

GOING VIRAL: THE LOOK OF ONLINE PERSUASIVE MAPS (PRE-PROOF)

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ABSTRACT

This article explores how persuasive maps are manifesting themselves in the online world. It compares and contrasts online persuasive geocommunications with their paper map ancestors. Several social issues stemming from anyone's ability to use online mapping tools to make persuasive maps and distribute them are discussed. It is argued that researchers are presented with a great opportunity to observe the development of persuasive mapping techniques in real-time as they continue to develop in conjunction with modern Web mapping technologies.

KEYWORDS

persuasive geocommunication, persuasive maps, rhetorical maps, Web cartography, locational privacy

INTRODUCTION

Web mapping has made it more feasible than ever for members of the public to collect data, design maps, and disseminate these maps to global audiences. Such developments have many benefits for the public at large, particularly regarding public participation GIS (PPGIS), organized resistance against corporate and government agendas, and for community building. These benefits have been exhaustively reviewed in previous literature. Contrarily, Web mapping technologies have also raised a host of social concerns as well. For example, a digital divide exists in nearly all societies – this divide

is both one of hardware (i.e., computer access) and education (i.e., knowledge access). Concerns about spatial privacy are also abundant.

One topic concerning Web mapping that has not been given sufficient attention by scholars, however, is online persuasive maps. Persuasive maps – or maps designed to promote one viewpoint or perspective over another (Tyner, 1982) – comprise a significant portion of maps produced in societies throughout the world. Throughout modern cartographic history, technological developments in map production have tended to make persuasive maps cheaper and easier to produce. The Internet has gone further than most previous technologies, however; not only are such maps incredibly easy to make, but also, the arguments one makes with these maps are virtually free to distribute on a global scale. As numerous gun owners in a New York county recently found out, the fact that someone you have never met can map your name and where you live and distribute it to the entire world to make a political statement is quite discomfoting (Haughney, 2013).

In this article it is argued that we are presented with a unique opportunity to witness and simultaneously analyze, in nearly real-time, how persuasive maps manifest themselves on the Web. This article starts with a brief overview of persuasive maps. This is followed by a brief discussion of the rhetorical styles found in persuasive print maps. Then, a small sample of online persuasive maps is analyzed to explore in which ways online persuasive maps are similar, or dissimilar, to their twentieth century ancestors. The article concludes with a call for identifying and analyzing persuasive map techniques as they arise online and suggests that such maps need to be studied more earnestly by geographic information scientists as they become ubiquitous.

Links to all of the example maps discussed in this article, and others which were found post publication, will be made available at www.ian.muehlenhaus.com/viral/.

PLACING PERSUASIVE MAPS WITHIN GISCIENCE

Persuasive maps are often neglected in geographic information science (GIS) literature because they do not always follow certain norms of scientific visualization (Muehlenhaus, 2013a). However, since the dawn of modern thematic cartography, beginning in the late 1700s (Robinson, 1982), different styles of persuasive maps have evolved in parallel to developments in academic cartography

(Muehlenhaus, 2011). Persuasive maps fill a different, and often antithetical, niche than scientific visualizations, but they remain nonetheless a part of GIS and ignored at the discipline's expense.

Much has been written about persuasive maps created using the print medium. Academic interest in these types of maps took off in earnest during World War Two, when both the Axis and Allied powers began using maps to try and sway their own and opposing populations to view the war in particular ways. Speier (1941) was one of the first to explore this use of maps in this fashion, warning that opposing forces may try to trick a populace with "magic cartography." It was also at this time that such maps were first associated with propaganda by geographers (Quam, 1943). At the dawn of the Cold War, people were again warned about the dangers of "carto-hypnosis" (Boggs, 1947). Tyner (1982) originally coined the term "persuasive maps" in her dissertation to describe maps that are meant to convince, expanding the definition to advertising maps as well. Others focused on government produced maps, typically referring to them as propaganda maps (Ager, 1977; G. Herb, 1999; Monmonier & Schnell, 1988; Pickles, 1992). Monmonier's (1996) book, *How to Lie with Maps*, again promoted a broader view of persuasive maps beyond state-based propaganda. However, little is known about how persuasive maps manifest and are used online.

Both scientific and persuasive geovisualizations are forms of visual communication. Both of these map types can be used to explore data and draw conclusions about an environment. Both are models of reality; they posit arguments about aspects of our environment. The difference between scientific and persuasive visualizations lies in how their communication goals are achieved. The difference is in how they frame – i.e., highlight and promote – their arguments.

Scientific visualizations are rationalist. Their *raison d'être* is to provide logical, scientific evidence for others to explore in search of an explanation or causation. In essence, scientific visualizations are typically exercises in bottom-up, inductive reasoning; they present a variety of facts, often data rich in content, and expect a map reader to explore the logically presented data and draw one's own conclusions, or the "truth," from what is being viewed. Scientific visualization is often veiled in the delusion of rationalist objectivity, something that is impossible via any medium of communication (Postman, 2005). A multitude of facts are presented, with a heavy data-to-ink ratio

ensuring that enough facts are presented to make informed decisions (Tufte, 1991). Evaluation and interpretation of the data is, theoretically, left to the discretion of the map reader. Successful scientific visualizations are not meant to persuade; they are designed to present facts in such a manner that “truth” becomes self-evident. Even though it is questionable whether objectivity and truth are possible in any form of communication (Foucault, 1986), striving for such objectivity in one’s visualizations is typically considered admirable. To fail to frame data rationally is considered anathema to good visualization.

In contrast, persuasive visualizations are created with a less limiting epistemology. Facts and truth are frequently irrelevant to the message. The goal of these types of maps is to persuade an audience to have the same viewpoint about something as the map’s creator. Thus, these maps are not always rationalist in their approach; they are more often sociopathic. When facts stand in contrast to the argument being made, persuasive maps can instead be designed as top-down rhetorical devices that target map reader emotions such as empathy.

Thus, not only do persuasive maps present a map user with a predetermined set of data, but crucially, they are designed with previously established convictions about the data being represented. Again, designers of persuasive visualizations are not necessarily concerned about striving for rationalist objectivity. Instead, they implore the map user to draw certain predetermined conclusions about what is being shown. Their communication is argumentative and purposeful. They use various visual rhetorical techniques to communicate and frame arguments for map readers (as shown in Figure 1). The techniques used in persuasive visualizations will vary depending on a variety of factors, including but certainly not limited to: the nature of the intended audience; available evidence supporting or opposing a particular viewpoint; and desired outcome of persuasion (e.g., to cast doubt upon, support for, or support against a particular belief or viewpoint).

