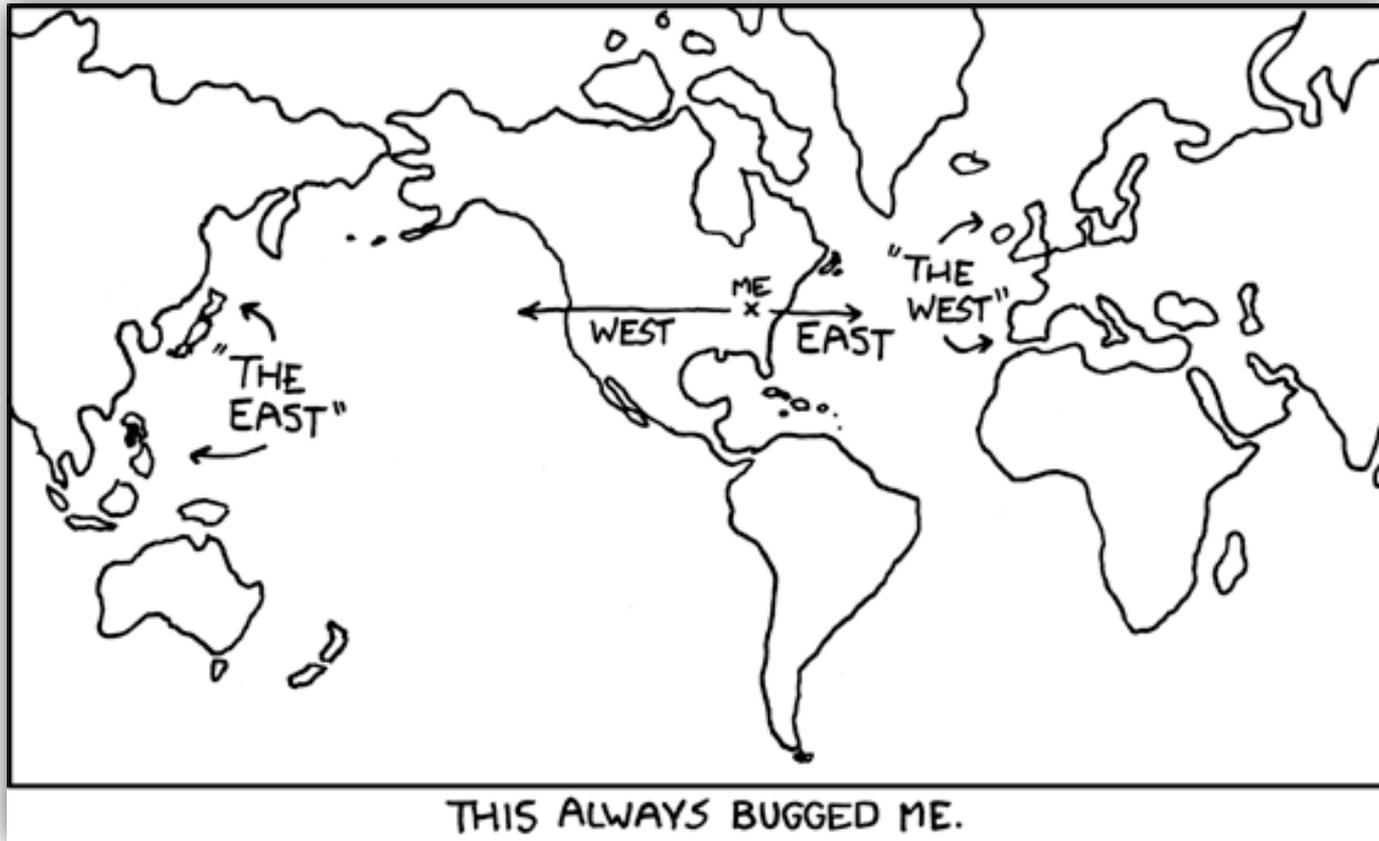
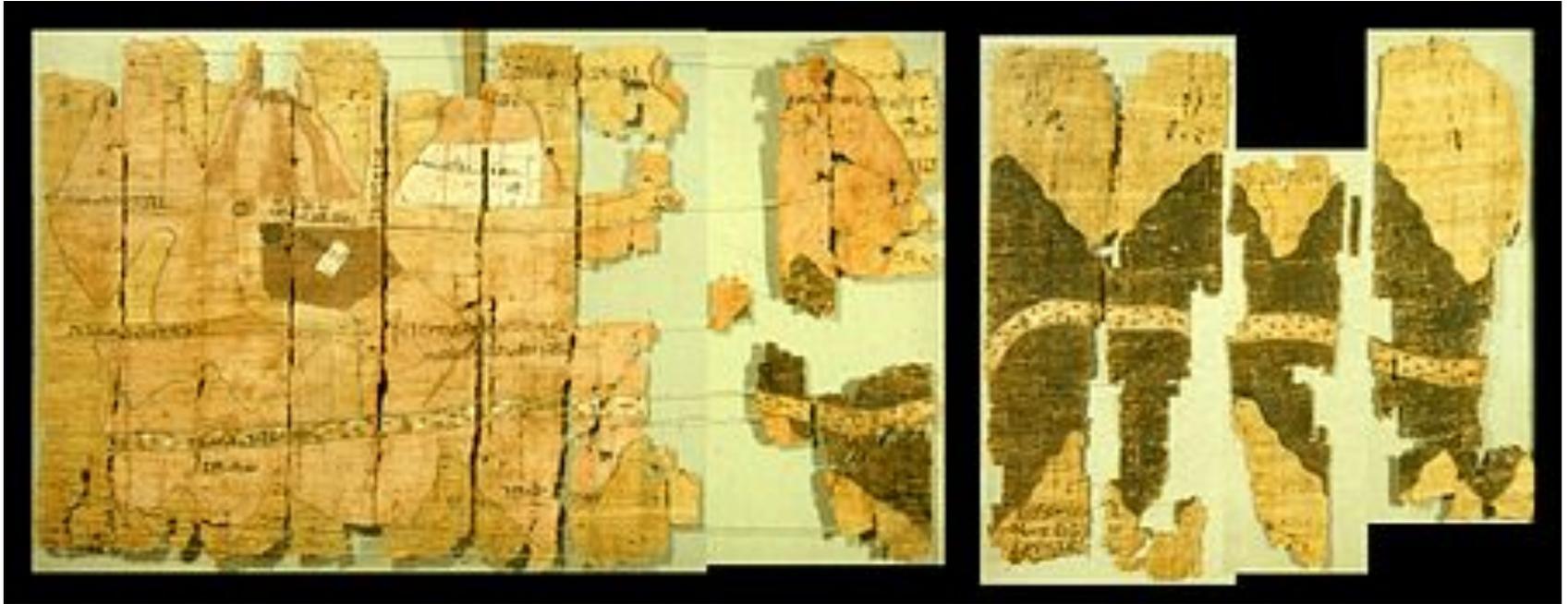


Maps



Data Visualization | Steven Bedrick & Jackie Wirz

Image from xkcd.com <http://xkcd.com/503/>



Turin Papyrus Map (~1160 BC): http://en.wikipedia.org/wiki/Turin_Papyrus_Map



Babylonian World Map (original ~500 BC) - http://en.wikipedia.org/wiki/Babylonian_Map_of_the_World



Ptolemy *Geography* (original ~150 AD) - The British Library Harley MS 7182, ff 58v-59.

A New Map of the **WHOLE**
According to the latest and most Exact Observations

WORLD with the Trade winds
Observations By H. Moll Geographer

In this Map is inserted A View of the General & Coasting Trade Winds, Monsoons or Shifting Trade winds Sets that Arrows among of Lines shew the Course of those General & Coasting Winds, and Arrows in the void Spaces shew the Course of Shifting Trade winds, and Abbreviation Sept. &c. Shew the Times of Year when such Winds Blow.

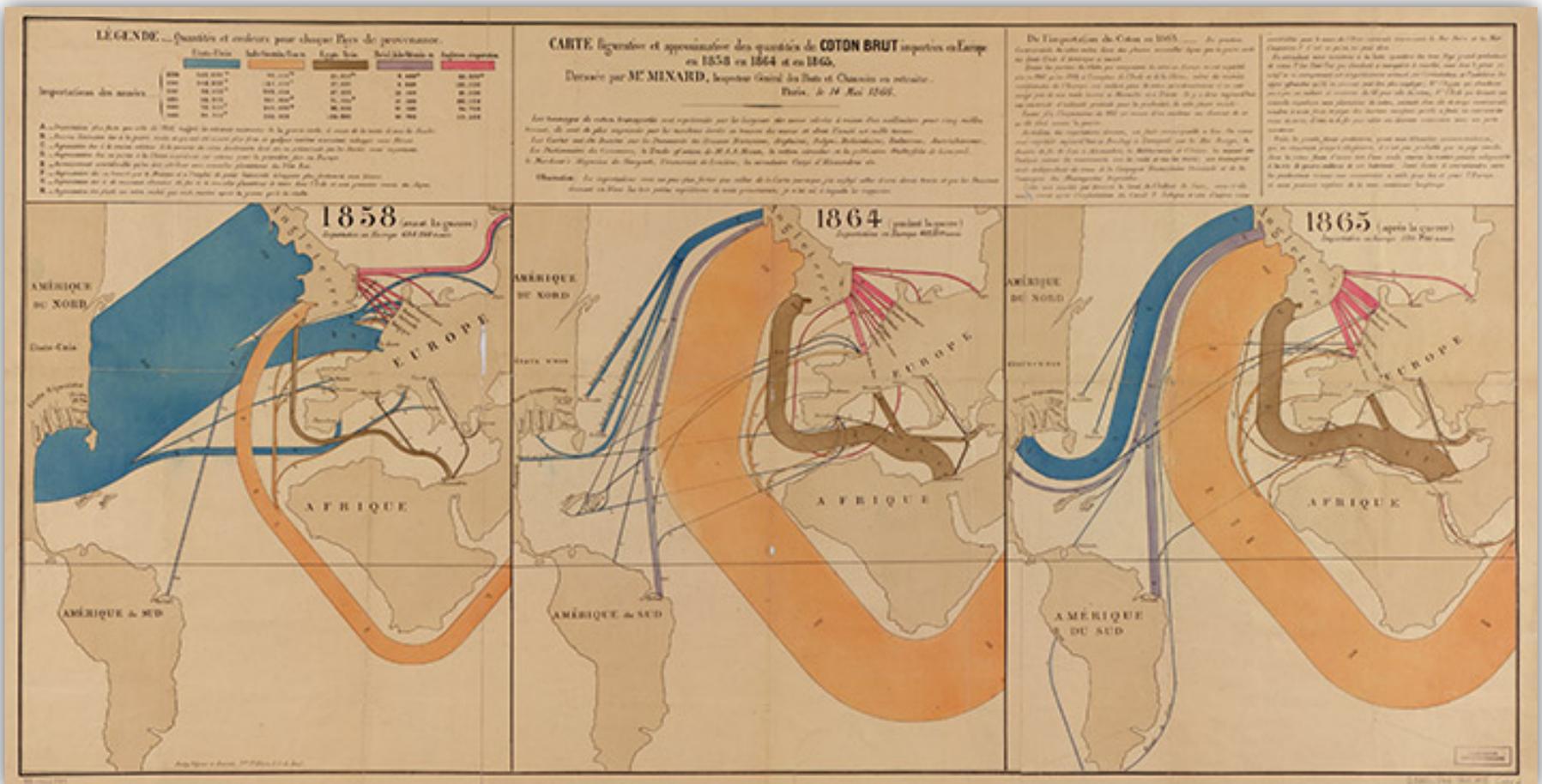
The Signs of the Zodiac The First 6 are Northern, the other Southern Signs

♈ Aries - March	♌ Leo - July	♎ Sagittarius - November
♉ Taurus - April	♍ Virgo - August	♏ Capricornus - December
♊ Gemini - May	♎ Libra - September	♐ Aquarius - January
♋ Cancer - June	♏ Scorpio - October	♑ Pisces - February



Printed for Tho: Bowles Print and Map Seller next to Chappin House in St. Pauls Church-yard, and John Bowles Print and Map Seller at the Black Horse in Cornhill London.

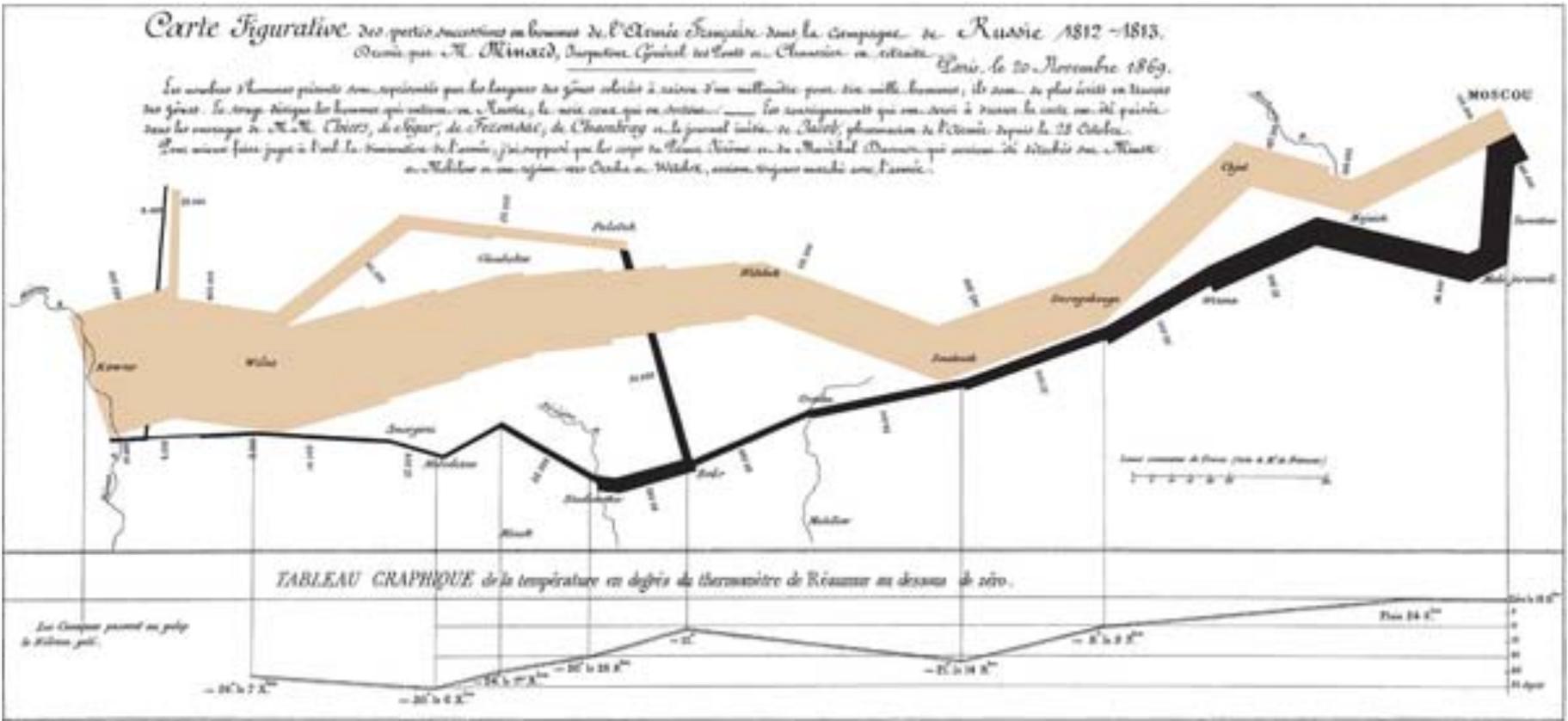
Herman Moll A New Map of the Whole World (1736). Image from Wikipedia.



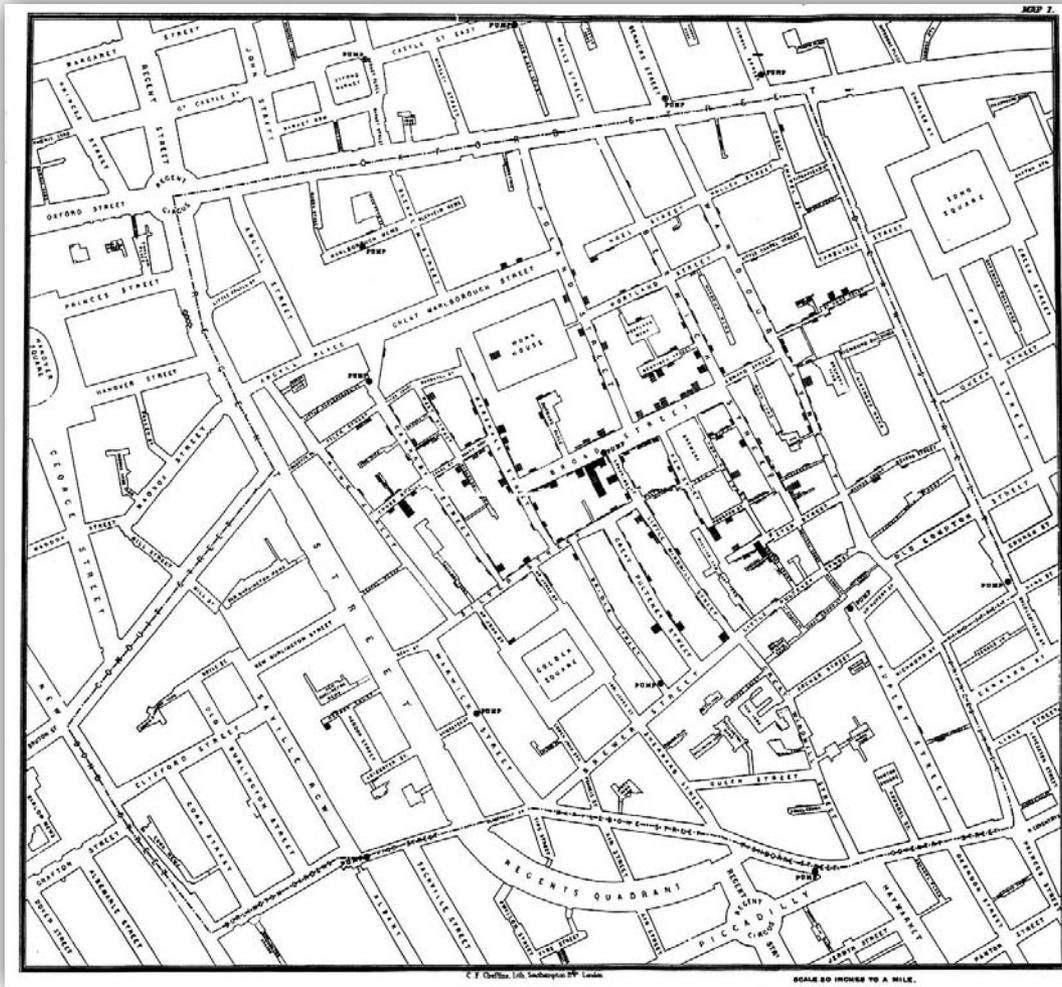
Charles Joseph Minard *Europe Raw Cotton Imports* (1866); Image from Scimaps.org

Carte Figurative des pertes successives en hommes de l'Armée Française dans la Campagne de Russie 1812-1813.
 Dessiné par M. MINARD, Inspecteur Général des Trains en Chef, en retraite. Paris, le 20 Novembre 1869.

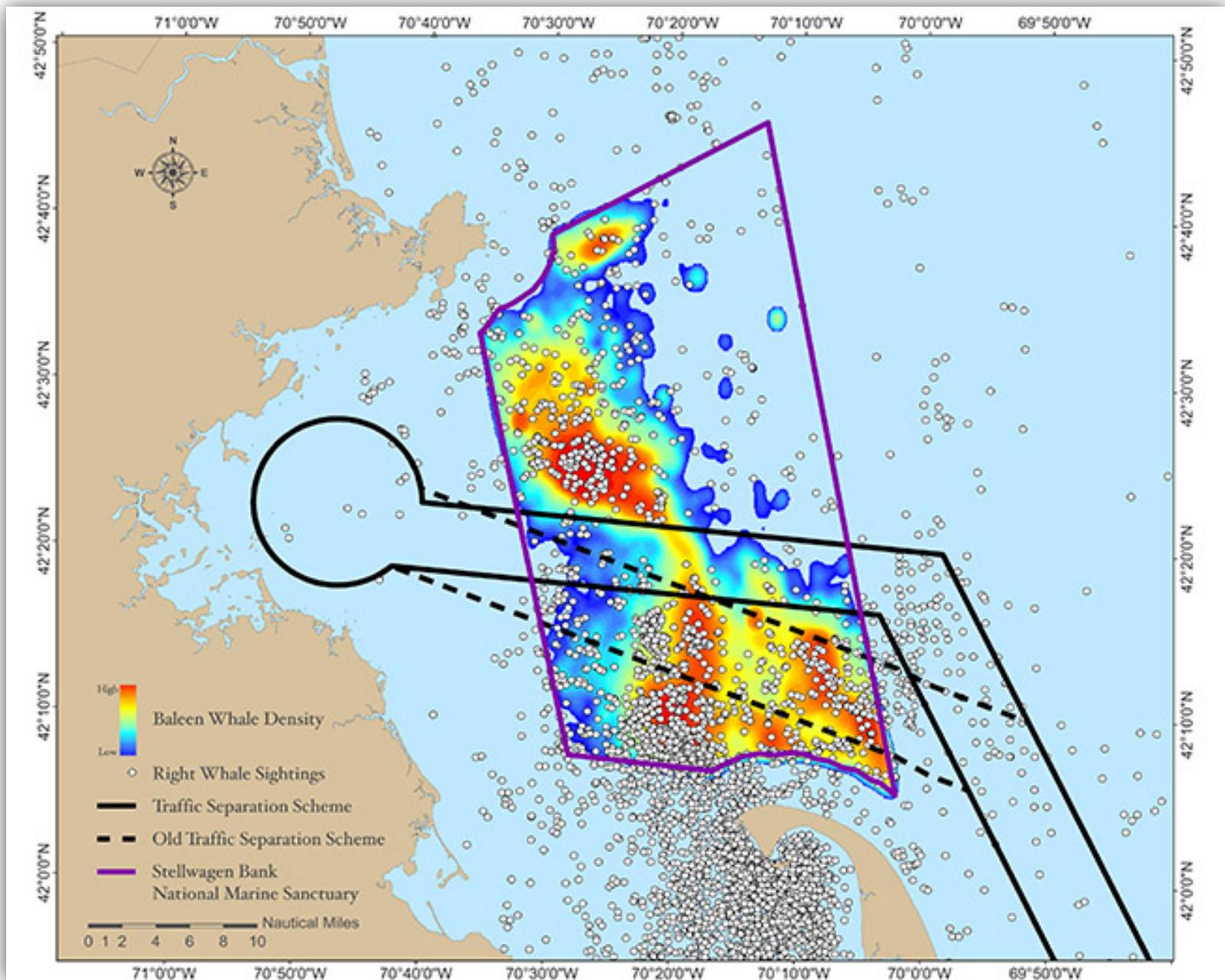
Les nombres d'hommes perdus sont exprimés par les longueurs des lignes colorées à raison d'un millimètre pour dix mille hommes; ils sont le plus écrits en lettres des lignes. Les traits blancs les hommes qui entrent en Russie, les traits noirs qui en sortent. Les arrangements qui ont servi à travers la route ont été peints dans les ouvrages de M. de Chateaubriand, de Fezensac, de Chateaugay et le journal intitulé de Balby, pharmacien de l'Armée depuis le 28 Octobre. Pour mieux faire juger à l'œil la dévastation de l'Armée, j'ai rapporté que les corps de Blücher, de Davout, de Barclay de Tolly, de Wittgenstein et de Wittke, ainsi qu'une partie de l'Armée.



Charles Joseph Minard map of Napoleon's disastrous Russian campaign of 1812 (1869)



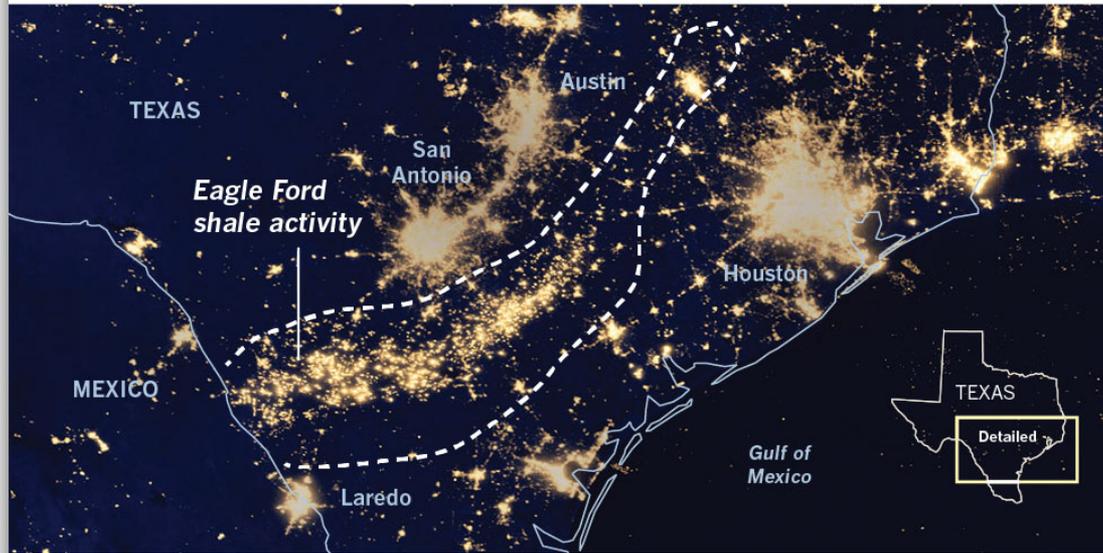
Cholera Cases in London, 1854, drawn by Charles Cheffins. http://en.wikipedia.org/wiki/John_Snow_%28physician%29



Wiley, Thompson and Merrick: *Realigning the Boston Traffic Separation Scheme* (2006): <http://scimaps.org/V.3>

Texas oil boom is visible from space

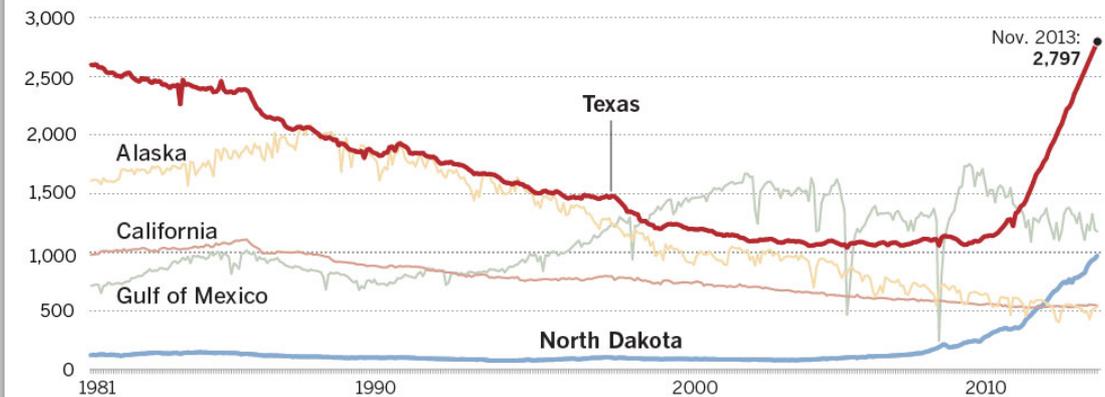
Lighting and natural gas flares from drilling on the 400-mile-long Eagle Ford shale formation can be seen from space in this image.



