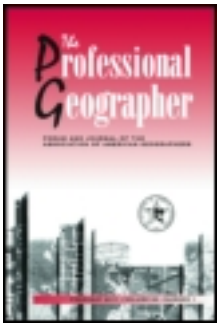
This article was downloaded by: [Mark Graham]
On: 20 October 2011, At: 10:42
Publisher: Routledge
Informa Ltd Registered in England and Wales Registered Number: 1072954
Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



The Professional Geographer
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/rtpg20

The Technology of Religion: Mapping Religious Cyberscapes

Taylor Shelton [a], Matthew Zook [b] & Mark Graham [c]
[a] Clark University
[b] University of Kentucky
[c] University of Oxford

Available online: 20 Oct 2011

To cite this article: Taylor Shelton, Matthew Zook & Mark Graham (2011): The Technology of Religion: Mapping Religious Cyberscapes, The Professional Geographer, DOI:10.1080/00330124.2011.614571

To link to this article: http://dx.doi.org/10.1080/00330124.2011.614571

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: http://www.tandfonline.com/page/terms-and-conditions

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae, and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand, or costs or damages

whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

Downloaded by [Mark Graham] at 10:42 20 October 2011

The Technology of Religion: Mapping Religious Cyberscapes

Taylor Shelton
Clark University

Matthew Zook
University of Kentucky

Mark Graham
University of Oxford

Downloaded by [Mark Graham] at 10:42 20 October 2011

This article combines geographical studies of both the Internet and religion in an analysis of where and how a variety of religious practices are represented in geotagged Web content. This method provides needed insight into the geography of virtual expressions of religion and highlights the mutually constitutive, and at times contradictory, relationship between the virtual and material dimensions of religious expression. By using the spatialities of religious practice and contestation as an example, this article argues that mappings of virtual representations of material practices are important tools for understanding how online activities simultaneously represent and reproduce the material world. **Key Words: cyberscapes, Internet, neogeography, religion, volunteered geographic information.**

本文结合互联网和宗教，分析各种宗教习俗在哪和如何在地理标记的网络内容中被表示。这种方法给宗教虚拟表达的地理提供了所需的洞察力，和突出了宗教表达的虚拟和物质层面之间既相互交构有时又相互矛盾的关系。利用宗教实践和论争的空间性为例，本文认为，物质实践的虚拟表示之映射是了解网上活动是如何同时表示和创造物质世界的重要工具。**关键词：网络风景，互联网，新地理学，宗教，自愿的地理信息。**

Este artículo combina estudios geográficos tanto de Internet como de religión en un análisis sobre dónde y cómo una variedad de prácticas religiosas se representan en contenidos web ubicados en la categoría geo. Este método da la necesaria ilustración en la geografía de expresiones virtuales de la religión y destaca la relación mutuamente constitutiva y a veces contradictoria entre las dimensiones virtuales y materiales de la expresión religiosa. Utilizando las espacialidades de la práctica religiosa y sus retos como un ejemplo, este artículo arguye que los mapeos de representaciones virtuales de prácticas materiales son herramientas importantes para entender cómo las actividades *online* simultáneamente representan y reproducen el mundo material. **Palabras clave: cyberpaisajes, Internet, neogeografía, religión, información geográfica voluntaria.**

Over the past two decades, the Internet has evolved from the exclusive domain of technophiles to a near ubiquitous aspect of everyday life. As more and more people come online, the use of the Internet increasingly reflects the concerns and interests of the population as a whole. At the same time, however, the Internet serves to represent and reproduce society in a variety of ways. Indeed, some argue that there is no clear division between the online and offline, the virtual and material, as the two are coconstituted and mutually influencing (Zook and Graham 2007a). Particularly compelling are the new types of linkages made between online activity and offline locations in which Internet users associate meaning—ranging from

The Professional Geographer, 00(0) XXXX, pages 1–16 © Copyright XXXX by Association of American Geographers.
Initial submission, August 2010; revised submission, March 2011; final acceptance, March 2011.
Published by Taylor & Francis Group, LLC.

the prosaic to the profound—to specific sites in the material world. These novel phenomena, commonly referred to as *geotagging* (also *georeferencing* or *geocoding*), provides an innovative means for studying the spatial contours of the virtual dimension of practically any subject, including religion.

Using geotagged data collected from the Internet, this article demonstrates that the measuring and mapping of online references to religion can provide important new insights into dynamic spatialities of religion and how online representations are simultaneously products and producers of offline social processes. In this effort, this article integrates the two relatively disparate literatures on the geographies of religion and the Internet. Although academic research into religion and the Internet have found some common ground in other disciplines (Campbell 2005), it remains a relatively understudied arena within geography. This article seeks to address this lacuna via a cautious examination of how the virtual dimension of religion is dispersed across the globe. This analysis can thus shed new light on both the geography of religion and the geography of the Internet.

This article argues the following: First, geocoded online data are valuable for identifying the online visibility and prevalence of different religions as well as the offline location and concentration of religious practices. Although this can be seen as a "proof of concept," this approach also underscores the power and flexibility of geotagged data in illuminating little-known religious practices as well as the virtual dimensions of well-known religious geographies. For example, the technique introduced in this article effectively illustrates how offline religious conflicts can be reflected in cyberspace. Because of the Internet's ability to provide new sites for religious representation beyond traditional sacred spaces, the ways in which these disputes occur online are deserving of further analysis. More generally, the cases of religion presented in this article highlight the intertwining of online interactions and offline sociospatial practices.

Dynamic Approaches to Geographies of Religion

The spatial distribution of religious practice is a long-standing interest in geography and is one of the standard markers by which regions are often identified (e.g., "the Islamic world," "the Bible Belt"). As Kong (1990, 2001a, 2010) outlined, however, the trajectory of religious geography has been multifarious, concerned with a variety of topics from a number of theoretical perspectives. Despite the differences in approaches and method, this work represents a collective attempt to understand the sociospatial configurations of religious belief and their relationships with the rest of society. As customs, cultures, and technologies continue to evolve, studies of the geographies of religion also need to reflect these changes.

From Ecclesiastical Geographies to Critical Geographies of Religion

Among the earliest forms of religious geography was "ecclesiastical geography," or the mapping and analysis of religious spheres of influence (Isaac 1965, in Kong 1990). This so-called ecclesiastical geography had a decidedly applied focus, as it was primarily employed by Christian missionaries to better understand those places in which they sought to find potential converts. Although ecclesiastical studies often contained colonial impulses (Kong 1990), there has also been significant work on how religious belief and practice overlay the human landscape without the pretenses of the Christian mission (Shortridge 1976; Crawford 2005; Warf and Vincent 2007; Warf and Winsberg 2008).

More recently, Kong (2001a) has argued that much of the current focus of religious geography has turned away from simple attempts to understand where religious practice takes place. Instead, there has been a considerable body of research united in the use of religion as a valuable lens through which larger questions of culture and politics can be understood. For example, Zelinsky (2001) examined the multiplicity of religious landscapes in the United States as an example of "American exceptionalism," a term that embodies a number of sociopolitical contentions. This research, along with that of Proctor (2006a, 2006b), further highlights the complex interconnections among religion, place, and politics. Other scholars have even criticized the notion of religion as being ontologically prior (Ivakhiv 2006). Likewise, religious geography has greatly broadened its scope of

Downloaded by [Mark Graham] at 10:42 20 October 2011

Downloaded by [Mark Graham] at 10:42 20 October 2011

what constitutes the "sacred" to more fully understand the spatialities of religious communities and practices (Brace, Bailey, and Harvey 2006). This has required a rethinking of the potential sites of study for religious geography beyond the traditional categories of organized denominations or sacred places. These trends have significantly broadened the scope of what falls within the realm of religious geography.