(Insert Figure 1 around here)

Importantly, techniques of persuasive visualization do not exclude those of scientific visualization. The two categories are not mutually exclusive (McCoy, 2000). The difference lies in the philosophy of the communication being employed: rationalist versus rhetorical arguments. When

data seemingly supports a rhetorical argument, it may well behoove a designer of persuasive visualization to frame an argument using a rationalist approach. Indeed, it has been argued that persuasive print maps often disguise their rhetorical nature by mimicking scientific representations (Monmonier, 1996). However, many times spatial data does not support our beliefs about the world or arguments we wish to make. When this is the case, persuasive visualization typically makes use of a variety of emotional visual stimuli (G. H. Herb, 1989; Pickles, 1992).

PERSUASIVE PRINT MAP STYLES

Persuasive maps take a variety of guises. They can be used to do much more than “lie” (Monmonier, 1996); they are often used to reify particular beliefs and entice people into thinking about an argument from a new perspective (Wood & Fels, 1992). They have evolved in parallel to the development of thematic cartography beginning in the late 1700s (Muehlenhaus, 2011).

Muehlenhaus (2010, 2012, 2013b) argues that persuasive print maps have an identifiable taxonomy. They can be broken down into one of four particular rhetorical and persuasive styles: sensationalist, propagandist, understated, and authoritative (Muehlenhaus, 2010, 2013b).

Sensationalist Rhetorical Style

Sensationalist persuasive maps are those that make use of numerous graphic design elements to trigger an emotional response to spatial data. The reason these maps are labeled sensationalist is that they bombard the map reader with a variety of superfluous graphics, text-boxes, dynamic and emotive symbolization. These maps are often data rich, but they are not designed with clarity in mind. They are instead created with the purpose of overwhelming and exciting the map reader with emotional inputs to be associated with the carefully orchestrated data being displayed. **Figure 2** is an example of a sensationalist print map.

(Insert Figure 2 around here)

The map in Figure 2 was designed with the intention of exciting map users. It is data rich, emphasizes dynamism with flow arrows, and uses a variety of colors, illustrations, pictures, and texture to attract and distract map users. The signs of danger, imbued via pictures of people in

radiation suits, the sarcastic title, and the flow arrows, demand attention. The multiple levels of data – including shaded relief, terraced radiation zones, urban areas outlined in red and yellow, and the unexplained inclusion of national parks – are meant to distract. Map users will have a hard time focusing on the legitimacy of the data and instead will be forced to continually refocus on a variety of visual cues imbued with persuasive intentions.

Propagandist Rhetorical Style

Propagandist maps are very rhetorical in nature. They often have an assertive title. They present a single message clearly and with rhetorical aggression. They differ from sensationalist maps in that they rarely present more than two different types of data – they are data light. Unlike sensationalist maps, propagandist maps are less likely to make use of superfluous illustrations. They often use mimetic and pictorial symbology. They also are prone to using extreme levels of contrast in color value and hue to highlight one aspect of the data. **Figure 3** is an example of a propagandist print map.

(Insert Figure 3 around here)

The map designed in Figure 3 shows little information at all. The data has been simplified to the nominal level – either you are dead or you are not. Few superfluous map elements are used; noticeably absent are data sources and a legend. The colors found on this map are high-contrast and toxic in appearance. The text used on the map is bombastic; even the text labeling safe areas contains the word “fatal.” The message is simple; if you live in these states you will die. The title makes this clear. Why you will die is less obvious but is succinctly summarized in a short sentence of text in the lower-left hand corner.

Understated Rhetorical Style

Understated persuasive maps are data light but professional looking. They tend to represent only one or two levels of spatial information. They are map element sparse; often making minimal use of legends, neatlines, titles, textboxes, and other supplemental map elements. If an element does not enhance the argument in any way, it is excluded. These maps may appear rationalist and objective, but they are loaded with dataset manipulations. The information being presented has been

extremely filtered, tailored to present an argument in a straightforward, exceedingly deceptive manner. **Figure 4** is an example of an understated persuasive print map.

(Insert Figure 4 around here)

The map in Figure 4 is somewhat blasé. At first glance, one might not even realize it is a persuasive map. This disarming nature is the power of understated design. The power lies in its simplicity. It purposefully omits data sources. It provides merely an outline of the US with simple and fairly easy to read isolines. It provides a simple legend in layperson English explaining how dangerous the different levels of radiation are. It does not seem to take a stand, one way or another, as to whether this is bad or good. Its title is neutral. And it has very little supplemental information to distract or attract a map user's attention.

Authoritative Rhetorical Style

Authoritative persuasive maps use a rationalist visualization to make a rhetorical argument. These maps often look like well-designed maps adhering to the rigors of academic norms. However, a series of data model and graphic manipulations have been used to forge an argument and present one way of seeing the world over others. **Figure 5** is an example of an authoritative persuasive print map.

(Insert Figure 5 around here)

Authoritative maps tend to use a more rationalist visualization method. This map, for example, hides its persuasive intent behind the appearance of objectivity and accuracy. It has numerous layers of data, including populated places, making it data rich with a high data-to-ink ratio. It has several legends and uses fake data sources for legitimacy. The map also does not use aggressive titling. It allows map users to look at the map and figure out what the data means inductively.

These four rhetorical styles of persuasive maps appear to have remained fairly consistent throughout the past 200 years (Muehlenhaus, 2011). Moreover, the different rhetorical styles have been used by a variety of producers, including governments, non-profit groups, corporations, and members of the scientific community. Analysis on persuasive maps thus far, however, has primarily

dealt with the print medium. Several important questions remain unasked. As modern Web mapping technologies evolve, how is persuasive mapping or, more appropriately given the context of interactive technologies, persuasive geocommunication changing? How well does the print taxonomy hold up in this entirely different medium? Are new forms of persuasive rhetorical styling manifesting themselves? The rest of this article differs from previous research on persuasive maps, including the author's, by exploring these maps' manifestations online instead of in print.

