

LETTERS TO THE EDITORS

GI science, not GIScience*

Dear Editors,

The abbreviation “GIS” has been tricky since Michael F. Goodchild proposed in the early 1990s that the meaning of the “S” should change from “systems” to “science” [5, 6]. Until then, no one had suggested that “GIS” would stand for anything else than “geographic information systems” (although “studies” and “services” were also later suggested [6]). “Geographic information systems” was a term coined in the 1960s, and by the late 1980s had evolved into widely adopted software tools [6]. The reason for Goodchild to challenge the meaning of the abbreviation “GIS” was that, at the time, certain researchers began increasingly to view GIS as more than just a tool or system. A shift of focus from systems to science was a way to address the lack of theory and to raise the status of the researchers involved in the field.

Initially, Goodchild argued for the use of the term “spatial information science” (in a keynote address at the 4th International Symposium on Spatial Data Handling), but later used “geographic information science” (in a keynote address at the Second European GIS Conference in 1991). When Goodchild shortly thereafter was asked to combine the two keynotes together into a paper for the International Journal of Geographical Information Systems (IJGIS) he wrote that he settled for “geographic” rather than “spatial” as he was intrigued by the ambiguity it implied about the decoding of “GIS” and as it seemed to him that “there might be general truths to be discovered about geographic space that were not equally true of other spaces” [6].

Goodchild started the ball rolling with his 1992 paper. Five years later, in 1996, the International Geographical Union changed the name and structure of their commission on Geographical Information Systems to two working groups: Geographical Information Science and Geographical Modelling [4]. In 1997, IJGIS changed “Systems” to “Science,” and Cartography and Geographic Information Systems followed suit in 1999. The First International Conference on Geographic Information Science was held in 2000, and in 2014, it was held for the eighth time. Nowadays, the domain addressed by geographic information science is well-defined and persistent [6], although the debate regarding whether it is a science or not still resurfaces every now and then [10].

While the scope of geographic information science as a discipline thus is no longer ambiguous, the denotation of the abbreviation “GIS” still is, and this poses a problem.

*The author would like to acknowledge Vilja Pitkänen at the Aalto University Language Center for her feedback on issues regarding the use of the English language and the author’s co-workers for their feedback on the text in general, especially Paula Ahonen-Rainio, Kirsi Virrantaus, and Andrei Octavian.

On the one hand, the traditional meaning of GIS as a system has not disappeared with the introduction of GIS as a science; but on the other hand, we need a distinguishable abbreviation for the science as well. In the literature, several solutions to separate the two can be seen, including “GIS” and “GISc” (e.g., [9, 10]); “GIS” and “GI Science” (e.g., [3, 11]); and “GIS” and “GIScience” (e.g., [1, 6, 8]) in regular use. While the abbreviation to be used for the system seems to be clear, the same cannot be said about the abbreviation for the science. Although “GIScience” is admittedly the most popular abbreviation, there is no commonly established abbreviation yet, and some even choose to not abbreviate it at all (e.g., [7]).

However, I argue that “GIScience” fails to solve the problem for several reasons. To start with, what strange kind of word is it and how should it be pronounced? It seems to be an abbreviation of some kind, i.e., “a shortened form of a word or name that is used in place of the full word or name” [9]. The most common types of abbreviations are initialisms and acronyms. Initialisms are abbreviations that are pronounced as individual letters (e.g. BBC and CEO) while acronyms are pronounced as a word (e.g. Nato and Unicef) [12]. This makes “GIS” an initialism, but “GIScience” belongs to neither of the two categories above. I would argue that most people pronounce it “GI science,” i.e., the first part as an initialism and the second part as a normal word separate from the first part. If this is the case, why should it be written as a single word? Furthermore, an abbreviation is usually recommended to be spelled out the first time it is introduced (followed by the abbreviation in brackets), but this is generally not the case with “GIScience.”

