

## NACIS news

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### program and abstracts

#### WEDNESDAY, OCTOBER 24

1:00-8:00 p.m. Registration  
1:00-3:00 p.m. NACIS Committee Meetings  
3:00-5:00 p.m. NACIS Board Meeting  
5:00-7:00 p.m. Dinner Break  
7:30-9:00 p.m. Opening Session

#### Welcome

James F. Fryman  
Vice President and Program Chairperson  
University of Northern Iowa

#### Keynote Address

Mr. Thomas Hammond  
NASA  
Kennedy Space Center

9:00-11:00 p.m. Reception and Cash Bar  
9:00-11:00 p.m. Poster Session:  
Products and Resources of  
University Cartographic Labs

#### THURSDAY, OCTOBER 25

8:00 a.m.-7:00 p.m. Registration  
9:00 a.m.-Noon Exhibits  
8:30-10:00 a.m. Sessions

#### SESSION A:

CARTOGRAPHIC PRODUCTION  
**A Cost-Benefit Analysis of Computer-  
Aided Map Design and Production**  
Charles P. Rader and Ellen R. White,  
Department of Geography, Michigan State  
University, East Lansing, MI

Within the last five years, microcomputer-based map design and production have become viable alternatives to manual design and production for cartographic production labs. A cost-benefit analysis between computer-aided map production and manual map production was carried out to determine their relative advantages. Two essential questions guided the analysis: (1) what are the relative capital investments in facilities and equipment, and (2) what are the relative costs of labor and materials in the design and production of maps between computer-assisted and



manual techniques? A survey of vendors was conducted to determine the investments in setting up two new labs, one which emphasized manual technologies and the other computer-assisted technologies. Two map design problems, a thematic map and a reference map, were each produced twice, once using traditional manual techniques and once using computer-assisted techniques, to determine relative production costs for each design. The results from this study indicate that the computer-assisted technologies and techniques compare favorably to more traditional ones. The results of the analysis are discussed in the context of the types of cartographic products that are customarily produced by labs, the expanding capabilities brought to cartographic representation by computer-assisted techniques, and the future role of cartographic labs in providing services. While no cost-benefit analysis is definitive, this study should contribute to understanding the tradeoffs in the ongoing change from older to newer technologies.

#### Communicating with a Cartographer

William G. Loy, Department of Geography, University of Oregon, Eugene, OR

Like an architect designing a building, a cartographer designing a map needs to establish clear communications with the client. As a city building permit department limits the size of a building on a lot, a publisher limits the image area on a page. Before a cartographer can design a map a copy of the publisher's 'Instructions for Contributors' setting the above limits and providing other information must be given to the cartographer. It is also useful to have a sample of a recent publication in the series for which the map is being designed to reveal actual publisher's practices regarding graphics. The client must also provide a recent good-quality somewhat oversize base map on which to compile. On a photocopy of this map the area of the thematic map to be created must be delineated (north to the top, if possible) in the proportion of the final image area. The information to be shown on the new map must be indicated clearly or referenced to the compilation map, probably in red on the photocopy. The cartographer must stress that it is the responsibility of the client to provide all of this necessary information before map design can proceed. Matters of schedule and cost should be settled at this time.

With publisher's information, client's information, and time/cost decisions made the cartographer can proceed to prepare an over-scale first-draft map using an easy-to-change method of map-making. Non-automated shops will probably use ink-on-mylar methods for linework and

Laserprinter or Linotronic lettering. Key to this process is the expectation by both client and cartographer that the first-draft map will be modified and improved. Time for corrections and improvements must be allowed and money budgeted for producing second or third drafts of the original effort. The final product will probably be a PMT at printing scale.

#### Textbook Graphic Production

Bonnie Sines, Department of Geography, University of Northern Iowa, Cedar Falls, IA

The maps in geography textbooks appear to be the work of the cartographer, who must accept the compliments or the criticism. However, the fact remains that often the final product is the result of decisions made by other technicians, who may lack the cartographic knowledge needed in understanding the intent of the original graphic. This paper will examine the problems encountered in creating maps and graphics for textbooks. In addition, possible solutions and alternatives will be discussed.

#### SESSION B: DEMONSTRATION

**Map Graft demonstration.** Detailed mapping software for the Macintosh. Paul Toomey

10:00-10:30 a.m. Break

10:30 a.m.-Noon Concurrent Sessions

#### SESSION C: ANIMATED CARTOGRAPHY

##### Tips and Techniques for Maintaining Visual "Headroom" on Animated Maps

Don Pirius and Phil Gersmehl, Department of Geography, University of Minnesota, Minneapolis, MN

It is convenient to approach the topic of four-dimensional cartographic design by way of analogy: a televised map has a relationship to its narration that resembles the connection between a printed map and surrounding text. This analogy may help clarify the similarities and differences between the design decisions for print and television maps.

For example, establishing a visual hierarchy on a printed black-and-white map is a relatively simple conceptual problem: the cartographer can select from a range of grays that fall along a single continuum from the color of the ink to the color of the paper. That constraint can make it difficult to design type that is legible across several intermediate grays. This problem of providing contrast is more complex but often easier to solve in color printed maps. The cartographer can choose

to use hue, value, chroma, or a combination of those attributes to help separate figure from ground information.

Designing a map for broadcast television adds a number of additional constraints and opportunities to the decision process. The low resolution of a television image makes type selection difficult, but simultaneous narration can reduce the need for on-screen type. Similarly, the ability to zoom in or out through time can make locational inset maps unnecessary. The analog nature of the broadcast signal poses some unique problems: the legal limits on color intensity are different for different colors, and the message should still be legible on black-and-white receivers. The designer of animated maps can employ a variety of techniques, including flicker, gradient screens, patterned backgrounds, and changes in intensity through time, in order to maintain visual headroom for the points that are to be emphasized. We will illustrate some of these choices by demonstrating a series of animated maps we have designed for a 10-part television-based correspondence course.