SAMPLING ONLINE PERSUASIVE MAPS

This study is exploratory in nature; a convenience search for online persuasive maps dealing with a variety of contentious current event topics was conducted. Using the Google search engine, the author simply typed phrases such as "Obamacare," "gun rights," "Iran nuclear development," "Proposition 8," "gay marriage," "immigration," "North Korea," "Greek bailout," and many other similar phrases followed by "interactive map." To find online static persuasive maps, the same search was conducted omitting the word "interactive." Empirical observations and numerous notes were taken about the different maps found. It became apparent early on that the types of persuasive visualizations being discovered were quite varied in nature depending on the persuasive skill level of the designer, and most importantly, the Web tools and mapping packages used to create them. Thus, the maps are organized into three categories based on their production characteristics. These categories may prove ephemeral and need updating in the future, but from simple observation, online persuasive visualizations break down into three end products: (1) mashups, (2) tailored dynamic representations, and (3) static maps. The characteristics of each type of persuasive visualization design are reviewed below, along with several interesting exemplars discovered from each category.

Mashups

In some ways, Web technologies have made it more difficult to differentiate overtly persuasive maps from poorly designed ones. One problem is that many of the maps on the Web are produced in reverse fashion from established cartographic design protocol. Traditionally, it is advisable for a

cartographer to begin a project by analyzing the spatial data she has and then formulate a plan for presenting that data as an objective visualization or framed argument to a particular audience. Often, though, online mapping compromises this process. Cartographers limit themselves – due to lack of software skills or a client’s final desired product – to using pre-fabricated tools for Web map design (e.g., Google Maps, ESRI’s ArcGIS Online). By the time data organization and design decisions are to be considered, the potential efficacy of the map’s communication is already grossly constrained by the limitations of the tool chosen.

Many Web map producers now start with the premise that they need to have an end product that looks like, or preferably is, a Google Map (or to be fair to other brands, what is commonly referred to in the industry as a “slippy map”¹). Modern map designers then try to make their data and design fit this predetermined delivery method with mixed results using an online mapping service such as Open Street Maps, Google Maps, or CartoDB (links to these resources are available under references). Such “mashups” almost universally use a Web Mercator projection, even if it grossly distorts and muddles the narrative being displayed (Battersby, 2009). Point symbology is frequently of the generic clip art, teardrop variety (Muehlenhaus, 2013c), and when pictorial symbols are developed, they are often less than aesthetically pleasing (e.g., too large, pixilated, grotesquely embellished, or simplistic). When it comes to thematic mapping, mashup maps tend to be comprised of Web-safe colors and frequently limit their representations to choropleth (see M. Peterson, 2008, for an overview of how easy it is to create choropleth maps in this fashion). Adding cognitive injury to design insult, many of these maps display their thematic data over an eye-burning, absolutely mind-bogglingly busy and bright base map. That’s if the map reader is lucky; just as often an aerial photograph is chosen for the background by default increasing the cognitive load on the map user and often rendering a map less intelligible (Mayer & Moreno, 2003).

Of course, such examples of poor cartographic design afflict both persuasive and non-persuasive visualizations online. How is it possible to tell whether an online visualization is using an

¹ “Slippy map” is the term used by cartographic professionals and Web developers to describe Web-based maps that allow a map user to pan-and-zoom with an interface tool such as a mouse or touch screen. These maps are typically comprised of numerous map tiles.

inappropriate projection, terrifying mimetic symbols, and bright red and orange colors to be persuasive as opposed to merely being a terrible map? There is no simple answer. The most straightforward method is to analyze the map contextually, based on its accompanying Web page or an entire Web site. If an interactive map is created by a lobby group, a political party or candidate, a company attempting to sell people things, or a non-profit organization promoting a campaign of some sort, there is a good chance it is part of a persuasive campaign.

In this study, a variety of persuasive mashups were found. These persuasive visualizations were the easiest to find. Most were created using Google Maps or Google Earth. These were also some of the most difficult maps to analyze, as they often were comprised of nothing more than generic slippy maps with varying amounts of unintuitive thematic data layered on top. Typically, these maps were embedded within a Web page. Such pages would frequently include a write-up or supplemental information and links concerning the topic being mapped. For example, the map in **Figure 6** not only highlights the size of the BP oil spill in the Gulf of Mexico, but includes links to compare its size to any city in the world. It also provides resources from which map readers can learn more about the magnitude and potential impact of the spill.

(insert Figure 6 around here)

The benefits of using APIs² to create online persuasive visualizations are manifold (M. P. Peterson, 2012). First, it is cheap; in fact, unless your map receives tens-of-thousands of hits, it is typically free. Second, such maps are quite easy to make – if not design – and there are many tutorials available online showing how to modify and personalize such maps. Third, the interface is built into the map already; the producer does not have to spend time developing a unique interface or method of delivery. Fourth, people love slippy maps; maps that can be panned, zoomed, and with which they can elicit a certain amount of excitement among map readers (M. P. Peterson, 2007). By

² API stands for Application Programming Interface. APIs are created and distributed by the creators of map services and data. An API is a collection of scripts and codes that Web mapmakers can use to interact with, make use of, and manipulate map services and map data. For example, the Google Maps JavaScript API allows a Web mapmaker to use Google Maps tiles underneath her own data. The tiles can also be manipulated – labels removed, base map colors changed – and map elements can be altered.

using an interface that allows users to have these controls, and view very detailed base map information, such maps may garner an aspect of authority.

However, using Google Maps or another API-based map does have some potential drawbacks (Muehlenhaus, 2013c). First of all, unless it is well designed and embedded in a formal Website, it may end up looking unprofessional – the opposite of the desired effect. Second, due to the limitations of working within the constraints of a third-party Web mapping application, the map itself may not be that convincing. It may not frame the argument from a certain perspective clearly due to the extraneous amounts of data included in the mashup. In sum, the map creator will have less control over the rhetorical nature of the map. This is compounded by the fact that only recently, and even then only with knowledge of JavaScript or other scripting languages, can one simplify the base map using an API. There is no doubt that an effective online persuasive visualization can be designed using this software; finding such examples, however, is more difficult. Several examples, with screen captures and URL links, are discussed below.

