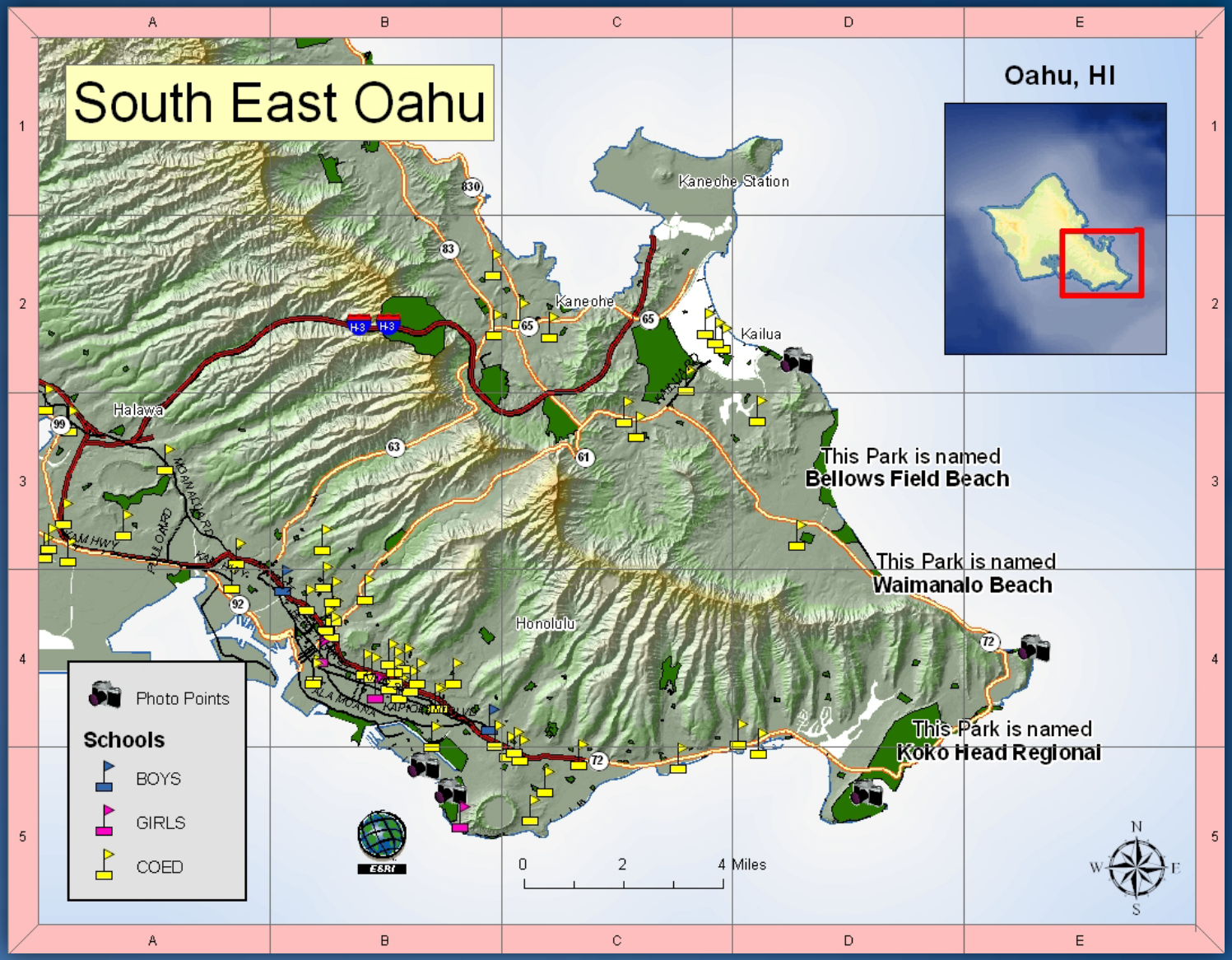
ArcGIS Desktop: Fundamentals of Cartography

Outline

- Symbology
  - Style Files - .style
  - Layer files - .lyr
- Labeling
  - Label Classes
  - Label Expressions
- Map Document files - .mxd
- Map Template files - .mxt
- Map Elements
  - Grids and Graticules
  - Extent Rectangles
- Printing
- Exporting

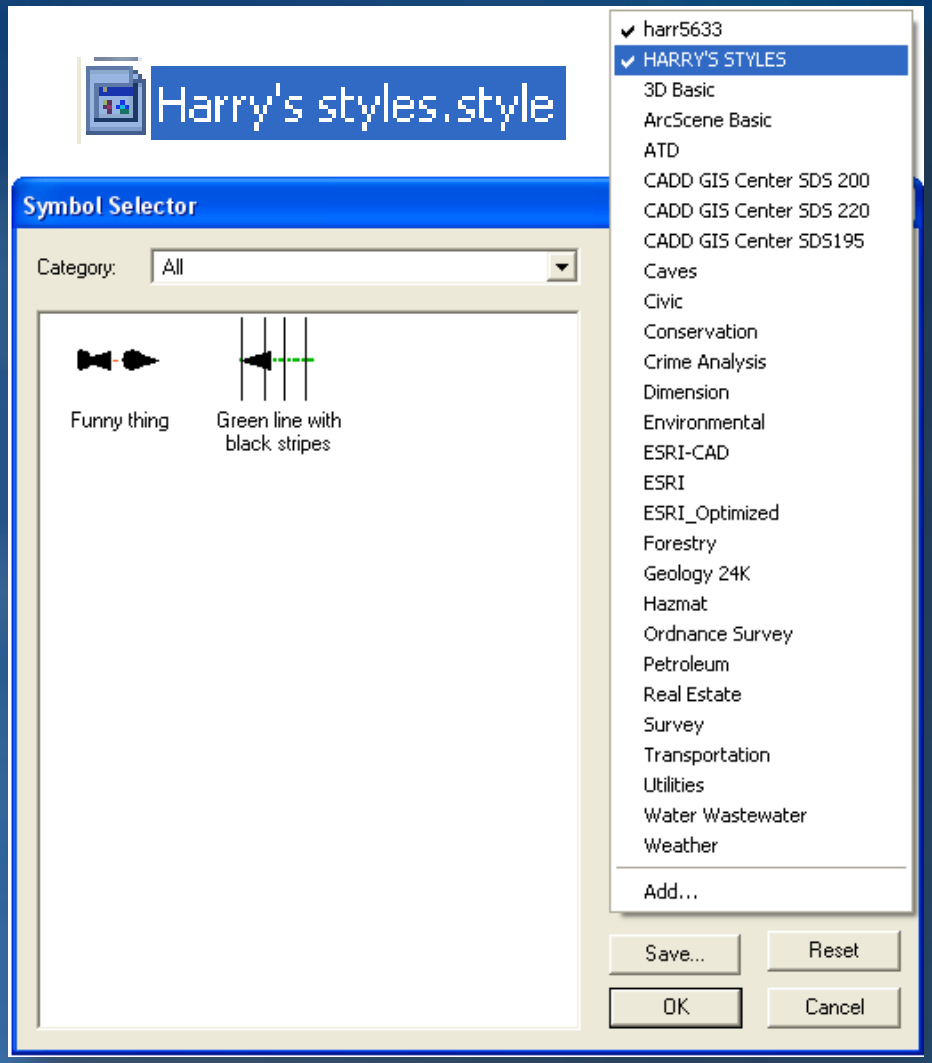
Let’s Make This Map



Demonstration

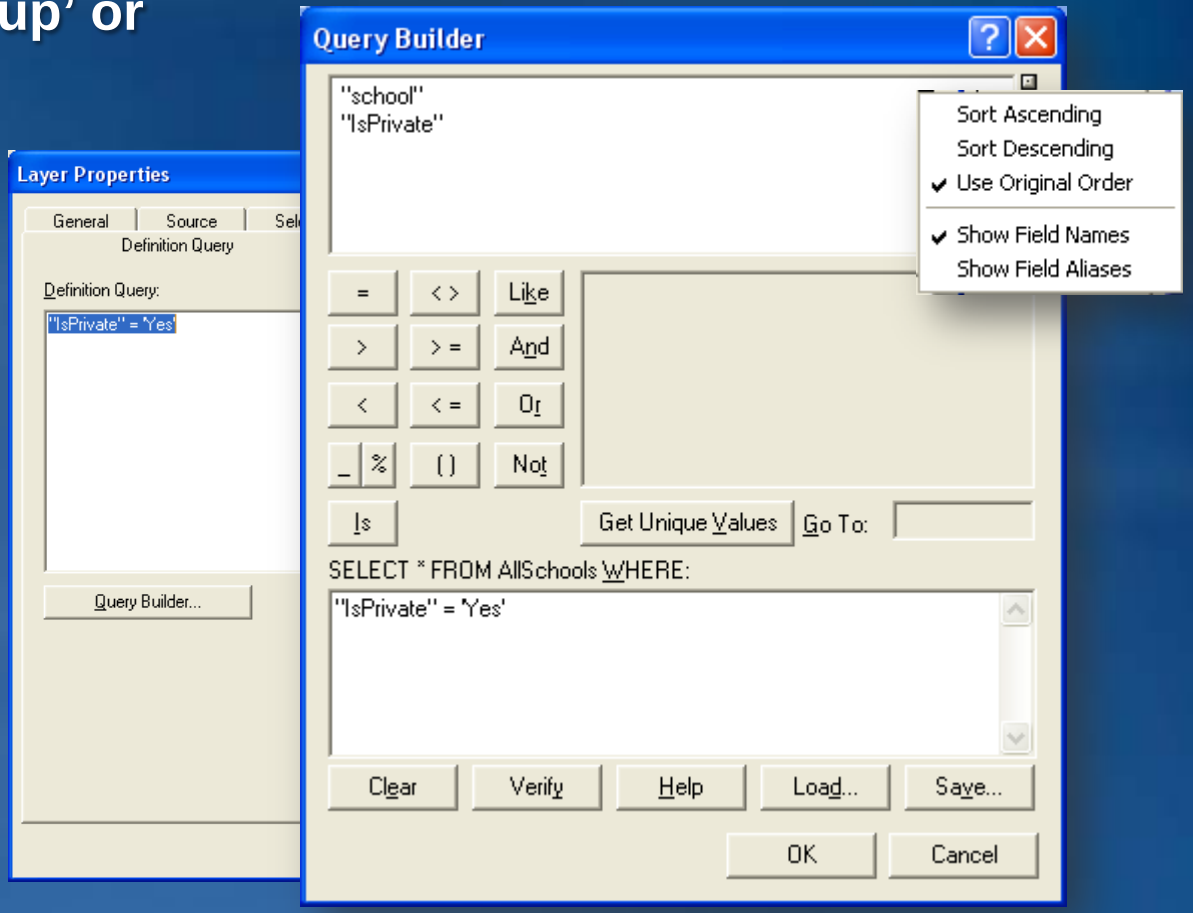
Style File - .style

- A Style File stores:
  - Map elements (graphics)
  - Symbols (objects)
- Can have multiple symbols and map elements
- Most commonly used ESRI symbols
- IS NOT dependant on Data
- Can be accessed through Tools>Styles>Style Manager



