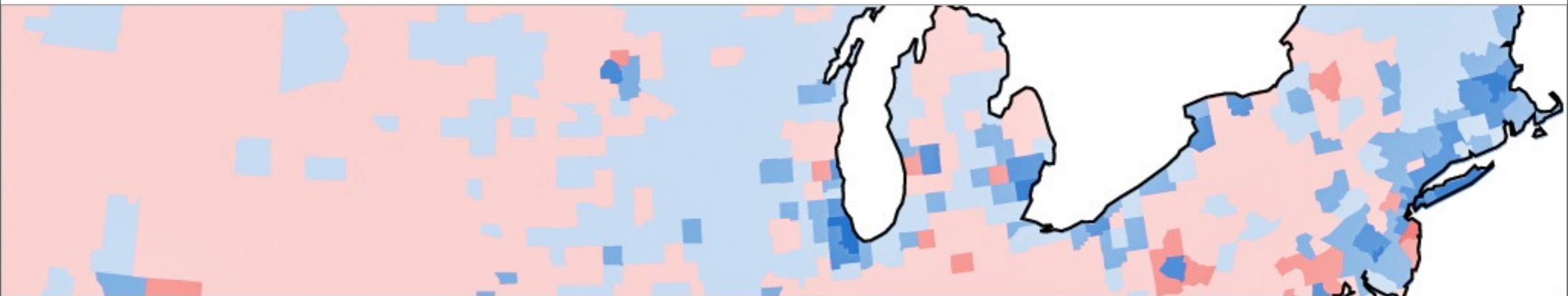# VALUE-BY-ALPHA MAPS

AN ALTERNATIVE TECHNIQUE TO THE CARTOGRAM

ANDREW WOODRUFF • ROBERT ROTH • ZACHARY JOHNSON

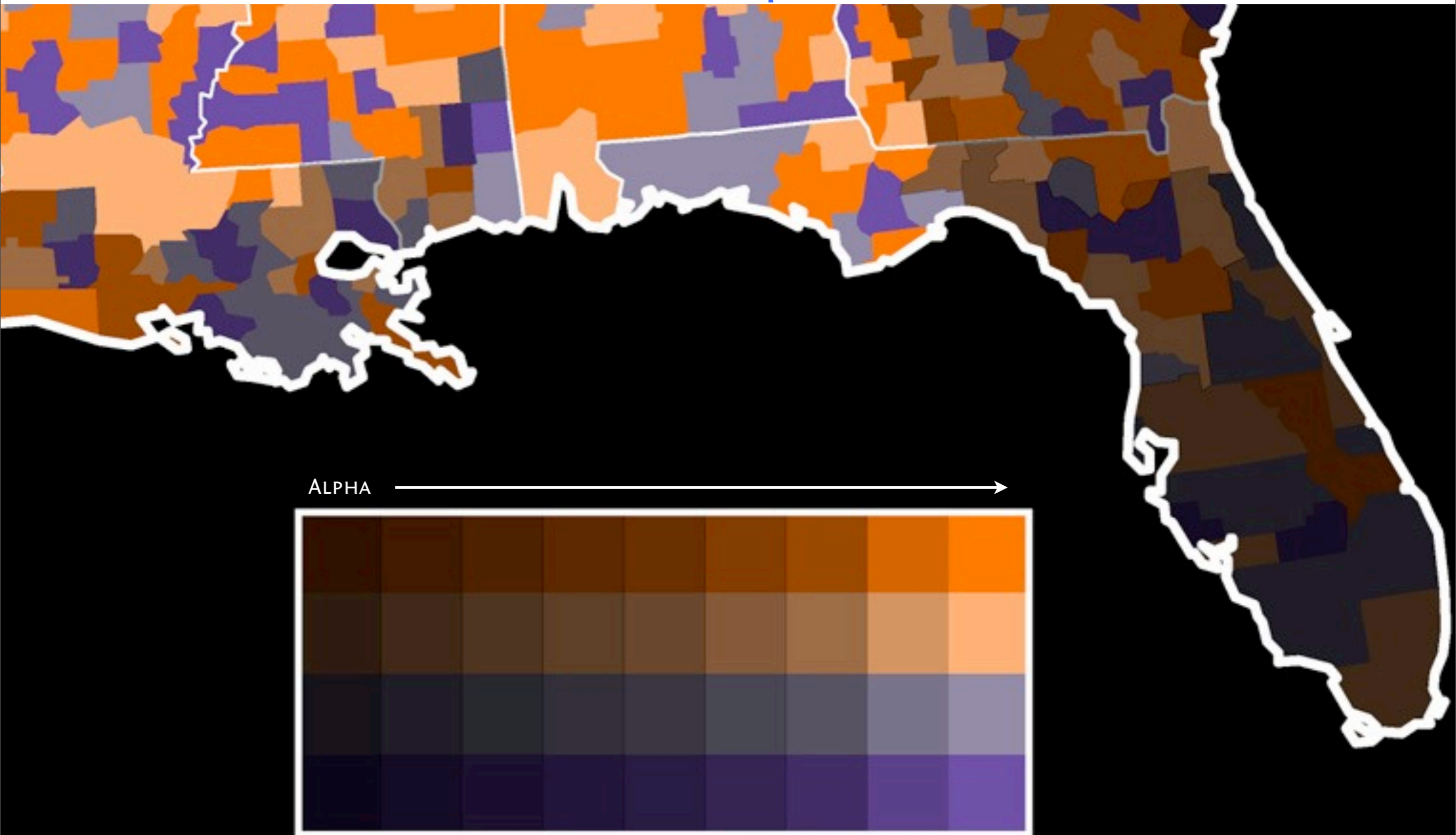AXIS MAPS   PENN STATE   AXIS MAPS
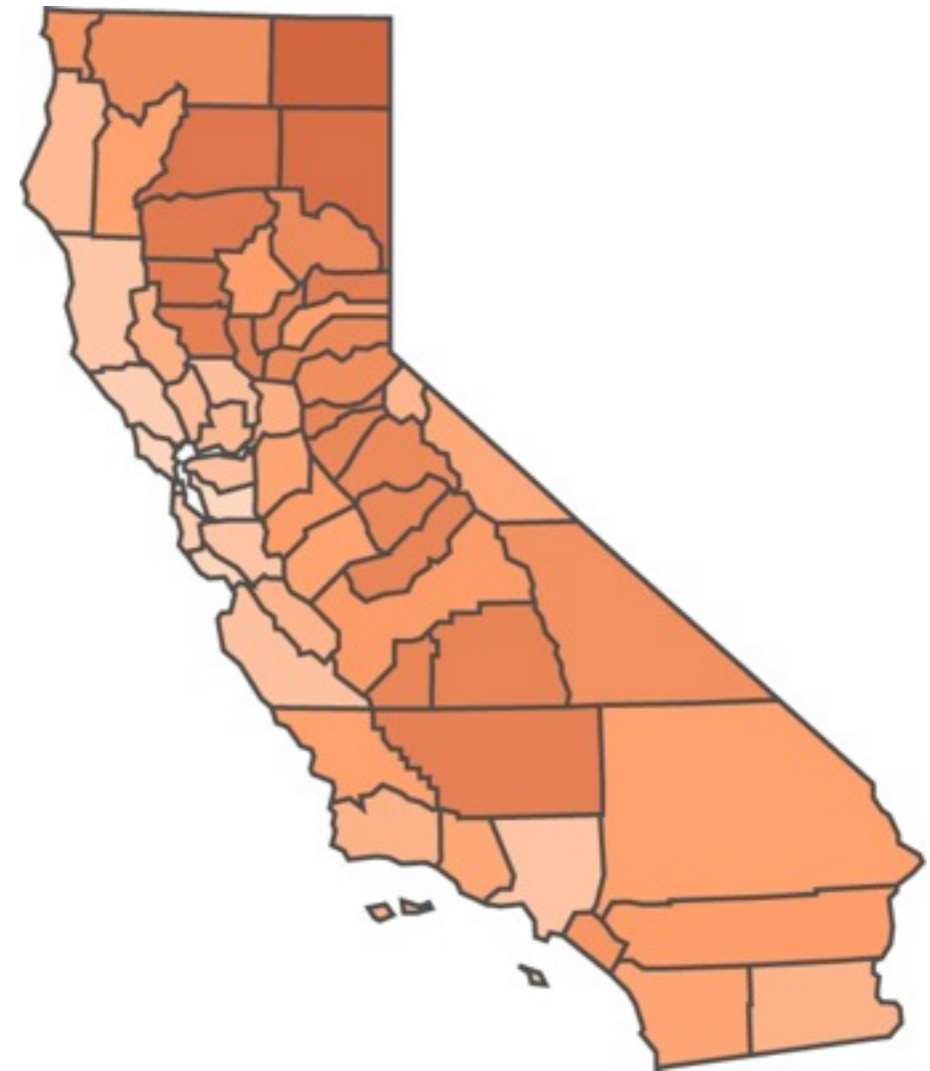
WHAT? BIVARIATE CHOROPLETH

