Qualitative GIS

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Only about a decade old, the field of qualitative GIS (QGIS, or qualitative geographic information science) has rapidly grown and expanded into many disciplines outside geography. Today, it straddles the intersection of geographic information science (GISci), social science, humanities, computer science, and the geoweb. In the past two decades, methods became less hard wired to epistemologies, and the seemingly profound epistemological disconnect between GISci, on the one hand, and qualitative research, on the other, no longer appears clear and immutable. That qualitative GIS has successfully established itself as a major research direction was reflected, among other ways, in the 2009 publication of *Qualitative GIS: A Mixed Methods Approach* (Cope and Elwood 2009). Qualitative GIS has been vividly discussed in scholarly journals, books, and blogs across geography and geographic information science. Spatial turn in social sciences and humanities made qualitative GIS an actively sought methodology that combines representation of place, qualitative inquiry, and information technology. It has been used in research in sociology, history, and digital humanities, and interdisciplinary research on information technologies and society in the health sciences, environmental perception, and even environmental engineering.

As social sciences and humanities turn their attention to space, place, and mapping, the epistemological debates in geography about GIS can fruitfully inform these disciplines' engagements with this technology. Unfortunately, these debates to a large degree remain confined to geography. Social scientists and humanities scholars, consequently, appear to be only moderately familiar with the geographic research on qualitative GIS, critical cartography, and critical GIS. They also tend to overlook rich theorizations of space and place developed by human geographers. When pursuing qualitative GIS, they often do not use the term or trace connections to these important literatures. Yet, the exciting spread of qualitative GIS creates opportunities for geographers to engage in mutually enriching conversations with other disciplines.

This entry, therefore, will examine not only the role of qualitative GIS in geography but touch upon research in other fields that the author, as a human geographer and critical GIS scholar, would identify as directly related to qualitative GIS. The entry begins by briefly reviewing the aspects of geospatial technologies that do align closely with qualitative information and qualitative research. It then discusses how geospatial technologies have been used in qualitative research and the ongoing integration of GIS with qualitative research methods. The recent but wide-ranging forays of GIS into the field of digital humanities, spatial social media, and neogeography are examined next. In conclusion, the entry reflects on the future of qualitative GIS.

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Epistemological interventions of feminist and qualitative GIS

Useful sketches of history of qualitative GIS can be found elsewhere (Cope and Elwood 2009), so highlighted here will be those epistemological interventions that, in the author's opinion, played a particularly important role in development of qualitative GIS in human geography and related disciplines.

Qualitative GIS stems directly from earlier interventions by feminist geographers and feminist GIS scholars. When the first feminist geographers argued that mainstream geography ignores experiences of women, they also advocated for qualitative research as necessary for addressing the nonquantifiable aspects of gendered experiences and informal social and economic relations. Once the limitations of quantitative methods were exposed, feminist geographers began to reassess their role and concluded that, if practiced reflectively within the feminist epistemology, quantitative analysis and statistics could be indispensable in the geographic research on gender, together with qualitative methods.

A decade later, feminist scholars have played an equally pivotal role in reclaiming GIS for feminist and critical geographic research. The fierce debates in the 1990s between GIS scientists and critical human geographers acknowledged the growing role of this technology in academic practice. But they also highlighted its ties to the interests of the empire, corporations, state surveillance, and militarism as well as to quantitative geography and positivism. Feminist geographers have specifically focused on the masculinist nature of GIS technology and the gender-blind research that it informed (Kwan 2002). They have not, however, rejected GIS altogether. Instead, feminist scholars have simultaneously led the efforts to reconstruct GIS as a mixed method that uses both quantitative and qualitative techniques. Neither the technology itself nor its applications are fixed, they argued; they evolve and depend upon who is using GIS and to what end (Kwan 2002; Cope and Elwood 2009).

To become a tool for feminist and critical geographies, however, GIS had to be reimagined as suitable for qualitative research. The prevailing assumption that GIS is only good for quantitative computation and modeling, therefore, had to be challenged at the epistemological level (Pavlovskaya 2009; Cope and Elwood 2009). Feminist GIS scholars pointed to the fact that we falsely associate computation with quantitative methods because computer technologies in general handle well qualitative information and tasks such as writing, graphic design, and visualization. Visualization of information in map form constitutes arguably the most important function of GIS. Maps, and digital maps in particular, have a powerful effect; they fascinate and convince the viewer regardless of whether the presented information is quantitative or not.

