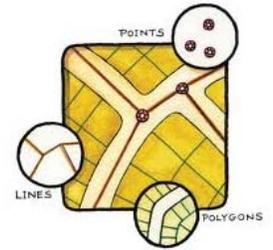


S Y M B O L O G Y



Symbology

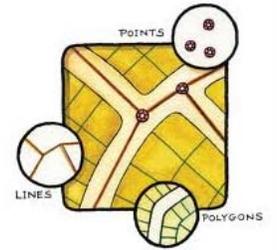


Session Objectives:

At the conclusion of this session, you will be able to:

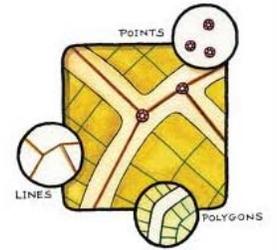
- Develop symbols that aid users in visualizing the “real world”
- Identify and apply the 4 levels of measurement used to describe real world phenomena.

Cartographic Symbolology



Features of the real world are symbolized on maps as points, lines, and polygons.

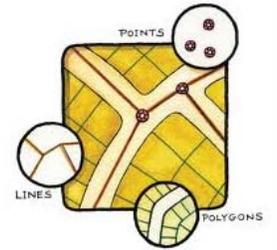
Visualizing the “Real World”



Google Street View



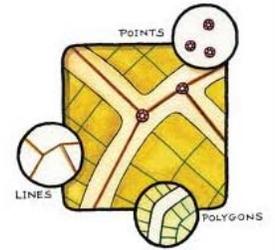
Visualizing the “Real World”



A perspective view, but still the “Real World” – Bird’s Eye View (Bing)

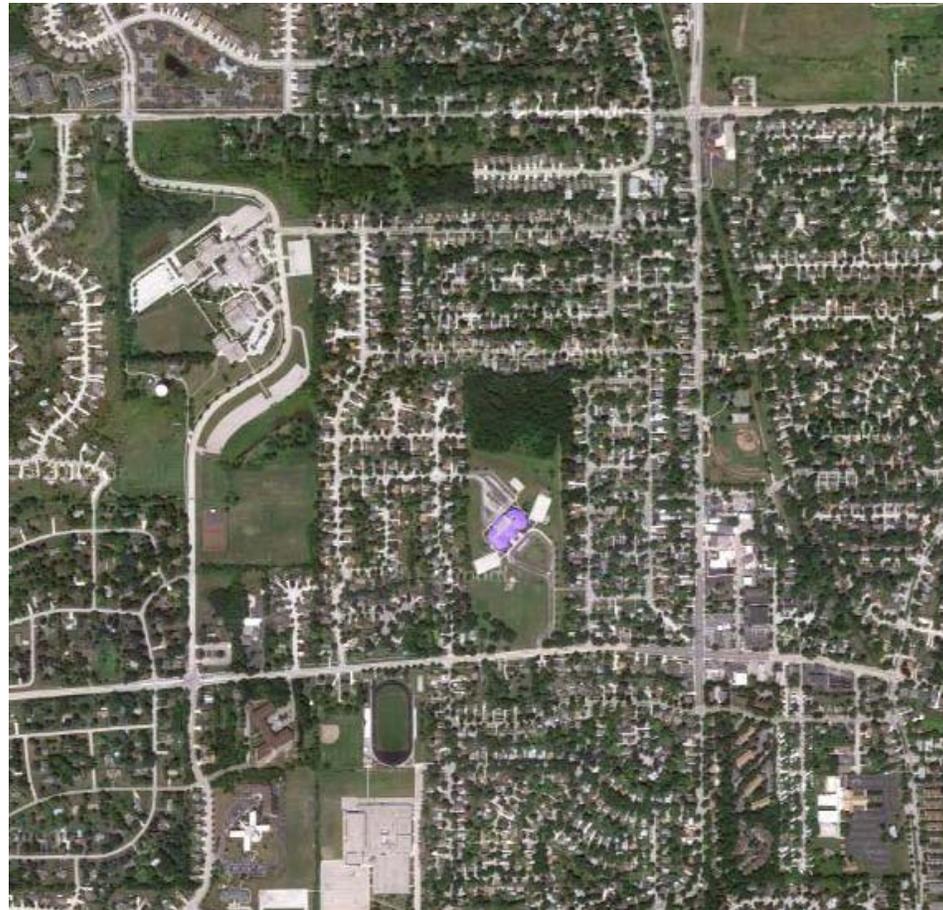


Visualizing the “Real World”

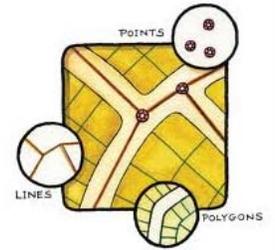


Overhead
aerial view of
same area.

Still “Real
World”, but
from another
perspective.