A scheme that varies color and alpha channels

2008 McCain votes
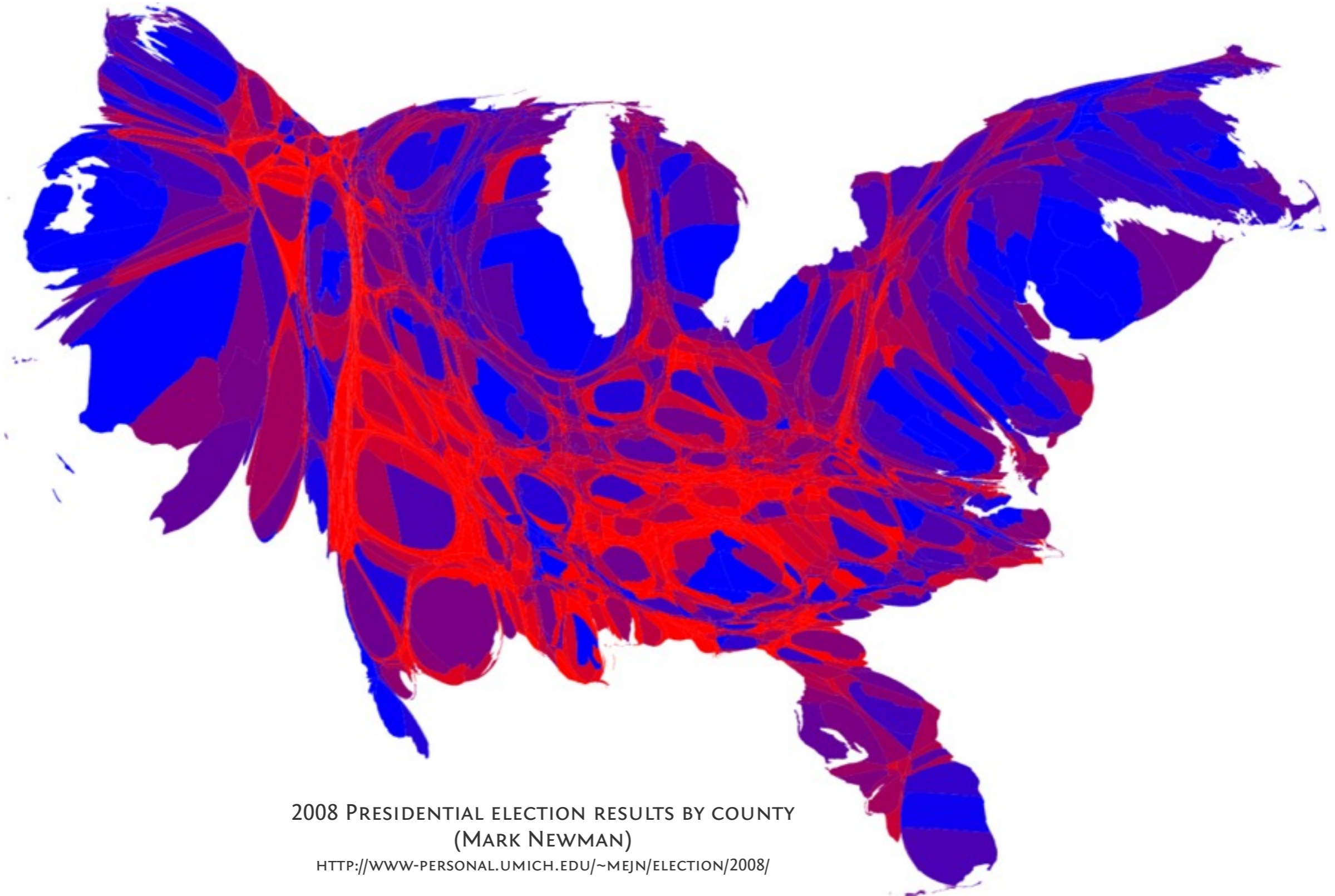
A choropleth map
of raw counts can
mislead.

2008 McCain votes
as a percent of total

So we standardize,
but lose the incidence
counts.

