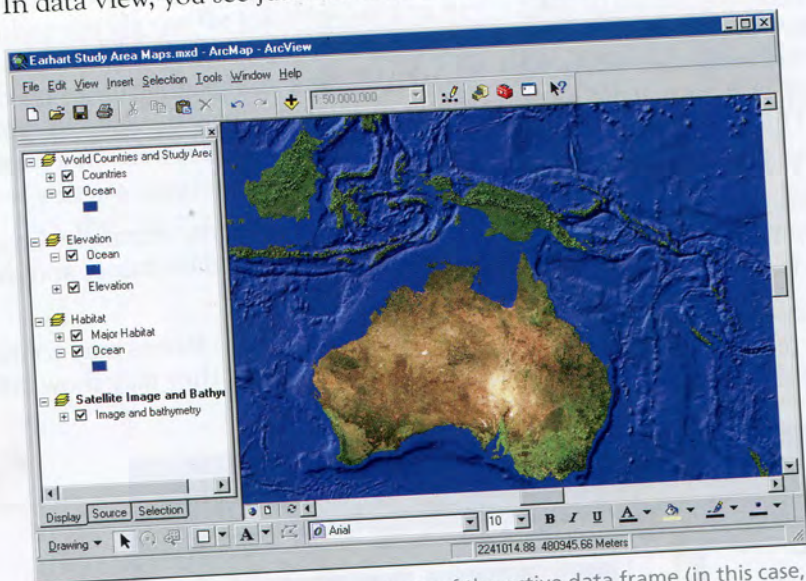
In layout view, you see map layers organized in one or more rectangles on a larger background rectangle. The smaller rectangles are called data frames and the background is called the virtual page.

A map document can have one data frame or many. Data frames may contain different sets of data (usually related to a common subject) or they may show different views of the same data.



A map document in layout view. The map has four data frames.

In data view, you see just one data frame at a time.



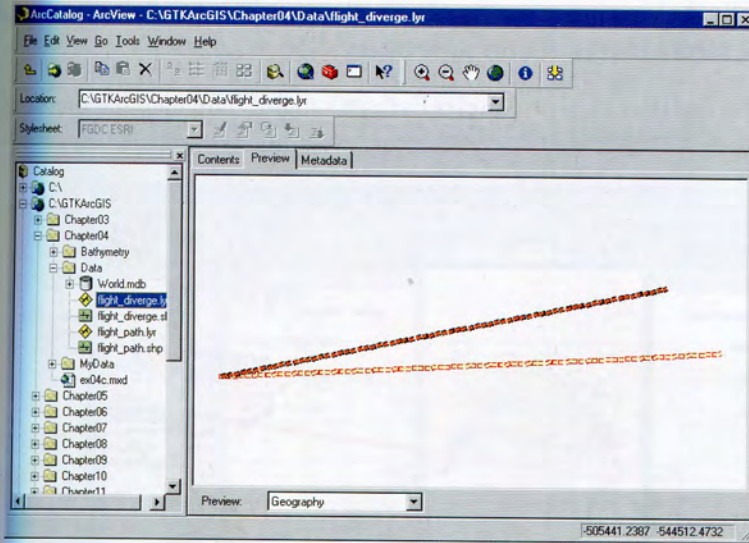
The display window shows the contents of the active data frame (in this case, Satellite Image and Bathymetry). The name of the active data frame is boldfaced in the table of contents.

Exercise 4c

The aviation history foundation hopes to raise money for an expedition to locate the wreckage of Earhart's plane. Part of your job is to create maps to interest potential investors. In chapter 19, you'll learn in detail about creating maps for presentation. For now, you'll learn how to add data to ArcMap from ArcCatalog and how to work with data frames in ArcMap.

- 1 If necessary, start ArcCatalog.