NASA

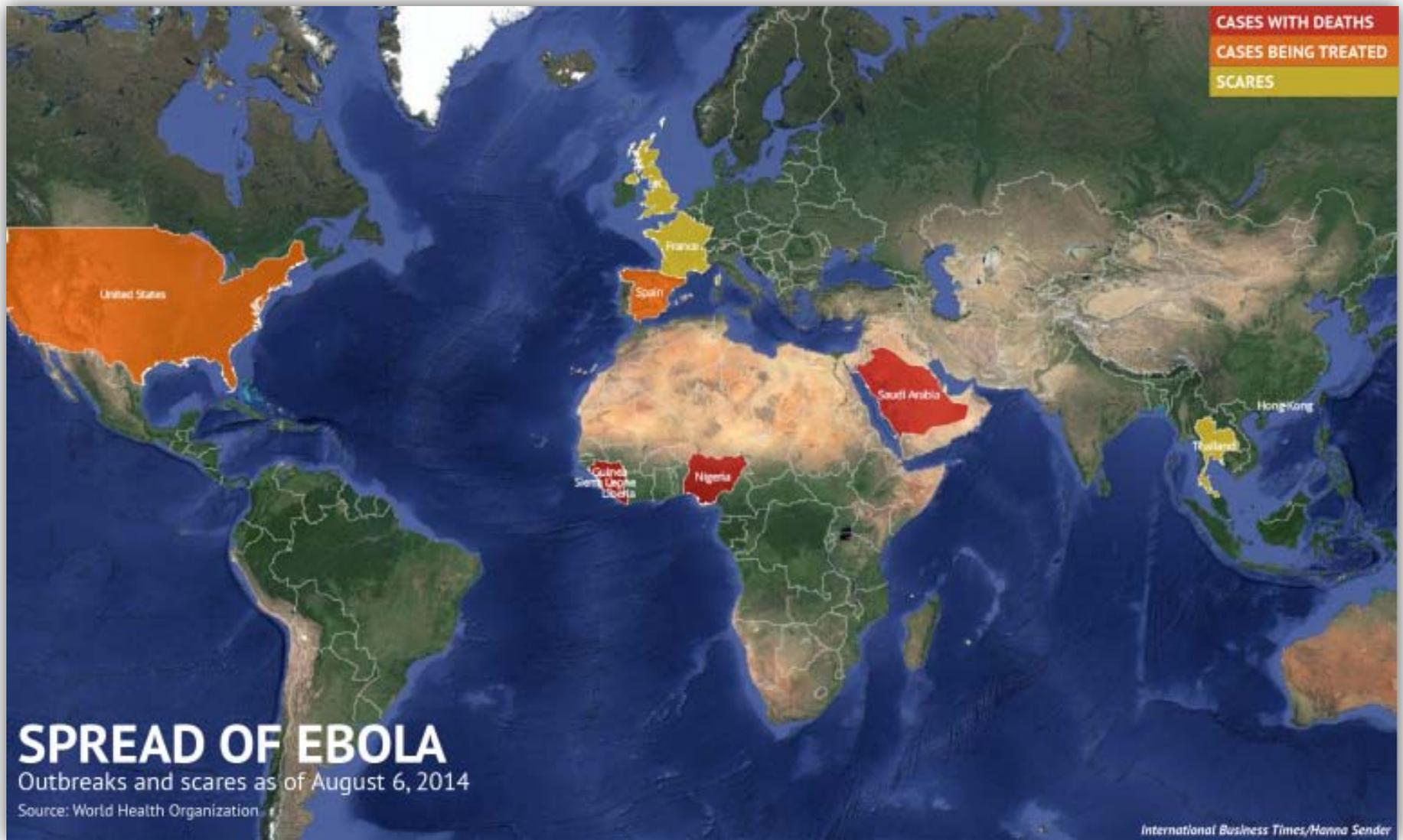
The new formation has helped make Texas the No. 1 oil-producing state in the nation.

Oil production from different U.S. regions (in thousands of barrels per day)



Source: Energy Information Administration

MATT MOODY Los Angeles Times



International Business Times/Hanna Sender *The Spread of Ebola* (2014)

Surging Seas

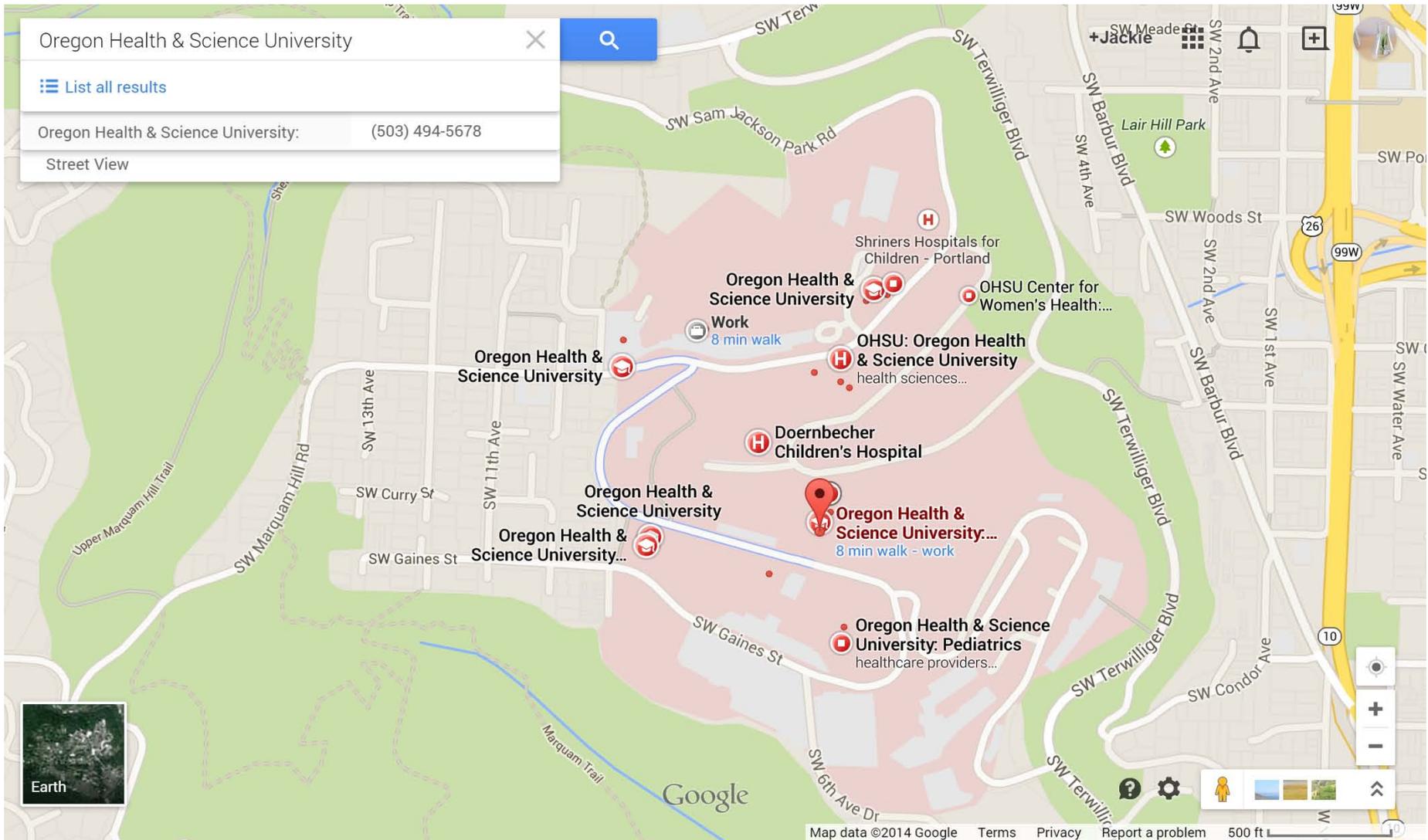
Sea level rise analysis by CLIMATE CENTRAL

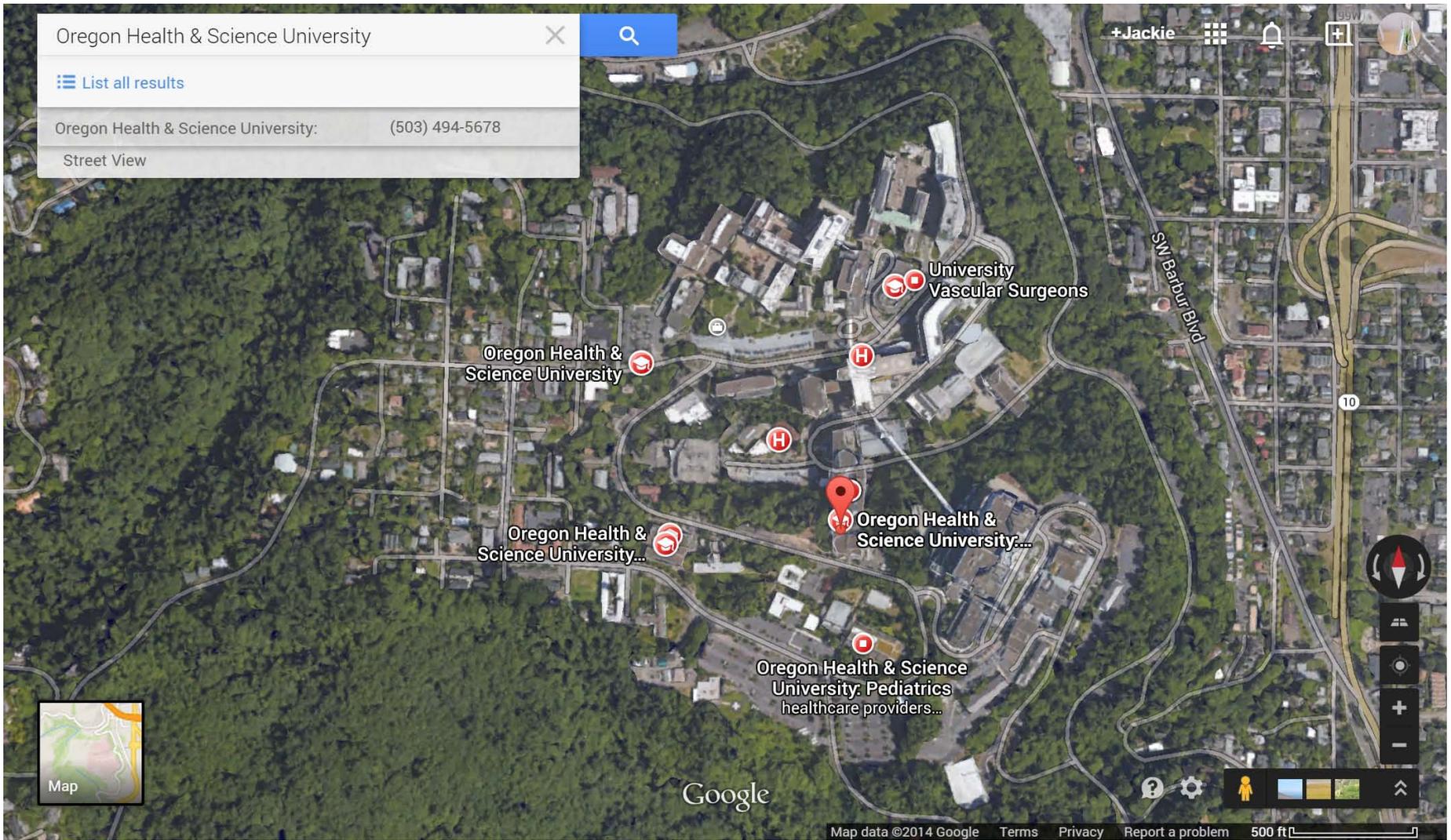
SUBMERGENCE RISK MAP

Cannon Beach, Oregon, United States

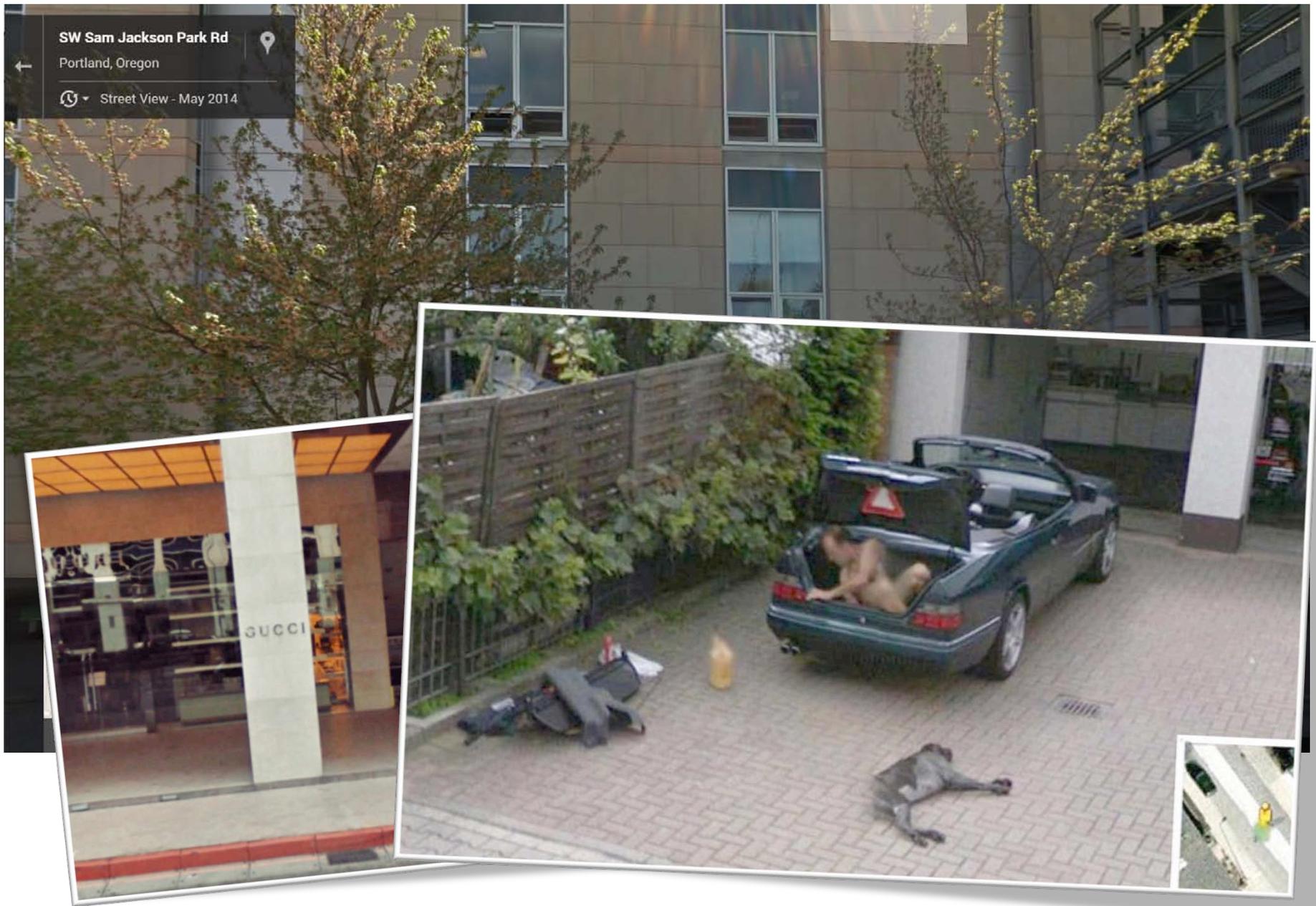


<http://sealevel.climatecentral.org/>





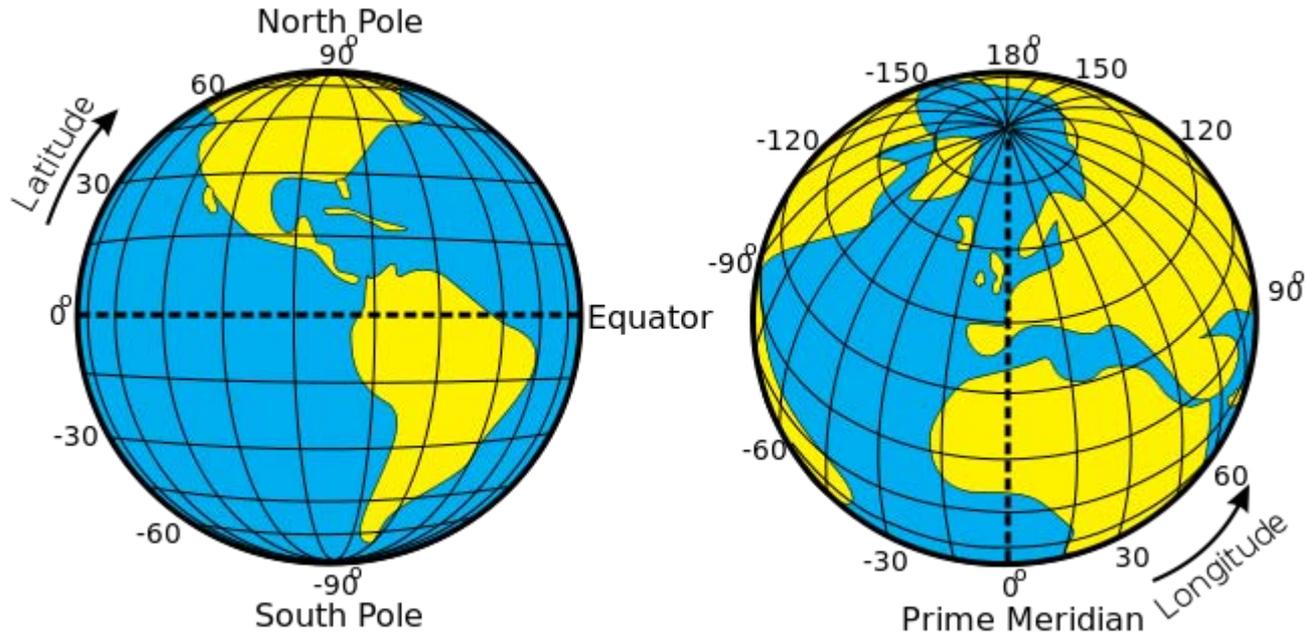
Google Maps



Google Maps

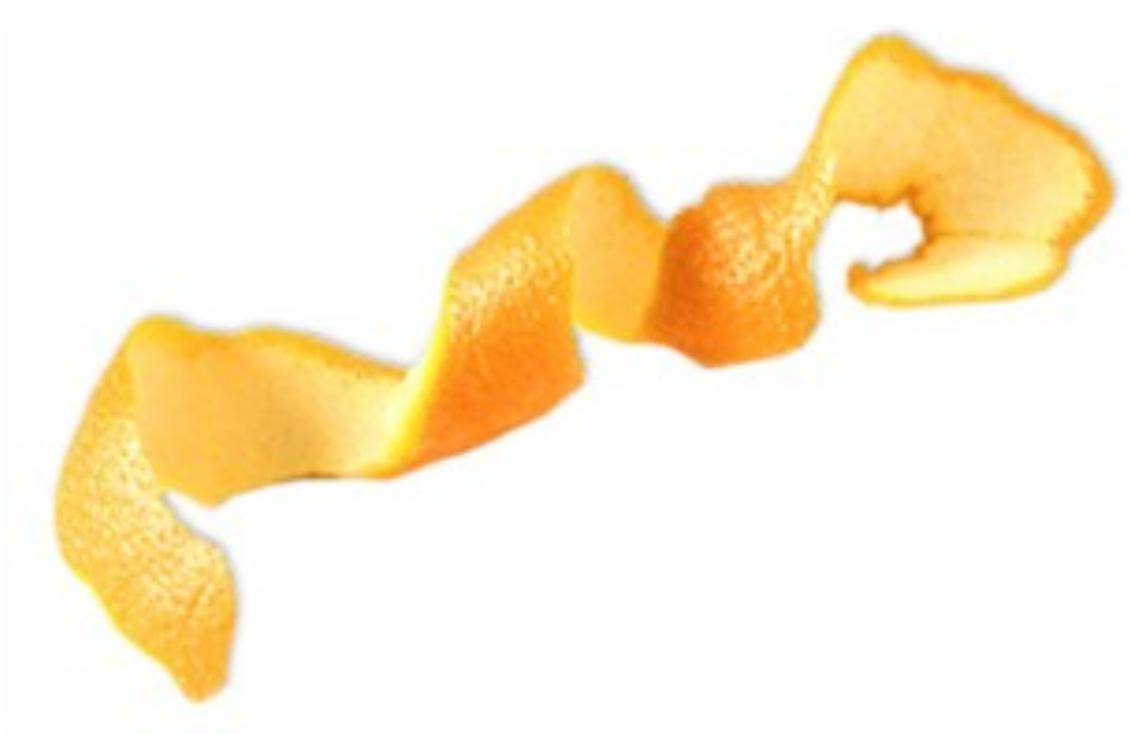
Maps 101

Overview and terminology



DMS: – Degrees, minutes, and seconds
Latitude: $40^{\circ}26'47''\text{N}$ – Longitude: $79^{\circ}58'36''\text{W}$

Decimal Degree: – Only degrees (real number)
Latitude: 40.446195 – Longitude: -79.948862



3D Spheres do not flatten well...

Distortion Happens:

Choose what you want to prioritize

- Distance between two points
- Direction between two points
- Shape of regions
- Area of regions
- Familiarity of projection...

A world map with a yellow color scheme and a dark grey semi-transparent text box in the center. The text box contains the title 'Azimuthal' and the subtitle 'Preserves direction / distance'.

Azimuthal

Preserves direction / distance

A world map with a dark gray background. The landmasses are colored in a bright yellow. A semi-transparent dark gray rectangular box is overlaid on the map, centered over the Pacific Northwest region of North America. Inside this box, the text 'Equal-Area' is written in a large, white, sans-serif font. Below it, the text 'Preserves area' is written in a smaller, white, sans-serif font. The highlighted area covers the western United States, Canada, and Alaska.

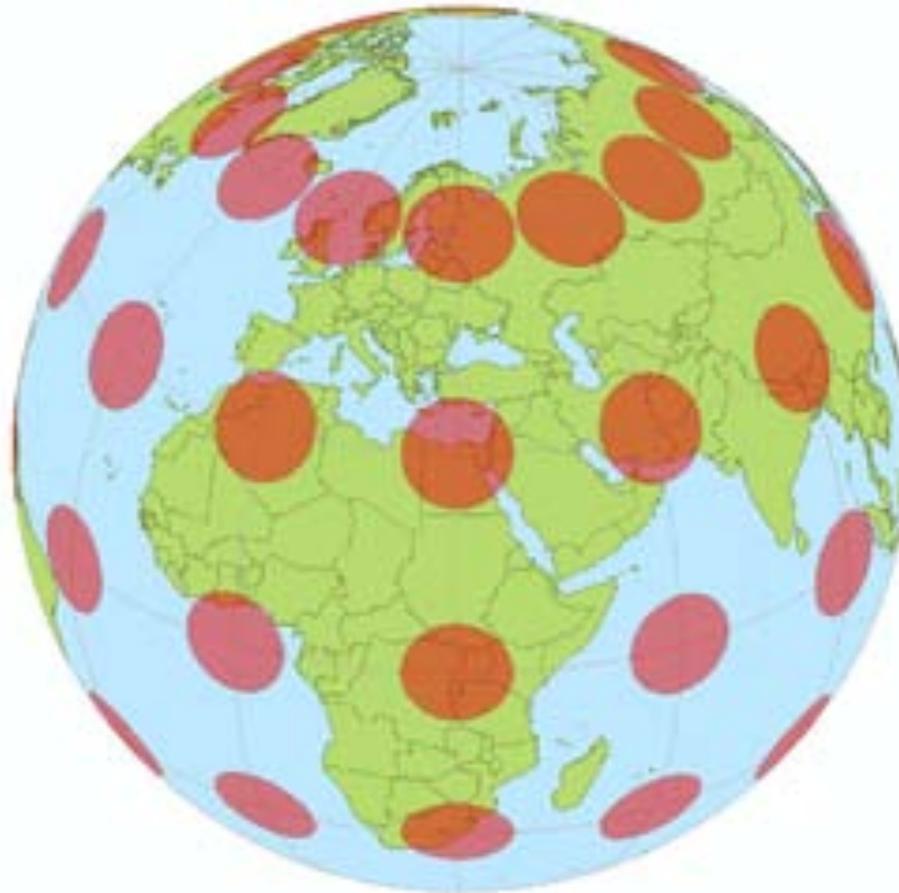
Equal-Area

Preserves area

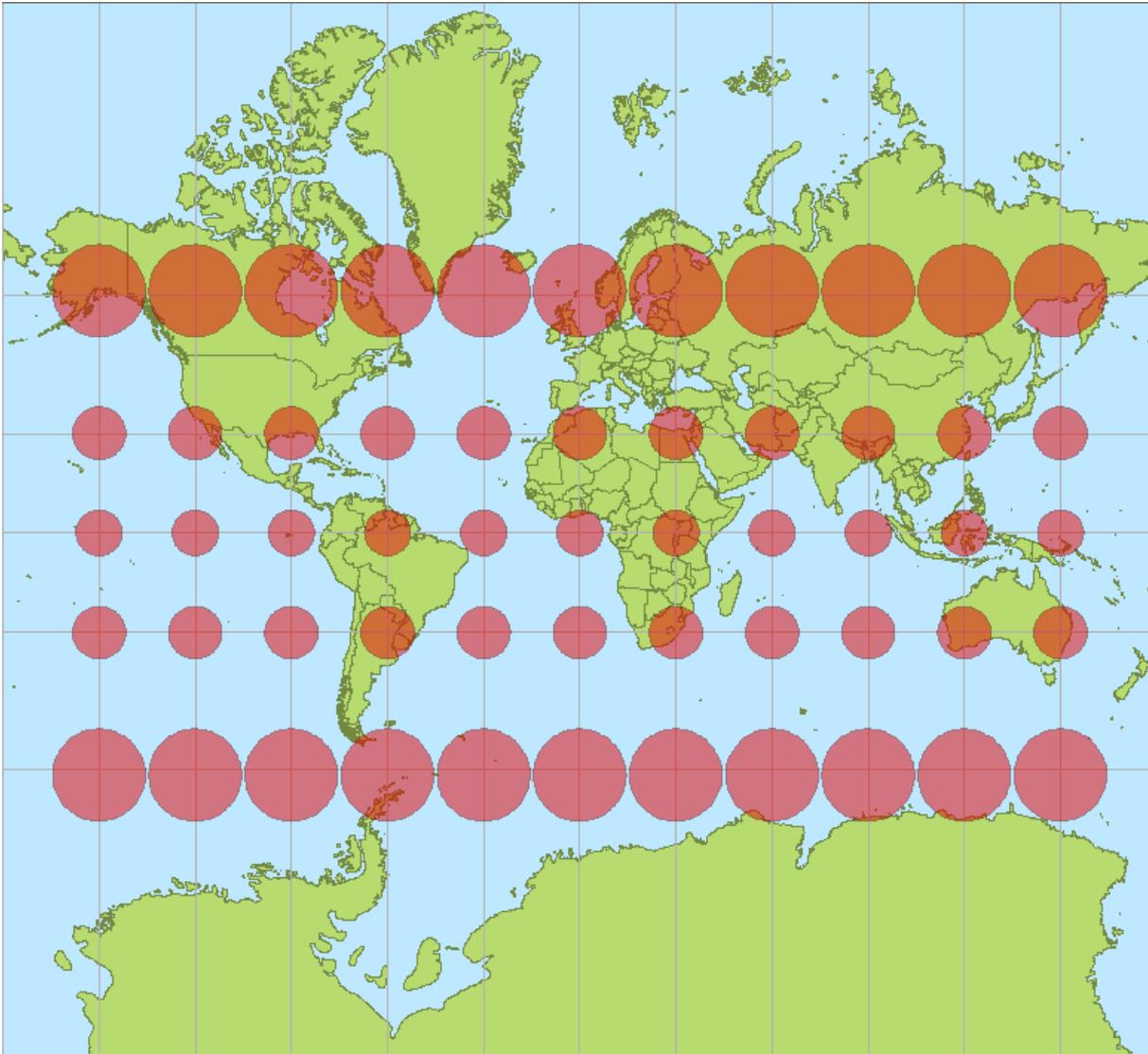
A world map with a dark gray background and yellow landmasses. A semi-transparent dark gray rectangular box is centered over the map, containing the text. The map shows the outlines of continents and country borders.

