The Oregon School Atlas Project

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An experimental multimedia atlas designed to help Oregon school teachers is under construction at the University of Oregon. Funded by a $100,000 legislative appropriation, the project will be completed in June, 1995–the end of the biennium. The school atlas staff includes Joe Searl and Bill Loy, directors; George Wuerthner, editor and writer; Nancy Unruh, educational consultant and researcher; Nancy Leeper, book designer; and Jim Meacham and Jane Sinclair, cartographers.

The content of the atlas was determined by having a forum of twenty-two teachers in January 1994. We told them that our goals were: (1) to design the optimal set of maps and materials to aid in teaching in Oregon, and (2) to incorporate ongoing curriculum changes while being true to our geographic heritage. They told us what they wanted.

We are organizing our materials around the National Geographic Society's "Five Themes in Geography" while addressing the issues raised by the *Federal Goals 2000: Educate America Act* and the new geography standards in *Geography for Life: National Geography Standards 1994*. We are also studying the new curricula called ARGUS (Activities and Readings in the Geography of the United States) and, to a lesser degree, GIGI (Geographic Inquiry Into Global Issues). We will use ARGUS ideas in an Oregon context.

The new *Oregon School Atlas* will come in a box not a binding. A suite of materials will be included. Equal attention is being given to primary, middle, and high school students. There will be grade-specific magazine-format atlases; teacher workbooks in loose-leaf binders holding base maps, data sheets, and teaching activities; CD-ROM disks; and a video cassette.

Our InfoGraphics lab is now preparing several dozen page-sized, black-and-white base maps that are suitable for photocopying or making into overhead transparencies. The maps include state maps and maps of other regions, which serve to compare Oregon to other regions such as the Middle East. The magazine-style atlases are to be 128 pages long, 8.5 by 11 inches in size, and produced with QUARKXPRESS on a Power Mac for full-color printing.

The CD-ROM project will focus on the physical and cultural landscapes of Oregon. It will feature aerial photographs and maps in an interactive format using the multimedia authoring software DIGITAL CHISEL. The CD-ROM is a joint project between Geography and our Fine and Applied Arts Department.

A second CD-ROM will be called *Oregon Connections* and feature comparative images of Oregon cities and their sister cities overseas. Eugene, for example, will be compared to its sister city of Kakegawa, Japan.

Our video project is aimed at primary school children. We are experimenting with creating short videos of interest locally on topics such as "The Geography of a Glass of Water." The video will trace our water supply from original intake through filtration, distribution, consumption, and disposal. Other video topics may include a loaf of bread, a letter, a piece of lumber, and the like. ❑

reviews

BOOK REVIEW

SOME Truth with Maps: A Primer on Symbolization and Design
Alan M. MacEachren. Association of American Geographers, Washington D.C., 1994, 129pp., 8.5 x 5.5 in., maps, illustrations, bibliography, paper. $10.00. (ISBN 0-89291-214-6)

Reviewed by Jeffrey C. Patton
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As the use of GIS and computer mapping software becomes more common in private and public agencies, an increasing number of individuals with little or no training in cartographic principles have become responsible for creating an ever growing number of maps. Some of the uses of these maps may be trivial or affect only a few people. However, other maps are employed for more serious endeavors such as locating hazardous materials storage facilities, tracking global circulation patterns, establishing new congressional districts, determining the distribution of federal dollars for health care, or deciding which elementary school an eight year old will attend. Such uses are of vital interest to everyone. In the preface to his book, Alan MacEachren writes: "*SOME Truth with Maps* details a process for systematically considering cartographic symbolization and design issues so that scientists and/or policy analysts will be equipped to deal with the inevitably unique mapping problems with which they are faced in the course of their activities." This is both an ambi-

tious and important task. As he points out, it was not his intention to provide a comprehensive text on map design; instead he wanted to describe a process for cartographic symbolization, categorization, and design. This process should lead to a more effective use of maps as analytic tools and communication devices.

Chapter one, "The Roles of Maps," lays the foundation for a discussion of cartographic design by noting the ways in which maps are used in scientific research. Using the model developed by David DiBiase (1990), MacEachren shows that, in the early stages of research, maps can function as powerful analytic tools for exploring data for unsuspected patterns and for the confirmation or refutation of hypotheses. In latter stages of research, maps may function as a means of synthesizing ideas for the researchers and finally as devices for the public presentation of the results and conclusions of research. Through a series of real-world examples, MacEachren not only illustrates how maps function as "visual thinking tools" (exploration and confirmation stages) and as "visual presentation tools" (synthesis and presentation stages), but he also shows how each role requires unique design strategies.

Chapter Two, "Cartographic Language," explores the relationship among the spatial dimensionality (positional, linear, areal, and volumetric) of the features to be mapped, the level of measurement for the collected data, and the graphic variables used to portray them. A set of graphic variables–size, shape, color value, color hue, color saturation, texture, arrangement, orientation, and focus–are defined. Each variable is discussed in terms of its suitability for the display of phenomena of each type of spatial dimensionality and for the measurement level at which data will be displayed. The chapter includes a summary chart that can be used as a general guideline for determining the suitability of each of the graphic variables discussed for particular representation problems.

"Abstracting Reality," the third chapter, begins with the statement, "Maps and map symbols are all abstractions, but the degree of abstraction can vary tremendously. Map designers must know how much abstraction is appropriate to a particular application or user and what kind of abstraction to apply." Two types of abstraction are discussed–the display form and the data being represented. The former is shown to occur along a continuum ranging from "images that mimic what an observer sees from a particular vantage point" to "graphics that represent relationships that may or may not be visible." A landsat image is given as an example of the "image" end of the continuum; a map displaying categories of ground water contamination by county lies near the middle of the continuum, and a simple line graph is found at the "graphic" end. Abstraction of the data to be represented is seen primarily as a function of categorization of the data (i.e., how many classes and what are the boundaries of those classes). The discussion of statistical methods for classifying data sets that follows is quite good. The last part of this chapter is a guide to displaying categorized data using the graphic variables discussed in Chapter Two.

