

Principles of Cartographic Symbolization

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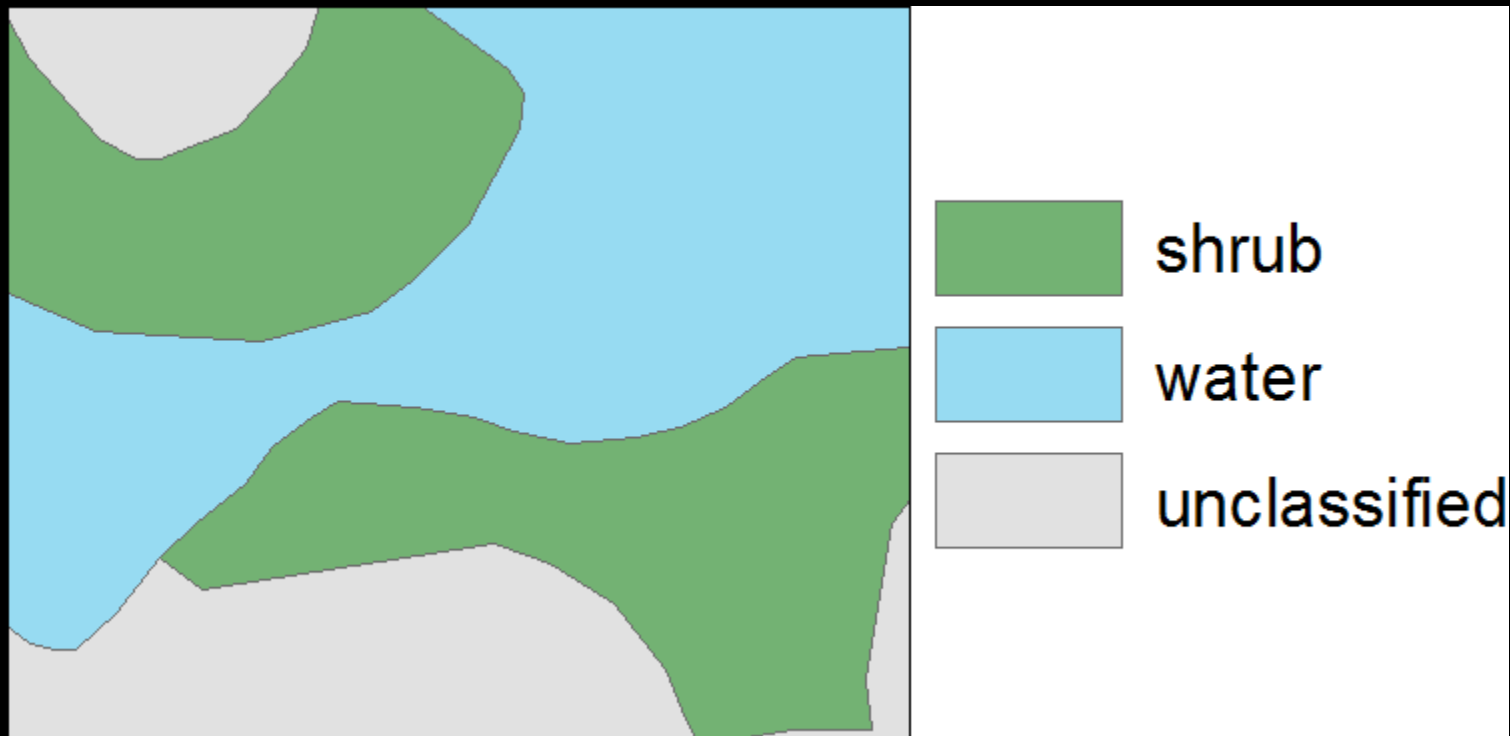
Introduction

Data Measurement

- Raw data: four standard measurement ways for map-based presentation
- Data measurement distinctions – map design ramifications
- How well (or not) the map will be understood

Nominal

- Code assigned to data observations
- No numerical significance between codes
- *Qualitative* data



