# Constructing Community Through Maps? Power and Praxis in Community Mapping*

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Despite the growing practice of community mapping, empirical research remains limited. Extant studies have focused primarily on "counter-maps" and indigenous maps, leaving many locally produced maps and their authors' perspectives unexplored. This article identifies the mapping process as critical to the definition and understanding of community mapping. It links critical cartography literature to goals of community-mapping practitioners through themes of inclusion, transparency, and empowerment. The discussion highlights the social construction and practice of "community," the relationship between maps and power, the definitional difficulties associated with community mapping, and the figurative and literal boundaries that constrain community cartography. Finally, it points to areas for further research and exploration. **Key Words: community-based map, community mapping, green map.**

Acommunity map is a map produced collaboratively by residents of a particular locale, often featuring local knowledge and resources. Community maps intimate the potential for radical social change, or at least the judicious reallocation of resources. Yet these maps are marked by symbolic and material boundaries that can impose, enforce, and restrict—even when employed for progressive ends. In order to understand the contradictions of community mapping, it is necessary to fully engage with its diverse practice. Empirical studies provide insight into possibilities of community maps, especially in securing indigenous rights and property (e.g., Aberley 1993; Flaville 1995; Nietschmann 1995; Peluso 1995; Offen 2003). Yet they shine only opaque light on the variety of community maps and the ways they are produced. Questions remain regarding the composition of community maps, how they should be evaluated, and the relationship between community maps and power.

In this article, I consider these questions in turn. I outline a broad definition of community mapping that addresses a literature imbalance toward indigenous and counter-maps, recognizing that not all community maps "involve a counter-mapping initiative at all" (Hodgson and Schroeder 2002, 97). Building on the critical cartography literature, I present a three-pronged framework that is common to a range of community-mapping projects. I make explicit the themes of inclusion, transparency, and empowerment that are implicit in the practice of community mapping. These themes are considered in light of both the extant literature as well as my research with Greenmap volunteers in Portland, Oregon. This research involved in-depth interviews and participant observation of the mapping process over a ten-month period. In this way, I contextualize the field of community mapping by illuminating the practical and philosophical decisions and difficulties confronted by one group of mapmakers. This approach reasserts the importance of *process* in community mapping and gives voice to its participants, while also complicating simple notions of "community" and "community mapping." In doing so, it articulates how the tension between community mapping as emancipatory politics or as the reproduction of power relations is constituted in its practice.

## A Cartographic Counterculture?

In recent years, two significant developments have emerged within cartography: (1) critical geographers such as J. B. Harley (1988, 1989) have illuminated the map's crucial and tendentious role in shaping the world, calling attention to the relationship between maps and power; and (2) a populist mapping culture has materialized, abetted by new, relatively accessible mapping technologies. Considering these developments together raises questions about the nature of community mapping. Specifically, can community mapping help produce egalitarian or socially just cartographic representations of place? Are power relations being reconstituted with the dissemination of cartographic knowledge?

Some practitioners and scholars have attempted to strip maps of their elitism, mystery, and seeming impunity, and have encouraged co-optation of maps by those less privileged or for social causes (e.g., Monmonier 1991; Wood 1992; Aberley 1993). Monmonier (1991, 3) seeks to dispel the "cartographic mystique" that surrounds maps and solicits for them "undue respect and credibility." Wood (1992) recommends an entire revolution in mapmaking in which maps are prolifically produced and manipulated, even for shameless self-promulgation. Harley (1989, 1991) himself calls for an alternative cartography that is not surreptitiously imposed by the will of the elite and that endorses principles of social justice.

Community mapping, then, might be seen as a response to conventional, elitist cartography, comprising an alternative, egalitarian counterculture. Empirically investigating this proposition, Peluso (1995, 387) introduced the term "counter-mapping" to explore how maps could be used by communities to represent themselves and stake claims to resources. Further studies highlight dilemmas presented by the practice of counter-mapping. For example, financial investment is required for specialized counter-maps; maps have the potential to "freeze" dynamic social processes in time; counter-mapping agendas can be co-opted or blurred in communities that collaborate with external entities (e.g., Peluso 1995; Rocheleau and Edmunds 1997; Hodgson and Schroeder 2002); difficulties arise in the cultural translation and interpretation between community-based maps and conventional maps (Rundstrom 1990); notions of "community" are often problematized in mapping (Kosek 1998); and there may be limited potential for maps to exert social change in the absence of broader social or political intervention (Kosek 1998; Hodgson and Schroeder 2002).

More recently, an extensive, parallel body of critical geographic information systems (GIS) and Public Participation GIS (PPGIS) research has examined the accessibility and use of GIS and spatial technologies by citizens and communities, and the effects of that use. In particular, these fields have been concerned with issues related to citizen engagement in decision making, social inclusion, empowerment, and democracy (e.g., Elwood and Leitner 1998, 2003; Elwood 2002; Kyem 2004; Sieber 2004).

Empirical scrutiny of community maps has enhanced our understanding of its practice, at the same time raising theoretical questions about its potential. However, the literature does not account for the wide variety of community-produced maps, such as parish maps, green maps, bioregional maps, and asset maps. Few cases yet exist to help us understand the underlying motivations and processes of map production. Finally, the literature does not offer a definition or method for analyzing community maps, particularly in relationship to issues of power and equality—concerns of many community-mapping scholars.

