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## Attempting to Close the Digital Frontier: A Mixed-Methods Approach to the Study of the Cyber Intelligence Sharing and Protection Act

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ATTEMPTING TO CLOSE THE DIGITAL FRONTIER: A MIXED-METHODS  
APPROACH TO THE STUDY OF THE CYBER INTELLIGENCE SHARING AND  
PROTECTION ACT

BY

RENEE L. PIESCHKE

A Thesis Submitted in Partial Fulfillment of the

Requirements for the Degree of

Master of Science

In

Geography

Minnesota State University, Mankato

Mankato, Minnesota

May 2014

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Attempting to Close the Digital Frontier: A Mixed-Methods Approach to the Study of the  
Cyber Intelligence Sharing and Protection Act

Renee L. Pieschke

This thesis has been examined and approved by the following members of the student's  
committee.

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Committee Member

*To my mother, Lucinda Pieschke (1955-2007)*

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Attempting to Close the Digital Frontier: A Mixed-Methods Approach to the Study of the  
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Master of Science in Geography  
Minnesota State University, Mankato  
Mankato, Minnesota, 2014

**Abstract**

A mixed-methods approach was taken to study the Cyber Intelligence Sharing and Protection Act (CISPA), recent legislation that would have considerable effects on the digital landscape. The combined methods help to define the problems underlying the legislation by defining stakeholders and isolating views from various media sources. The theoretical examinations of landscape studies, communications geography and Panopticism combined with methodology in political geography, and media analysis helps to develop a multi-angled view of the current perspective on the Cyber Intelligence Sharing and Protection Act. Landscape studies, with roots in Sauer's seminal work, "The Morphology of Landscape," contributed to the narrative of the research by helping to construct a sense of place. Communications geography and critical GIS help to ground the digital landscape in the field of geography. Political geography and the choropleth map illustrate the spatial patterns of politics surrounding the Cyber Intelligence Sharing and Protection Act, concluding that widespread approval of the legislation in the House of Representatives spans mostly rural Republican areas, while lack of support comes from more Democratic areas. Discourse analysis and term frequency analysis assist in the utilization of the internet as text, evaluating media responses to the legislation. Overall, the three media type nodes analyzed included mainstream media, personal blogs, and tech blogs. These nodes had a homogeneous view against the proposed legislation with subtle differences in word frequency around one percent of the corpus. The media corpus was



then analyzed against the legislation's word frequency, showing remarkable differences. For example, the word "privacy" occurred close to thirty percent in CISPA compared to the one percent in the media corpus. Reading through the documents, a consensus was made that though the legislation mentions protecting the privacy of internet users, it lacks methods to ensure it, which was one of the defining problems that has prevented the legislation's passage in the Senate.

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## **Abbreviations**

**ACTA** – Anti-Counterfeiting Trade Agreement

**CISPA** – Cyber Intelligence Sharing and Protection Act

**COPPA** – Children’s Online Privacy Protection Act

**DMCA** – Digital Millennium Copyright Act

**PIPA** – Protect Intellectual Property Act

**SOPA** – Stop Online Piracy Act

**USA PATRIOT Act** – Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism Act

## Glossary

**analog (equivalent)** – used as the opposite of digital. a physical version of a digital object such as a document, audio recording, or video.

**cyberspace** – a placename coined by William Gibson in his science fiction book, *The Neuromancer*, to talk about digitally created space.

**digital surrogate** – a digital version of a physical object such as a document, audio recording, or video.

**intellectual freedom** – an idea that underscores the need for privacy to create security in order to make advancements in knowledge.

**stem word** – a word that takes on the count of words with similar roots, but different endings.

**stop word** – a word such as an article, linking verb, or preposition that only provides meaning in context within a body of text, but can be removed during word frequency analysis; these words typically occur in high frequency.

**tech blog** – a blog put forth by the technology community. The word “tech” is used over the word “technology” because it is more commonly recognized on the internet.

**volunteered geographic information** – internet data with location metadata attached.

**Web 2.0** – jargon phrase meaning the participatory web, or the internet as it evolved to include the ability to express like and comment on.

**World Wide Web** – the official name of the Internet.

**Zipf’s law** – the higher the frequency of a term, the higher importance it has within a document or corpus of documents.

## Introduction

The internet as a place has been a digital frontier for almost a quarter of a century, influencing the way the world operates. In its infancy, the internet was designed as a place to connect people, specifically scientists and government officials, to information at rapid speed. Eventually, it was opened up to the general public. E-commerce developed and created the dotcom boom, which shifted the selling of goods and ideas to the virtual world. Alongside innovation came misconduct and crime. Legislation has had difficulty keeping up.

Because of the interdisciplinary nature of the digital landscape, the academic history comes from three main areas: landscape studies, cyberspace studies, and communication studies. Landscape studies developed in the early twentieth century, changing the way cultural geography research was conducted. On the other end of the century, cyberspace studies developed as a way to look at digital space.

The digital landscape is a perceived landscape of transistors and screens that help people communicate. Today, the digital landscape dominates everyday life. Tablet computers and smartphone technologies make it possible for individuals to take the internet with them wherever they go. A fiber optic network of cables traces over the globe connecting internet users. Systems of satellites and other wireless technologies help to carry the network even further. Stephen Graham noticed that terms like “information superhighway” and “electronic frontier” have helped give the internet a perceptible identity (S. Graham 1998). He argued that the language used to support the identity of this space also helped to shape it.

The field of geography has the strength of looking at the earth as a whole. It gives academics a spatial perspective. It also has a strong tradition in landscape studies that

evolved from just looking at physical spaces to looking at abstract concepts such as epistemology to investigate how we create landscapes. Weaknesses of geography include a lack of methodology created specifically for geography. Geographers have had to borrow from other social scientists employing qualitative methods like interviews, surveys, and discourse analyses in order to accomplish their research (Rowntree 1996a, 136). With the growing interdisciplinary nature of all academic research, the weakness of borrowing from other fields should be viewed as strength. No longer are disciplines siloed and forced to work with a specific set of methods. Researchers today collaborate across fields to produce better results.

A second weakness that digital landscape studies faces is a lack of a tether to physical locations on the earth. Sometimes, the digital landscape can only be viewed through conceptual models, not through maps. Some would argue that this is not geography, but computer or information science. Because of interdisciplinary studies, geographers like Paul C. Adams have solidified the place of communication flows and models in a subfield of cultural geography: communications geography (2009, 43–68).

In the 1990s, the internet became more accessible to the public through the affordability of the personal computer. Alongside availability came legislative attempts at harnessing the digital landscape to keep its users safe. Acts were formed by politicians to protect youth from being exposed or exploited online. At the same time, copyrighted material began to exchange hands using person to person networks, which violated copyright law. The law was amended to include the Digital Millennium Copyright Act of 1998. Various laws have been proposed and some have been adopted. The most recent legislation has been the Cyber Intelligence Sharing and Protection Act (CISPA).

Opponents of the act say the nature of the legislation is against the very backbone of the internet, which allows for the freedom of information without censorship. This study will examine internet policy in the past to present day in order to identify the barriers inhibiting future policies.

As early as 1997, scholars like Mark Poster noticed the dramatic effect the internet would have on democracy (2001, 259–260). On one side of the argument, governments would need to tighten control over information through heavy encryption to prevent security breaches and internet policies to protect users and intellectual property. The other side puts the control of information into the hands of internet users by giving them each a voice. In recent years, Congress has proposed several bills to tighten control over the internet by giving internet service providers (ISPs) and government agencies like the NSA the power to monitor internet activity and criminalize websites that allow for the unregulated sharing of information. Internet users have responded to these attempts with online petitions and calls to representatives. On January 18, 2012, several websites, including Wikipedia, coordinated a “blackout” of the internet to show internet users what would be lost if legislation were to pass (Ngak 2012). This managed to hinder support for the Stop Online Piracy Act (SOPA) and the Protect Intellectual Property Act (PIPA). However, legislation re-emerged later that spring under a new name, the Cyber Intelligence Sharing and Protection Act (CISPA).

The Cyber Intelligence Sharing and Protection Act was designed “to provide for the sharing of certain cyber threat information between the intelligence community and cybersecurity entities, and for other purposes” (“H.R. 624: Cyber Intelligence Sharing and Protection Act” 2013). The Cyber Intelligence Sharing and Protection Act amends

the National Security Act of 1947 to make it relevant to today's technology. According to Mike Roberts (R-MI), "[W]hile much cybersecurity monitoring and threat information sharing takes place today within the private sector, real and perceived legal barriers substantially hamper the efforts of the private sector to protect itself" (Permanent Select Committee on Intelligence 2012, 5). Privacy concerns about the legislation have been debated in the Senate and the White House. Still, the House of Representatives passed CISPA in the 112th and the 113th congresses.

Legislation leading up to CISPA include the Stop Online Piracy Act (SOPA) and the Protect Intellectual Property Act (PIPA). They advocated strongly for the protection of intellectual property rights on the internet that would have hindered the growth of the internet as a Web 2.0 technology. Wikipedia and other major internet companies opposed to SOPA and PIPA coordinated a blackout to illustrate what would happen if the legislation passed (Figure 1). Ultimately, the two bills were voted down.

Recent events have had internet users questioning their rights to privacy. In June 2013, a former National Security Agency (NSA) employee, Edward Snowden, leaked to the media that the NSA was collecting data on millions of internet and mobile technology users without their knowledge. Companies like Verizon and Apple were already cooperating with the NSA to share private communications information with the government. The Electronic Frontier Foundation (EFF) was founded by individuals who fight for the future of a free and open democratic internet (Manjikian 2010, 395). During the recent unveiling that the NSA was collecting internet and phone data in a warehouse in Utah, the EFF and similar organizations called the invasion of privacy a violation of the fourth amendment, which is,



The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no warrants shall issue, but upon probable cause, supported by oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized (“Fourth Amendment” 2014).

The United States was built on the idea that individuals would have a right to life, liberty, and property, without unwanted government interference or surveillance. This fallback to traditional human rights as outlined in the Bill of Rights makes internet surveillance synonymous with the colonial/social/institutional landscapes of the eighteenth and nineteenth centuries.



Figure 1. Wikipedia Screenshot from SOPA/PIPA Blackout (Ngak 2012).

In addition, the Supreme Court deemed net neutrality unconstitutional. Net neutrality was created by the Federal Communications Commission to protect the open

internet, making it unlawful to block or discriminate against content in order to inspire technological innovation online (Federal Communications Commission 2014). Internet watchdog groups like the Electronic Frontier Foundation and Fight for the Future have campaigned about Snowden, net neutrality, and other issues that threaten privacy and promote censorship on the internet.

The idea of progress is the evolutionary process of ideas that give birth to greater ideas (Nisbet 1979). The pervasive nature of computers has forced geographers to study the effects of technology on the landscape. Topics studied include the digital divide, the development of geographic information systems, and more recently, big data. Missing in the geographic literature is a political geography of the digital landscape, discussion of the management of information, and the protection of copyrighted materials.

