

## Preface

Unfolding landscapes evoke all sorts of feelings and memories. Maps allow us to visit or revisit areas of the world that fascinate us. They allow us to travel across continents, explore hidden cities, understand the planning of medieval walled towns, and escape to exotic locales that may no longer exist. The power of place is indescribable. The need for us as humans to understand “place,” as well as our place in the world, is essential. Geography gives us those skills and concepts to understand the physical, human, political, historical, economic, and cultural factors that affect the human and natural environments.

Libraries are part of the human environment. They represent our attempts to understand, to wonder, and to reflect on the myriad wonderfulness of our universes, local and far away, real and imagined. Libraries house riches, from books to journals to maps to globes to pictures in all sorts of two- and three-dimensional formats. Libraries also provide ways of knowing and understanding a topic or place or person through classification and naming. Libraries provide ways to access and acquire those materials that can give us a deeper understanding of all those factors that make us human and that help create societies. Libraries are also places of instruction, of learning how to find that bit of knowledge that keeps us wondering or lying awake at night trying to figure it out.

Both geography and librarianship have evolved significantly in their breadth of understanding their respective universes, including the emergence of exciting conceptual and theoretical models, innovative methodologies, cutting-edge technologies, and application of these technologies. We cover the waterfront, so to speak, from the tangible, such as paper, photographs, and maps, to the intangible, such as digital objects, numeric/spatial data, and streaming media. We have also evolved

from being “geography” and “library” to “geographic information science” and “library/information science.”

In writing this monograph, we have tried to address these new forms of geography and library. Without a doubt, technology and the attendant uses of technology affect everyone one of us. In the world of information it is impossible to dissociate oneself from the use of technology. Further, the growth of the online and digital environments have ensured that technology is here to stay. Fifty years ago, we would have been hard-pressed to imagine ourselves pulling up a map or a book on a cellular phone or a personal digital assistant. Today, instant messaging and digital books are intrinsic to, if not our lives, to the lives of the children and teenagers who are immersed in the digital world.

Examining how academic libraries and geographic information science intersect must begin with a review of the information-based economy we now live in. Certainly, the convergence of computer technologies and communication technology in the past two decades has revolutionized business organizations in how they operate, especially with the rapid and efficient transmission of information on a global scale. This economic restructuring is driven by an information economy that continues to value knowledge work as commodity. Geospatial data and libraries have become important components of socioeconomic processes, political activities, and academic research within the emerging information economy.

The social milieu is another aspect of this new economic structure that cannot be ignored. What information is available affects *how* individuals participate, as well as *who* participates. Libraries offer digital services and digital resources to increase access to information to a wider community of online users, both in the physical library as well as to remote users. Chapters I and II attempt to place geospatial information science and library/information science in the context of the information economy and the digital infrastructure we know as the Internet.

To create a holistic view of the “landscape of information,” librarians and geographers use classification schemes and measures relevant to the phenomena in the landscape under study. Analytic and statistical tools continue to enhance the use and display of spatial information, providing linkages to previously undiscovered and unknown relationships between factors. Research into the structure and interconnectedness of databases, data structures, and indexing methods have resulted in new data frameworks and typologies in both geographic and library information science. Both fields are still faced with challenges in the cataloging and mining of digital data. To do so will require us to address the challenges in describing geospatial works, such as quality and relevance of metadata, record formats, intellectual analysis of works, and search and retrieval frameworks to meet the different uses of geospatial information. These interrelated topics are integrated throughout Chapters II through VI.

Since the 1990s, digital geospatial data interoperability has been the target of major efforts by standardization bodies and the research community. With the rise of

new digital models, applications, and networks, we suggest that libraries can better organize and increase the resource discovery of digital geospatial data. For some, a “geolibrary” that results from the intersection of the library and the spatial data infrastructure would extend the use of geographic information far beyond scope of a traditional map library. As remote access to digital resources increases, how libraries will address the information tasks performed by users is critical. First, users will have to create effective search criteria to gather materials, determine if the items they found actually can meet their information need, hone in on specific items that are “perfect,” and then retrieve the actual item online. It sounds simple, however, in an online environment, access, discovery, and retrieval are more complicated. What will be important is that legacy materials, in print and superseded digital formats, are not lost to researchers and users, rather that they remain findable and usable through library catalogs and other digital frameworks. This is discussed in Chapters III, IV, and V as we delve into the design and development of databases, metadata frameworks, and standards to ensure interoperability and access.