Definition Queries

- Use Queries to ‘clean-up’ or ‘focus’ your map
- Data shown in the map should support the map theme
- Not necessary to export a sub set of data

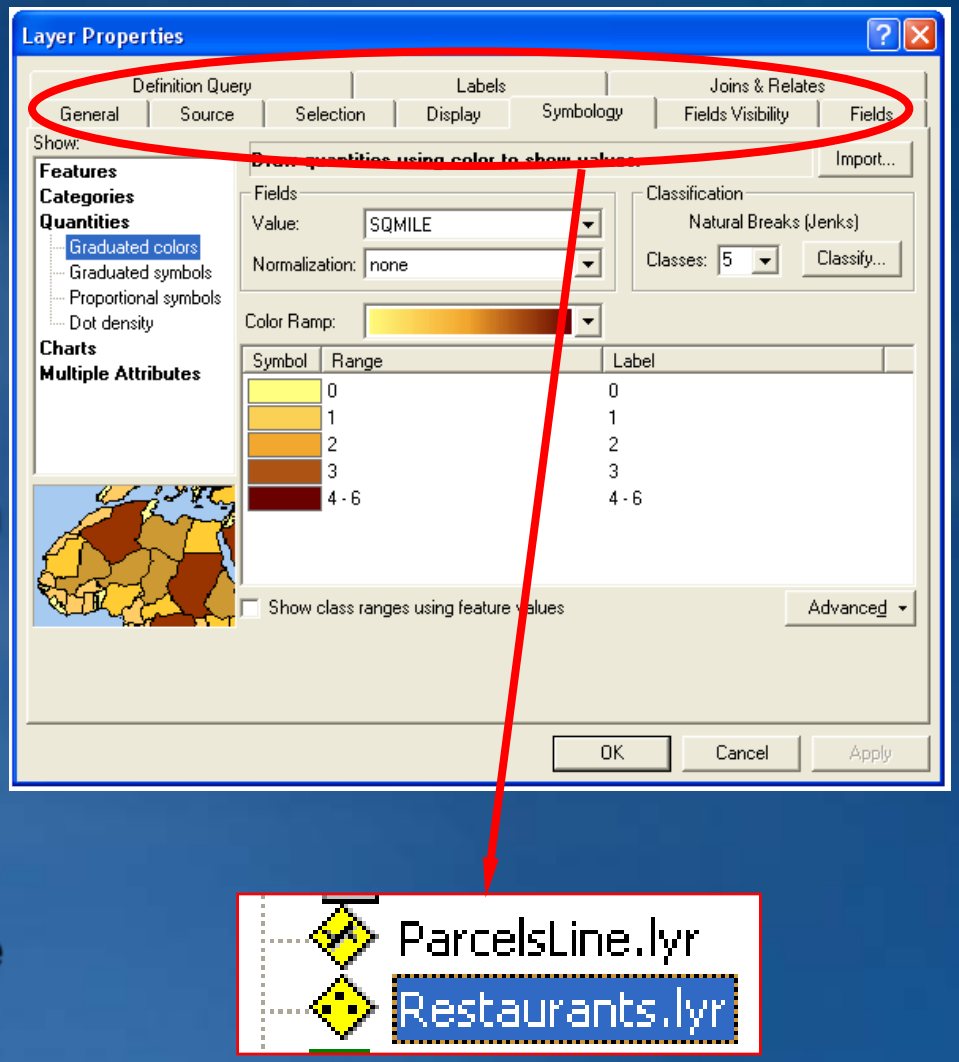


- The query may change based upon scale

Demonstration

Layer File - .lyr

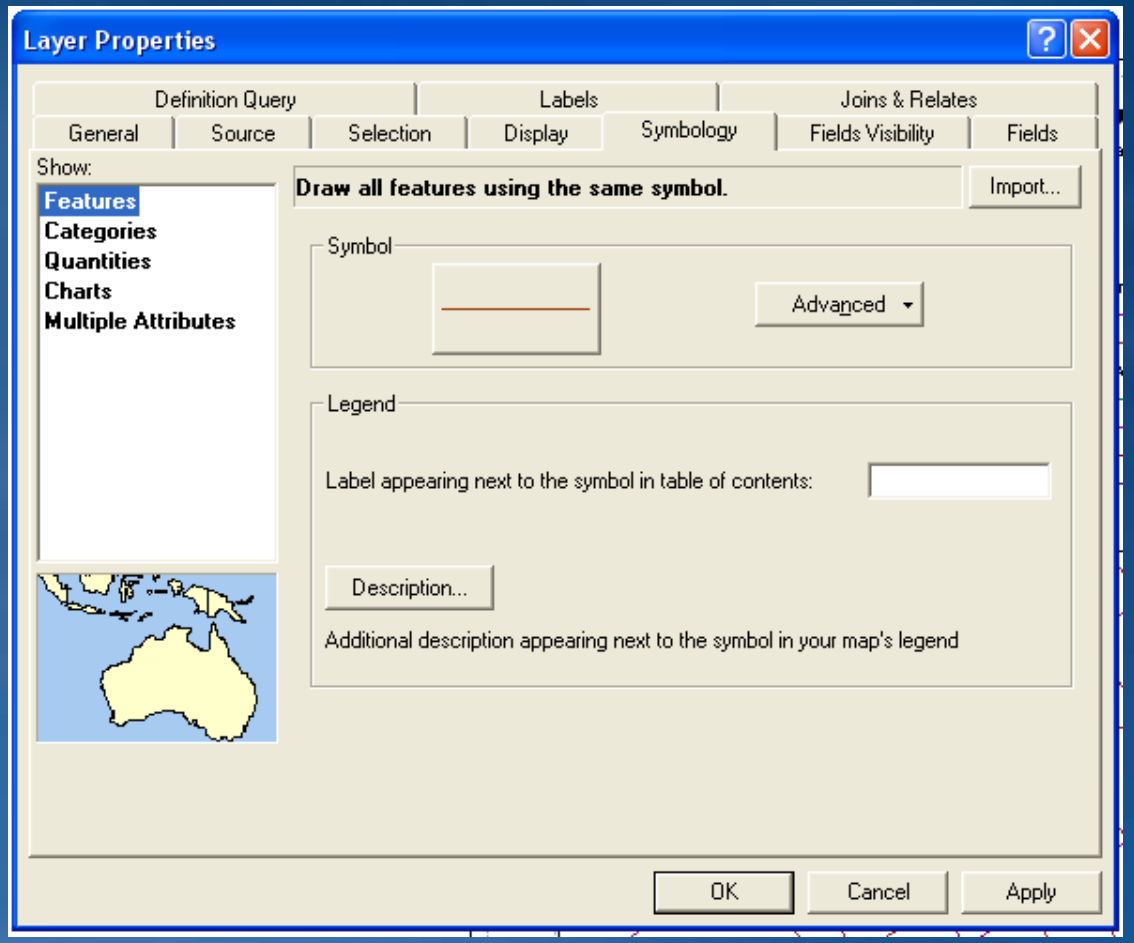
- A Layer File stores:
  - Definition queries
  - Symbology
  - Labeling
  - Joins and Relates
  - Transparency
- Can be created for any layer in your TOC
- A layer file is DEPENDENT on data
- The data must be stored in the EXACT path that the layer file contains



Layer Symbology

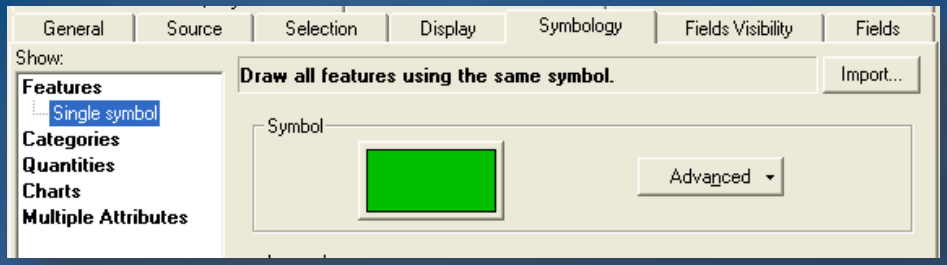
- There are 5 thematic methods to classify a layer

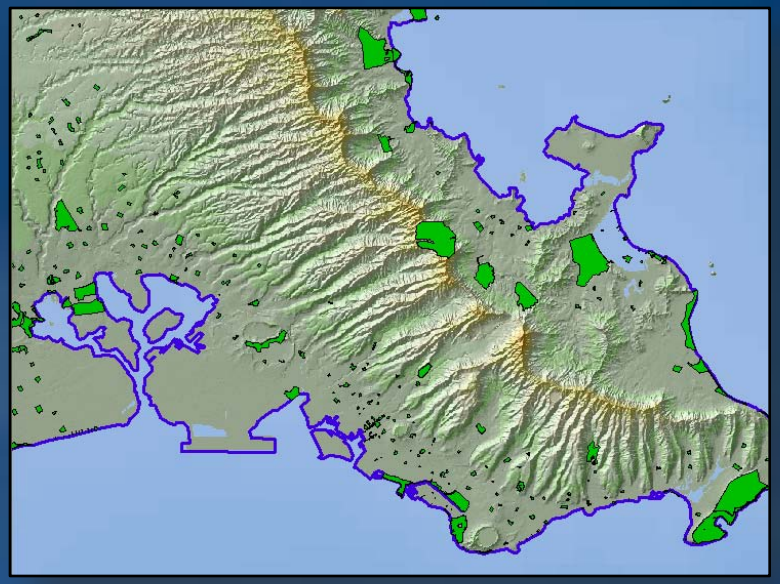
- Features
- Categories
- Quantities
- Charts
- Multiple Attributes



