

Introduction to ArcMap

Overview

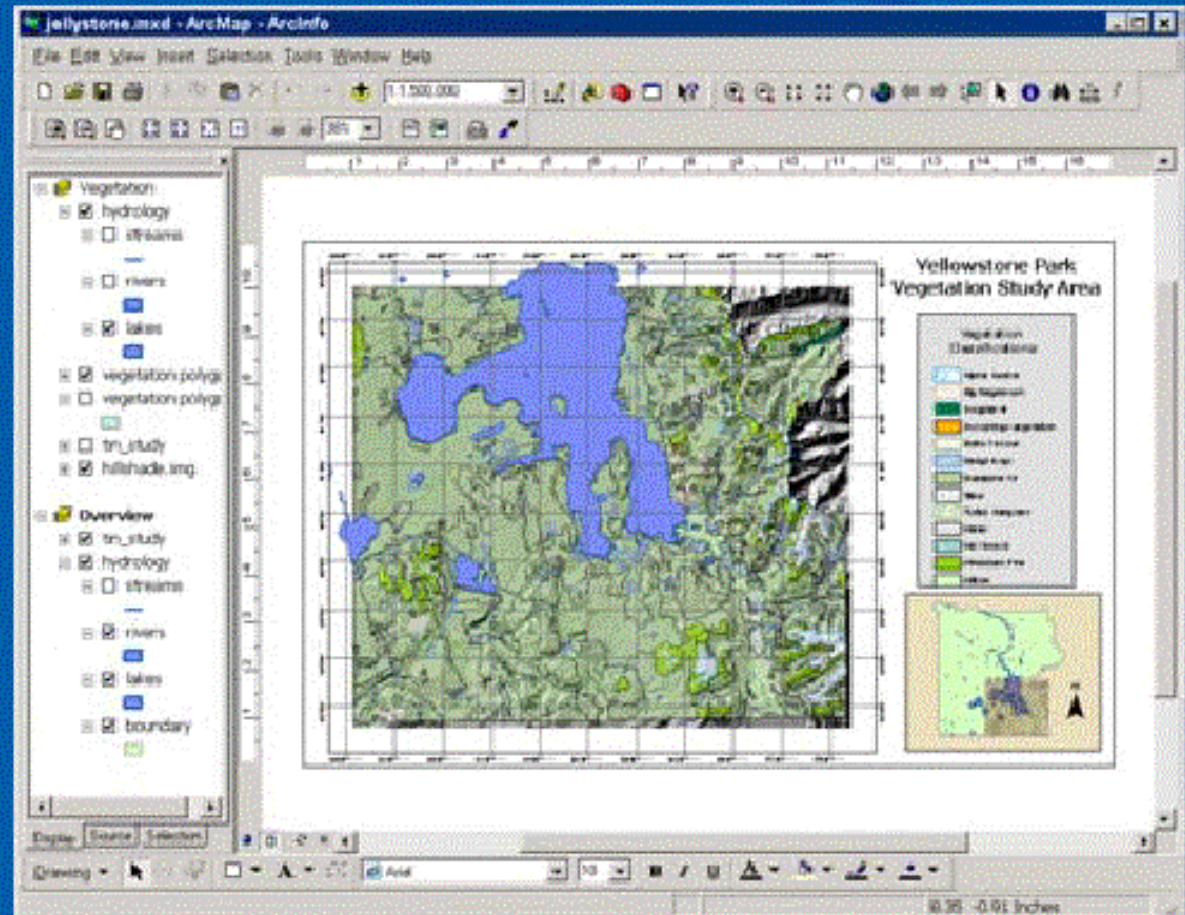
- **Topic 1: Display and Symbology**
- **Topic 2: Query and Editing**
- **Topic 3: Output**

- **Each topic will be followed by a live software demonstration**
- **Time will be available at the end of the presentation for a Q &A session**

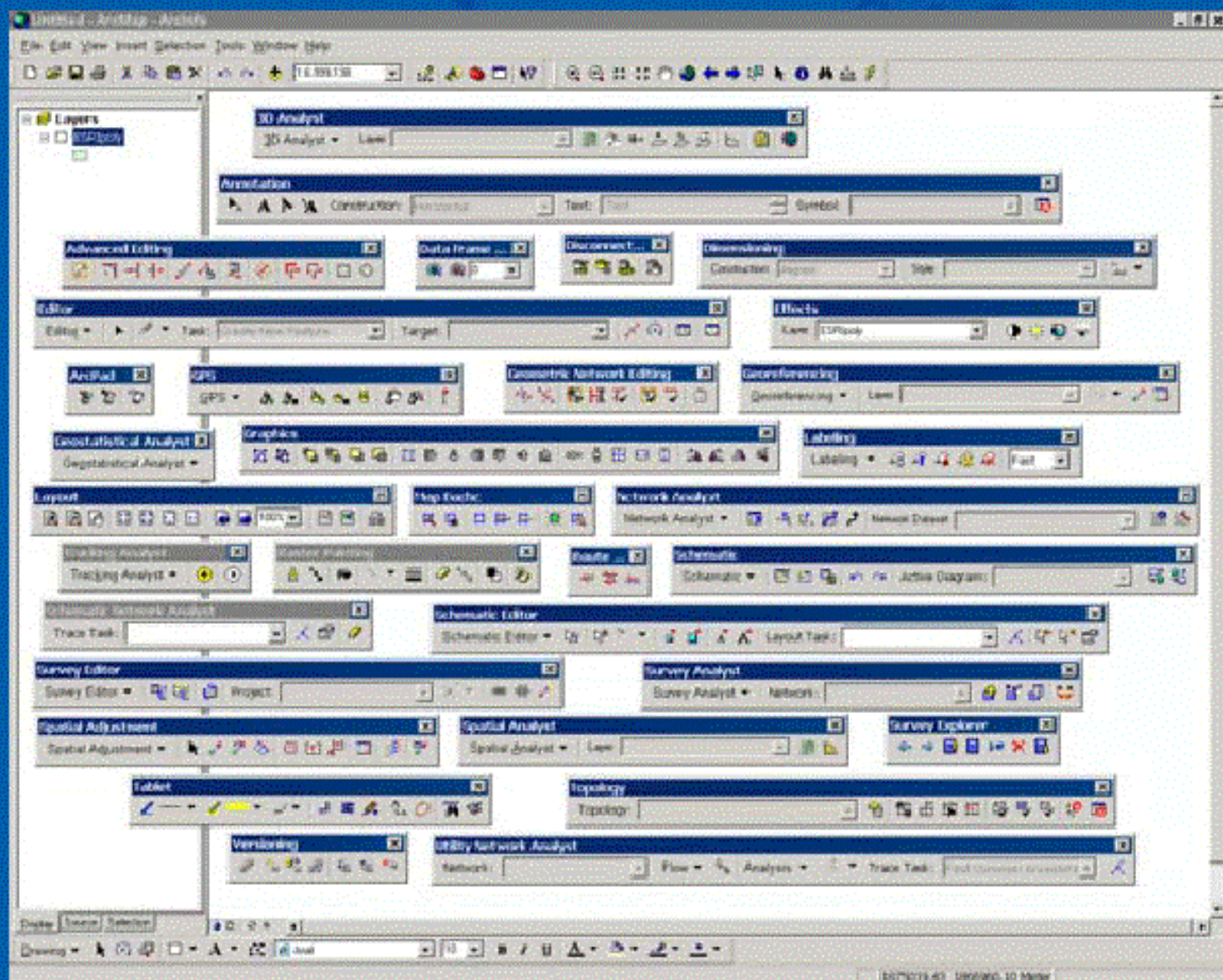
What is ArcMap?

based tasks

- **Perform map-based tasks**
 - Display
 - Edit
 - Query
 - Analyze
 - Graph
 - Report
 - Output



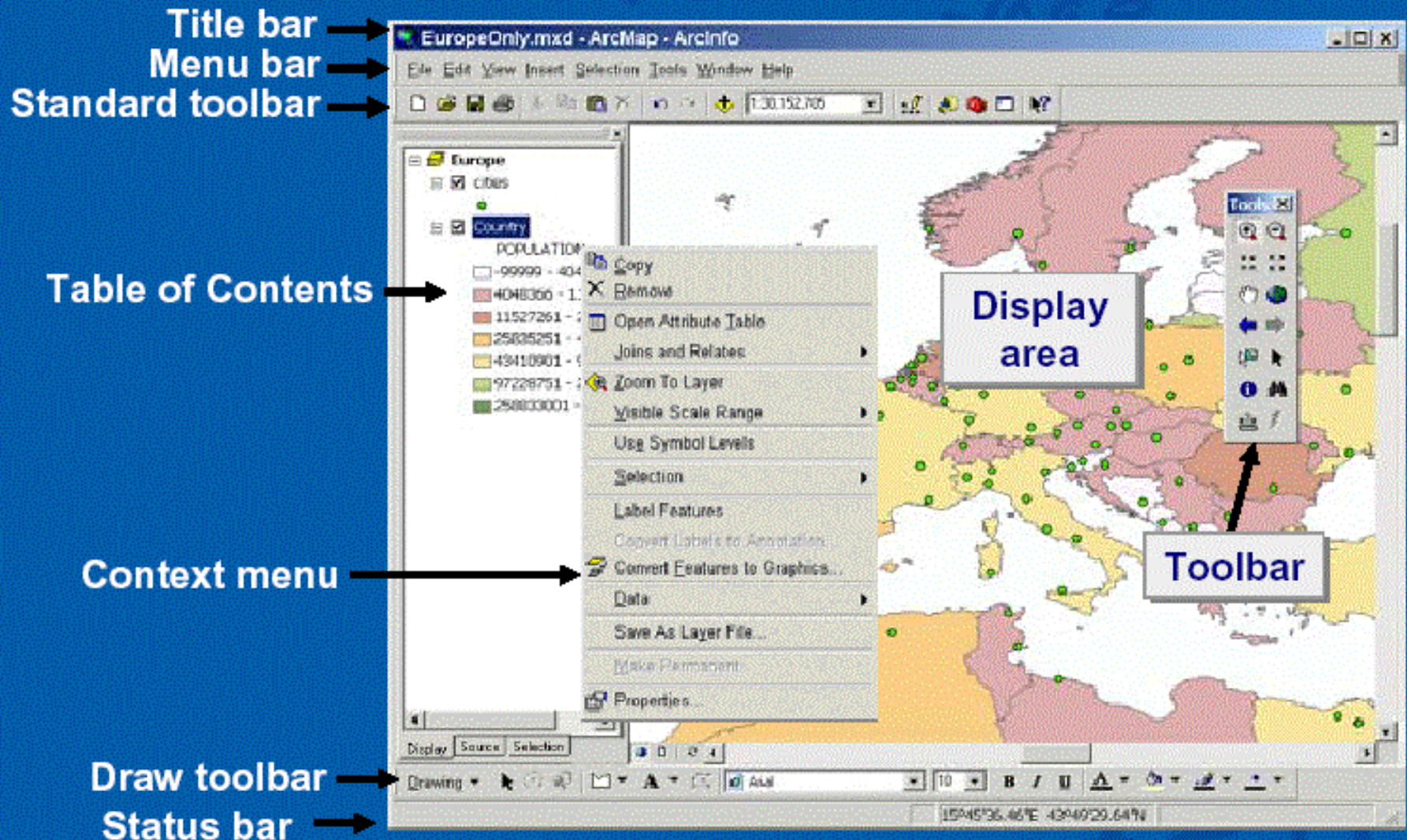
MANY toolbars!



Topic 1: Display and Symbology

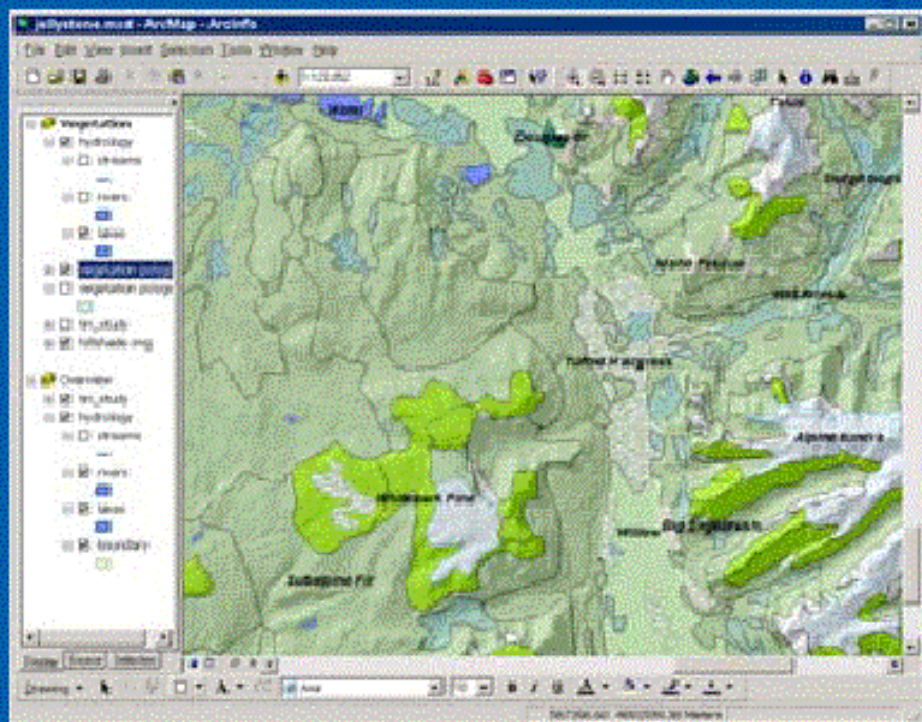
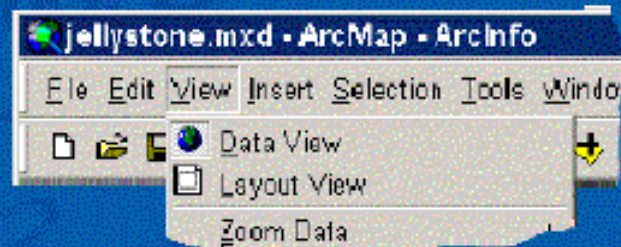
- The ArcMap interface and tools
- Data View and Layout View
- Layers, data frames, and maps
- ArcMap map navigation tools
- Layer properties for symbols and labels

The ArcMap interface

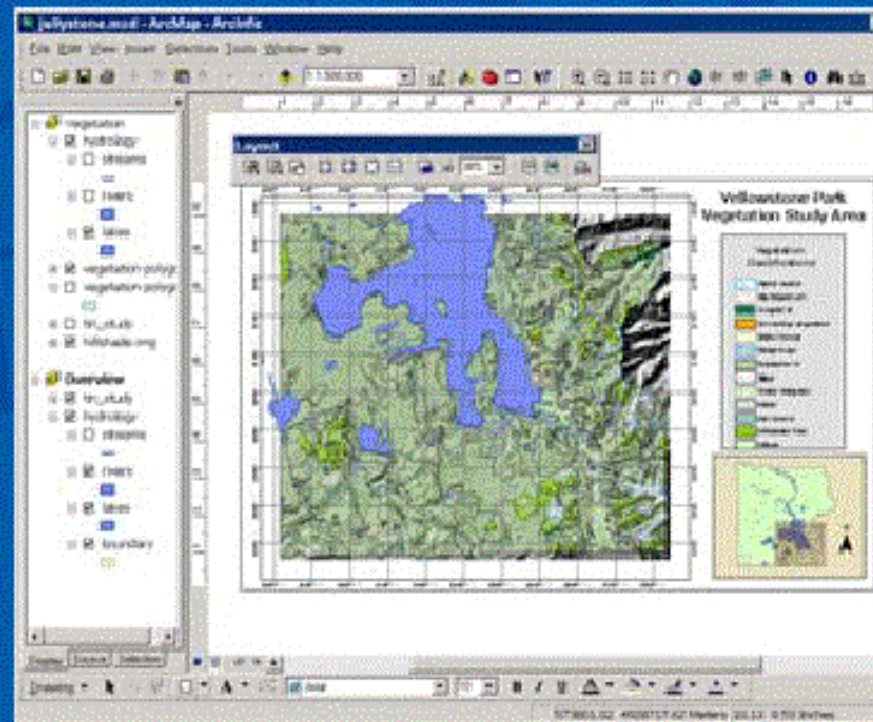


Data View or Layout View?

