



INTRODUCTION

Critical Interventions and Lingering Concerns: Critical Cartography/GISci, Social Theory, and Alternative Possible Futures

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Welcome to this special issue on Critical Cartographies and GIScience. The call for papers for this issue emphasized three major themes. First, we encouraged authors to focus on socio-political relations inscribed in mapping products and practice, including exploration of the potential for increased democratization of mapping technologies. Second, given the rapidity and intensity of technological innovation and change in the last few years, we were interested in papers that considered the particularities of this current moment with respect to cartographic and digital technology and diffusion, including how these changes force

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reconsideration of critical cartography/GIScience. Third, we explicitly sought to encourage fuller engagement between debates in critical cartography and broader discussions from social theory. For instance, we were interested in encouraging authors to draw further on theories, concepts, and insights from feminist, postcolonial, poststructural or other theoretical approaches to improve understandings of cartographic processes and practice, and vice versa. This third theme was the broadest and most ambitious, and is also perhaps the aspect of the field that is most nascent. While the special issue makes gains with respect to all these goals, there are many exciting possibilities for continuing work along these lines into the future. This is particularly true given the dynamism of the field and evolving applications of cartographic/GIS work. In addition, even as we are encouraged by the trends and possibilities suggested by the work in this special issue, and the scholarship on critical cartography/GIS on the whole, it also strikes us that some elements of the gulf between critical theory and mapping technologies and practice remain difficult to traverse, both theoretically and practically.

Judging from the quality and diversity of the papers presented here, as well as those abstracts and manuscripts that were submitted but do not appear in this issue, the work of critical scholars continues to push boundaries and find new horizons as this field enters the third decade since the publication of Harley's path breaking work. However, as the opening paper by Crampton and Krygier reminds us, (1) the roots of critical cartography/GIScience began long before that term was ever used and (2) mapping throughout history has been continually contested. It is also fruitful for purposes of our introduction to highlight the clarification offered by those authors on what is meant by "critique." As Crampton and Krygier note, "critique" is not a simplistic rejection of concepts or practices, nor do "critical cartographers" seek to invalidate maps. Instead, critique is characterized by a careful interrogation of taken-for-granted *categories* and *assumptions* with the hopes of better understanding the inherent situatedness of maps or any other form of knowledge. Such a broadened understanding of what is meant by "critical cartography/GISci" is essential to understand the contributions made by all authors of this volume.

This special issue deliberately encompasses a range of work from theoretical to applied. As a response to those who might argue that critical cartography/GIScience is little more than an academic debate, we felt it was important to include work that considers how cartography/GIScience can be engaged differently in the "real world." Stated another way, we felt it imperative to include examples of both strands of critical GIS/Cartographic scholarship, as framed by Schuurman (2000): those who engage in an applied fashion, and those working with social theory whose work may only engage tangentially with the way that geospatial tools and technologies are used in everyday senses. As one example of work that clearly engages with both critical scholarship, and the needs and interests of GIS practitioners, the paper by Fiedler, Schuurman and Hyndman

presents “an innovative approach developed to discern the spatial dimensions of risk for homelessness amongst recent immigrants in Vancouver, Canada” (page 145). Through the lens of GIScience, these authors argue for both better data (e.g., questionnaires) and better methods (dasyetric maps) and demonstrate how to enhance census GIS analysis to better reflect the geographic realities of our cities. Though these authors do not question the institutions themselves (e.g. the census), their contribution nonetheless speaks to critical cartography/GIS, particularly to better understand the limitations of common mapping practices (and of census data commonly used for such), and also to provide possibilities to improve mapping techniques, including reframing scales of analysis, to be better equipped to deal with socio-political and policy challenges.

At times, connections between critical cartographic approaches and applications of such insights are more difficult. In this special issue there is a tension in that some of the suggested modifications to mapping practices appear insufficient in light of the critiques raised by these authors. Clearly, in such cases, there is a need for cartography/GIS practitioners and software developers to take up these challenges, particularly to examine how cartography/GIS may actually be done differently with renewed knowledge offered by these discussions. Indeed, perhaps one of the foremost challenges for cartography/GIS scholars and practitioners is to continue to develop new ways to engage alternative knowledges (see Kwan, 2002; Sheppard, 1993; Johnson, Louis, and Pramono this volume).