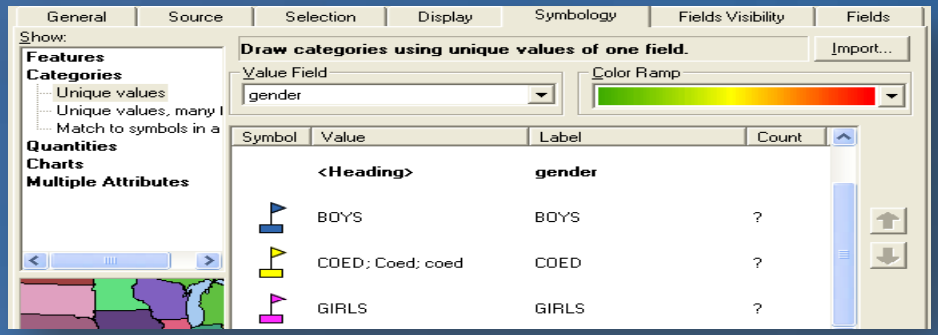
Displaying Qualitative (text) Values

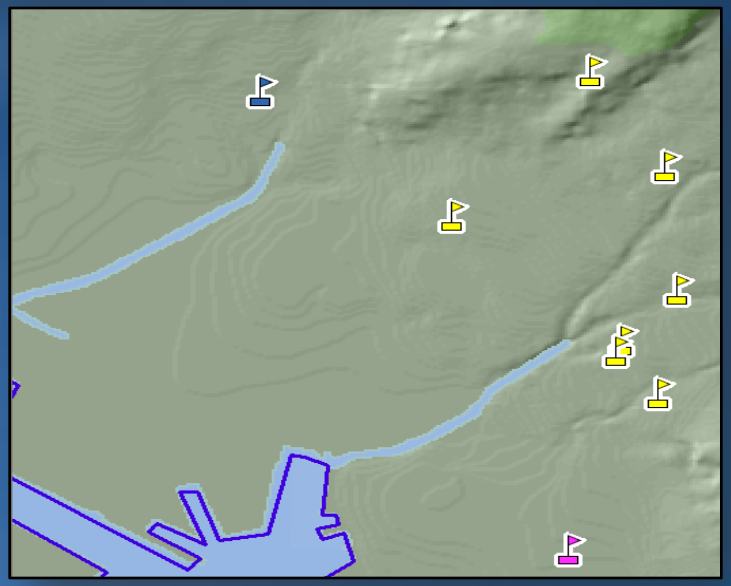
- **Features (ArcMap Default)**
  - Draw all features using the same symbol
  - Where are features located?





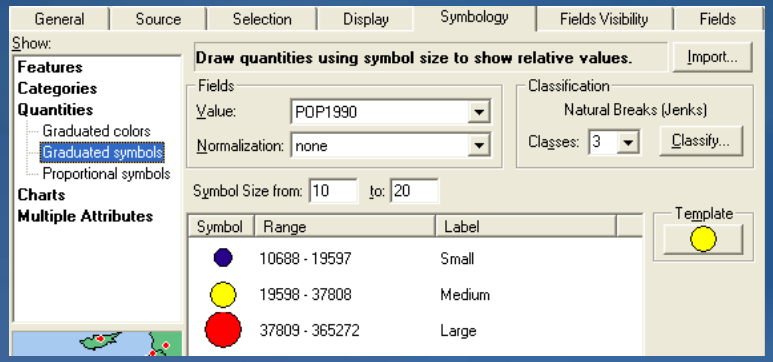
- **Categories**
  - Draw categories using unique values from a field(s)
  - Where are features located and what category or group do they belong to?

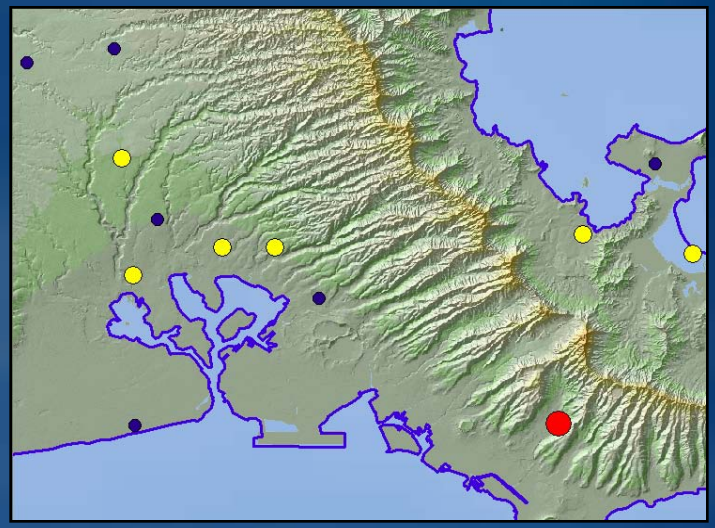




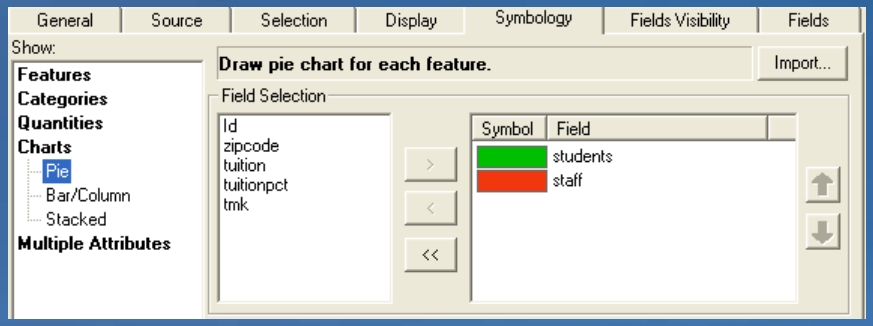
Displaying Quantitative (numeric) Values

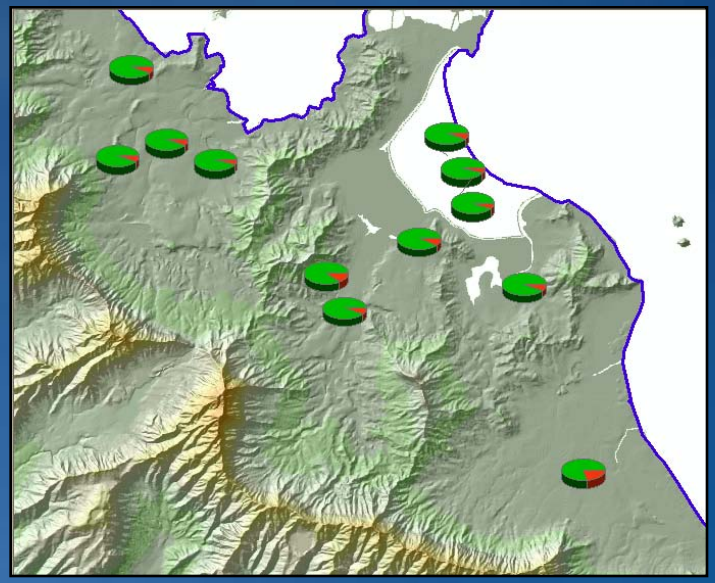
- **Quantities**
  - Draw features based upon counts, amounts, ratios, or ranked values
  - How much of something?





