

# LECTURE 3

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## ARCMAP OVERVIEW



*CEEN 4800/6965 - Special Topics*  
*Geographic Information Systems and Hydrologic & Hydraulic Modeling*  
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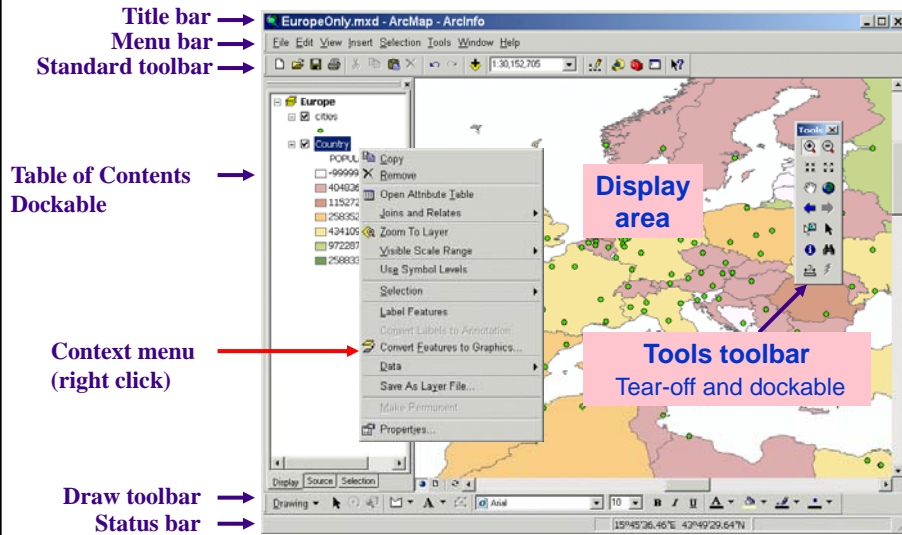
## OUTLINE

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- ◆ **ArcMap (Chapter 3)**
  - ◆ The ArcMap interface and tools
  - ◆ Data View and Layout View
  - ◆ Layers, data frames, and maps
  - ◆ Layer properties for symbols and labels
  - ◆ Getting help
  - ◆ Exercise 3a, 3b
- ◆ **ArcCatalog (Chapter 4)**
  - ◆ Options
  - ◆ Metadata
  - ◆ Exercise 4a, 4b
  - ◆ Homework No. 2

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# THE ARCMAP INTERFACE

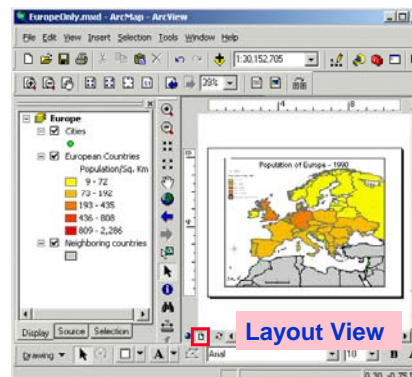
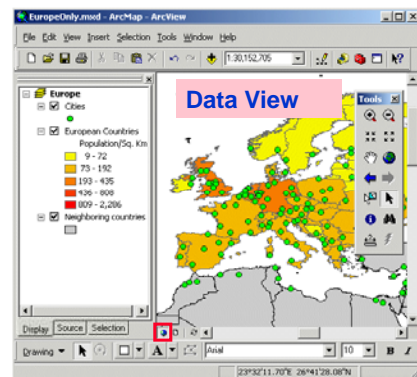
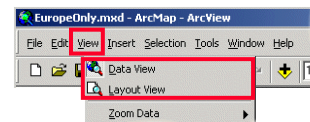


[Shortcut to ex03a.mxd](#)

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# DATA VIEW OR LAYOUT VIEW?

- ◆ **Data View**
  - ◆ For display, queries, editing, and analysis
- ◆ **Layout View**
  - ◆ For creating map layouts



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# LAYERS, DATA FRAMES, AND MAPS

