CAMPAIGN FINANCING FOR THE U.S. HOUSE OF REPRESENTATIVES:

AN INTERACTIVE WEB MAP

by

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DEDICATION

This thesis is dedicated to all the campaign finance reformers and outside the box thinkers.

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LIST OF ABBREVIATIONS

BCRA   Bipartisan Campaign Reform Act of 2012

CRP   Center for Responsive Politics

CSS   Cascading Style Sheets

CSV   Comma Separated Value

FEC   Federal Election Commission

FECA   Federal Election Campaign Act

FIPS   Federal Information Processing Standards

GIST   Geographic Information Science and Technology

IRS   Internal Revenue Service

OMS   Overlapping Marker Spiderfier

PAC   Political Action Committee

SIC   Standard Industrial Classification

SCOTUS   Supreme Court of the United States

SQL   Structured Query Language

SSI   Spatial Sciences Institute

UI   User Interface

USC   University of Southern California

USPS   United States Postal Service

ZCTA   Zip Code Tabulation Area

ABSTRACT

It is expensive to get elected to the U.S. House of Representatives, and in the past several decades the increase in spending has been very steep. In 2012, candidates spent an average of nearly $1.2 million (Ornstein, et al 2013). However, that includes only direct candidate or party expenditures, and does not included money spent by outside (i.e., "independent") groups. Lessig (2011) argues that the way campaigns are funded, and the dependence members of Congress have on a relatively small number of donors is a form of corruption in our political system. This thesis produces an interactive web map showing the geographic distribution of campaign contributions and independent expenditures made for members of the U.S. House of Representatives. Campaign finance data are most commonly displayed in tables and graphs. They are useful and important for those seeking to investigate the details of campaigns or needing to answer specific question, but a map is more accessible and engaging for the general public. There are numerous other visualizations available on the internet, but many have not been updated since 2012 election cycle (or earlier), or may not include all sources of spending. The web map created as a part of this thesis enables a user to select a candidate and view contributions summed by zip code using graduated symbols. The geographic origin of contributions is apparent, whether within or outside the district. A user can also search for groups that made independent expenditures and see the congressional districts where money was spent. An evaluation of the web map by a small sample of people showed the effectiveness of visualizing campaign finance data to better inform the public about money used in elections.

CHAPTER ONE: INTRODUCTION

Successful candidates seeking office at the federal level are required to raise large sums

of money to run their campaign organizations and communicate with voters through mass

media. Most voters probably do not think much about how that money is raised or where

it comes from, but it is central to the way our political system functions (Lessig 2011).

Politicians at the federal level spend a great deal of time fundraising and interacting with

donors from across the country (Cho and Gimpel 2007). Campaign finance regulation

requires candidates to disclose contributions (Briffault 2007). The public can then be

informed about money raised and spent in elections, but it requires some thought on how

to effectively communicate the complexities of the campaign finance system.

The best way to make campaign finance data accessible to voters is through data

visualization. The visual representation of data is a simple, efficient, and powerful form

of communication because large amounts of data can be condensed in a way that utilizes

the brain's capacity for processing visual information and recognizing patterns (Krum

2013). Ideally, a visualization of campaign finance data should engage people in a way

that motivates them to be more involved in the political process.

This thesis project aims to visualize campaign contributions and independent

expenditures through the use of an interactive web map showing direct contributions to

candidates for the U.S. House of Representatives, as well as spending by outside groups.

Although data for Senate candidates could have also been mapped, the House seemed

better suited for a thesis project because all seats are up for election during a two year

election cycle. Senators are elected every six years and only a portion of them are up for

re-election in a given two year election cycle. There are simply more candidates and

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more data to examine for the House, and it is easier to compare contributions and spending for different candidates.

1.1 Motivation

It has been argued that the increasing amount of money spent on elections undermines the integrity of our political system, but not in a way that the ties between candidates and funders are easily perceived (Lessig 2011). Those seeking to be elected to Congress are often dependent on a relatively small number of wealthy donors for much of their funds; raising doubts about whose interests are being served. In the 2010 election cycle 48% of contributions were from those who gave $200 or more, but the number of people making those contributions were less than 0.5% of country's population (Center for Responsive Politics 2010). This type of corruption is not blatant bribery or quid pro quo, as it has sometimes been in the past, and its effects are subtle.

There are few instances of a member of Congress taking money for voting a certain way or supporting specific legislation, but it does happen occasionally. Two recent examples of quid pro quo corruption were Representative Randall "Duke" Cunningham of California and Representative William J. Jefferson of Louisiana. Cunningham was convicted on bribery charges in 2006 after taking $2.4 million in exchange for assistance in acquiring Defense Department contracts. Jefferson similarly sought and took large bribes and was convicted on corruption charges in 2009 (Lessig 2011). The few legislators that do break the law do not improve people's view of politicians.

Although outright bribery is not the norm in Washington D.C, many people feel that large campaign contributions are close to bribes. A number of polls have shown a

clear majority of people perceive large contributions as a corrupting influence and that members of Congress give preference to contributors (Persily and Lammie 2004). The public consensus is that campaign contributions and money from lobbyists buys access and influence. Lessig (2011) argues that wealthy donors or potential donors have a much easier time getting their views heard by members of Congress. It is difficult to measure the exact effects that contributions have on gaining access, but one field experiment has shown that when individuals identify themselves as political donors they are three to four times as likely to meet with the Congressperson or his or her Chief of Staff compared to those who identify themselves as constituents (Kalla and Broockman 2014). More evidence is needed to prove conclusively that campaign contributions are corrupting, but they certainly appear to have some affect.

Burke (1997) refers to the influence of campaign contributions on policymaking as distortion corruption because contributions do not represent the views of the broader public. In other words the politicians' policy views are more closely aligned with their donors than their constituents (Stephanopolous 2014). This distortion may be one reason why the public has such a low opinion of Congress. In polls conducted by Gallup between January and August 2014 the average Congressional approval rating was 14% (Jones 2014). Voters may feel that Congress is not listening to them, but is listening to those giving them money.

Most people have the perception that campaign contributions influences politicians' behavior, whether or not there is direct evidence of this. There is a lack of trust in our government because of the presence of so much money in the political process (Lessig 2011). One aspect of this mistrust is the difficulty of tracking campaign

finance. It's hard to really know what is going on without becoming familiar with all the details. Complex regulations, outside spending, and the flow of huge sums of money make the whole system challenging to understand.

While it is important to be explicit when regulating money in politics, the complexity of the regulations creates a lot of jargon. Take the example of political action committees (PACs). They are groups independent of political parties or candidates that raise and spend money to influence elections through advertisements and direct contributions to candidates and parties. Federal election law limits how much individuals may contribute to PACs and how much PACs may contribute to candidates and parties (Center for Responsive Politics 2014b). The Federal Election Commission (FEC) classifies a PAC as being either a separate segregated fund (SSF) or a non-connected PAC. An SSF has a sponsoring organization such as a corporation or labor union, while a non-connected PAC does not. They also have different requirements for reporting administrative expenses and how they conduct fundraising (FEC 2014b). The term PAC applies to many different groups, but the distinction between SSF and non-connected PAC is not often discussed.

Money used in elections is classified by whether or not it is subject to federal campaign finance regulation. Contributions made directly to candidates are referred to as "hard money" and are subject to regulation. Contributions made to party committees and outside interests groups involved in federal elections is referred to as "soft money" (Center for Responsive Politics 2014a). Much of the legislation, court rulings, and debate regarding campaign finance since 2000 has focused on soft money and other outside spending. Despite efforts to curb outside spending it increased dramatically between 2002

and 2010; going from $27.7 million to $309.8 million (Center for Responsive Politics 2014e). The increase in spending has increased the complexity of campaign finance. More types of organizations have been allowed to spend more money (Tokaji and Strause 2014).

People usually encounter campaign finance data through news media. It is likely that most do not examine it any further. For those that do there are a number of online resources. Contributions and expenditures reported to the FEC by committees and outside groups are available on the FEC website. They are searchable, but are mostly viewed in tabular form. For example, a person could search for a particular candidate and see a table of all his or her contributions as well as the sum of the contributions. A number of organizations, including the Center for Responsive Politics and the Sunlight Foundation, are working to inform citizens about money in politics. Many of them produce high quality visualizations; primarily tables, charts, and graphs. The Sunlight Foundation created an excellent series of maps depicting political contributions by county (Sibley, Lannon, and Chartoff 2013). The advantages and disadvantages of these resources are discussed further in Chapter 2. It is the objective of this thesis project to complement the work already being done by showing both contributions to candidates and outside spending in a single map. Having both these sources of money in the same visualization allows for easier comparison and may provide new insights into campaign finance.

Spatial analysis of campaign contributions has proven useful in revealing patterns of participation in politics. Studies indicate that while wealth is a factor in the distribution of contributions, local social networks are also important in both volunteer involvement in political campaigns and donations to them (Cho and Gimpel 2010; Gimpel, Lee, and

Kaminski 2006). Analysis through tables or graphs, such as a table listing the sum of contributions from census tracts, would not have found these spatial relationships. A web map showing the distribution of contributions and independent expenditures will be more interesting to the general public than other visualizations because the data can be easily associated with a physical location. Seeing the spatial patterns will provide new insight, and tell the story of campaign finance in a impactful way.

1.2 Thesis Contribution

The intent of this project is to make campaign financing more comprehensible (than traditional tabular forms or static maps) in a visual way. The web map provides an interactive tool for users to understand the geographic attributes of campaign financing. The main contribution includes the visualization tools for understanding:

- the locus of money raised by candidates and

- where outside groups spend money to influence elections

1.3 Web map Overview

The interactive web map created as part of this thesis project shows the geographic distribution of campaign finance data for candidates of the U.S. House of Representatives in the 2014 election cycle. Figure 1 shows an example of a candidate's contribution data. The development process of the map is further discussed in Chapter 3 including data downloading and formatting, database design and creation, layer publishing, and application coding. The map supports basic navigation functions such as panning and zooming that have become common to web maps since the advent of Google Maps. It is designed to be easily navigated and responsive to user input.
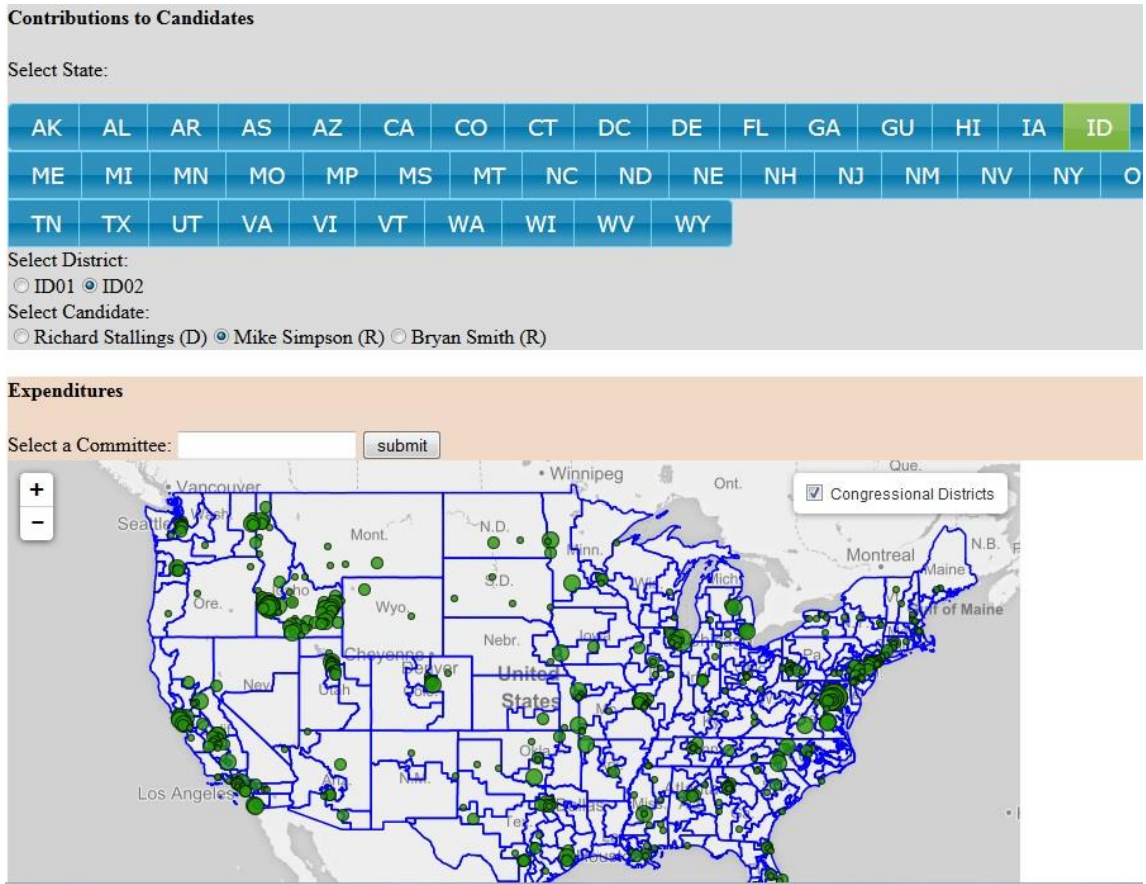
Figure 1 Map Screen Shot

The two kinds of data the map can display are direct contributions to candidates and independent expenditures. For the direct contributions users select a state by clicking on the state button. Then radio buttons with the congressional districts for that state appear, and the user clicks the button for a congressional district to see a list of candidates to choose from. Once a candidate is selected, the contributions are summarized by zip code and displayed with symbols sized according to the amount donated. The user can then click on a symbol to get more information about the donations from a given zip code.

Independent expenditures are viewed by selecting an organization from a dropdown list. The expenditures are displayed by Congressional District. The user can then click on a symbol to see which candidates the organization was supporting or opposing and how much money they spent. Viewing expenditure data on the map is a very efficient way of finding out what races a committee was seeking to influence.

Campaign finance data are most commonly displayed in tables and graphs. They are useful and important for those seeking to investigate the details of campaigns or need to answer a specific question, but a map may be more accessible and engaging for the general public. Furthermore, the interactivity provided by the technologies used in the web map allow the user to easily control what data are displayed and enable in depth exploration of the data.

This chapter discussed the motivation, impact, and general functions of the web map created for this thesis project. The remainder of this thesis is organized into four chapters. Chapter 2 examines the background of campaign finance regulation and law as well as campaign finance data visualizations. Chapter 3 presents the method for building the interactive campaign finance web map. Chapter 4 describes the evaluation of the web map by a sample of volunteers. Chapter 5 concludes and

CHAPTER TWO: BACKGROUND AND RELATED WORK

The first section of this chapter provides an explanation of campaign finance regulatory agencies, classifies contributions and expenditures, and outlines the types of groups that attempt to influence elections. Section 2.2 presents an overview of the history campaign of finance regulation at the federal level and discusses changes due to recent court decisions. Section 2.3 describes various online visualizations of campaign finance data.

2.1 Campaign Finance Regulatory Structure

Running for public office almost always requires some money. Candidates may choose to self-fund their campaigns, especially those that are very wealthy. In most cases however candidates rely on contributions from other people to finance the costs of campaigns. It is expensive to get elected to the U.S. House of Representatives, and in the past several decades the increase in spending has been very steep. Between 1982 and 2010 total spending by Senate and House candidates rose from $343 million to $1.8 billion (Garrett 2011). In the 2012 election, House candidates spent an average of nearly $1.2 million (Ornstein, et al 2013). But that includes only direct candidate or party expenditures, and does not include money spent by outside (i.e. "independent") groups. Much of the expense of campaigns can be attributed to television and other media advertisements as well as fundraising costs (Cantor 2009). The natural tendency for those who are wealthy to have or seek political influence requires some intervention to prevent the corruption of a democratic political system. The campaign finance regulatory structure attempts to do this in a number of ways, but its complexity requires some explanation.

2.1.1 Regulatory Agencies

There are two agencies that are involved with campaign finance regulation. The primary agency is the Federal Election Commission (FEC), which enforces campaign finance laws, discloses campaign finance information, and oversees public funding of Presidential elections (FEC). Most political organizations are required to report contributions and expenditures to the FEC, but loopholes in campaign finance law create some important exceptions discussed in section 2.1.3.

The Internal Revenue Service (IRS) determines the taxes paid by political organizations under Section 527 of the Internal Revenue Code (IRC). A political organization's primary function must be "influencing or attempting to influence the selection, nomination, election or appointment of an individual to a federal, state, or local public office or office in a political organization" to receive tax exemptions under Section 527 (IRS 2015). The IRS and the FEC have different functions, but are both important to regulating political fundraising and spending.

