cartographic perspectives

cartographic | *perspectives*

Number 9, Spring 1991

in this issue

message from the executive director

It gives me great pleasure to respond to the editor's request to address you as the new executive director of this vital young organization. NACIS is beginning its second decade in a position of considerable strength. This strength is, I believe, derived from several factors. We have been fortunate in our selection of elected leadership, for the vision of the organization they have pursued. We are fortunate to have had efficient and reliable executive directors to handle the day to day business of the organization, and we are fortunate to have committees which have worked well and with a purpose. In a sense though, to say 'fortunate' ascribes to mere luck our success, which is in truth a natural outcome of the dynamism of our organization.

Not listed in my litany of 'fortunates' is that on which your attention is currently focused. And again, given our membership, it is not especially surprising that we possess the human capital to produce a journal of such exceptional quality (several colleagues have remarked that it is the only cartographic journal which they read from cover to cover). This

gets me to the central point of this letter. Although it's frequently touted that an advantage of the Society is its compact size, we currently find ourselves engaged with a 'threshold' problem: our income falls short of what *CP* costs. This is not cause for immediate panic, but the problem must be successfully addressed within the next year. We do have a number of options: a) raise dues, b) decrease the number of issues per year, c) lessen the quality of the product, or d) moderately increase our memberships (especially institutional).

To my mind, option 'd' is the most reasonable. It is within our power to attain, and does not require backsliding or additional pain to our membership. *Cartographic Perspectives* is a journal

worthy of any college or university library, or library serving a cartographically inclined clientele. **Why aren't we promoting it?** I suspect because no one thought of it. My own naivete should serve as an example. Wanting to be a good Joe in this time of austerity, I have been donating my copy to the library, a fact I pointed out at the last NACIS Board meeting. "You're doing WHAT? — We need institutional memberships, make your library subscribe."

The above cited austerity is real, and I don't propose that we set a goal of thousands of institutional memberships. But if we had just **one hundred** total institutional members we would be running well in the black. This is not an unreasonable goal, and I believe that if each of us were to promote *CP* to our own libraries, we would be well on the way.

Before signing off, I must make one additional, related appeal — REMEMBER TO PAY YOUR DUES. Late dues payments cause all sorts of problems, especially for those responsible for distributing *CP*. We don't want to suspend your subscription any more than you want it suspended, but we cannot continue to send copies to (former) members for more than a few months. If you are reading this you've probably paid your dues, and I apologize for bothering you. However, as a member, you should realize that this is an ongoing organizational problem which will not go away, and requires our constant attention (next year).

Finally, I should say that following Ron Bolton will make my job both easier and more difficult. Easier because of the condition in which NACIS affairs were left, but more difficult in maintaining the high standards set by him. I believe the organization owes Ron a large debt of gratitude, and me, a lot of leeway.

Thank you for your attention,

and I sincerely hope to see you all in Milwaukee next October!
Christopher Baruth
Executive Director

CALIFORNIA GPS NETWORK SIDESTEPS CENSORSHIP
Global Positioning System satellite data is subject to the Defense Department policy of degrading its quality in the interest of preventing potential adversaries from using the information to guide missiles in wartime. However, that policy is not affecting the scientific programs of the nation's first continuously monitoring GPS network in California.

At the American Geophysical Union meeting held in San Francisco, scientists reported that their new system overcomes the DOD application of "selective availability" by using multiple receivers to make simultaneous measurements. They stress, however, that GPS selective availability does have adverse effects on networks with non-simultaneous observations.

GPS is a constellation of satellites put into orbit by the Defense Department since the early 1980s to support military and commercial air navigation around the world by supplying precise location information. Earth scientists soon learned that the signal could also be used to measure the relative position between two sites to an accuracy of millimeters. So far, most geophysicists using GPS have focused on movements of crustal plates, including crustal deformation, earthquakes, volcanoes, and related global changes.

As staff and budgets shrink and environmental requirements grow, facilities managers face a critical need for more timely access to geographic-based information to achieve regulatory compliance. An integrated Geographic Information System (GIS) can successfully satisfy this need for a large municipality. But for managers at smaller facilities, a full-function GIS often exceeds what is needed and affordable. Such managers can derive similar benefits 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 successfully built such a system using *AutoCAD* and *dBase III+*.