- **Charts**
  - Display a number of related numeric attributes for comparison

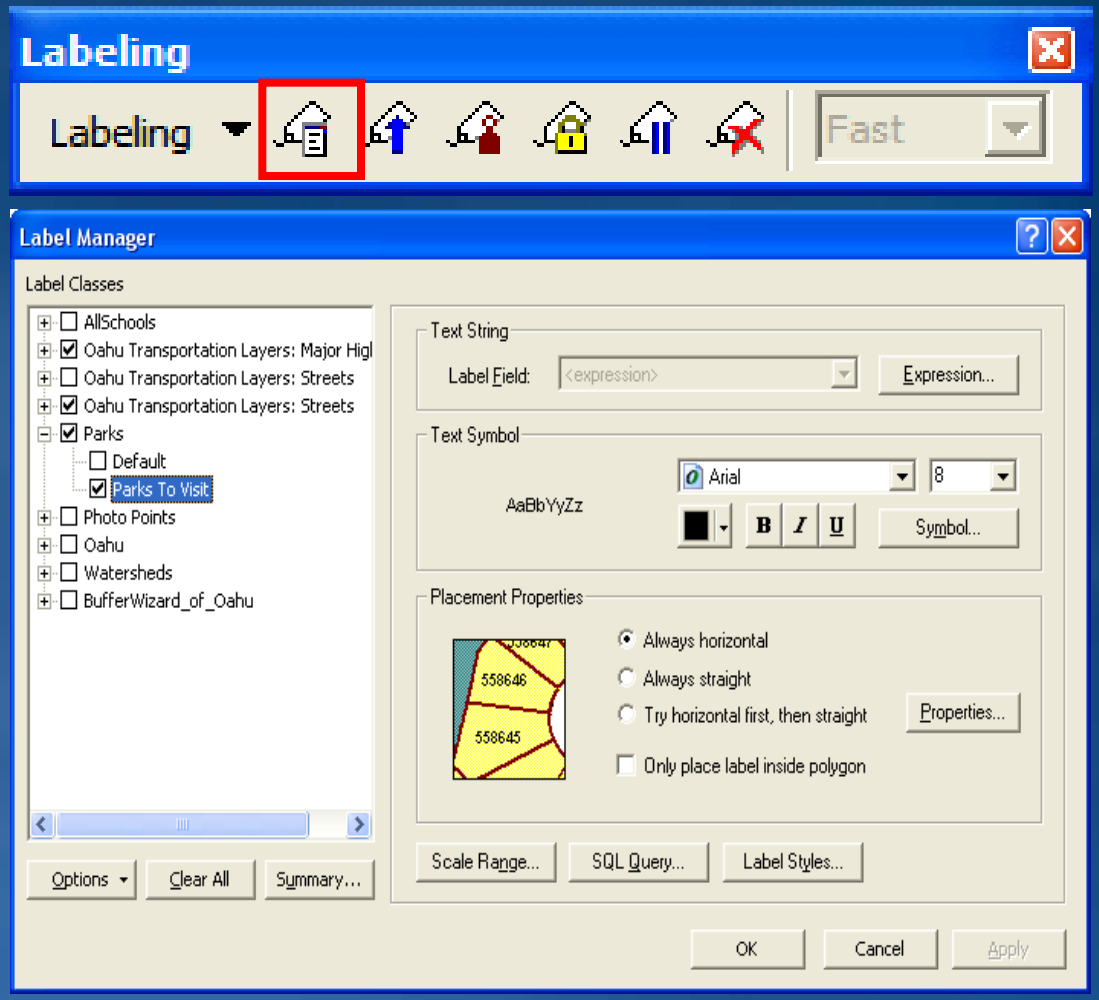




Demonstration

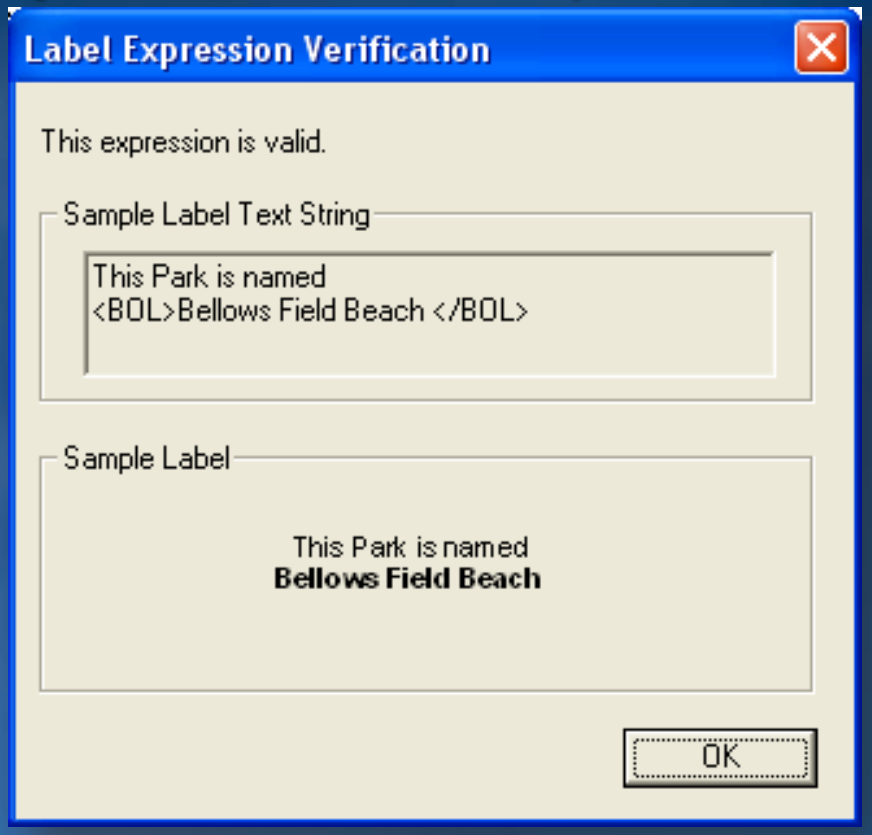
Label Manager

- Access it from the Label Toolbar
- Same functionality as going to a layers properties>Label
- Pause Labels



Labeling Features – Label Expressions

- Use the Help Button! Contains many of the common scripts
- With Label Expressions you can:
  - Add Text and Symbols
  - Concatenate Fields
  - Stack Fields
  - Format Text

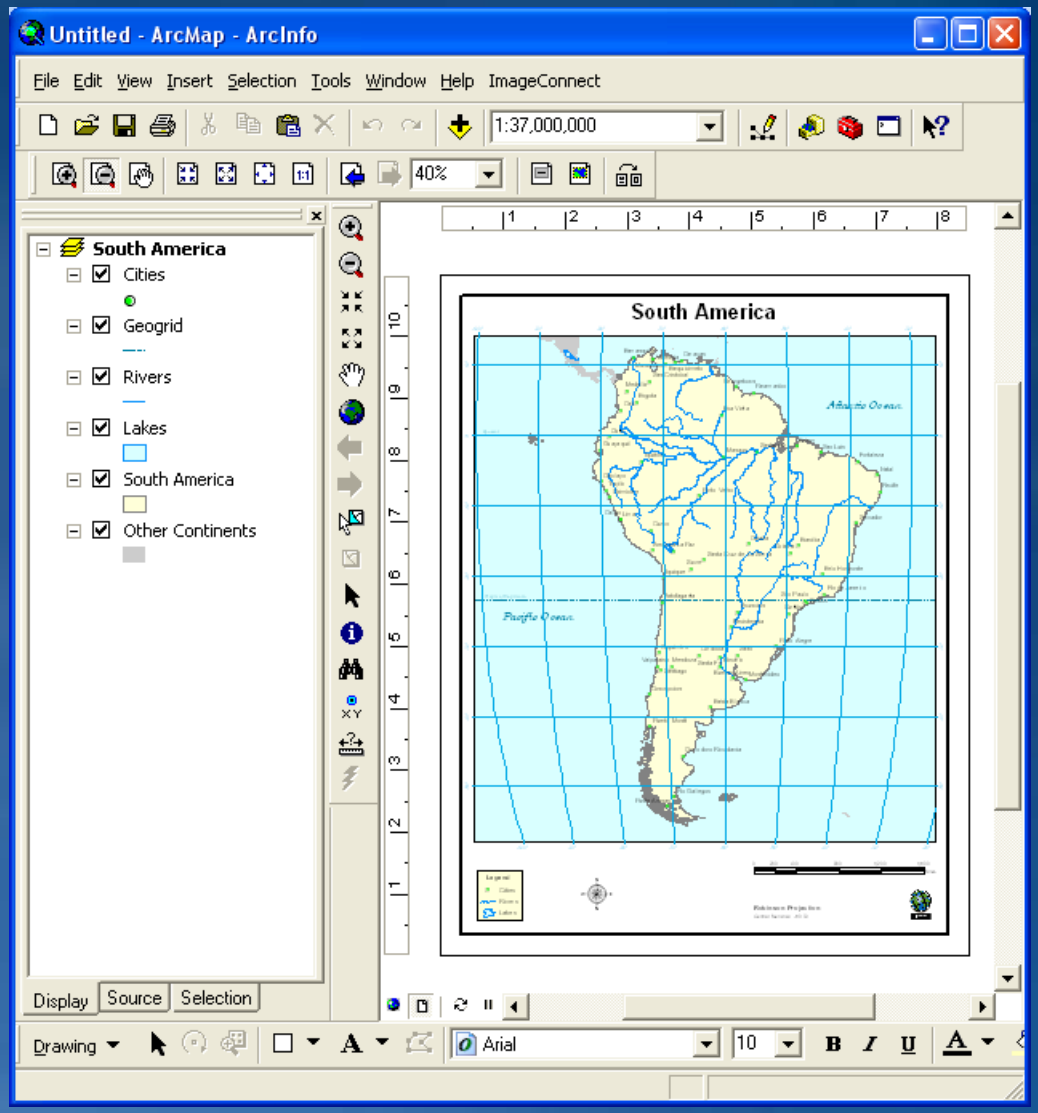


- Example:

"This Park is named" &vbnewline&
"<BOL>"&(Left([NAME] , Len([NAME])-4))&"</BOL>"

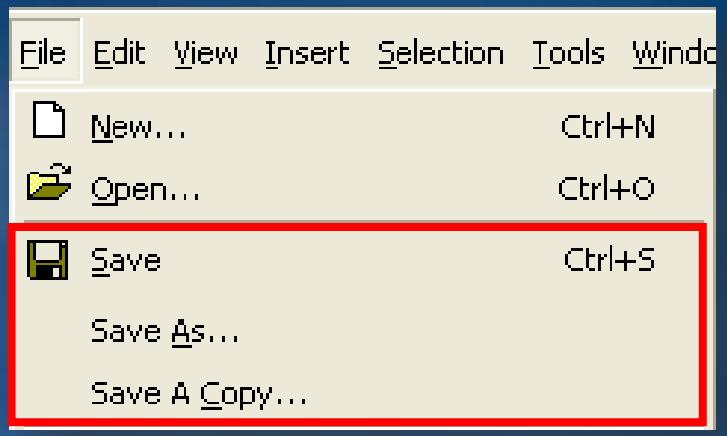
Map Document File - .mxd

- A Map Document stores:
  - Symbology
  - Toolbar Location
  - Custom Buttons
  - Custom Code (triggers)
  - Start up location
  - Map Elements



Saving a .mxd

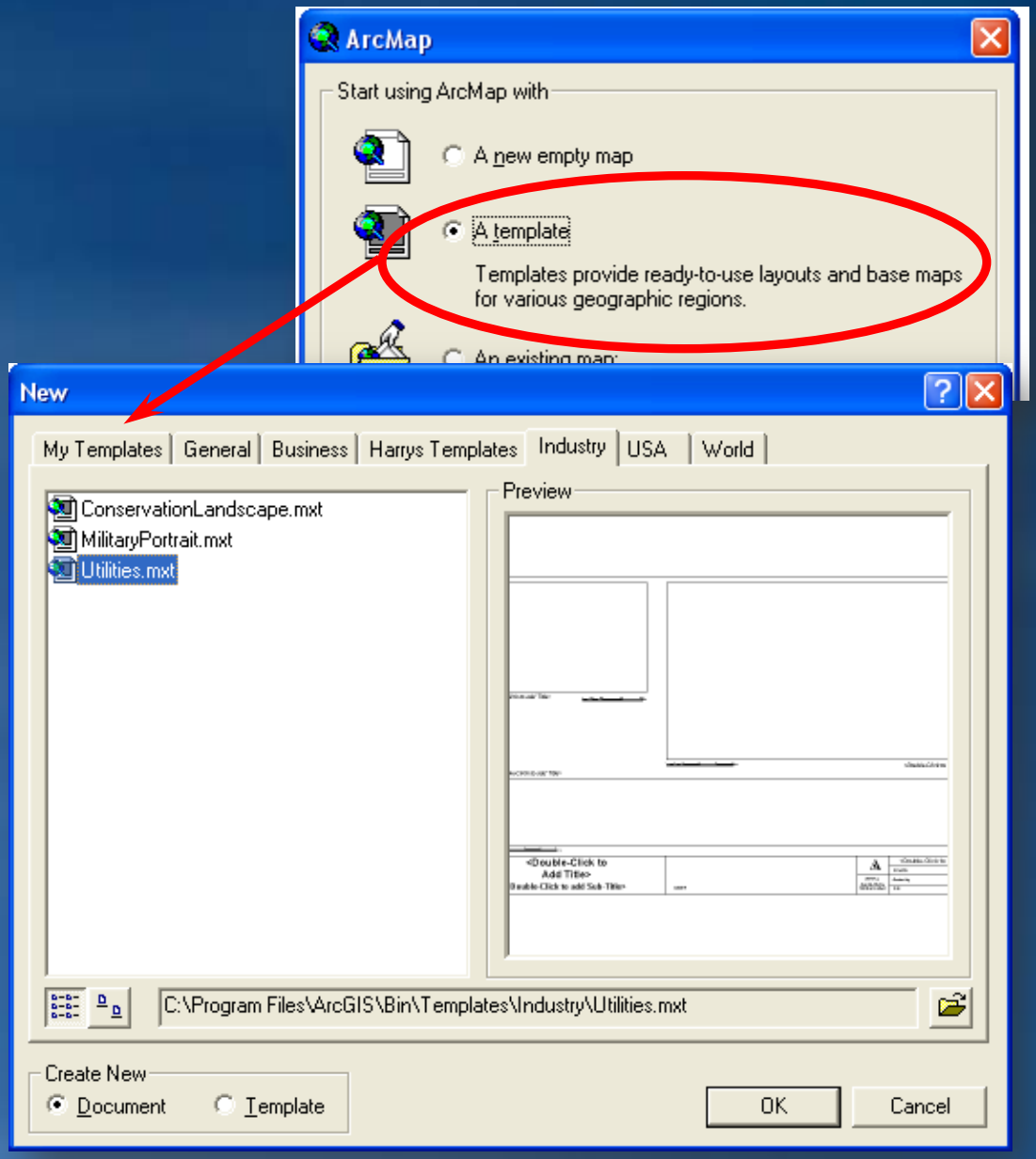
- There are 3 menu options to save an .mxd