#### Visualizing Paleo Ocean Circulation

David DiBiase and William Peterson, The Pennsylvania State University, University Park, PA

Four-dimensional cartography enables earth system scientists to represent the behavior of dynamic environmental processes in space and time. This presentation will include a five-minute animated video simulation of Mid-Cretaceous and Eocene ocean circulation patterns based on the research of Eric Barron and William Peterson at Penn State's Earth System Science Center. Discussion will focus on technical and design issues involved in producing the video with a Macintosh microcomputer at the Deasy GeoGraphics Laboratory.

#### Summary Graphics to Supplement Animated Cartographic Sequences

Mark Monmonier, Department of Geography, Syracuse University, Syracuse, NY

Viewers of animated sequences of maps might benefit from a single, more cognitively friendly graphic that summarizes dominant trends, salient relationships, and significant deviations introduced in the dynamic presentation. The theory of human information processing suggests that because the human eye-brain system does not instantaneously process patterns from short-term memory through to long-term memory, information presented toward the end of a dynamic cartographic sequence retards the memorability and comprehension of information presented



earlier in the sequence. Four types of summary graphics hold particular promise as animation supplements. The simplest and oldest of these is the *centrographic time-series map*, used since the late nineteenth century to portray the march westward of the center of the United States population. Useful modifications include disaggregation by population subgroups and point symbols for which size or value portrays relative dispersion about the geographic average. A second promising supplementary graphic is the *biplot*, a joint two-dimensional representation of time units and places based upon two principal components. Among the points in the biplot representing time periods, similar instants or periods of time plot as closely clustered points whereas highly dissimilar time units are more widely separated. Similarly, among the points representing places, similar places are close together and dissimilar places are far apart. A third strategy is *canonical trend-surface analysis*, which might extract one or two salient spatial trends, the canonical loadings of which can be plotted in a time-series graph showing when each trend was particularly prominent. A fourth summary representation is the *time-series correlation graph*, which reveals temporal variation in the apparent influence of given trends or regionalizations on a particular bivariate correlation. The time-series correlation graphic not only portrays the spatial coherence and temporal stability of a correlation but also fosters an understanding of geographic correlation, which is more complex than statistical correlation. Because an animated sequence of maps can promote understanding of an otherwise complicated summary graphic, the two approaches are complementary.

#### SESSION D: WORKSHOP Color as a Map Skill and a Descriptive Tool

Henry W. Castner, Department of  
Geography, Queen's University, Kingston,  
Ontario, Canada

**DESCRIPTION** — A hands-on workshop using color cubes in various activities to demonstrate various perceptual principles of color and to develop concepts of color description useful in the application of color in graphic communication.  
**BACKGROUND** — One essential 'map skill' involves the ability of children to use colors effectively in the maps and graphics that they produce in classroom assignments. There are a small number of perceptual principles that govern that use, and they can easily be demonstrated.

A related 'geographic skill' involves the ability to describe accurately the colors in our environment. For this, some sort of

perceptual model of color space is useful as well as some experience in discriminating colors by their perceptual dimensions.

Both of these skills can be demonstrated and enhanced with a color box based on the Munsell color system. The box is made up of cubes whose facets vary systematically by hue, value and chroma. Fortunately for geography teachers, these perceptual dimensions of color can be related to the earth itself, its axis, poles and equator; latitude and longitude; and distance below the earth's surface.

The workshop will involve hands-on activities with the color box as a way of demonstrating these skills and suggesting how color can be more effectively utilized.

Noon-1:00 p.m. Lunch Break  
1:00-5:00 p.m. Field Trips

#### FIELD TRIPS

**American Automobile Association**  
Visit to newly opened headquarters of AAA with tour of their cartography facilities.

#### Orange County GIS

Orange County has an extensive GIS under development. Tour looked at all aspects of their program.

#### Local Area Tour

Trip included boat tour of the lakes of Winter Park. Opportunity to visit shops in downtown Winter Park and/or visit local art museum.

6:30-7:15 p.m. Reception and Cash Bar  
7:15-9:00 p.m. Annual Banquet

#### President's Address

Diana Rivera  
Michigan State Libraries  
Michigan State University  
East Lansing, MI

#### Banquet Address

Thomas Cosby  
American Automobile Association  
Orlando, FL

#### FRIDAY, OCTOBER 26

8:00 a.m.-4:00 p.m. Registration  
9:00 a.m.-3:00 p.m. Exhibits  
8:30-10:00 a.m. Sessions

#### SESSION A: AUTOMATION IN CARTOGRAPHY

##### Global Positioning System: Status and Issues

Ronald M. Bolton and Claudette M. Dellon,  
Aeronautical Charting Division, National  
Oceanic and Atmospheric Administration,  
Rockville, MD

**System Status** — The Global Positioning System (GPS) space segment has eleven satellites in operation, and another was scheduled for launch in January, 1990. If spaced properly in their orbits, these twelve satellites will provide 24-hour, two-dimensional (latitude and longitude) global positioning capability — a milestone in history! Around 1993, the entire GPS configuration of twenty-one satellites should be in place. Three active spares will be orbited sometime later to ensure system integrity and continuous operation.

GPS receiver developments have been astounding — over 100 models are now manufactured. These sets allow precision survey and time transfer, and development of marine and aviation navigation equipment is gaining momentum.

**Issues** — The key issues affecting the future of GPS are:

- (1) DOD clarification of its commitment to provide GPS signals and related coding information to the civilian community.
- (2) The development of international standards that allow GPS and USSR's Global National Satellite System (GLONASS) to be used interchangeably by the user community.
- (3) The planned selective ability (S.A.) which provides a civil signal at an accuracy of 100 meters as opposed to the current civil military signal with 30-40 meter accuracy.
- (4) GPS integrity related to frequency, modulation of the frequencies and content of the satellite message sent to users is a significant issue. The Radio Technical Commission for Aeronautics (RTCA) is studying these issues.
- (5) The final issue is the full participation of the GPS civil community in GPS planning, implementation and operation to ensure that the DOD does not overlook cost and technical considerations of civil users.