Computer-aided Mapping for Facilities Management and Environmental Compliance

A Case Study

Diane C. Drigot
Margaret E. Elliott
Karen L. Glyn

F acilities managers need geographic-based information to make wise management decisions — especially in the area of environmental compliance. Siting facilities in environmentally sensitive areas, investigating former dump sites, tracking noise impacts, identifying historic properties, detecting leaks from underground storage tanks, developing site-specific spill contingency plans and assessing development impacts on protected wildlife populations are just some of the decision-making processes which require geographic-based information.

This need is often difficult to fulfill because while a great deal of environmental data may be available it may be scattered about in a variety of places and formats such as reports, maps, field sketches, photographs and engineering drawings of disparate sizes, scales, levels of complexity and accuracy. Staff and funds are often not adequate for timely data consolidation and evaluation to satisfy permit requirements, auditors, lawmakers, and the affected public.

An integrated Geographic Information System (GIS) can help address this need for a large facility or municipality; however, a different approach is needed for a smaller facility with an overextended staff, limited computer infrastructure, and modest budget resources. This paper will illustrate one approach to meeting this need: the development of an affordable microcomputer mapping system using CAD/CAM software linked with third-party database management software. The system was constructed in the context of a modest budget, colleagues with little or no computer literacy, and a large, slow-moving government bureaucracy.

This project evolved at the Marine Corps Air Station (MCAS), Kaneohe Bay. This military installation is located on Mokapu Peninsula on the northeast (windward) coast of the Island of O'ahu, Hawai'i (Figure 1). Facilities managers there are responsible for an inventory of over 2,000 structures and work spaces, more than 1,900 housing units, and many recreation areas, in support of military personnel assigned to numerous air and ground units of the tenant organizations. Although the Air Station itself occupies less than five square miles of land, it supports a resident population of approximately 16,800 military personnel and their families, 1,800 civilian employees, and about 3,000 retirees who have access to its community facilities. The Station also contains, and is surrounded by, an

Diane C. Drigot is Senior Environmental Protection Specialist with the Marine Corps Air Station, Kaneohe Bay, O'ahu, Hawai'i

Margaret E. Elliott[1] is Director of Insight International, Ventura, California

Karen L. Glyn[2] is a scientist with SETS Technology Inc., Mililani Technology Park, O'ahu, Hawai'i

PROJECT AREA

---

[1]At the time of the project, Margaret Elliott was team leader for the Geographic Analysis Center (GAC) at Naval Civil Engineering Lab (NCEL), Pt. Hueneme, Calfornia and co-coordinator of this project with Dr. Drigot.

[2]At the time of the project, Karen Glyn was contractor for Martin Marietta Data Systems assigned to the GAC at the NCEL, Pt. Hueneme, California, and stationed at MCAS Kaneohe Bay, O'ahu, Hawai'i.

incredible variety of land and water resources which must be carefully managed.

