

GIS: Research Methods

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BOOK REVIEW

GIS: Research Methods, edited by Nick Bearman. London, Bloomsbury Academic, 2020, 110 pp. £16.99 (paperback), ISBN: 9781350129559

Nick Bearman provides a thorough introduction to geographic information systems (GIS) for students, researchers, and scholars outside of the geographic discipline with his new non-technical text in the Bloomsbury Research Methods series. Bearman strikes a good balance between depth and breadth to produce a handy reference for anyone not sure where to start when it comes to GIS, from its historical beginnings in spatial data analysis that empowered John Snow in London more than a hundred years before the term *GIS* was coined, to its emancipatory power in citizen science today along with issues of equitable access and the ethical implications inherent in data collection.

Some cartographic fundamentals are given quick attention to help social scientists understand what makes a good map, which is a welcome inclusion that can be overlooked in GIS texts. Bearman acknowledges that any map is a model of the world. Therefore, mapmakers must be selective in the details they incorporate. Included in this discussion are coordinate systems, projections and their associated distortions, thematic map styles, classification schemes, necessary map elements, and some color theory. The nature of raster and vector data is also summarized along with varied examples to highlight strengths and weaknesses of employing either in a GIS (I wish I could credit the individual that engrained in my head *raster is faster, but vector is corrector*).


Anyone with some experience using GIS can sympathize with the sometimes overwhelming variety of files encountered. This text takes time to break down the infrastructure of shapefiles (e.g., .shp, .shx, .dbf, and .prj) as well as other file types to reduce bewilderment for newcomers. Bearman includes a brief cross-section of data analysis techniques, from spatial autocorrelation to varied spatial overlay operations, in a straightforward manner that is accompanied with useful figures. Further, he is helpful in reminding readers that the list provided is not exhaustive and that many techniques are used in concert with one another. This cruising altitude perspective is helpful for the intended audience to survey some of their options before zeroing in on more technical works.

The proliferation of GIS in the last few decades offers a robust set of options that must be considered by anyone interested in incorporating it. The differences between proprietary and open-source software are elucidated along with an objective overview of, and links to, the best-known desktop, web, and code-based mapping options available today. Bearman makes a particularly noteworthy observation when discussing research methods. He asserts that code-based

methods in GIS are the easiest to reproduce, and open-source platforms offer more transparent processes compared to their industrial counterparts that safeguard some of the workflow. The promotion of reproducibility and transparency transcends the bounds of GIS and resonates with anyone conducting rigorous science.

Bearman concludes with an exploration of future directions in GIS through autonomous vehicles and the geospatial infrastructure upon which they will operate, as well as the evolving integration between GIS and computer-aided drafting and design in building information management (BIM). Readers are reminded of the importance of good file management, including a backup strategy, and some useful resources are offered for those preparing to generate spatial data to make working with them less burdensome for both creators and collaborators. Significant weight should be given to Bearman's promotion of a critically reflexive approach to the inevitable problems encountered along the way. Critical reflexivity posits a thoughtful self-awareness of one's actions throughout the research process. One of the biggest barriers to using GIS is its steep learning curve, and the author provides beginners with a successful philosophy using simple language peppered with humor in a way that many other books on the subject lack.

Among the figures, there is an occasional map interpretation issue associated with the limits of grayscale in the paperback, but that never detracts from a figure's purpose when encountered. A missed opportunity includes having a chapter with a few examples of GIS being used in social science research. Closing the loop with examples of GIS scholarship by historians, sociologists, political scientists, and other non-geographers would go a long way to help the uninitiated picture their research in a similar context. For a book that equips those new to GIS, that shortcoming should in no way deter anyone from utilizing it. Nick Bearman has provided a valuable contribution for anyone interested in incorporating geographic information systems into their work.

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