Scale and the Interpretation of Voting Patterns in Virginia, 2003-2006

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Abstract

Electoral geographers are mostly concerned with mapping the responses of voters to different political candidates, while they also work to explain the factors that influence those responses. Yet most studies do not consider how different geographic contexts can affect the political perceptions of voters. In particular, people who live in close proximity to one another may come to embrace similar beliefs and values, while broader social and economic processes may divide these individuals into separate camps. Thus, electoral studies performed at the local level may produce different results than those done at the regional or national level. In exploring how different scales of analysis can give different interpretations of voting patterns, this research gathered data from a series of elections that took place in Virginia. These elections, which occurred between 2003 and 2006, span a variety of federal and state offices, with each presiding over a certain geographic jurisdiction. The study proceeded to map the results of each election in terms of three different types of geographic areas: precincts, counties, and legislative districts. The maps displayed the majority winners within each of these areas, giving a rough indication of the bases of support for each of the different candidates. The study then determined the number of instances where two neighboring areas both favored the same candidate, as well as the number of cases where they voted for opposing candidates. These data helped to shed light on the autocorrelation structure of voting patterns in Virginia, revealing how people in the same general vicinity tend to vote together. Overall, the results of this study

demonstrate that smaller geographic units (e.g., precincts) exhibit greater autocorrelation in voting than do larger areas. This observation agrees with the concept of sectionalism, which asserts that location and culture are key influences on voting behavior. However, the data also suggest that class differences are a major source of electoral cleavage, as people from different social and economic backgrounds tend to settle in different areas. The use of multiple scales of analysis thus presents multiple explanations for the voting trend of a given location.

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Table of Contents

Page

List of Tables

Page

List of Maps

Page

Chapter 1: Introduction and Statement of Purpose

1.1 Introduction

The field of electoral geography deals with the identification and explanation of spatial patterns in relation to voting in public elections. Electoral geographers attempt to show where candidates gain their popular support and to predict what types of people are most likely to vote for those candidates (Johnston 2005). As a research subject, the study of voting patterns stems from the larger field of political geography. Both address how political institutions influence, and are influenced by, the interactions of individuals across different scales (Demko and Wood 1999). In particular, electoral geography seeks to explain how the social circumstances of people's lives can guide their political preferences, and, in turn, their voting habits (Zuckerman 2005).

In theory, democratic elections allow the citizens of a sovereign state to choose the personnel and policies that will guide their national government (Denver 1989). The act of voting thus serves to operationalize the way a person may regard a particular candidate, political issue, or series of issues. As voting data are quantitative in nature, researchers can perform countless statistical analyses to help explain why people may support one party over another. In particular, a number of studies have examined election results from different locations and time periods in order to compare the ways that people respond to different agendas. A key focus of these studies is the jurisdictional division of sovereign states into distinct administrative units (Archer and Shelley 1986). In most democratic countries, there are special zones that serve to facilitate the tabulation of votes in a public election. These political units, which include counties, legislative districts,

and precincts, effectively delineate areas where people interact with one another on a regular basis. They therefore provide a spatial context for studying the influence of propinquity on voting behavior (Morrill 1994; Zuckerman 2005).

In working to improve upon traditional analyses of voting patterns, this research addresses the issue of scale. This geographic concept refers to the various levels at which human events take place (Johnston et al. 1994). In particular, electoral geographers tend to study voting patterns at the local, regional, and national scales (ibid.). Hudson (1992) relates that many problems involving the human use of the Earth require researchers to pay attention to multiple scales at the same time. Thus, it is helpful to regard the issue of scale in terms of a 'local-global continuum' spanning a variety of spatial contexts (Meyer et al. 1992). This idea can be of great assistance to the field of electoral geography, as it allows researchers to link together studies across spatial scales. To this end, Cox (1998: 1) describes the world of politics as "a nested hierarchy of discrete, enclosed jurisdictional spaces." This depiction of jurisdictional authority sheds light on the issue of scale by showing how it relates to the political subdivision of areas. As states are comprised of geographic units of varying sizes, it follows that voting data can be collected at many levels. Thus, the issue of scale enables researchers to compare voting trends at various distances across geographic space. This observation can be very beneficial for future studies in electoral geography, as it presents multiple perspectives for looking at voting and elections.

The field of electoral research consists of many distinct areas of interest, and thus a major challenge lies in linking together the different geographic aspects of voting and elections. Namely, most studies have focused on regressing voting results against census

variables such as age, race, and income (Johnston 2005). These efforts have generally shown that people who live in areas dominated by a single racial or ethnic group usually vote the same way in an election, as these people tend to share similar values and beliefs (Gimpel and Lay 2004; Johnston and Pattie 2004). While such analysis is vital to establishing the voting trend of an area, it does not address the spatial processes that impact voting decisions. For example, the 'neighborhood effect' suggests that media in local communities tend to screen all public information through a partisan filter (Taylor 1993). As a result, political minorities in these areas are likely to conform to the views of their neighbors, regardless of their own social or economic status (Taylor 1993; Gimpel and Lay 2004). Also, many electoral studies fail to explain how the geography of voting relates to the concept of representation. Under most electoral systems, candidates win seats in office by receiving a majority of votes from within an electoral district (Taylor 1993). Thus, the arbitrary drawing of district boundaries can have a direct influence on the outcomes of elections held within those districts.

This research aims to demonstrate how the issue of scale applies to all aspects of electoral geography. Namely, the idea of a hierarchy of jurisdictional regions is of great consequence to the analysis and interpretation of voting patterns. By looking at elections in terms of different scales, researchers can begin to synthesize the results of studies from different areas of the field. This approach to the issue of scale may also help to explain how different levels of analysis can lead to different interpretations of voting patterns. Such knowledge can prove valuable for candidates planning campaign strategies and for legislators seeking to strengthen their constituencies.

1.2 Statement of Purpose

In democratic societies, public elections are the most visible means of involving citizens in the decision-making processes of government. As such, elections deserve special attention for their role in conceptualizing the political choices and voting behaviors of individuals. These themes become readily apparent in the production of electoral maps, which allow viewers to identify those political units where people favor a specific candidate or party. In presenting the act of voting as a geographic variable, these maps suggest that there are certain environmental factors that help guide the decisions of individual voters.

The purpose of this study is to gain a better understanding of the spatial patterns of voting behavior in the Commonwealth of Virginia. By mapping the results of a series of elections over a set time period, this research expands upon the previous literature regarding the application of scale to the study of elections. The study uses the principles of spatial autocorrelation to assess how voting patterns covary across precinct, county, and district boundaries. The concept of autocorrelation refers here to the idea that any set of spatial data is likely to have characteristic distances or lengths at which it is correlated with itself (O'Sullivan and Unwin 2003). Thus, areas that are adjacent to one another are more likely to have similar voting patterns than areas that are far apart. In performing this analysis, I suspected that there would be a substantial clustering effect among smaller geographic units which voted for the same candidates. If there was indeed a geographical pattern to the preferences of voters, it would be most evident at the local level. By establishing the voting trend for the time period in question, the study allows for the comparison of census data across regions of different sizes. Future research may then

assist in divining the spatial factors that impact the voting habits of individuals. In summary, this study constitutes an effort to redirect how electoral geography approaches the issue of scale, a task which may help to enhance the field.

This thesis has two additional chapters. Chapter 2 presents a review of previous work in electoral geography relating to the different branches of voting studies. Chapter 3 focuses on the results of my study exploring Virginia voting patterns across a variety of geographic scales. It is written in preparation for submission to the journal *Southeastern Geographer*.

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Chapter 2: Literature Review

2.1 Introduction

Researchers have long paid attention to the analysis of voting trends and voting behavior. However, much of this work has focused on the results of a specific election or on the changes between two different elections (Johnston 1982). As a result, the field of electoral geography has remained very limited in focus. Thus, in order to produce a more thorough body of knowledge, it is necessary to integrate three separate areas of interest, as suggested by Taylor (1993). This chapter first discusses the geography of voting, which deals with the spatial patterns of partisan voting in elections. Second, it addresses the geographic influences on voting, describing how human environments can steer the choices of voters. Third, it examines the geography of representation, which assesses how the drawing of district lines affects the outcomes of elections. Finally, this chapter considers the issue of scale, discussing its significance as a framework for exploring each of these areas of electoral geography.

2.2 Geography of Voting

The geography of voting concerns the observed similarities and differences in the electoral patterns that exist within different regions. Most studies in electoral geography seek to identify and to categorize the many factors that affect how individuals choose to vote in elections. These studies then attempt to derive regional trends in voting by evaluating how those factors vary across geographic space. A voting trend refers to the

prevailing tendency of a certain group of people to support a particular candidate in an election. Such trends are generally evident at both large and small scales, and they will usually exhibit some degree of variation over geographic space. By observing for regional fluctuations in the results of elections, one can begin to perceive the spatial patterns that dictate the overall voting trend of a given area. It then becomes necessary to interpret these patterns in order to understand why certain groups of people vote in the manner that they do.

2.2.1 Two Models for Explaining Voting Patterns

There are two separate models employed by electoral geographers to help explain the spatial patterns of voting. The first model, formulated by Lipset and Rokkan (1967) for Western Europe, concerns the existence of "class cleavages" in society. This model suggests that people typically vote for candidates who they believe will serve on behalf of the interests of their own social class. In the United Kingdom, for example, support for the Conservative Party has traditionally been strong among the white-collar middle classes, while blue-collar workers have tended to favor the Labour Party (Johnston 2005). The second model, on the other hand, emphasizes the role of geographic sectionalism in deciding the outcomes of elections (ibid.). Used mainly in the United States, this model stresses that place, rather than class or any other socioeconomic trait, has the greatest influence on the voting habits of individuals (ibid.). In particular, the sectional approach contends that people will usually support political agendas that appeal to the customs, beliefs, and traditions of the places where they live. As people in different regions tend to embrace different values, many citizens will often vote along sectional lines in a state

or national election (Elazar 1984; Johnston 2005). Thus the sectional approach highlights the regional variations in the culture of a state or country.

The concepts of class structure and cultural sectionalism are of critical interest to the study of electoral geography. Namely, these concepts present different methods for assessing the voting tendencies of people in different locations. While the class structure approach works to ascertain the voting trend of a given area by regressing election results against census data for that area, the sectional approach examines voting trends a priori in order to determine the underlying factors behind those trends (Johnston 2005). These approaches thus offer different avenues for researchers to explore the various issues associated with the field. In particular, the sectional model applies to issues that concern the relative locations of voters, while the class cleavage model is more appropriate for explaining matters that are ubiquitous in nature. The convergence of class and culture thus provides a comprehensive framework for assessing the spatial patterns of voting.

2.2.2 Social and Economic Influences on Voting

The class cleavage and sectional voting models ultimately provide different perspectives for assessing the many social and economic processes that can impact voting decisions. In tandem, these perspectives form a two-dimensional policy space from which one may evaluate the preferences of all voters (Miller and Schofield 2003). Within this space, Ansolabehere et al. (2006) outline a series of social and economic factors that affect how different groups of people vote in elections. High-income voters tend to prefer lower taxes and less government spending, while low-income voters typically support policies that aim to redistribute wealth more evenly among classes

(ibid.). Similarly, conservative and liberal voters tend to select candidates based on their positions on prominent social issues, such as abortion and same-sex marriage (ibid.). The decision to vote in an election thus requires individuals to consider both their own class interests as well as the sectional interests of the places where they live.

Alvarez and Nagler (1998) deduce that in times of economic prosperity, voters will be more likely to favor incumbent candidates, regardless of their class affiliation. They find that people tend to attribute the health of their economy to the policies of their elected representatives, whether or not those policies have an actual impact on economic performance (ibid.). By this rationale, government leaders can still manage to win reelection even if a majority of the population disapproves of their political agendas. This circumstance gives lawmakers more freedom to advance their own policy objectives, underscoring the benign nature of voters during periods of stability (ibid.). In times of crisis, government officials may then pursue sweeping initiatives that claim to have the interests of the nation at heart. Peter Trubowitz (1992) explains how moments of uncertainty in the course of a nation often have the effect of dividing voters into separate political camps. He finds that there is a spatial dimension to "the national interest," whereby people from various regions have values and opinions that are distinct from those of people in other areas (ibid.). During extended periods of conflict, voters tend to revert back to their own sectional interests, making it impossible for elected leaders to achieve consensus over critical issues (ibid.). Thus, large-scale events such as war or economic recession can further polarize the electorate beyond the established social and economic cleavages.

2.2.3 Geographic Patterns of Voting

There is much evidence to indicate that the relative locations of individuals can influence their voting habits. This idea comes directly from the sectional voting model, while it can also apply to situations pertaining to the class structure model. Numerous studies have shown that people with similar beliefs and values tend to live near one another, and that these people generally vote along the same lines in elections (Agnew 1996; Huckfeldt et al. 2003; Johnston et al. 2004). These studies also demonstrate that the social division of labor within a community often leads to the spatial separation of people from different classes, thus dividing the electorate even further (ibid.). These observations suggest that there are certain underlying patterns that govern how different groups of people respond to various agendas.

In a classic study of urban politics, Roger Kasperson (1965) assesses the spatial patterns of voting from a series of mayoral elections in Chicago. He finds that the levels of support for different candidates roughly adhere to a pattern of concentric zones about the central city (ibid.). In the downtown area, people overwhelmingly prefer Democratic candidates, while people who live further away from the city core tend to favor the Republican Party. Kasperson (1965) also notes how the social and economic characteristics of the city seem to reflect this concentric pattern of voting. In the central city, family incomes are relatively low, few people own their own homes, and there are large concentrations of immigrants and non-whites. This trend differs from the general affluence of the outlying suburbs, where people enjoy higher incomes and better housing conditions (ibid.). Thus, a strong correlation is evident between voting and the spatial

patterns of urban settlement, suggesting that there is a certain degree of overlap between the class cleavage and sectional voting models.

Mellow and Trubowitz (2005) identify another key pattern that can influence how people choose to vote in elections. They address the geographic split between "red states" and "blue states" in America, relating how this dichotomy epitomizes the divisive nature of American politics (ibid.). For the most part, red states are predominantly rural and socially conservative, while blue states have large urban populations that embrace more liberal values. These distinctions reflect the sectional differences in American politics, while they overlook the class divisions that exist within individual states. As demonstrated by the U.S. presidential elections of 2000 and 2004, a state may either be red or blue, depending on whether it supports the Republican Party or the Democratic Party in a given election. Thus, the political culture of a region has a significant bearing on the voting habits of its citizens (Elazar 1984; Archer and Shelley 1986). It is important to note that the ideas and beliefs of a group of people will vary across different regions and localities. For example, residents of large cities are likely to have political views that contrast with those of people who live in suburban and rural communities. As a result, individual states may contain several counties and districts where people vote against the observed trend for the remainder of the state (Hartshorne 1954). This pattern suggests that different geographic settings tend to impact the voting decisions of individuals in different ways, an observation that agrees with the sectional voting model.

2.3 Geographical Influences in Voting

The analysis of voting data by areal units, while essential to the field of electoral geography, fails to consider the spatial contexts within which voting decisions take place (Taylor 1993). Therefore, another important aspect of the field concerns the ways that geography can influence the voting behavior of individuals. Here, the concept of voting behavior refers to the manner in which a group of people responds to a certain candidate, agenda, or initiative in an election. In addressing the spatial processes that affect voting behavior, a key point of emphasis is the thought that people who live in close propinquity to each other tend to vote along similar lines. This idea stems from Waldo Tobler's first law of geography, which states that "everything is related to everything else, but near things are more related than distant things" (Tobler 1970: 236). In addition, the concept of propinquity relates directly to the sectional voting model, suggesting that all geographic influences in voting are sectional by nature. Thus, propinquity is a major issue in electoral geography, as it applies to many of the sociospatial processes that shape the voting behaviors of individuals.

2.3.1 The Neighborhood Effect

The neighborhood effect is one of the most widely studied geographic influences on voting behavior (Taylor 1993). It refers to the process whereby people in close-knit communities come to support the same political parties as their neighbors. Unlike the class cleavage voting model, which highlights the importance of economic and social factors, the neighborhood effect deflects attention away from the issue of class structure (Agnew 1996). It instead addresses how the interactions of individuals in local settings can move these citizens to vote for the same candidates in an election (Gimpel and Lay

2004; Johnston et al. 2004). Thus, the neighborhood effect supports the sectional voting model, as the relative locations of individuals to other partisan voters may have a direct influence on their own voting behavior. Butler and Stokes (1974) expand on these ideas, discussing the results of a series of elections in Great Britain. They find that voters tend to conform to the dominant political norm of the area in which they live, regardless of their own social class (Butler and Stokes 1974; Denver 1989). The likelihood for an individual to favor a particular party thus depends on whether or not his or her neighbors prefer that same party. This observation reflects an important aspect of the neighborhood effect, which is the idea that personal networks can impact the voting behavior of individuals.