- **Data View**
 - For display, query, edit, and analysis
- **Layout View**
 - For map layouts



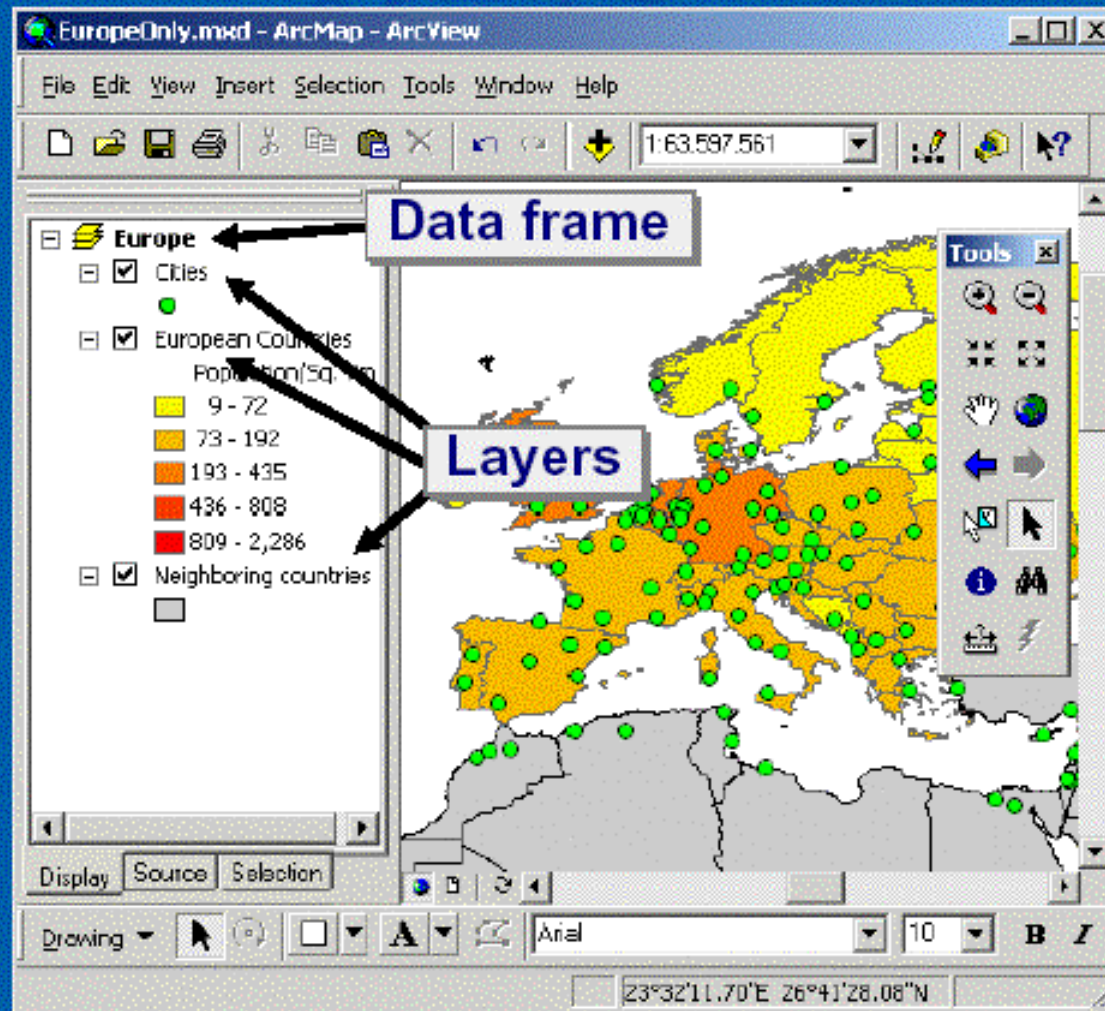
Data View



Layout View

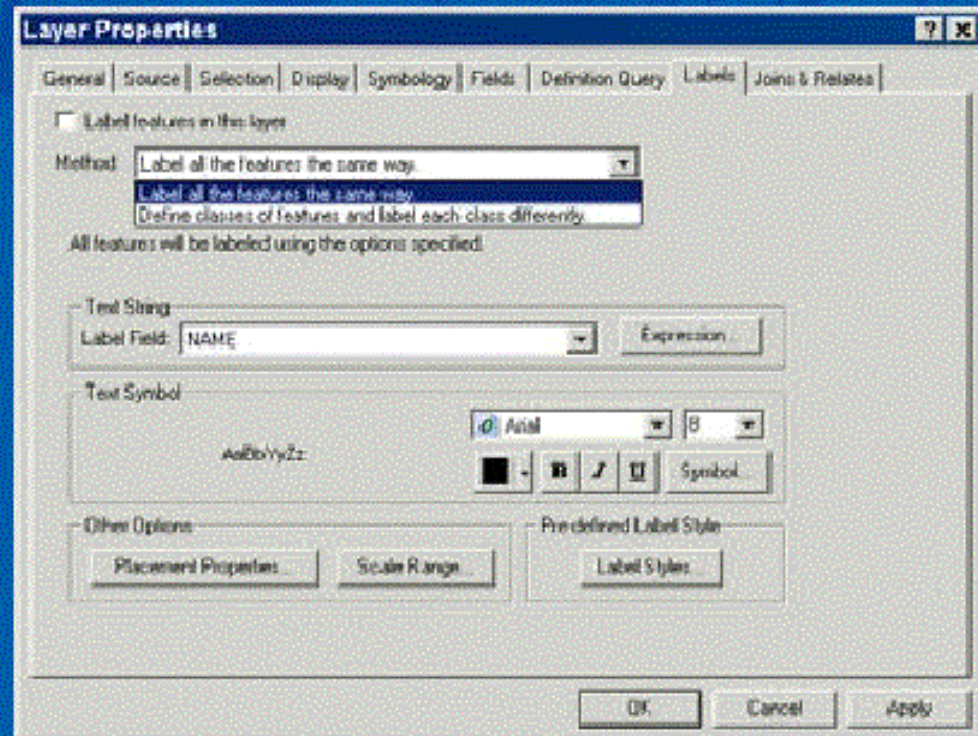
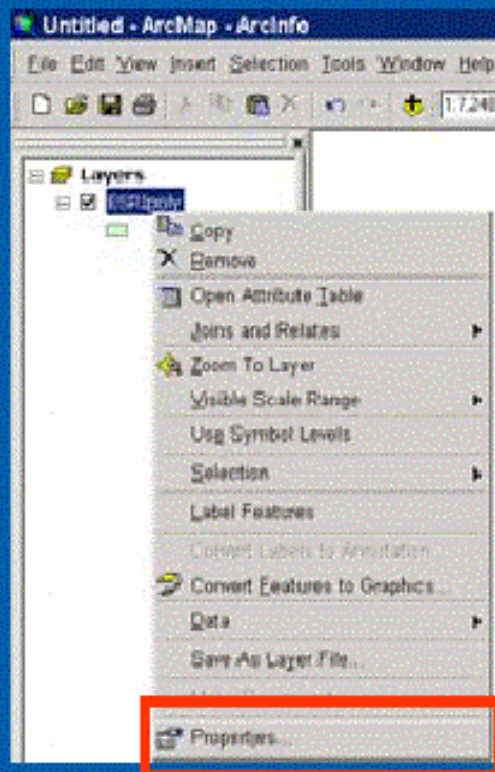
ArcMap terminology

- **Layer**
 - Stores display settings and more
 - Not a copy of data
- **Data Frame**
 - Organizes layers
 - Spatially referenced
- **Map Document**
 - Layers
 - Data Frames
 - Graphics
 - Map elements
 - Layout
- **Table Of Contents**



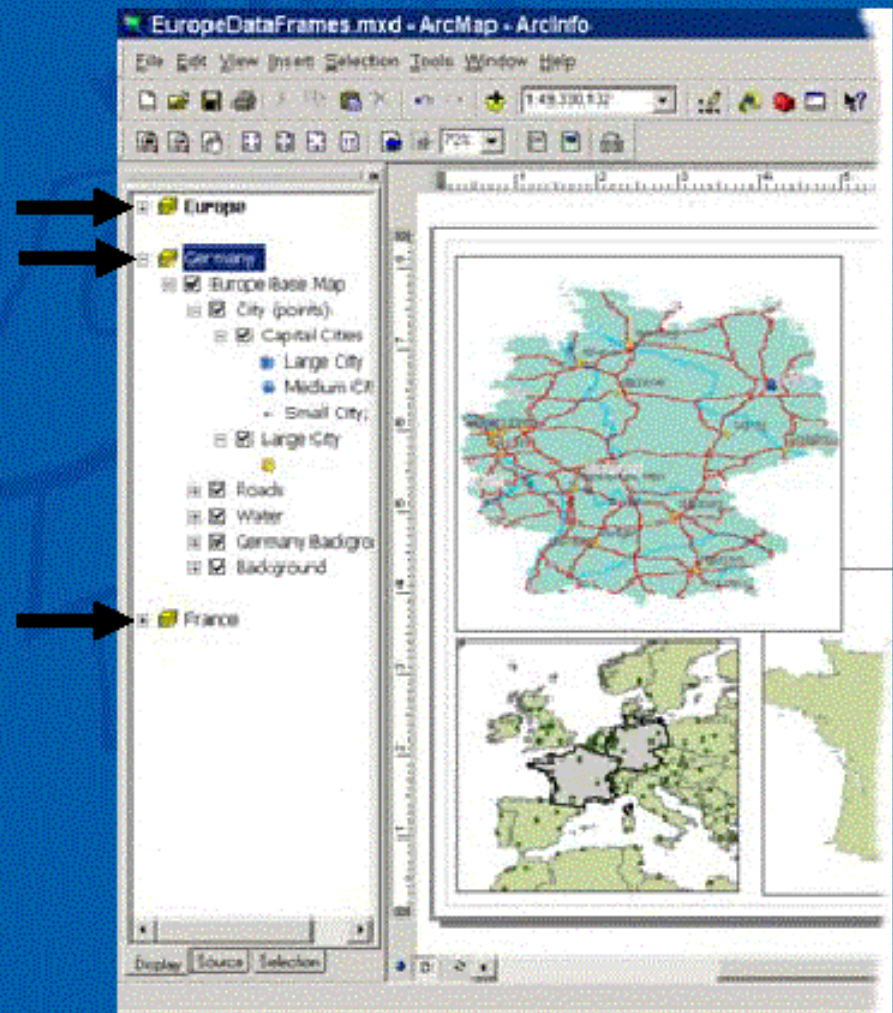
Layers

- **Reference spatial data sources**
 - any ArcGIS-supported data format
- **Set symbol, label, and many other properties**
- **Save as independent file *.LYR**



Data frames

- **Data frames contain layers and tables**
 - Create Group Layer
- **Maps can have many data frames**
 - Index and inset maps
 - Arrange in Layout View
- **Add from Insert menu**
- **Only one 'active' at a time**
 - Activate data frames from context menu



Maps

- Stored as MXD file
- Document contains settings for:
 - layers, data frames, graphics, map elements, layout, printer settings, more
- Use templates to standardize maps or map series
 - MXT files

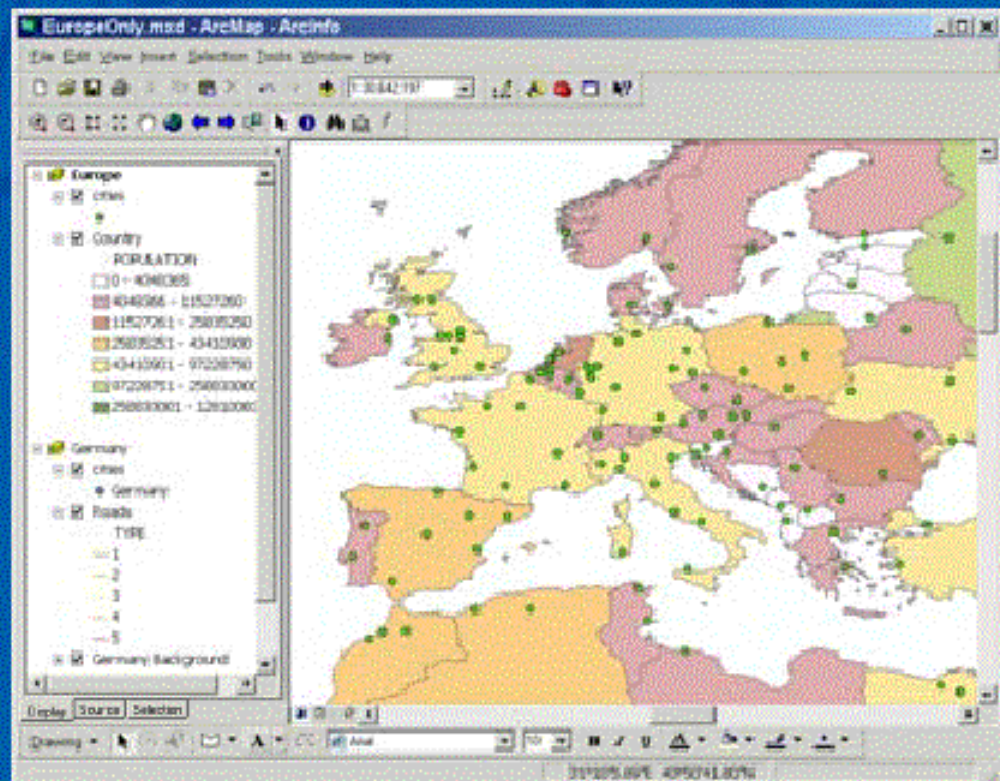
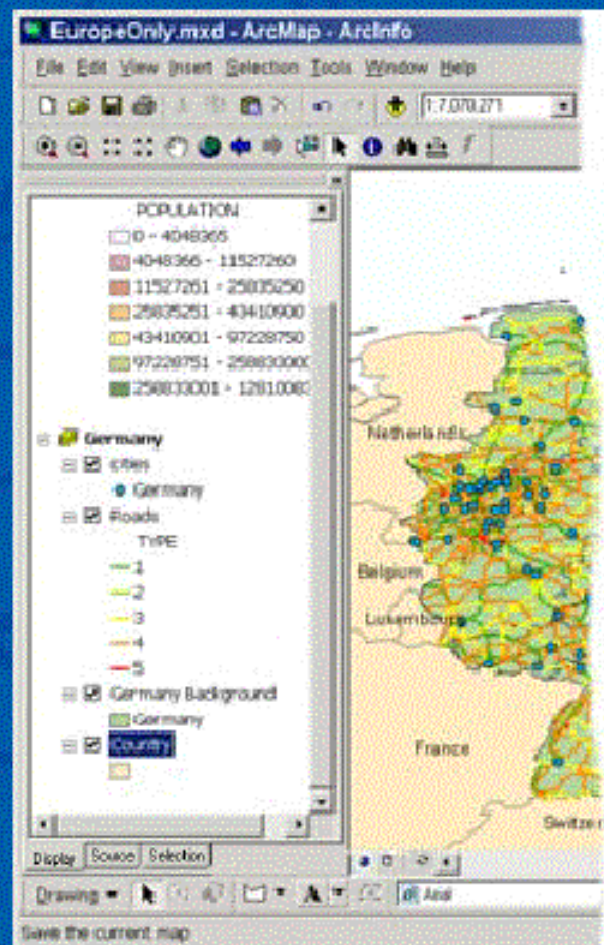