Despite years of research and inquiry, definitions of "community" are unstable and fluid. For example, the word is commonly used to describe a small geographic area, such as a neighborhood or town that presumably shares identity and solidarity. Yet scholarship has unsettled this romantic notion by pointing to conflict and power relations that underpin geographical communities, and also to the related existence of nonproximal, intentional communities, such as internet communities, work communities, or "the environmental community" (e.g., Godway and Finn 1994; Castells 1996; MacKenzie and Dalby 1997; McDowell 1999). The identities and meanings of communities (and their members) are contested and evolving (Crouch and Matless 1996; McDowell 1999), as are individuals' involvement in multiple communities. In this article, I use the word "community" to refer to a group of people who share geographic space, but I do not presume solidarity, solidity, or shared values among these residents.

Similarly, community-mapping projects emerge for various purposes and at various scales, and their meanings are altered in the mapping process. However, in part because mapping projects often lay claim to a community identity, it is important to provide a definition of community mapping. First, a community map implies a collective endeavor that attempts to represent a range of community members within a localized geographic scale. Second, community mapping is attentive to the process, not just the product; how participants work together and negotiate issues of place and representation is as important as the map itself. Third, community-mapping projects strive to be inclusive, empowering, and transparent. These three characteristics of community mapping are interrelated, and connect themes from critical cartography to goals articulated by community-mapping practitioners. They also hinge on a broad interpretation of maps as "graphic representations that facilitate a spatial understanding of things, concepts, conditions, processes or events in the human world" (Harley and Woodward 1987, xvi).

There are a multiplicity of community-mapping projects and they utilize a wide variety of techniques and technologies.[1] Together, these projects complicate conventional cartographic dynamics and may reconstitute or subvert power relations and the myriad ways they are produced or imposed. In this view, for example, territorial control is only one dimension of power, and the *process* of mapping unfolds dimensions of power not always evident in the product itself. Themes of inclusion, transparency, and empowerment shed light on important aspects of this counterculture at work. If what Chapin (1998, 6) posits is true—that community maps are often viewed as a popular "magic tool"—then these themes sharpen the critical lens.

## Themes in Community Mapping: Inclusion, Transparency, and Empowerment

### Inclusion

Maps have long been a tool of the affluent and powerful (Harley 1988). Scholars and proponents of community mapping have vociferously criticized this elitism. Inclusion of the non-elite is seen as one of community mapping's strengths. Here I consider two interrelated dimensions of inclusion: involvement of populations formerly excluded from mapping, such as indigenous populations, and diverse involvement within local communities, through, for example, the participation of women.

According to practitioners, community mapping "opens up cartography to the amateurs. It asks participants to share their experience, their values, and their vision about a particular place" (Lydon 2003, 4). There is often a process of "othering" in the self-promulgating community-mapping rhetoric that affirms locally derived knowledge. It often repudiates external, precision-based, professional or political maps composed by outsiders—signified in the slogan "map or be mapped" used by Maya mapmakers (Maya People of Southern Belize 1997). Amid this rhetoric and aided by new mapping technologies, multiple and marginalized groups are embracing community mapping, including schoolchildren, indigenous peoples in Belize and Southeast Asia, women, and working-class community members (e.g., Nietschmann 1995; Peluso 1995; Poole 1995; Hodgson and Schroeder 2002; Lydon 2003). Nonprofit organizations are increasingly using mapping technologies to engage in urban revitalization and community planning (e.g., Elwood and Leitner 1998, 2003; Elwood 2002; Sieber 2004). There is an upward trend of diverse participation in mapmaking.

Within specific community-mapping projects, the depth of inclusion is complex and may be obfuscated. Mac Chapin of the Center for the Support of Native Lands, an agency that funds indigenous mapping efforts, suggests that the higher the level of local participation, the more beneficial the outcome (Chapin 1998). Other mapping advocates echo this sentiment, and many projects actively solicit community involvement. For several parish and green mapping projects, town meetings have been held or neighborhood surveys have been distributed to gather feedback; the *Maya Atlas* project recruited village researchers and let community members vote on the map design; and indigenous mapping efforts in the Darién region of Panama benefited from technology that combines "maximum participation of the local people with the creation of maps of truly scientific value" (Gonzales, Herrera, and Chapin 1995, 33).

However, community maps may fail to incite community engagement or live up to lofty ideals

for participation. Edmunds, Thomas-Slayter, and Rocheleau (1995) found that women's space and perceptions of place were often excluded in indigenous maps. Crouch and Matless (1996) point out that parish mapping often fails to take root in urban communities and note the existence of gendered, romanticized, and affluent imagery in these maps.

Local green map projects, part of the Green Map System (Figure 1), have also struggled with inclusion.[2] An early study of green maps found low levels of participation by community residents (Richardson 1998), and other green mapping projects have failed due to lack of community capacity and logistical constraints (Parker 2002). My research on the Portland Greenmap[3] project reveals some of these tensions around inclusion. The Portland Greenmap, produced in 2002 (Figure 2), began as the initiative of two local residents and evolved into a core group of volunteers. The project's mission was "to strengthen Portland's awareness of and connection to its urban ecology and social resources through locally-created maps, thereby enabling residents to make more sustainable and socially-responsible lifestyle choices" (Portland Greenmap web site).