Huckfeldt et al. (2003) discuss the process of political socialization as it pertains to voting in elections. They find that many people are inclined to engage in dialectical arguments with their peers, in which they share information and viewpoints to help reach their own voting decisions (ibid.). However, if one only has contact with individuals who live in the same general region, then the perspectives gained by that person will be limited in nature (ibid.). Thus, people are more likely to vote in unison with their friends and neighbors than with those who live further away. Johnston et al. (2004) discuss these ideas further, addressing a series of spatial processes that relate to the neighborhood effect. According to these authors, many individuals choose to live in areas where they will be among the political majority, even though they may belong to a different class than their neighbors. People in these communities tend to emulate the behavior of others in the area, meaning that they will often vote for the same candidates in an election (ibid.). As a result, all classes living in a partisan area will be likely to support the

preferred party of that area, based on the perception that that party is best suited to act in the interests of the community (Taylor 1993; Johnston et al. 2004).

2.3.2 Other Influences on Voting

There are a number of other sectional influences which can have a great impact on voting behavior. Taylor (1993) brings up the concept of candidate voting, which suggests that people tend to vote for candidates who come from the same areas as they do. In the United States, for example, individuals running for political office will usually perform their best within their own state, county, or district (ibid.). This spatial pattern may influence how candidates manage their campaigns, causing them to devote less attention to places where they can expect to receive a majority of votes. With regard to campaign strategy, many studies have demonstrated that candidates who outspend their opponents on advertising and canvassing efforts will usually win the most votes in an election (Johnston 1979). If a candidate has a finite supply of resources with which to work, then he or she will target specifically those areas where there is no overwhelming support for any one party. Thus, the process of soliciting votes from the public involves a great deal of geographic maneuvering on the part of campaign officials. Also, sectional differences in the economy of a nation can influence the culture of different regions, thus affecting how voters respond to certain issues (Trubowitz 1992). For example, people who live in industrial areas will likely disagree with people from agrarian regions over agendas such as foreign policy (ibid.). Such ideological differences tend to divide the population into regional bases of support for different parties.

2.4 Geography of Representation

An additional area of interest to electoral geographers is the concept of political representation. In a representative democracy, a handful of individuals serve on behalf of the interests of their collective society. Thus, the purpose of an election is to determine who will be in charge of drafting and enforcing laws within that society (Johnston 1979). Under most democratic systems, candidates win seats in office by obtaining the greatest number of votes from within their respective jurisdictions (Taylor 1993). Theoretically, this practice enables all citizens to have an equal voice in the actions and decisions of their government. Yet the plurality voting system can also present a number of problems regarding the fair representation of voters in national legislatures. Namely, the arbitrary drawing of district borders can give certain parties a decided advantage in specific parts of a state.

The districting problem is a key concern for countries that utilize a representative form of government. In particular, regional fluctuations in the population of a country will ultimately cause certain districts to gain representative power at the expense of others. Thus it is necessary to periodically redraw district boundaries in order to ensure the equality of all voters. Taylor (1993) discusses the issue of redistricting at length, addressing the challenges it can present for conducting fair elections. He finds that different boundary configurations will produce different election outcomes within a given region, even if the underlying voting trend is constant for that region (ibid.). It has therefore been a traditional practice for politicians to try to adjust district lines in ways that would allow their own party to gain additional seats in office. As a result, the

practice of redistricting has long been susceptible to various types of abuse on the part of elected officials and party leaders.

Johnston and Pattie (2003) identify two different methods of districting that have historically been used to influence the results of elections. The first strategy, known as malapportionment, occurred when legislators would subdivide regions with a high concentration of partisan voters into several smaller constituent zones (ibid.). This practice effectively discriminated against voters at the individual level, thus allowing a minimum percentage of population to be able to elect a legislative majority (Johnston 1979). However, this type of redistricting became unconstitutional in the 1960s, and is no longer relevant in the United States today. The second technique, known as gerrymandering, refers to the uneven drawing of district boundaries to include a majority of voters who favor a certain party (Johnston and Pattie 2003). As opposed to malapportionment, this process creates districts that are more equal in terms of population, yet are often less geographically compact. Morrill (1994) outlines several different forms of gerrymandering, which include packing voters into single districts, as well as splitting them among regions where most people favor an opposing party. In either case, the votes of a particular minority group become largely ineffectual, earning an inadequate number of seats in office in relation to the total population of the group (ibid.). These concerns over fair districting help to conceptualize the idea of political representation, especially as it relates to geography and voting.

Within an election, individuals are able to voice their own opinions regarding a variety of issues that affect their collective society (Morrill 1994). This basic freedom constitutes a key component of democratic government, as the people of a sovereign state

have authority over the affairs of that state. Yet in the absence of a direct democracy, the people will instead select members of the population to make public decisions on their behalf. Under this system, the percentage of votes cast for a particular party ought to translate into a proportional allotment of representatives from that party (Johnston 1979). In many cases, however, there will be a discrepancy in the number of seats granted to a voting constituency, due to the winner-take-all nature of elections and the issues over fair districting. Thus, the orientation of electoral boundaries has a significant impact on the ability of voters to have a reasonable say in the democratic process.

2.5 Scale and Electoral Geography

In the most basic terms, 'scale' refers to the representative level of an activity taking place in geographic space (Johnston et al. 1994). This broad definition arises from the regional tradition of human geography, which encountered a variety of scale issues in describing and characterizing different regions (Meyer et al. 1992; Johnston et al. 1994). The advent of the quantitative revolution in geography helped to clarify the nature of these issues (Meyer et al. 1992). In particular, McCarty et al. (1956: 16) note that "conclusions derived from studies made at one scale should not be expected to apply to problems whose data are expressed at other scales." This observation reflects the essence of the issue of scale, which is the idea that different scales of analysis may produce different interpretations of spatial phenomena. Yet in spite of the advances brought about by the quantitative revolution, the field of electoral geography has remained undeveloped in its approach to the analysis of scale. Many researchers have tended to look at elections from a single geographic perspective, analyzing voting results in terms of individual

scales (Johnston et al. 1994). For example, Archer et al. (1985), Webster (1992), and LeFurgy (2005) all examine election outcomes at the county level, using these results to derive regional voting patterns. In doing so, they fail to consider how other levels of analysis might produce different patterns of voting. Thus, the current body of work in electoral geography has not sufficiently addressed the full magnitude of the issue of scale.

In sum, the field of electoral geography comprises three separate areas of interest which, for the most part, have little in common with one another. The lack of coherence within the field thus presents many challenges for electoral researchers. In working to overcome these obstacles, this research illustrates how the issue of scale applies to each area of study.

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Chapter 3: Scale and the Interpretation of Voting Patterns in Virginia, 2003-2006*

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Abstract:

Most research in electoral geography attempts to derive conclusions about the voting habits of people in specific parts of a state or country. Electoral geographers compare the voting records of different areas in order to explain how spatial factors may influence the ways that people view politics. Within this field of research, there is much potential to expand upon the current body of knowledge by addressing the concept of geographic scale. In particular, the issue of scale offers an original way of looking at the various spatial aspects of voting and elections. To help define the relationships between scale and voting, this study gathered boundary shapefiles and election data from the state

of Virginia. The shapefiles display three different types of geographic units in Virginia, which are voting precincts, counties, and legislative districts. The data show the detailed results from eight different statewide elections that took place between 2003 and 2006. By mapping these results for each geographic unit, the study was able to relate the spatial patterns of voting in Virginia in terms of three different scales. Also, for each election, the study measured the level of spatial autocorrelation in the observed voting patterns of each different type of unit. This task helped to demonstrate the influence of propinquity on voting behavior, showing how local areas tend to be more politically homogeneous than broader regions. In addition, this research discusses how the issue of scale might fit within the framework of electoral geography, citing examples of how it can apply to the different branches of the field.

3.1 Introduction

The concept of scale represents one of the most fundamental aspects of geographic theory. In particular, human geographers are interested in distinguishing the spatial extent of the areas at which various phenomena take place (Marston 2000). This research explores how the issue of scale applies to the field of electoral geography. By mapping the results of a series of elections at the precinct, county, and district levels, this research investigates how voting patterns in Virginia may vary across different scales of analysis.

The field of electoral geography remains largely disjointed as a research subject, as there has been little progress in consolidating its many areas of interest (Taylor 1993). Most studies only focus on one aspect of elections, such as voter alignments or districting

practices, and they often fail to consider how each of these elements might fit within a larger structure. In working to synthesize these disparate areas into a more cohesive body of knowledge, researchers have tried to organize the field into a systems-based academic framework. Notably, Taylor (1993) developed a systems model that incorporates the geography of voting, the geographical influences in voting, and the geography of voter representation. This model works to extend the focus of electoral geography beyond the analysis of individual elections, and toward the geographic processes that guide elections (ibid.). In doing so, the model emphasizes how studies from different areas of the field each play a specific role in determining the geographical effects of elections (ibid.). In working to enhance this model, the current study theorizes that scale is a vital aspect of electoral geography, with distinct applications for each of the areas outlined by Taylor (1993). The study examines each of these areas across a variety of scales, addressing how different perspectives can emerge from different levels of analysis.

One of the major assets associated with the concept of scale is its value as an organizational tool, particularly in fields of study that deal with the social construction of space. Here, scale exists not as a set of hierarchical categories, but rather as a relational device to help tie together elements of space and location (Marston 2000). In electoral geography, for instance, the relationship between income level and voting behavior in a certain region may vary depending on the extent of the area in question. People who live in high-income neighborhoods might all favor the same candidates in an election, while the region as a whole may be much more economically and politically diverse. This idea illustrates the concept of spatial autocorrelation, which theorizes that nearby entities tend to have more in common with one another than those that are further apart (Tobler 1970).

Yet people who live far from one another may also come to support the same candidates, suggesting that there are certain influences on voting that are ubiquitous in nature. Thus, voting patterns derived from studies made at the district level may or may not agree with patterns observed at the county or precinct levels (McCarty et al. 1956). This observation reflects the variable nature of geographic scale, as different contexts for studying a given phenomenon will lead to different explanations as to how that phenomenon affects voting behavior.

While there have been many electoral studies that have introduced the concept of scale, these efforts have mostly treated individual spatial contexts as separate, absolute entities (Agnew 1996). Namely, these studies have overlooked the unit of analysis problem, which refers to the idea that any geographic unit of analysis places an arbitrary delimiter on a set of spatial data. Most studies have tended to analyze the results of elections at a single spatial level, such as a state or county, without considering how these units merely provide artificial compilations of individual voting data (Archer et al. 1985; Webster 1992; LeFurgy 2005). Thus, alternate levels of analysis might yield entirely different conclusions about the voting behavior of a given area. This research aims to clarify the role of scale within electoral geography by showing how different levels of analysis can reveal different insights about voting and elections. By mapping the results of a series of elections in terms of locally and regionally defined areas, the study helps to shed light on the vast complex of spatial processes that affect how people respond to different ideas and initiatives (Swyngedouw 1997; Marston 2000).

In summary, the concept of scale can be an effective vantage point for conducting research on the geographic implications of elections. To date, there have been very few

studies which adequately address the relationships that exist between scale and voting. Most notably, Agnew's (1996) research on spatial context discusses how the study of elections might benefit from equal consideration of multiple scales. By exploring this idea in greater detail, the potential exists to enhance the status of electoral geography as a field of study. In particular, there is much to learn by studying how scale relates to the geography of voting, the influences of geography on voting, and the geography of voter representation.

3.2 Voting and Elections in Virginia

In exploring how different scales of analysis may provide different perspectives on voting behavior, this study examines a number of elections from the Commonwealth of Virginia. There are many different opportunities for people to vote in Virginia, from primary elections which seek to narrow down a field of candidates, to general elections that actually appoint candidates to public office. To provide a common frame of reference for addressing how voting patterns might vary at different scales, this research focuses only on general elections that involve the entire state. In particular, the study deals with the election of candidates to the Senate of Virginia, the Virginia House of Delegates, the executive branch of Virginia, and to the national equivalents of each of these governing bodies. A key point of emphasis within this research is the idea that local politics are an inherent aspect of all spatial processes that influence voting behavior (Marston 2000). According to Cox (1998), people tend to derive their own sense of self-awareness from the day-to-day social relations they experience within their own communities. These interactions lead them to identify with the sectional interests of the

places where they live, thus affecting how they perceive events on a much larger scale. In turn, the broader economic and social processes that dictate world events can cause people in local settings to revert back to the interests of their own social class (ibid.). Thus, the existence of multiple scales of analysis lends support to both voting models, offering a myriad of ways to assess the various factors that influence how residents of Virginia vote in elections.

Over the past hundred years, Virginia has experienced a series of radical shifts in the voting patterns of its citizens. Conservative Democrats dominated the state for much of the twentieth century, with the Byrd Organization using its political machinery to help dictate the outcomes of state elections (Wilkinson 1968). Following the passage of the Civil Rights Act of 1964 and the Voting Rights Act of 1965, the Democratic Party began to take a more liberal stance with regard to issues of social equality (Miller and Schofield 2003). In response to this series of changes, many social conservatives in Virginia began to defect to the Republican Party (Wilkinson 1968). Today the state is more politically diverse than in the past, with regional bases of support for each party. Specifically, the rural sections of Virginia have become Republican strongholds, while the state's urban and suburban areas lean toward the Democrats (Miller and Schofield 2003; Craig 2007). In addition, there are pockets of Democratic support in the coal-mining southwest region, in various college towns, and in poorer counties with high black populations (Clemons and Jones 2000; Associated Press 2007).

There are a variety of factors that affect the voting habits of people in Virginia. Throughout the state, people specialize in diverse fields, such as agriculture, high-tech business, and national security (Barone, Lilley III, and DeFranco 1998). Each of these

types of enterprises represents a specific public interest, and consequently, people tend to favor candidates whom they believe will best serve the interests of their own profession. In many cases, the interests of different fields will conflict with one another, especially over issues that concern the redistribution of wealth (Miller and Schofield 2003). Thus, people who live in regions dominated by a certain profession may often vote differently than those living in areas that specialize in another line of work. In addition to economic factors, there are also many social issues that can have an effect on voting patterns. The advent of racial desegregation created a huge political rift in Virginia, dividing those who favored affirmative policies from those who were against such efforts (Wilkinson 1968; Miller and Schofield 2003). As social movements have grown to include other minority groups, voters have discovered new outlets for expressing their own human concerns. The geographic dispersal of different racial and ethnic groups thus further influences patterns of voting in Virginia.

Under plurality systems of voting, electoral candidates win seats in political office by gaining the most votes within a defined region (Taylor 1993). This principle allows Virginia residents to choose the officials who will serve on their behalf, thus giving them indirect power in making public policy decisions. However, there are a variety of factors that effectively limit the scope of this influence. In the United States Electoral College, for example, Virginia only carries thirteen of the 270 votes needed to elect the President of the United States. Barring a faithless elector, all of these votes will go to the winner of the popular vote, essentially disfranchising those who supported a runner-up. A similar scenario occurs for those elections that are specific to Virginia, and for which only one person can represent the state. Namely, the two United States Senators from Virginia, the

State Governor, the Lieutenant Governor, and the Attorney General all win their seats in office by receiving a plurality of votes from throughout the state. For the members of the Senate of Virginia, the Virginia House of Delegates, and the United States House of Representatives, there are special districts that serve as the home bases for each elected official. This circumstance allows a more diverse body of individuals to represent the interests of different regions, thus enhancing the status of voters who are otherwise in the political minority. The ability of the plurality voting system to satisfy the wishes of the public thus varies for different types of elections in Virginia.

In researching the theory and practice of democratic elections, it is practical to view the electoral process in terms of geography and scale. Here, the Commonwealth of Virginia represents a complex political arena, within which there are many sectional and class interests vying for the attention of government leaders. As there are a variety of elected offices serving the people of Virginia, it follows that state residents have many outlets to voice their concern over specific agendas. Lower level representatives will be more responsive to local and regional issues, while executive officers must place the well being of all classes of people above that of any one area. Collectively, these political offices make up a synthetic framework of governance, under which Virginia residents are subject to the authority of more than one jurisdiction. This framework ties directly into the spatial organization of elections, as it establishes those districts where citizens vote from among a single pool of candidates to represent them in a specific office. In turn, this simple division of territory provides multiple contexts for exploring how sectional differences and class cleavages can each influence voting behavior. By examining voting trends at different levels of analysis, researchers can compare which of these models best

explains the voting trend of a given location. Thus, the concept of scale has multiple applications within the field of electoral geography, and it can be especially useful in studying the spatial patterns and implications of voting in Virginia.