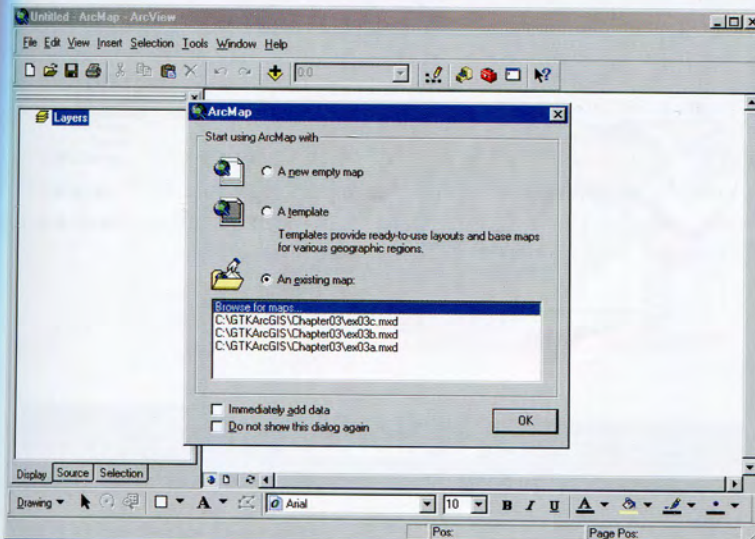
If ArcCatalog is open from the previous exercise, you are connected to **C:\GTKArcGIS\Chapter04\Data\flight_diverge.lyr**, as shown in the figure. If you started a new ArcCatalog session, navigate to this location and click the Preview tab if necessary.



- 2 On the Standard toolbar, click the Launch ArcMap button.



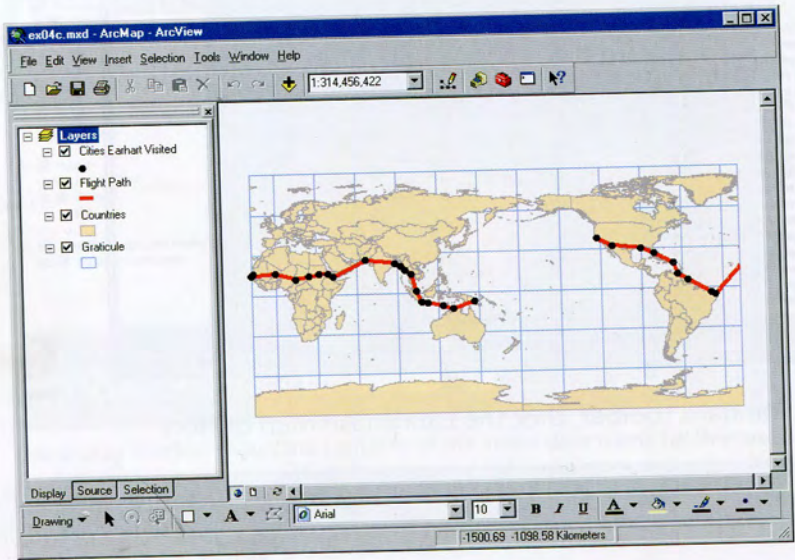
- 3 In the ArcMap dialog, click the option to start using ArcMap with an existing map, as shown in the following graphic, and click OK.



exercise 4c

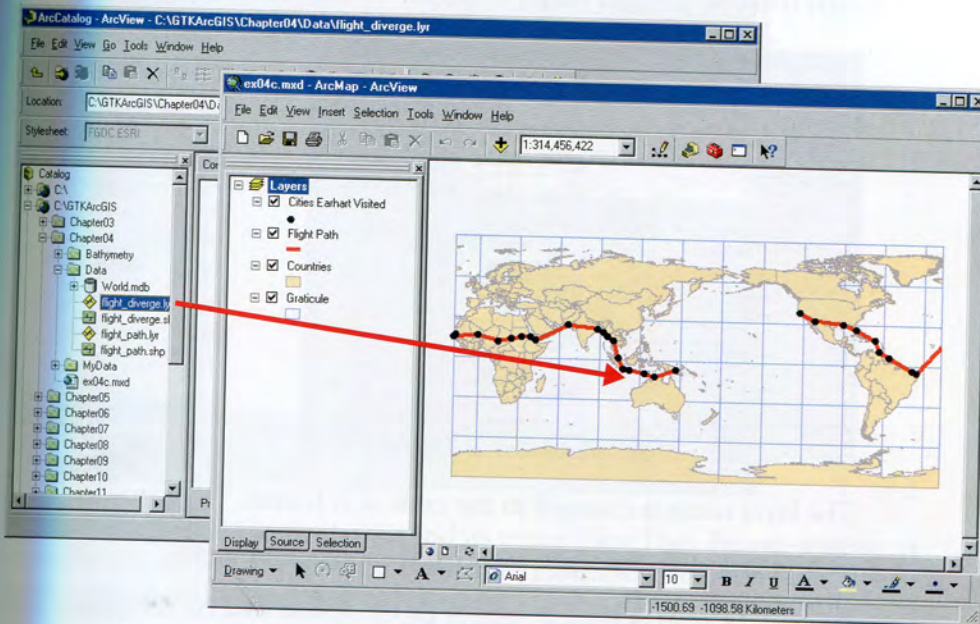
- 4 In the Open file browser, navigate to **C:\GTKArcGIS\Chapter04**. Click on the **ex04c.mxd** to highlight it and click Open.

