

MassMutual DSDP 2018:

# GEOGRAPHIC VISUALIZATION

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June 19, 2018

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Assistant Professor of Computer Science

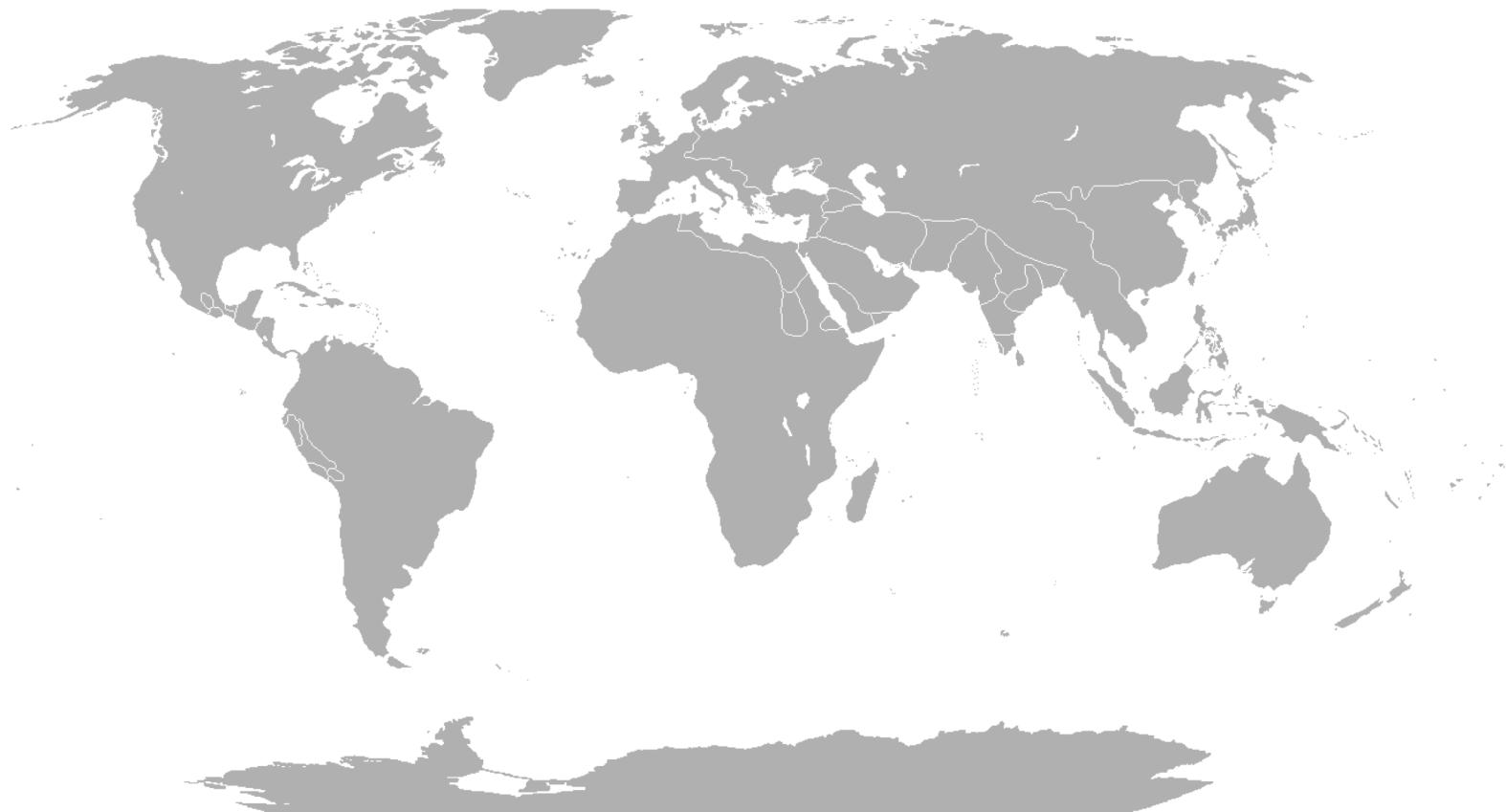
Smith College

# Outline

- Overview of geographic data
- Challenges
- Guidelines for making good geoviz

# Geographic visualization

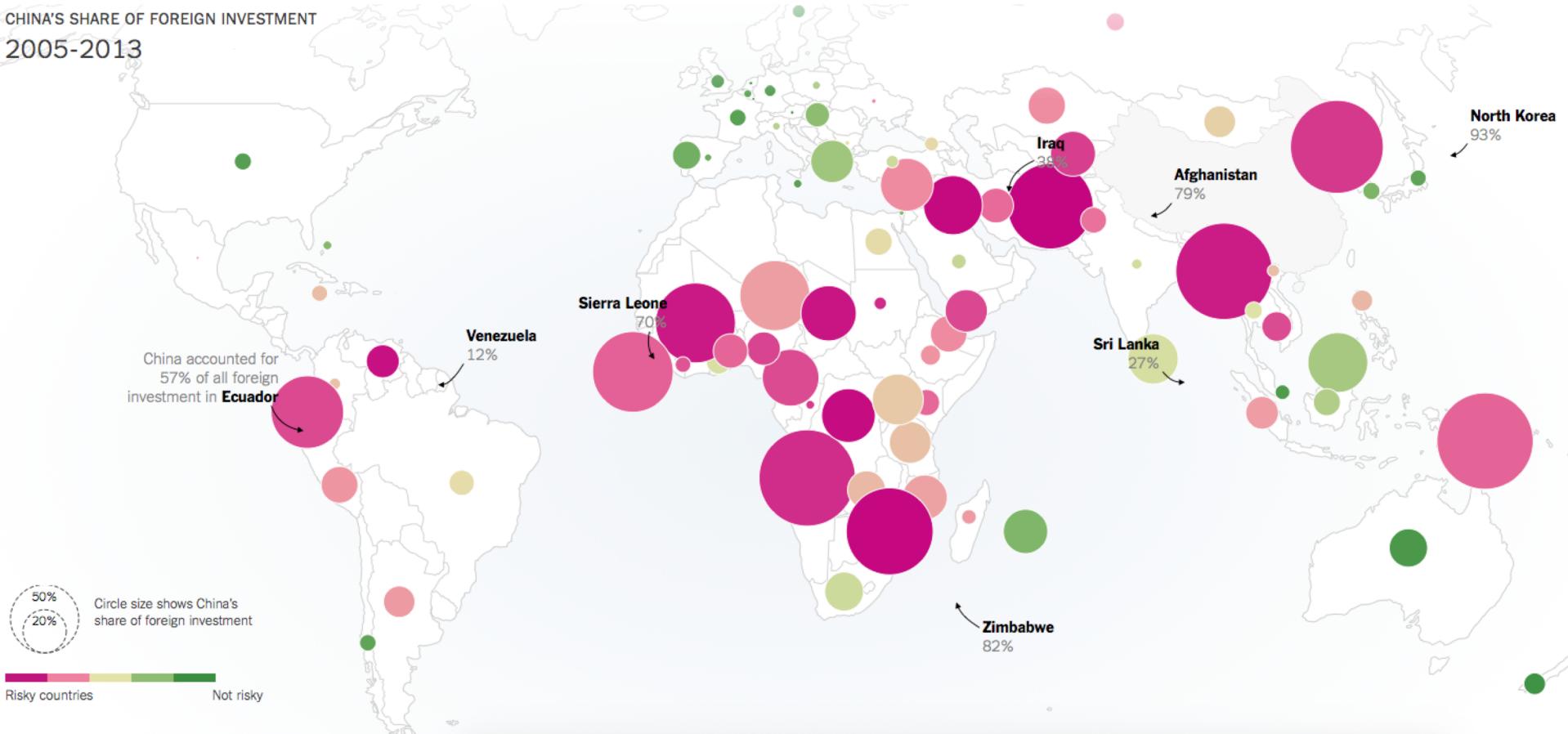
- Most common: maps
- Useful for making **geospatial** comparisons