2.1.2 Classification and regulation of contributions and expenditures

The main tool the FEC has for regulating campaign finance is disclosure. Disclosure is a two-step process in which contributions and expenditures are reported to the FEC then the information is made accessible to the public (Briffault 2010). Contributions include "gifts of money, goods and services (in-kind contributions), loans (other than bank loans meeting certain conditions), and guarantees or endorsements of bank loans" (FEC 2013). The broad range of contributions must be carefully tracked for accurate record keeping. Committees report all contributions to the FEC and are required to provide the names and addresses of individuals who contributed over $200 in a calendar year (FEC 2013).

Individuals and PACs may contribute a maximum of $2600 and $5000 respectively to each candidate per election (e.g. primary and general). There are also limits on how much may be given to party committees, see Table 1. Disclosure of contributions ensures that these limits are maintained.

Table 1 Contribution Limits for 2013-2014 (Center for Responsive Politics 2014b)

	To each candidate or candidate committee per election	To national party committee per calendar year	To state, district & local party committee per calendar year	To any other political committee per calendar year[1]	Special Limits
Individual may give	$2,600*	$32,400*	$10,000 (combined limit)	$5,000	None
National Party Committee may give	$5,000	No limit	No limit	$5,000	$45,400* to Senate Candidates per campaign[3]
State, District & Local Party Committee may give	$5,000 (combined limit)	No limit	No limit	$5,000 (combined limit)	None
PAC (multicandidate)[4] may give	$5,000	$15,000	$5,000 (combined limit)	$5,000	None
PAC (not multicandidate) may give	$2,600*	$32,400*	$5,000 (combined limit)	$5,000	None

Authorized Campaign Committee may give	$2,000[5]	No limit	No limit	$5,000	None

Source: Center for Responsive Politics, http://www.OpenSecrets.org

* These contribution limits are increased for inflation in odd-numbered years.

(1) A contribution earmarked for a candidate through a political committee counts against the original contributor's limit for that candidate. In certain circumstances, the contribution may also count against the contributor's limit to the PAC. 11 CFR 110.6. See also 11 CFR 110.1(h).

(2) No more than $46,200 of this amount may be contributed to state and local party committees and PACs.

(3) This limit is shared by the national committee and the national Senate campaign committee.

(4) A multicandidate committee is a political committee with more than 50 contributors which has been registered for at least 6 months and, with the exception of state party committees, has made contributions to 5 or more candidates for federal office. 11 CFR 100.5(e)(3).

(5) A federal candidate's authorized committee(s) may contribute no more than $2,000 per election to another federal candidate's authorized committee(s). 11 CFR 102.12(c)(2).

An expenditure is broadly defined as "a purchase, payment, distribution, loan, advance, deposit, or gift of money or anything of value made for the purpose of influencing a federal election (FEC 2013, 162)." Voters are most familiar with expenditures directed at them in the form of TV, radio, and internet advertisements, mailers, signs, and bumper stickers. Expenditures may be classified as either coordinated with a candidate's campaign or independent of the candidate. Independent expenditures are specifically for communications that expressly advocate the "election or defeat of a clearly identified candidate and which is not made in cooperation, consultation, or concert with, or at the request or suggestion of any candidate, or his or her authorized

committees or agents, or a political party committee or its agents" (Code of Federal Regulations Title 11). The definition of independent expenditures is clearly intended to prevent candidates from using contributions to outside groups to augment their own campaign spending.

Independent expenditures then fall into the category of express advocacy, defined as communications that "explicitly advocate for the defeat or election of a clearly identified federal candidate" (Center for Responsive Politics 2014a). Obviously candidates are likely to use express advocacy themselves since the whole function of their campaigns is to ask constituents to vote for them. In *Buckley v. Valeo* the Supreme Court gave examples of language that constituted express advocacy including " 'vote for,' 'elect,' 'support,' 'cast your ballot for,' 'Smith for Congress,' 'vote against,' 'defeat,' 'reject' "(Briffault 2011). Such phrases are a very narrow form of speech and it is not difficult to discuss a candidate without using them. Communications that do not meet the standard of express advocacy are treated as issue advocacy, which focuses on a particular matter voters may be concerned about such as gun control or abortion (Center for Responsive Politics 2014a). Advertisements may praise or criticize candidates without directly calling for their election or defeat and avoid being regulated by campaign finance limits (Briffault 2011). Increasing spending on issue advocacy to influence elections during the 1990s eventually led Congress to attempt to limit this form of political speech.

The Bipartisan Campaign Reform Act of 2002 (BCRA) implemented a number of changes in campaign finance law, and sought to regulate issue advocacy spending by creating a new class of communications called electioneering communications (Briffualt

2011). These are television or radio advertisements that identify a federal candidate, are directed at least 50,000 members of the candidate's electorate, and "air within 30 days of a primary election or 60 days of a general election" (Center for Responsive Politics 2014a). The BCRA prohibited the use of unregulated soft money from outside group for electioneering communications (Center for Responsive Politics 2014a). The BCRA did not go unchallenged and court rulings have led to significant weakening of its reforms. Section 2.2 provides further discussion of the court decisions and their consequences.

2.1.3 Outside Groups

There are several different types of outside groups that try to influence elections. Traditional PACs are those that contribute to candidate's campaigns; some of which also make independent expenditures. Individuals may contribute up to $5000 per year to a PAC. FEC regulations permit a PAC to contribute $5000 per election to a candidate as well as $15000 annually to a national political party (FEC 2013). Committees called Super PACs, or independent expenditure-only committees, sound similar to traditional PACs, but operate very differently. They are allowed to spend unlimited funds on elections as long as it is not in coordination with any candidate and they do not make any contributions directly to candidates (Center for Responsive Politics 2014a). Super PACs have become major players in elections, but they are not the only kind of group that has been used to avoid FEC regulations since the BCRA.

While the IRS broadly defines political organizations under section 527of the IRC, groups commonly referred to as 527s are a subset of organizations that operate outside of FEC regulations. Many 527 organizations are focused on state or local elections. Others get involved in federal elections, but do not claim it as their main

purpose (Tokaji and Strause 2014). They avoid reporting to the FEC by not expressly advocating for or against candidates (Center for Responsive Politics 2014a). 527 organizations were prominent during the 2004 presidential election, but have been less influential since that time.

Groups known as political nonprofits or 501(c)s receive tax-exemptions under section 501(c) of the IRC. There are three subtypes of 501(c)s that may make expenditures and contributions as long as it is not their primary purpose. There is some ambiguity in determining their primary purpose, but it must be less than half of their activities (Center for Responsive Politics 2014a). 501(c)(4)s are advocacy groups that promote "social welfare" (Tokaji and Strause 2014). Such groups include the National Rifle Association (NRA), the Sierra Club, Crossroads GPS, and Patriot Majority (Center for Responsive Politics 2014d). 501(c)(5)s are labor unions and agricultural groups. 501(c)(6)s are chambers of commerce and trade associations (Center for Responsive Politics 2014a). The different classifications allow additional avenues for a wide range of interest groups to influence elections.

Political nonprofits have become increasingly controversial because they are not required to disclose their donors and the 2010 Supreme Court *Citizens United* ruling allows them to spend unlimited funds. 501(c)4 and 501(c)6 groups are seen as tools for pooling corporate resources while hiding who is seeking to influence elections (Briffault 2010). Also, some Super PACs receive contributions funneled through 501(c)s, allowing the Super PAC to hide the identity of the true source of the money.

2.2 Campaign Finance Law

Campaign finance regulation has long been a part of the U.S. political system. The first regulations requiring some level of campaign finance disclosure at the federal level were enacted early in the 20th century. The 1907 Tillman Act banned candidates from accepting contributions from banks and corporations for use in general elections, and the first limited disclosure requirements were enacted in 1910 (Tokaji and Strause 2014). They were created among other Progressive Era reforms that sought to curb the power of corporations and special interests to influence politics and had corrupted many areas of government (Lessig 2010). Since then there has been a trend toward more disclosure and regulation of campaign finance (Briffault 2010). Laws passed through the 1960s were far from comprehensive and there was no agency to ensure enforcement.

Campaign finance laws were significantly strengthened in the 1970s. First, in 1971 Congress passed the Federal Election Campaign Act (FECA) which authorized limits on "contributions from candidates and their families", regulated expenditures on media, and required public disclosure of financial activity (Tokaji and Strause 2014). The Watergate scandal revealed serious financial abuses by the 1972 Nixon presidential campaign. This motivated Congress to amend FECA in 1974 by extending contribution limits to include those from individuals, parties, and PACs, set maximum spending limits for congressional and presidential candidates, and further strengthened disclosure. The FEC was also formed by the 1974 amendments to carry out the regulations (Tokaji and Strause 2014). Such comprehensive reform was certainly not without detractors and legal challenges have occurred over the years. Despite some changes in response to court rulings the FECA remained mostly intact for over 30 years.

The first and most influential court case was the Supreme Court's 1976 ruling in

Buckley v. Valeo. It invalidated the limits on expenditures, but left in place those for

contributions. The decision centered on whether the regulations violated First

Amendment freedom of speech rights, and if they were needed to avoid "corruption or

the appearance of corruption". Limiting expenditures were viewed as being too restrictive

on free speech, while contributions deserved less First Amendment protection because of

their potential for corruption (Burke 1997). All subsequent court decisions regarding

campaign finance have framed their arguments around *Buckley's* drawing of corruption,

but have differed in their interpretation of its meaning.

There has been a struggle to balance the need to limit corruption with the

protection of free speech. Supreme Court decisions often revolve around the definition of

corruption. They have at times taken a wider view and expanded the definition of

corruption. One of the Court's broadest delineations came in the 1990 *Austin v. Michigan*

Chamber of Commerce case in which it upheld a state ban on corporations making

independent expenditures. Here the Court went so far as to assert that corporate wealth

essentially had too much power to distort elections and would be an unfair advantage in

promoting political ideas (Briffault 2011). The Court viewed corruption to include the

concept of equality in the political process. Critics say this violates free speech and would

allow a campaign finance system in which money could only be spent if it were in line

with public opinion (Burke 1997). Although court rulings continued to generally maintain

the standards of corruption set forth in *Buckley* through the mid-2000s, most used a more

narrow definition of corruption than *Austin.*

As mentioned before, the BCRA of 2002, also called McCain-Feingold, made the biggest changes to campaign finance regulation since the original FECA. Besides the limits on independent expenditures for issue advocacy by defining them as electioneering communications and banning corporations and unions from funding those types of ads, it also prohibited candidates and national parties from raising soft money (Tokaji and Strause 2014). Initial challenges to the reforms of BCRA were upheld by the Supreme Court in *McConnell v. FEC* with the Court affirming the constitutionality of its limits on corporate campaign spending. The ruling also supported the electioneering communications measures and felt they were "properly tailored to regulate campaign messages" (Briffault 2011). The opinion of the Court has since changed, and has led to a rejection of a number of campaign finance regulations.

The first indication of the Court's new stance on campaign finance came in 2007. The composition of the Court had been altered with the retirements of Chief Justice William Rehenquist and Justice Sandra Day O'Connor and their replacement by Chief Justice John Roberts and Justice Samuel Alito. The case involved Wisconsin Right to Life, a 501(c)(4) organization, using TV advertisements urging citizens to ask Wisconsin Senators "to oppose filibusters of President Bush's judicial nominees" during the 2004 election (Tokaji and Strause 2014). In *Wisconsin Right to Life v. FEC* the Court acknowledged Congress' authority to regulate spending on campaign ads, but effectively invalidated the definition of electioneering communications. They ruled that if an ad could not be reasonably interpreted as "an appeal to vote for or against a specific candidate" then corporations could not be prohibited from funding the ads (Briffault

2011). Outside groups spending money independently to influence elections was not seen as potentially corrupting.

The erosion of limits on independent expenditures continued with the 2010 *Citizens United v. FEC* ruling. Citizens United is another 501(c)(4) organization that in 2008 sought an exception to electioneering communications regulations for ads that promoted its film *Hillary: The Movie*, which was highly critical of then presidential candidate Hillary Clinton. Briffault (2011) argues that the Court could have made a narrow interpretation of campaign finance rules in granting Citizens United an exception, Instead, the majority saw that the electioneering communication statutes violated the First Amendment and gave corporations permission to independently spend unlimited funds supporting or opposing candidates. The decision was major setback for supporters of campaign finance reform.

The majority opinion in *Citizens United* relied on a limited definition of corruption, and saw that the only legitimate reason for regulation of campaign finance would be to prevent quid pro quo corruption (Tokaji and Strause 2014). Since independent expenditures are by definition not coordinated with candidates, in the Court's view there was no danger of corruption. The majority also felt that disclosure requirements for independent expenditures were a sufficient form of regulation. The ability to quickly and more fully make campaign finance data available to the public through the use of Internet was seen by the Court to greatly reduce the potential for improper use of finances (Briffault 2010). It may be a small consolation that disclosure was upheld.

A D.C. Circuit Court of Appeals ruling, which came just two months after *Citizens United*, also had important consequences for campaign finance. In *SpeechNow.org v. FEC* PACs that wished to make expenditures but not contribute to candidates were granted permission to raise unlimited funds (Tokaji and Strause 2014). . The D.C. Circuit Court almost seemed to have no choice but to follow the Supreme Courts lead in *Citizens United*, and take a position that expenditures by independent groups were protected by the First Amendment and should not be restricted. The FEC did not appeal the decision, and set up guidelines for committees now known as Super PACs (Briffault 2011). Super PACs quickly became prominent in federal elections.

Corporations have long been banned from directly contributing to candidates' campaigns. The consensus that allowing direct corporate or labor union contributions has significant potential for corruption has remained in place. However, limits on contributions from individuals have been loosened. The 2014 *McCutcheon v. FEC* ruling further undermined campaign finance regulation. In the 2012 cycle an individual was limited to $46,200 in contributions total. The Supreme Court struck down the aggregate limits on individual campaign contributions, while upholding limits on how much could be given to individual candidates (Tokaji and Strause 2014). Donors could now contribute to as many candidates as they wanted.
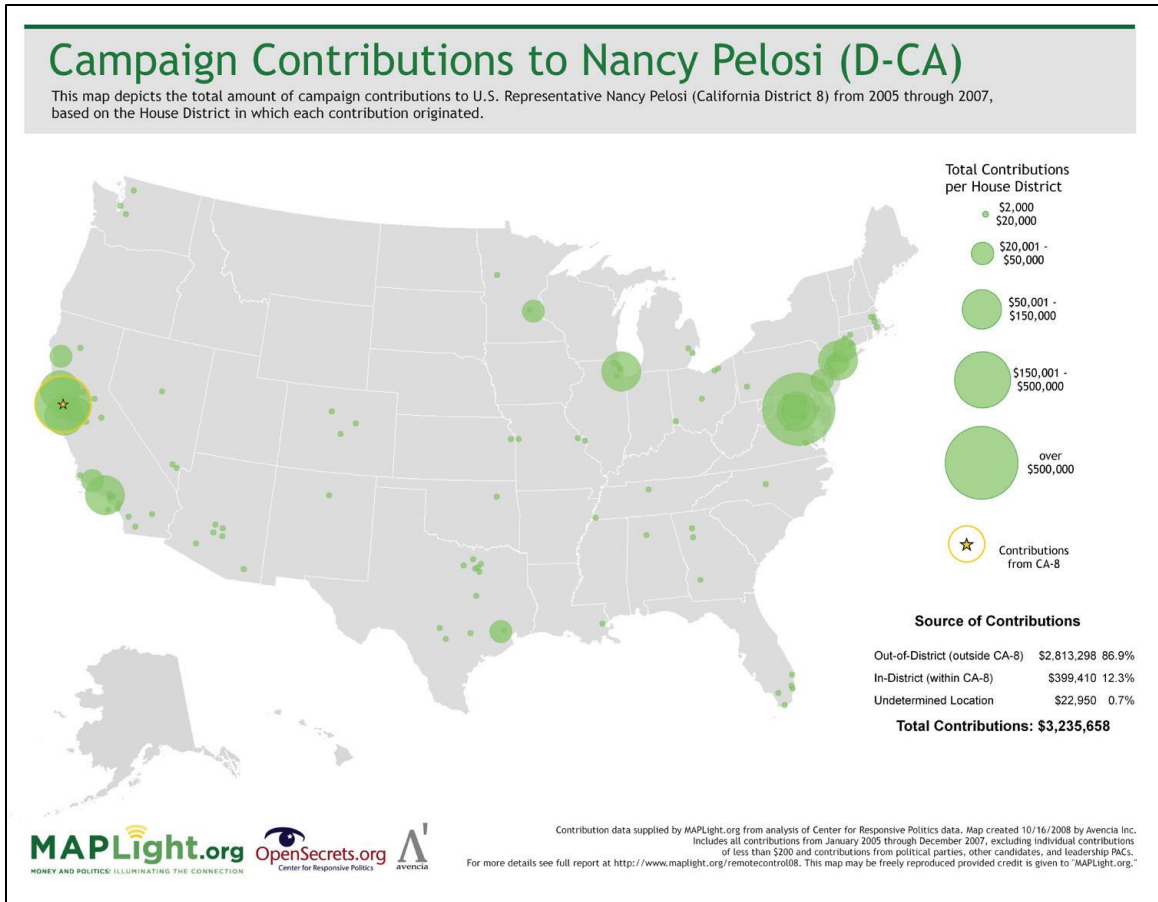
Disclosure is now more important than ever. Yet a large gap in the regulations remains. Political non-profits are not required to disclose any of their donors, but are required to report expenditures. (Tokaji and Strause 2014). There are occurrences of 501(c) organizations contributing to Super Pacs, which makes it nearly impossible to know the true source of the money (Briffault 2011). But even better disclosure may not

prevent financial abuses. Briffault (2010) argues that before BCRA there were those

willing to make six and seven figure soft money contributions to national parties despite

requirements of disclosure. However, efforts to improve disclosure should be

encouraged.

