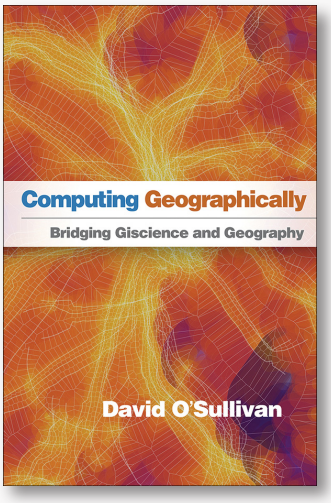
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COMPUTING GEOGRAPHICALLY: BRIDGING GISCIENCE AND GEOGRAPHY

By David O'Sullivan

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Computing Geographically: *Bridging Giscience and Geography*, by David O'Sullivan, seeks to reach across a broad range of interconnected ideas and concepts to bridge the distinct disciplinary traditions of geography, geographic information science (giscience), and computer science. O'Sullivan's research has often cut across both qualitative and quantitative themes of geography and giscience, and this book is another instance of that focus. It does not explicitly address cartography, and thus requires careful reading and assessment to apply its analysis to the practice of mapmaking, *per se*, while preserving a sense of its contributions as a whole. Nonetheless, the book provides a meaningful addition to the longstanding debates within geography dealing with how to develop reliable and consistent explanations of geographic reality that account for the complexities of human and natural environments.

Geography and giscience continue to evolve as new digital technologies reshape how we conduct research and teach. One outcome has been the growing use of geographical computing in everyday research and teaching, both within geography and across other disciplines. While these developments have opened up new opportunities, they also raise concerns about a possible disconnect between geographical theory and computational practice. As a result, it is important to reflect on what it actually means to "compute geographically." The nine chapters of the book address this concern by providing a conceptual and theoretical companion to the technical practice of geographical computing. Throughout the chapters, the author returns to some fundamental questions: What does it mean to "compute geographically" as an intellectual activity? How does geographical computing connect with geography and giscience as ways of thinking about and understanding the world? These questions form the central organizing thread that binds all the chapters together around the broader relationship between geographical thinking and computational practice.

The author begins the first chapter—"Building Bridges"—with "A History of My Spaces," where he outlines how he came to understand that a broad, ongoing structural insufficiency has arisen within the discipline of geography. Although the geographer's understanding of concepts of space, place, boundaries, scale, process, and relationality had been steadily evolving, it became apparent to O'Sullivan that their computational representation had not. To O'Sullivan, geography's expression and public identity have become ever more closely bound to GIS platforms, but advancements in giscience are following a path that seems to be leading away from geography. The author sees this divergence as problematic. For example, in much of GIS practice, "picking up and using available geospatial tools as they are, taking whatever assumptions about these concepts they embed for granted was (and still is) the norm, outside a narrow slice of the giscience literature" (7). O'Sullivan observes that "to a surprising extent these developments [in advancing computation in geographical settings] have occurred in isolation from developments in geographical thought and from the concepts used by

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geographers to describe, discuss, and explain the world" (1). This observation is both familiar and revealing, and it helps to explain why in many GIS contexts the map is treated primarily as documentation or output—evidence that data analysis has been completed—rather than as an object for reasoning and interpretation. In a very general sense, an important theme throughout the book is that representation is never an action that occurs only at the end of the analytical pipeline. It is already present explicitly and implicitly in the categories, data models, data structures, and conceptual assumptions we use to render the real world in computer spaces.

The opening chapter continues with the author's "Plan of the Book," which lays out how he will go about describing, analyzing, and addressing these issues.

Chapter 2—"Location and Space"—gives the representation argument much of its conceptual depth. While discussions about absolute, relative, and relational space are familiar within geography, O'Sullivan's refreshing treatment goes beyond a simple restating of the typology to reframe the traditional ways of thinking about data modeling. He tells us that every GIS representation—and every map that follows from it—already assumes an answer to the question of what kind of space the world is, and that—even before any symbolization choices are made—the world has already been partitioned into objects, fields, networks, and/or surfaces. In this sense, data models provide pre-assumed representational decisions that help shape and define what can be meaningfully mapped.