# Geographic visualization: points

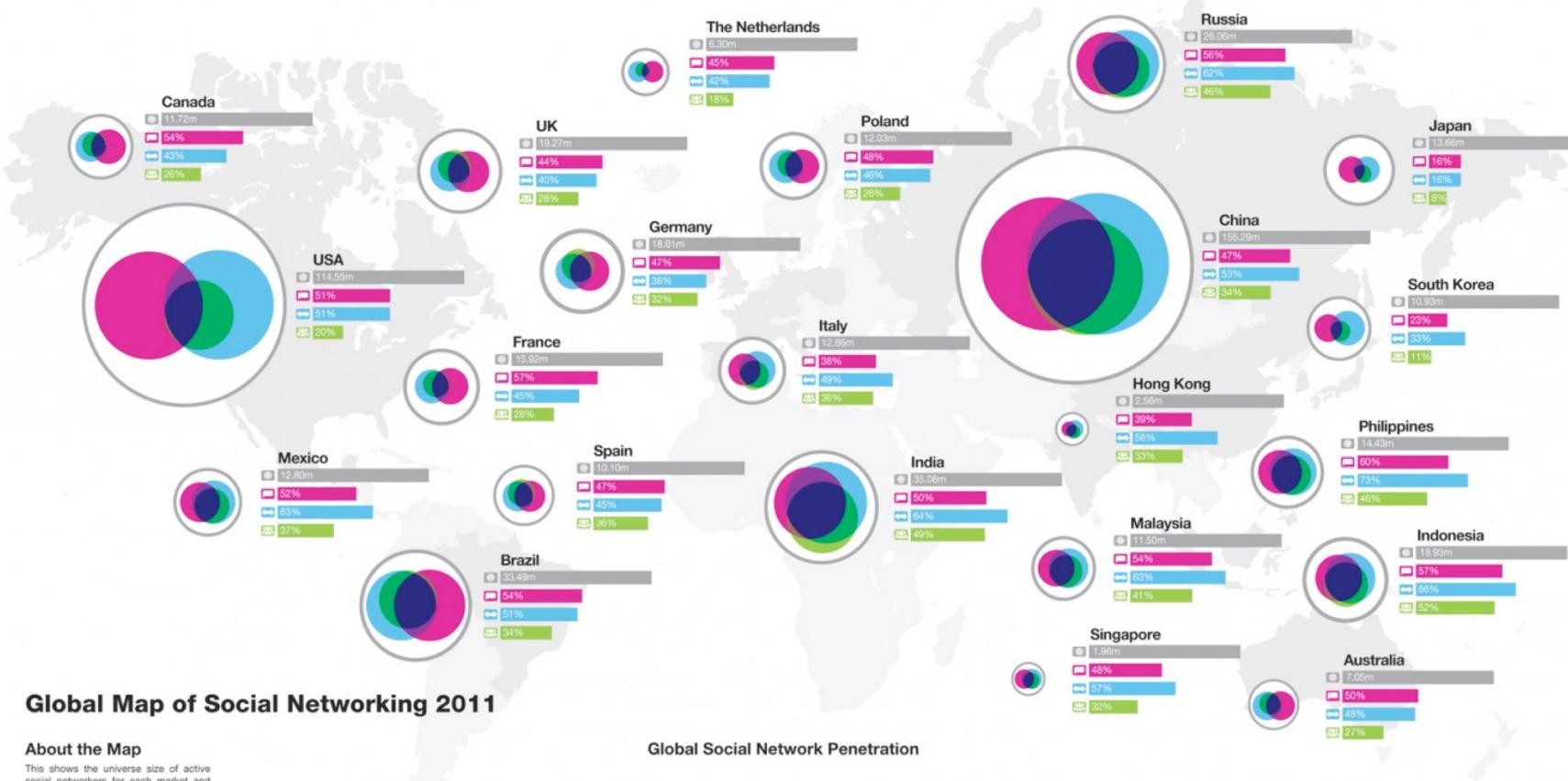
## The New York Times The World According to China

By GREGOR AISCH, JOSH KELLER and K.K. REBECCA LAI



# Geographic visualization: glyphs

designed by nikard.andresen@gmail.com

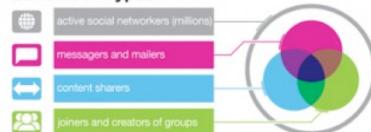


## Global Map of Social Networking 2011

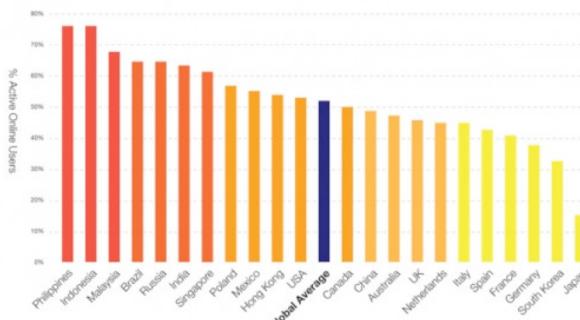
### About the Map

This shows the universe size of active social networkers for each market and then segments users into three behaviour types: Messagers, Groupers and Content Sharers. This behavioural data is based on a number of detailed questions we conduct into the way that consumers use social networks. Because social networking is now so big and touches every aspect of our internet experience this detail is essential for effective planning, and implementation of marketing activity across social networks. This data reveals that users across the world are very different in how they utilise their network, with more focus on messaging and less on content sharing in established markets like the US and UK but more focus on content and groups in fast growing markets like Indonesia and China.

### Behaviour Types:



## Global Social Network Penetration

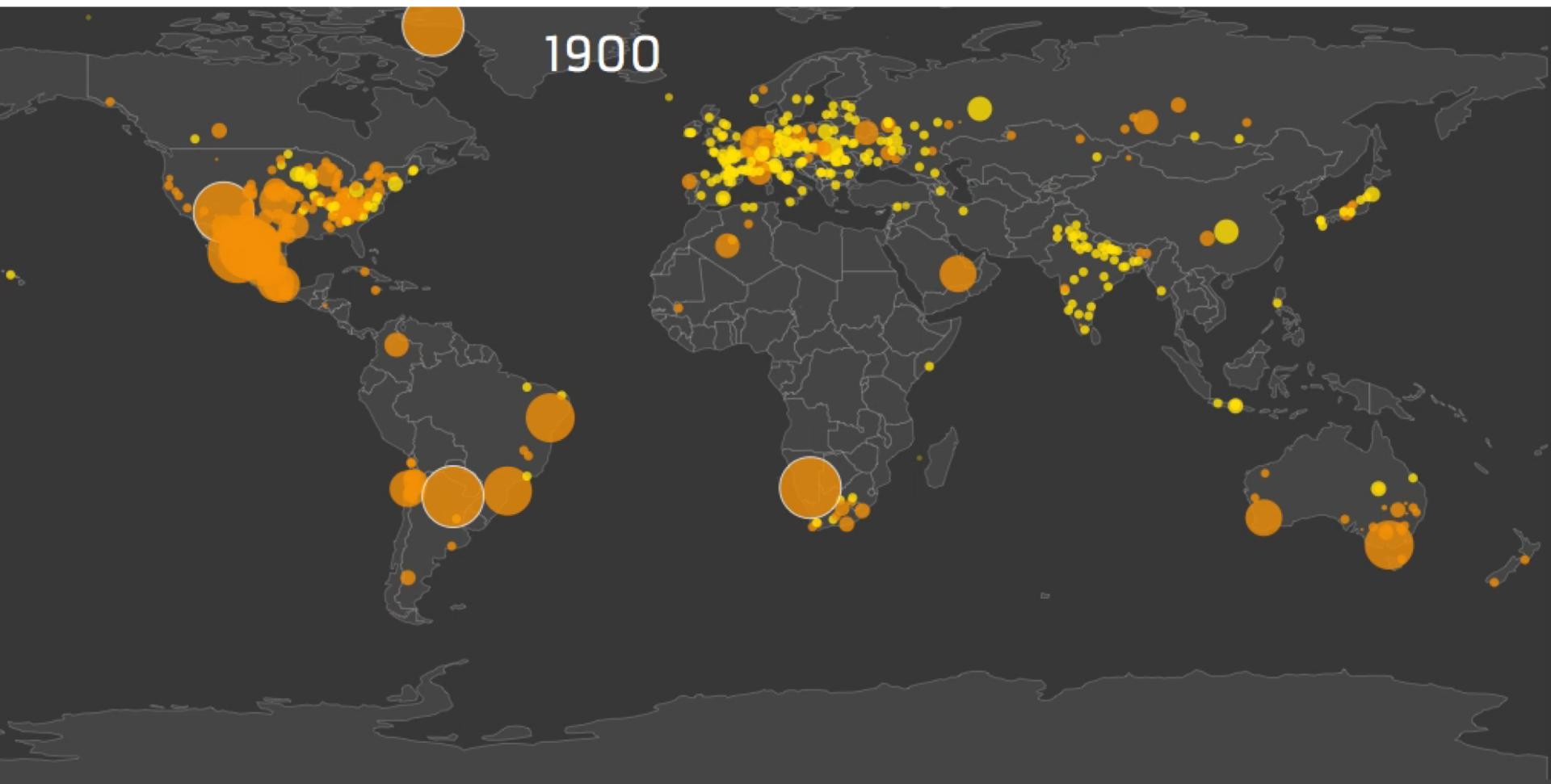


The most detailed study on the consumer adoption of the internet ever compiled:

