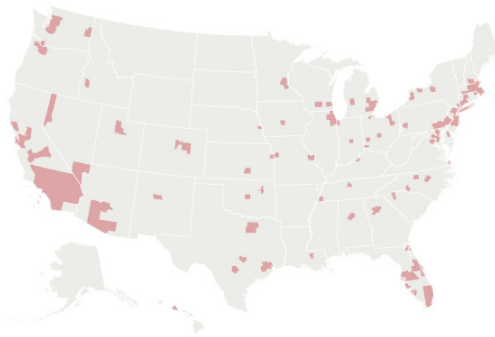


The Fix (<https://www.washingtonpost.com/news/the-fix/>)

Election maps are telling you big lies about small things

In 2012, about the same number of votes were cast in ○ **these 160 counties** as were cast in the ○ **rest of the country**. But, your run-of-the-mill election map won't show you that.



By Lazaro Gamio

Nov. 1, 2016

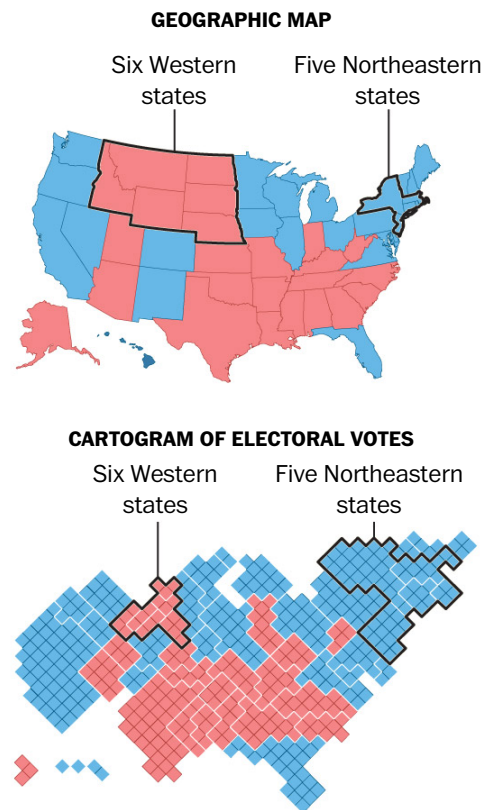
Nov. 8 is the Super Bowl for election maps, when red-and-blue geographical representations of the United States fill the front pages of news websites by night and are stamped into newspapers the next morning.

This kind of map is common in almost every election: 50 states (and the District), two colors, one winner. Despite its ubiquity, it is profoundly flawed.

[Here's everything that is more popular than Hillary Clinton and Donald Trump (<https://www.washingtonpost.com/graphics/politics/2016-election/unpopular/>)]

These maps say only one thing: Some states are bigger than others. In a presidential election, how much bigger the state of Wyoming is than New Jersey isn't relevant to the outcome, which is based on how electoral votes are apportioned.

If you chart the states by electoral votes, a more accurate picture of which states will elect Donald Trump or Hillary Clinton emerges.

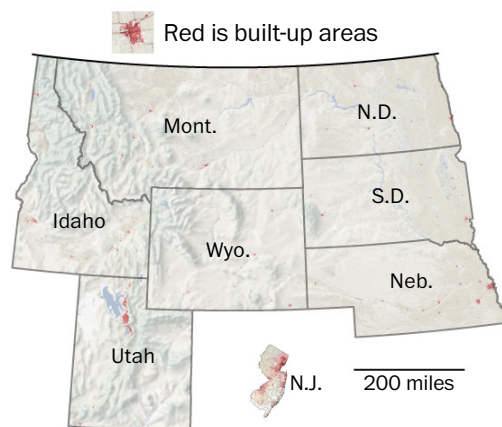


In contrast to a standard geographic map, this cartogram (<http://www.geog.ucsb.edu/~kclarke/G232/ToblerCartograms.pdf>) shrinks the country's expansive Republican center and exaggerates the small, electoral-vote-rich Northeast. The Post designed this cartogram for its 50-state poll (<https://www.washingtonpost.com/graphics/politics/2016-election/50-state-poll/>), and it's not alone (<https://www.wired.com/2016/10/electoral-maps-look-little-different-heres/>) in trying to solve (<http://news.nationalgeographic.com/2016/10/united-states-election-map-history/>) the big-being-small and small-being-big problem.