The GPS will service more users than any surveying/navigation system in the history of the world. It can meet survey or 3-D needs with the use of signals from four satellites, or it can meet less stringent 2-D navigational requirements by monitoring the signals of three satellites. All told, GPS is an important national and international resource.

#### Implementing a Cartographic Database to Enable Automation

Virginia Galvin, National Oceanic and  
Atmospheric Administration,  
Rockville, MD

The Aeronautical Chart Branch (ACB) of the National Ocean Service is beginning to automate the production of some of its charts. The transformation of the production process is an ongoing effort, depending on human considerations and technical



factors for success. Currently, production techniques for the Branch's products range from traditional manual compilation, engraving, and stick-up to the use of various levels of computer-assisted cartographic tools. Each chart series, with its standard scale, complexity of feature representation, revision cycle, and other characteristics, poses more or less of a challenge in the process of automation.

This paper describes the extent of current automation at ACB and evaluates the feasibility of introducing further automated solutions with regard to various types of charts. By implementing a cartographic database, using a commercially available relational database management system, increased efficiency and flexibility can be realized in the production of a significant number of charts. The paper summarizes the concepts that define a cartographic database and how these concepts serve to resolve problems of redundancy in the revision of charts, increase flexibility in the creation of new products, and enable the automatic flow of cartographic information from the database to the digital chart product.

Finally, the paper presents an overview of the operation of a commercial cartographic database developed for production of aeronautical charts by the Intergraph Corporation. It describes the software components of the Intergraph Aeronautical Charting System (IACS) to be installed by the Branch and provides a scenario of the cartographer's interaction with the system, emphasizing the expansion of his responsibilities in controlling the automated compilation process.

#### **Cartographic Change at National Geographic**

David Miller, National Geographic Society, Washington, DC

The discipline of cartography is being buffeted by technological change. These changes have transformed National Geographic's Cartography Division over the last ten years from an elite group, vested in traditional mapping methods, modestly producing some of the best maps in the world — to an elite group, sustained by digital revolution, modestly producing some of the best maps in the world. Our Scitex system brought us the benefits of raster technology in 1982, but it was not until the introduction of ARC/INFO in 1988 that computer technology began affecting every single person in Cartographic. ARC/INFO has changed the way we manipulate the fundamental qualities of a map: projection, symbolism, and scale. The Society's new *Atlas of the World* provides numerous examples of how our

new technology has been applied in updating and creating maps.

#### **SESSION B: ROUNDTABLE — ETHICS IN CARTOGRAPHY Ethics in Cartography Roundtable Discussion**

Organizer: Sona Karentz Andrews, University of Wisconsin-Milwaukee.  
Panelists: Patrick McHaffie, University of Kentucky; Elke Owen, Head Cartographer, American Automobile Association; Mark Williams, Editorial Art Director, Orlando Sentinel.

McHaffie reviewed the origins of the Ethics Roundtable, pointing out that cartography's increased interest in ethics is part of a larger societal trend. Williams described how short deadlines affect decisions about the use of copyrighted materials: "it is easier to ask forgiveness than to ask permission." Andrews discussed ethical implications of cartographic education, arguing that cartographic expressions are impressionistic, and that "it is not our role to act as cartographic police." Subsequent comments from the floor were diverse, but tended to revolve vaguely around the question of the perceived responsibilities of cartographic educators.

10:00-10:30 a.m. Break

10:30 a.m.-Noon Concurrent Sessions

#### **SESSION C: ATLASES National Atlas of Mexico**

Atlantida Coll-Hurtado, Instituto de Geografia, UNAM, Mexico, D.F.

The National Atlas of Mexico will be finished in December, 1990. It will show the actual knowledge we have of Mexico's nature, society and economy in the 1980's through more than 600 maps, scales ranging from 1:16,000,000 to 1:4,000,000, published in 164 separate sheets.

Being the first atlas of this kind in Mexico, its construction presented interesting aspects — academic, financial, organizational, etc. — which could be discussed within the Latin American realities: the main contents; analysis of quantity and quality of data available; mastering of cartographic language with or without the use of hardware and software; editing and publishing aspects; etc.

From another point of view, this National Atlas is the result of teamwork involving academic personnel of the National University of Mexico as well as other professionals from academic and government institutions. The inner organization is worth discussing: 120 authors working in more than 15 different institutions in Mexico City, Guadalajara and Monterrey.

The main contents of the National Atlas of Mexico are: I. General maps; II. History; III. Society; IV. Nature; V. Environment; VI. Economy; VII. Mexico and the world.

#### **Changing Directions: Historical Atlas of Canada**

Geoffrey J. Matthews, Department of Geography, University of Toronto, Toronto, Canada

Volume III of the *Historical Atlas of Canada* is scheduled to be published in October 1990 after four years of intense production and is expected to emulate the critical success achieved by Volume I. Rising production costs, a depleted budget and a paucity of new funding have compelled the project to examine more cost effective methods of production than are now being utilized. As a result of that study, the atlas executive and the University of Toronto in order to rescue the remaining volume in the project, have decided to cease operations for one year while the cartography office is refitted to a computer-based operation. A drastically smaller nucleus of computer trained cartographers will commence production of Volume II in 1991 with the goal of completion within two years. The style, design and integrity of the two previous volumes will be maintained, only the method of production will dramatically change.

#### **The Climatic Atlas of Michigan**

Hans J. Stolle, Department of Geography, Western Michigan University, Kalamazoo, MI

The Climatic Atlas of Michigan is the product of a nine year cooperative undertaking of two Western Michigan University faculty members, the state climatologist, and one member of the Michigan State University faculty. The atlas was published by the Notre Dame University Press and it is one of just a few existing state climate atlases.