- The “Save” Button
  - Saves the current document as an .mxd
- The “Save As” Command
  - Saves the current document as an .mxd or .mxt with a different name or file location
- The “Save A Copy” Command
  - Saves the current map document to a previous version of ArcMap or saves a copy of the current document as a .mxd or .mxt

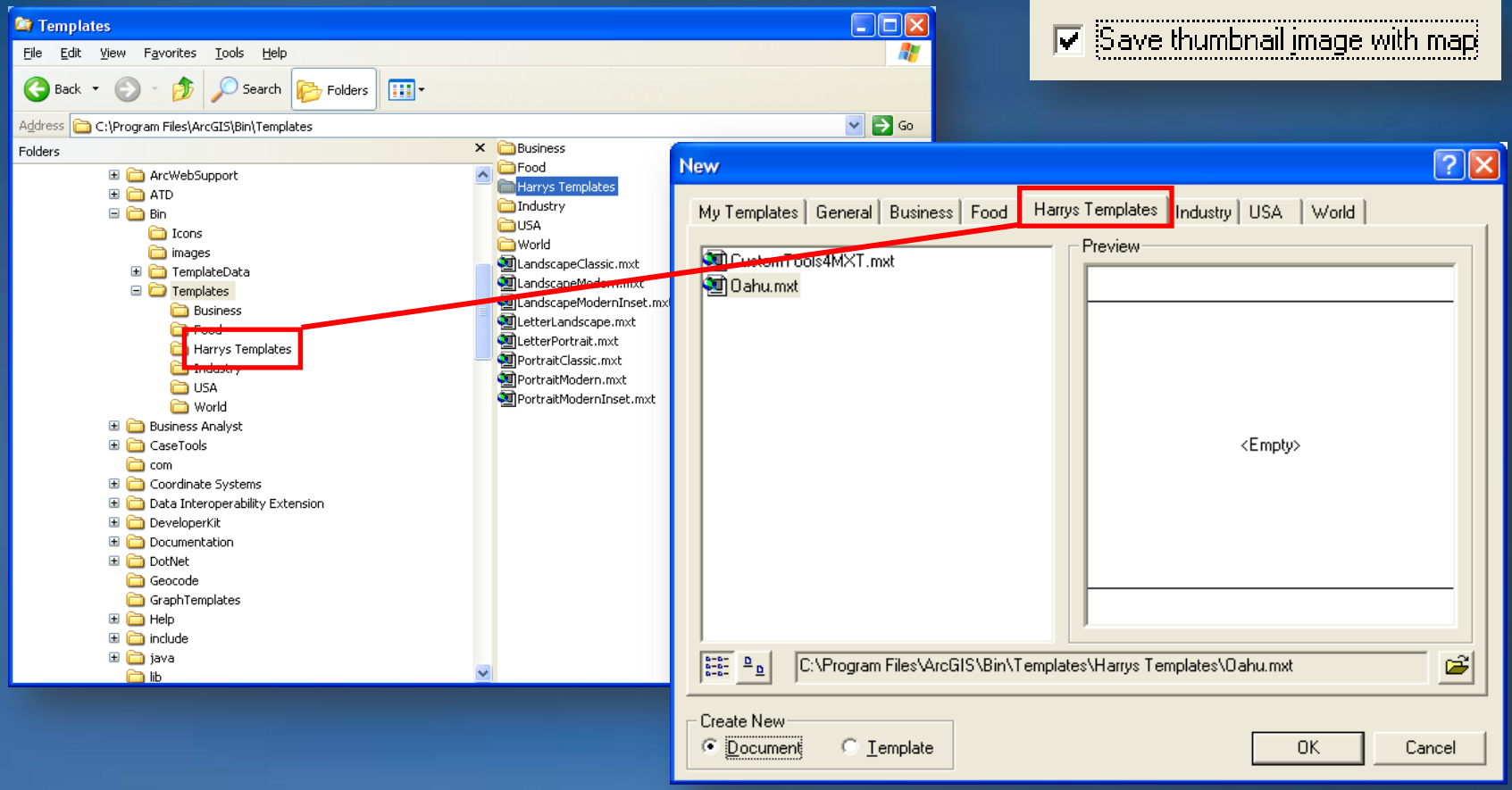
Map Template File - .mxt

- A Map Template stores:
  - Symbology
  - Toolbar Location
  - Custom Buttons
  - Custom Code (triggers)
  - Start up location
  - Map Elements



Creating Custom Template Tabs

- Create new folder in:
  <ArcGISDirectory>\Bin\Template
- To preview an .mxt save it with a thumbnail
  File>Document Properties



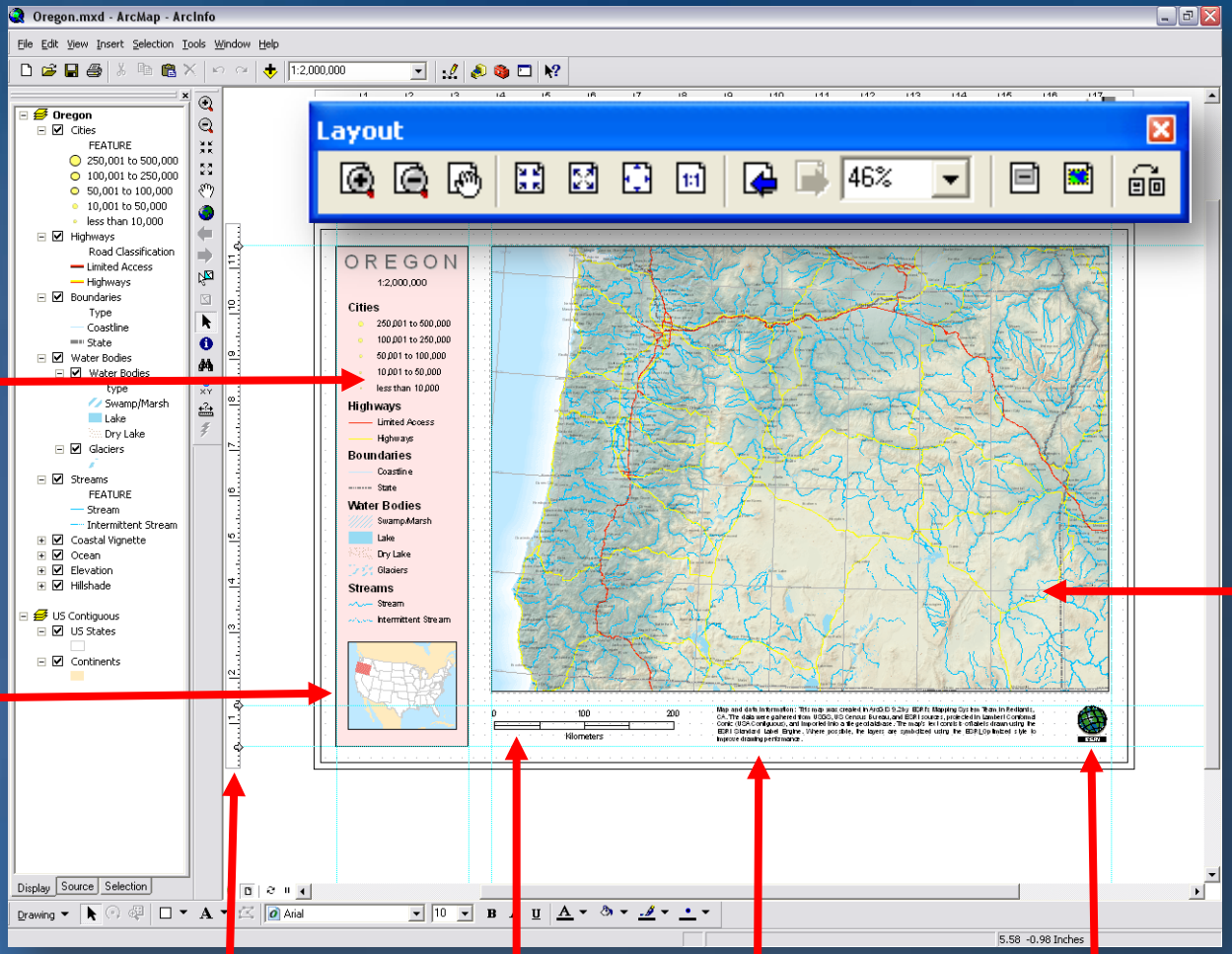
Demonstration

Layout and Data View

- Layout view shows the virtual page upon which map content and map elements are placed
- Data view is used for exploring, displaying, querying, editing, and analyzing spatial data