[Hate our electoral system? Here's who could have been president under other setups (<https://www.washingtonpost.com/graphics/politics/2016-election/election-outcome-other-systems/>)]

But this solution shows just one way of looking at the election. Each diamond in a state represents an electoral college vote in a system in which states with smaller populations are overrepresented (<http://themonkeycage.org/2012/07/compared-to-national-popular-vote-the-electoral-college-favors-voters-in-small-states-on-average-not-large-states-its-because-of-those-extra-2-electoral-votes-that-each-state-gets/>).

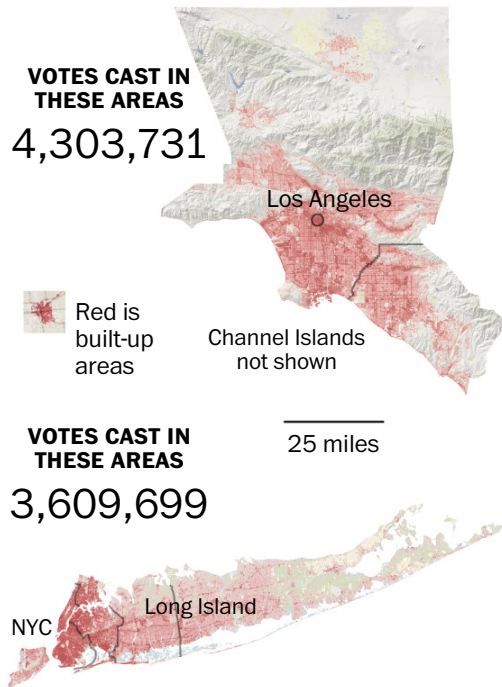
To understand where people voted, one must look at popular vote totals (<http://www.fec.gov/pubrec/fe2012/2012pres.pdf>) for states during the 2012 election. Take New Jersey, where 3,640,292 votes were cast in 2012, a number roughly equivalent to the number of votes cast in:



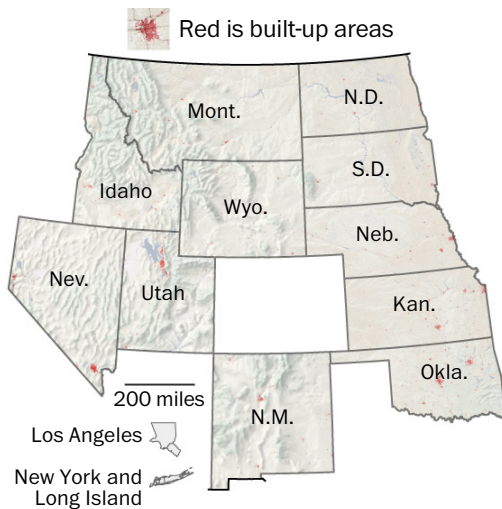
The votes cast in these seven states total just 250,000 more votes than in New Jersey.

At the county level, the divide between area and population is magnified. Six New Jersey counties near New York City accounted for more than a third of all the votes cast in that state.

If you look at the country's two largest cities, the size imbalance from population density balloons.



Nine counties in and around New York City and Los Angeles combine to make up 7.9 million of the 129 million votes cast in 2012, just 260,000 votes short of votes cast in these states:



Urban areas, where 80 percent (<https://ask.census.gov/faq.php>) of Americans live, are grossly misrepresented in a traditional election map. In fact, only 160 of the 3,000 counties nationwide were responsible for half of the votes cast in 2012. (As depicted on the map at the top of this page.)

