EnvSci 360
Computer and Analytical Cartography

Lecture 2

Data acquisition

Preparing data for mapping

Symbol editing and Styles

Data and Cartography

- Acquiring data
- Understanding data
  - Formats
  - Attributes
  - Reading metadata
- Processing and manipulating data to serve the needs of a map

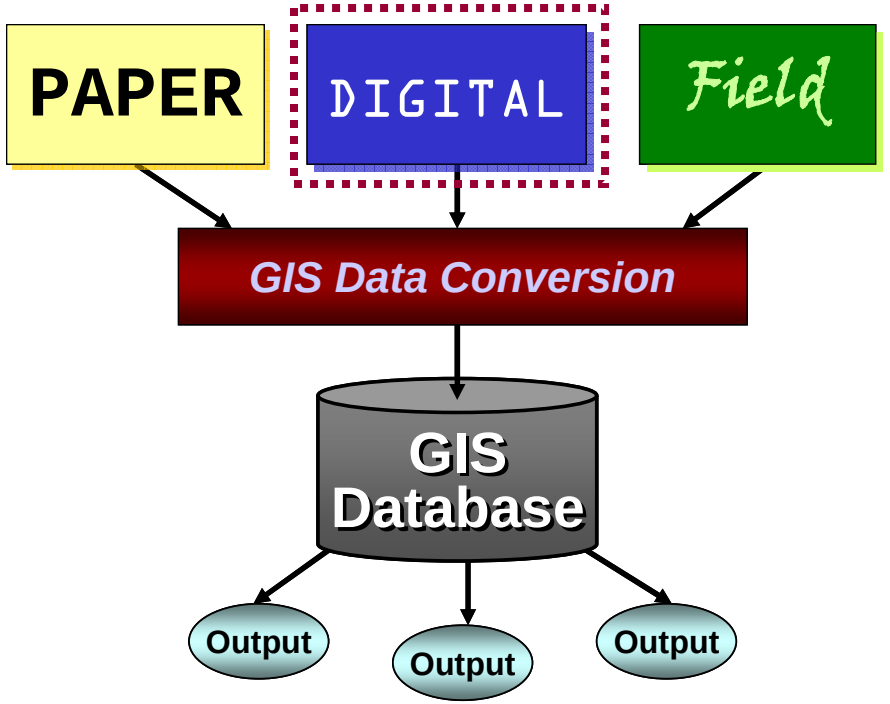
About Geographic Data

- The primary ingredients of all cartographic products
- Which data are needed comes after an analysis of the cartographic information needed by the mapmaker

Data Sources

- Paper
- Digital
- Field collection

- **In this class, we will use digital data**



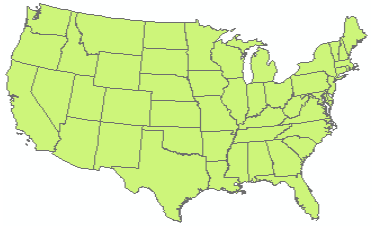
Data to map flow

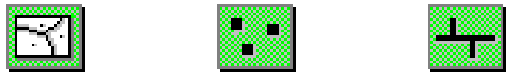
Where to Get Digital Data

- MANY sources:
  - The Web (Gov't. agencies)
    - MassGIS
    - data.gov, Census.gov, neurisa.org/state_GIS
    - Countless others (many are **free**)
  - With software
    - ESRI Data & Maps
  - Commercial providers
    - Navteq, TeleAtlas, etc.
    - See http://www.colorado.edu/geography/gcraft/notes/sources/sources_f.html