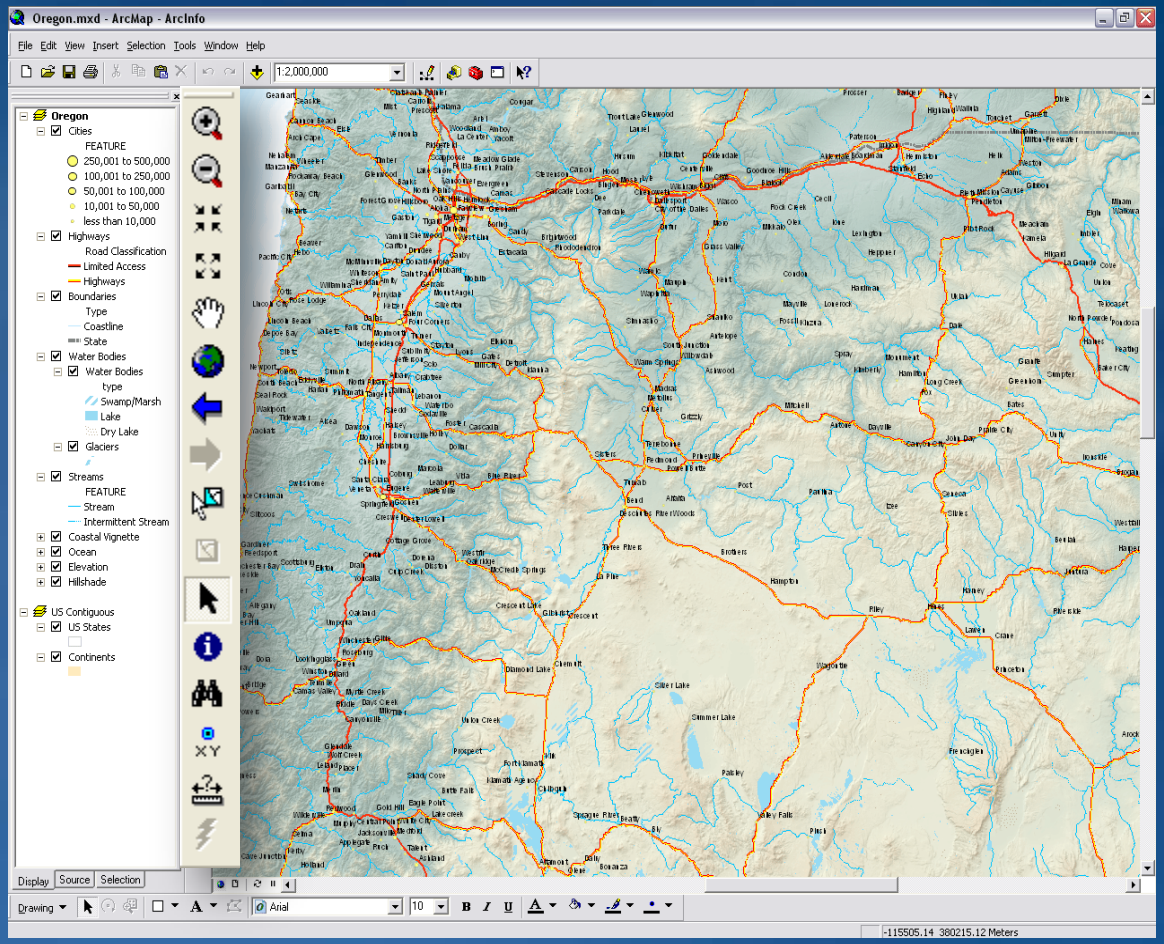
Layout View (Virtual Page)

Shows all data frames and map elements



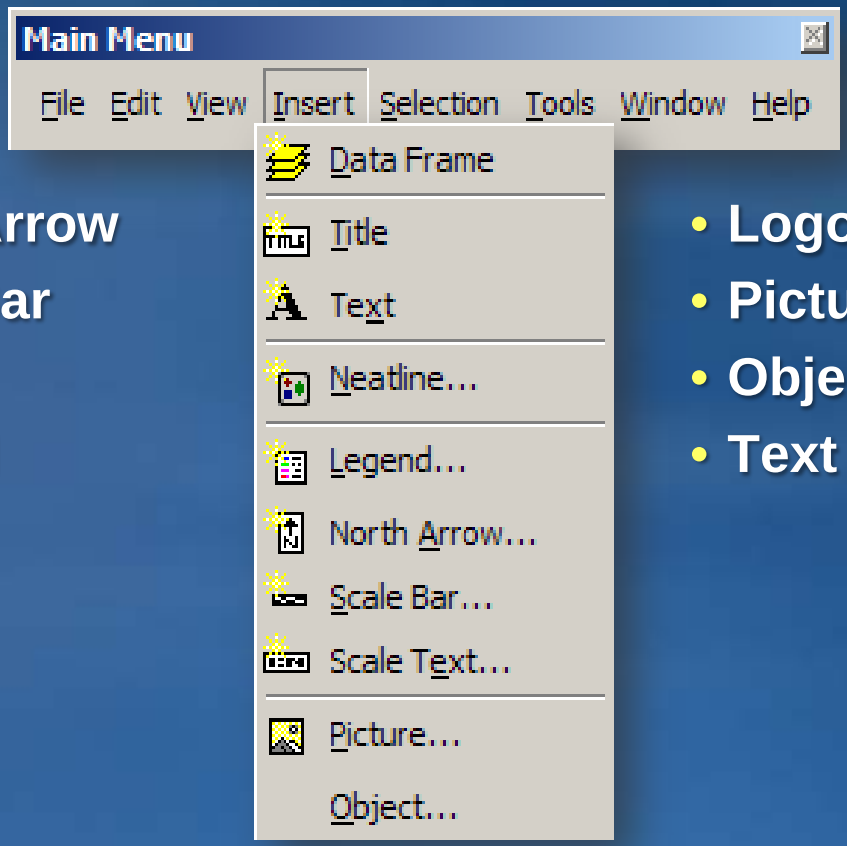
Data View (Data Manipulation)

- Shows only one data frame
- Analysis
- Editing
- Annotation
- Reports



Map Elements

- Map elements are added in Layout View

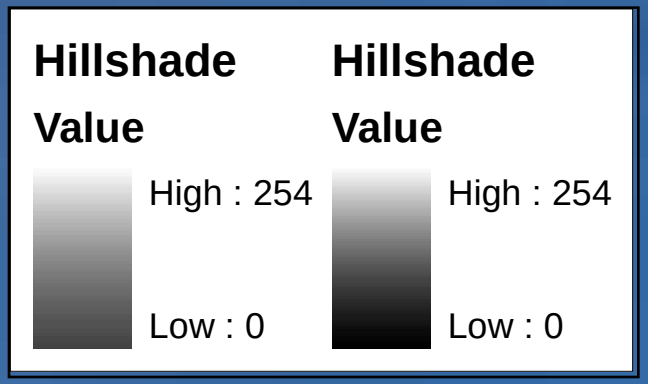


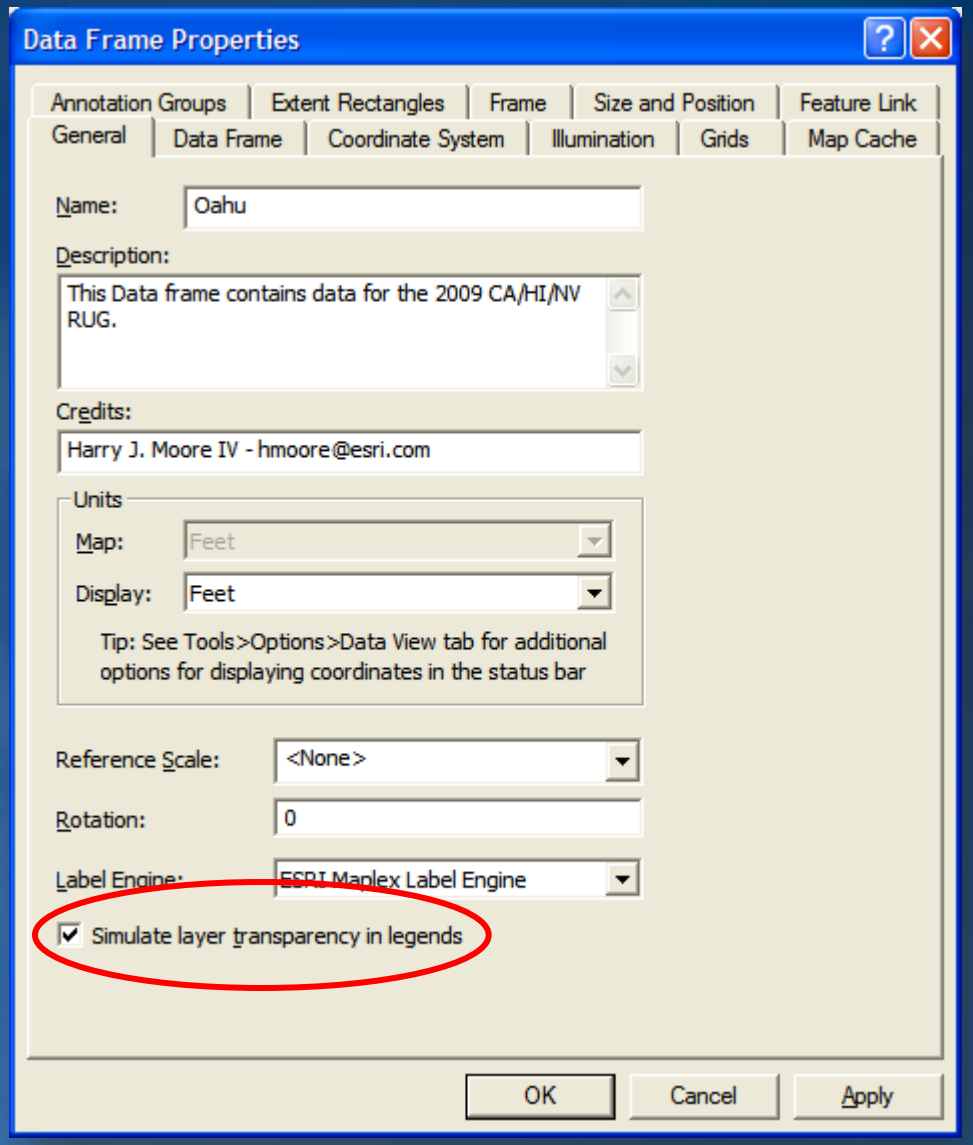
- North Arrow
- Scale Bar
- Title
- Legend