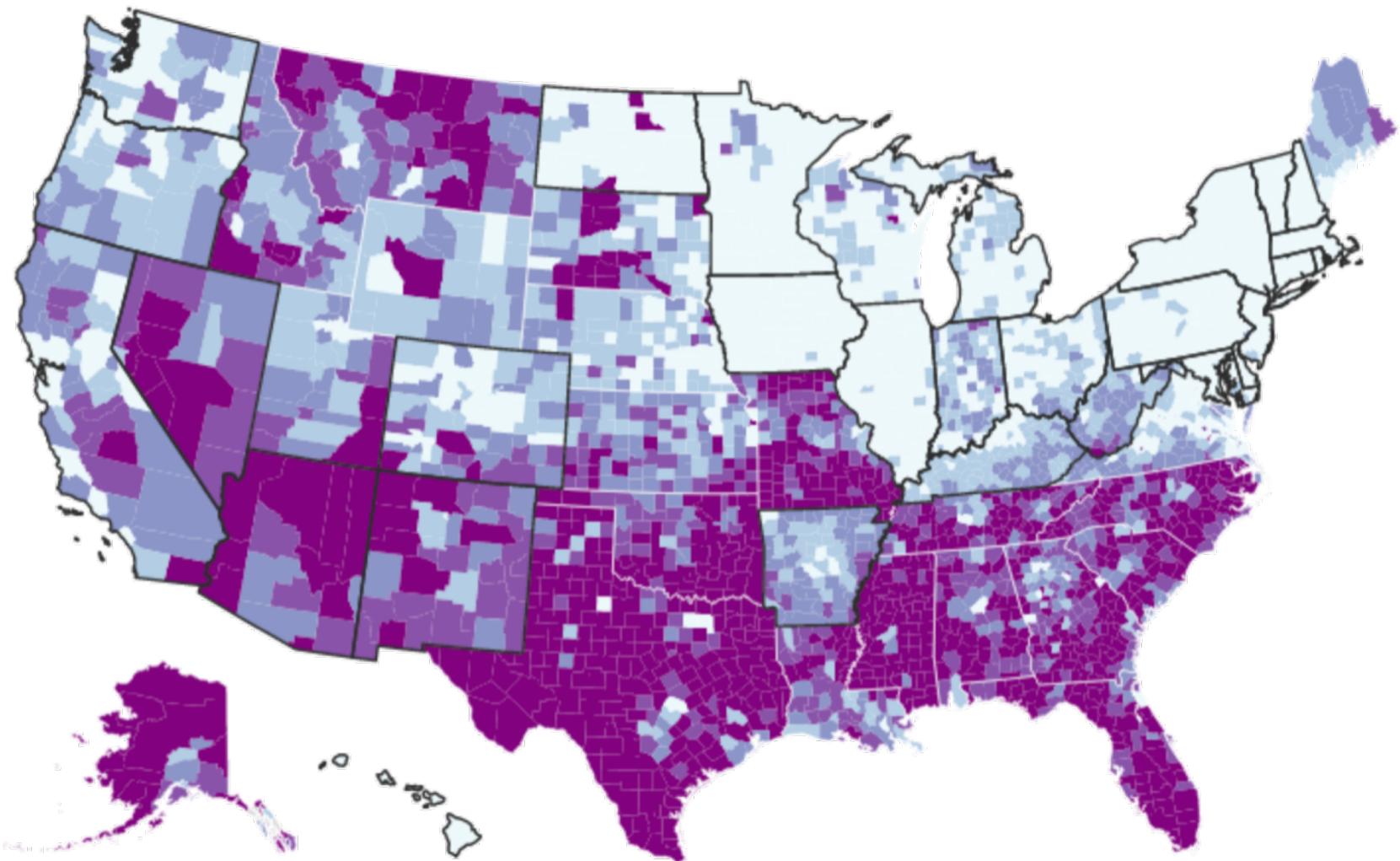
PC // Mobile // Tablets // TV sets // Gaming 100K+ surveys a year // 3 waves a year // 36 markets

Find out more // [www.globalwebindex.net/](http://www.globalwebindex.net/)  
mail // [globalwebindex@trendstream.net](mailto:globalwebindex@trendstream.net)

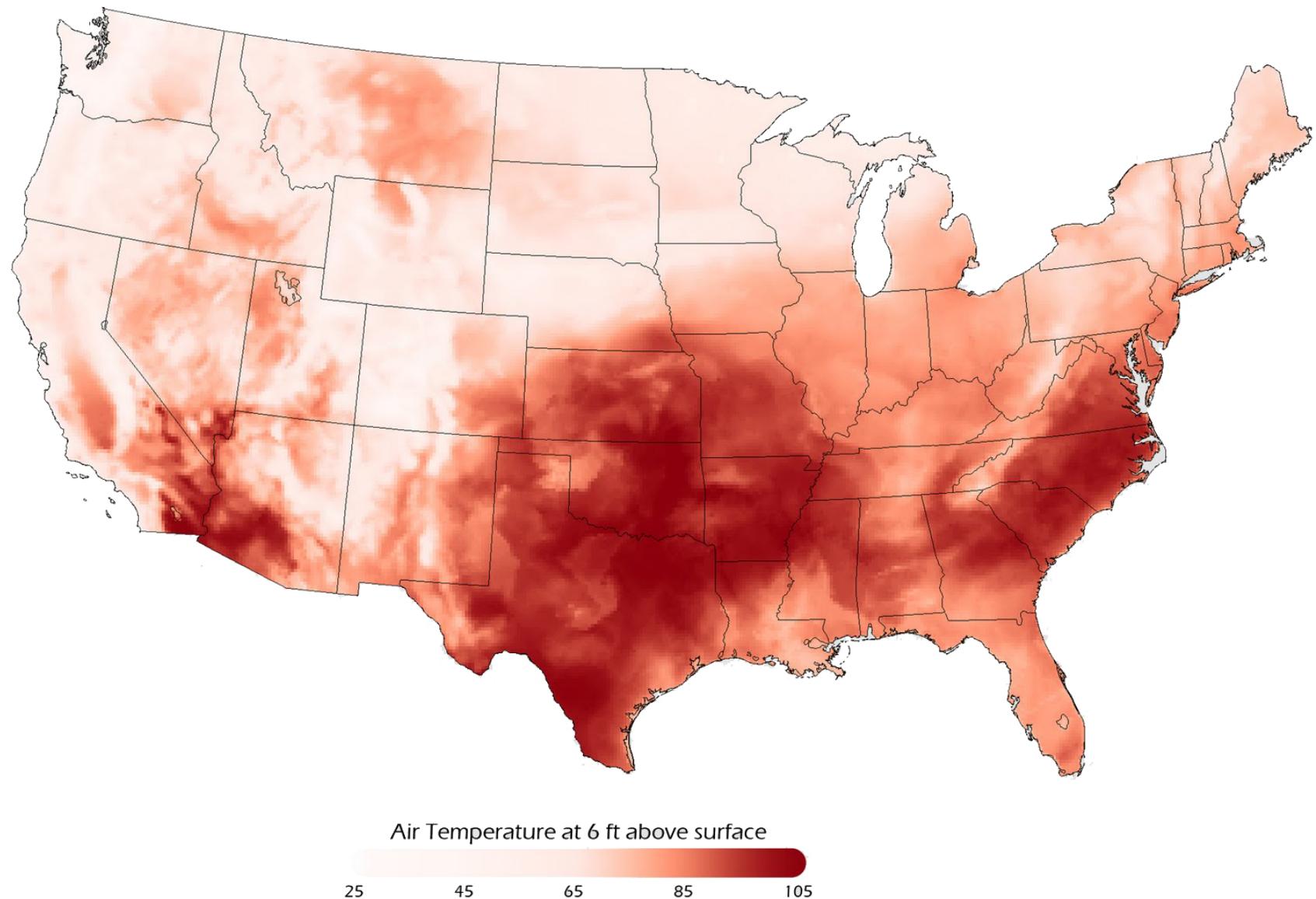
# Geographic visualization: over time



# Geographic visualization: filled regions



# Geographic visualization: heatmaps



# Geographic visualization: connections



# Examples: NYT maps

Google new york times map

All Maps Images News Shopping More Search tools SafeSearch

middle east syria kurdistan ukraine arab world saudi arabia immigration crime demographic population baseball college football nfl isis