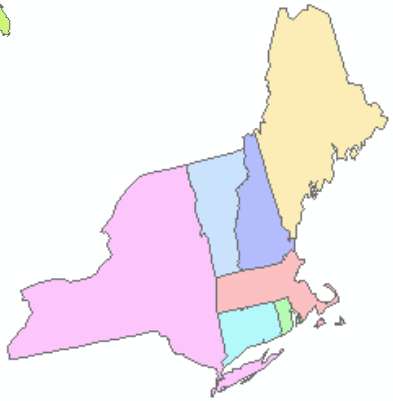
Data Formats We Will Use

- Shapefiles

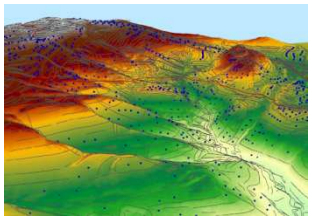




- Geodatabase feature classes

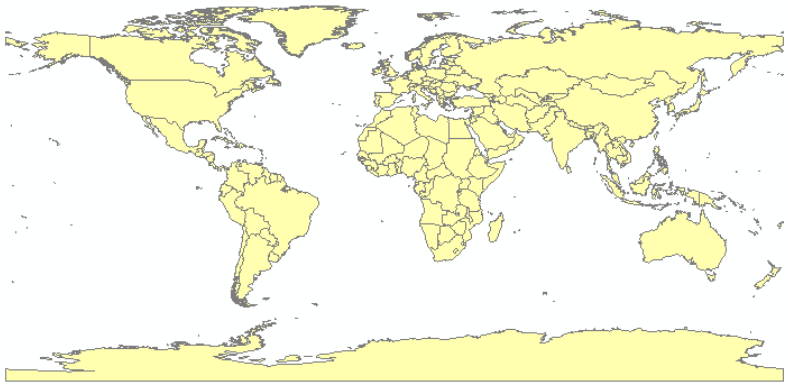


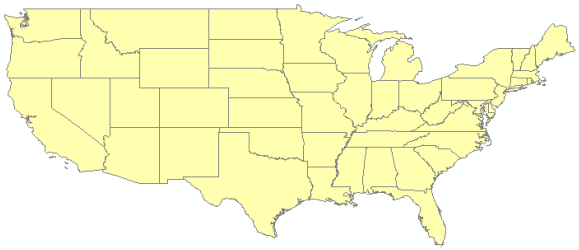
- Raster datasets
  - MrSID, JPEG, JPEG 2000, Imagine, Tiff, GeoTiff, GRID…