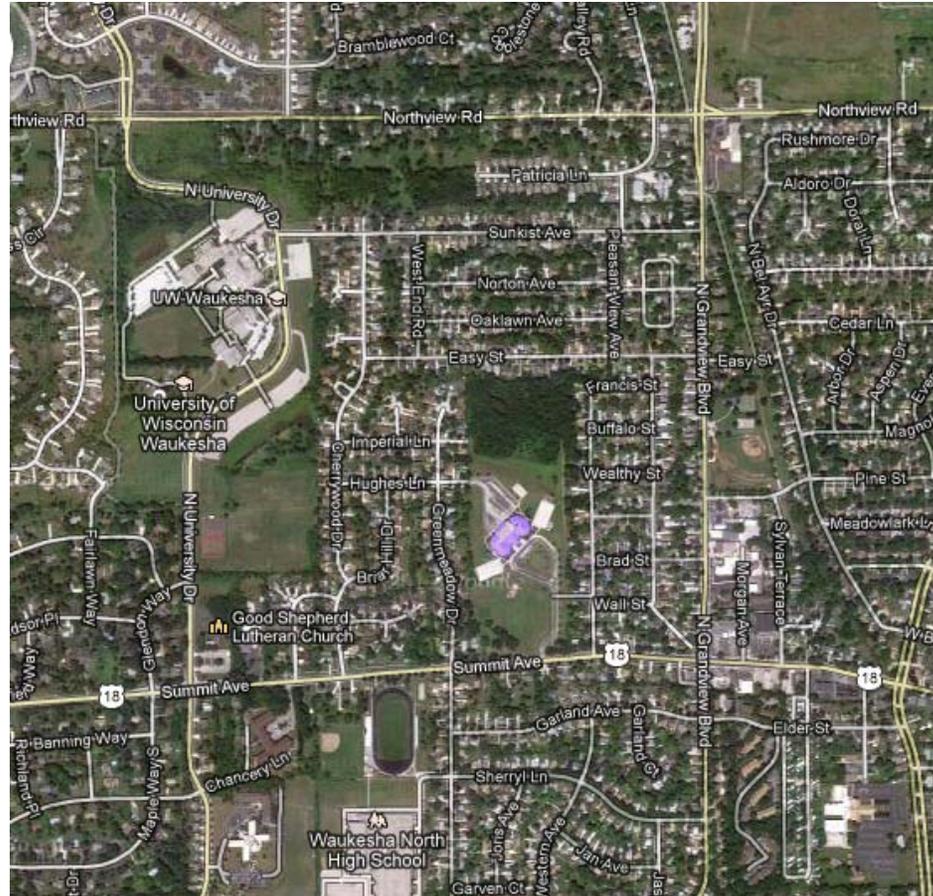


Visualizing the “Real World”

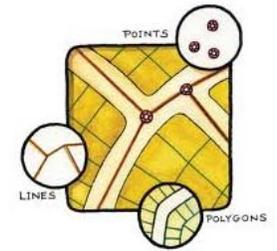


Same overhead aerial view, but with the addition of lines and labels (type).

Still “Real World”, but with a touch of cartography.

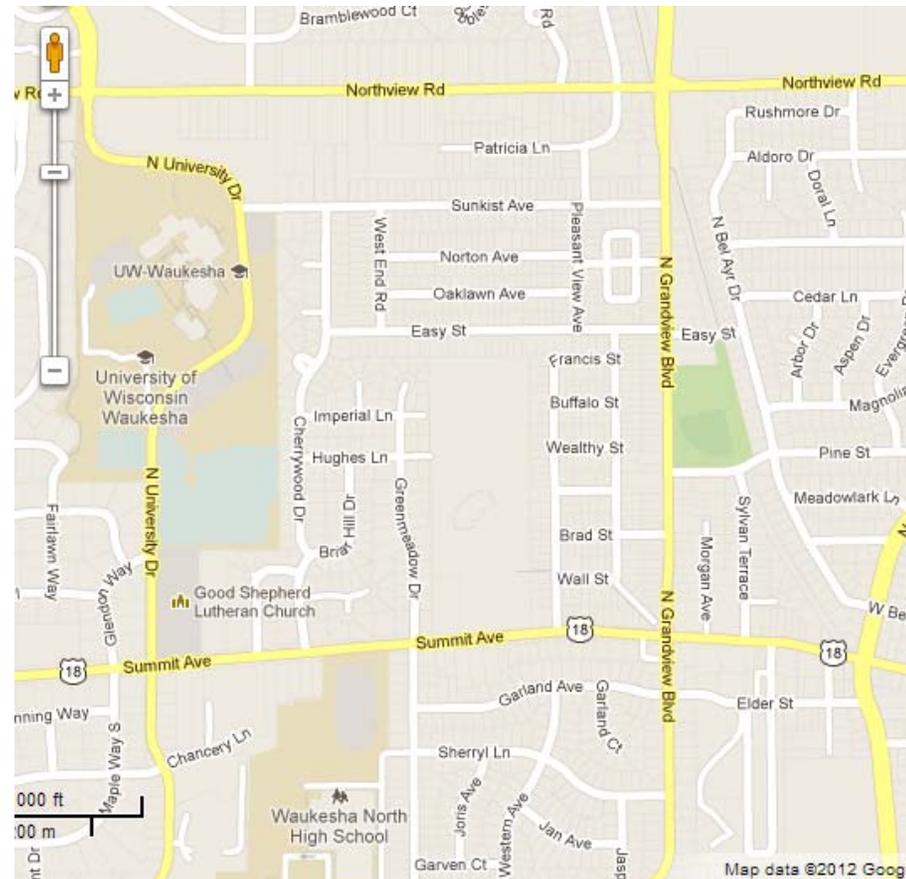


Visualizing the “Real World”

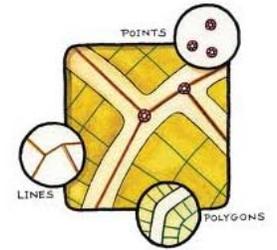


Same view as previous, but with aerial photography removed.