A mixed-methods approach was used to look at the Cyber Intelligence Sharing and Protection Act from multiple angles to see how it affects the digital landscape. Variety creates a larger understanding of the effects legislation like CISPA would have on the internet. Overall, the study will conclude which obstacles stand in the way of the passage of future internet policy and it will identify stakeholders interested in strengthening surveillance on the internet.

The next chapter, Landscape Studies, looks at a subfield of cultural geography with roots in Carl Sauer's "The Morphology of Landscape" (1996). It looks at the evolution of landscape studies and how they can be applied to the digital landscape.

Communications Geography, Critical GIS, and the Internet looks at cyberspace as an area of study for communications geography, another subfield of geography. It also

explores critical GIS, which is a field that has evolved into the mapping of volunteered geographic information from the internet and the exploration of Big Data.

Panopticon and the Internet is an examination the theoretical underpinnings of surveillance in society. From its inception as a prison to the development of surveillance scholarship, the Panopticon has been an important model, showing structure and power. Today, the internet acts as a sort of Panopticon, recording all digital actions, supposedly holding its users in check.

The Political Geography of CISPA looks at the spatial distribution of votes on the Cyber Intelligence Sharing and Protection Act as the two bills passed through the House of Representatives. This helps illustrate partisan support for the legislation as well as show patterns of support based on lesser populated areas.

The final chapter examines Media Responses to the Cyber Intelligence Sharing and Protection Act. The 244 documents that make up the media corpus come from different media sources including mainstream media, tech blogs, and personal blogs. Words analyzed to see if the language to discuss the legislation changed within each node or category. Word clouds were used to show the total frequency of words used throughout the corpus of documents. Words have been stemmed to include root words with multiple endings such as “bill, billed, bills, and bills’.” Fourteen words in support of and criticizing CISPA were used as guides to show differences between the nodes.

## Landscape Studies

Landscape studies inspire and construct narratives. In this subdiscipline, geographers take the milieu of ordinary everyday life and produce an interpretation of place so vivid, it draws in the reader. Landscape is “that segment of earth space which lies between the viewer’s eye and his or her horizon” (Rowntree 1996b, 129). It is also “a way of seeing” and “a land shape, in which the process of shaping is by no means thought of as simply physical” (Cosgrove 1985, 55; Sauer 1996, 300). No matter the definition, the landscape has been scrutinized by geographers since the early twentieth century. Several names are associated with the development of American landscape studies in geography including Carl Sauer, Fred Kniffen, J.B. Jackson, and John K. Wright (Lewis 1983). More modern influences on landscape studies include David Lowenthal, Yi-Fu Tuan, James Duncan and Denis Cosgrove. Looking at the way landscape studies have developed helps to ground more recent studies about the digital landscape.

Landscape studies in the United States began with a 1925 essay by Carl Sauer entitled, “The Morphology of Landscape” (1996). In it, he claimed the landscape is a summation of elements that geographers in turn should interpret. “The cultural landscape is fashioned out of a natural landscape by a culture group. Culture is the agent, the natural area is the medium, the cultural landscape the result.” (1996, 309–310). In 1939, Sauer was discredited by Richard Hartshorne who took up issue with Sauer’s use of the word “landscape” and veered toward more “empirical” geographic studies (Olwig 1996). Instead of putting an end to landscape studies, it divided the field into cultural and physical geographers.

Like Sauer, Fred Kniffen studied the way people used the land. He thought that a great deal could be learned by studying the way people use their surroundings to develop

dwellings (1965). This was termed “folk housing.” A lot of his research focused on the dwellings of Louisiana. On the internet, the surroundings are not tangible. However, it can be paralleled. People build web “sites” that are developed with software tools--some of which are open access and free to the public. Others are proprietary. Residents of the digital landscape work with what they have access to. They learn web development traditionally at school and untraditionally in the digital world through wizards, tutorials, and blogs.

Others like John Brinckerhoff Jackson looked at “folk housing,” too. During World War II, Jackson was part of the U.S. Army. “In northern France during the latter stages of the war, Jackson interrogated German prisoners and pored over aerial photographs, guidebooks, and regional geography studies to form his first comprehensive conceptions of cultural landscapes—the ones where his unit would fight next” (C. Wilson and Groth 2003, 8). This experience profoundly shaped the way Jackson looked at the land.

Jackson used the term “vernacular dwelling” to suggest a commonly crafted living space indigenous to a culture group (1994). His goal was to redefine the use of the word “vernacular” in vernacular architecture and give it a more broad application. A recurring theme of his was the vernacular landscape, the landscape in which people lived their daily lives (1984). Just like a vernacular language is an idiolect held in common between a group of people, a vernacular landscape is a commonly held place. The landscapes he studied were those of the American Southwest—specifically New Mexico (1994). He even produced a magazine, *Landscape*, where he instructed others to “look at everything” (Lewis 1983, 248).

Today, the digital landscape is in many ways a vernacular landscape. Its design is ambiguous and not intended to disenfranchise any cultural groups. Some argue that cost creates a barrier to the access of information on the internet. Third world countries lack the technology, connectivity and/or speed of first world countries. Even within the first world, there is a division between those who can afford internet access at home and those who must seek out public places such as libraries or the endangered cyber cafes. A trend in public places other than the library is to create Wi-Fi hot spots for laptops and other mobile devices and to remove public-use computers.

The 1960s marked the Civil Rights era in the United States, a time when different groups of individuals fought for their rights. This gave perspective to academia, which responded in kind by shifting research to the institutions that held people down and the subjective nature of the human experience (Gaddis 2002, 29).

In Geography, David Lowenthal was developing a new perspective to look at cultural geography and landscape. This came as a result of Richard Hartshorne's attack on Carl Sauer's morphology of landscape. "In his critique of the landscape concept, Hartshorne (1939) pointed out that the appropriate meaning of [landscape] [...] would refer to the 'appearance of a land as we perceive it'" (Olwig 2003, 873). This pushed Lowenthal into the creation of his work, "Geography, Experience, and Imagination: Towards a Geographic Epistemology," where he looked at how individuals formed perceptions of their environment (1961). This subjective view had a profound effect on research methods in the field.

David Lowenthal recognized the importance of the vernacular in a review of Jackson's *Discovering the Vernacular Landscape* (1985). Lowenthal inspired by John K.

Wright, reinvented landscape studies (Lowenthal 1961; Wright 1947). Wright encouraged his students to look beyond the landscape into the minds of the people interpreting the landscape. He wanted geographers to use imagination in writing to inspire future generations of scholars. Jackson's prose on landscape continues to draw readers in as it personalizes the experience from his perspective. Lowenthal took Wright's idea of looking inward and wrote on the epistemology of landscape.

Yi-Fu Tuan called Lowenthal's slant on landscape studies the "perceptual revolution." He stated that Lowenthal's "works of the 1960s have been remarkably fruitful in promoting a psychologically grounded geography" (2003, 878). Tuan himself published articles and books on perceived landscapes. One in particular, *Landscapes of Fear*, created insight into human emotions and their effects on surroundings (1979). Historically, people may not have ventured too far from what they delimited as a home area because of their fear of the unknown.

The digital landscape has two fear-producing concepts worth exploring: the digital divide and the data deluge. The digital divide can be defined in various ways. The most common way to view it is by those who actively participate in technological culture and those who do not, known as technophobes. Recently, the term has re-divided people into those who want to participate and those who once participated but have retreated from the "hive mind." The data deluge is the term given to the overabundance of information available to anyone at any given time. Search engines like Google and Bing return hundreds of thousands of results for users to navigate through. Discerning between relevant and irrelevant information becomes the problem. With the amount of information, users can feel overwhelmed and anxious. Recent training in library science

schools focus on creating information scientists to master the art of the query in order to cut down the number of search results to a more manageable number. Problems arise here as well through the use of keywords and the evolving nature of language.

The 1970s brought about Wilbur Zelinsky's superorganicism. Zelinsky, another student of Carl Sauer's, developed the concept of the superorganic as some sort of power larger than the sum of a group of people's perceptions of place (Mitchell 2000, 30). The superorganic gave justification to the grouping of individuals with similarly held culture as an attempt to unify the United States, which had been fractured by the civil rights movements. Zelinsky wanted to find commonalities to bridge the differences between the different groups (Mitchell 2000, 32). One of the key geographers who criticized Zelinsky's superorganicism was James Duncan, whose dissertation research followed the trend in cultural geography (Duncan 1977; Symanski and Duncan 1981). Duncan remarked on the reductionist view of culture, which took away from individual perspectives.

Through this came a more humanistic geography. According to Yi-Fu Tuan, "Humanistic geography achieves an understanding of the human world by studying people's relations with nature, their geographical behavior as well as their feelings and ideas in regard to space and place" (1976, 266). Around this time, Michel Foucault influenced geography by introducing concepts like Panopticism, which looked at power relationships and surveillance as the concept was applied to different institutions (Hungerford 2010).

In the 1980s, cultural geography had developed a "critical edge" with geographers like James Duncan along with Denis Cosgrove and Peter Jackson examining the



landscape with an emphasis on power (Atkinson et al. 2005, viii; Duncan 1993). This was known as the “new cultural geography” and it pushed the discipline toward a more sociologically critical geography (Mitchell 2000, 36, 57). Duncan and his wife began to apply literary theory to the way that landscapes were “read” (Duncan and Duncan 1988). They noted that the combination of literary theory and social theory helped make up for respective shortcomings. James Duncan later applied this to his work, *The City as Text: The Politics of Landscape Interpretation in the Kandyan Kingdom* (1990).

Elaborating on Jackson’s “ways of seeing” landscape, art and perspective played large roles in the research of Denis Cosgrove. He was part of the humanist renaissance revival of the 1980s that brought focus back to landscape studies in a more creative way. Cosgrove was also influenced by the contributions of Sauer, Wright, and Lowenthal. By examining early cartography and land surveying, he was able to legitimize the works of landscape painters as sources for study in geography (1985).

By the 1990s, Lester Rowntree built an excellent overview of landscape studies, which concluded with a section on contemporary landscape studies (1996b). What he found was “that most landscape research transcends methodological boundaries by drawing liberally from different domains” (1996b, 139). This is apparent even today with the growth of interdisciplinary studies. By the end of the decade, geographers such as Michael Batty and Rob Kitchin were discussing the virtual geographies of cyberspace, which taking from earlier studies the combination of social and literary theory, research could be conducted by reading and exploring the World Wide Web (Batty 1997; Kitchin 1998).