- Logos
- Pictures
- Objects
- Text Box

Legend Transparency

- Located on the General tab of Data Frame Properties
- Checked on in 9.3 by default
- The more transparent the layer the lighter the color





Titles and Text Elements

- Text categories:
  - Analytical: charts, tables, graphs
  - Descriptive: feature labels
  - Metadata: projection, author, date
  - Positional: grids, graticules, scale text

Legend

Projection

Title

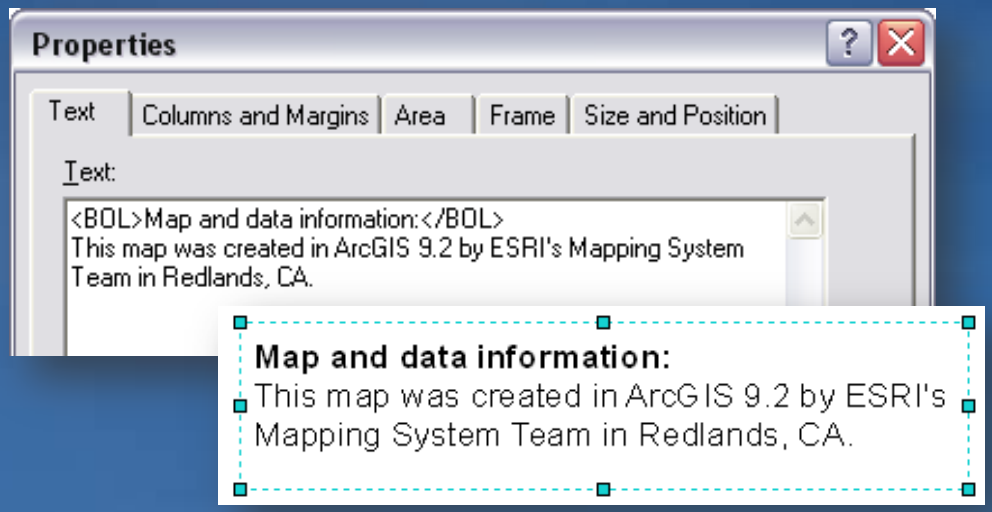
Author, date, and data source information

Titles and Text Elements

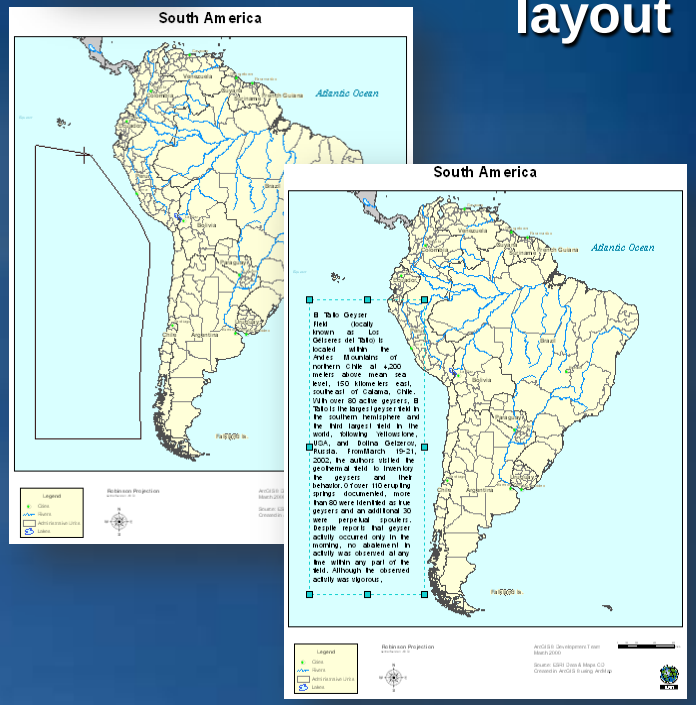
- Wrap text into a shape
- Create text in columns
- Format text with XML-based tags

Example:

Use the <BOL> xml tag to bold text



- Use the Draw toolbar to add text to your layout

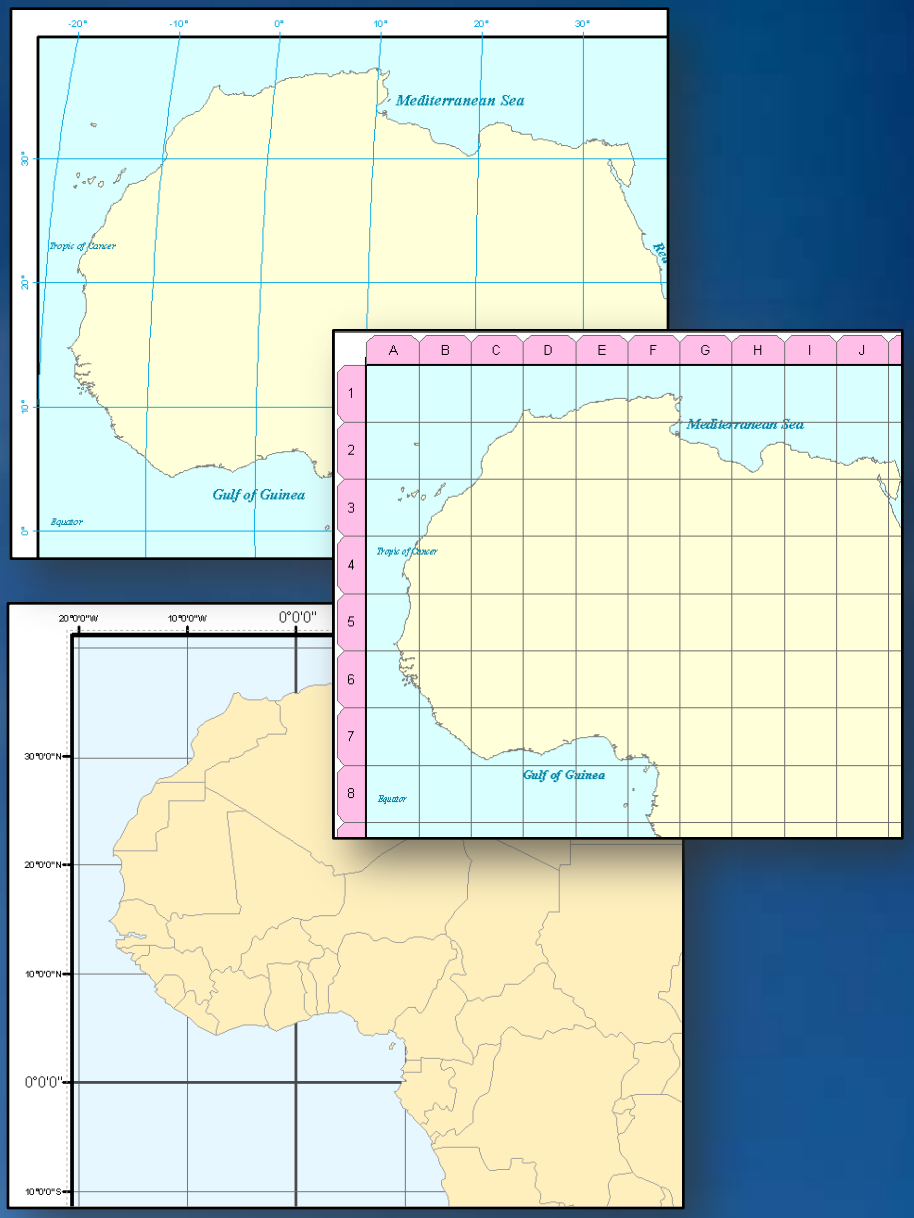


- Draw a graphic shape with the Paragraph Text tool and your text will wrap with the shape

Grids and Graticules

Three options:

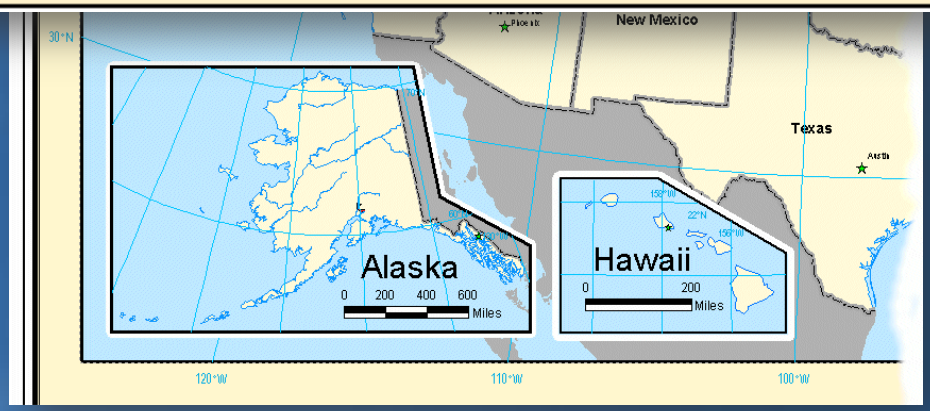
- **Graticules** – To show Lat and Long
- **Reference Grid** (Index Grid) - To divide the map into a specified number of rows or columns
- **Measured Grid** – To show UTM and State Plane
- Convert grid to graphic to control draw order of the Grid or Graticule