You see the familiar map of Amelia Earhart's flight. The map has one data frame that contains four layers. You will add a layer for the diverging flight paths.

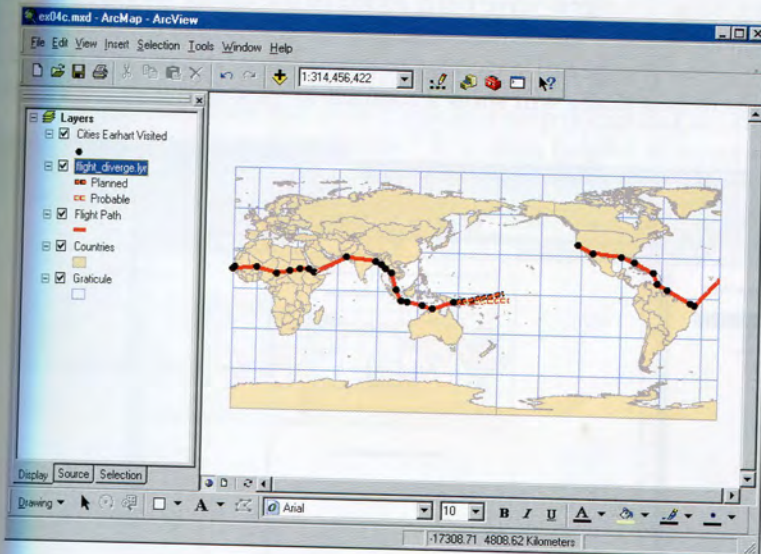


- 5 Position the ArcCatalog and ArcMap application windows so that you can see both the catalog tree and the ArcMap display window.

- 6 In the catalog tree, click on the **flight_diverge** layer file (yellow icon). Drag the file anywhere over the ArcMap display window and release the mouse button. Bring ArcMap forward by clicking on its title bar.



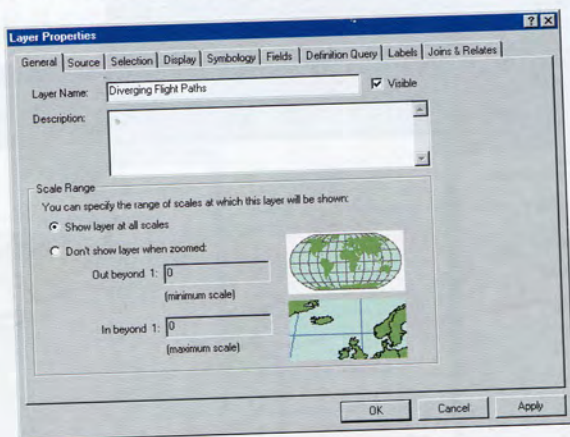
The layer file is added to ArcMap.



You'll rename the layer file.