Landscape studies are intimate interpretations of a scholar's research and may be subjective. Digital landscape studies are difficult because individuals experience digital space differently. According to Barnes and Duncan,

[W]riting about worlds reveals as much about ourselves as it does about the worlds represented. [...] [W]hen we write we do so from a necessarily local setting (there is no mountain top), the worlds we represent are inevitably stamped with our own particular set of local interests, views, standards, and so on. To understand critically our own representations, and also those of others, we must therefore know the kinds of factors bearing upon an author that makes an account come out the way it does (1992, 3).

There are digital natives, or individuals raised with technology, and digital immigrants who have had to learn to adapt to technology as it disrupted traditional ways of living (Prensky 2001). Digital immigrants have the advantage of knowing what came before the internet. They can make sense of the implications the internet has had on the world. They occupy an important position in time straddling a past world without the internet and a present world completely connected through broadband and wireless technologies.

Landscape studies are based on observation. Additional methods are necessary to help construct a comprehensive view of the effects of the Cyber Intelligence Sharing and Protection Act on the digital landscape.

## **Communications Geography, Critical GIS, and the Internet**

Communications geography studies how humans connect over the earth.

According to Barney Warf, communications geography is very interdisciplinary, drawing from “political communication, communication, cultural studies, media studies, and Internet studies, as well as sociological work on ICTs” (2010, 2). Geographers first started looking at the internet as place in the early- to mid-1990s. They used the term “cyberspace,” a word coined by science fiction writer, William Gibson, in his book, *The Neuromancer* (1984). These early studies utilized the landscape study approach, which was developed in the middle twentieth century to evaluate commonly held places and focused on epistemology, or the study of how people “know” (Lowenthal 1961).

In the mid-1990s, Barney Warf wrote about the effects of the internet on globalization (1995). Later with John Grimes, Warf studied the humanistic aspects of the internet by exploring the way marginalized individuals connected through this information and communication technology (ICT) (Warf and Grimes 1997). At the same time, Michael Batty referred to the study of internet worlds from a geographic perspective as “virtual geography”(1997). Stephen Graham commented on the “explosion of place” through the invention of the internet, suggesting that the realm of geographic study had expanded (S. Graham 1998). Rob Kitchin broke down virtual geography into economic, social, cultural and political geographies, iterating some of the same themes Warf had on globalization (1998). Sean Gorman and Edward Malecki focused more on the internet’s underlying infrastructure and how that affected connectivity (2002).

Today, geographers such as Matt Zook and Mark Graham are taking volunteered geographic information through websites like twitter and mapping the spatial distribution of trending term frequencies (M. Graham, Zook, and Shelton 2013; Zook et al. 2010).

Graham has also looked at the effects of the internet on the economy and trade (2010a; 2011).

The phrase “mapping the geoweb” refers to the use of GIS to explore data acquired from the internet. The practice of mapping the geoweb spawns from a subdivision of GIS studies known as critical GIS. Since the explosion of social media tools and the participatory web, otherwise known as Web 2.0, the internet has been rich with data that geographers began to explore using GIS tools (M. Graham, Stephens, and Hale 2013). This literature reviews the development of the critical GIS concept and moves beyond to investigate recent research considered in its purview.

### **What is Critical GIS?**

According to Mei-Po Kwan, “Critical GIS refers to the subfield of geographic information science that seeks to address the social and political implications of the development and use of GIS”(2008, 3). Others have defined critical GIS as the combination of GIS and social theory (Harvey, Kwan, and Pavlovskaya 2005).

Kwan goes on to say, “Important issues examined in critical GIS research include ontology, epistemology, representation, power, social justice, human rights to privacy, and ethical problems in the mapping of a variety of phenomena” (2008, 3). Critical GIS intersects with feminist and participatory GIS research (Elwood, Wilson, and Schuurman 2011).

Critical GIS began in the mid-1990s, alongside the birth of the internet and the widespread adoption of the personal computer. GIS was controversial, creating two research programs: “those critical of and those specializing in GIS” (Sheppard 2005). In 1999, Nadine Schuurman coined the term “critical GIS” to represent the subdiscipline of

GIS (Harvey, Kwan, and Pavlovskaya 2005).

Not long after that, critical GIS shifted focus from defending itself the debate of whether or not to use GIS to study social theory topics to how GIS could be used (Sheppard 2005). Discussion of methodology ventured into the exploration of hybrid geographies, which attempt to bridge the “qualitative-quantitative divide” in geography, which critical GIS does (Sui and DeLyser 2012). The result built a body of literature around big data, the geoweb, neogeography, volunteered geographic information, smart cities, privacy, and surveillance.

### **The Digital Landscape**

The digital landscape is a summation of the experience of digital space. It has its own digital culture; the culture created by the use of technology which has been networked together by the internet. The pervasiveness of technology has created “digital augmentations of place” or “augmented realities,” which changes the way people experience the world (M. Graham, Zook, and Boulton 2013; M. Graham and Zook 2013).

The process of grounding our virtual selves, of materially situating our electronically networked existences in the physical landscape, is a crucial aspect of understanding the new reality that has been created by information and communications technology. Infrastructure exhibits continuous agency in our lives, as without it the essence of urban life falls apart (Bauch 2013).

With the digital landscape comes the creation of an entire new data source. The activity on the internet creates footprints of traffic and ideas that can be analyzed by geographers. This body of data is known as big data.

### **Big Data**

Big data has many definitions (Gorman 2013). What some in geography consider big data, others in different industries and disciplines consider small. Big data can be

thought of by using the 3 V's: volume, velocity and variety (Goodchild 2013). Volume is the amount of data. It can be measured in terabytes, petabytes, exabytes, even zettabytes. Velocity is the speed at which information is updated which can be gathered within seconds of the moment it is created. Variety considers the vast differences between data types being collected and used.

Rob Kitchen explains, "Sources of big data can be broadly divided into three categories: directed, automated, and volunteered" (Kitchin 2013b, 262). Directed data refers to data that is specifically collected for a purpose such as surveillance and may be related to industry or government. Automated data is less specific. It includes website traffic and browser history that builds up automatically as caches of information. Volunteered geographic information is information that has been elected to be shared by users through public display in social media and by terms of service agreements. Ethical and privacy concerns arise with all three types.

### **Metrics and Agency**

According to Goodchild, "In the world of big data variety, observations come from numerous and disparate sources. The hidden process of synthesis is missing, and it is left to the user to try to compile useful information from the flood of uncoordinated sources" (2013, 282).

A metric is a unit of measurement. The establishment of metrics is necessary to glean meaning from big data. Tools such as Hadoop gather and digest the flood of information that comes from processing information (Wu et al. 2014).

The Oxford English Dictionary defines agency as "Ability or capacity to act or exert power" (2014). Agency looks at the influence behind the data. Who exhibits agency

over the collection of data? Does data collection as an entity act as an agent to affect how an individual lives or acts?

### **The Geoweb and Neogeography**

The “geoweb” is short for the geospatial web (Elwood and Leszczynski 2011). Websites like Twitter and Facebook contain geographic markup language or GML. Like extensible markup language or XML that codes digital information with metadata, GML codes digital information with location information such as coordinates for general place data. Location information can be extracted from websites to look at the spatial distribution of information.

Twitter data is prime for mapping activities because of the brevity of information delivered in a 140 character tweet and the available GML built into the sharing model. However, tweet location is an opt-in feature and several tweets fall into the data shadows by being locationless.

Twitter data is by nature ephemeral. Zook, Poorthuis, and a handful of other geographers implemented a server named DOLLY for the collection of tweets for fast retrieval. Storage of twitter data in DOLLY only goes back until June 2012 (Zook and Poorthuis 2014). The Library of Congress has been archiving tweets for the past few years, but there is currently no public way to search the twitter archive. Privacy concerns are there as well. As seen in Figure 1, point data needs to be aggregated in order to preserve privacy. DOLLY has also been used to investigate riots on the University of Kentucky campus (Crampton et al. 2013).

Because of the growing availability of GISoftware, people not trained in geographic methods are taking up the tools and creating map mashups, exploring

volunteered geographic information in new ways (Batty et al. 2010).

### **Smart Cities**

The arrival of the smartphone led to the geographic exploration of the smart cities. A smart city is defined as a city “increasingly composed of and monitored by pervasive and ubiquitous computing” (Kitchin 2013a). Smartphone technology enables citizens to create big data.

Beginning in 2007 with Apple’s introduction of the first generation iPhone and the later 2008 introduction of Google’s mobile Android operating system, the US consumer market became flooded with location-aware and Internet-connected mobile devices such as smart- phones and handheld tablet computers (Kelley 2013, 15).

Smart cities are cities are designed to help citizens engage with technology.

Wireless networks allow individuals to update locations, share pictures, and more, building a body of data that city officials can then use to improve cities (Torrens 2008). Most times, the data building is implicit, but sometimes it is explicit.

Matt Wilson examined the nonprofit organizations Sustainable Seattle and The Fund for New York City, where citizens geocoded places in cities that needed improvement. Similarly, geocoded information was used to build LGBTQ geographies and other less-visible geographies (M. W. Wilson 2011). Researchers like Sophia B. Liu take a more digital humanitarian approach to the geoweb and smart cities by looking at crisis map mashups (Liu and Palen 2010).

### **Privacy**

Ethical considerations come up when working with data extracted from the internet. Thinking back to the three main divisions of big data, directed, automated, and volunteered, people may not be complacent in being targeted by specific studies. For



individual protection, data may need to be aggregated at higher geographic scales, which helps protect personal privacy (Heipke 2010). This can be noted when looking at a case study of the use of volunteered geographic information to study the Haitian earthquake disaster (Zook et al. 2010). The issue becomes heightened when neogeographers who may not be governed by the institutional review board process attempt to create map mashups without ethical considerations for the data producers (Batty et al. 2010).

Privacy has been of concern to the internet since its inception. Information had permanence as it was transmitted from one computer to another over the network. In order to speed up access to information, websites like Google created cache indexes of the internet to increase retrieval time. Sarah Elwood and Agnieszka Leszczynski have started to investigate privacy and the implications on the future of critical GIS research. They wonder whether people's sense of privacy has decreased or whether they are simply unaware (Elwood and Leszczynski 2011). Watchdog groups like the Electronic Frontier Foundation and Fight for the Future have been bringing issues of privacy, ownership, surveillance, and net neutrality to the forefront using social media as a way to communicate to its internet base.

Critical GIS has evolved from being an eye critical on the adoption of GIS to explore social theory to a discipline that has embraced GIS to explore critically the geographic world of social theory—mainly on the digital landscape. Big data and volunteered geographic information are the buzzwords being used by the academic community today. Metrics and agency must be held in the researcher's mind when attempting to map the geoweb. Metrics need to be carefully selected in order to gather the most relevant data. Agency, or the power or influence something has over any part of the

data collection process, must be considered. In turn, privacy must be respected as the digital landscape changes. A critical eye is the most important tool a geographer can have when using big data to glean insights into human geography. This should be communicated to neogeographers as they take up GIS tools and create map mashups. Lastly, there are digital divides, which mean there are still huge gaps in who gets represented by data and that should be reflected in the research.