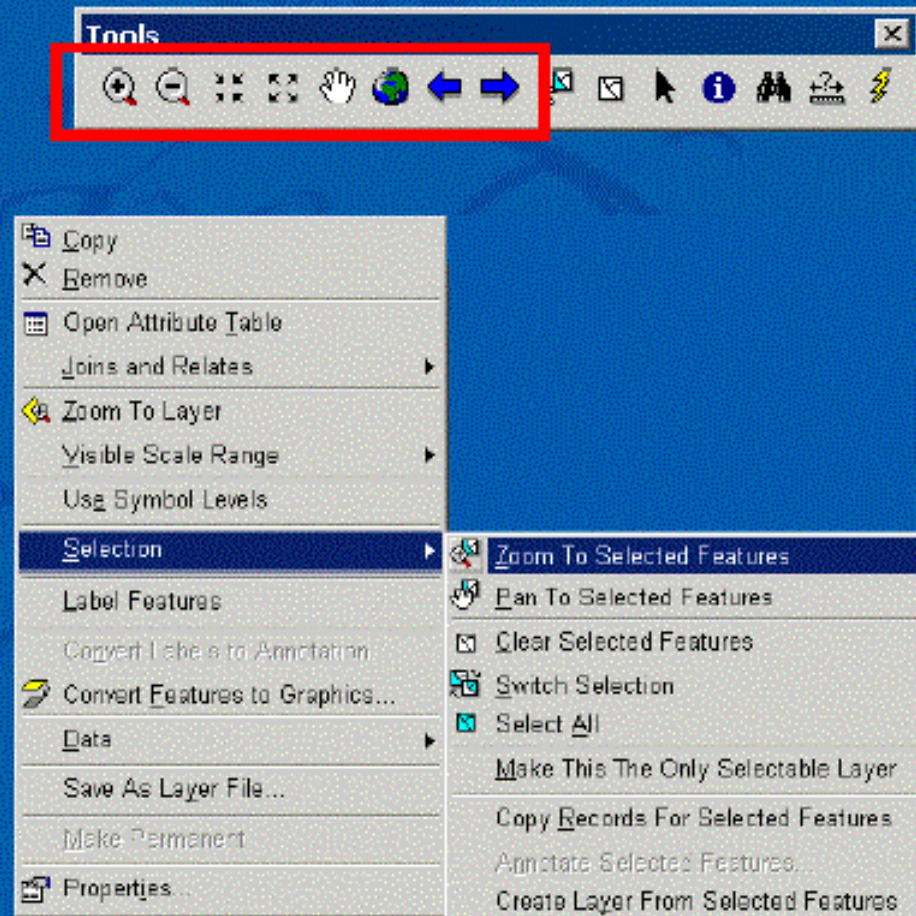
Table of Contents (TOC)

- **Control layer draw order**
 - ‘Smart’ defaults recognize geometry type
- **Rename data frames and layers**
- **Add/Remove layers**
- **Bottom tabs**
 - Display
 - Source
 - Selection
- **Use settings for map legend**



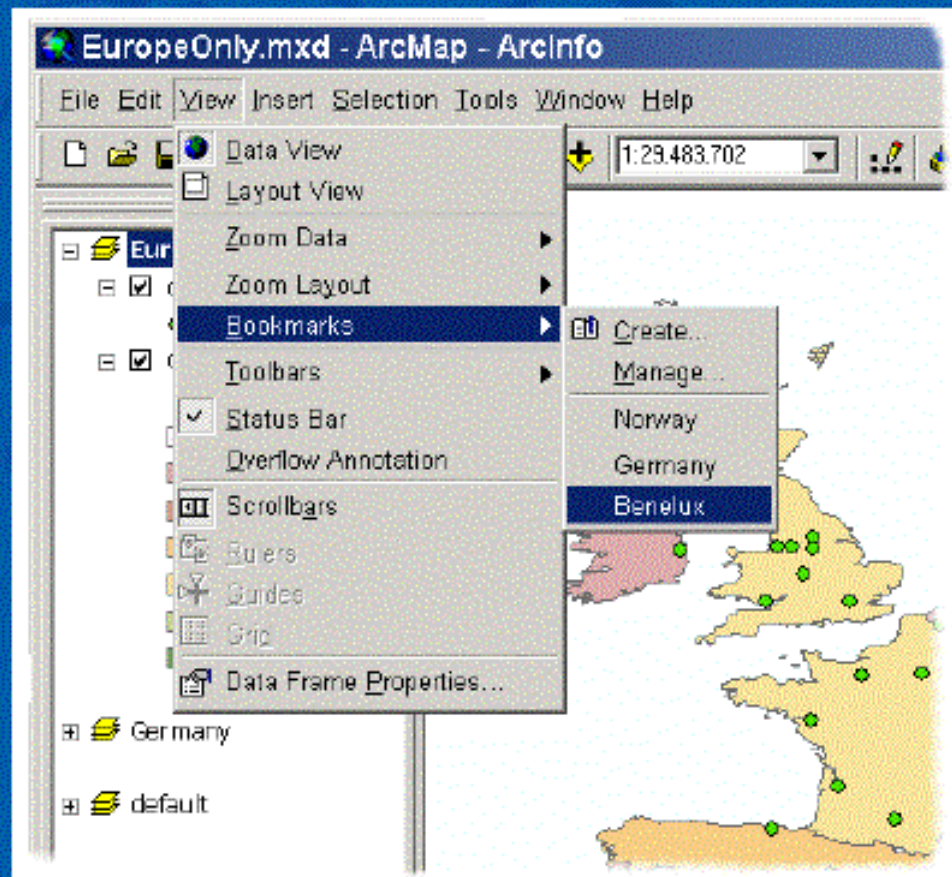
Moving around the map

- **Zoom in and out**
 - Fixed extent or interactive
- **Pan across the display**
- **Full extent**
- **Back or forward one step**
- **Zoom to layer**
- **Zoom to selected features**



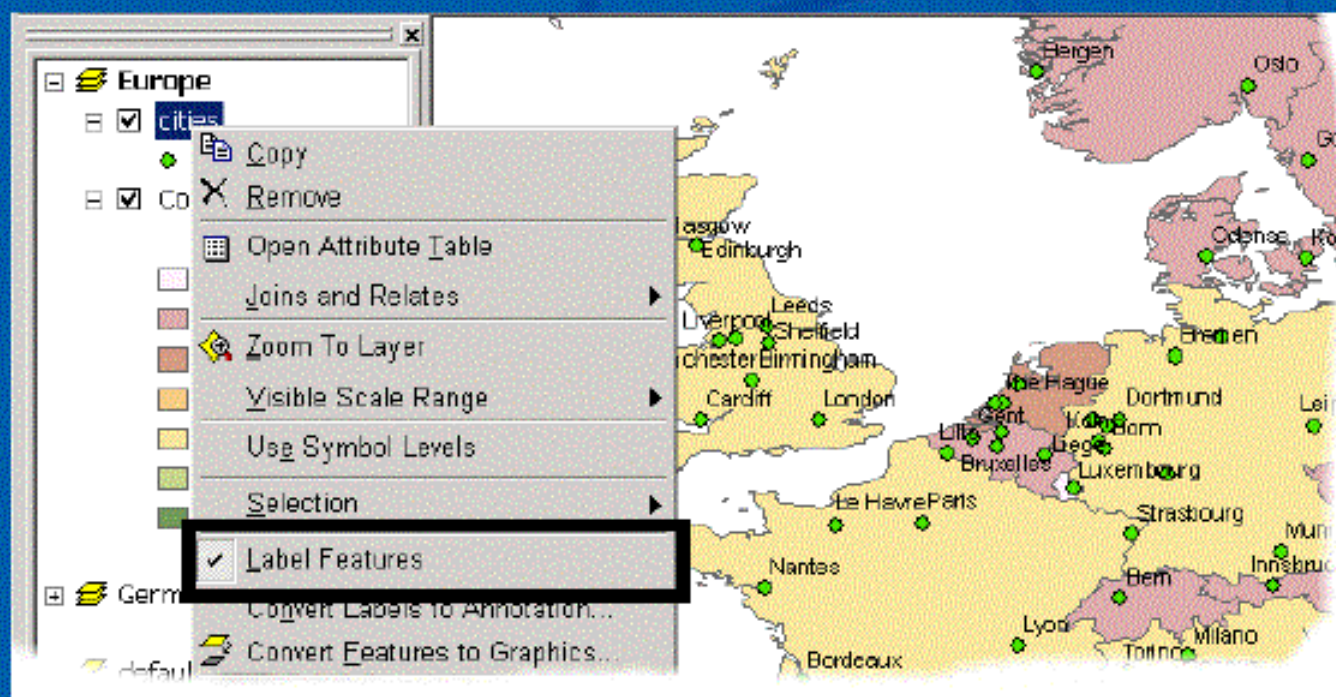
Using a bookmark

- Saves name and view extent
- Data frame specific
- Stored within MXD



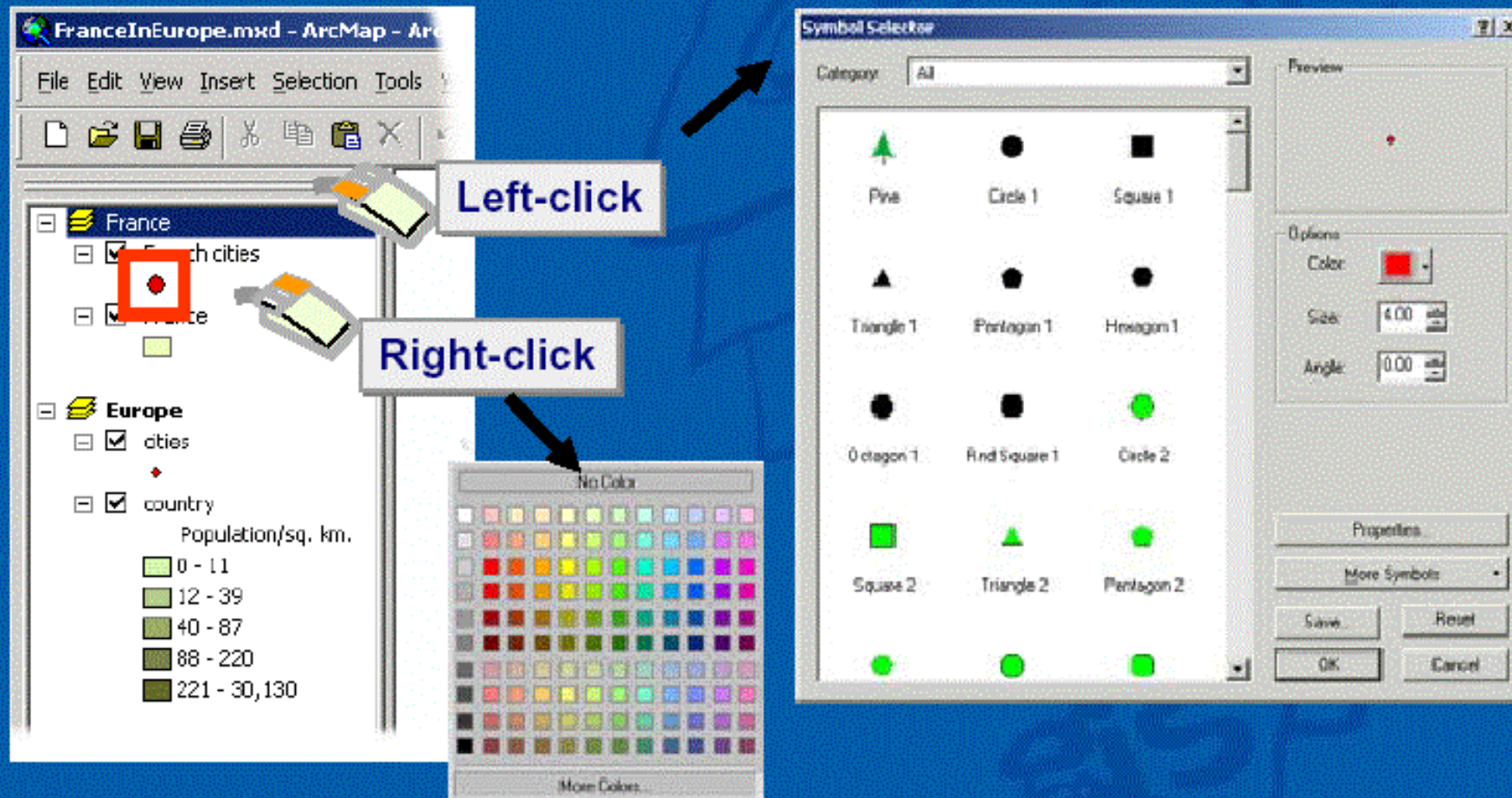
Feature Labels

- Label features dynamically using attribute values
- Layer properties control label appearance and position
- Use Labeling toolbar



