

# GEO 309 – Intro to GIS

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# Topics

- Discussion – Edney
- Elements of map design
  - Visual hierarchy
  - Visual variables
    - Basic color theory
    - Label placement
  - Design elements
  - Levels of measurement
  - Thematic and reference maps

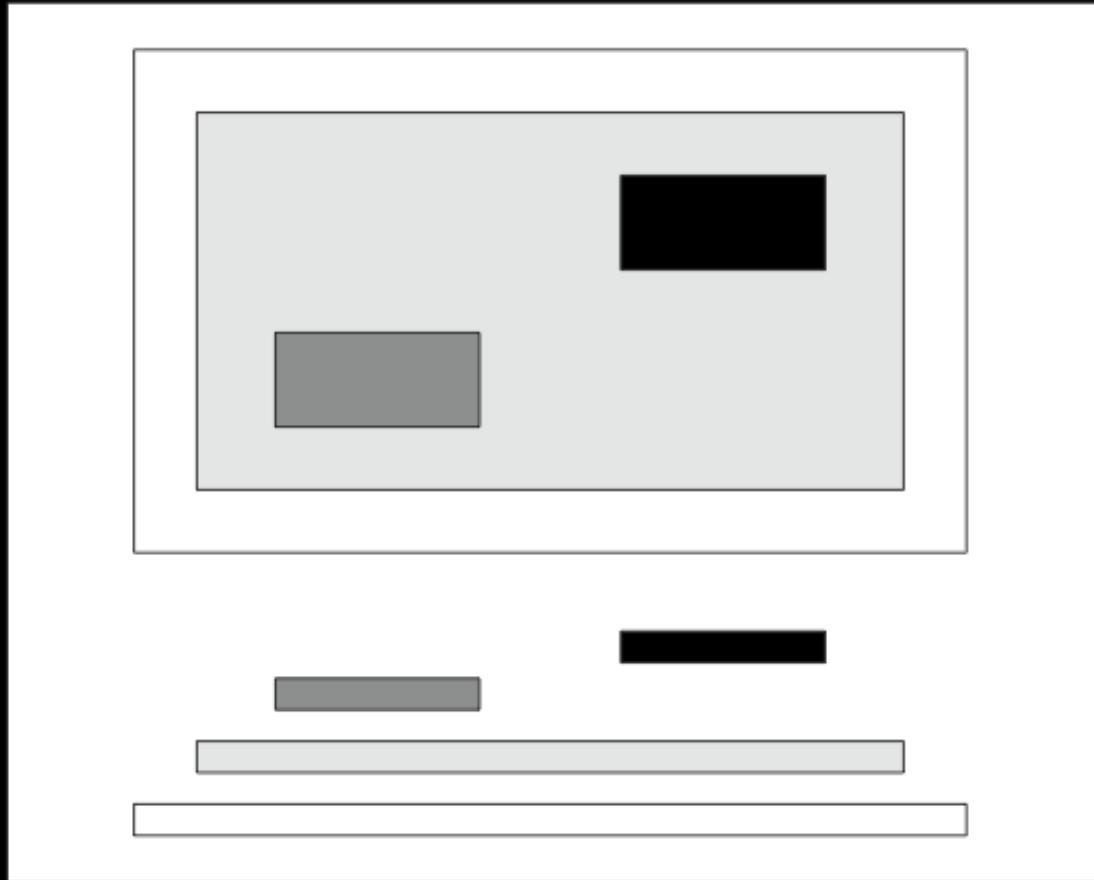
# Discussion - Edney

- Putting “cartography” into the history of cartography
  - Edney, M. 2005. Putting “cartography” into the history of cartography: Arthur H. Robinson, David Woodward, and the creation of a discipline. *Cartographic Perspectives*, 51: 14-29.

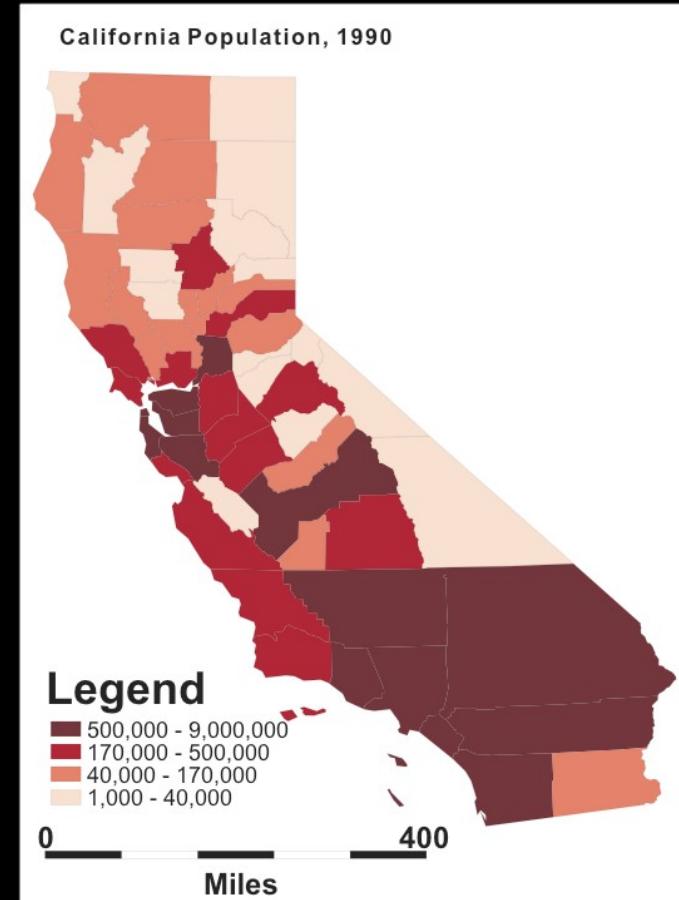
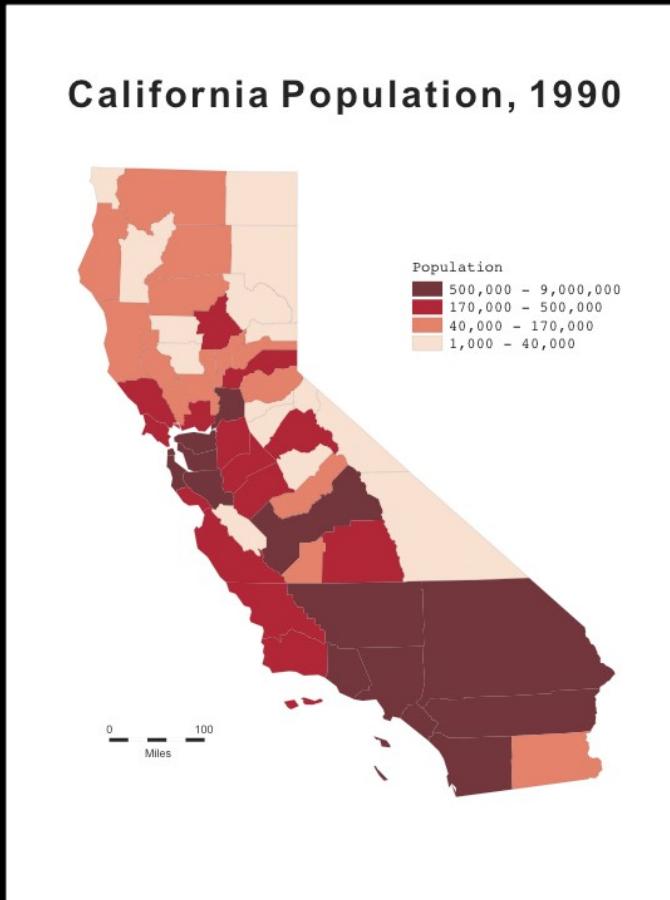
# Visual Hierarchy

- Arthur Robinson
  - Figure/Ground relationship
  - Balance
  - Contrast
    - Size
    - Color