Conformal

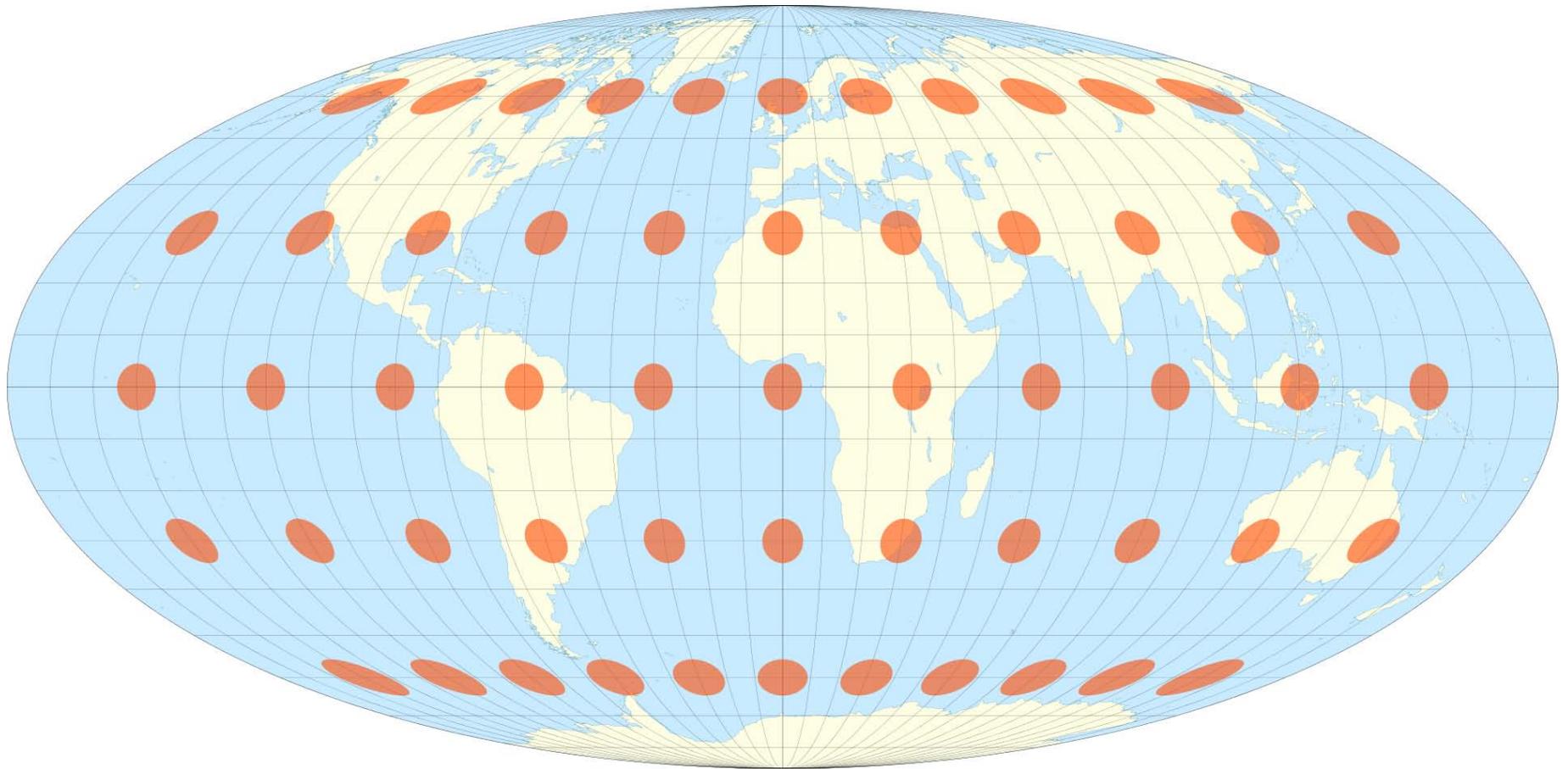
Preserves local angles



Tissot *Indicatrices*: http://en.wikipedia.org/wiki/Tissot%27s_indicatrix

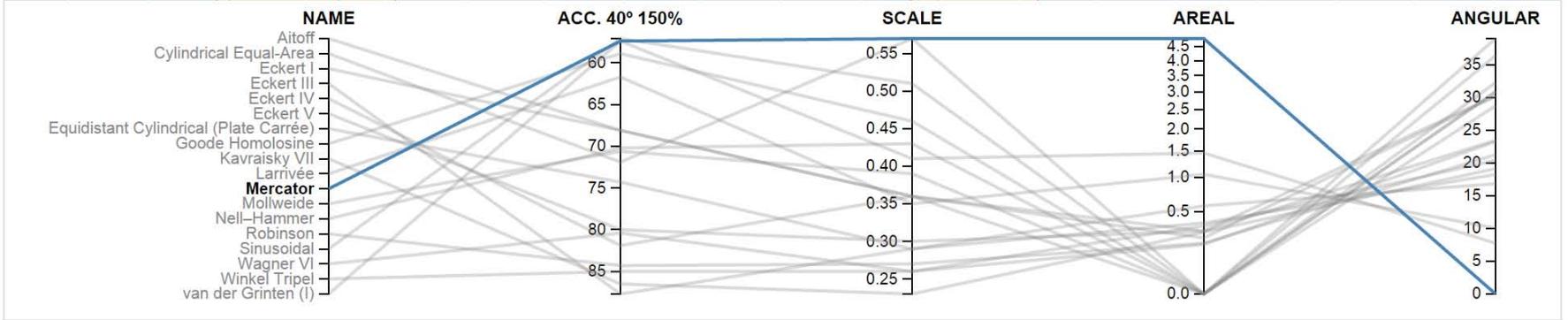
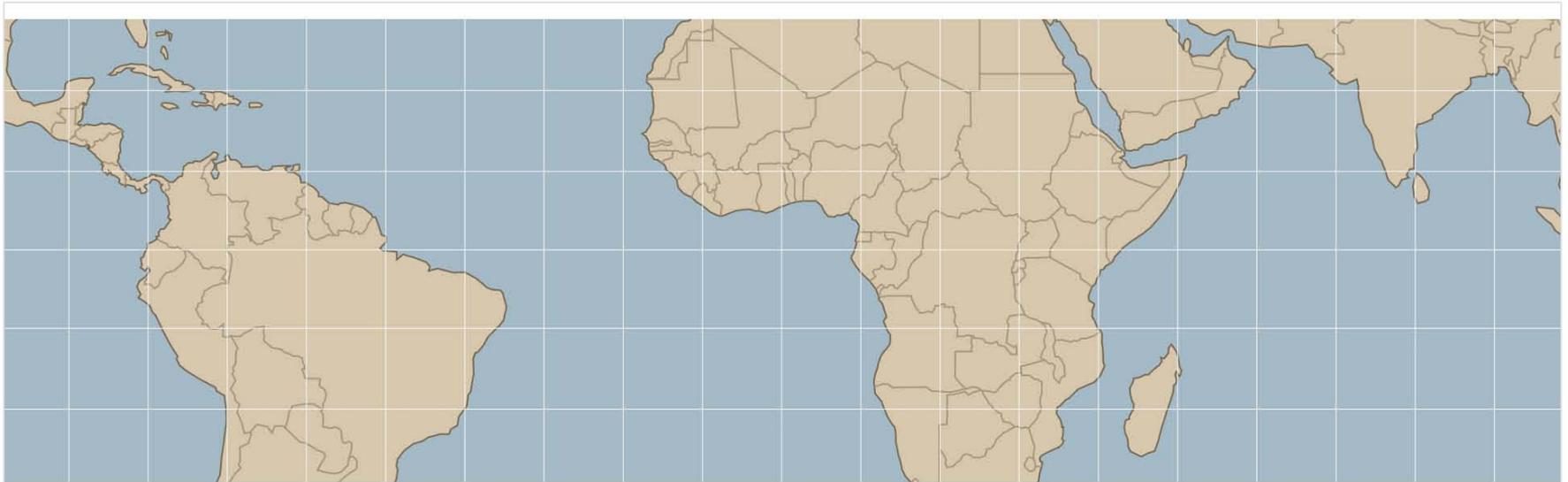


Tissot *Indicatrices*: http://en.wikipedia.org/wiki/Tissot%27s_indicatrix

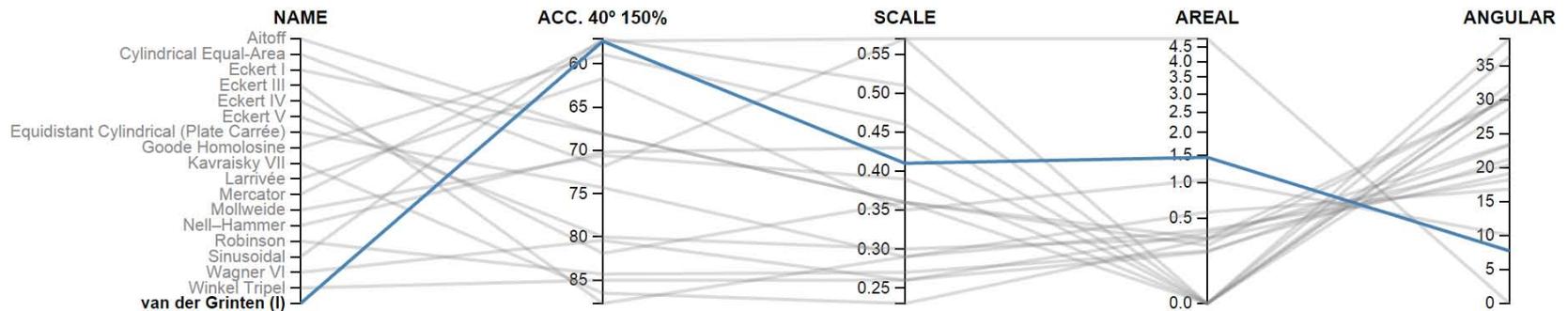
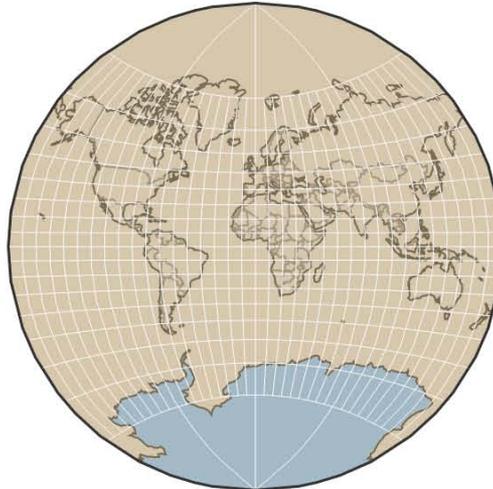


Tissot *Indicatrices*: http://en.wikipedia.org/wiki/Tissot%27s_indicatrix

Comparing Map Projections



Comparing Map Projections



WHAT YOUR FAVORITE

MAP PROJECTION

SAYS ABOUT YOU

MERCATOR



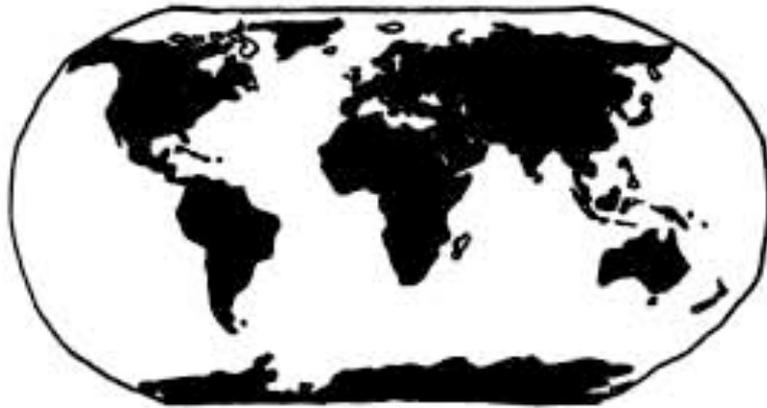
YOU'RE NOT REALLY INTO MAPS.

WHAT YOUR FAVORITE

MAP PROJECTION

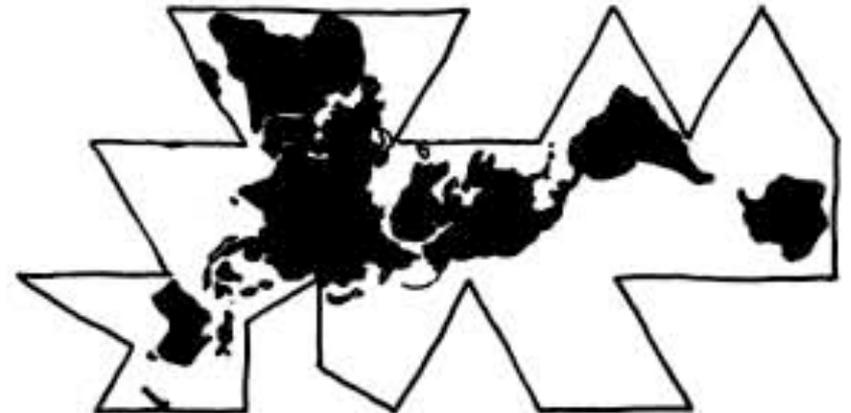
SAYS ABOUT YOU

ROBINSON



YOU HAVE A COMFORTABLE PAIR OF RUNNING SHOES THAT YOU WEAR EVERYWHERE. YOU LIKE COFFEE AND ENJOY THE BEATLES. YOU THINK THE ROBINSON IS THE BEST-LOOKING PROJECTION, HANDS DOWN.

DYMAXION



YOU LIKE ISAAC ASIMOV, XML, AND SHOES WITH TOES. YOU THINK THE SEGWAY GOT A BAD RAP. YOU OWN 3D GOGGLES, WHICH YOU USE TO VIEW ROTATING MODELS OF BETTER 3D GOGGLES. YOU TYPE IN DVORAK.

WHAT YOUR FAVORITE

MAP PROJECTION

SAYS ABOUT YOU

PEIRCE QUINCUNCIAL



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.

<http://xkcd.com/977/>

Maps Types

More than you'd think...

Physical Maps – Shows physical features (mountains, lakes)

Road Maps – Shows location and name of roads, other manmade features

Topographic Maps – Shows 3d topography in 2d map using contour lines

Thematic Maps – generally designed to depict a single theme (choropleth, proportional symbol, dot maps)

Other Maps – includes cartograms, flow maps, stylized

Thematic Maps

choropleth, proportional symbol, dot maps

Coropleth

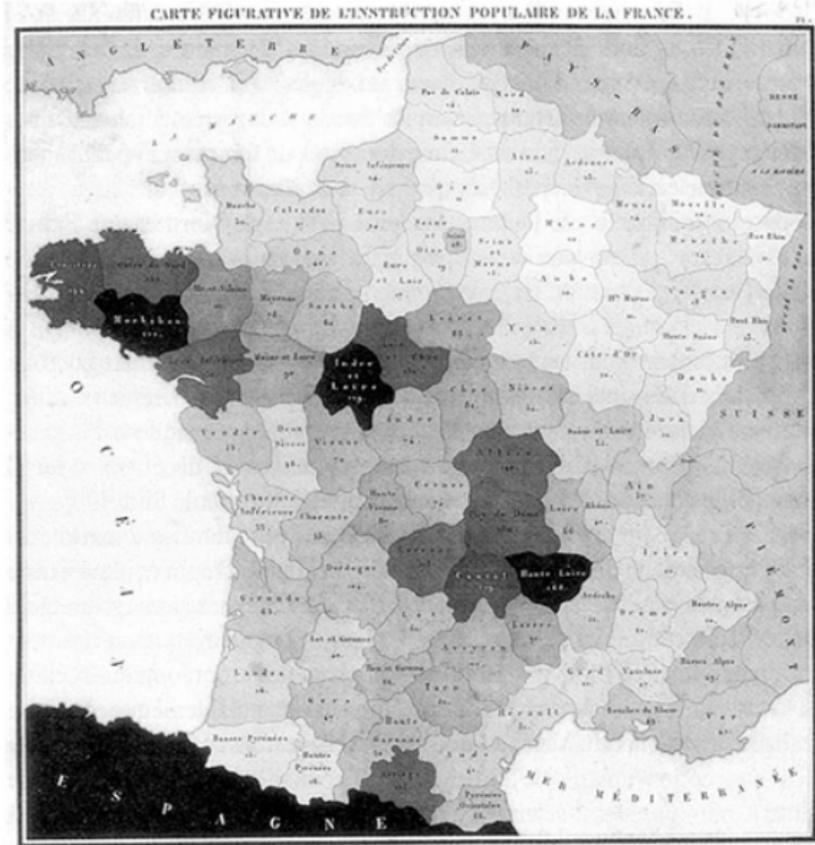
Uses color and intensity to indicate data values

- Use color *wisely!*

Data should be normalized

- Good: Percentages, ratios
- Bad: Counts, totals

Illiteracy in France



Charles Dupin, 1826

Total Population of 2000 Census Block Groups

Population Density of 2000 Census Block Groups



READING, WRITING, AND EARNING MONEY

The latest data from the U.S. Census's American Community Survey paints a fascinating picture of the United States at the county level. We've looked at the educational achievement and the median income of the entire nation, to see where people are going to school, where they're earning money, and if there is any correlation.



① HIGH SCHOOL GRADUATES 65% 75% 82% 88%



② COLLEGE GRADUATES 15% 22% 30% 40%

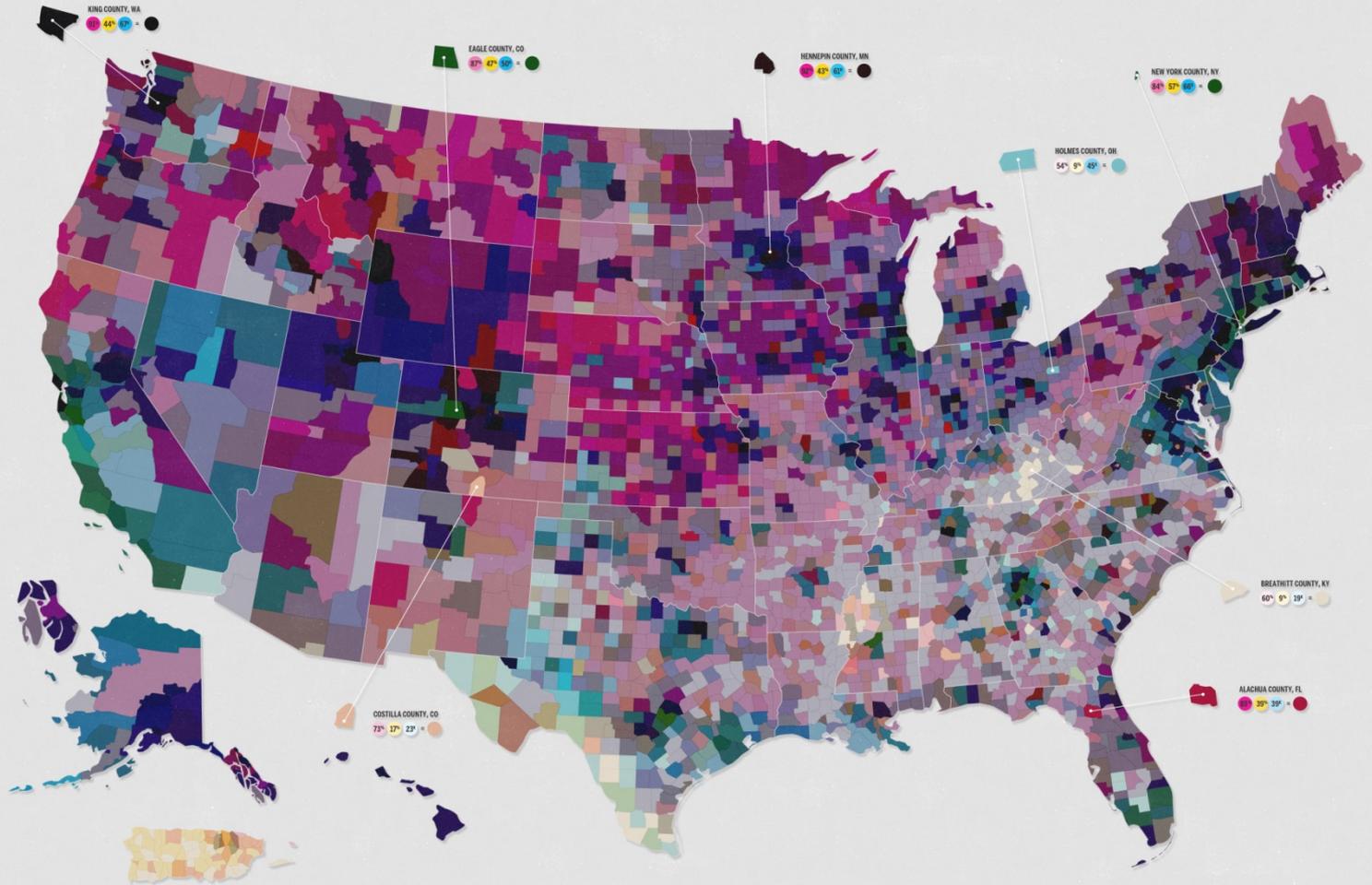


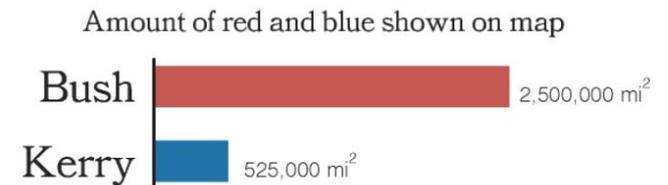
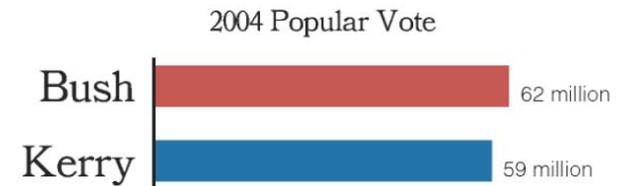
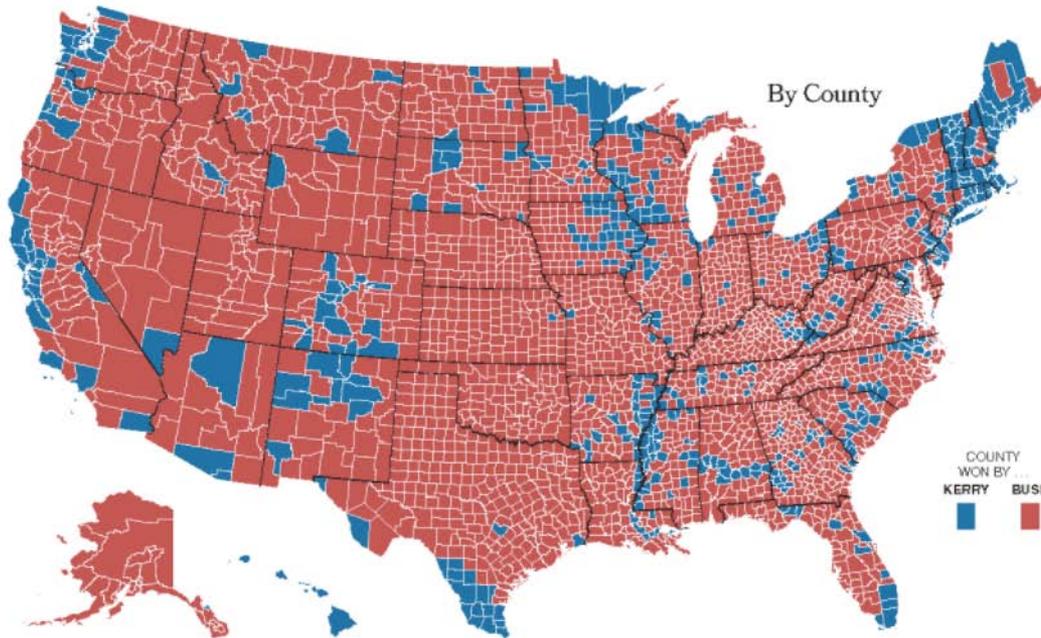
③ MEDIAN HOUSEHOLD INCOME 25K 40K 50K 60K

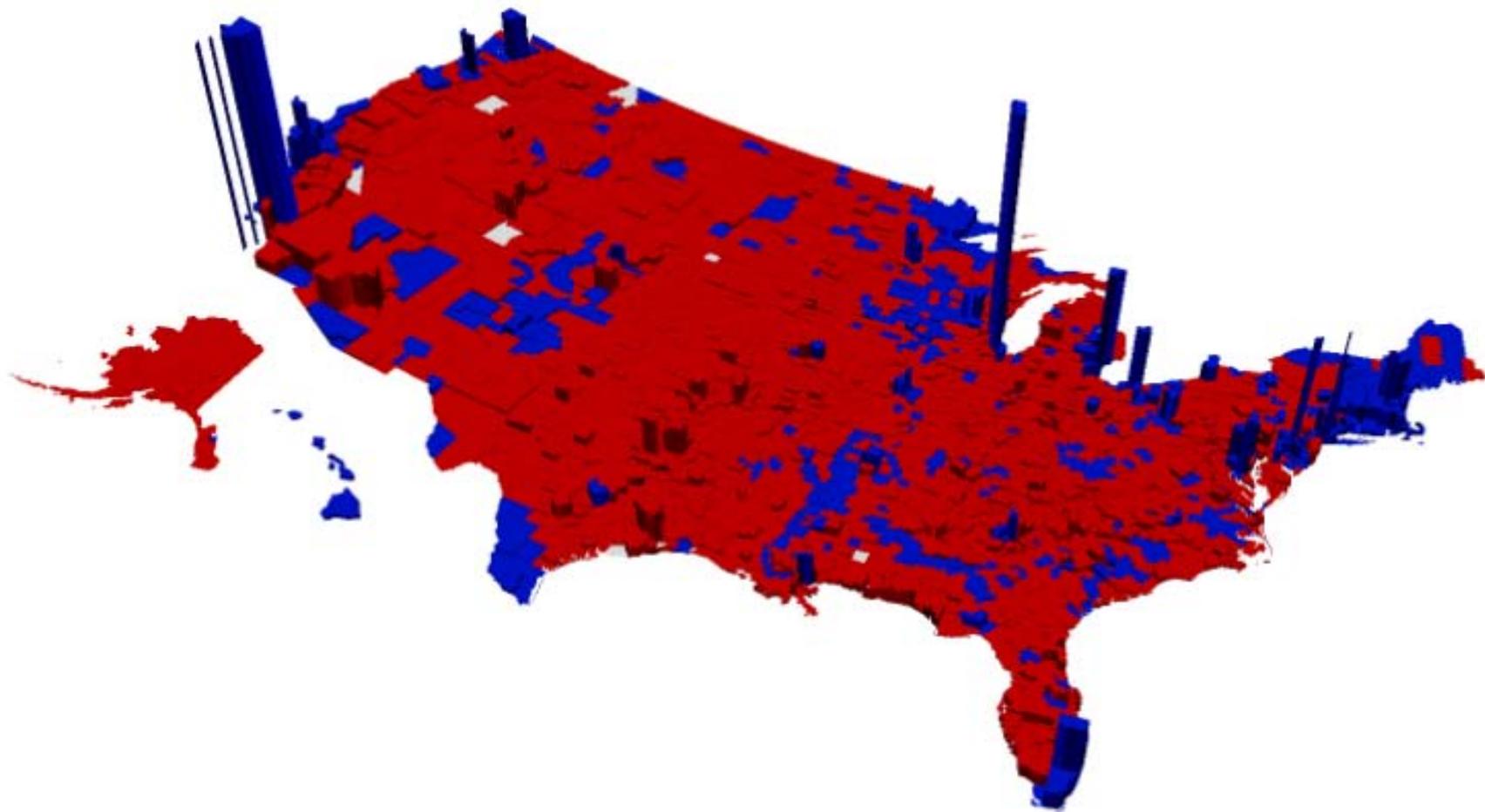
The map at right is a product of overlaying the three sets of data. The variation in hue and value has been produced from the data shown above. In general, darker counties represent a more educated, better paid population while lighter areas represent communities with fewer graduates and lower incomes.