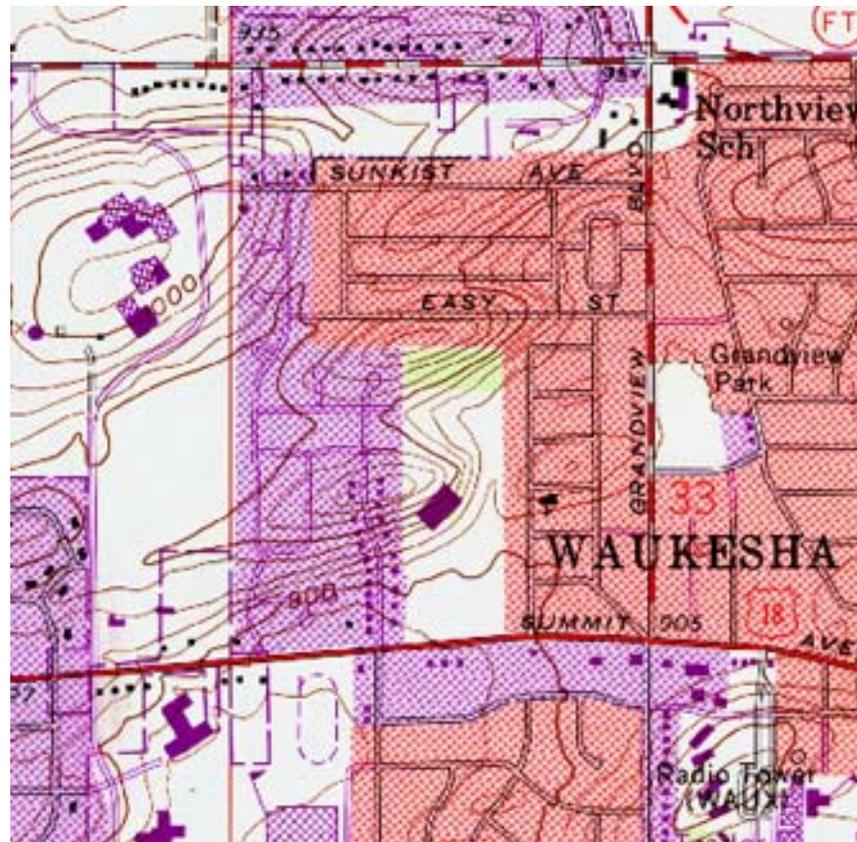
No longer “Real World”, but a cartographic representation of the “Real World”.



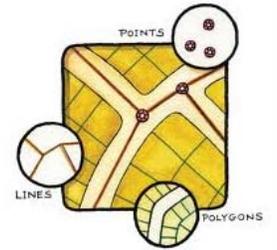
Visualizing the “Real World”



Another cartographic representation of the same area in the “Real World”.

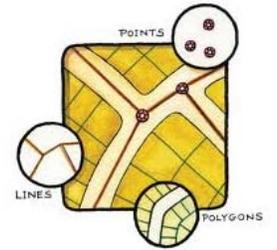


Cartographic Symbolology



As cartographers reduce the world to points, lines, and polygons, they use a variety of visual resources that will best convey the message they want to relate to the map user.

Cartographic Symbolology



shape

hue

orientation

The Cartographer's
Visual Resources

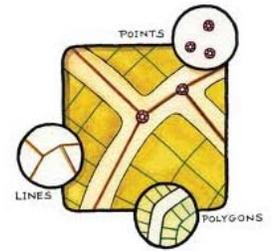
value

size

texture

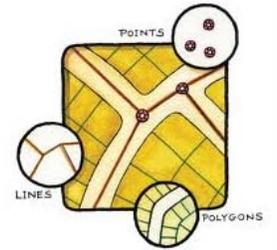
ILC

Strategies for Symbolization



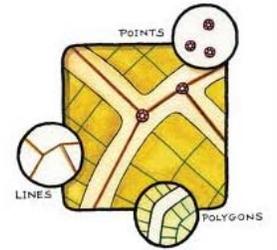
- Strategies vary greatly depending upon the nature of the phenomena being mapped
- There are **4** levels of measurement used to describe these real world phenomena
 - Nominal
 - Ordinal
 - Interval
 - Ratio

Nominal data



Grouped into a category based upon a qualitative consideration; **do not imply rank** (a road distinguished from a river, a forest from a field, etc.)

Nominal data symbology

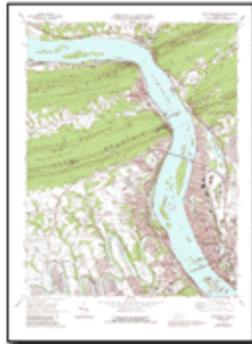
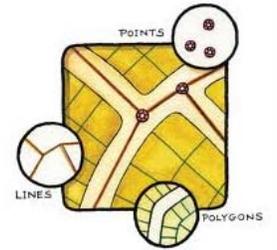


Nominal Data

Point	airport 	town 	mine 	capital 
Line	river 	road 	boundary 	pipeline 
Area	orchard 	desert 	forest 	water 