Iran Surrounded by American Military Bases

In the years following 2010 perhaps no other international issue garnered more attention in the West than Iran and its nuclear capabilities. Hundreds of online visualizations purporting to show Iran's nuclear capabilities exist. However, persuasion is a two-way street. The map included in **Figure 7** provides an alternative argument – it shows how Iran is surrounded by United States military bases. It portrays Iran as confined. The title of the accompanying article on the Web page makes no mistake about the map's intended argument: "Map: US bases encircle Iran." Unlike a majority of maps depicting Iran's nuclear facilities and uranium mines, which are loaded with fuzzy data and outright misleading information, the data on this map is not false – though it is presented with a particular rhetorical flair. This map was produced by Al-Jazeera, which is a news organization playing a crucial role in shaping opinion throughout the Islamic world. The map itself is essentially a default Google Map mashup. It even uses default icons. The descriptions of military bases are technical but written from an anti-imperialist perspective. The map certainly makes it look official; Iran is surrounded. Yet, the lack of design and mechanistic styling does not make this a very emotional

specimen. This map is likely targeted at those already upset with American militarization of the Middle East. It is less likely to emotionally woo new anti-American sentiment. The map lacks emotional panache. It is probably best characterized as an understated map, even though it makes use of Google's detailed base maps. The generic interface and symbology imply a straightforward, matter-of-fact assessment typically associated with understated persuasion.

(Insert Figure 7 around here)

What Health Reform Means to Your State

The Obama Administration has made use of persuasive maps since before it was an administration, stretching all the way back to the 2008 primary campaign. It often uses maps to personalize the benefits of its political agenda visually. The map in **Figure 8** is a prime example of this. It is purely propagandistic. It presents emotionally charged data (i.e., personal stories) in a manner that allows for only one interpretation – healthcare reform is already helping people everywhere across the United States. Data that goes against this narrative is omitted, naturally. Examples are used that include all ages and races, appealing to the widest possible audience. The colors used on the map are largely bright and cheerful – primary colors. Red is reserved for small businesses – the most threatening color on the map. The base map is extremely simplified. (This is an example of a well-designed slippy map, tailored for the message.) The data is simple at first but becomes more complex when you click on individual dots. Pop-up windows appear with embedded videos of personal testimonials and pictures of smiling, happy, presumably healthy, individuals. Included with the positive images is a litany of data about how the Affordable Care Act is helping people in that particular state – displaying only numbers that support the argument and the pictures of smiling people.

(Insert Figure 8 around here)

Proposition 8 Donors Map

The next example is more ethically troubling than many (**Figure 9**). Not only is it a persuasive map in that it is directed at raising money and support for a political position, it is also a map meant to target members of the opposition. This map began making the rounds via social network sites soon

after Proposition 8 referendum in California was passed. Proposition 8 was a state-wide referendum establishing a constitutional amendment banning gay marriage. Political donation records in the United States are public. So it did not take long for those opposed to the amendment to create a map showing the geocoded locations of the amendment's financial supporters. Not only that, the map also provides data on the names of donors, their employment affiliation, and the amount of their financial contributions. This is probably best categorized as an understated map. It provides succinct information. It allows the map reader to make up her mind about the patterns being shown and what to do with the information. It is just presenting the facts. Except the facts are meant to incite and anger and provoke one side into action. At best, the map will convince opponents of Proposition 8 to financially support the ongoing campaign against it. At worst, it will encourage these same people to harass or hurt individuals with whom they disagree.

(Insert Figure 9 around here)

Tailored Dynamic Representations

Dynamic cartographic representations proliferate on the Internet. Typically, they look like sleekly designed traditional cartographic representations, with a unique graphical user interface (GUI). They vary in interactivity from minimal (hitting play and pause) to much (allowing for layers to be turned on and off, data to be moved around, and changes in how the symbols are represented). Many of these maps are designed with software requiring an HTML browser plug-in such as Adobe Flash, Oracle Java, or Microsoft Silverlight. The more simplistic versions of these visualizations are designed as MPEG-4 video files to simply be viewed. With the solidification of HTML5 standards, it is expected that most of these maps will start being designed using HTML, Cascading Style Sheets (CSS), and JavaScript³ in the future.

These persuasive visualizations have several advantages. First of all, the cartographer has total control over what is shown on the map. The maps are typically created from scratch. Second, the

³ JavaScript *is not* Java. JavaScript is a scripting language used to provide native interactivity on Webpages. It is easily interpreted by nearly all Web browsers and therefore is considered a core HTML5 technology, along with HTML and CSS. Oracle's Java, on the other hand, is used to create many standalone applications and can be run in most Web browsers only via a plug-in.

cartographer has complete control over the design of the interface and layout. Third, the types of visualizations and representations that can be shown are more varied and, in general, are more professionally designed. These maps have a particular style and panache that the homogeneity of API maps rarely achieves.

The benefits of using these types of maps for persuasion are potentially enormous. The maps can be stylized depending on whom one's target audience is. Data can be omitted from base maps to better accentuate the argument and message being made. These maps are often developed with sexy animations – both superfluous and dramatic. Music and sounds (e.g., gunshots, explosions, screams of horror) can be added to the maps to better capture a map reader's attention and, potentially, empathy. Finally, users can be given some control over what is shown and how it is shown, helping to draw in map readers. Of course, since such a map is designed from scratch, the map reader may believe she has some semblance of control over what is being viewed, but the cartographer has already decided what cannot be seen or manipulated. The cartographer frames the limits of argument for map readers.

If these persuasive visualizations are potentially so effective, why are they not as ubiquitous as mashups? There are numerous drawbacks to creating such personalized visualizations. First, people are used to interacting with tiled, slippy maps. This is the norm. Thus, designing one's own interface and base maps may result in less trust among those viewing the maps. Second, such maps are not as quickly created as a mashup. One must spend considerable time designing, testing, and implementing a tailored dynamic map. Often this work requires a team of developers. If the project is hired out, it will cost more money and time to complete. Many online persuasive visualizations need to be produced quickly to be effective; mashups have a distinct advantage in this regard. Finally, most of these maps – until recently – have required browser plug-ins. If the goal of one's persuasive visualization is quantity and maximum distribution – i.e., number of views – over quality, a map dependent upon a plug-in is probably not desirable. (Plugins require users to have additional applications installed to view a map file.) Three examples of such maps are discussed below.

New York City Abortion Ratio by Zip Code

The map in **Figure 10** is a stellar persuasive visualization on many levels. Its Web address, www.nyc41percent.com, actually tells you what the map is showing – New York City has a 41% abortion rate. (Note: this is according to the producers of the map and has not been fact-checked here by the author.) The map is elegantly designed with smooth animation transitions as one moves a mouse about the map. One can interact with each city zip code to explore how rates vary across the city. The map presents temporal data – one can choose which year from the 2000s she would like data from or have the map play through an animation of abortion rates. A dark red color is used to represent the data. A simple zoom feature, that is really not necessary to view any additional information, facilitates the slick interface design and gives the map a modern feel. This map is of an understated nature. It really is just a choropleth map of ratio data. However, the message is difficult to miss and is subtly reinforced by how the data is defined and presented – the abortion rate in New York City is high.