The grid displays a variety of maps and data visualizations from the New York Times, including:

- New York Health Department Enforcement Map
- Breast in America Transportation Explorer
- Second most popular Facebook terms
- Your Map
- New York Times 2009
- The Vote for Mayor in Each Assembly District
- SHARE OF VOTE
- Hillary Clinton's Campaign Finances
- Made in NY Digital Map
- Gulf of Mexico
- Areas in New York City
- Hospital Care Credit Issuer
- Which Cities have the Most Crime
- Made in NY Digital Map
- New cases for the week ended Oct. 23
- Population per square mile
- Obama vs. McCain
- Arab Spring
- Demographic
- Population
- Baseball
- College Football
- NFL
- ISIS

# Discussion

**Question:**

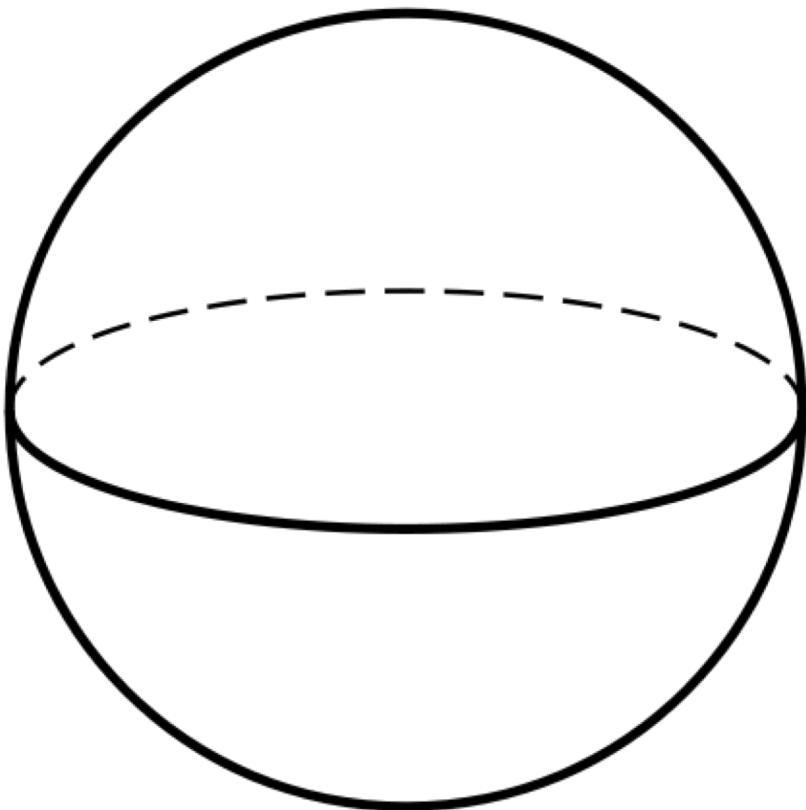
What makes geographic visualizations  
so compelling?



# Challenge 1: flat earth?



# Activity: spherical grumpy cat (5-7 min)



# Impact of map projections

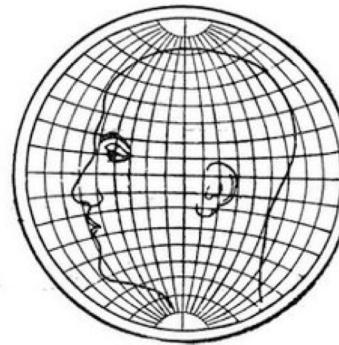
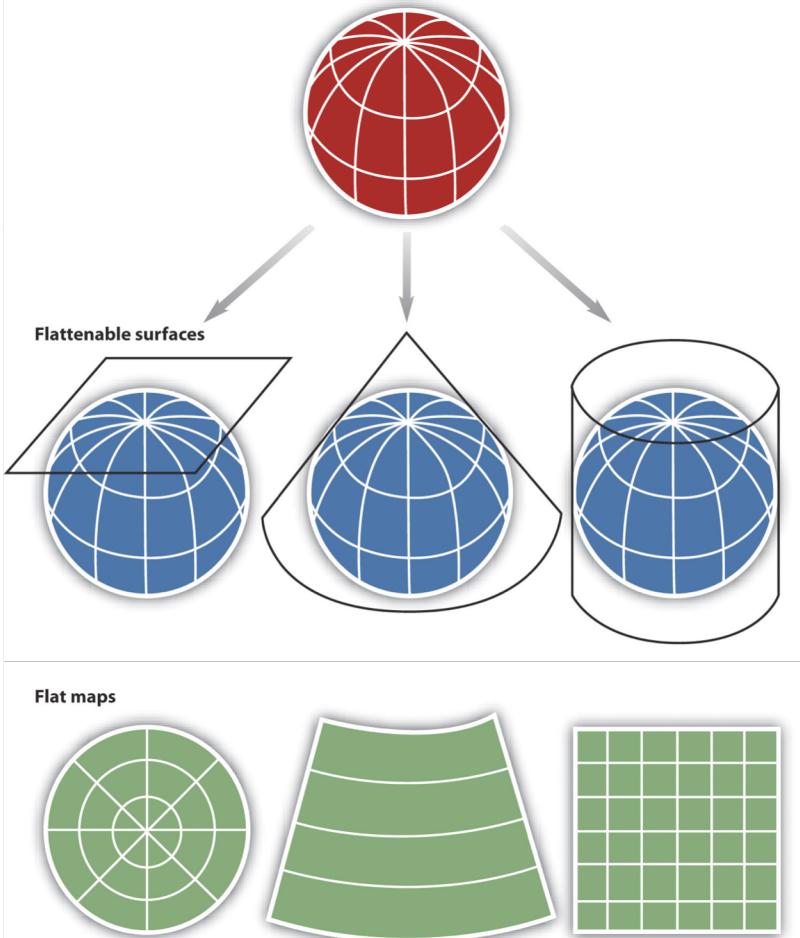


FIG. 42.—Man's head drawn on globular projection.



FIG. 43.—Man's head plotted on orthographic projection.

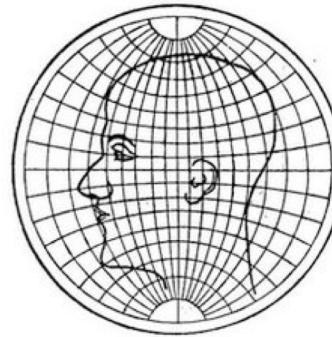


FIG. 44.—Man's head plotted on stereographic projection.

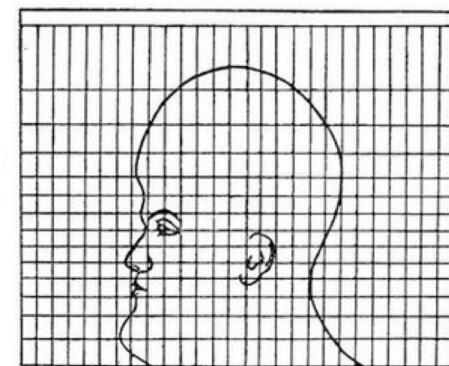


FIG. 45.—Man's head plotted on Mercator projection.

Campbell, J.E., & Shin, M. (2012). Geographic Information System Basics.

Deetz, C. H., & Adams, O. S. (1921). Elements of map projection with applications to map and chart construction.