2.3 Review of Websites and Visualizations

Organizations working to enhance disclosure have provided some spatial analysis of

campaign finance data. MapLight.org created a visualization in 2008 that used

proportional symbols to map contributions to members of Congress (Figure 2).

Contributions were summed by congressional district, and the size of the symbols

depended on the total amount for each district. The visualization was available online and

allowed the user to select a member of Congress and see the map for that member. Their

report revealed that on average 79% of campaign funds for House members came from

out of district, and 57% came from out of state (MapLight.org 2008). Successful

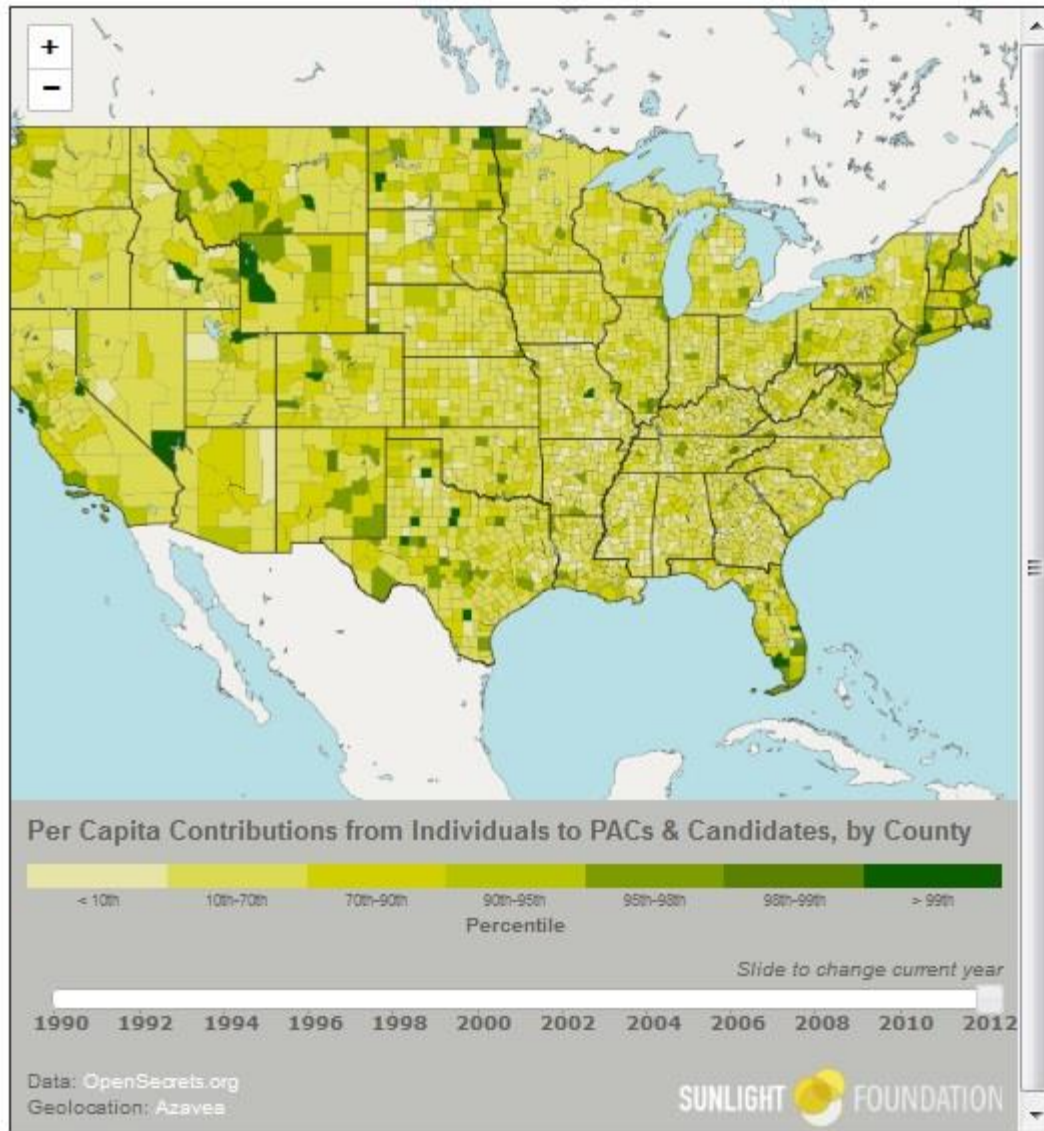candidates must be able to raise funds from areas outside their district.

Campaign Contributions to Nancy Pelosi (D-CA)

This map depicts the total amount of campaign contributions to U.S. Representative Nancy Pelosi (California District 8) from 2005 through 2007, based on the House District in which each contribution originated.

Total Contributions per House District

$2,000 - $20,000
$20,001 - $50,000
$50,001 - $150,000
$150,001 - $500,000
over $500,000

Contributions from CA-8

Source of Contributions

Out-of-District (outside CA-8)	$2,813,298	86.9%
In-District (within CA-8)	$399,410	12.3%
Undetermined Location	$22,950	0.7%

Total Contributions: $3,235,658

Contribution data supplied by MAPLight.org from analysis of Center for Responsive Politics data. Map created 10/16/2008 by Avencia Inc. Includes all contributions from January 2005 through December 2007, excluding individual contributions of less than $200 and contributions from political parties, other candidates, and leadership PACs. For more details see full report at http://www.maplight.org/remotecontrol08. This map may be freely reproduced provided credit is given to "MAPLight.org."

Figure 2 Map of Campaign Contributions for Individual Legislators
MapLight.org

One difficulty in trying to map finance data is there are some sources of contributions and expenditures that do not have accurate locations. Locations used to map contributions are determined by some form of geocoding, where address information is translated to coordinates such as latitude and longitude. Contributions from a national party committee, either the Republican National Committee or Democratic National Committee, to a candidate could have originated from individuals anywhere in the United States. MapLight.org (2008) cited this reason for excluding contributions to candidates from political parties, other candidates, and leadership PACs. Expenditures made by

organizations that do not disclose donors pose similar problems. Using the headquarters of these organizations is the only way to include the data.

The Sunlight Foundation has created a series of maps depicting campaign contributions in several different ways. One map shows the concentration of individual campaign contributions to PACs and candidates by county (Figure 3). A person can move the mouse pointer over individual counties to view the amount of money contributed per person. At the bottom of the map users can scroll over a timeline to see the changes in contribution over the last several election cycles, beginning with 1992 and continuing to 2012 (Sibley, Lannon, and Chartoff 2013). One unique feature is links that allow the maps to be embedded on other web pages. The maps are well designed and intuitive, but they do not associate contributions to specific candidates.

Per Capita Contributions from Individuals to PACs & Candidates, by County

| < 10th | 10th-70th | 70th-90th | 90th-95th | 95th-98th | 98th-99th | > 99th |

Percentile

Slide to change current year

1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012

Data: OpenSecrets.org
Geolocation: Azavea

SUNLIGHT FOUNDATION

Figure 3 Per Capita Contributions
Sunlight Foundation

Since 2007 the Federal Election Commission (FEC) has provided map based tools

for viewing contribution and expenditure data (Anonymous 2008). The House and Senate

map in Figure 4 allows the user to select a state then district or candidate and see the

funds they have received categorized by source; whether individual, PAC, party,

candidate, or other. Independent expenditures are accessed through separate maps (FEC

2014a). They provide easy to understand information, but the user interface (UI) lacks functions common to most web maps such as zoom.
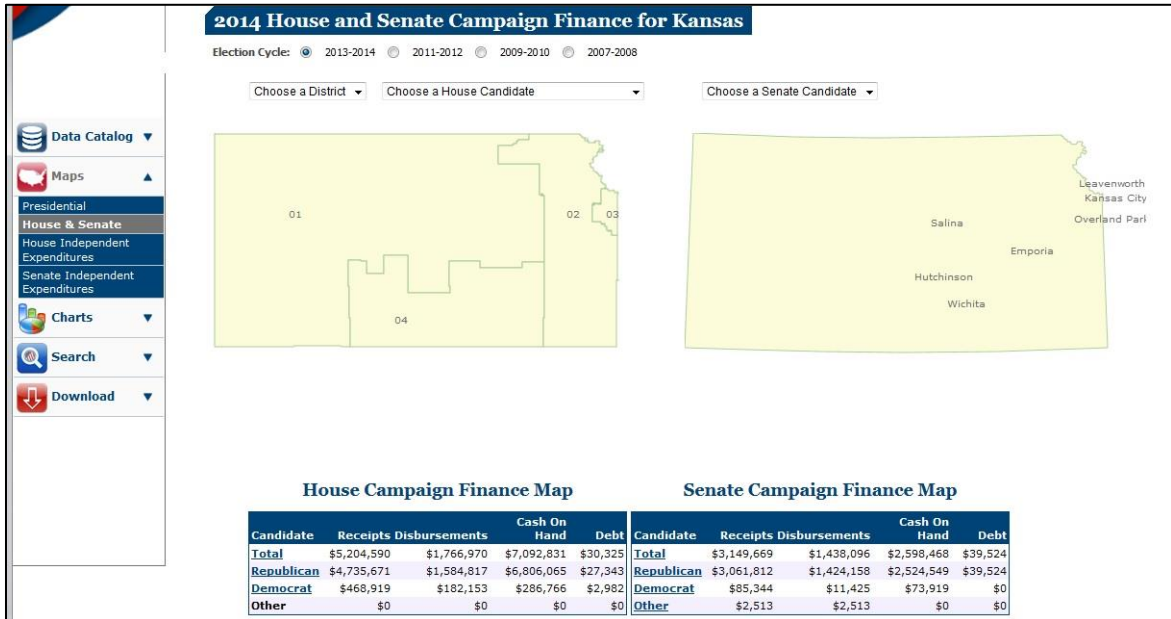
Figure 4 Example of FEC House and Senate Campaign Finance Map

News websites also visualize campaign finance data. The Wall Street Journal's Political Moneyball web app for the 2012 presidential election (Figure 5) was built using Tulip data visualization software. It shows proportional dot symbols representing money raised spaced relative to political ideology (e.g. organizations supporting liberal candidates are located close to each other) and are connected by lines to the committees to which they made contributions. It is very interesting visually, but because of its complexity it is not easy to navigate. The visualization is also not location based, so the geographic distribution of contributions cannot be discovered .
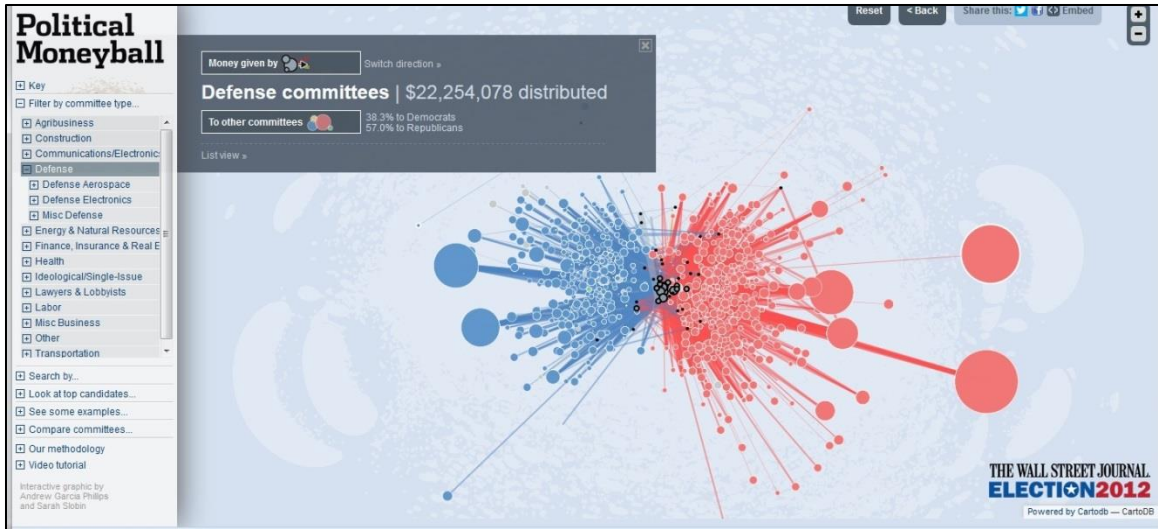
Figure 5 Political Moneyball by The Wall Street Journal

The application for this thesis bears the most resemblance to the MapLight.org project discussed earlier, at least on the user interface. The map has not been updated and there are no plans to do so (Philip Minnitte, March 4,2014, email message to the author). It is not known exactly what web technologies were used, but this project likely uses different ones due to rapid changes since the 2008 election.

While there are a number of good campaign finance maps and data visualizations accessible on the web, this project offers a couple of advantages and unique features. First, users are able to see a better approximation of where each candidate's contributions come from. Other visualizations either don't map data for specific candidates, or only provide tables and graphs of contributions. Second, the application is unique in that both contributions to candidates and outside spending can be viewed on the same map. Being able to look at contributions and outside spending provides a more complete picture of the money involved in House elections.

2.4 Choice of Technologies

The web application for this thesis is built on the open source geospatial platform

OpenGeo Suite installed on a Dell Inspiron N7110 laptop running on the Windows 7

operating system. OpenGeo includes a database component, PostGIS, to store and

manage spatial data, and a server component, GeoServer, to publish data over the web

(OpenGeo Suite). These are used to control access to the data being displayed. The client

side of the application uses the open source JavaScript libraries Leaflet and jQuery to

control the display, styling, and user interaction of the web map (Leaflet). The main

advantages of using all open source software are cost and ease of installation.

Additionally, anyone else could easily set up their own web map project based on this

thesis.

CHAPTER THREE: METHODOLOGY

This chapter discusses the development process of the web map as part of this thesis

project. Section 3.1 details the data sources and how they were downloaded. Section 3.2

presents the database diagram. Section 3.3 discusses data formatting and how it was

prepared for entering into the database. The creation of the database is described in

Section 3.4. Section 3.5 outlines how the data was uploaded to GeoServer. Section 3.6

explains how the web map was built.