(Insert Figure 10 around here)

A Nation Divided Over Immigration

The second example is also an understated style map (see **Figure 11**); many of the tailored dynamic representations were of this variety. This map is a very thinly veiled attack on Arizona state legislation concerning immigrant rights in the United States. A reader has three hyperlink options to choose from – *A Nation in Chaos*, *A Nation Divided*, or *A Nation United*. The ordinal categories comprising the map appear to be completely subjective, and they have somewhat stark descriptions. When one clicks on *A Nation Divided*, a map is shown that does not change too much from the original – strict anti-immigrant laws will remain in effect. Then, when a user clicks on *A Nation United*, the entire map goes gray. A short subtitle notes this is what will happen if the Supreme Court overturns the legality of the Arizona Law – the country will be united without Arizona style legislation. This map is not comprised of sexy graphics or anything of the like. It has very limited HTML interactivity. It communicates its argument succinctly and matter-of-factly.

(Insert Figure 11 around here)

A Map of Israeli Security

The most exciting map found in this convenience sample was also one of the most difficult to categorize (please see **Figure 12**). The map is a video animation highlighting the dangers that a Hamas-controlled Gaza Strip presents the Israeli state. The map was created by the Israeli Defense Forces (IDF) – i.e., Israel’s military. It is currently available both on their blog and YouTube (see caption for reference). Titled, *What Gives Israel the Right to Defend Itself?*, it presents an incredibly straightforward, and quite simplistic, animated map showing how dangerous the Gaza Strip is to Israeli sovereignty. It then notes that Israel has not only a right but an obligation to protect its citizens. It ends with an incredibly propagandistic enticement – “For More Information, Click the Link Below” – which takes users to an entire Web page devoted to the same argument being presented in the map.

This map is meant to dynamically bolster the argument that Israel is under siege. It is recommended that readers view this map in its entirety for an example of an extreme example of an online sensationalist geovisualization. There is narration; there is ominous music in the background; there are flow lines with arrows, rockets, and little innocent houses being attacked. Numerous arguments for Israeli’s right to defend itself – i.e., counterattack – are made while the map reader is subjected to a dynamic and exciting presentation of the dangers Israel must confront on a daily basis.

This is an example of an expensive, high-end, military-backed cartographic production the likes of which harks back to 1930s Germany (see for example G. Herb, 1999, and G. H. Herb, 1989). What it lacks in interactivity it more than makes up for in dynamism and superfluous graphic representation. This map takes the form of video, but is still very much a sensationalist map. It overwhelms the map viewer with information and visual stimuli over the course of 39-seconds. It is difficult *not to empathize* for a country that is, according to the map producer, barraged by missiles. Of course, what is understandably omitted from this persuasive map is data on how potentially excessive in force IDF counter-attacks on the Gaza Strip are and the international illegality of Israeli

settlements in the West Bank – a topic that is partially fueling Palestinian distaste for the Israeli state in Gaza as well.

(Insert Figure 12 around here)

Static Maps

The last category of online persuasive visualization is static maps. Though less technologically savvy than the previously discussed map types, static maps were nonetheless some of the most aesthetically appealing and ubiquitous. Most of these are produced using standard GIS, graphic design, or rudimentary drawing techniques. They are found online in a variety of formats (e.g., PNG, GIF, JPG, PDF).

The benefit of keeping one's persuasive visualizations simple is obvious. Any browser can open an image file. Moreover, these maps are easily distributed via email attachment, social networking site upload, and photo sharing sites. Persuasive arguments can not only be framed but sculpted in static maps; without interaction, it will be difficult for the intended message to be missed. Another advantage that static maps have over interactive ones is that they can be easily printed. Finally, a well-designed static map has the potential to become an Internet sensation (i.e., meme).

Jesusland

An example of this potential is found in the now infamous Jesusland map from 2004 (see **Figure 13**). The original version of this map was created by G. Webb the day after John Kerry lost in his election bid against President George W. Bush. The New York Times Magazine referred to this map as "an instant Internet classic" (Hitt, 2004). The map was originally shared within a relatively small online social circle (at yakyak.org); the simple map resonated so strongly with elements of the public, though, that this map became a meme among the left in the United States.

(Insert Figure 13 around here)

Of course, there are drawbacks to using a simple static representation as well. First, it has the potential to simply be overlooked. Interactivity is very attractive to Internet users. Embedded within a browser in the middle of a Webpage, the inability of a static map to catch a reader's

attention may defeat the purpose of creating the map in the first place. The lack of interactivity might benefit communication of the message (something that needs exploration), but a map reader's perception of the map is likely to be less engaged than if it were an interactive map. Another drawback of static maps on the Web compared to printed maps is resolution. The amount of aesthetic detail that can be conveyed via standard monitors and high-definition screens is still limited.

Static online maps do not merely need to be embedded as a graphic, however. Indeed, this author found several novel ways to draw map readers into a site and get them involved in reading, and even creating, the rhetoric on a persuasive map. The most egregious example of this is reviewed below.

What if Hamas was in Your Neighborhood?

The term "propagandist" may not do this map justice (see **Figure 14**). The Anti-Defamation League (ADL) came out with this cartographic campaign approximately five years ago. Using a simple Web interface, visitors could pick their US city from a list and print out maps to distribute of their city being bombed by rockets from the Gaza strip. Several things are absolutely fascinating about this series of static maps. First of all, the ADL figured out how to make static maps interactive by having users comb through propaganda material and then choose their own home city to be bombed. Second, the maps are personalized to an extreme. By producing a map of the range of Hamas rockets over Des Moines, Iowa, for example, the conflict between Israeli Defense Forces and Hamas is literally brought home for many map readers. It is bound to garner empathy among those who do not have an inherently pro- or anti-Israeli foreign policy opinion. Third, certain cities were not included in the list. Des Moines is an option, but not Minneapolis – a much larger metropolitan area. It is hard to know why this was done for certain, but it might be opined that, in reality, Hamas rockets do not have much range. Thus, they might not hit Minneapolis from its own suburbs. Finally, the most deceitful aspect of the argument being made with these maps is that the areas being rocketed by Hamas in Israel do not have particularly dense populations. Placing Gaza adjacent to

major US metropolitan areas housing millions of people is not at all comparable to its real location next to the Negev Desert. This is an exemplar online persuasive visualization to be certain.