## ◆ Layer

- ◆ Represent symbolized spatial data

Data frame

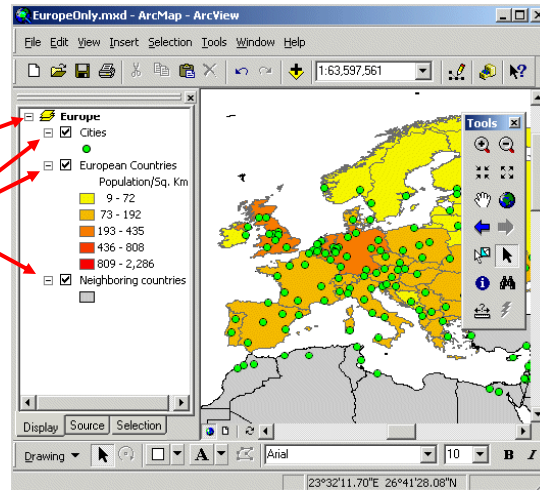
Layers

## ◆ Data frame

- ◆ Organizes layers

## ◆ Map contains

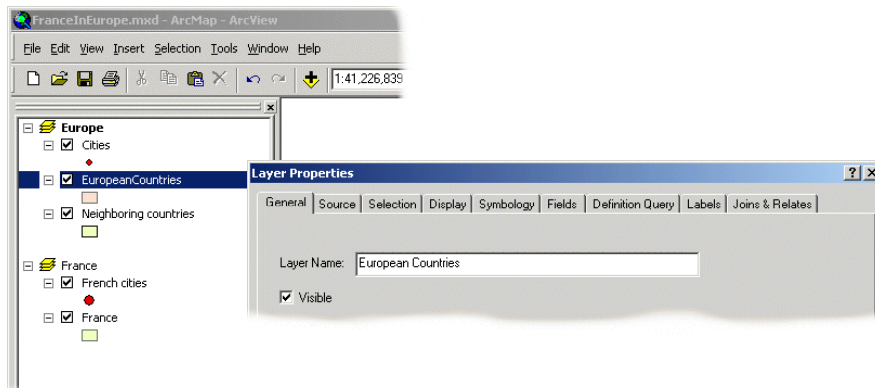
- ◆ Data frames
- ◆ Layers



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# LAYERS

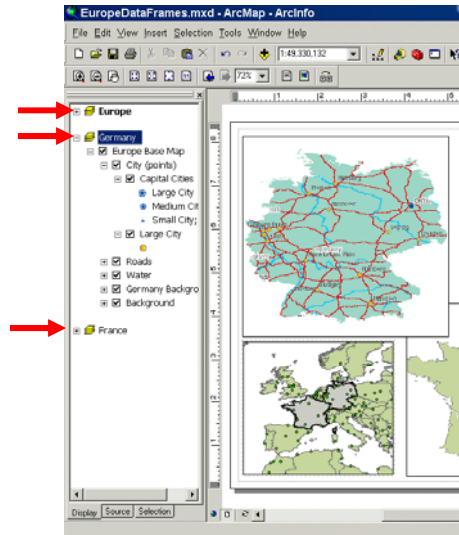
- ◆ Reference spatial data sources
- ◆ Set symbols, labels, and other properties
- ◆ Manipulate through context menu (right-click)



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# DATA FRAMES

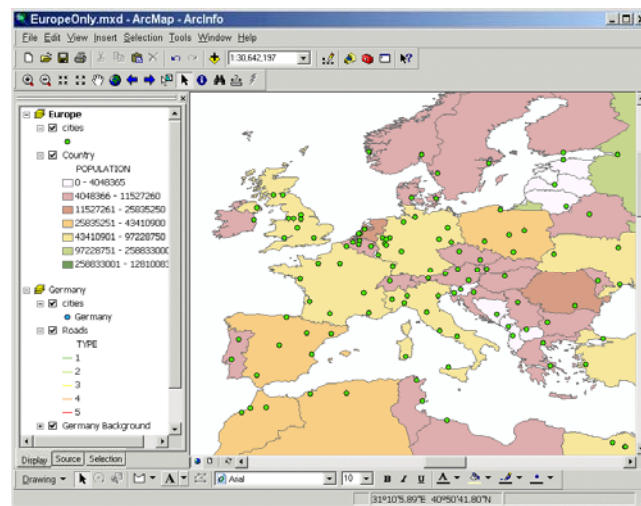
- ◆ Data frames are containers for layers
- ◆ Maps can have many data frames
  - ◆ Arrange in Layout View
- ◆ Add from Insert menu
- ◆ To view a data frame, activate it from the context menu (right-click)



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# MAPS

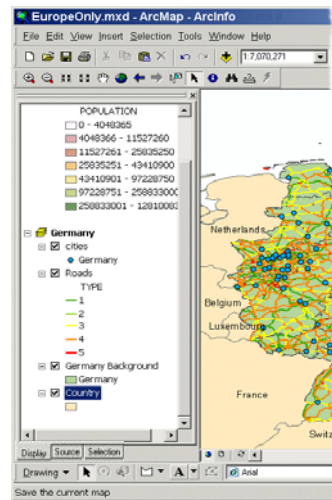
- ◆ Hold layers, data frames, and map elements (e.g., graphics and text that help explain map's context and purpose).
- ◆ Store information in a map document (MXD) file



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## MANAGING THE TABLE OF CONTENTS (TOC)

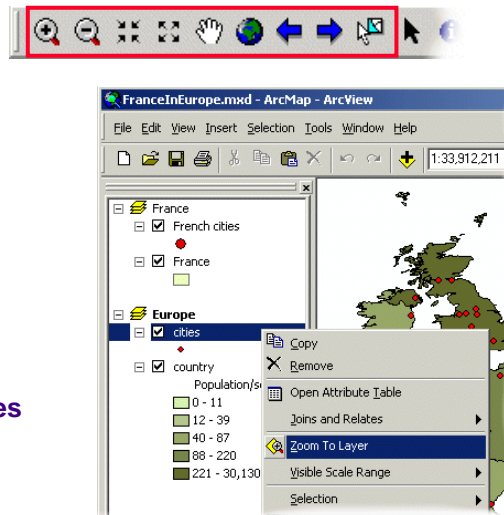
- ◆ Drag layers up or down to change display order
  - ◆ Smart defaults for layer draw order
    - ◆ Point, lines, and polygons
  - ◆ Layers draw in the TOC in order
    - ◆ From the bottom up
- ◆ Rename data frames and layers
- ◆ Remove layers
- ◆ Bottom tabs
  - ◆ Display
  - ◆ Source
  - ◆ Selection