exercise 4c

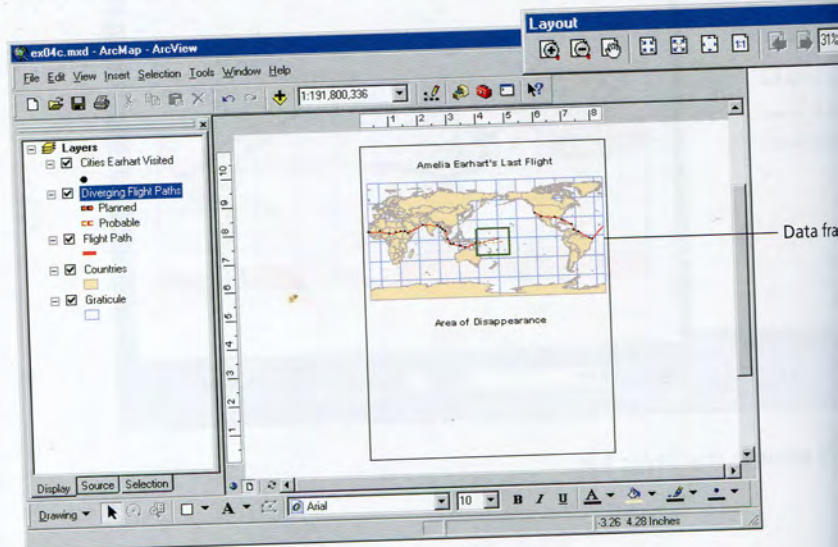
- 7 In the table of contents, right-click on flight_diverge.lyr and click Properties.
- 8 In the Layer Properties dialog, click the General tab. Replace the layer name with **Diverging Flight Paths**, as shown in the following graphic, then click OK.



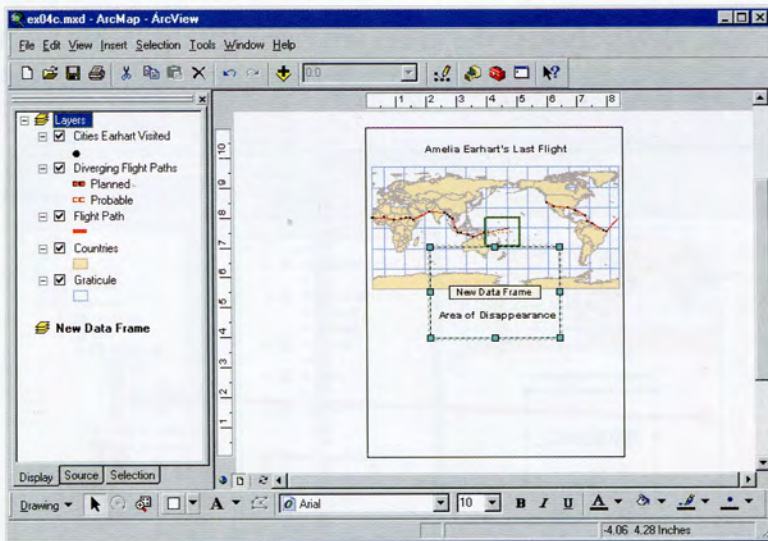
The layer name is changed in the table of contents.

- 9 In ArcMap, click the View menu and click Layout View.

You see the map as if on a piece of paper. A new toolbar, the Layout toolbar, appears. The map document has a single data frame, occupying the top half of the page. Some other elements have been added to the layout for you. There is a title above the data frame, a green rectangle graphic that marks the area where the map disappeared, and another title that will accompany a data frame you are about to add. This new data frame will show a zoomed-in view of the area of disappearance.



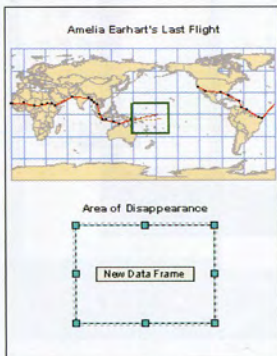
- 10 Click the Insert menu and click Data Frame.



A data frame is added to the layout and its name, **New Data Frame**, appears in the table of contents. The name is boldfaced, indicating that it is the active data frame—the one that layers will be added to.

- 11 In the layout window, move the mouse pointer over the new data frame. The cursor changes to a four-headed arrow. Drag the frame beneath the “Area of Disappearance” title.

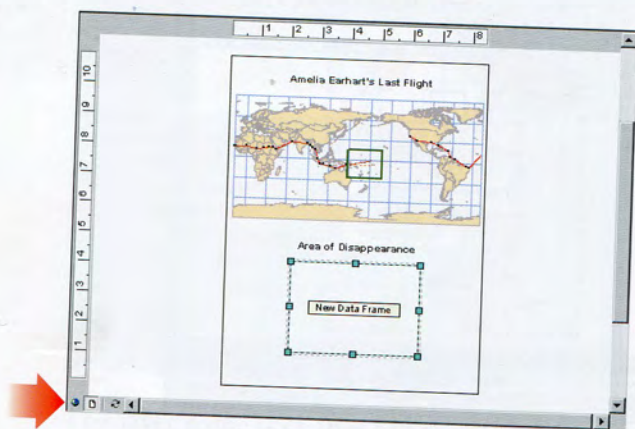
The name of a data frame is independent of any title you may choose to add to the layout. By default, the first data frame in a map document is called “Layers” and the second is called “New Data Frame.” It is often helpful to rename a data frame to something more descriptive (and you will do that later in this exercise), but it is not necessary.