## Panopticism and the Internet

According to special issue of *Scientific American* on technology and privacy that appeared in 2008, “A cold wind is blowing across the landscape of privacy. The twin imperatives of technological advancement and counterterrorism have led to dramatic and possibly irreversible changes in what people can expect to remain of private life” (Brown 2008, 46). The underlying root of technological advancement can be explained by Moore’s Law; the amount of digital space will double exponentially, allowing for larger computer processes to be developed. A large percent of human activity has migrated online in the past quarter of a century including shopping, dating, education, and general communications. The problem with computer mediated communications is that in order to transmit information, it must be put in concrete form. Individuals place a lot of trust in passwords and encryption to keep information safe, but others have developed ways to hack into sensitive information and exploit it for personal gain.

Most recently, whistleblower Edward Snowden exposed the NSA for collecting data from the internet and from cellular communications on everyone in the United States. This information was being regularly perused by complex algorithms in an attempt to detect cyber-terrorism threats (Greenwald 2014). Many say this is an affront to citizens’ fourth amendment right to privacy and warn of the advent of a surveillance state. Others know that the NSA has had its hands in this kind of surveillance from early on. *Omni*, a popular science magazine speculated in the late 1970s that the third world war would be a “cybernetic war,” with cybernetics being defined as “a mathematical theory [...] of complex systems” (Post 1979, 49).

The NSA, ten times the size of the CIA, used giant supercomputers to scan almost every telegraph, teletype, and Telex message sent through American borders. For

several years, these computers automatically searched for keywords such as “missile,” “China,” and “assassinate.” Messages containing keywords were recorded, and human operatives alerted. Illegal snooping on so vast a scale is impossible without computers (Post 1979, 104).

Panopticism is a social theory that studies of the effects of surveillance on society.

In the eighteenth century, philosopher Jeremy Bentham’s brother, Samuel, an architect, conceived the Panopticon, the ultimate prison model. Prisoners would be isolated from each other in individual cells. The captor would have an omnipotent view of his captives from a high tower in the center of the prison. From this height, the prisoners would not be able to detect when they were being watched and would therefore always have to behave (Figure 1). In the 1970s, Michel Foucault took the Bentham’s Panopticon model and applied it metaphorically to society, spurring a trend in surveillance scholarship known as Panopticism (Dobson and Fisher 2007, 307). Foucault thought beyond prisons and explored the implementation of the panoptic model in other social institutions such as schools, hospitals and madhouses.

Bentham laid down the principle that power should be visible and unverifiable. Visible: the inmate will constantly have before his eyes the tall outline of the central tower from which he is spied upon. Unverifiable: the inmate must never know whether he is being looked at at any one moment; but he must be sure that he may always be so (Foucault 1979, 201).

The constant feeling of being watched holds individuals accountable for their actions.

Today, physical structures are not as important as the electronic constructs that hold society in check. Bridging the digital divide has been important for the collection of information known as Big Data. Big Data, a sea of unstructured information, is pulled from internet usage. More commonly, internet users are noticing the digital eyes upon them as ads are tailored based on browser histories. They are becoming more aware of

the effects of capturing ideas and images in digital form—especially when they are haunted by the information they cannot retract (Bossewitch and Sinnreich 2012).

Individuals have always assumed they are being watched—by neighbors, by divine beings, by the government. In the internet age, some actually want to be watched. Digital voyeurism has escalated as people clamor to gain fans by producing content, sharing it on YouTube channels, blogs, and Twitter feeds in an attempt to be heard. Issues arise when internet users no longer feel safe to share. Surveillance can institute a self-censorship, hindering intellectual progress.

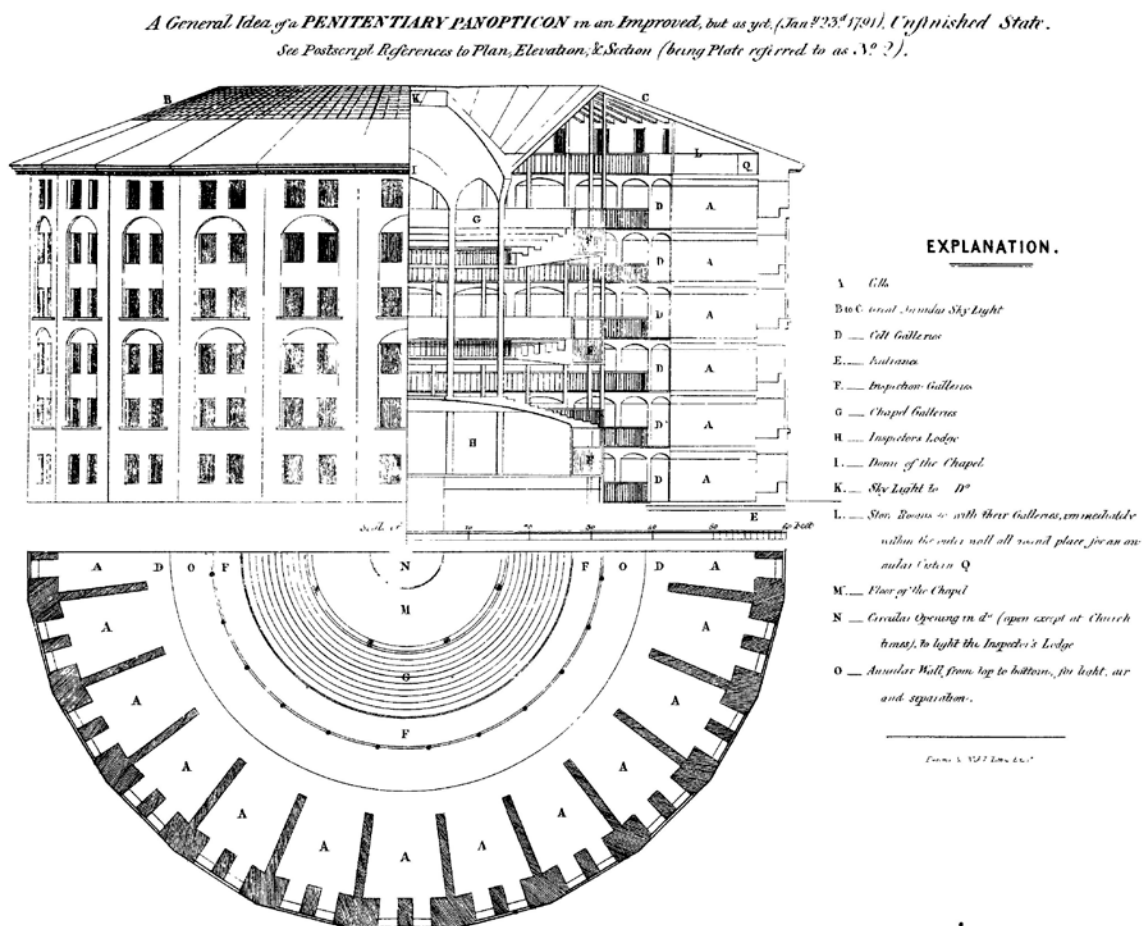


Figure 2. Penitentiary Panopticon Plan. Wikimedia Commons.  
[http://commons.wikimedia.org/wiki/File:Penitentiary\\_Panopticon\\_Plan.jpg](http://commons.wikimedia.org/wiki/File:Penitentiary_Panopticon_Plan.jpg)

## **Surveillance after September 11, 2001**

Panopticism holds new meaning since the September 11, 2001 attacks on the World Trade Towers in New York. The creation and implementation of the USA PATRIOT Act of 2001 gave the government the right to obtain homeland security information by any means necessary, including online surveillance (Jackson II and Hogg 2010). This evolved into a gross abuse of power by the NSA, which was revealed by Edward Snowden as he escaped to Russia.

The USA PATRIOT Act is a long acronym standing for the Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism.

The bill amended over 15 federal statutes, including the laws governing criminal procedure, computer fraud and abuse, foreign intelligence, wiretapping, immigration, and laws governing the privacy of student records. The amendments expanded the authority of the FBI and law enforcement to gain access to business records, medical records, educational records, and library records, including stored electronic data and communications (Kravitz 2003, 446).

Prior to the USA PATRIOT Act, the FBI instituted the Library Awareness Program in the 1970s, which called for the investigation of library lending records in order to target potential Soviet spies during the Cold War (Kravitz 2003, 446). "The FBI, through the USA Patriot Act, has the authority to check routinely on the reading habits of library users [...] to identify 'terrorist cells' and to protect national security" (Kravitz 2003, 445). The agency sought records without a warrant and libraries fought back. They thought a patron's right to privacy helped defend intellectual freedom (Kennedy 1989). Intellectual freedom is the right to read or research without fear of being criminalized. It supports the idea of progress, which is the philosophical idea that humankind's body of knowledge is continually moving forward (Nisbet 1979).

## **Recent Studies in Panopticism**

A few geographic studies have already explored the panoptic nature of the internet. Elwood and Leszczynski mentioned briefly the implication of privacy on the geoweb and the individuals choosing to contribute volunteered geographic information (2011). Volunteered geographic information is internet data with location metadata attached. Recently, geographers have taken geolocated social media and mapped it to show political or social trends. Ethically, location information must be aggregated to a level that does not identify the person who is unknowingly being analyzed.

Kar, Crowsey and Zale took that a step further and discussed location privacy and the growth and prevalence of technologies that can track an individual's GPS location (2013). The ethical issues of spatial tracking can be considered panoptic (Hungerford 2010). The number of individuals with mobile phones equipped with GPS has grown significantly in the past decade. The study surveyed a random sample of individuals to gauge their perception of location privacy issues. The results showed mixed feelings among respondents due to lack of awareness. De Saulles and Horner applied the "panoptic principle" directly to mobile technologies (2011). They noted that instead of a central jailer, complete strangers watch each other, keeping themselves in check through social contract theory.

Dobson and Fisher looked at the potential harms of technology by looking at surveillance through the concept of the Panopticon (2007). They discuss the Panopticon in three parts, the structural Panopticon of the past, the advent of video surveillance, and the "modern Panopticon" of Big Data, or "total information awareness" (2007, 309).

Warf and Grimes touched briefly on the Panopticon while discussing the use of the internet as a tool to create counterhegemonic discourses and spur activism (1997). The internet has been highly successful at connecting people with interests deviating from the norm, which is what is meant by the word counterhegemonic. Interests may include shared beliefs in political issues discussed through social media such as the event which came to be known as Arab Spring (Choucri and Goldsmith 2012). Social media activism not only connects individual internet users, it places targets on the backs of those who use it to affect change.

While discussing the advent of the internet, Graham mentioned early hopes that the internet “would create a global Panopticon; would bring about world peace; and of course it would cause distance to die and spell the end of geography as we know it” (2010b, 423). The global Panopticon cannot be fully realized until the digital divide is bridged. Even with everyone connected, the internet may not bring peace. As for the end of geography, the internet created the digital landscape, which has exploded with “multiple geographies” (Warf and Vincent 2007).

