Critical Geographies of Spatial Technologies

Geographers have made significant contributions to understanding the mutual implications of technology and society. With this topic as the focus of my research interests, three subfields will inform my dissertation research. First, emerging literature on the geoweb has emphasized the need to understand the social implications of the geoweb. Instead, most literature tends either to be descriptive in nature, or to focus on measuring "accuracy". Second, the critical GIS literature maintains that technology and society are reflected in each other. Technology reflects social relations, norms, and political agenda; likewise, technology effects those relations and the societies in which they are developed. In a sense, they are co-constitutive. Third, the qualitative GIS literature has shown that there is a politics underlying the representations of knowledges. For instance, representational technologies (such as GIS or the geoweb) often privilege certain ways of knowing, while marginalizing others. These politics have implications for the uses and effects of those representations.

Geoweb, VGI, Neogeography

Since the emergence of web-based geospatial services, in particular the release of Google Earth in 2005, geographers and geographic service providers have discussed this phenomenon in predominantly descriptive terms. Efforts have focused on how to characterize the geoweb and its entailed software and hardware, and where the geoweb diverges from traditional GIS (A. Turner 2006; Goodchild 2007b; Haklay, Singleton, and C. Parker 2008; Sui 2008; Schuurman 2009). The proliferation of descriptive terms for the geoweb is indicative of a struggle to capture what exactly the geoweb *is*, and the primary function(s) it serves (e.g., new types of data, new mode of mapping, new spatial media, or location-aware software) (Plewe 2007; Crampton 2009; Elwood 2009a; Sui 2008; Wilson 2011). A substantial

amount of other work has sought to characterize the *accuracy* of data produced through the geoweb (Frew 2007; Goodchild 2007b; Jain 2007; Flanagin and Metzger 2008; Mummidi and Krumm 2008) [1].

Some critical evaluation has looked at which lessons from the GIS literature we can use to understand the geoweb. In other words, which conversations around GIS make sense in the context of the geoweb (Schuurman 2009)? To this end, Elwood (2008) has advocated exploring the societal effects of the geoweb in ways motivated by concerns from feminist, participatory, and critical GIS. This and other calls for understanding the societal implications of the geoweb have raised questions about privacy (Goodchild 2007b; Elwood and Leszczynski 2010), political economy (Leszczynski 2011), and the ways social relations are reflected and influenced through digital geographic technologies (Crutcher and Zook 2009; Perkins and Dodge 2009; M. Gilbert 2010; Halford and Savage 2010).

The geoweb has increasingly been used to facilitate crisis mapping, the production of spatial data in areas hit by disasters. Inline with the predominantly descriptive nature of geoweb literature, particular qualities of the geoweb have been purported to be useful in disaster response and redevelopment situations, including its "reduced development time and improved usability" (Liu and Palen 2010, 86; citing Haklay, Singleton, and C. Parker 2008, 2034), which increases *map production* speed and efficient use of resources (Okolloh 2009; Zook, M. Graham, Shelton, and Gorman 2010). What is underlying many of these themes comes out more explicitly elsewhere: that the "democratic" – or "distributed" – nature of the geoweb is its primary strength in crisis mapping contexts (Heinzelman and Waters 2010; Talbot 2011; Roche, Propeck-Zimmermann, and Mericskay 2011; Starbird and Palen 2011).

Critical GIS

---

[1] These conversations often uncritically take for granted particular notions of accuracy that privilege Cartesian ways of knowing. In contrast, a recurring assumption in my work is that the geoweb implicitly questions these assumptions of "accuracy" by allowing users to produce "accurate" data where Cartesian logic is undermined.