3.1 Workflow for Campaign Finance Web Map

The process of developing the campaign finance web map included a number of separate

tasks (Figure 6). The initial step was to find and download the source data which included

a database of OpenSecrets.org campaign finance data, zip code shapefiles, and a

congressional districts shapefile. A database diagram was then created to guide the design

of the database and determine how to format the data. Formatting the data included

exporting the campaign finance data from the OpenSecrets.org database and editing the

attributes of the shapefiles. Then the database for the web map was created and the

formatted data was imported in the respective tables. The data was made available for use

in the web map by uploading to GeoServer. The final step in the development process

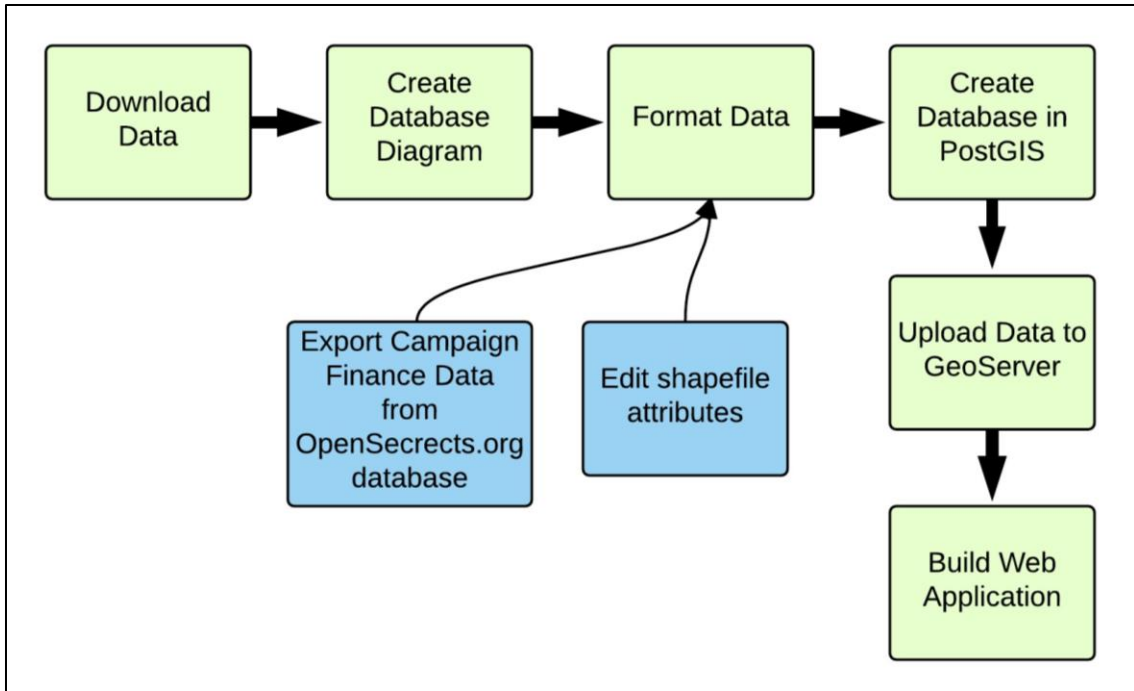was to build the web application with JavaScript code.

Figure 6 Workflow Diagram

3.2 Data Download

Two types of datasets were needed for the web map: campaign finance and geospatial

data. The main dataset was the campaign finance data, which included both contributions

to candidates and independent expenditures. The only spatial information with these data

was the addresses of individuals and PACs that made contributions. Mapping the

contribution data required a way for the address of the contribution source to be

translated into coordinates. The geospatial data used to do this was a zip code layer.

Coordinates of the zip codes were joined to the contributions and provided their location

on the map. The independent expenditures of PACs and other outside organizations were

placed on the map using the coordinates of the congressional district in which the money

was spent.

The Center for Responsive Politics (CRP) provides detailed campaign finance and lobbying data through its website (http://www.opensecrets.org). Anyone can download the data in compressed comma separated values (CSV) format if they create an account for the site. The files for each election cycle were downloaded in a single compressed file. A database, including all the tables and fields, would have to be created and then the CSV files would be imported into the tables one a time. A GitHub repository was found that included a PostGIS database backup file called campaign_finance.dump containing all the campaign finance data for election cycles starting in 1990 through February 2014. It was determined that using the .dump file was easier than the CSV files since all the data could be imported into PostGIS with a single, simple command. It was also faster because the database did not have to be created manually and the data for each election cycle did not have to be downloaded separately.

The one drawback to the campaign_finance.dump file was that it included only partial data for the 2014 cycle. It was desirable to include as much campaign finance information as possible for the map. Files that included contributions and expenditures reported through September 5, 2014 were downloaded from OpenSecrets.org. Although they were not the final numbers, they provided a more complete picture of campaign finance for the 2014 cycle.

The geospatial data needed for the project included four shapefiles. State and zip code boundary shapefiles as well as a zip code point shapefile were downloaded from ArcGIS Online via ArcMap. Congressional District boundaries were downloaded from the U.S. Census Bureau. Initially a Census Bureau zip code tabulation area (ZCTA)

shapefile was downloaded , but it did not meet the needs of the project because not all zip codes used by the U.S. Postal Service (USPS) were included.

3.3 Create Database Diagram

A database diagram was created early in the process to clearly define the data needs of the web application. The diagram enabled the relationships between the tables to be seen, and served as a guide for building the database. The design of the database was easily understood in this format. Adjustments were made to the diagram as the project progressed and changes were made to the database to better meet the functionality requirements of the web map. Figure 7 represents the final design of the tables in the database. Each table has primary key fields, highlighted in red, to ensure each row has a unique identifier and foreign key fields, highlighted in blue, that link the tables.
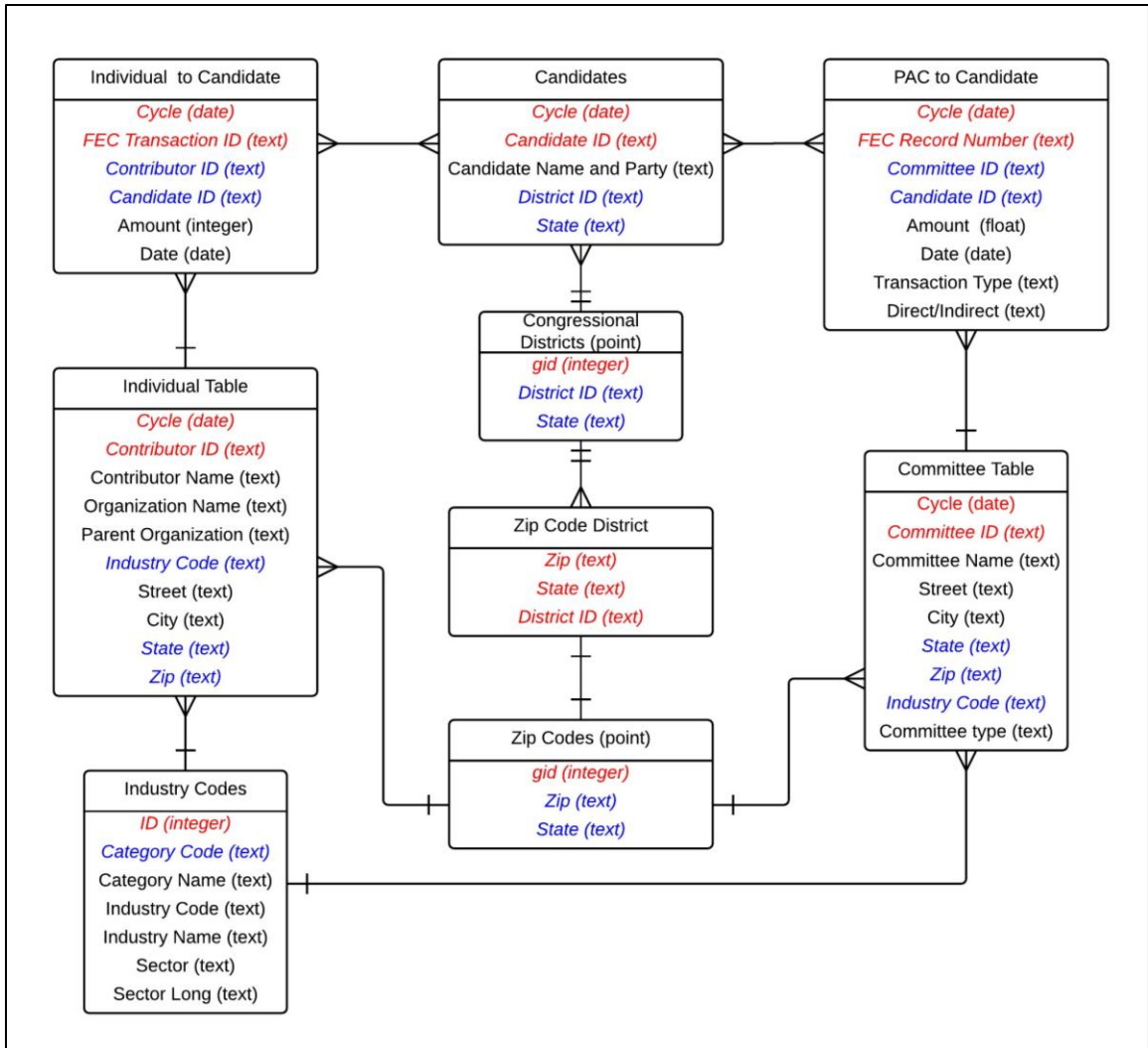
Figure 7 Database Diagram

The table most central to the database was the Candidates table. Candidates

receive contributions from both individuals and PACs, so the Individuals to Candidates

and PACs to Candidates tables, which contained fields with detailed the contribution

information, were linked to the Candidates table by the Candidate ID. The Candidates

table was also linked to the Congressional Districts table by the District ID- State foreign

key. The PACs to Candidates table contained both contributions and independent

expenditures. If the value of the Direct/Indirect field was "D", then the record represented

a contribution. A value of "I" meant it was an independent expenditure. The Committee

table held more detailed information about the PACs including the full name of the PAC, address, and industry category code. The Individuals table had similar data for individual contributors. The Individuals and Committees tables were linked to the Zip Codes and Industry Codes tables by the Zip-State and Industry Code foreign keys respectively. The Zip Codes and Congressional Districts tables each had point coordinates for the centroids of the features which were used to place the contributions and independent expenditures on the map.

3.4 Format Data

Before working with the campaign finance data it was necessary to install and configure OpenGeo Suite. The data in the campaign_finance.dump file was imported into PostGIS using the RESTORE command. This created a database called "campaign_finance". It included tables defined by Openecrets.org from which data for the web application was selected (Center for Responsive Politics 2015). The more complete 2014 data were then added to the database. There were more fields in the tables of the database than were needed for the web map. Since the database included candidates for all federal offices the data were filtered so that only rows containing information for House candidates were included in the output. The selection of the fields and filtering of the rows was accomplished using Structured Query Language (SQL) queries performed on the campaign_finance database, and the results were exported to CSV files.

Shapefiles also had to be processed to eliminate unnecessary data. They were modified using ArcMap. The zip code boundaries contained census data attributes that were not needed, so they were deleted from the attribute table. One unusual characteristic of zip codes is that they do not truly correspond to a geographic area. Instead they

represent a set of roads or a specific address serviced by the USPS (Grubesic 2008). The zip code boundaries file did not include all zip codes, but the zip code points file did. The Merge tool was used to give all the points a polygon representation, although that created some overlapping polygons.

Congressional District attributes were changed to match the format used by CRP. The original shapefile used the numeric Federal Information Processing Standards (FIPS) code to identify the state of the congressional district. For example the FIPS code for California is 06, so the 13th congressional district had a district ID of 0613. The CRP data had district IDs composed of the two letter state abbreviation and district number, so the example district ID was CA13. The Field Calculator in ArcMap was used to create the CRP formatted district ID.

3.5 Create Database in PostGIS

The first step in building the database was to create an new, empty database called House_campfin (Figure 8). The tables were created using the database diagram as a guide. They were then populated with the data exported from the campaign_finance database. The pgShapeLoader tool was used to import the zip code and congressional district polygon shapefiles. It was later determined that point geometry better met the needs of the map, so new tables were created for the zip codes and congressional districts. Point coordinates for the features were calculated using the ST_centroid function.
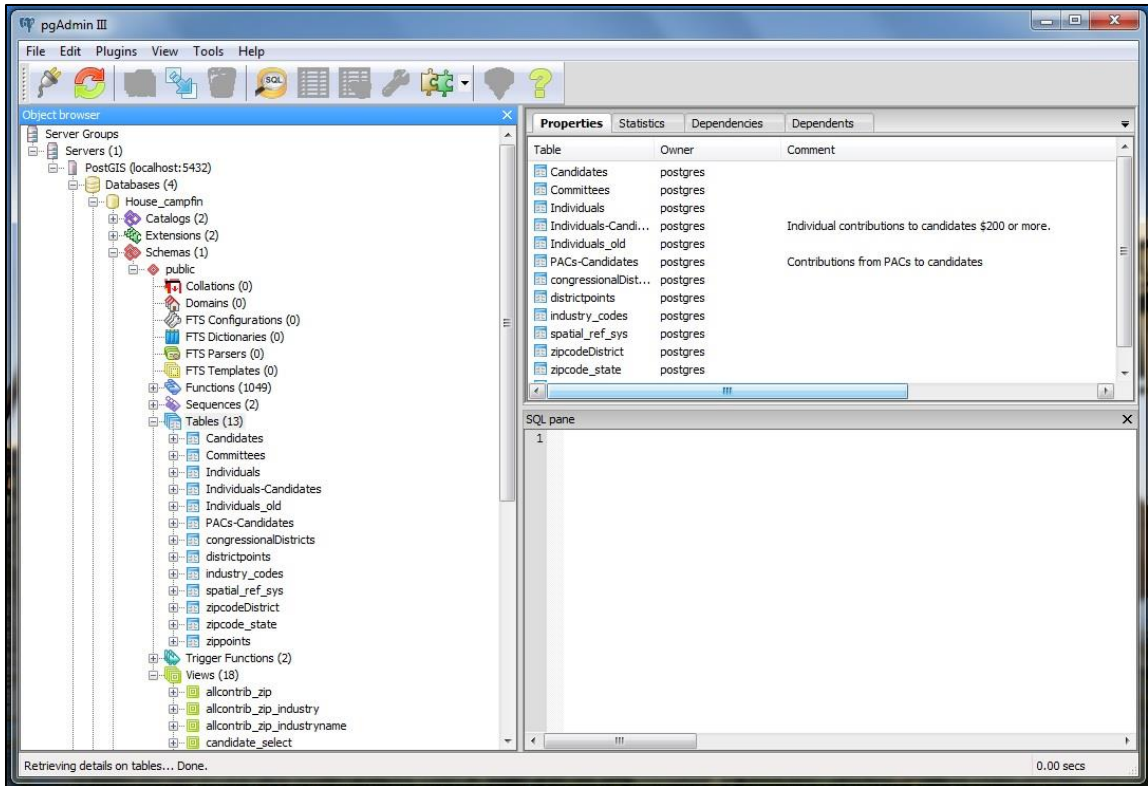
Figure 8 PostGIS Database

After the data had been imported primary keys and foreign keys were added to the

tables. These keys are a type of constraint on the data that help ensure there are not errors

in the data (PostSQL). Constraints were necessary for the maintenance of the database,

but a great deal of time had to be spent fixing problems with the data before they could be

added.

One challenge that took considerable effort to overcome was the errors in the

address information for individuals. The foreign key linking the individual table to the

zipcode_state table could not be created until all the errors had been eliminated. Several

different types of errors related to the zip code and state fields had to be dealt with. First,

there were data entry errors. The state may have been entered incorrectly or the zip code

may have had numbers mixed up. The state or zip code may also have been missing completely. If the street address and/or city fields were correct, then the incorrect data was determined by entering the address in the ZIP Code Lookup tool on USPS website or by searching for the address in Google Maps. Some street address information was also incorrect and erroneous zip codes could not be fixed. There were also individuals with foreign addresses, although they weren't always obvious. These had to be deleted since the database could not handle foreign addresses.

The percentage of individuals with errors in their address information was probably less than one percent. However, that was roughly 2,000 records that needed to be corrected or deleted. It took many hours to search for the zip codes and make the edits.

Data in the Committees and Candidates tables had errors as well. There were some zip code errors in the Committees table, but there were only about 20 that had to be corrected. The Candidates table included candidates that were not actually running for House seats in 2014. It was not certain why, but it seemed to that at least some candidates that had run in previous cycles still had committees that received or distributed funds even though they weren't running in 2014. A number of these candidates were found because the district they were in did not exist. Others were not found until the web map was being built and more candidates were being listed than had actually been running for office.

As development of the map began, some other additions were made to the database. Queries had to be written that would return the necessary data to the users as they interacted with the map. When the queries were being tested in PostGIS, some of them had significant performance issues. They would run indefinitely without returning

any data. The problems were likely caused by the way the queries were looking for data across multiple tables. As the queries were executed they had to run through loops that took far too long to process. The solution to the looping was to create "views."