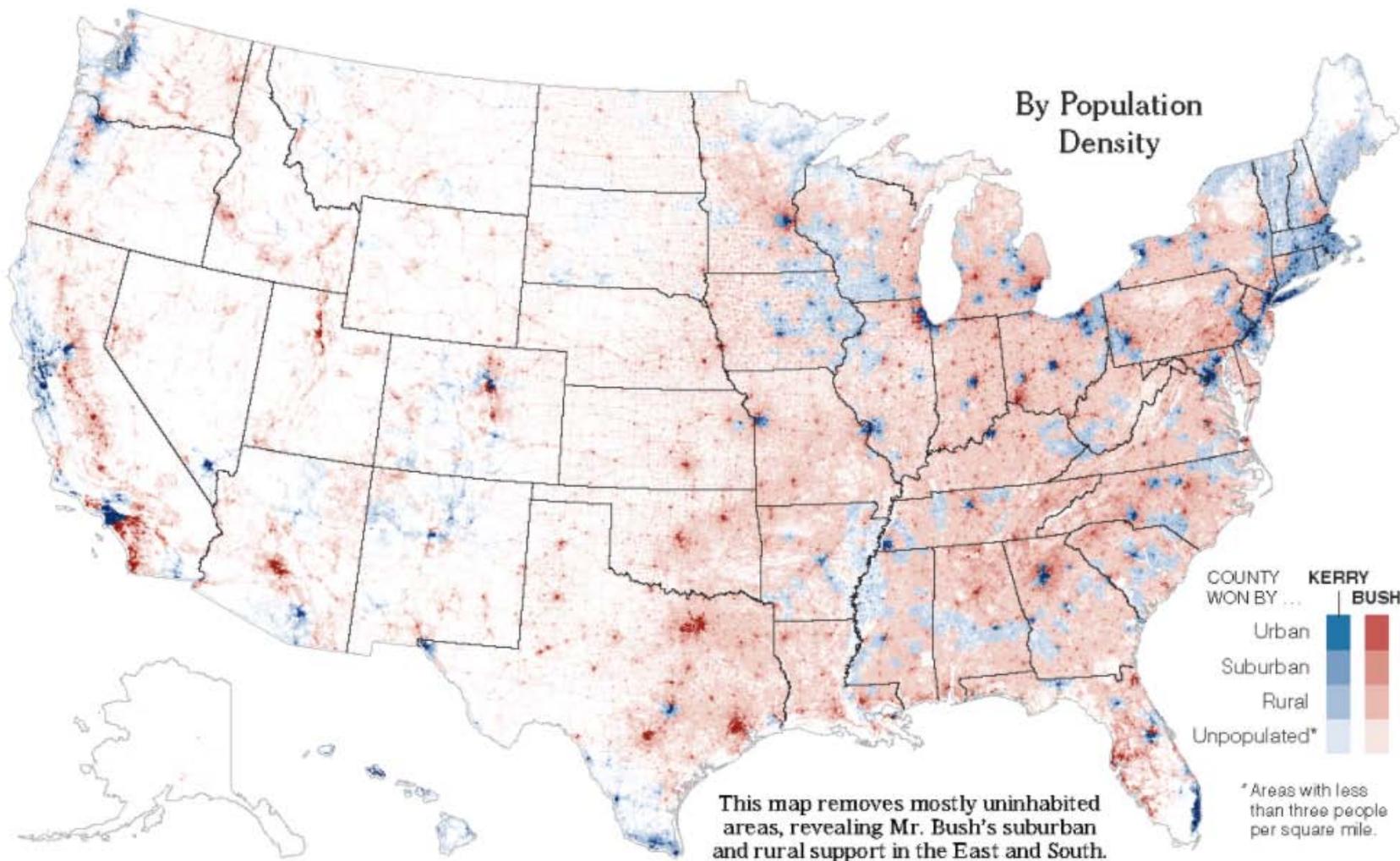
A collaboration between GOOD and Gregory Huback
SOURCE: US Census







Slide modified from Hanspeter Pfister, Harvard



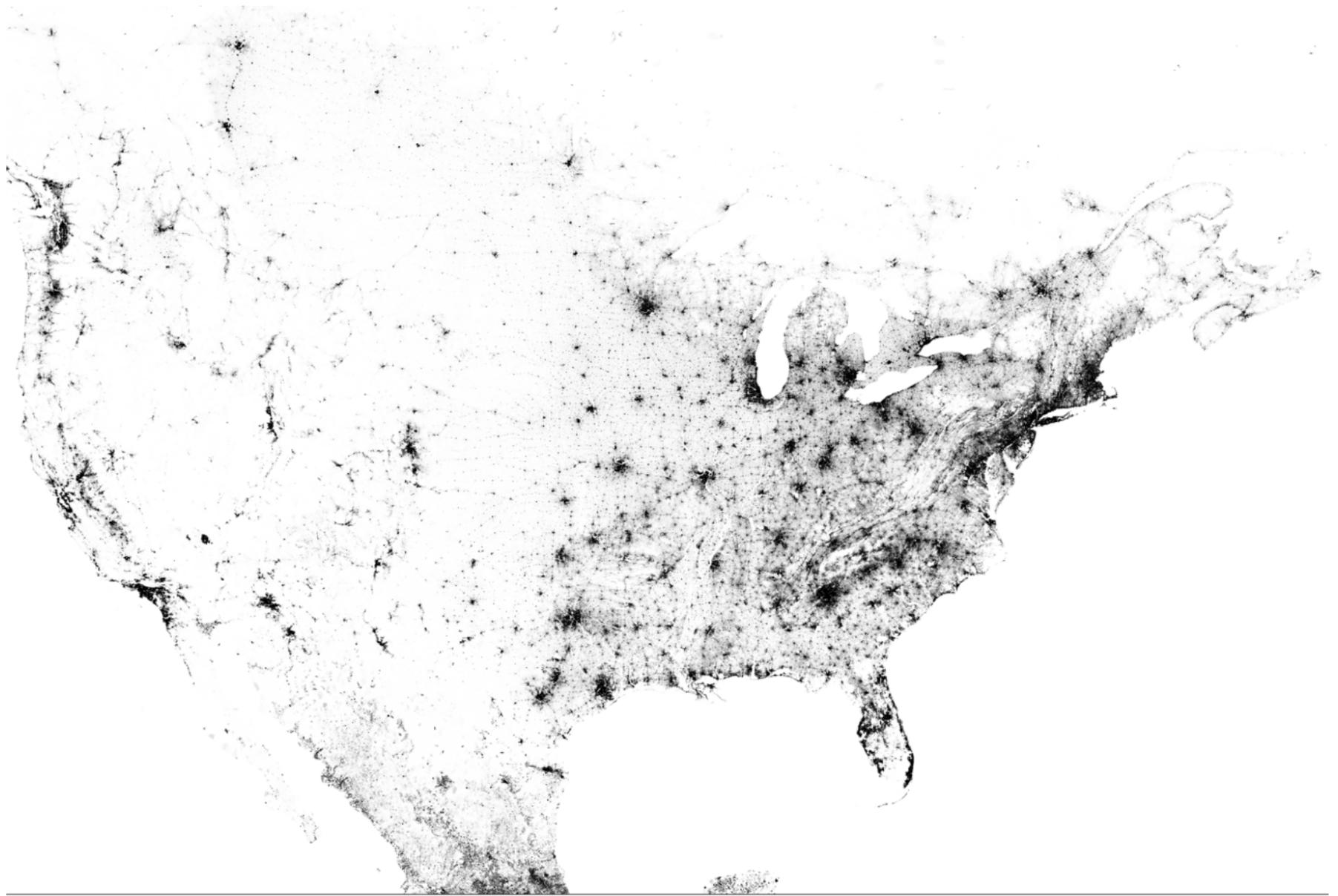
Slide modified from Hanspeter Pfister, Harvard

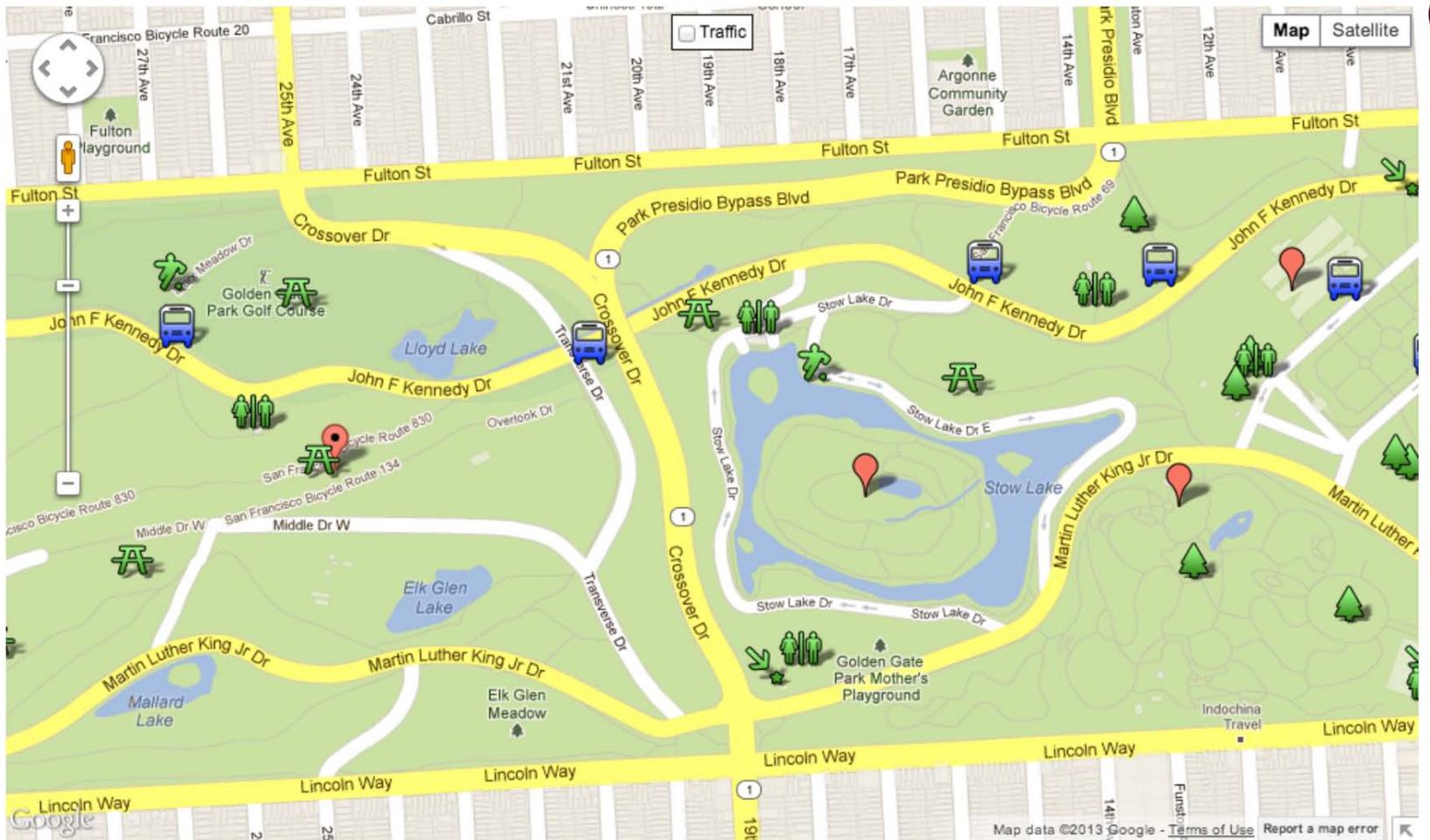
(Proportional) Symbol Maps

Use symbol size, color, or shape to code data in map overlays

Data sets be aggregated to points within an area

- e.g. Cities





<http://www.golden-gate-park.com/interactive-golden-gate-park-map.html>

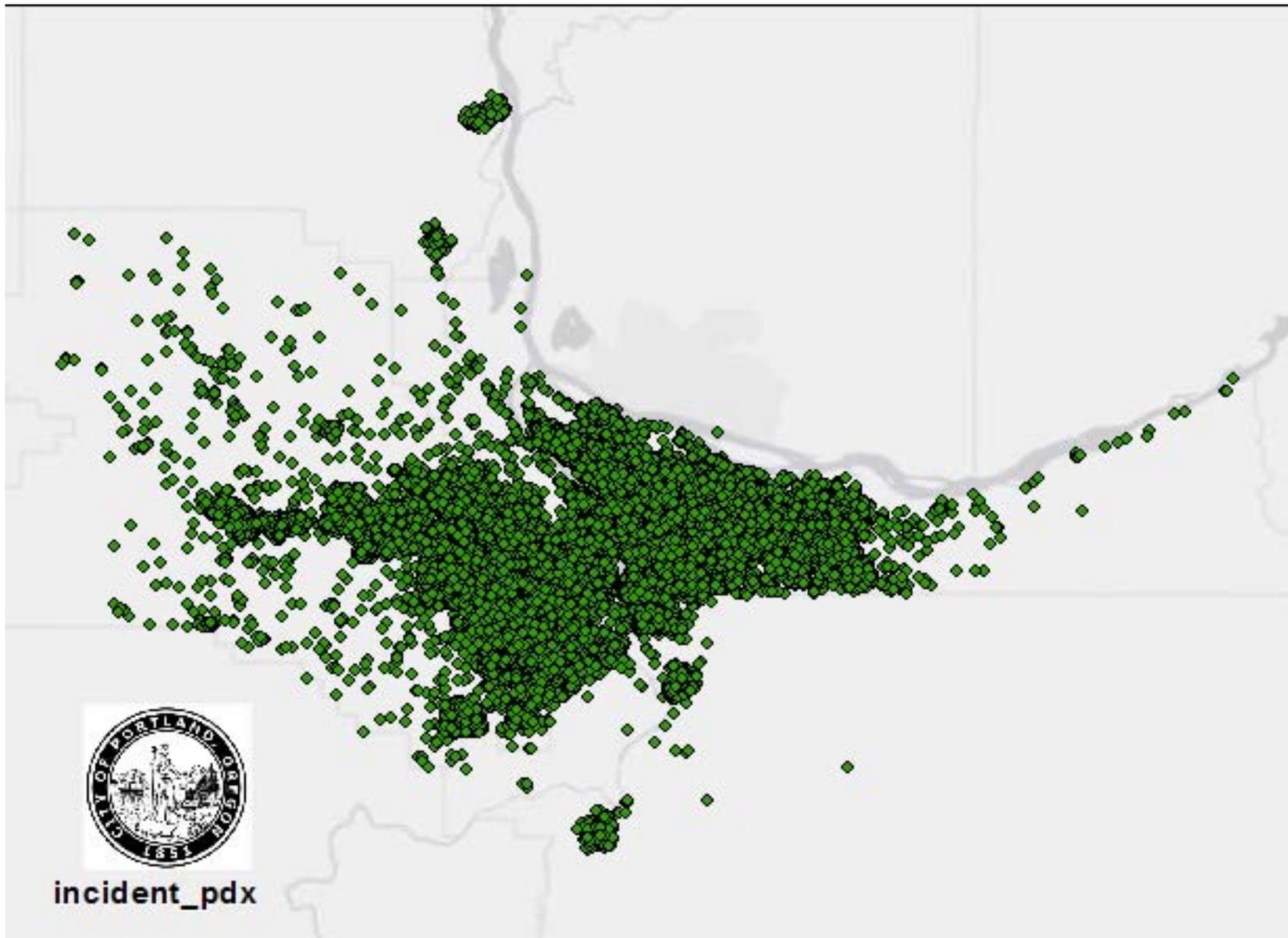
A note on data:

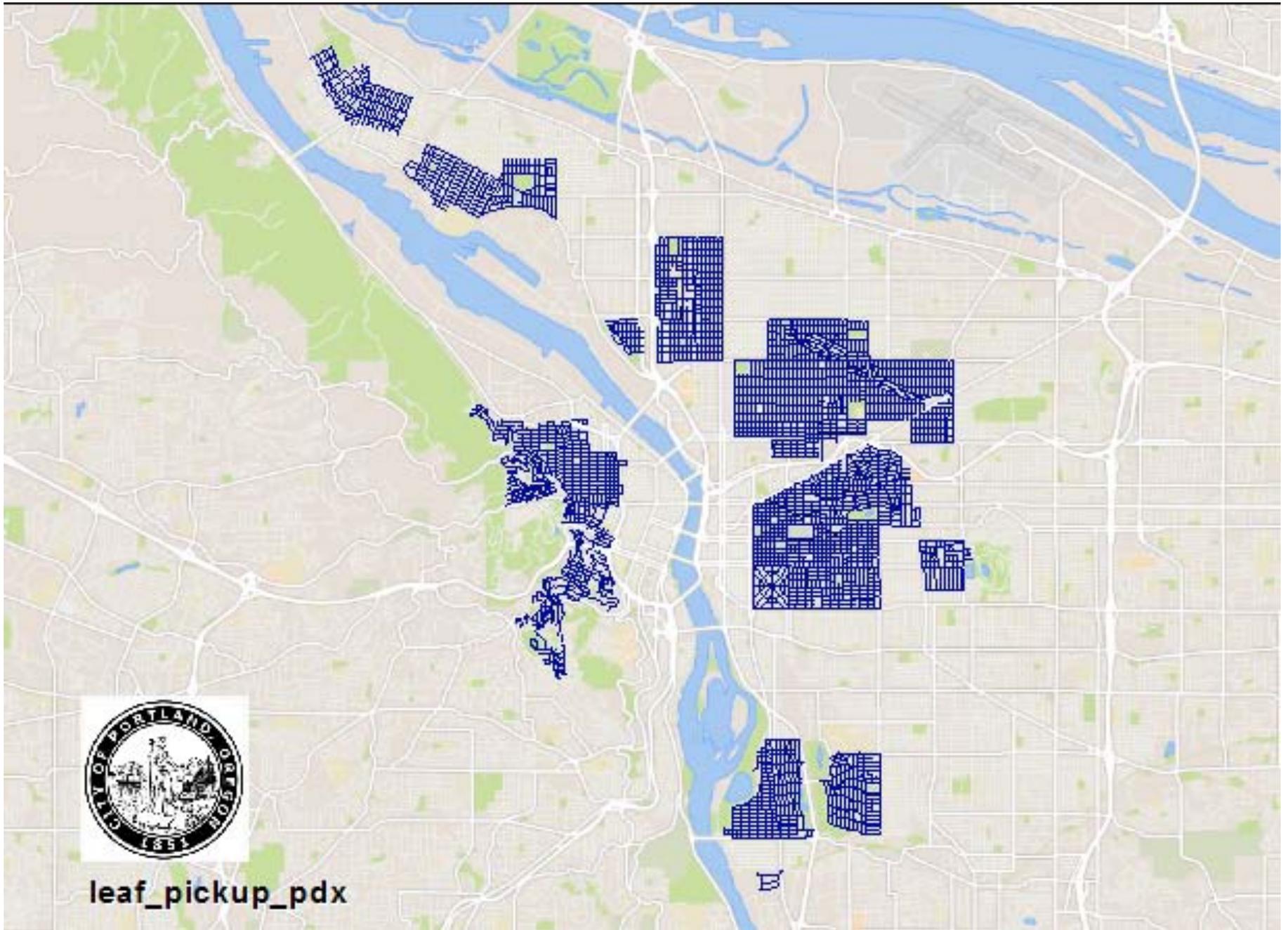
Typically, geodata comes in two main forms:

Points are single locations in some coordinate space

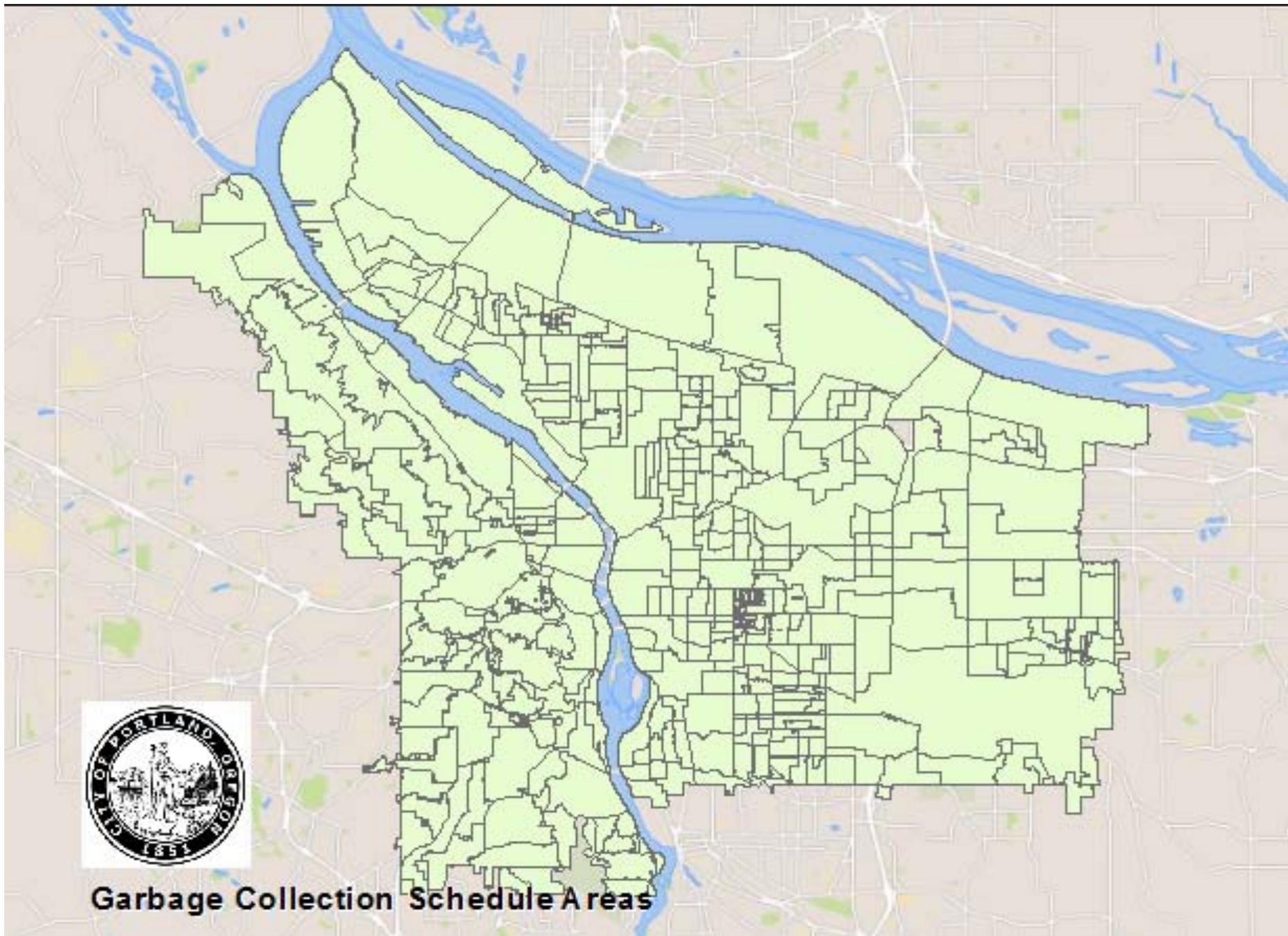
Shapes are collections of points

Shapes are either *Lines* or *Areas*





leaf_pickup_pdx



Garbage Collection Schedule Areas

So you've got data: now what?

Points, polygons, lines, etc. all represent (at least!) two types of information:

1. Implicitly, a location in space
2. Explicitly, some collection of associated data

Examples!

<http://www.civicapps.org/datasets>

<http://www.civicapps.org/datasets/street-trees>

<http://www.civicapps.org/datasets/leaf-pickup>

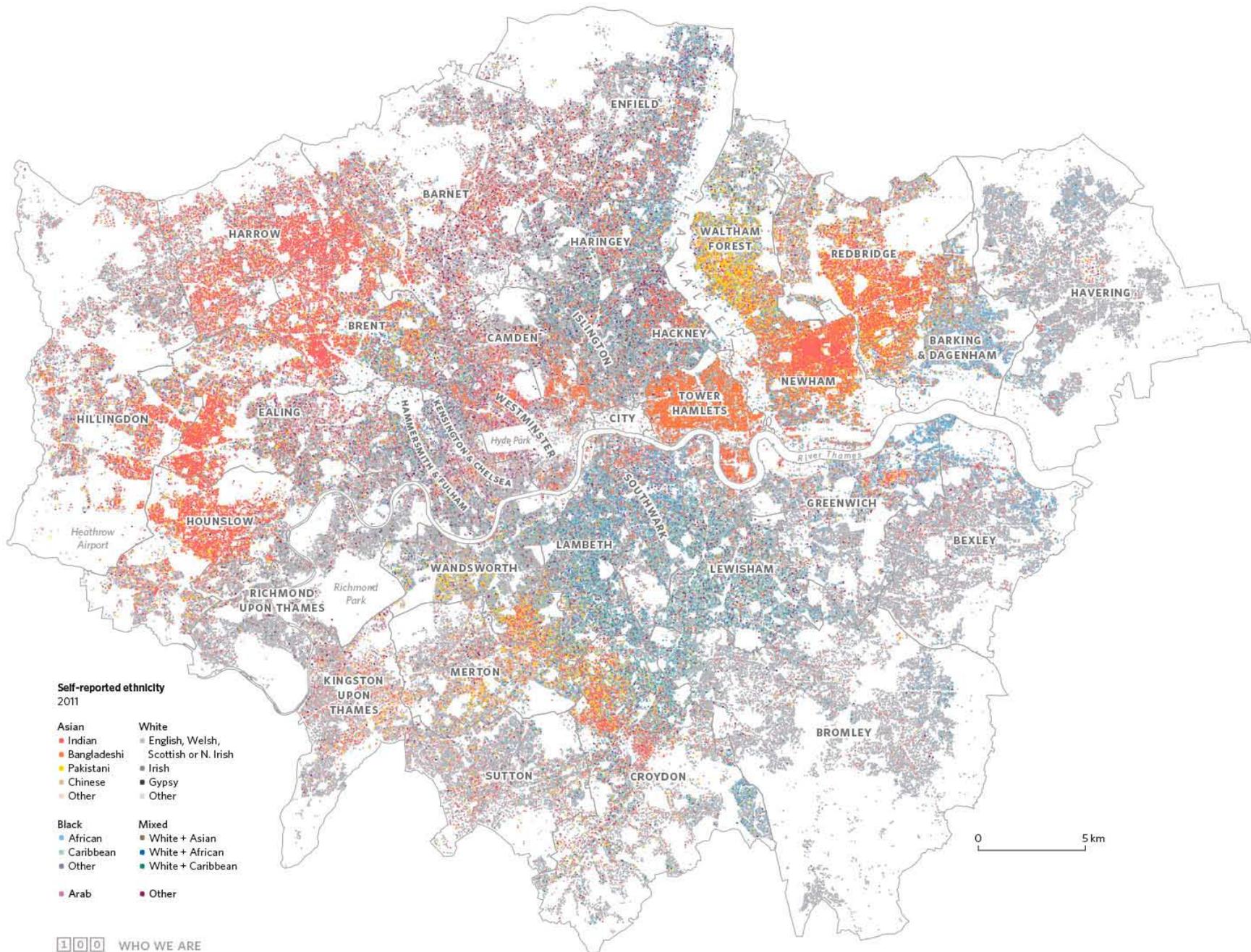
<http://www.civicapps.org/datasets/garbage-collection-schedule-areas>

So you've got data: now what?

Points, polygons, lines, etc. all represent (at least!) two types of information:

1. Implicitly, a location in space
2. Explicitly, some collection of associated data

Everything we've learned about perception, visual encodings, etc. applies!