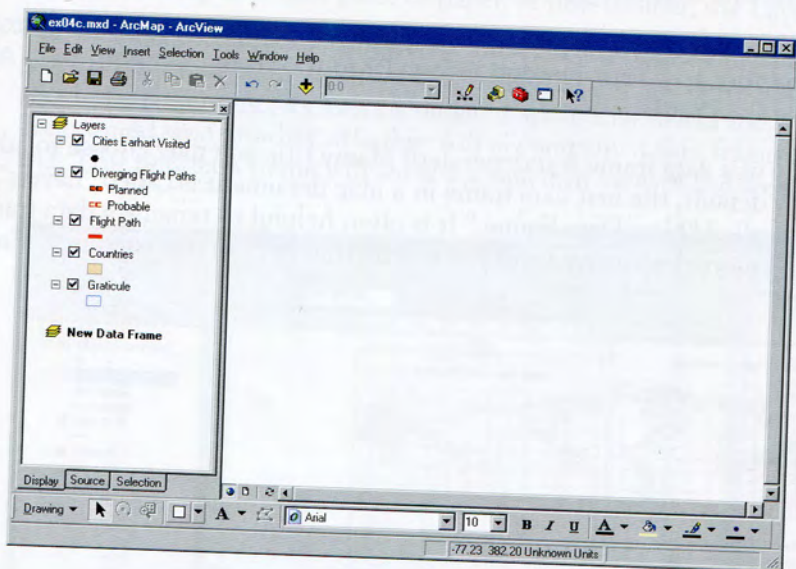
exercise 4c

You'll switch back to data view to add layers to the new data frame. (You can do this in layout view as well.)

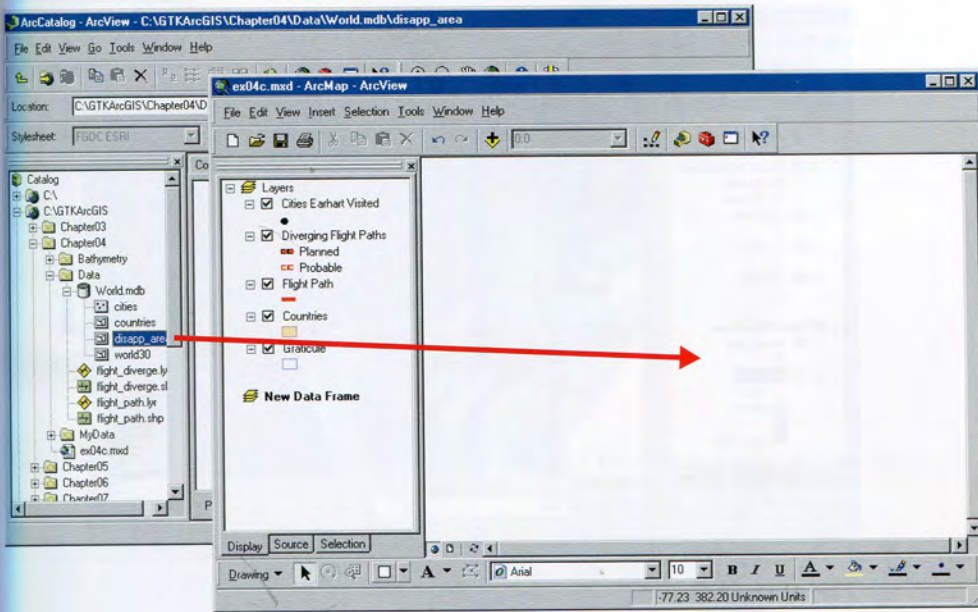
- 12 Click the Data View button in the lower left corner of the layout window. The Data View button and the Layout View button next to it can be used instead of the menu to switch between views.