While bringing concepts and approaches from social theory to debates about Cartography/GIScience is certainly not new, the papers here add to these discussions in interesting ways. For example, much earlier work in critical cartography/GIS was based on a binary of “map maker / map user” which has become so blurred in the last 15 years that many of us find it increasingly difficult to neatly define who is the author, or the user. This is due in part to changing technology (see Crampton and Krygier’s look at map hacks), a broadening of access to map data and literacy (see Johnson et al’s look at indigenous mapping), and a more subtle understanding of how maps work (see Del Casino and Hanna). In addition to contributing some novel dimensions to these debates, there are also clear echoes of long-standing concerns of the field. For instance, there is obvious lingering concern with simultaneous potential of certain geospatial technologies to be emancipatory or to forge new political possibilities², and the pitfalls and concerns that necessarily accompany such potential (see discussions in the literature related to public participatory GIS and counter-mapping). In this volume Harris and Hazen discuss such ambiguous potential with respect to conservation

² For instance, of the type implicitly acknowledged by much work on counter-mapping, with many examples of indigenous or other marginalized groups engaging in mapping to support land claims.

challenges, Johnson et al. do so with respect to indigenous mapping, and Proppen does so with respect to the “always locatable subject in motion and in real time” made possible by GPS technologies. Related to this, there is also unease among scholars related to the (increasing) dominance of spatial/cartographic/GIS approaches. For instance, in the discussion of the use of cartography/GIS for conservation there is concern that the dominance of these technologies may lead to over-reliance on certain conservation practices, downplaying other possibilities, and unduly emphasizing conservation spaces that may lend themselves more readily to common map forms (Harris and Hazen). With respect to indigenous mapping (Johnson et al), a central challenge is how to engage indigenous scholars in cartographic practice in ways that are attentive to the ambiguous potential and histories of cartographic enterprise, with the aim of avoiding *further* marginalization of indigenous mapping and knowledges. Thus, the question remains: how to engage the clear potential of cartography/GIS, without hierarchizing knowledge or sidelining other possibilities, knowledges, and approaches?

When reading through the papers in this issue, several clear topical-theoretical themes also emerge. What follows in this introduction is a more detailed look at common themes and theories, and shared insights and challenges: from mapping as *performative* (see papers by Del Casino and Hanna, and Harris and Hazen), to the notion of mapping in relation to *Actor Network Theory* (ANT) and the role of *boundary objects* (see Harvey, Delcasino and Hanna), to the persistent concern with respect to the *ambiguity* of cartographic/GIS potential, at once offering critical opportunities and limitations (see especially Johnson et. al., and Proppen).

Major Themes and Challenges

Performativity: Maps as Practice

Two papers in this special issue explicitly engage performativity theory, drawing from the work of feminist theorist Judith Butler. More generally, all papers seem to approach maps not as final, static, or fixed products, but rather as processes and iterative practices, subject to changing meanings and uses. Thus, a theme that appears through several of the papers is that while mapping products and practices may *appear* to fix and reify meaning, they are always subject to altered understandings, revisions, or differing enactments. For instance, Del Casino and Hanna richly consider the ways that maps are iteratively produced, breaking down central binaries, such as author/reader and mapping product/practice. With their conceptualization of *map spaces*, they highlight “the intertextual and experiential connections brought to (maps) through use” (page 45). This concept is particularly helpful for drawing attention to the ways that maps alter how people

use and experience space, and also the ways that people's experiences and understandings of space alter how they read, understand, and use maps. Given such a conceptualization, the idea that the map "author" can fix meaning associated with a map towards a specific political goal appears unlikely. Instead, maps are performed, enacted, and iteratively interpreted with respect to different meanings and purposes depending on the time, space, and interests involved in their production *and* use. Such an approach invites us to move beyond analyses of what is represented on maps—for example, Harley's notion of reading the map and its silences—to focus on the ways that maps are practiced, including the multiple meanings, multiple entryways, and mobile intertextualities enabled by mapping as process and product. Echoing tenets from semiotics, these authors argue that maps work (iteratively and differentially) by making connections to other representations and experiences of spaces.

The notion of maps as performative is similarly highlighted in the work by Harris and Hazen. These authors provide examples of the ways that maps may serve to reinforce particular meanings associated with certain spaces over time, demonstrating the idea of citationality³ as an important dimension of performativity. With respect to citationality in mapping, reproducing the designation of 'protected area' on printed maps may consolidate understandings that protection has happened (in the past tense), or may serve to cement the idea that that territorial approaches generally, or certain spaces in particular, are the most effective ways to meet conservation challenges.