# Challenge 2: granularity mismatch

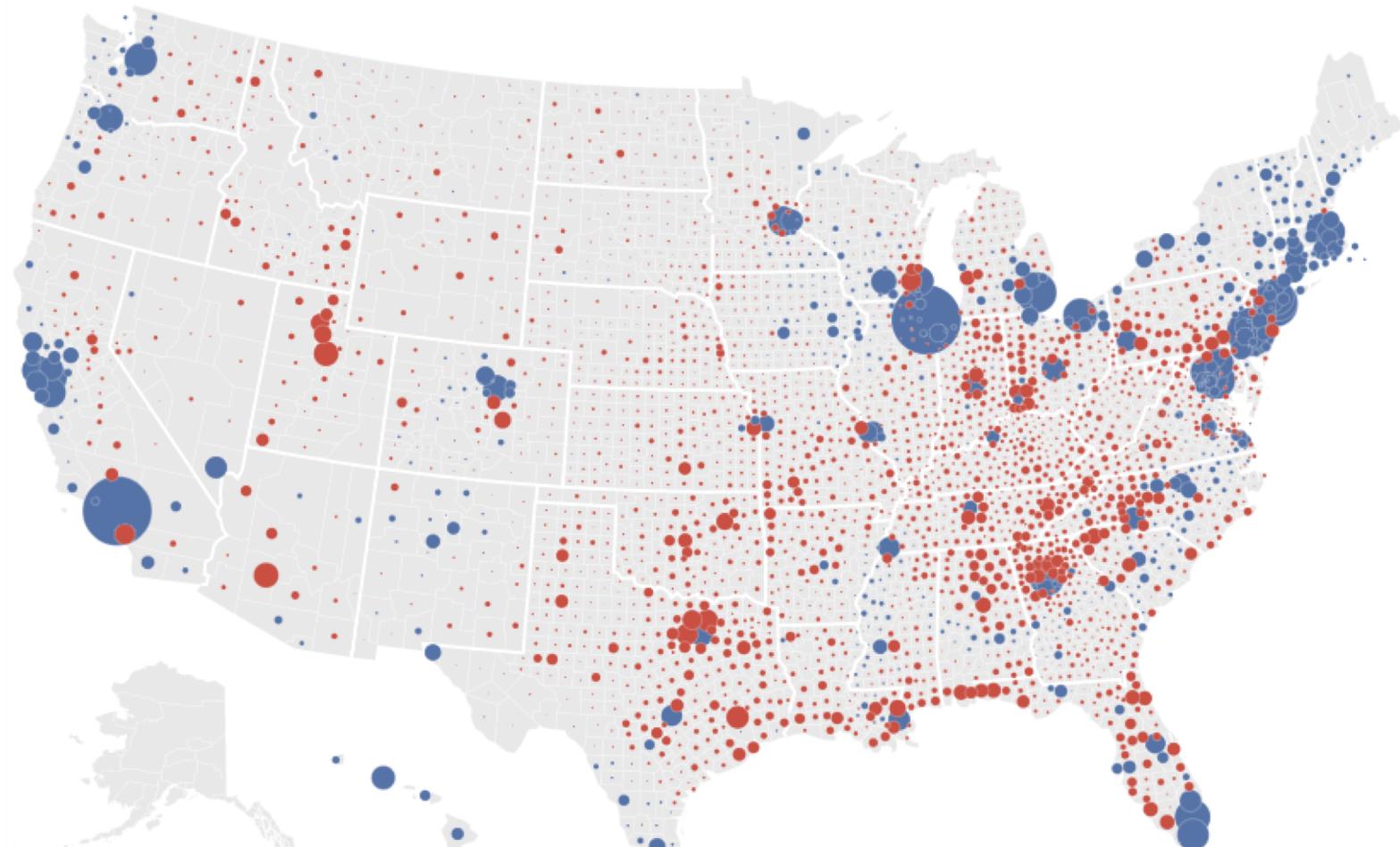
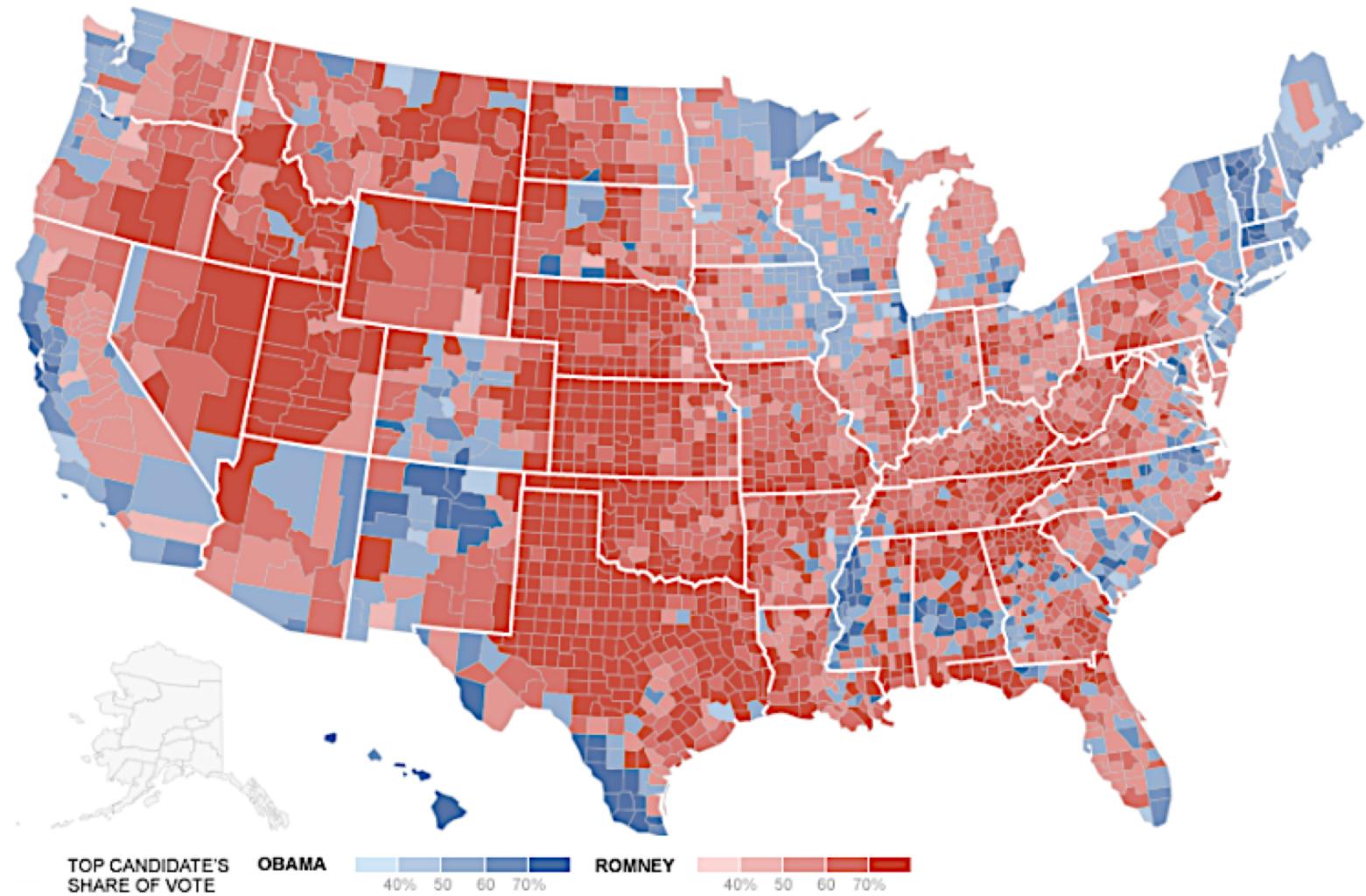
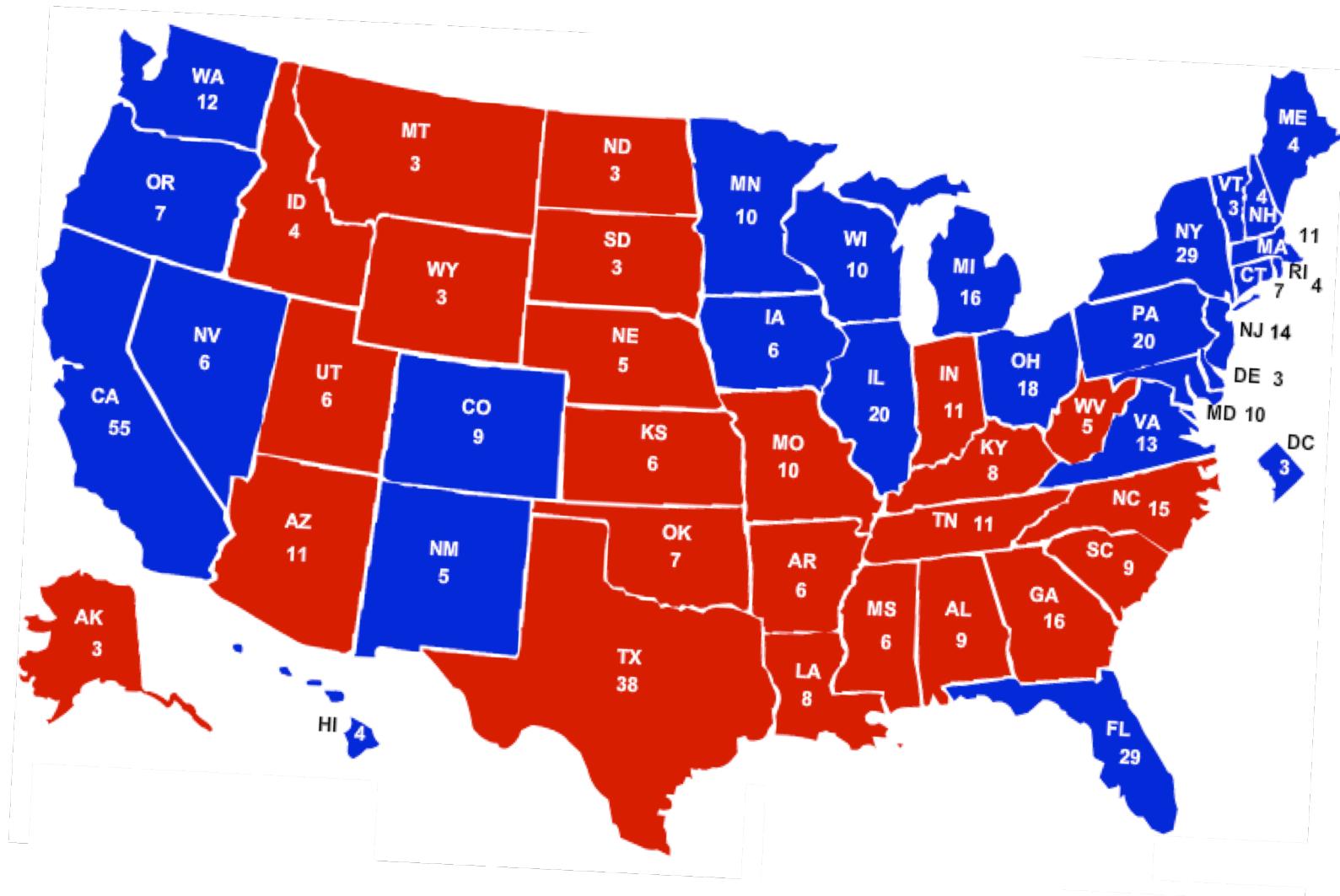