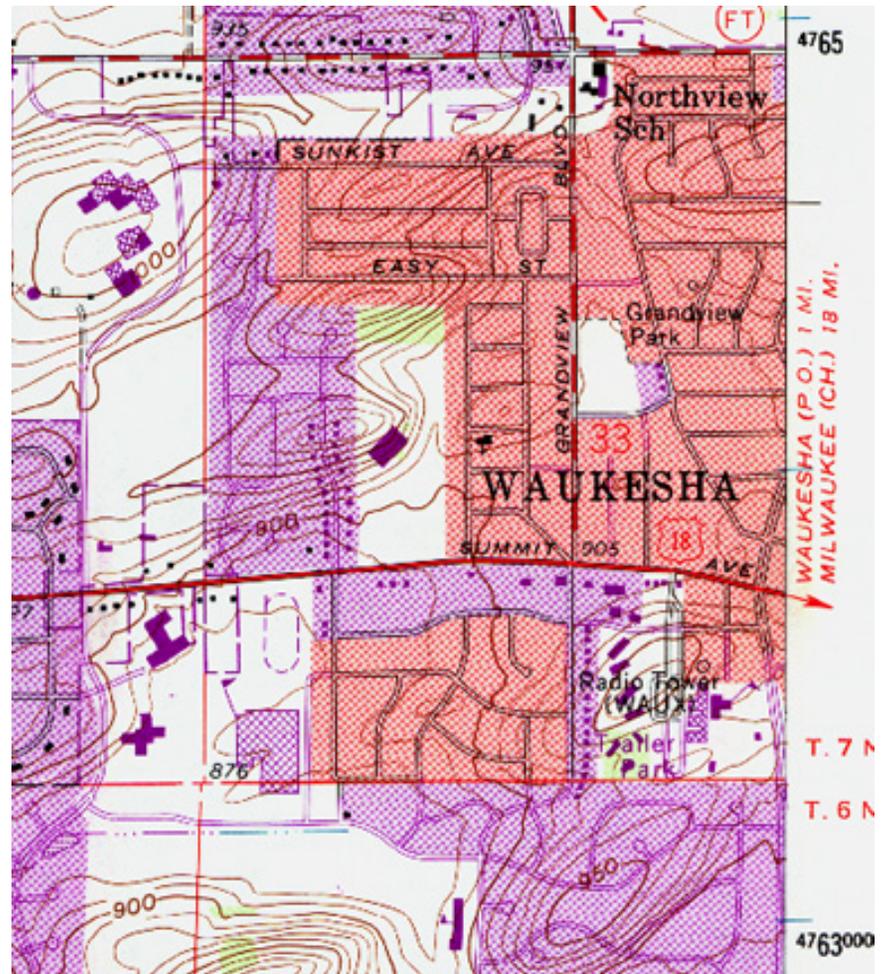
Nominal data symbology

Examples

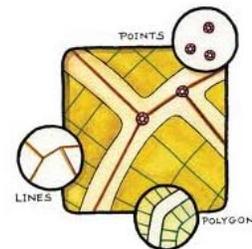


7.5-minute DRG

Primary highway, hard surface	
Secondary highway, hard surface	
Light-duty road, hard or improved surface	
Unimproved road	
Trail	
Railroad: single track	
Railroad: multiple track	
Bridge	
Drawbridge	
Tunnel	
Footbridge	
Overpass—Underpass	
Power transmission line with located tower	
Landmark line (labeled as to type)	TELEPHONE

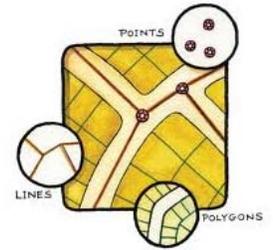


Ordinal data

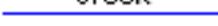


Provide information about rank or hierarchy using a quantitative (relative) measure (small, medium, large city; low, medium, high-quality); **do not have specific numerical values.**

Ordinal data symbology

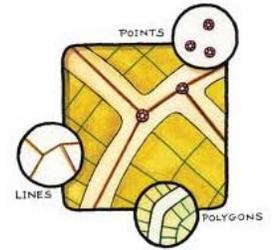


Ordinal Data

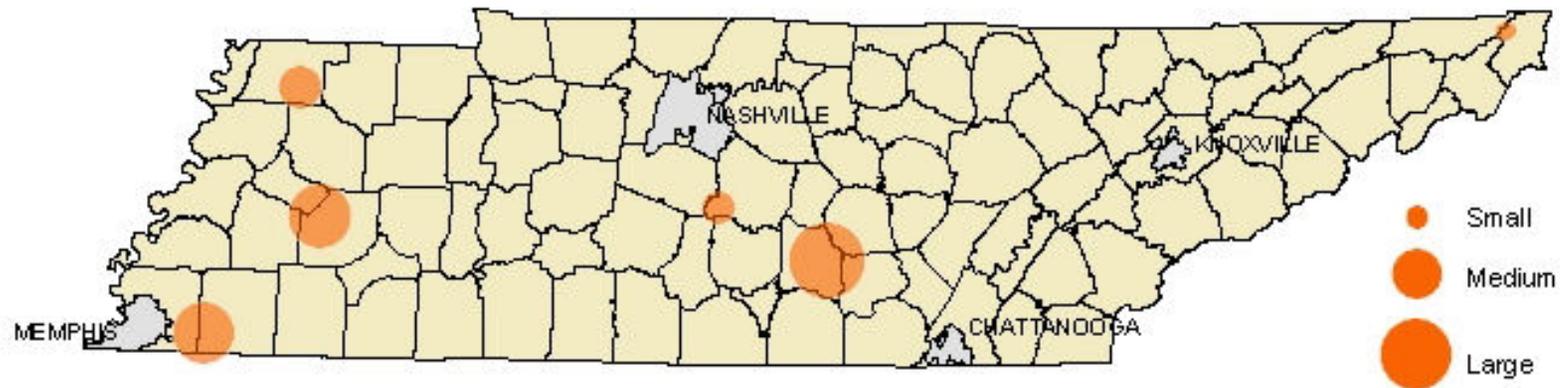
Point	Airports  international  national  regional	Oil well production  high  medium  low	Populated places  large  medium  small
Line	Roads expressway  major  local 	Drainage river  stream  creek 	Boundaries international  provincial  county 
Area	Soil quality  good  fair  poor	Cost of living  high  medium  low	Industrial regions  major  minor