As technologies continue to advance, a greater need for legislation arises. De Saullés and Horner state “that the ethical response to emerging technologies and the formation of appropriate technologies requires collaboration between ethicists, technologists, policy makers and so on” (2011, 206). So far, policy makers have taken the lead, proposing legislation such as the Stop Online Piracy Act, the Protect Intellectual Property Act, and the Cyber Intelligence Sharing and Protection Act. Legislation has met an outcry of disapproval from mainstream media as well as tech blogs and personal blogs.



### **Political Geography of CISPA**

In the early 1990s, the personal computer became affordable and people began connecting from their homes using dial-up modems. During these nascent years, there were limited rules and regulations on the digital landscape. Similar to the concept of the American West in the nineteenth century, this was the digital frontier. Early internet adopters were digital pioneers. No one specifically governed cyberspace. Eventually, as more people signed up for service, it was necessary to set rules to protect users from each other.

As early as 1997, scholars like Mark Poster noticed the dramatic effect the internet would have on democracy (Poster 2001, 259–260). On one side of the argument, governments would need to tighten control over information through heavy encryption to prevent security breaches and internet policies to protect users and intellectual property. The other side puts the control of information into the hands of internet users by giving them each a voice. In recent years, Congress has proposed several bills to tighten control over the internet by giving internet service providers (ISPs) and government agencies like the NSA the power to monitor internet activity and criminalize websites that allow for the unregulated sharing of information. Internet users have responded to these attempts with online petitions and calls to representatives.

On January 18, 2012, several websites, including Wikipedia, coordinated a “blackout” of the internet to show internet users what would be lost if legislation were to pass (Ngak 2012). This managed to hinder support for the Stop Online Piracy Act (SOPA) and the Protect Intellectual Property Act (PIPA). However, legislation re-emerged later that spring under a new name, the Cyber Intelligence Sharing and Protection Act (CISPA).

CISPA was designed to circumvent the fourth amendment, which protects people from unreasonable searches and seizures. According to Mike Roberts (R-MI), “[W]hile much cybersecurity monitoring and threat information sharing takes place today within the private sector, real and perceived legal barriers substantially hamper the efforts of the private sector to protect itself” (Permanent Select Committee on Intelligence 2012, 5). The House of Representatives passed CISPA in the 112<sup>th</sup> and the 113<sup>th</sup> congresses. This study looks at the spatial distribution of votes by congressional district in order to analyze the stakeholders and their agendas.

### **Issues and the Internet**

Several issues of concern come up when discussing the internet. How do some of the laws that formerly governed analog objects apply to digital objects? The internet, which is no longer in its infancy, faces many challenges when it comes to privacy and the protection of intellectual property. The digitization of information simplifies the sharing process, making it accessible in moments to people around the world.

In 1969, the predecessor to the internet, ARPANET, was created to communicate research over long distances for the U.S. Department of Defense (Ayres and Williams 2004). It eventually evolved into the World Wide Web, which was introduced in 1989 by Tim Berners-Lee (Ayers 1999, 325–326). Since the explosion of the internet in the early 1990s, copyright violations have increased.

Copyright law was originally intended to be a limited monopoly on creative works in order to give incentives for creators to produce new works. The limited monopoly originally lasted ten years. More recently, the law has become bloated. The monopoly on creative works is no longer limited because it extends to the creator’s death

and beyond, leaving heirs to the estate to collect royalties. This is not just a domestic problem. With the assistance of the internet, the world became a global community. Globalization affects foreign policy because it creates accountability through interconnectedness. Therefore, countries are under the constant surveillance of each other.

Several countries belong to the Berne Convention, which is an agreement to unify copyright law globally. The United States joined the Berne Convention in 1988 under the presidency of Ronald Reagan (Belanger 1995). The same countries usually adhere to treaties put out by the World Intellectual Property Organization.

A decade later, the Digital Millennium Copyright Act was born. “In 1998 the U.S. Congress passed the Digital Millennium Copyright Act (DMCA), which harmonized U.S. law with the World Intellectual Property Organization (WIPO) Internet Treaties” (Curtis 2006). The DMCA granted “safe harbor” to internet service providers and websites that allowed for the free sharing of information. Therefore, only internet users would be held accountable by law for violating intellectual property rights. Websites like YouTube, Facebook, and many more allow users to upload content to the internet freely with no regulation over copyright infringement. If content is discovered to be infringing on protected content, the sites will issue users takedown notices and remove it.

DMCA also implemented the use of Digital Rights Management (DRM). DRM is code embedded into files in order to control who can use digital content, whether that content can be copied or shared, and how long that content will work before it expires. DRM schemes “are known as Technical Protection Measures (TPMs) in law,” which are necessary to comply with the WIPO Copyright Treaty (Rosenblatt 2007).

Jumping ahead, the Cyber Intelligence Sharing and Protection Act (CISPA) was first introduced during the 112<sup>th</sup> Congress as H.R. 3523 “to provide for the sharing of certain cyber threat intelligence and cyber threat information between the intelligence community and cybersecurity entities” (Permanent Select Committee on Intelligence 2012, 1). In order to obtain such information, the internet would need to be heavily monitored. The bill would give government intelligence agencies and internet service providers an exemption to current legal barriers, which protect the privacy of individuals. Perceived threats to the public and the private sector include espionage and the devaluing of intellectual property.

### **Visualizing the Distribution of Votes on CISPA**

One type of map that the field of political science uses is the choropleth map because political boundaries make sense when trying to see the spatial distribution of electoral and legislative data. Legislators represent districts created by political boundaries. Therefore, a choropleth map will accurately represent votes. Whether a legislator’s voting decision reflects the individuals living in his or her district is a question for the field of political science. There are two legislative bodies to consider: the Senate and the House of Representatives. The Senate has two legislators per state regardless of the state’s population. The House of Representatives bases its configuration on population per regions known as congressional districts.

A choropleth map was implemented to show the distribution of votes by congressional district. A choropleth map consists of boundaries that create regions that are interpreted on the computer as polygon shapes. The polygons are colored to reflect the theme that the mapmaker attempts to illustrate. GIS has made choropleth maps one of

the simplest maps to produce. There are some ethical issues to consider when employing choropleth maps. However, their basic construction and ability to generalize data make it an important map type across the disciplines, especially in political science.

A U. S. Congressional District TIGER shapefile was downloaded from the Census.gov website for the 112<sup>th</sup> Congress. A column for “StateName” was added to help with the editing process. Using the Congressional District Wall Map also provided on that website, districts were labeled with current legislators by district. The wall maps were useful because they listed the legislators for each state by name and matched them with the district they represented. For example, Tim Walz, the democratic representative for District 1 in Minnesota, covers the congressional district that parallels the state’s southern border. A third column was added to show party affiliation and a fourth column was added to display the way they voted pertaining to CISPA.

Voting information was collected using the Office of the Clerk, U.S. House of Representatives website. The Library of Congress Thomas database provided a way to search the Office of the Clerk website for the House of Representatives, which gave voting decisions by legislator for the Cyber Intelligence Sharing and Protection Act, recorded in Roll Call 192.

The colors used for map symbology were selected based on the colors that represent the Republican and Democratic parties. Republicans are red, while Democrats are blue. Those in favor of the legislation are shown in the true hue of each color. Those opposed are shown in a darker shade. A gray-striped pattern was used to show districts with no data from an abstained vote or an empty seat.

Before spatially distributing the votes, an assumption was made that states such as California and New York would have more pro-legislative support due to the heavy concentration of media industries that rely on intellectual property protection for profitability. Instead, results showed Republicans in favor of CISPA through much the Great Plains and in many of the states where there is only one representative.

Population-wise, California and New York have the most representatives per state. Therefore, they are important when it comes to influence over legislation. The Silicon Valley area of California shows a Democratic lack of support. This may be due to the strong presence of the internet industry. Representatives and the constituents informing them may be more aware of the repercussions of such legislation here than in other places. Further away from the populated California coasts, more representatives voted in favor of CISPA. A similar pattern emerges in New York. Closer to New York City, there is a lack of support. However, in upstate New York the congressional districts show more support.

Based on recent current events, the Democratic Party has been more focused on public welfare and the protection of civil liberties, while the Republican Party focuses more on capitalism and the protection of property. CISPA is legislation that supports the Republican agenda. The House of Representatives has more Republicans than Democrats right now. Similar legislation put forth by the Senate, which is currently filled with more Democrats, never made it to a vote.

CISPA is still alive in Congress. It is waiting on approval from the Senate and the Executive Branch. If it fails to pass, the bill may be re-written until some form of it passes. Currently, the United States is looking at other ways of achieving control over the

internet and intellectual property, such as the Trans-Pacific partnership—an international agreement between Brunei, Chile, New Zealand, and Singapore containing a section covering intellectual property giving internet service providers and government officials the right to monitor civilians on the internet without a warrant. The result of such permission would be censorship, which would strip individuals of their right to post information online without it being checked by the government.