(Insert Figure 14 around here)

THE STATE OF ONLINE PERSUASIVE MAP DESIGN

The above categorization and analysis of online persuasive maps leads to more questions than it answers. A brief overview of the evidence found in this sample is in order. Analysis will be broken down into a series of questions. First, to what extent do online persuasive maps parallel the rhetorical nature of static ones outlined by Muehlenhaus (2010, 2013b)? How are they similar; how are they different? Second, what are the potential benefits and drawbacks of the different styles and mediums of online persuasive maps? Finally, were there any observable patterns regarding what types of organizations are using maps as rhetorical tools to make arguments, and if so, were there any repetitive techniques or styles?

Similarities and Differences from Print Maps

Online persuasive visualizations appear to still be in an embryonic stage of development. A vast majority of the maps found for this analysis were simplistic and less than aesthetically pleasing compared to what a search for their printed counterparts might find. Those that do exist tend to camouflage themselves as standard visualizations quite well – authoritative rhetoric – by using a standardized API.

One reason that online persuasive visualizations are not as comprehensively developed as print ones may be simply due to the changing nature of both mapping and society. As maps have become easier and cheaper to create, and the server space where they are stored is easily appropriated for other data, their longitudinal value is diminished. We live in a data-driven society with 24-hour news cycles. Maps of any variety simply have less staying power online; the stories they tell and the arguments they make are rapidly fleeting and forgotten.

Some have argued that map design for the Web has suffered for this (M. Peterson, 2008b). This author concurs. However, design is not being deprecated in GIS because aesthetically pleasing

maps are no longer appreciated. Rather, design is disappearing because there is a diminishing return on spending too much time on the aesthetics of Web maps. Play dough is a great building medium; it is even slippery in a sense! One could build elegant and marvelous things out of it. It is rare one does, however, because the medium is designed to be ephemeral. The designs are eventually discarded. The same might be said for Web content in general.

As relating to Muehlenhaus' (2010, 2013) aforementioned taxonomy, the styles continue to exist but do not appear to be as strongly delineated as they were in his print sample. His taxonomy likely needs to be modified for persuasive Web visualizations, as it cannot adequately account for the ubiquitous use of satellite imagery and extremely detailed base maps found in many APIs. In print, most of these highly detailed maps would probably fall into the authoritative category, as until recently aerial photos and detailed base maps were expensive to produce or purchase the rights to. Therefore, persuasive print visualizations that used such techniques were often produced by governments or wealthy publishers. These days, maps using aerial photography are some of the easiest and cheapest to produce online. The authoritative novelty of such data has been delegitimized through ubiquity.

Understated persuasive visualizations proliferate on the Web. Most dynamic cartographic representations viewed in this study fell into the understated category. There are a variety of reasons that non-API-based, interactive maps are more likely to be understated than authoritative, sensationalist, or propagandistic. First, many professional cartographers, bona fide information architects, believe in the power of abstraction. Less can be more; it can help the map reader interpret things clearly. Given that those trained enough to design their own dynamic cartographic persuasive representations are likely professional designers, it makes sense that they would simplify their maps to communicate and persuade more effectively. Even among the understated maps that were data rich, users typically had the ability to turn layers of data on and off. They often had intuitive, personalized interfaces. Finally, the maps rarely started with all of the data being shown concurrently, as is often the default with API mashups.

Sensationalist and propagandistic maps were primarily found online as static representations, likely produced for maximum distribution on the Web. There were several animated maps that fit these specifications, but these were not necessarily interactive – just elaborate movie clips with play and pause. Many of the propagandistic persuasive visualizations were designed for print; the Web appears to merely be a tool for their rapid and widespread distribution.

Benefits and Drawbacks of Different Online Persuasive Visualization Designs

As outlined above, there are likely benefits and drawbacks to the three different compositions of online persuasive visualizations reviewed here. First, API mashups are a relatively easy way to create maps that reach a broad audience, don't require browser plug-ins, and can be updated very easily. Personalized, interactive online persuasive visualizations are potentially more emotionally powerful and aesthetically pleasing – though studies have yet to confirm this – but are far more likely expensive, difficult, and time-consuming to produce. Static persuasive visualizations are used for a variety of reasons. Probably the main benefit of using a static image is that it is a tested and proven medium of persuasion. The impacts of static graphics on human empathy are well established in graphic design literature (Buchanan, 1985). Also, static maps may have more dissemination potential, as they don't require a URL link but can be attached to emails, social network postings, and more. This distribution advantage is likely to diminish in the near future, however, as HTML 5 standards progress and begin to further incorporate video embedding (Vaughan-Nichols, 2010).

Telltale Design Patterns

This study was not broad enough to earnestly draw any conclusions about patterns and styles of online persuasive maps. However, a couple of techniques did seem to proliferate. Pictorial point symbols were very common on maps in this sample. When it came to thematic representation of areal features, choropleth and proportional symbol representations were used most frequently. Before the study began the author opined that animated flow maps would be an effective and dynamic method to use in certain persuasive circumstances. Only several such visualizations were found, though.

The only correlation between the map producer and type of persuasive Web map being produced in this exploratory study was that institutional producers tended to make more aesthetically pleasing maps. Citizens' groups and less well funded, tech-savvy map producers were more likely to use out-of-the-box slippy maps. It is too early to argue that a digital divide among persuasive mapmakers exists, but it certainly appears this could be a possibility.

CONCLUSION

This article has explored the nature of online persuasive visualizations. Like their counterparts in print, these come in many guises. By organizing these maps into groups based on the nature of their production, qualitative analysis of their styles is possible. Moreover, they can be compared and contrasted to their ancestors in print. Obviously, the Web medium allows for these types of maps to have far more features than they would if they were only in paper form. However, it is still unclear whether the art of framing an argument, or of controlling how a debate is contextualized, is given any particular advantage through interactivity.

What has become evident in this research is that persuasive maps have moved online. Though still relatively simplistic in their design compared to what has been done with print persuasive maps, it can only be hypothesized that certain producers will hone their skills and that more producers of such maps are sure to come, as Web map production and design become more accessible to the masses. Static maps created for distribution online may have even more power than interactive ones, as they turn into Internet memes (e.g., the Jesusland map in **Figure 13**).