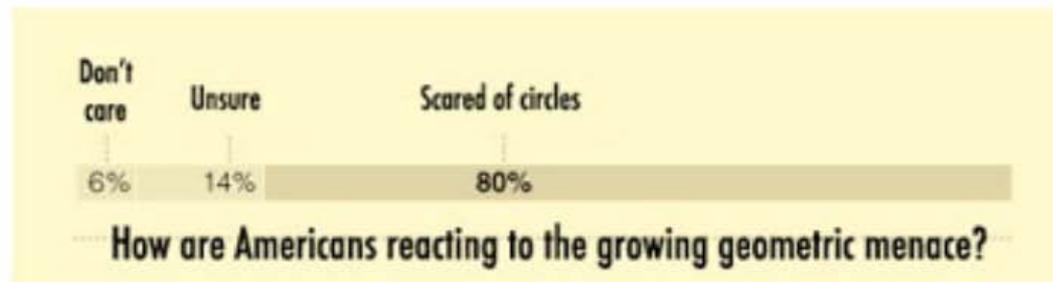
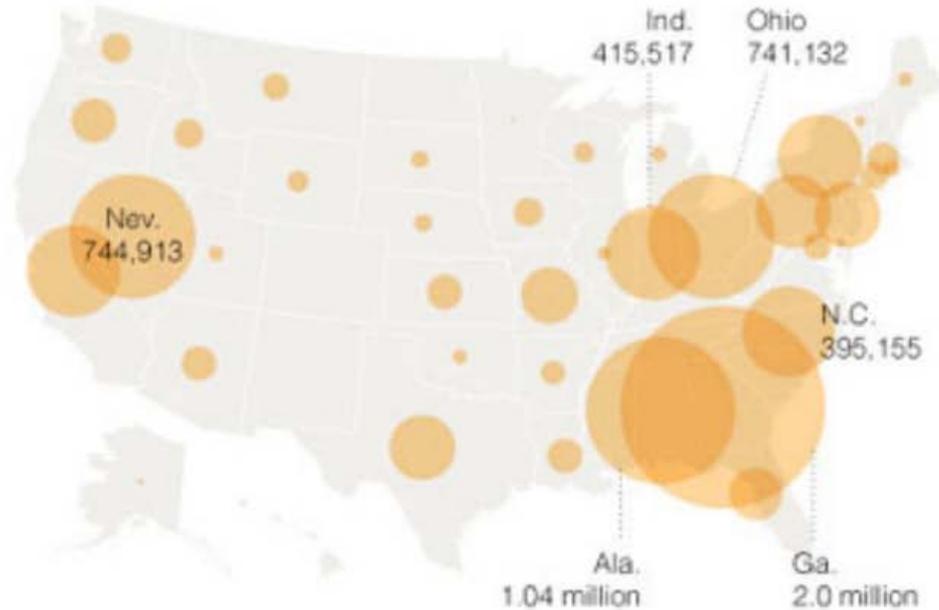


Self-reported ethnicity
2011

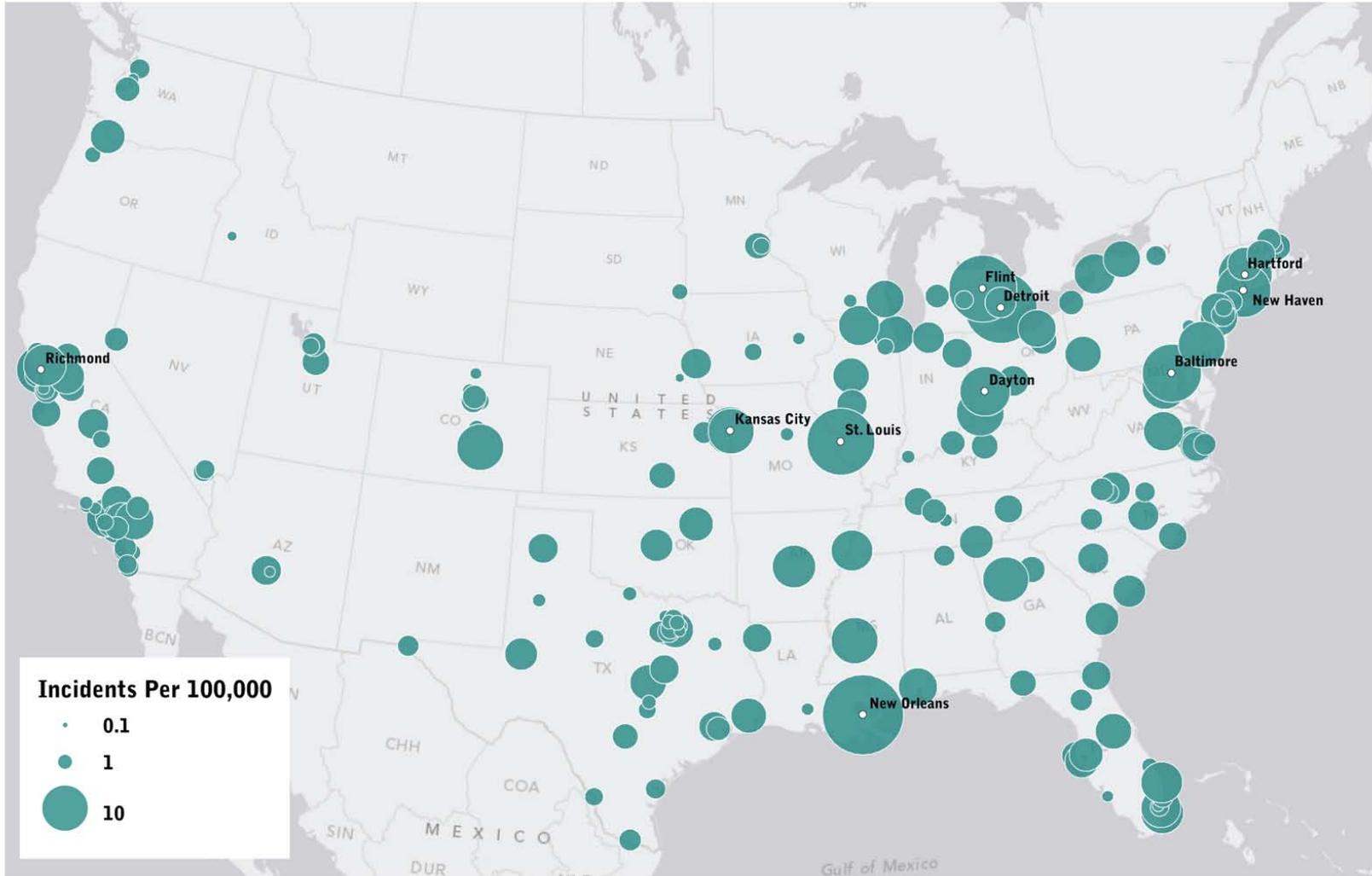
- | | |
|---------------|--|
| Asian | White |
| ● Indian | ● English, Welsh, Scottish or N. Irish |
| ● Bangladeshi | ● Irish |
| ● Pakistani | ● Gypsy |
| ● Chinese | ● Other |
| ● Other | |
| Black | Mixed |
| ● African | ● White + Asian |
| ● Caribbean | ● White + African |
| ● Other | ● White + Caribbean |
| ● Arab | ● Other |

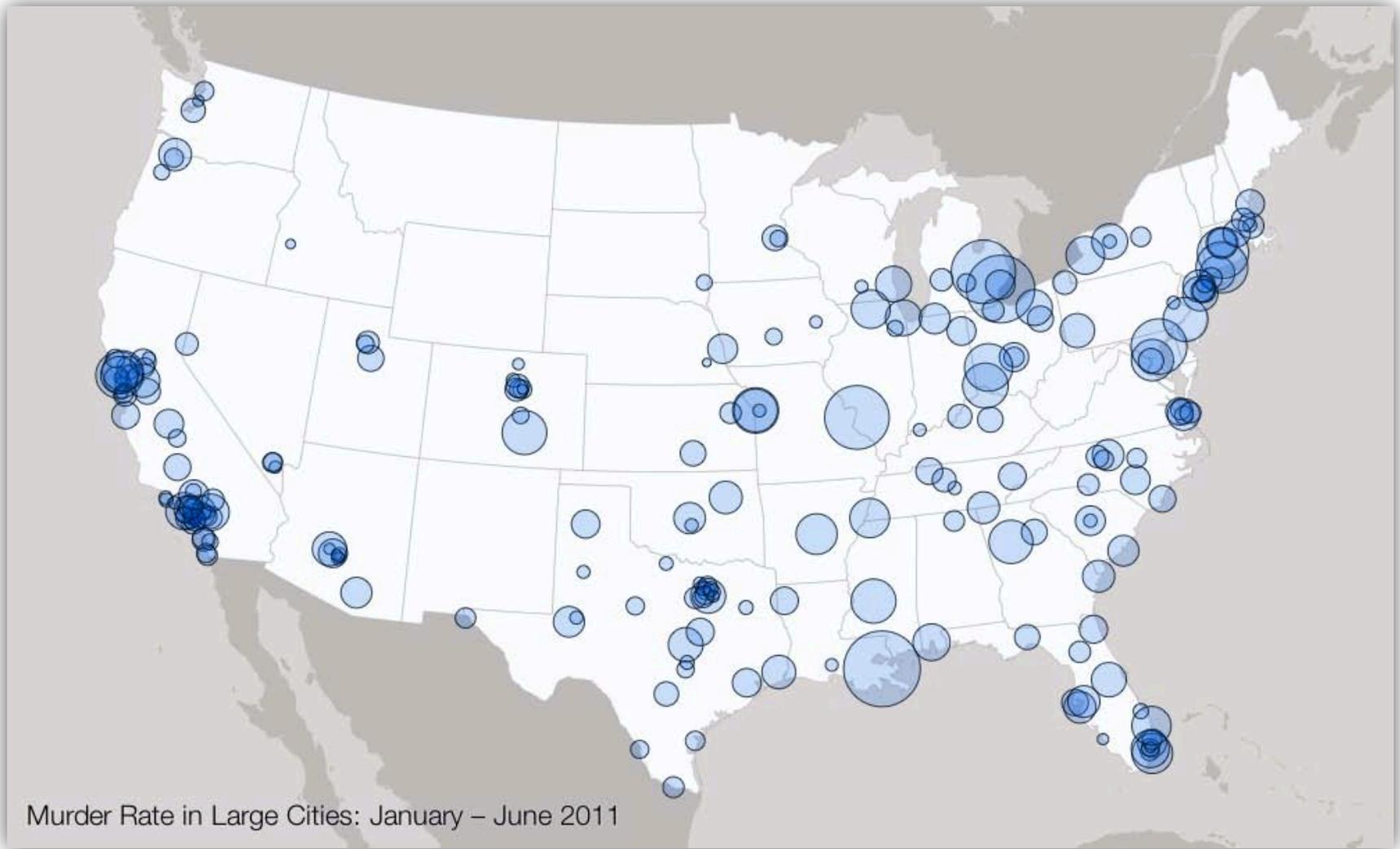
Killer circles threaten America

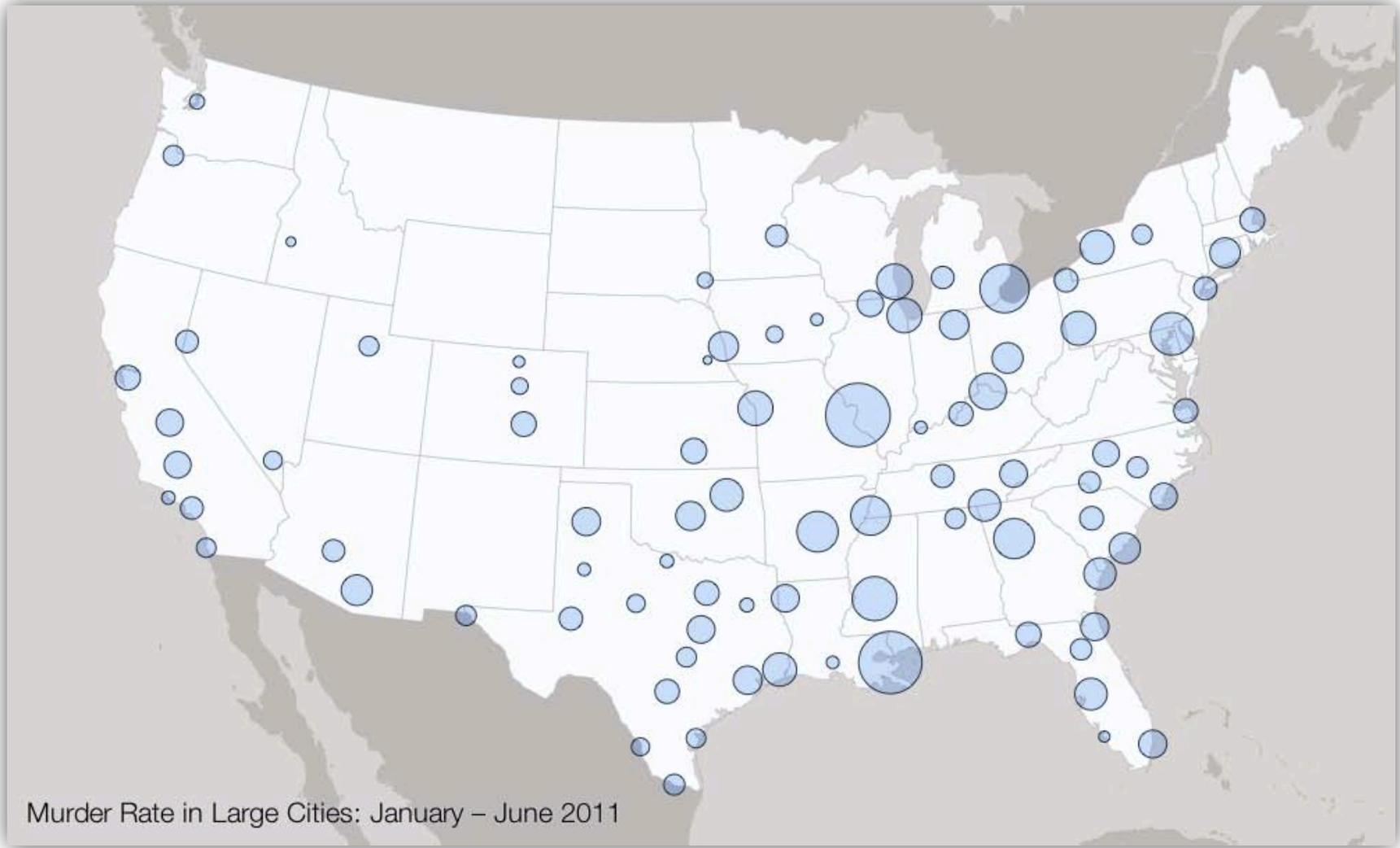
- No sides
- Area equal to πr^2
- Extremely round
- Often fatal
- North Dakota, New Mexico, Colorado remain circle-free

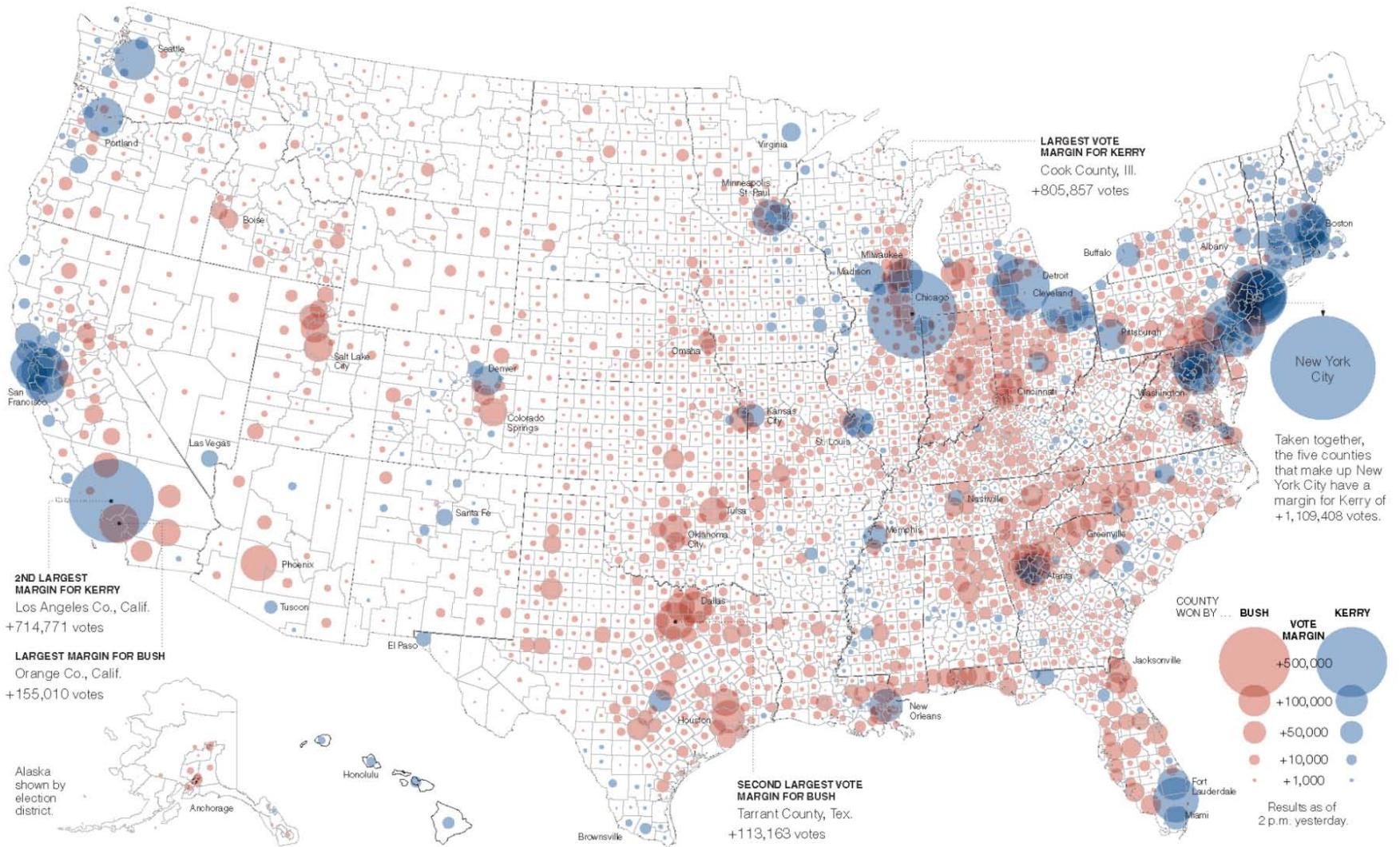


Murder Rate in Large Cities: January-June 2011



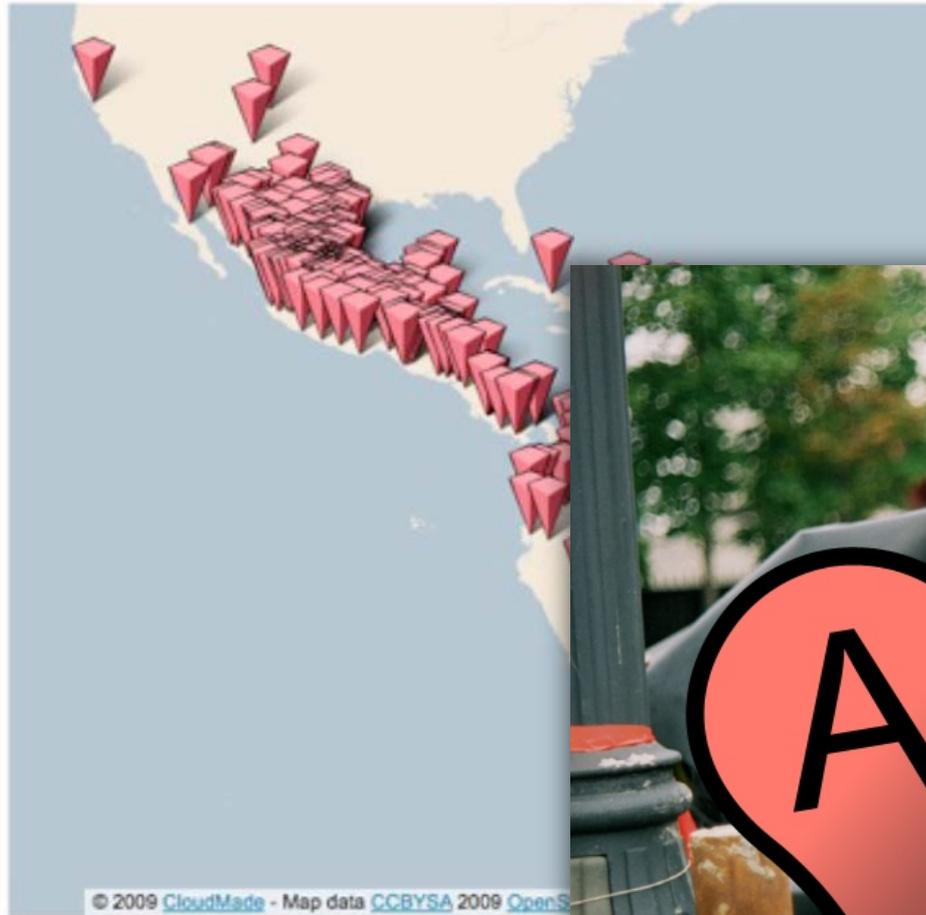






Slide from Matthew Erickson, NY Times

“Red Dot Fever”





<http://ngm.nationalgeographic.com/2011/02/geography/usa-surnames-interactive>

Isopleth

Color codes data according to values

Use contour lines to follow data at specific values

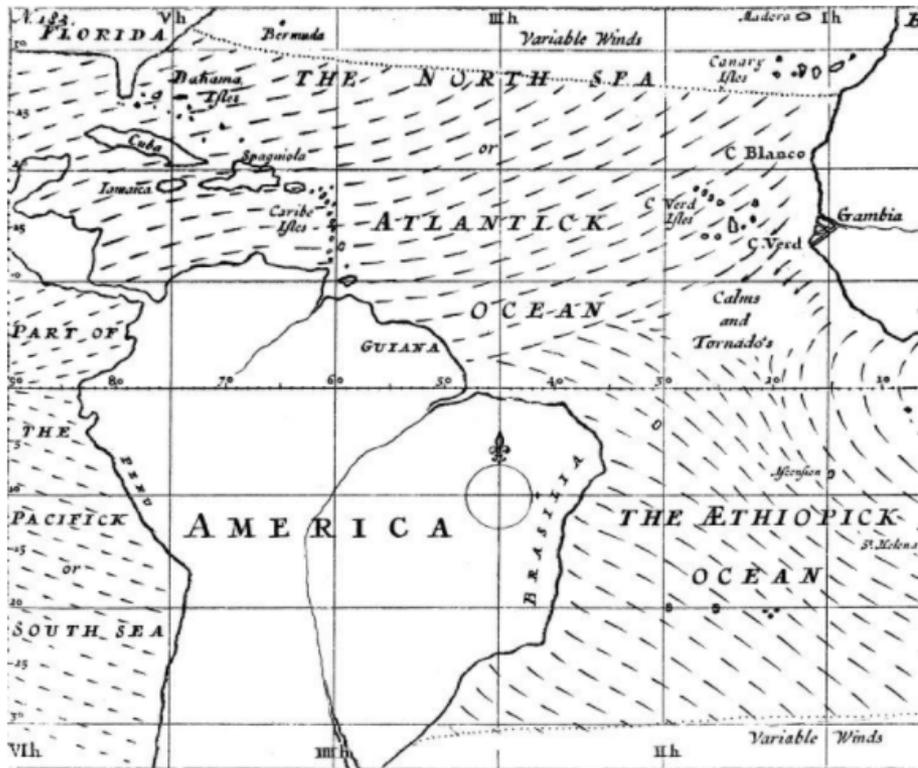
Use “heat maps” display gradient data

Data should be normalized and binned or smoothed

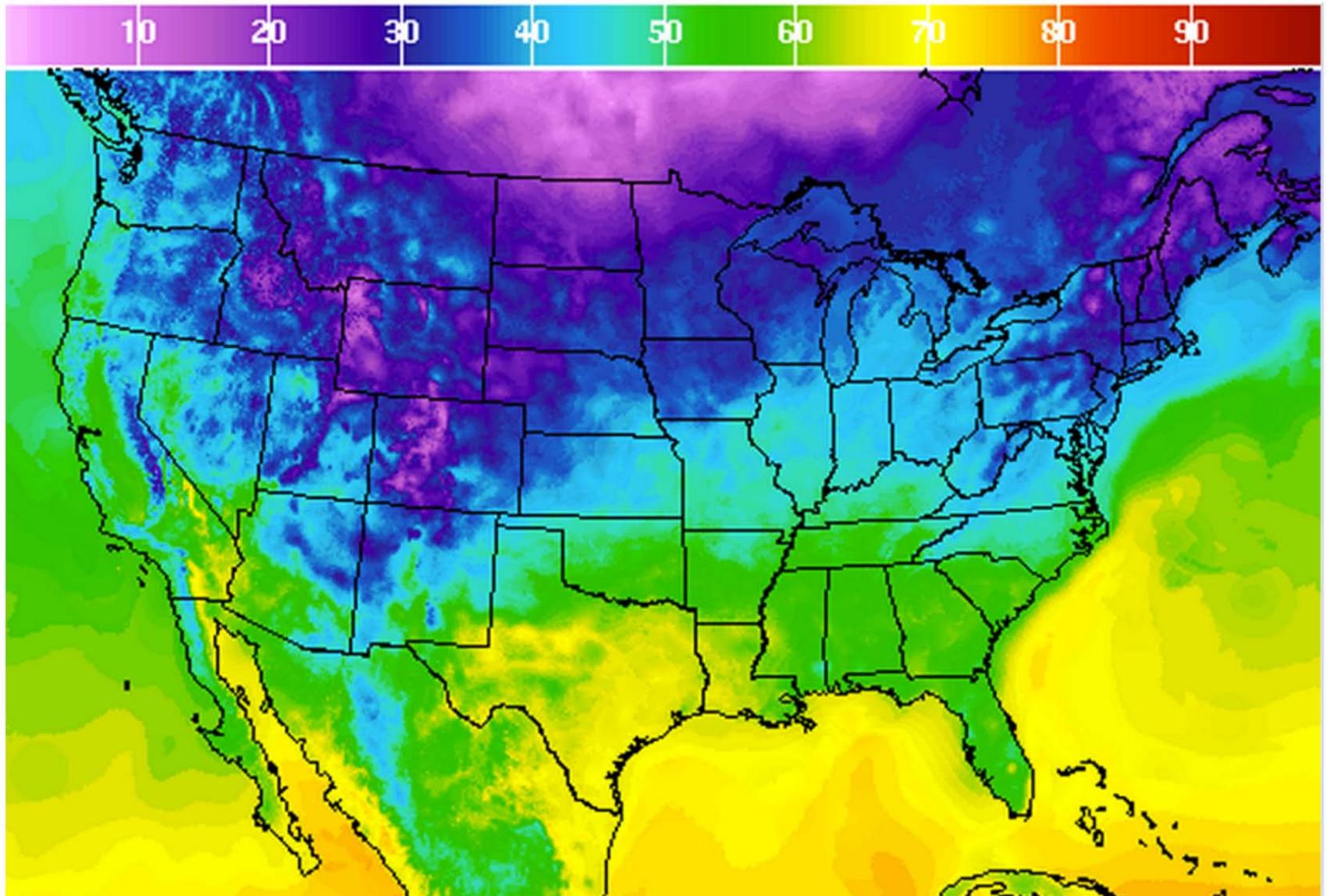
- Binning determines number & visual density of isopaths
- Smoothing involved with heat map



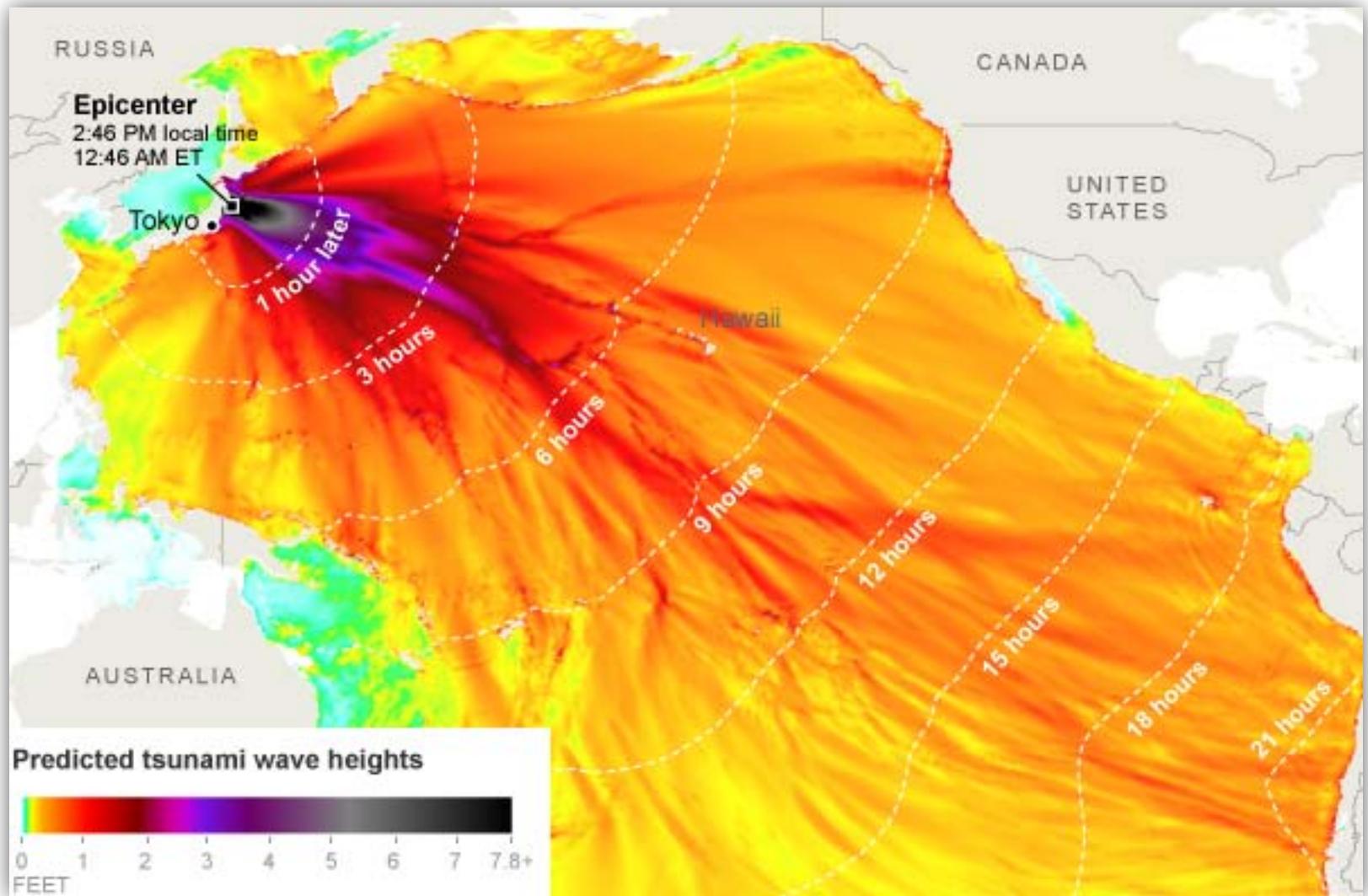
Lines of Equal Magnetic Declination
Edmond Halley, 1701



Wind Map, Edmond Halley, 1686



<http://graphical.weather.gov/sectors>



http://www.nytimes.com/interactive/2011/03/11/world/asia/maps-of-earthquake-and-tsunami-damage-in-japan.html?_r=0#panel/2

Cartogram

Use data attribute values to distort the area or shape of familiar maps

Only as useful as your target population is familiar with the baseline map!