Moreover, the affective impact of maps provides them with ontological power to produce landscapes. Once visible, the mapped places and phenomena become real; they exist and require explanation. Being on the map, therefore, incorporates actors and phenomena into social imaginaries (this applies to both quantitative and qualitative data but social sciences have been suffering from a dearth of qualitative information because this information was not treated as scientific). Omission from the map, either intentionally or by ignorance, in contrast, leads to theoretical as well as socioeconomic and cultural marginalization (Pavlovskaya 2009). Since mainstream GIS mainly works with quantitative data sets, it fails to represent phenomena, processes, and experiences of

paramount importance that are not quantified. Informal social practices, alternative economies, unpaid domestic work, barter exchanges, gift economies, emotions such as trust or fear, local and indigenous knowledge, class oppression, gender exploitation, racism, and other social relations remain invisible in our landscapes and conceptually marginalized. Qualitative research methods offer insights into these processes. Therefore, integrating them with GIS begins to address their conceptual (and, by extension, political) marginalization.

Geospatial technologies and qualitative information

Assuming that GIS works only with quantitative computer coded information, we have long ignored the fact that qualitative data such as text, images, and sounds are also coded for computation and, therefore, can be part of GIS analysis. Today, the production of digital spatial information is rapidly expanding (the so-called big data phenomenon) and so is its qualitative component. Some of this qualitative content is a result of conversion from nondigital sources. It includes historical and library archives, diaries and literary narratives, photographs, newspapers, and many other sources. The rest is born out of the digital age itself and incorporates webpages and blogs, geotagged social media such as tweets and Facebook posts, global positioning system-tracked movements, and digitally recorded consumer information. Numerous grassroots mapping projects also generate new digital and often qualitative data about their communities. GIS technology is increasingly capable of handling these diverse newly available qualitative data. In addition, GIS keeps converging with other digital media and this process transforms it into a multimedia visualization and analytical tool popular with digital humanities, social computing, geoinformatics, neogeography, volunteered geographic information (VGI), public participation GIS, augmented reality research, humanitarian aid, and many other projects.

In contrast to the 1990s and 2000s, desktop GIS packages no longer dominate the geospatial field. Various open source and free Internet-based mapping applications are widely available today. Many of them provide new methods and algorithms for handling large volumes of information while the producers of digital spatial information adopt formats compatible with these new analytical tools. Initially a source of information for people, the Internet is becoming a geoweb that act at once as an analytical tool and as a source of data for the new tools. GIS scholars and computer programmers focus on the algorithmic handling of these data (DeLyser and Sui 2013) but constructing meaning from this data in conjunction with social theory requires the insights and methods of qualitative GIS.

Doing qualitative research with geospatial technologies

Qualitative GIS researchers first attempted to integrate GIS into their work by mapping data from in-depth interviews. Initially, they analyzed interview data using grounded theory methods and related coding techniques and then mapped the results in a desktop GIS using the conventional cartographic symbols of different color, size, and thickness (Knigge and Cope 2006). It was vital for them to visualize the marginalized social phenomena that lacked quantitative representation (e.g., household economies or community gardens).

Local knowledge mapping projects also play exactly this role. They reveal understandings of the landscape that differ from the dominant representations created by states, experts, or corporations. Often called counter-mapping projects, they translate local spatial knowledge into claims to resources and land. In some cases, this is achieved by contrasting local ecological knowledge of resource users with professional expertise and satellite image classification. Other projects attempt to secure community access to resources by mapping informal land-use rights or how different groups of fishermen collectively use fishing grounds (Weiner *et al.* 1995; St Martin 2001).

The spreading use of GIS and other digital technologies by indigenous communities to represent indigenous knowledge and organize together gave birth to a new term, "indigital" (Palmer 2009). Digital indigenous mapping practices contribute to renegotiations of colonial legacies in many parts of the world, advancing and also posing challenges to postcolonial struggles. Here qualitative GIS can also make a lasting impact. In addition, public participation GIS (PPGIS) scholars worked to map assets of economically marginalized and minority communities in urban areas as a way to involve these communities in planning and economic decision-making. When visualized and shared as maps, their collective local knowledge has a potential to transform planning practices, together with the ways the communities perceive and value their neighborhoods (Elwood 2006; Knigge and Cope 2006). Qualitative GIS can inform such projects in terms of understanding exclusions created in the collective production of knowledge.