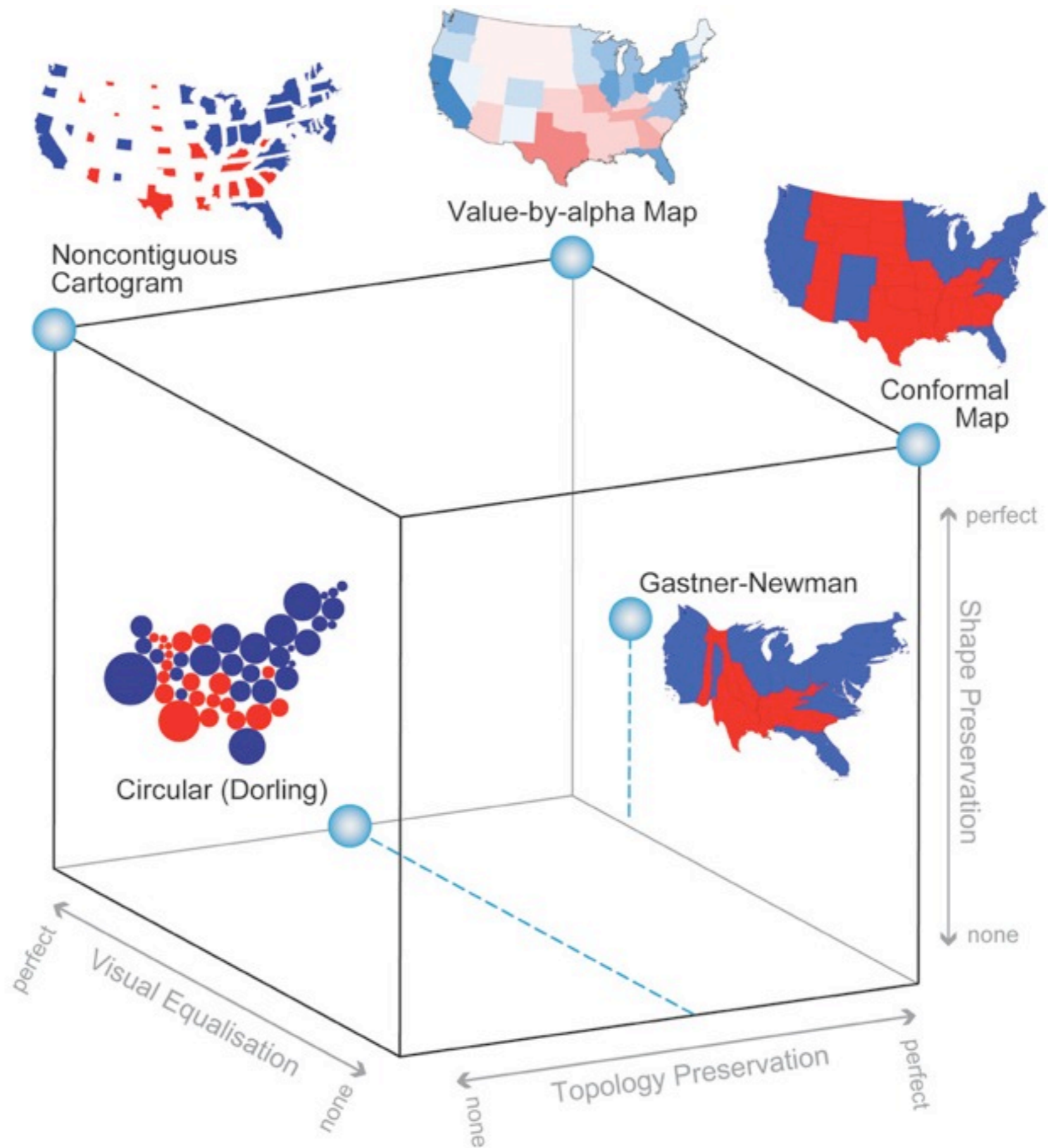# WHY? ENTER THE CARTOGRAM

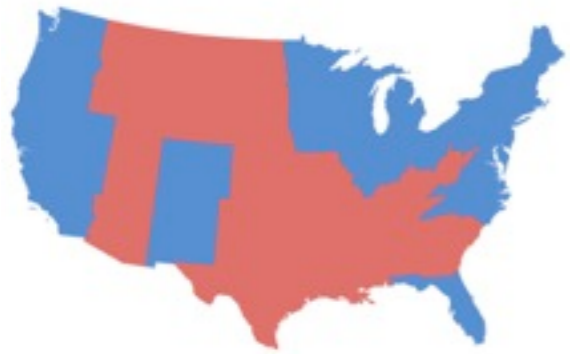
2008 Presidential election results by county
(Mark Newman)
http://www-personal.umich.edu/~mejn/election/2008/

WHY? CARTOGRAM³

Noncontiguous Cartogram

Value-by-alpha Map

Conformal Map

Gastner-Newman

Circular (Dorling)

Shape Preservation
perfect — none

Visual Equalisation
perfect — none
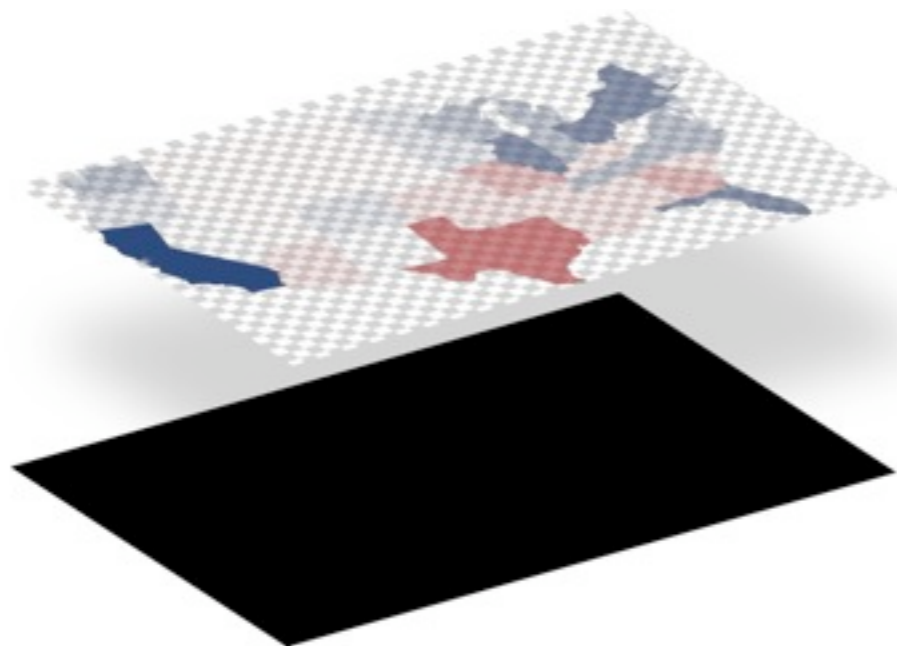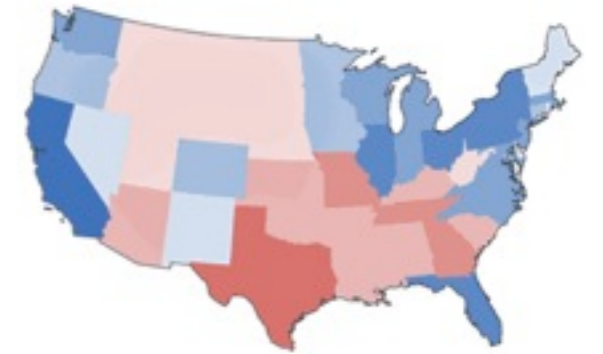
Topology Preservation
none — perfect