Change symbol properties

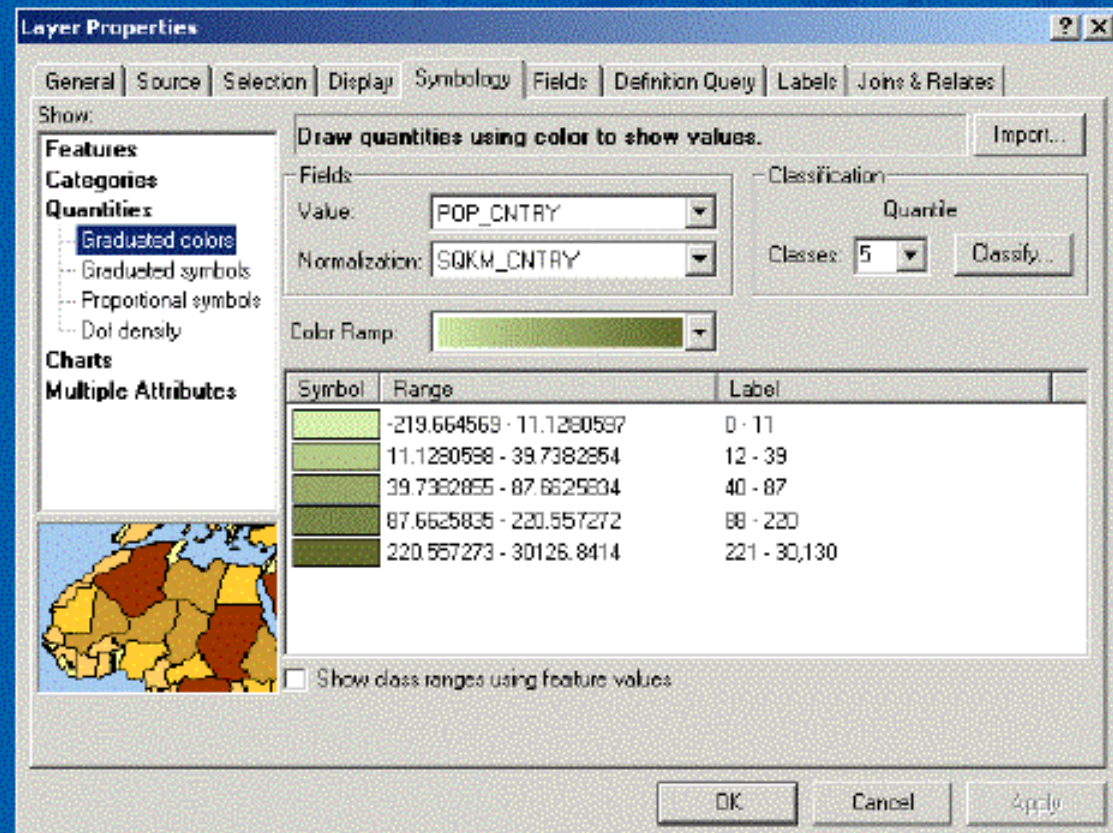
- **Use Layer Symbology tab or Table of Contents**
 - ArcMap contains over 12,000 symbols
 - Create or import custom symbology

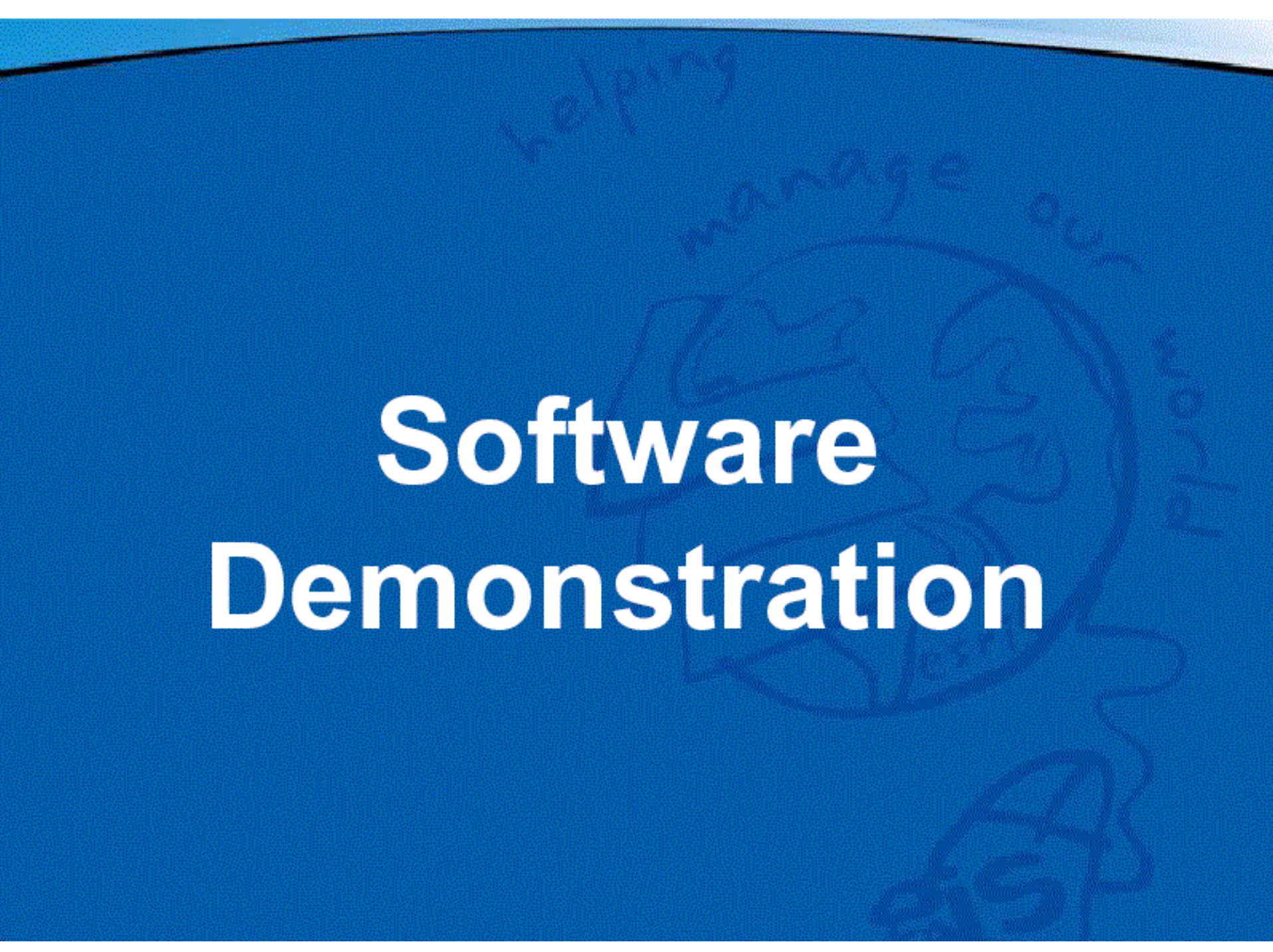


Classify and symbolize features

- Based on attribute values
- Layer Properties contain classification and symbolization tools

Thematic
classification
methods



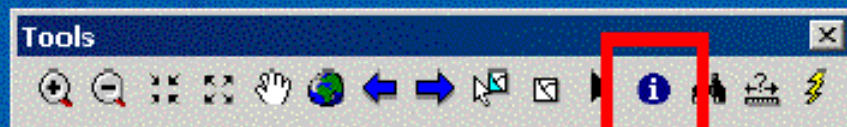


Software Demonstration

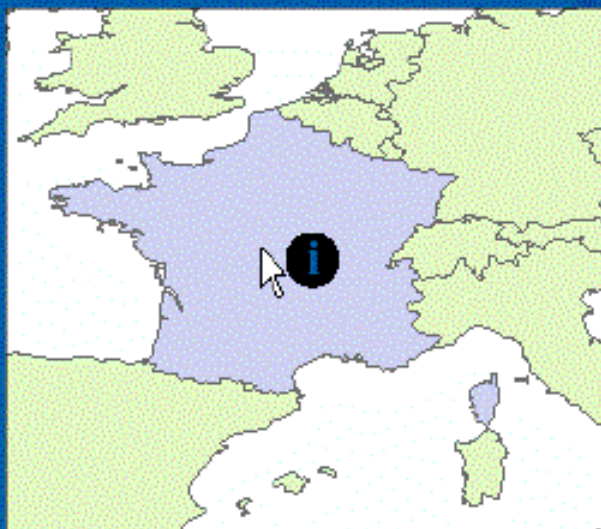
Topic 2: Query and Editing

- **Tools for examining your data**
 - Identify, Find, Measure, Hyperlinks
- **Selection tools**
 - Attributes, Location, Graphics, Interactive
- **Editing tools**
 - Editor toolbar, sketch

Identify



- Pop-up window displays available attribute information for selected feature



Identify Results

Layers: (Top-most layer)

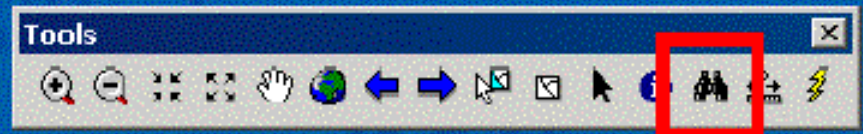
country

- France

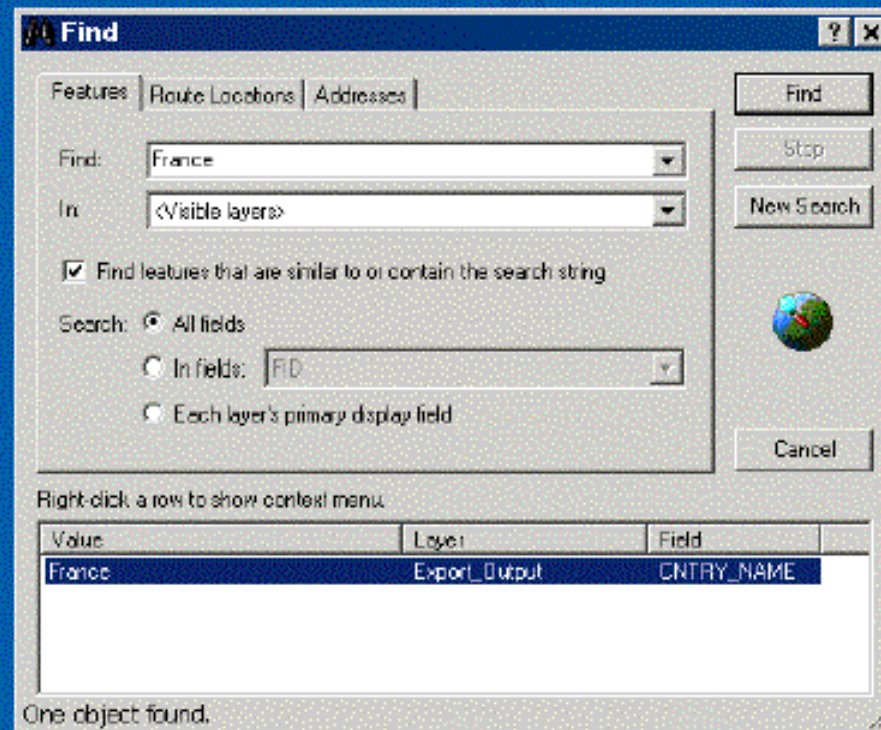
Location: (2.300569 47.265073)

Field	Value
FID	77
Shape	Polygon
FIPS_CNTRY	FR
GMI_CNTRY	FRA
CNTRY_NAME	France
SOVEREIGN	France
POP_CNTRY	57757060
SOKM_CNTRY	546728.875
SQMI_CNTRY	211092
CURR_TYPE	Franc
CURR_CODE	FRF
UNLOCKED	1

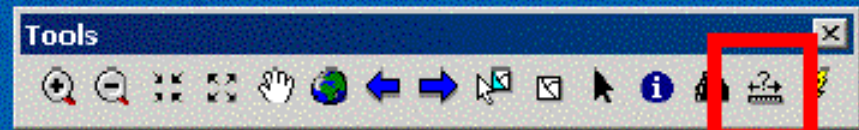
Find



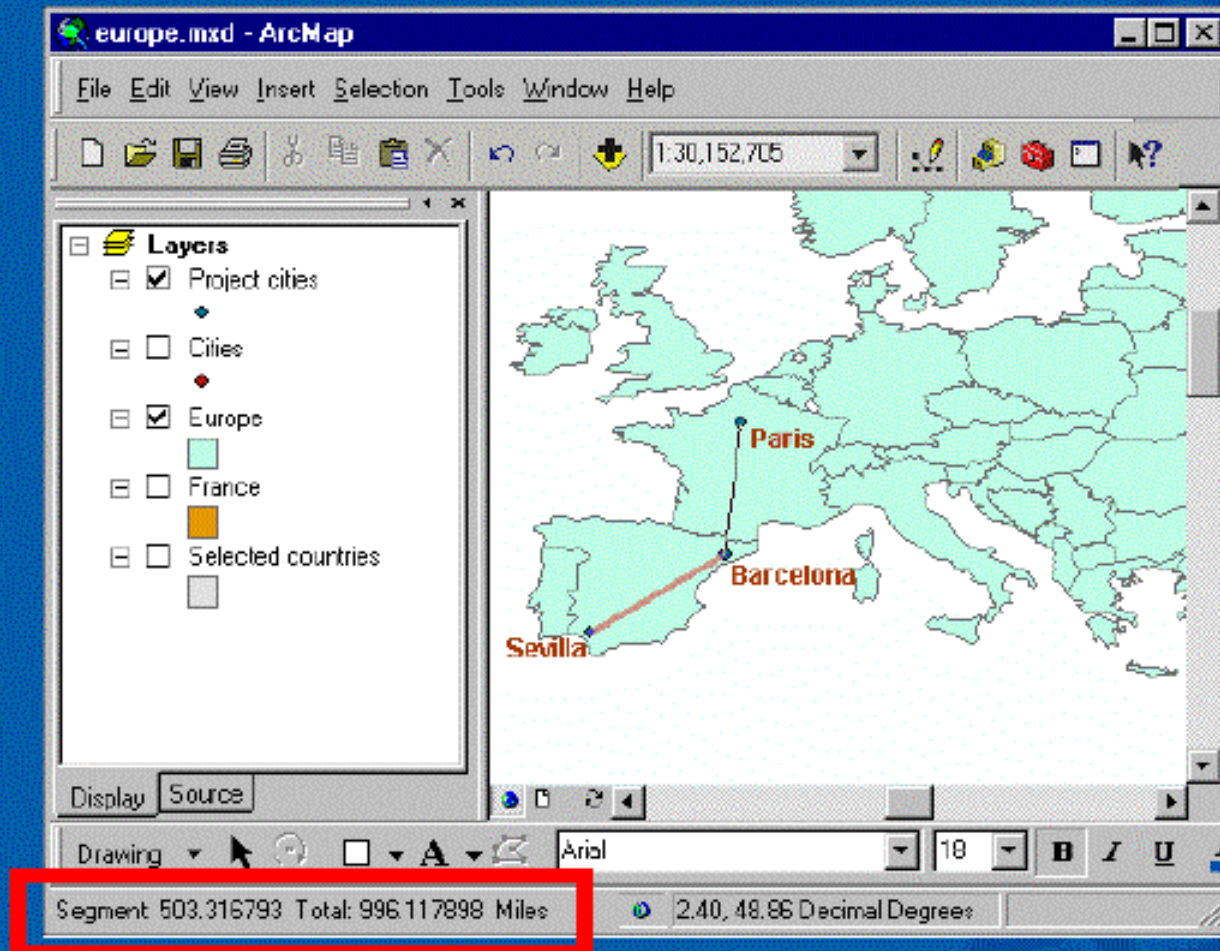
- **Locate specific feature or attribute based on text value**