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## MOVING AROUND THE MAP

- ◆ Tools Toolbar
  - ◆ Zoom in
  - ◆ Zoom out
  - ◆ Fixed zoom in
  - ◆ Fixed zoom out
  - ◆ Pan
  - ◆ Full extents
  - ◆ Previous view
  - ◆ Zoom to selected features
- ◆ Context Menu
  - ◆ Zoom to a layer

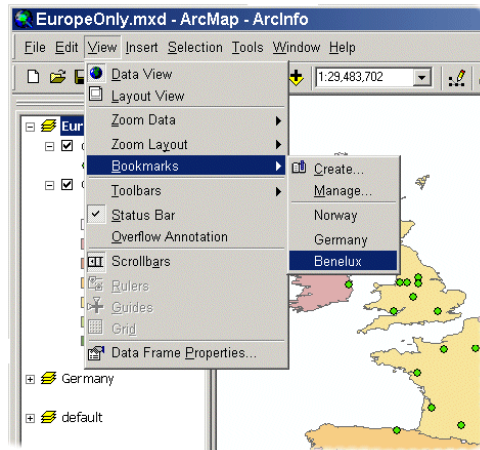


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## USING A BOOKMARK

### ◆ Spatial bookmarks

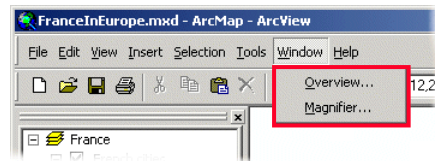
- ◆ Set and name spatial extent
- ◆ Return to it at any time
- ◆ Data frame specific



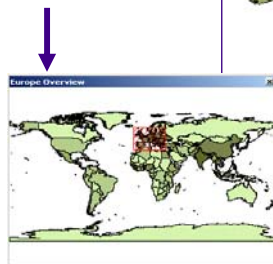
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## MAGNIFIER AND OVERVIEW WINDOWS

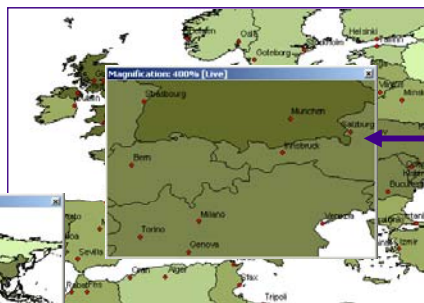
- ◆ See more detail or overview without changing display



Shows full extent of data plus extent of Data View



OVERVIEW



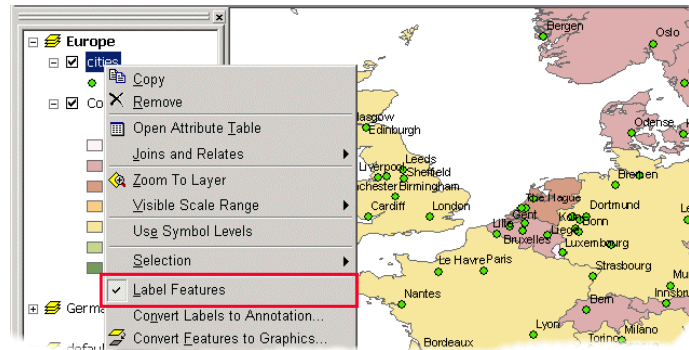
MAGNIFIER

Move over display like a magnifying glass

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# LABELING FEATURES

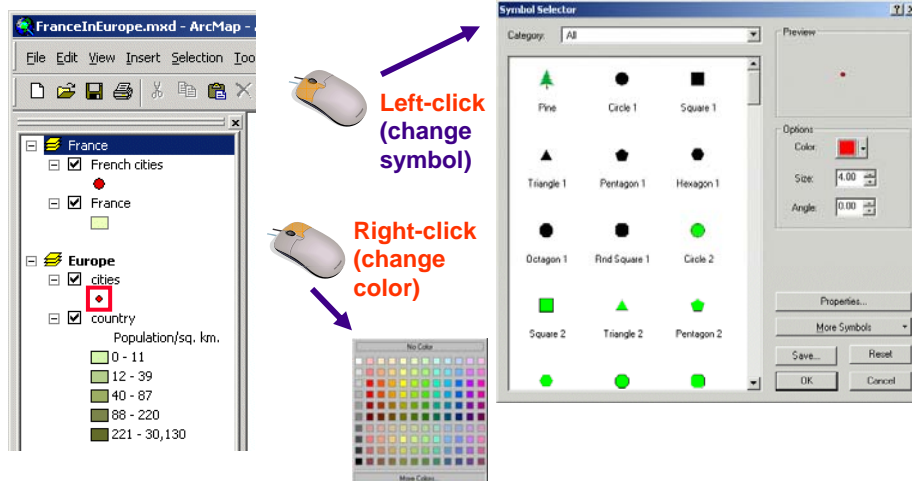
- ◆ Label features dynamically using attribute values
- ◆ Layer properties control appearance and position



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# CHANGING SYMBOL PROPERTIES