Image courtesy of politicalmaps.org

# Example: 2012 Presidential Election

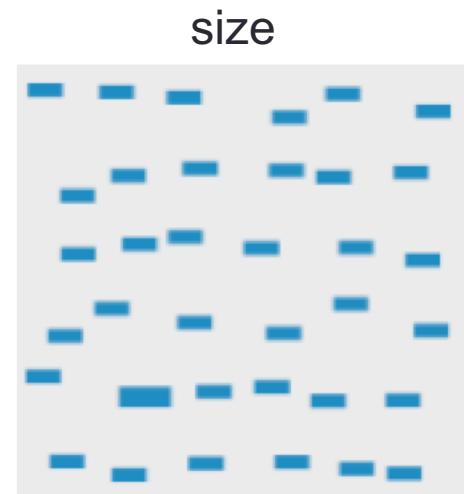
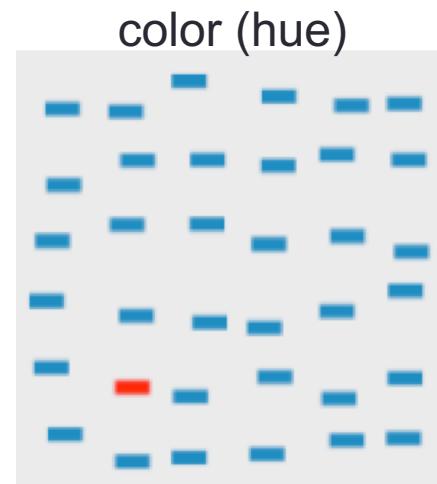
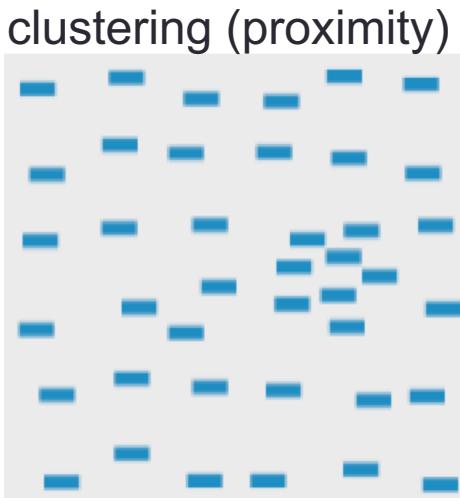