This article was but a first expedition into the world of online persuasive maps. It was extremely limited in scope. The analysis was descriptive and based off of a convenience sample. Only English phrases were used to search for these maps. Certainly more advanced online persuasive maps exist of which the author is unaware. Likewise, thousands of even less effective ones surely proliferate. This article in no way pretends to be holistic or authoritative. These limitations out in the open, there are several key take-away points.

First, these maps are already quite abundant and are almost certainly going to accrue in the future. It will be to GIScience's advantage to begin seriously identifying and analyzing these types of maps earlier rather than later. It is the belief of this author that researchers are being afforded a wonderful opportunity to preemptively prepare for and analyze the development of a particular genre of maps in real time, as the maps evolve and grow more abundant. It would be a mistake to merely dismiss these as irrelevant anomalies that are not of interest to GIS professionals, as has largely been done with persuasive maps in the print medium. Some of the most beautiful and convincing maps in the history of print cartography have been persuasive ones. Surely, there will be something to learn about design and visual rhetoric from their online counterparts.

Second, it becomes even more imperative (than it already was) to start educating the public now about the drawbacks of reading maps uncritically. The shift from Web 1.0 to Web 2.0 has made maps easy to distribute, share, and promote. The move of GIS from desktop applications to cloud services will indubitably make collecting and manipulating spatial data for persuasive purposes easier than ever. With both the altruistic and capitalistic benefits of "GIS for everyone" come other social ramifications. A startlingly large number of people already trust their GPS devices... to death (see for example Tremlett, 2010). People's mental maps of the world are already being distorted by the ubiquitous use of global projections, most notably the Web Mercator (Roberts, Schein, Dear, Gregory, & Thrift, 1995). Without proper education and instruction, a large part of the public outside of academia will be susceptible to simply believing what they see in a given online persuasive visualization.

Third, due to their potential for interactivity, online persuasive maps will offer new techniques of rhetorical communication that print maps could not. Many of the techniques embraced by print maps, however, will likely remain powerful rhetorical devices on the Web. Of the maps in this sample, the most overtly persuasive ones still used established static techniques of manipulation to make arguments. Many of the maps reviewed for this study were completely or mostly static in nature.

In fact, a question that might be addressed in future research is whether interactivity is even beneficial for communicating an argument. It is well established that it can benefit map readers using maps to complete specific tasks and for researchers using maps for exploratory visualization. However, if framing an argument is your primary goal, perhaps less user interactivity is more effective, as conceivably it would allow the producer to control information and hone her arguments more effectively. Perhaps one reason we still see so many static persuasive maps online is that user interactivity may actually reduce the map reader's ability to focus on the rhetorical message itself. It may be no accident these maps lack interactivity; it very well could be a deliberate attribute of their design.

Conversely, persuasion is not just about communication; it also depends on perception. More research might be done on differences in trust among these different types of online visualizations. For example, perhaps people trust static maps less than interactive maps. Even with interactivity, it would be interesting to begin seeing whether map readers trust tailored dynamic representations more or less than tile-based, slippy maps. These are only several of the many avenues for future research concerning the dawn of online persuasive visualizations.

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REFERENCES

- Ager, J. (1977). Maps and propaganda. *Bulletin of the Society of University Cartographers*, 11(1), 4–14.
- Battersby, S. E. (2009). The effect of global-scale map-projection knowledge on perceived land area. *Cartographica: The International Journal for Geographic Information and Geovisualization*, 44(1), 33–44.
- Boggs, S. W. (1947). Cartohypnosis. *The Scientific Monthly*, 64(6), 469–476.
- Buchanan, R. (1985). Declaration by design: Rhetoric, argument, and demonstration in design practice. *Design Issues*, 4–22.
- Foucault, M. (1986). Truth and power. In P. Rabinow (Ed.), *The Foucault Reader* (pp. 51–75). Penguin.
- Haughney, C. (2013). After Pinpointing Gun Owners, Paper is a Target. *New York Times*. Retrieved January 23, 2013, from <http://www.nytimes.com/2013/01/07/nyregion/after-pinpointing-gun-owners-journal-news-is-a-target.html?pagewanted=all>