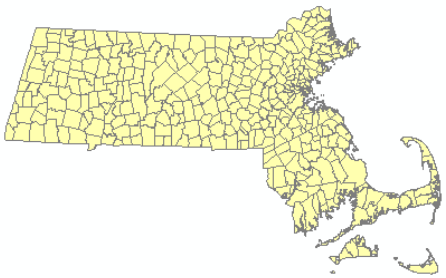


Data Processing

- ***Why process or work on data before you map it?***



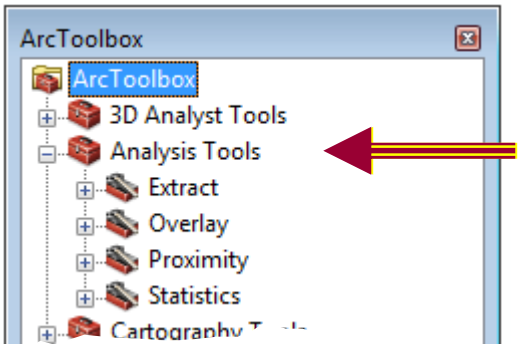


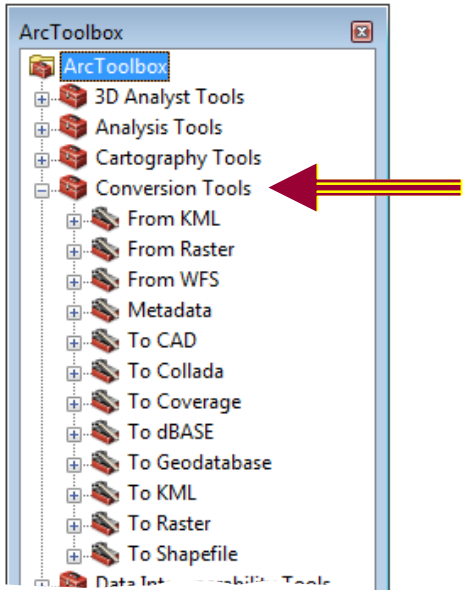


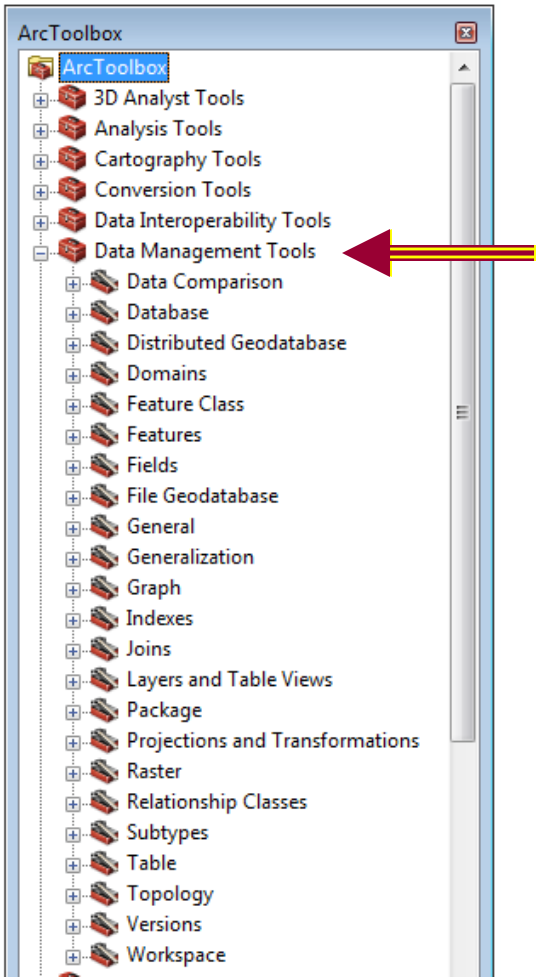
Data Processing

Use ArcToolbox tools

- **Preparation often needed to fulfill your mapping needs**
  - Clip, Merge, Dissolve, Convert, Project, Overlay, etc.
  - Modify attribute table
    - Add fields, calculate values, etc.

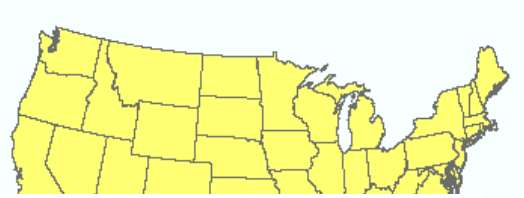


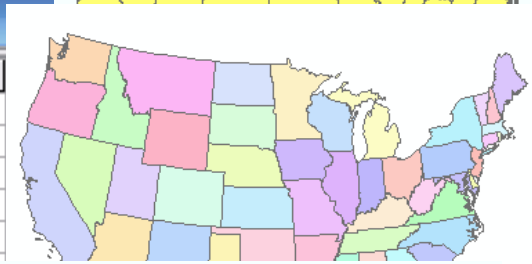


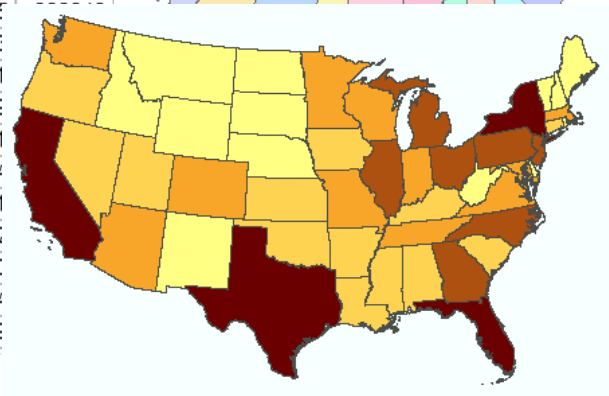


Why Attributes Matter

- ***Why is it important for a cartographer to understand the attribute table behind the geometry?***