HOW? CONSTRUCTION

Variable of interest   Equalizing variable   Value-by-alpha
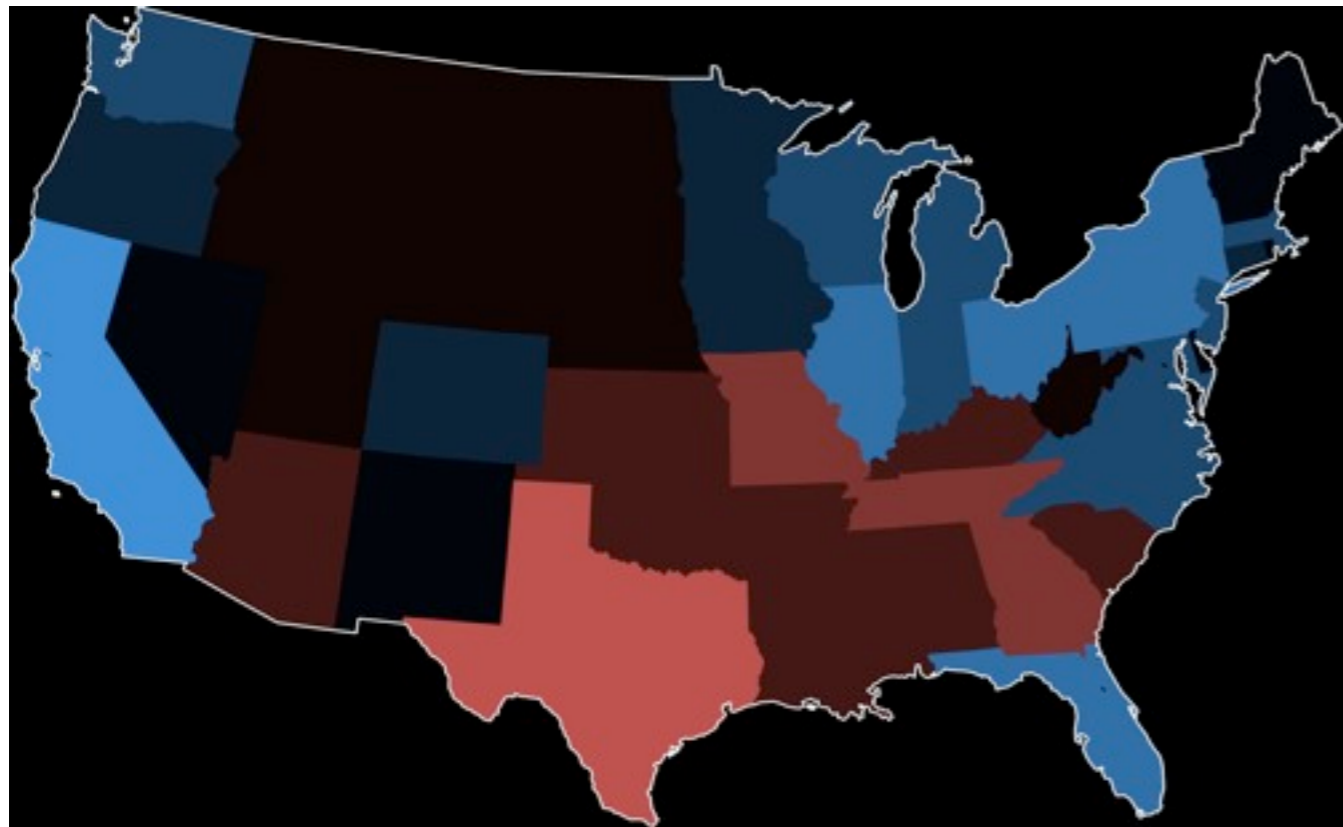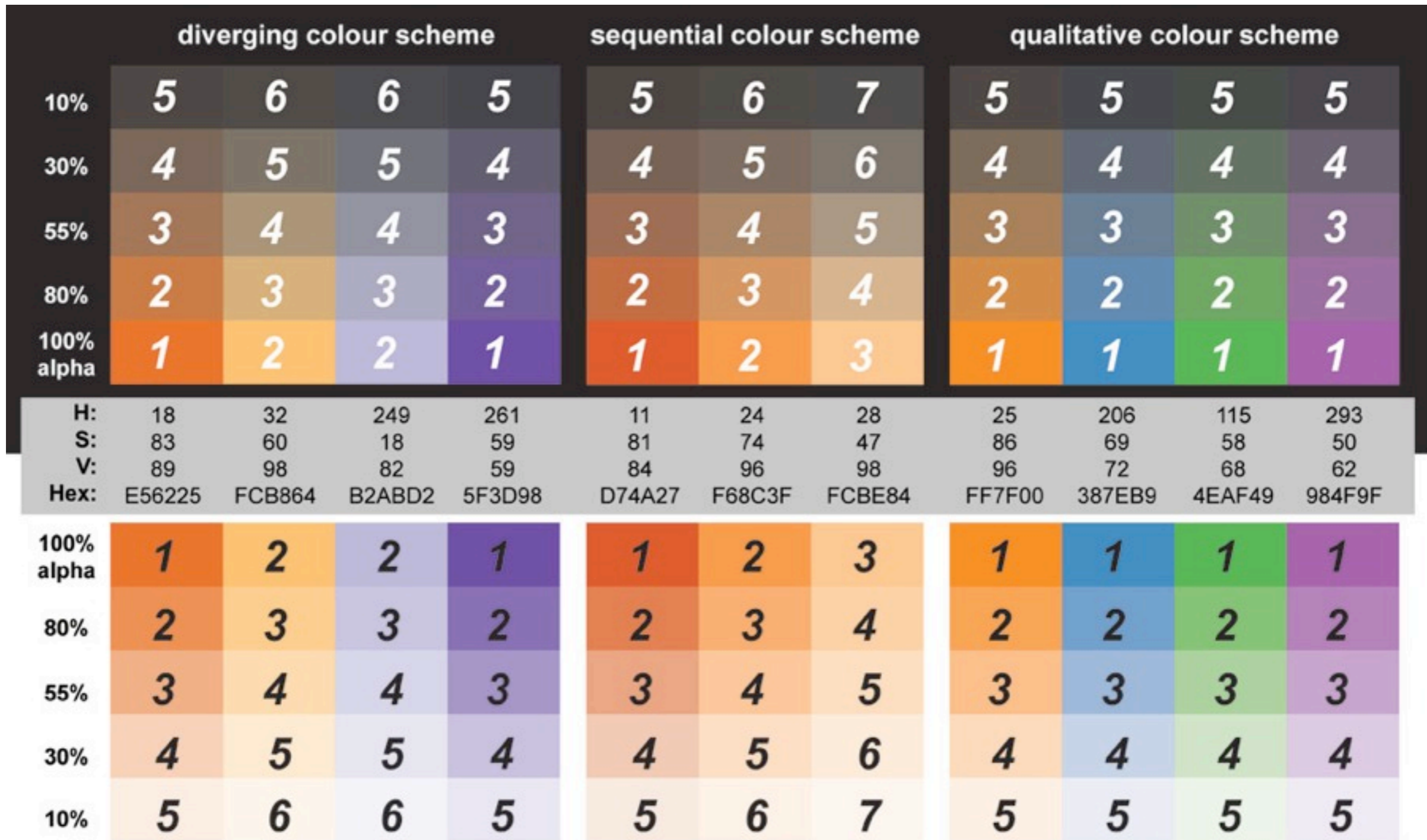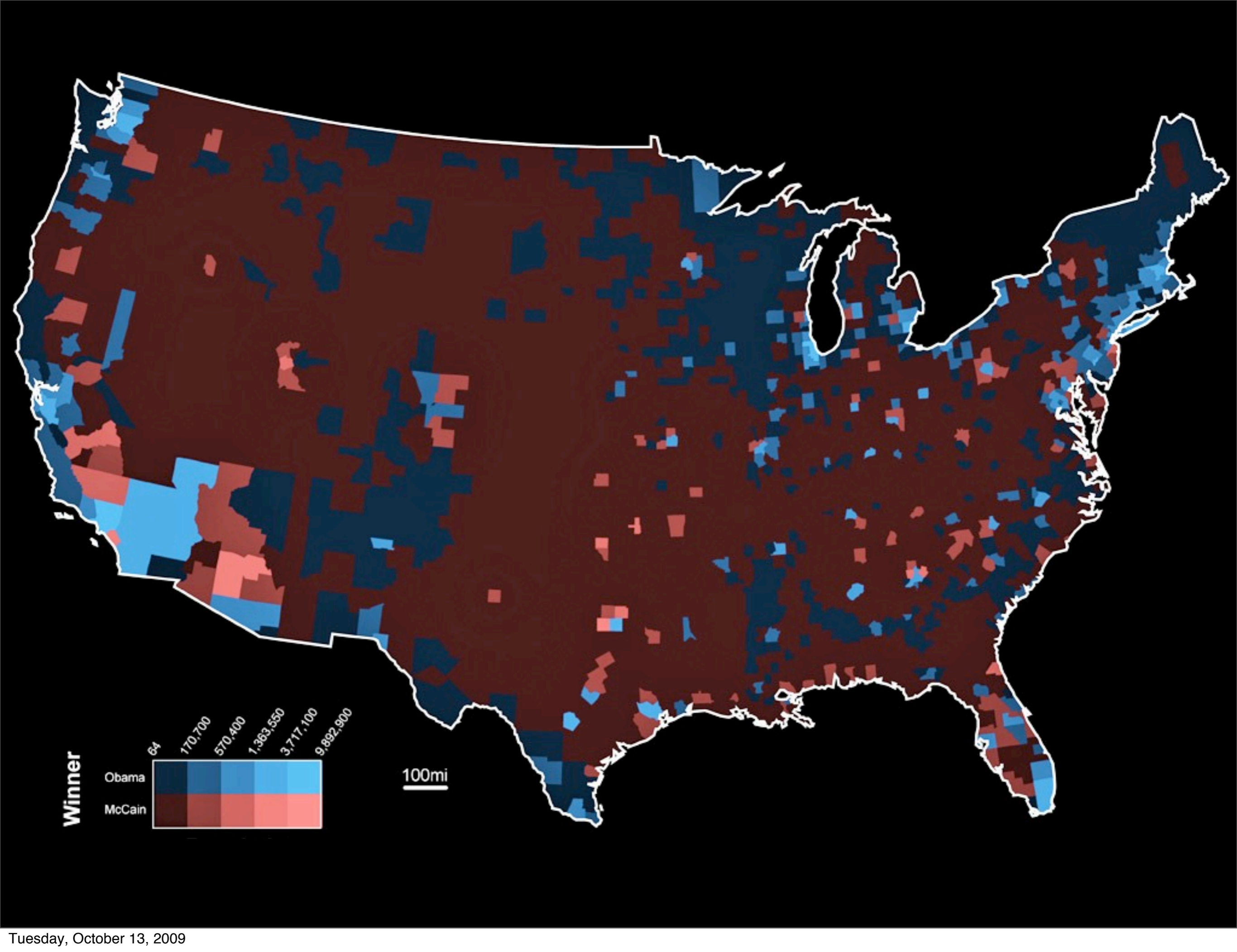
+

