

# General Examinations - Oral Component - PPGIS Followup

Jack Reid

September 30, 2021

The origin of the term public participation geographic information system (PPGIS) arose in 1996 over the course of two meetings of the National Center for Geographic Information and Analysis (NCGIA), though exactly when and exactly what the definition was is somewhat unclear. Multiple sources state that it was originally defined as “a variety of approaches to make GIS and other spatial decision-making tools available and accessible to all those with a stake in official decisions” [1, 2]. Both of these sources in turn cite Schroeder [3], but that source does not appear to contain the term PPGIS or the definition. Additionally, their citation says that Schroeder’s summary “Criteria for the Design of a GIS/2” was a summary of the summer NCGIA meeting, when in fact it is a summary of the earlier spring NCGIA meeting. The technical report summarizing both the spring and summer meetings confirms this, with PPGIS appearing nowhere in the earlier meeting summary [4].

Nonetheless, the Schroeder reference is relevant, as it lays out criteria for a new generation of GIS, denoted GIS/2, many of which are clearly leading towards what would become PPGIS: “A GIS/2 would increase emphasis on the role of participants in creation and evaluation of data... GIS/2 would accommodate an equitable representation of diverse views, preserving contradiction, inconsistencies and disputes against premature resolution... System outputs would be redefined to reflect the standards and goals of the participants, rather than closeness of fit to standards of measurable accuracy (such as positional accuracy in a Cartesian coordinate system)” [3]. By the time the summer conference occurred, the term PPGIS had definitively been invented, however, as the name of the second meeting as “Public Participation GIS Workshop.” Both the conference website [5] and Schroeder’s actual summary of the summer meeting (contained in [4]) confirm this timeline.

Neither of these two sources contain the earlier definition, however. The conference website instead states that “Increased public involvement in the definition and analysis of questions tied to location and geography is the domain of Public Participation GIS. The goal of the concept is to overcome the limitations of present GIS technologies and to address barriers in the institutional settings within which GIS is practiced. A public participation approach would situate GIS analytical tools within an expanded framework of communication and discourse, opening opportunities for public participation across the processes of problem definition and problem resolution.” Schroeder’s report meanwhile takes pains to differentiate PPGIS from GIS/2, stating that “While GIS2 was situated within a framework of specifications to be applied to the future of the technology and its expanded capacities, PPGIS was attached to the particular problems of bringing a wider public into effective use of the technology at whatever level its development may have attained” [4].

At this point I will like to dispense with the discussion of the details provenance and instead focus on the actual substance of the meaning of PPGIS, which we can see as the throughline in the above definitions and criteria. It is about empowering the public, rather than experts or government officials, to produce, store, analyze, and apply geospatial data, and thereby have an increased role in decisions made using that data. The need for PPGIS did not arise out of whole cloth at these two NCGIA workshops, however. Instead it arose out of an already existing dissatisfaction with how GIS was being constructed and applied. Many of the intellectual contributors to this discontent were present at these workshops, including John Pickles, Michael Curry, Eric Schapprd, Michael Goodchild, and Nicholas Chrisman.

John Pickles was one of the lead critics of status quo GIS. He called out practitioners failing to recognizing the social consequences of “unmediated technical practices.” These consequences took a variety of forms, in his eyes. He pointed out that “like all highways, the information highway requires points of access, capital investment, navigation skills, and spatial and cultural proximity for effective use,” that GIS practitioners had “not paid much attention to the rights of individuals to control information about themselves, to withdraw from databases involving themselves, and to review the information available and the ways in which it is being used,” and that their approach was “imperialist, reductionist, and technicist”, prone to “myopia” and limited to a “inherently conservervative form of analysis.” Perhaps most importantly, Pickles compiled many of his critiques, along with numerous others, in his book *Ground Truth: The Social Implications of Geographic Information Systems*, which was published only a year prior to the NCGIA workshops [6].

Michael Curry extended Pickles’s critique and, building explicitly upon Winner [7], argued that these ethical deficiencies were not mere “contingent features of current practice,” but instead that ethical in-

consistencies were “inevitable” and “necessary” in the creation and maintenance of GIS [8]. He pointed out that the collection of GIS necessarily involves some level of othering, as the data contains information about more humans than just ourselves. No matter how careful you are, no matter how humble you are, making a GIS for or about others will come up ethically short in some ways. We must recognize this and make conscious choices to avoid exacerbating such consequences. This idea would become key to PPGIS, as activists would seek to ensure that a community’s own ethics are embedded in the GIS that is used to collect their data.

Curry also highlights the importance of differentiating how to use a tool and how the tool works and that in this the idea of the expert versus the layperson arises, the scientist and the subject. This too is key to later PPGIS proponents, who seek to unify these two roles to the greatest extent possible by working to make the users (the public) know how the tool works (often by having the public involved in its construction and maintenance), thus avoiding (or at least mitigating) the construction of hierarchy.

Eric Sheppard, meanwhile argued that GIS was a social technology that has developed in a certain context, specifically one centered in North America and Great Britain; driven by priorities such as military surveillance and private enterprise; and constrained by data availability, cost, and a relatively weak geography intellectual discipline in the US [9]. If GIS as it was in the mid 1990s was merely one possible path, what other paths might it have taken or might it yet take? In particular, what does a path that involves wider access to information and GIS technology in particular look like? PPGIS would arise soon after Sheppard wrote on this topic as one potential answer.