Ordinal data symbology

Examples

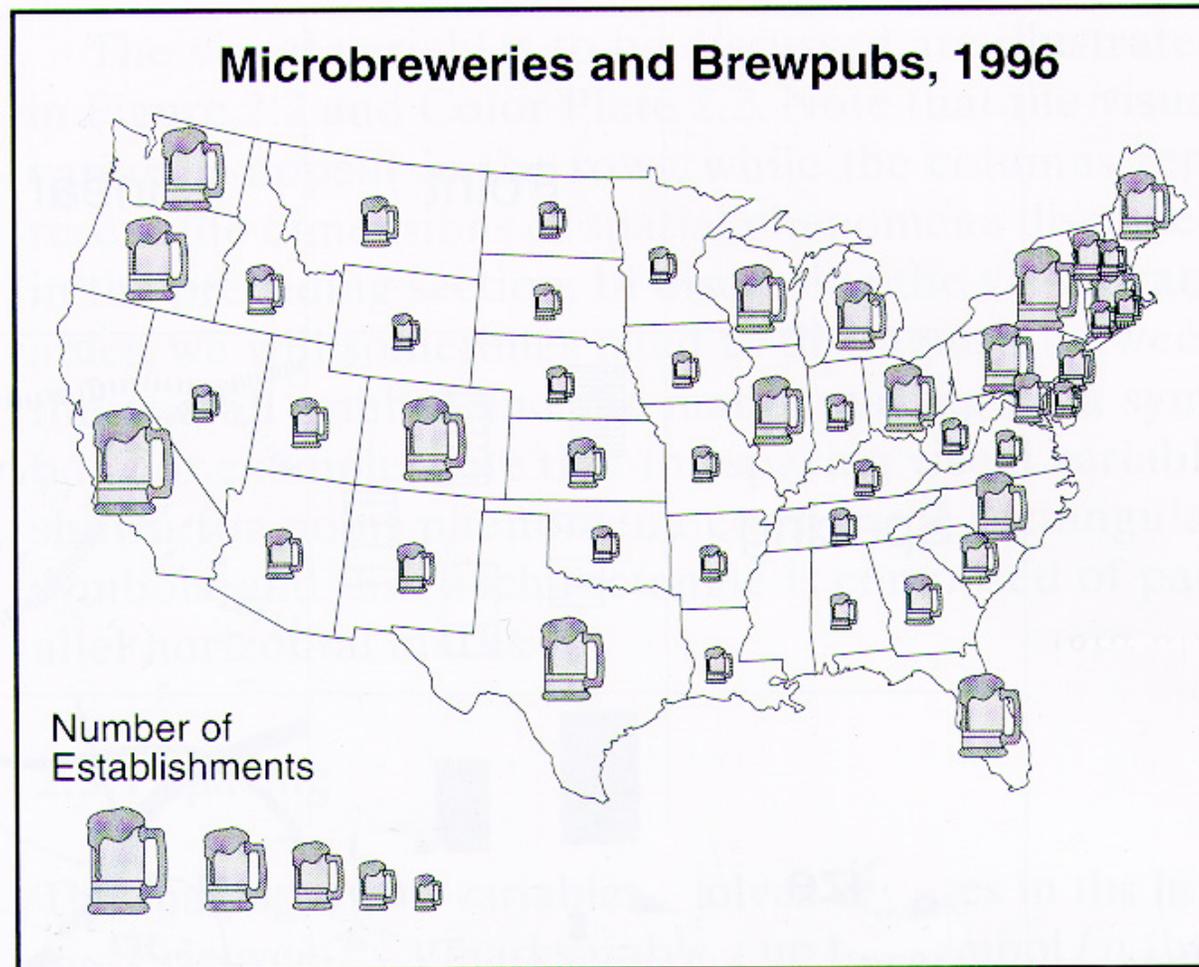
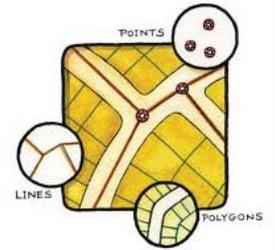


Tennessee Wetland Mitigation Banks

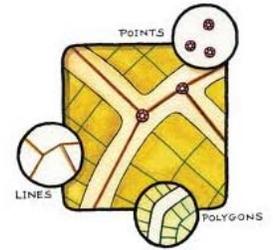


Ordinal data symbology

Examples



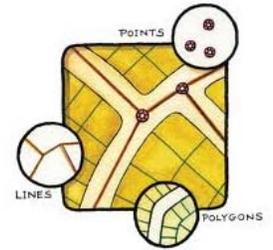
Interval / Ratio (continuous) data



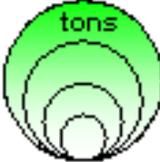
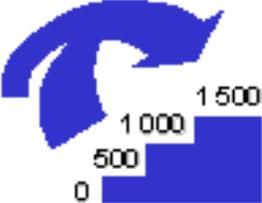
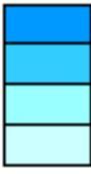
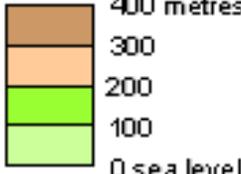
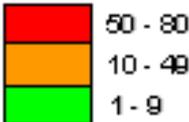
Interval data, in addition to being ranked, include numerical values; possible to calculate the difference between ranks expressed in a standard unit (temperature).