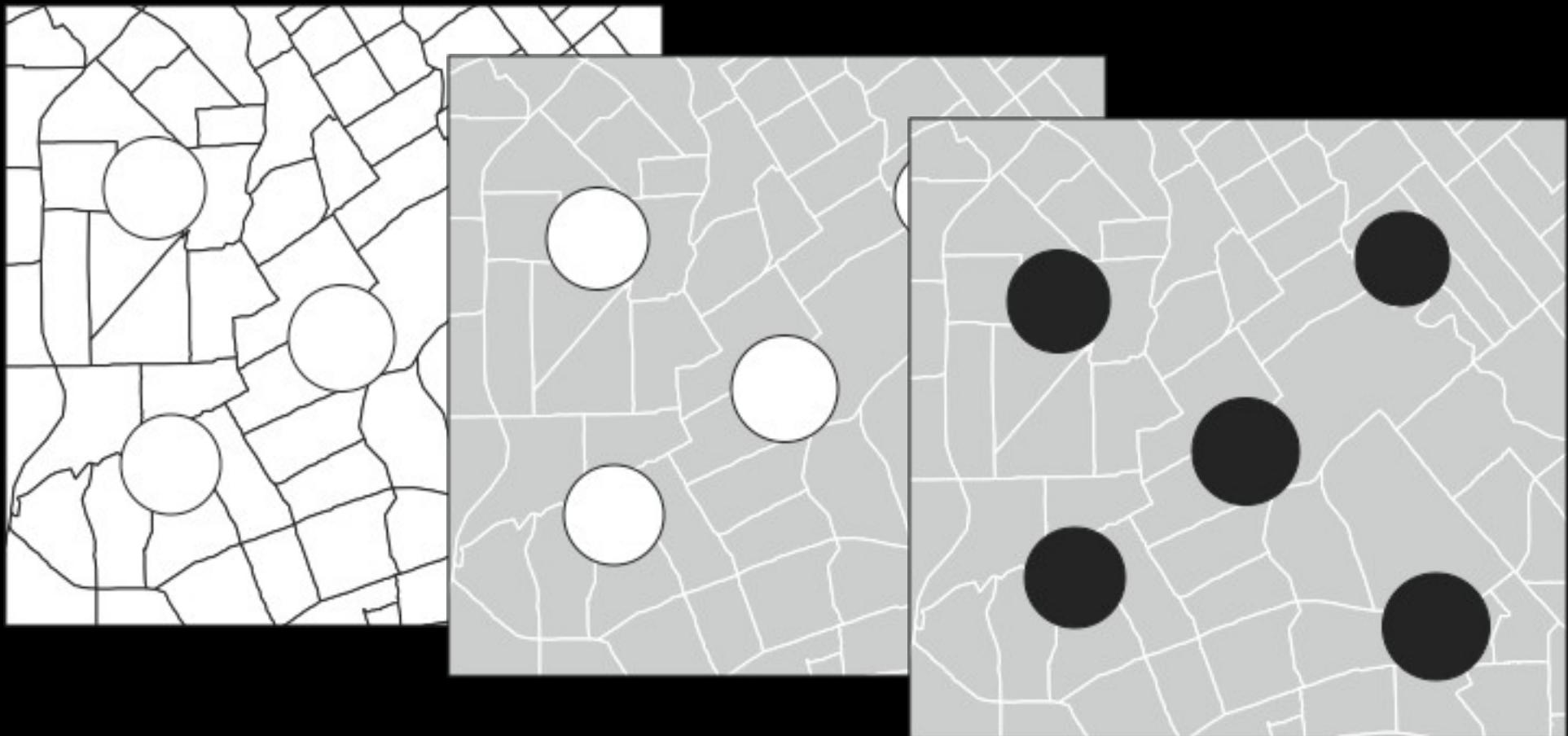
# Visual Hierarchy - Figure/Ground



# Visual Hierarchy - Balance



# Visual Hierarchy - Contrast



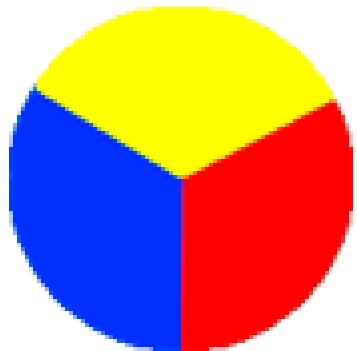
# Visual Variables

- Jacques Bertin
  - Size
  - Shape
  - Color
    - Hue, Value, Saturation
  - Pattern & Texture
  - Orientation

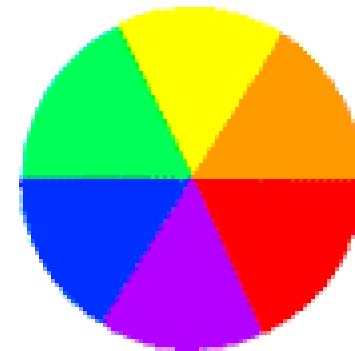
# Visual Variables

	Points	Lines	Areas	Best to Show
Shape		Possible, but too Weird to Show	Cartogram	Qualitative Differences
Size			Cartogram	Quantitative Differences
Color Hue				Qualitative Differences
Color Value				Quantitative Differences
Color Intensity				Qualitative Differences
Texture				Qualitative & Quantitative Differences