This paper summarizes the production of the atlas from its early planning to the print-ready color separations. Problems of data collection and compilation are explained, the design of the atlas format as well as individual maps is illustrated, and the methods of cartographic production and project management are discussed.

Helpful insights gained during this project are pointed out and a sabbatical research project which is a direct result of work done for the atlas is briefly described.

#### **SESSION D: ROUNDTABLE — CARTOGRAPHY LABS IN THE NINETIES Cartography Laboratories in the '90s Roundtable Discussion**

Organizer: James Anderson, Florida State



University. Panelists: Greg Chu, University of Minnesota; Will Fontanez, University of Tennessee; Craig Remington, University of Alabama; Ellen White, Michigan State University.

The panelists described their laboratories' staff, clientele, products, rates, and equipment, then discussed trends foreseen for the coming decade. In general, computer-assisted techniques are preferred for small format production, but most panelists felt that traditional methods would continue to be required for large format work. The appropriateness and value of off-campus contract work was the central topic of subsequent discussion.

Noon-1:30 p.m. Luncheon  
1:30-3:00 p.m. Concurrent Sessions

#### Luncheon Speaker

Dr. Robert Aangeenbrug  
Chair, Department of Geography  
University of South Florida  
Tampa, FL

#### SESSION E: GEOGRAPHIC INFORMATION SYSTEMS GIS Applications for Transportation Planning

Eckart F. Leistikow, Pennsylvania  
Department of Transportation,  
Harrisburg, PA

This presentation will identify and describe the essential components that define an automated cartographic operation. It further introduces the concept of computer assisted cartography and describes the relationships between manual and automated ones. Special emphasis focuses on the cartographer's role in facilitating cartographic automation within the framework of an ever growing Geographic Information System for Transportation. The paper will demonstrate the idea of teaching cartographers to use computers - rather than teaching computer operators to make maps; thereby promoting the rapid proliferation of automated cartography among State DOT's and leading Metropolitan Planning Organizations.

**Computer Mapping for Decision Support in Facilities Management and Environmental Compliance in Spite of Shrinking Funds and Increasing Requirements**  
Diane Drigot, and Karen Glyn, Marine Corps Air Station, Kaneohe Bay, HI and Marge Elliott, Insight International, Ventura, CA

As staff and budgets shrink and environ-

mental requirements grow, facilities managers face a critical need for more timely access to geographic-based information to achieve regulatory compliance. Geographic Information Systems (GIS) can successfully satisfy this need for large municipalities. But for managers at smaller-scale facilities, a traditional GIS often exceeds what is needed and affordable. One can gain similar benefits of a GIS with minimal staff, budget, and equipment investments by developing a microcomputer-based system, using CAD/CAM software as a mapping package linked with third-party database management software.

This paper describes how a military installation in Hawai'i — an urban microcosm influenced by a myriad of environmental issues — successfully built such a system using AutoCAD and dBASE III+. A team led by a government environmental specialist and a geographer, with the support of cartographers, facilities managers, and engineers, used a unique developmental approach resulting in an automated graphic and non-graphic environmental information management system. This system allows for: (a) working within a modest budget to procure minimal and expandable equipment; (b) on-the-job staff participation in the creation and use of real-time products as the system evolved; (c) further refinement by the user as additional requirements surface; and (d) later expansion from environmental compliance to all areas of facilities management applications.

Examples show use of this system in the areas of: wildlife law enforcement, environmental impact assessment, endangered species management, historic preservation compliance, hazardous waste training, oil and hazardous substances spill contingency planning, selection of sites for military housing and training, and leak detection management of underground storage tanks.

Recommendations cover: (a) other practitioners with similar needs and constraints; (b) novice and professional cartographers who know of others with similar requirements; (c) GIS system designers regarding the needs of beleaguered bureaucrats and other potential users with little or no computer literacy.

#### SESSION F: ROUNDTABLE — MAPS AND THEIR KEEPERS IN THE NINETIES Maps and Their Keepers Roundtable Discussion

John D. Sutherland, University of Georgia  
Libraries, Athens, GA

Handling of non-standard cartographic formats and new technologies in cartographic information delivery was discussed.

3:00-3:15 p.m. Break  
3:15-5:00 p.m. Annual Business  
Meeting

#### SATURDAY, OCTOBER 27

8:00-11:00 a.m. Registration  
8:30-10:00 a.m. Sessions

#### SESSION A: CARTOGRAPHIC INFORMATION Cartographic Information Sources on Topographic, Hydrographic and Cadastral Maps

A. J. Brandenberger and S. K. Ghosh, Laval  
University, Quebec, Canada

Topographic, hydrographic and cadastral maps are indispensable tools to provide quantitative information on the earth's surface on land and under water. However, in the context of the enormity and complexity of such mappings, the obtaining and retrieving of such information remain perpetual exigencies. The paper identifies the specifics and pertinent map production organizations. The information sources and their limitations are discussed. Finally a data bank developed at Laval University with world-wide potentiality is presented. Its feasibility is discussed.

#### Main Factors of Land Degradation in Mexico

Maria Concepcion Garcia Aguirre and  
Graciela Perez Villegas,  
University of Mexico

In Mexico, problems related to pollution and land degradation became more notorious in the beginning of the fifties. However, it was until the seventies when several institutions undertook projects to study and solve these problems. Most of the present information about this topic refers to local studies. For this reason, the coordinator of the project *Atlas Nacional de Mexico*, devoted a special section to thematic maps about impact of human activities on land resources, water resources, air, etc. The map of land degradation shows the main factors causing the deterioration of land resources, such as deforestation, fires, erosion, grazing activities, several types of industry (oil, thermoelectric, chemical, etc.) and the effect produced by human settlements and tourism. It indicates the distribution of these factors and its level of impact (medium or severe) throughout the Mexican Republic. In the top right side of this map, there is a small map scale (1:16,000,000) that indicates the level of degradation of natural resources. The



evaluation was based on the measurement of area transformed into grassland, crops, secondary vegetation and soil erosion. Impact on wildlife was estimated considering species extinction, level of endemism and percentage of disturbed habitat. Finally, a table indicates the land cover change in three periods. It was estimated by measuring existing vegetation maps with a digitizing program (AU220).