Like interval data, ratio data can be arranged along a scale, but it has a non-arbitrary zero-point (population, elevation above sea level, precipitation).

Interval/Ratio data symbology

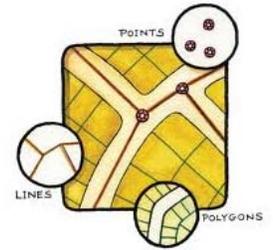


Interval and Ratio Data

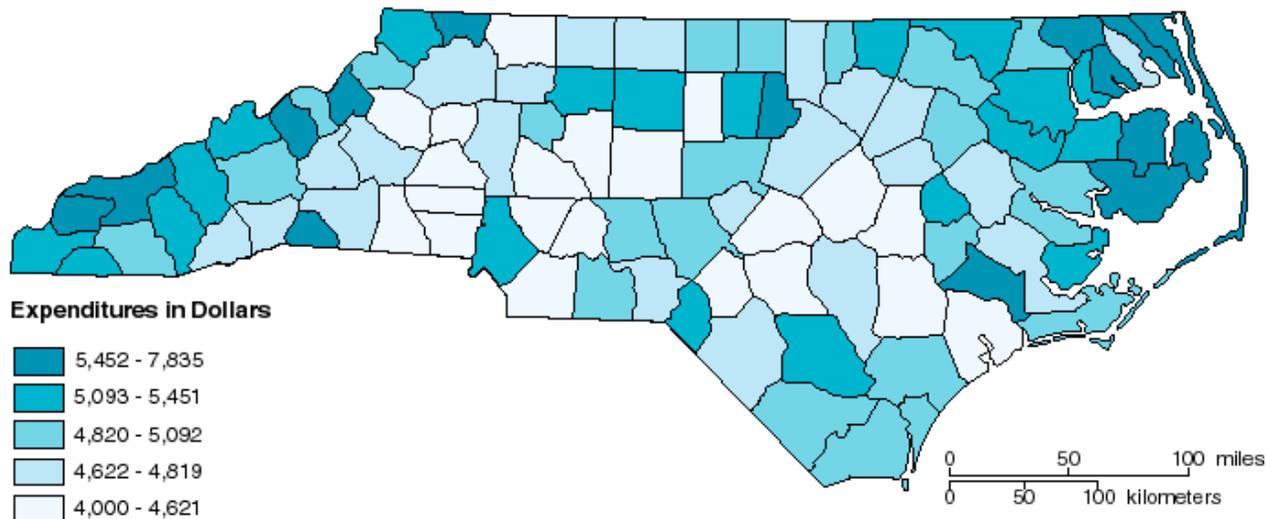
Point	Election results % of votes 	Mineral production tons 	Populated places 
Line	Roads: load capacity over 10 tons  5 - 10 tons 	Stream flow 	Elevation 
Area	Precipitation 	Elevation 	Population density Persons / km ² 

Interval data symbology

Examples



Per Pupil Expenditure for Public Education in North Carolina, 1994-1995

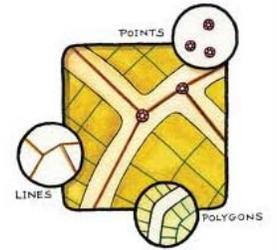


Source: NC Department of Public Instruction, *Statistical Profile*, 1996.

Shown here is an example of a single-hue graded series for a 5-class choropleth map. Single-hue series' really work better for 4 or fewer classes but a single hue can be "stretched" to 5 distinct value/chroma steps by varying the percentage of the hue, and decreasing the value (adding black) of the hue for the highest data class. Percentages shown here are: 8, 24, 48, 80, and 100% Cyan with 10% Black added to the 100% Cyan. Percentages will vary depending on the hue used. Green works well for a 5-class single-hue graded series. Magenta, red, orange and brown can also form 5-class single hue series' but yellow would not work well.