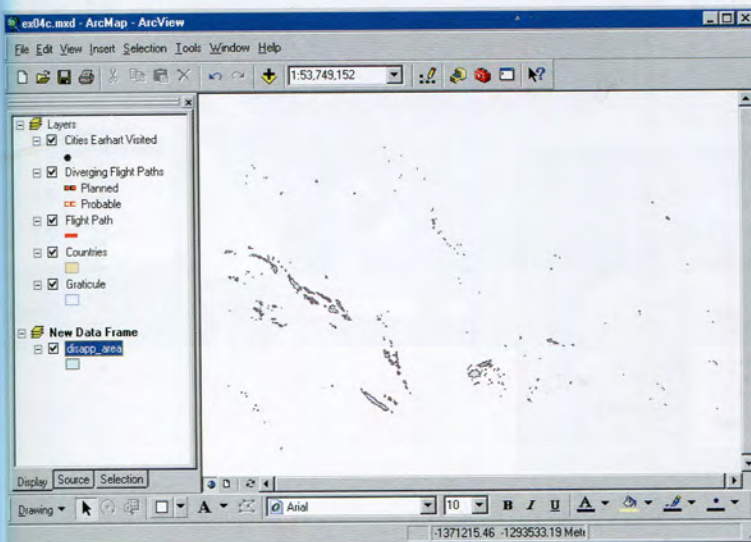
The display window is empty because the active data frame (New Data Frame) contains no layers.



- 13 Make ArcCatalog the active application by clicking on its title bar. In the catalog tree, click the plus sign next to the World geodatabase and click on **disapp_area**. Drag the feature class to the ArcMap display window and release the mouse button.



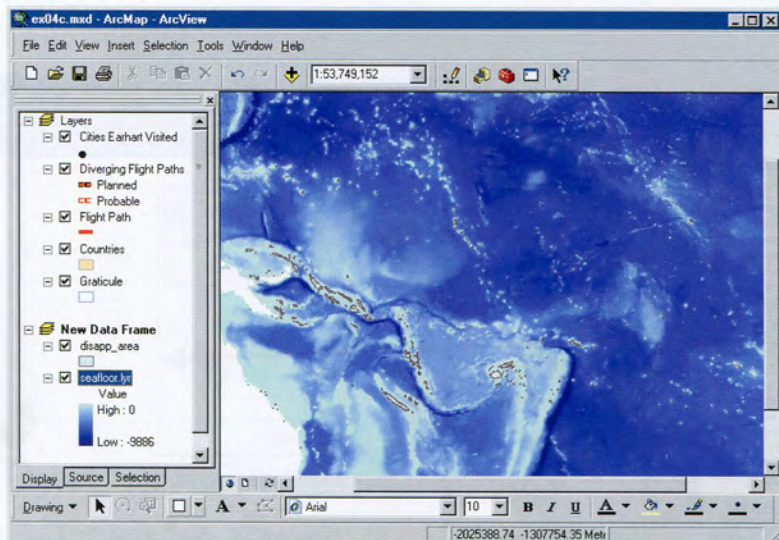
- 14 Bring ArcMap forward by clicking on its title bar. The feature class is added as a layer to the new data frame.



ArcMap assigns a random color to the **disapp_area** layer, so your color may be different.

exercise 4c

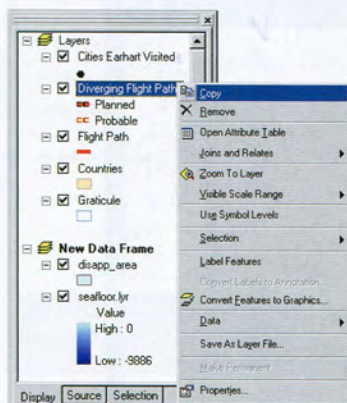
- 15** Make ArcCatalog the active application. In the catalog tree, click the plus sign by the Bathymetry folder and click on **seafloor.lyr** (yellow icon). Drag the file to ArcMap and bring ArcMap forward.



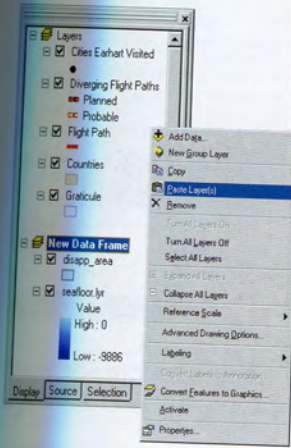
The **seafloor.lyr** layer displays underneath the **disapp_area** layer.