#### Recovering an Ancient Hawaiian Cultural Landscape for Purposes of Modern Land Use Planning

Muriel B. Seto, Donna Wong and Mikilani Ho, Hawaii's Thousand Friends, Kailua, HI

Hawaii is target for a host of investment interests, but our land use planners too often find evidences of native culture lying where least expected in pathways of modern progress, after construction is well underway. Unfortunately, early cartographers brought bias to Hawai'i mapping: "The names of many geographical features in the islands known to the Hawaiians are not given in the gazetteer — outstanding cliffs, rocks, small streams and gulches, and some trivial land marks. Such names were thought not to be of enough importance to include in the work." (*A Gazetteer of the Territory of Hawaii*, J. W. Coulter, 1935, University of Hawaii, Honolulu). This attitude comes home to haunt us.

Hawaiian activists, applying historic preservation and environmental laws, are occasionally able to modify, delay, or halt public and private developments perceived detrimental to cultural, land-centered value systems. Acrimonious confrontations have resulted at great financial cost to development interests, but without generating long term solutions.

For five years, Hawaii's Thousand Friends has authored an ambitious effort to fill the void through federal Library Services funds employing knowledgeable native Hawaiian researchers for a computerized database of cultural sites. In our paper we show how we developed criteria for rediscovery of the original Hawaiian cultural landscape through recording sites mentioned in publicly available standard texts, many of which are early observations made by post-contact western residents and visitors, or are from the writings of early literate Hawaiians.

We will also describe how, with a small state grant for a pilot project, we concentrated on inventorying early maps for the Island of O'ahu, recording their locations, conditions, and public availability. Many early maps are not officially recorded, controlled, nor are they properly archived. Some are believed to have been lost, strayed, or stolen. We show how, using our data collection forms, we recorded those

cultural sites which are shown on the maps, including them in our database collection.

In this paper, we describe how wedding data from the literature to information contained on O'ahu maps serves to create a mappable pre-historic record of sites for use by native Hawaiians, and by land use managers and developers, among others. We also analyze future steps to be taken, utilizing computers, for greater public accessibility to expanded cultural maps, and toward obtaining greater protection and maintenance for unusually vulnerable early maps of Hawai'i.

#### SESSION B: ROUNDTABLE — AUTOMATED CARTOGRAPHY IN THE NINETIES

##### Automated Cartography in the '90s Roundtable Discussion

Organizer: Ronald M. Bolton, Aeronautical Charting Division, National Oceanic and Atmospheric Administration. Panelists: Will Fontanez, University of Tennessee; Dewey Hicks, Alexandria Drafting Company; John Krygier, The Pennsylvania State University; David Miller, National Geographic Society; Elke Owen, American Automobile Association; Craig Remington, University of Alabama.

Remington described the technical and institutional implications of the Intergraph GIS and mapping system at the University of Alabama. Krygier described the all-digital production scenario at the Deasy GeoGraphics Lab, and argued that human interaction with computers, rather than automation *per se*, is the important issue for the future of computer-assisted cartography. Owen described the on-going computerization of cartographic production at AAA as an evolutionary process that never quite reaches equilibrium due to continuing technological developments. Fontanez presented the 'small lab perspective' on combining photomechanical and computer-assisted production methods. Miller recounted the ten-year history of computerization at NGS, observing that the blurring of previously discrete design, research, editorial, and production functions requires difficult structural adjustments in a large institution. Hicks stressed the necessity of generating profit as a private-sector mapping business; valuable existing stocks of film-based artwork and the exorbitant costs of suitable output devices compels ADC to combine computer-assisted and traditional production methods. Bolton presented perceived trends in computer hardware and operating systems for mapping, and focused on implications of automation on personnel and institutional structures. Expecting that 'hybrid' production technologies will persist, Bolton discussed the importance of

developing flexible attitudes in individuals, and replacing the traditional hierarchical management structure with a 'team approach.'

10:00-10:30 a.m. Break  
10:30-Noon Sessions

#### SESSION C: GENERAL CARTOGRAPHY Deconstructing Brian Harley (Or, How Cartography Lost Its Innocence) Jeremy Crampton, The Pennsylvania State University, University Park, PA

At first glance, it is surprising that a practical discipline like cartography should greet Brian Harley's exhortations toward probably its most radically theoretical (and theoretically radical) 'elements of cartography' if not with total acceptance, then at least with a dawn chorus of recognition unparalleled for the discipline. Yet it is that very practicality, in comparison with academically more prestigious (and theoretical) colleagues in the humanities that no doubt fuels the welcome. Out of insecurity, cartographers have sighted/cited a tasty fad to call their own. Yet while the praise is justified, it would be a mistake to have cartography shape itself around his exact formulations. For one thing, Harley is only one voice among the clamor of 'postmodernists,' 'poststructuralists,' and 'deconstructionists,' and brings his own particularly historical agenda to the discipline. Harley does not pretend to be offering 'The Way' in the evangelical manner (pace Godlewski), but is offering an example. For another, he has not yet come close to pushing the boundaries of exploration that, map in hand, we expect of cartographers. By this, I refer to the theoretical side of his writing (which is, after all, what has caused the excitement). While Harley has begun the critique of maps as records of the landscape to be examined mathematically (for example, he rejects the cartographic criticism of the Gall-Peters projection as scientific reductionism) he would still allow maps, problematically, to have full representational status. That is, that graphic symbols simply 'stand for' something else ('reality,' 'the world,' 'the landscape,' or whatever). This position, to me, is outmoded and difficult to sustain convincingly. I would like to propose an alternative to the 'maps as representations' position, one which more radically incorporates postmodern critiques of representation; perhaps even to subvert it altogether.