# Example: 2012 Presidential Election

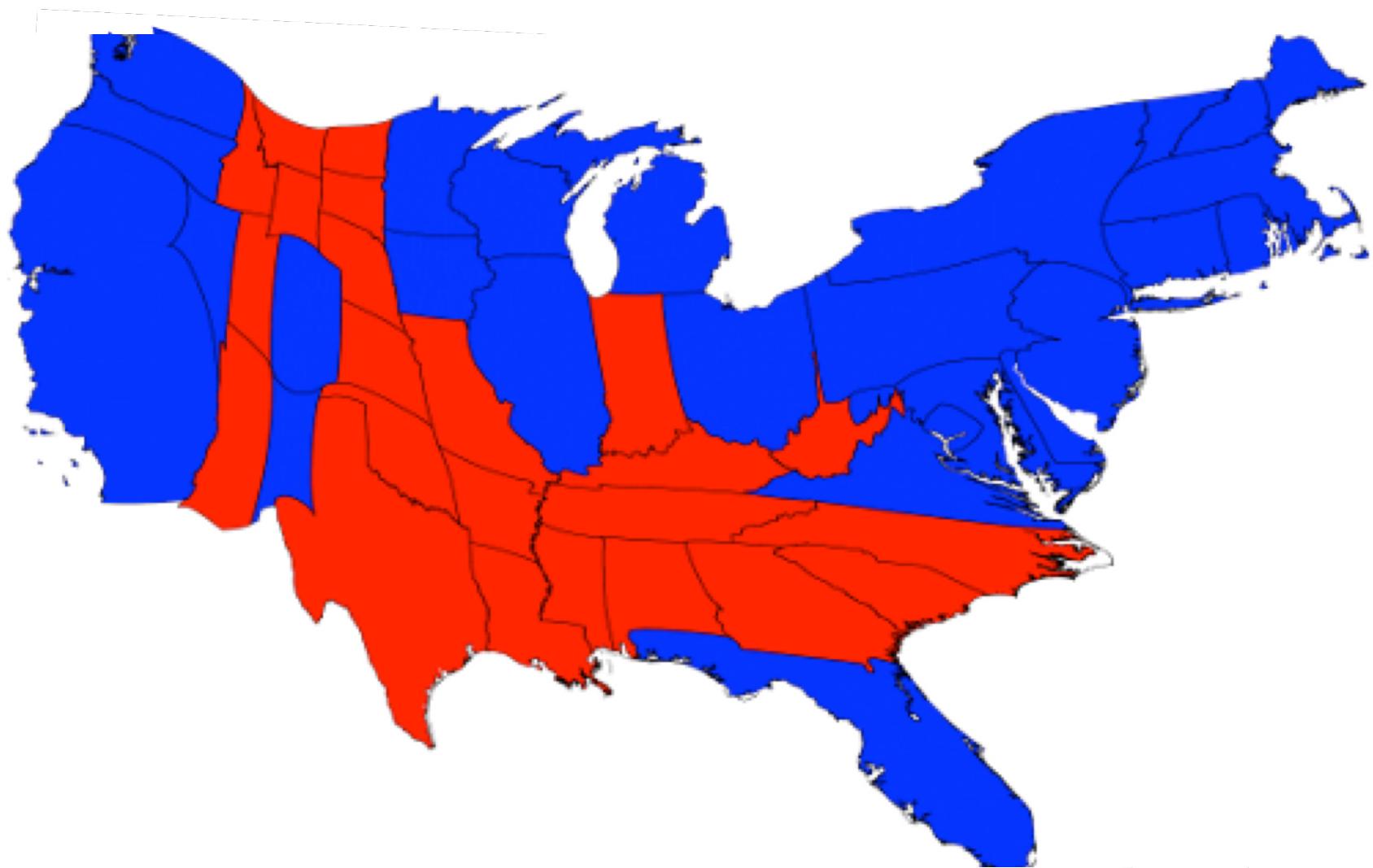


# Challenge 3: perceptual trickery

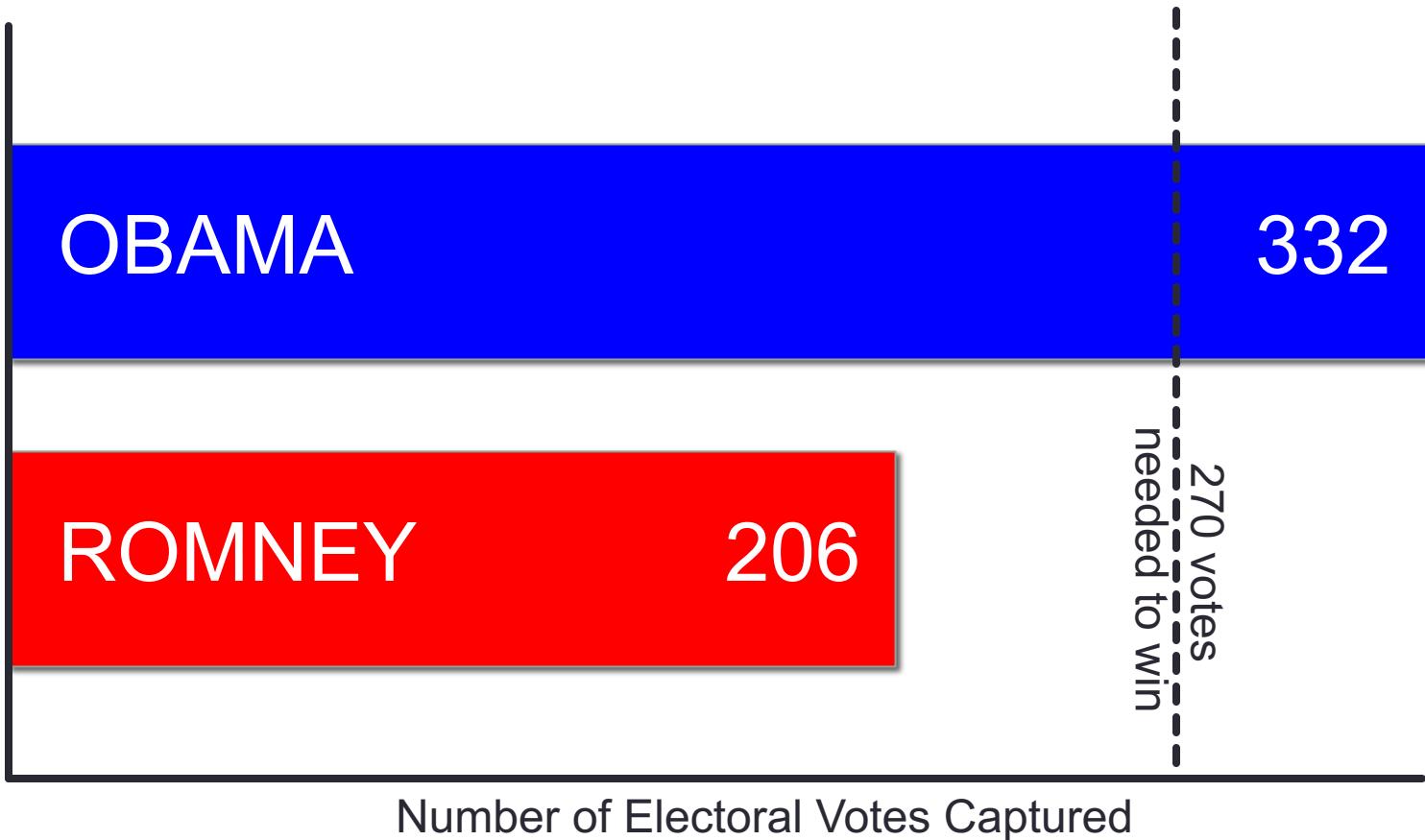
- Flashback to when we talked about **perception**
- What **preattentive features** are at work in these maps?