Chapter 3 is titled "Scale and Projection," and logically extends this argument through a direct contrast between the concept of scale found in geographical theory and that underpinning giscience. Scale, he argues, goes beyond resolution or extent; it is also a way of organizing relevance and importance. Similarly, projection is presented as an invitation to reflect on the fact that all maps embody choices, trade-offs, and necessary compromises in how the world is represented. O'Sullivan's sustained attention to scale and map projections emphasizes his point that these are more than the technical matters GIS largely assumes; they are also expressions of the impossibility of neutral representation.

The "Place and Meaning in Space" chapter is one of the more conceptually useful parts of the book. It takes "place"—a term that is often used loosely in GIS contexts—and treats it as something that requires genuine theoretical and representational attention. O'Sullivan's progression from space to place to experience to context, and finally to meaning, is well paced and intellectually coherent, making a persuasive case for why place cannot be reduced to location alone. The sections on gazetteers, vague places, and cognitive maps are particularly effective because they link abstract ideas to forms of representation many readers will recognize from their own experiences. The argument makes it clear that while parts of place can be operationalized, place itself resists being made fully computable—and, further, it shows where current giscience approaches are helpful, and where they risk flattening something that is inherently relational and experiential. However, keen readers may wish for more concrete guidance on how these ideas could reshape everyday GIS workflows.

In the fifth chapter, "Lines and Areas," the author turns his attention not only to lines and areas—themes that I, and others, consider the grammar of cartography—but to boundaries as well. Boundaries are treated as both geometric artifacts and decision acts that carry legal, political, and epistemological consequences. The section on "The Arbitrariness of Boundaries" adds conceptual weight to the fact that spatial units are constructed and exert a powerful influence over what can be observed, measured, and governed. The subsection on "The Modifiable Areal Unit Problem" outlines a specific boundary issue where different meanings and statistics can result from using different administrative area units. Classification and aggregation are approached similarly. Rather than being presented as neutral analytical conveniences, they are treated as mechanisms for producing similarity and difference. The most impactful choices in a map often occur well before anything is drawn.

The next three chapters, 6–8, progress the argument from static to time-dependent representations that more closely reflect the space-time realities of the . This is captured well in the phrase "representation as process and practice" (250). For cartography, this is a familiar and evolving idea: maps show results and also participate in the making of those results. The examination of time as a mapping variable further strengthens the discussion. Static representations tend to freeze processes into sequences of states. The book brings this issue to the foreground and invites more explicit and reflective thinking about the kinds of temporal narratives our maps can plausibly justify and support.

The ninth and final chapter, "Doing Giscience, Doing Geography," focuses the main arguments of the book and provides a concluding synthesis. It reinforces the argument that representation is an integral part of the practice of geographic work. Speaking both to research and to teaching, O'Sullivan's argument that giscience and geography need a shared "space to think" is presented as something with practical consequences for how we design tools, how we train students, and how we evaluate what counts as useful work. The tone is cautious, but optimistic—there is no pretense that these changes will be easy or that existing practices are misguided, but the chapter makes a strong case that continuing as-is is intellectually limiting. The book ends on a deliberately open and collaborative note, suggesting that whatever resolutions emerge will be the product of shared work rather than solitary insight: "I am excited to see what we can come up with, together" (255).

From a cartographic point of view, the book occupies an unconventional position. There is no practical guidance on map design, symbolization, layout, or visual hierarchy, but throughout the text maps are treated more as a mechanism for geographical thinking than as a final packaging for an analysis. The book offers a language for understanding maps as both products and arguments—that is to say, as representational commitments that actively shape what can be seen, said, and done. Collectively, these ideas enrich cartographic training by grounding mapmaking in a clearer conceptual framework and a more explicit sense of why the map itself matters. In the end, this book will resonate most strongly with readers looking for a deep conceptual reflection on the close, symbiotic relationship between the practices of geography, giscience, and cartography. Readers looking for quick technical solutions or ready-made workflows will likely be disappointed with *Computing Geographically*, and may find it conceptually demanding. Rather than being a limitation, this demanding nature reflects the book's aim to treat geographical computing in general as well as giscience, cartography, and geography with more intellectual care, reflection, and depth.