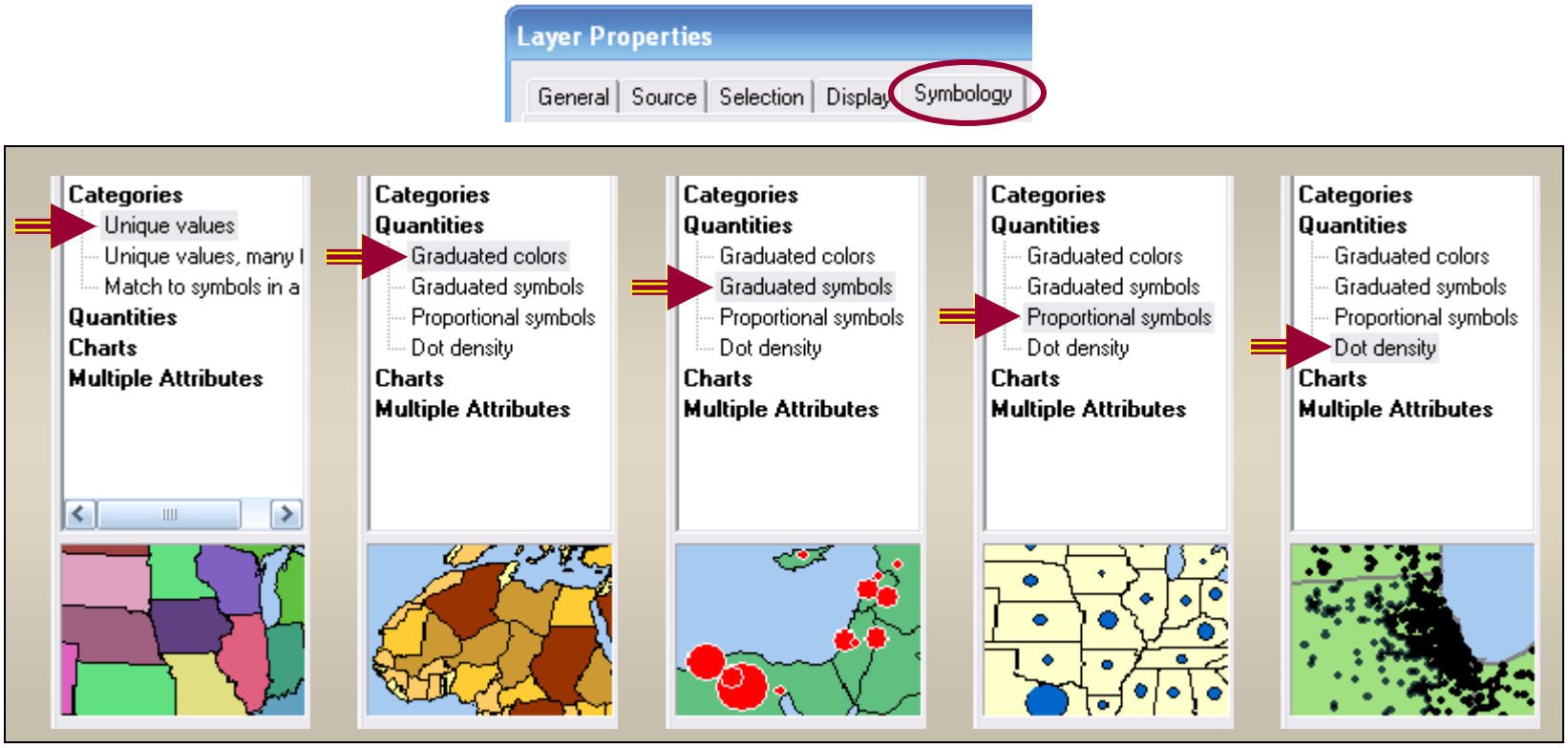


Attributes of States

STATE_NAME	STATE_ABBR	SQMI	POP2000	POP2007	WHITE	BLACK
Alabama	AL	51716	4447100	4663715	3162808	1155930
Arizona	AZ	113713	5130632	6363799	3873611	158873
Arkansas	AR	52913	2673400	2889091	2138598	418950
California	CA	157776	33871648	37483448	20170059	2263882
Colorado	CO	104101	4301261	4883413	3560005	165063
Connecticut	CT	4977	3405565	3556875	2780355	
Delaware	DE	2055	783600	880458	584773	
District of Columbia	DC	66	572059	591318	176101	
Florida	FL	55815	15982378	18893813	12465029	
Georgia	GA	58629	8186453	9654958	5327281	
Idaho	ID	83344	1293953	1513708	1177304	
Illinois	IL	56299	12419293	13122246	9125471	
Indiana	IN	36400	6080485	6413133	5320022	
Iowa	IA	56258	2926324	3030140	2748640	
Kansas	KS	82197	2688418	2811114	2313944	
Kentucky	KY	40320	4041769	4258898	3640889	

