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Cartography for Communities: An Examination of Participatory Action Mapping

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CARTOGRAPHY FOR COMMUNITIES: AN EXAMINATION OF PARTICIPATORY ACTION MAPPING

by

AMBER J. BOLL

Under the Direction of Katherine B. Hankins

ABSTRACT

Participatory Action Mapping (PAM) as a methodology strives to fill the gaps created by participatory and critical mapping methodologies. Public participatory GIS (PPGIS), which often fails to elicit a bottom up approach to mapping, and community mapping, which typically produces critical mappings that often fail to be taken seriously by decision makers both fall short in offering members of the public meaningful opportunities to make claims about particular places. Through the implementation of a critical mapping methodology that utilizes professional cartography techniques, PAM offers community organizations the ability to assert their claims through maps. Using a critical cartography lens, this case study focuses on PAM with a community-based organization in west Atlanta and reveals how this methodology can be successful in engaging professional mapping practices to communicate the truths of, and subsequently inspire action among, community members.

INDEX WORDS: Participatory action research, Community-based, participatory research, Public participatory GIS, Community mapping, Westside Atlanta, Critical GIS

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ACTION MAPPING

by

AMBER J. BOLL

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2015

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August 2015

DEDICATION

To Damien, whose world spins at a speed and degree of tilt that is complementary to mine. I could not be more thrilled and grateful that our orbits have aligned.

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Anyone who knows my story understands that this ride of mine has been one filled with wonderfully challenging twists and turns. As such I have many people to thank for being on the ride with me. First and foremost to my advisor, Dr. Katherine Hankins, who kept me afloat when I was certain my only option was to sink. Also, my committee members, Dr. Andy Walter and Dr. Daniel Deocampo, provided thoughtful feedback to my work. I appreciate the support and guidance from you both. I extend the biggest of thanks to the members and leaders of the Westside Atlanta Land Trust. Thank you for trusting me. Bit by bit, you all have the ability to change the world.

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1 INTRODUCTION

In recent decades, scholars writing in the critical cartography literature have argued that maps and mapping are results of power-knowledge relationships, wherein uneven power relations are embedded in how maps are made (and by whom) and how they are read or understood (Harley 1989). Critical mapping practices, meaning the production of maps by non-professionals, attempts to expose and uproot top down power-knowledge relationships and put the power of the map into the hands of the public. A popular form of critical mapping practice is community mapping. Community mapping occurs when a map is produced, "...by a particular local, often featuring local knowledge and resources" (Parker 2006, 23 emphasis added).

Even with the increasing frequency of members of the public participating in map production, however, professionally produced maps continue to wield their power in formal decision-making processes, such as in municipal planning and policy-making. While non-professionally produced maps may indeed go viral on social media or make a stately wall decoration at the local community center, often they have limited ability to represent the interests of community members in important decision-making arenas. For example, a quick glance at the maps and data provided on the website of the Atlanta Regional Commission, a regional planning and policy making body of the metropolitan Atlanta region, make it clear that community-produced data and representations are not often incorporated into official decision-making conversations that can have a real impact on the communities in question.

While community-created maps continue to be undervalued in decision making discussions, a remedy could include allowing a trained cartographer to perform the mapping on behalf of the community. In recent decades, scholars have developed public participatory geographic information systems (PPGIS) as a methodology that incorporates perspectives of the

public into professionally-produced maps and mappings (Sieber 2006). PPGIS, as it is currently practiced in most universities and nonprofit organizations, however, continues to work from a top down structure and often only engages the public to assist in the data collection process to answer a previously determined research question. As such, PPGIS is often not effective in addressing questions *asked by* the community. Participatory action mapping (PAM) is a mapping methodology that attempts to fill the gap that exists between PPGIS and community mapping. By partnering members of the community with academic cartographers, PAM provides communities the opportunity to decide what should be mapped, participate in the mapping process, and produce professional maps, which have the potential to challenge the kinds of spatial representations made by professionals in policy-making bodies and organizations such as the Atlanta Regional Commission.

This thesis examines the ways in which PAM fulfills or challenges critical cartography's approach to maps and mapping with the goal of establishing a methodology that is as critical as it is effective. Critical cartography conceptualizes maps and mapping to occur within what I identify as three pillars of power: 1) naturalized codes, 2) constructions of truth(s), and 3) inspiration for action. In what follows, I explore these tenets of critical cartography and apply them to my own mapping experience with a community-based organization. This case study of mappings completed with the Westside Atlanta Land Trust (WALT) reveals that PAM has the potential to code spatial claims through the cartographic principles taught to university students, can create truths for both outsiders to the community and to those living within the community being mapped, and inspires action for both the community-based organization's members and local, city, state, and federal leaders. Ultimately, this research, in seeking to develop a

methodology that is both practical and theoretical, could contribute to best (or better) practices in community mapping in addition to informing the critical cartography literature.

2 CONCEPTUAL FRAMEWORK

The purpose of this case study is to explore the effectiveness of participatory action mapping (PAM) as a methodology for providing community organizations an avenue to engage in critical mapping practices that have the ability to influence decision-making processes. As such, it is crucial to examine the literatures of public participatory geographic information systems (PPGIS) and community mapping, two mapping approaches most closely connected to PAM, to gain an intricate understanding of the current boundaries of their approaches in addition to the results they have elicited from practice. This examination is couched in a discussion around the many shifts mapping methods have taken over time and the arguments advanced by scholars of critical cartography. Lastly, I examine literature from participatory action research (PAR), which provides the overarching framework from which PAM draws.

2.1 Geography and Mapping

Eckert in his 1908 publication, “On the Nature of Maps and Map Logic”, begins his writing with the following three quotations: “Maps are the basis of geography...”; “Maps represent the deposit of geographic knowledge for any given period...”; and “Maps are the indispensable tools and implements of geography and geographic teaching,” (Eckert and Joerg 1908, 344). These quotations, he explains to readers, are the affirmations of prominent geographers of the time (though he fails to provide their names). Taking Eckert’s claims as emblematic of the time, it is clear that to early scholars in geography, maps and mapping were viewed as a cornerstone for theory, methodology, and pedagogy in the discipline. Eckert even

goes as far as to question readers if they could ever fathom geography without maps, as he views the relationship between the two to be “indivisible.” Today, despite the significant shifts that have occurred in mapping methods and the incorporation of maps into other disciplines, a strong association between geographers and maps remains, as maps continue to be the “primary language” for geographical expression (Borchert 1987). While geographic thinking is so strongly correlated with maps, however, it remains a challenge to apply a single definition about what makes a spatial representation a map.

2.1.1 What is a map?

The term “map” is one that is often taken for granted, rarely provoking anyone to pause and think about its meaning. The term is gracefully applied to broad range of applications while somehow managing to avoid mass confusion. If one does pause a moment to think about how one would describe what a map is, it becomes clear very quickly the discrepancies that emerge. One may say that a map is “a representation of the earth’s surface.” While this may hold true, how does this definition distinguish a map from a photograph or painting of a landscape (Crampton 2010)? To highlight this conceptualization of a map, I offer the images below offer different depictions of Grand Canyon Village. Which of these images would be appropriately labeled as a “map”?

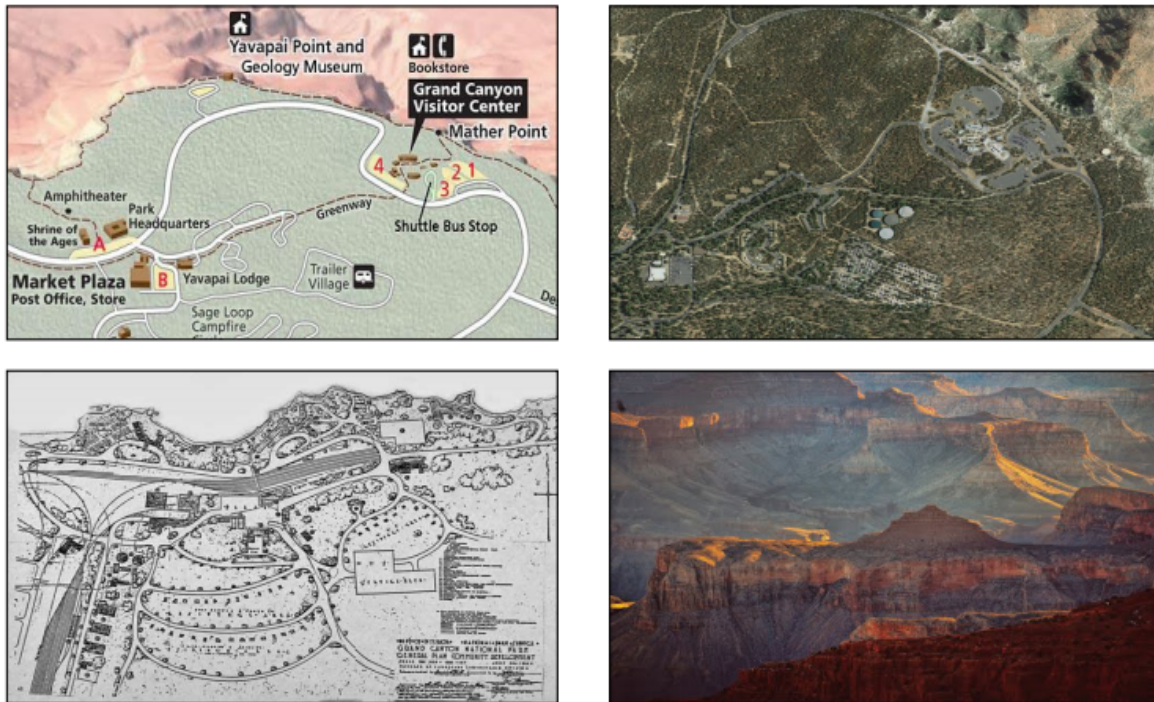


Figure 1. What makes a map a map?

Top Left: http://www.nps.gov/grca/planyourvisit/arch_day.htm

Top Right: <https://www.google.com/maps/place/36%C2%B003'28.7%22N+112%C2%B006'42.5%22W/@36.055821,-112.1215718,1889m/data=!3m1!1e3!4m2!3m1!1s0x0:0x0>

Bottom Left: http://grandcanyonhistory.clas.asu.edu/history_whoownsgrandcanyon.html

Bottom Right: <http://www.panoramio.com/photo/2456481?source=wapi&referrer=kh.google.com>

Crampton (2010, 43) insists that “if we want to answer the question of what a map is then we must begin by acknowledging that it is a culturally learned knowledge” and goes on to argue that only through the submersion in a certain society at a particular point in time can there be any degree of agreement on what a map is (Wood 2010). The table below highlights how discrepancies have existed among researchers, cartographers, and geographers even during the past 50 years, as the prominent viewpoints on maps has largely positioned them as scientific tools as well as scientific artifacts.

Table 1. Definition of a Map

Definition of Map	Source
Maps serve as the base to register geographic data...to communicate the results of research in more generalized form.	Broek (1965, 64)
Maps are representations which follows the basic rules of communication of determining your source, channel, and recipient to assist in clearly articulating the message	Robinson and Petchenik (1976)
The notion of a map...is essentially that of a model, a representation of a geographical area (usually) on a flat surface. Ordinarily, each point on the cartographic diagram corresponds to an actual geographical position on earth, according to a definite scale or system of projection	Henricksen (1994, 52)
[Maps are understood to be] merely an objective tool for transmitting information.	Pickles (2004, 33)

2.2 The Rise of the “Scientific” Map

The perspective of the “scientific” map emerged due to the professionalization of cartography (Pickles 2004). This process of professionalization consists of a transition of mapping from being viewed as just a skillset to becoming an entire professional field that took place within academia following WWII (Crampton and Krygier 2006). During the war, maps were developed and employed in the execution of wartime tactics (Crampton 2001). Arthur Robinson, who developed what became a prominent map projection that bears his name, is sometimes referred to as the “dean of modern cartography” (Montello 2002), worked as a Chief of the Map Division for the Office of Strategic Services during the war, and his maps informed the decisions of those who orchestrated the war. Robinson naturally emerged as a figurehead in the world of mapping and used his prominence to put out a call for a scientific approach to map design (A. Robinson 1979), positioning maps as merely a medium of (scientific) communication. He inadvertently worked to distance cartography from the creative and artistic dimensions surrounding design by advocating for the prioritization of the functionality of maps through

strict, scientifically-produced guidelines, and claimed that aesthetics were secondary (Crampton 2010).

Additionally, Robinson introduced the Map Communication Model (MCM) to mapping practices. The MCM, like other communication models, outlines the ways in which information is transferred between source and user, providing a feedback loop for cartographers to anticipate the ways in which their products will be interpreted. The model, over time, became a frequently practiced method in cartography and translated well into technology-based mapping methods (Crampton 2010).

The introduction of Geographic Information Systems (GIS), or a computer system that analyzes and visualizes geographic data, intensified the argument that mapping is a scientific method (Downs 1997). GIS emerged in the practice of mapping in the 1960s and offered cartographers the ability to layer information, perform analyses, and uncover patterns with the push of a button that would have taken a great deal of time to complete through past methods (Coppock and Rhind 1991). While GIS gained in popularity through use for military purposes (Pickles 2004), the new range of abilities introduced by GIS to all map makers shifted the understanding of maps into being, "... geographer's instrument of *scientific discovery*... it is a means of bringing the impossibly large within the bounds of human vision and therefore knowledge" [emphasis added] (Downs 1997, 113), increasing the scientific positionality believed to be held by maps. As GIS continued to gain prominence, academics became critical of the ways in which GIS was making an impact on society. From these critiques emerged the practice of public participatory GIS.

2.3 Public Participatory GIS

Public Participation GIS (PPGIS) emerged as a practice that sought to make GIS more accessible to the public (Sieber 2006). Through its inclusionary model, PPGIS attempts to alleviate the accusations made toward GIS for being a process that alienates, or makes “other” the population being studied with GIS methods (Craig, Harris, and Weiner 2002; Sieber 2006). Elwood (2006, 696) outlines the practice that emerged to “intervene” in these alienating GIS technologies in three ways: 1) including an increase in diversity of participants in GIS research 2) expanding both the types of spatial knowledge a GIS can include (such as pictures, drawings, and audio files) and its accessibility (for example, through online access platforms) and 3) re-designing the software/databases of GIS to incorporate social characteristics when representing and analyzing spatial data (to include cultural context and information capturing concepts that are difficult to measure, such as emotion). Sieber (2006, 503) discusses the potential social impacts of PPGIS by arguing, “PPGIS provides a unique approach for engaging the public in decision making through its goal to incorporate local knowledge, integrate and contextualize complex spatial information, allow participants to dynamically interact with input, analyze alternatives, and empower individuals and groups.” While there are opportunities for granting members of the public opportunity to participate or inform decision making, possibly going as far as empowering individuals or groups, the main premise of PPGIS is using the knowledge of the public to inform GIS research.