Ordinal

- Data in rank orders
- No numerical difference between items





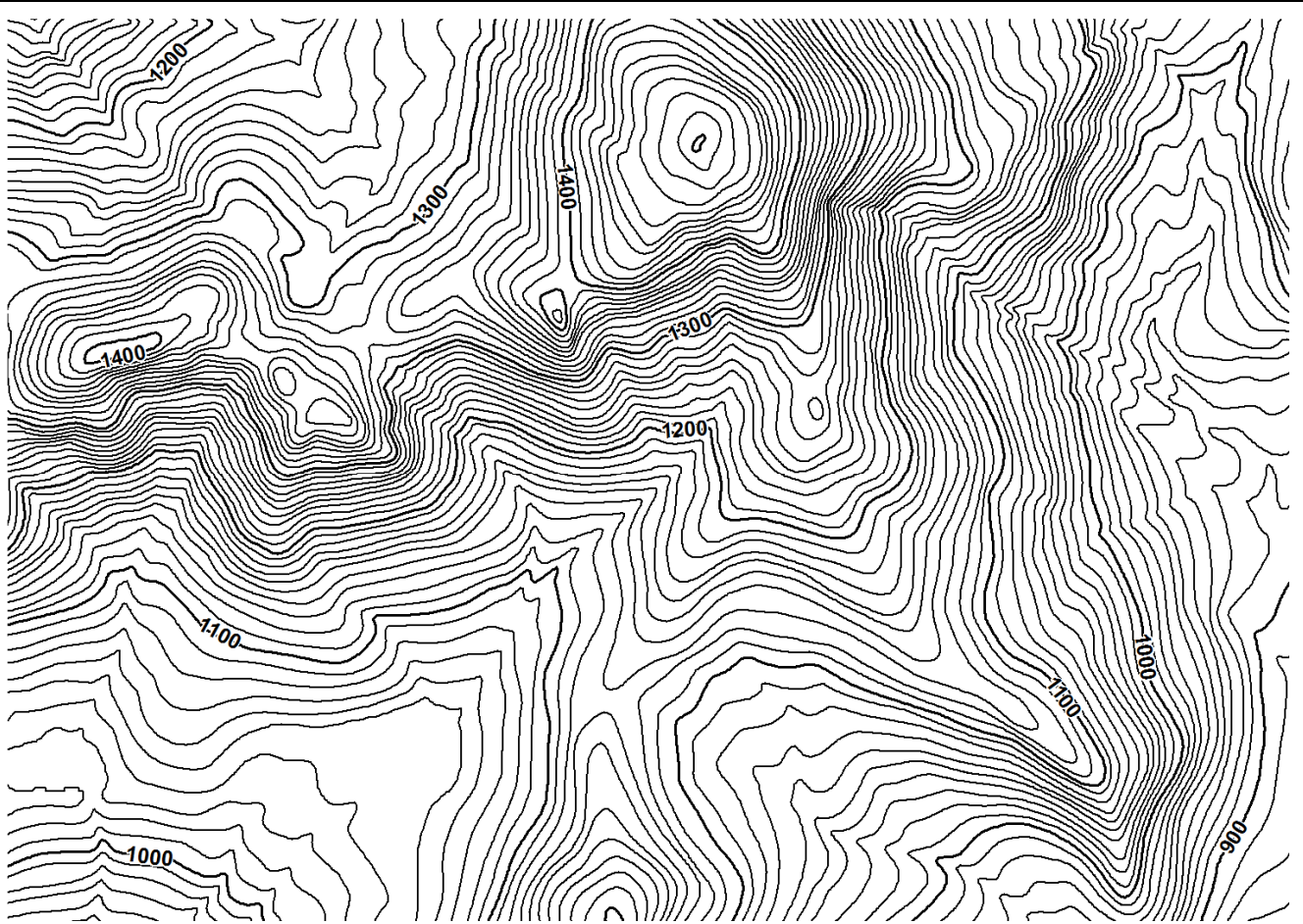
	(01) Principal Arterial Interstate
	(02) Principal Arterial Expressway
	(04) Principal Arterial Other
	(06) Minor Arterial
	(07) Major Collector
	(08) Minor Collector

