The Maps Lecture

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CS 448B, Stanford Fall 2012
Stamen

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Why Maps Now?
New uses for geodata
New sources for geodata
• Visualizing data on maps:
  Dots, more dots, continuous data, choropleths and cartograms

• Cartography:
  Projections, scale and data

• Publishing tools:
  Before Javascript, after Javascript
Visualizing Data On Maps
Dots
Dots can be symbols
Guess the crime
Dots can can be good symbols
Dots should fit the map
Dots can include data
Dots are ubiquitous
More, Smaller Dots

Clusters and point density maps
“Red Dot Fever”
This map is counting many small things

http://sta.mn/zzz

the black lines show Chicago’s official community areas.

each dot represents twenty-five people. Here, Hispanic is exclusive of other categories.

block-level data from the U.S. census.

scale 1:200,000
Clustering, grouping
Three dimensions shown by color
One dimension shown by hue
Let patterns emerge
Continuous Data

Heat maps and isolines
Don’t hide the context
Try smooth gradations
Break data into buckets
Meaningful buckets
“Iso” means “same”
Isolines for elevation
Isochrones are isolines for time.
Isolines for windspeed
Perpendicular lines show tidal phase
Choropleths
Five quantiles

Unemployment

Polymaps is a project from SimpleGeo and Stamen.
“soda”

Generic names for Soft Drinks by County

Survey data courtesy of Alan McConchie
Visit www.popvssoda.com to participate.

Map by Matthew T. Campbell
Spatial Graphics and Analysis Lab
Department of Cartography and Geography
East Central University (Oklahoma)
Map Template courtesy of www.mymaps.com

Respondents through March 1, 2003

http://popvssoda.com
Generic names for Soft Drinks by county

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Respondents through March 1, 2003
Choose colors well
Focus on the foreground
Cartograms

...and other spatial distortions
New York Times ratings

Click on a district below to learn more.

http://sta.mn/4xk
Progressive distortion
Harry Beck’s London tube diagram
People *love* the tube map

Thursday, November 1, 2012
Tube map + isochrones

Time to Travel from Arnos Grove
Major distortions can stay recognizable
Cartography
Projection

Flattening the globe onto a flat screen
Latitude, Longitude

P = 40°N, 60°W
A sphere tears when you flatten it.
There are interesting ways to tear spheres
WHAT YOUR FAVORITE
MAP PROJECTION
SAYS ABOUT YOU

MERCATOR

YOU’RE NOT REALLY INTO MAPS.

VAN DER GRIJNTEN

YOU’RE NOT A COMPLICATED PERSON. YOU LOVE THE MERCATOR PROJECTION; YOU JUST WISH IT WEREN'T SQUARE. THE EARTH'S NOT A SQUARE, IT'S A CIRCLE. YOU LIKE CIRCLES. TODAY IS GONNA BE A GOOD DAY!
You think that when we look at a map, what we really see is ourselves. After you first saw Inception, you sat silent in the theater for six hours. It freaks you out to realize that everyone around you has a skeleton inside them. You have really looked at your hands.
Projections usually have a home
Projections are usually designed for paper
Surveyors usually prefer cartesian math

SPC Zones - 2004

Thursday, November 1, 2012
Three example ways to categorize projections...
Azimuthal
Preserves direction
Equal-Area
Preserves area
Conformal
Preserves local shapes
Spherical Mercator is ubiquitous on the web—why?
(the square will be important later)
One notable interesting way to tear a sphere
You can drag the map with your mouse, and use the +/- buttons to zoom. The circle in the center will always indicate North for that point, and when you stop dragging the map will re-orient itself automatically. Read more about this on my blog.
Scale

How big is your map?
This is not “scale”
Scale is an idea imported from print
Choose the right content at different scales
Four maps, same area
Generalizing shapes
What shows at different scales?
Shapes change at different scales

Figure 11. Fragmentation of a river into polygons and lines with different thresholds leading to different results (c, d, e).
Data

Where data for maps comes from
Natural Earth Data

naturalearthdata.com
...for small to medium scales
...for large scales...
...and things mapped by no one else.
Our Awesome Government

nationalatlas.gov, census.gov, usgs.gov, etc.
Publishing Tools
<2005

WMS and related technologies
Tiles, Javascript
images
style
data
interaction
images
style
data
PostGIS

An open source spatial database,
postgis.refractions.net
TileStache

For serving tiles,
tilestache.org
Mapnik

For rendering tiles,
mapnik.org
OpenLayers, Modest Maps

For putting maps in a browser,
openlayers.org — modestmaps.org
Polymaps

For the future, polymaps.org
Put it all together...
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  Dots, more dots, continuous data, choropleths and cartograms

• Cartography:
  Projections, scale and data

• Publishing tools:
  Before Javascript, after Javascript
Thank You!

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