Religion and Technology

One of the key directions in this expanding field of study is the role of information and communication technologies (ICTs) in mediating and representing religious practice (Kong 2001b). Far from having a single predetermined application of a communications technology to religion, applications and technological practices are as varied as those engaged in their use. This variation is reflected by the wide variety of topics studied by those interested in religious geography and ranges from one-to-many television or radio broadcasts of religious programming (Stump 1991; Kong 2006), the use of the Internet to promote religious education (Brunn and Long 2000), or the many-to-many constructions and contestations of religious narratives on the Internet (Campbell 2007; Cheong et al. 2009). This article builds on this work and seeks to understand the mutual constitution of technological practices, digital representations, and the material world with respect to religion.

Reflections on the links between material and offline practices and the virtuality of the Internet are not new to geographic scholarship. Indeed, there is a long tradition of arguing against ideas that new ICTs would result in the "death of distance" (Cairncross 1997) or the rendering of geography irrelevant, as had been posited about earlier communication technology advancements (Fischer 1994). Far from making geography less important, it is clear that new communications technologies amplify the importance of space, place, and distance (Castells 2001), albeit not necessarily in accordance with historical patterns.

For instance, the infrastructure necessary to produce the world's high-speed telecommunications network grounds flows of information in a distinct material reality that determines who has access and who does not (Graham and Marvin 1996, 2001). The concentration of these physical infrastructures in dense urban environments is in no way surprising, although it reaffirms the connection of the digital to the physical (Gorman and McIntee 2003). Even in places with dense communications networks, there remain significant socioeconomic impediments to access, which are only reinforced by the inability of these segments of the population to participate in the exchange of information through the Internet (Chakraborty and Bosman 2005; Crang, Crosbie, and Graham 2006). Because of these persistent inequalities, the production of online content is often concentrated in urban areas (Zook 2000; Townsend 2001) and divided along lines of race and class (Warf 2001; Crutcher and Zook 2009).

Emerging Religious Cyberscapes

Perhaps more important than focusing on the connections between ICTs and geography is the fact that the two are mutually constituted, in much the same way as religion and society as a whole (Cooper 1992). In other words, ICTs have both the potential to reinforce existing social hierarchies and the capacity to enable new forms of spatial practice.

This potential has become more readily visible with the advent of Web 2.0, the name given to the rise of user-generated online content in the form of blogs, wikis, photo sharing, and social networking sites like Facebook and Twitter. Web 2.0 remains a contested concept with fuzzy boundaries, but its ultimate importance lies in the shift from viewing the user as consumer to viewing the user as producer (O'Reilly 2005). Due to the decentralization of content production, it is frequently argued that Web 2.0 allows for the production of a qualitatively different, not to mention more open and democratic, online social world (Shirky 2008). Rather than the existing practices of one-to-many dissemination of traditional media such as television, radio, and print, Web 2.0 relies on a many-to-many network of content production and consumption, in theory allowing anyone with a computer and an Internet connection to create content that is just as accessible as major media outlets.

Of particular relevance to the discipline of geography is the rise of Web 2.0 spatial applications. With the release of tools like Google

Downloaded by [Mark Graham] at 10:42 20 October 2011

Earth or Wikipedia, Internet users are able to create content (text, photos, etc.) that can be associated with a particular point on the Earth's surface (i.e., geotagging). These practices have been given many names, perhaps most notably *neogeography* (Turner 2006; Goodchild 2009; Graham 2010) and *volunteered geographic information* (Goodchild 2007; Elwood 2008), to highlight the distinct spatial content of such Web 2.0 content. The adoption of neogeographic practices and use of volunteered geographic information has been astounding. Google Earth alone had been downloaded more than 700 million times by July 2010 (Birch 2010). Although not all users are also content creators, the fact that Google Earth and its companion Web application, Google Maps, allow users to search specifically for user-generated content highlights the importance of these new Web 2.0 spatial applications.

Whether or not user-generated geographic information represents a truly democratic alternative to traditional cartographic practice or just another example of corporate omnipresence (Harvey 2007; Boulton 2010; Graham 2011a, 2011b), Web 2.0 mapping tools have allowed Internet users to construct new representations of place through georeferenced text, photos, and video (Zook and Graham 2007b). These representations—also referred to as *cyberscapes*—act as interfaces between virtual content and material experiences. Cyberscapes are constituted by any number of types of user-generated, georeferenced content, including Google Maps placemarks, tweets, Flickr photos, or geotagged Wikipedia articles and blog posts. These subjective representations of users are then often digitally reordered by search engine ranking algorithms, producing, reproducing, and shaping particular worldviews (Zook and Graham 2007a). It is therefore important to begin to more closely study how user-generated cyberscapes are impacting both sociospatial practices and our ability to study those practices.

This article pays particular attention to the implications of virtual representations for social research and asks how cyberscapes can provide researchers insights into the geographies of religion. By comparing religious cyberscapes to the wealth of scholarly knowledge about the offline geography of world religions, it is possible to test the extent to which material religious practices are reflected within online representations. Even more important, this method allows one to study aspects of religious practice (e.g., interfaith conflicts and new conceptions of the sacred) that have hitherto been extremely challenging to study using more traditional means. At the same time as cyberscapes are used to analyze the geographies of religion, it is possible to see this exercise as allowing the geographies of religion to shed light on how cyberscapes are produced and might or might not be representative of the material world and what factors might help to produce these incongruities between the two.

A Method for Measuring Religious Cyberscapes

To collect data on cyberscapes, a specially designed software program was used, which tallies the number of references to particular keywords (e.g., Christianity or Allah) that have been geotagged to particular locations and are indexed in Google Maps. The software conducted queries using a variety of religious terminology in February and July 2010. At each location, the number of hits for each keyword was collected and recorded. In essence, the program automates the usually manual process of searching for a particular keyword (e.g., Catholic) in a specific place (e.g., Chicago, IL).[1] Figure 1 provides an example of such a manual search with a result of 7,519 geotagged references containing the term Catholic near Chicago, Illinois.[2]

One of the chief advantages of this method is that it avoids many of the pitfalls of relying on fixed, hierarchical conceptions of scale (cf. Marston, Jones, and Woodward 2005). By using points and buffers to sample, we are able to eschew a local-to-global organizational framework and instead collect data based on a sampling architecture that is more concerned with the density of sampling points. For example, the data presented in this article cover the entire surface of the globe and are sampled from approximately 250,000 latitude and longitude coordinates on the Earth's surface derived from a 1/4° grid.[3] It is, however, also possible to utilize a range of gradations in grid size that are more appropriate for metropolitan and regional-level research, as is done later in this article.