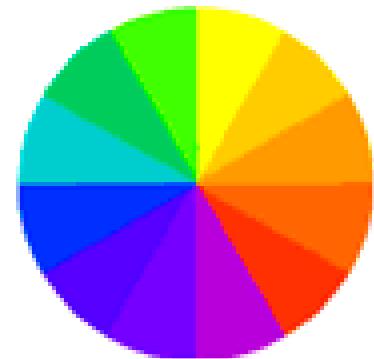
# Visual Variables – Color Theory



**Primary Colors**



**Secondary Colors**



**Tertiary Colors**

# Visual Variables – Color Theory

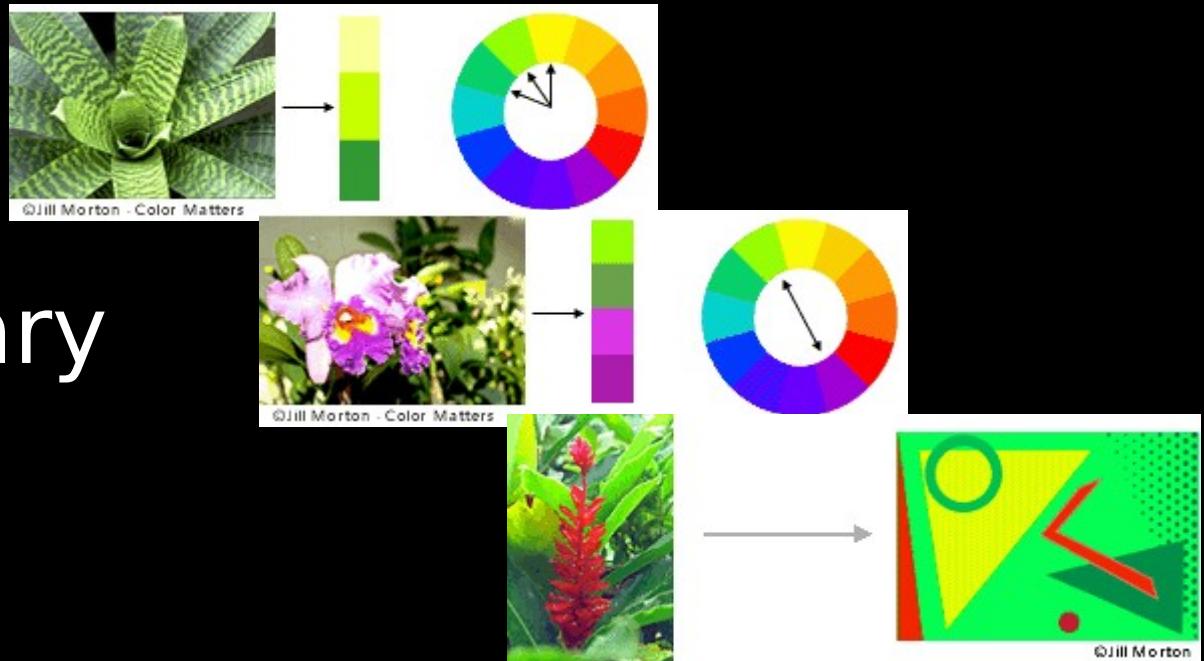
Harmony

- Analogous

- Complementary

- Nature

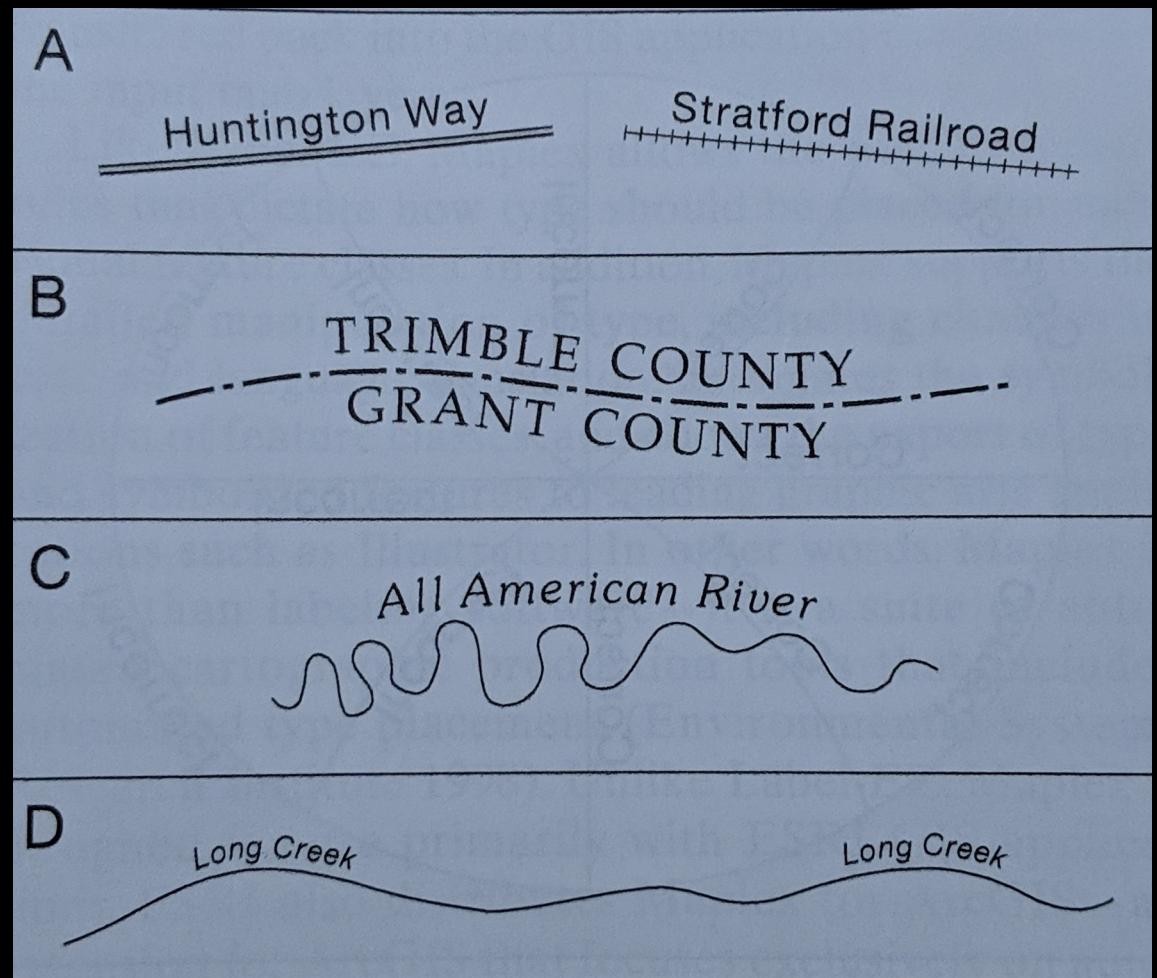
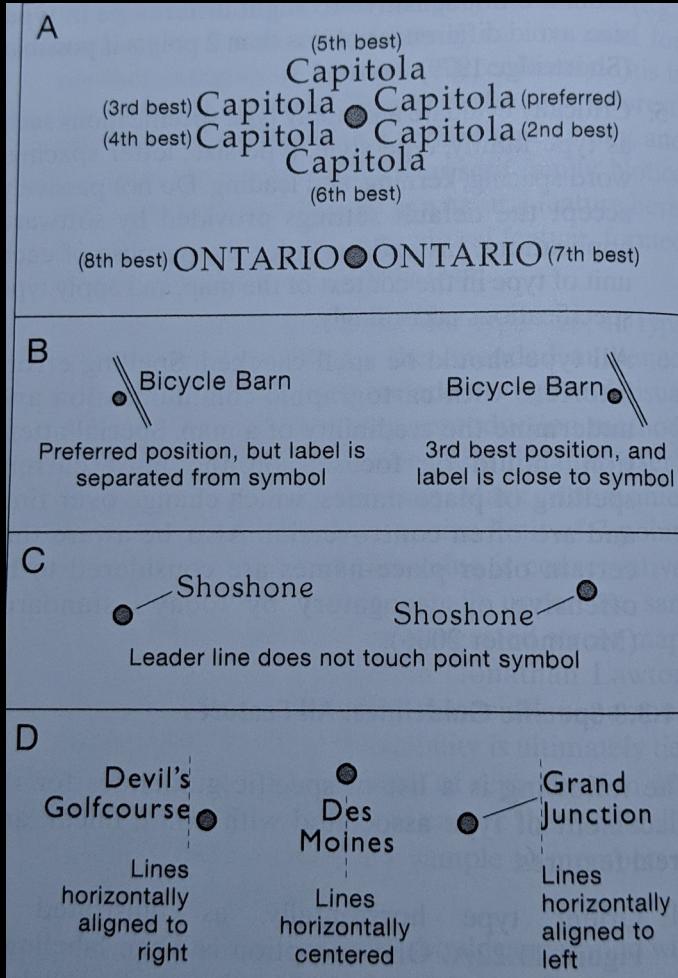
Context



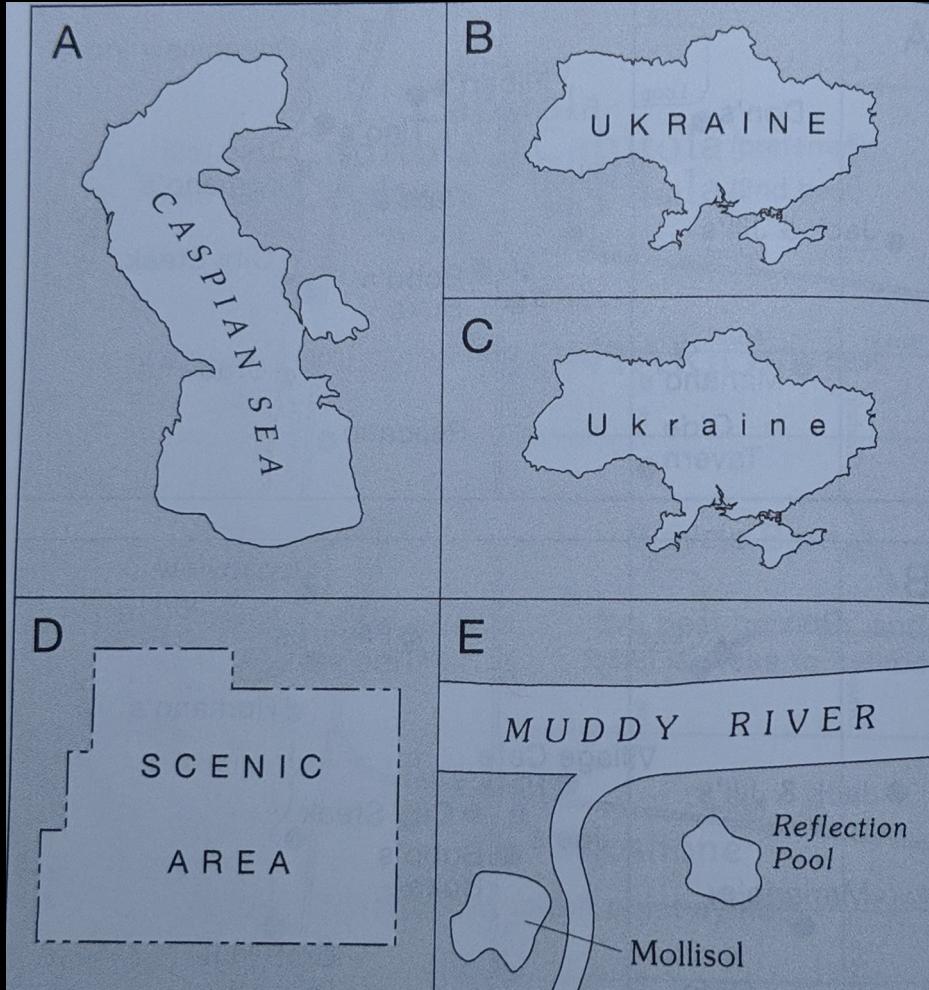
# Visual Variables – Label Placement

- General
  - Simple vs Decorative scripts
  - No more than two types of script
  - Realistic type sizes based on medium
    - Sizes >> Importance
  - Evaluate automatic labeling outputs
  - Spell check!