Boundaries and Boundary Effects

Related to the above discussion, Harvey also looks at the effects of boundaries drawn on maps, specifically "boundary objects" in relation to changing administrative geographies in the United States. As such, there is an interest common to these papers related to the ways that geospatial technologies rely on, and assert, boundaries in particular ways. By producing maps in ways that emphasize or legitimate boundaries, the assertion is made that the polygons that result themselves have implications. For instance, when Harvey considers ways that administrative boundaries are being refashioned and asserted in relation to neoliberal governance in the United States, he argues that administrative boundaries serve as a clear foundation for political contestation, also creating uneven access to resources between counties or other "boundary objects." With respect to conservation geographies, Harris and Hazen consider that geospatial

³ In an oversimplified sense, citationality refers to the sedimentation or iterative citation of meaning through everyday practices that may give the appearance of fixity through iteration.

technologies, including cartography and GIS, contribute to conservation practices that rely on fixing boundaries. Particularly given the flows, movements, and changes that are inherent to ecosystem function, the boundaries that are drawn and reaffirmed through cartographic practice are often overly harsh and overly-fixed territorial technologies that may be incongruous with conservation needs and processes. Thus, both works highlight a concern for boundaries as a foundational dimension of the geospatial toolkit, with particular interest in the effects of boundaries inscribed by cartographic practice. Are there ways that boundaries drawn and asserted through geospatial practices, whether for administrative units or conservation areas, could be made less absolute, more-blurry, or less fixed in space and time? Similarly, what are the implications and socio-political outcomes of “boundary objects” for instance, creating uneven geographies of resource access among communities in San Diego, or resulting in political contestation that is largely forged along arbitrarily mapped boundaries? Lastly, the idea of “boundary effects” is also central to the work of Fiedler et al. In their interrogation of the inadequacy of census data for certain research problems, part of their argument relates to the effects of the census tract as a taken-for-granted boundary object that guides so much social-scientific research and GIS work, obscuring realities and patterns that might only be visible by shifting scales and operational assumptions in such analyses.

Ambiguity of Cartography/GIS: A double edged sword

Yet another clear thread across the papers, and one that has been well-established through other works in critical cartography/GIS, is the ambiguity of cartographic and GIS/GPS technologies. Across all the papers in this issue, there is recognition of the potential of cartography and GIS, accepting these as important tools and set of practices that are here to stay. Further, there is also some recognition that these technologies have clear emancipatory or political potential with respect to certain goals and outcomes. That said, there is also a strong undercurrent of concern with respect to the dominant and widespread use of these tools, particularly in ways that might allow them to become hegemonic, to silence, or to downplay other approaches or knowledges (see Schuurman 2000 for a summary of such concerns in earlier debates). Related to this there is also recognition of an ambiguous potential in terms of increased possibilities for surveillance and control that may also accompany the proliferation and extension of GIS/GPS technologies and data access (see Proppen this volume, also Pickles 1995, Monmonier 2002). As noted, a primary question that recurs in the literature is how to harness the capabilities of tools such as GIS without hierarchizing knowledge or sidelining other approaches. A corollary question is how to harness the emancipatory or political potential of GIS and other emergent geospatial technologies, while minimizing risks to society, such as privacy concerns?

At the core, these are precisely the key concerns of the piece by Johnson, Louis, and Pramono. In brief, these authors are interested in the ways that Indigenous communities might productively engage with the possibilities offered by cartography and GIS, but to do so in ways that are mindful of its limitations (for instance, with respect to marginalizing Indigenous cartographies), and that are also attentive to its socio-political histories (e.g., uses in support of colonialism). As such, they contribute to several other general concerns that permeate the critical cartography literature. First is how to deal with knowledges that are not easily conveyed in conventional map form (cf. Sheppard, 2001). Their second concern relates to the need to engage with cartographic possibilities, but to do so in ways that are also attentive to the risks and challenges of doing so. Such concerns seem particularly pressing in the current moment: as cartographic and GIS technologies become more available, and proliferate in socio-political and legal battles, the necessity of engaging with and deploying such technologies is paramount, highlighting the need to forge ways of doing so in ways that are attuned to these concerns. Similar threads appear elsewhere in the volume as well. Just as Johnson et al. are concerned that increasing use of cartography/GIS by Indigenous communities may further marginalize Indigenous cartographic traditions or possibilities, Harris and Hazen similarly highlight the possibility that alternative, more flexible, or more widespread non-territorial approaches to conservation may be rendered less visible with the continued reliance on mapping practices. This fits into wider ongoing efforts to reformulate GIS and make it more amenable to alternative approaches, such as feminist GIS (Kwan 2002), or other works generally referred to as AltGIS, GIS2, or public participation GIS (PPGIS). While elements of counter-mapping, PPGIS, and democratized mapping are intended to counter the domination of particular mapping practices and products, these efforts also engender the possibility of affirming the role of mapping in general, consolidating our vision and discussions around this toolkit, despite its limitations.