- Herb, G. (1999). Before the Nazis: Maps as weapons in German nationalist propaganda. *Mercator's World*, 4(3), 26–31.
- Herb, G. H. (1989). Persuasive cartography in Geopolitik and national socialism. *Political Geography Quarterly*, 8(3), 289–303. doi:10.1016/0260-9827(89)90043-8
- Hitt, J. (2004). Neo-Secessionism. *The New York Times Magazine*. Retrieved from http://www.nytimes.com/2004/12/12/magazine/12NEO.html?_r=1
- Mayer, R. E., & Moreno, R. (2003). Nine ways to reduce cognitive load in multimedia learning. *Educational Psychologist*, 38(1), 43–52.
- McCoy, K. (2000). Information and Persuasion: Rivals or Partners? *Design Issues*, 16(3), 80–83. doi:10.1162/07479360052053342
- Monmonier, M. S. (1996). *How to lie with maps* (2nd ed., p. xiii, 207 p.). Chicago: University of Chicago Press.
- Monmonier, M. S., & Schnell, G. A. (1988). Political Maps. In *Map appreciation* (pp. 201–246). Englewood Cliffs, N.J.: Prentice-Hall.
- Muehlenhaus, I. (2010). Lost in Visualization: Using Quantitative Content Analysis to Identify, Measure, and Categorize Political Cartographic Manipulations. *Geography*. University of Minnesota.
- Muehlenhaus, I. (2011). Genealogy that Counts: Using Content Analysis to Explore the Evolution of Persuasive Cartography. *Cartographica*, 46(1), 28–40.
- Muehlenhaus, I. (2012a). If Looks Could Kill: The Impact of Rhetorical Styles in Persuasive Geocommunication. *The Cartographic Journal*, 49(4), 361–375.
- Muehlenhaus, I. (2012b). If Looks Could Kill: The Impact of Rhetorical Style on Persuasive Geocommunication. *The Cartographic Journal*, 000(000), 1–16. doi:10.1179/1743277412Y.0000000032
- Muehlenhaus, I. (2013a). The Design and Composition of Persuasive Maps. *Cartography and Geographic Information Science*, 40(forthcoming), <http://dx.doi.org/10.1080/15230406.2013.783450>.
- Muehlenhaus, I. (2013b). Four Rhetorical Styles of Persuasive Geocommunication: An Initial Taxonomy. In *Proceedings of the International Cartographic Conference* (p. 7). Dresden, Germany: ICC.
- Muehlenhaus, I. (2013c). *Web Cartography: Map Design for Interactive and Mobile Devices* (p. 250). Boca Raton, FL: CRC Press. Retrieved from <http://www.ian.muehlenhaus.com/webcartography>
- Peterson, M. (2008a). Choropleth Google Maps. *Cartographic Perspectives*, (60), 80–83.
- Peterson, M. (2008b). Maps and the Internet: What a Mess It Is and How to Fix It. *Cartographic Perspectives*, (59), 4–11, 67.
- Peterson, M. P. (2007). Elements of multimedia cartography. In W. Cartwright, M. P. Peterson, & G. Gartner (Eds.), *Multimedia cartography* (Second., pp. 63–73). Berlin: Springer.
- Peterson, M. P. (Ed.). (2012). *Online Maps with APIs and WebServices*. Berlin: Springer-Verlag.
- Pickles, J. (1992). Text, hermeneutics and propaganda maps. In T. J. Barnes & J. S. Duncan (Eds.), *Writing worlds: discourse, text, and metaphor in the representation of landscape* (pp. 193–230). New York: Routledge.
- Postman, N. (2005). *Amusing Ourselves to Death* (Revised ed., p. 208). New York: Penguin.
- Quam, L. O. (1943). The use of maps in propaganda. *Journal of Geography*, 23, 21–32.
- Roberts, S. M., Schein, R. H., Dear, M., Gregory, D., & Thrift, N. (1995). Earth shattering: global imagery and GIS. In J. Pickles (Ed.), *Ground Truth* (pp. 171–195). New York: Guilford Press.
- Robinson, A. H. (1982). *Early thematic mapping in the history of cartography* (p. xiv, 266 p.). Chicago: University of Chicago Press.
- Speier, H. (1941). Magic Cartography. *Social Research*, 8(3), 310–330.
- Tremlett, G. (2010). GPS Directs Driver to Death in Spain's Largest Reservoir. *The Guardian*. Retrieved June 15, 2012, from <http://www.guardian.co.uk/world/2010/oct/04/gps-driver-death-spanish-reservoir>

Tufte, E. R. (1991). *Envisioning Information* (2nd print., p. 126 p.). Cheshire, Conn.: Graphics Press.

Tyner, J. (1982). Persuasive Cartography. *Journal of Geography*, 81(4), 140–144.

Vaughan-Nichols, S. J. (2010). Will HTML 5 restandardize the web? *Computer*, 43(4), 13–15.

Wood, D., & Fels, J. (1992). *The Power of Maps. Mappings* (p. viii, 248 p.). New York: Guilford Press.

FIGURE CAPTIONS

Figure 1 This is an extract of a CIA map appearing in a report to Congress in the lead up to the Gulf War in 2003. The map shows CIA data on weapons of mass destruction (WMD) believed to be in Iraq. (You can view the original map in its entirety at www.ian.muehlenhaus.com/viral/.) Not only was the CIA data completely wrong, and perhaps even fabricated, but the symbology chosen for the map was also misleading. One of these violent mimetic symbols actually represents weapons that were positively destroyed by Saddam Hussein – the explosions. If Congresspersons did not look closely at the map legend, they were likely to miss this important fact.

Figure 2 A Sensationalist persuasive map of *fake* nuclear radiation data from a hypothetical nuclear meltdown in the United States. Originally published in (Muehlenhaus, 2012b). Used with permission. Copyright Manney Publishing.

Figure 3 A Propagandist persuasive map of the same *fake* nuclear radiation data from a hypothetical nuclear meltdown in the United States. Originally published in (Muehlenhaus, 2012b). Used with permission. Copyright Manney Publishing.

Figure 4 An Understated persuasive map of the same *fake* nuclear radiation data from a hypothetical nuclear meltdown in the United States. Originally published in (Muehlenhaus, 2012b). Used with permission. Copyright Manney Publishing.

Figure 5 An Authoritative persuasive map of the same *fake* nuclear radiation data from a hypothetical nuclear meltdown in the United States. Originally published in (Muehlenhaus, 2012b). Used with permission. Copyright Manney Publishing.

Figure 6 An example of a mashup-based online persuasive visualization using the Google Earth plug-in. You can type in your home location and see how big the Gulf of Mexico Oil Spill was compared to where you live. Accessed on June 7, 2012 at <http://paulrademacher.com/oilspill>. (Courtesy of Paul Rademacher, www.housingmaps.com)

Figure 7 Screen capture from Al-Jazeera Web map entitled, *Map: Iran is surrounded*. Accessed on June 7, 2012 at <http://www.aljazeera.com/indepth/interactive/2012/04/2012417131242767298.html>. (Source: www.aljazeera.com)

Figure 8 *What Health Reform Means to Your State*. The White House Website used an interactive Web map to help promote its controversial health care reform initiative. Accessed on June 7, 2012, at: <http://www.whitehouse.gov/healthreform/map#>. (The White House)

Figure 9 A Google Mashup showing the names, locations, and work affiliations of, as well as the amount of money contributed by, donors to the Proposition 8 Campaign in California. Accessed on: June 7, 2012 at <http://www.eightmaps.com> (Source: www.eightmaps.com)

Figure 10 New York City's Abortion Rate by Zip Code. Screen capture shows the rate for an individual zip code within the city. Accessed on June 7, 2012 at <http://www.nyc41percent.com>. (Courtesy of the Chiaroscuro Foundation)

Figure 11 Maps accessed on June 7, 2012 at http://www.americanprogress.org/issues/2012/04/immigration_map.html. (Courtesy of American Progress)

Figure 12 Israeli Defense Forces Animated Map on YouTube. "What Gives Israel the Right to Defend Itself?" Accessed on May 21, 2012, at <http://youtu.be/LxX6f5R4-3E> (Source: Israeli Defense Forces, YouTube)

Figure 13 A version of the Jesusland meme widely circulated on the Internet recreated by author. (Source: by Liftarn, GFDL or CC-BY-SA-3.0 via Wikimedia Commons).

Figure 14 A downloadable poster for free distribution. One can pick the city in which she lives to personalize the cartographic terror. Accessed: June 7, 2012 at: <http://www.adl.org/Israel/posters> (Source: Anti-Defamation League Website)