# Visual Variables – Label Placement

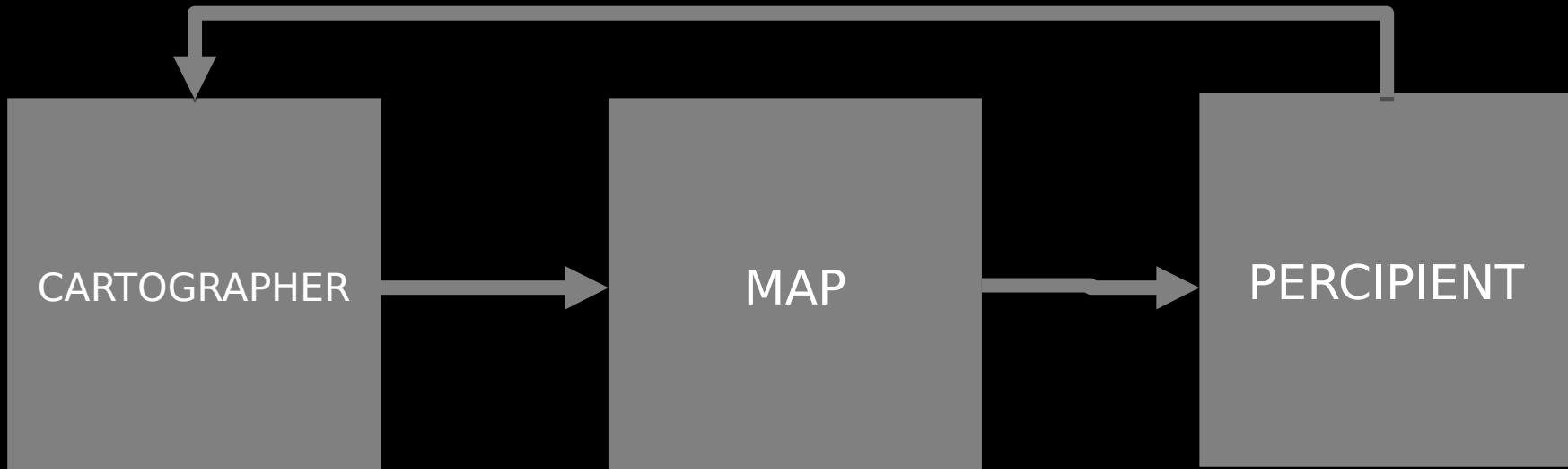


# Visual Variables – Label Placement



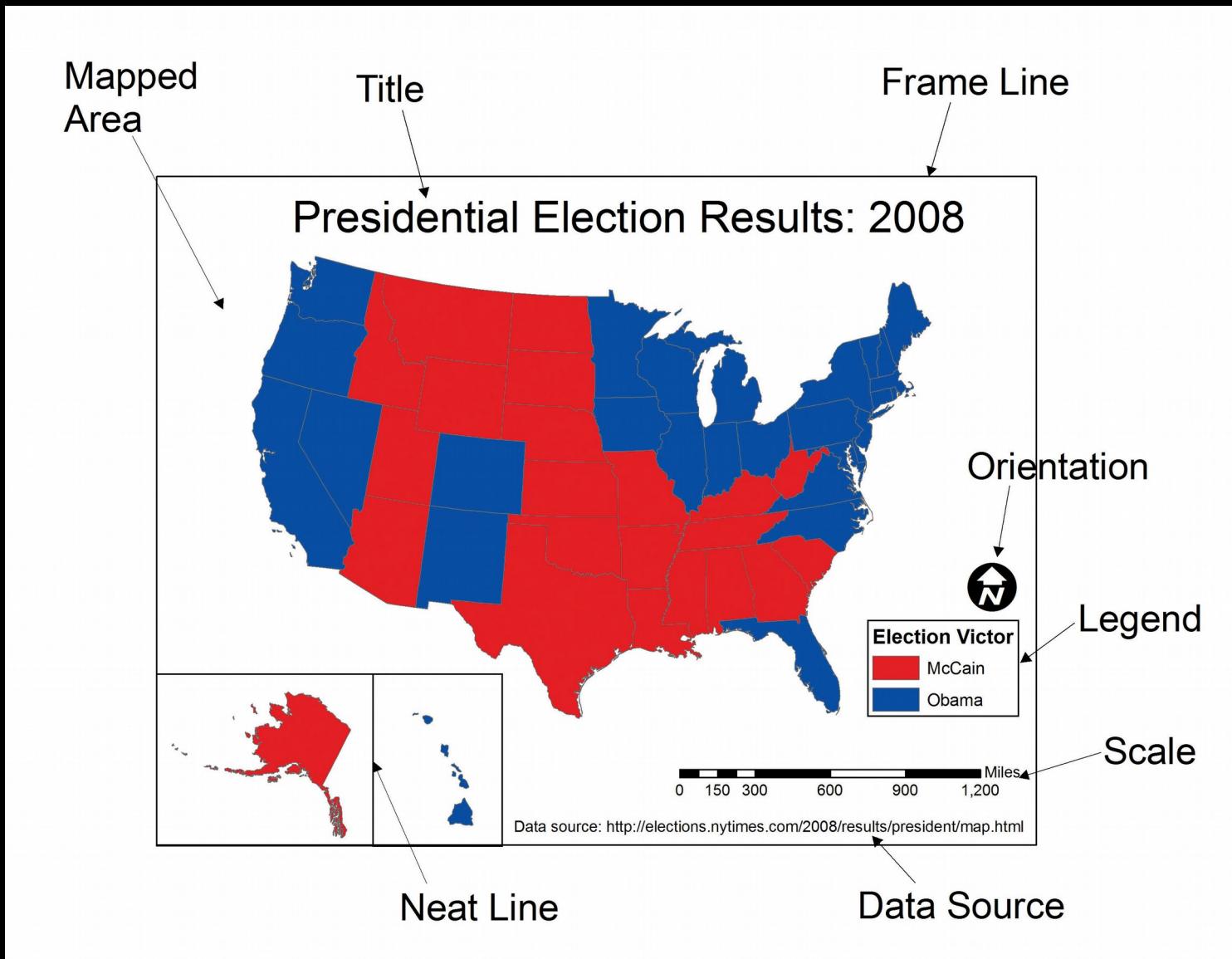
# Design Elements

- Map Communication Model
  - Arthur Robinson via Claude Shannon  
(Mathematics)



# Design Elements

- Title
- Scale
- Explanatory text
- Legend
- Directional indicator
- Border
- Sources/credits
- Insets/locator maps



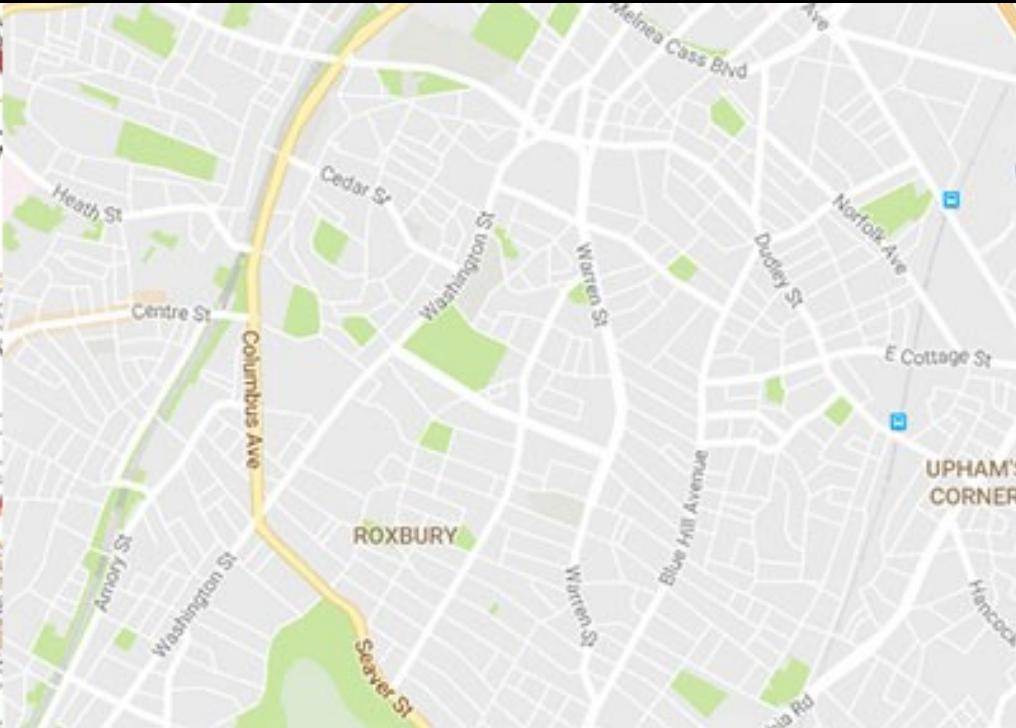
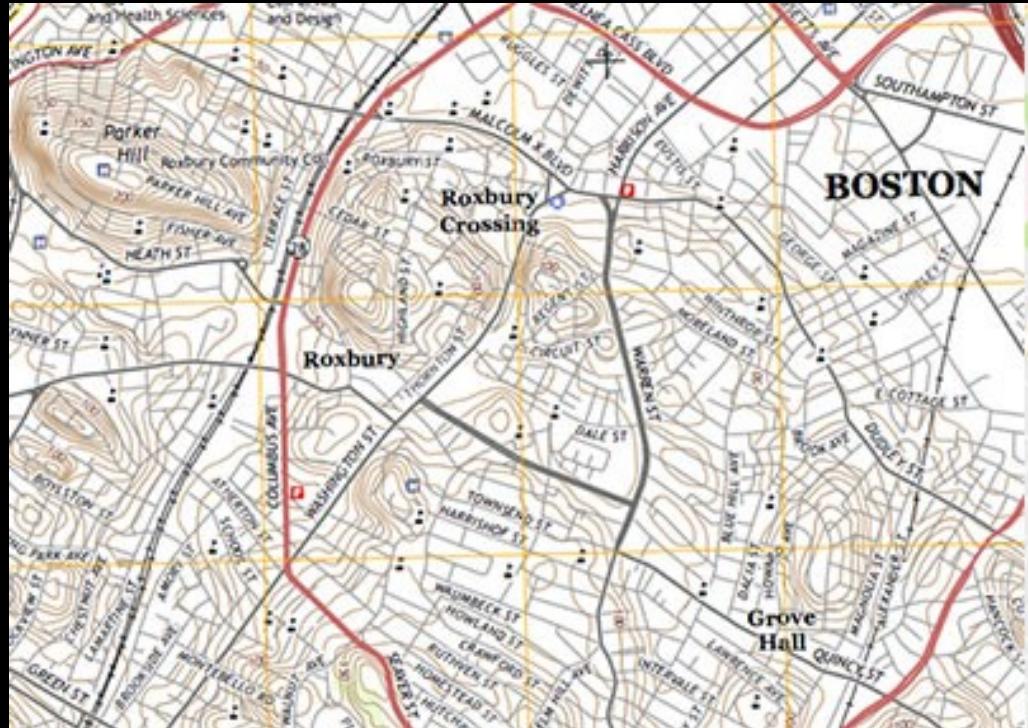
# Levels of Measurement

- Numeric
  - Interval & Ratio
  - Quantitative Measures/Counts
  - Individual or Aggregate
- Nominal
  - Qualitative or Categorical
- Ordinal
  - Order categorical data
  - Sequential color schemes