#### Affordances and Invariants in Navigation and Landscape Analysis

Henry W. Castner, Department of Geogra-



phy, Queen's University, Kingston, Ontario, Canada

Information processing and constructivist approaches to environmental cognition have been challenged by James Gibson's theory of direct perception of the environment. His theory is based upon the idea that structures in the environment are present in the ambient light reflected from surfaces in that environment.

For animals, sensitivity to a structure makes possible certain actions; the evolution of that sensitivity would then define the animal's ecological niche. Aspects of the environment which have functional consequences for the animal are called affordances. From this, perception can be viewed as a process of directly perceiving the affordances of one's ecological niche.

This paper examines some implications of Gibson's theory for map skill research and education. Two specific ideas are examined: affordances, which may provide a way of identifying landscape attributes that are functionally meaningful to a body in motion; and transformations in the ambient array which facilitate the detection of invariant structures, structures which geographers seem particularly responsive to in landscape description and analysis.

**Patterns of Cartographic Materials Usage**  
John D. Sutherland, University of Georgia Libraries, Athens, GA

One of the traditional ways of measuring library performance, or how well a library meets its objectives and goals, is the measurement of user satisfaction. User studies have focused on either users or use. The user-focused study attempts to survey user behavior while the use-focused study measures material used. This paper will describe both types of studies. Using data from a long-term use research project at the University of Georgia Library's Map Collection, use patterns in this Map Collection will be defined. Combining this study with other published and unpublished data patterns of use in United States Map Collections will be outlined.

**SESSION D: ROUNDTABLE —  
COMMERCIAL MAPPING IN  
THE NINETIES**

**Commercial Mapping in the 1990's  
Roundtable Discussion**

Bertram Green, The Map and Globe Store, Orlando, FL

What are the major issues and problems that face commercial mapping in the 1990's? This, plus many other relevant questions will be discussed by a panel of personnel engaged in commercial mapping.

1:00 p.m. *Post-Conference Trip to Kennedy Space Center*

#### **MINUTES OF THE BOARD MEETING, AUGUST 18, 1990**

President Rivera organized a conference call and the following members participated: J. Anderson, D. Rivera, F. Fryman, G. Chu, E. White, P. Gilmartin, P. McHaffie, N. Ryckman, D. DiBiase.

A motion was made to accept the minutes from the previous board meeting by Anderson. Second by Fryman. Unanimous. Rivera reported that she has been in touch with two potential candidates for the office of Executive Director. Requirements are 2-4 hours per week and some institutional support. This person is responsible for the day to day conduct of NACIS business. Gilmartin suggested spending NACIS money to support operations of the office. There was general sentiment in support of this idea and it will be discussed further at the October board meeting. Rivera asked about the status of the Constitution. Anderson reported that the Constitution had been reviewed by Marsha Selmer and Ron Bolton for errors and it was ready to distribute to the membership at the annual meeting. Question was asked about the non-profit status of the organization. Chu will investigate and report at the October board meeting. Anderson was authorized to distribute copies of the Constitution at the October meeting.

#### **Treasurer's Report**

Chu distributed a copy to board members prior to the conference call (see following). Anderson moved to accept. McHaffie second. Unanimous.

#### **1992 Site**

Bolton distributed letter prior to meeting with airfare costs to selected cities. Cities under consideration were Philadelphia, San Antonio, and Minneapolis. Gilmartin asked if we had site coordinators for these sites. Anderson suggested that local arrangements be separate from program planning so that the Vice President would not have so many responsibilities. Gilmartin suggested a questionnaire be made available at October meeting asking membership about site preferences and their ability to assist with local arrangements. Jeff Patton will be asked to prepare questionnaire.

#### **Nominations**

Proposed nominees for the Board of

Directors are Ron Bolton, Will Fontanez, and Hull McLean. Ed Hall was proposed for Treasurer. A nominee for Program Chair was not yet available. The question was asked if a past president could be nominated for president again. After reviewing the Constitution, the board's opinion was that they could not. Anderson suggested that Bolton prepare appropriate language to amend the Constitution and the matter be discussed further at the October board meeting.

#### **Membership**

Chu reported that we would be exchanging lists with ACSM. ACSM's list contains approximately 4,000 names.

#### **Publications**

DiBiase reported that questions have been asked about subscriptions separate from membership. Anderson suggested looking at this issue as well as definitions for Institutional Membership. Ryckman and Rivera will investigate and report to the board in October as to how other organizations handle these issues. DiBiase also raised the issue of charging for back issues and some general comments concerning the cost of *Cartographic Perspectives*. DiBiase would like to have a new editor identified by the Milwaukee meeting.

#### **1990 Program**

Fred Fryman has organized fourteen sessions. Anderson commented on field trips and other local arrangements.

It was reported that the contract had been signed for the 1991 meeting in Milwaukee. The local arrangements committee has requested time at the business meeting in Orlando to make a brief presentation.  
—James R. Anderson, Jr., Secretary

#### **TREASURER'S REPORT AUGUST 14, 1990**

As of this date, our membership stands at 290; there are 30 institutional members, 223 individual members, and 37 student members. I suspect many 1989 or previous members still have not paid their 1990 dues. The Spring, 1990 issue of *Cartographic Perspectives* were sent only to those who have paid their 1990 dues (anyone who has not received this issue should check to see if dues have been paid through the 1990 calendar year). There has been some confusion in the past that some members thought the registration fee for the previous annual meeting includes the following year's membership dues; this is not true. We ought to make a special effort during the Orlando meeting to let members know that the registration fee for the annual meeting does not include next year's membership.



The balance in our bank account today is \$16,157.04. The interest gained from this account between 1/1 and 7/13 (date of bank statement) is \$553.67. All major bills have been paid. The cost of producing the last two issues of *Cartographic Perspectives* was \$3850. As we head into the Orlando meeting, our financial situation is very stable.