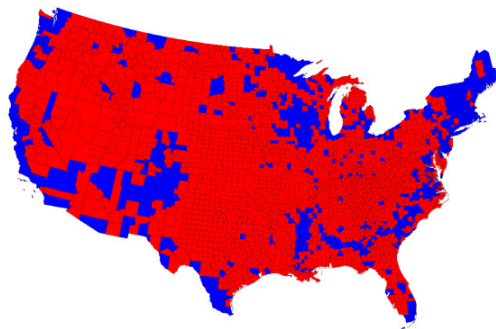
Tackling the problem

Mark Newman (<http://www-personal.umich.edu/~mejn/>), a professor of physics at the University of Michigan, has found a novel solution to this problem.

He's published (<http://www-personal.umich.edu/~mejn/election/2008/>) cartograms (<http://www-personal.umich.edu/~mejn/election/2012/>) of election results since 2004 (<http://www-personal.umich.edu/~mejn/election/2004/>), using software (<http://www-personal.umich.edu/~mejn/cart/>) he wrote based on a method he co-invented (<http://www.pnas.org/content/101/20/7499.abstract>). His maps distort state and county geography by population, so small states and urban counties that were outweighed by a sea of red now bulge and hold their own against the more sparsely populated parts of the country. (He's also made maps for the 2016 election (<http://www-personal.umich.edu/~mejn/election/2016/>))

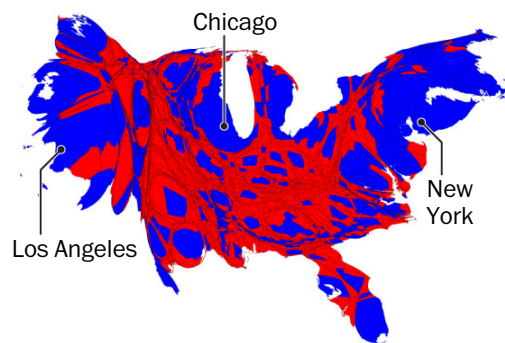
GEOGRAPHIC MAP

Winner of county popular vote



CONTIGUOUS CARTOGRAM

Sized by county-level election returns



Maps courtesy of Mark Newman

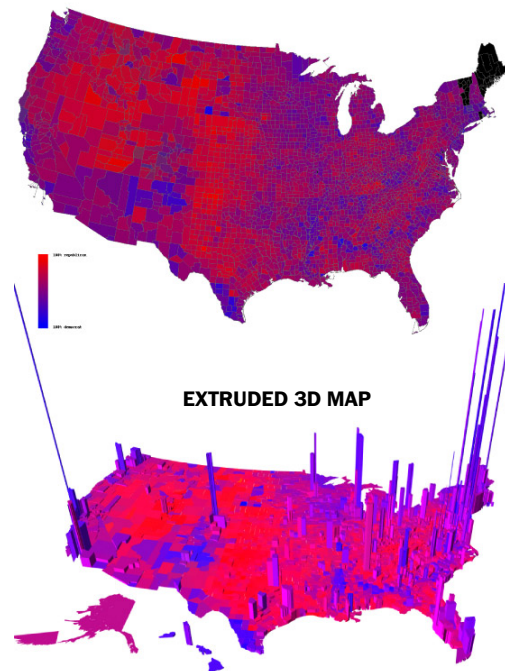
“Once people saw the map rescaled, they realized that it was a better representation of the outcome of the election,” Newman said. He’s made cartograms of this sort with other data sets, but the first set of election cartograms he published in 2004 were viewed more than a million times. “They caught people's imaginations the most,” he said.