Michael Goodchild is another important figure to note, less because of his contributions to PPGIS and more due to his role in how the GIS traditionalists (for the lack of the better word) would come to adopt aspects of PPGIS while still maintaining some distance. He acknowledged the ethical concerns raised by writers such as Smith (on the military uses of GIS) [10] and Pickles (on surveillance) [11], while at the same time disavowing personal moral responsibility and criticizing such authors for taking “extreme positions” [12]. Instead, he argued that GIS scholars “should be aware of the technology’s possible uses, for good and evil, and of the difficulties we all frequently face in making such clear distinctions.” He allows that ethical concerns have their place in GIS research agendas and expresses some hope that there will one day be a “productive literature on GIS by geography’s social theorists,” but stops well short of conceding any pressing need for methodological reform. Such a stance is important to recognize as it is still largely held by many experts and those in positions of power. Such individuals will often state that it is important to “carefully establish policies covering data access, data security, and transparency with respect to its collections” [13], but not cede their privileged positions as the collectors, holders, and analyzers of the data.

Nicholas Chrisman, along with his later collaborator Francis Harvey, were important in connecting GIS to social constructivism [1] and highlighting the inherent local aspect of GIS, in contrast to the universal aspects of GIS espoused by Goodchild and others. They argue that many instances of GIS serve as “boundary objects,” that is objects that simultaneously differentiate, mediate, and stabilize different populations [14]; they engineer agreement and are instantiations of relationships. They use as an example of this the harmonization of multiple different GIS datasets classifying wetlands in the United States. This harmonization allowed for communication and agreement among the diverse audiences (government agencies and communities) those who participated in its creation and adopted it. Furthermore, it helped define these groups as a distinct community from those who did not participate in its construction and who refused to adopt it (specifically the Corps of Engineers). This concept of what a GIS technology does, this creation of certain communities and exclusion of others, would become a key idea in later PPGIS development. A traditional top-down GIS excludes the public and thereby treats them as outside of the community of decision-makers. Involving the public in the creation and use of GIS, instead enables the construction of new communities (perhaps multiple neighborhoods or government agencies and those they govern) that can reach some level of agreement and common understanding.

To mention in brief a few other somewhat later thinkers who were not present at the NCGIA workshops (to the best of my knowledge). Nadine Shuurman proposed a theoretical framework for analyzing the social implications of GIS (Critical GIS) that is grounded pragmatism that enables an avoidance of impotent despair [15]. Renee Seiber, meanwhile, greatly advanced the development of the PPGIS after its definition, contributing both the literature review that was a key part of this recounting [1] and 14 guiding principles for PPGIS [16]. I should also acknowledge that this brief historical discussion does not include the numerous actual PPGIS practitioners in communities around the world, who, while certainly informed by the thinkers listed here, arguably did much more to actually fulfill the promise of greater participation.

## References

- [1] R. Sieber, "Public Participation Geographic Information Systems: A Literature Review and Framework," *Annals of the Association of American Geographers*, vol. 96, pp. 491–507, Sept. 2006.
- [2] N. Schuurman, *GIS: A Short Introduction*. May 2004.
- [3] P. Schroeder, "Criteria for the Design of a GIS/2," in *NCGIA Initiative 19: GIS and Society*, (South Haven, Minnesota), Mar. 1996.
- [4] T. Harris and D. Weiner, "GIS and Society: The Social Implications of How People, Space, and Environment Are Represented in GIS- Scientific Report for the Initiative 19 Specialist Meeting (96-7)," Tech. Rep. 96-97, UC Santa Barbara, South Haven, Minnesota, 1996.
- [5] K. Beard, M. Egenhofer, X. Lopez, and H. Onsrud, "NC-GIA Workshop on Public Participation GIS Home Page." <https://web.archive.org/web/20070519204841/http://www.spatial.maine.edu/~schroedr/ppgis/ppgishom.html>, May 2007.
- [6] J. Pickles, ed., *Ground Truth: The Social Implications of Geographic Information Systems*. New York: The Guilford Press, 1st edition ed., Dec. 1994.
- [7] L. Winner, "Do Artifacts Have Politics?," *Daedalus*, vol. 109, no. 1, pp. 121–136, 1980.
- [8] M. Curry, "Geographical Information Systems and the Inevitability of Ethical Inconsistency," in *Ground Truth: The Social Implications of Geographic Information Systems* (J. Pickles, ed.), pp. 68–87, New York: The Guilford Press, 1st edition ed., Dec. 1994.
- [9] E. Sheppard, "GIS and Society: Towards a Research Agenda," *Cartography and Geographic Information Systems*, vol. 22, pp. 5–16, Jan. 1995.
- [10] N. Smith, "History and philosophy of geography: Real wars, theory wars," *Progress in Human Geography*, vol. 16, pp. 257–271, June 1992.
- [11] J. Pickles, "Geography, GIS, and the surveillant society," in *Papers and Proceedings of Applied Geography Conferences*, vol. 14, pp. 80–91, 1991.
- [12] M. Goodchild, "Geographic Information Systems and Geographic Research," in *Ground Truth: The Social Implications of Geographic Information Systems* (J. Pickles, ed.), pp. 31–50, New York: The Guilford Press, 1st edition ed., Dec. 1994.
- [13] S. Goldsmith and S. Crawford, *The Responsive City: Engaging Communities Through Data-Smart Governance*. San Francisco, CA: Jossey-Bass, 1st edition ed., Aug. 2014.
- [14] F. Harvey and N. Chrisman, "Boundary Objects and the Social Construction of GIS Technology," *Environment and Planning A: Economy and Space*, vol. 30, pp. 1683–1694, Sept. 1998.
- [15] N. C. Schuurman, *Critical GIS : Theorizing an Emerging Science*. PhD thesis, University of British Columbia, 2000.
- [16] "About Public Participation Geographic Information Systems (PPGIS)." <http://www.ppgis.net/the-practice/about-ppgis/>.