

later, he and three assistants were working on it full-time.

Bayer had an interest in natural phenomena as well as maps and diagrams. He saw the atlas not as just an exercise in book design, but also as a chance to rethink the conventional idea of an atlas as simply a collection of maps. He placed the hyphen in the word 'Geo-Graphic' in the title to indicate that the atlas had "in addition to many GEO-graphic maps, many GRAPHIC illustrations of subjects closely related to modern geography" (Bayer 1953, p. 4).

Bayer organized and edited all the material in the atlas and wrote much of the text. He traveled to cartographic centers in the U.S. and Europe in his search for the best graphic methods for mapping and illustrating complex geographic information. The article includes twenty-seven figures reproduced in lush color. Most of these are maps and illustrations from the atlas. Perhaps the most fascinating illustrations are three figures which are sketches of the page layouts originally done in pastel, pencil and colored pencil which are shown with the final pages in juxtaposition.

The author estimates that 4000-5000 separate pieces of art were prepared for the book. The figures and the text are adequate testimonial to Bayer's originality and fastidious attention to detail. His uncompromising attitude resulted in the printing being done partly by Rand McNally and partly by de Agostini of Italy. The story of the design of this atlas is an inspiring account of a significant personal and cartographic achievement.

#### REFERENCE

**Bayer, Herbert** (1953) *World Geo-Graphic Atlas*. Container Corporation of America.

## cartographic artifacts

### BIBLIOGRAPHY

*Computer Aided Mapping*  
February 1984-September 1989,  
Citations from the Compendex  
Database. National Technical  
Information Service, 5285 Port  
Royal Road, Springfield, VA  
22161. November 1989, 134p,  
supersedes PB88-8868526. PB90-  
850439/WNR; price code: PC  
N01/MF N01.

This bibliography contains citations concerning applications of computer techniques to cartography. Topics include automatic mapping, geographic data bases, computerized photomapping, and descriptions of appropriate algorithms and hardware. Applications for mineral resource exploration and land use analysis are also considered. (This updated bibliography contains 292 citations, 50 of which are new entries to the previous edition.)

### ANNOTATED BIBLIOGRAPHY ON TACTICAL MAP DISPLAY SYMBOLOLOGY.

J.K. Schmidt, Human Engineering  
Lab., Aberdeen Proving Ground,  
MD. Aug 89, 120p, AD-A213 257/  
9/WNR, price code: PC A06/MF  
A01.

An annotated bibliography on tactical military symbology is provided with corresponding documentation to enhance its use as a reference. The present work is an effort to bring together a rather disparate literature base connected with the portrayal of tactical information on anything from a conventional paper map to an advanced digital map. In addition, pertinent research references concerning specific information encoding techniques are included. Each of the 210 citations presented from the literature contain refer-

ence information and an abstract or summary. All listings are indexed by author and subject. Keywords: map symbology; tactical situation display; map display.

Contact: National Technical  
Information Systems, 5285 Port  
Royal Road, Springfield, VA 22161.

### EOSAT PUBLISHING GIS DIRECTORIES

After surveying almost 100 domestic firms offering remote sensing value-added services, EOSAT has updated the U.S. edition of its Directory of Landsat Related Products and Services. The directory provides the names and addresses of value-added companies, cross referenced by state and application specialties. EOSAT is offering a new publication that includes information on more than 200 companies worldwide involved in development and use of geographic information systems (GIS). The publication is called *Landsat & GIS: A Directory of Geographic Information Systems and Related Products and Services*.

*Landsat World Update*, February 28, 1990.

### EOSAT INTRODUCES NEW LINE OF TM DIGITAL PRODUCTS

All Landsat Thematic Mapper (TM) digital products are now offered in an improved computer tape format, known as Fast Format, which reportedly will speed product delivery and reduce customers' computer time. Earth Observation Satellite Co. (EOSAT) will begin delivery of the new Fast Format products March 1, 1990.

The prices of many Landsat products will be raised March 1 — the first increase since 1988—and EOSAT is capitalizing on the timing of the price increase to facilitate the customers' transition



to Fast Format. EOSAT began accepting orders for Fast format products January 22.