Measure

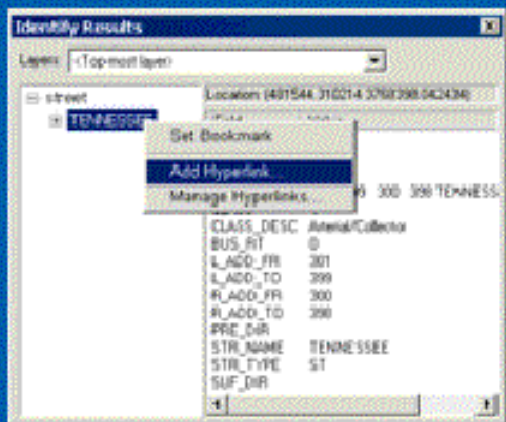
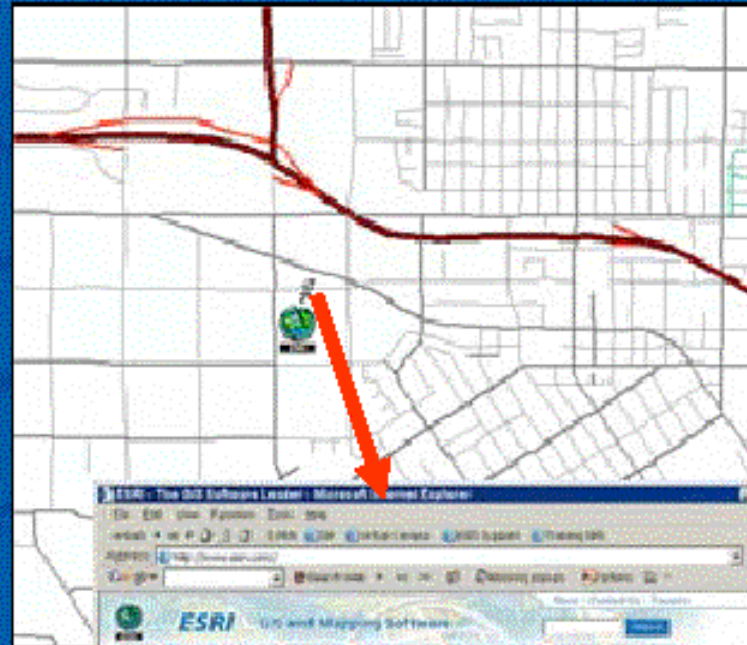
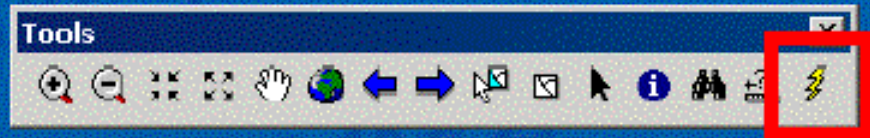


- Measure simple linear distances



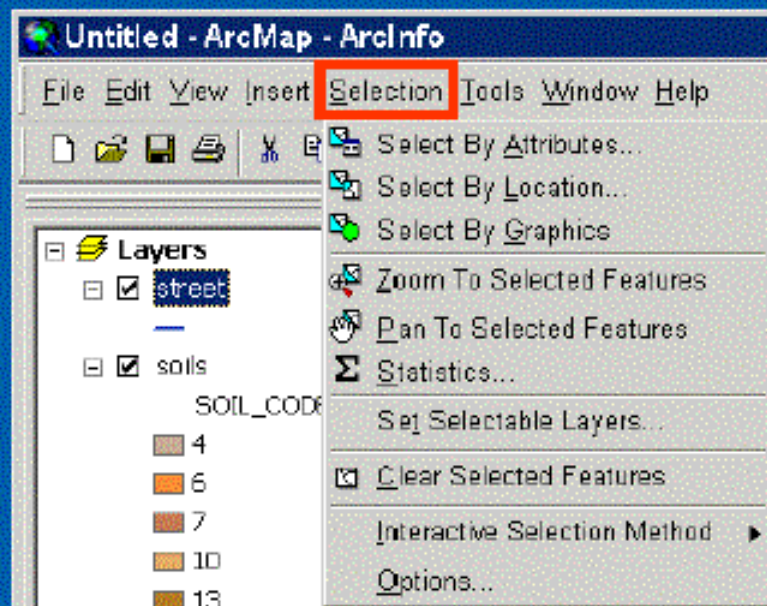
Hyperlinks

- Link to:
 - Document
 - URL
 - Macro
 - Multiple links per feature
 - Access through Identify window



Selection methods

- Interactive, attributes, location, graphics



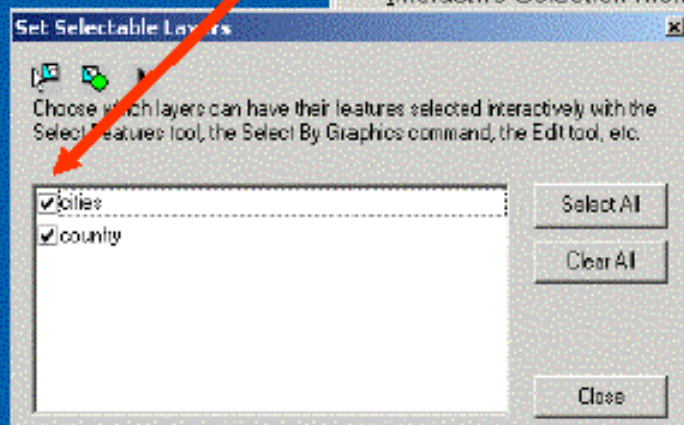
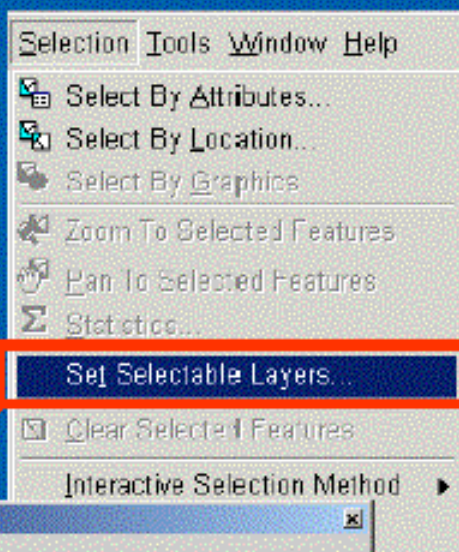
Selected features



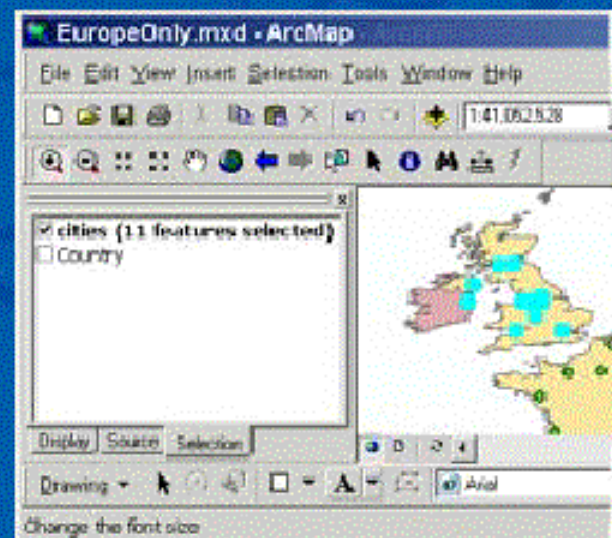
Set selectable layers

- **Specify from Selection menu or Table of Contents tab**
 - Layers available when using interactive selection tool

Method 1



Method 2



Select By Attribute

- Use a SQL 'where'-type clause to select features
- Save and reload selection expressions
 - Use Verify button to check syntax

Select By Attributes

Layer: WorldCountries

☐ Only show selectable layers in this list

Method: Create a new selection

[OBJECTID]
[NAME]
[ABBREVN]
[FIPS_CODE]
[WBL_CNTRY]
[REGION]

= < > Like > >= < <= Or ? * () Not

'Afghanistan'
'Albania'
'Algeria'
'Angola'
'Antarctica'
'Argentina'

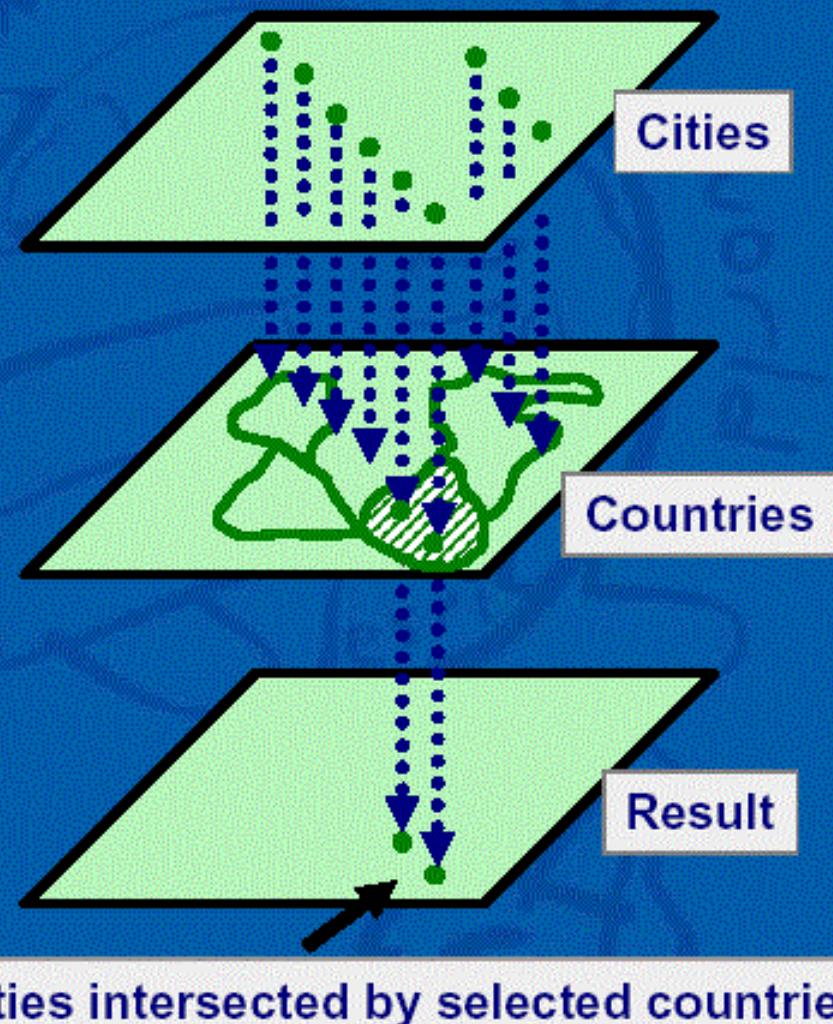
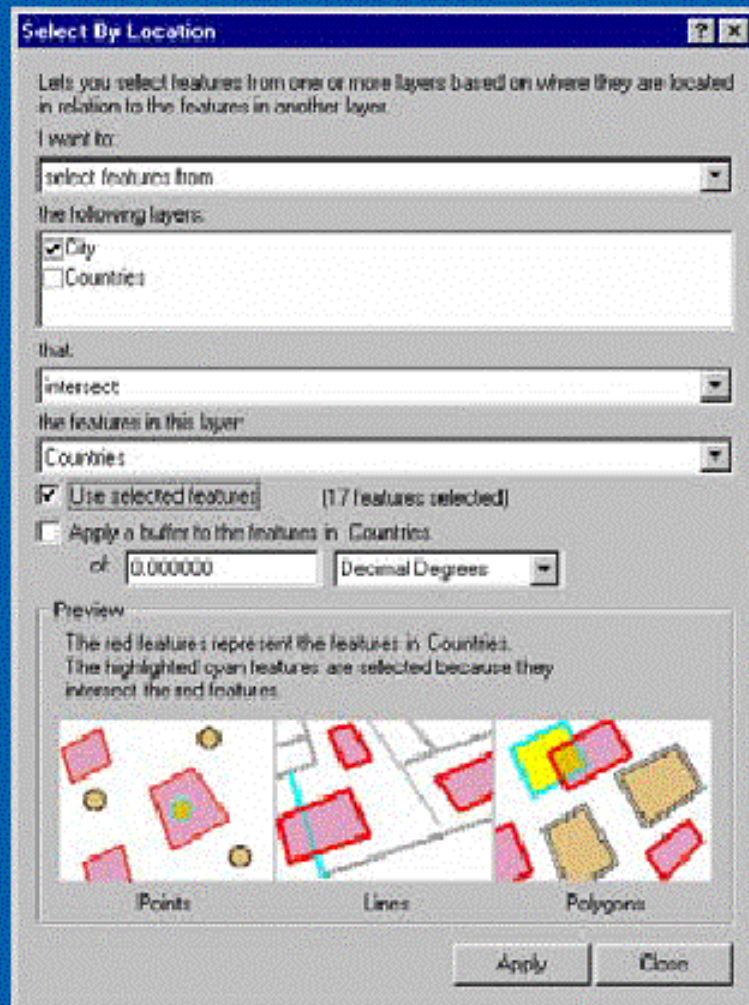
Is Get Unique Values Go To

SELECT * FROM WorldCountries WHERE:
[NAME] = 'Canada'

Clear Verify Help Load... Save...
OK Apply Close

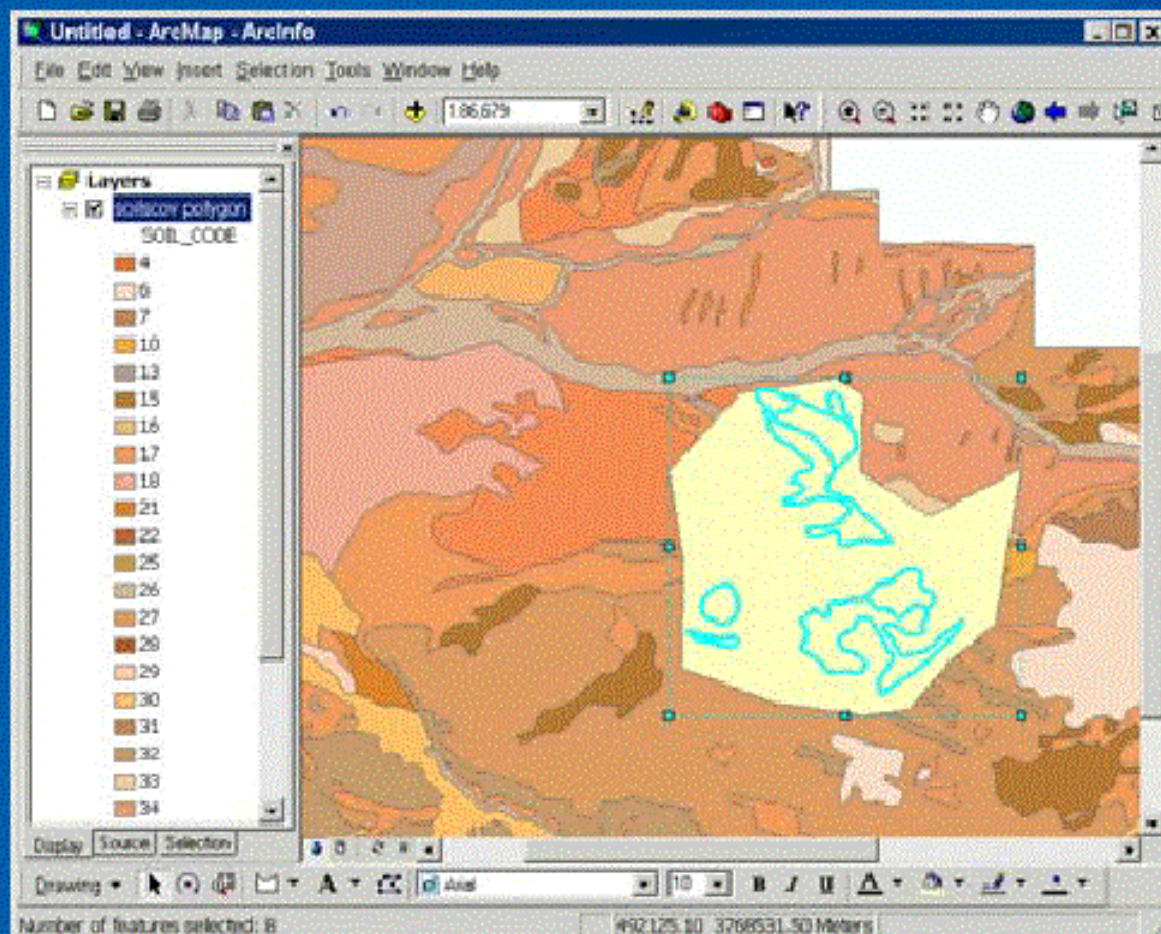
Select by location (spatial query)