### CISPA Votes by Party, H.R. 3523, 112th Congress

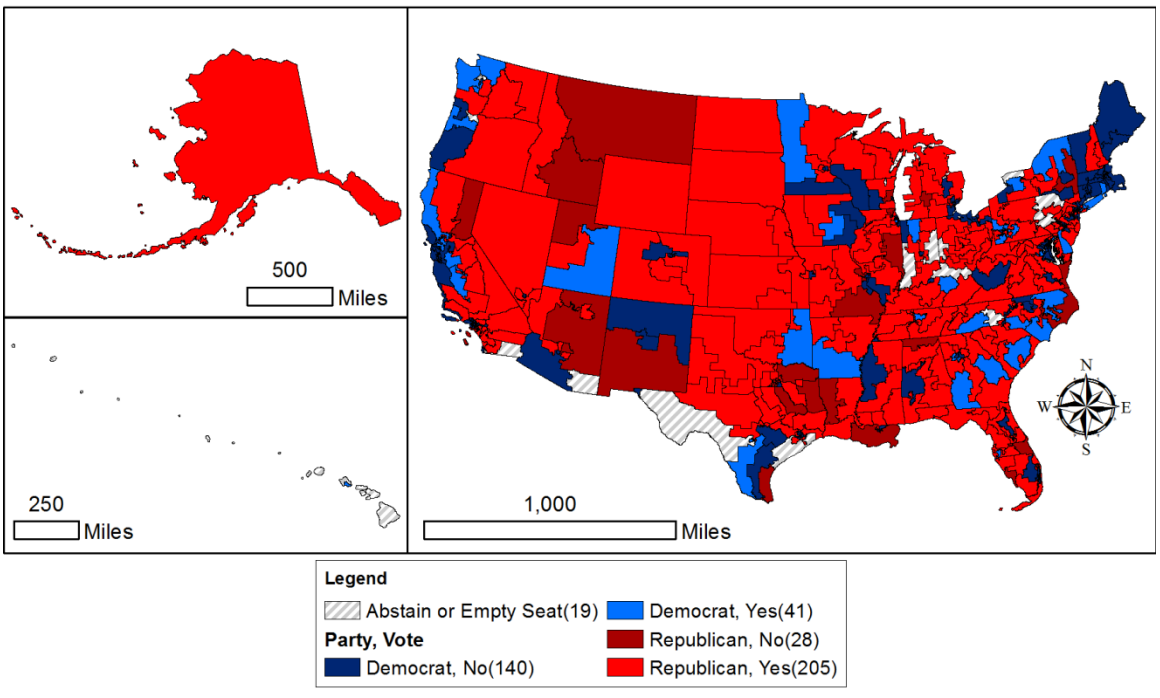


Figure 3. Distribution of votes relating to CISPA during the 112th Congress

### CISPA Votes by Party, H.R. 624, 113th Congress

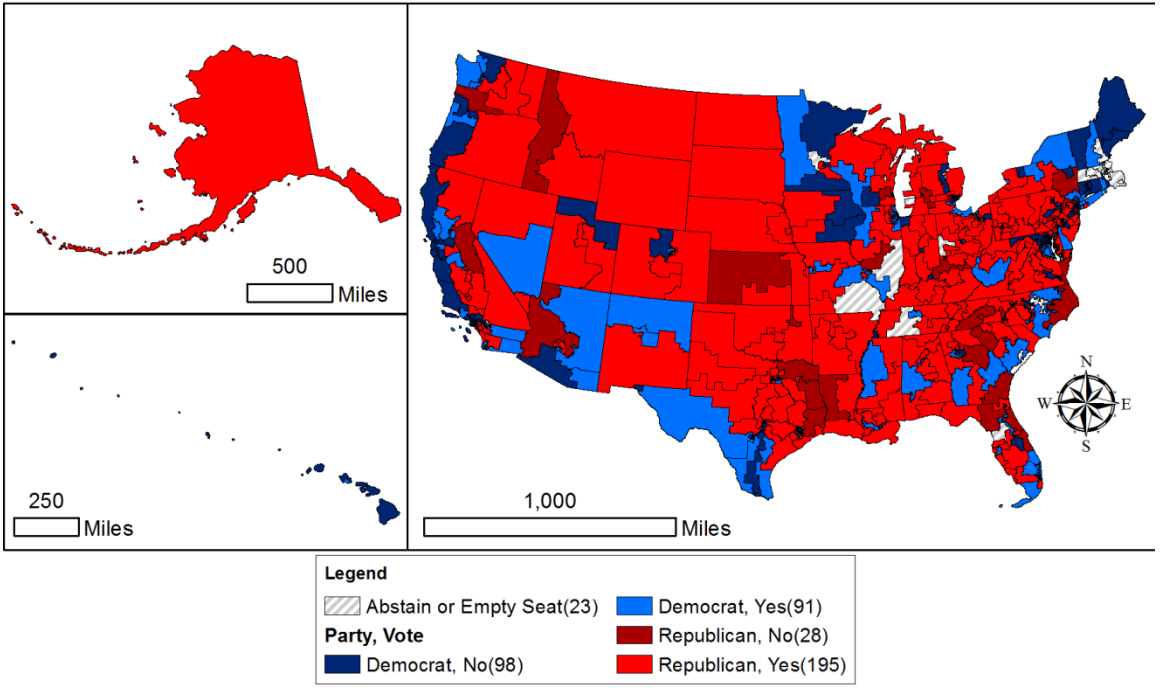


Figure 4. Distribution of votes relating to CISPA during the 113th Congress



## **Media Responses to the Cyber Intelligence Sharing and Protection Act**

Media carries information between individuals. Traditional forms of media include books and newspapers. They evolved with the advent of film technologies to include photographs and videos. The digital turn took traditional media and created digital surrogates of documents and objects so they could be easily transmitted across the internet. The internet is made up of an infinite number of texts constructing an infinite number of discourses. According to Barnes and Duncan, “[Discourses] are frameworks that embrace a particular combination of narratives, concepts, ideologies and signifying practices, each relevant to a particular realm of social action” (1992, 8). Texts can be broken down to examine larger themes in the discourse of pending cybersecurity legislation. Term frequency analysis paired with data visualization methods can help foster a sense of place on the digital landscape as it pertains to specific, focused topics.

Today, people obtain information through a variety of ways. On the internet, sources may be formal or informal, lengthy or brief. Because of the democratic nature of the internet, the sources where people get their news has changed to include not only mainstream media sources, but blogs, which may be edited for content in a formalized manner or freely posted by an individual using personal blogging platforms. Skepticism regarding the validity of information looms in the background, but fact checking and evaluating sources has become second nature to internet users. This chapter examines articles, which have considerable length when pitted against social media platforms such as Facebook and Twitter, where brevity is emphasized and information may be limited to 140 characters.

The internet is a globally shared information and communication technology (ICT). In the age of globalization, what happens in one country affects other countries.

The study area is topical and focuses on the United States' currently evolving internet policies. Legislation has been introduced in both the Senate and the House of Representatives. Most Senate legislation never made it to a vote. The Cyber Intelligence Sharing and Protection Act (CISPA), has passed the House of Representatives twice.

## **Methods**

Textual analysis may utilize documentary, landscape, or creative sources (Hay 2010, 10). Documentary sources include websites. This study utilizes news stories found on the internet. Landscape sources involve direct observation of the place being studied, such as the internet itself. "Landscape here is understood as the entwining of social meaning with, and its expression through the physical environment" (Hay 2010, 10–11). The physical environment of the internet consists of the zeroes and ones of binary code that are visible on screens after being processed through a computer. "This entwining is crucial to the creation of *place* as a definable and knowable geographic location. Thus landscape is a specific and highly contextual 'way of seeing'" (Hay 2010, 11). Creative sources might be works of fiction, concept maps, and other interesting elements that may be interpreted to contribute to the study.

Word frequency analysis was used as a component of discourse analysis in order to automate a comprehensive view of word usage over a corpus of documents. Three nodes delineated the documents into the following groups: mainstream media, personal blogs, and tech blogs. According to Zipf's Law, the more frequent a term appears in a document, the higher its significance (Altmann, Pierrehumbert, and Motter 2009). This research includes examining the power structures behind formal, informal, and hybrid media as sources of information about recent legislation that could censor the internet and

create a surveillance state. By coding articles by type and analyzing their term frequencies, they can be compared to show differences between news platforms today.

This study takes a sample of articles from mainstream media, tech blogs, and personal blogs using a basic keyword search to create a corpus of documents. Words were then formulated into word clouds, weighting the words occurring most frequently with larger font sizes. After determining word frequency, the words were evaluated using Zipf's Law, where terms that appear more frequently are considered to have higher importance.

The methods for term frequency analysis are rather simple and they do not require a lot of technical expertise. Programs like NVivo 10 and AtlasTI can digest massive amounts of text and turn that information into visualizations. The process is not completely automated. The information can be queried and analyzed based on the nature of the research. The idea behind this methodology comes from Zipf's law, that words occurring more frequently in a corpus have a higher impact than words occurring less frequently. It is evident that the words occurring most frequently will be words like articles and auxiliary verbs. These words are called *stop words* and are generally excluded from term frequency analyses because they lack significant meaning by themselves. A list of stop words can be found in Appendix B.

There are shortcomings of term frequency analysis. It does not take into account phrases such as "White House" or "House of Representatives." Instead, these words are taken individually. Proper names are also not recognized as one term. Journalists usually supply a first and last name during the first mention of an individual in an article followed by last name only usage afterward. Acronyms can also cause issues. "NSA" will

be taken as one word where “National Security Agency” will be taken as three separate words. This type of phrasing would work better using traditional coding methods.

Coding information requires individuals to create a system of tagging important words and phrases that have meaning to the research objective. This type of scrutiny was beyond the scope of this study. Instead, this study looks at whether the internet could be used as text and whether term frequency analysis can give insight to public opinion on the Cyber Intelligence Sharing and Protection Act.

Because of the lack of customization in NVivo 10’s word cloud generator, the word frequency queries were exported and used at Wordle.net, an online word cloud generator. Noticeable words from the clouds were isolated further using Tableau, a business intelligence and analytical software. Term frequencies were normalized against the total number of words per respective source type for comparison purposes.

### **Data Collection**

Data was collected using NVivo 10, qualitative research software put out by QSR International. It allows for the collection and manipulation of textual information. Nodes were created for the following:

- Mainstream Media
- Personal Blogs
- Tech Blogs

Within each node, word frequency queries were computed. NVivo 10 took out stop words and amalgamated stemmed words, or variants of words with the same root and different endings. The remaining words were turned into word clouds.

A total of 244 articles were collected to interpret. Articles were found using the query,

“CISPA” or “Cyber Intelligence Sharing and Protection Act”

Mainstream media sources included CNN, CBS News, Fox News, ABC News, BBC News, Reuters, and Time. A search query at NBC News failed to return results. More mainstream media types could have been evaluated. Limited access to content behind paywalls and certain websites not working with NVivo’s NCapture application led to the resulting seven sources.

Tech blog sources included Mashable, ZDNet, The Verge, Ars Technica, Venture Beat, Tech Crunch, and Wired. These tech blogs were referenced in many review articles in a google search for “top tech blogs.” Some of the journalists found writing for mainstream media also put forth articles through tech blogs.

Personal blog platforms were isolated using Google’s blog search function. This helped to assure colloquially produced content. The platforms used were Blogspot, Wordpress, LiveJournal and Type Pad. Privately hosted blogs on personal domains were not identified due to a rising trend in career blogging or blogging for profit. The goal was to gather amateur postings, where language usage was more casual. One issue with personal blogging that should be considered is the trend for some bloggers to copy large amounts of text from news articles, citing it for their own readers and making commentary. This can influence term frequency by making the mainstream media results similar to the personal blog results. Overall, this could not be avoided.



Figure 5. Nodes compared by number of items coded.

Tech blogs had the highest number of articles, 121. This may be due to the relevance of cybersecurity legislation to the tech industry. For personal blogs, 64 postings were analyzed. BlogSpot and WordPress articles had thousands of results. Using relevancy as an indicator, the top 24 results were used for each platform. LiveJournal and TypePad had very few results, so all postings were considered in the sample. Mainstream media had fewer articles, 59. A tree map (Figure 5), shows the nodes compared by the number of items coded. Orange represents tech blogs. Green represents personal blogs. Purple represents mainstream media.

NVivo 10's cluster analysis tool on the corpus showed that word similarity did not follow source types (Figure 6). LiveJournal and TypePad as blogging platforms were set apart from the rest of the media sources. However, BlogSpot and WordPress shared similarities with a few tech blogs and Time.

