

Political Science and GIS

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Introduction

Political scientists and political geographers frequently use geographic or spatial techniques in their research. For example, mapping and other geovisualization tools have been used extensively in electoral studies as well as in various geopolitical studies of empires, wars, boundaries and trade routes. These political studies have focused on different scales of analysis, from the local and regional to the national and global levels.

There is evidence of an increased use of spatial analysis techniques within the social sciences generally, and for political science in particular. In part, the increased use of spatial methods arises from the increased mapping, visualization and spatial analysis functionality of GIS software. However, this trend is also driven by the increased availability of geospatial data on a variety of socioeconomic and environmental domains relevant to political scientists as well as the ability to couple advanced spatial statistical software with GIS software (e.g., SpaceStat and Arcview).

For more detailed reviews and issues relating to the use of spatial methods in political science you are encouraged to consult the introductions of two recent special issues published in political science-related journals in 2002:

Political Analysis (10: 3) on “Spatial Methods in Political Science” (Edited by Michael Ward and John O’Loughlin)

Political Geography (21:2) on “The Development and Application of Spatial Analysis for Political Methodology.” (Edited by Michael Ward)

Both of these special issues emerged from a conference held in Boulder, CO in March 2000. The conference was titled “New Methodologies for the Social Sciences: the Development and Application of Spatial Analysis for Political Methodology.” Some materials from this conference, including abstracts and copies of many other papers, can be found at <http://www.colorado.edu/IBS/PEC/spatialconf.html>.

Also, it is worth noting that an earlier special issue of *Political Analysis* (9:3) can be found at the *Political Analysis* (Oxford University Press) website at <http://www.pan.oupjournals.org/> (see <http://web.polmeth.ufl.edu/pa/backissues.html>).

Researchers at Penn State can view PDF versions of all of the papers on-line through the E-Journal Title Search (ERLIC) at <http://apps.libraries.psu.edu/cf/fasttrack/search.cfm>. Hardcopies of some of these papers are also available in a folder in 802 Oswald Tower.

Recent Special Issues

Political Analysis (10: 3)

Theme: Spatial methods in political science
Editors: Michael Ward and John O'Loughlin.

This special issue includes five articles that include descriptions and uses of the following techniques: Exploratory Spatial Data Analysis (ESDA), Local Indicators of Spatial Association (LISA statistics), spatial autocorrelation, spatial regression modeling, and Markov Chain Monte Carlo (MCMC) methods.

Substantive topics/applications covered in this special issue include: the electoral geography of Weimar Germany (using ESDA), an MCMC approach to modeling the spatial context of war and peace, spatial networks among voters in St. Louis and Indianapolis and papers on spatial effects and ecological inference.

Political Geography (21:2)

Theme: The development and application of spatial analysis for political methodology.
Editor: Michael Ward

This special issue includes six articles that includes descriptions and uses of the following techniques: point pattern analysis, visualization, spatial correlograms, Exploratory Spatial Data Analysis (ESDA), network studies and boundary analysis.

The substantive focus of the papers tends to be on electoral geography and international relations. Papers include: a GIS-based spatial analysis of neighborhood effects and voter turnout including the use of point pattern analysis (Sui and Hugill); a study of race, space and voter turnout in St. Louis using mapping and spatial correlograms (Kohfeld and Sprague); a study of networks among voters and neighbors in St. Louis and Indianapolis (Baybeck and Huckfeld); an excellent article on the geography of party replacement in Italy (1987-1996) using ESDA and LISA statistics (Shin and Agnew); the use of highly disaggregated data on the nature of boundaries and borders to help understand international disputes and conflicts (Starr); and, a study discussing the inclusion of spatially conceptualized and carefully examined geographic factors to help understand international conflict (Tir and Diehl).

Related GIS Resource Documents

GIS_RD_02-03 (GIS and Spatial Analysis)
GIS_RD_02-06 (Spatial Regression Models)
GIS_RD_02-09 (Exploratory Spatial Data Analysis)
GIS_RD_02-10 (Using DynESDA)
GIS_RD_02-11 (Using DynESDA for Moran and Local Moran plots)