3.3 Methods

3.3.1 Choice of Elections

This research gathered the voting results from eight different sets of elections in Virginia, acquiring these data in Microsoft Excel format from the Virginia State Board of Elections. The elections chosen include the State Senate elections of 2003; the United States presidential election of 2004; the 2005 elections for the Governor, Lieutenant Governor, and Attorney General of Virginia; the House of Delegates elections of 2005; and the 2006 elections for the United States Senate and the United States House of Representatives. This sample covers every statewide office in Virginia, as well as every type of federal office for which there is a general election in Virginia. The sample also accounts for those federal and statewide legislative bodies for which different districts vote upon different sets of candidates. In addition, the time period chosen for this study (2003-2006) considers the most recent occurrence of each type of election for which data were available. In examining such a diverse array of elections, this study conceptualizes the idea of scale in terms of the spatial extent of the jurisdiction of a political office.

3.3.2 District Boundaries

In order to map the results of these elections, it was necessary to be able to accurately display the different district boundaries for each election year. This research

collected shapefiles for a variety of areal units in Virginia; these include legislative districts, voting precincts, counties, and independent cities. Upon downloading these files from the Virginia Division of Legislative Services, the study compiled a database of these features in ArcGIS 9.2. To ensure their accuracy, the study compared the boundary files with existing maps obtained from voter registrars and GIS departments throughout the state. This exhaustive process, which required over six months of work, involved a series of cumbersome tasks. Specifically, the study had to adjust the borders of a number of precincts, in order to account for those precincts that opened or closed during the time period. There were also several cases in which there was no visible physical feature on which to base a boundary between two adjoining precincts, and in these cases, the study displayed a single, combined precinct (Spain 2000). In addition, there were places where the boundaries of a precinct, county, or district overlapped with those of another region. In such cases, the study divided those areas into two or more constituent zones, based on whether people living in different zones vote in separate elections. By utilizing multiple types of areal units to assess voting patterns in Virginia, this research allows for the comparison of election results across a number of geographic scales.

3.3.3. Mapping Election Results

To help demonstrate how voting patterns vary across scales, the study proceeded to map the results of each election for all of the different-sized areas. By dissolving the election data into sums of votes for each district type, this research was able to determine the majority winners within every geographic unit included in the study. These results were then ready for import into ArcMap, which joined the newly created data tables with

the boundary shapefiles. The resulting choropleth maps shaded each areal unit a certain color, depending on who received the most votes within that specific region. In sum, there were twenty-four maps produced (see Maps 3.1.1-3.8.3), which display the results of eight separate elections in terms of three different geographic scales.

There are several points to note about this mapping process, especially regarding the nature of the election data and the boundary files. For the elections to the Senate of Virginia, the Virginia House of Delegates, and the United States House of Representatives, the maps distinguish candidates only by their party label, as these bodies consist of multiple members from across the state. Many of these elections involve only one leading candidate, meaning that voting is nearly unanimous in certain areas. Overall, there were 19 of 40 Virginia Senate elections, 51 of 100 Virginia House elections, and one of eleven United States House elections that went uncontested. Because different parts of the population vote in separate elections, the maps split those counties and precincts that are within more than one legislative district. This situation arises in about 13 percent of counties for United States House elections, 31 percent of counties for Virginia Senate elections, 42 percent of counties for Virginia House elections, and less than 2 percent of precincts for all elections. The maps omit several of these subdivided precincts altogether, about 0.1 percent of all precincts, because there was no shapefile found to reflect the voting results in these locations. Roughly 1.5 percent of all precincts share an undefined boundary with another precinct, and in these cases, the combined vote totals of the adjoining precincts display as a single unit. While the results of elections to the Senate of Virginia and the Virginia House of Delegates display in terms of senate and house districts, all other elections use congressional districts as their largest units of

analysis. Also, none of the precinct maps account for the presence of absentee voters, because their votes go to Central Absentee Precincts, which have no spatial dimensions.

3.3.4. Autocorrelation Analysis

Upon mapping the results of each election, the next step was to measure the level of autocorrelation between areal units with similar voting patterns. As per Tobler's (1970) first law of geography, one would expect that nearby places would favor the same types of candidates in an election. To test this theory, the study used ArcMap to create topologies for Virginia's precincts, counties, and legislative districts. This process helped determine the number of instances where each areal unit touches the boundary of another unit of the same type. The study considers both the "rook's case," in which neighboring areas meet only at common borders, as well as the "queen's case," where they also touch at corners. By accounting for each of these cases, the study covers all the possible ways that two areas may be adjacent to one another. The study does not take into account the presence of large water bodies, such as the Chesapeake Bay, which effectively separate those areas that otherwise share a boundary. It ignores all indefinite borders between precincts, a situation involving roughly 1.5 percent of all precincts included in the study. Also, for those districts and precincts that consist of multiple, non-contiguous areas, the study merges the borders that each area shares with another district or precinct.

Having established which areal units are adjacent to which others, this research then classified the joins between the different regions in terms of the election winners in each region. For example, a Republican-Republican join would exist for two neighboring counties that each favored a candidate from the Republican Party. The raw joins counts

thus provided a rough insight into the general autocorrelation structure of voting patterns in Virginia. To determine the statistical significance of these counts, the study computed the expected values and standard deviations of each count for an independent random process. Here, the percent share of the popular vote for a candidate in an election serves as the probability for that candidate to have received the most votes in a given area. Upon calculating the Z-scores (at the $p = 0.05$ level) for each data sample, the study then determined the levels of autocorrelation in Virginia voting results at each of the three different scales. Using the program GeoDa, this research performed a univariate analysis of the election winners within each precinct, county, and legislative district included in the study. This process yielded Moran's i scores for each different level of analysis, thus providing a measure of autocorrelation for electoral patterns in Virginia.

3.4 Results

3.4.1 Election Outcomes

The statewide results for each of the eight elections included in the study are as follows: in 2003, twenty-four Republicans and sixteen Democrats won seats to the Senate of Virginia (Maps 3.1.1, 3.1.2, and 3.1.3); in the United States presidential election of 2004, George W. Bush defeated John Kerry for Virginia's thirteen electoral votes (Maps 3.2.1, 3.2.2, and 3.2.3); in 2005, Democrat Tim Kaine won the Virginia gubernatorial election (Maps 3.3.1, 3.3.2, and 3.3.3), while Republicans Bill Bolling and Bob McDonnell won the elections for Lieutenant Governor (Maps 3.4.1, 3.4.2, and 3.4.3) and Attorney General (Maps 3.5.1, 3.5.2, and 3.5.3) respectively; also in 2005, fifty-eight Republicans, thirty-nine Democrats, and three Independents gained seats within the

Virginia House of Delegates (Maps 3.6.1, 3.6.2, and 3.6.3); in 2006, Democrat Jim Webb earned a seat in the United States Senate (Maps 3.7.1, 3.7.2, and 3.7.3); and also in 2006, eight Republicans and three Democrats won elections to the United States House of Representatives (Maps 3.8.1, 3.8.2, and 3.8.3). Table 3.1 lists the detailed results for each of these elections.

3.4.2 Voting Results by Area

This research tabulated the results of each election for all legislative districts, counties, and precincts in Virginia. In doing so, the study determined the numbers of geographic units won by each individual candidate. These counts, which appear in Table 3.2, reveal a number of inconsistencies in the allotment of votes among the various regions. Specifically, there are several cases in which the number of areas won by a candidate is significantly out of proportion with his or her share of the popular vote. This trend is most evident in the results of the elections for the United States President (Maps 3.2.1, 3.2.2, and 3.2.3), the Lieutenant Governor of Virginia (Maps 3.4.1, 3.4.2, and 3.4.3), the Attorney General of Virginia (Maps 3.5.1, 3.5.2, and 3.5.3), and the United States Senate (Maps 3.7.1, 3.7.2, and 3.7.3). In each of these cases, the Republican candidate won a greater percentage of areas than the statewide vote totals would have predicted. The results of the election for the Governor of Virginia (Maps 3.3.1, 3.3.2, and 3.3.3) also seem to reflect this trend, albeit to a much lesser degree. By contrast, the electoral maps for the Senate of Virginia (Maps 3.1.1, 3.1.2, and 3.1.3), the Virginia House of Delegates (Maps 3.6.1, 3.6.2, and 3.6.3), and the United States House of Representatives (Maps 3.8.1, 3.8.2, and 3.8.3) each show a more proportional allotment

of votes among the different parts of the state. Overall, one can surmise that the base of support for the Republican Party is more regional in nature, while the Democratic Party is stronger in localities with high population densities. These observations also suggest that people in Virginia tend to vote in accordance with their class interests in representative elections, while they appear to support the sectional interests of their surrounding area in elections involving the entire state. Since representative elections only involve small portions of the state, it follows that sectional influences would not manifest themselves at those smaller levels as they would in elections involving larger areas.

3.4.3 Joins Counts

Table 3.3 shows the number of occurrences in which regions favoring a certain candidate are adjacent to other areas that supported the same or another candidate. The table lists separate counts for the rook's case and the queen's case, considering how some political units meet only at individual points. In nearly every case, there were more joins between Republican areas than there were other types of joins, due to the fact that many geographic units favored a Republican candidate. This pattern is readily apparent in Maps 3.2.3, 3.4.3, 3.5.3, and 3.7.3, which show the precinct results for various statewide elections. However, there were relatively few joins between areas where people voted for candidates from opposing parties. This observation suggests that people with similar voting habits tend to concentrate together in places that are geographically distant from areas where people vote in a different manner. In particular, Maps 3.1.3, 3.3.3, 3.6.3, and 3.8.3 indicate the presence of distinct voting blocs which exist throughout the state.

3.4.4 Measures of Spatial Autocorrelation

In order to measure the level of autocorrelation between areas with similar voting records, this study first calculated the expected values (Table 3.4) and standard deviations (Table 3.5) for each of the different joins counts. These figures assume that the number of areas won by a candidate will be proportional to his or her share of the popular vote in a given election. This research determined the distributions of joins that would occur for each election if the spatial patterns of voting were totally random, using the following formulas provided by O'Sullivan and Unwin (2003):

$$E(J_{BB}) = kp^2_B$$

$$E(J_{WW}) = kp^2_W$$

$$E(J_{BW}) = 2kp_Bp_W$$

$$E(s_{BB}) = \sqrt{(kp^2_B + 2mp^3_B - (k + 2m)p^4_B)}$$

$$E(s_{WW}) = \sqrt{(kp^2_W + 2mp^3_W - (k + 2m)p^4_W)}$$

$$E(s_{BW}) = \sqrt{(2(k + m)p_Bp_W - 4(k + 2m)p^2_Bp^2_W)}$$

$$m = 0.5\sum k_i(k_i - 1)$$

where k is the sum of all joins within a given map, p_B and p_W are the probabilities of an area voting for candidates B and W, and k_i is the number of joins to the ith area. Upon gathering this information, the study then converted the joins data into standard scores, using the formula

$$Z = (X-\mu)/\sigma$$

where X is the actual number of joins of a given type, μ is the expected number of those joins, and σ is the expected standard deviation of the probability distribution for that particular join type. The resulting Z-scores, which appear in Table 3.6, represent the

statistical significance of the raw joins counts listed in Table 3.3. Finally, the study exported the original area shapefiles from ArcMap, which were at this point joined with the election data tables. By creating contiguity-based spatial weights in GeoDa, this research was able to measure the level of autocorrelation in the electoral patterns of each different area. Table 3.7 lists the Moran's i values for each election at the district, county, and precinct levels.

From looking at the table of autocorrelation scores, the value of Moran's i for a given election is close to 0 at the district level, and gradually approaches +1 as one moves down in scale to the county and precinct levels. This trend indicates that smaller areal units are much more likely to exhibit positive spatial autocorrelation in terms of their respective voting patterns. Since there are a greater number of joins between precincts than between counties or districts, it follows that there are also more data observations from which to obtain a high Moran's i value. Indeed, the degree of autocorrelation appears to be greater in the voting patterns of precincts (Maps 3.1.3, 3.2.3, 3.3.3, 3.4.3, 3.5.3, 3.6.3, 3.7.3, and 3.8.3) than in those of counties (Maps 3.1.2, 3.2.2, 3.3.2, 3.4.2, 3.5.2, 3.6.2, 3.7.2, and 3.8.2) or districts (Maps 3.1.1, 3.2.1, 3.3.1, 3.4.1, 3.5.1, 3.6.1, 3.7.1, 3.8.1). Thus, there is evidence to support the idea that different patterns of voting arise from different geographic scales. Altogether, the data suggest that there is positive autocorrelation in Virginia voting patterns, an effect that is most pronounced at the local scale.

3.5 Discussion

3.5.1 Geography of Voting

The electoral maps included in this research each reveal a certain spatial pattern in the voting habits of Virginians. These maps display the regional bases of support for the Republican and Democratic Parties, reflecting the political dominance of these parties throughout the state. The overall electoral trend appears to be consistent with the class cleavage theory promoted by Lipset and Rokkan (1967), while it also seems to agree with the sectional model suggested by Johnston (2005). Here, social cleavages such as those between rich and poor, black and white, and urban and rural each impel voters to favor one party over another. Since people with common socioeconomic traits generally live in the same areas, it follows that these individuals would support the same candidates in an election. Thus, there is a strong sectional component to the class cleavage voting model, as evidenced by the appearance of voting blocs in the electoral maps of Virginia. These observations indicate that different social and economic classes tend to settle in different regions, meaning that both models are applicable to voting in Virginia. Further study of the census attributes of Virginia voting districts may help determine the extent to which class and location influence voting behavior.

One of the primary assumptions of this research is that people will only vote for candidates whose political agendas are consistent with their own personal views. The act of voting thus serves to operationalize the way an individual may regard a certain issue or multitude of issues. While the electoral maps do not explain the reasons people voted the way they did, the comparison of geographic scales helps to relate the spatial variability in the factors that impact voting. Clearly, the clustering of counties and precincts that voted along party lines provides visual evidence of the various social cleavages that exist in Virginia. By looking at these divisions in terms of multiple scales, one can explore how

the characteristics of different areas might influence the ways that people view politics. In addition, the election outcomes suggest that certain Virginians tend to favor different types of candidates for different offices. As the maps demonstrate, areas that typically vote for one party in a presidential election may often support another party in a regional or state election. For example, Maps 3.8.1, 3.8.2, and 3.8.3 show that Southwest Virginia residents favor a Democratic candidate in the United States House of Representatives, while Maps 3.2.1, 3.3.1, 3.4.1, 3.5.1, and 3.7.1 indicate that the region tends to vote Republican in other statewide elections. There is also much spatial variability in the results of elections to the Senate of Virginia (Maps 3.1.1, 3.1.2, and 3.1.3) and Virginia House of Delegates (Maps 3.6.1, 3.6.2, 3.6.3), as opposed to the relative uniformity in the results of other types of elections. These trends suggest that party affiliation is less of a mobilizing factor in local and regional elections than it is for elections that occur at the state or national level.

3.5.2 Geographical Influences in Voting

The autocorrelation data obtained from the study highlight a number of influences on voting in Virginia. In particular, the joins counts (Table 3.3) and Moran's i values (Table 3.7) indicate that people in local communities generally vote in unison, while broader regions tend to be much more politically diverse. This observation is pertinent to both the class cleavage and sectional voting models, as members of the same social class may come to develop regional perspectives by sharing information and ideas with one another. The data thus agree with the basic premise of the "neighborhood effect," which finds that the interactions of individuals in close-knit areas can motivate these people to

vote for the same candidates in an election (Gimpel and Lay 2004; Johnston et al. 2004). As evidenced by the high numbers of joins between precincts won by the same party, the established patterns of voting in an area appear to influence the voting decisions of individuals in those areas. The data also reflect how the interests of one part of the state may often be considerably different from those of another region. In accordance with the sectional model, people who live in the same area might vote unanimously to support or oppose an agenda that would have a certain impact on their community. Yet the maps show that there are substantial pockets of support for either party, implying that there is much disagreement among classes over a number of issues. Thus, critical topics are a major source of electoral cleavage in Virginia, as implied by the positive autocorrelation in the joins data.

Evaluating the countless influences that impact voting behavior is a task that goes well beyond the context of this research. Rather, it is more practical to characterize these spatial processes in terms of the geographic scales on which they occur. According to the autocorrelation tables, the level of contiguity between areas with similar voting records is highest at the local scale. This trend reflects how personal networks and local media tend to screen information about issues and candidates, leading many people to side with the locally dominant party. However, the idea of the neighborhood effect does not take into account the presence of minority factions within partisan communities. Since there are many instances where much of the population voted against the overall trend of the surrounding area, it follows that there are certain influences in voting which transcend political boundaries. The joins tables show a general lack of correlation in the voting patterns of large districts, meaning that people in different regions may be just as likely to

support the same candidates in an election as they would be to favor opposing candidates. Thus the issue of scale serves as a window for comprehending how space and propinquity may impact the decision on how to vote in an election.