Unlike in other cities where green maps have been undertaken by existing organizations, the Portland Greenmap volunteers had to simultaneously create an organizational identity and produce the map—which required volunteers, data collection, public outreach, financial resources, and technical expertise. For more than two years, the volunteers met regularly, collected and georeferenced sites, and updated and maintained the project's web site. They also networked with nonprofit organizations and neighborhood associations, implemented outreach and publicity efforts, and actively solicited donations from individuals and businesses.

In the Portland Greenmap project, mapping volunteers strove to create a grassroots community endeavor rather than an elite production. In interviews, they expressed the desire to produce a map that authentically represented the "entire community" (interview). They believed that engaging in the mapmaking process would help community members internalize and act on a mission of community sustainability. In this vein, they held several events to publicize the project and gather input for the map. Many such events yielded limited turnout,



**Figure 1** *Portland Greenmap sample icons. The Green Map System encourages the development of local maps featuring environmental resources. It includes a set of icons to denote particular kinds of places, such as community gardens or green businesses. Image provided by Portland Greenmap.*
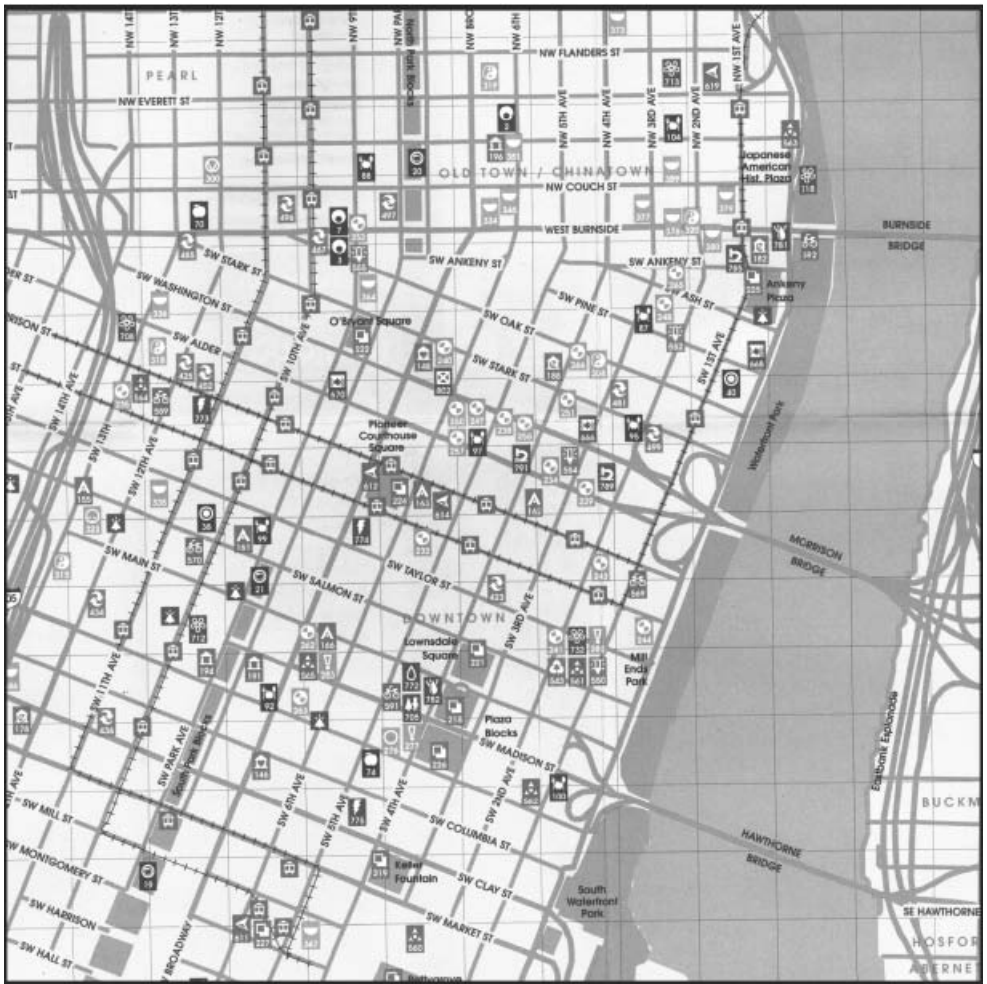
**Figure 2**   *Inset of downtown Portland. Image provided by Portland Greenmap.*

and large sections of the community did not participate in the project. In the end, approximately thirty-five individuals and 200 community organizations contributed to the map. Primarily, these contributors were middle class, affluent, Caucasian community members, who were at least partially invested in environmental causes. It is possible that the environmental movement or the map's green focus disenfranchised some Portland residents who also may not have understood its purpose, urgency, and benefits. Indeed, these were things map volunteers struggled to articulate—especially to those with perhaps more pressing concerns. It did not

seem to occur to volunteers that the Portland Greenmap was, or could be perceived, as anything but "a great idea."