Now you will copy the Diverging Flight Paths layer from the Layers data frame to the new data frame.

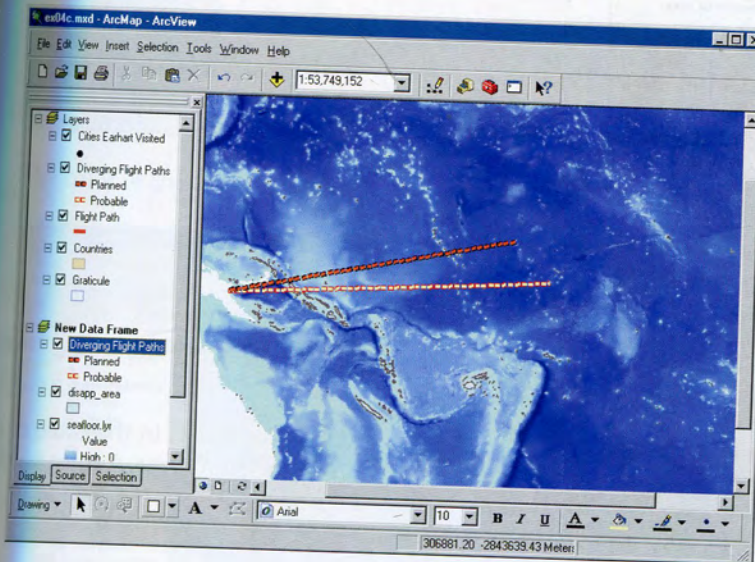
- 16** In the ArcMap table of contents, right-click on the Diverging Flight Paths in the Layers data frame. On the context menu, click Copy.



- 17 In the table of contents, right-click on New Data Frame. On the context menu, click Paste Layer(s).

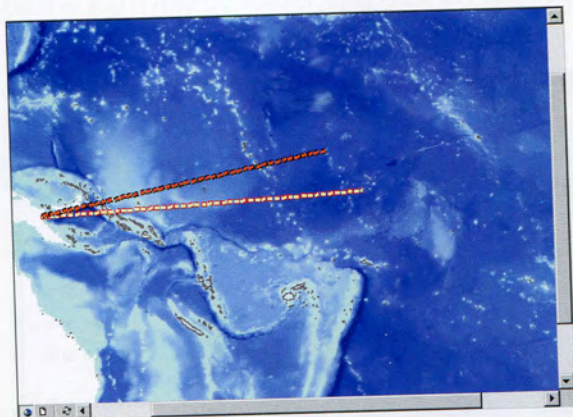


The Diverging Flight Paths layer is pasted into the new data frame and displays on the map.

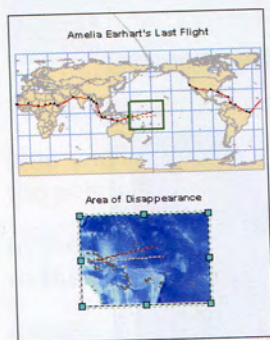


exercise 4c

- 18 Click the Layout View button in the lower left corner of the layout window

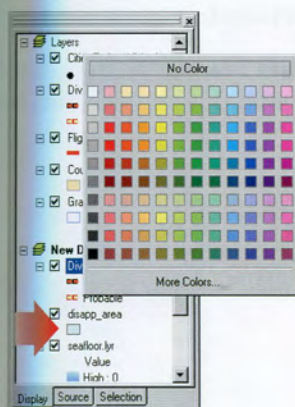


The data frame displays the data you've added to it.

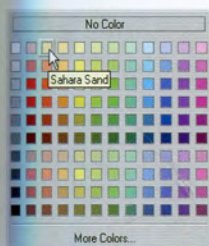


Now you'll change the color of the `disapp_area` layer to make it contrast with the blue of the seafloor layer.

