

Chapter Six deals with map projection research, argued to be related to "further development of theory and practice, improving the mathematical basis of a map, obtaining new sets and variations which possess definite advantages over known projections, and satisfying new cartographic requirements facing science and the economy." Viewed very much from a mathematical perspective, we are informed that map projection research is about solving differential equations with partial derivatives of the first order involving elliptic, hyperbolic, parabolic, and combined functions. Twenty pages lead us through examples of this type of investigation, however, research into social aspects of map projections and the search for map projections suitable for mapping non-spherical worlds is ignored.

Chapter Seven focuses on best and ideal map projections, examining what projections satisfy given conditions of representation. "Best projections are divided into those "minimizing and optimizing distortion of a minimax and variational (least squares) type," or those "satisfying in an optimum way an entire group of requirements for projections in accordance with the particular purpose of the map being designed (e.g. graticule simplicity, distortion values, etc.)." We learn that minimum distortion has been essentially completely solved for conformal projections, but is not yet adequately solved for other types of projections, with no concrete solutions. In 35 pages we are guided through a number of conditions of representation and associated projections, including an interesting section on anamorphous projections, offering a theoretical basis for cartograms. A section on map projections for maps on globes explains projection strategies for pasting map gores onto balls for globe construction.

Chapters Nine and Ten carry on with the theme of what map projection to use where and when. Chapter Nine explores the choice and identification of suitable map projections. Entirely devoid of mathematics, this chapter takes 12 pages to go through suggestions for most suitable projections from mapping of the world and continents through to mapping of, for example, geology, fauna and flora, history, economics, transportation, and communication. We also learn how map projections can be identified from the shape of the graticule. Chapter Ten is devoted to the problems and directions of automation in obtaining and applying map projections. The chapter commences by listing eight problems with automation of map projections, thereafter dealing with each in some detail. Concerns noted include the problem of computerized selection of the best map projections and automated identification of a given projection.

This book is a 'must have' on the book shelves of anybody with a serious interest in map projections. It does not make for easy reading. It is crammed with mathematics and it will frighten most students. However, closer scrutiny will reveal that this book is full of information about the history and mathematics of map projections found in few other texts. It offers an insight into Russian work on map projections hitherto largely hidden from those not fluent in the Russian language. Yes, I was disappointed that this text did not cover some of the social aspects of map projections and that it failed to address map projections for truly non-spherical worlds. However, John Snyder and Lev Bugayevskiy must be congratulated on rising to the challenge of co-authoring a book where neither speaks the language of the other, coming up with what is no doubt a major contribution to the literature on map projections. □

BOOK REVIEW

The AGI Source Book for Geographic Information Systems 1995
David Green and David Rix,
editors. London: The Association
for Geographic Information, 1995.
392 pages, diagrams, index.
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9)

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The *AGI Source Book*, formerly the *AGI Yearbook*, is a recent publication in the annual series by the Association for Geographic Information (an organization whose mission is to "spread the benefits of geographic information and GIS to the wider community and to help all users and vendors of GIS"). One of the means by which the AGI accomplishes this task is through the production of this business oriented *Source Book*. The *Source Book* contains two main sections: an articles section (106 pages) which addresses many broad GIS technological considerations, and a trade directories section (208 pages). There is also a 62 page "Miscellaneous Reference Material" section which includes listing of European GIS organizations, GIS standards, a comprehensive GIS dictionary, and other related resource materials. With the exception of several pages of color advertisements, the *Source Book* is a black and white publication.

The first section of the *Source Book* contains a collection of articles by leading GIS business and academic authors from North America and Europe. The aim of this section is to "present a view of GIS futures together with an appraisal of some of the most important GIS technology issues" (p. 17). The fourteen articles in this section address many of these issues of the larger GIS commu-

nity. Articles include: Michael Goodchild's "Information Highways," Dick Newell's "Where is GIS Technology Going?," and David Maguire and Jack Dangermond's "Future GIS Technology." The breadth of topics within the book is impressive, ranging from cartographic concerns, in David Green's "An Exciting New Role in GIS for the Cartographer of the Future," to remote sensing issues, as in Gordon Petrie's "Photogrammetry and Remote Sensing." Classical issues in GIS are also examined in the context of current technology, as in Robert Laurini's "Distributed Geographic Databases," P.A. Burrough's "Accuracy and Error in GIS," and H. Bishop Dansby's "Access to Digital Data in U.S. Federal Agencies." Other important aspects of GIS are also explored in articles by Duane Marble ("An Introduction to the Structured Design of Geographic Information Systems"), David Rix ("Recent Trends in GIS Technology"), M.J. Ives and K.J. Crawley ("GIS Implementation Issues"), Joseph K. Berry ("Implications of a Humane GIS"), and David Rhind ("Spatial Data from Government"). In addition to the timeliness of the GIS topics, the articles also address technological issues such as the current and changing status of DOS/Windows, Windows NT, and Windows '95 operating systems, and issues involving the Internet and World Wide Web.

The articles are well written and edited, although as with many other compendium works from multiple authors, they exhibit a wide variety of writing styles, from relatively informal but informative, as in Goodchild's article, to a very formal and academic style, as in Burrough's article. Lack of a narrow theoretical focus or topic range amplifies this disparity between writing styles, as do the varying degrees of

willingness from the authors to "date" their works with the extremely time sensitive aspects of GIS technology. The articles as a whole are not overly theoretical and include many appropriate illustrations, diagrams, and flow charts.

Although the *Source Book* contains many articles by prominent GIS specialists, the text's business orientation is evident in the second section where about half of the book's 392 pages are dedicated to a set of trade directories. These directories contain listings of businesses and organizations (primarily in the United Kingdom) which use or distribute geographic information. These organizations are listed not only within the context of a single index, but are also under an appropriate subject category, such as suppliers of hardware products, suppliers of software products, transport applications (e.g., navigation and vehicle location), utility applications (e.g., gas and water distribution networks), and providers of training services. In all, there are forty different directories in this extremely thorough section, providing a wealth of information about the organizations and appropriate contact person.

Both sections of the *AGI Source Book for Geographic Information Systems* clearly meet the editors' objectives for a work that GIS users and vendors need, as well as addressing present and future technology issues. The strength of the *Source Book* is its attention to the current GIS business needs. The timely technology specific issues that normally date most theoretical publications, combined with current GIS business information, make this a valuable reference. This temporal sensitivity, however, is also the primary weakness of this text since the trade section will become quickly

dated in such a dynamic discipline. By linking the trade section (which is so temporally sensitive) with the articles section (with its breadth of topics), it is possible that the editors may have attempted to do too much within the confines of a single volume. The *Source Book*, does, however, provide access to a diverse number of topics by leading GIS specialists, as well as giving the reader an idea of what is happening with GIS sources in the United Kingdom. In addition, the glossary is among the better ones that I have seen in a work of this nature.

In conclusion, the primary users of this source book will be persons in private sector GIS, particularly within the United Kingdom. Beyond the U.K., larger research organizations, universities, and users of GIS data that are involved with cooperative research projects with United Kingdom counterparts will be able to benefit greatly from this book. Academic readers of *Cartographic Perspectives* need to note that this is not (nor was intended to be) a substitute for a text on teaching the principles of GIS. At \$125.00 per copy, most instructors will balk at picking up one for their personal collections, as will North American small business and county governments which focus on large-scale mapping and other more localized projects. Ultimately, I believe that this source book deserves consideration for inclusion as a secondary text, ancillary business resource, or incorporation into a research library collection. □