—Gregory Chu, Treasurer

#### NACIS BOARD MEETING MINUTES, OCTOBER 24, 1990, Orlando, Florida

President Rivera called the board meeting to order at 3:10 p.m. The following members were present: Pat McHaffie, Ellen White, Jim Anderson, Fred Fryman, Diana Rivera, Nancy Ryckman, John Sutherland, Pat Gilmartin, Jack Dodd, Ron Bolton, Jerry Thornton and Craig Remington.

Minutes of the last meeting were approved with one correction. Fryman reported that meeting planning was progressing well. The Census Bureau has been forced to cancel their presentation due to federal budget problems and Mapgrafix has been substituted. Anderson reported that the budget for the meeting was being met. Rivera opened discussion on search for new CEO by summarizing what had occurred to date. Two candidates have been proposed but they have not been able to accept at this time. Gilmartin proposed allocating money for the Executive Director. Anderson proposed up to \$400 a year for Executive Director expenses. Gilmartin seconded. Unanimous. Bolton agreed to serve as CEO until a successor was appointed. White moved to allow Fryman to appoint new CEO from candidates suggested. Unanimous.

Bolton reported that the straw vote on the constitutional change had passed by an overwhelming margin. He suggested that this fact be mentioned at the business meeting, but that according to the Constitution the membership would have to vote.

Chu presented the Treasurer's report. He stated that for the year we had basically broken even. The cost of *CP* has increased and may be a problem in the future. Chu reported that we are not listed as non-profit according to the IRS. Chu consulted with an accountant who provided him with necessary forms. Chu volunteered to work with the new treasurer to file the necessary forms.

Rivera asked about the status of the data base. Chu highlighted some problems. The issue of membership being paid at the meeting was discussed. It was suggested that dues be for calendar year only. It was recommended that explanation of dues be made in *CP*, dues notices, and new society brochure. An effort will be made to

produce a more current data base during this next year.

Bolton reported on the results of the election. Bolton, Fontanez, and McLean were elected to the Board. Ed Hall was elected Treasurer and Jack Dodd was elected Vice President.

Ryckman reported on subscription services. She stated that these services were given a discount by the organization or charged a fee to the library. Ryckman suggested getting the journal indexed. Ryckman also recommended that we not offer *CP* on a subscription basis. Sutherland moved that we not offer *CP* on a subscription basis. Ryckman seconded. Unanimous. Rivera asked about distinction between individual and institutional memberships. Sutherland moved that we do not offer subscription services at a discount. Second by Chu. Unanimous. Bolton commented that if we offer discount to one we needed to be able to explain why we didn't offer to all. Rivera asked about paying for back issues. Chu suggested for back issues that the requestor be asked to join NACIS. Ryckman moved that we charge 1/4 of the current institutional rate plus \$2.00 postage and handling. Ryckman withdrew motion after further discussion. Sutherland moved that we charge \$10 for each back issue. Second by McHaffie. McHaffie moved that we define a back issue as any issue before the current issue. Passed 2-0 with the remaining members abstaining. Anderson suggested that we monitor the purchase of back issues. McHaffie moved that we limit sale of back issues to 10 copies per buyer. Second by White. Unanimous. Ryckman will research indexing of *CP*.

Rivera discussed the replacement of the *CP* editor. Pat Gilmartin was approached about the position. Gilmartin declined due to a possible conflict with her assistant editorship of another journal and the fact that she had turned down their offer of an editorship. Rivera asked Gilmartin to assist incoming President Fryman in proposing names for a new editor.

Sutherland reported that Bob Lyon would like to have exhibitors given better consideration. Anderson reported that we are not encouraging exhibitors and that they were offered exhibit space in exchange for registering for the meeting. Rivera and White asked about the use of the NACIS name and logo without Board approval. Bolton suggested that we draft a letter stating that any future use of our logo be approved by the Board. Lyon also expressed a desire to advertise in *CP*. Chu reported that advertising could jeopardize our non-profit status.

Thornton on behalf of the Inter American Committee reported that participants from Mexico had asked about the possibility of

co-sponsoring a conference with NACIS to be held in Mexico City. Bolton suggested that we present the idea to the membership.

A questionnaire is going to be circulated to the membership concerning future meeting sites. Bolton cautioned that membership should be told that final decision would be made by the Board based on criteria such as hotel cost, airfare cost, and local arrangements availability. Bolton reported that Minneapolis, Philadelphia, and San Antonio had been asked to submit bids. White suggested that we go to Minneapolis since Chu has volunteered to do local arrangements. Anderson moved that we go to Minneapolis in 1992. Fryman seconded. Unanimous. Rivera thanked Pat Gilmartin and Ellen White for their service on the Board.

—James R. Anderson, Jr., Secretary

#### NACIS BUSINESS MEETING, OCTOBER 26, 1990, Orlando, Florida

The meeting was called to order by President Rivera at 3:26 p.m. Anderson made local arrangement announcements. Bolton reported that 72 people had voted. Jack Dodd was elected Vice President, Ed Hall was elected Treasurer. Ron Bolton, Will Fontanez, and Hull McLean were elected to the Board. Rivera asked for vote on the proposed change to the Constitution. Unanimous. Anderson reported that approximately 100 had registered for the meeting. MacEachren reported that Jeff Patton would be the new chairman of the Publications Committee. MacEachren asked that anyone who would like to have their paper considered for publication submit a copy to Patton. Rivera announced that we would need a new editor for *CP* next year.

Sona Karentz Andrews, co-chair of local arrangements for next year's Milwaukee meeting announced that the meeting would be held at the Astor Hotel. The dates will be October 20-23. Room rates are \$61 for a single. The luncheon will be on Monday with the banquet on Tuesday. Suggestions for field trips include GIS facilities, BLM, Forest Service, AGS, breweries, and the public art museum. Andrews asked for input on the Milwaukee meeting. The 1992 meeting will be in Minneapolis with Greg Chu serving as local arrangements chair. Rivera reported that an invitation had been extended from Costa Rica to meet in San Jose. Mexico has also extended an invitation to have a joint meeting in Mexico City. These meetings would be in the form of a mid-year meeting. Rivera asked for members to submit nominations for NACIS officers and board members.