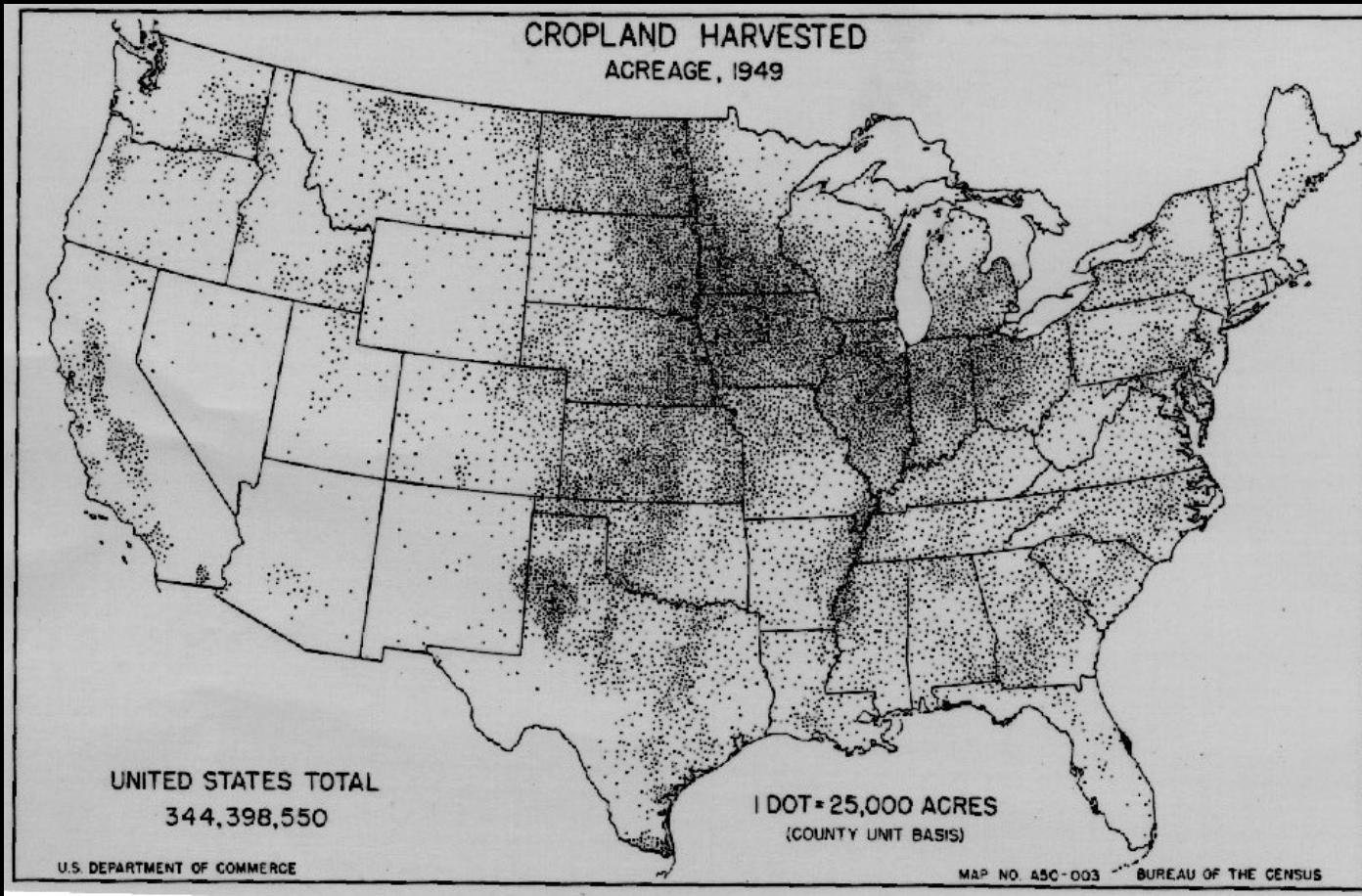
# Thematic & Reference Maps

- Base Maps
- Dots
- Proportional/  
Graduated Symbol
- Choropleth
- Flow Maps
- Cartograms
- Terrain
- Typographic
- Propaganda
- Geovisualization

# Reference Map

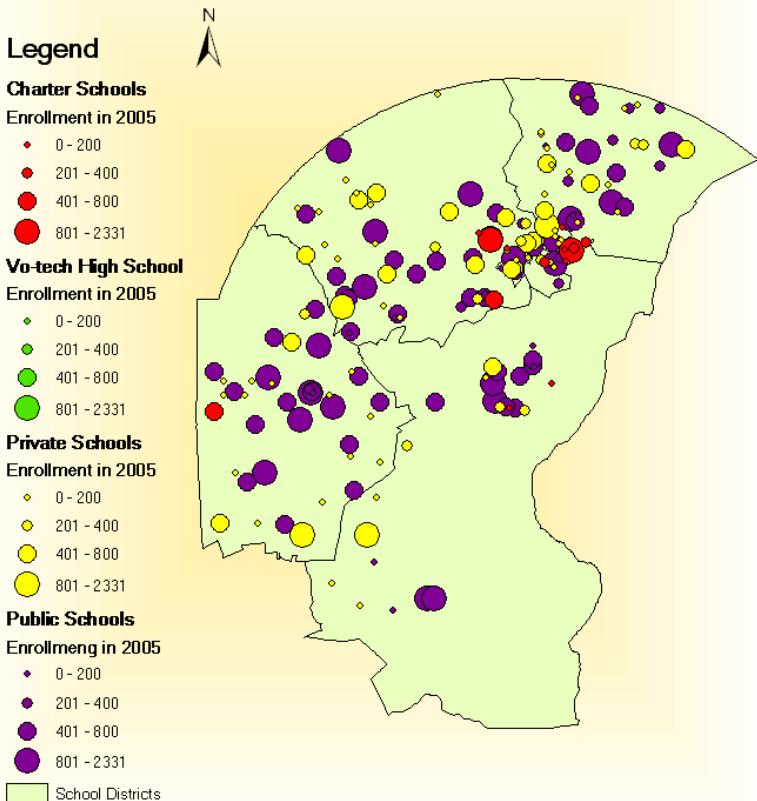


# Dot Map



# Proportional/ Graduated Symbol Map

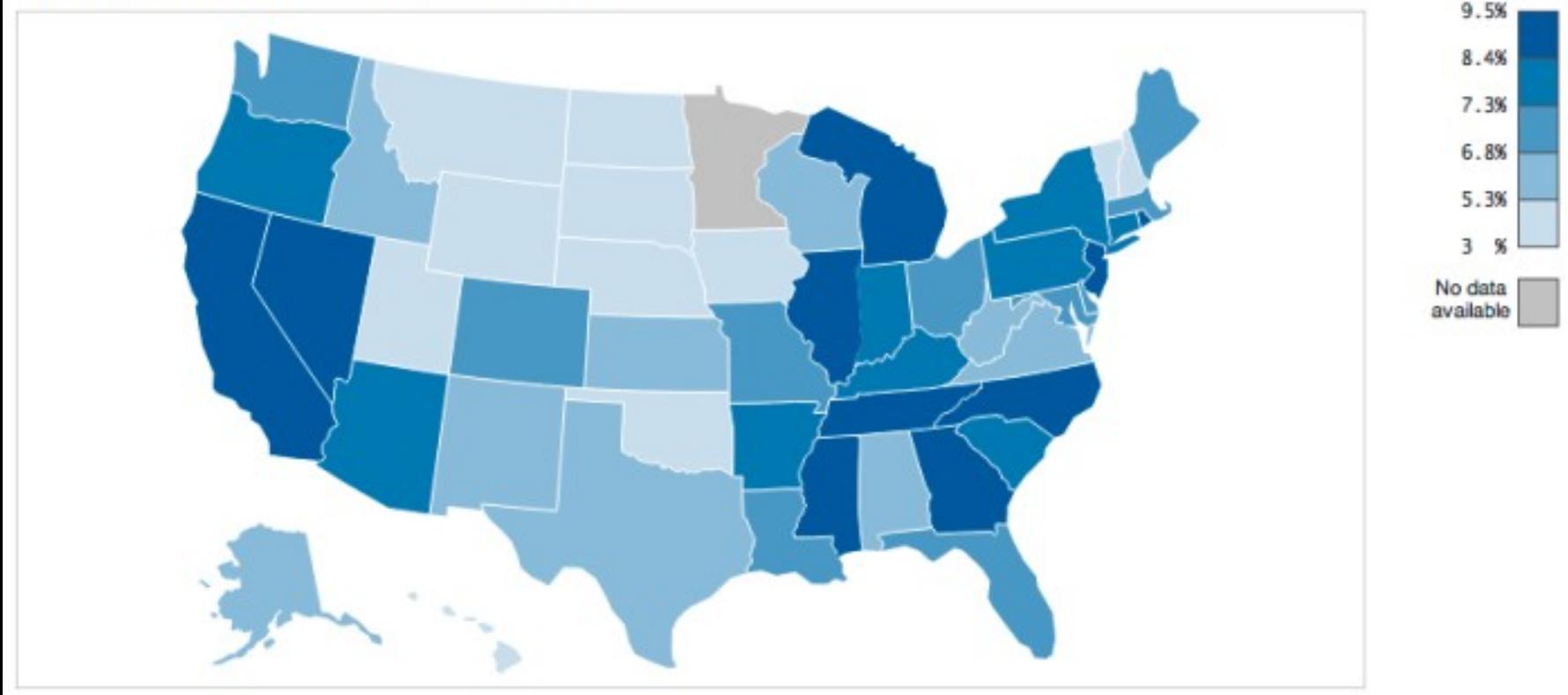
Graduated Symbol Map  
of Four Types of School