Despite their desire for inclusion, Portland Greenmap volunteers were also constrained by limited financial and human resources, lack of community organizing skills, and conflicting priorities. Some volunteers were resigned to the view that greenmapping had greater appeal to those invested in environmental issues, and of a particular class status, similar to themselves. They did not know how to reach and engage other populations. They faced decisions about how to dedicate their resources: toward the

production of the map or toward garnering deeper community involvement. While attempting to balance the two, volunteers viewed map production as the priority and claimed control of the maps' content:

> People will give their input and some of it will be good and some of it won't. But we really need to stay with the criteria, regardless of whether or not the community gave their input.
> —(Portland Greenmap volunteer, male, age 27)

In summary, community mapping legitimizes a diversity of authors and images by altering technical and access barriers. For example, it philosophically and in some cases legally and practically affirms local knowledge, it validates the production and use of nontechnical maps, and it exposes community members to geographic and mapping technologies that were previously unavailable to them. However, intentional exclusion, limited resources, and lack of critical reflection can impede mapping projects from attaining input from diverse groups, and questions remain about who constitutes the "community." Projects may fail to produce a map, or produce one that is nonrepresentative or embedded in local power relations. These are only some of the issues that arise around inclusion. Unfortunately, too few case studies probe issues of inclusion in diverse mapping projects, and little is known about how organizational and individual perceptions and decisions structure the inclusive (or exclusive) nature of community-mapping projects.

## Transparency

Transparency considers the lucidity of the goals, context, and authorship of community maps, in juxtaposition to maps seen as "coming from nowhere" (Wood 1992, 70) and operating behind a "mask of a seemingly neutral science" (Harley 1989, 5). Community maps are often self-consciously social and political in their intent; they are based on joint or communal authorship; and transparency is seen as part of the map's social capital. Transparency is a complex notion that is gaining importance in literature related to urban decision making and PPGIS. In particular, scholars have analyzed how GIS and mapping tools can increase the transparency of public decision making for community members, thereby encouraging broader engagement (Drew 2003; Drew and Nyerges 2004). Transparency is associated with many concepts—including clarity, accessibility, accountability, and openness (Drew 2003). In this article, I apply these conceptions of transparency to the actual process and product of community mapping.

Community-mapping projects often clearly articulate and make public their project goals. These goals are often steeped in local political or social circumstances, reinforcing the notion of transparency as a context- and place-specific concept (Drew 2003). The Marinography Mapping project describes its mission in the following way:

> The Marinography Mapping project seeks to involve the community in the process of discovering the natural, social, and cultural ecology of our area through art and communication. This project intends to give individual, local voices a chance to be heard telling their own stories of place through images, dreams, memories, anecdotes, current perceptions and visions for the future of the land.
> —(Castle 1998)

Objectives of maps may implicate a broad audience of both internal and external consumers, including local community members, tourists, developers, or authoritarian governments. For example, a Calgary youth map promoted a plan for the local government to convert an army base into an eco-park, and the Algonquin First Nation made composite maps to create a local resource management plan (Lydon 2003). Such efforts seek both to make information accessible through the use of maps and to hold institutions accountable once the map has been produced.

Projects also attempt to make authorship and context of the map salient to their audiences. For example, green map project volunteers in Madison, Wisconsin, agreed that the map was going to be value-laden and they wanted this to be clear to community members from the very beginning (Wisconsin Environmental Initiative 1999). Makers of the *Maya Atlas*, the only contemporary indigenous atlas, declared transparency to be one of the project's five guiding criteria (Maya People of Southern Belize et al. 1997). Rather than obfuscating the authors, community maps may seek to attain power by publicly displaying community authorship. A web site, brochure, or detailed description often accompanies a community map, describing the

## ☸ ORGANIC/NATURAL FOOD

**Definition:**

Products grown without pesticides or synthetic fertilizers, and no chemicals or waxes are added after harvesting. If processed, it is usually prepared in a way to maximize the nutritional value to those who eat it. Organic produce prepared food, dairy & meat is becoming more popular and easier to get all the time. Some natural food places include fair trade practices in their definition of ecological foods.

**Criteria:**

♦ Significant amount of local, organic and sustainable products

♦ Home delivery of local or sustainably produced foods

♦ Local producer or processor of sustainable food products

♦ Resource for sustainably produced food and certification systems

**Figure 3**  *An example of criteria created by mapping volunteers for the category ''Organic/Natural Food.'' This description of the criteria was posted on the Portland Greenmap web site and a cursory version was printed on the map. Information provided by Portland Greenmap.*

process and featuring the community as author(s). Community authorship can help make the map more credible or accountable to local community members as the knowledge is derived from those familiar with and presumably knowledgeable about a place.

