

The US election

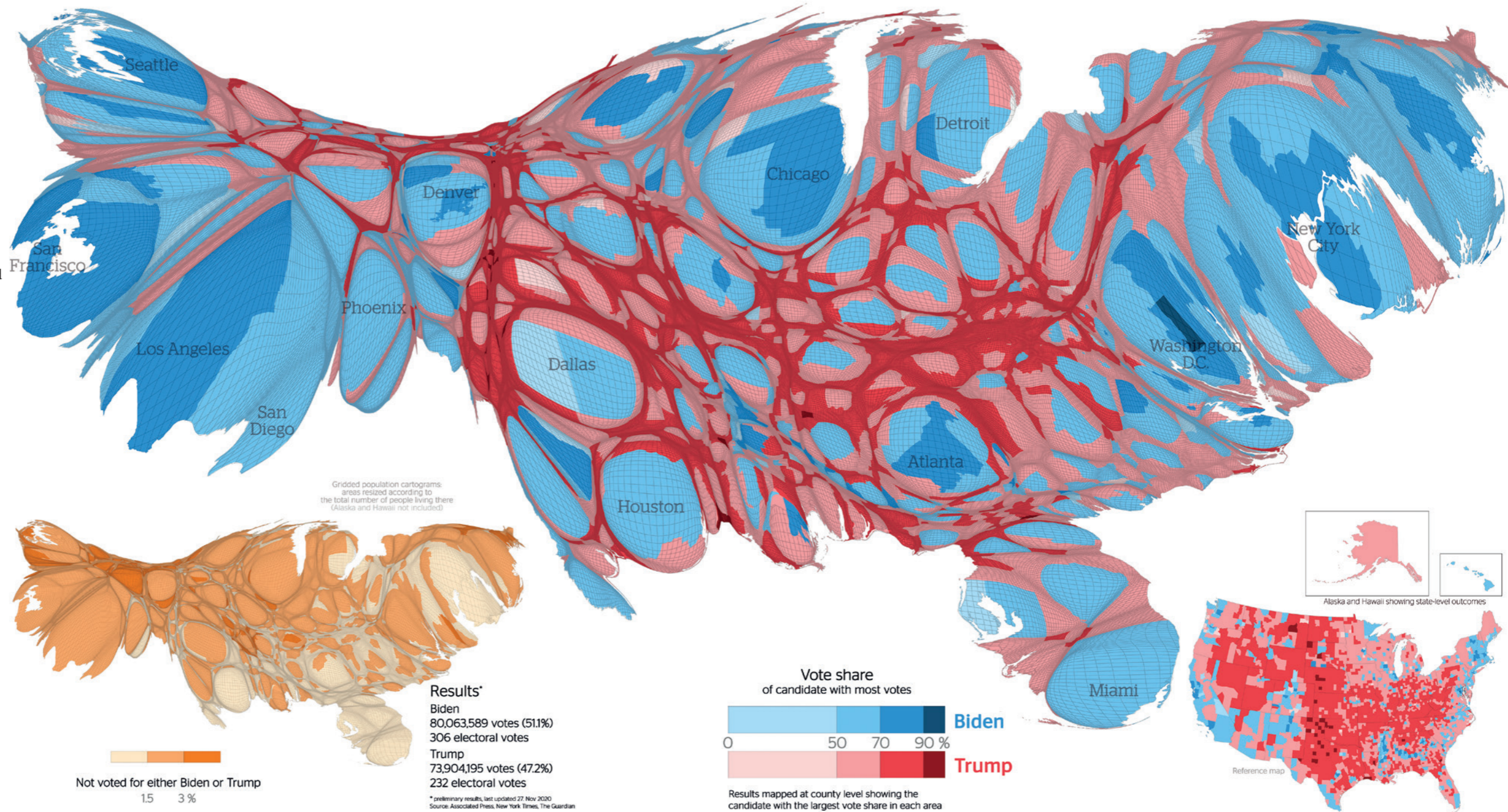
Normal maps don't cut it when it comes to the US election
By Benjamin Hennig

Unlike the 2016 presidential election, in which Donald Trump won despite not winning the popular vote, the 2020 election in November produced a decisive winner. Joe Biden did not only secure a convincing majority in the Electoral College, but also a comfortable margin in the people's vote. The overall winning margin of Joe Biden in the popular vote was much larger than that of Hillary Clinton when she stood against Donald Trump in 2016. Yet, this victory remains largely hidden when viewed through the lens of a conventional land area map.

Conventional mapping techniques display data from a geographical perspective. For election outcomes this means that they show vote shares plotted onto the distribution of land area. This usually leads to sparsely populated rural areas being over-represented. In contrast, dense urban areas, which often have very different demographics are hidden from these maps, therefore providing misleading representations of an election outcome. On a conventional map, Trump's defeat is relativised due to his success in some of the states that have a relatively large land mass but relatively low populations and low Electoral College votes.

Cartograms provide a solution to this problem by adjusting the underlying basemap according to indicators other than land area. Population-weighted cartograms are the most common, in which areas are resized according to the number of people who live there. In a population cartogram, vote shares can be shown in relation to those who actually matter most in an election: the people.

This cartogram shows such an equal-population projection and displays the varying vote shares of the respective winning candidate in each county of the contiguous United States. It uses



a gridded cartogram transformation where each grid square is proportional to the number of people who live there. The most densely populated regions stand out in this map.

Comparing the electoral outcome on a normal map and an equal-population projection shows how Biden's vote dominates the geographic distribution

of votes in the most densely populated areas (those that stand out in the cartogram). A large majority of urban centres, including some in the Midwest, show a majority of votes for Biden. Yet, his vote share in many places is lower (50 to 70 per cent) than Trump's support in his respective strongholds (70 to 90 per cent). Trump's vote share was highest

in rural areas and – though weaker compared to 2016 – some suburban belts around the cities.

It is also noteworthy that those who voted for neither of the two candidates tended to be larger in number towards the central, western and particularly north-western parts of the country. Compared to the previous presidential

election this share of the vote has gone down, while the overall turnout was at levels not seen in over a century.

Biden's win may look decisive, but it is also a divisive one. The political divide remains prevalent within the population and, as shown in these maps, is geographically complex. Once the dust has settled, the wider implications

of a hugely divided country will be the largest challenge for the next presidency and most likely for many more to follow. The outgoing president may have changed US politics in the past four years, but this was only made possible through the divisions that have been building up in American society for a much longer time than that. ●