The fourth chapter focuses on two of the most critical issues that must be considered when using or creating maps: visualization errors that can occur when viewing a map and how to represent the uncertainty of information. MacEachren discusses two types of visualization errors: Type I, which he calls "seeing wrong," and Type II, which he labels "not seeing." MacEachren presents a vivid example of how a Type I error occurred in the depiction of temperature on a map of North America. Initially, the data (temperature readings collected at a series of weather stations) was plotted directly onto a map of the continent and then interpolated from these points into a continuous surface (i.e., isotherms). The result was a decidedly false impression of the data. The correct procedure would be to plot the points in spherical coordinates, interpolate the continuous surface, and then project the resulting 3D surface onto a 2D map. In this example of a Type I error, some areas of Central America and the Arctic varied as much as 15° C from their actual temperature and a decidedly different pattern of temperatures resulted. Examples of Type II errors resulting from improper selection of projections and from poor data classification choices are also given. The remaining part of this chapter deals with the types of uncertainty commonly encountered in GIS and mapping, including the quality, completeness, and precision of data as well as the introduction of variability due to spatial and attribute aggregation occurring with data categorization. Two graphic variables are presented as being "intuitively appealing for representing uncertainty: color saturation and focus." The advantage of these graphic variables for representing uncertainty is that "both imply a lack of clarity or mixture of possibilities"–a virtual definition of uncertainty.

The final chapter is a brief look at cartographic composition. Graphic hierarchies, color selection for multivariate maps, the impact of scale on the material presented, and information displayed in the margins are all considered. The chapter ends with a discussion of a

variety of display media and some suggested solutions for problems encountered when moving from one media form to another.

Each chapter includes a brief summary and endnotes. Illustrations, a real strength of the book, are in black and white and in color. The book concludes with a bibliography and a short list of suggestions for additional reading.

In his preface, MacEachren writes: "The purpose of *SOME Truth with Maps: A Primer on Symbolization and Design* is to introduce existing and potential users of computer-mapping and GIS software to cartographic symbolization and design issues, problems, and approaches." At this he has more than succeeded. This book is very well-crafted; he easily guides the reader through some of the most fundamental issues of map use and design with carefully constructed illustrations, explanations, and real-world examples. Cartographers, GIS practitioners, policy makers, or anyone concerned with the visualization of information will find that this book fills an important gap in the literature. It is an elegant little book that adeptly outlines the questions that must be considered when using or designing maps and provides the reader with a conceptual framework that addresses and solves those questions.

Reference

DiBiase, David. 1990. Scientific visualization in the earth sciences. *Earth and Mineral Sciences* (Bulletin of the College of Earth and Mineral Sciences). The Pennsylvania State University 59(2): 13-18. ❑

BOOK REVIEW

Boundaries of Home: Mapping for Local Empowerment

Doug Aberley, editor. Gabriola Island, BC and Philadelphia, Pennsylvania: New Society Publishers, 1993. The New Catalyst Bioregional Series v. 6. 138 pp., 37 maps and diagrams.

$34.95 USA cloth (ISBN 0-86571-271-9), $9.95 USA paper (ISBN 0-86571-272-7), $11.95 Canada paper (ISBN 1-55092-207-6).

Reviewed by Margaret Pearce and Jean McKendry
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This book is a cartographic text written for the bioregionalism movement. It is the sixth book in the Bioregional Series of the Canadian magazine *The New Catalyst*. The goal of bioregionalism, as summarized by the editor, Doug Aberley, is "to wed dynamic human populations to distinct physical territories defined by continuities of land and life. The promise is that these bioregions will be inhabited in a manner that respects ecological carrying capacity, engenders social justice, uses appropriate technology creatively, and allows for a rich interconnection between regionalized cultures."

The purpose of *Boundaries of Home* is to explain how mapping is a potential tool for bioregionalists (or "reinhabitants," as they call themselves) to use in the pursuit and expression of their environmental agenda. For Aberley, cartography promotes three of the goals of bioregionalism. First, it allows a graphic visualization of the boundaries, patterns, and relationships of the bioregion, or home place. Second, the act of making a bioregional map encourages the mapmakers to more deeply experience and become more involved in their home place. Third, the unique level of information provided by bioregional maps gives reinhabitants the power they need to act on the problems that they perceive. The map is thus the vehicle "to take our aspirations for social justice beyond the realm of desire into the terrain of empowerment and practice."

Implicit in Aberley's bioregional world view is that institutions that represent the "status quo" are responsible for environmental destruction and thus must be "reformed and ultimately replaced." Professional cartography, as a part of that status quo, is symptomatic of the problems that bioregionalism seeks to confront and overthrow. "In our consumer society," Aberley writes in the introduction, "mapping has become an activity primarily reserved for those in power, used to delineate the 'property' of nation states and multinational companies. . . The result is that although we have great access to maps, we have also lost the ability ourselves to conceptualize, make and use images of place–skills which our ancestors honed over thousands of years." Beyond Aberley's intention to teach mapping skills to people without a background in cartography, he seeks to fill them with a sense of outrage at their cartographic disenfranchisement.

Aberley begins his book by presenting his philosophy and the reasons why we, as readers/reinhabitants, should map. This introduction is followed by a discussion of aboriginal mapping and a collection of case studies. These essays are intended to spark readers' imagination and inspire them into thinking about how to map from bioregional principles. The maps used to illustrate these