Similar concerns related to the proliferation of, and ambiguous potential of, new technologies are taken up centrally by Propen, using two study examples to explore issues of relevance to a “critical GPS.” In this contribution, Propen is concerned with the ways that “GPS exacerbates issues around privacy, consent, (authorship), and the circulation of personal information by potentially allowing for real-time tracking and thus an always-locatable subject” (page 135). Her examples nicely elaborate the tension and ambiguity of such technologies, and their increasing availabilities and proliferation, for instance through increasingly affordable hand-held devices. While power and surveillance are increasingly issues of concern, they need not be always viewed negatively. For instance, the *Amsterdam RealTime Project* provides a clear example of “a technological apparatus functioning within the context of consent, awareness, and an interest in the individual’s better understanding of their own lived experience” (page 141). For Propen key issues relate to consent and witting authorship of maps, while for Johnson et. al is is a critical literacy that allows users to engage with mapmaking

while maintaining a critical consciousness about possibilities and limitations of such. Both papers, therefore, are engaging with foundational questions of what it means to author maps, including forging understandings of what possibilities are enabled by this, particularly given a larger field of use and engagement where maps are often used for less than positive, affirming, and emancipatory ends.

These are precisely the concerns about the ambiguity of cartography and GIS that remain central to debates in critical cartography/GIS in general, and to authors of this special issue in particular. We also feel that these are precisely the issues that will continue to require attention into the coming years as well.

Where do we go from here?

In reading these papers it is clear that the field of critical cartography/GIScience continues to be heavily influenced by a few key thinkers. First among these is Brian Harley (1989, 1990), whose ideas can be seen throughout this special issue. It was also of interest to us as editors how many of these papers turn to theorists from outside of cartography and geography, particularly Foucault and Butler (e.g., 1979 and 1990 respectively), to better understand cartographic interactions and applications. Such consistencies open up new questions in terms of what types of approaches are fruitful for engagement with cartographic practice, or other social and technological challenges generally, and also highlight the need to continually draw on new ideas, particularly to meet the challenge of invigorating fresh and unexpected approaches. While we can only begin to imagine what it is about these theorists that makes their work so readily applicable to a range of questions, it is clear that Foucault's interest in (1) technologies of discipline and surveillance, (2) as well as the importance of knowledge and (3) spatio-temporal organization of people and things as central to operations of power have broad relevance to a range of questions in human geography. For Butler, it is similarly her focus on the ways that power operates through the mundane and everyday (of language, ideas, and of practice) that provides insights into the iterative, citational, and performative dimensions of mapping, socio-political processes, and gender relations alike. It remains an open question what new approaches and theories will continue to move critical cartography/GIScience forward.

Another overarching theme we take from this collection of works is the need to be continually vigilant and attentive to the limitations of common approaches, even as we accept their utility for certain interests and needs. Drawing on Johnson et al., one way to frame this might be the need to be attuned to the multiplicity of cartographic possibilities, some of which might be obscured by over-reliance on certain commonplace techniques and approaches. Again using their language, we might all seek to engender a "critical cartographic literacy" that

is mindful of assumptions and limitations of cartographic practice. Doing so would allow us to be reflexive in terms of how we choose to engage, or not, with cartographic possibilities, techniques, and technologies, including forcing us to consider their reformulation in ways that might be more consistent with alternative possibilities, political goals, or futures. As other scholars of critical cartography have raised, to forge such a literacy may also require functional literacy of the software, programming, and assumptions of different cartographic/ GIS tools themselves, offering a clear challenge to future scholars to gain competency across these fields. Clearly there are no simple answers to overcome some of the limitations of cartographic work, and equally obvious is that we cannot and should not reject the possibilities and potential of cartographic techniques. Instead, we should continue to debate, and refine, the theoretical and practical toolkit, both to recognize and make possible multiple approaches, and to work towards achieving critical cartographic literacies in ways that are mindful of the critiques raised.

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