Certainly, one of the major reasons for the popularity of the term “GIScience” is that one of the main conferences in our field, the International Conference on Geographic Information Science, has used it since its beginning. However, “GIScience” seems to be used to refer to both the conference series and the discipline, which is yet another unnecessary ambiguity. As for journals, none of them is promoting the use of the term “GIScience” as actively as the conference series. Of the 44 most important journals in the field of geographic information science [2], none have “GIScience” in their title; two of them have “geographic information science” (or “geographical information science”¹) in their title; and one has “GIS” in its title.

For geographic information science to be fully recognized as a discipline, with all the integrity that it implies, we need to agree on using only one abbreviation, which should not be “GIScience.” “GIScience” is neither a word nor an abbreviation, it is merely a buzzword. Instead, let us use “GI science,” an abbreviation which is formed in accordance with standard practice. This assists correct pronunciation, with the opening initialism written in upper case and “science” in lower case. This would also allow the creation of new abbreviations when needed, e.g., “GI studies,” “GI services,” “GI scientist,” and “GI users.” Likewise, we can talk about, e.g., “GIS software,” “GIS hardware,” and “GIS users.” Let “GIS” stand for the system, “GIScience” for the conference series if necessary, and let us once and for all agree that the science should be abbreviated as “GI science.”

Andreas Hall
Aalto University, Finland

¹This is another intriguing ambiguity but of less importance. Geographic and geographical seem to be used interchangeably and lack any clear difference in meaning.



References

- [1] ANDRIENKO, G., FABRIKANT, S. I., GRIFFIN, A. L., DYKES, J., AND SCHIEWE, J. Geoviz: Interactive maps that help people think. *International Journal of Geographical Information Science* 28, 10 (2014), 2009–2012. doi:10.1080/13658816.2014.937719.
- [2] CARON, C., ROCHE, S., GOYER, D., AND JATON, A. Giscience journals ranking and evaluation: An international Delphi study. *Transactions in GIS* 12, 3 (2008), 293–321. doi:10.1111/j.1467-9671.2008.01106.x.
- [3] CHRISMAN, N. R. What does “GIS” mean? *Transactions in GIS* 3, 2 (1999), 175–186. doi:10.1111/1467-9671.00014.
- [4] FISHER, P. Editorial. *International Journal of Geographical Information Science* 11, 1 (1997), 1–3. doi:10.1080/13658819709506176.
- [5] GOODCHILD, M. F. Geographical information science. *International Journal of Geographical Information Systems* 6, 1 (1992), 31–45. doi:10.1080/02693799208901893.
- [6] GOODCHILD, M. F. Twenty years of progress: GIScience in 2010. *Journal of Spatial Information Science*, 1 (2010), 3–20. doi:10.5311/JOSIS.2010.1.2.
- [7] HIRTLE, S. C. *Geographical design: Spatial cognition and geographical information science*, vol. 11 of *Synthesis Lectures on Human-Centered Informatics*. Morgan & Claypool Publishers, 2011. doi:10.2200/S00342ED1V01Y201103HCI011.
- [8] MACEACHREN, A. M. Cartography as an academic field: A lost opportunity or a new beginning? *The Cartographic Journal* 50, 2 (2013), 166–170. doi:10.1179/0008704113Z.000000000083.
- [9] RAPER, J. Geographic information science. *Annual Review of Information Science and Technology* 43, 1 (2009), 1–117. doi:10.1002/aris.2009.1440430109.
- [10] REITSMA, F. Revisiting the “is GIScience a science?” debate (or quite possibly scientific gerrymandering). *International Journal of Geographical Information Science* 27, 2 (2013), 211–221. doi:10.1080/13658816.2012.674529.
- [11] VIRRANTAUS, K., FAIRBAIRN, D., AND KRAAK, M.-J. ICA research agenda on cartography and GIScience. *Cartography and geographic information science* 36, 2 (2009), 209–222. doi:10.1559/152304009788188772.