A view is a query stored in the database. The results of the query are not stored or "materialized", but they could be queried just as a table would be (PostgreSQL). Returning contributions summarized by zip code was one query that was greatly simplified by views. It required creating three views. One view was created that summed the contributions from PACs to candidates by zip code, and another did the same for contributions from individuals. Then the two summary views were queried to make a single view with total contributions per zip code per candidate. More views were created as the map was developed, and they became the main way the map returned data from the database. They allowed data to be de-normalized for specific uses, which helped improve performance. They also simplified the queries needed for user interaction with the map.

3.6 Upload Data to GeoServer

Once the data were imported into the tables and all the constraints were implemented, uploading to GeoServer could begin. The first step for this was to create a Data Store, which is the connection between GeoServer and the PostGIS database. GeoServer could then see all the tables and views in the database and make them available to the web map through publishing.

The data were published using two different techniques. If all the data in a published layer was to be displayed on the map or another part of the page, then the table or view was published directly by GeoServer (Figure 9). The attributes and geometry columns were read and interpreted by GeoServer, and could then be added to a web map.

The congressional district polygons table and some of the views were published in this

manner. If only a portion of the data from a table or view was to be displayed, then SQL
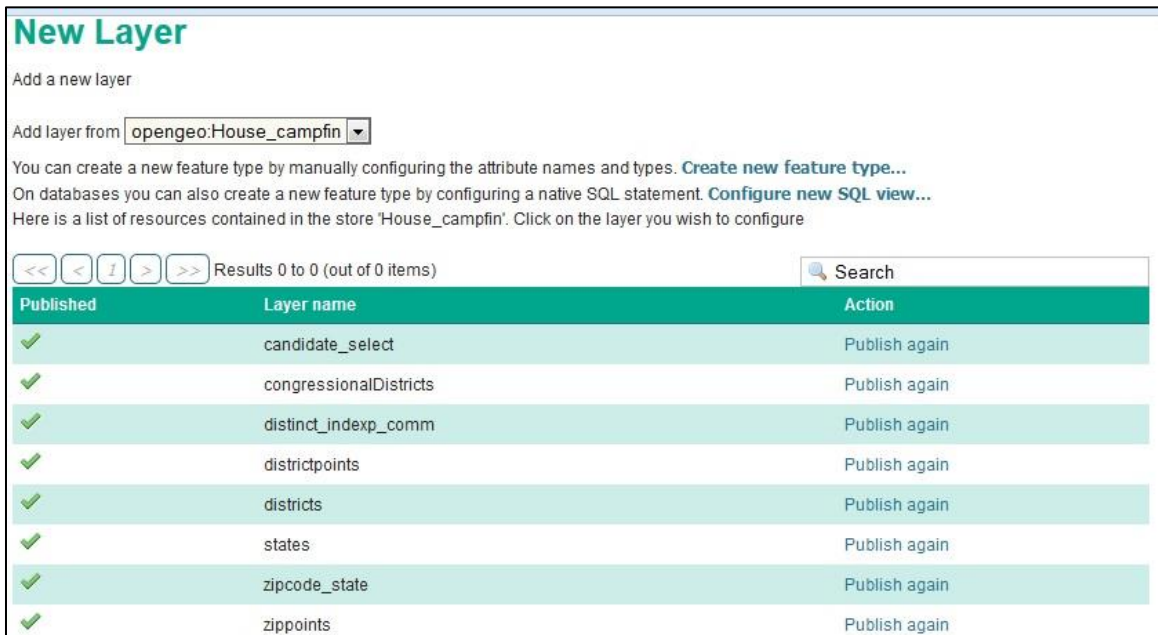
View layer was created.

Figure 9 Layers Published Directly from the Database

The SQL View method used a SQL query to return a portion of the data one or

more tables. For example, the SQL View settings in Figure 10 show the query for

independent expenditures. Using a SQL query allowed for more flexibility in what data

were added to the map as well as enabling user interaction through input parameters. The

parameter for the independent expenditure layer was called commname. The value for

commname came from a committee name selected by the user. The query then returned

the expenditures made by that committee. Parameters were used in all the SQL View

layers.

Edit SQL view

Update the definition of the SQL view and its metadata

View Name

independent_expend

SQL statement

```
SELECT
   indexp_cands."CommitteeID",
   indexp_cands."District_ID",
   indexp_cands."FirstLastP",
   Sum(indexp_cands."Amount") AS Expenditures,
   indexp_cands."TransType",
   districtpoints.geom

FROM
   indexp_cands INNER JOIN
   districtpoints
   ON
   indexp_cands."District_ID" =
districtpoints.districtid

WHERE

indexp_cands."CommitteeName" = '%commname%'

GROUP BY indexp_cands."CommitteeID",
indexp_cands."District_ID", indexp_cands."FirstLastP",
indexp_cands."TransType", districtpoints.geom
```

SQL view parameters

Guess parameters from SQL   Add new parameter   Remove selected

☐	Name	Default value	Validation regular expression
☐	commname	GUN OWNERS OF AM	^[\w\d\s\&\-\.\(\)\,\\%/!]+

☐ Escape special SQL characters

Figure 10 SQL View for Independent Expenditures Layer

3.7 Build Web Application Using Leaflet

Once some of the layers were published through GeoServer, the iterative process of

developing the code for the map began. The map was built using the Leaflet and jQuery

JavaScript libraries. They were downloaded and the html code linked to these locally

stored copies along with their respective Cascading Style Sheets (CSS). The html

included elements for user interaction (Figure 11) and a *div* element containing the map.

Figure 11 User Input Controls

The first layer added to the map was a basemap. The basemap for the application was obtained from MapBox. A free MapBox account was created so that an access token could be used to authorize access to the basemap. The Light basemap was chosen because the colors of the data markers stood out well against its grayscale color scheme. Next the Congressional Districts layer was added as an additional reference, which the user could toggle on and off with a check box control on the map (Figure 12).
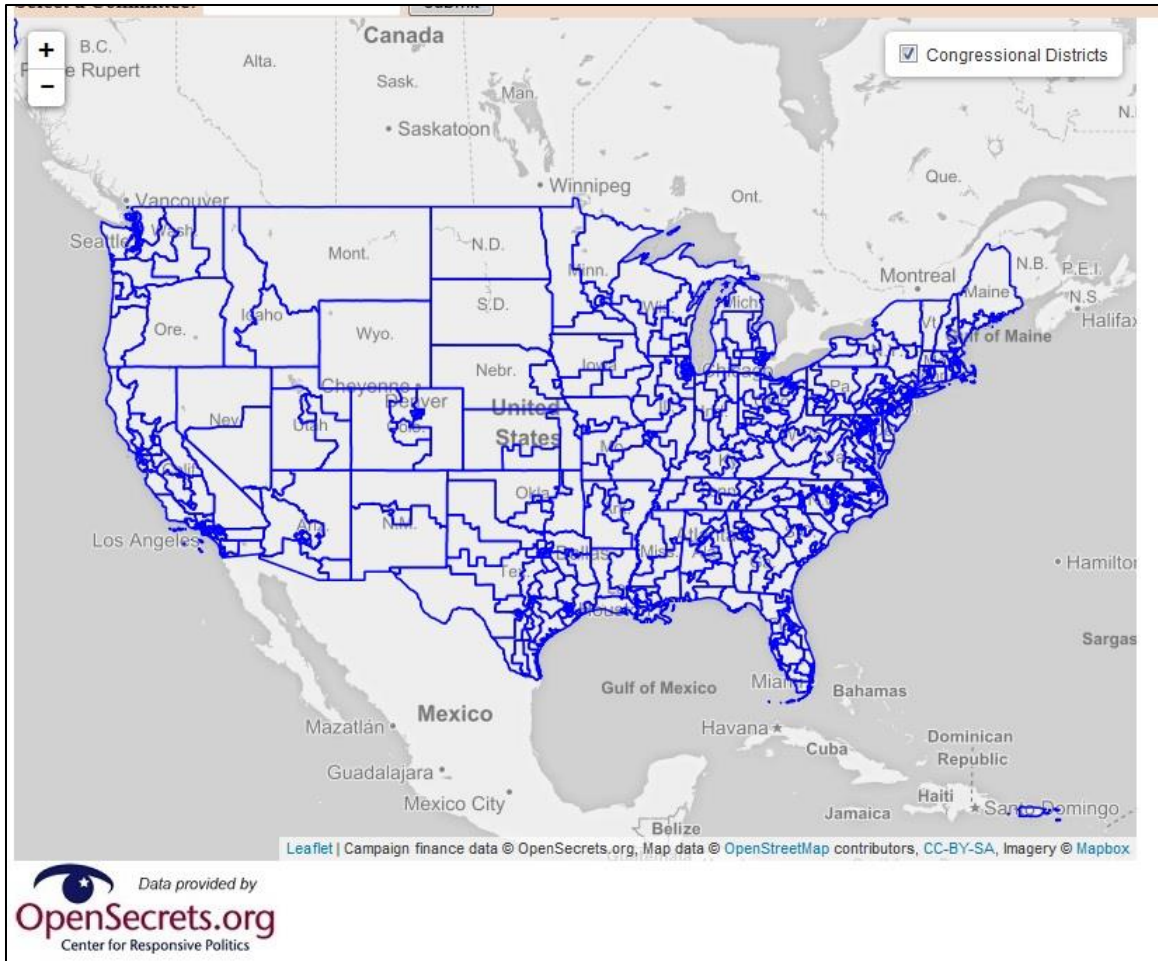
Figure 12 Map with Base Layers

User interaction with the map was controlled by the same basic process (Figure 13). Input made by the user triggered a request to a GeoServer Layer via a jQuery ajax function (jQuery.ajax 2015). When a candidate or committee was selected then the relevant campaign finance data was displayed on the map. Specific ways users could interact with the map are detailed below.
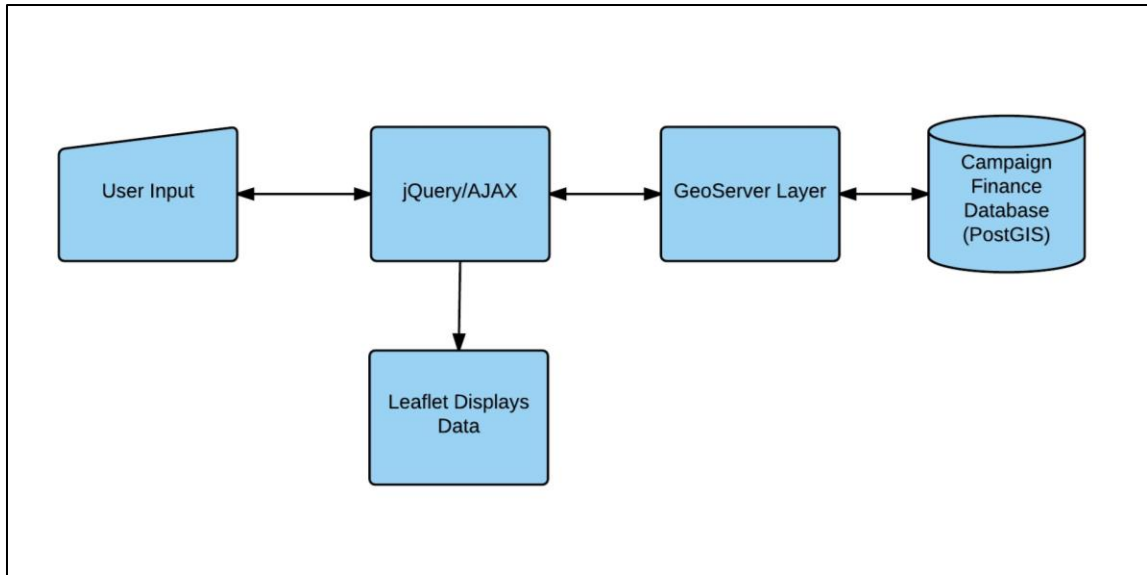
Figure 13 Data Flow Diagram

The map could display two types of campaign finance data; direct contributions to candidates and independent expenditures. The user displayed contributions to a candidate by making three selections. First they selected a state and then radio buttons with the congressional districts were displayed (Figure 14). After the button for a district was clicked, the candidates from that district appeared (Figure 15). The button for the desired candidate was clicked and the map refreshed to show markers for all the zip codes from which the candidate received contributions (Figure 16).

Figure 14 Map State Selected

Figure 15 Map with Congressional District Selected
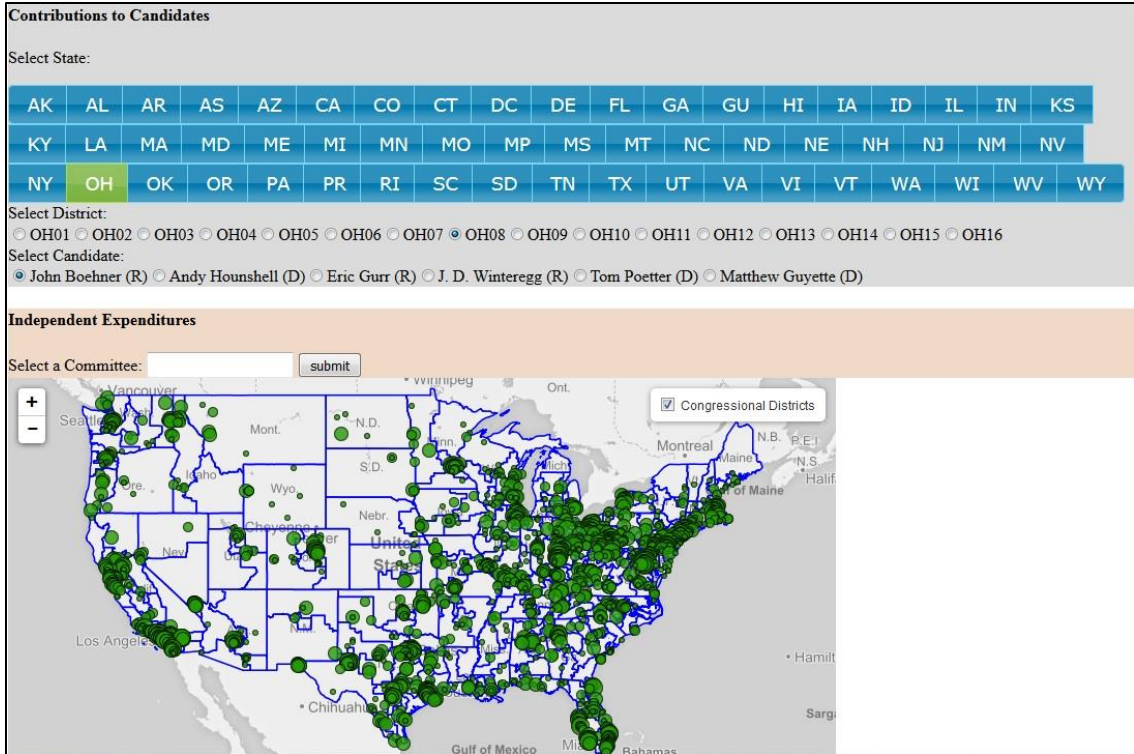
Figure 16 Map with Candidate Selected

The markers for the contributions were sized proportionally based on the amount contributed from the zip code. When a candidate had contributions from a large number of zip codes, the markers frequently overlapped and where sometimes directly on top of other markers. A plugin for Leaflet called Overlapping Marker Spiderfier (OMS) was used to handle overlapping markers. When a user clicked on a group of overlapping markers the OMS code caused them to separate so that a single marker could be selected more easily (Figure 17). If a marker was directly on top of another, the bottom marker could not be selected without the OMS.
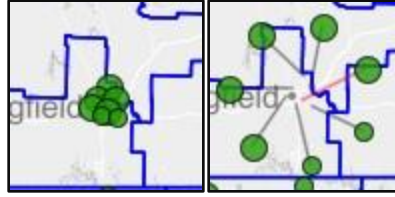
Figure 17 Overlapping Markers Before and After Clicking

