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Editorial

The future of GIS in social sciences

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The utility of GIS (Geographic Information Systems) has proven to be a powerful way to navigate today's data-rich environment, be it academia, industry, or everyday life. For example, Google Earth and handheld GPS (global positioning system) devices are now part of the daily routine of billions of people around the world. In addition to the way GIS has changed how people understand and interact with social reality, the use of GIS is now at the forefront of modern social science methodology.

What exactly is GIS?

GIS is typically defined as a computer data system capable of capturing, storing, analyzing, and displaying geographically referenced information. This information is attached to a location and can be identified by latitude and longitude, or by more common names such as a street address. Although the occasional use of maps and spatial thinking in the social sciences goes back more than two centuries, it has only been about three decades since applications of GIS features became systematic in social science research. As computing capacity has increased so have the applications and possibilities for GIS. Perhaps unsurprisingly, the "hard sciences" such as geography, physics, and climatology were among the first to take advantage of GIS. A quick search of just one term "GIS" in two popular databases – Science Citation Index (a mostly "hard science" index) and Social Sciences Citation Index (both spanning 1900–2017) reflects this imbalance, with 31,671 citations found in the Science Citation Index and only 9467 citations found in the Social Sciences Index.

How to use GIS

The quest for knowledge in social science begins with a question, and there are several ways in which the use of GIS can be helpful in providing new ways to answer old questions. For example, GIS allows questions to be asked that can be answered by combining findings from different disciplines. Through integration, maps displaying the environmental quality of a setting can be overlaid with maps of human health to examine correlations that might suggest risk and protective factors. GIS also provides a means to answer questions related to the temporal context of a phenomenon. For example, instances of illness may be better understood when mapped to show when they appeared and in what order in particular neighbourhoods. The use of GIS is critical in epidemiological research and can easily be applied to other social phenomena such as crime and unemployment.

GIS has been particularly helpful in answering questions related to access to social and health services. Mapping the geographical location of services with population data from where needs are most prevalent allows not only an understanding of how accessible services are, but also what transportation services might best be provided. Adding network analysis – determining the nature and quality of the connections between people – can then provide policy makers with a comprehensive overview of how best to serve vulnerable populations.

GIS can also be used in demography to study issues related to migration and migration related health problems. Being able to spatially relate health issues over

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time to population movements (e.g., urbanization, density changes) can help identify causes and consequences of population movements and disease clusters.

The future of GIS

Knowing what GIS is and how it might be used in social science research is a first step to becoming proficient. But realistically, because established researchers are less likely to embrace new methodologies, the future of GIS is going to be dependent upon emerging scholars. GIS is only now being taught in some university graduate programs and there is a need for skilled teachers. As with many new methodologies where desire for instruction exceeds available teachers, many GIS users are self-taught through web-based instructions and workshops.

There are several challenges to increased use of GIS. One issue, common to mastering any new software, is the speed which the software becomes outdated or is revised.

GIS software continues to change and improve over time and there are now several GIS applications that range from being free to being very expensive. There may come a day when there is a free, user-friendly GIS software that is perfect for a particular researcher, but there is no certainty as to how soon that will be. Whether and when a researcher should invest the time to learn GIS is a gamble that must be made on a case by case basis.

To be sure, there is going to be a demand for GIS researchers in the future. As the field grows, there will be clear indications of how GIS methods provide more meaningful answers for research and policy than traditional research methods alone. Additionally, we are now in the era of “Big Data”, when there will be more and larger data bases that can be researched through GIS and/or linked through geo-spatial analysis. For researchers interested in health and social sciences, becoming familiar with GIS possibilities may prove very useful. Just don’t wait until it’s too late.