- Use features in one layer to select features in another



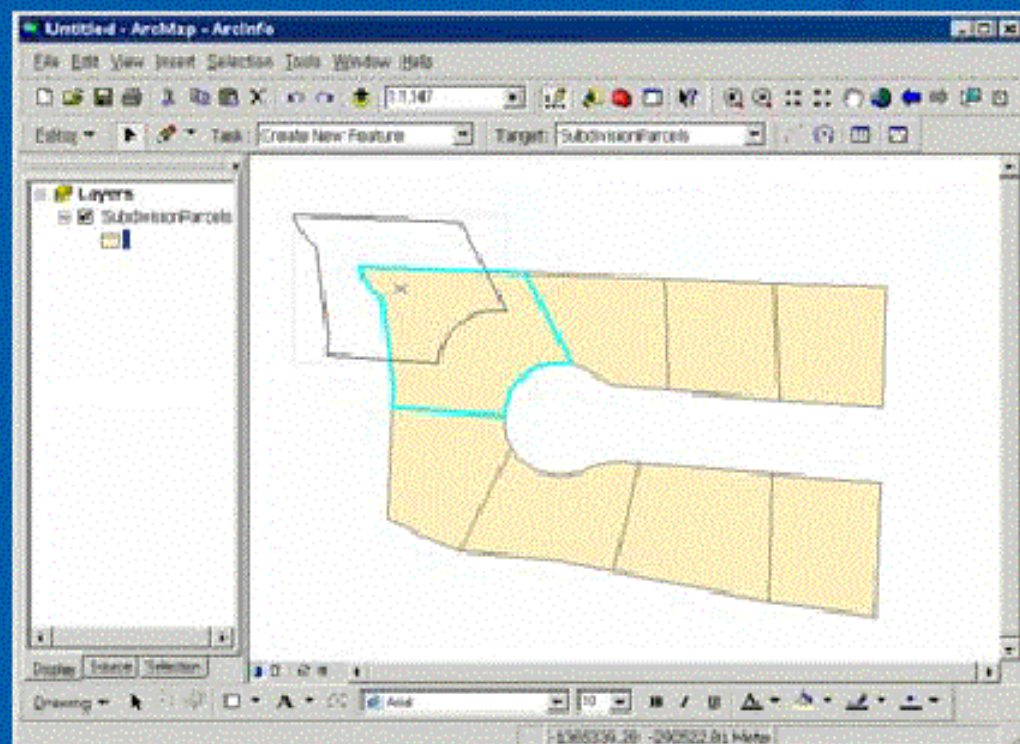
Select By Graphics

- Use Draw toolbar to create graphic shape



Edit Data

- **ArcMap is the data editing application**
 - ArcCatalog is the 'schema editor' and data manager
- **Tools to edit feature geometry and attributes**
- **Manage editing environment through Editor toolbar**



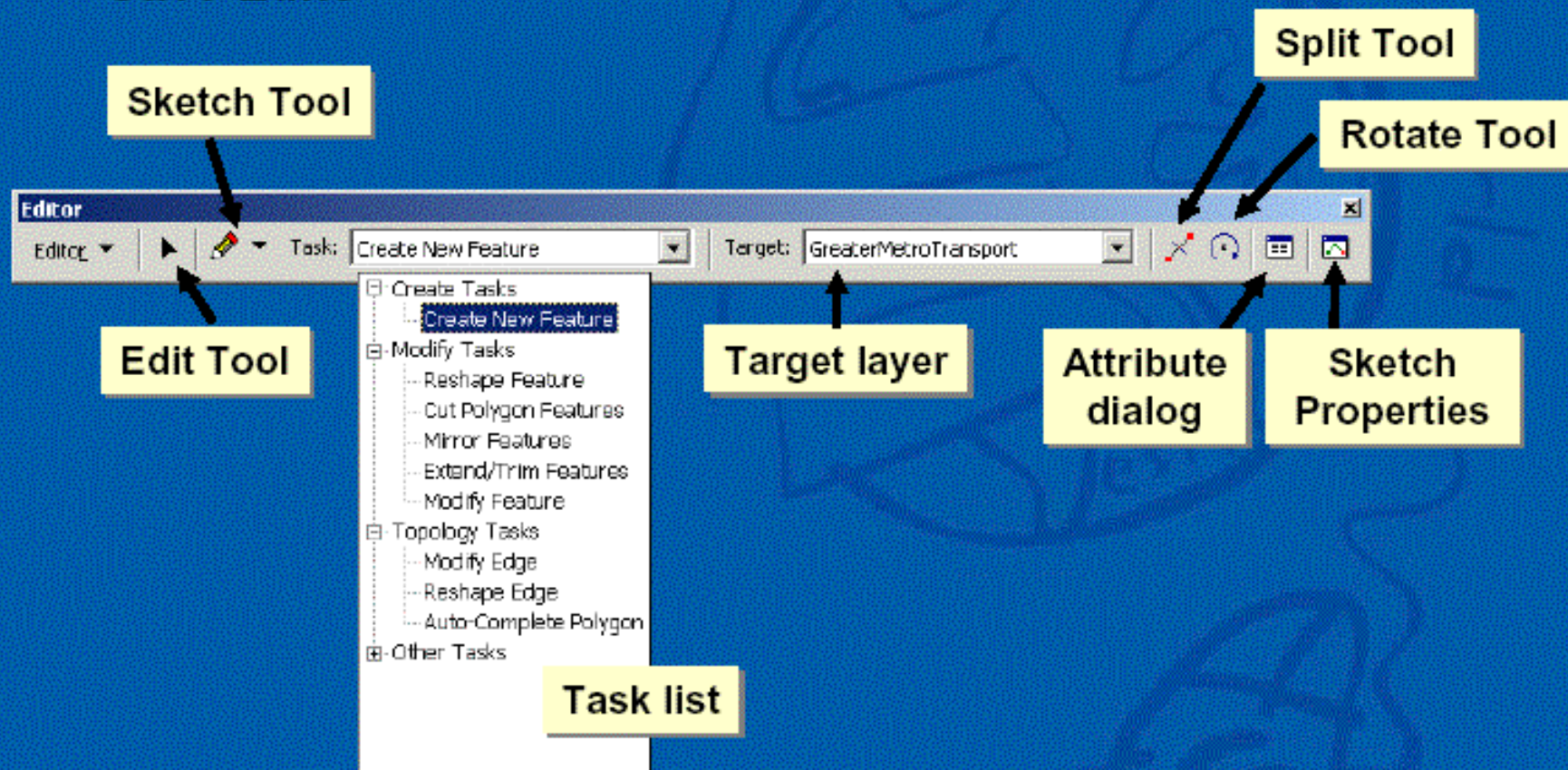
The screenshot shows the "Attributes" window. The "Parcels" layer is selected, and the attribute table for the selected feature is displayed. The table has two columns: "Property" and "Value".

Property	Value
OBJECTID	759
FID_Parcels	728
PID	1783400000001000
ACRES	313.92
SYMBOL	28
PARCELSUM	1
OWNER_1	KANSAS, STATE OF
OWNER_2	KANSAS STATE UNIVERSITY
ADDRNUM	00000
SITUSADDR	MARLATT AVE
PROZIP	66503
OWNER_1ADD	CONTROLLER'S OFFICE
CITY	MANHATTAN
ST	KS
ZIP	66506
ZIPX	0108
TWP	14
TU	130
SUB	

The status bar at the bottom of the window indicates "18 features".

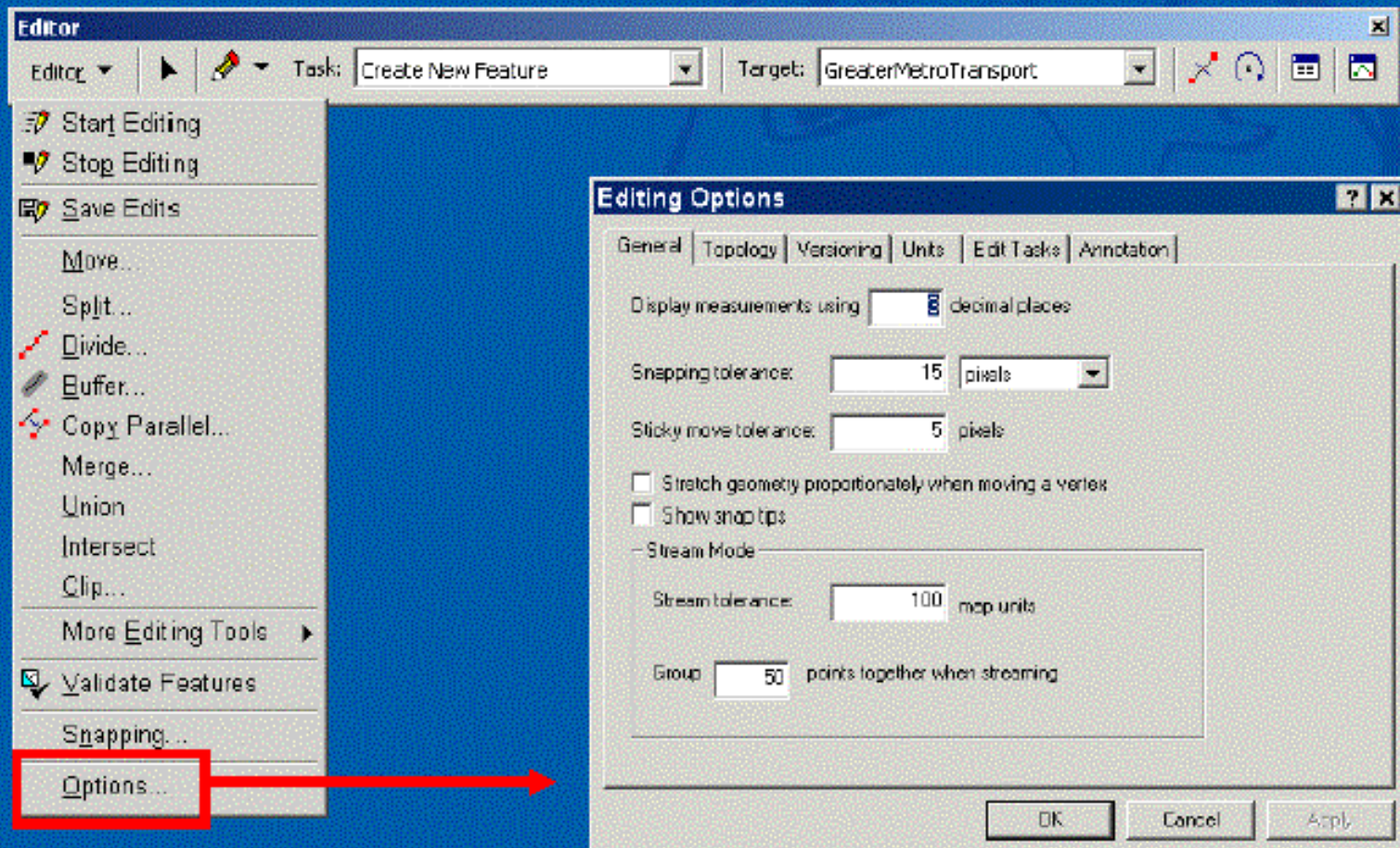
Editor toolbar

- Main location for edit functions
 - Start / End edit sessions
 - Set edit environment parameters
 - Save Edits