3.5.3 Geography of Representation

In mapping the results of different elections in Virginia, this research sheds light on the concept of voter representation. The electoral maps depict the leading vote getters for each county, precinct, and legislative district, while Table 3.1 presents the statewide totals for each candidate. In all cases, candidates win elections by receiving a plurality of votes from either the entire state or a specific district within the state. While this process is generally fair and equitable to all Virginia citizens, there are a number of points to note about the tabulation of votes per each of the state's electoral regions. The maps and data tables suggest that certain parts of Virginia are hotly contested among parties, while other areas are more politically homogeneous. Thus, the outcomes of state elections tend to ride on those areas where people are equally likely to vote for any one of the leading candidates. The locations of district boundaries may also have a direct influence on the results of legislative elections in Virginia. Since each district elects one member to represent it in office, the inclusion of certain geographic areas within a given district can impact its overall electoral trend. This idea is apparent in Maps 3.1.1, 3.6.1, 3.8.1, and Table 3.2, which show the partisan breakdown of seats in the Senate of Virginia, the Virginia House of Delegates, and the United States House of Representatives.

The basic principle behind voter representation is that a legislative body ought to give adequate voice to the concerns of its electorate. Yet this research demonstrates that

the translation of votes into seats can be very problematic for sovereign areas that have multiple types of electoral regions. Here, the issue of scale poses a challenge to the fair allotment of political offices among the voting population. From looking at the different electoral maps, there is an obvious relationship between the size and location of an areal unit and its observed voting trend. Namely, the maps reveal several instances where an individual county or precinct voted against the overall trend of the representative district within which it lies. This circumstance reflects the arbitrary nature of district boundaries, illustrating how voting patterns tend to vary across different spatial scales. The data also suggest that smaller geographic units tend to be less competitive in elections than larger ones. Thus, counties (Maps 3.1.2, 3.6.2, and 3.8.2) or precincts (Maps 3.1.3, 3.6.3, and 3.8.3) could form an alternative basis for the allocation of government seats among the various regions of Virginia.

3.5.4 Further Research

The issue of scale is a very complex aspect of geographic research, and thus there remain a number of questions regarding its precise role within the study of elections. In particular, the spatial patterns of voting within a given region could have much to do with the distribution of voters who belong to a certain social or economic class. By measuring the correlation between voting and other variables at different scales, future studies can help to further explain how spatial contexts may affect voting behavior. While this particular study focuses on the electoral patterns that prevail throughout the state of Virginia, there are numerous other contexts from which to examine voting and elections. For example, studies that focus on individual counties or districts might yield very

different results regarding the level of autocorrelation in the voting habits of people. In addition, there are alternate methods to the joins test which may be more effective at displaying the autocorrelation present in electoral patterns. For example, future studies might take into consideration the lengths of borders between adjacent geographic units, as well as the presence of natural barriers.

3.6 Conclusion

The concept of scale presents a unique perspective for exploring the influence of geography on voting and elections. By relating how regional processes and local events influence one another, scale helps to link together studies from distinct areas of interest within the field. In particular, researchers can better comprehend the spatial patterns of voting by studying how social and economic stimuli move across different scales. This insight may help to predict how different places will respond to initiatives that originate at various levels of government. In turn, the identification of local and regional voting blocs can assist in improving how legislative bodies represent people in different parts of a state or country. Thus, the concept of scale can give structure to the study of voting patterns, thereby allowing researchers to develop more sound conclusions regarding the spatial effects of elections.

Overall, the results of this study demonstrate that location and propinquity are key factors which impact voting patterns in Virginia. This assertion supports both the class cleavage and sectional voting models, as each of these perspectives relates to the social production of geographic space. In addition, the juxtaposition of scales provides many outlets for observing how the spatial context of an area may influence the political views

of Virginia citizens. By assessing the spatial autocorrelation in the major social variables that can affect voting, further research will help to more fully understand the role of scale in electoral geography.

3.7 Acknowledgments

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Chapter 3 Tables

Table 3.1 Statewide election outcomes, with vote totals and percentages per candidate

Year	Office	Party	Candidate	Votes	Percent
2003	Senate of Virginia	Republican	N/A*	615991	55.77
		Democrat	N/A*	456236	41.30
		Independent	N/A*	24845	2.25
		Write Ins	N/A*	7505	0.68
2004	President of the United States	Republican	George W. Bush	1716959	53.68
		Democrat	John Kerry	1454742	45.48
		Libertarian	Michael Badnarik	11032	0.34
		Constitution	Michael Peroutka	10161	0.32
		Write Ins	N/A*	5473	0.17
2005	Governor of Virginia	Democrat	Tim Kaine	1025942	51.72
		Republican	Jerry Kilgore	912327	45.99
		Independent	Russ Potts	43953	2.22
		Write Ins	N/A*	1556	0.08
2005	Lieutenant Governor of Virginia	Republican	Bill Bolling	979265	50.47
		Democrat	Leslie Byrne	956906	49.32
		Write Ins	N/A*	4065	0.21
2005	Attorney General of Virginia	Republican	Bob McDonnell	970886	49.96
		Democrat	Creigh Deeds	970563	49.95
		Write Ins	N/A*	1801	0.09
2005	Virginia House of Delegates	Republican	N/A*	979280	56.11
		Democrat	N/A*	641029	36.73
		Independent	N/A*	83910	4.81
		Libertarian	N/A*	11307	0.65
		Constitutional	N/A*	4961	0.28
		Independent Green	N/A*	1665	0.10
		Write Ins	N/A*	23076	1.32
2006	United States Senate	Democrat	Jim Webb	1175606	49.59
		Republican	George Allen	1166277	49.20
		Independent Green	Gail Parker	26102	1.10
		Write Ins	N/A*	2460	0.10
2006	United States House of Representatives	Republican	N/A*	1222790	53.23
		Democrat	N/A*	947103	41.23
		Independent	N/A*	65254	2.84
		Independent Green	N/A*	50457	2.20
		Libertarian	N/A*	2107	0.09
		Write Ins	N/A*	9525	0.41

*Note: N/A indicates that there are multiple candidates within a particular party.

Data Source: Virginia State Board of Elections

Table 3.2 Numbers of legislative districts, counties, and precincts won by each candidate

Year	Office	Party	Candidate	Districts Won	Counties Won	Precincts Won
2003	Senate of Virginia	Republican	N/A*	24	113	1330
		Democrat	N/A*	16	83	954
		Independent	N/A*	0	0	2
		Write Ins	N/A*	0	0	0
2004	President of the United States	Republican	George W. Bush	9	102	1532
		Democrat	John Kerry	2	32	757
		Libertarian	Michael Badnarik	0	0	0
		Constitution	Michael Peroutka	0	0	0
		Write Ins	N/A*	0	0	0
2005	Governor of Virginia	Democrat	Tim Kaine	6	57	1125
		Republican	Jerry Kilgore	5	77	1166
		Independent	Russ Potts	0	0	0
		Write Ins	N/A*	0	0	0
2005	Lieutenant Governor of Virginia	Republican	Bill Bolling	8	95	1336
		Democrat	Leslie Byrne	3	39	958
		Write Ins	N/A*	0	0	0
2005	Attorney General of Virginia	Republican	Bob McDonnell	8	84	1286
		Democrat	Creigh Deeds	3	50	1004
		Write Ins	N/A*	0	0	0
2005	Virginia House of Delegates	Republican	N/A*	58	151	1334
		Democrat	N/A*	39	98	902
		Independent	N/A*	3	11	86
		Libertarian	N/A*	0	0	0
		Constitutional	N/A*	0	0	0
		Independent Green	N/A*	0	0	0
		Write Ins	N/A*	0	0	0
2006	United States Senate	Democrat	Jim Webb	4	41	979
		Republican	George Allen	7	93	1324
		Independent Green	Gail Parker	0	0	0
		Write Ins	N/A*	0	0	0
2006	United States House of Representatives	Republican	N/A*	8	106	1413
		Democrat	N/A*	3	49	879
		Independent	N/A*	0	0	5
		Independent Green	N/A*	0	0	6
		Libertarian	N/A*	0	0	0
		Write Ins	N/A*	0	0	0

These figures include those counties and precincts that are split by a legislative district boundary, with the table listing each subdivided unit as an individual county or precinct.

*Note: N/A indicates that there are multiple candidates within a particular party.

Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services

Table 3.3 Numbers and types of joins between adjacent areas

			Rook's case			Queen's case		
Year	Office	Join Type	District Joins	County Joins	Precinct Joins	District Joins	County Joins	Precinct Joins
2003	Senate of Virginia	R-R	31	202	3191	33	212	3403
		R-D	49	164	1000	51	172	1133
		R-I	0	0	7	0	0	8
		D-D	15	128	2177	15	129	2347
		I-I	0	0	1	0	0	1
2004	President of the United States	Bush-Bush	16	210	3650	16	216	3881
		Bush-Kerry	6	76	1322	6	78	1458
		Kerry-Kerry	0	20	1412	0	22	1561
2005	Governor of Virginia	Kaine-Kaine	4	50	2327	4	53	2578
		Kaine-Kilgore	13	122	1522	13	126	1657
		Kilgore-Kilgore	5	134	2529	5	137	2661
2005	Lieutenant Governor of Virginia	Bolling-Bolling	14	177	3062	14	183	3235
		Bolling-Byrne	7	105	1419	7	107	1559
		Byrne-Byrne	1	24	1906	1	26	2111
2005	Attorney General of Virginia	McDonnell-McDonnell	14	151	2862	14	157	3036
		McDonnell-Deeds	7	116	1518	7	118	1670
		Deeds-Deeds	1	39	1984	1	41	2172
2005	Virginia House of Delegates	R-R	103	296	3211	105	301	3412
		R-D	80	187	972	80	194	1101
		R-I	19	37	137	20	37	147
		D-D	59	152	1966	59	155	2136
		D-I	4	6	28	4	6	36
		I-I	0	12	165	0	12	173
2006	United States Senate	Webb-Webb	3	29	2003	3	31	2225
		Webb-Allen	8	102	1368	8	104	1490
		Allen-Allen	11	175	3048	11	181	3225
2006	United States House of Representatives	R-R	14	218	3508	14	224	3743
		R-D	8	80	928	8	82	1046
		R-I	0	0	14	0	0	14
		R-G	0	0	28	0	0	31
		D-D	0	75	1937	0	77	2099
		D-G	0	0	4	0	0	5
		I-I	0	0	6	0	0	6
		G-G	0	0	1	0	0	1

The table omits those join types for which there were no joins. R=Republican; D=Democrat; I=Independent; G=Independent Green.

Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services

Table 3.4 Expected numbers and types of joins between adjacent areas, under an independent random process

			Rook's case			Queen's case		
Year	Office	Join Type	District Joins	County Joins	Precinct Joins	District Joins	County Joins	Precinct Joins
2003	Senate of Virginia	R-R	29.54	153.63	1987.27	30.79	159.54	2148.37
		R-D	43.76	227.58	2943.76	45.61	236.33	3182.40
		R-I	2.38	12.39	160.31	2.48	12.87	173.30
		D-D	16.21	84.28	1090.15	16.89	87.52	1178.53
		I-I	0.05	0.25	3.23	0.05	0.26	3.49
2004	President of the United States	Bush-Bush	6.34	88.18	1842.62	6.34	91.06	1991.32
		Bush-Kerry	10.74	149.43	3122.42	10.74	154.31	3374.41
		Kerry-Kerry	4.55	63.30	1322.78	4.55	65.37	1429.53
2005	Governor of Virginia	Kaine-Kaine	5.88	81.84	1715.49	5.88	84.52	1854.30
		Kaine-Kilgore	10.47	145.56	3051.03	10.47	150.32	3297.91
		Kilgore-Kilgore	4.65	64.72	1356.58	4.65	66.83	1466.34
2005	Lieutenant Governor of Virginia	Bolling-Bolling	5.60	77.95	1633.88	5.60	80.50	1766.09
		Bolling-Byrne	10.95	152.34	3193.15	10.95	157.32	3451.53
		Byrne-Byrne	5.35	74.43	1560.12	5.35	76.86	1686.36
2005	Attorney General of Virginia	McDonnell-McDonnell	5.49	76.38	1601.06	5.49	78.88	1730.61
		McDonnell-Deeds	10.98	152.72	3201.06	10.98	157.71	3460.08
		Deeds-Deeds	5.49	76.33	1600.00	5.49	78.83	1729.46
2005	Virginia House of Delegates	R-R	83.44	217.25	2044.66	84.38	221.97	2210.91
		R-D	109.23	284.42	2676.84	110.47	290.60	2894.48
		R-I	14.30	37.23	350.40	14.46	38.04	378.88
		D-D	35.75	93.09	876.12	36.16	95.11	947.35
		D-I	9.36	24.37	229.37	9.47	24.90	248.01
		I-I	0.61	1.60	15.01	0.62	1.63	16.23
2006	United States Senate	Webb-Webb	5.41	75.26	1582.01	5.41	77.72	1710.16
		Webb-Allen	10.74	149.33	3138.92	10.74	154.21	3393.17
		Allen-Allen	5.33	74.07	1557.00	5.33	76.49	1683.12
2006	United States House of Representatives	R-R	6.23	105.68	1822.38	6.23	108.52	1969.99
		R-D	9.66	163.71	2823.02	9.66	168.10	3051.69
		R-I	0.67	11.28	194.50	0.67	11.58	210.26
		R-G	0.51	8.72	150.40	0.51	8.96	162.58
		D-D	3.74	63.40	1093.27	3.74	65.10	1181.83
		D-G	0.40	6.76	116.49	0.40	6.94	125.92
		I-I	0.02	0.30	5.19	0.02	0.31	5.61
		G-G	0.01	0.18	3.10	0.01	0.18	3.35

These figures assume that there is no autocorrelation between areas favoring the same candidate.
The table omits the expected values for those join types for which there were no joins.
R=Republican; D=Democrat; I=Independent; G=Independent Green.

Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services

Table 3.5 Expected standard deviations in the spatial distribution of joins between adjacent areas

			Rook's case			Queen's case		
Year	Office	Join Type	District Joins	County Joins	Precinct Joins	District Joins	County Joins	Precinct Joins
2003	Senate of Virginia	R-R	9.06	21.94	79.96	9.39	22.79	86.36
		R-D	6.18	14.54	52.67	6.36	14.97	55.93
		R-I	3.45	8.39	30.60	3.58	8.73	33.13
		D-D	6.83	16.50	60.11	7.08	17.13	64.81
		I-I	0.24	0.55	1.99	0.24	0.56	2.09
2004	President of the United States	Bush-Bush	3.92	16.19	77.46	3.92	16.74	83.61
		Bush-Kerry	2.52	9.61	44.39	2.52	9.80	46.58
		Kerry-Kerry	3.38	13.89	66.37	3.38	14.36	71.58
2005	Governor of Virginia	Kaine-Kaine	3.80	15.68	75.12	3.80	16.21	81.07
		Kaine-Kilgore	2.69	10.42	48.57	2.69	10.66	51.30
		Kilgore-Kilgore	3.41	14.05	67.23	3.41	14.52	72.51
2005	Lieutenant Governor of Virginia	Bolling-Bolling	3.72	15.34	73.48	3.72	15.86	79.29
		Bolling-Byrne	2.38	8.92	40.92	2.38	9.07	42.63
		Byrne-Byrne	3.65	15.02	71.93	3.65	15.53	77.60
2005	Attorney General of Virginia	McDonnell-McDonnell	3.69	15.20	72.80	3.69	15.71	78.55
		McDonnell-Deeds	2.36	8.82	40.42	2.36	8.97	42.06
		Deeds-Deeds	3.69	15.20	72.78	3.69	15.71	78.52
2005	Virginia House of Delegates	R-R	15.90	26.50	81.03	16.09	27.09	87.49
		R-D	12.47	20.63	63.12	12.60	21.03	67.58
		R-I	8.62	14.39	43.99	8.72	14.71	47.58
		D-D	10.49	17.44	53.35	10.61	17.82	57.46
		D-I	7.10	11.86	36.26	7.19	12.13	39.23
		I-I	0.94	1.53	4.69	0.94	1.56	4.96
2006	United States Senate	Webb-Webb	3.66	15.10	72.40	3.66	15.61	78.12
		Webb-Allen	2.53	9.63	44.63	2.53	9.83	46.85
		Allen-Allen	3.64	14.99	71.86	3.64	15.49	77.54
2006	United States House of Representatives	R-R	3.90	17.99	77.14	3.90	18.48	83.27
		R-D	3.08	13.64	57.88	3.08	13.95	61.74
		R-I	1.67	7.80	33.52	1.67	8.02	36.28
		R-G	1.48	6.90	29.68	1.48	7.10	32.11
		D-D	3.06	14.05	60.16	3.06	14.42	64.85
		D-G	1.31	6.11	26.25	1.31	6.28	28.41
		I-I	0.15	0.62	2.58	0.15	0.63	2.71
		G-G	0.11	0.47	1.95	0.11	0.47	2.04

The table omits the expected standard deviations for those join types for which there were no joins. R=Republican; D=Democrat; I=Independent; G=Independent Green.

Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services

Table 3.6 Statistical significance of the raw joins counts for each join type

			Rook's case			Queen's case		
Year	Office	Join Type	District Joins	County Joins	Precinct Joins	District Joins	County Joins	Precinct Joins
2003	Senate of Virginia	R-R	0.16	2.20	15.05	0.24	2.30	14.53
		R-D	0.85	-4.37	-36.91	0.85	-4.30	-36.64
		R-I	-0.69	-1.48	-5.01	-0.69	-1.47	-4.99
		D-D	-0.18	2.65	18.08	-0.27	2.42	18.03
		I-I	-0.20	-0.45	-1.12	-0.20	-0.46	-1.19
2004	President of the United States	Bush-Bush	2.46	7.52	23.33	2.46	7.46	22.60
		Bush-Kerry	-1.88	-7.64	-40.56	-1.88	-7.79	-41.14
		Kerry-Kerry	-1.35	-3.12	1.34	-1.35	-3.02	1.84
2005	Governor of Virginia	Kaine-Kaine	-0.50	-2.03	8.14	-0.50	-1.94	8.93
		Kaine-Kilgore	0.94	-2.26	-31.48	0.94	-2.28	-31.98
		Kilgore-Kilgore	0.10	4.93	17.44	0.10	4.83	16.48
2005	Lieutenant Governor of Virginia	Bolling-Bolling	2.26	6.46	19.43	2.26	6.46	18.53
		Bolling-Byrne	-1.66	-5.31	-43.36	-1.66	-5.55	-44.40
		Byrne-Byrne	-1.19	-3.36	4.81	-1.19	-3.28	5.47
2005	Attorney General of Virginia	McDonnell-McDonnell	2.31	4.91	17.32	2.31	4.97	16.62
		McDonnell-Deeds	-1.69	-4.16	-41.64	-1.69	-4.43	-42.56
		Deeds-Deeds	-1.22	-2.46	5.28	-1.22	-2.41	5.64
2005	Virginia House of Delegates	R-R	1.23	2.97	14.39	1.28	2.92	13.73
		R-D	-2.34	-4.72	-27.01	-2.42	-4.59	-26.54
		R-I	0.55	-0.02	-4.85	0.63	-0.07	-4.87
		D-D	2.22	3.38	20.43	2.15	3.36	20.68
		D-I	-0.75	-1.55	-5.55	-0.76	-1.56	-5.40
		I-I	-0.65	6.79	31.96	-0.66	6.67	31.62
2006	United States Senate	Webb-Webb	-0.66	-3.06	5.82	-0.66	-2.99	6.59
		Webb-Allen	-1.08	-4.92	-39.68	-1.08	-5.11	-40.62
		Allen-Allen	1.56	6.73	20.75	1.56	6.75	19.89
2006	United States House of Representatives	R-R	1.99	6.25	21.85	1.99	6.25	21.29
		R-D	-0.54	-6.14	-32.74	-0.54	-6.17	-32.49
		R-I	-0.40	-1.45	-5.38	-0.40	-1.44	-5.41
		R-G	-0.35	-1.26	-4.12	-0.35	-1.26	-4.10
		D-D	-1.22	0.83	14.02	-1.22	0.82	14.14
		D-G	-0.30	-1.11	-4.29	-0.30	-1.10	-4.26
		I-I	-0.12	-0.49	0.31	-0.12	-0.49	0.14
		G-G	-0.10	-0.39	-1.08	-0.10	-0.39	-1.15

These scores reflect the statistical significance of the observed joins counts for each join type, at the probability level p = .05. Large positive or negative scores indicate that the number of instances of a particular join type is unlikely to have occurred by chance. The table omits the Z-scores for those join types for which there were no joins. R=Republican; D=Democrat; I=Independent; G=Independent Green.

Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services

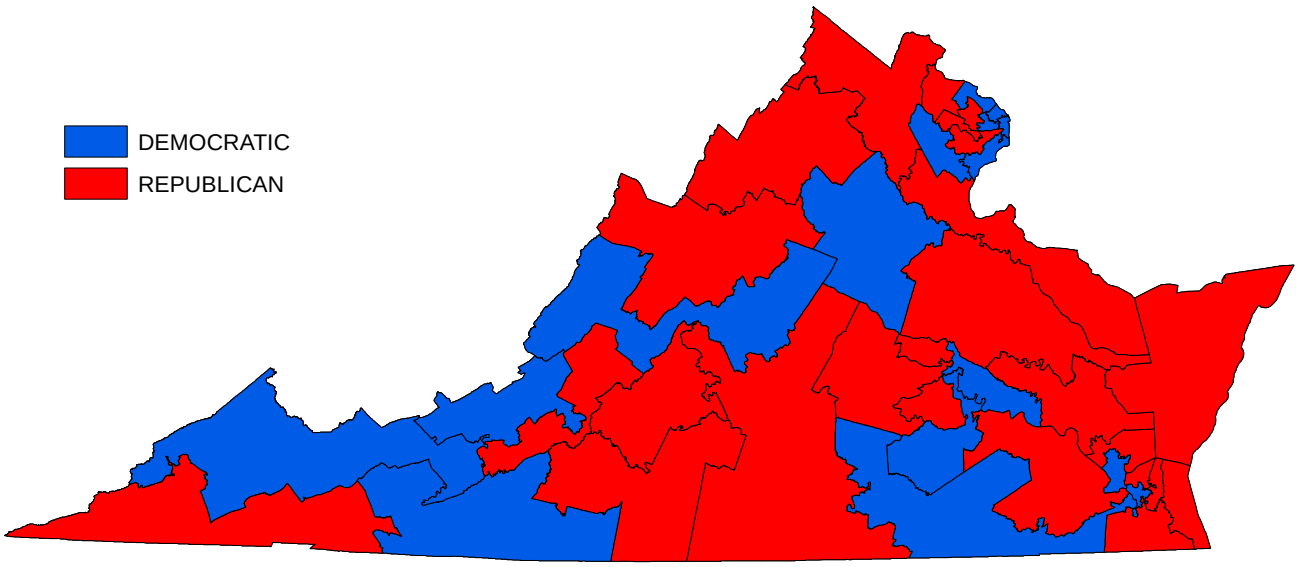
Table 3.7 Autocorrelation scores for each unit of analysis

		Rook's case			Queen's case		
Year	**Office**	**Districts**	**Counties**	**Precincts**	**Districts**	**Counties**	**Precincts**
2003	Senate of Virginia	-0.0123	0.3803	0.6684	-0.0235	0.3691	0.6594
2004	President of the United States	-0.1556	0.2283	0.5171	-0.1556	0.2382	0.5112
2005	Governor of Virginia	-0.1117	0.1373	0.4936	-0.1117	0.1351	0.4884
2005	Lieutenant Governor of Virginia	0.0986	0.1357	0.5132	0.0986	0.1449	0.5080
2005	Attorney General of Virginia	0.0986	0.1760	0.4616	0.0986	0.1849	0.4570
2005	Virginia House of Delegates	0.1400	0.3136	0.6238	0.1402	0.3115	0.6122
2006	United States Senate	0.2857	0.1900	0.5496	0.2857	0.1990	0.5460
2006	United States House of Representatives	-0.2375	0.5624	0.4967	-0.2375	0.5675	0.4886

These scores reflect the level of autocorrelation in the voting patterns of different geographic units in Virginia. Moran's i values that are near 0 indicate that there is no autocorrelation for a given example; conversely, there is strong positive autocorrelation for those cases where a Moran's i value is closer to +1.

Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services

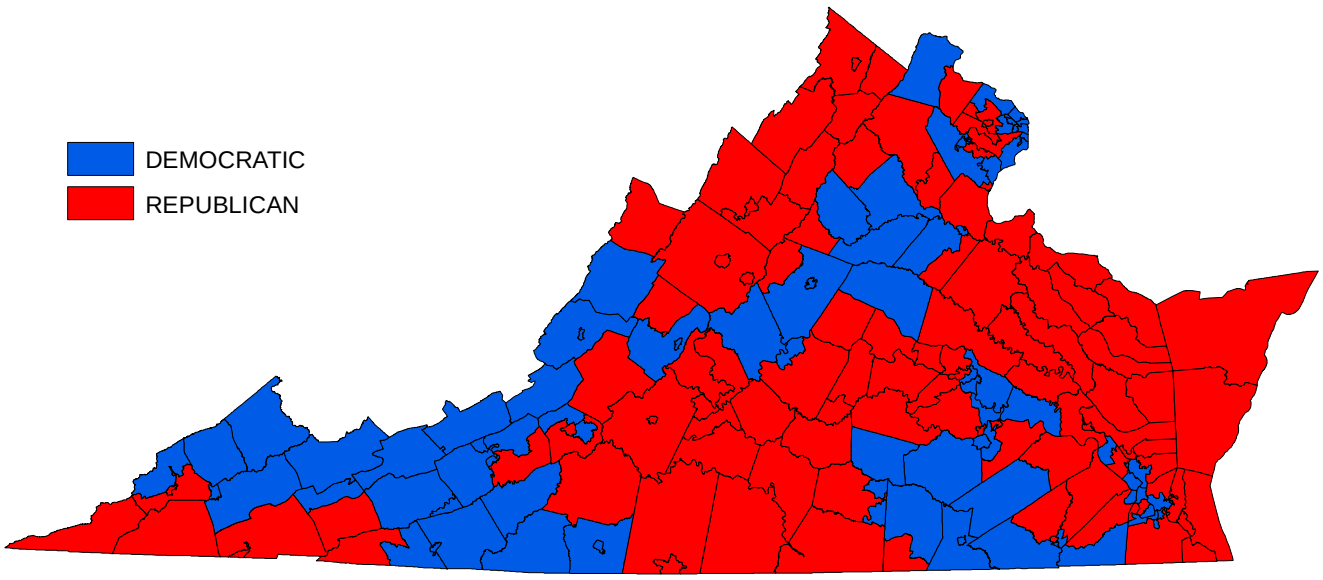
Chapter 3 Maps



Map 3.1.1 2003 Senate of Virginia election results by senate district

Projection: Albers Conic

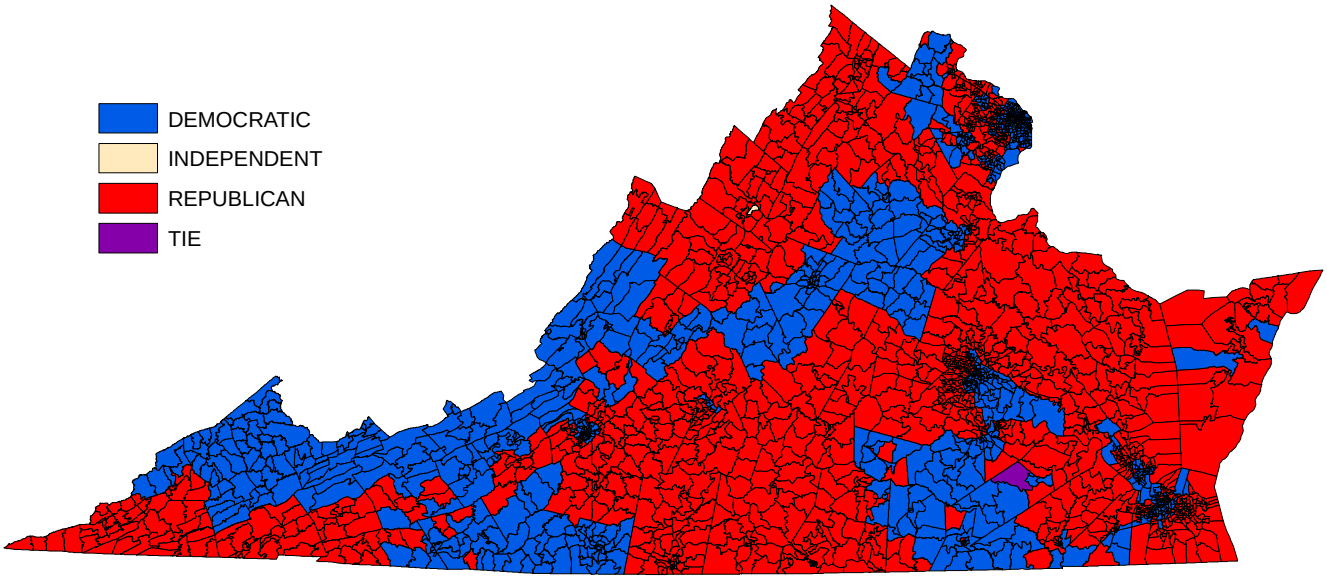
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.1.2 2003 Senate of Virginia election results by county

Projection: Albers Conic

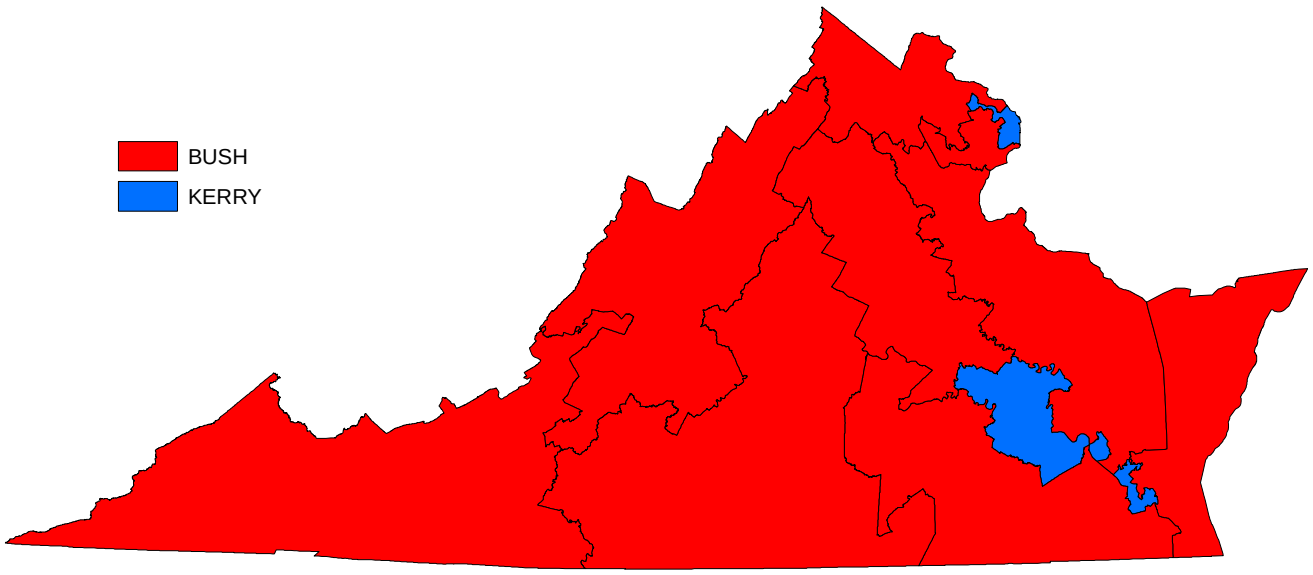
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.1.3 2003 Senate of Virginia election results by precinct