- ◆ Symbology tab from PROPERTIES window, or
- ◆ Table of Contents



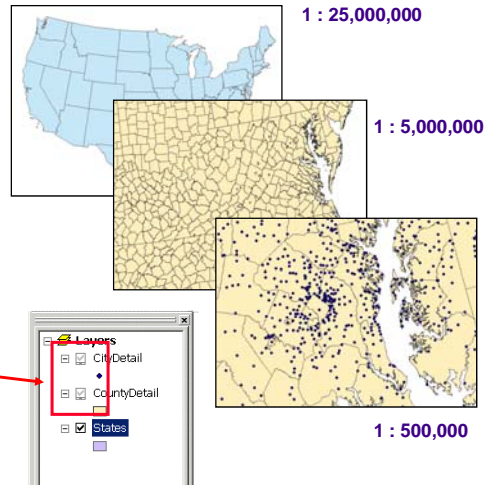
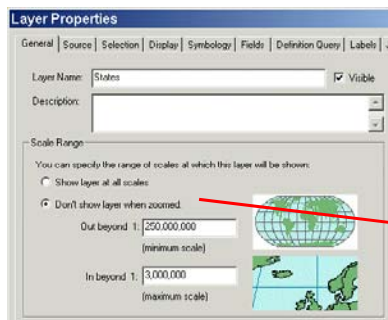
3-14



## SCALE-DEPENDENT DISPLAY

- ◆ Display layers at specific scale range

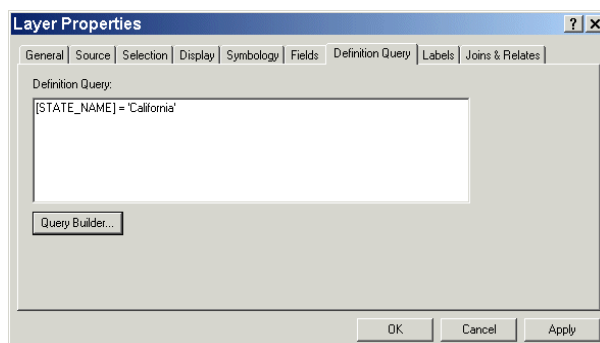
- ◆ Reduces clutter
- ◆ Reduces drawing time



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## CREATING A DEFINITION QUERY

- ◆ Build a query based on attributes
- ◆ Only displays queried features
- ◆ Does not affect source data



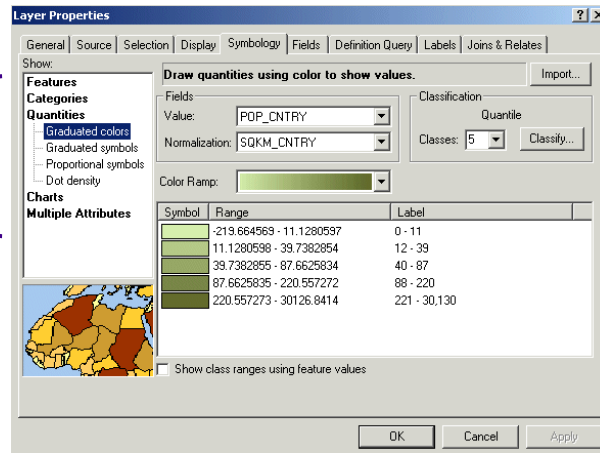
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# LAYER SYMBOLOGY IN ARCMAP

- ◆ Same symbol for all features, or
- ◆ Different symbol based on attribute values (color coding or classification)

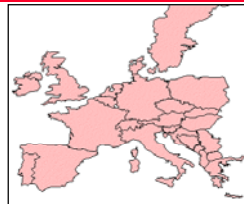
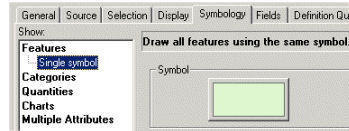
Thematic classification methods



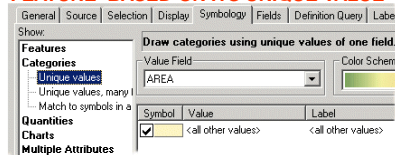
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# DISPLAYING QUALITATIVE VALUES

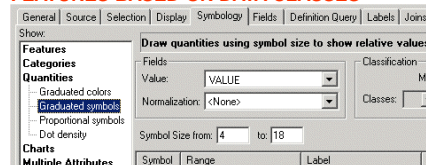
## SINGLE SYMBOL



## DIFFERENT SYMBOL FOR EACH FEATURE BASED ON ITS UNIQUE VALUE



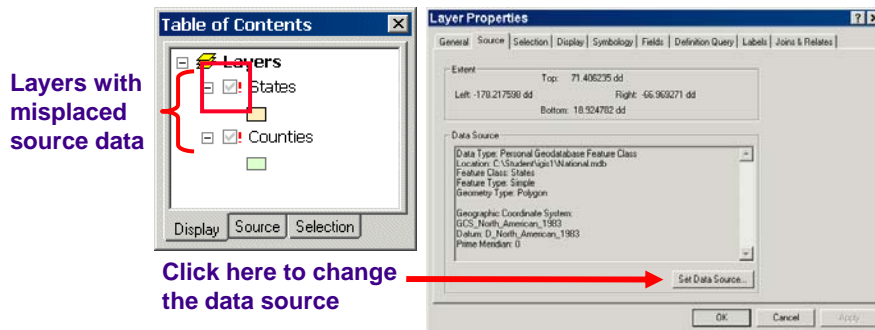
## DIFFERENT SYMBOL FOR GROUP OF FEATURES BASED ON DATA CLASSES



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## CHANGING THE DATA SOURCE FOR A LAYER