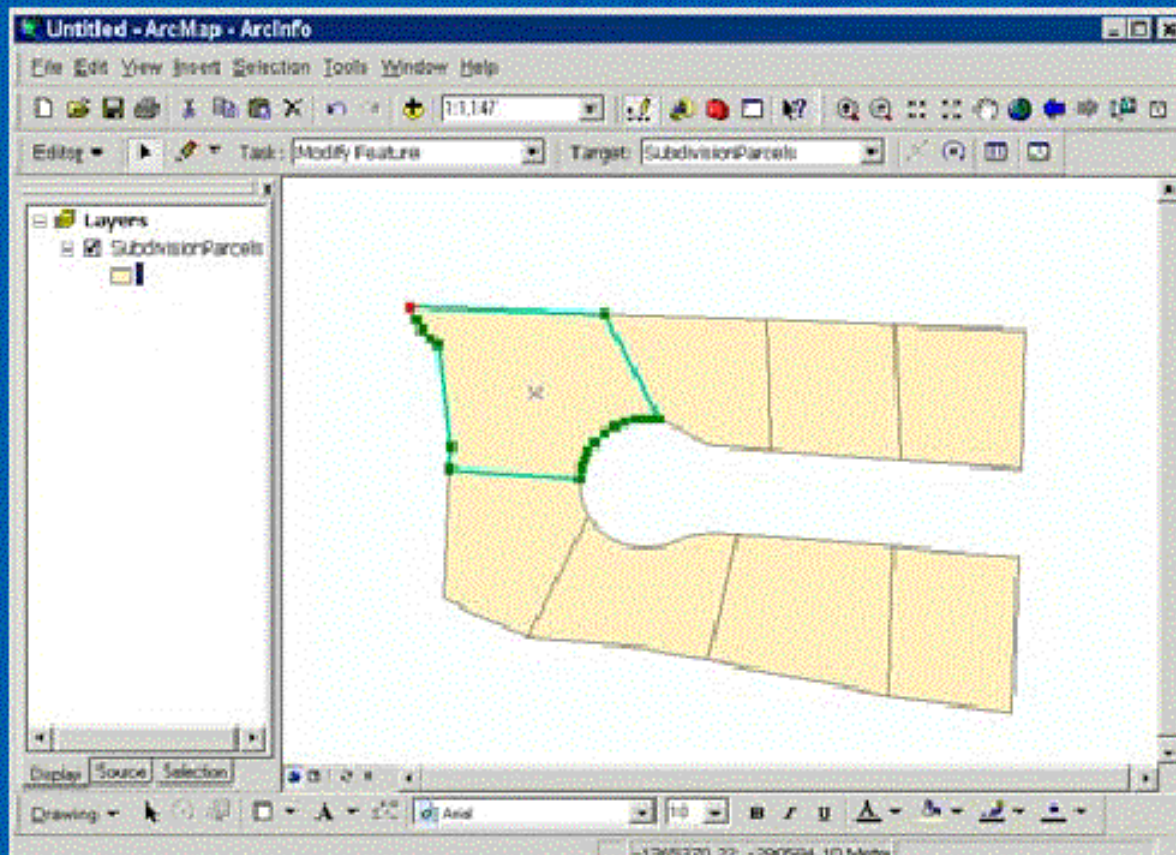
Edit session settings

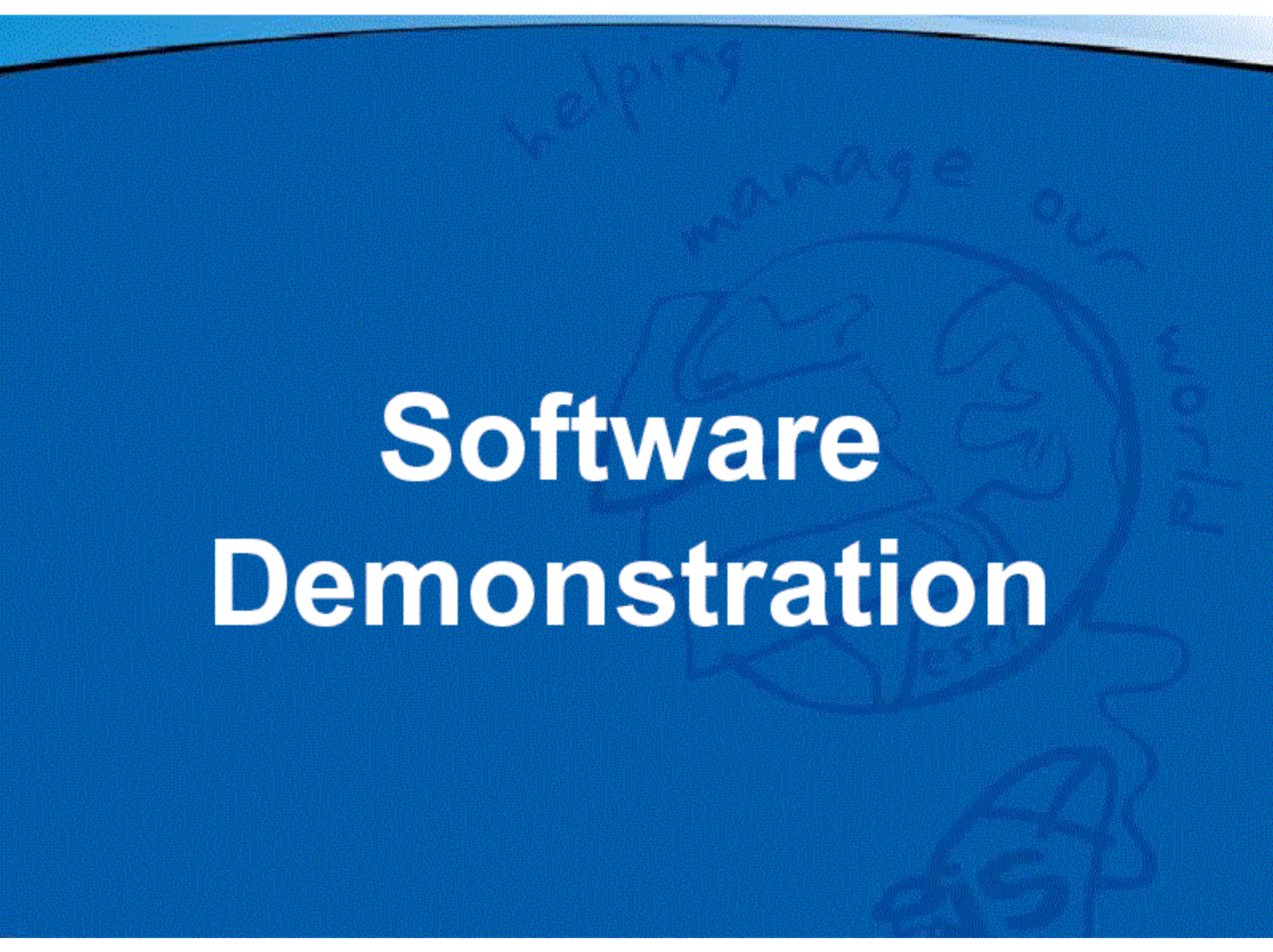
- Set snapping and digitizing tolerances
- Control additional editing operations



Sketch or feature?

- Some tools edit existing features
- Some tools edit sketch
 - “In ArcMap, a shape that represents a feature's geometry”
 - Create new features

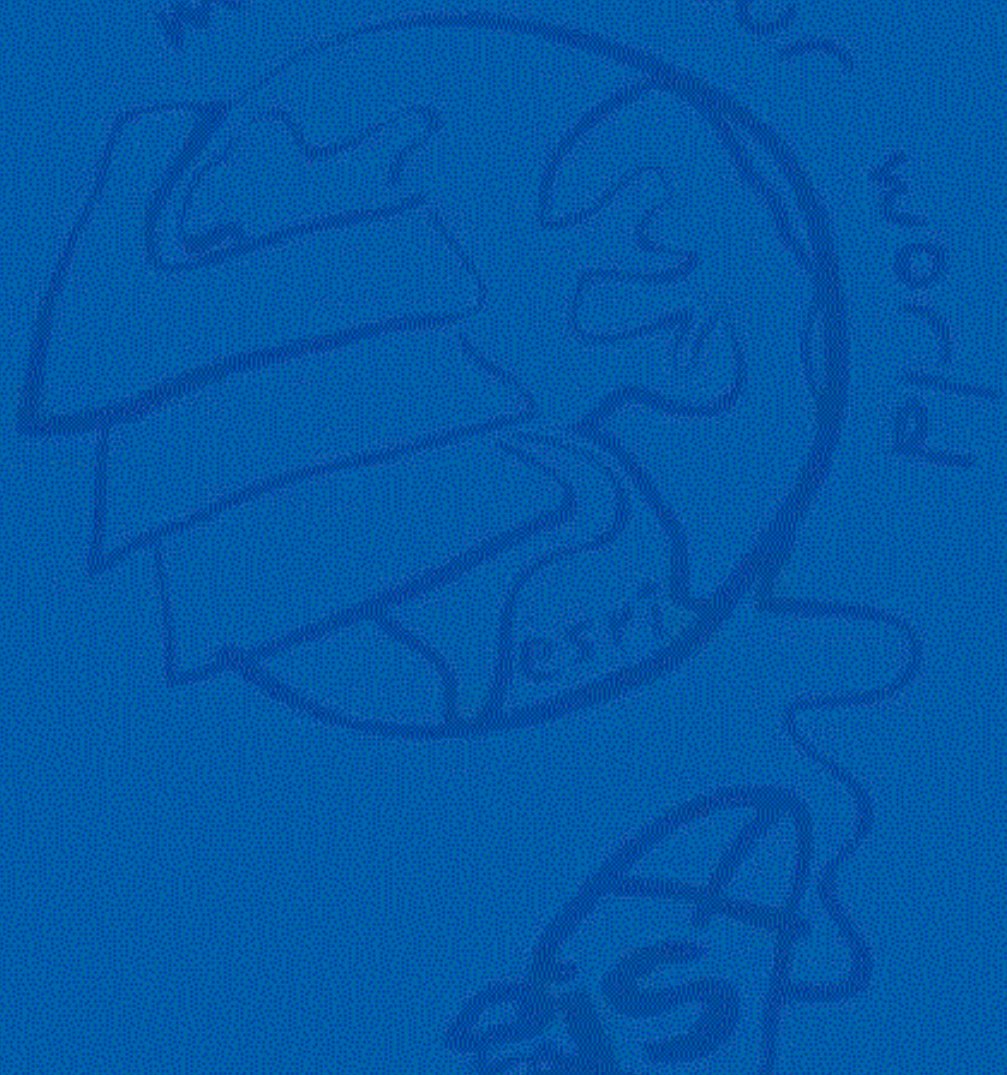


The background is a solid blue color. Faintly visible in the background is a white line drawing of a hand holding a globe. The hand is positioned at the bottom, with fingers wrapped around the globe. The globe shows continents and oceans. Above the globe, the words "helping", "manage", and "our" are written in a cursive, handwritten style. To the right of the globe, the word "world" is written vertically in the same style. At the bottom right, the letters "GIS" are written in a bold, sans-serif font.

Software Demonstration

Topic 3: Output

- What's in a map?
- Layout tools
- Add map elements
- Map text
- Map templates
- Print maps
- Export maps



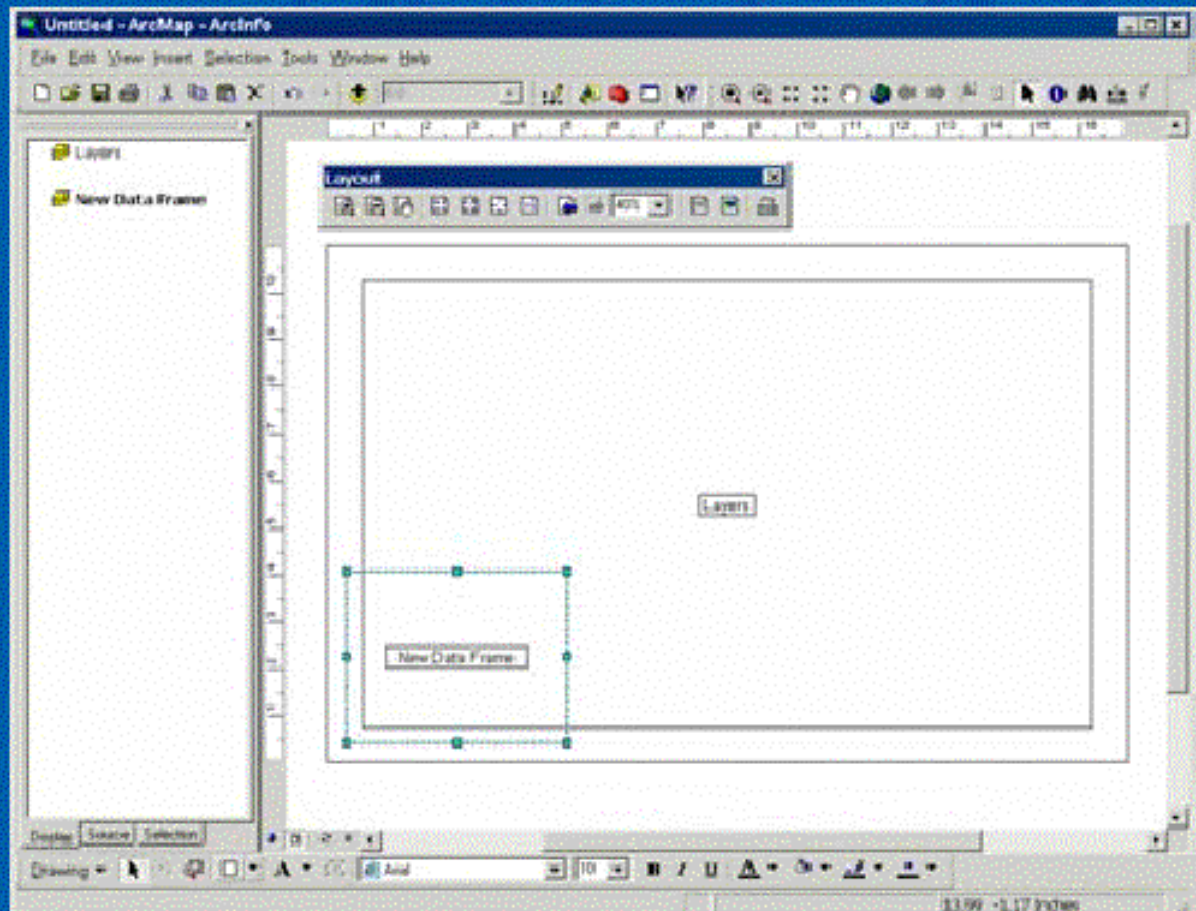
What's in a map?



- What would you add?

Layout view

- Rulers appear at view window margins
- Layout toolbar automatically added
- Virtual page outline
- Data Frames

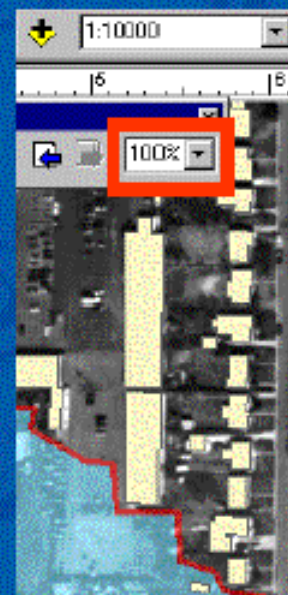
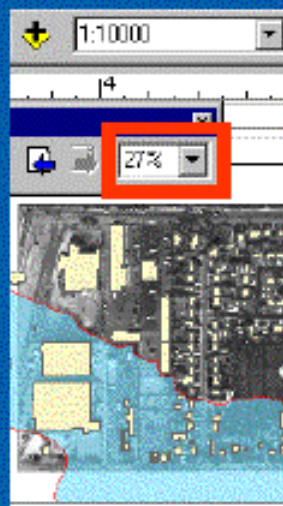


Layout tools

- Zoom and pan in virtual 'page space'



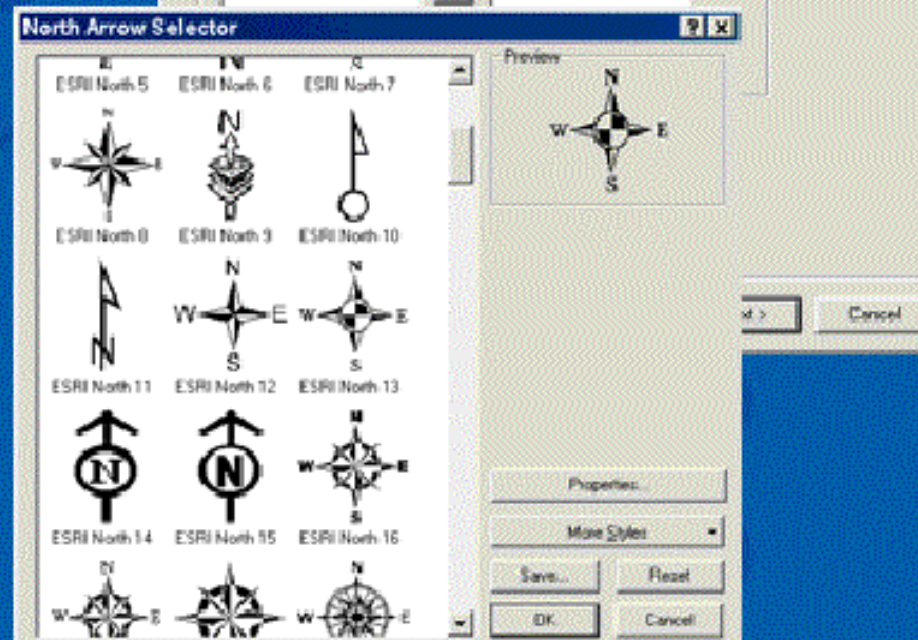
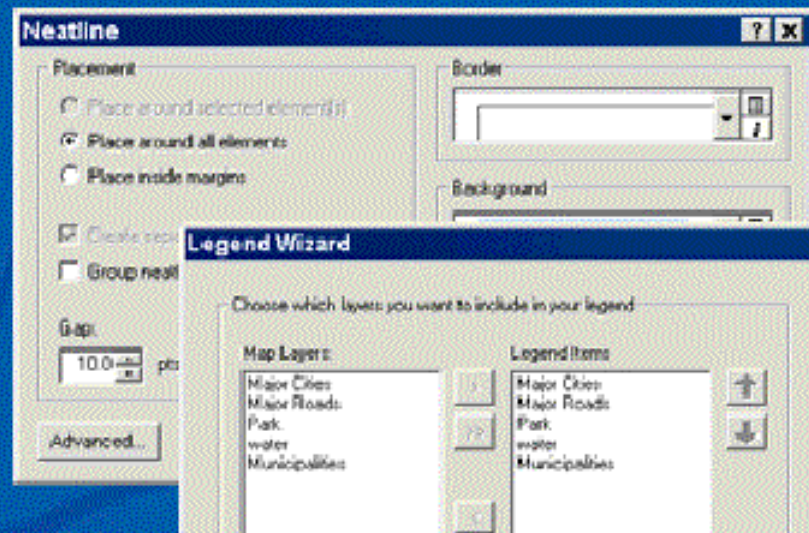
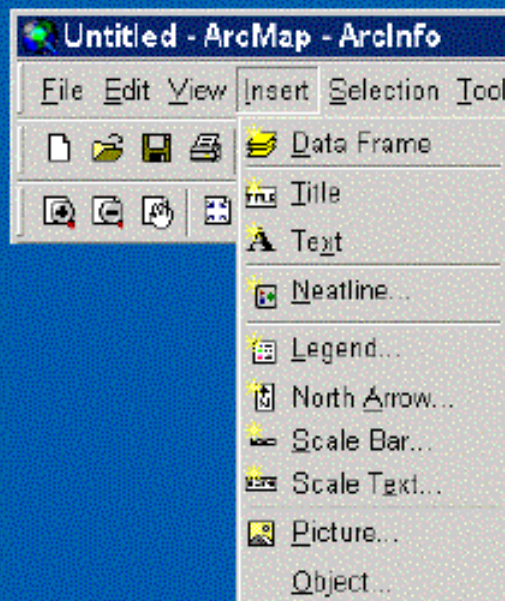
Map scale remains the same, but % of page view changes



- Additional layout settings from Tools > Options
 - Grid spacing, page layout units, rulers on/off, more...