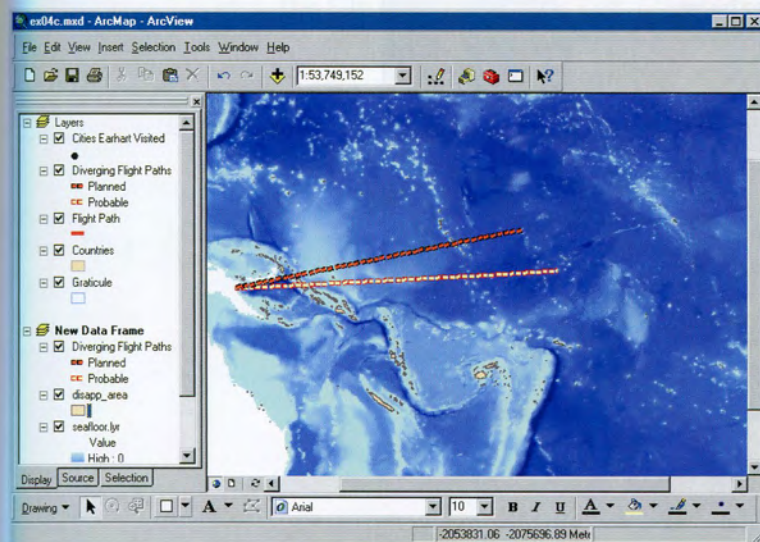
- 19 Click the Data View button to switch back to data view. In the table of contents, right-click on the polygon symbol for the `disapp_area` layer. A color palette



- 20** Move the mouse pointer over the color palette. Each color square is identified by name. Click Sahara Sand.



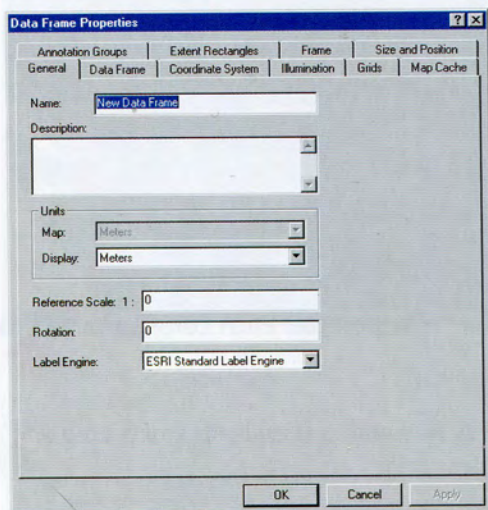
The color of the layer is updated in the table of contents and in the map features.



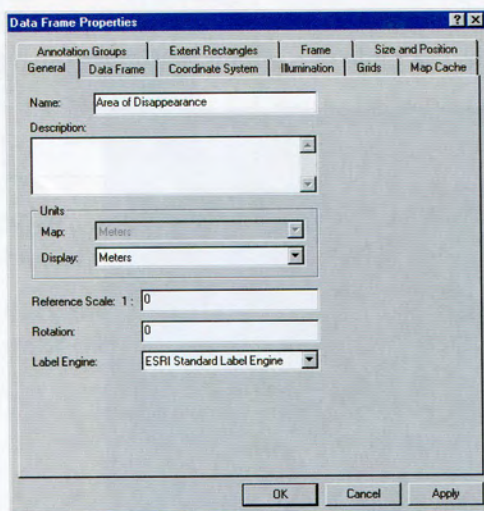
exercise 4c

Finally, you will rename the data frame.

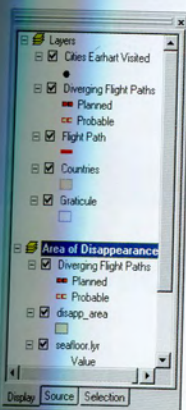
- 21** In the table of contents, right-click on New Data Frame. On the context menu, click Properties. The Data Frame Properties dialog opens. Click the General



- 22** In the Name box, New Data Frame is highlighted. Type Area of Disappearance in its place, as shown in the following graphic, then click OK.



The new name is displayed in the table of contents.



You know how to preview data in ArcCatalog and look at its metadata. You can use ArcCatalog to search for spatial data on disk. And you know how to add layers from ArcCatalog to ArcMap. You'll have no trouble managing the data for the Earhart project.

- 23 Make ArcCatalog the active application. Click the File menu and click Exit.
- 24 If you want to save your work, click the File menu in ArcMap and click Save As. Navigate to **C:\GTKArcGIS\Chapter04\MyData**. Rename the file **my_ex04c.mxd** and click Save.
- 25 Close the Layout toolbar. If you are continuing to the next chapter, leave ArcMap open. Otherwise, click the File menu and click Exit. Click No when prompted to save changes.