For PPGIS projects to be successful, the participants and roles of each participant need to be clearly defined early on (Tulloch 2008). A clear definition of appropriate roles allows researchers, community leaders, and participants to take the first step towards understanding the duties and responsibilities of each party involved. In PPGIS, the term “public” often times

remains a very flexible term, offering definitions such as “all affected stakeholders” (Schlossberg and Shuford 2005,15). Freeman (1984, 46) defines the public as “any group or individual who can affect or is affected by the achievement of the organization’s objectives.” It is clear that “the public” can be positioned to refer to a wide range of differing groups of people, creating opportunities for processes of inclusion and exclusion in PPGIS exercises. For instance, geographers Eden and Bear (2012), who focus on the intersections between the public and the environment, categorize the public as general or specialized. The general public is any person or group of people, while a specialized public denotes a group of people that has a particular knowledge concerning an issue. PPGIS practitioners Schlossberg and Shuford (2005) divide the public into three categories: those affected by a decision, those bringing knowledge to a decision, and those who have power to affect a decision or the implementation of a decision or project.

Once the “public” has been defined for a project, one must then decide how and what role this defined public is expected to have, or how engaged it should be. Inclusion can be acted out in a number of different ways, ranging from participation in the formulation of the research question to being solicited for data collection or data visualization preferences (Elwood 2006). In some instances, the public may determine the purpose, goals, and outcomes of the project (Schlossberg and Shuford 2005)¹. In other projects, the purpose and goals of the research may also determine the “public” needed for a project. The adaptability of PPGIS methods makes PPGIS applicable to a wide range of projects. This same conceptual flexibility has also created challenges in establishing structured methods for project achievement that could be performed on large scales. Despite the lack of rigid structure through which to implement such projects, academics have remained committed to the PPGIS model in efforts increase GIS accessibility in a range of capacities.

2.3.1 Academic PPGIS Programs

There are number of academic institutions that have created localized mapping programs with the inclusionary PPGIS model as the foundational approach. These programs have been established on the premise of increasing access to GIS in their cities/regions. For example, the Syracuse Community Geography program engages the residents of the greater Syracuse area in the participation of knowledge production through the use of GIS (J. Robinson 2010). Since the inception of the program in 2003, Syracuse Community Geography, under the direction of Dr. Jonnell Robinson, has been working alongside community members, offering services of GIS in efforts to effect positive change throughout the area. Some projects completed through the program are an examination of housing demolition completed with the City of Syracuse Bureau of Planning and Sustainability, A Safe Routes to School map completed with the Outer Comstock Neighborhood Association and area schools, and a geographic analysis of urban forestry efforts completed with Cornell University Cooperative Extension of Onondaga County. A similar model has been introduced in Atlanta at Georgia State University. Though in its beginning stages of development, the Atlanta Community Mapping and Research Center (ACMRC) specifically works towards including “disenfranchised” individuals and communities in the research process. Examples of projects completed by the ACMRC include a canvassing of invasive species in urban parks completed with the Atlanta Botanical Gardens and an examination of food deserts in the Bankhead neighborhood completed with The Atlanta Mobile Market. Both Syracuse Community Geography and the ACMRC are highly dependent on Esri’s ArcGIS for the creation of maps and analysis for their community mapping partners.

Programs such as these are focused on processes of inclusion; this refers to establishing and maintaining partnerships with community-based organizations, establishing the base of

skilled students to participate in GIS projects, partnering students with the community-based organizations and allowing students to work with the organizations to attempt to meet their mapping needs. While these processes are vital to the success of such partnerships, it must be recognized that it is the maps produced through the partnership that exist regardless of the processes through which the partnership is established or maintained. The maps will continue to work, communicating claims about a particular area long after the student-organization or community-university partnerships conclude. By focusing on the processes of inclusion, these methods can be ambiguous about the maps they create.

One aspect that is nearly constant among all PPGIS projects is that while they do include the public, or members of community-based organizations, in acts of data collection or validation, they do not typically consult those members of the public for their perspectives on what should be mapped in the first place (Perkins 2007). This means that while the data are collaboratively curated with members of the public using GIS, control over the map and the message it presents often times remains out of the hands of community members. At the opposite end of the spectrum is community mapping, a type of critical mapping and a method in which non-experts are in complete control in the development of maps. While many scholars and practitioners of PPGIS celebrate PPGIS's inclusivity, it is clear that, especially when contrasted with community mapping, PPGIS is more "top down" than it is "bottom up." Before I discuss critical mappings in any more detail, I provide the method a more robust framework of reference by examining in detail the works of scholars of critical cartography.

2.4 Critical Cartography

This social critique of maps began when Brian Harley posed the question, "what type of rules governed the development of cartography?" (Harley 1989, 3). Discussions around these

rules, according to Wood (2010, 120), are about “...trying to lay bare, understand, and question the presumptions of professional cartography.” Through his own examination, Harley determines, “...an alternative epistemology, rooted in social theory rather than in scientific positivism” (Harley 1989, 3), would be a more appropriate lens through which to view maps. Academics and critics such as Denis Wood, John Fels, John Pickles, and Jeremy Crampton all heed Harley’s call for the creation of a cartography grounded in social theory and have led the development of an approach that has become known as “critical cartography.” Critical cartographers take head on the task of exposing the “epistemological myths” about the knowledge production of mapping practices that are typically opaque and largely created by professional cartographers, who explicitly or implicitly adopted the “scientific” approach to map-making.

2.4.1 Power Relations

The cornerstone of critical cartography is the assertion that power relations are always present within the creation and utilization of maps. For example, Crampton (2010, 41) argues that “Critical cartography... conceives of mapping as embedded in specific relations of power... in what we chose to represent, how we choose to represent objects such as people and things, and what decisions are made with those representations.” It is the individuals and regimes in positions of power that get to choose what and how the map represents a particular aspect of a place. Crampton (2010) and others draw from Foucault’s concept of power-knowledge.

Power-knowledge is a concept that focuses on how a powerful minority is able to, “...impose [its] idea of right, or the truth, on the majority” (Fillingham 1993, 6). Essentially, those who maintain power in a given social hierarchy are those who define truth for the rest. As power was increasingly granted to mapmakers as the professionalization of cartography

occurred, maps and mapping have become methods through which an idea of “right” can be both established and reinforced. For example, countries can make significant statements by producing maps that omit, and thereby ignore the existence of, the boundaries of a country. The map declares and fortifies this viewpoint as a way to indoctrinate its readers into taking a stance that the omitted country should indeed not be recognized as a country. Harley highlights how maps are a type of discourse through which power structures are reflected and reinforced:

The key to this... power is thus cartographic process. By this I mean the way maps are compiled and the categories of information selected; the way they are generalized, a set of rules for the abstraction of the landscape; the way the elements in the landscape are formed into hierarchies; and the way various rhetorical styles that also reproduce power are employed to represent the landscape. To catalogue the world is to appropriate it, so that all these technical processes represent acts of control over its image.... the world is disciplined. The world is normalized. We are prisoners in its spatial matrix. For cartography as much as other forms of knowledge, all social action flows through boundaries determined by classification schemes (Harley 1989, 13).

The key here is that the cartographers are the ones in positions of power who are doing the cataloguing and classifying. As such, they are the ones who create the lens through which the rest can view the world.

2.4.1.1 Pillars of Power

As maps have wielded power during certain eras and in particular places, I identify three main pillars that represent the elements of power-knowledge that maps embody. These three pillars include the process of coding maps and their naturalization; the creation of truth(s); and the inspiration of action. While each pillar is connected to the others, I see them as important elements of critical cartographic understandings of how maps maintain power.

2.4.1.2 *Naturalization through Coding*

The concept that maps serve as mirrors of the “real world” is a result of naturalization. Naturalization has occurred when the map is believed to represent neutrally what exists in the world, nothing more and nothing less, completely ignoring the social perspective and field of power through which maps are created (Wood 2010; Crampton 2010; Pickles 2004). Pickles offers a nice explanation of naturalization:

The myth of the dispassionate neutrality of the map hides the socially constructed nature of the image. In this view, the map is a transparent object that reflects like a mirror that which is real: the map is the ‘mirror of nature’ in which the real is represented transparently as objective neutral and accurate. (Pickles 2004, 61)

A brief example of naturalization is offered through the way in which the International Cartographic Association’s defines the map as “...a graphic representation of a space” (ICA 2014). This definition expresses that the data a map displays already exist in the world and the map is serving only as a mirror to that data.

Pickles goes on to describe that, “Maps work by naturalizing themselves by reproducing a particular sign system and at the same time treating the sign system as a natural and given” (Pickles 2004, 60-61). This reproduction of a sign system is referred to as the process of coding. Coding assigns a socialized correlation between a signifier and a signified to produce a sign. A signifier is the physical object or action that occurs, while the signified is the meaning that the signifier conveys. A non-map example of coding is provided by a fire truck and a pulled over car. The lights and sound of the sirens alone do not hold any meaning; however through the process of coding, a socially agreed upon assignment of meaning, we are socialized to understand the sign and therefore to drive our car to the side of the road. The relationship between the signified and the signifier changes in different settings: the same vehicle with sirens or horn honking heard in the context of parade would not elicit the same signified meaning.

Within maps, codes are the ways in which an assignment scheme associates, or signifies, meaning to symbols (shapes and colors). For example, a symbol of a small circle can represent a location where a fire has been reported to have taken place. Likewise in a representation of a “hot spot” analysis, the color red may mean a high concentration of fires in an area, and the color green may mean a low concentration. These codings can become socially agreed upon by cartographers, thereby naturalizing the meaning of “red” to be associated with a high intensity, for example.

Wood (2010) dives deeper into the process of coding and argues that maps employ statements of ontological claims by displaying what exists in the world, or what he refers to as *this* and the spatial locations of things in the world, or what he refers to as *there*. The *this* and *there* statements are the tools that, as Harley (2010) describes, assign, prioritize, and rank concrete spatial claims, asserting truths over an area and giving power to the map. In a map showing reported fire incidences responded to by a neighborhood’s fire department, for example, residential buildings, businesses, commercial spaces, and even vehicles serve as the attributed *this* (or the existence of). *This* house that burnt is *there*. *This* boundary for the fire station is *there*, and if you live on the other side of the boundary line, you must be served by a different station (see section 2.4.2.3, where I discuss how maps can inspire action). A successful process of coding therefore goes beyond cartographic production and involves social assent whereby the coding imparted by the map is accepted and lived by. If a map is successfully coded, then it becomes naturalized, masking the fact that there was any social process involved in coding at all.

2.4.1.3 *Maps create truth*

Through the power of the naturalized codes, maps represent specific perspectives or agendas a person, or a group of people, have regarding a particular place. Maps are powerful

because they naturalize social perspectives or agendas. Maps are powerful because the fact that they make truth claims through “cultural coding” is not seen or acknowledged. The map is simply accepted. Because these perspectives are naturalized through cultural coding, the claims made by a map are then available to be accepted as true. This transition from coding to truth is a result of the scientific perspective toward maps, wherein maps became seen as mirroring the real world, a process I discussed earlier. Harley (1989, 4) argues that, “...the methods of cartography have delivered a true, probably progressive, or highly confirmed knowledge.” Pickles takes a slightly different approach when he asserts that maps bring objects into reality, creating truth.

“Maps create objects whose existence is mythic, at least to the extent that these identities are highly formalized abstractions whose effects (once represented as a real object) become very real. Once conjured up, new spatialized identities begin to work as real places...from this vantage point the real has been conjured out of the copper and ink by the cartographic magician; transubstantiation has been achieved and the magician’s gold (the real thing) is available to us for use” (2004, 94).

Crampton takes a middle-of-the-road approach by claiming, “Mapping creates knowledge as much as (and for some, instead of) reflecting it... Mapping...is the production of knowledge, and therefore, truth” (Crampton 2010, 46). For all of these scholars, the production of knowledge results from the assertion or reassertion of claims that are made through naturalized maps.

To continue with the example of fire maps, maps have transitioned from coded representations to representation of truth when decision makers choose to use the map as a basis for their decision making. A map that has successfully been coded and naturalized may not be accepted as truth if the map does not meet socially-agreed upon standards appropriate for map design or for datasets. A map of reported fires that is created from cardboard and crayon is not likely to be accepted as truth due to the current social preference for data and representation produced with computers and advanced mapping software. However, the same data represented

in a GIS map may be accepted as fact without challenge. It could cause the rethinking about what parts of town are the most prone to house fires, for example.

Wood and Fels (1986) provide the most well recognized articulation of a map's ability to assert truth through their deconstruction of a North Carolina Official Highway Map. They begin by highlighting the codes and naturalization, explaining the way the map highlights roads while ignoring biking paths, displays locations for tourist activities while silencing its other economic drivers, asserts the state's identity through pictures of the state flag and state bird, selects "points of interest" for travelers, and even offers a little prayer for drivers, the "mask of innocence and transparency" (Harley 1989, 9). The map creates a hierarchy of towns and roads as to organize the way in which those who move through the spaces of North Carolina are viewing the landscape. As one drives through a small town, the hollow black dot that represents it on the map tells the reader "this is not the best that North Carolina has to offer. Wait till you get to the city indicated by the star with a circle around it!" These codes are used to make assertions about what it is that gives North Carolina its North Carolina-ness. Wood and Fels make the case that these cartographers, while they were making this map, were actually *making* North Carolina.

Maps can confirm their readers' already socially-produced impressions of a place, or they can encourage their readers to think about space in a different way. If a map has been naturalized completely, the new or reaffirmed information represented through the map can transform from a simple claim to a truth. When a claim is accepted as truth, the claim can provide the foundation or justification to inspire action in the world.

2.4.1.4 *Maps inspire action*

Just as the map makes mythic objects into reality (Pickles 2004), maps can inspire the transitions of thoughts and ideas into reality. Maps, and their assertions of truth, are the perfect

tool for providing validation for decision making, informing a larger conversation around a pattern or process, reporting history, or simply navigating between destinations.