Insert map elements

- Use Insert menu
- 'Smart' graphics
 - Maintain dynamic links to map data



e.g. Modify legend properties

- Properties for all map elements can be changed
 - Default settings may not suit your purposes

The image shows a 'Legend Properties' dialog box with several tabs: 'Legend', 'Items', 'Frame', and 'Size and Position'. The 'Legend' tab is active, showing a title 'Legend', a 'Show' checkbox, a 'Position' dropdown set to 'above', and a 'Symbol...' button. Below these are 'Patch' settings (Width: 30.6217, Height: 15.3108, Line: a solid line, Area: yellow) and 'Spacing between' settings (a table with values for title and items, items, columns, layer name and group, groups, heading and classes, and labels and descriptions). A 'Right to left reading' checkbox is at the bottom.

Annotations include:

- A 'Double-click' box with an arrow pointing to the legend box on the left.
- A 'Modify' box with an arrow pointing to the 'Legend Properties' dialog box.
- A 'New settings' box with an arrow pointing to the modified legend box on the right.

Legend

7.66638981 - 60.2418218
60.2418219 - 134.11737
134.117371 - 310.820661
310.820662 - 524.929025
524.929026 - 3814.97012

Double-click

Legend Properties **Modify**

Legend Items Frame Size and Position

Title
Legend

☐ Show Position: above Symbol...

Patch
Width: 30.6217
Height: 15.3108
Line:
Area:

Spacing between:

title and items	8.7475
items	5.47108
columns	5.47108
layer name and group	5.46816
groups	5.46816
heading and classes	5.47108
labels and descriptions	5.47108

☐ Right to left reading

OK Cancel Apply

New settings

Per sq. km

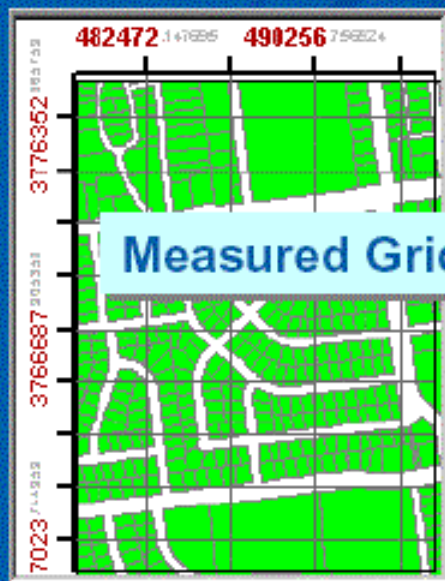
	7.66638981 - 60.2418218
	60.2418219 - 134.11737
	134.117371 - 310.820661
	310.820662 - 524.929025
	524.929026 - 3814.97012

Incorporate a reference system

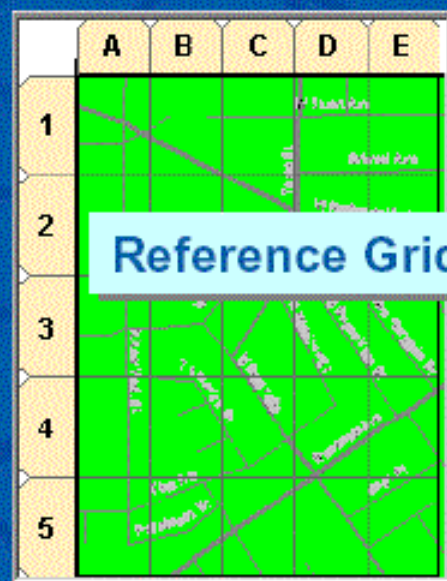
- Display reference positions on maps
- Available reference systems:



Latitude/Longitude



Map Units



ABC/123

- Use multiple graticules or grids on the same map
 - Property of each data frame

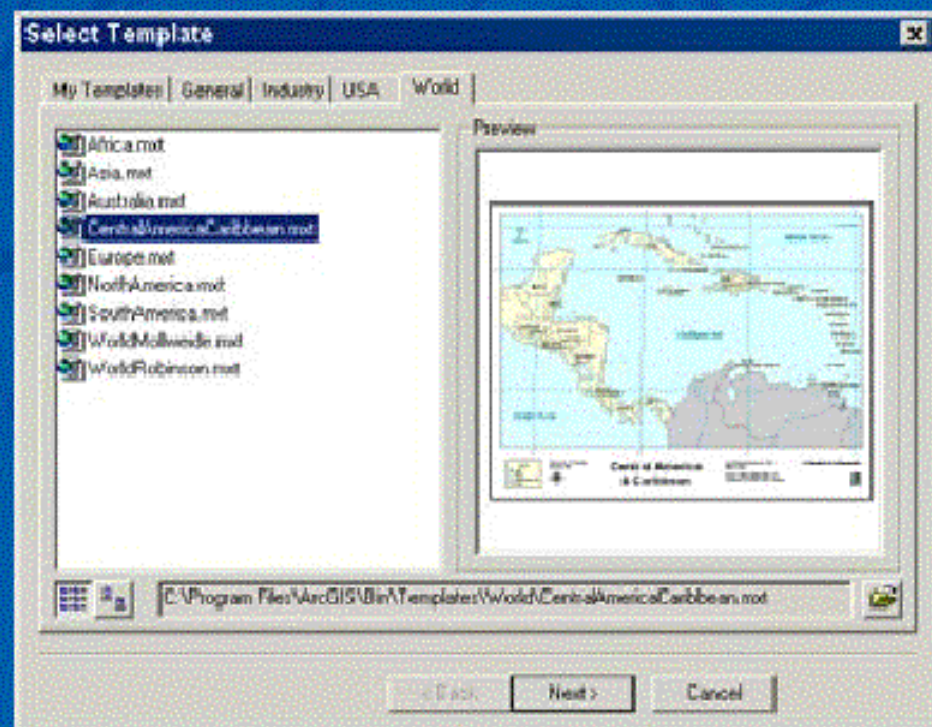
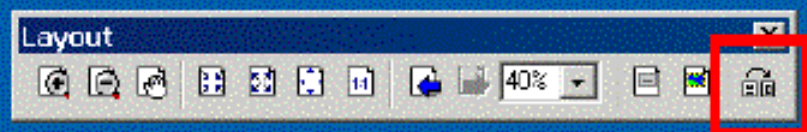
Map Text

- **Descriptive**
 - Additional feature labels or map body text
- **Analytical**
 - Tables, charts, models
- **Positional**
 - Coordinates, grids, graticules
- **Metadata**
 - Legal disclaimers, accuracy disclosures
- **Text placement can consume up to 80% of map design time**



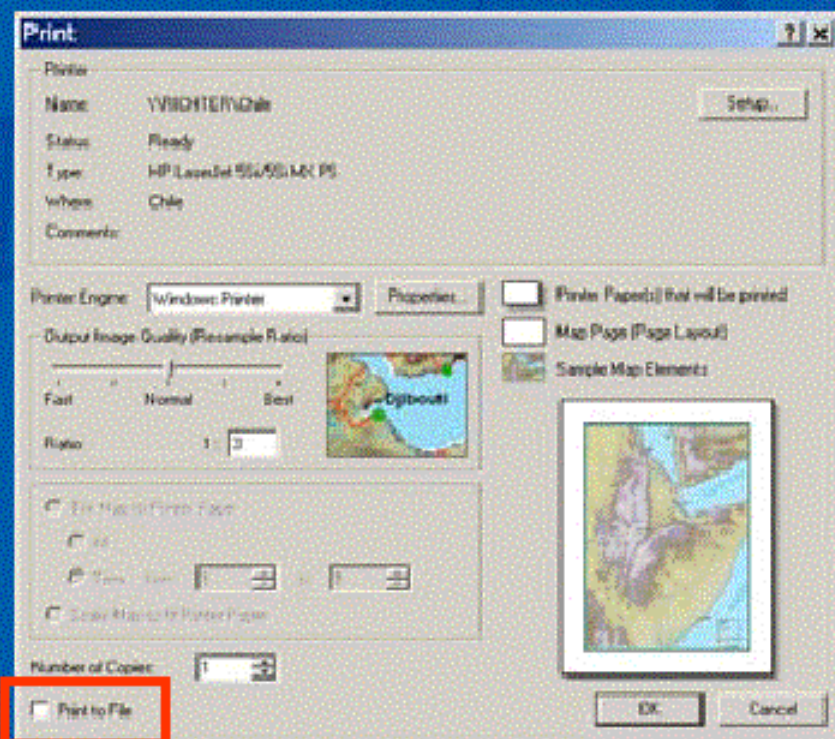
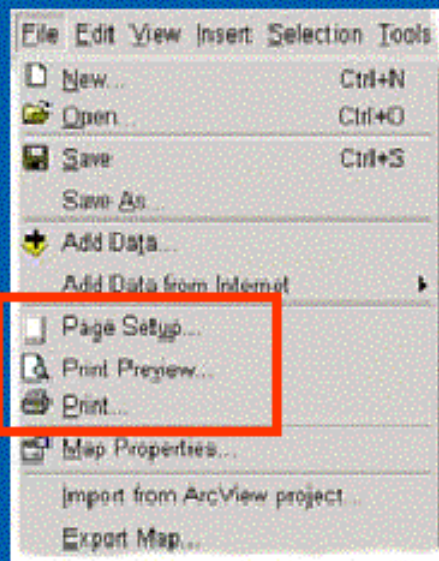
Create and use map templates

- Gives all maps in a series the same look
- ArcMap 'stock' templates
- Create your own



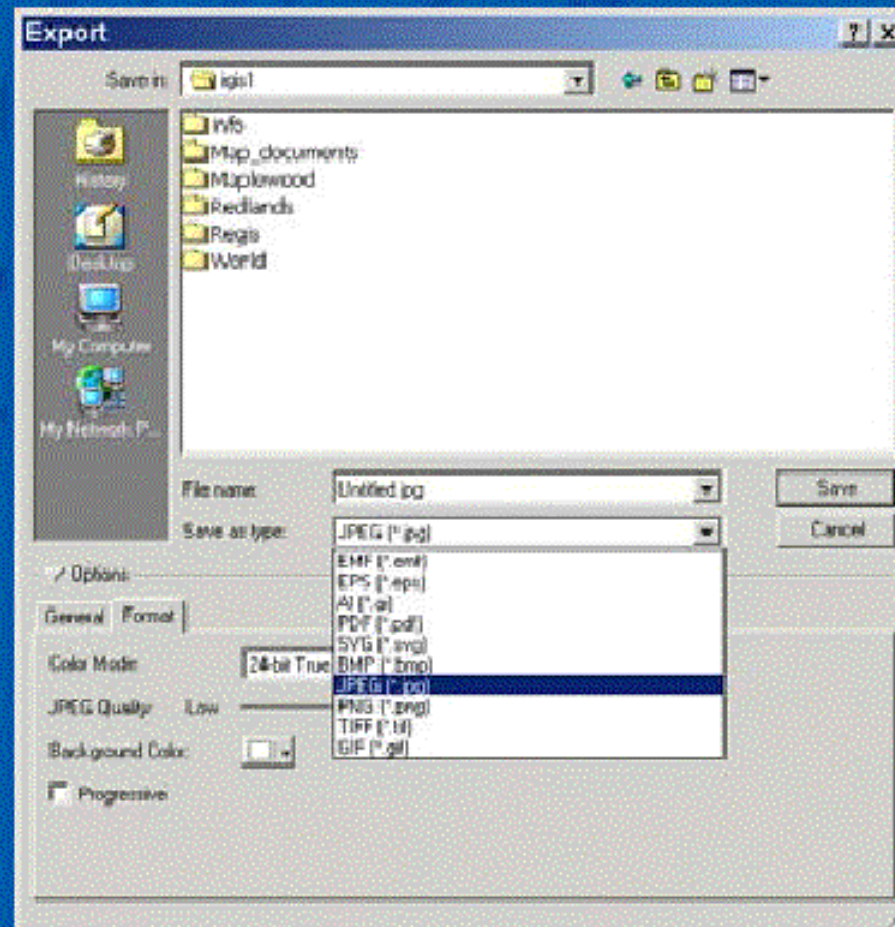
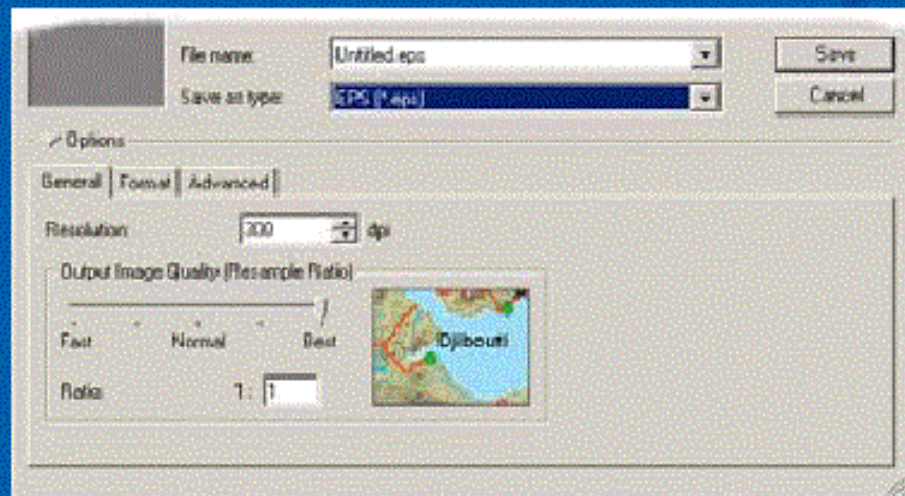
Print and plot maps

- Send document directly from ArcMap
- ArcPress will manage printer load from desktop
- Print to File



Export a map

- **Export to an image format**
 - Each format has different output options
- **Copy map to clipboard**





Software Demonstration