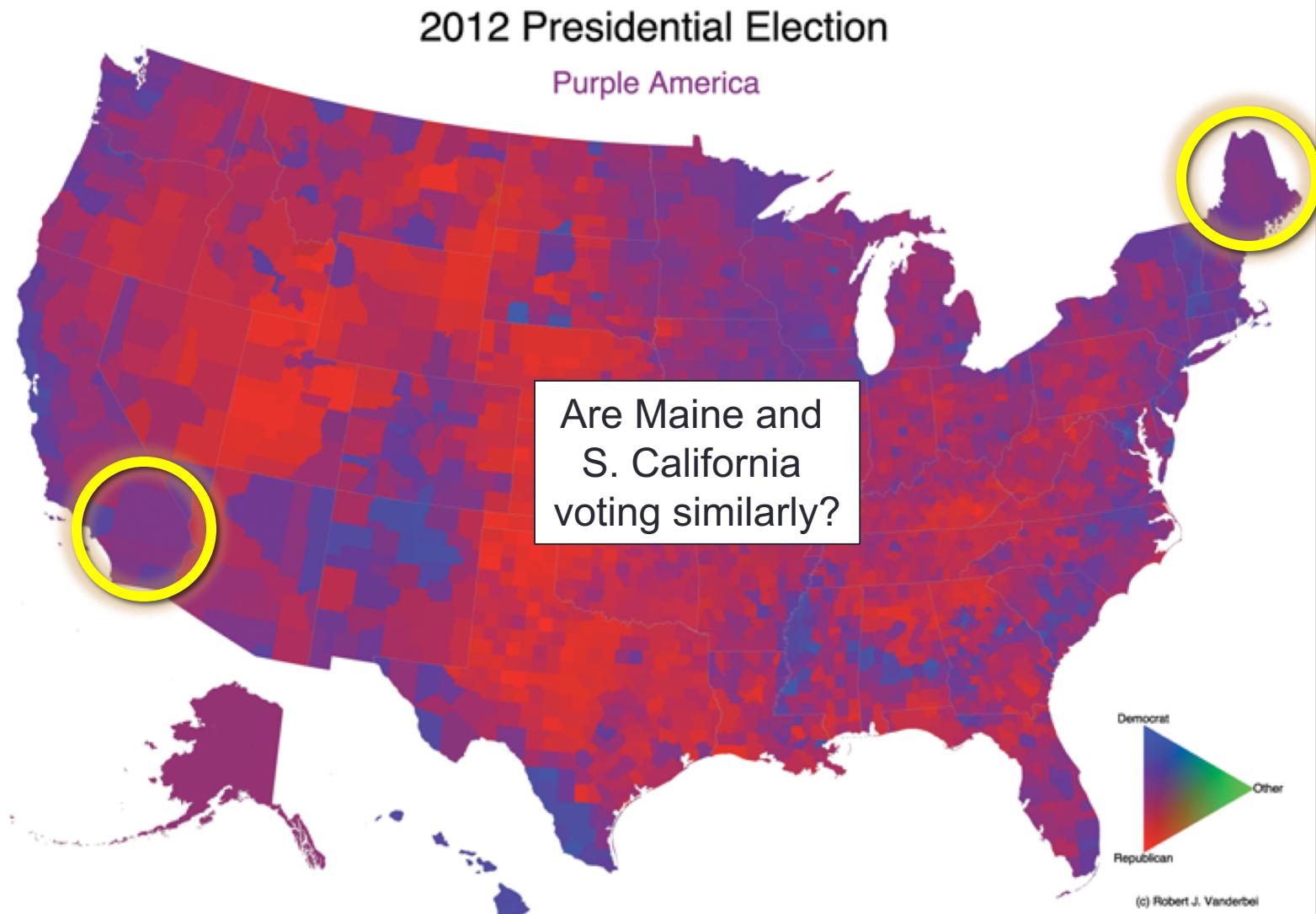
# Example: 2012 Presidential Election



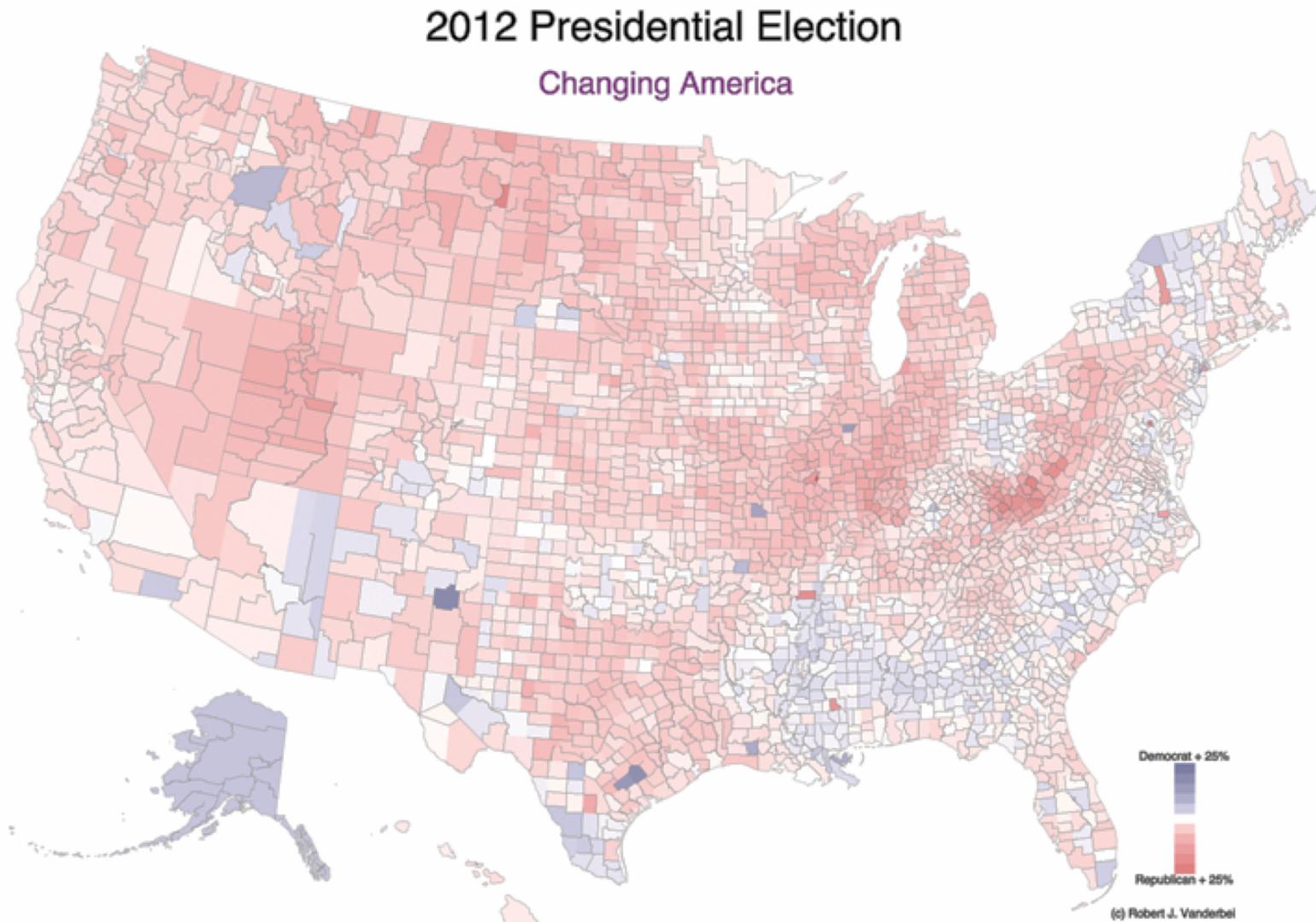
# Example: 2012 Presidential Election



# Challenge 4: non-adjacent comparison



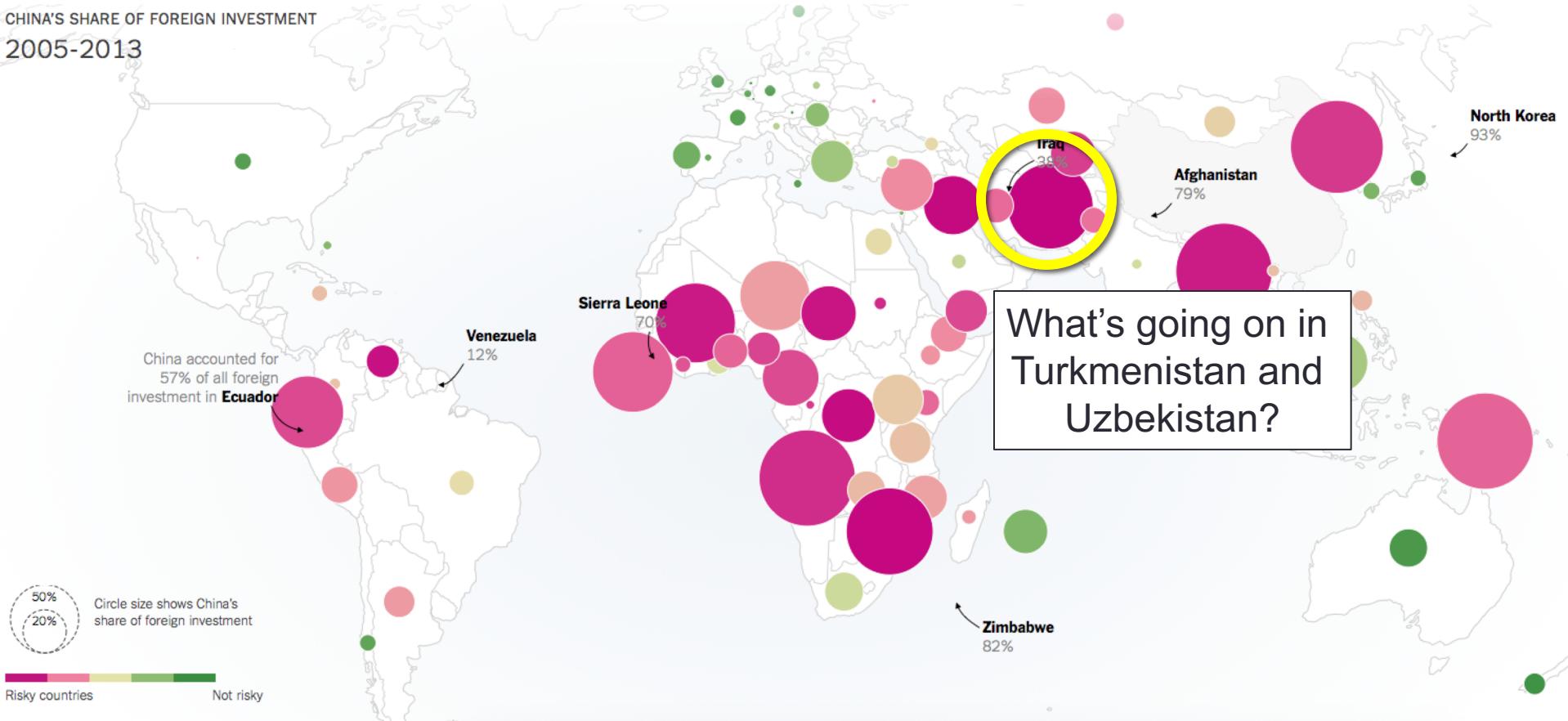
# Challenge 5: missing data



# Challenge 6: occlusion

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# Discussion: (rough) guidelines for maps

## **Question:**

What do we need to keep in mind  
to make good geographic visualizations?