> Such an atlas would include the history as told by the Mayas, individual village histories as told by the residents . . . and by developing an atlas of our land, people throughout Belize and the world will be able to appreciate our unique way of life and respect indigenous land rights.
> —(Maya People of Southern Belize et al. 1997, 1)

In the Portland Greenmap project, volunteer map makers were particularly concerned about making criteria for including sites on the map transparent to map users. The criteria help determine what activities or places are "conducive to sustainable living," and therefore warrant inclusion in the map [see Figure 3 for an example]. Attuned to the discursive power of maps, they shied away from ambiguous criteria:

> One of my problems that I've had is that most of the [Green] maps that have been done have very little criteria. . . . Every map has a value judgment associated with it—especially these—because you're taking something that is not easy to quantify and you're putting them on the map. And if you do that you have to have at least some explanation for what is on there. Our goal is to have transparent criteria. It's not going to be perfect but it's going to be a starting point.
> —(Portland Greenmap volunteer, female, age 27)

Here the goal of lucid and explicit criteria was in part to engage the reader with the design and

content decisions in the map's production. Greenmap volunteers sought to explain rather than simply impose the map's content and values. Readers could then decide for themselves whether to accept, explore, or contest the map's content, guiding criteria, and premise. In a way that is different from many community maps, the Portland Greenmap invites readers into the knowledge construction process through its transparency, an approach that volunteers hoped would stimulate community dialogue. They also saw transparency as a way to hold themselves and their map accountable to the community and to map readers. In this way, they presented the sample map and criteria at several community events, which indeed led to some community debate.

> I got into a discussion about vegetarian restaurants with this guy and he is like "what is environmental about vegetarian restaurants?" and I went into my spiel about how beef production requires more resources etc., explaining it as I know it and he was like "this is completely bullshit" and just walked away.
> —(Portland Greenmap volunteer, male, age 27)

Volunteers hoped to build on and deepen such debates, and planned to continually finesse the maps' criteria. However, in the end, due to printing and legibility concerns, only an abbreviated version of criteria was included on the map. More detailed criteria were posted on the map's web site.[4] Volunteers also made presentations at several community events, in which they displayed a sample map and site selection criteria.

Although its mission was salient in presentations and materials, the Portland Greenmap's content and context are embedded in a particular environmental discourse of varying familiarity and palatability to Portland residents, as the vegetarian discussion suggests. This problem was only partially acknowledged by volunteers, and no specific strategy for reconciling it was in place. Volunteers distributed the map widely at no cost, although this did not address cultural, interest, or knowledge barriers in interpretation. The names of about twenty contributing volunteer authors appear on the map's back cover; this list reveals only a generalized gender identity of members, but other contextual clues in the map hint at other identity issues. For example, the map reads: "much of Portland's population resides here because of its continued dedication to sustainability," a contention that intimates both privilege and flexibility of lifestyle.

Rundstrom (1990) suggests that maps embody values and beliefs of a culture and its institutions and thus the interpretation and analysis of such maps should be steeped in cultural context and knowledge. The intent to provide this context characterizes community maps. According to Lydon (2003, 4), "Community mapping is not mapping for or of a community, it is mapping by the community of their values, assets, and visions for the future." This context aids the comprehension of external viewers (outside of the community) while simultaneously reinforcing their role as outsiders, and may also strengthen the identity and insider knowledge of those within the community. Of course, such notions of insider, outsider, and bounded communities remain fraught with difficulty. Issues of transparency and access are context-sensitive, shifting, and partial (Drew 2003). Ultimately, what is transparent and accessible to some will necessarily appear selective and exclusive to others; the notion of a community-contrived map can marginalize "outsiders" within the community who contest the map's representations. The way transparency is conceived of during the map-making process and the project's relative commitment to it play critical roles in shaping the project's outcomes.

## Empowerment

If maps are tools of power for the elite, then can mapping help others claim such power? Both researchers and practitioners suggest that empowerment is an essential byproduct of community mapping (e.g., Aberley 1993; Crouch and Matless 1996; Nietschmann 1995; Stone 1998; Lydon 2003), but rarely explicate its meaning. Empowerment is given multiple definitions in social science and critical GIS research (e.g., Perkins and Zimmerman 1995; Rappaport 1995; Friedmann 1996; Elwood 2002; Kyem 2004), two of which are relevant here. In some cases, empowerment is defined as *social or procedural change* in which communities or citizens gain greater control over resources and legitimacy in decisions (Elwood 2002; Kyem 2004). Other research describes empowerment as *building capacities or human capital for collective action*, in which communities acquire skills, politicized consciousness, or knowledge that informs or inspires collective action (e.g., Friedmann 1996; Elwood 2002; Kyem 2004). While not mutually exclusive or exhaustive, these definitions can connect three activities commonly discussed in the community-mapping literature to concretized conceptions of empowerment: (1) the ability to self-define and represent place; (2) the acquisition of control over natural or other resources; and (3) the mobilization of collective action (e.g., Aberley 1993; Peluso 1995; Clifford 1996; Lydon 2003; Offen 2003).

Community mapping proponents use the appeal of self-representation to draw in potential mapping participants, at times building an ideology that supports the status quo or stasis of place:

> Somewhere between the Internet and the rainbow a place like yours is struggling to keep its integrity. Making a parish map is about creating a community expression of values, and about beginning to assert ideas for involvement. It is about taking the place in your own hands.
> —(Clifford 1996, 4)

The ability to self-represent a community can be both a form of social/procedural change and a capacity-building endeavor. Community mapping can strengthen and rework community identity as representations often reflect and reinforce knowledge or perceptions of place (e.g., Rundstrom 1993; Peluso 1995; Offen 2003). It can challenge map silences that imply the absence of peoples or resources, heighten consciousness, and counter deficit maps. For example, some inner-city neighborhood groups have created asset maps that feature local

resources in contrast to city maps that highlight problems such as criminal activity and poverty (McKnight and Kretzmann 1993).

