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Book Review: Lloyd, Christopher D. 2014. *Exploring Spatial Scale in Geography*. Chichester, England, Wiley.

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Author

O'Sullivan, David

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Book Review

By David O'Sullivan, Department of Geography, University of California, Berkeley

Lloyd, Christopher D. 2014. *Exploring Spatial Scale in Geography*. John Wiley & Sons, Chichester, UK.

This book provides a systematic and comprehensive account of the many spatial analytic methods useful for understanding the implications of spatial scale for geographical data. The author effectively and concisely covers a wide range of methods, using a variety of different datasets and examples. Numerous well designed tables, figures, and maps effectively illustrate the methods, and enhance the explanations.

Scale is a topic whose definition can quickly get out of hand. Rather than grapple with the philosophical complexities of scale as a general concept in geography or other disciplines, the author here settles on 'spatial scale' as a label that denotes a strictly spatial data-oriented concept, intimately bound up with any attempt to characterize the geographical structure of social or physical phenomena. Indeed, the aim is more modest even than this: "the key focus is on scale as the size or extent of a process" (page 1). It is testament to the far-reaching implications of any attempt to address scale in analysis, that even with the focus narrowed to this degree, a case can be made for book-length coverage! Other general definitions and context are covered in the opening two chapters, before the core content of the book, extending over seven chapters begins.

Chapter 3 briefly considers the modifiable areal unit problem, particularly its scalar, or aggregation component. While there seems no particular need to dwell on this topic, the treatment here feels a little brief, perhaps reflecting the fact that addressing aggregation effects in spatial data remains a relatively underexplored area.

The following chapter on 'Measuring Spatial Structure' is a meatier affair, running close to 60 pages, and by some distance the longest in the book. The coverage here includes standard measures of spatial autocorrelation (Moran's I, Geary's C and friends) in both their global and local forms, variography, and point pattern analysis. While none of this material is particularly novel in its approach, the writing and examples are admirably clear, and the account of variography is especially useful, covering material that can be somewhat impenetrable with great clarity. Chapter 5 provides an account of various forms of spatial regression and like the material on variography does so in a clear, organised way using accessible examples.

The next three chapters see a change of direction toward topics much less often covered in the general spatial analysis literature (in geography at least): fractal analysis (Chapter 6), various 'image processing' transforms for gridded data (Chapter 7) and areal interpolation methods (Chapter 8). These are interesting inclusions, which move the book beyond what might otherwise be a fairly 'traditional' spatial

analysis syllabus. The account of various image processing transforms is particularly promising, providing a nice introduction to a complex and unfamiliar topic. It is also welcome to see areal interpolation, arguably central to so many studies conducted in a GIS context taken more seriously than is typical. These are relatively short chapters so the coverage in each case is necessarily rather condensed, but nevertheless they each provide useful orientation to the wider literatures on which they draw.

The last of the book's substantive chapters returns to more familiar ground, in an account of geostatistical interpolation, here viewed as a change in statistical support, whether at the same or different scale from available control point data. Again, this is an accessible entry point to a much wider literature, which focuses particularly on how insights from geostatistical methods can be used to devise optimal sampling schemes in terms of spatial resolution. A brief final chapter rehearses what has been covered in the core chapters.

The book is not intended to be read in order straight through, but is organized to provide the reader with rapid access to the research literature on spatial analytic methods. Chapters have separate reference sections and the publisher clearly intends them to stand alone as 'review' articles. In aggregate there are over twenty pages of bibliographic references, which even allowing for duplications makes the book as a whole a substantial and useful point of reference.

In the first chapter, the author expresses the hope that this book might become "the first port of call for those with an interest in spatial scale and spatial data analysis" (page 3). To the extent that scale is central to spatial analysis this goal has been accomplished. Given the book's title, I expected a steadier focus on scale in particular, rather than spatial analysis methods in general. That would probably have been a shorter book, with a more consistent emphasis on scale and the issues it raises for spatial analysis. Even so, this book could be a useful addition to any spatial analyst's personal – or, at the price, more likely institutional – library. It will certainly provide useful readings for advanced undergraduate or graduate classes exploring the topics covered.