Projection: Albers Conic

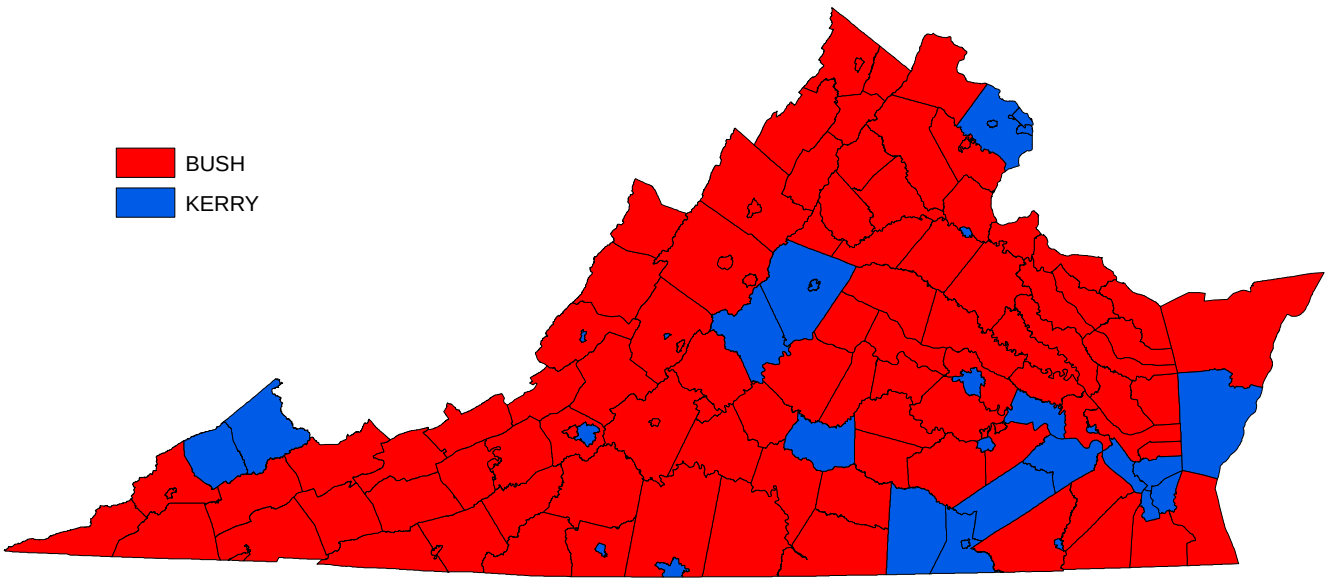
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.2.1 2004 U.S. Presidential election results by Virginia congressional district

Projection: Albers Conic

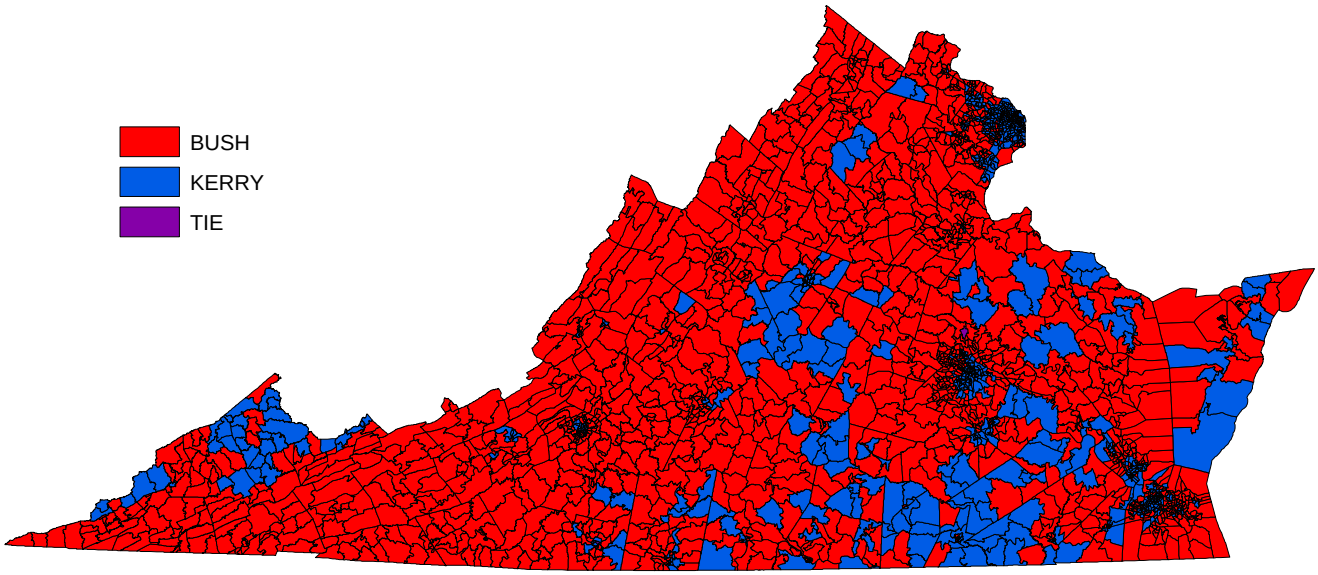
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.2.2 2004 U.S. Presidential election results by Virginia county

Projection: Albers Conic

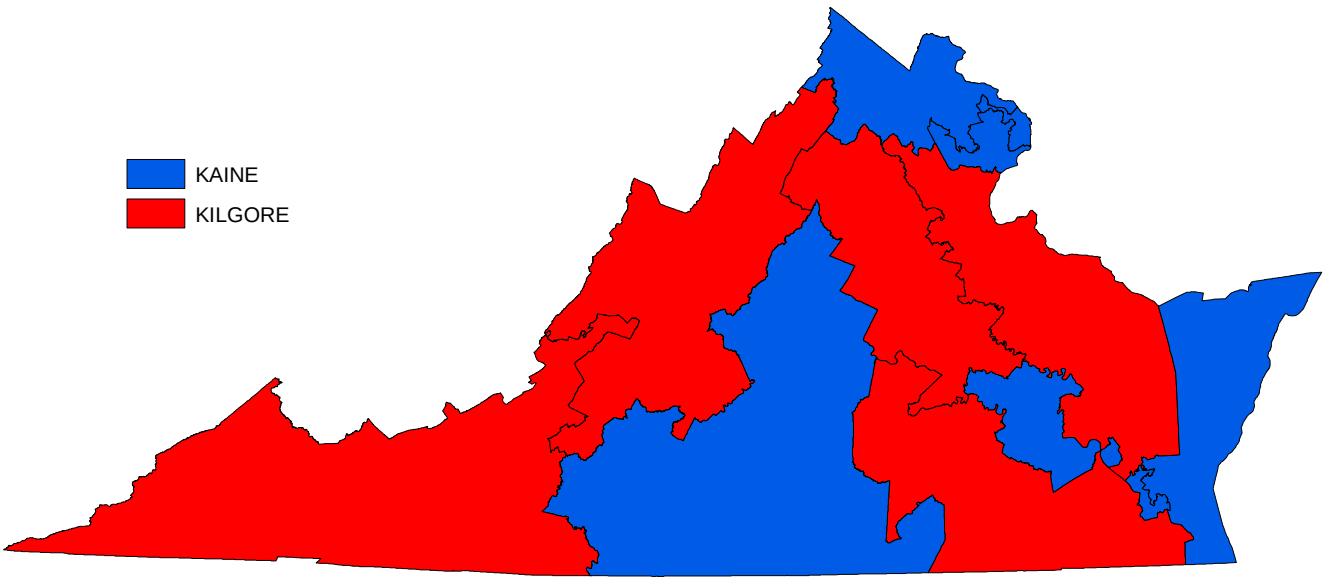
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.2.3 2004 U.S. Presidential election results by Virginia precinct

Projection: Albers Conic

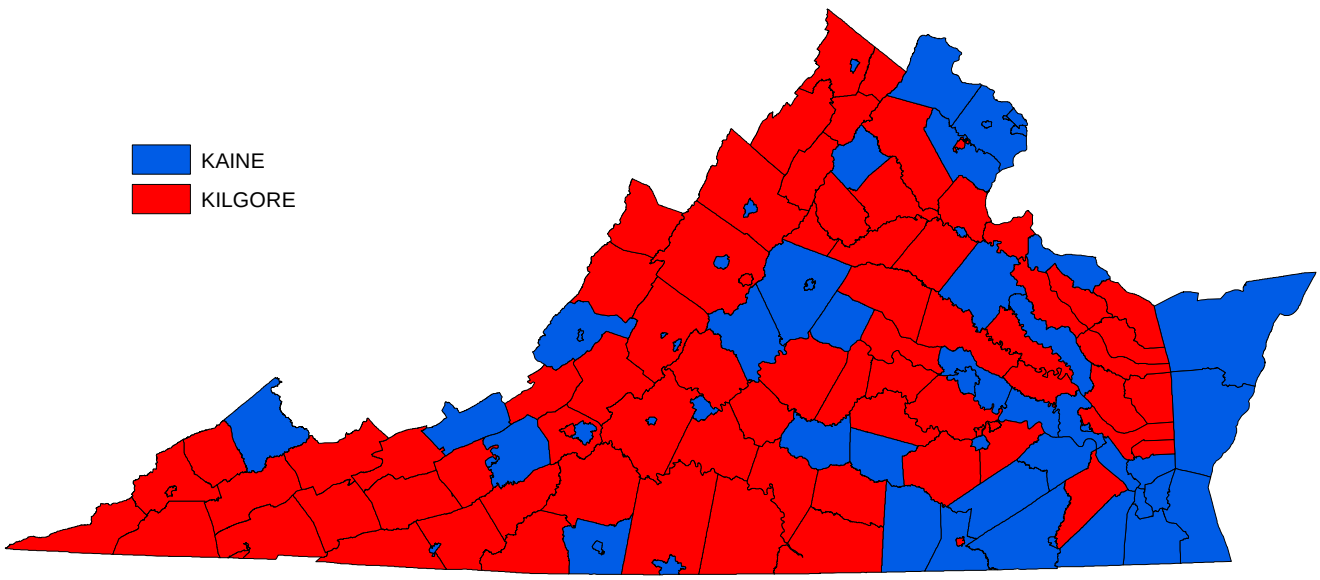
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.3.1 2005 Virginia Gubernatorial election results by congressional district

Projection: Albers Conic

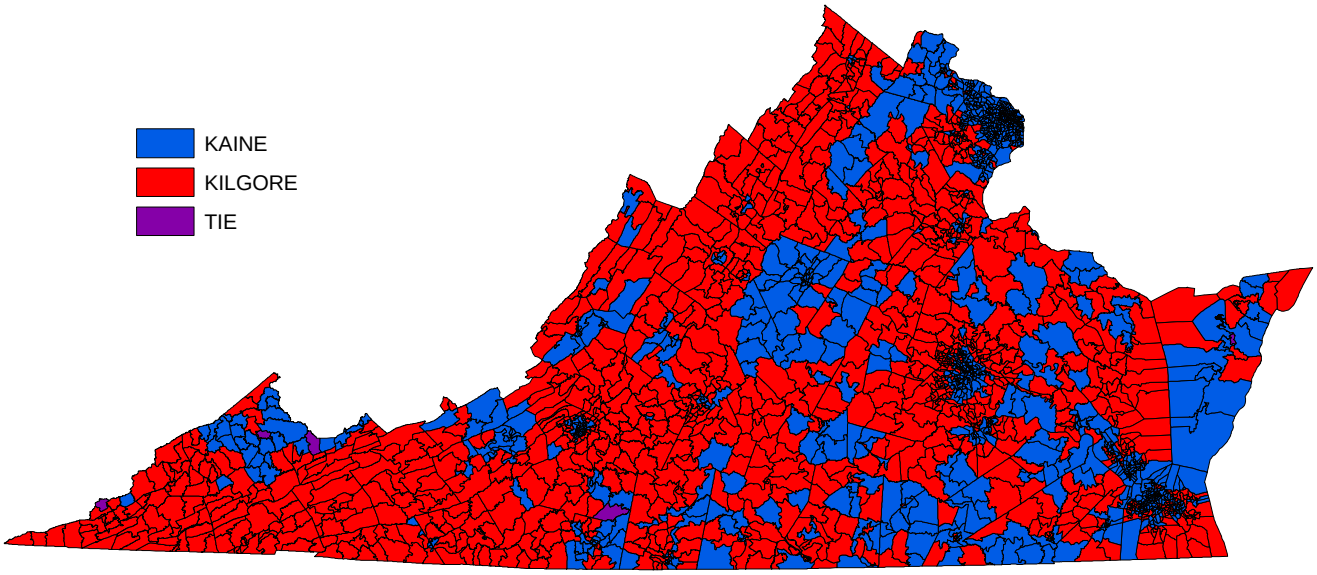
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.3.2 2005 Virginia Gubernatorial election results by county

Projection: Albers Conic

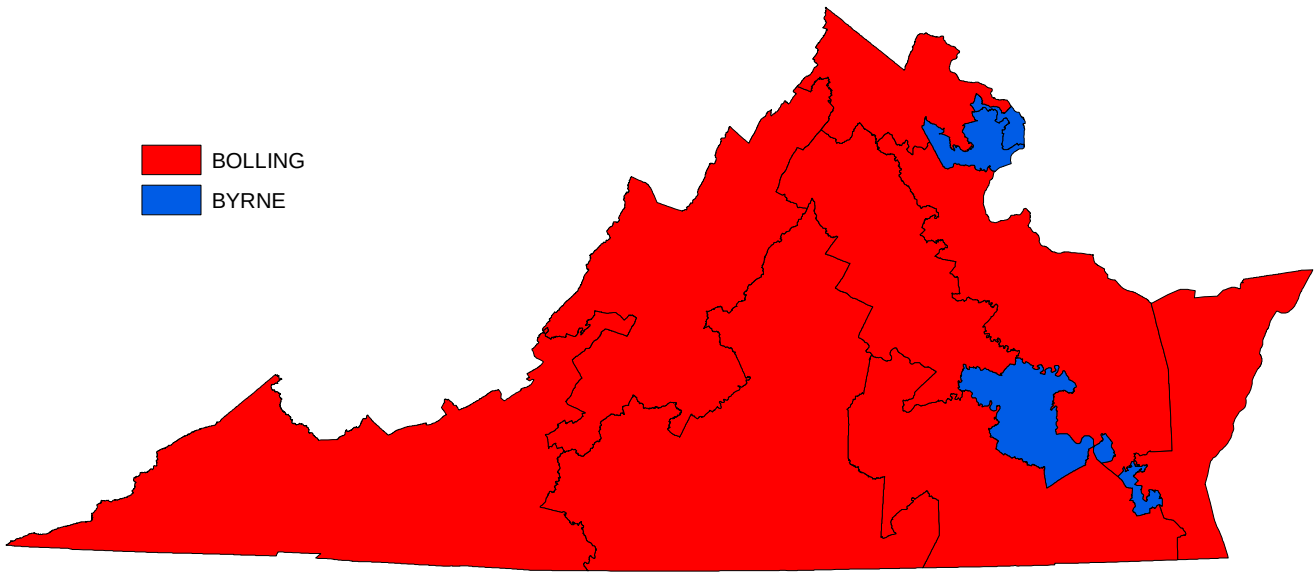
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.3.3 2005 Virginia Gubernatorial election results by precinct

Projection: Albers Conic

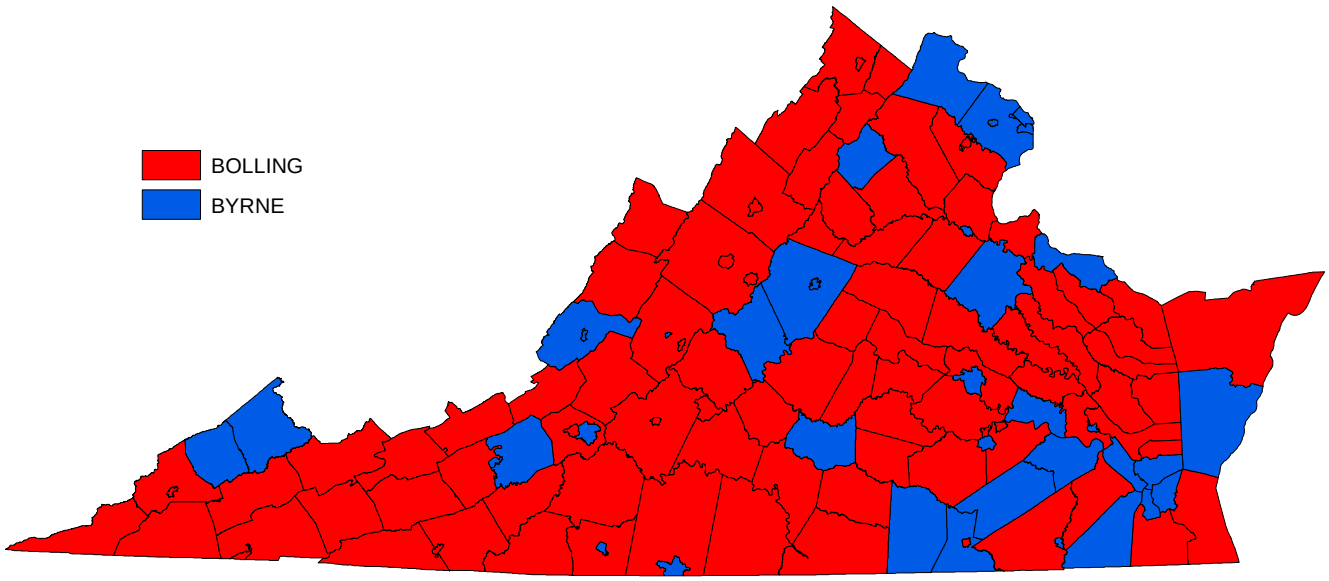
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.4.1 2005 Virginia Lieutenant Gubernatorial election results by congressional district