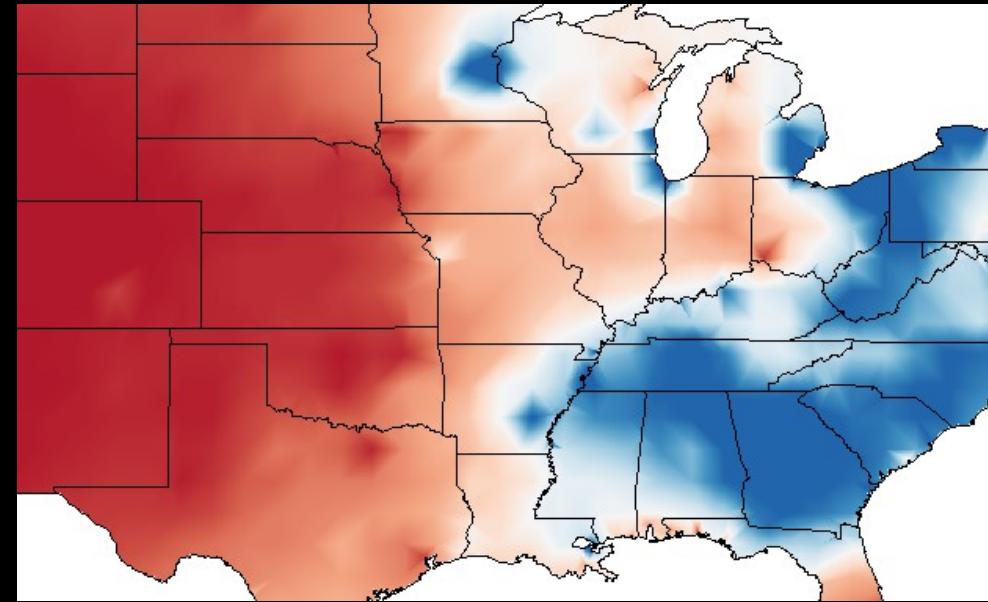
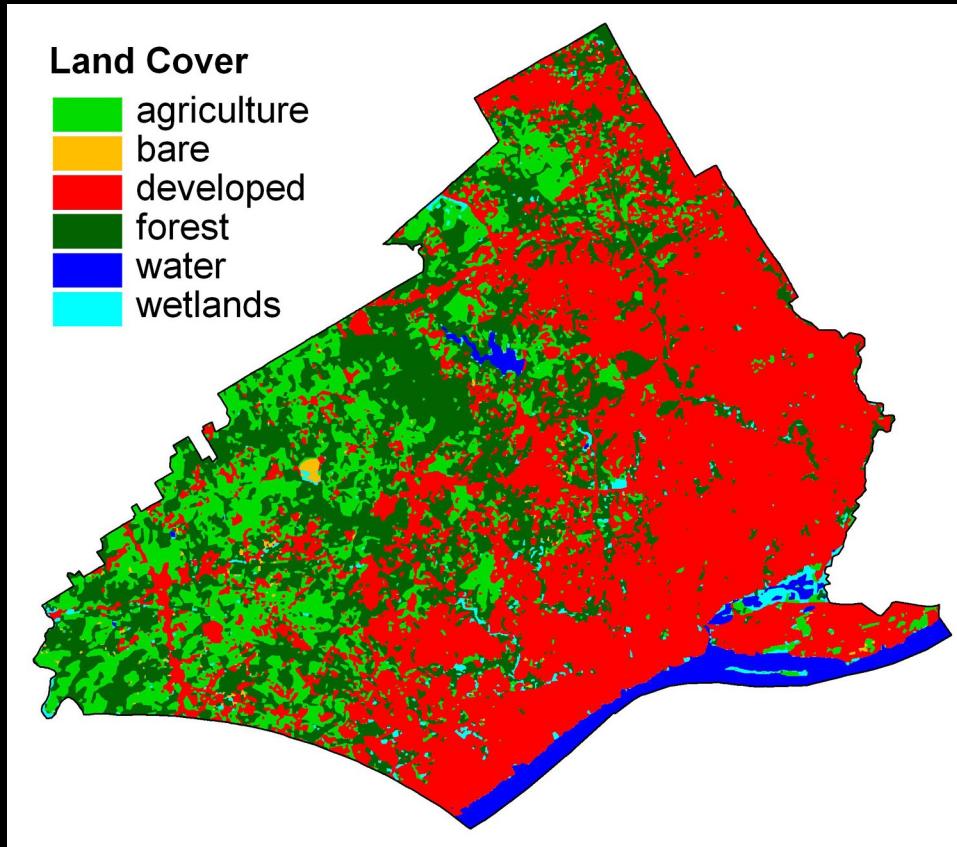
# Choropleth Map

## Unemployment Rate (by State)

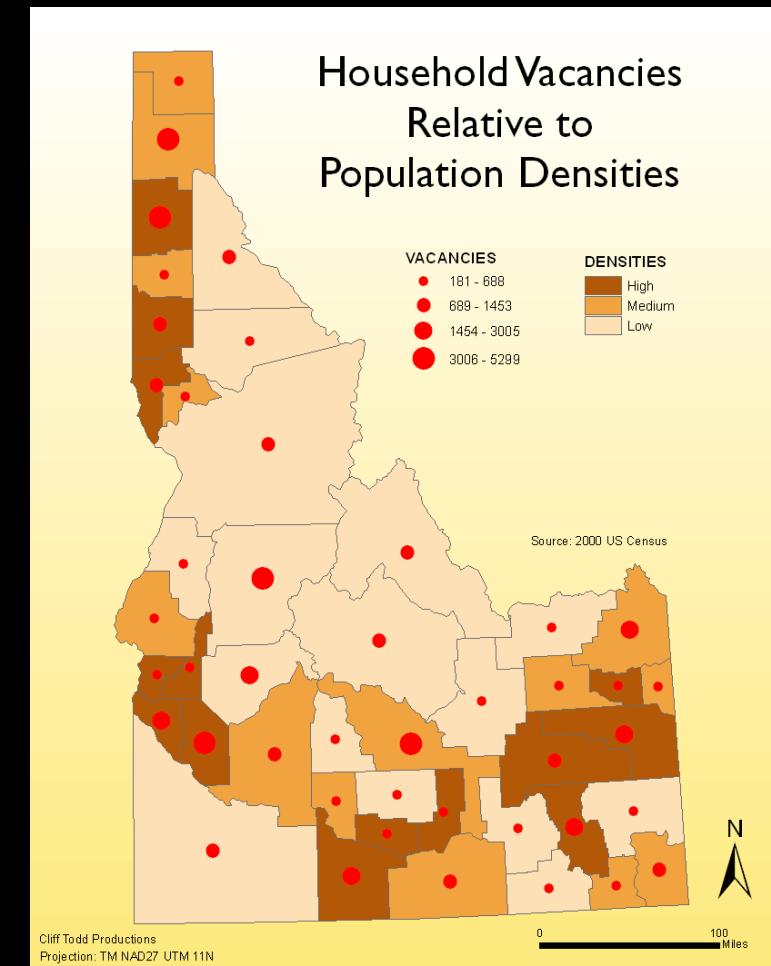
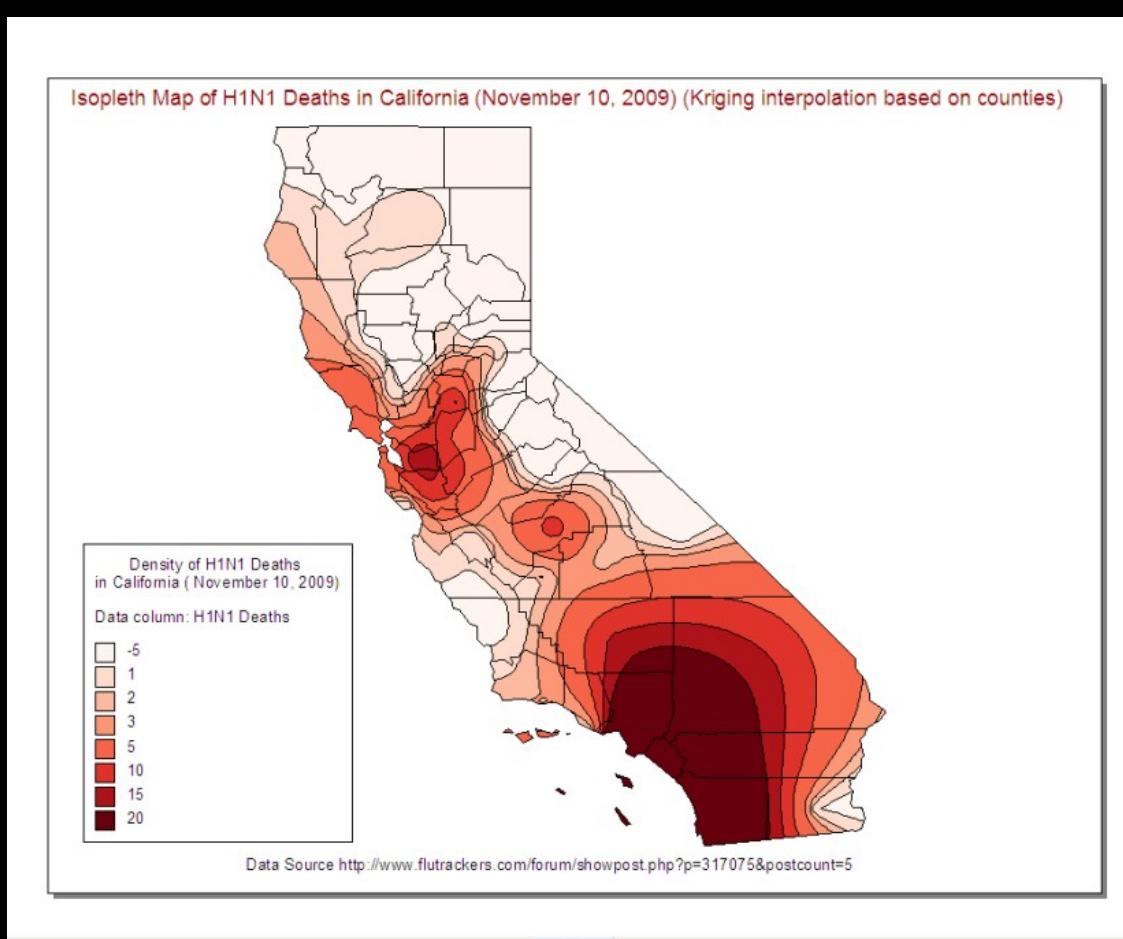
Month: Aug 2013 Seasonal Adjustment: Seasonally Adjusted Units: %