Chu presented the Treasurer's report and reported that our balance was about the



same as this time last year. Current membership is 317. Expenses are up due to the increased costs of CP but this has mostly been offset by increased dues and membership. DiBiase suggested allocating money to fund students to attend meetings or to provide scholarships. MacEachren noted that the production costs of CP were being absorbed by Penn State's Deasy Lab.

Rivera reported that the Board was searching for a new executive officer to replace Ron Bolton. Remington thanked all of those who had participated in the poster session. Donna Schenstrom objected to introducing the Latin American visitors at the banquet since the organization encompasses those countries. Sutherland suggested introducing all first time attendees instead. Andrews suggested publishing meeting participants in the program. Rivera introduced new officers. Bolton urged everyone to attend the Milwaukee meeting. The meeting was adjourned at 4:10 p.m.

—James R. Anderson, Jr., Secretary

#### CP WINS AN OZZIE

The trade periodical *Magazine Design & Production* has recognized *Cartographic Perspectives* with an "Ozzie" award for Design Excellence, Honorable Mention, Best Overall Design, New Association, Nonprofit or Government Publication. CP also is featured in the "Gallery" section of the September/October 1990 issue of *Aldus Magazine*, a periodical for users of Aldus Corp.'s *PageMaker* and *FreeHand* desktop publishing software. CP's original design was realized by David DiBiase with crucial encouragement from Alan MacEachren. Editorial assistant Suzanne Peterson has been responsible for the look of the bulletin since issue number 5. The production, printing and distribution of CP is supported with the annual dues of NACIS members.

#### INVITATION FOR COMMENTS ON DATA ACCESS AND CONFIDENTIALITY

(continued from page 2)

ality and without undue risk of adverse effects on public cooperation with censuses and surveys?

**Persons or business harmed by disclosure.** Do you know of any instances in which persons or businesses were harmed by unlawful or unintended disclosure

of information they provided to the government under the condition that the information was to be used only for statistical purposes? How did this happen? What were the consequences? (This category differs from the first two in that statements need not be based on your own personal experience.)

Please submit your statements to George T. Duncan c/o Committee on National Statistics, National Research Council, 2101 Constitution Avenue N.W., Washington, DC 20418. If you have any questions, please call Virginia de Wolf, Study Director, at (202) 334-2550. We look forward to hearing from you.

AAG Newsletter 25:9 November 1990

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*ACSM Bulletin.* Offering feature articles, regular commentaries, letters, and news on legislation, people, products and publications, the American Congress on Surveying and Mapping's *Bulletin* is published six times a year. Contact: Membership Director, 5410 Grosvenor Lane, Bethesda, MD 20814; (301) 293-0200.

*Bulletin of the Society of University Cartographers.* Published twice a year, the *Bulletin* features articles on techniques and ideas applicable to the cartographic drawing office. Contact John Dysart, Subscriptions Manager, Room 514, Middlesex Polytechnic, Queensway, Enfield, Middlesex, EN3 4SF, England.

*Canadian Cartographic Association Newsletter.* A quarterly publication offering news and announcements to members of the CCA. Contact: Canadian Cartographic Association, c/o Jim Britton, Sir Sandford Fleming College, School of Natural Resources, PO Box 8000, Lindsay, ONT K9V 5E6; (705) 324-9144; e-mail: britton@trentu.ca; fax: (705) 324-9716.

*Cartographica.* A quarterly journal endorsed by the Canadian Cartographic Association/ Association Canadienne de Cartographie that features articles, reviews and monographs. B V Gutsell, founder and editor. ISSN 0317-7173. Contact: University of Toronto Press Journals Department, 5201

Dufferin Street, Downsview, Ontario, Canada M3H 5T8; (416) 667-7781.

*Cartographic Journal.* Biannual Journal of the British Cartographic Society. Includes research articles, 'shorter' articles, official records of the Society, book reviews, and list of recent cartographic literature. Contact: Hon. Secretary, Charles Beattie, 13 Sheldrake Gardens, Hordle, Lymington, Hants. SO4 10FJ England.

*Cartography.* Biannual Journal of the Australian Institute of Cartographers. Each issue contains two parts, the Journal proper and the Bulletin. The Journal contains original research papers, papers describing applied cartographic projects, reviews of current cartographic literature and abstracts from related publications. ISSN 0069-0805. Contact: John Payne, Circulation Manager, GPO Box 1292, Canberra, A.C.T. 2601, Australia.

*Cartography Specialty Group Newsletter.* Distinguished biannual publication of the Cartography Specialty Group of the Association of American Geographers. Features vital news announcements and comics. Contact: Ellen White, Executive Editor, CSG Central Office, Department of Geography, Michigan State University, East Lansing, MI 48824; (517) 355-4658.

*Cartomania.* This quarterly newsletter of the Association of Map Memorabilia Collectors offers a unique mix of feature articles, news, puzzles, and announcements of interest to cartophiles. ISSN 0894-2595. Contact: Siegfried Feller, publisher/editor, 8 Amherst Road, Pelham, MA 01002; (413) 253-3115.

*Geotimes.* Monthly publication of the American Geological Institute. Offers news feature articles, and regular departments including notices of new software, maps and books of interest to the geologic community. Articles frequently address mapping issues. ISSN 0016-8556. Contact: Geotimes, 4220 King Street, Alexandria, VA 22302-1507.

*GIS World.* Published six times annually, this news magazine of Geographic Information Systems technology offers news, features, and coverage of events pertinent to GIS. Contact: Julie Stutheit, Managing Editor, GIS World, Inc., P.O. Box 8090, Fort Collins, CO 80526; (303) 223-4848; fax: (303) 223-5700.

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