Robert J. Vanderbei (<http://www.princeton.edu/~rvdb/>), a professor at Princeton, has also tried different methods (<http://www.princeton.edu/~rvdb/JAVA/election2012/>) to show results. When he saw a county results map (<http://www.esri.com/news/arcnews/spring01articles/usatoday.html>) in USA Today the morning after the 2000 election, he noticed the county he lived in was shaded red. Puzzled, he looked up the original data and found that his county broke 51-49 toward Bush.

[Latest results from the Post-ABC presidential tracking poll (<https://www.washingtonpost.com/graphics/politics/2016-election/who-is-winning-the-presidential-election-so-far/>)]

‘Why not make it purple?’ he said. A week after the election, he published a map (<http://www.princeton.edu/~rvdb/JAVA/election2000/>) called “Purple America,” which shows each county in a continuous scale from blue to red. He’s also taken his maps into the third dimension, extruding the counties by margin of victory.

'PURPLE AMERICA' FROM 2000 ELECTION



Maps courtesy of Robert J. Vanderbei

Approaches like these provide a greater level of nuance that is lost in more binary approaches.

[Most of Trump's charts skew the data. And not always in his favor. (<https://www.washingtonpost.com/graphics/politics/2016-election/trump-charts/>)]

For example, nearly 900,000 people in Los Angeles County voted for Mitt Romney. That enormous number of votes amounts to just under 28 percent of vote there, and it's a detail that's glossed over when that county and the rest of the state are painted blue.

So, why don't we see more maps that accurately portray this nuance in popular media?

Things take time

Our national tradition of election maps has a rich history, dating at least to the late 1800s.

“We think we’ve invented the election map, but it’s been done before,” said Susan Schulten, chair of the history department at the University of Denver. She discovered what may be the earliest example (<http://www.mappingthenation.com/blog/the-nations-first-electoral-map/>) of a county-level map showing election results, published in 1883.