=

or

HOW? COLORS

Black or white modifying color

HOW? COLORS

Winner

Obama

McCain

64 170,700 570,400 1,363,550 3,717,100 9,892,900

100mi

Tuesday, October 13, 2009

SMR

>1.50
1.01-1.50
0.51-1.00
<0.50

unreliable ———— reliable

high

low

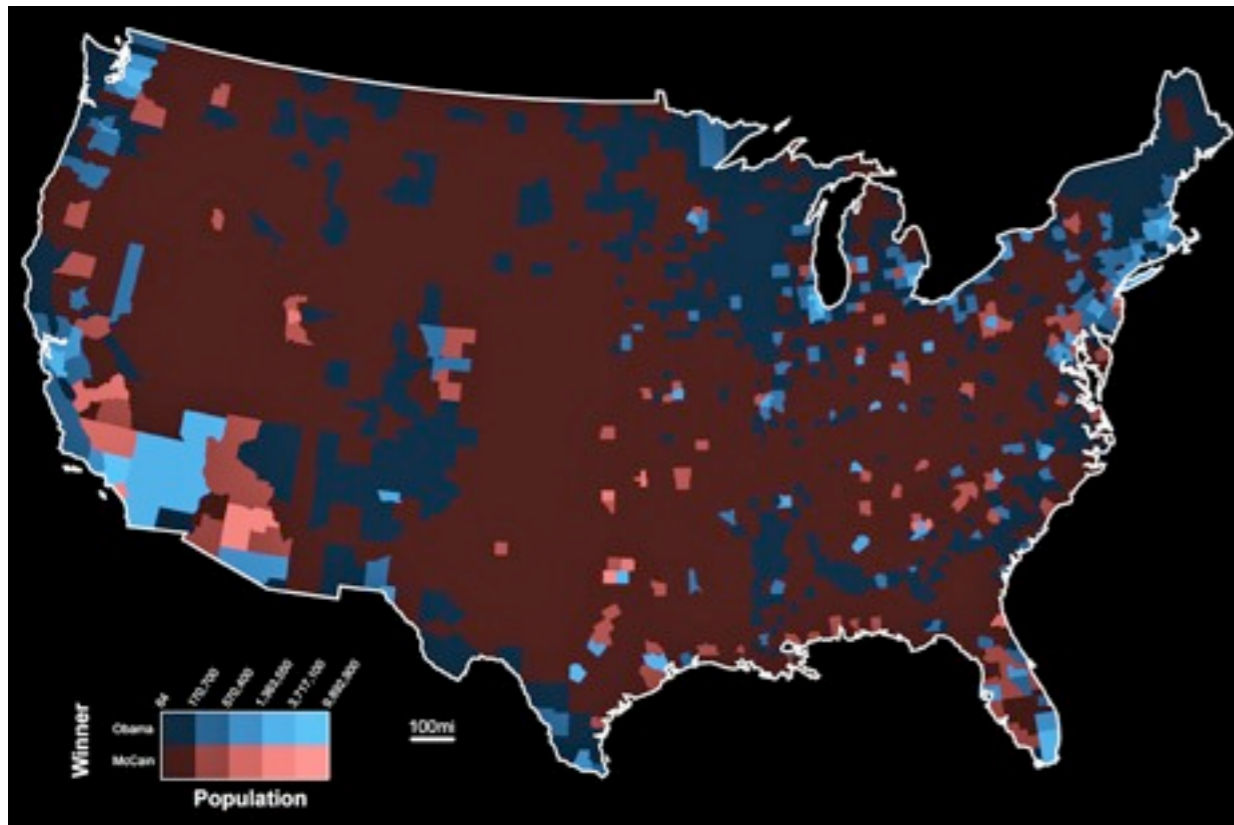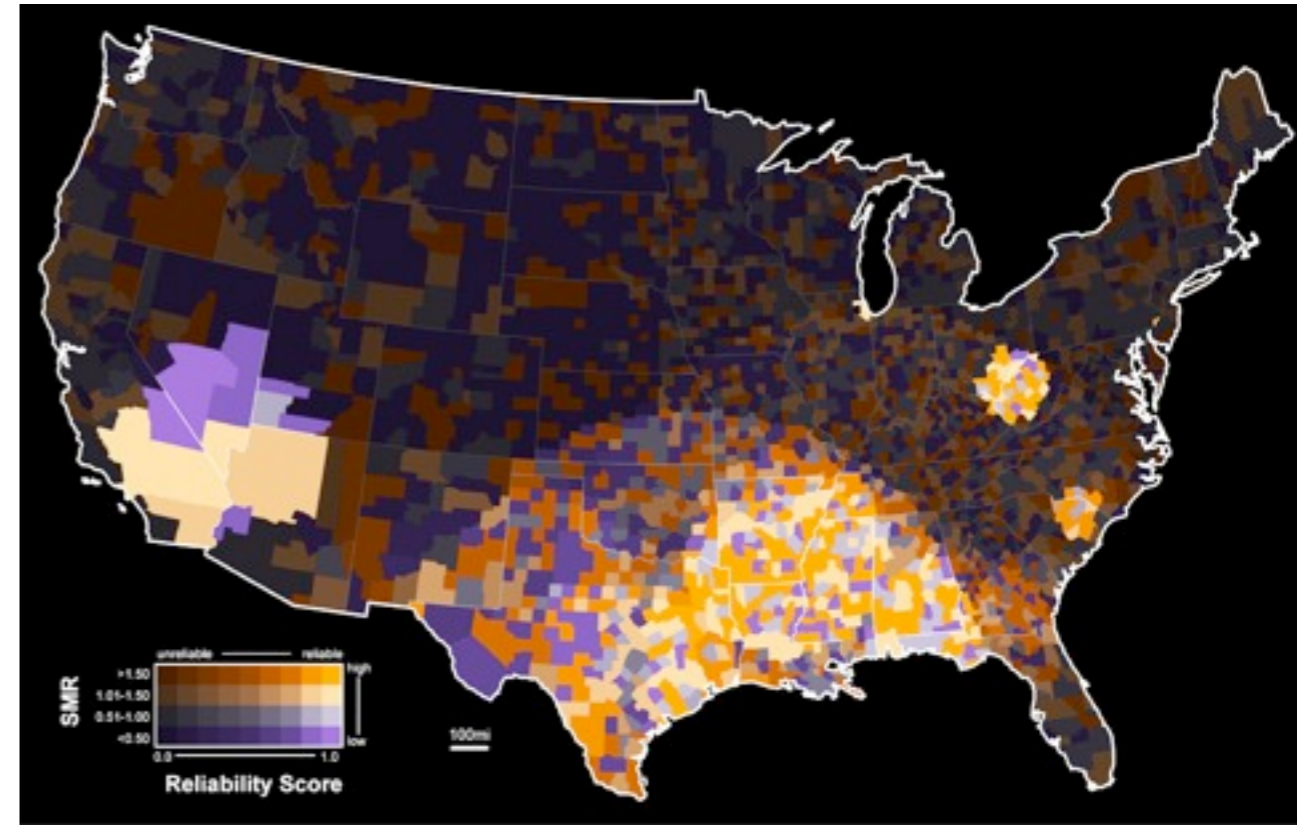0.0 ———— 1.0