In my example of fire reporting, a boundary line on a map asserts a truth that a person's house fire would be serviced by fire station 16, but if she lives on the other side of the line, she must be served by a different station. In the instance that a resident who lives inside of the fire station 16 boundaries would call the fire department, fire fighters from station 16 would be called into action and trucks would be driven on the determined quickest route to get to her home. In a map that represents the concentration of reported house fires, this resident's neighborhood, having been determined a hot spot for fire concentration, could be the location of door-to-door canvassing by members of the Red Cross to provide free smoke detectors to residents.

Through these three pillars of power I identify, maps are able to create and reinforce power-knowledge in the world. Critical cartography exposes the entire political process, including these pillars, within which professional map production exists. With an increased understanding of these power relations, recent movements in mapping have begun to challenge top down approaches to mapping, developing critical mapping strategies.

2.5 Critical mappings

Recent modes of cartography have been "slipping from the control of the powerful elites that have exercised dominance over [cartography] for several hundred years," (Crampton and Krygier 2006, 12). If maps are tools that the professionals use for knowledge production, is it possible that the public could make competing and equally powerful claims with maps (Crampton 2010, 41)? Mapping that challenges professional map-making has been framed as critical mapping (Wood 2003; Crampton 2010; Wood and Krygier 2009). More specifically, according to Crampton (2010: 41), "Critical mapping operates from the ground, without top-

down control and does not need the approval of experts in order to flourish.” Critical mapping differs from critical cartography in that the mapping confronts the power dynamics that have been revealed by scholars of critical cartography through practice.

One well-recognized example of critical mapping is an art map, or a representation of space created by individuals or groups that either utilize previously created maps (typically ones made by professionals) or construct their own representation of space using less traditional methods (see Figure 2). Wood argues that by expressing space through art, the mask of neutrality is stripped away from the map, as art does not attempt to veil its biases, allowing the biases to be discernable and open for discussion. There is a great deal of interest in the work of art maps because of the way they “... contest not only the authority of professional mapmaking institutions... to reliably map the work, they also reject the world such institutions bring into being,” (Wood and Krygier 2009, 9). For example, the picture below depicts a map of Paris that

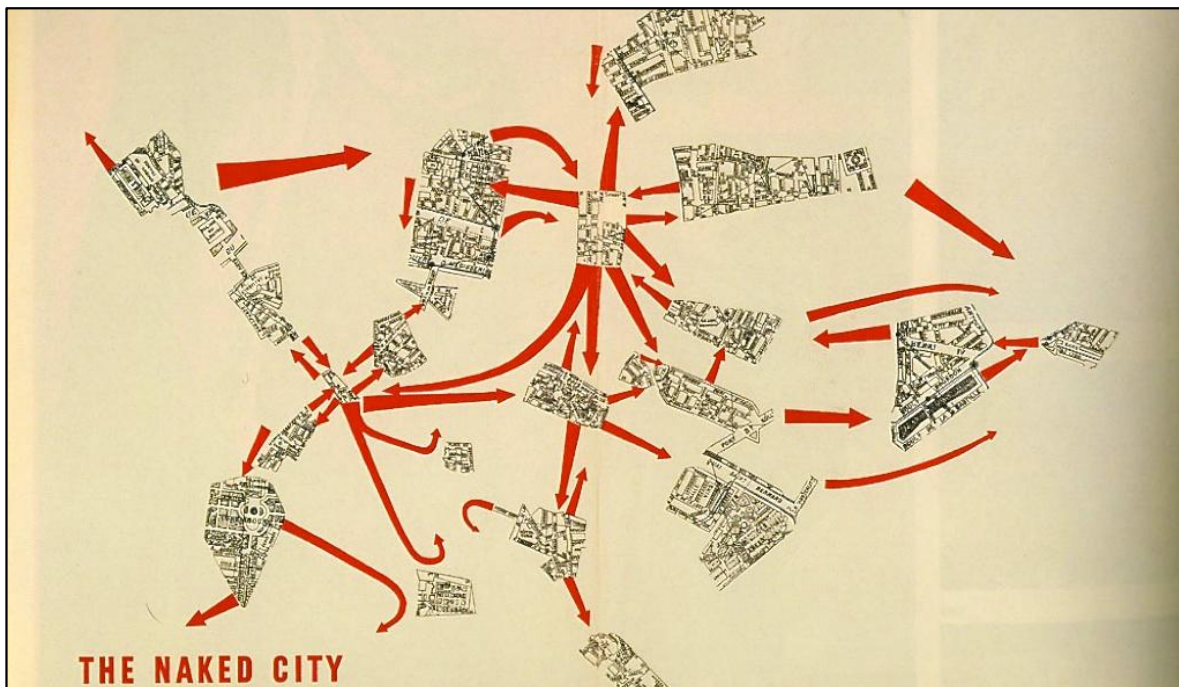


Figure 2. Art maps challenge professional cartography
 Guy Debord. (1955). The Naked City, 02 25, 2015, from: [http://www.ultra-book.com/users_2/t/a/tatalaeti/img_cms/images/guy%20debord\(2\).jpg](http://www.ultra-book.com/users_2/t/a/tatalaeti/img_cms/images/guy%20debord(2).jpg)

has been split up into its different neighborhoods; red arrows have been drawn to represent how Parisians generally travel between the different neighborhoods. This subjective view of Paris demonstrates how these alternative methods can starkly contrast and challenge the authority of the professional mapmaking institutions while at the same time revealing a particular perspective about the city. Beyond the instances of art maps, due to the latest “technical transition” (Perkins 2003), anyone who has a home internet connection has the ability to utilize open source, collaborative, mapping tools and engage in forms of critical mapping. Perkins (2003) and Monmonier (1985) assert that recent technological transitions of mapping practices are creating opportunities not only to advance the technical abilities of professionals, but to advance the mapping practices of the public through the introduction of open source data, mobile mapping technology, and the geospatial web. Through map hacks (using a web based map for one’s own purposes), hybrid, or even every day mappings, individuals are asserting their claims about a space through the use of newly available technologies (Crampton and Krygier 2006). Crampton (2010) demonstrates how tools such as Google Earth provide individuals who have an internet connection the ability to create interactive, 3D visualizations, and agrees with Perkins and Monmonier that mapping has been taken out of the exclusive realm of professional cartographers. As mapping continued to expand outside the boundaries of professional cartography, members of the public worked together to create maps that represented their own spatial claims in a process known as community mapping.

2.5.1 Community Mapping as Critical Mapping

Community mapping occurs when a map is produced, “...by a particular locale, often featuring local knowledge and resources” (Parker 2006, 23 emphasis added). Local knowledge is incorporated when mapping is made available to “... the amateurs as it asks participants to

share their experience, their values, their vision about a particular place” (Lydon 2003, 4). These methods engage a critical mapping approach, as they take map creation out of the hands of the powerful by giving members of the public the ability to make maps. This redistribution creates opportunities for entire communities to engage in discussions around space and actively articulate social, economic, political, or aesthetic claims about that space (Perkins 2007). The ability to assert spatial claims through maps is especially important for marginalized communities, as they typically do not have available to them the resources that allow them to create knowledge about their neighborhoods. There are a number of well-established community mapping projects that have gained a significant amount of traction regionally and globally, including the UK-based project *Parish Map*.

2.5.2 *Parish Map*

One of the earliest well-known community mapping projects began in 1985 when the charity Common Ground, based in the United Kingdom, began the Parish Map Project. This traveling initiative encourages local residents to map their parish using whatever skills or knowledge they have. Common Ground was keen to avoid centralized standards and only offered general guidelines as a way to encourage communities to represent their unique perceptions about their spaces. Since its inception, over 2000 communities have engaged in the parish mapping project (Perkins 2007), a large percentage of which are in rural England (Crouch and Matless 1996). The lack of central standards for the initiative and high levels of participation led to diverse outcomes. Community mapping engages participants in process of negotiation; Perkins (2007) reflects that, “The process sees different voices raised. The remit encourages sharing, but the format tends to articulate a single voice. On the surface most parish mapping seems to be uncontested, largely aesthetic and to reflect a single unified sense of place. But final

products often hide uneasy and negotiated compromises” (Perkins 2007, 131). While disagreements may be masked by the map, the act of mapping allows opportunities for interaction and dialogue between community members. Perkins (2007) explains that, “many parish mapping projects have also involved a strongly performative element...,” meaning that the mapping initiative sparked the organization of community events and social gatherings. Simply by engaging in the mapping project, communities further built social relationships. Community mapping projects often highlight the processes that take place in refining the vision of a large community into one singular representation. The Green System project is another example that faces the challenges of representing the opinion of many in a map.

2.5.3 The Green Map

The Green Map System is a well-developed example of what a technology-based community mapping can accomplish. Through the collection and sharing of locally-collected data in the Green Map Systems online database with a standardized set of symbols and mapping practices, the program sets out to create a depiction of sustainable development around the globe. The program’s first map was made of New York City in the 1990s and was created as a way for community to make eco-cultural claims about their neighborhoods to aid in the development of a model for sustainable planning. From this installment, the project has grown to a global network of projects that have been completed in 900 communities in 65 countries. Similar to the Parish Map Project, the Green Map system is centrally organized while leaving the work to be done by the community that is being represented. However, the Green Map project places a greater emphasis on a structured process and methods in an attempt to standardize global data sets. This structure can restrict a single community’s ability to make its claims, as participants must conform to meet the established guidelines (Parker 2006).

As more and more people are participating in mapping, is it possible that the spatial claims made by the public can wield the same types of power as the ones that are made by the professional cartographers? That question has not yet been examined in detail. While scholars of critical cartography propose the framework from which to do so, there has been no area of study that has ontologically examined this. Crampton (2010, 37) asserts that community and participatory mapping is "...not likely to provide solutions for underserved populations to bootstrap themselves out of poverty", in a discussion of the democratization of cartography, but does not further explain why this is to be true. But it does appear to be true that community mapping, and other critical mapping efforts, continue to lag behind professionally-produced maps in the sense that the main power they seem to have is that they have been produced through bottom-up methods. It remains to be seen if there have been any significant upsets of power relations in decision-making conversations, as maps used by local, city, state, and federal leaders do not resemble that of the Paris art map or the parish maps but instead remain as spatial representations that reflect the Arthur Robinson-era of cartographic methods. Because of this, I propose a new methodology of mapping that attempts to bridge the ability to be critical and the ability to be powerful. This methodology is couched in the effective approach of participatory action research.

2.6 Participatory Action Research

Participatory action research (PAR) references a research methodology that partners researchers and members of the public together in working towards effecting positive change. This methodology challenges the traditional understanding of "objective" scientific research design, removing the barrier between the "researcher" and the "researched" (Wadsworth 1998) and offers a method of equality that attempts to directly benefit the communities involved

(Kindon et al. 2007). McIntyre (2007,44) suggests that PAR is a method for researchers who are, “committed to co-developing research program with people rather than for people.” While the primary goal of much qualitative research is to understand a phenomenon from an individual’s viewpoint, PAR incorporates action into the research approach, which is “the systematic collection and analysis of data for the purpose of taking action and making change” (Gillis and Jackson 2002, 265). What most distinctly separates PAR from other qualitative methodologies is the active inclusion of participants in the action research process (MacDonald 2012). As such, PAR is considered democratic, equitable, liberating, and life enhancing (Kach and Kralik 2006). This methodology has been heavily applied to four main areas: community development, organizations, schools, and environmental studies (Selenger 1997).

2.7 Participatory Action Mapping

Through the review of the literature, in addition to my experiences as a student of geography and GIS, it becomes apparent that participatory mapping methods are failing to offer the public significant opportunities for sustainable empowerment. Therefore, I suggest PAM as a methodology that combines the resources and expertise of PPGIS, the critical mapping perspective of community mapping, and the effort to effect positive social change of PAR. Through this methodology, mapping experts and members of the public work in tandem to create maps that advocate for social change. While a mapping collaboration can be acted out in a wide range of combinations of efforts from either party, the main premise of PAM is that both the mapping expert and the non-expert/s are actively engaged in the process of deciding and acting out what to map and how to map it.



Figure 3 Participatory Action Mapping

There are six key elements that make up PAM. The first and most significant element is that the **partnership is based on equality**, as is the case with most participatory action methods. Such a partnership often requires ample opportunity for the establishment of trust. Especially in communities suffering from larger issues of systemic disenfranchisement, residents suffer from fatigue as they have worked with multiple “helicopter researchers” (meaning researchers who “literally or figuratively fly into their communities, administer surveys, and leave-never to be heard from again by the community” (Ferreira and Gendron 2011, 154)). Another way to avoid a “helicopter researcher” experience, and the second element of PAM, is that it is best that the community engaged in the partnership should **have a need or desire in place for maps and mappings prior to the creation of the PAM partnership**. I argue that this element provides the strongest foundation for a meaningful partnership and helps avoid the engagement of community members in mapping simply for the sake of fulfilling course or dissertation requirements for the academic partner. A third element of PAM is that it is best to **define who participates and in what ways early** on in the partnership. This process of definition provides a foundation of expectations for all involved in the research, allowing all parties to move forward with confidence. These definitions of participation should not be rigid, however. Community work is very fluid, and the methodology should be so as well. Therefore, PAM’s fourth element is to

keep an open and flexible workflow. This flexibility allows for a process of refinement to take place during the mapping process. The process of refinement is very important for the success of PAM to ensure that maps produced through the expertise of the mapping partner are precise in their expression of the community's perspectives. Therefore, the fifth element of PAM is **engaging in an iterative mapping practice.** This can be performed through the presentation of multiple drafts of maps to the community members. When presented with a draft, community members are prompted to provide detailed feedback with the goal of ensuring the map/mappings align with the community's perspectives as closely as possible. Changes are made based on community feedback, and the updated draft is presented for additional feedback. This process repeats as many times as necessary, or as negotiated by the partners. The sixth and last element is to **employ sustainable mapping methods.** Sustainable, in this case, refers to the ability of the maps and mappings to continue to work on behalf of the community once the partnership has expired. This requires that the community has access to, and potentially workable knowledge of, the map data and tools used by the mapping partner. By engaging these six elements, PAM strives to provide a framework for research that is supportive in exploring and challenging everyday injustices faced by community members.