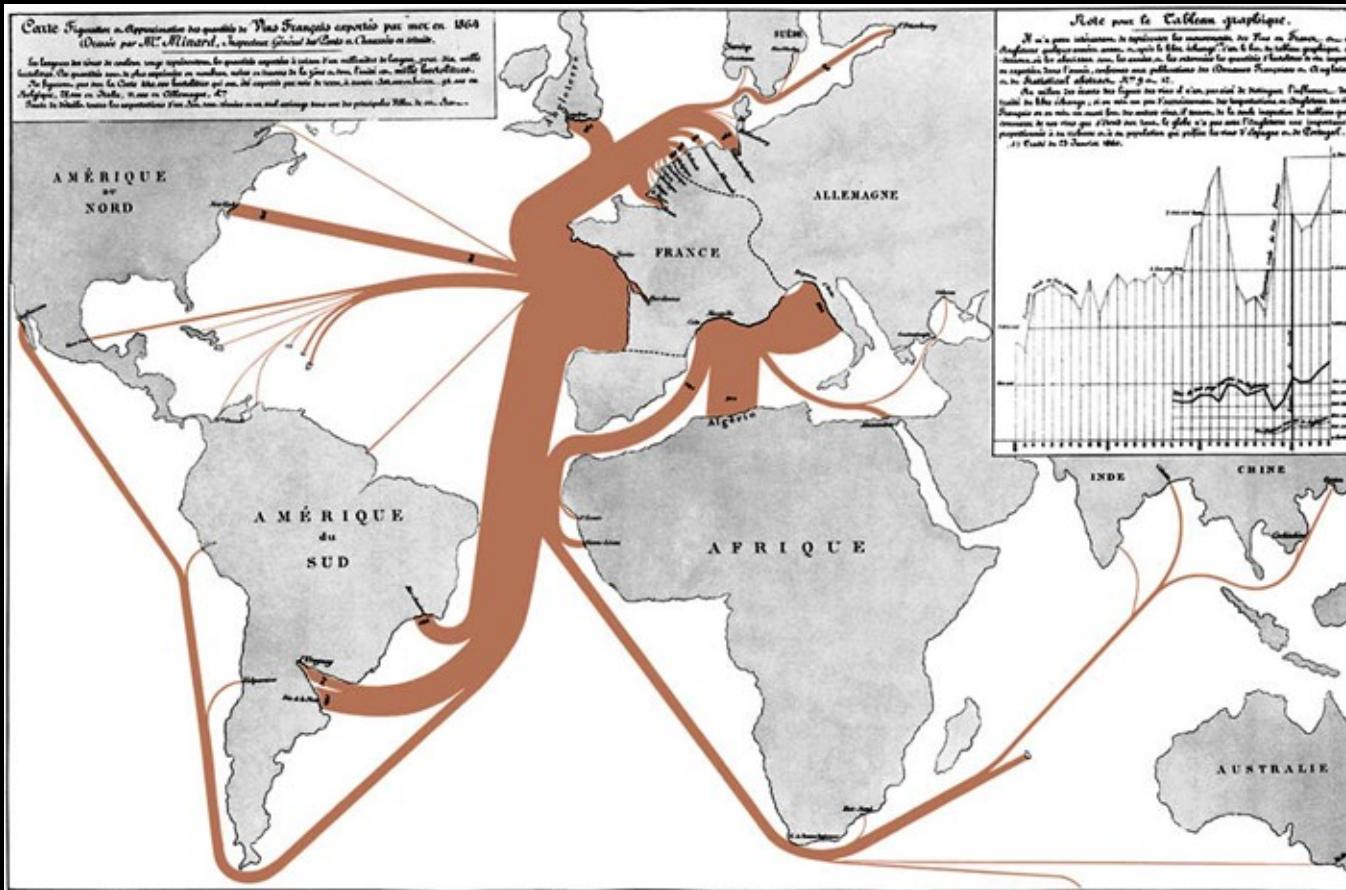
# Dasymetric & Isarithmic Maps



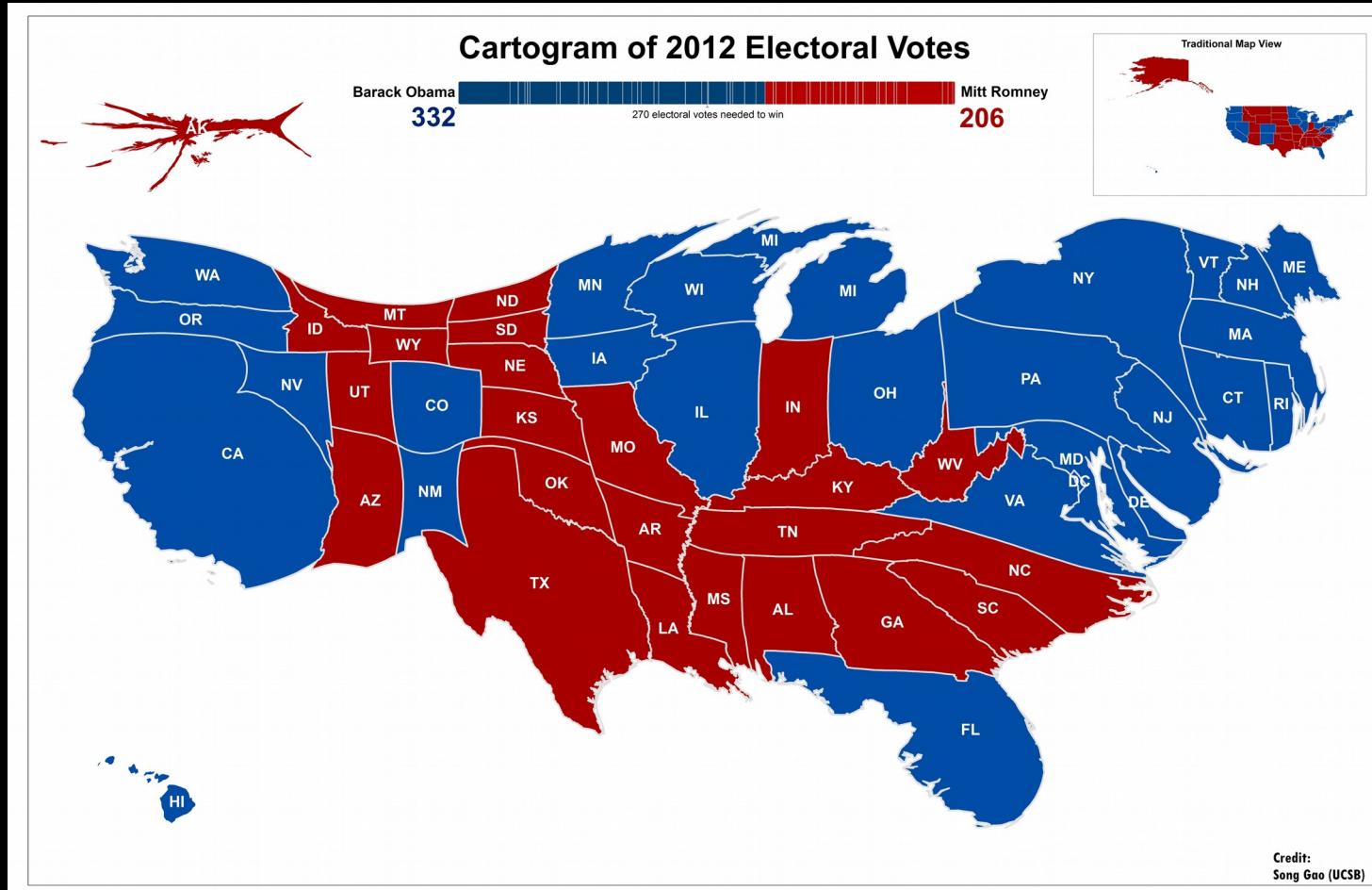
# Isopleth & Multivariate Maps



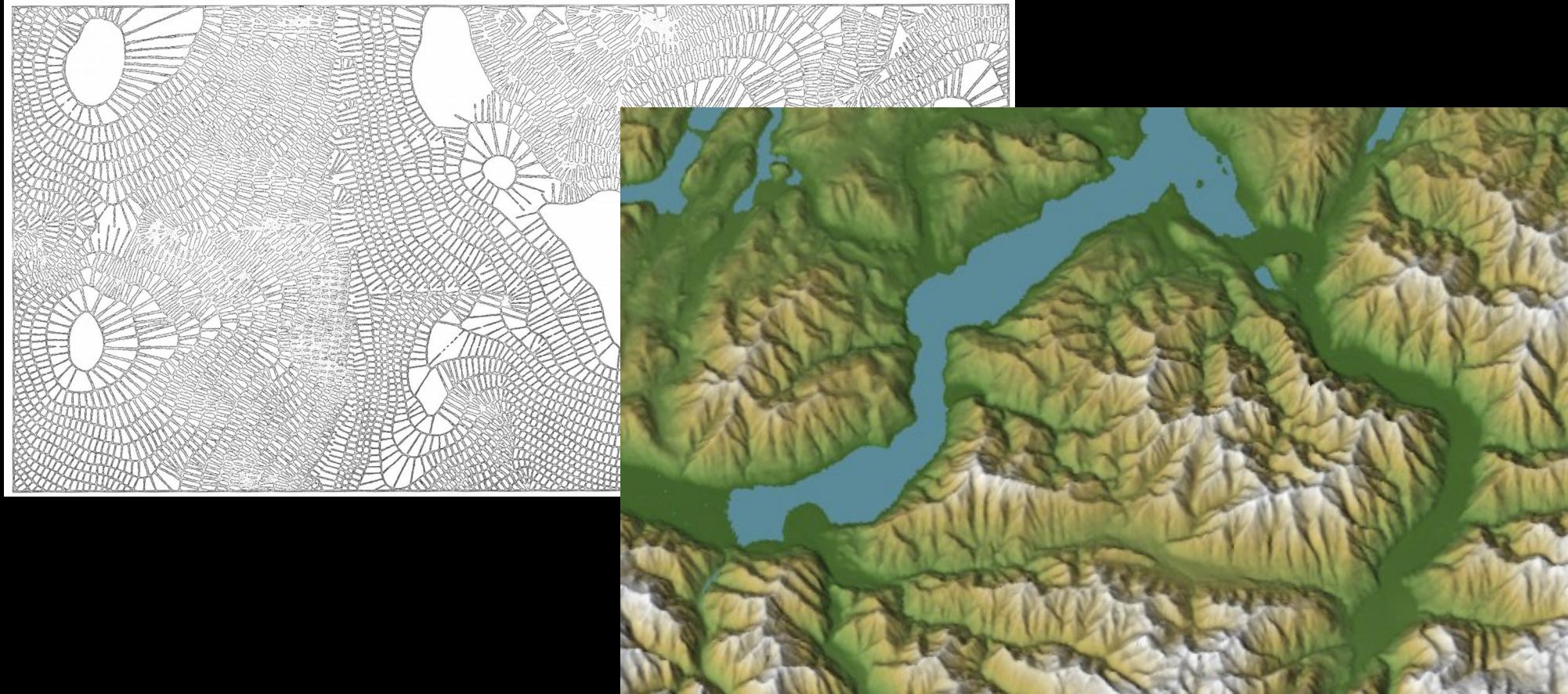
# Flow Map



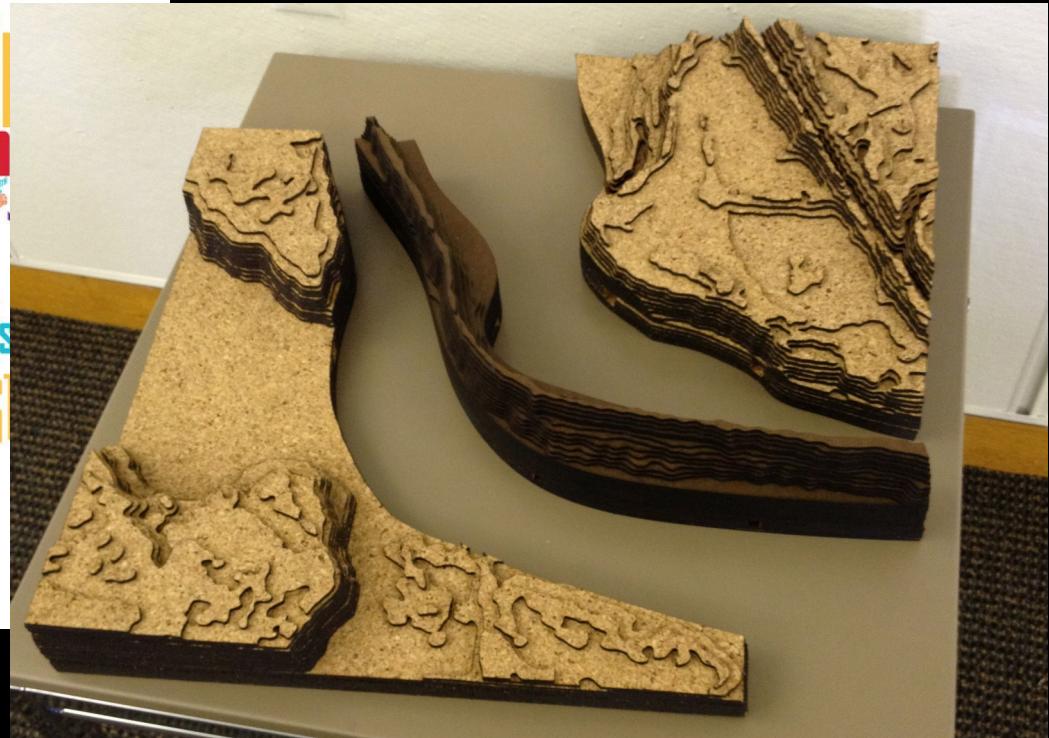