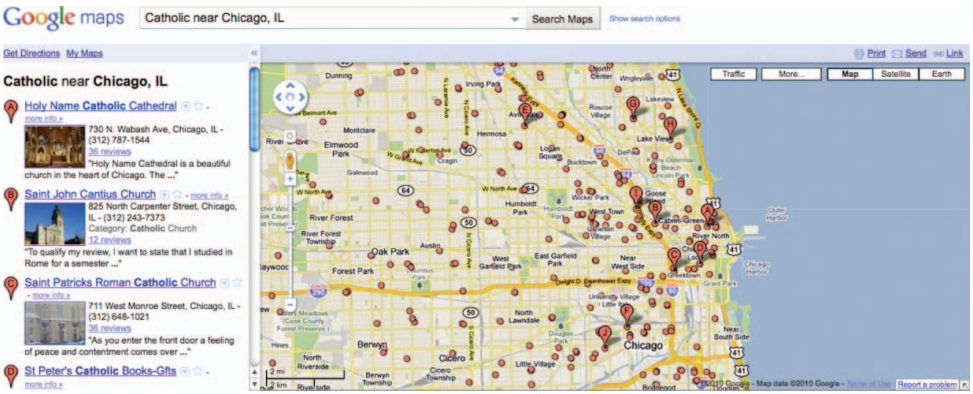


Figure 1 *Google Maps search for Catholic near Chicago, Illinois. (Color figure available online.)*

Downloaded by [Mark Graham] at 10:42 20 October 2011

Another important strength is the unlimited flexibility in the selection of keywords to be searched. One need not limit terms to established religions or orthodox dogma. For example, this article explores the results of keywords for the names of religions (e.g., Christianity or Islam), denominations within religions (e.g., Lutheran or Sufi), buildings associated with particular religious practices (e.g., church or mosque), and the names of deities or otherwise important religious figures (e.g., Jesus or Allah). Although these keyword searches do not embody the full range of religious practice, they are representative of a diversity of religions and ways of representing those beliefs textually. For instance, both mainstream religions (e.g., Christianity, Judaism, Islam, and Buddhism) and less populous belief systems (e.g., Scientology or Zoroastrianism) were queried, as well as a variety of denominations within religions—from Anglican, Catholic, and Baptist to Sunni, Shi'a, and Sufi.

Through a comparison of the relative number of references to keywords at different locations, it is possible to examine religious inscriptions on the virtual landscape. In other words, by measuring the amount and diversity of content written about religion by believers and nonbelievers alike, including the location of places of worship, concentration of faith communities, or other sites imbued with spiritual meaning, we can begin to engage in a critical analysis of how these virtual representations either do or do not appear to correlate to expectations based on material practice. Using a series of vignettes, this article argues that although online religious representations open up new spaces for, and ways of, measuring religious practice, online content ultimately and necessarily offers only selective representations of the world. So although the geographies of user-generated online content are broadly reflective of offline practices, including that of religion, user-generated content remains subject to the same uneven power relations at work in the material world.

Mapping a New Ecclesiastical Geography

Just as the earliest geographers of religion were interested in mapping the spatial extent of religious beliefs around the world using surveys, census reports, and attendance at religious services, this article uses geotagged references to religious terminology on the Internet to create a new ecclesiastical geography, albeit one focused on the virtual extension of material places. The maps from this analysis highlight the variable concentration and scarcity of online religious representations, allowing one to see how the online dimension of various places is influenced by a variety of factors.

The map of Christianity in Figure 2A offers a somewhat unexpected ecclesiastical geography. Virtual references to Christianity are highly clustered in Western Europe and North America, and only a relatively small number of references are found in the rest of the world. This

Downloaded by [Mark Graham] at 10:42 20 October 2011

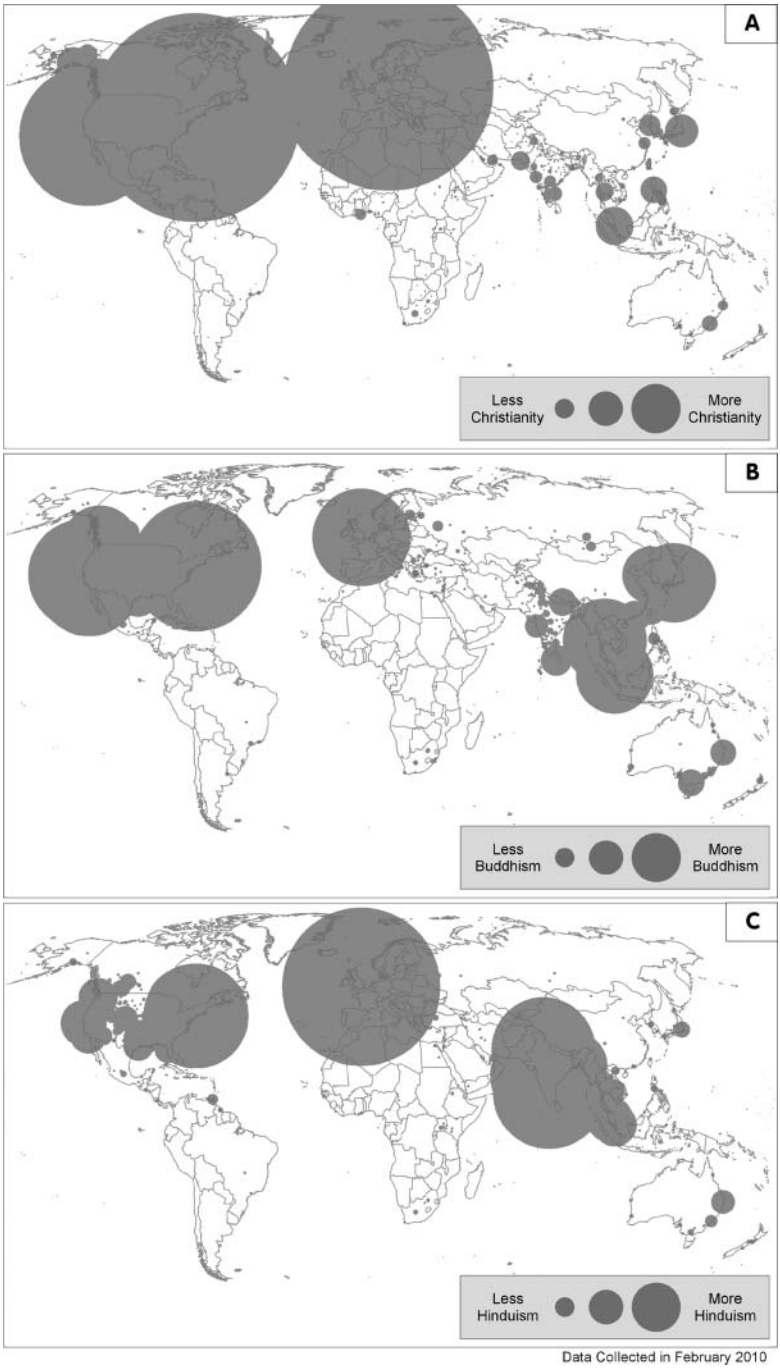


Figure 2 *Major world religions in Google Maps: (A) references to Christianity; (B) references to Buddhism; (C) references to Hinduism. The exact size of the symbols in these maps is neither the same across all three maps, nor is it associated with any particular quantitative value. These maps show only the relative concentrations of references to each particular keyword. This same method of representation is repeated in Figure 6.*

Downloaded by [Mark Graham] at 10:42 20 October 2011

is particularly surprising given the extremely large number of Christians in sub-Saharan Africa and South America, among other places. This would seem to indicate that the concentration of references to a particular keyword is not associated with mere population density. Instead, as previous work on the geographies of user-generated content has suggested, the correlation between levels of Internet access and the degree of engagement with user-generated digital content in a place seem to be the largest factor in why some places are underrepresented in cyberscapes (Graham 2009). It is important to highlight the uneven representations offered by this method because of the potentially significant material consequences of being omitted from these virtual ecclesiastical geographies.

