

# Political Science and GIS: How Geographic Information Systems can help you rule the world!

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## How is GIS relevant to political science?

Political scientists can use Geographic Information Systems (GIS) in many different ways. Since its inception in the early 1960's federal agencies have been utilizing GIS on a daily basis in order to improve efficiency of their operations (see list below). As technology has advanced and become more readily available, state and local governments have also implemented GIS in areas such as city planning, utilities, and law enforcement. Internationally, GIS has been used to help mediate conflicts; the Dayton Accords made use of GIS to help create new political borders in Bosnia and Herzegovina.

A key use of GIS is in redistricting. Illustrating population distribution in a spatial format can simplify redistricting. Minority groups advocate the use of GIS to ensure that the minority vote is maximized through the redistricting process.

In campaigning, GIS is beginning to be used to target potential voters in a more specific manner. Get-out-the-vote efforts can be especially helped by GIS; by looking at the characteristics and population of a neighborhood, much can be inferred about the people who live there. In research, GIS is also widely used. Several studies have been conducted on the relationship between voting practices and distance from polling place using GIS.

"County and state governments have a responsibility to hire qualified GIS staff and manage the quality and accuracy of data holdings."

-van Wyngaarden and Yancey

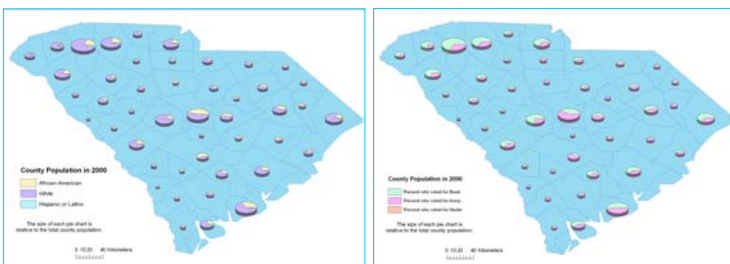


Figure 4. Map of racial distribution by county throughout South Carolina

Figure 5. Percentage of South Carolina population that voted in the 2004 Presidential election.

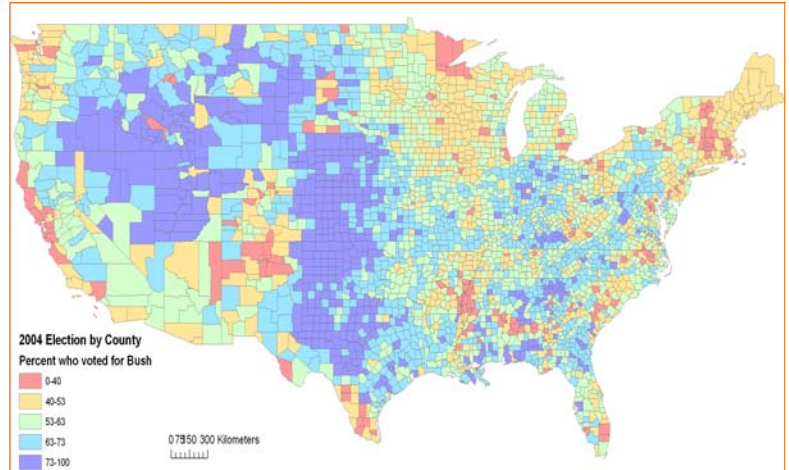


Figure 1. Distribution of United States population by county who voted for Bush in the 2004 Presidential Election

As an example of how GIS can be used to interpret data, we have created several maps using information from the U.S. Census Bureau and *USA Today*. By using data available on the internet and utilizing ArcView software, it took two students less than 2 hours to create the maps seen on this poster. The maps make the election data much easier to visualize and aid in analyzing the data.

•Figure 1 maps the percentage of population who voted for George W. Bush by county across the entire U.S.

•Figures 2 and 3 focus on the swing state of Florida. Figure 2 again shows the distribution of Bush votes by county, and Figure 3 shows the percentage of African-Americans by county.

•Figures 4 and 5 are focused on South Carolina; Figure 4 shows the racial distribution by using pie charts that are sized according to total county population, and Figure 5 shows the vote for each candidate in the same format.

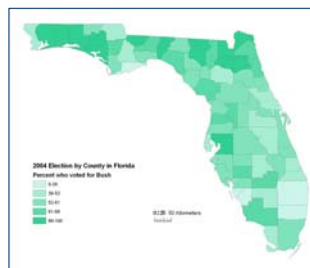


Figure 2. Distribution of Florida population by county who voted for Bush in the 2004 Presidential Election

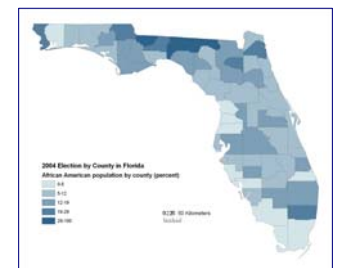


Figure 3. Distribution of African American population in Florida in 2000 by county

## GIS in Federal Agencies

### U.S. Department of Agriculture:

GIS is used to assess worldwide crop conditions by PECAD as well as by the NRCS as a way to disseminate information to landowners.

### U.S. Department of Commerce:

The U.S. Census Bureau maintains census data in formats which are compatible with GIS and provide the data to the public in downloadable form as well as allowing the public to map the data online. The NOAA also uses GIS extensively in its work.

### U.S. Department of Homeland Security:

GIS has been instrumental in mapping the damages from recent natural disasters, as well as targeting terrorist organizations internationally.

### U.S. Department of the Interior:

The Bureau of Reclamation uses GIS to manage water and energy resources.

### U.S. Environmental Protection Agency:

GIS technology is used throughout the EPA in order to provide all employees with the data they need. The Waste Management Facility Siting Tool and the EnvironMapper are two of the EPA's most visible uses of GIS.

- Further Reading:
- Crampton, Jeremy W. "GIS and Geographic Governance." *Cartographica*, Spring 2004, Vol. 39 Issue 1, p. 41 (13p). (Academic Search Premier, politic), GIS
- Dyck, Joshua J. and James G. Gimpel. "Distance, Turnout, and the Convenience of Voting." *Social Science Quarterly* (Blackwell Publishing Limited), Sep. 2005, Vol. 86 Issue 3, p. 531 (18p), found at <http://search.epnet.com/login.aspx?direct=true&db=aph&an=17780494>. (Academic Search Premier: voting, GIS)
- "Federal GIS." *ArcUser*, April-June 2004, Vol. 7 No. 2, p10 (3p).
- Gimpel, Jim. "Computer Technology and Getting Out the Vote." *Campaigns & Elections*, Aug. 2003, Vol. 24 Issue 8, p. 39 (2p). (Academic Search Premier, politic), GIS
- Hapsel, Moshe, and H. Gibbs Knotts. "Location, Location, Location: Precinct Placement and the Costs of Voting." *The Journal of Politics*, May 2005, Vol. 67 Number 2, p. 560 (14p). (Academic Search Premier: voting, GIS)
- Roach, Ronald. "How Geographic Information Systems Can Help Maximize Minority Voter Influence." *Black Issues in Higher Education*, 12 Dec. 2000, Vol. 16 Issue 22, p38 (2p). (Academic Search Premier: voting, GIS)
- Van Wyngaarden, Robert, and Will Yancey. "GIS is a Cornerstone in Understanding Tax Exposure." *Geoworld*, Nov. 2003, Vol. 16 No. 11, p24 (2p).