Feminist scholars pushed the "bounds of GIS" to map the experiences of women in a number of ways. Mei-Po Kwan's pioneering work combined the computational power of GIS, feminist economic geography, and a new take on Hägerstrand's time–space geography. She analyzed gender differences in access to urban opportunities by mapping daily movements of women based on information from their diaries. The resulting three-dimensional (3-D) visualizations showed that women's daily life paths differed considerably from those of men, while differences between women by class and race also stood out (Kwan 2002). These visualizations revealed how hierarchies of gender, class, and race continue to shape women's use of urban space.

In another project, Kwan (2008) turned to mapping emotions and feelings, another underrepresented form of experience. She created a geography of fear experienced by a Muslim woman during her daily travels around the city before and after 9/11. Segments of her daily path reflect the strength of her emotion with different colors. This powerful visualization shows that the woman felt unsafe for weeks in her car and even at home after the tragic events.

This author's work on postsocialist Moscow involved qualitative interviews with households with children in Moscow about the economic practices that helped them survive the economic devastation during the transition to capitalism in the 1990s. Each household used a combination of economic practices in which the share of informal, unpaid, and in-kind exchanges and production of goods and services has increased following privatization of urban services (Pavlovskaya 2009). The theory of transition ignored household economies because it focused on macroeconomic scale and structural transformation of the formal economy. Mapping multiple economies of households made it clear that blindness of the national policy to the scales of households and the form in which the transition was experienced by ordinary people

made households bear the everyday brunt of the economic transformation.

Matthews *et al.* (2005) illustrate the effectiveness of using GIS in combination with ethnographic research that seeks to understand the challenges of the urban poor who struggle to maintain both family and employment responsibilities. Their large-scale ethnographic research project produced geo-ethnographies of five US cities that encouraged new policy approaches by changing the ways in which social scientists and social workers understand the experiences of poverty.

Joining ethnographic methods with GIS has proven fruitful in research on artistic communities and creative industries. Artists are increasingly engaged in the production, and understanding the meaning, of urban space, but artistic creativity is hard to measure using formal indicators. In their research on distribution of artistic activity in the Australian city of Darwin, Brennan-Horley and Gibson (2009) interviewed artists and mapped their creative spaces (spaces in which they produce art) as well as their travel between those spaces. They found that most creative activity takes place outside the formal cultural centers (such as theaters or art galleries) and concentrates outside the formal cultural hubs. When designing policies that support creative production, local governments need to consider these geographies.

Integrating GIS with qualitative research

In addition to mapping the results of qualitative analysis, scholars attempt to integrate qualitative analysis with spatial visualization more directly. Knigge and Cope (2006) developed an approach called "grounded visualization" that involved close interaction between methods of grounded theory (e.g., coding) and GIS analysis. Their spatial database of community gardens in Buffalo, New York, included information derived by continued rounds of qualitative grounded theory analysis. Visualizing this information on the map, in turn, provided new ideas for such an analysis.

Further methodological innovations combined the rigor of qualitative and geospatial analysis at the level of software that allowed for conducting both types of analysis jointly. One such innovation is the so-called computer-aided qualitative GIS (CAQ-GIS) that made it possible to query and retrieve interview information and spatial locations related to a particular qualitative code or concept with greater ease (Jung and Elwood 2010). Another innovative integration involves adding select qualitative analysis functionality to a GIS. By programming qualitative analysis functions in ArcGIS software, Kwan and Ding (2008), for example, constructed the so-called geo-narratives that dynamically linked the interviewed respondents' stories to the places about which they were told. Visualizing these connections demonstrated a high degree of spatialization of the individual narratives. Kwan and Ding's (2008) research has also inspired others to visualize human mobilities. These developments are important because conventional GIS still offers only a limited functionality to represent movement.

These innovations nevertheless push the development of market-based and open source software to integrate qualitative research with space. Thus, qualitative analysis software now incorporates basic mapping capabilities while computer scientists within and outside the GIS field pay increasing attention to qualitative visualization. Qualitative GIS, however, can uniquely contribute to the task of explaining these visualizations using social theory.