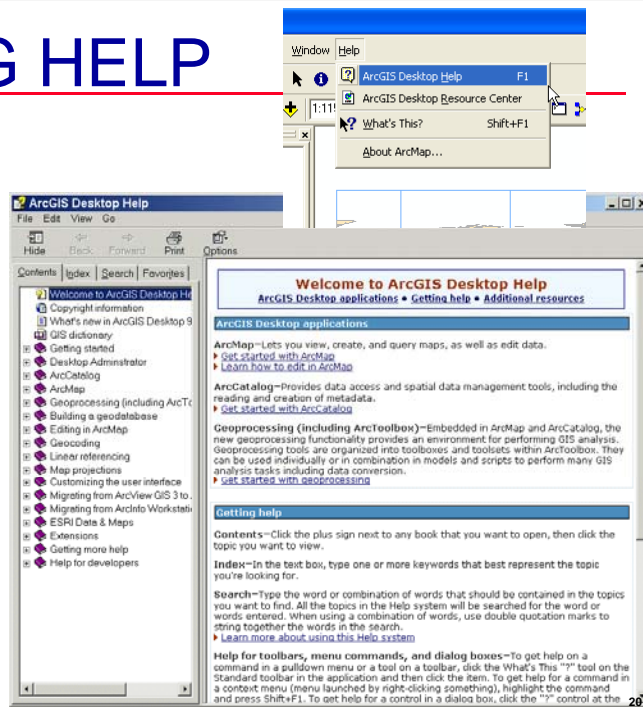
- ◆ Map documents can lose track of the source data if source data is moved or renamed
- ◆ Use Source tab to change the data source for a layer
  - ◆ Shortcut: Right-click the layer > Data > Set Data Source



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## GETTING HELP

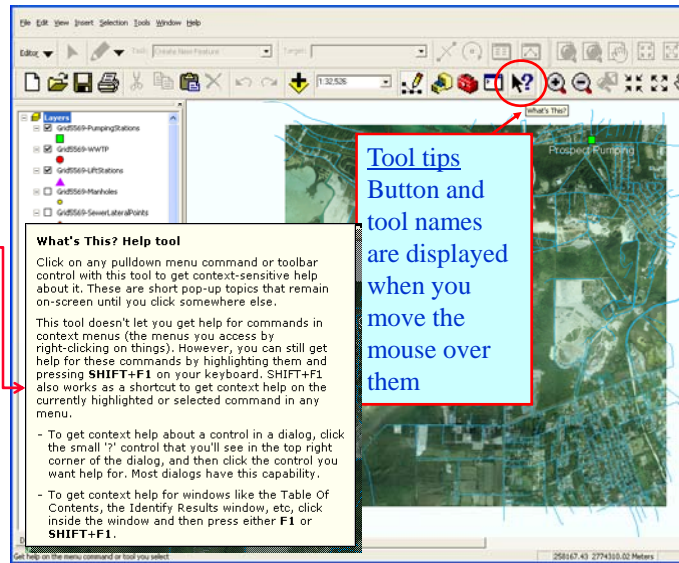
- ◆ F1 or Help Menu > ArcGIS Desktop Help
- ◆ Four tabs
  - ◆ Contents
  - ◆ Index
  - ◆ Search
  - ◆ Favorites
- ◆ Online Support <http://support.esri.com>



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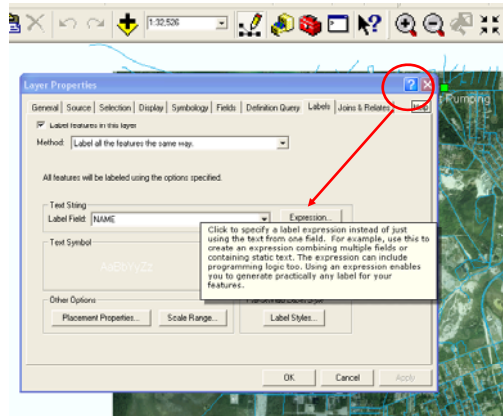
## TOOL TIPS AND “WHAT’S THIS” BUTTON

- ◆ Tool tips
- ◆ Click on any menu or toolbar with this tool to get context-sensitive help about it. These are short pop-up topics that remain on-screen until you click somewhere else.



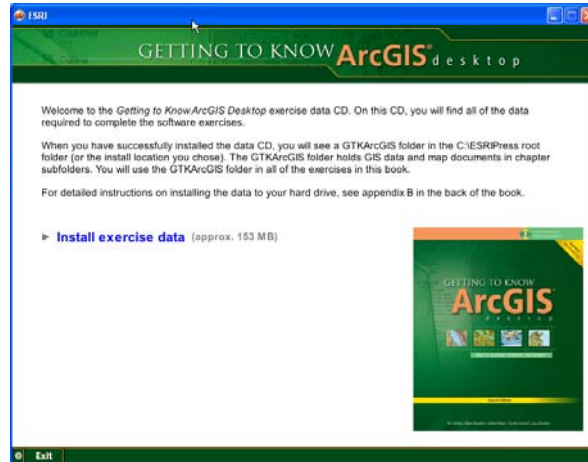
## F1, SHIFT+F1, ?