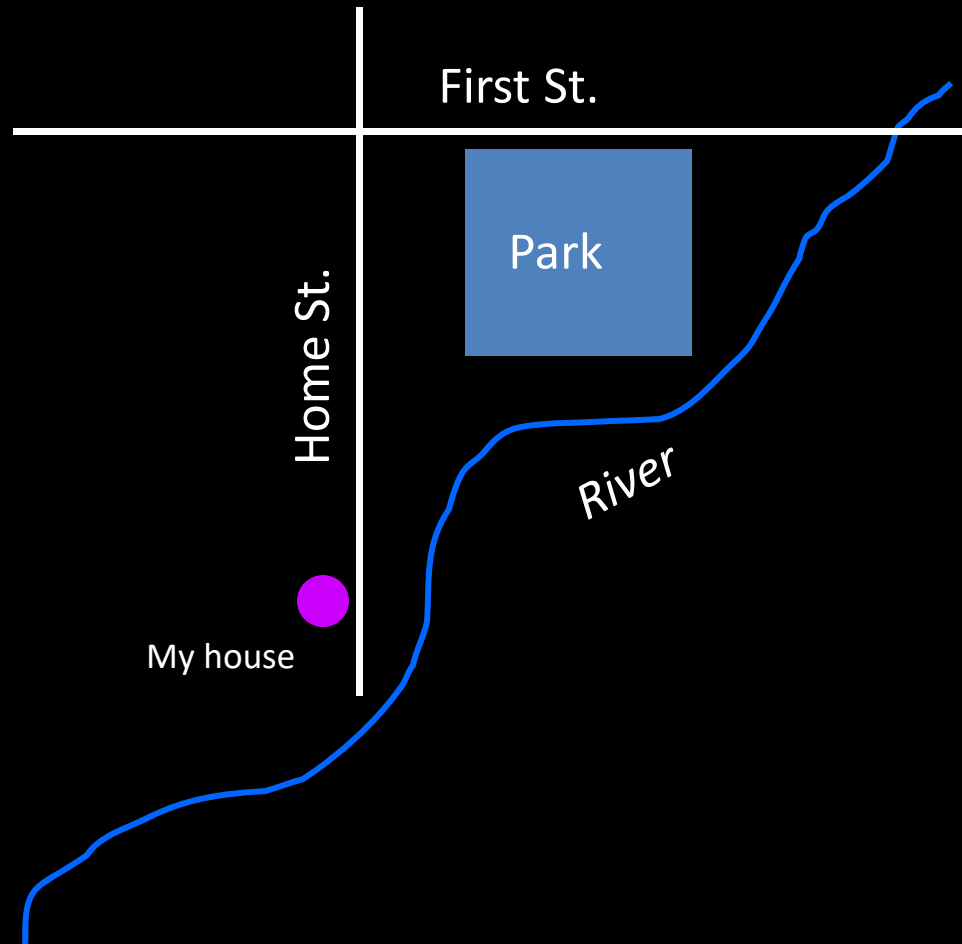
Image source: <http://gis3.dot.ny.gov/html5viewer/?viewer=FC>

Interval and Ratio


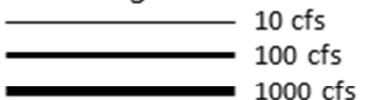



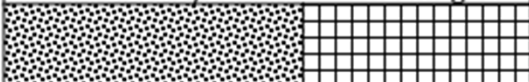





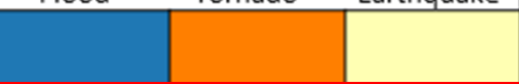





- Interval - ordered with explicit indication of numerical differences between categories based on an arbitrary zero point
- *Quantitative data*
- Ratio - ordered with explicit indication of differences between categories based on an a **non-arbitrary** zero point

- Point
- Line
- Areal



Visual Variables

	Graphical Element		
Visual Variable	Point	Line	Area
Size Qualitative? – Ordinal Quantitative? – Yes	Disaster Effected Population  100 500 1000	Flooding River Flow Rate  10 cfs 100 cfs 1000 cfs	Crop Area Drought Impacts  low high
Shape Qualitative? – Yes Quantitative? – No	Disaster Relief Stations  medical food shelter	Relief Access Road Types  Paved road Dirt road	Earthquake Damage Status Destroyed Undamaged 
Orientation Qualitative? – Yes Quantitative? – No	Water Well Status  clean treatable contaminated	Evacuation Road Status  open closed	Landmine Inspection Status Cleared Not Cleared 
Color Hue Qualitative? – Yes Quantitative? – No	Building Damage Status  none partial destroyed	Refugee Camp Boundaries  food medical	Hazard Vulnerability Flood Tornado Earthquake 
Lightness Qualitative? – No Quantitative? – Yes	Hazard Risk Index  low high	Gas Plume Volume  10ppm 100ppm	Disaster Counts per District 10 100 1000 

More on Thematic Maps

- Proportional Symbol Map: use symbols of varying sizes that are proportional to the value or magnitude being shown
- Isarithmic Map: use line symbols to display phenomena that are continuous in nature
- Dot density Map: distribution of an observation or observations at specific points

Choropleth Maps

Proportional Symbol Map

Isarithmic Maps

Dot Density Maps

Summary