Reliability Score

100mi

Tuesday, October 13, 2009
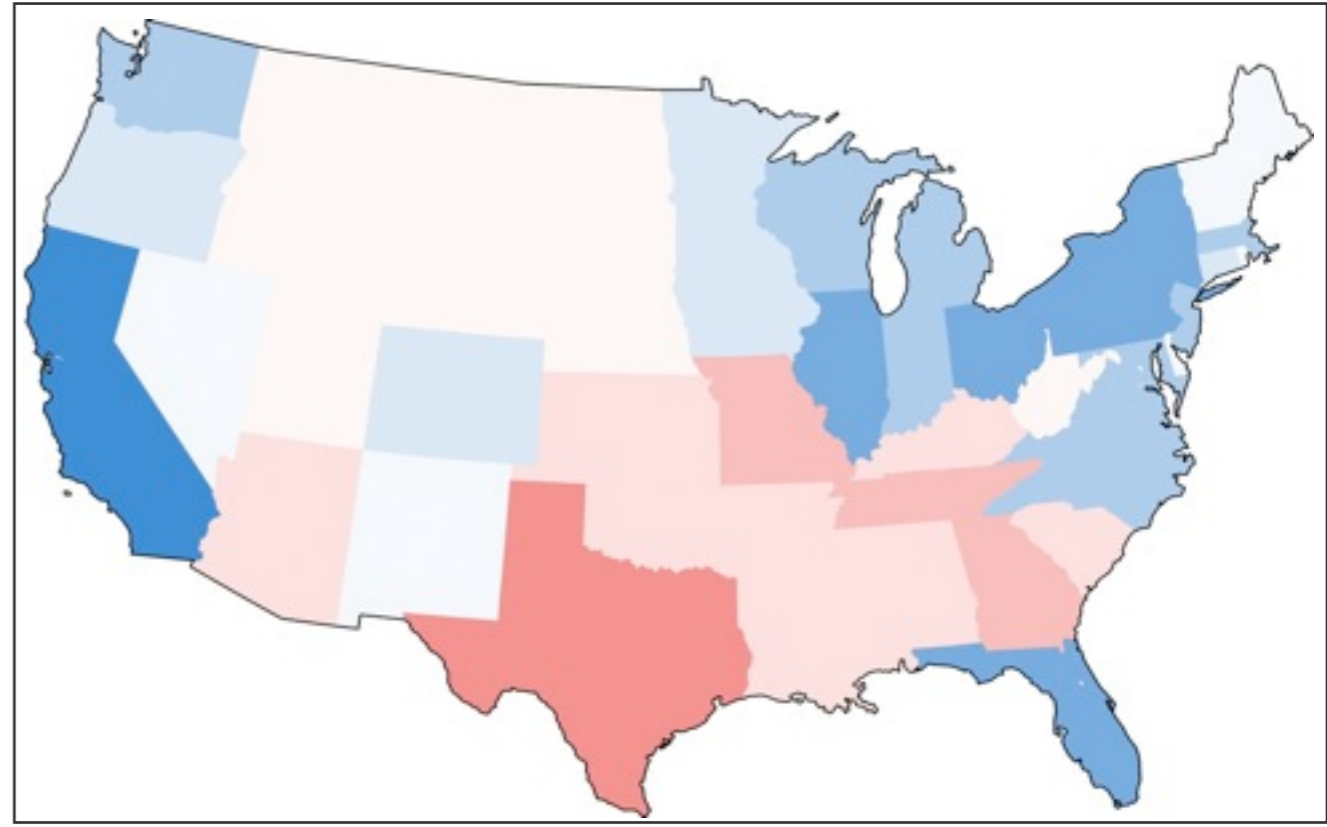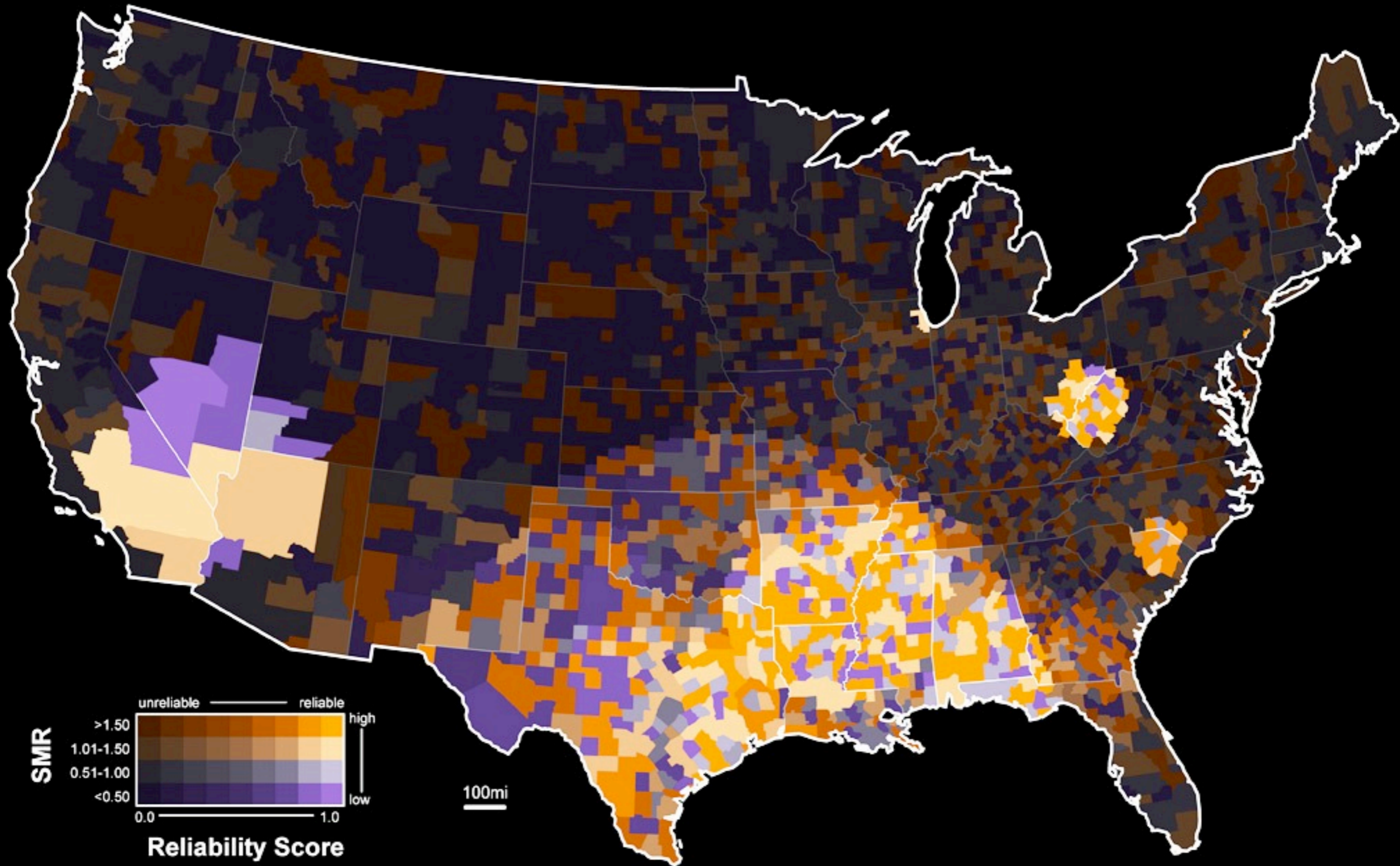
WHEN? CONSEQUENCE

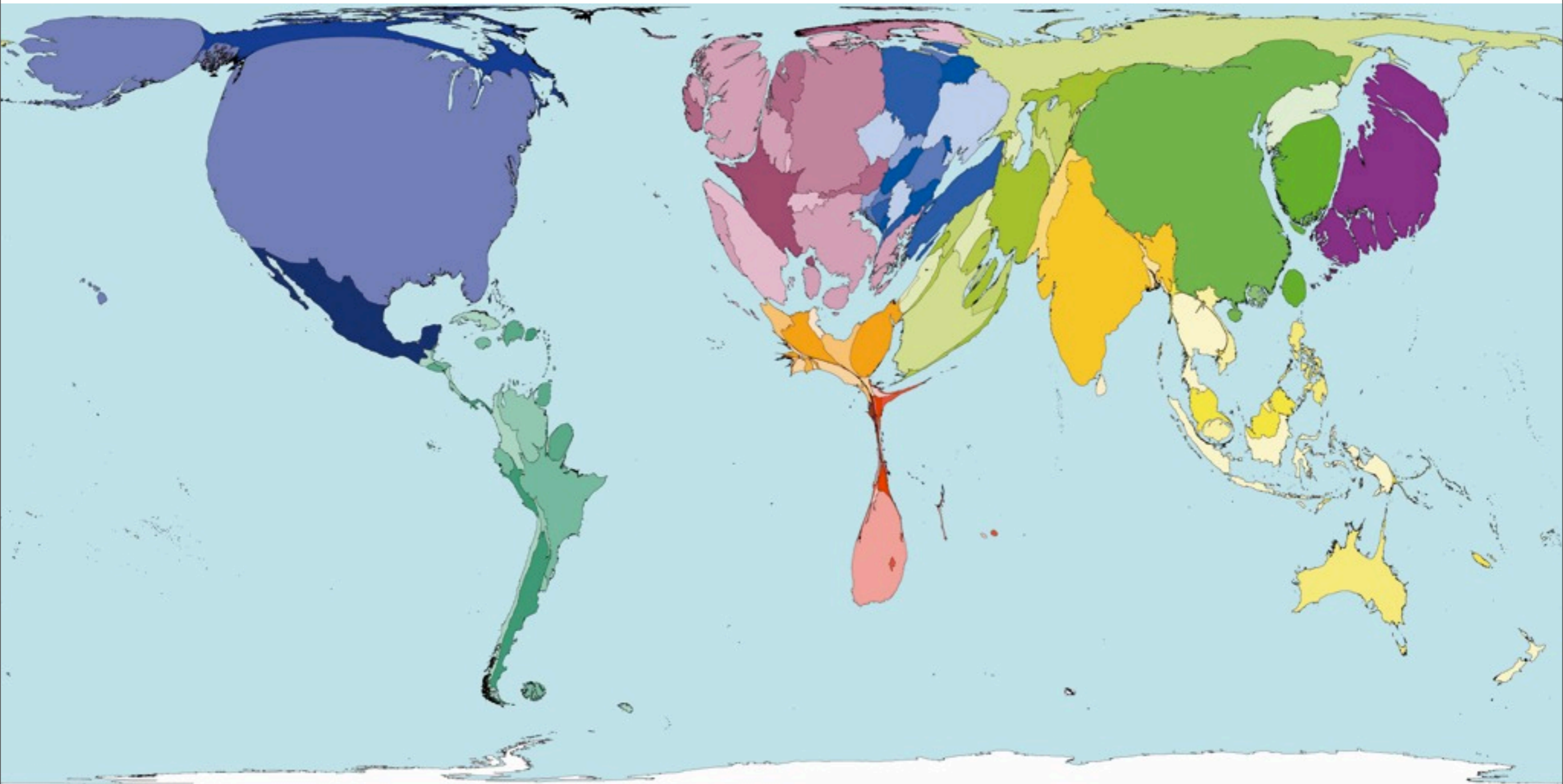Election results in counties with more population are of greater consequence.