# Cartogram Map



# Terrain Map



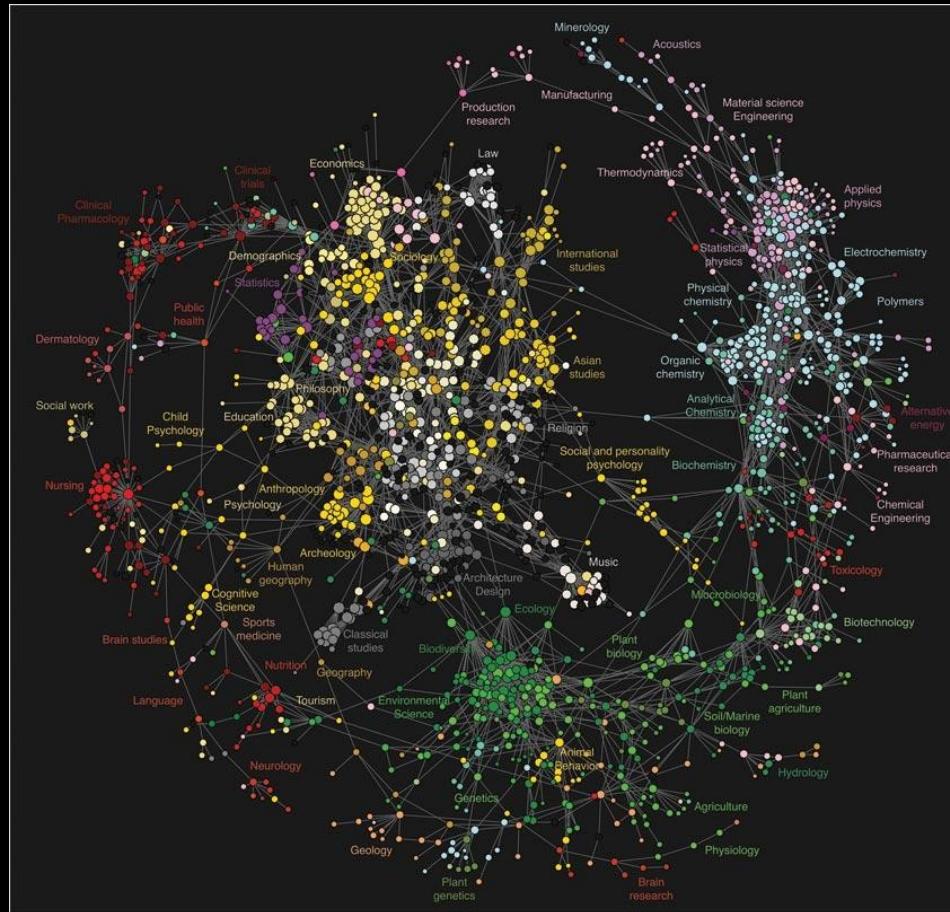
# Typographic & Art Maps



# Propaganda Map



# Geovisualization



# Resources

- ColorBrewer
- Usability.gov
- TypeBrewer
- Rich's Map Resources
  - Data Sources