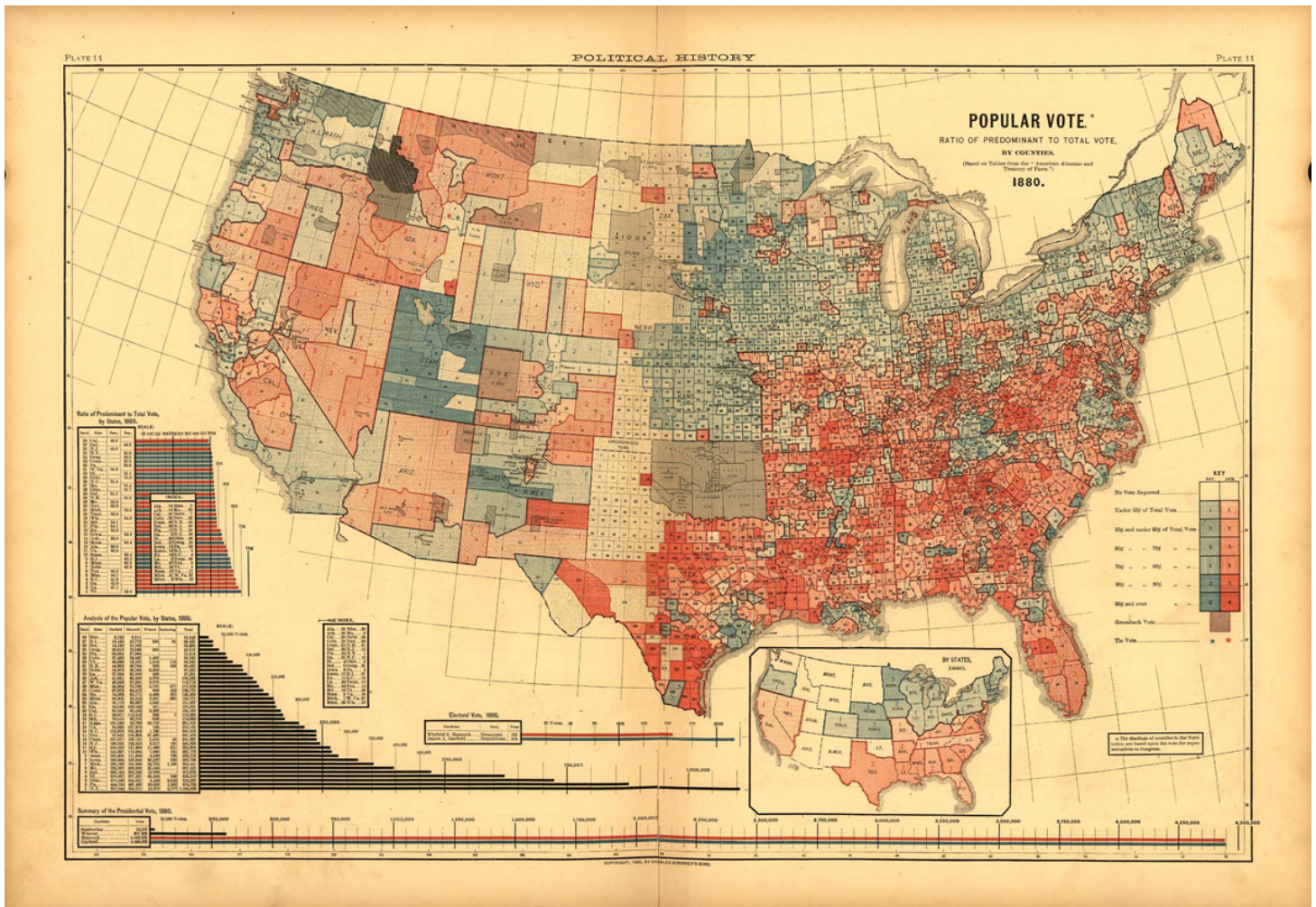


Plate 11 from Scribner's statistical atlas of the United States, published in 1883.

This example comes from a statistical atlas (<https://www.loc.gov/item/a40001834/>) and shows the result of the 1880 election using the familiar red and blue color scheme with different shades for margin of victory. One thing you will notice: The colors are flipped. Republicans are in blue and Democrats are in red.

The color convention (<https://www.washingtonpost.com/news/the-fix/wp/2015/04/10/red-vs-blue-a-brief-history-of-how-we-use-political-colors/>) we know today began to be worked out in the unlikeliest of places:

television (<http://www.smithsonianmag.com/history/when-republicans-were-blue-and-democrats-were-red-104176297/>). The increasing prevalence of color television gave us the first iterations of the maps that are so common today. In fact, it wasn't until 2000 (<http://washingtonmonthly.com/2004/11/14/red-states-and-blue-states-explained/>) that commonly used colors were red for Republican and blue for Democrat.

[The 2016 election, in graphics

(<https://www.washingtonpost.com/graphics/politics/2016-election/2016-election-graphics/>)]

Though cartograms are a more accurate way to show election results, it's difficult to escape the need to preserve geography. "Part of the goal is to keep a map that is recognizable," Newman said, "but map the area to the value you're interested in."

While cartograms have been around since at least 1870 and have enjoyed a recent burst in popularity (<http://news.nationalgeographic.com/2016/10/improved-election-map-cartograms/>), maps in general date back thousands of years (<https://www.math.rutgers.edu/~cherlin/History/Papers2000/sullivan.html>). And like most deep-rooted traditions, they tend to change very slowly. Consider this: The map projection (<http://mathworld.wolfram.com/MercatorProjection.html>) used for maps on most phones (<https://www.wired.com/2013/07/projection-mercator/>) is based on a map created for navigation (<http://www.math.ubc.ca/~israel/m103/mercator/mercator.html>) in 1569 (<https://www.britannica.com/science/Mercator-projection>).

Changing that won't be easy, but it has to start somewhere.

Additional mapping work by Laris Karklis.

Correction: A previous version of this article mislabeled the Channel Islands in Los Angeles County.