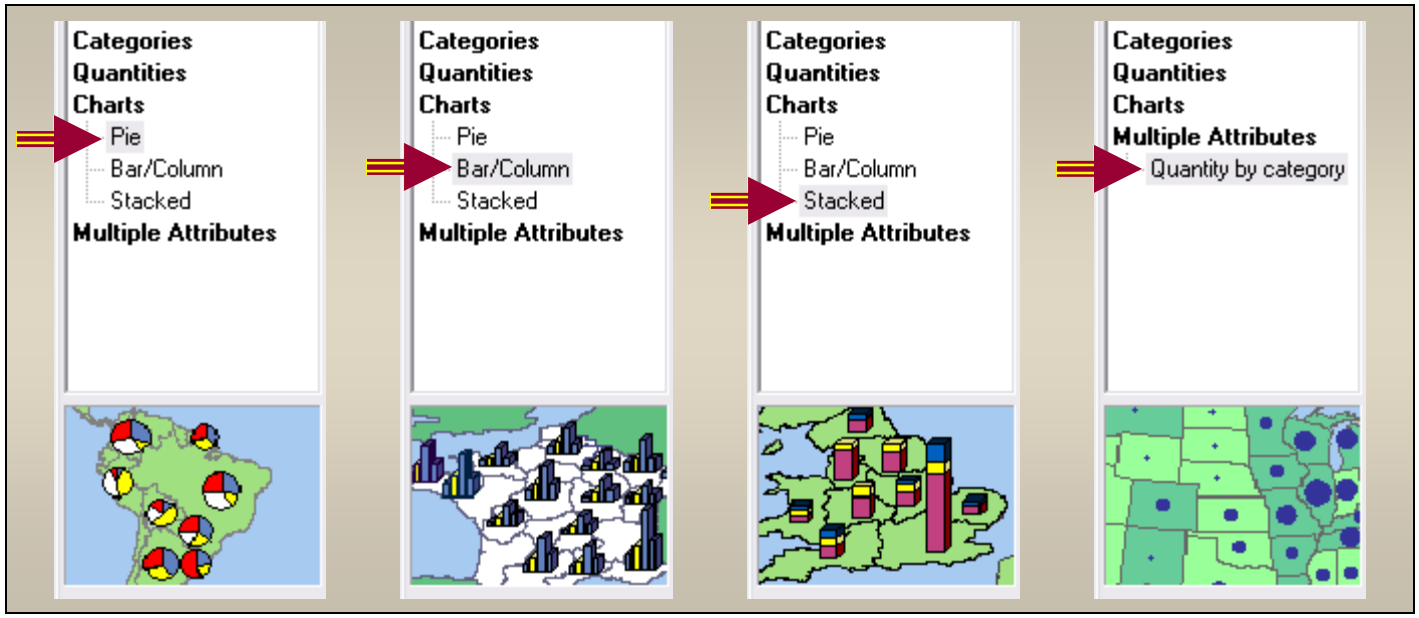
Why Attributes Matter

- **Cartographic symbolization is usually based on attributes**
  - How you distinguish one feature from another



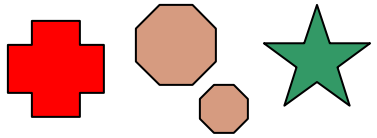
Why Attributes Matter

- **Patterns and information emerge when basing symbology on data attributes**
  - Categories, qualities, quantities, ranges, multivariate mapping, normalization, statistics and joins, etc.