For more information, contact: Kevin Corbley, Media Coordinator, (301) 552-0547, (800) 344-9933, ext. 547; RCA Telex: 277685 LSAT UR.

### GRASS 'YELLOW PAGES'

The GRASS Interagency Steering Committee wants to put together a GRASS 'Yellow Pages.' The purpose of this document is to consolidate information on organizations providing services for GRASS users. The document will be revised annually. Any organization that provides training, software distribution, data development, data translation, hardware configuration, programming applications, documentation, turn-key systems or other services that might be of interest to GRASS users is welcome to submit a listing. Advertisements can also be placed.

The GRASS 'Yellow Pages' will be distributed annually with an issue of the GRASS *Clippings* newsletter and also distributed at technical meetings, through the GRASS Information Center and through various GRASS distribution and training sites.

Please provide the following information if you would like to place an entry: name of organization, point of contact, service/system provided to GRASS users, address and telephone number.

For details concerning format, deadlines, fees, copies, and other information contact Marlo Oechel, USA-CERL/EN, P.O. Box 4005, Champaign, IL 61824-4005, (217) 352-6511, ext. 533.

### NOAA PUBLISHES FIRST EEZ SEAFLOOR MAP

The National Oceanic and Atmospheric Administration (NOAA) has published the first highly

accurate bathymetric map of the U.S. Exclusive Economic Zone (EEZ), depicting the underwater Monterey Canyon off southern California. The map includes a three-dimensional isometric view inset of the area covered by the map.

The 1:100,000-scale Monterey Canyon Bathymetric Map is the first of a series of EEZ maps to be produced using multibeam survey data, which produces a photographic-quality representation of the seafloor. Established in 1983, the U.S. EEZ includes all waters and the seafloor within 200 miles of the United States coast.

The Monterey Canyon map, and the approximately 40 additional multi-beam survey maps of the EEZ to be produced over the next two years, will be useful to oceanographers, geologists, geophysicists, those in commercial and recreational fishing, state and local government planners, and anyone needing a precise view of the seafloor for non-navigational purposes.

Earlier bathymetric maps represented the seafloor using lines of soundings of water depths taken at intervals of roughly 3 to 10 miles. The Monterey Bay map and the others to follow will use depth soundings taken over nearly 100 percent of the seafloor.

"The difference in accuracy and bottom coverage between the old bathymetric maps the New Monterey canyon maps is like night and day," said NOAA Captain Christian Andreasen, chief of NOAA's Nautical Charting Division. "Our ships, equipped with multi-beam survey systems to 'sweep' the bottom, recorded about 20 million soundings to produce the Monterey Canyon map, compared to about 50 thousand soundings that would have been taken with a single-beam survey system."

The 46 by 26-inch Monterey Canyon Bathymetric Map depicts

the seafloor about 70 nautical miles seaward of the California coast between Point Lobos, south of Monterey, to Sand Hill Bluff, north of Santa Cruz, including Carmel Canyon, Monterey Bay, Soquel Canyon, Ascension Canyon, and the newly named Cabrillo Canyon and Ano Nuevo Canyon.

The map is available for \$10 from the Distribution Branch, National Ocean Service/NOAA, Riverdale, MD 20737-1199. Phone: (301) 436-6990.

### THE FUTURE OF THE NATIONAL MAPPING PROGRAM

The National Research Council has recently published *Spatial Data Needs: The Future of the National Mapping Program*. The 78 page report was prepared by the NRC's Mapping Science Committee, which was established in 1987 in response to a request by the Director of the U.S. Geological Survey. In its request, the USGS asked the NRC to:

- 1) Examine the needs for the geographic and cartographic data provided by the USGS. Do the Survey's current mapping activities and products adequately address these needs?

- 2) Examine and advise on USGS programs of research and development of hardware and software for original data acquisition, processing, storing, marketing, and distribution of digital cartographic data and synthesized information products to the user community.

- 3) Examine the scope and content of the USGS's activities in geographic information systems (GIS) and recommend their role in assembling and maintaining digital data bases from within the USGS and from other sources.