According to a survey of forty U.S. neighborhood organizations, many local community organizations value self-representation in maps (Elwood and Leitner 1998). By making maps, neighborhoods understand and display their own conceptions and repudiate other representations of their community, such as those proposed by developers; this gives them legitimacy and enhanced effectiveness in negotiations with government and business. In composing maps that document history, places of value, and land-use traditions, indigenous communities imprint their existence in visual form and actively resist their historical marginalization. These local representations do more than resist, according to Nietschmann:

> Such a map can only be challenged by another map, and the effectiveness of the challenge is based on the geographic authenticity of the mapmakers. A map of homelands or home waters automatically makes all maps—be they antecedent or subsequent—subject to suspicion because they are made by the occupiers' cartographers.
> —(Nietschmann 1995, 37)

Mapmaking often builds capacity for community mobilization, enhancing knowledge, and raising political consciousness. For example, prior to community mapping, the Honduran Mosquitia, comprising 174 communities, dealt individually with cattlemen and loggers. Mapping created a feeling of territory, leading to the organization of seven regional Miskito federations for collective action against resource usurpers (Stone 1998). Community asset maps have often spiraled into urban projects such as the renovation of underutilized space or the building of community gardens or green space. In Thailand, villagers mapped their territories as a first step in creating new conservation and development activities with foresters (Fox 1998). Similarly, the Standlake Parish Mapping project began with a benign mission to celebrate the community and its new village hall. However, during the mapping process, village members decided to join together to battle against gravel mining in the town's center (Crouch and Matless 1996). In a parallel case, a children's mapping project of an abandoned stream park in Victoria, Canada, led the town council and other organizations to implement a regional creek restoration project (Lydon 2003).

Finally, indigenous communities have effectively used maps and the mapmaking process to secure legal control over resources and rights, as has been abundantly described in the literature (Aberley 1993; Flaville 1995; Nietschmann 1995; Peluso 1995; Offen 2003). For example, the atlas and place name research done by the Gitksan and Wet'suwet'en native communities was used to challenge Canadian control over their territories; counter-maps have been used in Indonesia to help locals share in forest management; and the *Maya Atlas* has secured resource use for the Maya people in South America.

In the Portland Greenmap project, volunteers wanted to use the map's authority to self-define or redefine the community, particularly its perceived environmental identity.

> The great thing about the Greenmap is that it is constructing an alternative reality because it is not what you usually see mapped.
> —(Portland Greenmap volunteer, female, age 26)

Greenmap volunteers also hoped this "alternative reality" would increase personal empowerment and social justice advocacy among residents. For example, lower-income areas in North Portland contain a disproportionate number of the city's brownfields, and environmentally friendly businesses are concentrated in higher income areas downtown and in South Portland[5] (Figure 4). The map display of resource distribution might foster political consciousness among community members and leaders, leading them to act upon this inequity.

> When you are laying out the resources in the city and showing where the resources are, you're also showing where they're not ... when we look at the layer where all the brownfields are—they're in the poorer areas ... and when we look at the resources where you can buy organic produce and where you can have community gardens and all the great things about Portland, you know they're not going to be in those areas ... it's a good way to draw attention to those places that are underresourced, and maybe get people to pay attention to some of the reasons why. It's one thing to talk about it or maybe read about it, but there is something about a visual image that is far more compelling. You get the whole picture because it's on one literal picture.
> —(Portland Greenmap volunteer, female, age 26)

**Figure 4** *Close-up of a neighborhood in North Portland. When compared to other areas on the map, North Portland has relatively few ''green resources,'' made apparent by the small number of icons in this image. Image provided by Portland Greenmap.*
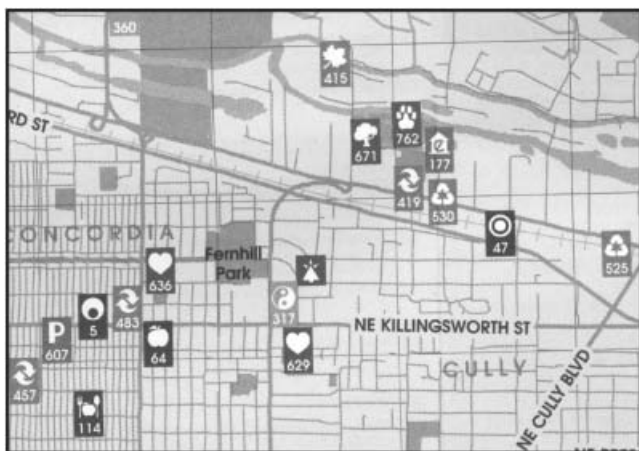
However, the quotation above illustrates problems with the relationship between the volunteers' perceptions, the mapping project, and empowerment. Like many comments from volunteers, the quotation implicates a particular middle- or upper-class reader who presumably needs to be *enlightened* about such problems, and therefore is likely not already experiencing them. It is this population that the map would purportedly stir to collective action against injustices. Yet, definitions of empowerment as social change or capacity building clearly implicate citizens acting for themselves, rather than being acted upon.