To make things findable and retrievable requires compatibility between hardware and physical facilities; software applications and software; and network standards and transmission codes. It also requires that persons who produce and provide access to resources work within standards to ensure interoperability between *my* system and *your* system, our interfaces, and our respective products. Standards exist for cartography, hardware and software, telecommunications, and information technology at national and international levels. It also requires a common language to ensure availability, access, integration, and sharing of geographic information. How language is used in the discipline of geographic information science, as well as those disciplines using its methodologies and data, will have the user looking at semantics, which change as one moves across and within disciplines. It is exciting to see new forms of linguistic and semantic relationships emerge across fields and among researchers. Chapters IV, V, and VI address these issues from the perspective of cataloging, metadata, and ontology development.

For librarians, the opportunity to work with geospatial data and its users offers a world of exciting possibilities. There will be new services, new resources, new research collaborations, and possibly new business ventures, should libraries also become producers of data or other geographic information products. This means, of course, more sources, more options for sources, higher patron expectations, and, of course, more reliance on new technologies. Accordingly, the most remarkable opportunities and challenges emerge within academic libraries with regard to the incorporation of technology and services into our daily work lives. Both affect how libraries operate and how librarians keep up with ever-changing technology, user needs, and user expectations. It also affects the instruction and training we provide to our users, from the undergraduate student new to maps, much less complex data sets, to the researcher who is looking for assistance in managing a literature review or gathering background information on a topic that is inevitably squirreled away in thousands of places, none of them obvious. It also affects how we teach. Geospatial

data requires us to rethink how questions are asked *and* answered. It also requires us to rethink how we teach users to navigate the foreign and highly mathematical territory of geospatial information. Chapters VI, VII, and VIII address these issues from the perspective of accessibility, reference services, and collection development.

Those of us who run libraries now have opportunities to support the scientific research infrastructure at our universities and colleges. GIS also allows us to increase our market of services and resources as geospatial data users are in every college, in every department, in every school, and throughout administrative units, such as facilities planning and building maintenance. It creates further opportunities for collaboration in large, distributed, and often international partnerships and consortia, as we house, share, and produce product. Most importantly, it allows us to keep current with innovative practices and technologies that can make the world a better place, or at least allow us to better understand it.

Education will also have to change to encompass GIS. Programs must be designed to best meet the information needs of library students and library professionals to acquire the necessary technical knowledge and computer skills to handle geospatial information. Even the most basic of GIS services requires significant investment in training programs and resources for librarians and staff. A more holistic, trans-disciplinary approach to training and working with other disciplines will provide a richer, in-depth education for librarians with geospatial information. This is discussed further in Chapter IX.

What does the future hold for geographic information science and library/information science? Forecasting the future is always fraught with the possibility of being wrong. What we do suggest in Chapter X is that GIS applications will become easier to use and more intuitive for the user. As with computing, there will be accompanying increases in analytic capacity. Further, GIS software will become more embedded within current and emerging applications and technologies, much as word processing, spreadsheets, and databases are now found in computer “office” suites.

Can GIS help us assess, evaluate, and interpret trends of mutual influences across society? How will the digital divide, literacy, and economic disparities influence future applications and their use? Data integrity and privacy will continue to be a concern as data is misrepresented or misused. What will be the effects on social organizations, groups, and places affected by uses and outcomes of GIS, such as communities, business monopolies, or political hegemony?

For the four of us, all librarians in an academic environment, this book has allowed us to explore some of the larger, and smaller, issues that are at work in our interactions with students, researchers, community users, and other librarians. It has also permitted us to explore less obvious connections, such as social constructionism and the issues of trust in a distributed data-sharing environment. Most importantly, it has given us an opportunity to take questions that we have had with descriptive and semantic concerns and explore them more fully within the framework of geographic

and library information sciences. After all, if semantics are enmeshed in philosophy and perception, a map and geospatial data are then also sites of critical inquiry.

It is our hope that the reader of this monograph will be intrigued, provoked, and reflective as he or she works their way through this attempt to tie geographic information science and library science, theory and practice, together in a coherent being, with applications in the real world for practitioners, students, educators, and those individuals fascinated with the world of maps and landscapes, real or imagined.