Humanities GIS, neogeography, and beyond

The expansion of spatial digital qualitative information has occurred when both proprietary and open source tools for visualization and spatial analysis are becoming widely available. Some of them replicate nondigital forms of analysis while also making it faster and more expansive (for example, applying grounded theory methods to qualitative data using ATLAS.ti or a similar software package). Other digital tools, however, enable distinctly new kinds of analysis, especially for algorithmic processing of big data. They include, for example, visualization of large qualitative data sets, knowledge mining, rhythmanalysis, dynamic and semantic analysis, and others (see DeLyser and Sui 2013; Manovich 2016).

The emergence of digital humanities in the past two decades at the crossroads between humanistic inquiry and digital technologies, according to some authors, might represent a radical break with existing scholarly traditions because of the drastic impact of the technological and informational revolutions on knowledge production. The new field of geohumanities, or spatial humanities, focuses on the meaning of place constructed through digital literary geographies, histories, and memories, and local community participation. (The Association of the American Geographers has recently launched a new peer reviewed journal called *GeoHumanities*.) In contrast, social computing and geoinformatics are primarily concerned with direct visualization of the information from social media and other high-volume and dynamic data generated by contemporary publics (Manovich 2016). Finally, the ongoing decentralization and increased collective production of place-based geographic information known today as neogeography might represent another pivotal shift (Warf and Sui 2010).

The impact of geoinformatics, social computing, digital humanities, and neogeography on how we represent and understand place would be hard to grasp without the theoretical and methodological contributions of qualitative GIS and critical human geography. These remain vital to understanding the new forms of geographical knowledge because of their insights into the role of spatial (quantitative and qualitative) information in the analysis of place and space; the ontological power of mapping that transforms conceptually marginalized processes into objects of theory and practice; and their commitment to rigorous social theoretical analysis when explaining the emerging spatial patterns.

The use of GIS in literary geography

Understanding place using literature as a form of geographic data has been a long-standing tradition in humanistic and cultural geography. Invigorated by critical scholarship, literary geographers have brought into sharper focus the relations between social power and literary landscapes. While it has been common to analyze literary texts through narration, digital humanities and qualitative GIS began to map the spatial settings of literary narratives in order to reveal new aspects of their spatial organization and gain additional insights into their meaning.

It is important to note that the efforts to map literary landscapes originate in different theoretical perspectives. Literary geographers are likely to use advanced visualization capabilities of GIS together with social theoretical insights from humanities, geography, and critical GIS. Travis (2014), for example, combines critical literary theory with feminist and qualitative GIS in order to create sophisticated 3-D visualizations of Irish

literary texts that incorporate the nonlinear and even nested literary spaces (e.g., a novel within a novel).

In contrast, humanities scholars who discovered mapping as part of their relatively new focus on space and place construct literary landscapes without using geographic theories of space, place, and time or critical cartography and GIS. They also bypass desktop GIS in favor of online mapping tools (e.g., Google or Open Streets Maps) that allow them to quickly add the needed placemarks to the base maps. The literary cartography project "Mapping St Petersburg," for example, visualizes in this way the geography of Dostoevsky's novel *Crime and Punishment* (Young and Levin 2013). These fascinating experimental efforts, however, could benefit from the insights of cultural geography and critical cartography and GIS.

Digital historical atlases

Digital historical atlases have become a hallmark of digital humanities projects. Highly interactive, they put online previously inaccessible information from historical archives. The website Digital Harlem (http://digitalharlem.org/), for example, aims to portray the everyday life in this famous neighborhood for the period between 1915 and 1930. The website includes information "drawn from legal records, newspapers and other archival and published sources" and allows users to search it by different events, persons, and other categories. The results are presented as maps overlaid on contemporary and historical maps of Harlem. The amount of information available through the website is astonishing; however, police records predominate because they are the most systematic source. This puts a particular slant on how everyday life in Harlem at that time is depicted. Critical cartography and feminist and qualitative GIS scholarship on the epistemological dangers of silences created by mapped data would be highly relevant here. This would stimulate more balanced data sourcing and the greater inclusion of, for example, memories, diaries, and newspaper descriptions that are harder to incorporate but would prevent the (unintentional) marginalization of the cultural heritage of this iconic neighborhood.

Neogeography and crowdsourcing geographic data

Neogeography, including VGI, public participation GIS, community mapping, and citizen science, provides new sources of highly decentralized, collectively constructed, and often qualitative geographic knowledge. Warf and Sui (2010, 201) characterize neogeography as part of the citizen science that uses the geoweb to produce geocoded data as well as analyze it. Despite being developed only recently, neogeography, many authors agree, has profoundly changed how geographic information and knowledge are created. Neogeography projects flourished not least because the newly available geospatial tools are easy to learn and work well for basic geovisualization. This has made mapping considerably less dependent on expensive GIS software and technical expertise.