While the history of our present day understanding of maps remains brief, there has been an even shorter span of critically examining the ways in which maps are produced and how they act in the social world. While critical cartography exposes the power that maps hold, critical mapping has emerged to challenge the constraints of professional cartography. As methods such as community mapping and PPGIS produce maps that are either whimsically critical or inaccessible to the public, PAM is an approach that attempts to bridge the two. There are additional forms of participatory methodologies that are worth mentioning briefly here as a way

to establish their connections and distinctions to PAR. Counter mapping is a type of participatory mapping that pairs indigenous populations and researchers or activists to produce maps that can be used to advocate for the rights of indigenous peoples (Peluso 1995, Chapin et al 2005, Herlihy and Knapp 2003, Harris and Hazen 2005). The term counter mapping was coined by Nancy Peluso (1995), who accounts of using sketch maps to assist the indigenous population in Kalimantan, Indonesia re-claim forest territories that were being taken over by industry. While counter mapping efforts share the type of partnership model of PAM, the partnerships are typically led by academic activists and thereby do not fulfill the practices of equalization enacted by PAM. Another form of participatory research is community-based participatory research (CBPR). CBPR focuses the efforts of PAR within a self-defined community group and has been practiced largely by researchers in public health (Israel et al 1998, Wallerstein and Duran 2003, Minkler and Wallerstein 2008). The action oriented prospects of methods such as PAR or CBPR closely align with many of the six tenants of PAM. PAM, however, narrows the lens onto a specific method, mapping, in ways these other methodologies do not.

Through an examination of the ways in which the tenets of critical cartography exist in PAM, I seek to examine this methodology in its potential to be a process that is simultaneously critical and effective, acting as a way to access the power that professionally-produced maps hold.

3 RESEARCH QUESTION AND METHODOLOGY

This study's guiding research question, framed by literature in critical cartography, public participatory geographic information systems, community mapping, and participatory action research, sets out to explore the proposed participatory action mapping (PAM) methodology. More specifically, I explore the ways in which PAM lives up to the processes revealed by critical

cartographers. Therefore the guiding question for this research asks the following: **In what ways does participatory action mapping (PAM) fulfill or challenge insights offered by critical cartography?**

To answer this question, I employ a case study approach to observe the ways in which members of a community-based organization and I, utilizing the tools and techniques of a professional cartographer, engage in the co-production of knowledge through mapping. A case study approach is the application of a close examination to a single process to reveal applications that can be used in a broader context (Yin 2009). For this research, I will examine my mapping

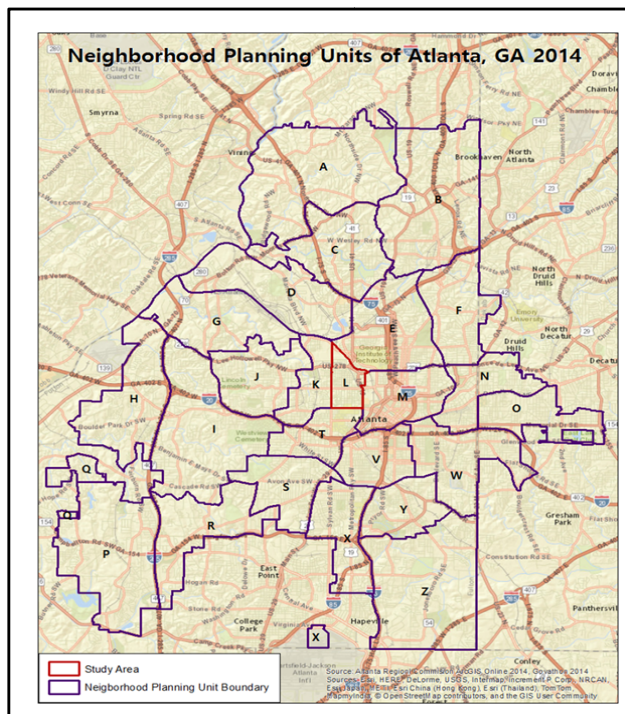


Figure 4 Map Showing Neighborhood Planning Units of Atlanta
Map by Amber Boll

partnership with the Westside Atlanta Land Trust (WALT) and my experiences in English Avenue and Vine city community mapping project to examine the successes and failures that

PAM elicits. The empirical research for this project consists of two forms of data collection: 1) direct and participant observation during the advisory board meetings for WALT and 2) individual interviews engaging the members of WALT in a critical examination of maps.

3.1 Case Study

The mission of the Westside Atlanta Land Trust (WALT) is to “...organize the community’s power for self-determination to serve and preserve in-place residents, small businesses and their successive generations in redeveloping areas (waltprogram.org).” Its primary efforts are performed through the development of a community land trust (CLT) model. A CLT is a model for collective ownership of land, where members of the land trust are all considered owners of the land while the structure on top (e.g., the house) can be rented or owned by an individual. This allows the individual to only pay taxes on the structure they are occupying and not the land, as the property taxes are the responsibility of the land trust. WALT utilizes this method of property ownership as a method to create an affordable housing stock within the community.

WALT concentrates its work specifically in the English Avenue and Vine City neighborhoods, which combined make up Neighborhood Planning Unit (NPU) L in Atlanta’s twenty-five district citizen advisory council divisions (see Figure 4). The 2010 Census reports NPU L to be home to over 7,000 residents, the majority of which are Black (see Table 2). This area is located in a portion of Atlanta that is undergoing redevelopment (see Figure 5). As such, the model to create affordable housing for residents is relevant to preventing residents from being displaced by the forces of gentrification.

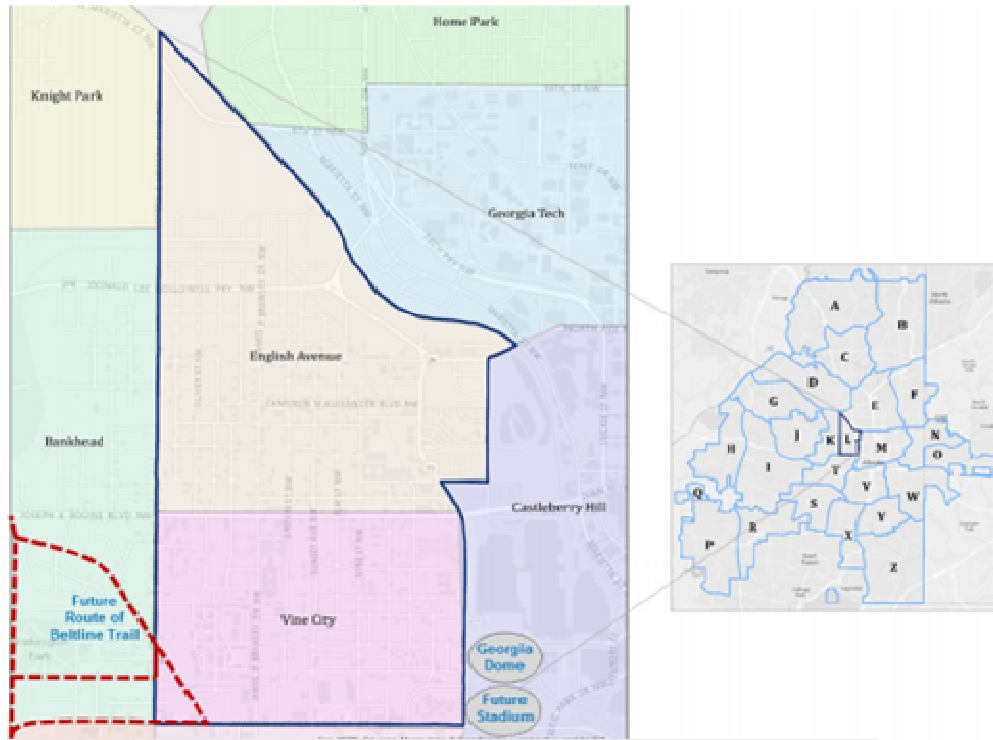


Figure 5 Development Near NPU-L
Map by Amber Boll and Andy Walter

3.2 Establishing the Partnership

Members of WALT have completed a previous research project in collaboration with Georgia State University's Department of Geosciences. More precisely, during the summer of 2014, Dr. Katherine Hankins advised a group of undergraduate students participating in a National Science Foundation (NSF) funded Research Experience for Undergraduates (REU), as they completed a research project with WALT. The leaders of WALT and Dr. Hankins have kept in contact and in fall 2014, leaders of WALT reached out to Dr. Hankins to ask for some assistance in utilizing the data from the summer's research projects to make maps. Dr. Hankins, aware of my interest in community mapping, asked if I would like to take on the community-mapping project with WALT. In October of 2014 Dr. Hankins and the leaders of WALT

arranged an introduction meeting where I was able to meet with them for the first time and, after hearing about their specific mapping needs, agreed to take on the project. Since this date, I have been attending WALT advisory board meetings.

3.2.1 Study Site

Research was performed at three locations. The first location was the meeting space for the WALT advisory board meetings. These meetings took place the first and third Saturday of the month from 3pm to 5pm at 186 Sunset Avenue. The second location was the Parent as Partners Academic Center 225 J.P. Brawley Drive (Vine City neighborhood) and the third was the Outdoor Classroom & Learning Garden at 386 Elm Street (English Avenue neighborhood).

3.3 Observation

I completed both direct observation and participant observation as part of this research. I observed a series of bi-monthly public advisory board meetings for WALT. These meetings were held the first and third Saturday of the month from 3pm-5pm at the Neighborhood Union Health Center Community Room and have been averaging attendance rates of approximately thirty people, including adults and teenagers.

3.3.1 Direct Observation

Observations were made to assist in determining the spatial understanding that WALT members have toward their neighborhood and to gain an understanding of what it was that members of WALT would like to assert about their neighborhood in the creation of maps. Additionally, observation of these advisory board meeting allowed me to become familiar with the group, their mission, and their plans for action, which was necessary to situate their desire for

the maps and to understand the perspective from which WALT asserts spatial claims through mapping efforts.

I observed characteristics about the population that was in attendance at meetings. This refers to generalized age (youth, middle aged, and senior), gender, race, and level of participation throughout the meeting. Observations were made regarding the use of, reference to, and discussion around maps that took place during the meetings. Additional observations were made when specific spatial locations within the English Avenue and Vine City neighborhoods were referenced.

Table 2 Demographics of NPUL

Demographic Breakdown of NPUL	
Identity	Population 2010
Hispanic/Latino	193
White/Caucasian	407
Black	6464
American Indian	10
Asian	62
Hawaiian/Pacific Islander	0
Other	8
Two or More Races	163
Total Population	7307

Source: 2010 Census

3.3.2 Participant Observation

During advisory board meetings, I participated in conversations surrounding the creation of community maps. Participation was experienced first through a brainstorming session to determine what maps the members of WALT desired. A prioritization of these maps allowed me to know in what order the maps should be produced. From there, we determined appropriate data

sets and formulated methods for primary data collection. Once data were collected for a map, it was organized and visualized using Esri's ArcMap 10.1. The second point of participation was when map drafts were presented to the organization to ask for feedback, comments, and design suggestions. Hand written notes were made during points of participation, specifically surrounding map brainstorming and editing, which were typed and analyzed using Nvivo 10.

This process required researcher reflexivity. To invoke a more rigorous type of reflection, I participated in weekly discussions with my advisor. In addition, I attended a bi-weekly meeting for geography researchers, consisting largely of Master's students in the Department of Geosciences. During both types of discussion I was able to be critical towards my role in the community-mapping project to uncover the ways in which I was personally influencing the process of mapping with members of WALT.

3.4 Interviews

Interviews were completed after the community mapping projects were finalized. This portion of the research engaged members of WALT in a critical assessment of the co-produced maps. Leaders of WALT (CEO, Executive Chair, Vice Chair) were interviewed individually and asked questions about the maps that we produced throughout the mapping partnership. Snowball sampling was used to gain access to additional members of WALT to be considered for interviewing. Interviews generally lasted between 30 and 45 minutes with some lasting up to an hour and participants were compensated for their time with a gift card with a minimum amount of \$20 to Wal-Mart. Interviews took place at one of two WALT locations. The first location was the Parent as Partners Academic Center 225 J.P. Brawley Drive (Vine City neighborhood) and the second was the Outdoor Classroom & Learning Garden at 386 Elm Street (English Avenue neighborhood).

Interviews consisted of three sections: 1) Personal map use, 2) Community map reflection and 3) Mapping partnership reflection (see Appendix A participant list). Section 1 was developed to establish a baseline for how members of WALT talk about maps in general conversation. Understanding what words they use to describe the maps that they use in their daily lives helped me understand their interpretation of the collaboratively produced maps. Section 2 asked interviewees to provide a summary of their experience throughout the PAM process and recall the goals that members of WALT set out with at the initial stage of the project. They were then asked to provide feedback about the final version of the maps and mappings produced through PAM. Section 3 asked interview participants to reflect on the process and outcomes of PAM. Interviews were transcribed and coded using NVivo 10 for emerging themes couched within the tenets, or my three identified pillars, of critical cartography.

3.5 Researcher Subjectivity

I am a white, female researcher in my mid-twenties and I have spent a large majority of my life in rural Minnesota and North Dakota. I have had four years of GIS and cartographic training focusing around the use of Esri's ArcGIS. Many of my classes have focused around service learning objectives in which maps were made for a community-mapping partner. In past partnerships, the community-mapping partner has presented a range of mapping needs that they have and students are then tasked to create maps with these needs in mind. There is little collaboration on the collection of datasets, discussion around design principles, or even sharing of preliminary map drafts. Final drafts are simply presented to partners near the end of the semester. The creation of this research question and the development of participatory action mapping were impacted by my past experiences as a graduate research assistant for the Atlanta Community Mapping and Research Center at Georgia State University during the 2013-2014

academic year. As mentioned, it was during that time I assisted in numerous PPGIS project and began to question the ability of the maps to achieve what it was that the community-based organizations were setting out to accomplish with the creation of maps. Turning to an action-oriented, open mapping process largely addressed the shortcomings, as I demonstrate below.

4 RESULTS

As a methodology which is informed by critical cartography, participatory action mapping (PAM) is effective in producing community-based mappings in that it allows the final, collaboratively-produced representations the ability to stand up against professionally-produced maps. This ability grants members of the public access to resources and knowledge, allowing them to produce maps which have the ability to “speak” on the level of professionally articulated maps. Through processes of direct and participant observation, document analysis, and individual interviews, this research utilized the main pillars of critical cartography to analyze the process and results of PAM and how it measures up to professional mapping processes.

4.1 WALT Maps and Mappings

In order to fully appreciate the mapping process and the potential for PAM, it is necessary to understand the maps and mappings that were produced throughout my partnership with WALT. In what follows, I provide an overview of each map (see Appendix B for an image of each map).