In many ways, however, religious references on the Internet mirror corresponding offline religious practices. For example, Figures 2B and 2C illustrate significant clusters of references to Buddhism in East and Southeast Asia, and the largest cluster of references to Hinduism is located on the Indian subcontinent. Both maps are thus largely consistent with the offline distribution of religions. In both cases, however, a significant number of references can be found in Western Europe and North America, an observation that perhaps owes much to the practice of those religions by large diasporic populations on both continents. The fact that searches were conducted only in English (an issue discussed in more detail later) likely also contributes to the number of results found in Anglophone countries.

Absolute measurements are only one way of understanding the location of different religious practices. Also of interest to this new ecclesiastical geography is mapping the locations where virtual references to one religious belief are more prevalent than all others. As such, it is instructive to compare relative counts of religious references that have been overlaid onto the same places (see Figure 3). Figure 3 compares references to five prominent Christian denominations in the United States. At each point on the Earth's surface, the number of references to the given set of keywords was compared. Each point was then assigned a color value based on which of those keywords had the most references at that particular point.[4] For instance, in Figure 3, a green dot indicates that the number of references to Baptist is higher than the number of references to Catholic, Lutheran, Methodist, and Mormon in the same location.

As the previous example illustrates, this particular method of visualization can present striking contrasts among different regional religious preferences. References to Baptist dominate the U.S. South; Lutheran prevails in the upper Midwest; and references to Mormon are strongest in the Rocky Mountain region of Utah and Idaho. Quite unsurprisingly, these concentrations correlate strongly to both the prevalence of adherents in a particular place and popular conceptions of the religious culture in these particular areas. This can potentially be attributed to the more even distribution of the Internet across the United States, as opposed to the global scale, where access is significantly more unequal. Somewhat more surprising is the belt of Methodists that divides the largely Baptist South from a mix of Lutherans and Catholics to the north. In contrast to these clusters is the diversity of geocoded religious references that are apparent on the West Coast of the United States. These findings affirm previous work by Shortridge (1976) on the diversity and heterogeneity of religiosity in the American West. Likewise, the spatial concentrations of each of the previously mentioned religions actually conform quite closely to a more advanced centrographic analysis undertaken by Crawford (2005) using census-like data at the county level, further affirming the validity of these methods in this case.

Figures 2 and 3 thus illustrate the often close relation between online and offline practices, simultaneously calling attention to how issues of inequality and scale can affect these visualizations. Nevertheless, this method helps to illuminate the possibilities of a new ecclesiastical geography focused on the online representations of religion. More important, it shows that the virtual sphere is an important site for religious activity and suggests that these references can constitute new digital spheres of influence that can be claimed and contested by practitioners of different religions.

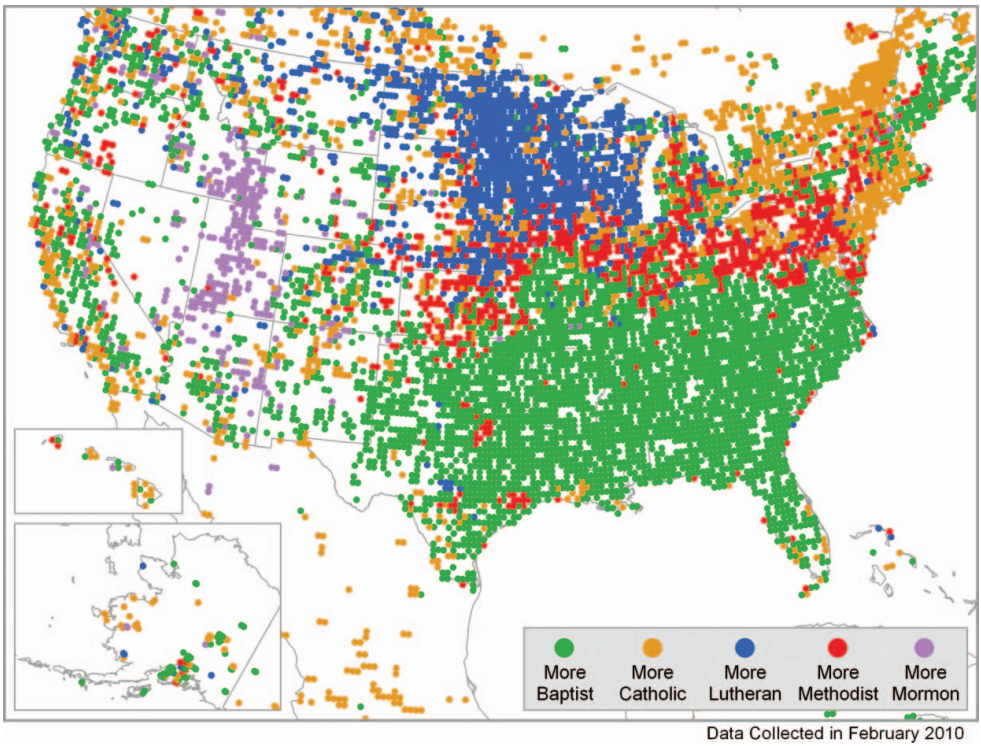


Figure 3 *Christian denominations in the United States. (Color figure available online.)*

Downloaded by [Mark Graham] at 10:42 20 October 2011

Uncovering Cyberspaces of Religious Conflict

Heeding Kong's (2001a) call for more research on how the Internet provides new frontiers for religious conflict, this section extends our comparative analysis of online religious geographies to a number of sites of religious contention. In this instance, references to religious keywords can illustrate the relative strength of religious representation on the Internet as well as how the online presence of different religious groups conforms to (or transgresses) sites of religious contention in the material world and the official borders of nation-states.

These representations within virtual space, marked by overlapping but contradictory and contentious depictions of the same places, are often new expressions of conflicts in physical space and add a new layer to already complex and variegated representations of place (Graham 2010). In Figure 4, references to Buddhism, Hinduism, and Islam are mapped in Asia, employing the same method as in Figure 3. Although cyberscapes are rarely uniform in their conformance to any kind of political boundary, they do exhibit distinct patterns that are indicative of the influence of nation-states on the construction of online representations. For example, the clustering of references to Hinduism almost exactly mirrors the boundaries of India, a country where the majority of citizens are Hindu. Similarly, references to Buddhism are concentrated in Japan, Thailand, South Korea, Nepal, and Sri Lanka, and references to Islam are most concentrated in Malaysia, with smaller pockets located in and around Pakistan.