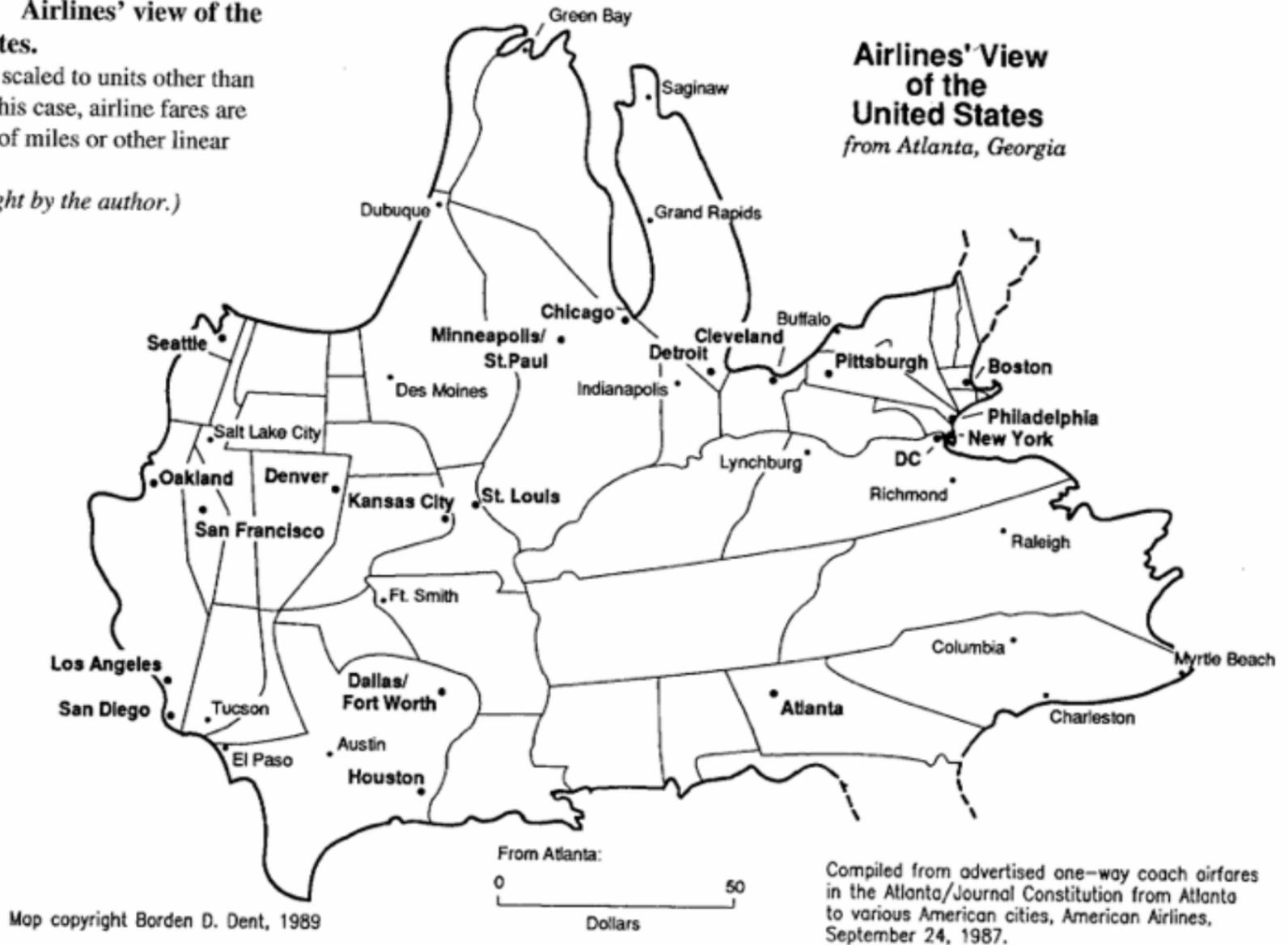
Can scale by:

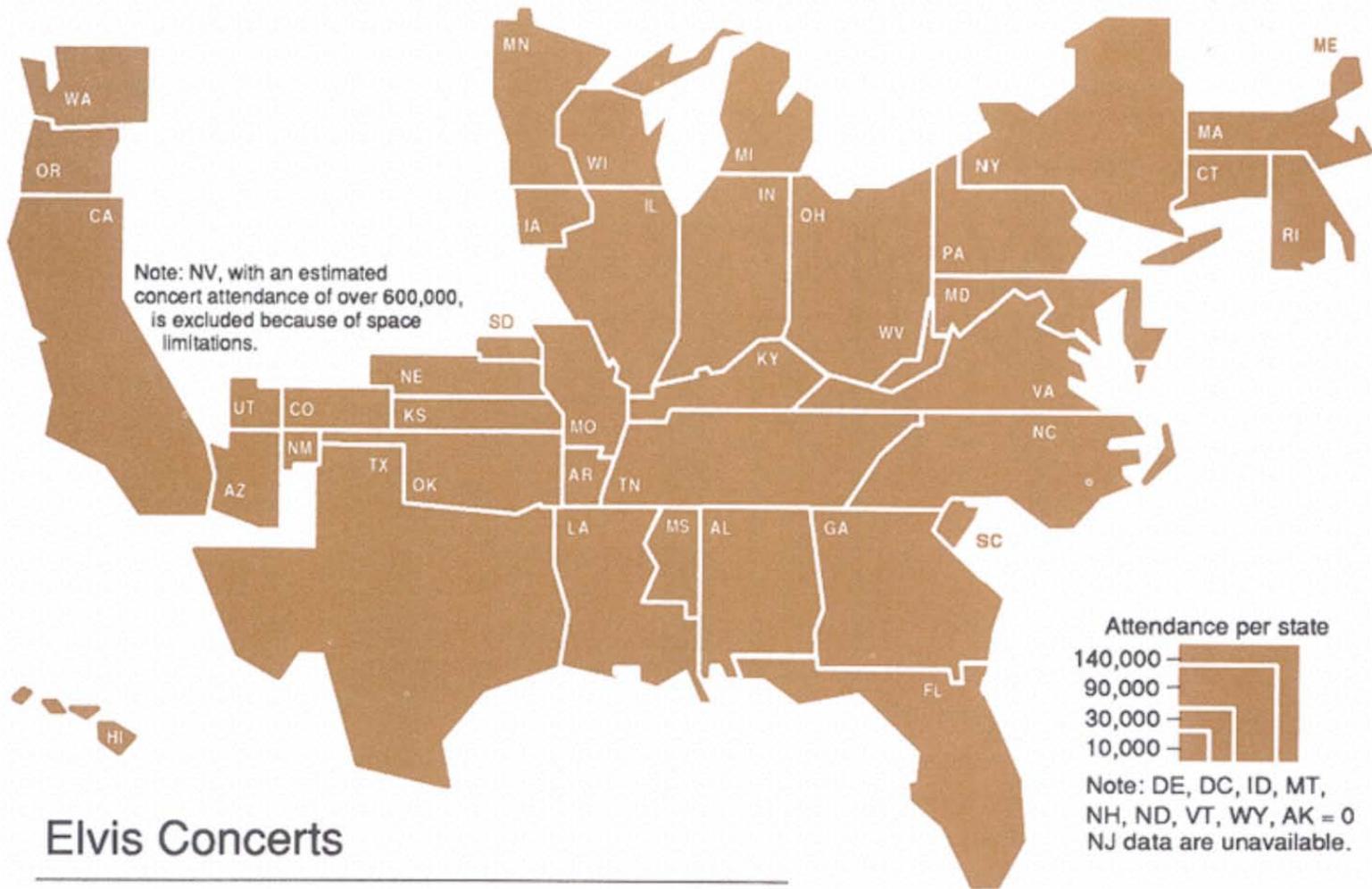
- *Distance*
- Dorling Cartograms –*scaled shape*; does not maintain region shape
- *Area*

Figure 1.8 Airlines' view of the United States.

Maps can be scaled to units other than distance. In this case, airline fares are used instead of miles or other linear units.

(Map copyright by the author.)





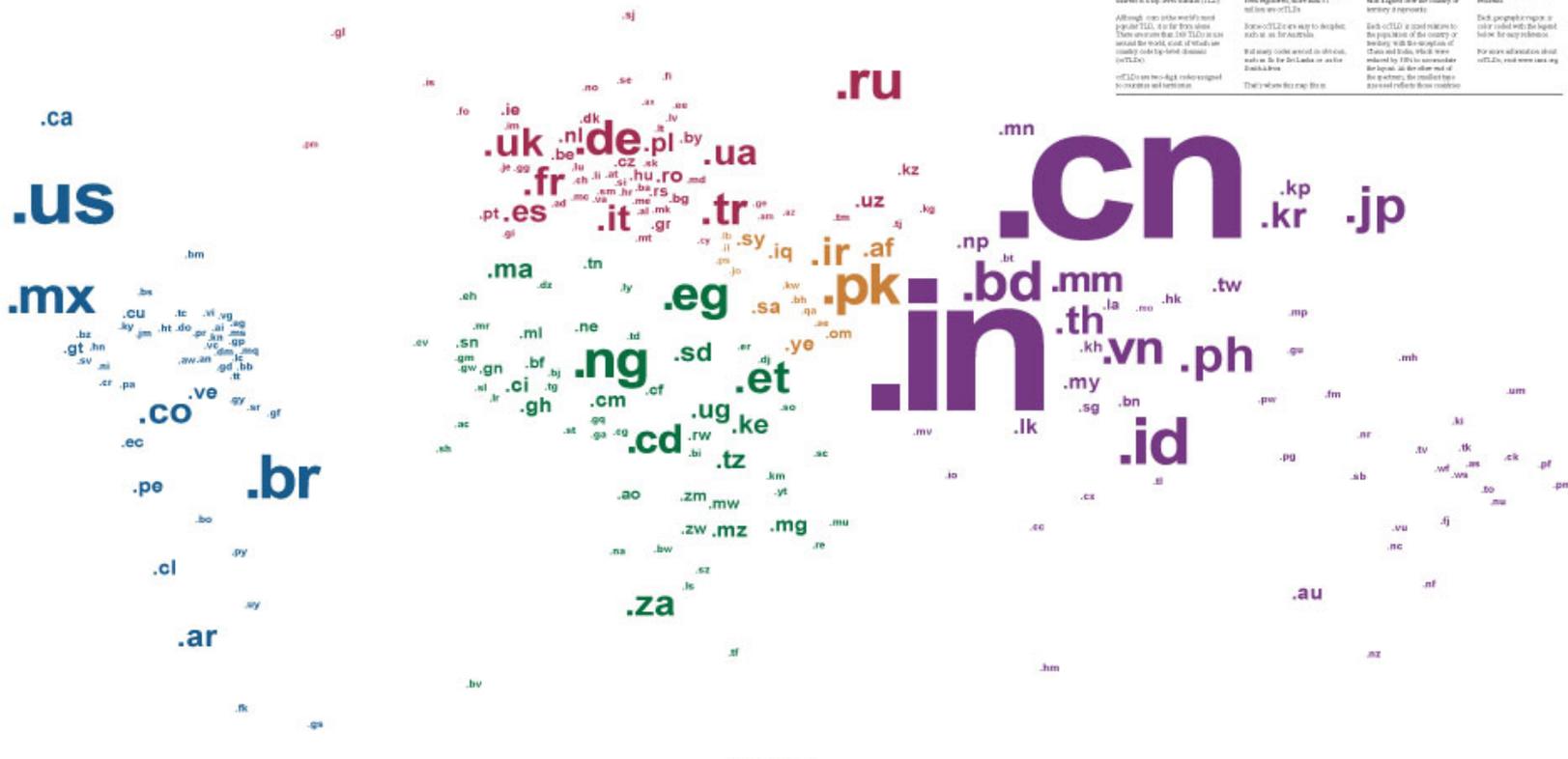
Elvis Concerts

Attendance per State, 1970 - 1977

Source: Stanley, David E., with Frank Coffey. *The Elvis Encyclopedia*. Santa Monica, CA.: General Publishing Group, Inc , 1994.

Country Codes of the World

At the end of every TLD and most address is a top-level domain (TLD).	Other TLDs within TLDs have been registered, some have TLDs for ccTLDs.	The map includes 331 ccTLDs, with 13 without an ccTLD, or without a representative.	with 13 without or those without.
Although some of the world's most popular TLDs, it is far from clear that anyone has the TLDs as a central domain, most of which are mostly used by local domains (ccTLDs).	Some TLDs are not to be confused with ccTLDs as they are not ccTLDs.	Each ccTLD is used relative to the population of the country or territory, with the exception of .EU and .EUROPE, which were introduced by WHO in accordance with the rules set out in the ccTLDs, and were not ccTLDs.	Each ccTLD is used relative to the population of the country or territory, with the exception of .EU and .EUROPE, which were introduced by WHO in accordance with the rules set out in the ccTLDs, and were not ccTLDs.
ccTLDs are not to be confused with ccTLDs as they are not ccTLDs.	They're not to be confused with ccTLDs as they are not ccTLDs.		



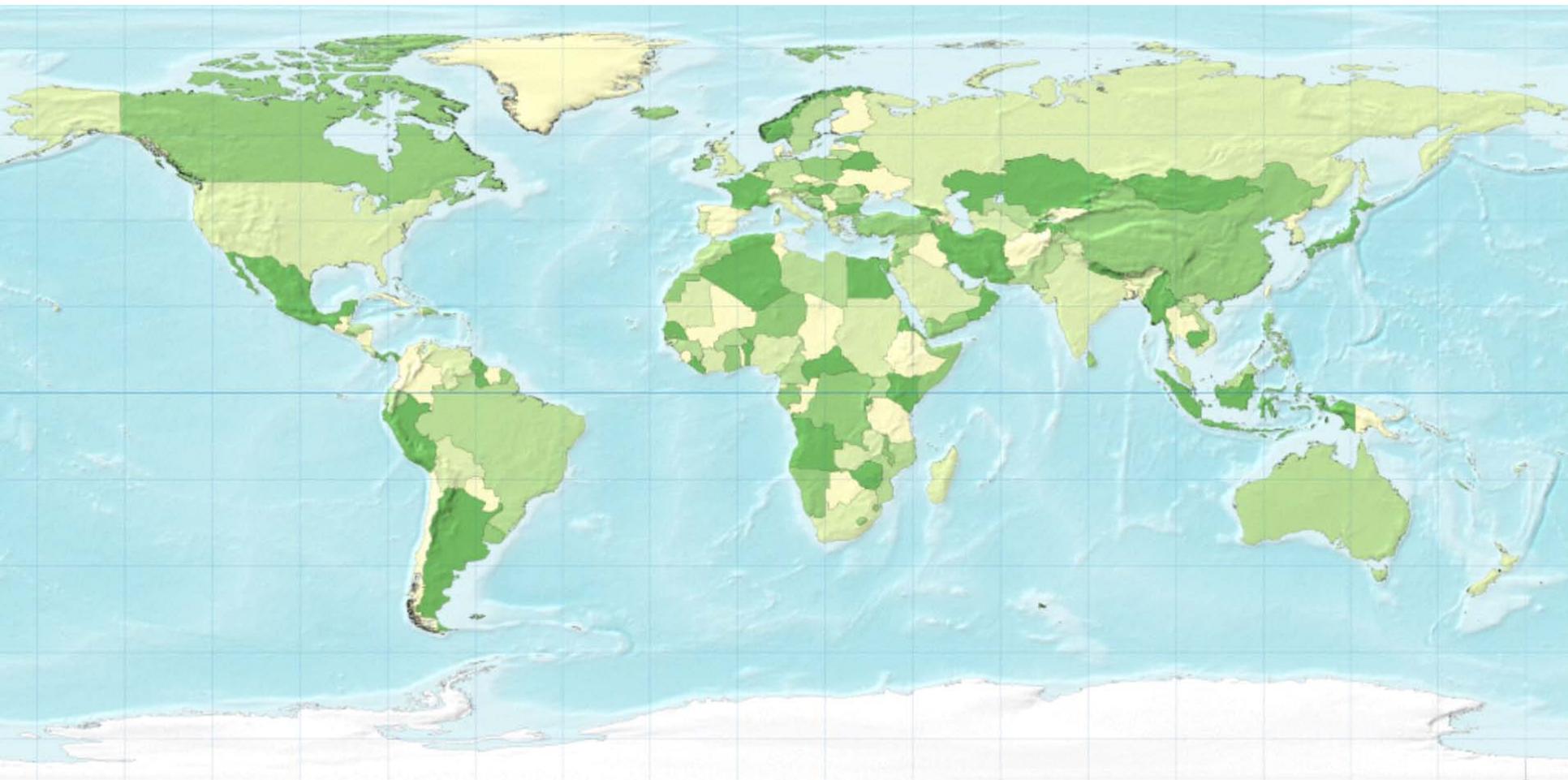
Americas .ag Antigua and Barbuda | .ai Anguilla | .an Netherlands Antilles | .ar Argentina | .aw Aruba | .bb Barbados | .bv Bermuda | .bo Bolivia | .br Brazil | .bz Belize | .ca Canada | .cl Chile | .co Colombia | .cr Costa Rica | .cu Cuba | .dn Dominica | .do Dominican Republic | .ec Ecuador | .fk Falkland Islands (Malvinas) | .gf French Guiana | .gp Guadeloupe | .gs South Georgia and the South Sandwich Islands | .gt Guatemala | .gy Guyana | .hm Heard and McDonald Islands | .il Israel | .im Isle of Man | .in India | .io Tokelau and McDonald Islands | .it Italy | .je Jersey | .kg Kyrgyzstan | .kz Kazakhstan | .lk Sri Lanka | .lb Lebanon | .li Liechtenstein | .lt Lithuania | .lu Luxembourg | .lv Latvia | .mc Monaco | .md Moldova | .me Montenegro | .mk Macedonia | .ml Mali | .nl Netherlands | .no Norway | .pl Poland | .pm Saint Pierre and Miquelon | .pt Portugal | .ro Romania | .rs Serbia | .ru Russian Federation | .se Sweden | .si Slovenia | .sk Slovakia and San Marino Islands | .sd South Sudan | .sg Singapore | .sh Saint Helena | .si Slovenia | .sk Slovakia | .sv Sweden | .th Thailand | .tl Timor-Leste | .tm Turkmenistan | .tn Tunisia | .tr Turkey | .ua Ukraine | .uk United Kingdom | .us United States | .uy Uruguay | .uz Uzbekistan | .va Vatican | .vc Saint Vincent and the Grenadines | .ve Venezuela | .vg Virgin Islands, British | .vi Virgin Islands, U.S.

Europe .ad Andorra | .al Albania | .am Armenia | .at Austria | .az Azerbaijan | .ba Bosnia and Herzegovina | .be Belgium | .bg Bulgaria | .by Belarus | .ch Switzerland | .cy Cyprus | .cz Czech Republic | .de Germany | .dk Denmark | .ee Estonia | .es Spain | .fi Finland | .fr France | .ge Georgia | .gg Guernsey | .gi Gibraltar | .gl Greenland | .gr Greece | .hr Croatia-Horvatika | .hu Hungary | .ie Ireland | .im Isle of Man | .is Iceland | .it Italy | .je Jersey | .kg Kyrgyzstan | .kz Kazakhstan | .lk Sri Lanka | .lb Lebanon | .li Liechtenstein | .lt Lithuania | .lu Luxembourg | .lv Latvia | .mc Monaco | .md Moldova | .me Montenegro | .mk Macedonia | .ml Mali | .nl Netherlands | .no Norway | .pl Poland | .pm Saint Pierre and Miquelon | .pt Portugal | .ro Romania | .rs Serbia | .ru Russian Federation | .se Sweden | .si Slovenia | .sk Slovakia and San Marino Islands | .sd South Sudan | .sg Singapore | .sh Saint Helena | .si Slovenia | .sk Slovakia | .sv Sweden | .th Thailand | .tl Timor-Leste | .tm Turkmenistan | .tn Tunisia | .tr Turkey | .ua Ukraine | .uk United Kingdom | .us United States | .uy Uruguay | .uz Uzbekistan | .va Vatican | .vc Saint Vincent and the Grenadines | .ve Venezuela | .vg Virgin Islands, British | .vi Virgin Islands, U.S.

Middle East .ae United Arab Emirates | .af Afghanistan | .al Albania | .am Armenia | .at Austria | .az Azerbaijan | .ba Bosnia and Herzegovina | .be Belgium | .bg Bulgaria | .by Belarus | .ch Switzerland | .cy Cyprus | .cz Czech Republic | .de Germany | .dk Denmark | .ee Estonia | .es Spain | .fi Finland | .fr France | .ge Georgia | .gg Guernsey | .gi Gibraltar | .gl Greenland | .gr Greece | .hr Croatia-Horvatika | .hu Hungary | .ie Ireland | .im Isle of Man | .is Iceland | .it Italy | .je Jersey | .kg Kyrgyzstan | .kz Kazakhstan | .lk Sri Lanka | .lb Lebanon | .li Liechtenstein | .lt Lithuania | .lu Luxembourg | .lv Latvia | .mc Monaco | .md Moldova | .me Montenegro | .mk Macedonia | .ml Mali | .nl Netherlands | .no Norway | .pl Poland | .pm Saint Pierre and Miquelon | .pt Portugal | .ro Romania | .rs Serbia | .ru Russian Federation | .se Sweden | .si Slovenia | .sk Slovakia and San Marino Islands | .sd South Sudan | .sg Singapore | .sh Saint Helena | .si Slovenia | .sk Slovakia | .sv Sweden | .th Thailand | .tl Timor-Leste | .tm Turkmenistan | .tn Tunisia | .tr Turkey | .ua Ukraine | .uk United Kingdom | .us United States | .uy Uruguay | .uz Uzbekistan | .va Vatican | .vc Saint Vincent and the Grenadines | .ve Venezuela | .vg Virgin Islands, British | .vi Virgin Islands, U.S.

The following slides depict “The World” using different cartogram data distortions.

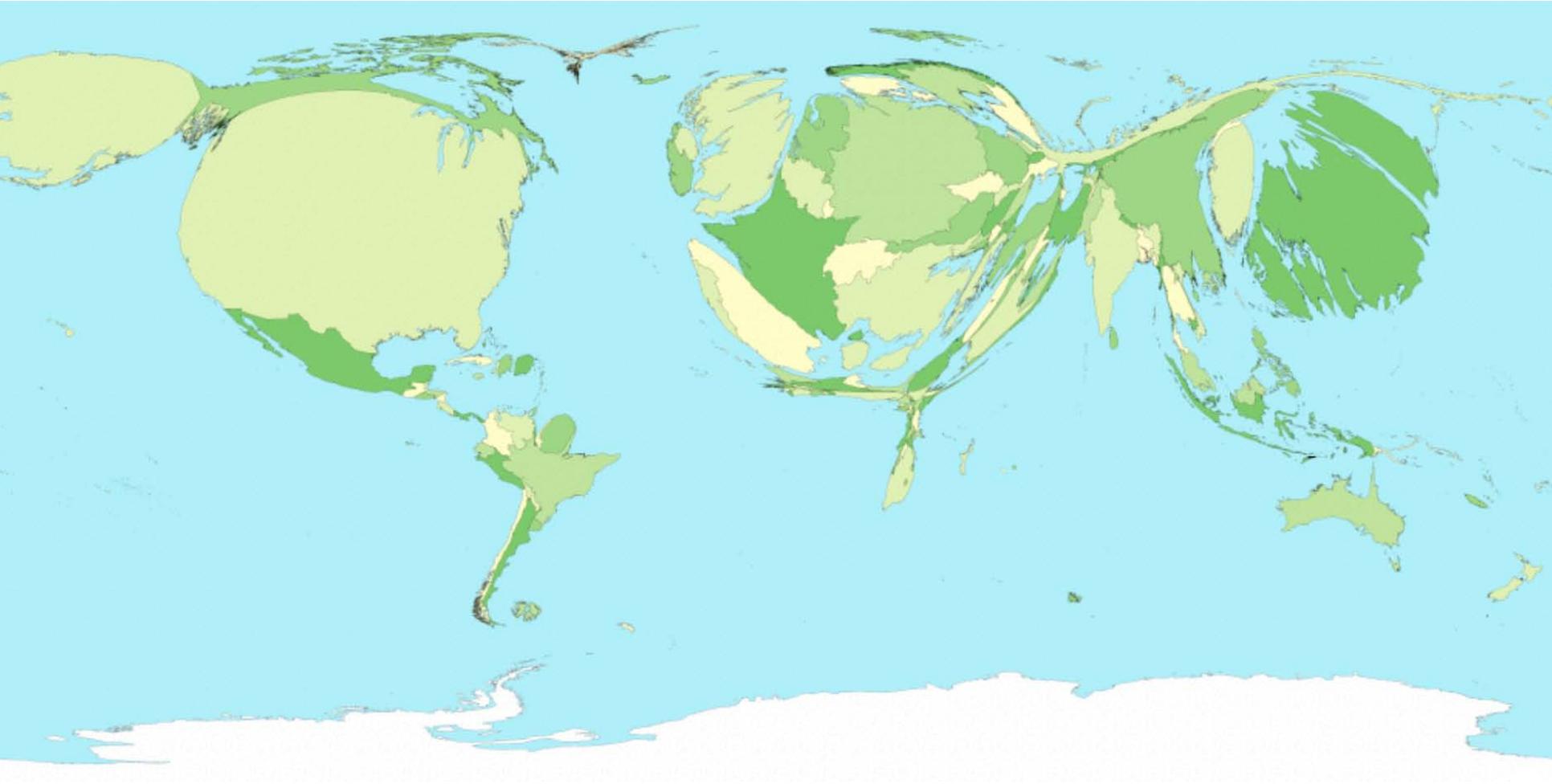
Images are originally from Mark Newman, University of Michigan.