The first mappings were a pair of two maps, one a poster map and one an interactive web-based map, that highlight the area’s systemic suffering from infestation of black mold which has become incurable in many homes. The poster map was the “Implementation Strategy: WALT Smart Relocation in NPU-L” while the web map was “1894 English Avenue and Vine City”. The concept of this map was proposed by a leader of WALT early on in the partnership

who wanted to highlight from different perspectives on the causes of the damp conditions that allow the black mold to thrive. Because of this leader's intimate knowledge of the area, which had been informed through antique maps in addition to an understanding of the reported oral histories, he knew that there had once been creeks that flowed through the area, which had been filled in and later became the ground upon which houses were built. With an understanding of the water drainage system, this leader and other members of WALT suggested the need for a map that simply highlights the elevation of the area to extract information about which homes are at the highest risk of mold infestation due to being located in an area where water collects during heavy rains. I will refer to these maps as "Smart Relocation" and "1894 Overlay" when discussed individually and "Elevation and Water maps" when discussed as a pair.

The third map that was created as part of this partnership is the "Vacancy in NPU L" map. The purpose of this map is to display the amount and location of vacant residential parcels in neighborhood planning unit L. This was achieved through the display of Fulton County GIS data sets from each year between 2009 and 2014 in a poster map. The color scheme reflects the hues used in the WALT logo. The concept for this map was proposed by a member of WALT during the presentation of the Smart Relocation map and, as questions began to arise regarding the accuracy of the Fulton County data, members wished to examine the story that the dataset tells regarding the vacancies in the area over time. I will refer to this map as "Vacancy Over Time".

The final product produced through this partnership was a mapping methodology that allows members of WALT to survey the built environment of English Avenue and Vine City neighborhoods as a way to refute the claims (which has been determined as inaccurate by community residents) made by the Fulton County GIS data. Data collection is completed through

the population of a feature layer through a web map, which are both hosted on Esri's ArcGIS Online platform, using Esri's Collector for ArcGIS smartphone application. The feature layer and web map are titled "WALT Built Environment Survey". I will refer to this mapping as the "Built Environment Survey." The point-based feature layer allows for a drop down menu of category options with which a point can be symbolized. The categories are currently as follows: abandoned lot, vacant lot, closed business, operational business, church, fire-damaged structure, occupied good condition, occupied needs improvement, occupied dilapidated, vacant good condition, vacant needs improvement, vacant dilapidated, school, miscellaneous/other. Additional attribute information about each point consists of fields that are populated with text: owner, when the most recent owner was applied, if there are any back taxes, and the parcel identification number. One of the most impactful amenities of this application is the ability to capture and attach media such as pictures and video. To add clarity to how this mapping method is performed, I provide a brief overview of what each member of WALT performing the data collection would experience.

To begin, if the member of WALT is not a resident of the area, she will begin by determining a local guide that is able to join her in the neighborhood for data collection. Once in the area with a resident, the WALT member stands in front of a property parcel for which data has not been collected and uses her smart device. 4G must be enabled to open and load the Built Environment Survey within the Collector for ArcGIS app. With the web map displaying on the device, the WALT member selects the "Collect a New Feature" button. A list then appears containing each of the symbols of the categories discussed earlier. With the intimate knowledge of the resident, whether that be from the WALT member herself or from a local guide, she knows that the house that is on the parcel that is being classified actually experienced a severe

kitchen fire which was never repaired. So although the building simply appears to be boarded up and vacant, the WALT member will apply the classification of “Fire Damaged” to this parcel. Once a classification is selected, the screen shifts to a list of the additional attribute information. The WALT member may then type in the information about the kitchen fire into the notes. Here is also where the media is attached. This is completed when the WALT member selects the “Attach” button and uses the camera on her device to capture a picture or video of the parcel. When a satisfactory picture has been taken, the WALT member selects “Done”, attaching the picture. Once any attribute information and attached media is complete, the app then switches to a map screen where the WALT member can use the location determined by the smart device to place the location of the point. Once saved, the web map is then updated in real time, meaning that an individual on another device can refresh his map, and the new point will display. After completing the point placement portion of the data collection process, the WALT member then returns to the WALT operating office and populates the attributes of owner, ownership year, and back taxes after completing research on the parcel using Fulton County tax assessors’ resources. WALT’s goal is to collect data for each parcel within NPU L. The feature layer and web map went live in March of 2015 and as of the end of May 2015 WALT members have collected over 850 data points.

The creation of these three maps and the one mapping platform took place from October 2014 to March of 2015. Beginning in June 2015, WALT members and I have been holding weekly meetings to provide training for members of WALT on how to maintain, edit, and create new features and web maps such as the Built Environment Survey and the 1894 Overlay. Now that a foundation has been established in reference to the map and mappings that resulted from

the PAM approach and my partnership with WALT, I now examine how these representations and the process of formulating them fulfill or challenge the main tenets of critical cartography.

4.2 WALT and Key Elements of PAM

Along with the first element of PAM, this partnership between members of WALT and me was based on equality, meaning that we each had skills and information that the others needed. As discussed, a partnership often requires ample opportunity for the establishment of trust. In my participation with WALT, it was clear, if only by the color of my skin, that I was an outsider to this organization and I would need to work to gain their trust. As it was agreed that I would engage in mapping practices with WALT's entire membership body, I worked to build rapport with WALT members by attending bi-monthly advisory board meetings regularly. WALT members later shared that simply by being present at meeting after meeting and asking questions, I already had set myself apart from the typical researcher. What also helped establish my trustworthiness and my effectiveness in facilitating a PAM research methodology was my active listening and working to meet their requests. I worked to understand what exactly they wanted to accomplish with the maps we were working to create.

This partnership was possible because they had a desire in place for maps and mappings prior to the creation of our PAM partnership. Leaders and I determined at the beginning of the partnership that I would work to make a map addressing the arson-for-profit problem the community is facing (where property owners collect insurance money for deliberately-set fires) in addition to an examination of the condition of the area's sidewalks. So during advisory board meetings, I was careful to pay attention to conversations that focused on these issues. However, because of a perceived acceleration in the stadium and Beltline development process, the priorities of the organization changed, and so did their mapping needs. My ability to engage in an

open and flexible research framework, with the in depth understanding of their mission and goals was established with my regular meeting attendance and rapport building, which enabled me to adjust the previously established mapping plan to better meet their mapping needs. When it came time to engage in the mapping process, each map was shown multiple times, allowing WALT members the opportunity to provide critique. Changes were made based on feedback, and an updated draft would be presented. In regards to the sustainability of the maps and mappings, copies of all files of the maps have been shared with WALT if they want to update or re-use data or maps that I created. Additionally, all of the data that was collected as a part of the Built Environment Survey was done in HELP ORG INC's ArcGIS Online organizational account, not the account of GSU. Lastly, upon request of WALT leaders, we have met once a week for two months for training sessions. For these training sessions, members of WALT make requests about what types of mapping methods they would like to learn and I develop and deliver hands-on training for members of WALT on the requested methods. Now that I have provided a foundation for how the overall project fit within the framework of PAM, I examine how these maps/mappings and the process of creating them fulfill or challenge the main tenets of critical cartography.

4.3 Naturalized Coding through PAM

As I discussed in chapter 2, codes are the sets of conventions that communicate meaning, and naturalization is when the codes become masked, causing them to go unnoticed. This portion of data analysis examines the most prominent ways in which coding and naturalization are present or absent in each of the maps produced during my partnership with members of WALT. This analysis reveals that the process of coding and the masking of these codes occur in the instances of PAM because the maps were coded using techniques that are similar to those that

professional cartographers use. Because I was trained in cartography and GIS, I use my skill sets to express the arguments being made by members of WALT, thereby allowing these arguments to be made with similar systems of codes and processes of naturalization.

The WALT Smart Relocation map had two primary characteristics that were brought to the forefront of conversations around coding and naturalization: color and dataset. The coloring in the symbology of this map is an aspect of this map that received a lot of commentary, most often with a very positive tone. WALT members appreciated the bright hues and the use of red to associate with low elevation, correlating it with a “bad” feature, and the green as a representation of high elevation represented a “good” feature. The use of red to represent bad and green to represent good is a social construct. By utilizing this code on the map, the representation attaches meaning to what is good and what is bad. The low lying area is bad, even though in different applications, it could be that the low lying areas would be “good” and vice versa.

The reason why I love this map [is] ‘cause I love colors. I love colors. I told [name of other member] this, when I seen this implementation strategy I told her, you know what draws me to this map ‘cause of these colors. I mean this red, you know, red is always a hotspot...a trouble spot (Aaliyah).

The colors is awesome. Yeah wow. Look at the red. I mean it really shows you....Yeah. Water. That’s the water. You can see it. And then it gets oranger.... I mean, even a toddler can look at this and know what they’re looking at (Mason).

By implying that even a toddler could read this map, this member makes clear that he believes the meaning of the color is obvious to even the most untrained eye. The color has become neutralized in a way that makes people think, “how else would this be represented?”

The colors of elevation data represented were accessed from the Atlanta Regional Commission GIS data hub. At no time did this data and questions about its accuracy ever enter into the conversation. The additional data that were represented regarding the residential parcels and whether they were occupied or vacant were, however, put into question in a number of

instances. This data were accessed through the Fulton County GIS data hub. It should be noted, however, that this questioning was not consistent.

The first challenge of the Fulton County GIS data was during the initial presentation of the first draft version of this map. During this presentation, one of the most respected leaders of WALT gently stated that he did not feel that the data were representing an accurate number of classified vacancies and that the real number is much higher than the county's database suggested. Everyone quickly followed suit. This dataset, for a moment, became the primary focus of the conversation; a member inquired where the data were from, and when I informed them that it was from the Fulton County tax assessor's office, the dialogue shifted. Members of WALT expressed confidence that the data were not correct. This ability of members of WALT to call into question the accuracy of the data highlights the inability of this particular coding to have naturalized the data. However, this inability does not hold true in every instance. When members were shown the same map during the individual interviews, only two individuals pointed out the supposed inaccuracy of the dataset without being prompted. In this map, however, the Fulton County data was not the focus, the elevation was. This means the coding of this map did not prompt map readers to examine in detail the accuracy of the Fulton County data. In the NPU-L Vacancy map, however, the vacancy reports of the NPU-L data *were* the focus, granting map readers to then become aware of the inaccuracies. This difference highlights the importance of the context in which coding takes place. In both maps, the Fulton County data was successfully coded and naturalized; the different reaction to the same coded data was a result of different coding context.

The 1894 Overlay map, because of the seemingly straight-forward nature of its representation, underwent a seemingly effortless process of coding and naturalization. This

apparent ease in reality speaks to largely to social processes of naturalized coding. A member of WALT explained,

This is my favorite- this is [a] history map... Everything is in this picture. You got the modern dome, which you can see a piece of where they're building the new dome, you got downtown, you've got a neighborhood- how it looked in 1894! You're crossing, what's that... 160 years!? Wow... WALT can show, "Hey you see these hills? You see these creeks?" And now I'm going to slide over here. You can see the problems from here to eternity (Mason).

By overlying this historical map on top of current day aerial imagery, the map truly does appear to be an absolute objective representation, an unbiased representation of the area. It must be remembered, however, that this map specifically directs users to pay attention to the rolling hills represented in the 1894 map and compare those locations to the present day imagery. The map is coded in that is it guiding the user to view the representation through a specific lens.

The processes of coding and naturalization within the Vacancy in NPU L map was atypical compared to the other maps in that the map naturalized incorrect data. Typically when naturalization is discussed, it is done within an arena where the data are being presented and accepted as a mirror to reality. In this case, the map was effective in naturalizing the concept that this dataset was indeed *not* serving as a mirror to reality.

In this map, the different-sized rectangles represent different property parcels, and the color coding assigned to them represented whether the parcel was classified as occupied residential, vacant residential, or non-residential. There were six data sets being represented in this poster-sized map. As such, in order to bring to the focus the main objective of the map, the vacancy counts of each year, I placed the number of total vacancies next to the corresponding data frame for each year. It was the presence of these numbers that significantly assisted in enabling the map to naturalize that the represented Fulton County data were incorrect.

That ain't right. I can count this on just on maybe 2 streets, 3 streets, and you know how many streets we got on our neighborhood. That ain't right at all... You know that's completely off. I don't know where they get their numbers from. This is way off. You know that just by lookin' at it (Ethan).

More simply put, on WALT member states

[Fulton County] is not telling you the truth. And why?... Shoot, I mean James P Brawley [a street in the neighborhood] is a ghost town. Just driving up that street alone, you would look at this again (Chloe).

Through the coding that takes places in this map, the data was naturalized as being incorrect. The built environment survey is examined through a different lens than the previous three maps.

Because it is more of a data collection platform than it is a final map, the data is in a consistent state of flux as it is being collected, organized, and edited. The two images of the Built

Environment Survey show the look of the survey at two different points in time, highlighting the ways in which the editing process is changing the look and feel of the web map. The reason that these edits and changes to the symbology are being made is due the training sessions I have

recently been providing for leaders and members of WALT. Three sessions took place throughout the month of May 2015 where WALT members were trained and briefed on how the map was made, how to make edits to the map, and how to maintain the database in order to continue successfully the mapping process once my partnership with WALT comes to an end.

Once the members of WALT had the ability to make edits to the map on their own, changes were made to the symbology for each of the classifications in addition to the applied base map. The differences proved to be very significant in the visual representation of the web map. By changing the symbology, the members of WALT are changing the way the represented data is coded. Within the methodology of PAM, members of the community are able to adjust directly the application of codes in ways such as this.

During a preparation for a presentation, the PowerPoint presentation from a previous presentation from which we were editing for the upcoming presentation, had in it screen shots from the earlier version of the web map before the edits to the symbology. One leader of WALT, when asked if the screen shots should be changed to display images of the most recent version, she responded with a prompt, “no”. Her justification was that the new version is “a lot to take in, and we don’t want to overwhelm the audience.” There reveals a recognition that this coding scheme may not be straight forward to an outsider. The coding was updated as a way to improve the usability to those who are performing the data collection, not general members of the public.

While the extent of this study does not allow the research to capture the full impacts of the coding schemes being applied by members of WALT and how their coding schemes impact the naturalization process of the data for those who are not members of WALT, the fact that so many changes were made to the design of the web map speaks volumes to the ways in which the members of WALT have coding preferences that differ from more traditional cartographic coding schemes. This topic is addressed also in the “PAM as Critical Cartography” section.