In addition, some volunteers admitted the possibility that the map could actually have a disadvantageous effect on low-income communities by reproducing stereotypes:

> It would be nice to say that here is a bald spot [of ecological businesses] and now that everybody is aware of that maybe some businesses will start to fill it in. But I don't know that that's a reality. I think, [it might bring] more social divisions of which communities are perceived to be more socially or environmentally-minded.
>
> —(Portland Greenmap volunteer, female, age 24)

These concerns could have been mitigated by a community-driven, empowering, and inclusive mapping project that facilitated citywide collective action. In fact, the Portland Greenmap did raise capacities, consciousness, and awareness among some organizations and community members, who reported taking individual actions to make the community more sustainable.

However, the map was articulated by a relatively elite group of individuals. In these ways, it may have had empowering effects on specific community members. However, it was not a generalized awareness or generic empowerment that was potentially attained, but one focused on creating a more sustainable community as defined by the Portland Greenmap. In addition, the mapping process failed to engage (and therefore empower) the entire community. In fact, it may possibly have disenfranchised community members that it had hoped would benefit from the project.

When three specific issues are examined (self-representation, collective action, and resource control), evidence suggests that community mapping can produce two related forms of empowerment: the capacity for collective action and social/procedural change. Community maps provide a medium for community interaction, consciousness-raising, and conceivably action. By mapping the land, communities may reclaim the territory for themselves, figuratively and literally. This evidence suggests that empowerment as social change and as capacity building is possible through community mapping. However, the mapping process and product can also be binding, exclusionary, or disempowering at various scales and in various ways (see Peluso 1995; Elwood 2002; Hodgson and Schroeder 2002; Kyem 2004). Further nuanced, longitudinal studies of mapping process and outcomes are still needed. How mapmakers think through and engage ideas of empowerment and for whom it is envisioned and occurs

need to be better understood. Furthermore, these projects need to be understood in relation to extant power relations and possibilities for social change.

## Discussion

The themes of inclusion, transparency, and empowerment offer insight into both particularities and commonalities of community maps, as well as the relationship between community maps and power. These issues form the root of empirical and theoretical tensions in the study of community mapping, which are salient in the literature and in my own research on the Portland Greenmap. In this section, I elaborate on these themes and tensions and discuss further avenues for exploration, including connections between this article's framework and the growing body of PPGIS research.

This article depicts the complexities of themes of inclusion, transparency, and empowerment, and the importance of the mapping process in providing insight into them. In the Portland Greenmap, the perceptions, actions, and negotiations of the Portland mapping volunteers help explain why the project fell short in its attempts at inclusiveness, transparency, and empowerment. Internal debates and commitment to transparency during the mapping process led volunteers to develop particular and partially transparent criteria for sites on the map. In the same vein, practical limitations and trade-offs made by volunteers hindered the project from involving a broad community base, and a lack of critical reflexivity kept them from seeing the project as an elite production or potentially disempowering to some community members. These dilemmas and constraints are not exclusive to the Portland Greenmap project. I would argue that the challenge faced by community mapmakers of being inclusive, transparent, and empowering—in addition to design, organization, and production challenges—is a difficult one. Similarly, terms like *inclusion* are subjective and multiscalar, and it is therefore problematical to gauge their attainment in diverse mapping projects. Each community mapping process entails unique priorities, opportunities, and constraints that affect the inclusive, transparent, and empowering nature of the project. Moreover, each project is differently located within and connected to extant power

relations and processes of social change. Community maps are best evaluated in light of these tensions and the contexts of map production.

This article also hints at the challenges inherent in defining community and community maps. In some ways, geographic and social conceptions of community are constructed and reconstituted in the mapping process, reinforcing the fragility of such constructs (Kosek 1998). For example, Portland Greenmap volunteers chose the city's political boundaries to define the map's margins, which kept discussion about environmental resources to a particular predesignated scale. Yet even within this scale, Greenmap volunteers had difficulty securing community involvement and resources, and took more than three years to map a 147-square-mile area that contained 530,000 residents. In addition, the map's green emphasis and elite participation reinforced a *particular community identity* embraced by liberal, environmentally-friendly, affluent community members. Perceptions of community resources and places generated in the mapping process are now inscribed onto paper. The resulting map looks very different than would a "Portland African American History Community Map," yet it presumes to speak for the community.

Similarly, a community of purpose in Portland was created and reified in the mapping project, as individuals and organizations became linked by common environmental concerns and values during the mapping process. The project's outreach efforts brought people together, perhaps temporarily, but their collaboration is now visually reinforced by their shared co-presence on the map. Through the use of resources on the map, residents may further strengthen the connections among varied progressive, social, and environmental community efforts. Ironically, discourse, the planning process, and the map itself also had the effect of inscribing otherness through referral to disenfranchised community members as "them," through the disparate geographic concentration of resources that is evident on the map, and through a map narrative marked by assumptions about privilege as representative of community identity.