Additional information about the contributions appeared in a popup when the user clicked on a marker (Figure 18). The zip code and total contributions for the selected marker were listed first. The contributions were then listed by industry category. The industry categories were created by CRP based on the federal government's Standard Industrial Classification (SIC) codes and cover over 400 specific industries and ideological interests. Categories for contributions from individuals were determined by the person's occupation or employer (Center for Responsive Politics 2014c). The various categories were different for each zip code and were partly a reflection of the local economy and interest groups.
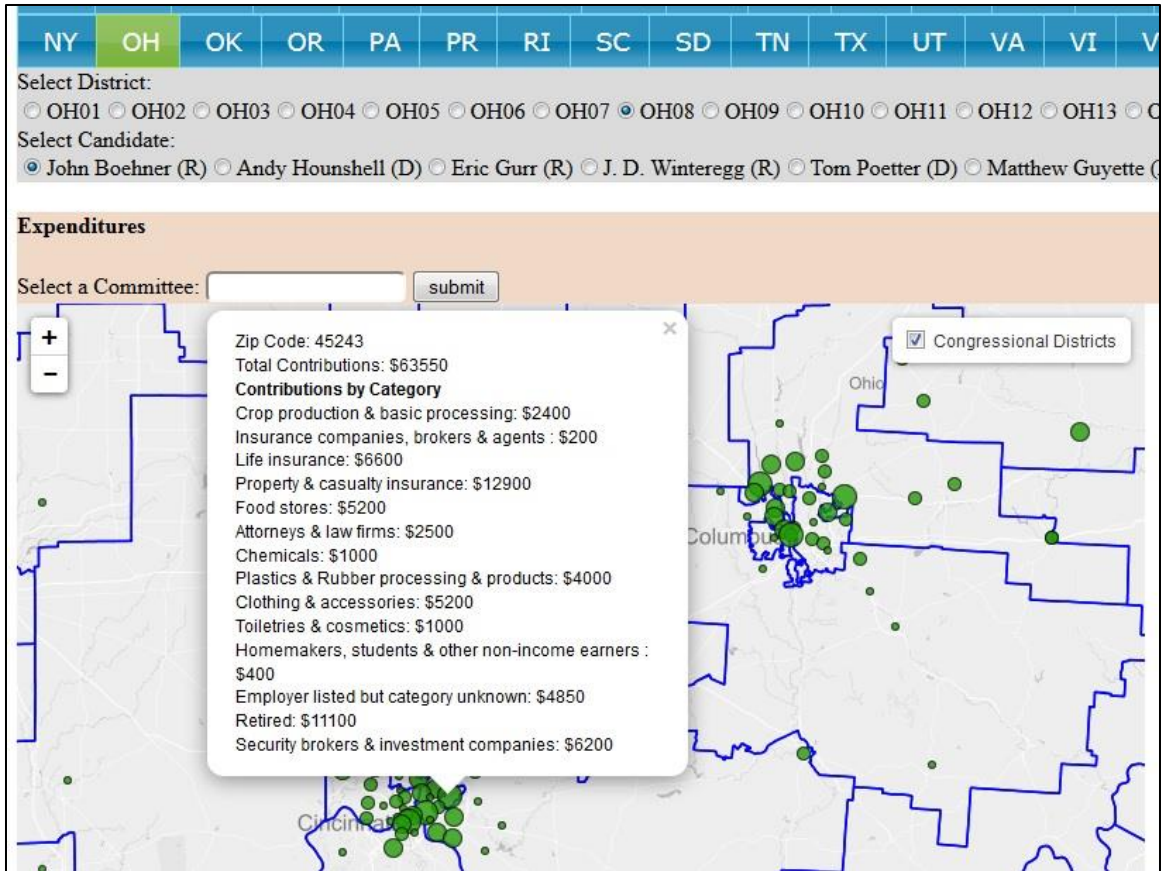
Figure 18 Popup with Contribution Information

Independent expenditures were selected in a different way from the contributions. A jQuery User Interface (UI) autocomplete widget was used for user input. After the user typed at least three letters in the search box the autocomplete widget returned all the committee names that included the typed letters (Figure 19). A committee could then be selected from the list, and the user then clicked the submit button to display the expenditures of the selected committee (Figure 20). The expenditure markers were sized proportionally, and color coded green if money was spent supporting a candidate or orange if opposing a candidate. If there were any overlapping markers, the OMS would separate them just as it did with the contribution markers.
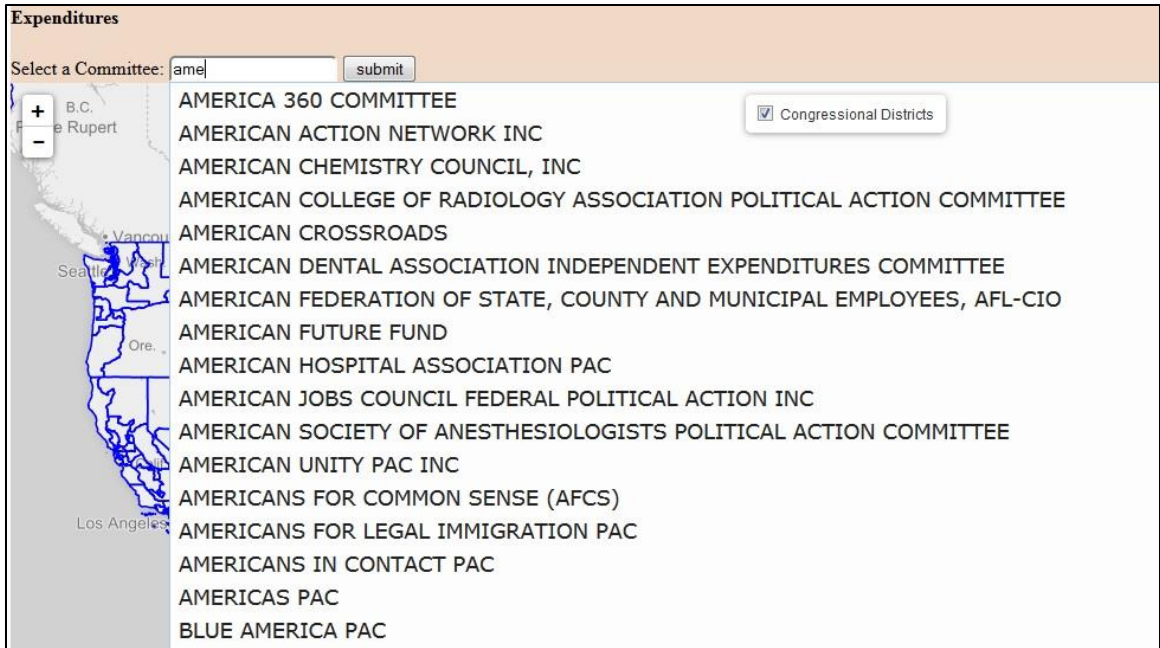
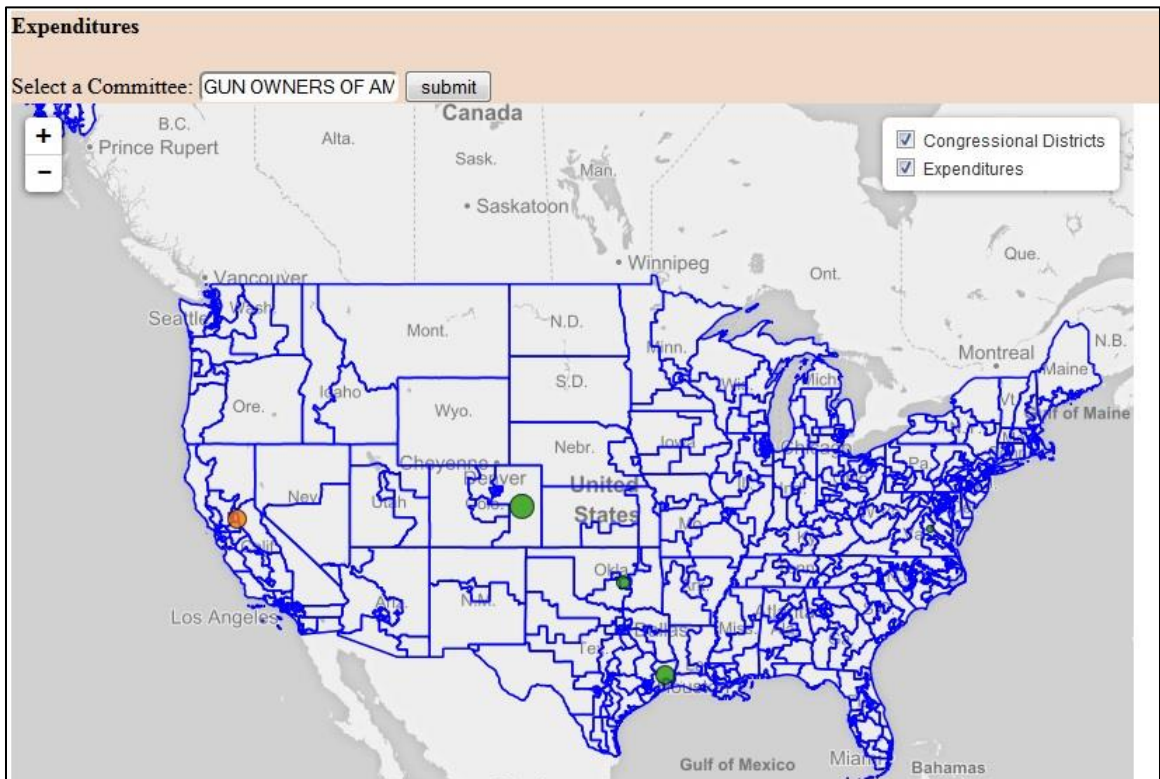**Figure 19 List of Committees During User Input**

Figure 20 Expenditures Displayed After a Committee was Selected

More specific information about the expenditures was made available in a popup; similar to the contribution data but simpler (Figure 21). When a user clicked on a marker, the popup appeared. The congressional district in which the money was spent was given along with the total spent and the candidate the committee was supporting or opposing.
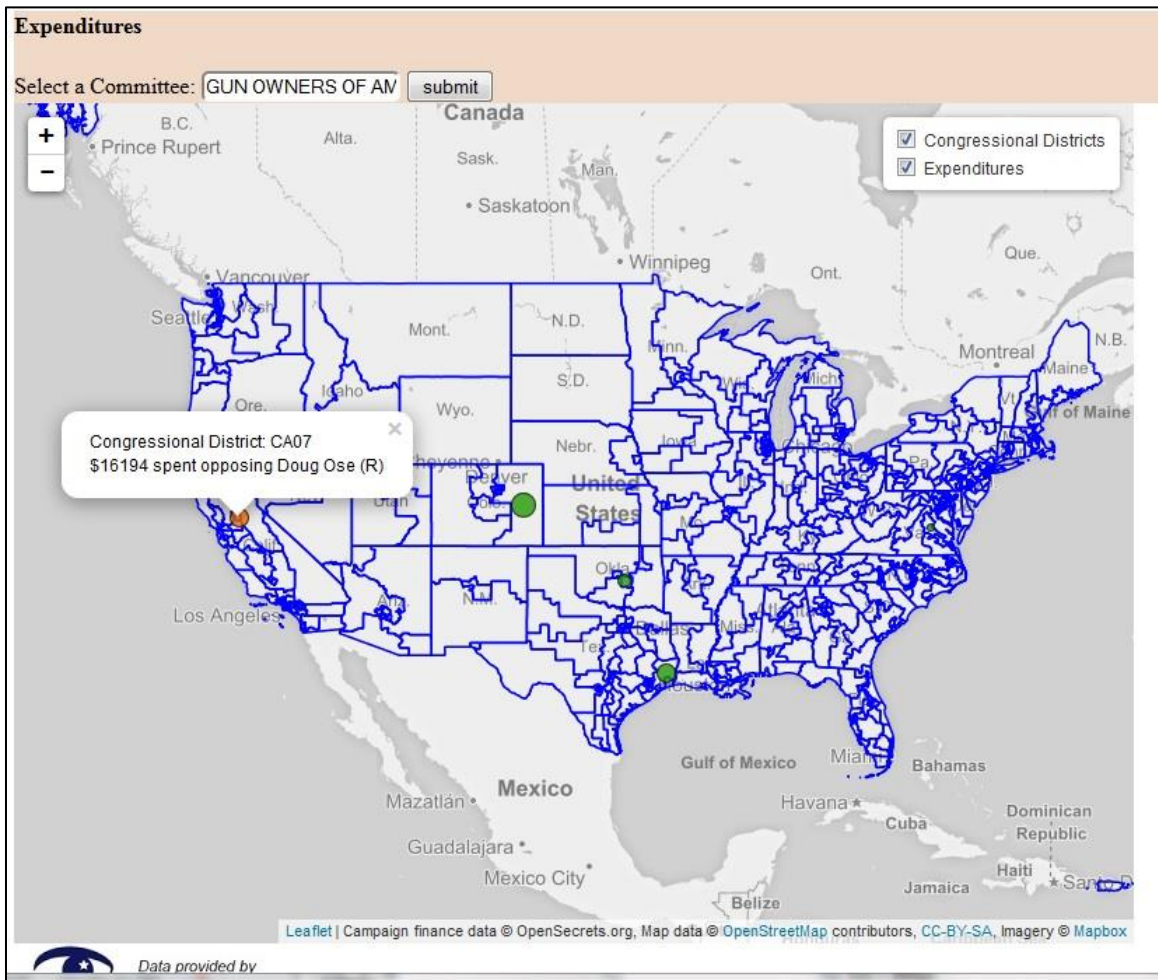

Figure 21 Popup with Expenditure Information

As with any application development process, building the web map was an iterative process. A number of challenges had to be overcome. The ajax requests had to be formatted correctly for GeoServer to accept them. Otherwise no data would be returned. The data were returned in a GEOJSON format, which was difficult to parse for

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the needs of the user interface. The SQL View layer settings included regular expression validation which help prevent security breaches. They also had to be set correctly for data requests to be accepted by GeoServer.

Designing the user interface (UI) was another challenging aspect of the project. Some options that were explored for selecting a candidate were not able to be implemented. Time was spent researching a way to show the states, districts, and candidates in a tree view, which would have put them in hierarchal list structure. However, all the tools and plugins found for tree views required very specific data structures that were too difficult to achieve for this project. The UI that was created may not be the most ideal, but it had adequate controls for the user to explore the data. It was also hoped that the styling of the UI would be more polished. A jQuery UI theme was applied to the state selection buttons, but there wasn't time to apply it to the rest of the page elements. Overall the web map worked well and was very responsive to the user.

CHAPTER FOUR: EVALUATION

The campaign finance web map was evaluated by 10 volunteers to assess how well it met

the goals, discussed in Chapter 1, of visualizing where contributions to candidates come

from and where outside groups spent money. The evaluators were a small sample of co-

workers and friends of the author. Five evaluators were employees at Valley Air Photos

in Caldwell, Idaho, and five were friends of the author residing in Meridian, Idaho. A

Google Survey Form was used to ask questions about the map and store the evaluators'

answers. The questions fell into three categories: evaluator background knowledge,

comparison of the campaign finance web map to the FEC website, and open ended

feedback.

4.1 Background Knowledge

The evaluators were asked three questions about their general knowledge of politics and

experience with web maps. The answers gave an indication of their perceptions of

campaign finance. The first question asked "How often do you watch, listen, or read

about national politics?" with 50% answering daily or weekly (See Figure 22). The rest

of the responses were in the monthly to rarely/never range. This may reflect how much

the evaluators follow national news more generally. It is likely that someone who follows

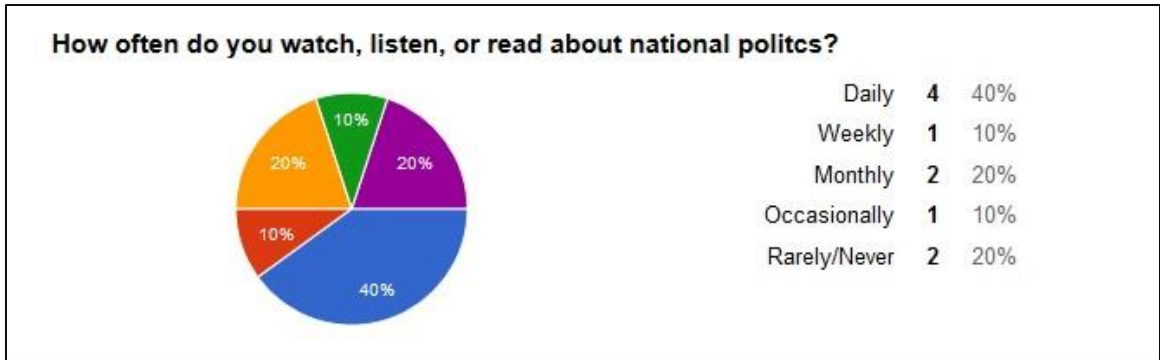national news regularly would be exposed to stories about politics.