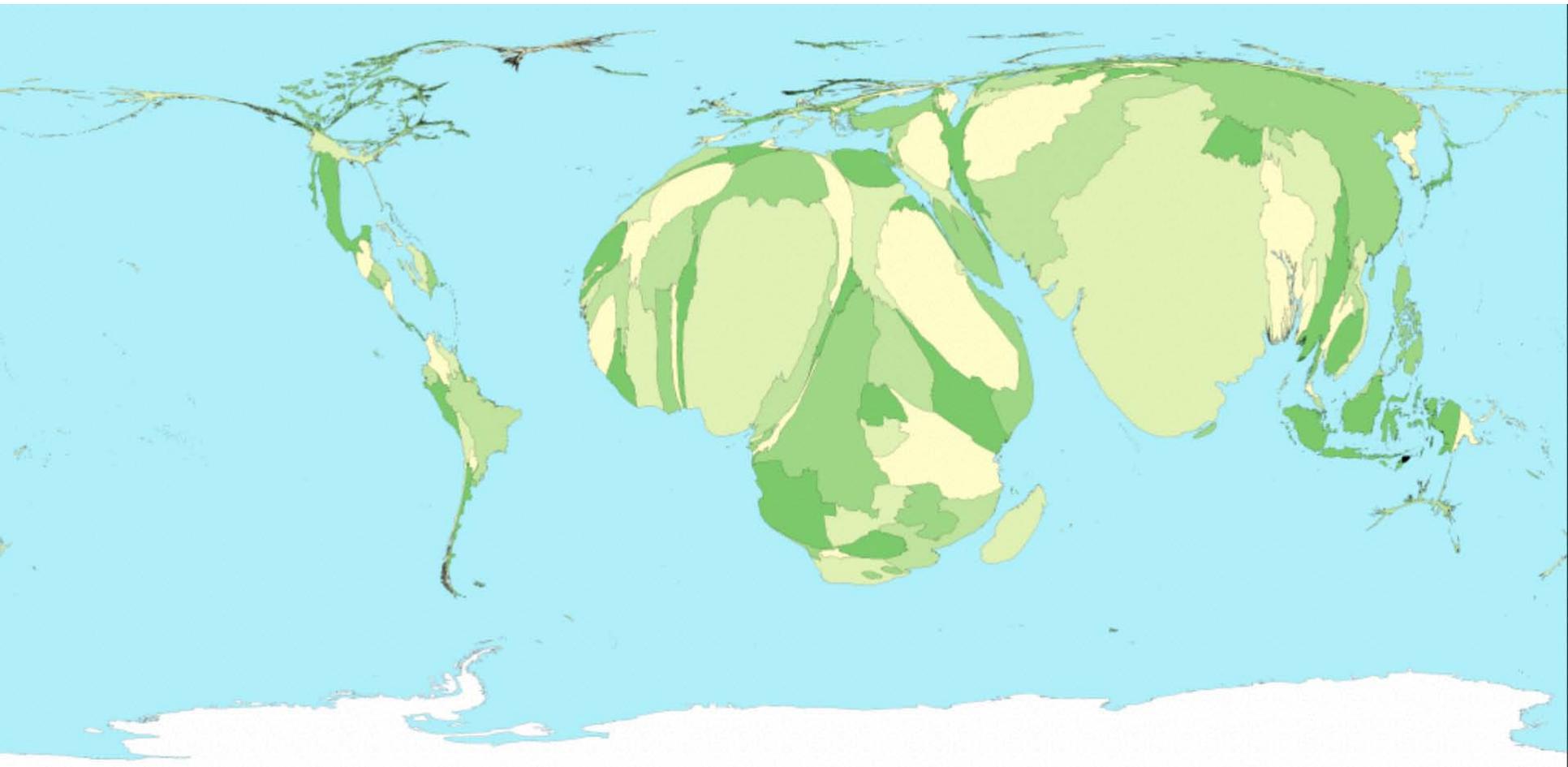
POPULATION



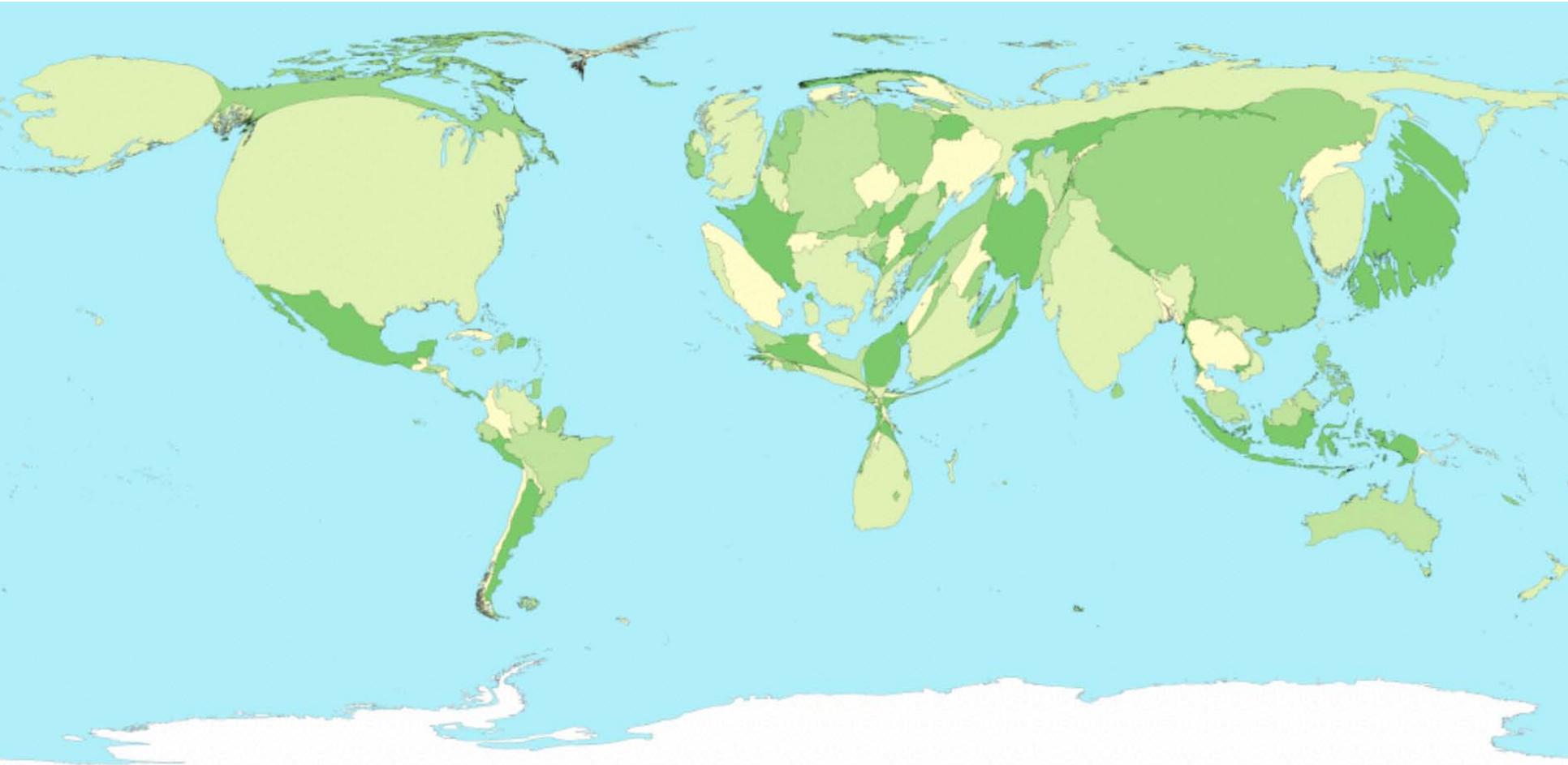
GDP



Child Mortality



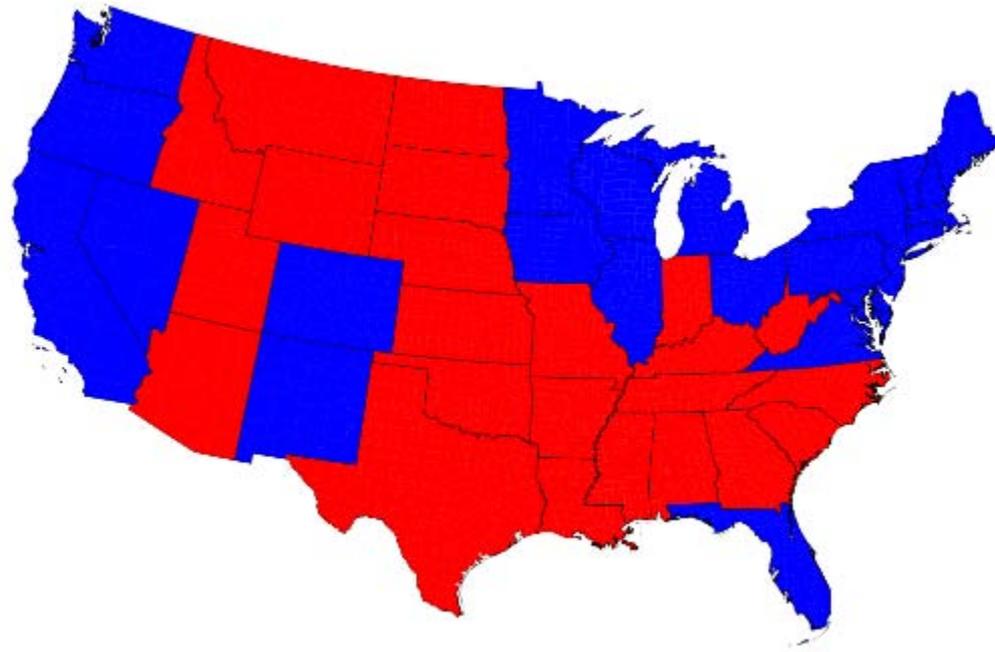
Greenhouse Gas Emissions



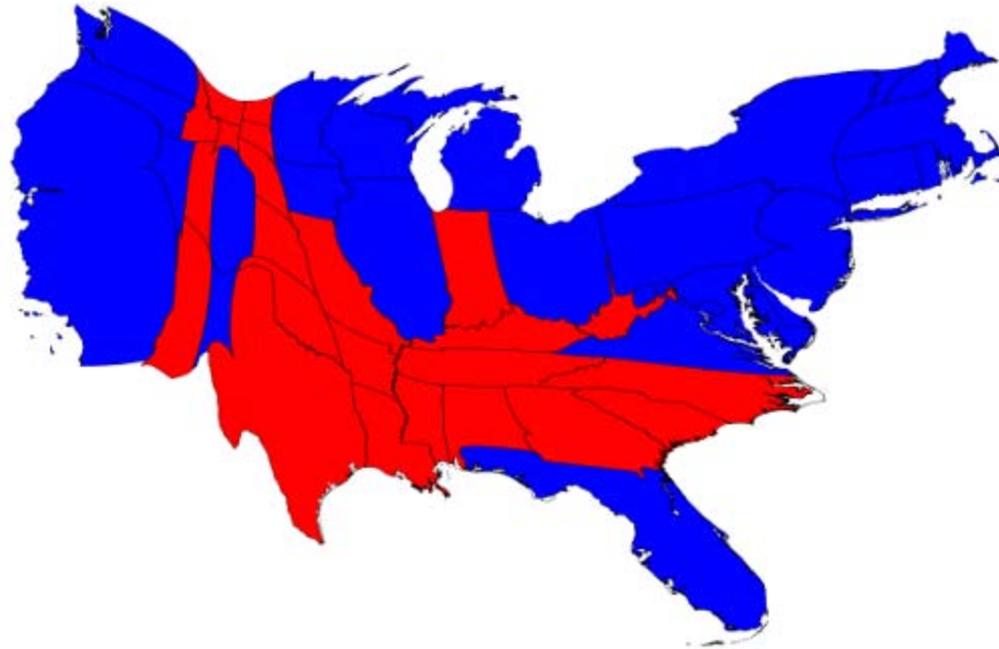
The following slides depict the 2012 Presidential Elections using different cartographical approaches.

Images are originally from Mark Newman, University of Michigan.

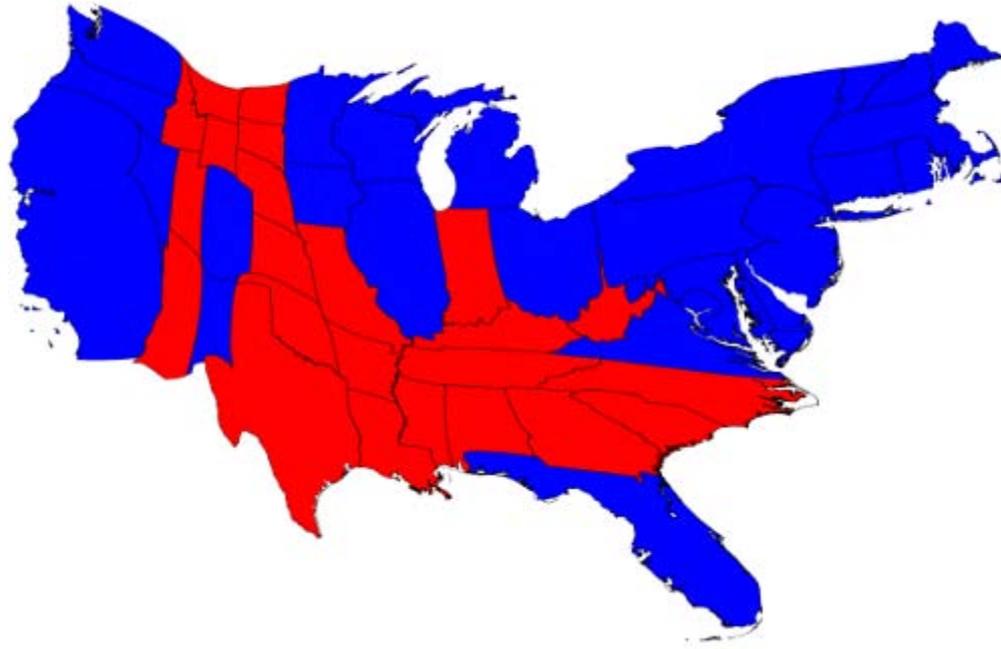
Election Results by State



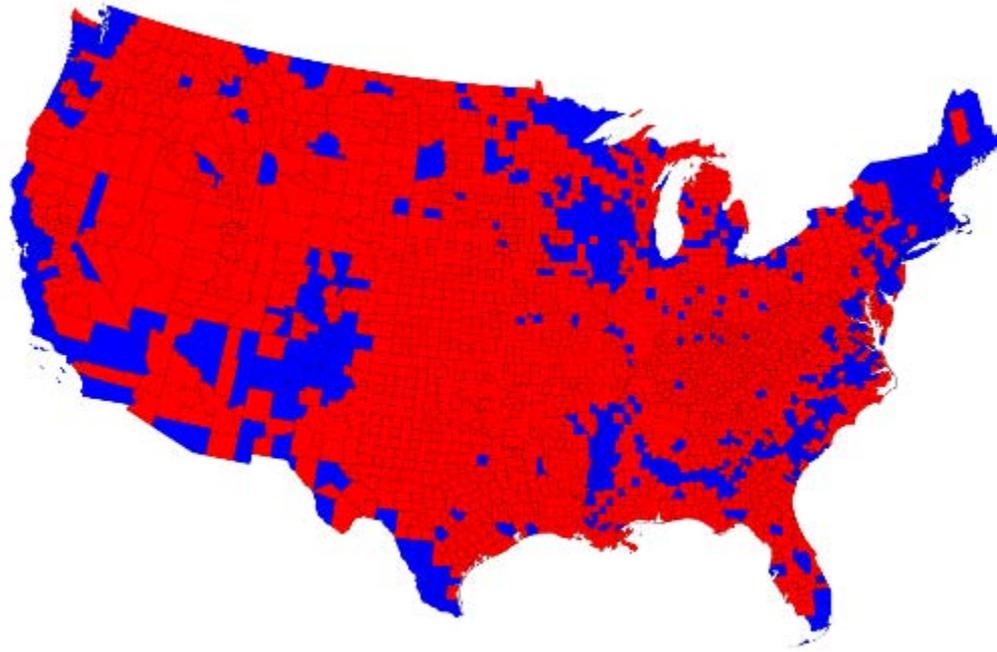
Election Results by Population of State



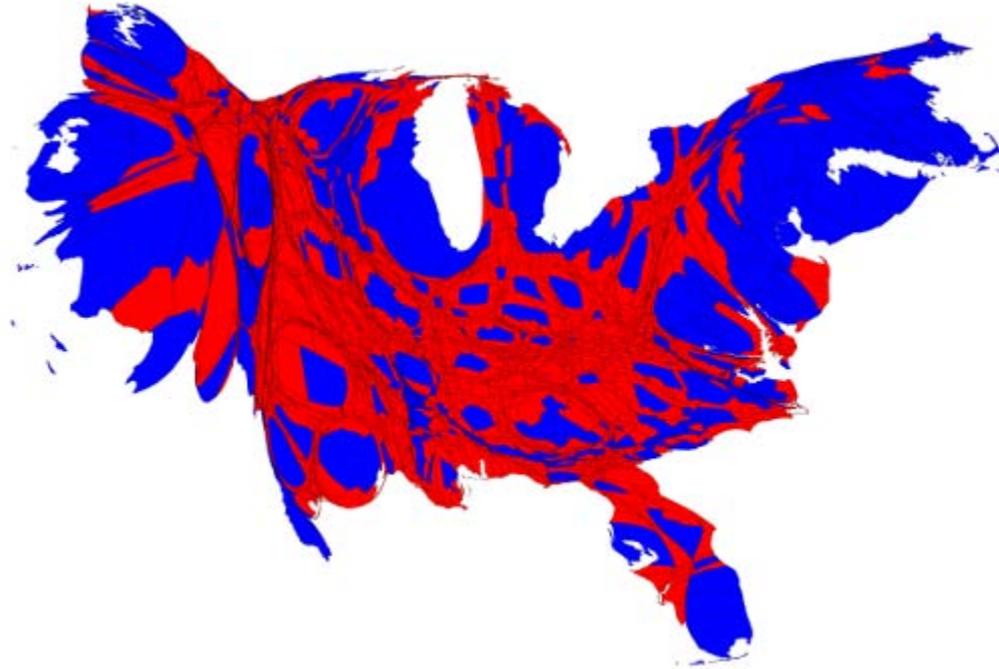
Election Results by Electoral College Votes



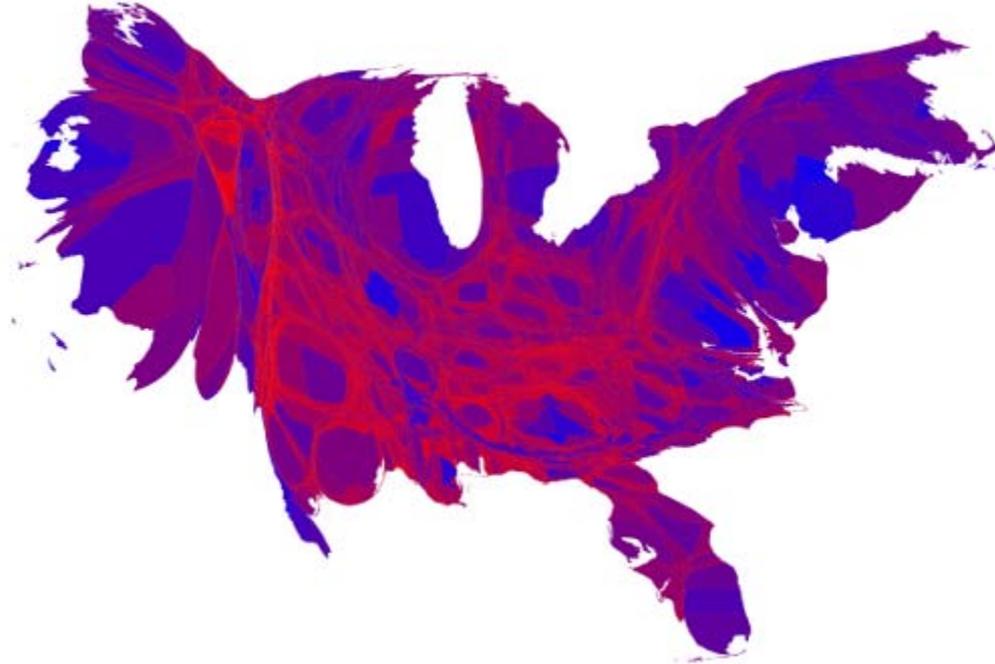
Election Results by County



Election Results by County Population



Election Results by County Population with Gradient Binning



Flow Maps

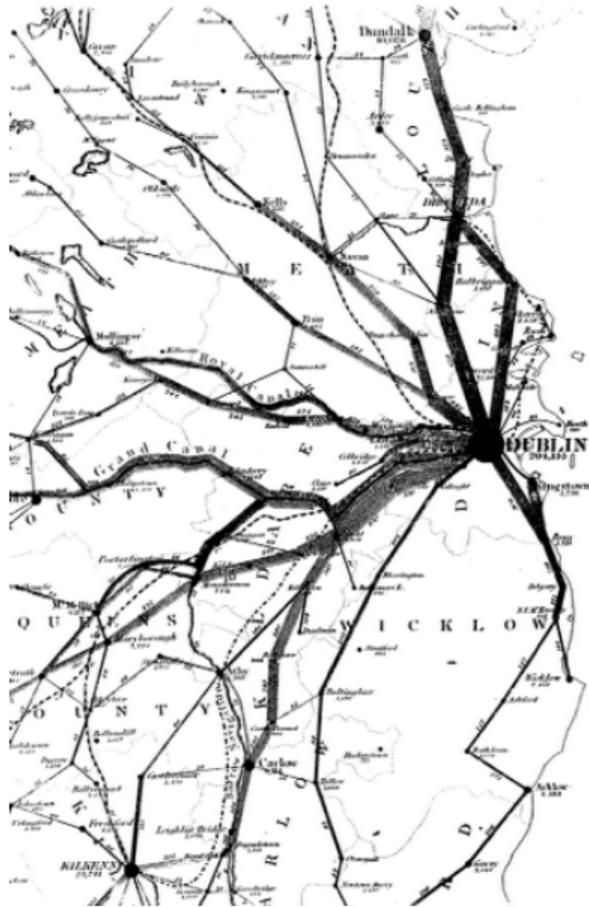
Reduce visual clutter by clustering edges

Encoding

- Edge between two locations indicates flow between those locations
- Width of edge proportional to flow
- Usually wider end of edge is source of flow

Limitations – Can get difficult to compare flows – Best flow maps are done by hand

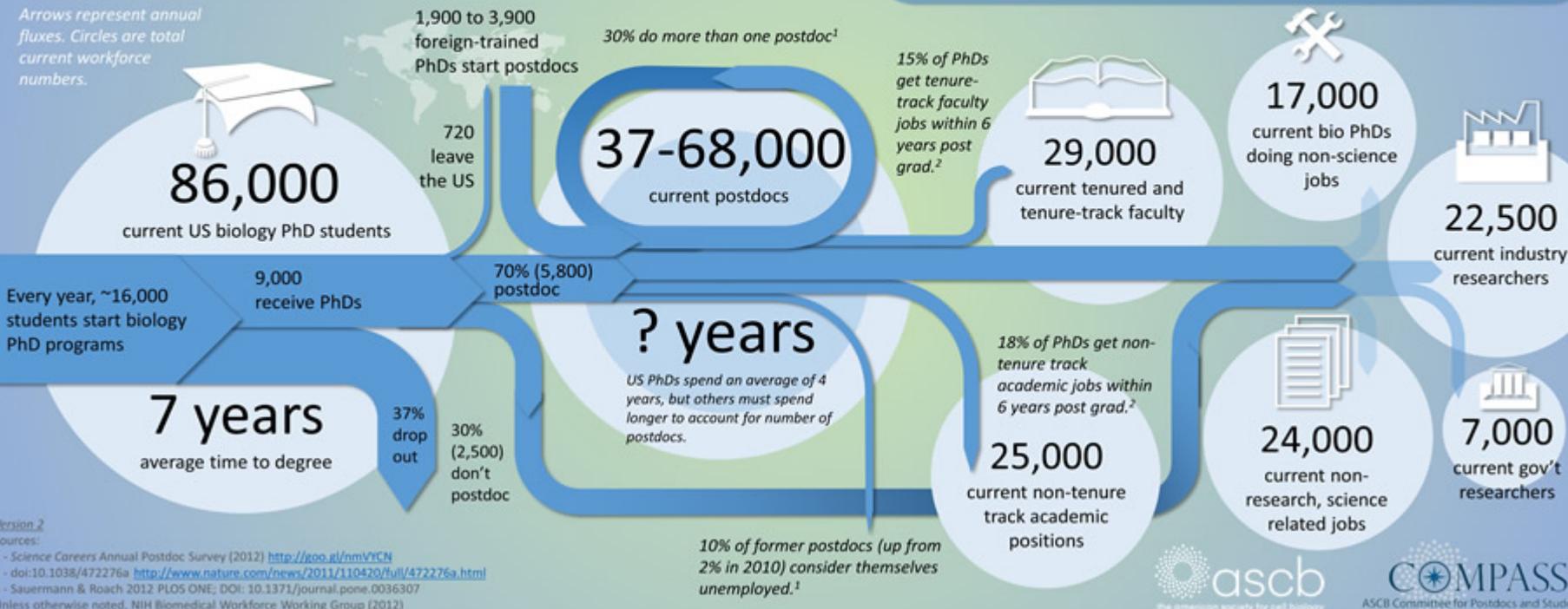
Special types: Sankey Diagrams



Transportation of Passengers
in Ireland
Henry Drury Harness, 1837

Where will a biology PhD take you?

Arrows represent annual fluxes. Circles are total current workforce numbers.