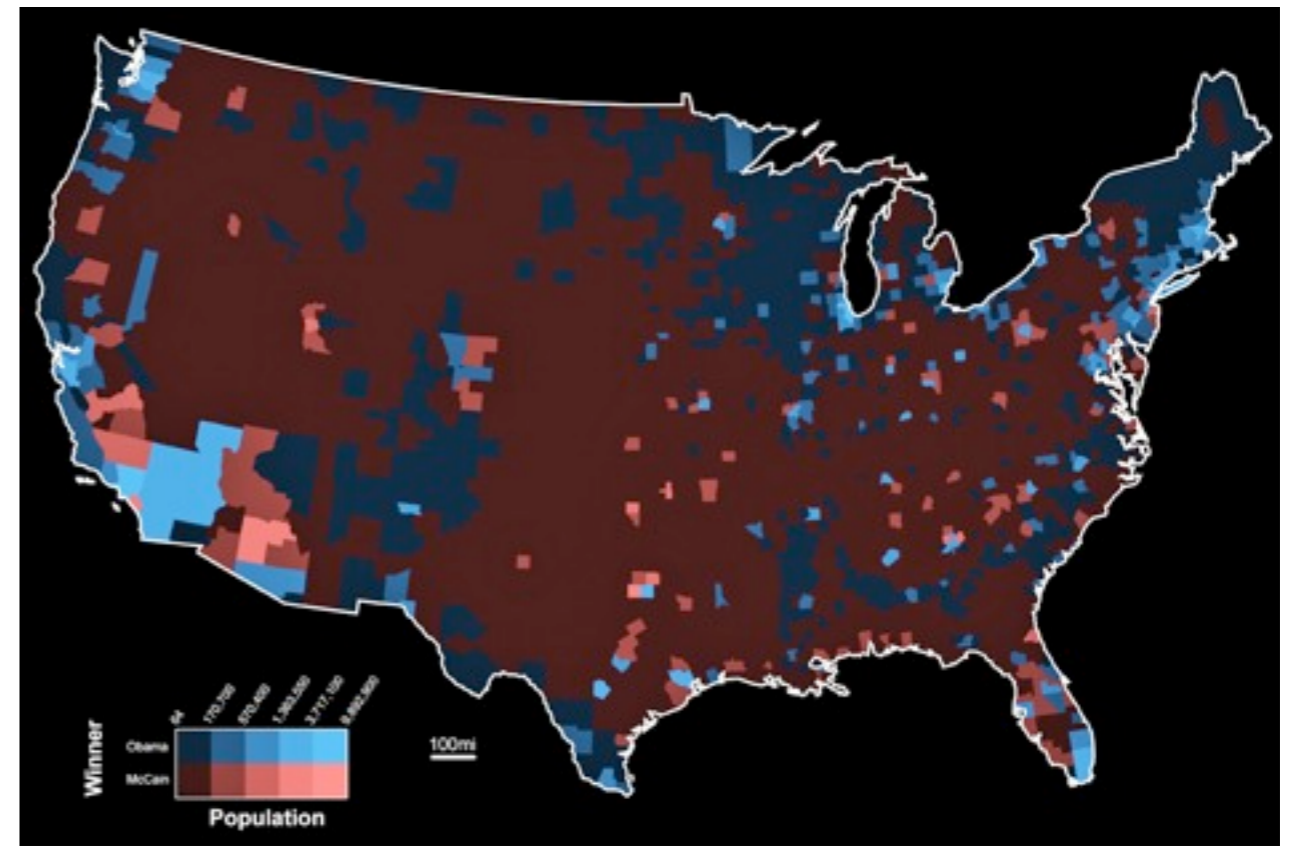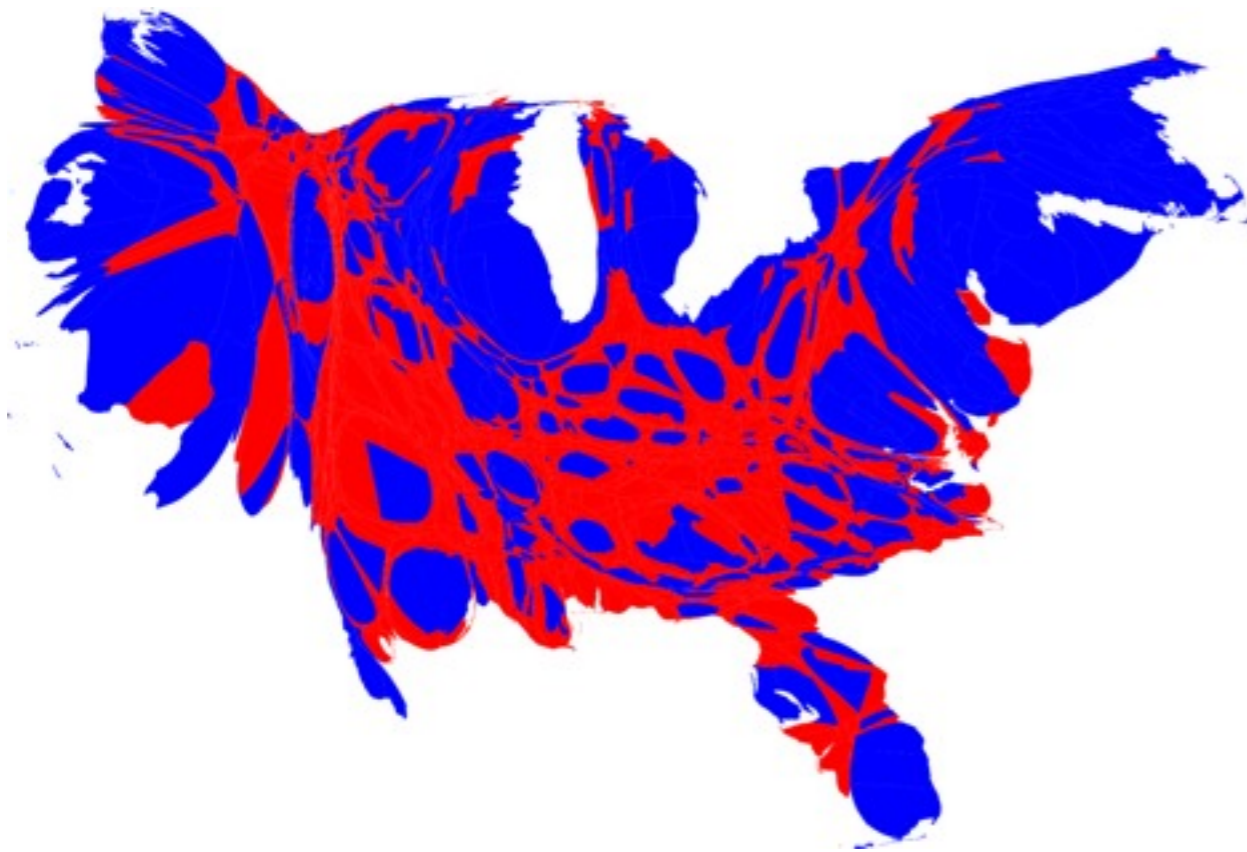SMR in counties with greater reliability is of greater consequence.
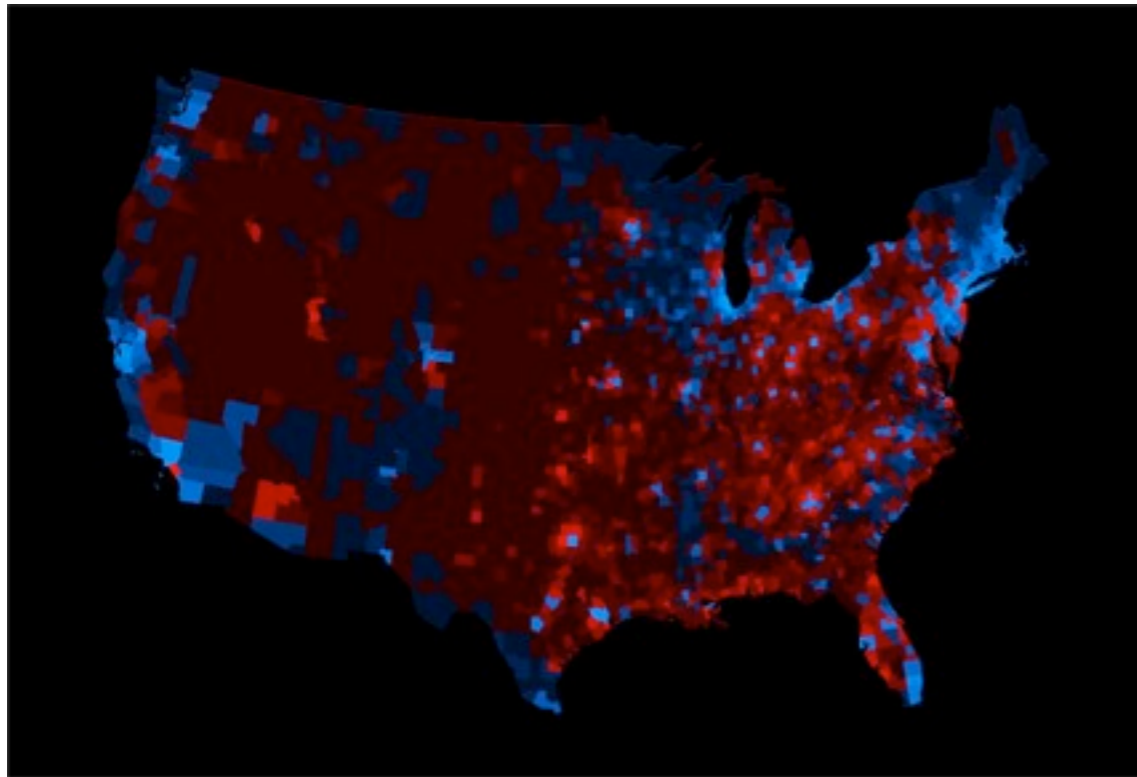
WHEN? zOMG!