In this way, it becomes clear that questions of methodology are central to the study of community mapping. Community-mapping projects cannot simply be abstracted from broader

social contexts, nor can maps be analyzed separately from the process in which they were constructed. Maps may be powerful tools, but they draw and reconstitute their power within and through these relations. Mapping projects cannot be presumed to be progressive simply because ill-defined communities rather than authoritative agents produce them. Similarly, the outcomes of mapping projects emerge through time, and even projects with subversive aims can be misappropriated by powerful interests. Finally, community is not a separable or distinctly spatial analytical unit; there is no fixed target. Mixed methodologies and evolving interdisciplinary approaches are needed to investigate and illuminate the possibilities and practice of community mapping. Critical qualitative methods such as institutional ethnography (Naples 2003) and extended case studies (Burawoy et al. 1991, 2000) could be particularly fruitful in illuminating the multiscalar "relations of rule" in which community-mapping projects are embedded, and which they may effectively undermine or indirectly reproduce. These methodological approaches facilitate research that is located in everyday lives and particular geographic contexts, but draw connections to discursive and structural relations that extend across space and time. Directly related, discursive analysis of the practices and products of community mapping allows for a critical reading of the ways in which languages and maps convey and reveal dimensions of inclusion, transparency, and empowerment within community mapping.

Finally, the study of community mapping is not the sole purview of "scholars." Community-mapping practitioners are familiar with and working in local contexts. As practitioners, they accumulate, construct, and apply knowledge and technologies in real time, simultaneously producing new questions for research and enhanced practice. My research on the Portland Greenmap project showed volunteers to be attuned to the power of maps and to have complicated commitments to and challenges with inclusion, transparency, and empowerment. The Portland Greenmap volunteers' experiences and reflections also challenged my theoretical and practical perceptions, raised new questions, and demonstrated the limitations of my short-term research project. The volunteers' openness to extended interviews and participant observation helped provide a window into the community-mapping process provided in this article. Although only a partial representation that has been filtered through my "researcher lens," it is offered in the spirit of improved practice. At the same time, my questions and observations caused Portland Greenmap volunteers to rethink their activities and to consider their work within broader arenas of community mapping and social justice. Thus, community-mapping practitioners and scholars can be effective partners in the analysis and enhancement of community mapping.

Furthermore, community-mapping studies call for interdisciplinary theoretical approaches. In this article, critical cartography themes of inclusion, transparency, and empowerment were used to interrogate theory and identify tensions common across community-mapping projects. These themes also provide a bridge between the field of community mapping and a growing, sophisticated body of PPGIS research. The two fields share a generalized commitment to social transformation and the use of previously inaccessible tools to enhance citizenship engagement and democracy. They also rely on case studies to produce and refine theory. In practice, community mapping and public participation GIS projects can be one and the same at the local scale; many community-mapping projects draw on GIS technologies to achieve specific goals, as was the case with Portland Greenmap. In recent years, PPGIS scholars have examined issues related to empowerment, inclusive technologies, and transparency (although not always together) and have labored to articulate the meaning, relevance, and potential attainment of them. This article both draws on and adds to this dialogue in ways that might benefit both fields. Other potential theoretical and methodological groupings could also benefit from the study of community mapping. Critical feminist and social theories can direct attention to evolving and elusive constructions and appropriations of knowledge in mapping, including interpretations of "empowerment." These same theories can shed light on the roles of multiply situated social agents and communities within mapping projects. Feminist praxis also provides a model of the type of politically engaged and collaborative research that could particularly benefit the field of community mapping. Finally, critical science studies offer

insight as to how particularly "knowledges" (such as indigenous knowledge or cartographic technologies) are socially constructed and appropriated—central issues in the study of community mapping. Numerous additional theoretical approaches from within and beyond geography can be usefully drawn upon, inform, and be informed by the scholarship and practice of community mapping.

In conclusion, in this article I argue that defining and understanding community-mapping projects is problematic, complex, and contingent—but nevertheless important. Community mapping is a growing phenomenon, and evidence suggests that positive outcomes of such projects are possible. Yet closer scrutiny can reveal production processes fraught with tension and marked by unacknowledged privilege. In the Portland Greenmap project, volunteers had no plans to evaluate the map and were initially relatively unreflexive in their assumptions about its audience and anticipated effects. As such, they were unable to implement the ambitious visions for social change that they desired. What seems most crucial then is that scholars and practitioners draw on multiple methodological and theoretical approaches to critically evaluate community-mapping projects in a sustained manner. This effort can help sort hyperbole from politically and socially embedded "realities" of mapping agendas, and can contribute to the production of a more robust and reflexive cartographic counterculture. ■

## Notes

[1] The range of techniques is wide. Community maps may be hand-drawn, painted on fabric or poster, or printed as folded maps or book-length atlases. A number of community maps are entirely web-based. For data sources, mapping projects draw on interviews, stories, surveys, and drawings made by individual community members. These data are often cross-referenced with GPS coordinates or extant geographical data systems. Increasingly, community-mapping projects employ GIS technology in various forms, suggesting an important relationship between the fields of community mapping and PPGIS.

[2] The Green Map System encourages the development of local maps featuring environmental resources. It includes a set of icons to denote particular kinds of places, such as community gardens or green businesses. (Local projects register with the Green Map System to use and adapt their icons, but remain locally autonomous; see Figure 1.)

[3] Although affiliated with the Green Map System, the Portland project used the "Greenmap" spelling as a way to express its unique local identity.

[4] The criteria were not edited after the original production of the map, and the Portland Greenmap web site is no longer updated or available. Volunteers have moved on to other projects and interests. A brief description of the Portland Greenmap project is available on the Green Map web site (www.green map.org).

[5] In the end, the Greenmap did not include the city's 1,000 brownfield sites. The map does identify four Superfund sites, all located in North Portland. Two are in lower-income residential areas.

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