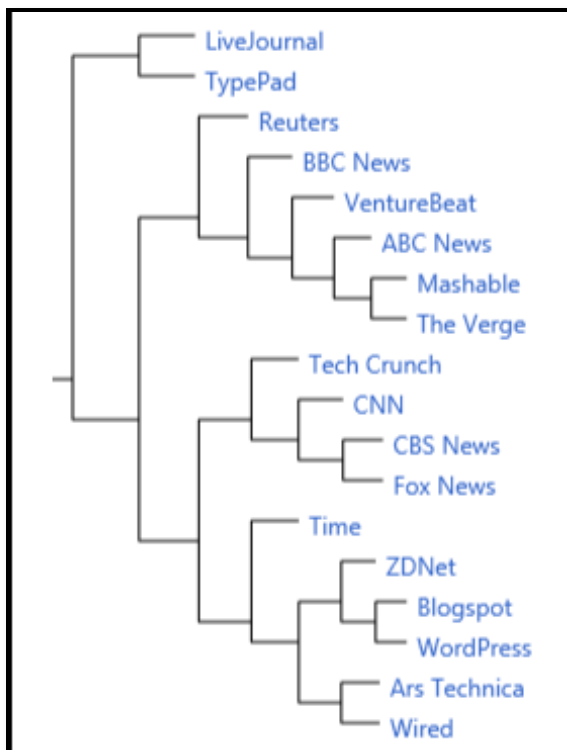


Figure 6. Nodes clustered by word similarity.

## Results

Word clouds visualize higher frequencies with proportionally larger font sizes. A first look at the results of the term frequency analysis was the corpus word cloud (Figure 8), which provides a summation of term frequency throughout the three media types.

Overall, the acronym “CISPA” remains dominant. The words represented by the acronym, (cyber, intelligence, sharing, protection, and act) influence the frequency of the terms occurring outside the legislation’s name. “Bills” and “governments,” though large, are expected to be based on the theme of the corpus.

“Privacy,” “security,” and “cybersecurity” stand out against the other words in the cloud. The words hold strong connotations in respect to the Cyber Intelligence Sharing and Protection Act. A common theme running through the corpus was how to balance privacy and security (Fitzpatrick 2013a; Kelly 2013a; MacKinnon 2012).



Figure 7. Corpus Word Cloud.

Three additional word clouds were created to look at the difference in emphasis among words depending on the source type. Originally, it was assumed there would be more obvious differences between the source types due to the formality of mainstream media and the more colloquial writing of the personal blogs. Tech blogs vary in writing styles from formal to colloquial.

At first glance, they look very similar. This gave the sense that opinion across the source types was homogeneous. The overall tone of the corpus suggested a lack of support for the legislation, but no real proposals for alternatives. The mainstream media cloud featured in Figure 8 tends to emphasize CISPA slightly less. The tech blog cloud in Figure 9 emphasizes privacy a little more. To investigate the subtle differences further, fourteen words were isolated and graphed (Figure 12). Seven words were angled toward criticism including critics, freedom, liberties, privacy, problems, spying and surveillance. Another seven words were angled toward support including attacks, cybersecurity, solutions, support, terrorists and threats.





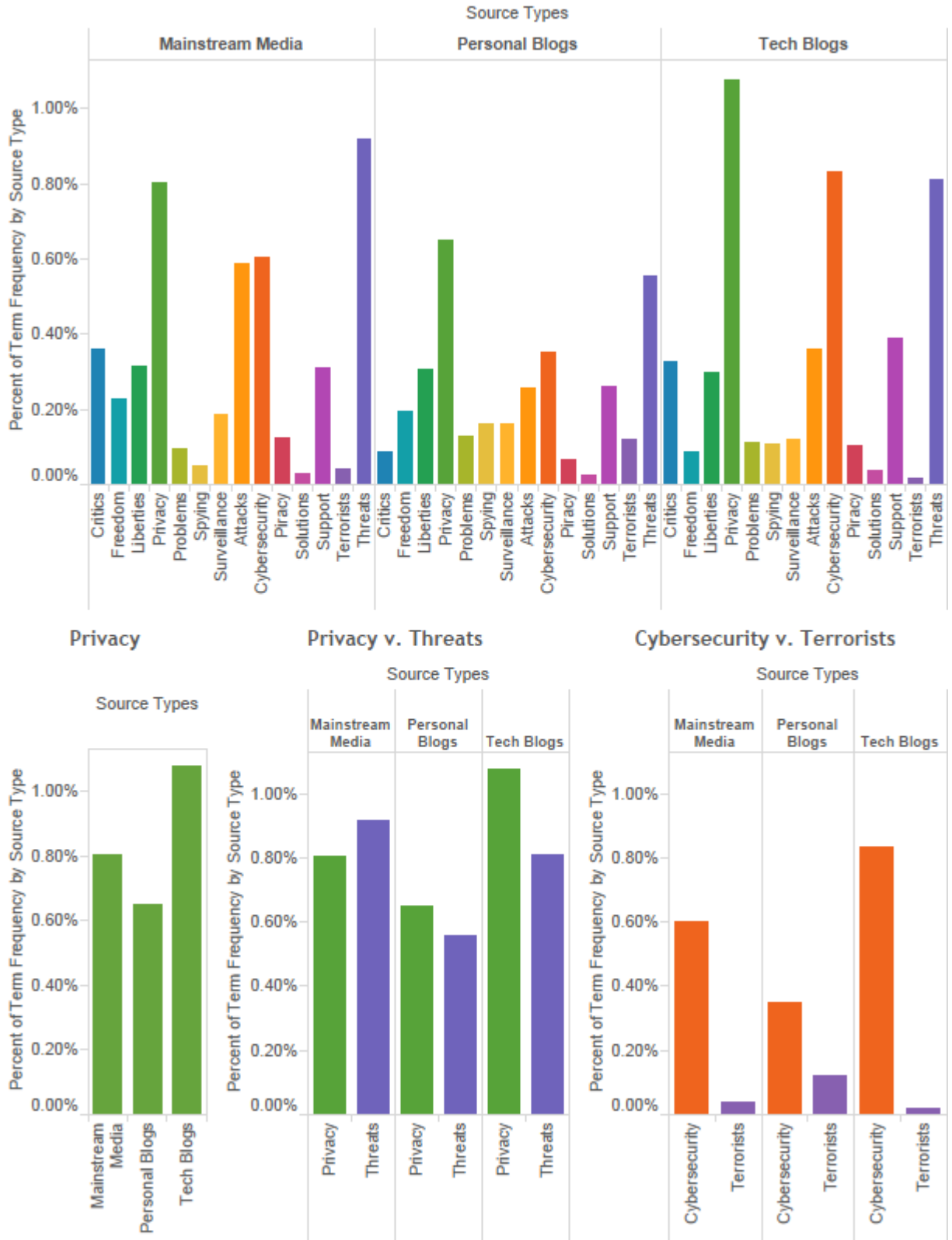


Figure 11. Media Corpus Term Frequency

Charts were normalized by dividing the total number of occurrences per word by the total number of words per node. For each node, the isolated words had around a one percent emphasis versus the total number of words. Normalization was necessary because term frequency varied between the nodes based on the number of sources collected. When left unmodified, the tech blog word count dominated the graphs.

Words that immediately stand out in the graph are privacy, attacks, cybersecurity, and threats. Focusing on privacy, tech blogs used the word most frequently. This can be attributed to a heightened awareness of privacy in the technology industry and close connections with privacy advocates such as the Electronic Frontier Foundation and the American Civil Liberties Union. Mentioned in one corpus document from the tech blog node,

Privacy groups are adamant the information sharing called for by CISPA will compromise Americans' online privacy, particularly if data is shared with military organizations such as the National Security Agency or if companies are immune from liability for privacy transgressions committed in the name of CISPA (Fitzpatrick 2012, n. p.).

It is interesting to note that privacy occurs less frequently in personal blogs. This may be due to a younger generation of internet users growing up without a sense of privacy.

Word pairs were generated to look more closely at dynamics. The first word pair examined privacy against threats; privacy being a word the critics would use to discredit CISPA and threats being used to emphasize the need for legislation like CISPA. Threats were emphasized over privacy in the mainstream media node. This matched the original prediction that mainstream media would frame CISPA differently to the general public. In both the personal and tech blog nodes, privacy occurs more than threats, showing greater concern for civil liberties rather than safety.