- ◆ To get context help for windows like the Table Of Contents, the Identify Results window, etc, click inside the window and then press F1.
- ◆ “What’s this” button doesn't work on commands in context menus (the menus you access by right-clicking on things).
  - ◆ To get help for commands, highlight them and press **SHIFT+F1**
- ◆ To get context help about a control in a dialog, click the small '?' button in the top right corner of the dialog, and then click the control you want help for.



## EXERCISE DATA

- ◆ The exercise data has already been installed on the class computers in folder: **C:\ESRIPress\GTKArcGIS**
- ◆ To do exercises from your own computers, install ArcGIS software (trial version) and exercise data from the CDs included with the text book.
- ◆ See Appendix B of the text book for help.



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## IMPORTANT NOTE ABOUT EXERCISES

- ◆ When working on lab computers, in all exercises where you need to create or save data on computer, do not save it on the C: drive (even if the book says so), because:
  - ◆ You might not have permission to write on the C: drive of lab computers
  - ◆ Anything you save on C: drive will be automatically deleted later
- ◆ Solution:
  - ◆ Create or save data on N: drive (YSU's student account server)
    - ◆ Drawback: Your N: drive might not have enough storage space
  - ◆ Create or save data on your memory stick (E: drive)
  - ◆ Replace C:\ with N:\ or E:\ in exercise
    - ◆ If an exercise recommends saving to C:\MyData\CityData.mdb, you would save to N:\MyData\CityData.mdb or E:\MyData\CityData.mdb

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# CLASS EXERCISES



- ◆ **Exercise 3a:** Displaying map data (Amelia Earhart's last flight)
  - ◆ By instructor as demo
- ◆ **Exercise 3b:** Navigating a map
  - ◆ By students in the class
- ◆ **Exercise 3c:** Looking at feature attributes
  - ◆ By students as Homework 2

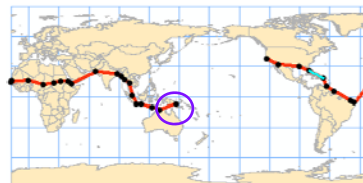
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## AMELIA EARHART'S AVIATION TRAGEDY

- ◆ One of the world's most celebrated aviators
- ◆ 1932: became the first woman pilot to cross the Atlantic and in doing so set a new time record of 14 hours and 56 minutes.
- ◆ 1937: Determined to set another "first", she decided to fly around the world with flight navigator Fred Noonan. Her twin engine, propeller driven Lockheed Electra lifted off from Miami, Florida. As they were entering their last one-third of the flight over the Pacific Ocean, the plane vanished somewhere between New Guinea and tiny Howland Island.
- ◆ Attempts then, and even now, to locate the plane have been unsuccessful. Their disappearance remains one of the great mysteries of aviation.



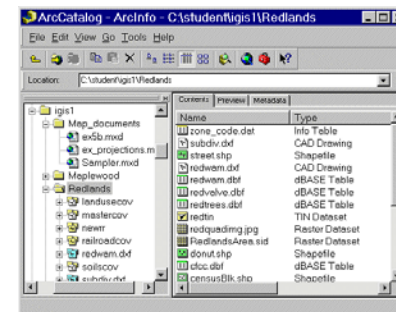
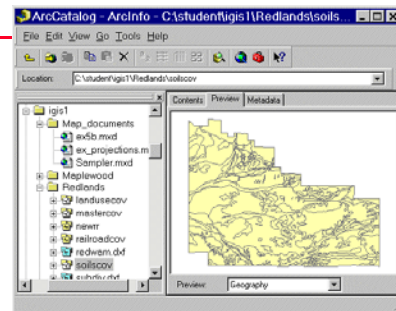
[www.ameliaearhart.com/](http://www.ameliaearhart.com/)



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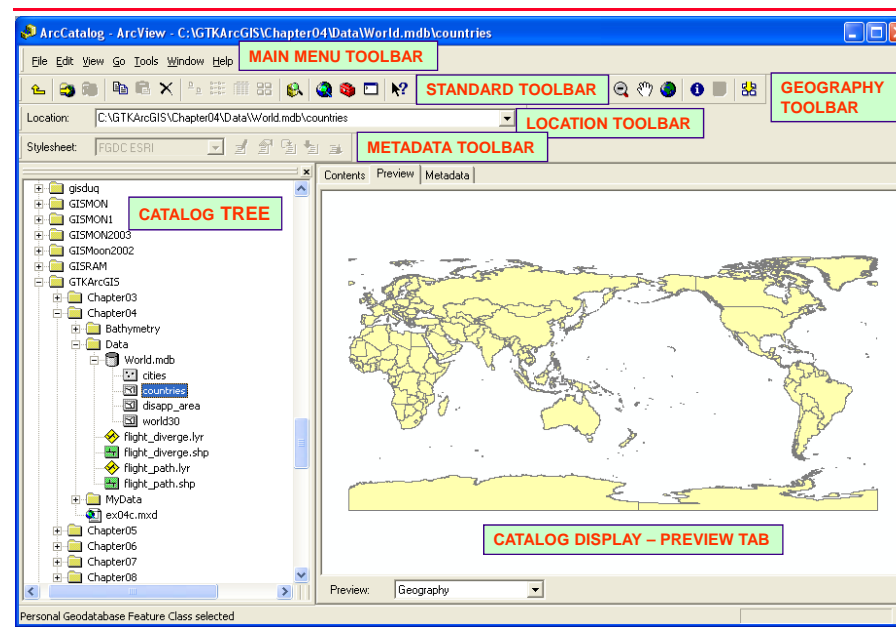
# ArcCatalog