The range of neogeography projects varies from crowdsourcing data on car emissions to humanitarian emergency mapping (most famously in the aftermath of the Haiti earthquake) to deep mapping of cities (see next section), mapping noncapitalist economic practices such as the solidarity economy (www.solidarityeconomy.us/), collective urban resources (such as #MapJam by Sharing Cities Network in 60 cities worldwide http://mapjam2014-shareable.nationbuilder.com/), or

activist mapping of election violations (www.kartanarusheniy.org) and wells drilled for fracking (Inman 2015), among many others.

Qualitative GIS has much to contribute to neogeography in terms of understanding the collective practices of geographic knowledge production. This research on community participatory mapping and public participation GIS commonly involves academics who mediate the interaction between communities, GIS technologies, and policymakers. Neogeography, in contrast, is often self-organized, and academics play a less prominent role. In this situation, control over spatial data and resulting knowledge is moving away from a relatively tight circle of GIS academic, government, or industry experts into the hands of nonacademic communities. The degree of decentralization is clear when comparing 1 million GIS users with the 400 million neogeographers worldwide (Warf and Sui 2010, 201). The latter form self-selected groups with access to the Internet that generate spatial information that serves their interests. This stands in contrast to both the conventional GIS research that seeks to discover the objective truth and PPGIS that aims to generate a representative community view. Qualitative GIS scholars could offer methods for analysis of data produced by neogeography as well as insights into the politics of representation, partiality of knowledge, and political economy of neogeography.

Deep mapping and digital urbanism

Humanities scholars have been inspired by GIS because it allows for digital "deep mapping" (Bodenhamer, Corrigan, and Harris 2013). Deep mapping creates rich, textured, and multilayered descriptions of places using environmental, social, historical, political, economic, and cultural information from official sources such as natural history, census statistics, newspapers, and historical archives as well as less formal sources such as personal histories and memories, photographs, observation, interviews, and conversations. The goal is to articulate a collective sense of place. GIS provides a way to generate meaning of place by juxtaposing spatial layers with diverse information, and such digital deep maps can, compared to a narrative, represent place more directly. New digital media allow for creating multimedia deep maps that exist in cyberspace and also interact with the inhabitants of the place. Historical maps are layered over contemporary street networks, and census statistics are combined with memoirs of past residents while local communities articulate contemporary sense of place by posting photographs, comments, and other materials. Digital deep mapping projects could thus become collaborative modes of spatial knowledge production that develop at the intersection of artistic, scholarly, and participatory (neogeographic) representation of places.

One such "digital urbanism" project is edmontonpipelines.org at the University of Alberta. It depicts urban space in Edmonton, Canada, and seeks to build inclusive citizenship. The metaphor of pipelines supports the idea of channeling into a single website the past and present life of this oil city. Among other things, the website includes the indigenous people's memories, although somewhat superficially, which raises questions similar to those that qualitative and PPGIS scholars have asked in their own research. In particular, why these and what other citizens of Edmonton have been underrepresented in this digital urbanism project? Qualitative GIS research has addressed problems of exclusion through mapping in many contexts, making it directly useful in digital urbanism projects.

Spatial social media

Social media (such as FaceBook, Twitter, and other platforms) constitute a new source of large volumes of dynamic qualitative data that social computing scholars seek to analyze algorithmically (Manovich 2016). The increasing number of posts are geotagged, which transforms them into geospatial data that can be semantically analyzed and mapped. Such maps are of great interest to the public and can potentially change how people think about the world (see, for example, www.floatingsheep.org). One popular method to analyze tweets is to generate content clouds in which the most frequently used words are plotted, for example, with larger fonts, and mapped across space. This method is attractive because it maps unmediated textual information. However, it pulls words out of context and shows the frequency of the use of a word instead of the meaning of the tweet. Thus, mapping the frequency of tweets that mention a political candidate during the election campaign, for example, would not indicate whether people tweet in support of or against this candidate (Jung 2015). To address this problem, Jung (2015) uses a qualitative GIS method that combines grounded theory coding techniques with the semantic analysis of the spatial media content. Codes are words or expressions that show the meaning of blocks of text or tweets. Mapping the resulting "code clouds" would not conflate statements in support of or against politicians, preventing claims to popularity based simply upon how often a name is mentioned in tweets. Mapping the codes reflects spatial differentiation in political support as opposed to a mere presence in mass media.