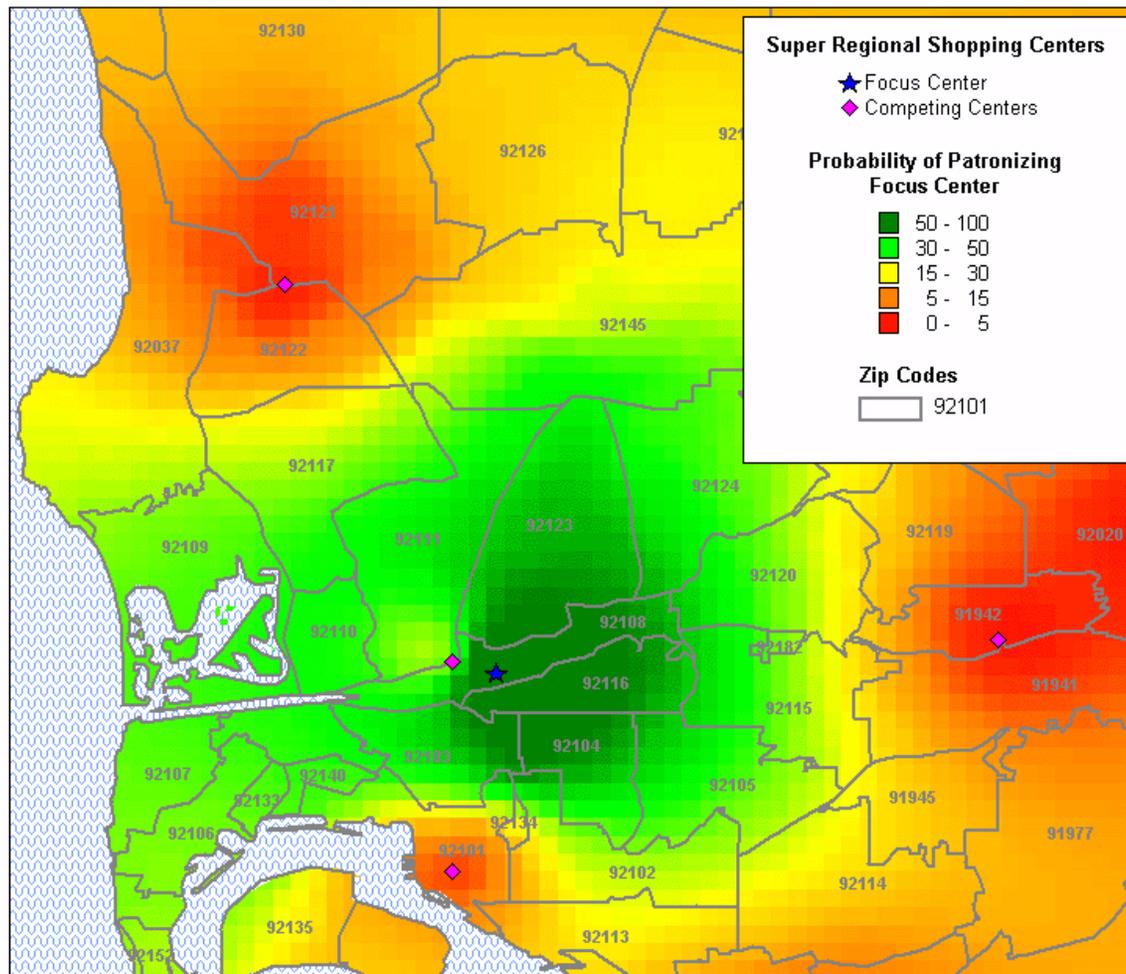
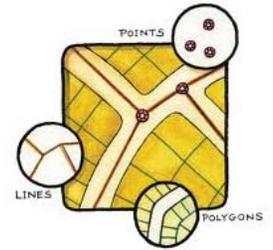
Ratio data symbology

Examples



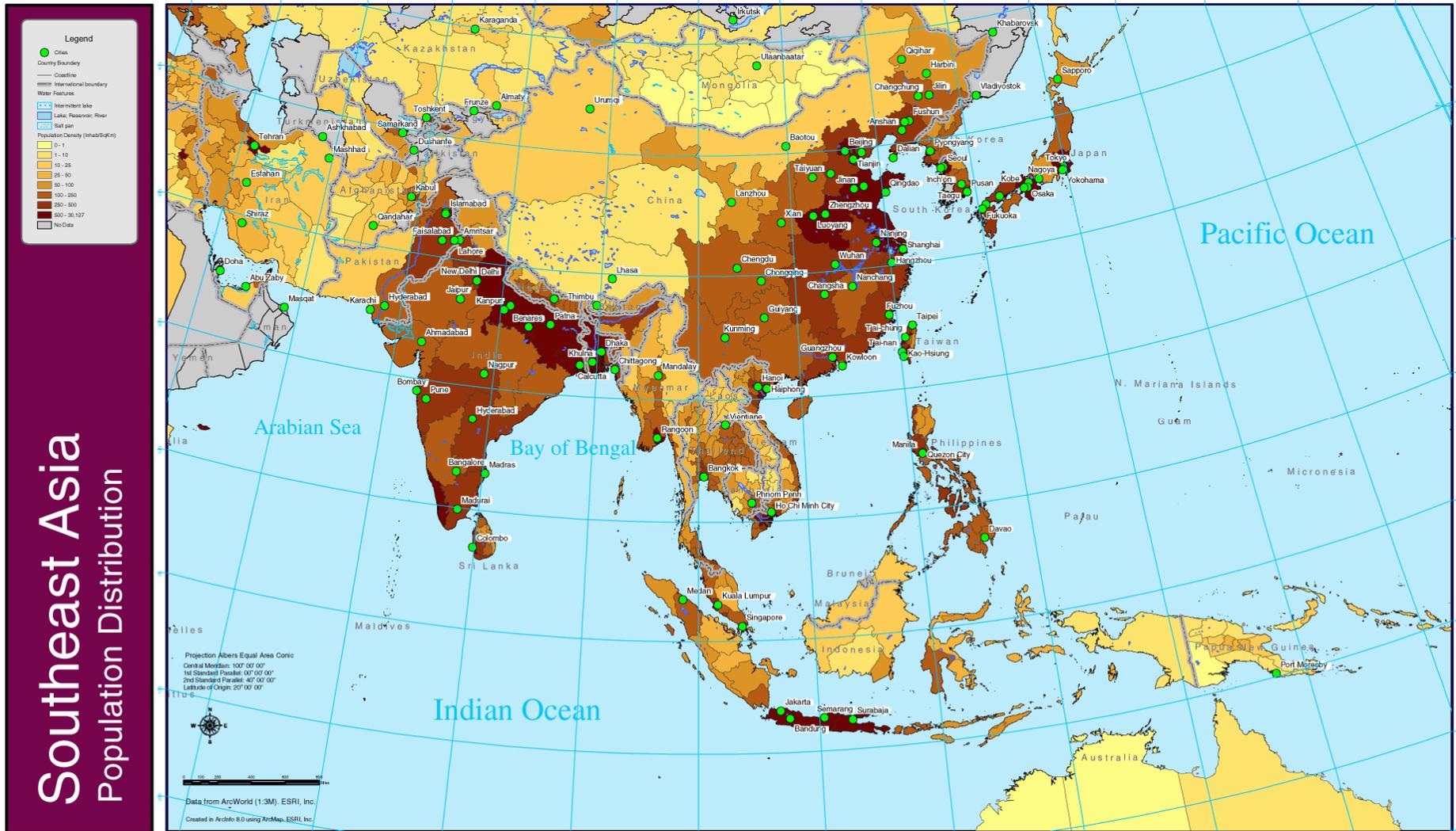
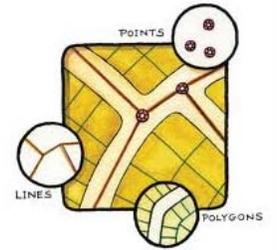
Interval data symbology