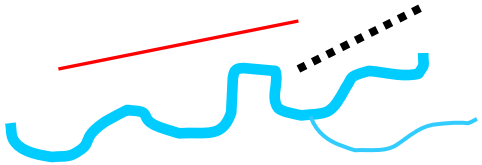


From Data to Map Symbols

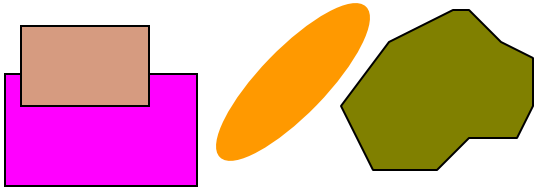
Basic elements and primary variables



Points, with different hues and sizes

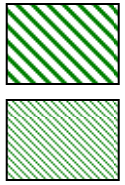


Lines, with different hues, widths, and styles

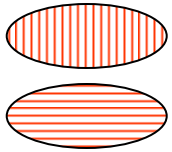


Areas, with different hues, sizes, orientation, and shapes

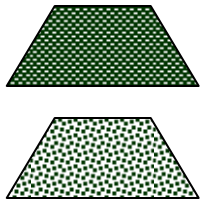
Secondary visual variables



Texture



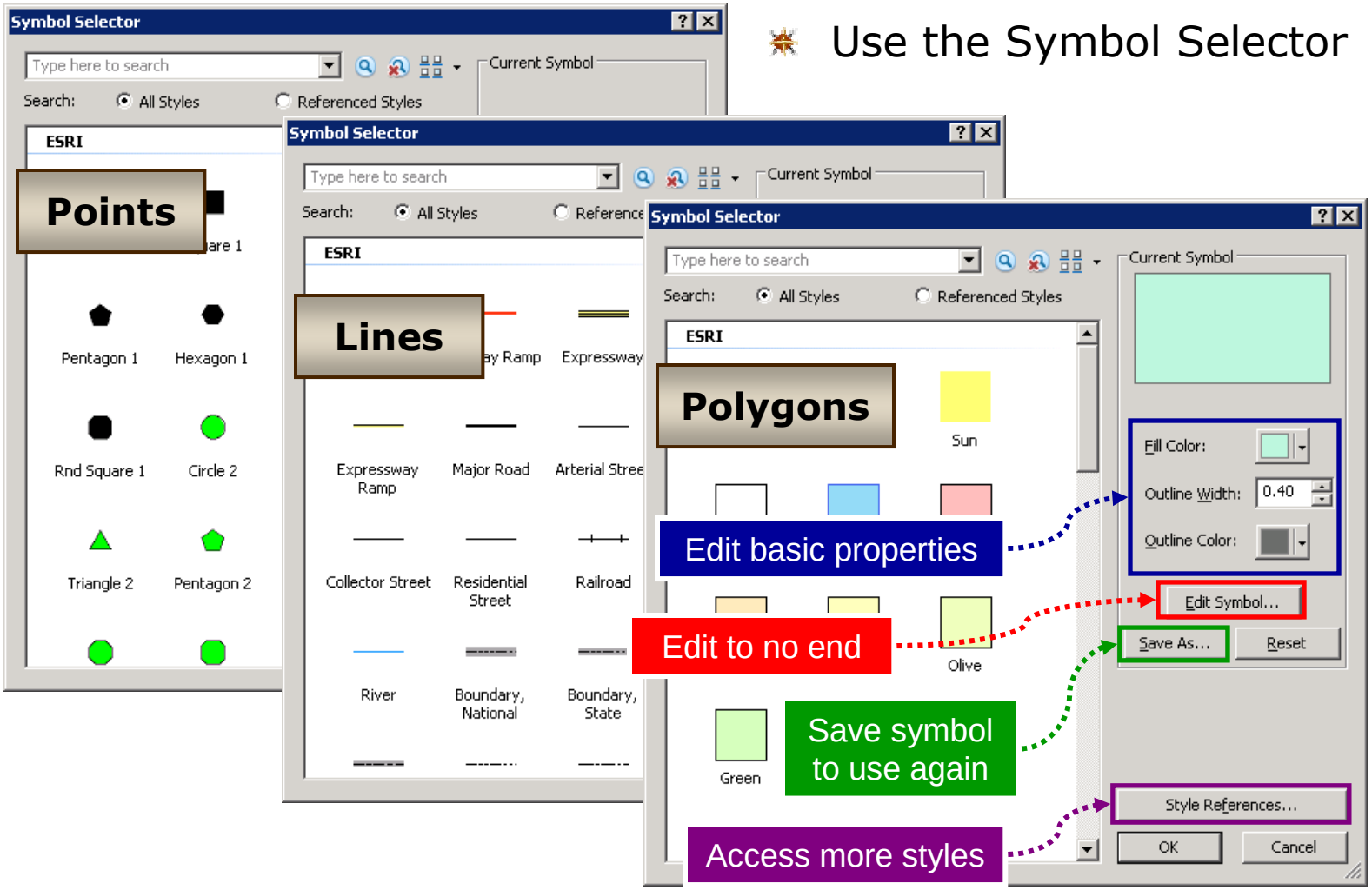
Orientation



Arrangement

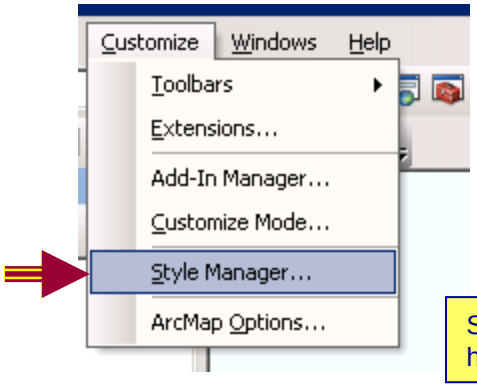
Modifying Map Symbols

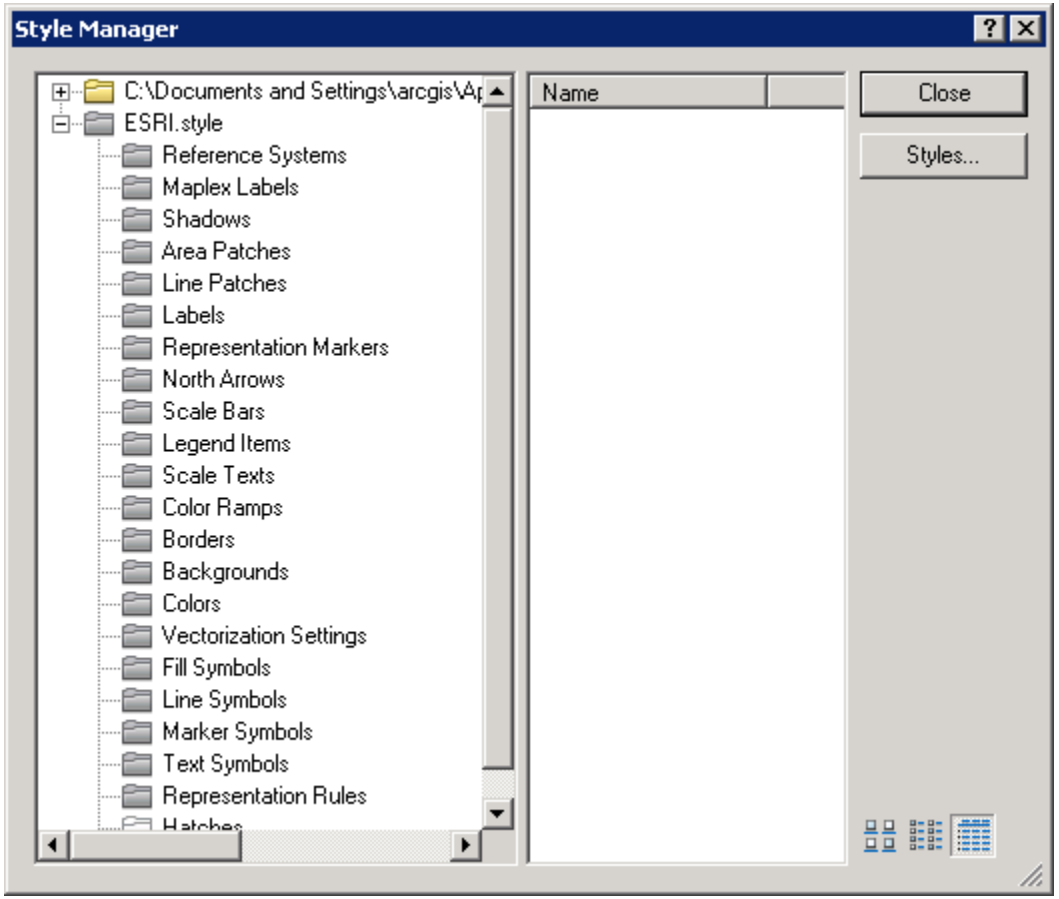
- Use the Symbol Selector



Style Manager

- Organize styles and their contents (symbols and map elements).





See “Managing style contents” in ArcGIS Desktop Help:
http://desktop.arcgis.com/en/arcmap/latest/map/styles-and-symbols/managing-style-contents.htm