While the processing of spatial social media information is high on the agenda in big data analytics, very often the data is parsed and visualized mechanistically without using rigorous methods for construction of meaning. Qualitative GIS methodologies, therefore, can usefully inform and work in conjunction with textual analysis of the geoweb. In addition, it is sometimes forgotten that spatial social media suffer from the old and new forms of digital divide. Critical and qualitative GIS scholarship, however, points to the fact that cyberspace is highly fragmented along the lines of class, race, and gender as well as Global North and Global South. This research adds an important dimension to analysis of social media.

Conclusion

The formerly dominant view of GIS as a primarily quantitative tool was owed to its origins in military applications, quantitative geographic tradition, and the computer industry. Yet, following critical GIS debates, qualitative GIS has emerged as a field that pioneered ways to map new types of data derived from qualitative interviews, historical archives, literary texts, and, more recently, social media, neogeography, and artistic visions of place. It also advanced integration of qualitative research methods with geospatial analysis in order to account for nonquantifiable, uncounted, and conceptually marginalized but important experiences and socioeconomic practices. Qualitative GIS, therefore, constructs new imaginaries of place and space that can contribute to inclusive citizenship. Advancing the fusion of critical human geography with GIS mapping would help to realize better this potential of qualitative GIS.

In less than a decade, qualitative GIS became widely used not only in geography but across social sciences and humanities. Involving GIS in mixed methods and qualitative research would not have been possible without epistemological

interventions by feminist and qualitative GIS scholars. These scholars asserted the importance of qualitative data, argued for its compatibility with GIS, countered conceptual marginalization of unmapped subjects and processes, and theorized the ontological role of mapping and the necessity of participatory generation of geographic knowledge. These interventions both legitimized qualitative GIS as a field and reconfigured GIS technology in the light of feminist and critical epistemologies.

The recent but intense diversification of Internet-based and open source geospatial tools has coincided with the rapid growth of digital qualitative information. Historic archives and library collections are being converted into digital form on a massive scale, making it possible to digitally analyze them for the first time. Tweets and consumer data are increasingly geotagged. In addition, public science, neogeography, crowdsourcing, VGI, and similar projects provide self-selected groups with the means to generate new forms of geographic information. New tools for processing and visualizing the volumes of often qualitative big data appear overnight. New fields are flourishing, including social computing, geoinformatics, geo-/spatial humanities, digital urbanism, and indigital networks, among others, that utilize these new data and tools to present and use information in spatial form.

While the context in which qualitative information and mapping intersect today has changed, the debates within qualitative GIS about the nature of geographical knowledge and representations of space remain highly relevant and current to these new fields. The latter, however, are not always aware of qualitative GIS interventions and often use the qualitative GIS approach without naming it as such. Yet, learning about contributions of qualitative GIS would prepare scholars in social sciences and humanities for the challenges of big data and the digital age. Thus, they would be equipped to deal with space and geographic knowledge in a profound way and see their work in the context of ongoing urban, economic, cultural, and environmental struggles as well as the politics of geographic knowledge and barriers to participation in its production.

As these lines of research and social practice continue to evolve and expand, the epistemological significance of qualitative GIS stands to grow. It is well positioned to equip scholars practicing qualitative GIS with theories, critiques, and ideas that enable progressive struggles while also allowing them to generate new insights by learning from the new digital spatial contexts.

SEE ALSO: Critical GIS; Geographic information science; Feminist methodologies; Public-participation GIS; Qualitative data

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Abstract: In less than a decade, qualitative GIS became widely used not only in geography but across social sciences and humanities. Following critical GIS debates and feminist GIS interventions, qualitative GIS has emerged as a field that pioneered ways to map new types of data derived from qualitative interviews, historical archives, literary texts, and, more recently, social media, neogeography, and artistic visions of place. It also advanced integration of qualitative research methods with geospatial analysis in order to account for nonquantifiable, uncounted, and conceptually marginalized but important experiences and socioeconomic practices. Qualitative GIS, therefore, constructs new imaginaries of place and space that can contribute to inclusive citizenship. Advancing the fusion of this scholarship with new spatially oriented and digital research in social sciences and humanities would help to realize better this critical potential of qualitative GIS.

Keywords: critical GIS; feminist GIS; qualitative GIS