Projection: Albers Conic

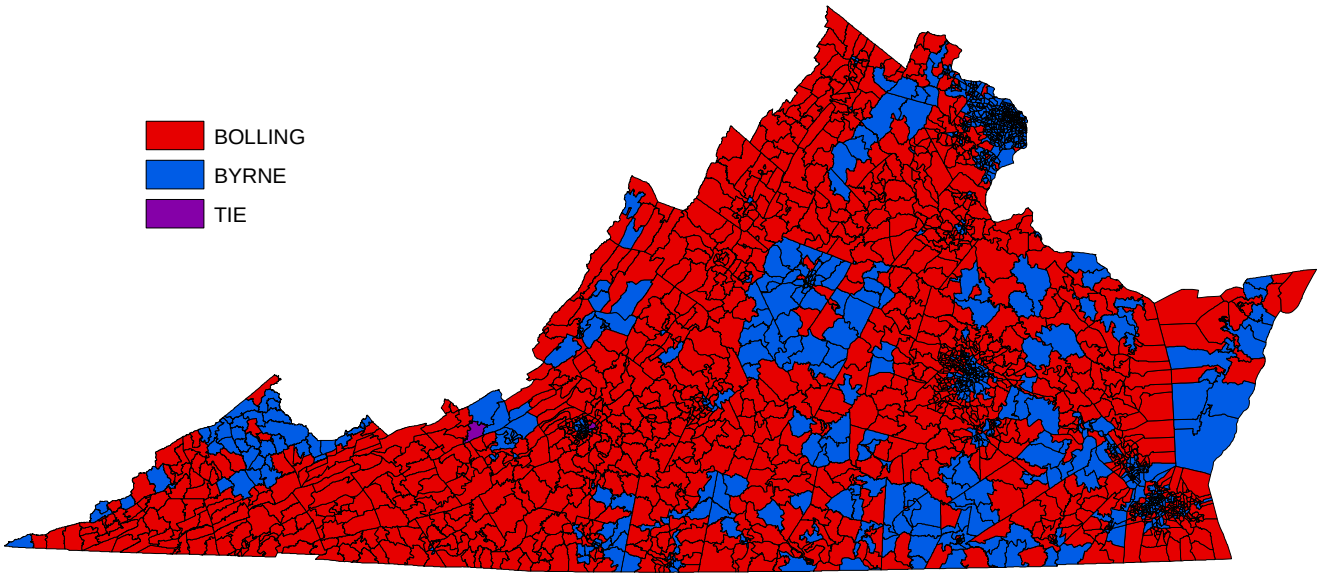
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.4.2 2005 Virginia Lieutenant Gubernatorial election results by county

Projection: Albers Conic

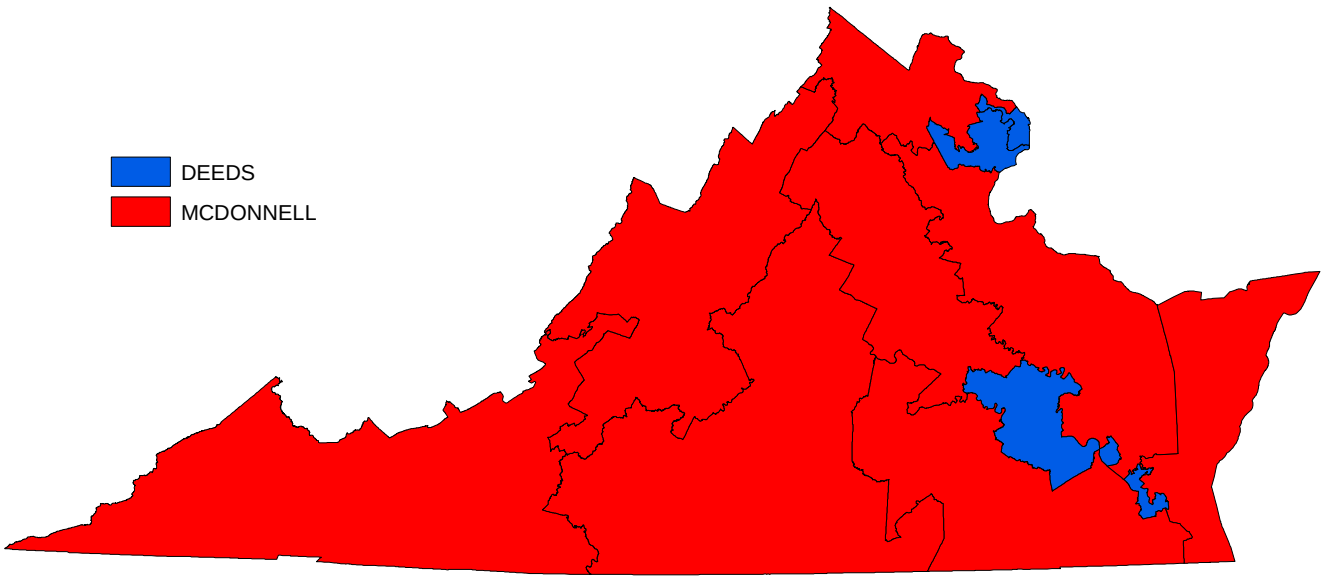
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.4.3 2005 Virginia Lieutenant Gubernatorial election results by precinct

Projection: Albers Conic

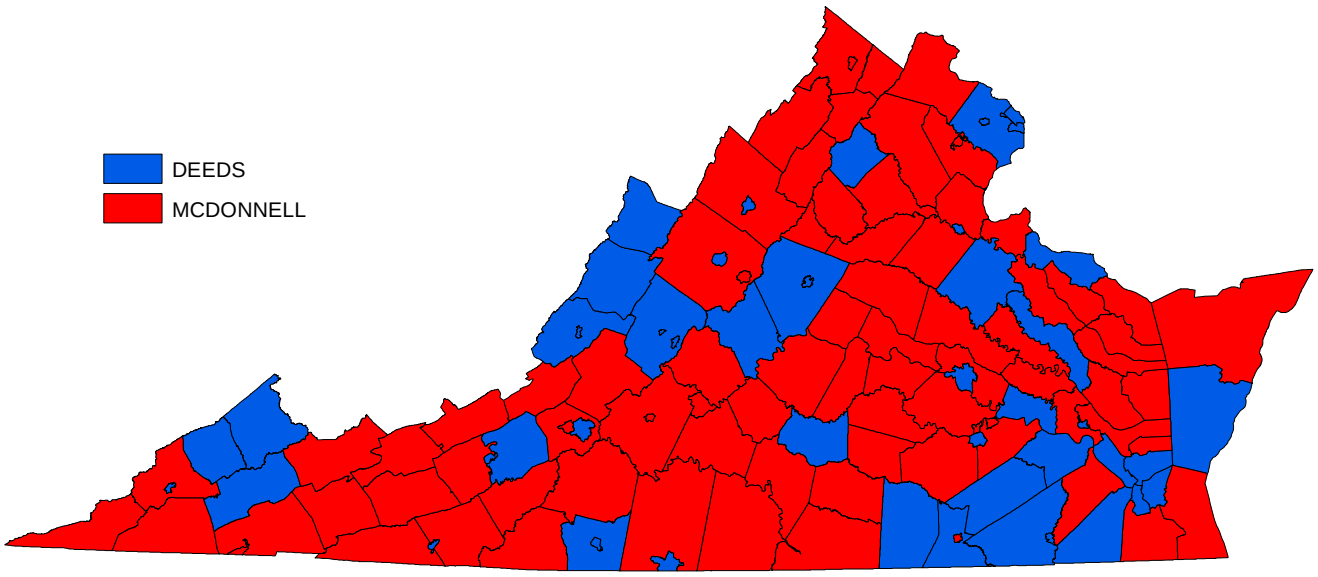
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.5.1 2005 Virginia Attorney General election results by congressional district

Projection: Albers Conic

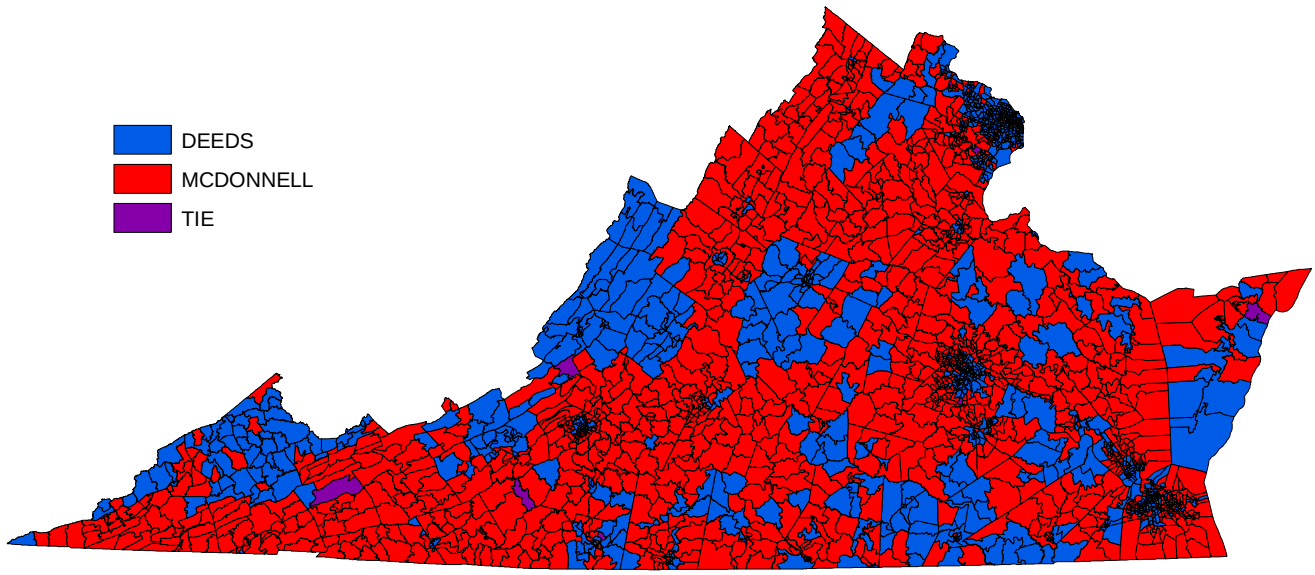
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.5.2 2005 Virginia Attorney General election results by county

Projection: Albers Conic

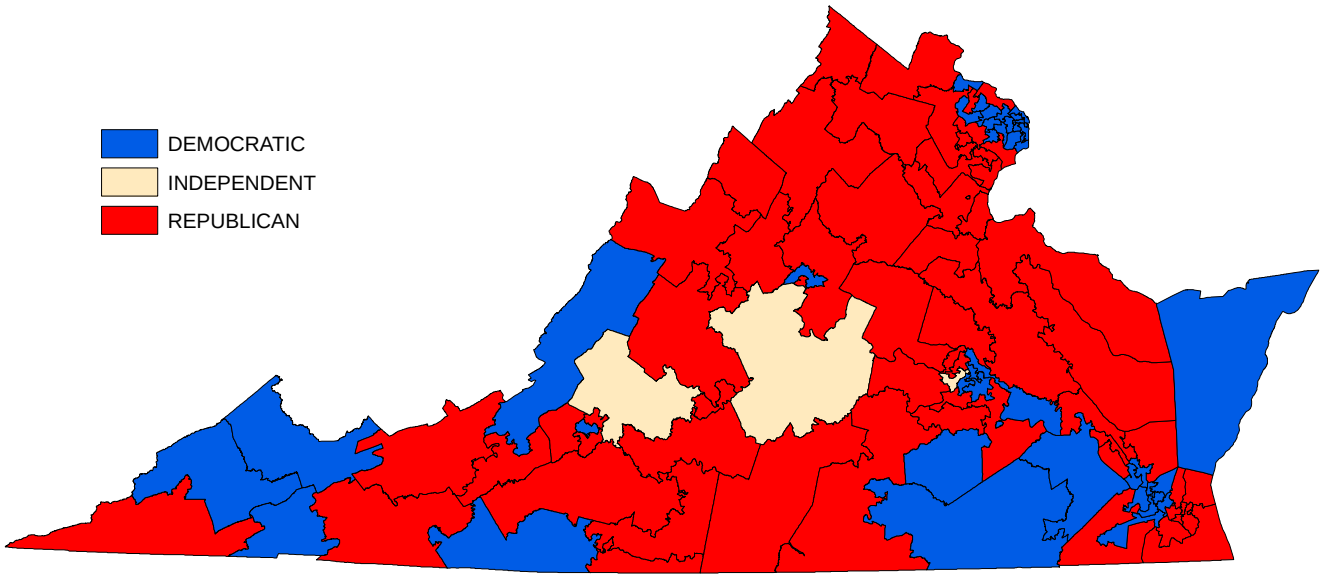
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.5.3 2005 Virginia Attorney General election results by precinct

Projection: Albers Conic

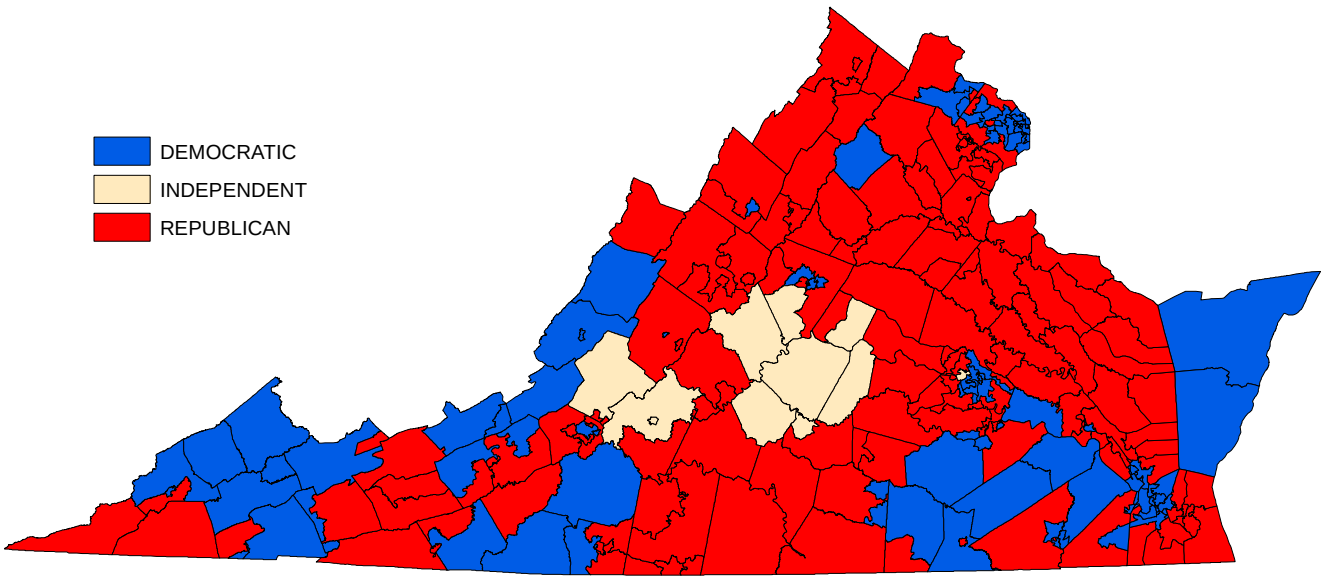
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.6.1 2005 Virginia House of Delegates election results by house district

Projection: Albers Conic

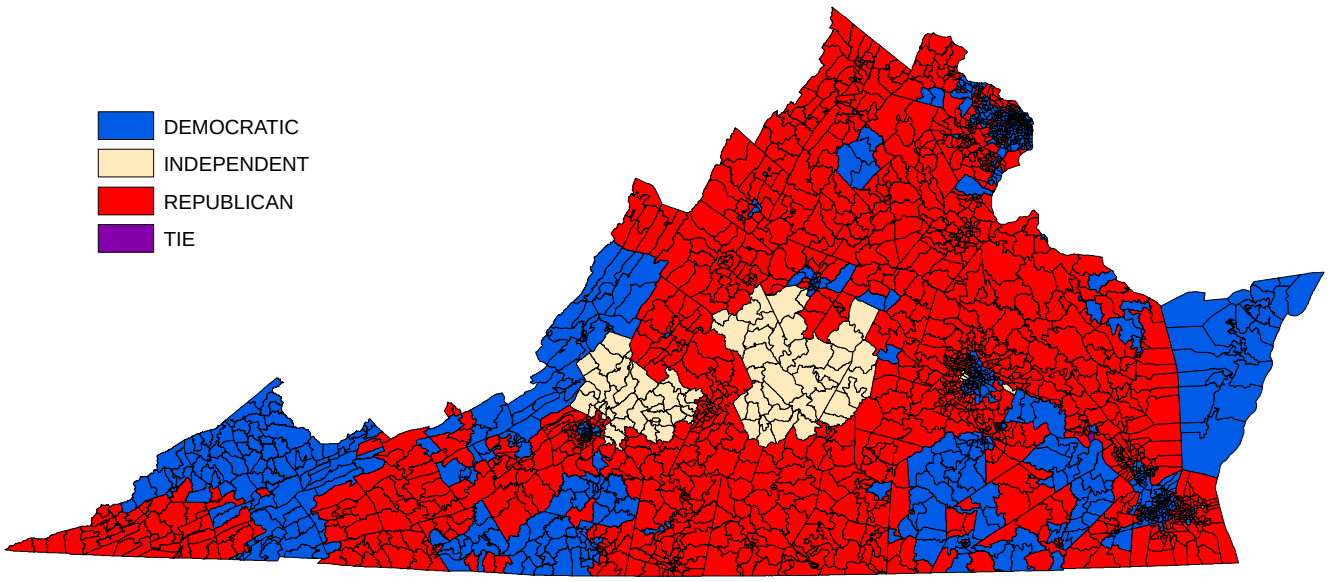
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.6.2 2005 Virginia House of Delegates election results by county