In some cases, these differences are simply illustrative of the cultural differences among nations based on religious beliefs. In others, however, these cyberscapes can be riddled with sociopolitical contentions, like in the ongoing struggle between India and Pakistan over the

Downloaded by [Mark Graham] at 10:42 20 October 2011

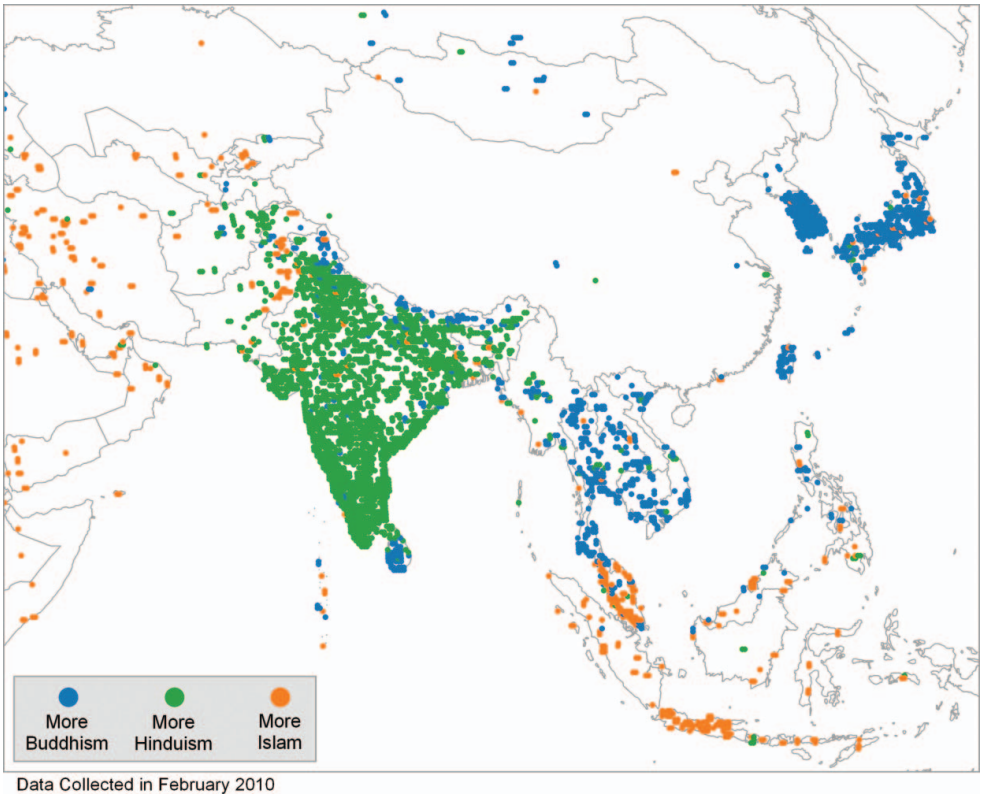


Figure 4 *Buddhism, Hinduism, and Islam in South and Southeast Asia. (Color figure available online.)*

Kashmir region. They can also reflect the varying levels of online engagement and the production and reproduction of relevant cultural information (e.g., note the lack of representation in Bangladesh). It is unclear whether or not the larger number of references to Hinduism than Islam in this region is a result of language differences, varying levels of Internet access, or a concerted effort to claim virtual territory.

Another example of how virtual information can shed light on real-world conflict is a close examination of the ongoing conflict within the state of Israel and the occupied Palestinian territories. This analysis uses the same basic approach of collecting data, but its specificity allowed for three important refinements to the method for measuring cyberscapes. First, rather than searching for names of religions, this effort uses keywords based on the names for places of worship for each of the three religions that have deep and ongoing ties to the region: *synagogue* for Judaism, *mosque* for Islam, and *church* for Christianity. Second, searches for the first two keywords were conducted in both English and the local language of the population: Hebrew for synagogue and Arabic for mosque. Third, the search grid for these queries was much finer than the one utilized at the global level, with a search radius at each point of approximately 0.8 km (0.5 miles). This approach allows for the documentation of places at which geocoded references to one religion's place of worship are greater than the number of references to places of worship for either of the other two religions.[5] The results, illustrated in Figure 5, show one aspect of the contours of religious cyberscapes in the region.

The clustering of references within and around the city of Jerusalem is a clear indication of its importance to all three Abrahamic

Downloaded by [Mark Graham] at 10:42 20 October 2011

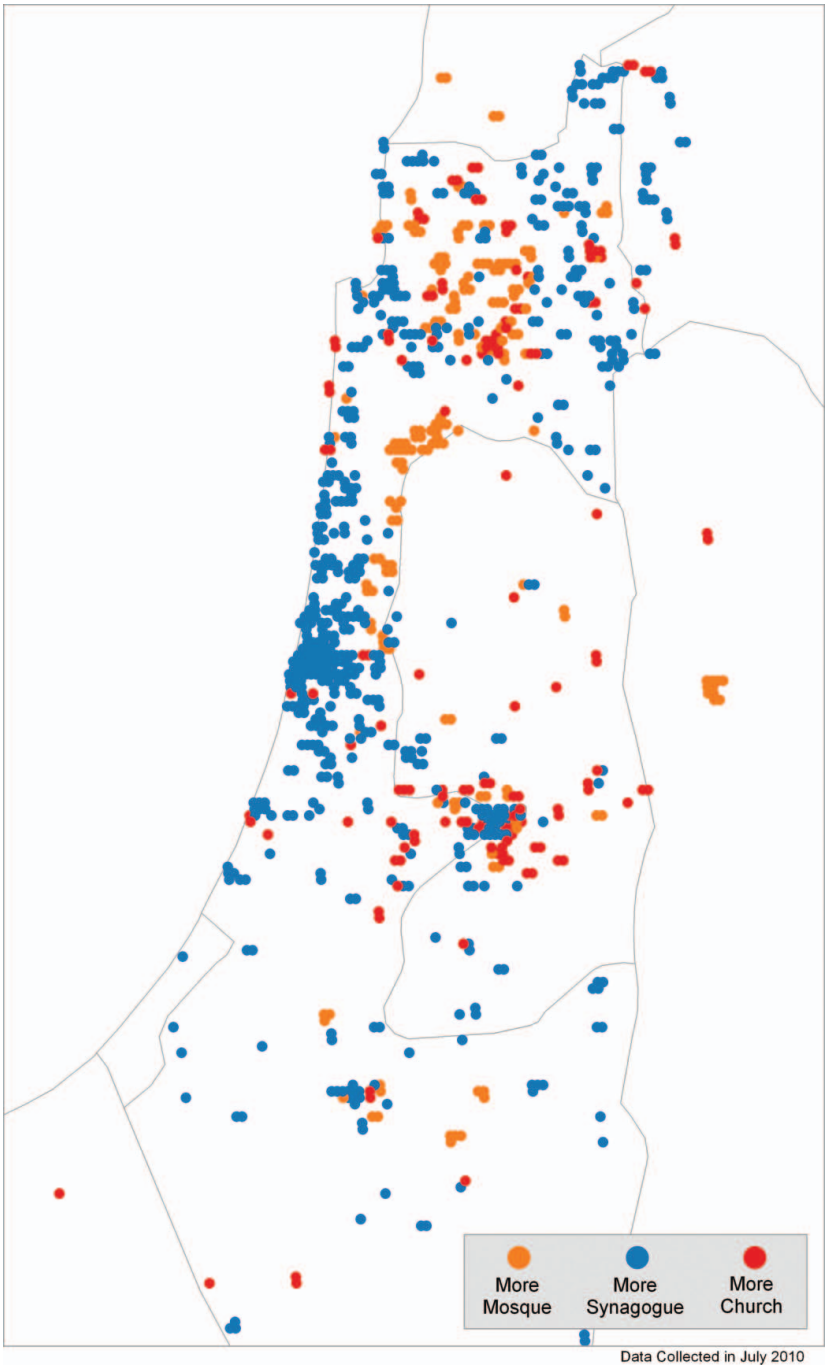


Figure 5 *Places of worship in Israel and the Palestinian territories. (Color figure available online.)*

Downloaded by [Mark Graham] at 10:42 20 October 2011

religions. Jerusalem is important both politically and spiritually to Jews, Muslims, and Christians, as all lay claim to spaces within the city with particular spiritual significance. Figure 5 provides an illustration of this conflict in the relative diversity of references to each of the three religions within and around the city.