- 4) Respond to requests for guid-



ance on mapping and geography.

The Committee's report was prepared to address the first and third of these charges in a specific fashion, and to provide general guidance on the second. The Executive Summary of the report follows.

"The U.S. Geological Survey (USGS) has an exceptional opportunity to contribute significantly to the overall economy of the United States by becoming proactive in managing spatially referenced digital data (srdd). This conclusion was reached by the Mapping Science Committee in its study of the technological transformation that has occurred in recent years related to the integration, processing, and display of spatial data for the purposes of making decisions.

"If ours is to be an information-based economy that is competitive on a global basis, there is a crucial need for a coordinated and efficient national information infrastructure to facilitate the sharing and communication of information resources. This must include a geographic or spatial data component dealing essentially with where things are to support all manner of resource, transportation, planning, administration, marketing, and communication activities. The most important function of the USGS's National Mapping Division (NMD) in the future will be to act as the federal coordinator of the national geographic data infrastructure, not just to produce maps and derived digital data.

"The paper or analog map, traditionally the primary tool for decision support, is being supplemented by combinations of computer hardware and software known as geographic information systems (GIS). These digital systems are becoming increasingly powerful, and therefore the demand for digital data for use within them is increasing. The committee discovered, through

briefings with the USGS and several other federal agencies and by conducting an extensive set of interviews, that this demand is being met by data-generating organizations that include federal agencies, state and local governments, and private firms, as well as by data sets produced and/or managed by the USGS/NMD. As a nation, we can expect to experience substantial redundancy and excessive cost if uncoordinated, unstandardized, localized data base building continues unchecked.

"The committee believes that NMD should expand its role in inventorying and managing general-purpose srdd and in making such data available to user communities. The committee found that there is significant and often wasteful duplication of effort in digitizing map data at a wide variety of scales, one of the most important being the 1:24,000 scale of USGS map production. The capability of the new computer-based tools creates the possibility of and the demand for even more current information for decision making. The committee believes that to better prepare to meet the future spatial data needs of the nation NMD must begin a process of redirecting its roles, goals, and mission to better serve not only the USGS and the Department of Interior, but the cartographic enterprise as a whole. To accomplish this, NMD must be restructured to better meet future user requirements. NMD must expand its role in coordination of mapping activities both within and beyond the federal establishment. The committee urges other federal agencies to participate in supporting the development of the National Digital Cartographic Data Base (NDCDB) and to follow NMD's lead in creating and adopting national standards. The USGS will be looked to for leadership in the area of standards and in

the structuring and operation of an enhanced NDCDB — a national spatial data base. The committee also believes that there is a need for NMD to examine innovative ideas for continuing and strengthening its existing work-sharing and cost-sharing programs, including the concept of a data donor program. NMD must continue to be sensitive to the emerging needs of the federal agencies for the operational production of special-purpose continental and global scale map products, such as those associated with programs such as the global change initiatives and those of the Decade for Natural Disaster Reduction Program. Finally, the committee also recommends that NMD expand its research program and improve its ties with universities and public and private sector users, in the interest of improving the overall quality of our national cartographic enterprise."

The entire report is available from the Board on Earth Sciences and Resources, National Research Council, 2101 Constitution Avenue, Washington, DC 20418.

#### CANADIAN METROPOLITAN ATLAS SERIES

The latest *Metropolitan Atlas Series* was released in December 1989 and contains 12 volumes. Each volume displays the results of the 1986 Census for one major Census Metropolitan Area (CMA) in Canada by using maps, graphs and explanatory text in an 11 by 17 inch format. The 12 centres covered are St. John's, Halifax, Quebec, Montreal, Ottawa-Hull, Toronto, Hamilton, Winnipeg, Regina, Calgary, Edmonton and Vancouver. Each volume contains 35 thematic maps and associated graphs, grouped into 5 major themes: demography, family and social issues, housing, employment and income. The basic geostatistical unit used to portray the



thematic information is the census tract, an area roughly the size of a city neighbourhood, with an average population of about 4,000.

