GIS and Voting Demographics Overview

Voting is both a right and a responsibility, and the way citizens practice democracy can say a lot about how they value their own communities and society. Utilizing modern technology may provide a pathway to understanding trends in voting and how to increase voter turnout. Historically, surveying people after they left the polls was the best way to evaluate voter behavior. This would later lead to phone and internet surveys to build upon demographics and informational relationships. Social and political scientists have attempted to use this knowledge to better classify people of different groups and evaluate their interests, values, and voting behavior. Political Action Committees, political campaigners, and private interest groups have scoured this data for years hoping to find ways to appeal to and motivate voting behavior in favor of specific candidates or issues. The introduction of GIS (Geographic Information System) to the field of voting and politics has the potential to revolutionize the future of how campaigns function, while at the same time providing important tools to social and political scientists in classifying and mapping voter demographics, behaviors, and trends.

GIS is such an innovation to the field of voting demographics due to its ability to combine such large amounts of data, finding correlations among many different fields and points of interest. The aggregate information can be viewed and filtered in countless ways, providing very specialized representations of patterns, relationships, and areas. This is very useful for people tasked with sorting through large data loads hoping to find parallels as it provides access to all the layers of information at the same time. Researchers using only a couple sources of data, say census data from the state and a digital map found online, can combine their resources into a very useful digital aid. GIS allows the manipulation and representation of the information in many ways, filtering data values into groups, assigning graphical differences to regions based on demographic information, and examining district lines and other geographic features for ways of relating them to the human behavior contained within. In the studies reviewed, the most used tools were Google Earth/Maps, ARC software, census data, polling records and local election committee voter information.

The tools GIS provides can be used for improving voter turnout by looking at potential obstacles faced by citizens in specific regions, outlining ways to focus on mitigation. If examining an area of low voter turnout the case may be that it is simply too difficult to get to the polling station because of a lack of reliable public transportation. In such a case, campaigners can look into providing shuttles to get people to and from the polls, or setting up more polling stations, all while GIS mapping allows the best selection of collection points and effective routes. If information suggests people of a certain income level are deciding not to vote or just don’t care about politics, GIS can provide tools to target them in raising awareness of local issues or candidates that might more closely affect their lives by providing avenues for meetings, speakers, or directly canvassing. Along with income, information regarding race/ethnicity, age, and education level can be used to better target potential voters. GIS mapping can provide detailed demographic maps based on specific regions to narrow the focus for researchers and campaigners to convey their message or plan.
Local planning committees are also able to use GIS maps and technology to choose congressional district boarders, as well as creating whole new districts as populations fluctuate and grow. This has the potential to both increase and decrease proportionate representation of voters based on the potential for abuse. Gerrymandering occurs when redistricting activities aim to politically homogenize an area, drawing lines to separate different demographics to favor a specific party or candidate. While not illegal in practice, such actions may be ethically questionable as the results can further marginalize voters, both physically and figuratively. The specific data GIS maps and systems provide have many applications when it comes to understanding and drawing congressional district maps. It’s all up to the user if they want to increase or decrease democratic representation and voter participation.

In a number of voting demographic studies looked at, GIS proved to be a vital component to the research conducted. In many of them, the first step was to acquire a GIS map of an area, and slowly compile data through it, later extrapolating the necessary and relevant information. The studies proved that social and political sciences gain just as much value through the utilization of GIS as the other sciences like geography, geology, hydrology etc. This will almost certainly be a trend across other disciplines as the potential of GIS is better understood. One of the reasons for this is in how GIS maps are able to convey large amounts of information in a way that is visually accessible to a large amount of people. Many people suggest that the world is shrinking as our travel and communication technologies expand and improve, GIS is most likely yet another technology that will lend itself to that sentiment as we advance into the future.

GIS and Voting Demographics Annotated Bibliography


Mr. Bowen looked at studies regarding voter representation and redistricting utilizing GIS and a term called “coterminosity” to address political subdivisions. He found examples of both increases and decreases in political representation from the changing of district lines. He looked at classical views on county and town districts being the model for congressional districts, while also examining views related to how it might reduce representation, and hence, need updating. His goal was to create empirical data that related to the performance district mapping. His results showed redistricting can enhance voter representation and participation best when utilizing the compaction of districts and coterminosity.


The two researchers sought to model the socio-political landscape in Australia by creating a GIS based e-laboratory. Their goals were to investigate spatial local voting patterns
during federal elections and model the relationships between that data and census data. They found correlations between demographics and socio-economic factors to opinions on political parties. In examining the results of three federal elections, they found fluxes in socio-economic traits coinciding with voting trends. They were able to chart the political swing that took place in the most recent of the examined elections by comparing acquired data about all three.

Sperry, S. L. 2005. Are Republicans Sprawlers and Democrats New Urbanists?–Understanding the Spatial Analysis of the 2004 Presidential Vote. Clemson University, Department of Planning and Landscape Architecture.

Professor Sperry sought to address a modern concept related to how where people live effects their voting patterns. Utilizing ARCGIS, 2004 presidential election voting results, and 2000 census data, he was able to examine voting patterns related to cities, suburbs, rural towns, but most importantly, urban sprawl. He discovered strong connections between the population density of where voters lived and how they voted. While he did not discover the results he was seeking to specifically address correlations between urban sprawl and voting preferences, he was satisfied with the information he garnered about population density.


The authors evaluated the results of the 2008 and 2010 elections in Wisconsin, focusing on the gains and losses in state legislature and gubernatorial races. Utilizing GIS technology and cartographic maps, they were able to draw distinctions based on spatial analysis that showed relationships between the locations of voters and their political swings in voting. They compared the democratic gains in 2008 to their losses in 2010, represented through GIS mapping. A key to their success in the study was in their access to specific voting district results. They found the information it provided shed light on local contextual trends in the overall voting analysis.


The authors in this study sought to approach the idea of voter participation as being related directly to a system based on incentives and costs. They looked at the travel time related to actually going to vote as an opportunity cost, and measured that against the sample’s income (wages). Using the formula: C(costs)<P(probability)B(Benefit)+D(Consumption Benefit), combined with GIS tools, they validated information from the New Zealand national election survey data. They found fluctuations in the opportunity cost of participants greatly affected their decision to participate in voting. In the end it appeared the income of an individual better predicted their voting patterns than the distance they had to travel to cast a ballot.


Mr. Forrest looked at the effects on political representation by the demographic complexity of the United States, legal developments based on increased voter rights, and the introduction of GIS and new technologies. He found that changing demographics represented new voting blocks that were not always represented by their districts. Protections to voters and their rights also had an impact on racial representation in our political system as minorities who
vote constitute the majority within some subdivisions. He found that the use of GIS allowed campaigns and redistricting committees a level of precision not seen before, arguing both for and against its application. He sees the new technology as being a double edged sword, granting new information about voters and their districts could as easily be used to enhance democratic participation as it could to disenfranchise voters.