

Preface

Spatial analysis is where the GIS rubber hits the road—where all the hard work of digitizing, building a database, checking for errors, and dealing with the details of projections and coordinate systems finally pays off in results and better decisions. But spatial analysis has often seemed inaccessible to many users—too mathematical to understand, too difficult to implement, and lacking in good textbooks and guides. Here at last is the ideal book, written by Andy Mitchell and based on ESRI's vast experience with applications of spatial analysis to a host of real problems. The book covers every area of GIS application, so readers will find examples that relate directly to their own concerns, whether they be in hydrology, transportation, or regional planning. The organization is intuitive, with sections on all of the major forms of simple spatial analysis. As noted in chapter 1, 'Introducing GIS analysis,' ESRI plans to follow and build on this with a second more advanced book, which will cover some of the more complex methods.

We tend to think of spatial analysis as something different from mapping—and substantially more sophisticated. The phrase "just a mapping project" is often heard in GIS circles, and carries with it the implication that if sophisticated GIS software is used only to display data in visual form that somehow it is being underutilized. In fact the earliest GIS—the Canada Geographic Information System—had no display capabilities at all in its original design, and could only produce numerical output in table form. One of this book's most valuable contributions is to show how mapping and analysis are intimately linked, and how we gain most from GIS when we combine carefully designed visual display with numerical summaries. The book includes abundant

examples in color of the use of GIS for visual display. As the author points out, analysis does not have to involve complex mathematical operations, but begins in the human mind as soon as the map is in view, because the eye and brain are enormously efficient at detecting patterns and finding anomalies in maps and other visual displays. GIS works best when the computer and the brain combine forces, and when the GIS is used to augment human intuition by manipulating and displaying data in ways that reveal things that would otherwise be invisible.

This book will appeal to GIS users in all areas of GIS application. It will be invaluable reading for people encountering GIS for the first time, and wanting to see where its real power lies. It will make an excellent textbook for courses in GIS in high schools, community colleges, and undergraduate programs, and as a supplement for practical work. This is not a software manual, and it rightly avoids tying to any particular brand or version of GIS. So although its origins are in ESRI, it should be valuable to users working with other brands of GIS, and will be useful to professionals who are concerned about interoperability across different brands, because of its focus on the basic principles of simple spatial analysis rather than on any one software product. ESRI has done the field a great service by sponsoring and publishing this book.

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