2000 Carbon Emissions

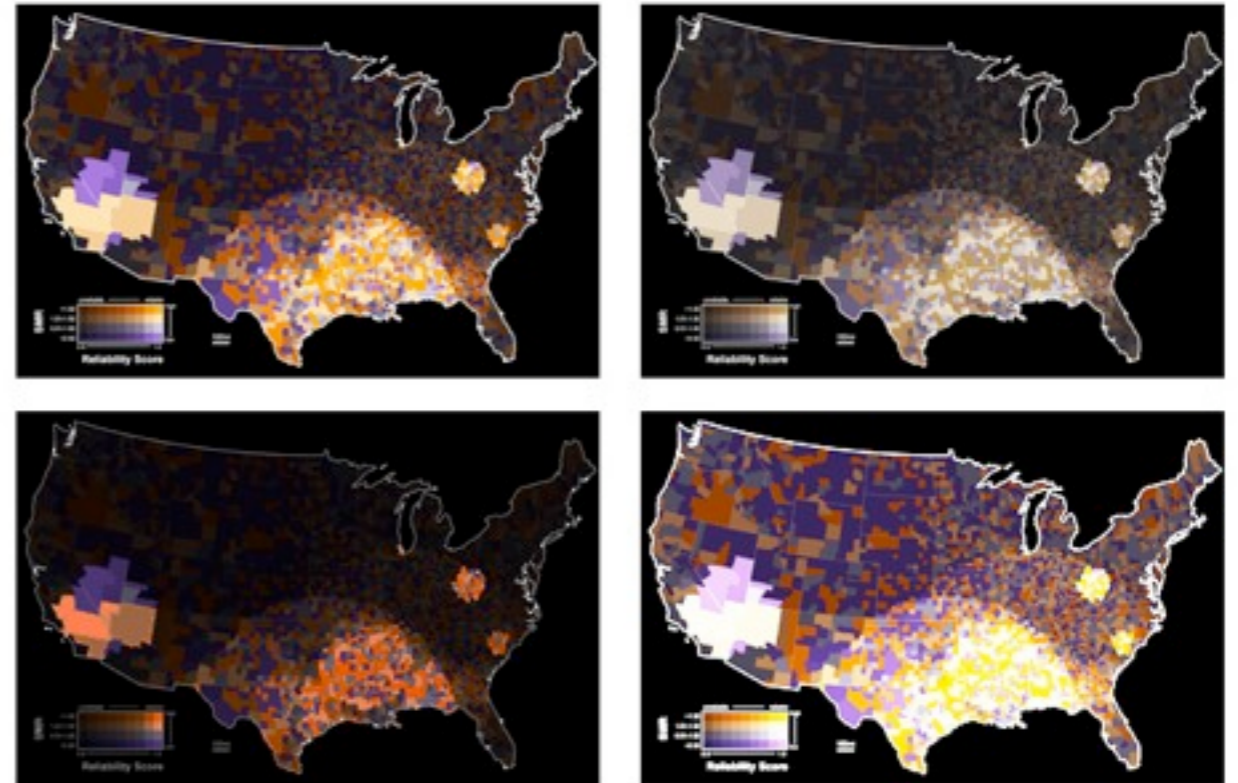Tuesday, October 13, 2009

WHEN? DISPARITIES vs PATTERNS
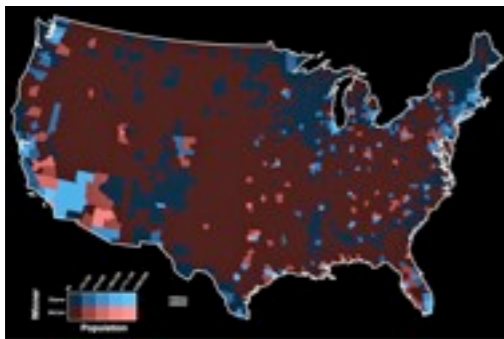
FURTHER QUESTIONS

Standardization

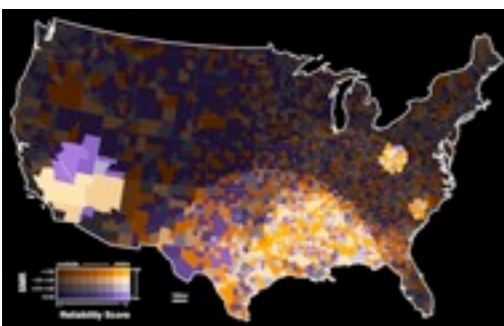Display medium

And do the maps work?

WHO?

Roth, RE, AW Woodruff, and ZF Johnson. (forthcoming) Value-by-alpha Maps: An alternative technique to the cartogram. *The Cartographic Journal.*

Shout-outs:

Mark Harrower, Dave Heyman, and Ben Sheesley for the 2008 Election Map

Jin Chen, Eugene Lengerich, Alan MacEachren, and Adam Naito for the Cervical Cancer Mortality Map