Projection: Albers Conic

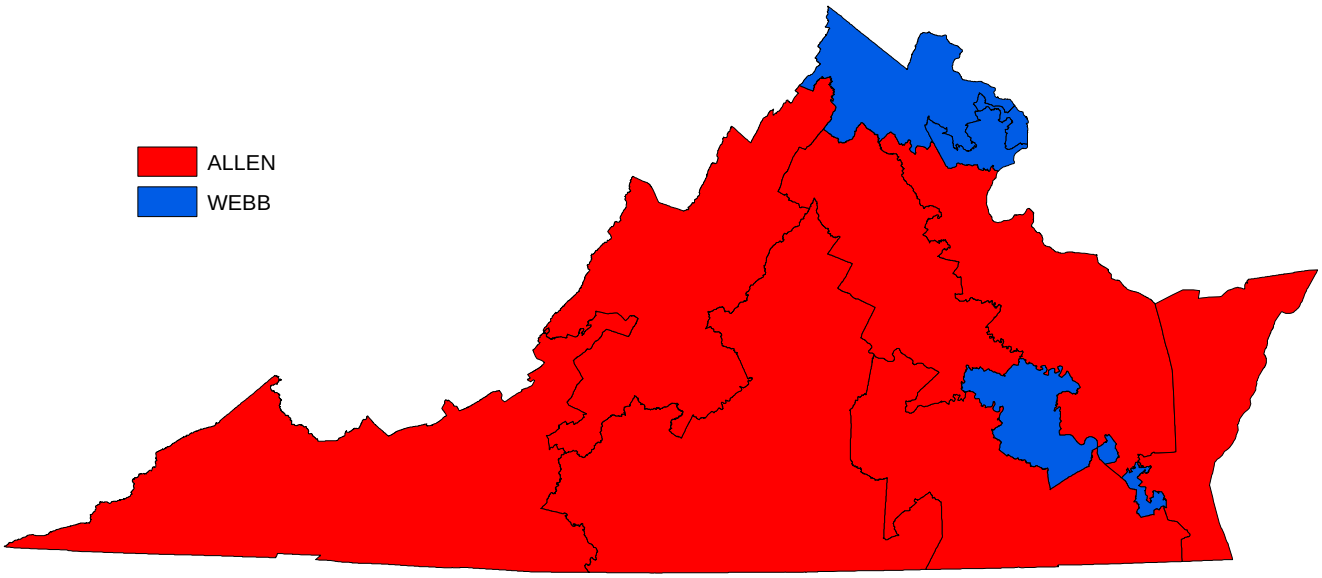
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.6.3 2005 Virginia House of Delegates election results by precinct

Projection: Albers Conic

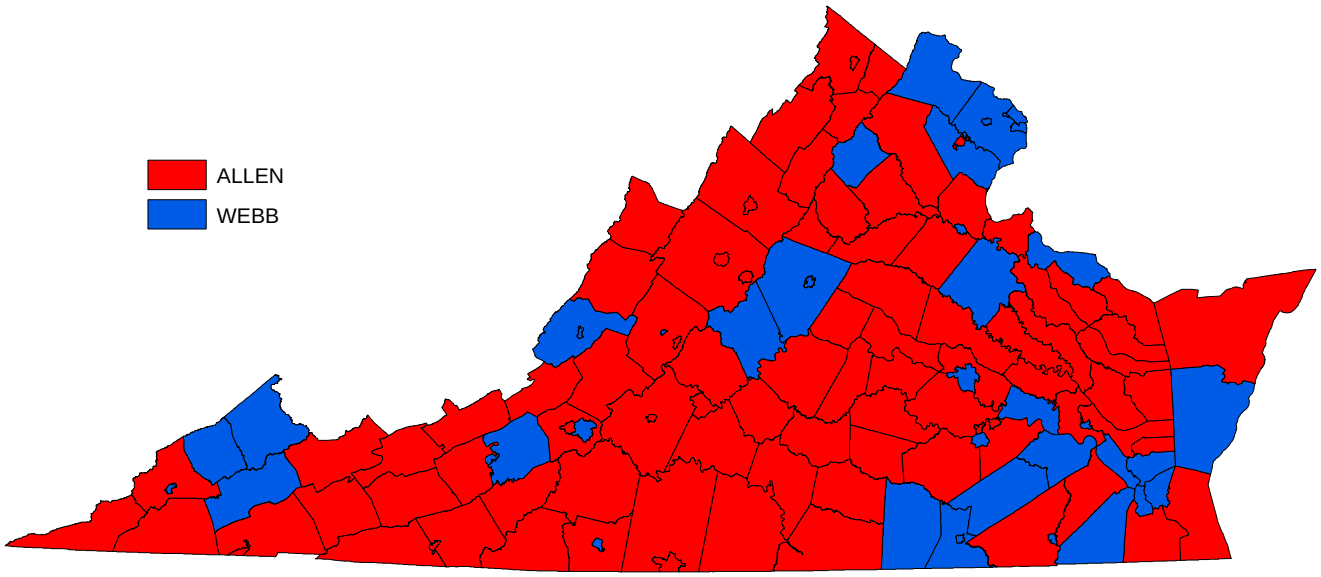
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.7.1 2006 U.S. Senate election results by Virginia congressional district

Projection: Albers Conic

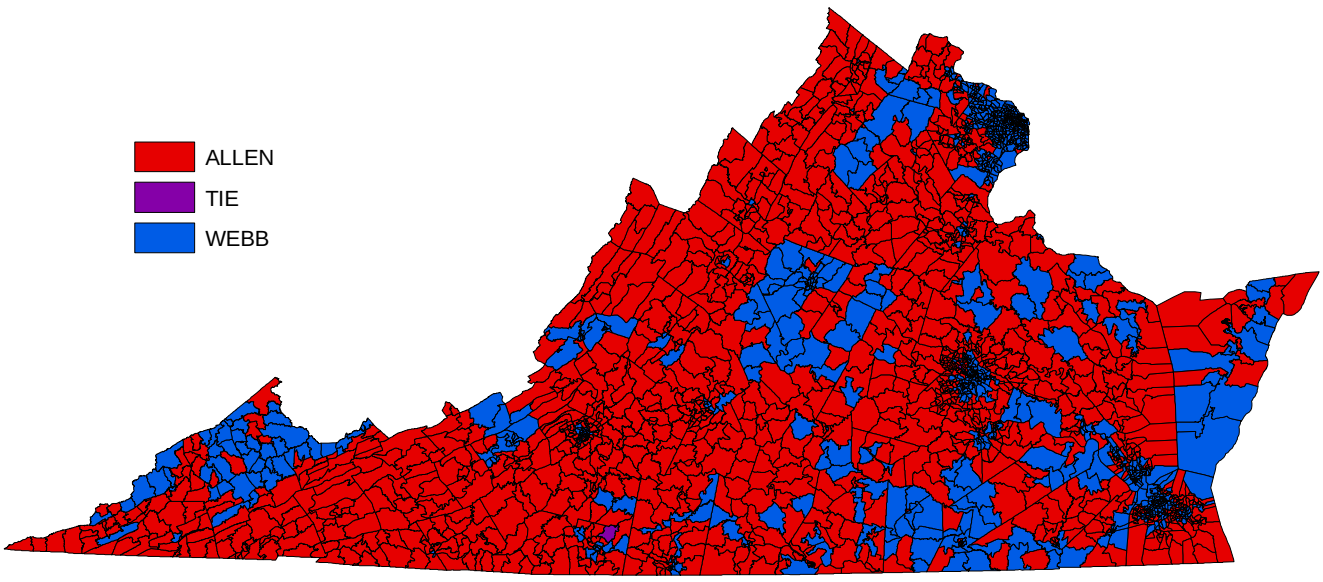
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.7.2 2006 U.S. Senate election results by Virginia county

Projection: Albers Conic

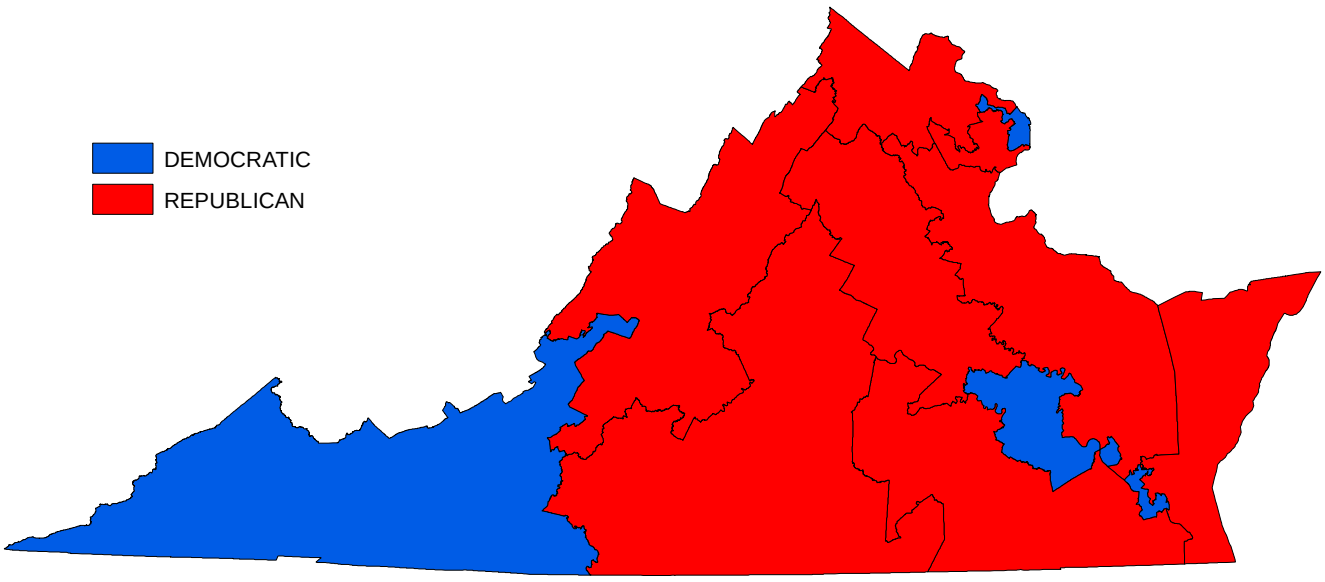
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.7.3 2006 U.S. Senate election results by Virginia precinct

Projection: Albers Conic

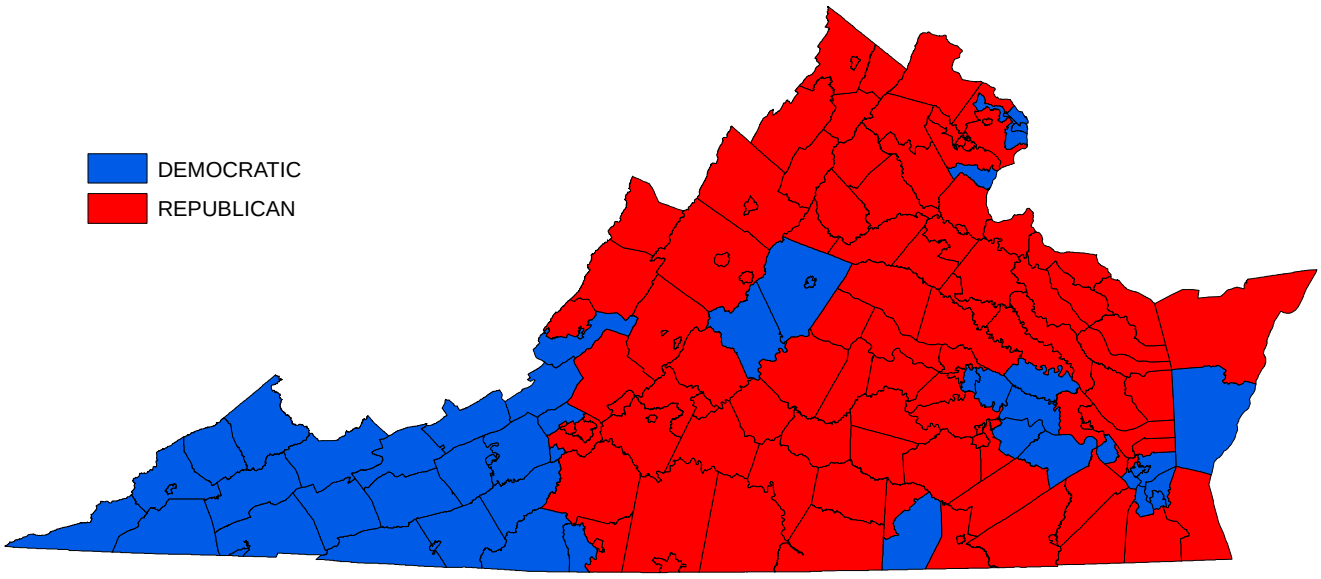
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.8.1 2006 U.S. House of Representatives election results by Virginia congressional district

Projection: Albers Conic

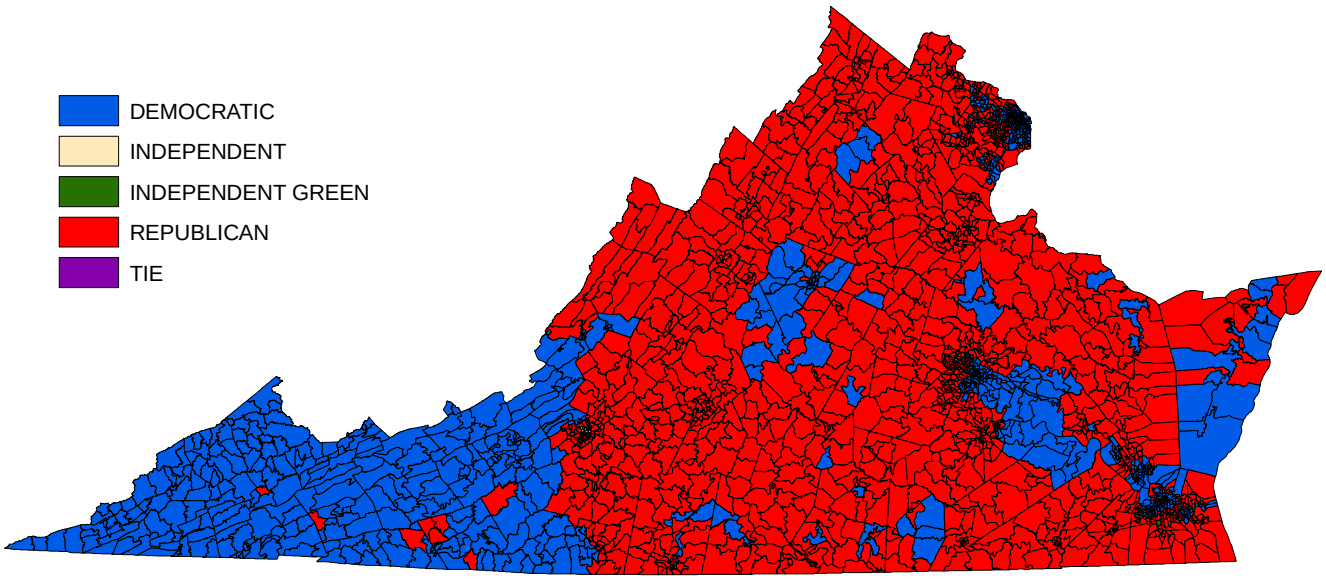
Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.8.2 2006 U.S. House of Representatives election results by Virginia county

Projection: Albers Conic

Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services



Map 3.8.3 2006 U.S. House of Representatives election results by Virginia precinct

Projection: Albers Conic

Data Sources: Virginia State Board of Elections, Virginia Division of Legislative Services