Examples

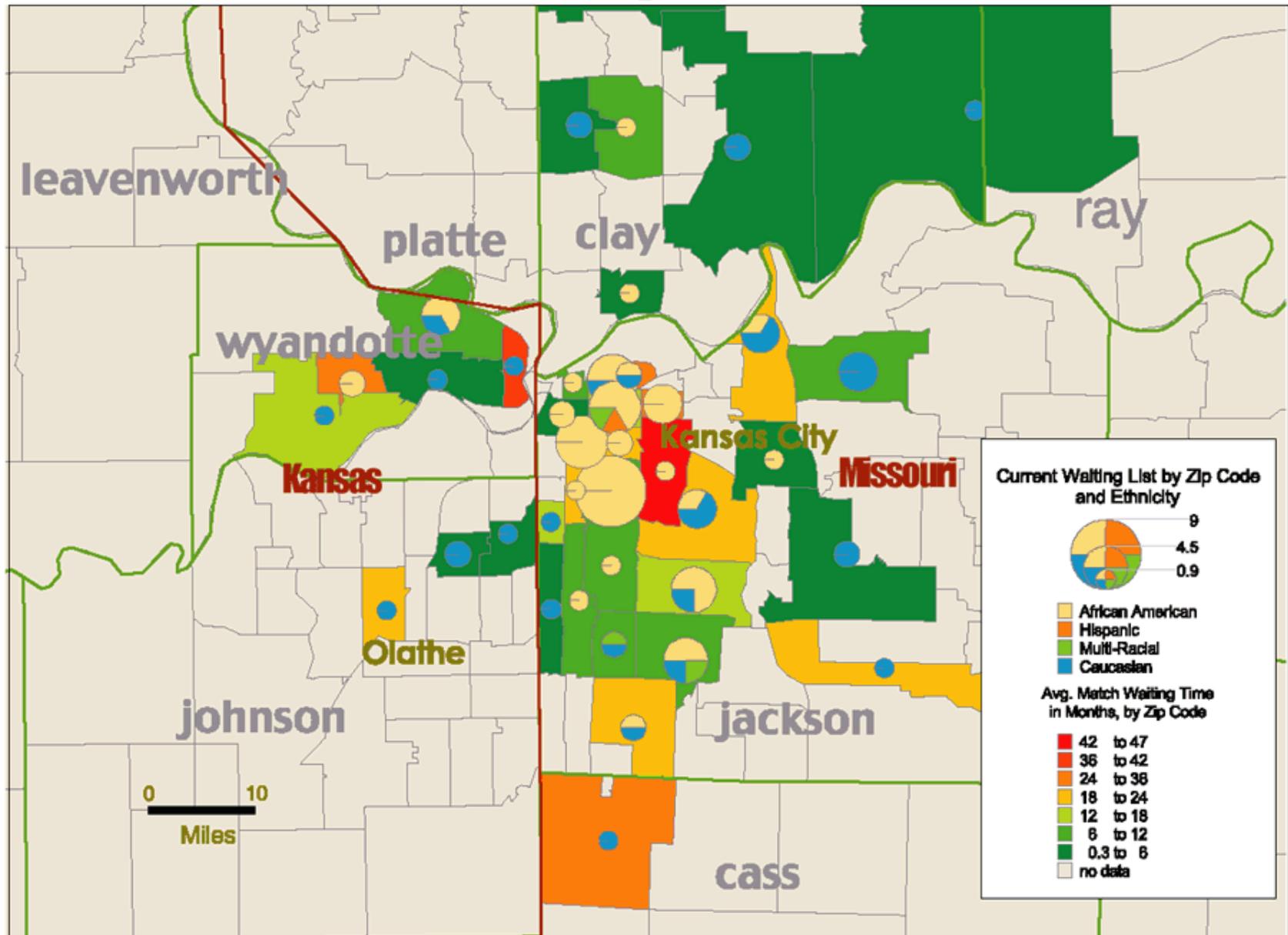


Ratio data symbology

Examples



Big Brothers Big Sisters of the Greater Kansas City Area Little Brother Waiting List as of March 1999



Nominal
Ordinal
Interval
Ratio