Through this examination of data collected through observation and individual interviews, it is clear that the process of naturalization through coding is occurring within and throughout the maps and data collected with and by members of WALT. The coding and naturalization processes for PAM work within the same social structures as professionally created maps do. Therefore, non-professionals are able to utilize PAM as a way to engage in the same level of coding and naturalization as professionally-produced maps. While the full impact of coding schemas being decided upon and applied directly by the members of WALT remain unclear, it is clear that this process was instrumental in the members taking ownership of the data and map in the case of the Built Environment Survey. Regardless, because these representations

are successfully being naturalized, they are able to work to create truth. The next section outlines the ways in which the naturalized maps and data have been extremely successful in creating truths for a number of groups.

4.4 Creating Truths through PAM

Truths, or assertions of what exists and what is real, are created through maps and mapping by processes of naturalization through coding. By effectively coding and thereby naturalizing the claims made by these maps, they are able to assert the claims as fact in reference to a particular area. For members of WALT, these maps and the arguments that they make have been successful in creating truth for the mission that the organization is pursuing.

The maps and data collection platform were expressed to be representations of the truth in multiple instances, even using the language of “truth” to discuss the ways in which the map represents the data.

I see the community and I see people’s truth. I see the truth in this map... because I obviously know that people from WALT went out and collected this data and they are telling the honest truth about their community and the fact that they did it in the community says a lot. So I see truth in this map (Liam).

Another leader of WALT discusses what comes to mind when viewing the collection of maps.

That we’re telling the truth. Right so it’s like most people are, like, you talk about fecal fountains, that’s not true, that can’t be true, that can’t be. And it’s, like, no it’s really true, and we can prove that there’s a reason why when we say there’s a collection of water in the community, now we can point to where it’s at. (Tiana)

The members of WALT see these maps as representations of truth. But this is not surprising because it is their truths and understanding of their neighborhoods that are being represented.

The test of these maps ability to assert truth is to ask: What do these maps mean to non-WALT members? Are they being accepted as truth? According to the reports shared by members of

WALT during advisory board meetings, the answer is an overwhelming “yes”. The map that has received the most viewing by members of the public is the Built Environment Survey.

Members are reporting that city leaders are accepting the data collected in the Built Environment Survey as truth to such a high degree that there are even discussions taking place about members of WALT being hired by the city to complete this data collection throughout all of Atlanta (more about this in section xx below). These leaders do not question the accuracy of the data. They do not ask about the classifications that are being applied, the decisions that were made about what data to collect and represent, or the reasons behind the production of the survey. The data, it appears, are being unchallenged due to a successful process of coding and naturalization and has been accepted as fact.

Not only is PAM allowing outsiders the opportunity to accept the lived experience of members of this neighborhood as truth to non-residents, such as community and city leaders, but it is also realigning the scope of truth for residents. For members of the community, there is a type of re-alignment of the understanding of their every-day lived experience that takes place after participating in data collection or viewing the maps. More specifically, participants spoke of experiencing a type of “re-awakening” through the process of applying classifications and enumerations on the built environment during the Built Environment Survey. Some of the ways participants summed up their experiences were as follows:

If you’re looking at the neighborhood, you know, there’s a lot of vacancies but a lot of times we’re so conditioned from being over there every day that a lot of us aren’t knowledgeable... that walk past these spots every day don’t even realize how many houses are like that because were so conditioned to being in this neighborhood every day that it’s normal. Hey, we walk past these every day; we ain’t paying no attention. But when you start getting involved and looking at maps like this and realizing the key points like how you got vacant houses, hotspots. And the colors is what draws it (Aaliyah).

I walk to school past these buildings every single day. Every day. How was it that I was unaware of the dire state that the houses on these streets were in?! When I looked at the

maps, the next time I walked along this path... I actually saw the buildings for what they were. Vacant. Dilapidated. Fire damaged. I had become so de-sensitized to this reality. The map has re-sensitized me and brought me back to the real world. Now we must face these conditions head on and fight to make it better. Admitting and understanding there is problem is the first step to correcting it (Liam).

This is the community that Martin Luther King's adulthood home is in. And just like he had a dream, we are living in a dream. But this dream is actually a nightmare. This map showed me that. We are living in a nightmare, and now it is so clear to me (Charlotte).

The maps and mapping have provided opportunities for residents to examine intimately the conditions of their built environment and, in doing so, these residents are now viewing these spaces through a different lens. The creation of truth that has been a result of PAM, in this case, has been so significant that the truth has been shifted even for those who live in these areas every day. This occurrence was an unexpected result of PAM and the creation truth the process of mapping was predicted to elicit.

But the fact is, as discussed in the challenges of community mapping, these maps and mapping do not represent a single person's "truth", although is it presented as such through the display of a single map or single data points. A member of WALT who is not a resident of the community spoke to the discrepancies that can occur within the Built Environment Survey,

What is this house, what would this house be classified as because, me, as I'm looking at a house and I'm seeing, you know, boards and stuff on the house and this and that and that... I'm looking at it as dilapidated but someone else might look at it as needs improvement so that's one thing that... because I was looking at a lot of places that I thought were dilapidated and everyone else was like, "no that needs improvement". Ok, well, if you say so, that is fine with me, but I think that should definitely be explained before, you know, definitely getting more people to go out to take pictures (Destiny).

Destiny exposes the challenges in attempting to represent the message of a single truth through the representation of an individual data point. While there are now over 1,000 data points on the Built Environment Survey map, it may be the case that there were many

opportunities for the map to force a number of perspectives to take the form of one. Another member of WALT, though one who was a resident of the area, offered similar comments around the classification of data of the Built Environment Survey when stating, "...the only argument I could see someone making is what is classified as a vacant condition?" (Liam). Therefore, while residents and non-residents alike are in full understanding of the discrepancies that may exist within the maps and dataset, the map and dataset remain able to assert their truths, revealing the power of maps and mapping.

Through the successful processes of coding and naturalization that these maps have undergone, the maps have also been successful in asserting the claims and arguments made by members of WALT as truth. The adjustment of "truth" that is known about this area has taken place for residents and non-residents alike. While residents are experiencing a process of re-sensitization to the built environment, non-residents are being made aware of the lived experience of these residents. As these claims are being widely accepted as true, leaders of local organization and governments are making and putting ideas in action with intentions of creating significant change in English Avenue and Vine City.

4.5 PAM and Inspiring Action

The ability to inspire action is the most significant element through which maps impact our world. With the appropriate alignment between coding/naturalization and the creation of truth, maps are the justification groups or individuals need in order to make changes in the world, whether that is to adjust the districting of voters, decide the location of a new prison, or, in the case of WALT, decide the correct avenues to place residents in homes that are free of mold infestation while protecting the community from the forces of gentrification.

Due to the short time frame in which this data collection took place, this is the pillar of power that has received the least detailed examination. However, even within this short period, there is a clear call to action elicited by these maps in which members of the community members and leaders are participating.

For the leaders and members of WALT, these maps and mappings inspire action in multiple ways. The pair of elevation maps has redirected the focus and subsequent planning efforts of WALT members, honing in on educating residents who are located in the areas of low-lying elevation while simultaneously canvassing the areas of high elevation for vacant homes in good condition that residents of the low lying areas could be relocated to. One WALT member captures this:

Well we have to remove and replace these people from outta this bowl... we need to get prepared to use this map to keep people from living in this area. And place them up above it or something. This map, it's showing us all options (Brianna).

As members of WALT organize their planning and implementation based on the data represented by Elevation and Water maps, it is clear that these maps have been the inspiration for such action.

The Vacancy Over Time map, as it has been made specifically for the purpose of bringing to light the vacancies that were not being accounted for by the Fulton County GIS data, informed the locations in which the data collection for the Built Environment Survey should focus. Members knew where areas with the most vacant houses and lots were located, and they stressed that it was important to capture these areas first as to make the strongest argument in challenging the Fulton County data.

The Built Environment Survey has provided an organizational reference for WALT, served as a method to communicate instances that are out of compliance with city code to

Atlanta's code enforcement, and has sparked the desire for this data collection to be performed beyond the borders of NPU L. Similar to the Elevation and Water maps, WALT is organizing its actions around the data reflected by the Built Environment Survey. For example, through the ease of access which the map provides about which parcels are vacant, in addition to owing significant amounts of back taxes, leaders of WALT are formulating approaches on how to obtain these properties. Outside the realm of WALT, the members reported that due to the ability to document occurrences that are out of compliance within the neighborhood through the use of the Built Environment Survey, that Atlanta's code enforcement agency was out to correct the issue the same day.

I'm working on a project right now because of your mapping project by me taking a picture and showing them this apartment in my neighborhood has a fecal fountain in the yard. I was coming up the street to visit my aunt and I caught an infant, maybe 1 year old come outside and playing in it. I had had your mapping project to take a picture of that apartment, pinpoint it, send this data back on the map. [Code enforcement] come and cleaned this up and when they sent the city out. If I wouldn't of had the mapping, I wouldn't have had any proof! (Aaliyah).

The mapping of the Built Environment Survey has resulted in the correction of out-of-compliance incidents in English Avenue and Vine City, inspiring action to expand beyond the members of WALT and to the leaders of local government.

The Built Environment Survey is not only convincing leaders of local government to take action in correcting problems in NPU L, but it is also making such an impression on these leaders that members of WALT are being called upon to perform data collection for the entire city of Atlanta. As per discussion that took place during a Code Enforcement Commissioners meeting in May of 2015, avenues are being explored to hire members of WALT, as employees of the city, to train and lead others to perform a Built Environment Survey throughout the entire city. While negotiations are in the works with the city, neighboring NPU leaders have reached

out to the members of WALT, and planning meetings have been held to organize a Built Environment Survey in neighboring NPUs, with members of WALT serving as consultants. Both opportunities provide members of WALT an opportunity to obtain employment, while addressing the mission of WALT for self-determination.

The data collected confirms that the maps and mapping have inspired actions for members of WALT, residents of the English Avenue and Vine City neighborhoods, and leaders of both the city and the NPU system. Through the organization and planning for implementation of WALT's mission, in addition to the expressed interest in implementing this data collection process beyond NPU L and the financial support that accompanies such action, PAM is clearly inspiring positive action that impacts English Avenue and Vine City neighborhoods.

4.6 PAM as Critical Mapping

As a method that is led by an individual who is trained in the tenets of professional cartography with the resulting maps and mappings that follow more traditional cartographic rules, PAM falls somewhere in the middle of the scale ranging from critical mapping to professional mapping. As the "cartographer" in this partnership with WALT, I ensured that every layer of data represented in these maps was a result of a direct request from a leader or member of WALT. This type of "by community request only" data vetting was possible because members of WALT were motivated to participate in the production of maps and mappings which they had requested. This allows PAM to be "participatory" and "grassroots" to an extent that other methodologies often fail to achieve.

There were, however, different levels of engagement. While members of WALT were very active in the data collection process for the Built Environment Survey, members were very reserved in their involvement in the creation of the other maps. During my presentations of maps

and mappings during advisory board meetings, there was not a single suggestion for change given during the portion of my presentation where I opened the floor up to members to provide feedback. While there was plenty of discussion that took place around the map being presented, the feedback was positive and often demonstrably excited. This was a challenge in ensuring that the map was completely representative of the members' perspectives, thereby decreasing the "critical" nature of the map.

Also, I found that when members of WALT would speak of the Smart Relocation, 1894 Overlay, and the Vacancy Over Time maps, they would say they belonged to me, not to them. This occurred even though I explicitly stated during each draft presentation that these maps belong to WALT in an attempt to provide them the agency they may need to feel like they have the right to suggest changes. During an interview, a member of WALT even went as far as to correct himself when speaking of the maps, saying, "Well how we always try to show, excuse me how you show, on the map for us, on our meetings and everything, it['s] really showing the low elevation..." demonstrating how significantly WALT members desire to include me in the ownership of these maps.

Another stark example of WALT's assertion that I am owner of these maps was when a member of Housing and Urban Development (HUD) was slated to come to a WALT advisory board meeting in March. As such, I was asked to present the pair of elevation maps (the Smart Relocation and 1894 Overlay web map) as a way to display to these HUD representatives that WALT is engaged in active partnerships with researchers from Atlanta's universities. When I arrived at the meeting location, there was an item titled, "Boll Theory" on the meeting's agenda. This agenda item was referring to my presentation of the two maps showing elevation. As the maps represent a valley, or a bowl, that is present within the neighborhood, the title of the

presentation used my last name, “Boll”, as a play on the word “bowl, to assert to members of HUD my personal involvement in the creation of these maps. It was I who had brought this elevation into reality through the creation of these maps. The phrase, “The Boll Theory” continues to be used to this day in reference to the elevation in the area in the attempts to relocate individuals in mold-infested homes in the bottom of the bowl into vacant homes in good condition located at higher elevations.

Leaders and members of WALT clearly are striving to keep my name and the name of Georgia State University in association with these maps. If it is I who made them, a student at a research university who is the “expert” on mapping, then the maps are taken more seriously. When a leader of WALT was asked if the maps were representative of Georgia State or WALT, (meaning that if someone looked one of the maps, what their first impression be regarding who the author of the map is) she replied

They see Georgia State. But then when we explain to them that Georgia State laid the foundation as it relates to the base map, but the data points that are collected and the information that’s extracted from, you know, municipal websites and then imported into that mapping system, that they’re like, wow, you’re right. A student could not do that by themselves, this is certainly more man and woman power behind that. So I think that that, too, is telling them a story. Just the sheer fact that it is community driven, truly. (Tiana)

Why would WALT members want to attribute their claims with my work? It is because there is a perception that I can help translate their claims into the “language” that the individuals they are wishing to get their message to: leaders of local, city, state, and federal governments in particular. Members spoke about the ability to make their lived experience known to these leaders through these maps, a language in which they both can participate, was imperative to their success as an organization. Following are illustrations of participants’ comments regarding the ability to speak the language of decision makers in government:

...we saw the attention that was given to those [who] were able to talk the same language as those in the room. So it was like the platforms that we were at, you know, there was a preferred method of communication in which at those times as a grass roots organization, we didn't have those tools. We didn't have, we didn't know that language. It seemed too much like a foreign language that we couldn't obtain it. So that really started to really weigh on our morale. You know, like, wow, we keep going to these places, and people aren't listening because we aren't talking the language they want us to speak. These maps are the right medium through which we can get on their level (Tiana).

You have to know how to speak the language and since we don't know the language...we know that other people understand them and if we want to reach a certain level we have to present this data to senators, city councilmen and we have to show them and the only way to speak their language is through the maps. Cause that's hard core truth (Anthony).

You have to speak the language. When you're speaking with city officials, state, any type of government official you have to have it in order, correct, black and white. That's the language they speak...See, they used to ignore us...But now, because of the map, they can't...(Gabrielle).