My critique of the geoweb will inevitably be influenced by the critical GIS research program. The critical GIS research program emerged in the 1990s in response to charges that GIS is an inherently quantitative, positivist, and reductionist technology (Pickles 1995a; Sheppard 1995; Schuurman 2000; F. Harvey, Kwan, and Pavlovskaya 2005; O'Sullivan 2006; Pavlovskaya 2006). Through a variety of "engagements with and through GIS" (Leszczynski 2009, 585), the critical GIS research program explored the social dimensions of GIS, as well as its ontological foundations (Pickles 1997; Wright, Goodchild, and Proctor 1997; Chrisman 1999; Kwan 2002b; S. L. McLafferty 2002; Chrisman 2005; Zook 2005; Leszczynski 2009). This research primarily oriented around three theoretic influences: feminist critiques of knowledge and technology, post-structuralist concern for the epistemological foundations of knowledge, and discussions of inclusion and empowerment coming from the participatory GIS (PGIS) agenda.

Borrowing from Haraway's (1991) notion of 'situated knowledges', feminist critiques of knowledge and technology argued that all knowledge is partial, and thus geographic technologies always represent one of many ways of knowing the world (Kwan 2002a, 2002b; Schuurman and Pratt 2002; Sara McLafferty 2005; M. R. Gilbert and Masucci 2006; Pavlovskaya and Martin 2007). Similarly, post-structuralist theory influenced the critique of GIS through an overall focus on the epistemological foundations of knowledge in GIS (Taylor 1990; Lake 1993; Aitken and Michel 1995; Pickles 1995b, 1997). These critics argued that GIS necessarily entails a return to positivism, the empiricist endeavor that relies on objective, value-free knowledge. This claim was disputed by some GIS scholars (e.g., Goodchild 1991; Openshaw 1991; Leszczynski 2009)), but others sought to address the concern by developing a critical social theory of GIS (Sheppard 1995; Curry 1997; Openshaw 1997; F. Harvey and Chrisman 1998; Kwan 2002a; Schuurman 2002; Chrisman 2005; Sheppard 2005) and by developing critically-motivated methodologies (Knigge and Cope 2006; Pain, MacFarlane, K. Turner, and Gill 2006; Schuurman and Leszczynski 2006; Dunn 2007; Elwood 2009b). P/PGIS literature contributed to the critique of GIS through an emphasis on the

technical barriers, power dynamics, and social networks that influence the ways people interacted with, are represented in, and come to utilize, spatial technologies (Trevor Harris, Daniel Weiner, Warner, and Levin 1995; Trevor Harris and Daniel Weiner 1996; T. Harris and D. Weiner 1998; Elwood and Ghose 2001; J. M. Corbett and Keller 2005; Sieber 2006; Elwood 2006b).

These three sets of critiques opened the possibility for multiple knowledges to be represented in GIS, and for a critical examination of the inherent privileges and politics afforded by spatial technologies (borrowing ideas from STS, e.g., Winner 1985; Latour 2000; Nakamura 2002). Indeed, much research on the critical geographies of spatial technologies now maintains that spatial technologies and society are mutually implicated, that one can "read" society in these technologies and that the technologies in some ways shape geographies (Chrisman 2005; Rose-Redwood 2006; Crampton 2009; Uprichard, Burrows, and S. Parker 2009; M. Gilbert 2010; Kitchin and Dodge 2011).

Qualitative GIS

Recent work has sought to open up the representational capacity of GIS, specifically working to make representing qualitative data easier. This research area aims to challenge masculinist, impersonal, and "god's-eye" ways of knowing, by representing qualitative information such as emotions, narratives, ethnographic data, and memory (Matthews, Detwiler, and Burton 2005; Knigge and Cope 2006; Pain, MacFarlane, K. Turner, and Gill 2006; Elwood 2009c; Jung 2009; Wilson 2009; Jung and Elwood 2010). These developments take place on the levels of software and methodologies.

Another approach to these broad political goals is to argue that even standard GIS is already open to interpretations in favor of feminist politics and diverse narratives (Kwan 2002b, 2007; Elwood 2006a, 2006c, 2009c). This approach centers on the under-representation of marginalized groups and how GIS can ameliorate that under-representation (Timander and S. McLafferty 1998; S. L. McLafferty 2002), or how interpretation can serve as a vehicle for politicizing GIS representations(Elwood 2006a, 2009c). In

short, GIS is not inherently limited to singular politics; rather, it, like spatial technologies more broadly,

is contested and re-appropriated in favor of diverse politics.