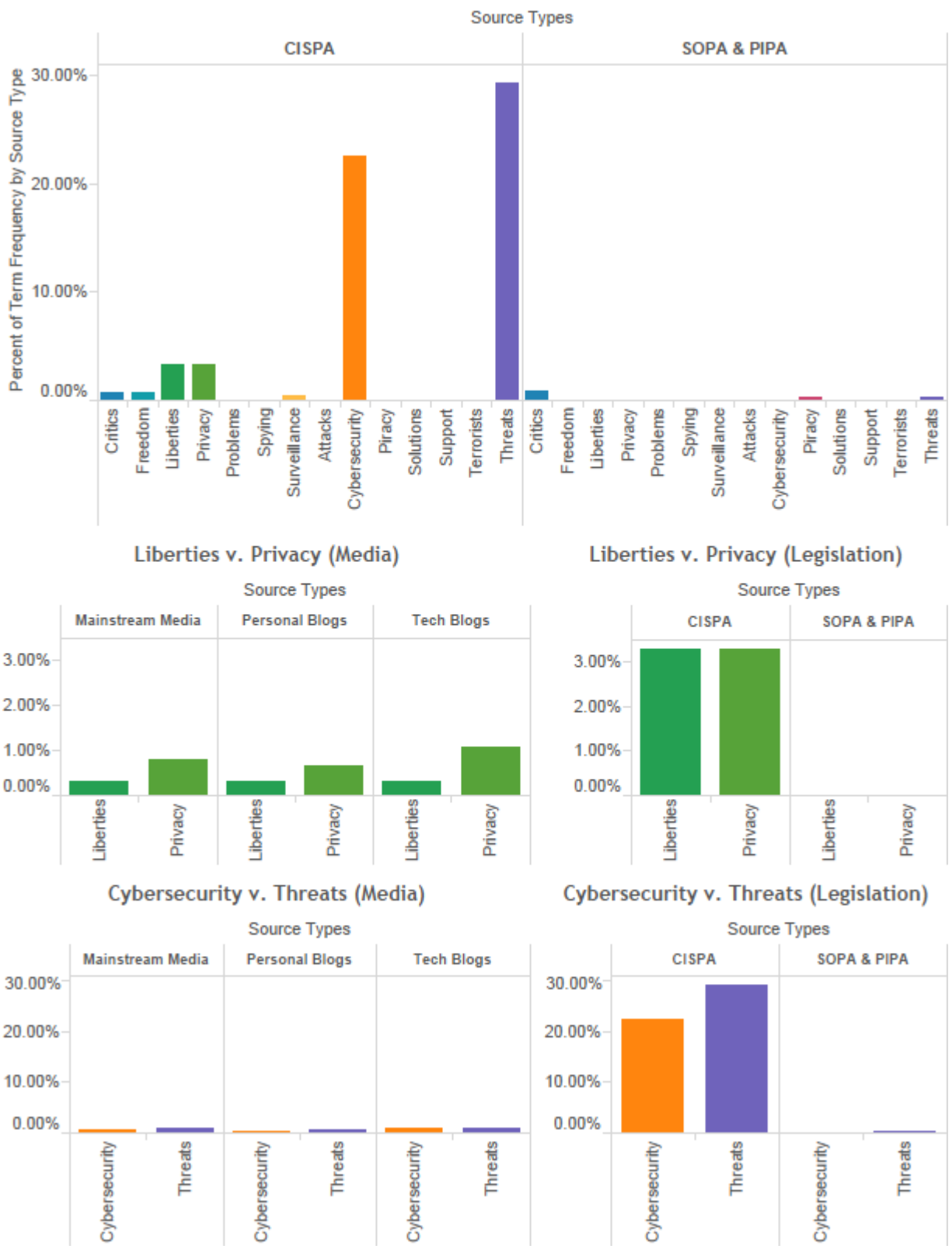


Figure 15. Legislation Corpus Term Frequency

Legislation corpus frequencies were then analyzed in comparison to the media corpus frequencies in graph format (Figure 15). Frequencies were again normalized against each node. As noted earlier, cybersecurity and threats are significantly dominant, with threats occurring more. They make up between 20-30% of the Cyber Intelligence Sharing and Protection Act. This is much more significant than the media corpus. The words are insignificant when looking at the number of occurrences in the SOPA and PIPA node. Cybersecurity is not mentioned, while the word “threats” hovers around less than one percent.

Liberties and privacy were also isolated and compared against the other nodes. The terms were never mentioned in the SOPA and PIPA node. For CISPA, they made up over three percent of the bill. This is much more often than they occurred in the media corpus. One complaint noted about the Cyber Intelligence Sharing and Protection Act was that it may mention privacy, but it sets forth no obvious path toward maintaining privacy (Finan 2013; Mullin 2013). The same might be said about liberties.

## **Discussion**

While the methods are not without fault, it does show that there are subtle differences in emphasis between the media types. For the media corpus, word clouds by node may appear homogeneous to the naked eye suggesting a uniform criticism of CISPA through the media. Isolating and pairing terms gives insight into subtle differences. The most differences occurred when comparing the media corpus against the legislation corpus.

Privacy is of most concern when looking at CISPA. Since September 11, 2001, the Bush administration gave the NSA the power of surveillance by any means necessary

in order to counter terrorism. The USA PATRIOT Act, provisions of which were originally set to expire, has been extended, creating a surveillance state, violating the U.S. Constitution on the basis of a culture of fear. With CISPA, Congress has attempted to write legislation to legalize ongoing behavior of corporations and government agencies on data collection practices that have been in place since the beginning of the ambiguous War on Terror.

Since CISPA has passed the House of Representatives twice, it is the piece of legislation to watch. It is already in its third incarnation, relabeled the Cyber Information Sharing Act or CISA and put forth by the Senate Select Committee on Intelligence (McNeal 2014). If it passes the Senate, the House of Representatives will most likely pass it as well. President Obama has threatened to veto CISPA in the past (Hollister 2012; Cheredar 2012; Fitzpatrick 2013b; Kelly 2013b). Recent authorization of trade agreements with similar restrictions on internet activities and digital liberties shows the susceptibility of such legislation being passed.

Term frequency analysis should be used in conjunction with other methodologies. On its own, it only shows a limited view of the topic area. A thorough reading of the corpus documents is necessary in order to gain a sense of context. Word trees could not be used because of the number of documents in the corpus. The result of attempting to create a word tree to show context of a word in a sentence created an incomprehensible image. Future research could include a more complex form of coding. Sentiment analysis software could also be explored to pick up on emotional leanings toward or against the research topic. The corpus could be extended beyond articles, blog postings, and bills to include social media and interviews.



## Conclusion

The internet is a disruptive technology. When it was introduced, it changed the way people communicated in such a radical way that legislation has not been able to catch up. Information was previously protected by intellectual property law due to the limitations of the media carriers on which they were provided. Stone tablets can be considered the oldest carrier format. In order to share or duplicate the information provided on a stone tablet, it would have to be physically transported or recreated. Eventually, carriers became lighter and easier to transport such as the use of scrolls and eventually books, but the barrier to sharing and duplication remained the same. The 1960s invention of another disruptive technology, the Xerox Copy Machine, allowed for the swift reproduction of print media. This made the unauthorized reproduction of copyrighted material difficult to control.

Sound and video technology follows a similar timeline. The first sound recordings were on wax records produced one at a time. The carrier for sound evolved over time from the use of cylinders to wire, dictabelts, and the development of magnetic tape reels. In 1958, a consumer version of the magnetic tape reel allowed for personal recording and the replication of copyrighted audio material. The first videocassette recorder (VCR) also utilized magnetic tape, which allowed for individuals to do the same with video materials as they were doing with audio materials.

Computers brought about a new kind of digital media. Text, audio, and video were compressed into file formats using bits and bytes, which could be exchanged over a growing network: the World Wide Web. This brought a rise in instances of copyright infringement as people who were unfamiliar with the details of the law began to copy and

share information online. This prompted the U.S. government to establish internet policy, which has been evolving to keep up with new innovations in technology.

The digital landscape can be examined using several methodologies either individually or combined to create a larger picture. The combinations may be subjective. Landscape studies are not an exact science. The interdisciplinary nature of digital landscape studies means the tools of examination are infinite and left to the researchers' abilities and interests. At this point in time, the internet cannot be analyzed all at once. There are multiple dimensions to it, including a temporal dimension extending back decades and occupying several petabytes of space.

Critical GIS and communications geography will continue to be affected by advancement of technology. Many studies going on today rely heavily on open data, or data made publicly available for scholarship and research. Surveillance can disrupt intellectual freedom through censorship. Individuals fearing the tracking of their digital movements may be inclined to share less, stunting the nature of the participatory web.

The Cyber Intelligence Sharing and Protection Act survived the House of Representatives twice only to be tabled in the Senate. The bill has resurrected a third time in the Senate under a slightly altered name, the Cyber Information Sharing Act or CISA (McNeal 2014). If it gains Senate approval, the House of Representatives will likely approve it as well. Whether or not it contains enough protection measures for the privacy of internet users is left to be seen. Cybersecurity is of great concern globally to the protection of digital assets. Legislation to strengthen the United States' cybersecurity will affect the legislation in other countries as well.

Term Frequency Analysis in its most basic form is an indicator of the importance of words that arise during the discussion of a topic. For the Cyber Intelligence Sharing and Protection Act, the two main concerns have been and will continue to be privacy and cybersecurity. The government wants to control information in the name of national security. The public wants information to be free. The government wants to be able to monitor the entire internet in order to secure the country against potential cyber threats. The public wants its right to privacy.

The internet is a vast wealth of information. More sophisticated tool for the study of the internet will develop as technology evolves. The digital landscape has become so entwined with how people connect over the earth that it is hard to fathom a future disconnected world. Technology will continue to advance and laws will need to progress with it.

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## Appendix B: List of Stop Words Applied to Word Frequency Queries

### Default Stop Words for NVivo 10

a about above after again against all am an and any are aren't aren't as at be because been before being below between both but by can can't cannot can't could couldn't couldn't did didn't didn't do does doesn't doesn't doing don't don't down during each few for from further had hadn't hadn't has hasn't hasn't have haven't haven't having he he'd he'll he's he'd he'll her here here's here's hers herself he's him himself his ahow how's how's i i'd i'll i'm i've i'd if i'll i'm in into is isn't isn't it it's its it's itself i've let's let's me more most mustn't mustn't my myself no nor not of off on once only or other ought our ours ourselves out over own said same say says shall shan't shan't she she'd she'll she's she'd she'll she's should shouldn't shouldn't so some such than that that's that's the their theirs them themselves then there there's there's these they they'd they'll they're they've they'd they'll they're they've this those through to too under until up upon us very was wasn't wasn't we we'd we'll we're we've we'd we'll were we're weren't weren't we've what what's what's when when's when's where where's where's which while who who's whom who's whose why why's why's will with won't won't would wouldn't wouldn't you you'd you'll you're you've you'd you'll your you're yours yourself yourselves you've

### Stop Words Applied to Media Analysis

#117 #15 #192 @cispetition @cosmothegod @houseintelcomm @jqontech @libshipwreck @repmikerogers @smc90 @tnajoewolverton @youranonnews '60s '80s 000 0001 000th 0412 092013#sthash 100 103 105 1078 108 10am '11 1103 112 1127 112th 113 113th 114 1140 11pm 11th 120 1201 123 127 129 12th 130 131 132 133 13th 140 141 145 148 14th 150 151 153 156 1600 162 165 167 168 170 1759 1778 180 182 18th 192 1947 1950s 1959 196 1960s 197 1970 1978 1980s 1981 1984 1986 1988 199 1990s 1993 1994 1995 1996 1998 19th 1st 200 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2018 202 2038 206 20th 210 2105 211 215 2151 218 21st 223 225 2278 22nd 234 238 240 248 250 2511 25th 262 265 268 26th 278 287 288 292 293 295 2nd 300 303 3078 3079 3080 30pm 325 3250 326 33pm 350 3523 360 3630 390 395 396 400 401 4035 410 415 42612 42pm 4348 438 4rth 4th 500 510 530 532 565 5652 5856 600 605 61398 6233 624 627 650 670 675 685 6a00e55197a0e188330163045a205e970d 737 743 750 75670 770 773 7788 800 8200 827 833 845 877 8th 90431318 911 950 985 990 a 'a' a5fst52w about above after again against all am an and any are aren't aren't as at be because been before being below between both but by can can't cannot can't could couldn't couldn't did didn't didn't do does doesn't doesn't doing don't don't down during each few for from further had hadn't hadn't has hasn't hasn't have haven't haven't having he he'd he'll he's he'd he'll her here here's here's hers herself he's him himself his how how's how's i i'd i'll i'm i've i'd if i'll i'm in into is isn't isn't it it's its it's itself i've let's let's me more most mustn't mustn't my myself no nor not of off on once only or other ought our ours ourselves out over own said same say says shall shan't shan't she she'd she'll she's she'd she'll she's should shouldn't shouldn't so some such than that that's that's the their theirs them themselves then there there's there's these they they'd they'll they're they've they'd they'll they're they've this those through to too under until up upon us very was wasn't wasn't we we'd we'll we're

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### Stop Words Applied to CISPA Legislation Analysis

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