Figure 22 Chart of Survey Question #1 Responses

The next question dealt with the evaluators' attitude about money in politics. It asked, "How important do you feel campaign finance and money spent in elections is?" No one felt that money was unimportant. There were 7 that answered it was very important and 3 answered somewhat important (Figure 23. The responses were in line with polls mentioned in Chapter 1 showing a majority of people perceiving money having an influence on politicians.
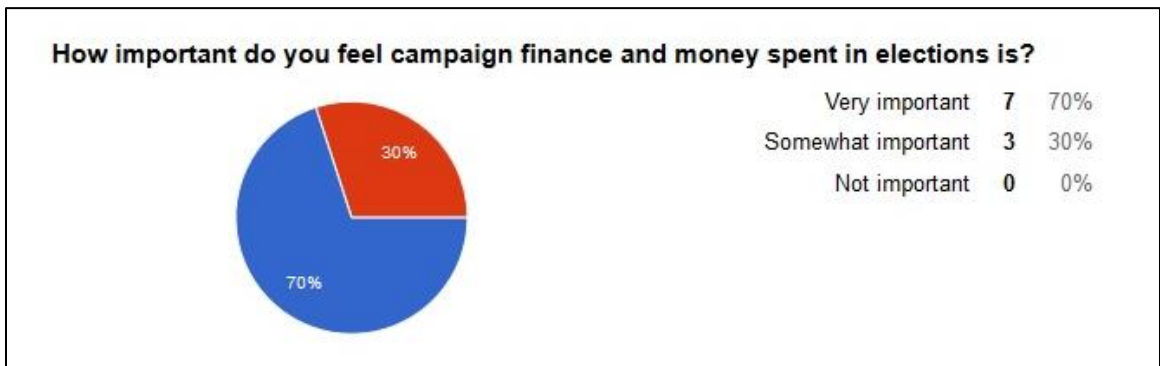

Figure 23 Chart of Survey Question #2 Responses

The third background question gave some idea of the evaluators' experience with web maps. In answering the question "How often do you use web maps?", 1 responded with daily, 4 with weekly, and 2 with monthly. The other 3 answered occasionally or rarely/never. Figure 24 shows a chart of the responses. Most of the evaluators used web maps at least monthly, so most of them would be comfortable using web maps to find locations and information.
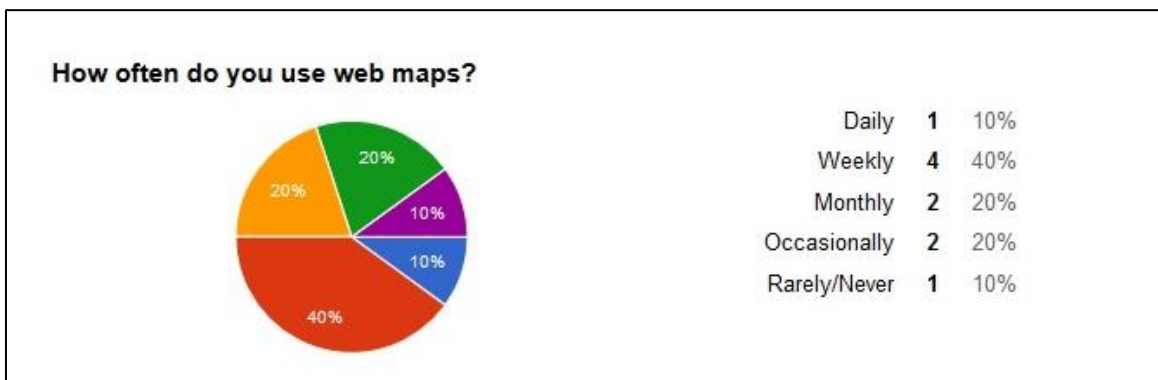

Figure 24 Chart of Survey Question #3 Responses

4.2 Comparison to the FEC website

Most of the questions in the survey asked the evaluators to compare how the campaign finance web map presented data with how pages on the FEC website presented data. Three candidates, all of whom were incumbents, where chosen for the evaluators to find contributions and independent expenditures. The names of some candidates were more likely to be recognized by the evaluators than others. Mike Simpson is the representative for Idaho's 2nd Congressional District. The evaluators were likely to be most familiar with him since they all lived in Idaho. John Boehner, who is Speaker of the House, would be familiar to anyone that follows politics. For this group of respondents,

Barbara Lee, from California's 13th Congressional District, was likely to be less recognized. The results for the contribution questions will be discussed first, then the independent expenditure questions, followed by some general comparison questions.

4.2.1 Contributions Comparison

The survey asked evaluators, "Using the Federal Election Commission (FEC) 2014 House and Senate Campaign Finance page and this web map, which tool better informed you about contributions made to Representative Mike Simpson?" The same question was asked for John Boehner and Barbara Lee. The evaluators were answer on scale of 1 to 5, with 1 being "FEC page is much better" and 5 being " Web map is much better". They were instructed to answer the question by finding the contributions for each candidate on the web map, and then find contribution data on the FEC page. Figure 25 shows the responses for contributions made to Mike Simpson. The evaluators felt better informed by the web map than the FEC page, with 60% answering with a 4 or 5. Two responded with a 3, one gave a 2, and one gave a 1.
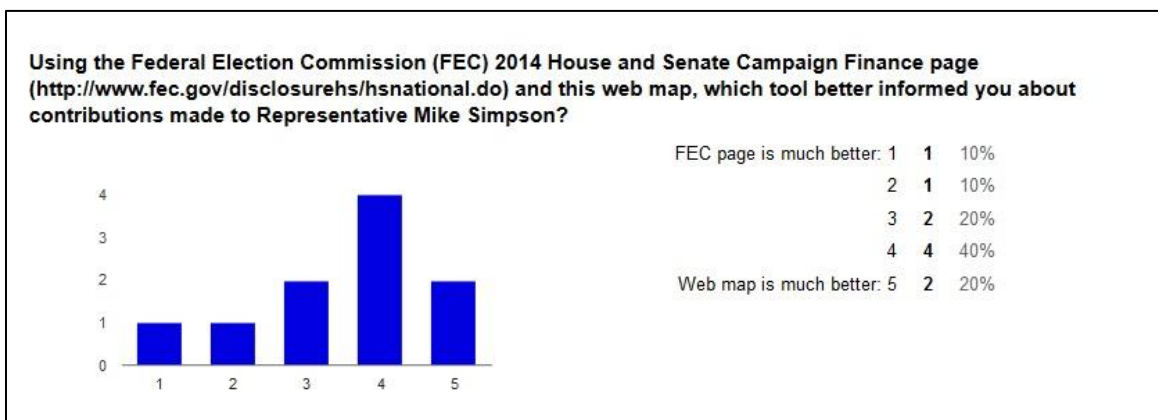

Figure 25 Graph of Survey Question #4 Responses

The evaluators more strongly favored the web map for contributions to John Boehner (Figure 26). Only one felt better informed by the FEC page, while 80% preferred the web map.
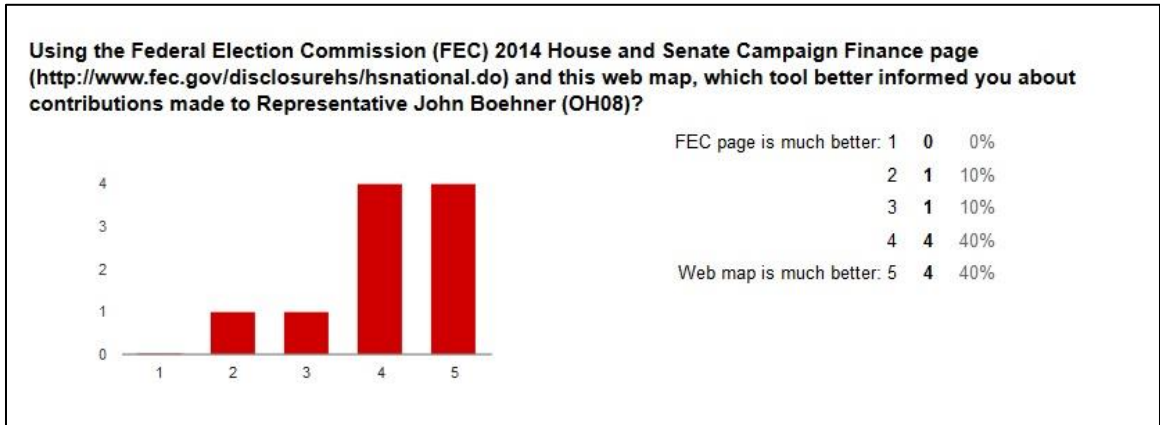

Figure 26 Graph of Survey Question #6 Responses

The evaluators again felt better informed by the web map for contributions to Barbara Lee, with 60% giving a 4 or 5 (Figure 27). Three evaluators responded with at 3 and one gave a 1.
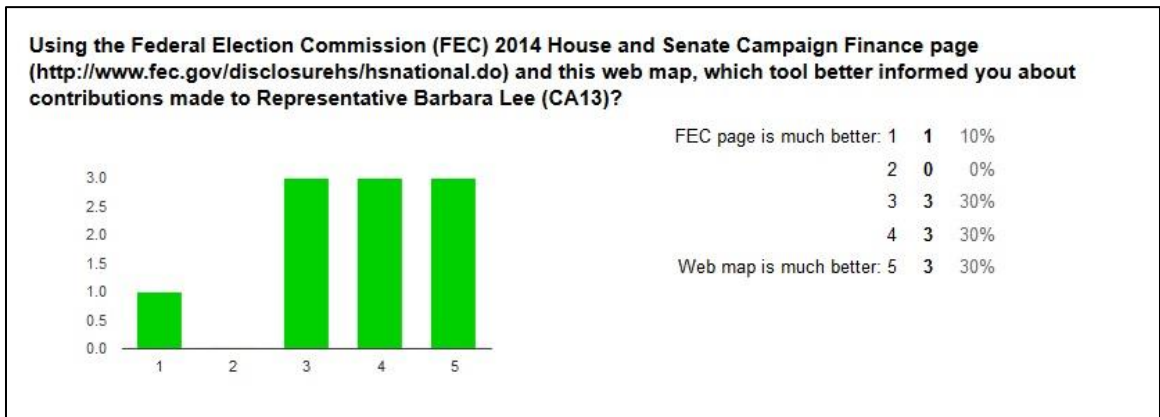

Figure 27 Graph of Survey Question #8 Responses

The responses to the contribution questions were quite similar for all three candidates. However, it was interesting to see stronger preference for the web map in the responses for John Boehner. He received far more contributions than the other two candidates, and the visualizing the data on the web map made a stronger impression.

4.2.2 Independent Expenditures Comparison

The questions for independent expenditures were very similar to the contribution questions and used the same scale. Evaluators were asked, "Using the FEC 2014 House Independent Expenditures page (http://www.fec.gov/disclosureie/ienational.do) and this web map, which tool better informed you about money spent by outside groups supporting or opposing Representative Mike Simpson?" The same question was asked for the other two candidates. Figure 28 shows the responses to the independent expenditure question for Mike Simpson. The evaluators felt somewhat better informed by the web map, with five answering with a 4 or 5. Three evaluators gave a 2 or 1, and two answered with 3.
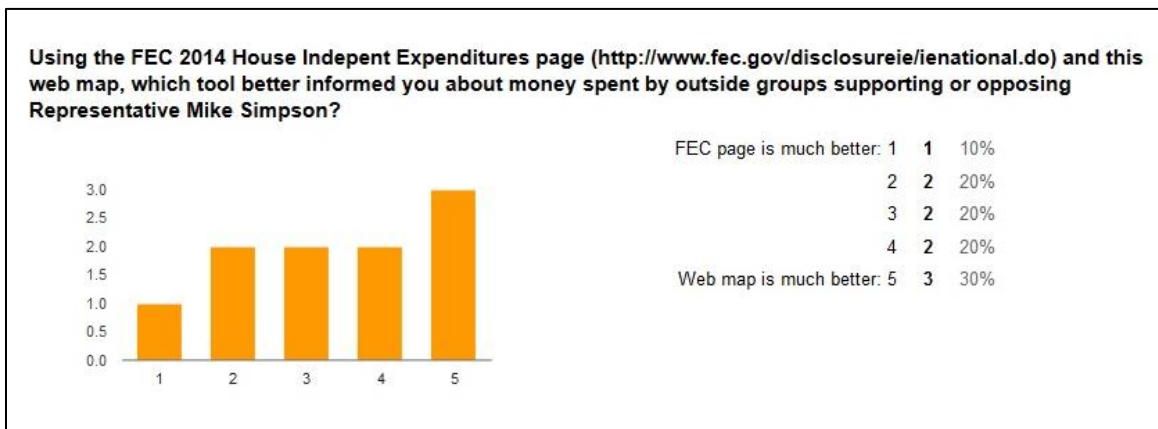

Figure 28 Graph of Survey Question #5 Responses

The evaluators said they were somewhat better informed by the FEC page in their responses to the independent expenditures question for John Boehner (Figure 29). Four responded with a 1 or 2. Four were neutral; responding with at 3. Only two thought web map better informed them.
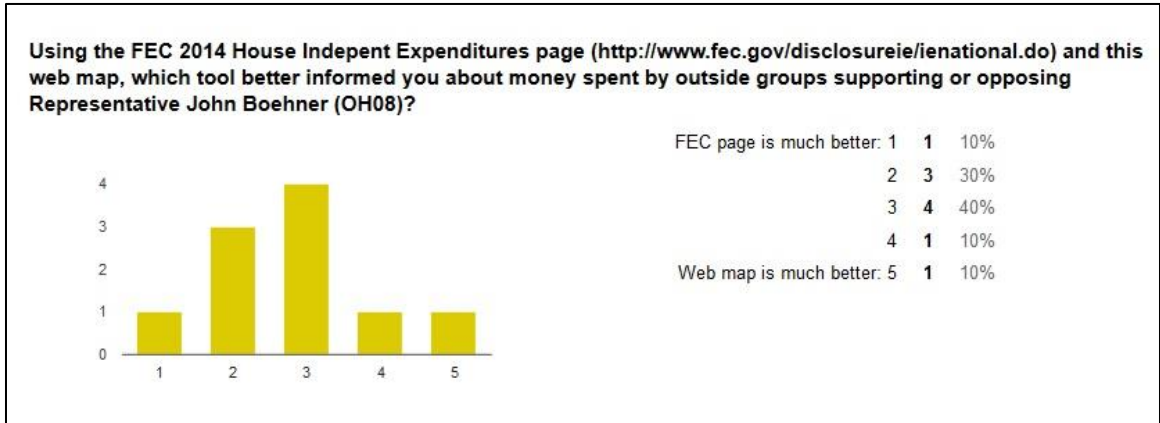
Figure 29 Graph of Survey Question #7 Responses

Asking about independent expenditures for Barbara Lee was problematic. After four people had completed the survey it was discovered that there were not any independent expenditures in Barbara Lee's district. The last six evaluators were informed of the situation. Half the evaluators answered with a 3, two felt better informed by the FEC page, and three felt better informed by the web map (Figure 30). The responses for this question are of questionable value, since there really wasn't any data to find.