- ◆ A window into your database
- ◆ Browse your data
- ◆ Manage your data
  - ◆ Copy, Rename, Delete
- ◆ Create and view data documentation (metadata)



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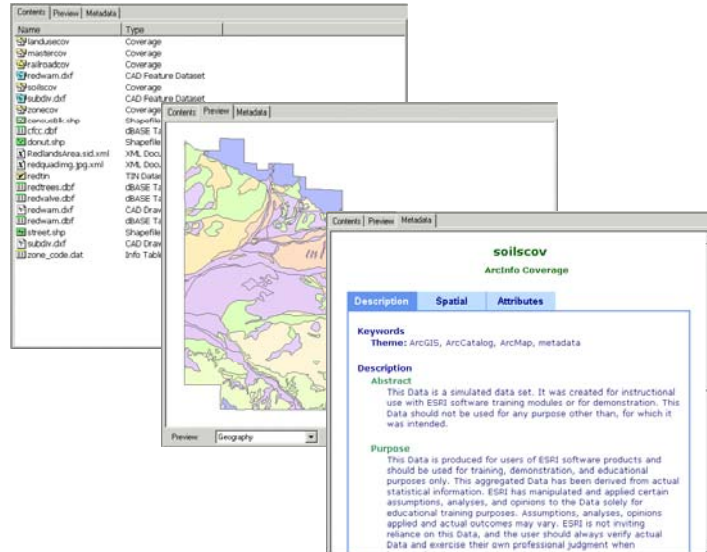
# ArcCatalog Interface



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# Three ways to view data

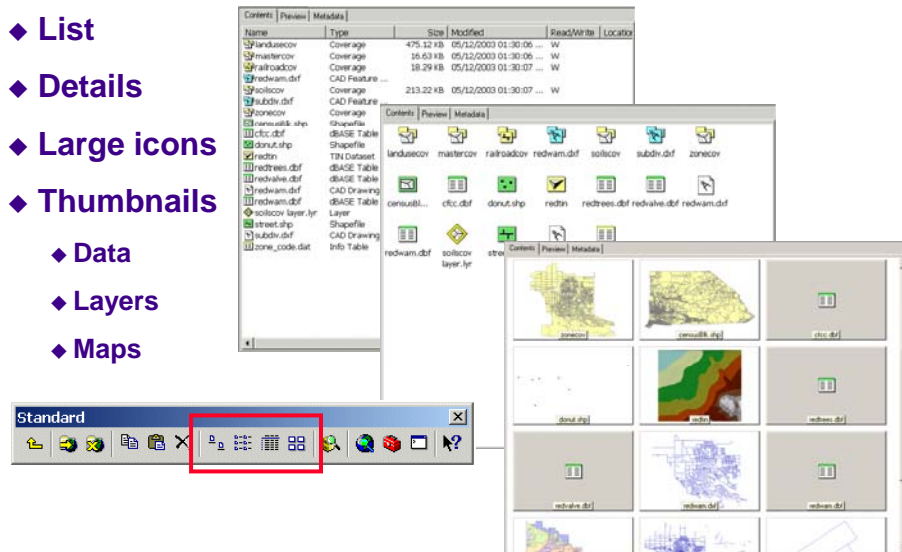
- ◆ Contents
- ◆ Preview
- ◆ Metadata



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# The Contents tab

- ◆ List
- ◆ Details
- ◆ Large icons
- ◆ Thumbnails
- ◆ Data
- ◆ Layers
- ◆ Maps

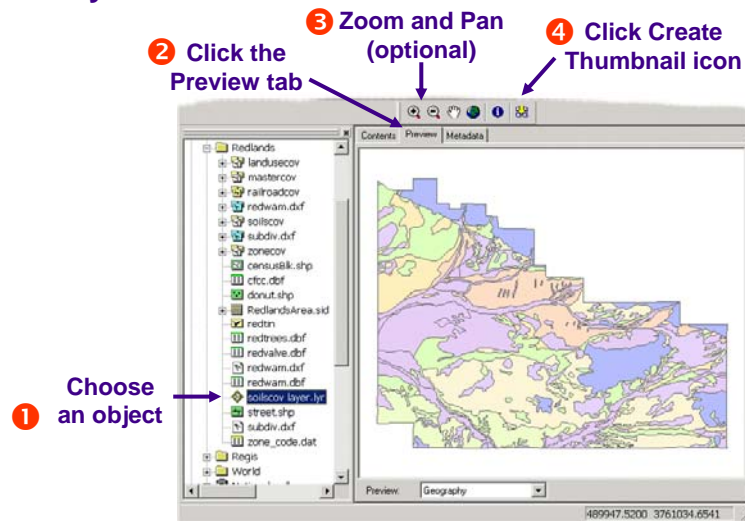


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# Creating thumbnail images

## ◆ Used by Contents thumbnail view



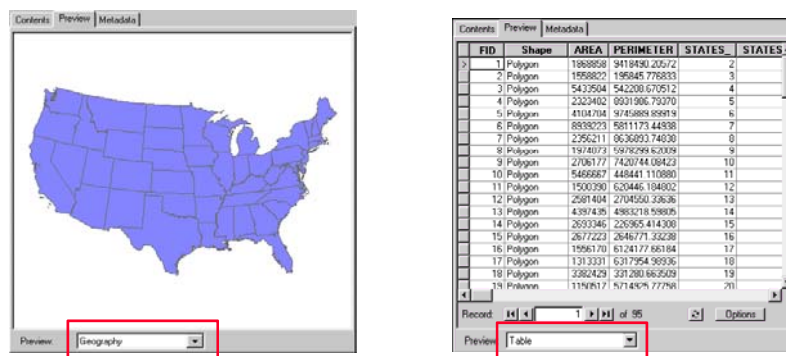
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# The Preview tab

