

# Maps as Representations of the World

John Wilson  
Natural History Museum  
Tuesday, 26 January, 2010

## What is a Map?

- An illustration that shows what is happening on the Earth's surface?
- Stylized, generalized or abstracted
- Require careful interpretation
- Usually out of date
- Typically show a static situation ...

John Wilson  
Maps of the World: 2/20

## Map Characteristics (2)

- Often highly elegant and/or static
- Easy to use to answer some questions, but difficult or time-consuming to answer others

John Wilson  
Maps of the World: 3/20

## Cartographic Abstraction Process

- Select features to include on map
- Classify selected features into groups
- Simplify jagged lines
- Exaggerate features that are too small to show at scale of map
- Choose symbols to represent different classes of features chosen

John Wilson  
Maps of the World: 4/20

## Photo Maps ...


John Wilson  
Maps of the World: 5/20

## Line Maps ...

John Wilson  
Maps of the World: 6/20

## Thematic Maps ...

- Area class map
- Boundaries differ from map to map because they are determined by variation of attribute being mapped




1939 WPA Land Use Map

John Wilson  
Maps of the World: 7/20

## Data Storage ... (Role #1)


- Maps can be very efficient, high density data stores
  - Imagine a map with 1,000 place names on it
  - Such a map contains distances between 499,500 pairs of places
- Takes 150 GB to store information on 1:50K scale topographic map series in UK



John Wilson  
Maps of the World: 8/20

## Map as a Spatial Index (Role #2)

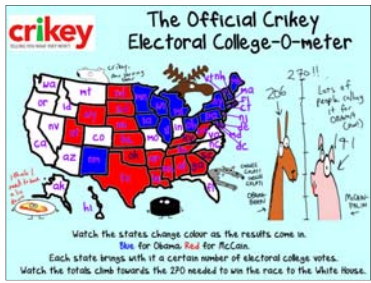
- Map can show boundaries of areas and identify each area with a label
- Separate text with corresponding entries may provide greater detail about each area
- Map is linked to descriptions with series of colors and numeric codes
- Modern GIS is organized around this simple idea



John Wilson  
Maps of the World: 9/20

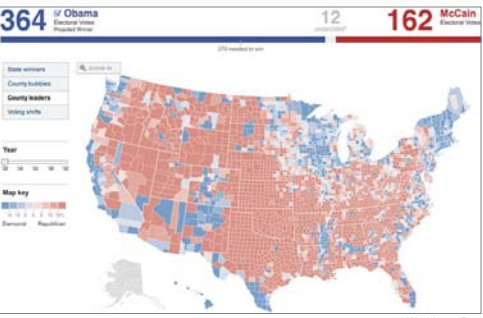
## Data Display ... (Role #3)

- Maps provide useful ways of displaying information
- Most maps are a compromise because of space, time, and budget limitations
- Maps are cast as snapshots



John Wilson  
Maps of the World: 10/20

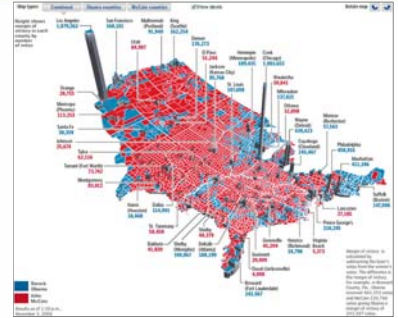
## Data Display (2)



Washington Post

John Wilson  
Maps of the World: 11/20

## Data Display (3)

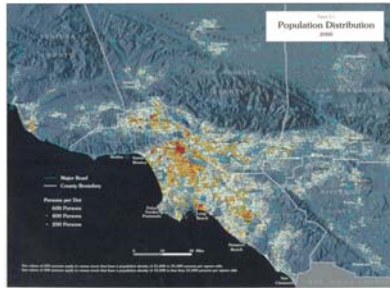


Washington Post

John Wilson  
Maps of the World: 12/20

## Data Analysis ... (Role #4)

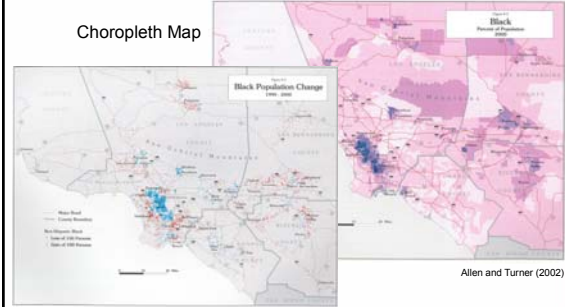
- Maps can be used to test hypotheses
- Can support classical scientific method when used in this way



Allen and Turner (2002)

## Data Analysis (2)

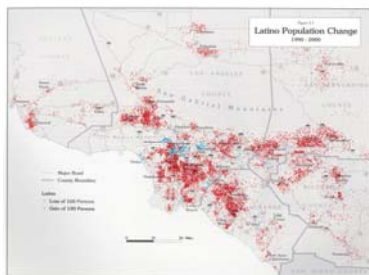
Choropleth Map



Allen and Turner (2002)

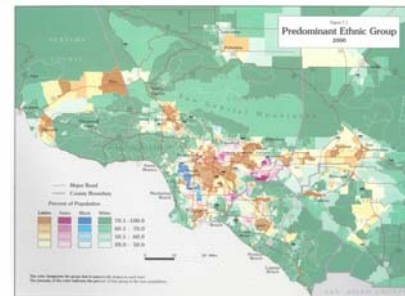
## Data Analysis (3)

- Maps can be used to examine relationships between two distributions using simple transparent overlays



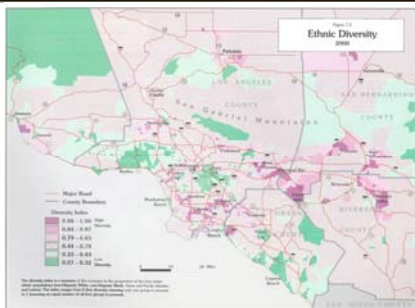
Allen and Turner (2002)

## Data Analysis (4)



Allen and Turner (2002)

## Data Analysis (5)



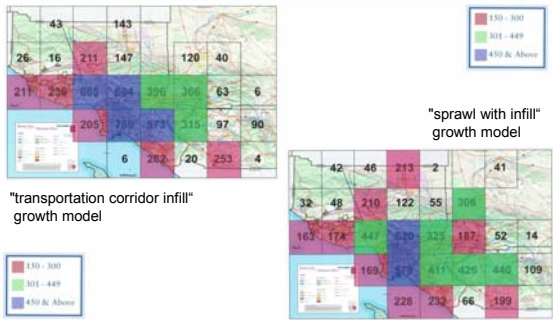
Allen and Turner (2002)

## Data Analysis & Decision-Making



- Maps can be used to build and evaluate predictions

## Decision-Making (2)



John Wilson  
Maps of the World: 19/20

## The Correct Map of the World!



John Wilson  
Maps of the World: 20/20