Although most maps are straightforward one-variable choropleth maps using soft red patterns, a number of themes incorporate different techniques to convey the spatial distribution of the data. For instance, three different ethnic origins are mapped together using dots of 3 colours. Also, the distribution of separate but related variables (such as education and income) is brought to life using two-variable choropleth maps with 3 colours and 9 classes. The two largest CMAs (Toronto and Montreal) have 53 by 36 cm maps, while the other CMAs have maps of 28 by 22 cm.

As a result of a user survey conducted on the 1981 *Metropolitan Atlas Series*, major improvements were incorporated in this 1986 Series. For instance, the development and use of an up-to-date urban ecumene permits a more accurate spatial representation of Census data. As well, the maps focus on a 'window' area which includes a very large percentage of a CMAs population (up to 97 percent), with a dramatic increase in the scale of the core area. Thirdly, each theme includes either a graph which compares values across all 25 CMAs in Canada, or a scatter-gram of 2 variables.

In addition, each *Atlas* volume contains a helpful Census Tract Reference map in colour, and two transparent plastic maps containing, respectively, the boundaries of Census Subdivisions (municipalities) and Forward Sortation Areas (the first 3 digits of a postal code). These can be used as overlays to view the same themes using different geostatistical units.

The maps are supplemented by informative explanatory text on each major theme written by subject matter specialists, and by

an extensive set of appendices with notes on data quality, the derivation of map variables and a set of selected map summaries.

The volumes in this Series (catalogue numbers 98-101 through 98-112) are priced at \$24, except for the (larger) Toronto and Montreal volumes, which are priced at \$30. The complete set of 12 Atlases (Catalogue number 10-520) is available for \$240, representing a 20% discount. The Atlas volumes can be ordered by writing Publication Sales, Statistics Canada, Ottawa, K1A 0T6, or by calling the national toll-free order line, 1-800-267-6677.

#### XEROXABLE U. S. ATLAS

*The United States Today* is the latest reproducible atlas published by World Eagle, Inc. The 8.5 by 11 inch atlas is printed in black and white, and contains comparative maps, tables and graphics depicting resources, commodities, trade, cities, food and agriculture, health, schools, jobs, energy, industry and demographics. The atlas is available in paperback, looseleaf or hardcover bindings at costs of \$25.50, \$26.50 and \$36.95, respectively. Contact: World Eagle, Inc., 64 Washburn Avenue, Wellesley, MA 02181; (617) 235-1415.

#### NEW GIS TEXT AVAILABLE FROM ACSM

*Fundamentals of Geographic Information Systems: A Compendium* is a new publication co-published by the American Congress on Surveying and Mapping (ACSM) and the American Society for Photogrammetry and Remote Sensing (ASPRS). This volume focuses on the fundamentals, principles, and issues in geographic and land information systems (GIS/LIS).

*Fundamentals of Geographic Information Systems* was compiled and edited by William J. Ripple. It is a follow-up to his first GIS

compendium entitled *Geographic Information Systems for Resource Management*, published in 1987, which concentrates on GIS/LIS applications.

Topics covered in this 248-page, softbound compendium include a definition of GIS, a history of technology, requirements and principles for GIS implementation, GIS data-quality issues and error assessment, how to select and evaluate a GIS, and a guide to sources on GIS literature. A comprehensive listing of GIS newsletters and editors is also included.

William J. Ripple is Director of the Environmental Remote Sensing Applications Laboratory (ERSAL) in the College Forestry at Oregon State University in Corvallis. Ripple has 12 years experience in research and applications of geographic information systems and remote sensing for the study of vegetation and other natural resources.

*Fundamentals of Geographic Information Systems* sells for \$45.90 to ACSM members and students, and is available to non-members for \$65. Orders must be prepaid; send check or money order to ACSM Publications, 5410 Grosvenor Lane, Bethesda, MD 20814. To order by phone with VISA or MasterCard, contact: ACSM Publications, (301) 493-0200.

#### new maps

**WORLD.** World seismicity, 1979-1988. (NEIC Poster 1). Denver: National Earthquake Information Center, 1990. 3 spheres on 1 sheet. (U.S. Geological Survey, NEIC Maps, Box 25046), Federal Center, MS967, Denver, CO 80225).