Figure 30 Graph of Survey Question #9 Responses

Comparing the web map and the FEC page for independent expenditure data was more difficult than for the contribution data. The web map was designed to look at independent expenditures by separate outside groups, not the total spent by all groups supporting or opposing a candidate. The FEC page could better answer the independent expenditure question in aggregate because users could see the total spent in a particular district as well as what was spent supporting or opposing a candidate.
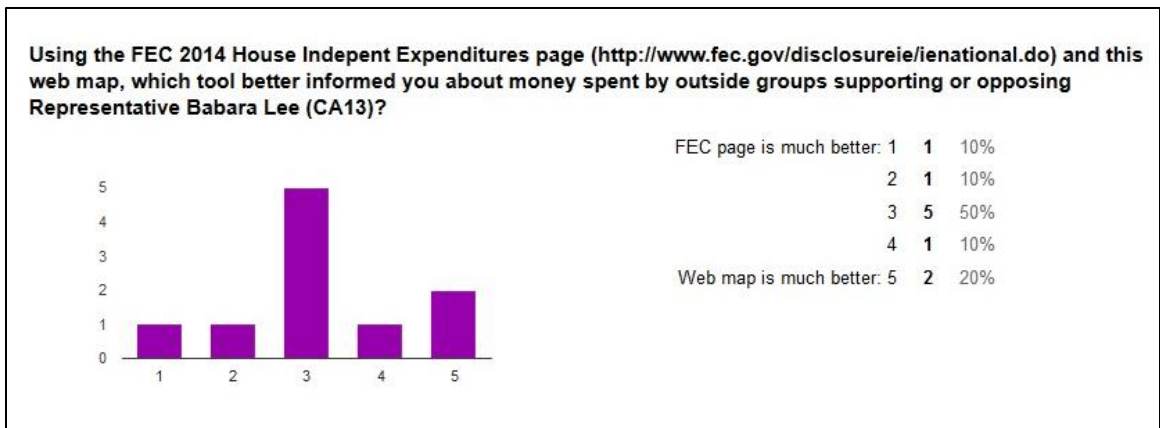
4.2.3 General Comparison

After looking at data for specific candidates the survey asked evaluators to compare the web map and the FEC pages more generally. The survey asked, "After exploring the contribution data in the web map are you better informed about the geographic distribution of money donated to U.S. House candidates in general compared to how the data is presented on the FEC House and Senate Campaign finance page?" The responses corresponded well with those for the candidate specific contribution questions (Figure 31). Six of the ten evaluators felt better informed by the web map and three felt they were about the same. Only one evaluator felt better informed by the FEC page.
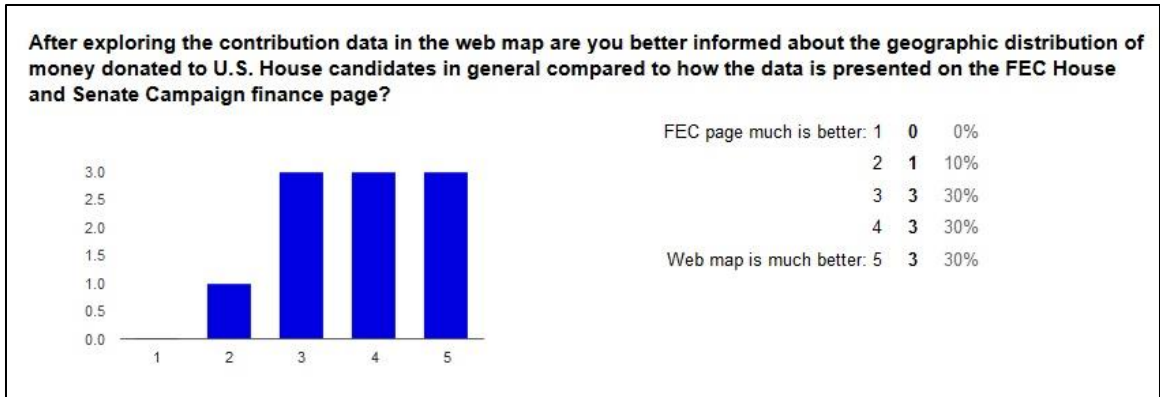
Figure 31 Graph of Survey Question #10 Responses

The survey also asked about the overall independent expenditure presentation. The question said, "After exploring the independent expenditure data in the web map are you better informed about where money is spent by outside groups in U.S. House elections compared to how the data is presented on the FEC Independent Expenditure page?" The responses were less consistent with the candidate specific independent expenditure questions (Figure 32). Six of the ten evaluators felt better informed by the web map when asked about the independent expenditures in general, with none being better informed by the FEC page. Whereas they had somewhat favored the FEC page when asked about independent expenditures for specific candidates. The results indicated that while the web map didn't let users see all the independent expenditures in a district, it was still informative.
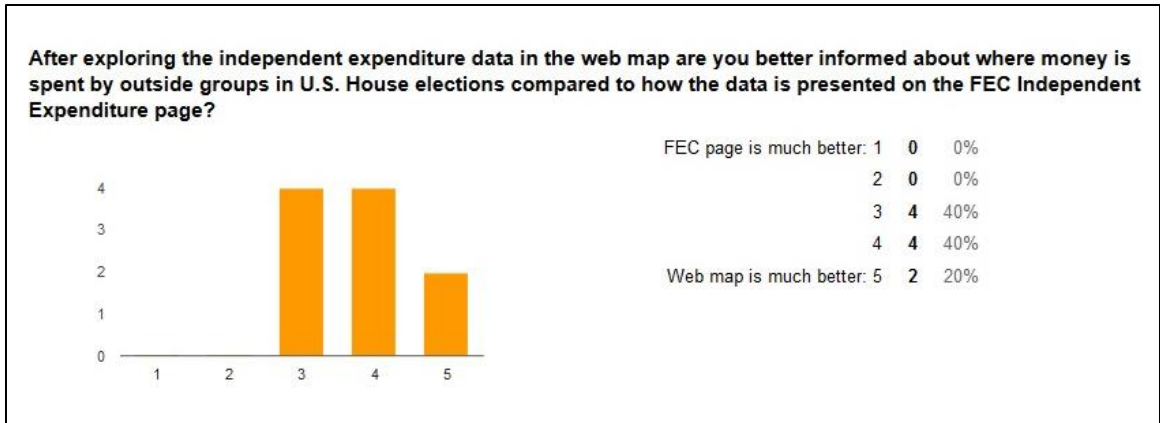
Figure 32 Graph of Survey Question #11 Responses

Finally, the survey asked evaluators to compare the ease of use of the tools (Figure 33). The question said, "How easy is the campaign finance web map to navigate and search compared to the FEC pages?" Half of the evaluators thought web map was easier to use, three thought they were about the same, and two thought the FEC page was easier to use.
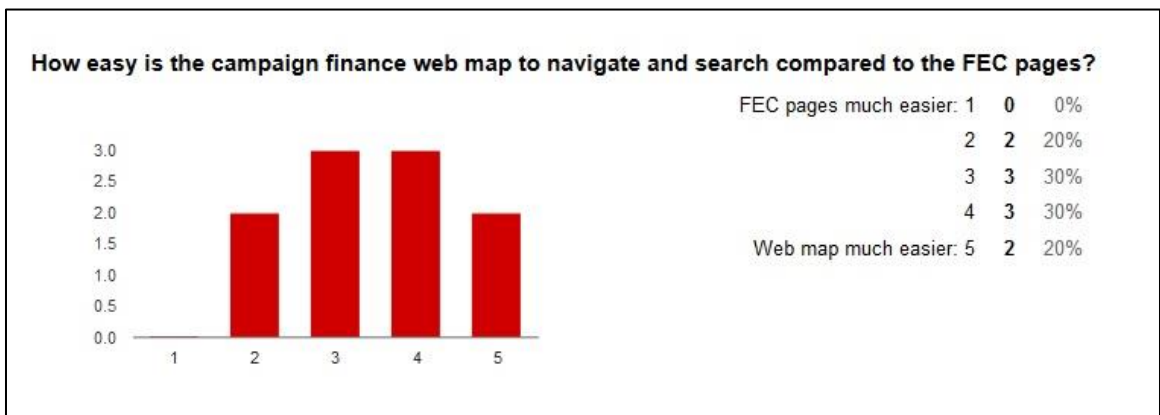

Figure 33 Graph of Survey Question #12 Responses

4.3 Web Map Feedback

The last section of the survey asked evaluators to answer four open-ended questions. These questions helped provide a little more insight to how they reacted seeing the campaign finance data and give suggestions for improving the web map. The first question asked, "How did the web map change your understanding of campaign contributions to U.S. House candidates?" In general, the evaluators had a better understanding of where candidates get contributions from. One was not aware that the information could be accessed before doing the survey. Three evaluators mentioned they hadn't realized how much of contributions come from outside the candidate's district. The way the data was visualized made a strong impression and was easy to understand.

The second open-ended question asked, "How did the web map change your understanding of outside spending in U.S. House elections?" The evaluators were interested in seeing where money was spent by outside groups. Some were surprised or shocked by how much outside spending there was. One said it should be a crime. There seemed to be some misunderstanding about what constituted independent expenditures. A few of the responses used the word contribution or talked about giving money to candidates. The concept of outside spending can be confusing and perhaps it was not explained well enough in some instances. The third open-ended question asked, "How can the campaign finance web map be improved?" A number of useful suggestions were made. Two evaluators thought that the total contributions for a candidate should be shown. One person would have preferred a graph of contributions by category in the popup. This respondent asked for something more visually appealing than the list in the popup. It was also suggested that the user should also be able to search for candidates by

name, so if a user did not know the state or district of a candidate, there could still be way to find contributions.

Last of all, a space was provided for the evaluators to make additional comments. It was not required and not everyone left a response. One evaluator felt the web map was easy to navigate and showed the contribution and expenditure data in a "distinctive manner" Another would have liked to have more time to explore the map and wanted a more direct way of finding specific candidates. One suggestion made was to link to the more in-depth data found on the FEC website. The web map was good for quick searches, but additional useful information could be made available. In a conversation after completing the survey, one evaluator stated that the web map was better "at telling a story."

CHAPTER FIVE: DISCUSSION AND CONCLUSION

Chapter 5 describes the contribution of the campaign finance web map to improve the public's understanding of campaign contributions and independent expenditures and how well it met the contributions set forth in Chapter 1. This chapter then concludes with a discussion of improvements that should be made to the web map and potential future work.

5.1 Results of the Campaign Finance Web Map

The complexities of the campaign finance system can be difficult to follow. Large sums of money and the number of outside groups seeking to influence elections make the task of informing voters increasingly challenging. Data visualization can be an effective way of presenting campaign finance data. This thesis project created an interactive web map with the goal of providing tools for viewing the spatial patterns of contributions to individual candidates and expenditures made by outside groups. Visualizing the data in this way reveals aspects of campaign finance that charts and tables do not.

There are other campaign finance data visualizations available, but the application is unique in mapping both contributions and expenditures. It also better approximates the locus of contributions and outside money spent opposing or supporting candidates. The approach used in this thesis can inspire others to try new ways of presenting campaign finance data. Voters need to be better informed about the campaign finance system and the more tools available for visualizing the data the better they will understand how campaign finance affects the political process. They will then be able to make more informed choices when voting.

Based on the responses in the evaluation survey, the web map met the goals of creating tools for visualizing contributions to candidates and independent expenditures. Those who evaluated the web map better understood where candidates' received contributions from, and where outside groups spent money. Overall, they preferred the way the data was presented on the web map compared to how it was presented on the FEC website. The sample size of evaluators was small, so their responses may not correlate well with a larger population. However, the survey results indicate that the web map is a more engaging way of showing campaign finance data than the usual tables and charts. Future work should include larger samples of users evaluating the web map in a way similar to what was done for this thesis.

The accuracy of the locus of campaign contributions is limited by the accuracy of the address information. While trying to correct errors in the zip codes, it was discovered that some individuals had made contributions from different addresses. Most of the different addresses were from previous elections cycles. It is possible that they had moved, but they also might have more than one residence. Another possibility is that a person used a business address instead of a home address. When there were errors in the address information, the address that most closely matched was used. If a correct zip code could not be determined then the contributor had to be deleted. These errors were a small percentage of the total, so the overall accuracy was high.

5.2 Web Map Improvements

The web map is adequate as it is currently designed, but a few changes would make it more useful. The suggestion to show the total amount of contributions a candidate has received is a good one. Seeing the total amount would allow someone to better compare

candidates and give more context to all the markers displayed on the map. Another relatively easy improvement would be to add the ability to search for candidates by name. The same autocomplete widget used for the committee name search would make finding a specific candidate quick and easy. The user could also avoid having to select a state, then a district, and then select from a list of candidates.

The number of clicks it takes to see the contributions can be a bit awkward. A more extensive redesign could reduce the number of clicks and have users interact more directly with the map. Users could click on a congressional district in the map and see a list of candidates. There is more than one way this functionality might be implemented, and further research is needed to determine the best approach.

Refining the style of the UI is another area that would improve the user experience.

5.3 Future Work

The campaign finance web map is currently implemented in a development setting on a laptop. A number of steps will need to be taken to make it available on the internet. The first step will be to install OpenGeo Suite on a server and transfer the House_campfin database to it. The layers will then need to be published in GeoServer. The code for the web map will also need to be copied to the server. A domain name will have to be acquired, or use an existing organization's website to host the map.

There are no firm plans to make the map available on the internet, but a couple of the evaluators offered to help set it up on their personal servers. One of them also had a couple of domain names that could be used. It may be worthwhile to contact some organizations such as CRP or the Sunlight Foundation to see if they would be interested

in hosting the map. This would give greater exposure to the map than using a domain name that few people are familiar with.

The web map does not currently have the complete data from the 2014 election cycle. Before it is made publicly available the most up to date data will need to be downloaded from OpenSecrets.org and imported into the database. However, this raises several issues that need to be addressed for the long term maintenance of the web map. The most immediate problem will be dealing with the errors in the addresses of individuals and PACs. When new data is imported to the tables, it overwrites the existing data and all the errors previously corrected will return. It is not practical to manually correct the errors every time new data is available. The simplest way to deal with them is to delete the records with address errors, but even that would be a long process to carry out manually. An automated process for dealing with the address errors must be created for the web map is to be updated regularly. One possible method could be to write a Python script that reads the data in CSV format. It would look at the zip code field and try to find a match in a list of the actual zip codes. If a match was not found the record would be deleted. A SQL query might also be written that does the same thing inside the database.

There are also issues with being able to use the web map for more than one election cycle. The 2014 election cycle is over and the 2016 election cycle has begun. People are likely to be more interested in what is happening campaign finance right now than in the past. The web map could be modified to display data from different cycles. However, there are changes to zip codes and congressional districts over time that will have to be dealt with.

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APPENDIX A: GOOGLE EVALUATION SURVEY

Campaign Finance Web Map Survey

* Required

How often do you watch, listen, or read about national politcs? *

⊙ Daily

⊙ Weekly

⊙ Monthly

⊙ Occasionally

⊙ Rarely/Never

How important do you feel campaign finance and money spent in elections is? *

⊙ Very important

⊙ Somewhat important

⊙ Not important

How often do you use web maps? *

⊙ Daily

⊙ Weekly

⊙ Monthly

⊙ Occasionally

⊙ Rarely/Never

Using the Federal Election Commission (FEC) 2014 House and Senate Campaign Finance page (http://www.fec.gov/disclosurehs/hsnational.do) and this web map, which tool better informed you about contributions made to Representative Mike Simpson? *

	1	2	3	4	5	
FEC page is much better	⊙	⊙	⊙	⊙	⊙	Web map is much better

Using the FEC 2014 House Indepent Expenditures page (http://www.fec.gov/disclosureie /ienational.do) and this web map, which tool better informed you about money spent by outside groups supporting or opposing Representative Mike Simpson? *

	1	2	3	4	5	
FEC page is much better	⊙	⊙	⊙	⊙	⊙	Web map is much better

Using the Federal Election Commission (FEC) 2014 House and Senate Campaign Finance page (http://www.fec.gov/disclosurehs/hsnational.do) and this web map, which tool better informed you about contributions made to Representative John Boehner (OH08)? *

1 2 3 4 5

FEC page is much better ◎ ◎ ◎ ◎ ◎ Web map is much better

Using the FEC 2014 House Indepent Expenditures page (http://www.fec.gov/disclosureie/ienational.do) and this web map, which tool better informed you about money spent by outside groups supporting or opposing Representative John Boehner (OH08)? *

1 2 3 4 5

FEC page is much better ◎ ◎ ◎ ◎ ◎ Web map is much better

Using the Federal Election Commission (FEC) 2014 House and Senate Campaign Finance page (http://www.fec.gov/disclosurehs/hsnational.do) and this web map, which tool better informed you about contributions made to Representative Barbara Lee (CA13)? *

1 2 3 4 5

FEC page is much better ◎ ◎ ◎ ◎ ◎ Web map is much better

Using the FEC 2014 House Indepent Expenditures page (http://www.fec.gov/disclosureie/ienational.do) and this web map, which tool better informed you about money spent by outside groups supporting or opposing Representative Babara Lee (CA13)? *

1 2 3 4 5

FEC page is much better ◎ ◎ ◎ ◎ ◎ Web map is much better

After exploring the contribution data in the web map are you better informed about the geographic distribution of money donated to U.S. House candidates in general compared to how the data is presented on the FEC House and Senate Campaign finance page? *

1 2 3 4 5

FEC page much is better ◎ ◎ ◎ ◎ ◎ Web map is much better

After exploring the independent expenditure data in the web map are you better informed about where money is spent by outside groups in U.S. House elections compared to how the data is presented on the FEC Independent Expenditure page? *

1 2 3 4 5

FEC page is much better ◎ ◎ ◎ ◎ ◎ Web map is much better

How easy is the campaign finance web map to navigate and search compared to the FEC pages? *

1   2   3   4   5

FEC pages much easier ○ ○ ○ ○ ○ Web map much easier

How did the web map change your understanding of campaign contributions to U.S. House candidates? *

How did the web map change your understanding of outside spending in U.S. House elections? *

How can the campaign finance web map be improved? *

Additional Comments

Submit