We've been told for decades that people on the West Side, we don't talk right, we do not have the capacity to participate in conversations around policy. These maps talk for us And even though I'm educated I still didn't know how to speak the language until I met y'all (Madison).

... WALT has to have community stakeholders that can speak that language and put it on display (James).

Discussions around the right "language" to use in business discussions are a frequented topic during WALT advisory board meetings. Leaders of WALT express that they are at a disadvantage when attempting to engage city leaders in conversation because there is the expectation that residents of the English Avenue and Vine City neighborhoods do not know how to speak clearly or correctly, that residents default to a language laden with sloppy grammar and slang.

What hinged on the ability of the claims and arguments of WALT members to be translated into the produced maps and mappings was that the members felt I had done my due diligence to understand them and their claims more fully before putting their assertions and insights into the map. Participants expressed this sentiment in the following ways:

I watched you in the meetings listening to us, taking our advice and I can tell by your work. You understand what I'm saying, that you paid close attention, you really like a voice for us. Through your maps is really like a voice for us. That's right cause we ain't have nobody speak for us. Not as far as data, black and white. We got people out there talking but I'm talking about proof where we can speak their language, tell them go on and see the site, see for yourself. This is really the number of houses that's vacant, dilapidated compared to y'all's map. You are off key. So now we got that proof (Aaliyah).

You first, you came in and the first couple of meetings you took a moment to understand the history of the neighborhood and that's important. You have to understand what you're getting yourself into first and then after that you took our ideas each and every time and it got better from different aspects (Mason).

... I have noticed is that people come in to communities with a pre-conceived notion with how they are going to help the community and what they think the community needs. And they miss the mark just about every time. So when you say partnership it's like a conversation. You have to talk and then you have listen. You have two ears and one mouth. So you're supposed to listen more. But people that come in with their helper hat on have no idea where to begin. And so that is why the organization, an organization like ours gets looked over because we're telling you your hat's on backwards. And it's like who are you to tell me how to wear my hat? So when they come in and want to do things in a particular way it's just not fitting for this particular community. It doesn't work well for us... The key to showing that you're not that stupid is to ask questions. And you did (Chloe).

In this sense, the ability of PAM to be “critical” is in the hands of the “mapping expert.” How much of an effort does the expert put towards attempting to incorporate to her fullest ability the claims that the community groups wish to make? This, like PPGIS, allows for gray space to emerge within the methodology of PAM. The fact remains, those with the knowledge and the resources are the ones who hold the power. The members of WALT were not aware that the ability to build a database that could be populated in real time using smartphone technology would be within their reach.

Additionally, the members of WALT and those that they recruited to perform the data collection are limited to those who have access to a smartphone. One member of WALT, as I

was expressing how I was surprised by the high degree of technology access the community appeared to have, corrected me and stated that those who have smartphones are mainly those who are active in the community and who tend to hold jobs. Most residents of the neighborhood, she described, have basic Boost Mobile phones that do not have 4G capabilities. While the data collection of the built environment survey appears to be inclusive in its methods, in reality the same issues of accessibility to technology continue to be barriers to participation.

Does PAM, in the act of balancing between engaging community groups with the mapping experts measure up to a type of critical mapping? Because PAM grants community organizations access to the resources necessary to create maps and perform mappings through a methodology which is both aware of and simultaneously leverages the politics of mapping, it is indeed a critical practice.

4.7 Additional Reflections of PAM for WALT

Members of WALT reflected on how this map and data is allowing their lived experienced to be accepted as real, or validated. One interviewee even went as far as to compare his experience of the creation of these maps to being a process of being freed from slavery.

It's like the movie "12 Years a Slave" And he kept saying 'I'm a free man, I'm a free man'. This is what I'm talking about with the slavery. This is documentation, this is county documentation, this is law! According to most, this is law! So you could be picked up saying I live on so and so, not according to the county. You are not accounted for. So they can go off and be enslaved again. ...And so it's sort of like you don't count, you don't exist, we have made up our own rules around you, about you. Who's going to call the county a liar? So therefore you're captured, you're a slave...There's nobody listening to you because you don't have proper documentation. He got free because somebody finally sent somebody with his papers. So this map, it's sort of saying I told you I was free. I told you I wasn't a slave. See that house where you say, see, you see!? There's a house right there, and it is vacant. And I've been telling you this for years, and I finally have that opportunity to show you. I'm not a slave (Chloe).

Another member echoed this sentiment when asked about the PAM process.

It has been life changing. I know community residents have truly, truly, changed... they will never go back to their way of thinking of being desensitized to their environment Washington High School—in front of it has a cast bronze statue of Booker T. Washington...and it's called unveiling the slave. And that's what's happening. It's like the people of this community have been in bondage because no one was listening. Now, because of these maps, people will listen. Our lives are being represented in a factual way, and they can't ignore us. We're freed from bondage (Tiana).

These statements, coming from members of a majority African American community, speak to the extent of the impact that the maps and mappings produced from participating in PAM have made on members of WALT.

In this chapter I examined the ways in which PAM fulfills or challenges the seemingly unquestioned processes of professional cartography as revealed by critical cartography. Findings are organized around the concepts of critical cartography. Data from observation, individual interviews, and document analysis revealed the ways PAM provided the potential for community members to assert truths and inspire action based on their claims.

5 CONCLUSIONS

As a method informed by the main tenets of critical cartography, participatory action mapping (PAM) has the ability to simultaneously be a critical mapping while offering communities the opportunity to engage in dialogue with the cartographer in the map-production process. PAM fulfills the insights offered by critical cartography (coding, naturalization, creation of truth, and inspiring action) and allows communities access to the powers that maps embody. Through a case study where PAM was enacted in a partnership between Georgia State University and the Westside Atlanta Land Trust (WALT), this research examined the process and resulting maps and mapping to explore the ways PAM fulfills or challenges perspectives of critical cartography. More specifically this research examines cartographic constructs of maps and mapping to occur within three pillars of power: 1) naturalized codes, 2) constructions of truth,

and 3) inspiration for action. This case study of mappings completed with the Westside Atlanta Land Trust (WALT) reveal that PAM continues to code spatial claims through the cartographic principles taught to university students, can create truths for both outsiders to the community and those living within the community being mapped, and inspires action for both the organization and local, city, state, and federal leaders

PAM is inspired by the partnership and collaboration process performed in PPGIS methodologies. These types of partnerships allow universities to get in touch with the communities they operate within while providing the community with access to resources and training. PAM and PPGIS differ in that PAM mitigates the distinction between the researcher and the researched and is strongly oriented towards an action-based result. PAM is also inspired by community mapping methodologies which provide communities with the opportunity to build rapport between neighborhood residents while creating spatial representations that have the ability to communicate their perspectives to outsiders. Community members hold unique and important perspectives about their communities that deserve to be communicated to decision makers. Community mappings, however, rarely take the “scientific” form necessary to be taken seriously by the decision makers. By performing mapping practices that mirror the scientific presentation of maps and mappings that are currently so preferred, PAM is able to produce maps that are taken seriously by decision makers.

As this thesis proposes PAM as a new research methodology, there is plenty of opportunity for future studies. One future direction is an attempt to understand the larger impact of PAM. It is likely that the complete impacts of PAM require a longer time period of examination to be fully analyzed. In the case study of WALT, current conversations allude to the possibility of the positive changes that WALT is working towards. It is always a possibility,

however, that the maps and mappings are not accompanied by enough momentum to bring these discussed ideas into a reality, turning PAM into a methodology that, more like community mapping, is better oriented towards establishment of social capital and community cohesion. Therefore, a future direction for the development of PAM is to observe the impacts of such efforts over a period of years instead of months.

Additionally, in this case study the leaders and members of WALT were extremely active and engaged in the partnership as they pursued their mission of engaging in practices of self-determination. However, what happens in the instance where community members are not so inclined to be so closely involved in the PAM process? There is an opportunity to perform a comparative study among multiple groups, with multiple goals and multiple cultural settings to observe the ways in differing bases of community members impacts the effectiveness of PAM.

Ultimately, this research establishes PAM as a methodology that is equally as critical as it is effective. With these findings, literatures in both critical and community mappings, in addition to literature in critical cartography, contribute to best (or better) practice of community empowerment through mapping.

NOTES

¹ While one could argue that PAM is more closely related to the methodology of PPGIS, I assert that PAM is more closely aligned with PAR. While PAM may frequently incorporate GIS, PAM's main focus is largely action research oriented methodology.

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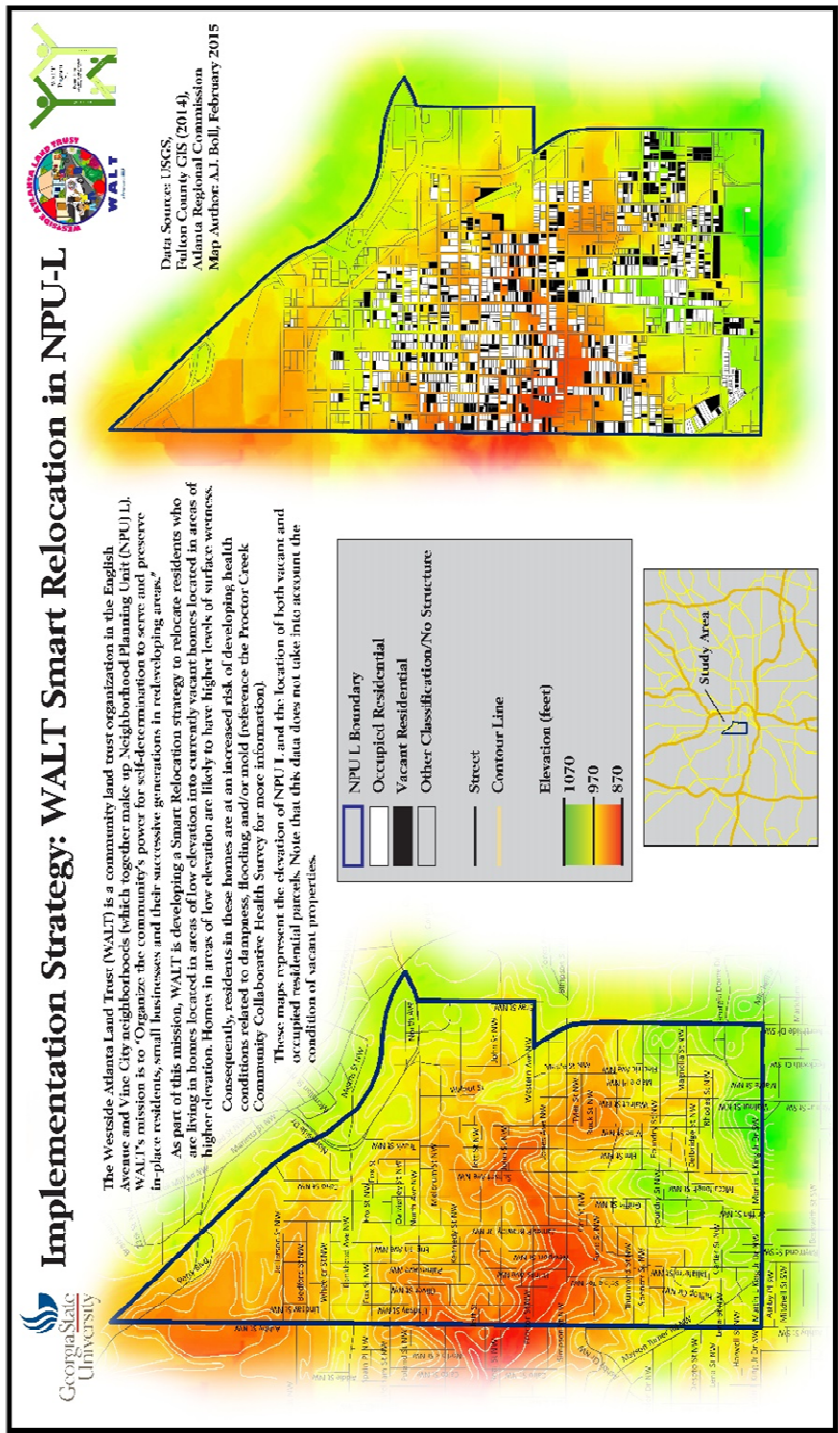
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APPENDICES

Appendix A: Interview Participants

Pseudonym	Gender	Age Range
Aaliyah	F	31-40
Brianna	F	41-50
Anthony	M	41-50
Chloe	F	41-50
Liam	M	15-17
Destiny	F	18-23
Mason	M	31-40
Gabrielle	F	23-30
Mia	F	51+
Daniel	M	15-17
Elijah	M	15-17
Jada	F	15-17
Abigail	F	15-17
James	M	51+
Madison	F	23-30
Charlotte	F	31-40
Dana	F	41-50
Michael	M	51+
Ethan	M	31-40
Tiana	F	31-40

Appendix B: WALT Maps and Mappings

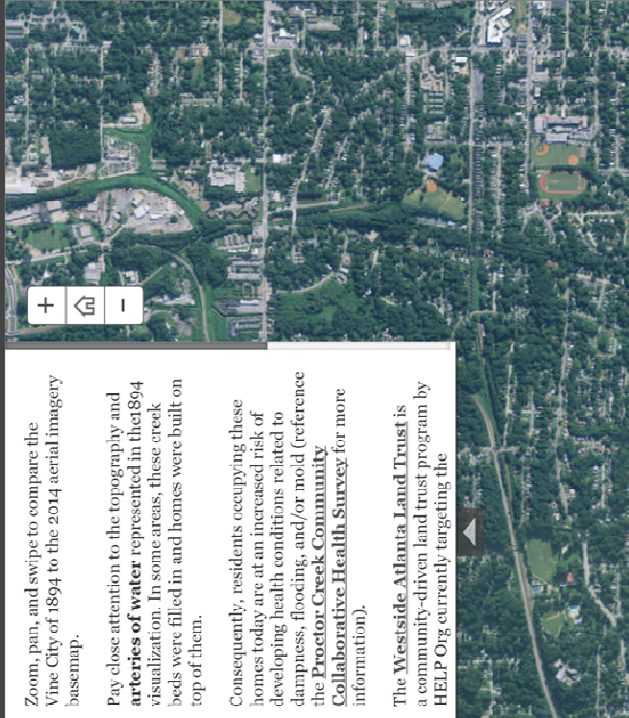


Implementation Strategy: WALT Smart Relocation in NPU-L

1894 English Avenue and Vine City

A birds-eye view of the English Avenue and Vine City neighborhoods in Atlanta, GA

The Westside Atlanta Land Trust

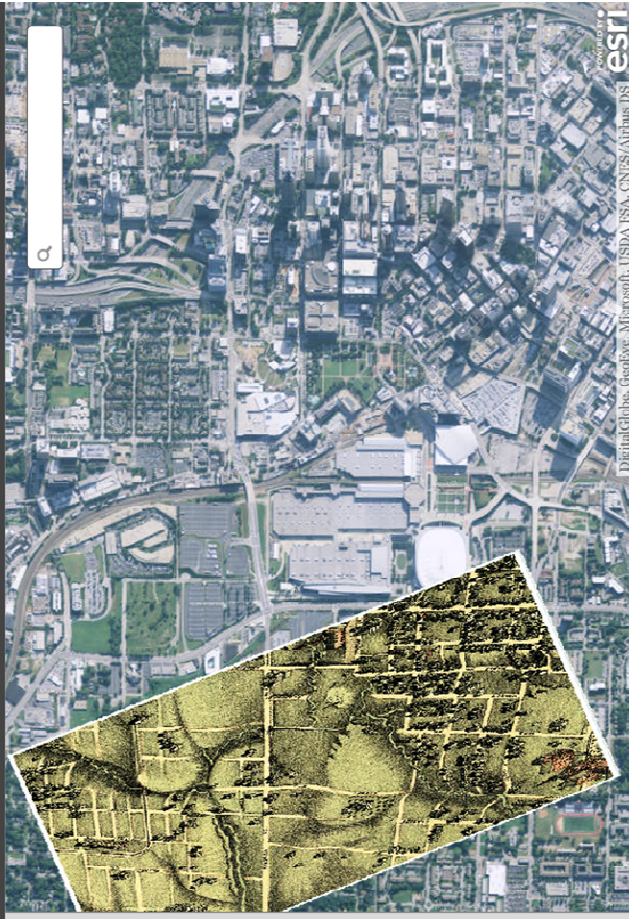


Zoom, pan, and swipe to compare the Vine City of 1894 to the 2014 aerial imagery basemap.