## ◆ Two views

- ◆ Geography view, or
- ◆ Table view

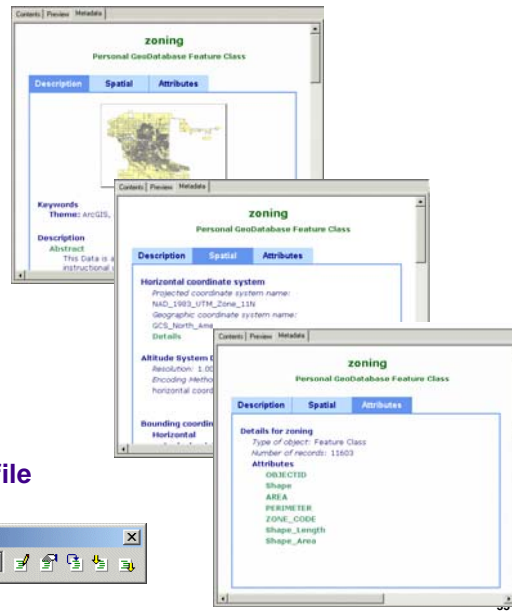
## ◆ Choose from dropdown list



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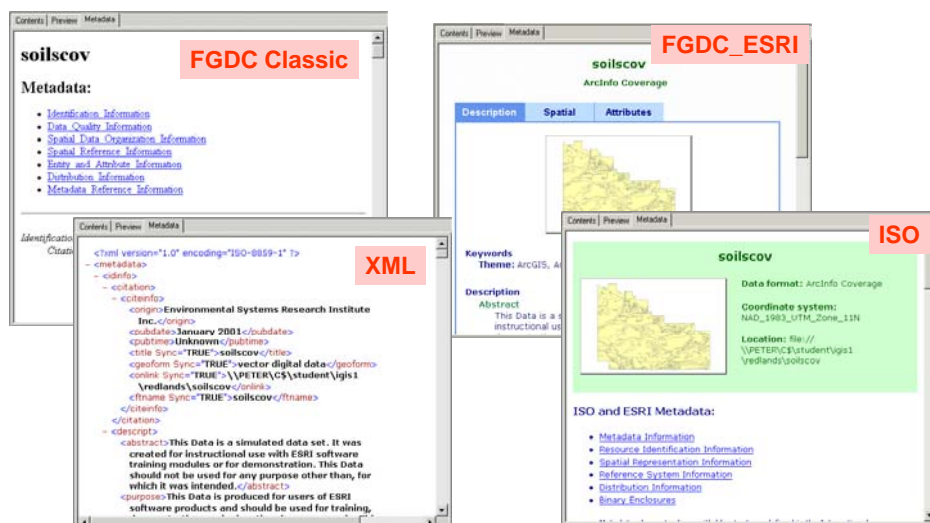
# Introducing metadata

- ◆ Descriptive information about data source
  - ◆ Metadata = Data about data
- ◆ Metadata tab
  - ◆ Description
  - ◆ Spatial
  - ◆ Attributes
- ◆ Metadata toolbar
  - ◆ Create and edit content
  - ◆ Convert between different file formats



# The Metadata tab

- ◆ Create and display metadata in a variety of ways



FGDC: Federal Geographic Data Committee

ISO: International Standards Organization

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# CLASS EXERCISES



- ◆ **Exercise 4a:** Browsing Map Data
- ◆ **Exercise 4b:** Searching for Map Data
- ◆ **Exercise 4c:** Adding Data to ArcMap
  - ◆ Complete as Homework 2

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## HOMework 2: EXPLORING ARCMAP



### 1. Complete Exercise 3c

- ◆ Submit documentation that you completed the exercise successfully. You will do this by submitting “Statistics of flight\_path” window shown on Page 50. Copy the window in a Word file, add a title for homework name and number, and add your name. Print and submit this Word document.

Hint: Use Ctrl+Alt+PrintScreen to copy (screen capture) the active window and CTRL+V (or Edit/Paste) to paste the active window in your Word file.

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## **HOMEWORK 2: EXPLORING ARCMAP**



### **2. Complete Exercise 4c**

- ◆ **Print and submit the map (layout) shown on page 85 with the following enhancements:**
  - ◆ Add a north arrow to the map layout
  - ◆ Add a title to the map layout for homework name, homework number, and your name.

### **3. Answer two questions from Exercise 4c:**

- a. **What's the seafloor elevation in meters at Howland Island? (use the pixel in which most of the island is located)**
- b. **What's the seafloor elevation in meters at Nikumaroro Island? (use the pixel in which the smaller of the two islands is located)**

### **4. Save the mxd file as HW2.mxd (on your own drive)**

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