Although Figure 5 shows that the virtual territory of the state of Israel is well populated with references to synagogues, it is also marked by a diversity of references to Muslim and Christian sites of worship. Of particular importance is that geocoded references to mosque and synagogue do not conform to the political boundaries between the state of Israel and the Palestinian territories of the West Bank or Gaza Strip in the same way that references to Buddhism, Hinduism, and Islam correlated to national borders in Figure 4. This is in part because the political boundaries within this region do not necessarily correspond to ethnic and religious population patterns. Not only do a significant population of Muslims live outside of the Palestinian territories but so do a significant number of Jews and Christians live within them. Indeed, the predominance of references actually corresponds quite closely with the offline presence of various ethno-religious groups. The concentration of references to mosques in much of the Northern District of Israel is reflective of the fact that the region is predominantly Arab, and the scattered references to synagogues throughout the West Bank correspond to a number of Israeli settlements in the area, especially around East Jerusalem (Btelsem 2002). In this sense, mapping references to various keywords helps to reflect the lived reality of these spaces in a way that the simple drawing of borders and claiming of territories cannot.

An important qualification to this mapping is the recognition that the politics of representation in Google Maps are not straightforward. The exclusion of information about Palestine from many Web 2.0 spatial applications can potentially preclude any representation at all (Ben-David et al. 2008). For instance, within Israel and the Palestinian territories, references to mosque and synagogue make up 21 percent and 60 percent, respectively, of the entire sample, with mentions of church representing the remaining 17 percent. These numbers stand in stark contrast to the actual demographics of the region, where nearly 55 percent of all people are of the Jewish faith, over 40 percent are Muslim, and but a small fraction are Christian.[6] The discontinuities between these two indicators show that Christians seem to possess a disproportionately powerful voice in the Web 2.0 world of Google Maps, as compared to Muslims. The reasons behind this, however, are less clear and highlight some of the constraints to this approach.

Methodological Limitations

In the examples presented, it has been shown that the mutual constitution of the material world and online representations of it can be better understood through an analysis of geotagged Google Maps content. There exist, however, a number of issues related to the methods employed in this article. These concerns, although important to address and be aware of, should not be seen as negating the importance and relevance of the methods demonstrated in this article. As with most methods, mapping references to geotagged Web content is meant to offer specific insights into a certain set of practices and processes but not to be an all-encompassing means of understanding of all aspects of the geography of religion or of the Internet.

First, virtual representations tagged to specific places can, in theory, be created by anyone from anywhere. One need not be in India to create content about Hinduism geotagged to the River Ganges or in Jerusalem to code a reference to the Church of the Holy Sepulchre. Indeed, one need never have even visited a place to create such content. Nor does a reference necessarily connote a positive endorsement. Hypothetical representations could reference the destruction of a synagogue, mosque, or church, just as equally as they could hope for the construction of more religious buildings in a place. Representations of place are always multiple and are tempered by any number of social, political, and economic factors in the world (Graham 2010). Because only a minority of people have access to the Internet and an even smaller proportion still are

Downloaded by [Mark Graham] at 10:42 20 October 2011

active creators of content (Ortega, Gonzalez-Barahona, and Robles 2008), a relatively small number of people have a disproportionate degree of power when it comes to constructing the virtual landscape. We therefore see that although measurements of online references are by no means perfect representations of the perspectives of all individuals or groups, they are, in many ways, accurate reflections of the persistently uneven power dynamics at work in both the online and offline worlds. In other words, the religious cyberscapes captured in this article are not intended to present a perfectly representative reflection of offline religious practices. Nonetheless, they do offer useful insights into how inequalities in the offline world are reflected in the unevenness of representation in the online world.

Second is the central issue of language. Because particular terms of interest differ across language and space, it is difficult to account for the full possibilities of how religion is represented online, especially at the global level. For example, Jesus is both the central figure in the Christian faith and a common first name in Spanish-speaking countries. Such differences in meaning can easily lead to the recording of false positives when performing automated queries, whether in Google Maps or any other Web 2.0 platform of interest.

A further illustration of how language shapes cyberscapes is shown in Figure 6, which visualizes the result of searches conducted using a 100-m grid, limited to Bangkok, Thailand. At each point, searches for the keyword *temple* in both English (Figure 6A) and Thai (Figure 6B) were conducted. Based solely on the differences in language use, there are obvious spatial discontinuities between the two maps. Clearly, English speakers and Thai speakers envision and inscribe different spaces associated with the respective terms for temple. The analysis of language use in user-generated geographic information has great promise in that it can reveal how the creation and use of this information vary across cultures and places. For instance, returning to Figure 6, English-language references to temple in Bangkok mostly refer to high-profile tourist destinations, whereas references to the word in Thai are in many cases closely associated with alternate sites of local religious practice.

These differences reveal the thorny problem of language in selecting keywords, but there are a number of methods through which these issues can be addressed. A straightforward way is to simply restrict analysis to regions with largely uniform language use, as was done in Figure 3, which examined Christian denominations within the United States. Although this sharply limits the range of cases studies possible, it does serve to constrain the variability in results based on language differences. Second, one can continue to use terms from one language (e.g., English) across multiple language areas but be extremely cautious in interpreting the results, as was shown in the global distribution of religious references in Figure 2. This is primarily a means to identify new avenues for research across a range of languages and subjects. Finally, one can conduct searches using the same keyword translated into multiple languages that are relevant both topically and geographically. This is largely restricted to clearly defined case studies of specific cities or regions (as in the case of Bangkok or Israel and Palestine).

The final issue of the analysis is the question of scale. Although it is possible to map georeferenced information at any number of scales—from the urban to the global—and thus examine a variety of different spatial patterns, the analysis remains necessarily constrained by the fact that data collection is limited to the aggregate of this information. That is, although we can find where the highest concentrations of the keyword Christianity exist and can conceive of a range of possible reasons, we cannot understand any context beyond its being tagged to that particular location. Who created a reference to Christianity? Why? Was the reference positive or negative? What other things were included in this particular placemark? What potential effects would this particular representation have on another person? All of these questions, although interesting and important, exist at the microscale, affective level, which cannot be examined using the methods employed in this article. This weakness, however, can easily be translated into a strength by pursuing in-depth case studies of religious cyberscapes that interrogate the issues raised here. Indeed, an important goal of this article is to call for exactly this kind of extended analysis.