Pay close attention to the topography and **arteries of water** represented in the 1894 visualization. In some areas, these creek beds were filled in and homes were built on top of them.

Consequently, residents occupying these homes today are at an increased risk of developing health conditions related to dampness, flooding, and/or mold (reference the **Proctor Creek Community Collaborative Health Survey** for more information).

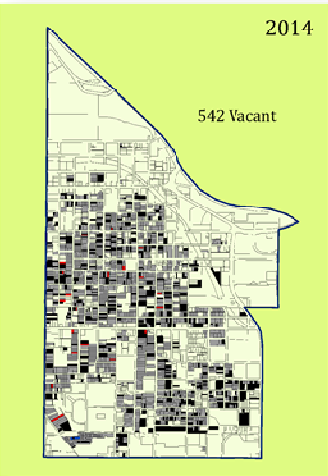
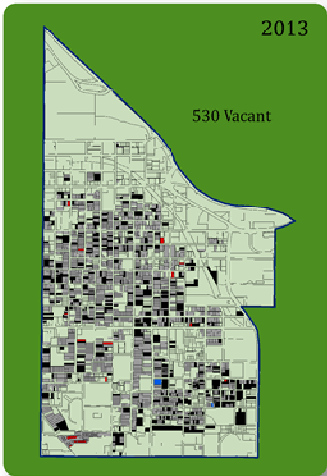
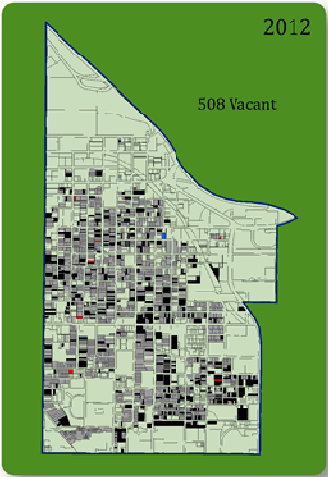
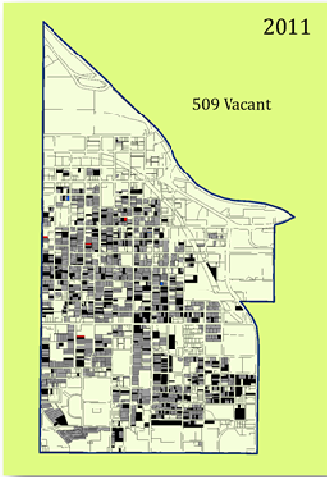
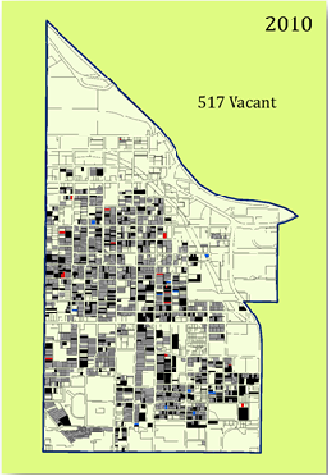
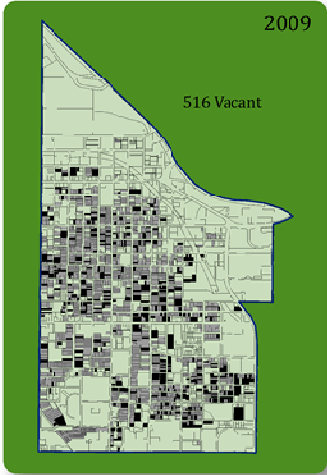
The **Westside Atlanta Land Trust** is a community-driven land trust program by **HELP.Org** currently targeting the



1894 English Avenue and Vince City



Residential Vacancy of NPU-L Over Time (2009-2014)



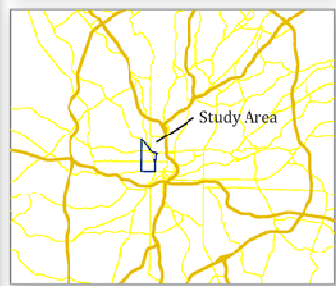
The Westside Atlanta Land Trust (WALT) is a community-driven land trust program by HELP Org currently targeting the English Avenue and Vine City neighborhoods (which together make up Neighborhood Planning Unit (NPU) L). WALT's mission is to, "Organize the community's power for self-determination to serve and preserve in-place residents, small business, and their successive generations in redeveloping areas."

As a part of this mission, members of WALT are interested in addressing the vacancy epidemic which is taking place within NPU-L's residential housing stock. These six visualizations examine the changes in residential parcel classifications from 2009 to 2014, specifically focusing on the classifications of "Occupied" and "Vacant". Parcels in each year's dataset which are newly vacant (meaning that in the previous year the parcel was categorized as "Occupied" but was updated in the examined dataset to be "Vacant") are represented in red.

Over the past six years, a total of 76 residential parcels went from being categorized as "Occupied" to "vacant", with the most significant shift taking place between the years of 2012 and 2013. As of 2014, there are 542 residential parcels categorized as vacant, making up a total of 27% of the available residential parcels in NPU-L.

- Vacant Residential Parcel
- Occupied Residential Parcel
- Newly Vacant
- Newly Occupied
- Non-Residential Parcel/No Structure
- NPU-L Boundary

Data Source: Fulton County GIS (Tax Parcel Data)
Map Author: A.J. Boll, March 2015



Residential Vacancy of NPU-L Over Time (2009-2014)

HOME > WALT Built Environment Survey
NEW MAP CREATE PRESENTATION WALT

Find address or place

Q

Save

Share

Print

Directions

Measure

Bookmarks

Table Options

Parcel Classification Based on Observation (357 features, 0 selected)

Parcel Environment Code	OWNER	BACK_TAXES	NOTES	OWNERSHIP_YEAR	PARCEL_NUMBER
Miscellaneous/Other	State of Georgia	0	Georgia Dome... 1 Georgia dome dr. atl. Ga, 30313	23	
Fire Damaged Structure					
Fire Damaged Structure	noneEric.Gilliland@CSN.EDU	0	no taxes owed	2006	
Occupied-Need Improvement					

Legend

Parcel Classification Based on Observation

- X Abandoned Lot
- Business-Closed
- Business-Operational
- Church
- Fire Damaged Structure
- Occupied Dilapidated
- Occupied-Need Improvement
- Occupied-Good Condition
- Vacant- Dilapidated
- Vacant-Needs Improvement
- Vacant-Good Condition
- Miscellaneous/Other
- No Code

NDU L Boundary

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WALT Built Environment Survey: March 2015

HOME ▾ WALT Built Environment Survey NEW MAP CREATE PRESENTATION WALT

Details Add ▾ Edit Basemap Legend

Save ▾ Share Print Directions Measure Bookmarks Find address or place

Legend

Parcel Classification Based on Observation

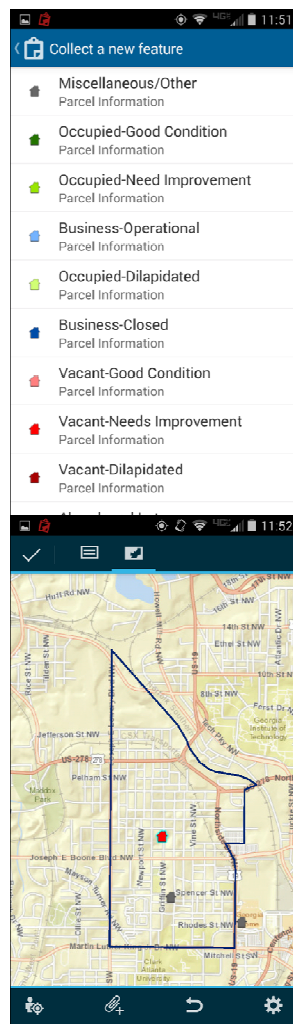
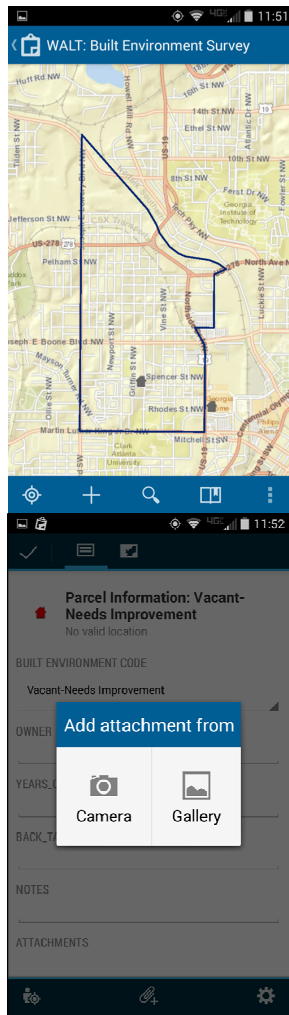
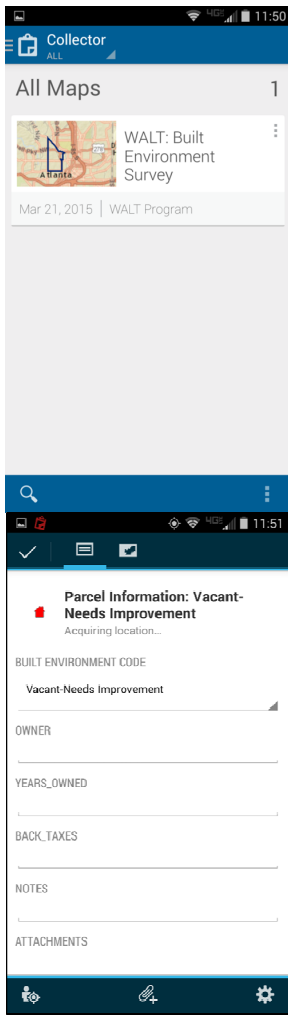
- Abandoned Lot
- Business-Closed
- Business-Operational
- Church
- Fire Damaged Structure
- Occupied-Dilapidated
- Occupied-Need Improvement
- Occupied-Good Condition
- Vacant-Dilapidated
- Vacant-Needs Improvement
- Vacant-Good Condition
- Miscellaneous/Other
- Vacant Lot
- School
- No Code

NPU L Boundary

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WALT Built Environment Survey: June 2015

Appendix C: Collector for ArcGIS Application



Appendix D: Interview Questions

This list of question will be used to guide the individual interview process. Based on the responses, some questions would not be appropriate or may become redundant. Therefore, it is not required that all questions be asked during the interview.

Personal Map Use: These questions are to establish a base understanding of how the interviewee understandings, approaches, and uses general maps.

How do you use maps in your daily life?

If they express that they do not use maps in their daily life-ask the following: could you explain why you do not use maps in your daily life?

If they express that they do use maps in their daily life-ask the following: What types of maps do you use and what do those maps look like?

Community Map Reflection: These questions examine the ways in which the interviewee views the specific map(s) created during the community mapping process. This collection of questions was developed to specifically examine research question part 1: What are the spatial claims asserted by the collaboratively produced maps?

Please provide a summary of the steps that were completed throughout the community mapping process. How would you explain this process to an outsider?

What goals did WALT set out to meet with the community mapping project?

Interviewee is shown map of Vine City/English Avenue area created during the community mapping process

How does this map compare to others you've seen?

How do you interpret this map?

Describe how you think this map may be viewed by people who are not from this neighborhood?

In what settings and situations do you see this map being used?

Mapping Partnership Reflection: These questions examine the ways in which the interview participant views the mapping process that took place in collaboration with an

academic partner. This collection of questions was developed to specifically examine part 2 of the research question: In what ways does an academic mapping partner help or hinder the expression of claims that members of a community-based organization set out to make?

Think back to the beginning of the mapping process. How do you think the function of this map compares to WALT's original goal of creating such a map?

Are there any changes, additions, or subtractions you would think would strengthen the function of this map?

In your view, what contributions did the researcher make and what contribution did members of WALT make that lead to the final version of this map?

Were there any contributions made by both the researcher and the community?

Appendix E: Coding Scheme

1. Map Use
 - a. Personal map use
 - b. Professional map use
2. Process
3. Coding and Naturalization
 - a. Successful process
 - b. Failed process
4. Truth
 - a. Maps represent truth
 - b. Maps represent perspective
 - c. Maps represent lies
5. Action
 - a. Organizing action occurred
 - b. Decision making action occurred
 - c. No action
6. Critical mapping
 - a. Critical (bottom up)
 - b. Not critical (top down)
 - i. Leverage not critical methods