Extent Rectangles and Data Frames

- You can have multiple extent rectangles

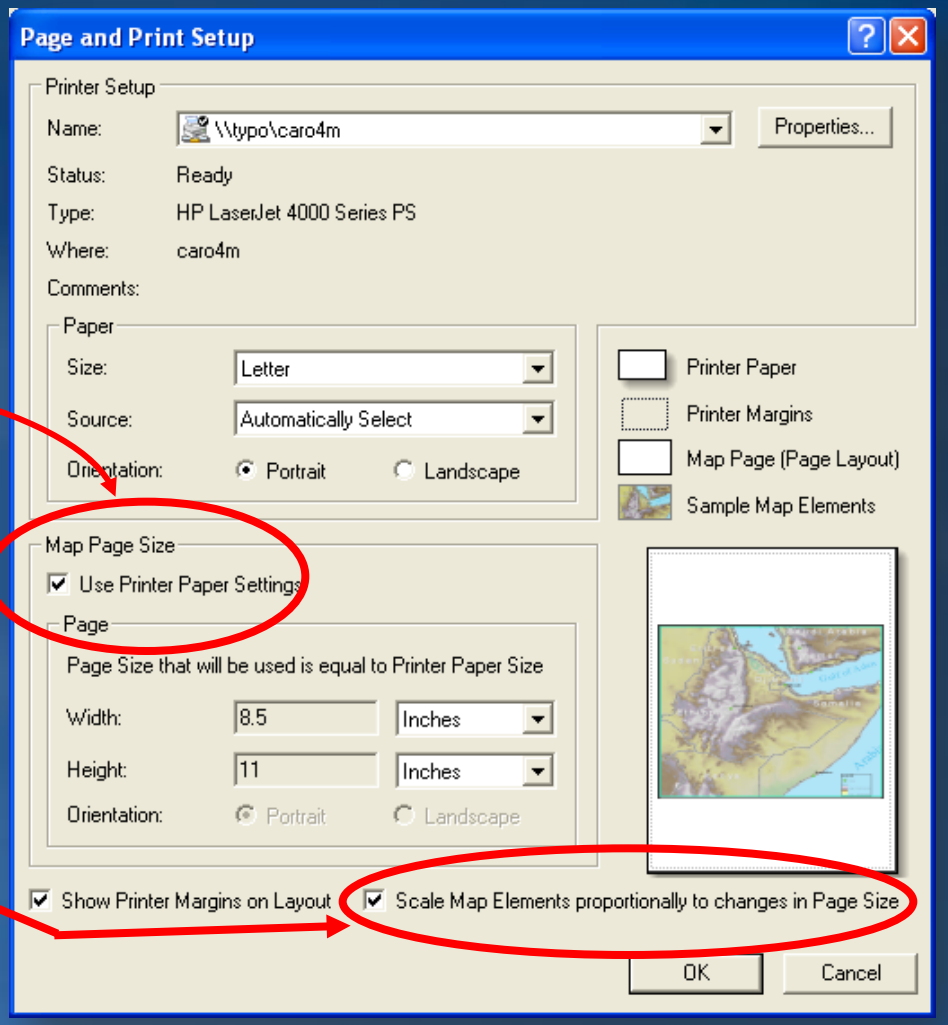
- Clipping the data frame does not alter the actual data or the data frame.



Demonstration

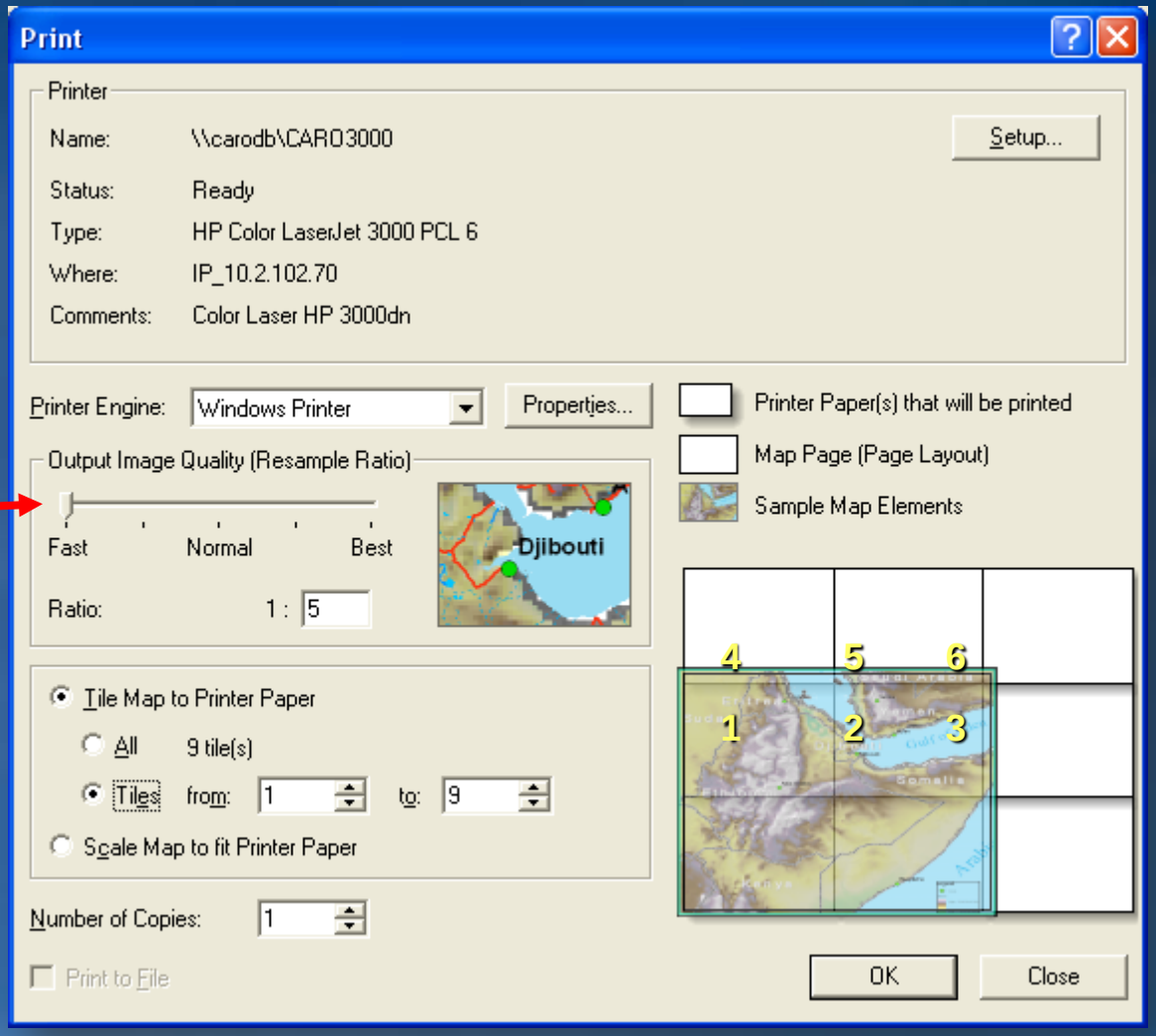
Page and Print Setup

- Use Printer Page settings to prevent “clipping” of map or to match the printer page to the map page
- Use Scale Map Elements to automatically scale map elements when changing the page sizes
- Set your page and printing set up before you begin creating your map



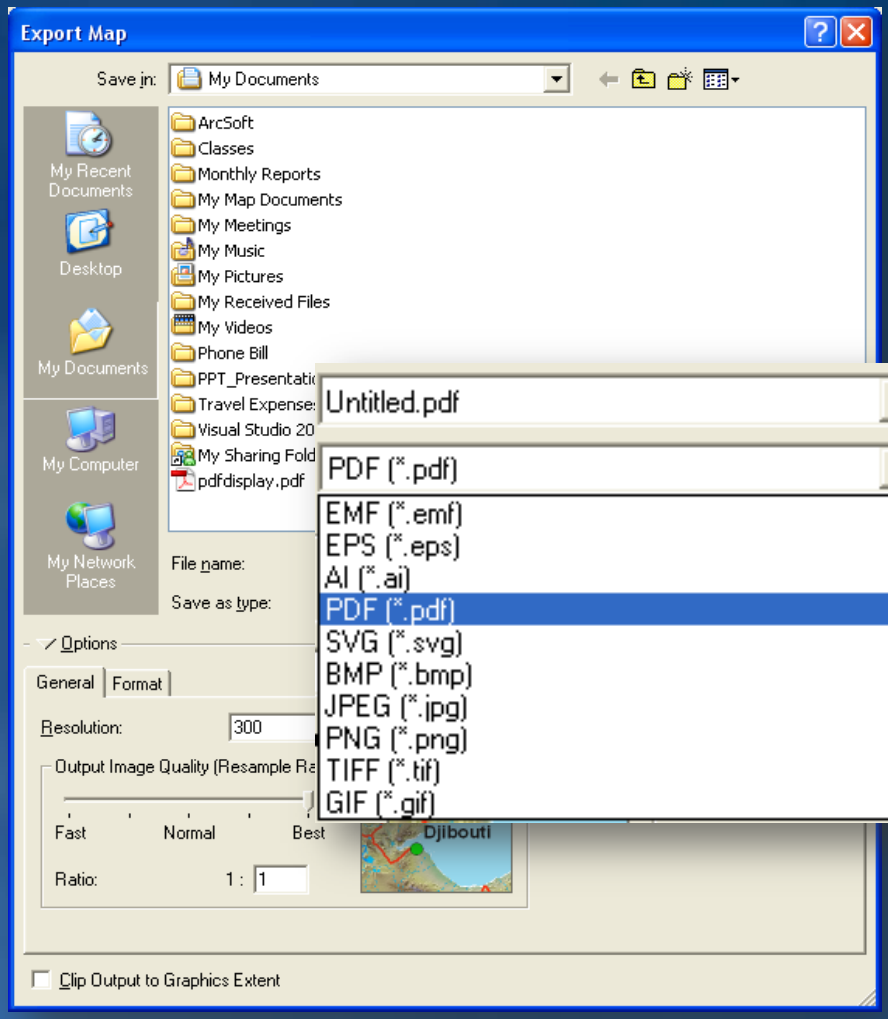
Printing

- Printing Engine
  - Windows Printer is best choice for quality and accuracy
- Output Image Quality is used to resample Raster data
- Page Tiling
  - Enabled when Use Printer Paper is unchecked and the map size is larger than the page size



Exporting

- CMYK is used to print maps
- RGB is used to view maps on a monitor
- Use embedded fonts when exporting to a PDF
- For web use:
  - JPEG, GIF, PNG, SVG
- For printing use:
  - PDF, EPS, AI, EMF



- Eliminate the white margin around your image by turning on the Clip Output To Graphics Extent option

Conclusion

- ArcMap has tools to create organized and visually pleasing maps
  - Map elements
  - Label Manager
- ArcMap tools help streamline workflow and prevent redundant work
  - .style files
  - .lyr files
  - .mxt files

Resources

- Online ArcGIS 9.3 Desktop Help
  http://webhelp.esri.com/arcgisdesktop/9.2/index.cfm?TopicName=welcome
  - Search for “Page Layout and Map Composition” and “An Overview of Mapping and Visualization”
- http://mappingcenter.esri.com/
- Virtual Campus Training Seminars
  http://training.esri.com/gateway/index.cfm
  - Making Better Map Layouts with ArcGIS *FREE*
  - Cartographic Design Using ArcGIS 9
  - The 15-Minute Map: Creating a Basic Map in ArcMap
- Instructor-Led Classes
  - Introduction to ArcGIS I
  - Introduction to ArcGIS II