Version 2

Sources:

1 - Science Careers Annual Postdoc Survey (2012) <http://goo.gl/nmVYCN>

2 - doi:10.1038/472276a <http://www.nature.com/news/2011/110420/full/472276a.html>

3 - Sauerbmann & Roach 2012 PLOS ONE; DOI: 10.1371/journal.pone.0036307

Unless otherwise noted, NIH Biomedical Workforce Working Group (2012)

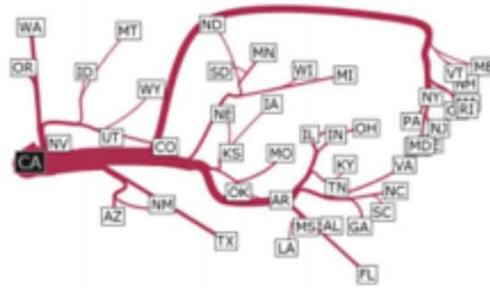


Migration from California

Tobler 1987



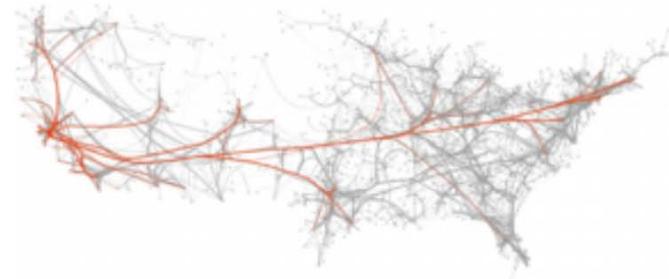
Phan et al. 2005



Verbeek et al. 2011



Cui et al. 2008

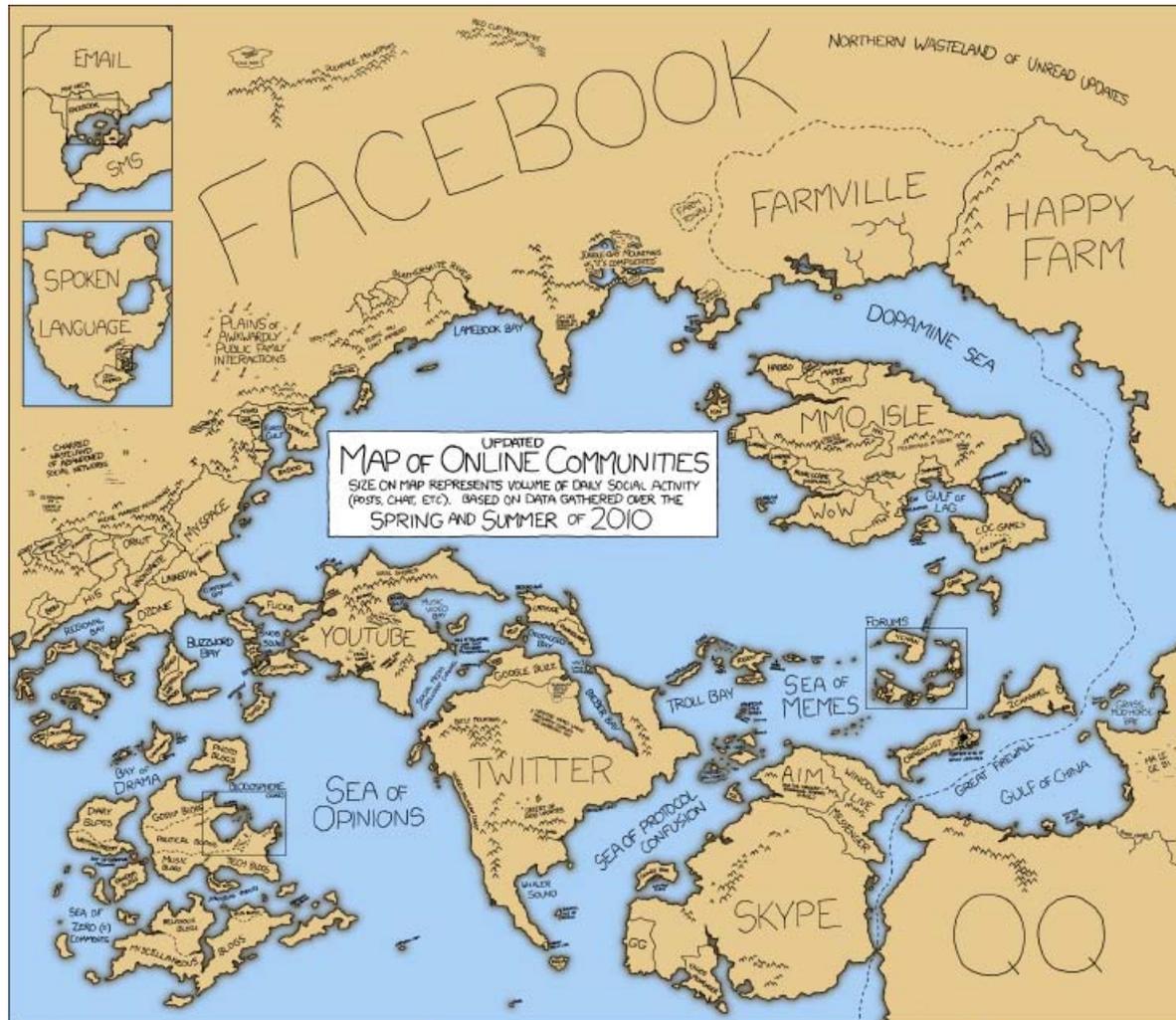


Holten & van Wijk 2009

For Fun...

Extra entertaining thematic maps

Generalizations... and gross generalizations



ABOUT THIS MAP

COMMUNITIES RISE AND FALL, AND TOTAL MEMBERSHIP NUMBERS ARE NO LONGER A GOOD MEASURE OF A COMMUNITY'S CURRENT SIZE AND HEALTH. THIS UPDATED MAP USES SIZE TO REPRESENT TOTAL SOCIAL ACTIVITY IN A COMMUNITY - THAT IS, HOW MUCH TALKING, PLAYING, SHARING, OR OTHER SOCIALIZING HAPPENS THERE. THIS MEANT SOME COMPROMISES OF APPLES AND ORANGES, BUT I DID MY BEST AND TRIED TO BE CONSISTENT.

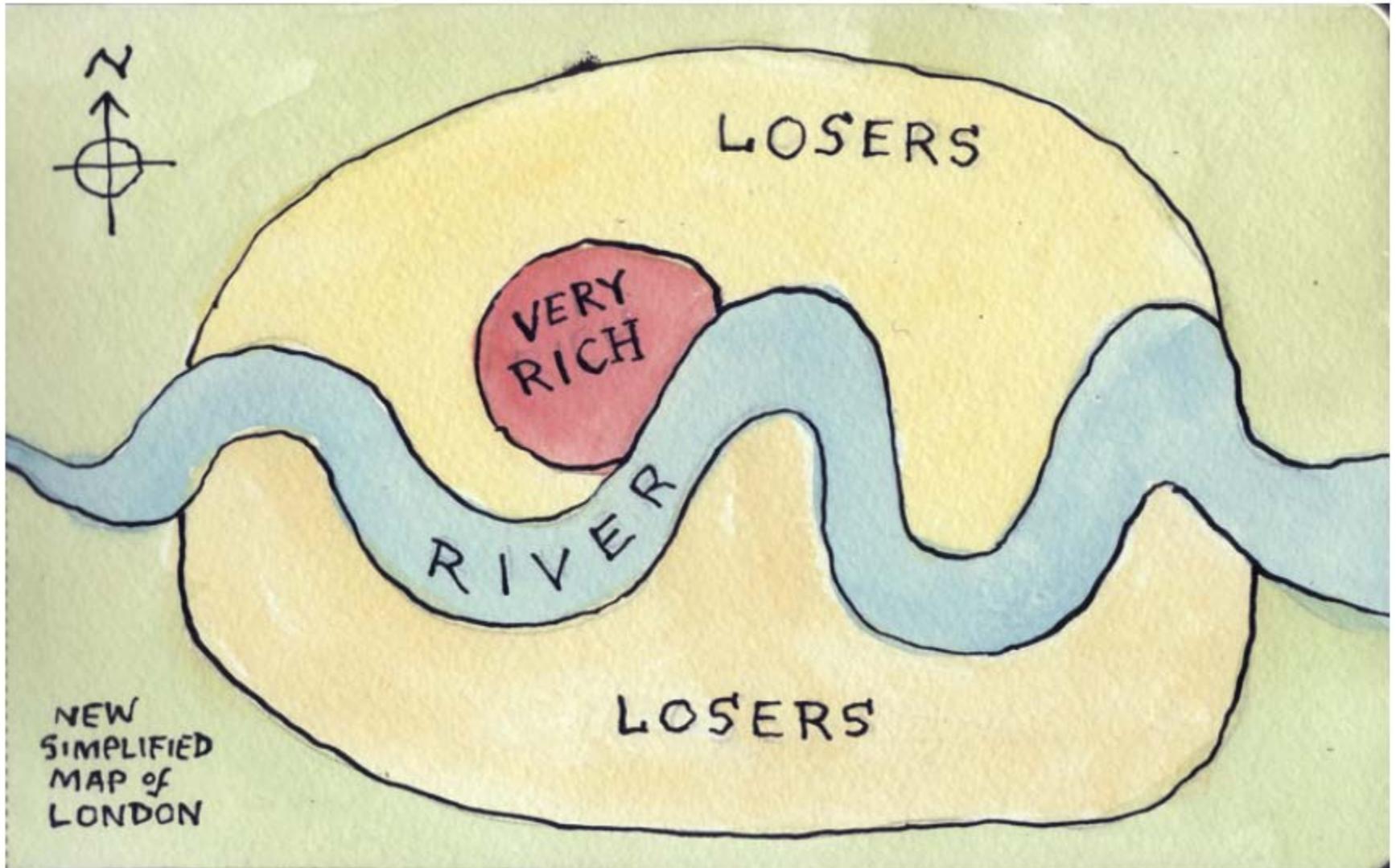
ESTIMATES ARE BASED ON THE BEST NUMBERS I COULD FIND, BUT INVOLVED A GREAT DEAL OF GUESSTIMATED SPIRITUAL INFERENCE, RANDOM SHAPING, REPAIRWORK SHAPING, A 120,000-CELL SPREADSHEET, SPINNING, CACKLING, TEA-LEAF READING, GOAT SACRIFICES, AND GUT INSTINCT (I.E. MAKING THINGS UP).

SOURCES OF DATA INCLUDE GOOGLE AND BING, WIKIPEDIA, PLEVA, DISFORUM.COM, SPINBLEUR, WOODRUFF, ANGSTREIT, EVERY WEBSITE SPINNING PAGE I COULD FIND, PRESS RELEASES, NEWS ARTICLES, AND INDIVIDUAL SITE EMPLOYEES, THANKS IN PARTICULAR TO FOLKS AT LAST.FM, LIVEJOURNAL, REDDIT, AND THE NEW YORK TIMES, AS WELL AS SYSDRUMS AT A NUMBER OF SITES WHO SHARED STATISTICS ON CONDITION OF ANONYMITY.





London Underground by Harry Beck (1933): http://en.wikipedia.org/wiki/Harry_Beck

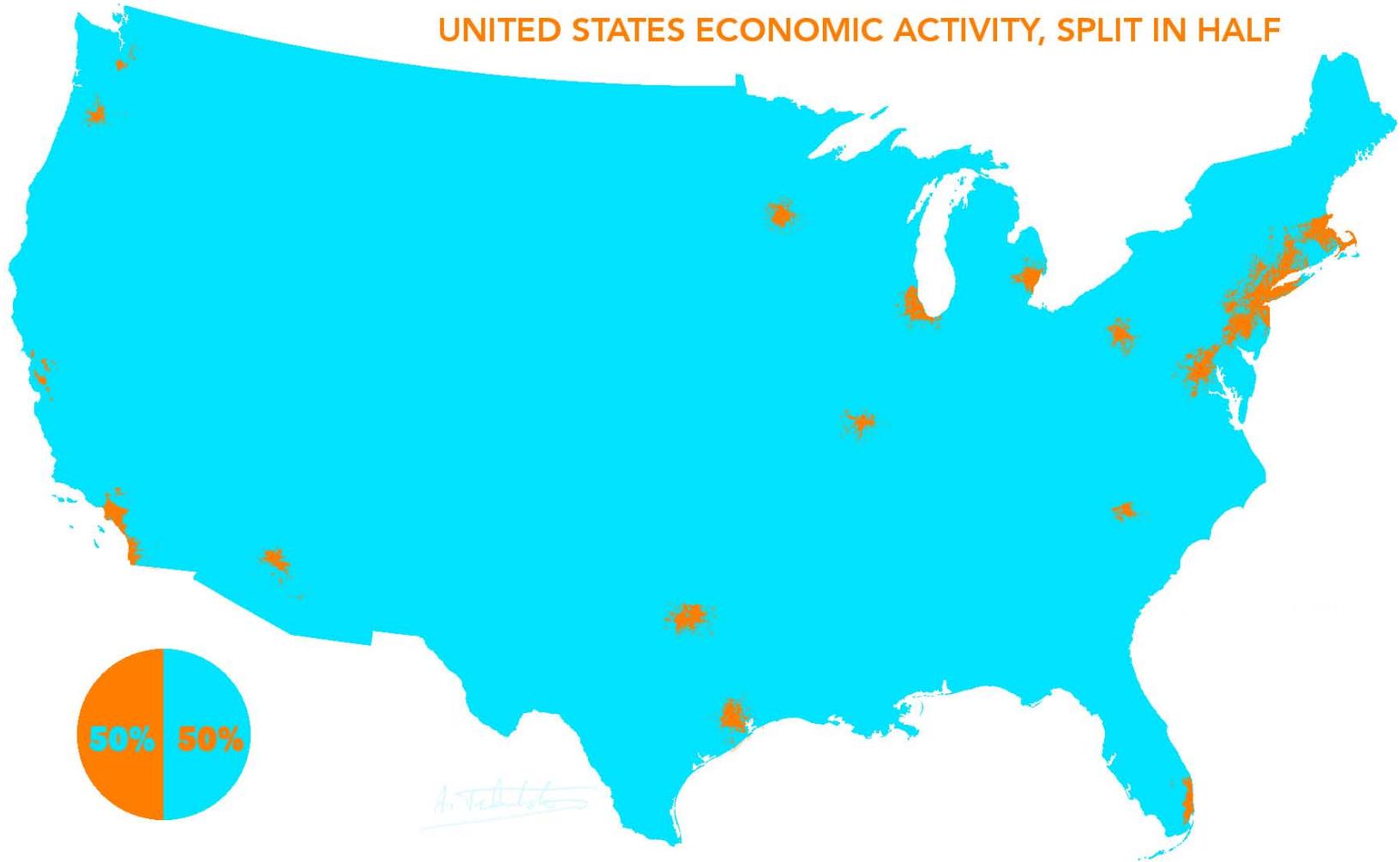


From Memory (was: Maps from Memory): <http://www.flickr.com/groups/46079190@N00/>

Some conversations

Is it good? Is it bad? Is it... something else?

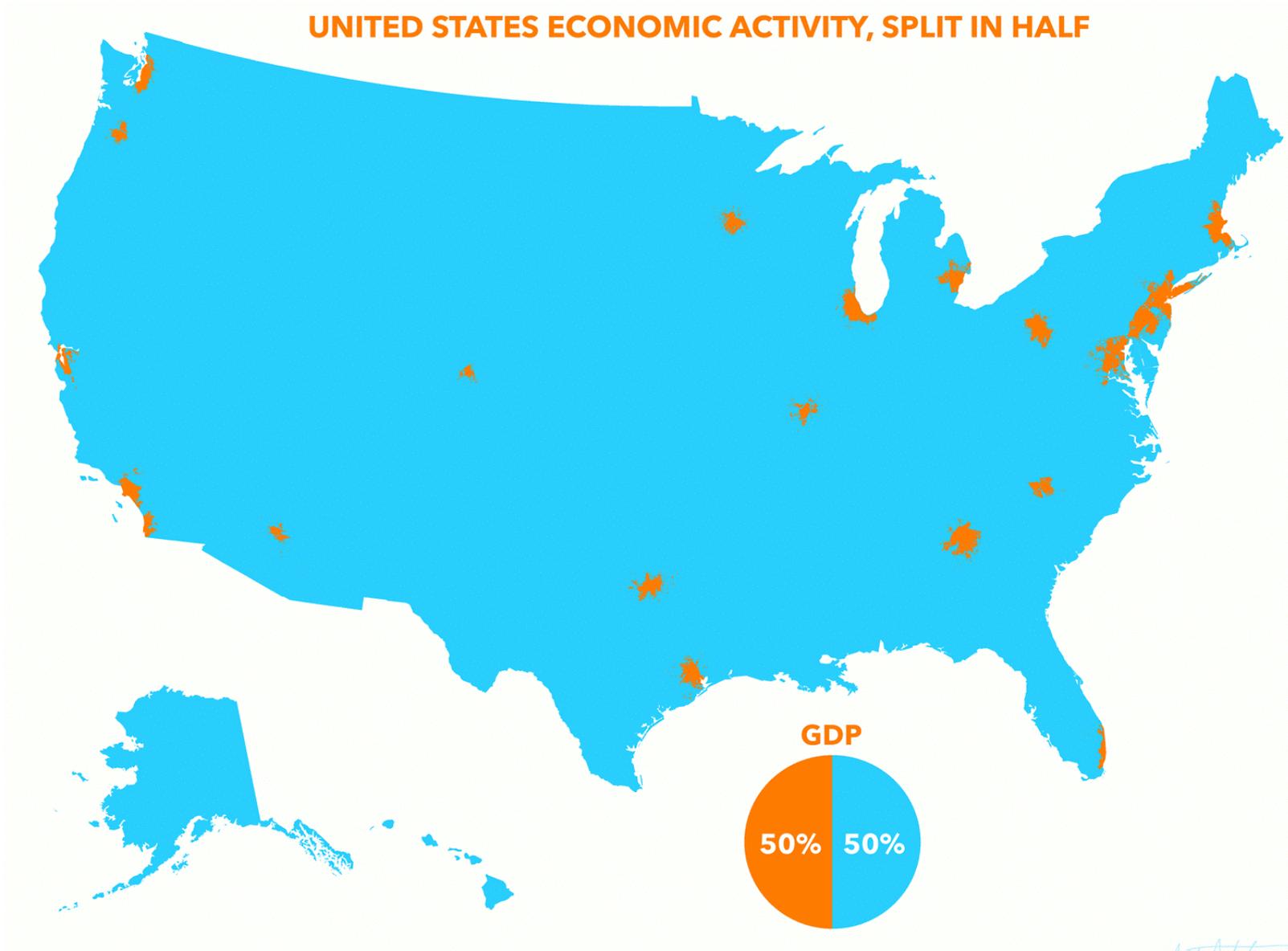
UNITED STATES ECONOMIC ACTIVITY, SPLIT IN HALF



Data From: <http://www.usmayors.org/metroeconomies/2013/201311-report.pdf>

Image From: <http://i.imgur.com/9slRTRJ.png> (atrubetskoy)

UNITED STATES ECONOMIC ACTIVITY, SPLIT IN HALF



Data From: <http://www.usmayors.org/metroeconomies/2013/201311-report.pdf>

Image From: <http://i.imgur.com/9slRTRJ.png> (atrubetskoy)

UNITED STATES ECONOMIC ACTIVITY, SPLIT IN HALF

“The reason this is getting any attention at all is because it’s a map. If it were a bar chart or similar, people would just ignore it. But no matter how simple or obvious your data, once it’s shown on a map, people find it interesting.”



UNITED STATES ECONOMIC ACTIVITY, SPLIT IN HALF

“Where does the map say “hey, I'm showing you that population density is highly correlated to GDP production.” It doesn't. Therefore, it's misleading if you don't know much about the U.S., which was one of my points above.

Simplicity is not a virtue. Clarity is. If by striving for simplicity you sacrifice data that are necessary to put the information into a proper context (and you point out what those data could be), you're doing it wrong.”

50% 50%

UNITED STATES ECONOMIC ACTIVITY, SPLIT IN HALF

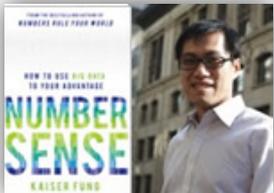
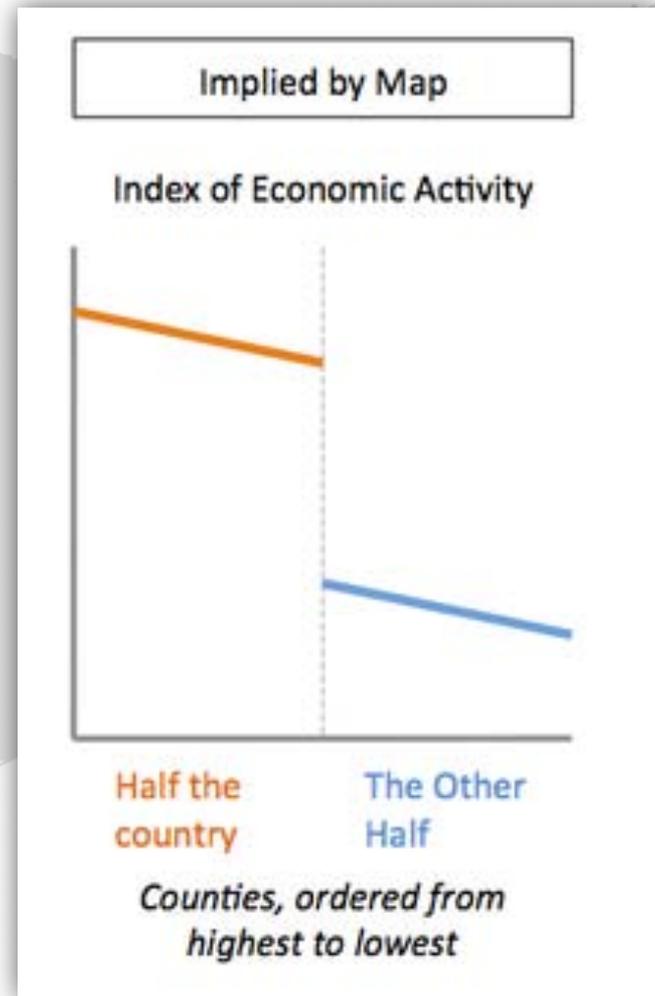
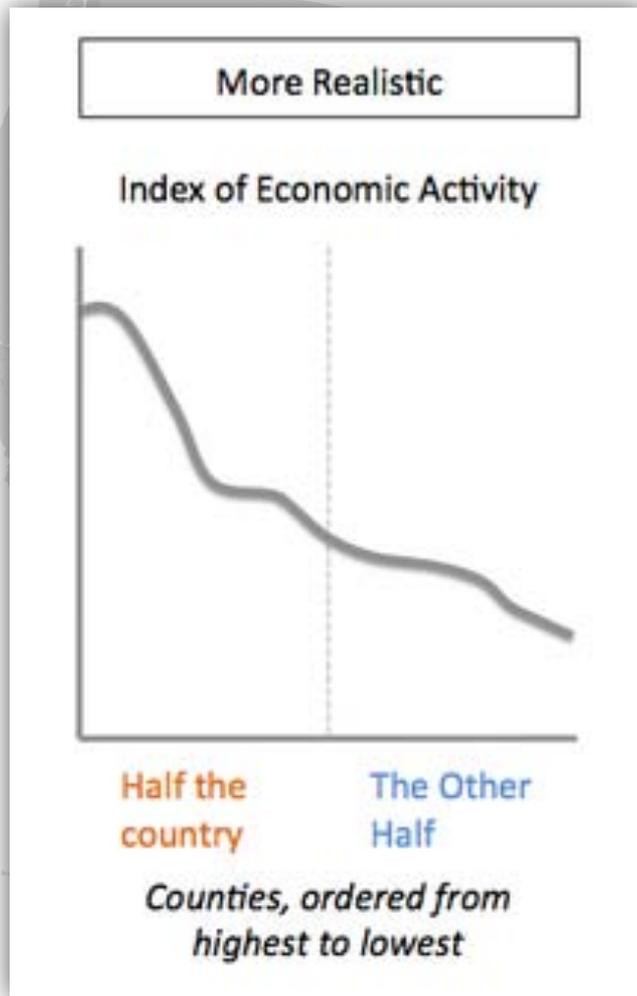
“The objective of visualisation is not just to surprise, enlighten and reveal new things to all. If you can, wow, oh my god and the rest. But sometimes it just reinforces, maybe showing something we know but from a different angle. That’s ok. It is still legitimate to serve 'just' that objective.”



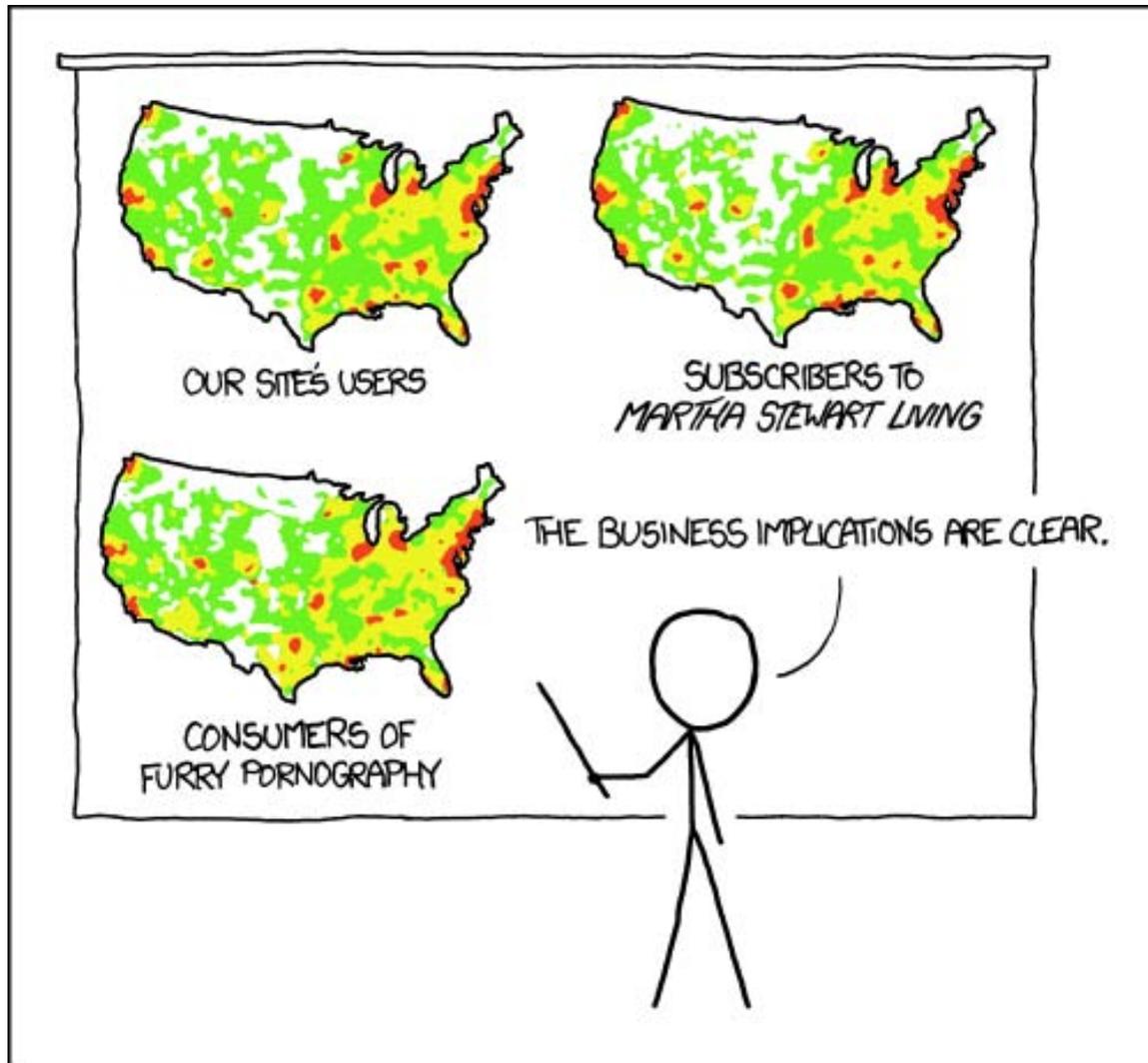
visualising
data

<http://www.visualisingdata.com/index.php/2014/02/defending-the-incredible-gdp-map/>

UNITED STATES ECONOMIC ACTIVITY, SPLIT IN HALF



<http://junkcharts.typepad.com/numbersruleyourworld/2014/02/numbersense-and-true-lies.html>



PET PEEVE #208:
GEOGRAPHIC PROFILE MAPS WHICH ARE
BASICALLY JUST POPULATION MAPS

<http://www.thefunctionalart.com/2014/02/the-incredible-gdp-map-that-shows-that.html>

<http://www.visualisingdata.com/index.php/2014/02/defending-the-incredible-gdp-map/>

<http://junkcharts.typepad.com/numbersruleyourworld/2014/02/numbersense-and-true-lies.html>