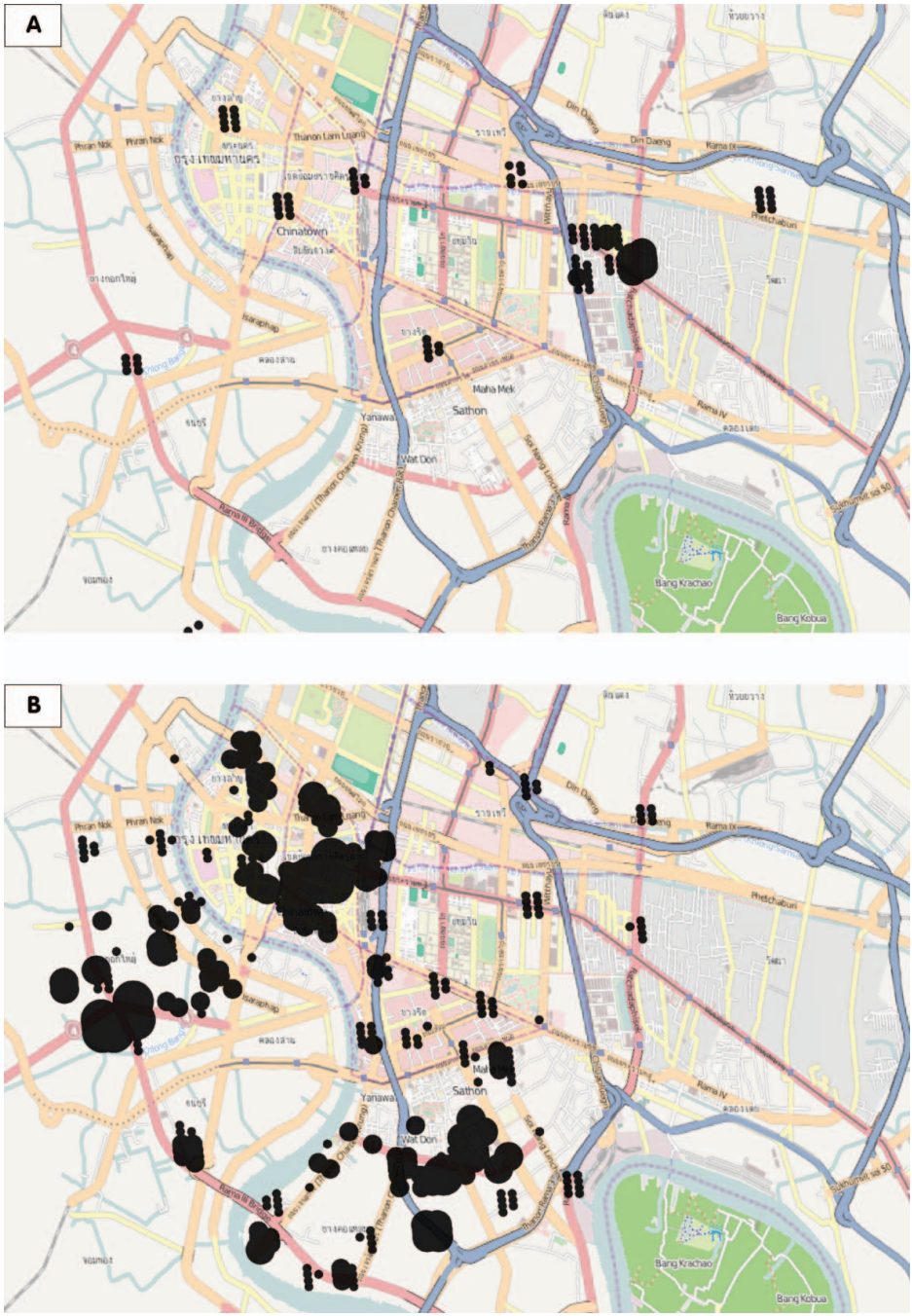


Figure 6 *Temple in Bangkok, Thailand: (A) references in English; (B) references in Thai. All imagery © OpenStreetMap contributors, CC-BY-SA. http://www.openstreetmap.org. (Color figure available online.)*

Downloaded by [Mark Graham] at 10:42 20 October 2011

Downloaded by [Mark Graham] at 10:42 20 October 2011

Conclusion

This article offers an innovative look into new, informal spaces of religious practice online that Kong (2001a; 2001b) contended are a key component of a new religious geography and how these virtual spaces are coconstitutive of the material spaces and places with which they are associated. As religion extends outward from churches, mosques, and temples into these informal online spaces, it is important to devise new means for measuring and understanding these emerging practices to complement and inform existing methods used to study religion. Moreover, the approach and insights offered in this article on religion can easily be extended to a variety of other cultural markers and social activities.

Although the first step of this work is simply mapping the contours of this phenomenon in a way similar to the earliest ecclesiastical geographies, it is done without the intent of evangelizing. Rather, it is done to better understand the multiplicity and mundanity of religious practices and how the everyday and the sacred, the material and the digital, are made and remade. The analysis presented here clearly shows how offline practices are inscribed into online representation, but it also illustrates how these reflections have a logic of their own. Old material patterns persist but are layered and filtered through these new activities within the digital realm.

Of particular interest are spaces of religious conflict in which virtual religious practice offers digital extensions to existing disputes over voice and claims to territory. As online information becomes more deeply integrated into daily life, understanding the intersections of the material and the digital becomes increasingly relevant. Especially important to spaces of conflict are the ways in which certain voices or religious inscriptions are alternatively promoted or excluded from online and offline representations. In short, to study religious geographies in the twenty-first century, one must necessarily understand the blending of age-old material practices with newly formed digital platforms and representations. ■

Notes

[1] For further explanation of this method, see Graham and Zook (2011).

[2] The use of representations within the Google search engine only provides insights into a subset of the total amount of content available online and, indeed, alternate sources of content like Twitter, Flickr, or Wikipedia could also have been used to measure ecclesiastical geographies. Google is the world's most popular search engine, however, and thus the ways in which places are represented in it are a key source of spatial knowledge online.

[3] Each search also specified a radius around every point to delineate which geocoded data to include in search results. The exact value of the radius parameter varied according to latitude to adjust for the contraction or expansion of distance between longitudes near the poles and equator, respectively. In the case of the global searches, the average radius was approximately 16 km (10 miles).

[4] Points without a colored dot either possessed no references to any of the keywords being analyzed or had two keywords with an equal number of references greater than that of each of the other keywords.

[5] For synagogue and mosque, whichever version of the keyword (English or Hebrew/Arabic) returned the most references at a point was used as the value. For example, if synagogue received twelve hits at one location but the Hebrew text for synagogue recorded twenty hits at the same location, twenty was used as the value to be compared to references to mosque and church.

[6] These percentages are aggregates of the statistics from the CIA World Factbook entries for Israel, the West Bank, and the Gaza Strip.

Literature Cited

Ben-David, E., G. Langlois, A. Mager, and E. Weltevrede. 2008. Cyberlands. Digital Methods Initiative. http://wiki.digitalmethods.net/Dmi/CyberLands (last accessed 16 August 2010).

Birch, P. 2010. Announcing Google Earth 5.2. Google LatLong blog. http://google-latlong.blogspot.com/2010/06/announcing-google-earth-52.html (last accessed 26 February 2011).

Boulton, A. 2010. Just maps: Google's democratic map-making community? *Cartographica* 45 (1): 1–4.

Brace, C., A. R. Bailey, and D. C. Harvey. 2006. Religion, place and space: A framework for investigating historical geographies of religious identities and communities. *Progress in Human Geography* 30 (1): 28–43.

Brunn, S. D., and E. Long. 2000. The worldviews of southern seminaries: Images, mission statements, and curricula. *Southeastern Geographer* 40 (1): 1–24.

Btelsem. 2002. Jewish settlements in the West Bank: Built-up areas and land reserves. http://

Downloaded by [Mark Graham] at 10:42 20 October 2011

www.btselem.org/download/settlements_map_eng.pdf (last accessed 16 August 2010).

Cairncross, F. 1997. *The death of distance: How the communications revolution will change our lives*. Cambridge, MA: Harvard Business Press.

Campbell, H. 2005. Making space for religion in Internet studies. *The Information Society* 21 (4): 309–15.

———. 2007. Who's got the power? Religious authority and the Internet. *Journal of Computer-Mediated Communication* 12 (3): 1043–62.

Castells, M. 2001. *The Internet galaxy: Reflections on the Internet, business, and society*. New York: Oxford University Press.

Chakraborty, J., and M. M. Bosman. 2005. Measuring the digital divide in the United States: Race, income, and personal computer ownership. *The Professional Geographer* 57 (3): 395–410.

Cheong, P. H., J. P. H. Poon, S. Huang, and I. Casas. 2009. The Internet highway and religious communities: Mapping and contesting spaces in religion-online. *The Information Society: An International Journal* 25 (5): 291–302.

Cooper, A. 1992. New directions in the geography of religion. *Area* 24 (2): 123–29.

Crang, M., T. Crosbie, and S. Graham. 2006. Variable geometries of connection: Urban digital divides and the uses of information technology. *Urban Studies* 43 (13): 2551–70.

Crawford, T. W. 2005. Stability and change on the American religious landscape: A centrographic analysis of major U.S. religious groups. *Journal of Cultural Geography* 22 (2): 51–86.

Crutcher, M., and M. Zook. 2009. Placemarks and waterlines: Racialized cyberscapes in post-Katrina Google Earth. *Geoforum* 40 (4): 523–34.

Elwood, S. 2008. Volunteered geographic information: Future research directions motivated by critical, participatory, and feminist GIS. *GeoJournal* 72 (3–4): 173–83.

Fischer, C. 1994. *America calling: A social history of the telephone to 1940*. Berkeley: University of California Press.

Goodchild, M. 2007. Citizens as sensors: The world of volunteered geography. *GeoJournal* 69 (4): 211–21.

———. 2009. Neogeography and the nature of geographic expertise. *Journal of Location Based Services* 3 (2): 82–96.

Gorman, S., and A. McIntee. 2003. Tethered connectivity? The spatial distribution of wireless infrastructure. *Environment and Planning A* 35 (7): 1157–71.

Graham, M. 2009. Wikipedia's known unknowns. *Guardian Unlimited* 2 December. http://www.guardian.co.uk/technology/2009/dec/02/wikipedia-known-unknowns-geotagging-knowledge (last accessed 16 August 2010).

———. 2010. Neogeography and the palimpsests of place: Web 2.0 and the construction of a virtual earth. *Tijdschrift voor economische en sociale geografie* 101 (4): 422–36.

———. 2011a. Cloud collaboration: Peer-production and the engineering of the Internet. In *Engineering earth*, ed. S. Brunn, 67–83. New York: Springer.

———. 2011b. Time machines and virtual portals: The spatialities of the digital divide. *Progress in Development Studies* 11 (3): 211–27.

Graham, M., and M. Zook. 2011. Visualizing the global cyberscape: Mapping user generated placemarks. *Journal of Urban Technology* 18 (1):115–32.

Graham, S., and S. Marvin. 1996. *Telecommunications and the city: Electronic spaces, urban places*. London and New York: Routledge.

———. 2001. *Splintering urbanism: Networked infrastructures, technological mobilities and the urban condition*. London and New York: Routledge.

Harvey, F. 2007. Just another private–public partnership? Possible constraints on scientific information in virtual map browsers. *Environment and Planning B: Planning and Design* 34 (5): 761–64.

Isaac, E. 1965. Religious geography and the geography of religion. In *Man and the earth*, University of Colorado Studies, Series in Earth Sciences No. 3. Boulder: University of Colorado Press.

Ivakhiv, A. 2006. Toward a geography of "religion": Mapping the distribution of an unstable signifier. *Annals of the Association of American Geographers* 96 (1): 169–75.

Kong, L. 1990. Geography and religion: Trends and prospects. *Progress in Human Geography* 14 (3): 355–71.

———. 2001a. Mapping "new" geographies of religion: Politics and poetics in modernity. *Progress in Human Geography* 25 (2): 211–33.

———. 2001b. Religion and technology: Refiguring place, space, identity and community. *Area* 33 (4): 404–13.

———. 2006. Religion and spaces of technology: Constructing and contesting nation, transnation, and place. *Environment and Planning A* 38 (5): 903–18.

———. 2010. Global shifts, theoretical shifts: Changing geographies of religion. *Progress in Human Geography* 34 (6): 755–76.

Marston, S. A., J. P. Jones III, and K. Woodward. 2005. Human geography without scale. *Transactions of the Institute of British Geographers* 30 (4): 416–32.

O'Reilly, T. 2005. What is Web 2.0. O'Reilly Media. http://oreilly.com/pub/a/web2/archive/what-is-web-20.html (last accessed 16 August 2010).

Ortega, F., J. M. Gonzalez-Barahona, and G. Robles. 2008. On the inequality of contributions to

Wikipedia. Paper presented at the 41st annual Hawaii International Conference on System Sciences, Manoa, HI.

Proctor, J. 2006a. Introduction: Theorizing and studying religion. *Annals of the Association of American Geographers* 96 (1): 165–68.

———. 2006b. Religion as trust in authority: Theocracy and ecology in the United States. *Annals of the Association of American Geographers* 96 (1): 188–96.

Shirky, C. 2008. *Here comes everybody: The power of organizing without organizations.* New York: Penguin Group.

Shortridge, J. R. 1976. Patterns of religion in the United States. *Geographical Review* 66 (4): 420–34.

Stump, R. 1991. Spatial implications of religious broadcasting: Stability and change in patterns of belief. In *Collapsing space and time: Geographic aspects of communications and information*, ed. S. D. Brunn and T. R. Leinbach, 354–75. London and New York: Routledge.

Townsend, A. 2001. The Internet and the rise of the new network cities, 1969–1999. *Environment and Planning B: Planning and Design* 28 (1): 39–58.

Turner, A. 2006. *Introduction to Neogeography*. Sebastopol, CA: O'Reilly Publishers.

Warf, B. 2001. Segueways into cyberspace: Multiple geographies of the digital divide. *Environment and Planning B: Planning and Design* 28 (1): 3–19.

Warf, B., and P. Vincent. 2007. Religious diversity across the globe: A geographic exploration. *Social & Cultural Geography* 8 (4): 597–613.

Warf, B., and M. Winsberg. 2008. The geography of religious diversity in the United States. *The Professional Geographer* 60 (3): 413–24.

Zelinsky, W. 2001. The uniqueness of the American religious landscape. *Geographical Review* 91 (3): 565–85.

Zook, M. 2000. The web of production: The economic geography of commercial Internet content production in the United States. *Environment and Planning A* 32 (3): 411–26.

Zook, M., and M. Graham. 2007a. From cyberspace to DigiPlace: Visibility in an age of information and mobility. In *Societies and cities in the age of instant access*, ed. H. J. Miller, 241–54. New York: Springer.

———.2007b. Mapping DigiPlace: Geocoded Internet data and the representation of place. *Environment and Planning B: Planning and Design* 34 (3): 466–82.

TAYLOR SHELTON is a doctoral student in the Graduate School of Geography at Clark University, 950 Main Street, Worcester, MA 01610. E-mail: jshelton@clark.edu. His research interests lie at the intersection of economic and Internet geographies.

MATTHEW ZOOK is an associate professor in the Department of Geography at the University of Kentucky, 1422 Patterson Office Tower, Lexington, KY 40506. E-mail: zook@uky.edu. His research focuses on the impact of technology and innovation on human geography with a particular focus on digital and geospatial technologies.

MARK GRAHAM is a research fellow in the Oxford Internet Institute at the University of Oxford, 1 St Giles, Oxford OX1 3JS, UK. E-mail: mark.graham@oii.ox.ac.uk. His research focuses on geographies of the Internet, and the role of information and communication technologies within the context of economic development.

Downloaded by [Mark Graham] at 10:42 20 October 2011