The attraction of these resources has encouraged development of adjacent communities right up to the Station's gate. Responsible facilities managers must contend with increasingly intense user pressures, environmental constraints, and conflicting cultural values attributed to the surrounding air, land, and water spaces — the very resources upon which the Marines depend to accomplish a variety of military missions. They must ensure that all Station activities are carefully sited so as to meet not only military requirements, but also those of all federal and pertinent state and local laws in such areas as environmental compliance. Their job is complicated further by the fact that approximately 25 percent of the peninsula is environmentally constrained by steeply sloping terrain, unsuitable soils, endangered wildlife habitats, historic sites including an ancient Hawaiian burial ground, fragile coastlines, and surrounding air and waters zoned with some of the most stringent air and water quality standards in the state and nation. Additionally, aircraft flight paths are constrained by noise impacts and accident risks otherwise imposed upon the adjacent communities, and by bird/aircraft strike hazards due to nearby protected waterfowl
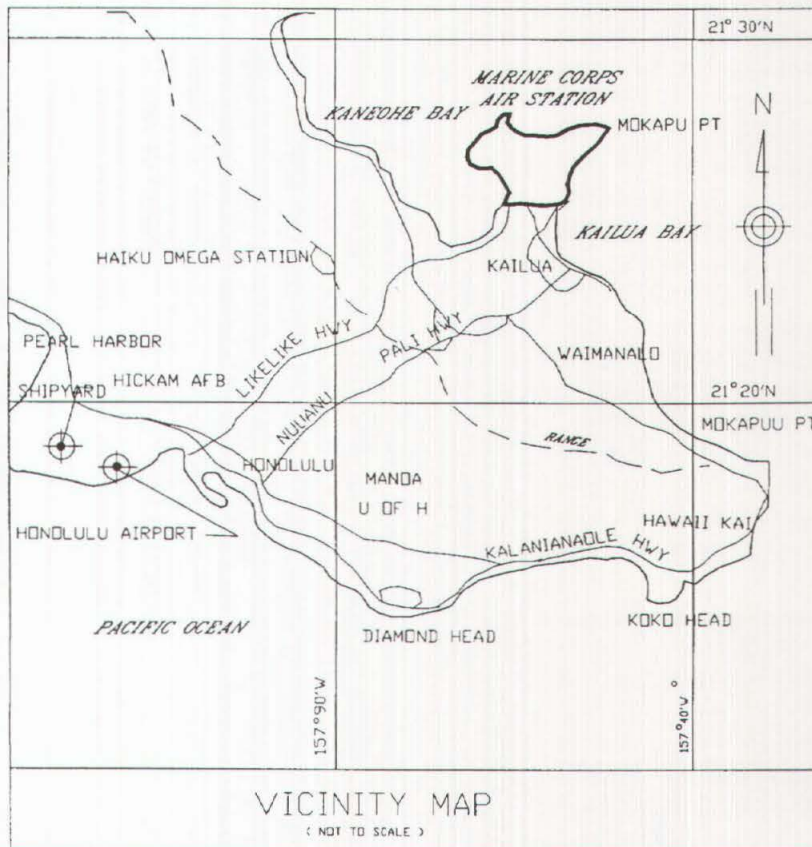

Figure 1: Plan of the Marine Corps Air Station, Kaneohe Bay, Hawaii

sanctuaries and migratory flyways. Also, marine water training space is limited by public boating, fishing, and swimming, and by protected species such as live coral reefs, endangered humpback whales, and threatened green sea turtles. On land no digging can take place without planning for the possibility of disturbing archaeological artifacts and/or ancient Hawaiian burials. Any change in activities or facilities invariably affects or is affected by one or more of these constraints, making quick access to environmental data, both graphic and non-graphic, essential for immediate use to support the decisions of facilities managers.

SPECIFIC OBJECTIVES
OF THE PROJECT

When this project started in 1986 we considered it of critical importance that the system be developed and tested in phases, starting with one manageable data set for specific applications and building to include other data sets, one application at a time, to ultimately cover all areas of facilities planning and management.

Since environmental factors frequently constrained facilities planning in so many areas, the project team decided to pilot-test the new system in the environmental arena and later expand it to cover all areas of facilities planning and management.

Although abundant environmental data were available to Station

managers, most of it was dispersed in various contractor reports, engineering drawings, paper maps, field sketches, aerial photos, and field notes. All were at different scales and formats. During time-critical periods of planning or decision-making it was extremely difficult to gather these scattered data sets, then synthesize, analyze, and redisplay the important environmental information that they contained. This situation was aggravated by the frequent turnover of military managers who were required to make critical and far-reaching decisions without the benefit of having the data readily available.

We also felt strongly that the system should be very easy to learn and use, since there were no desktop computers readily available and very few environmental or other facilities staff who had any experience with computers could afford the time for lengthy training sessions.

The system should also be compatible and translatable to/from the existing computer-aided mapping system used by "sister" agencies — in this case *Computervision* — and with the Marine Corps-wide planned future computer-aided mapping system known as Land Use Management System (LUMS) which uses the *ARC/INFO* GIS format.

For real-time decision support, the system should allow interactive manipulation of both graphic and associated non-graphic data so that simple queries of the non-graphics can be made and their results displayed in the graphic environment. For example, a real-time environmental compliance requirement is the ability to locate and leak-test all underground storage tanks within certain deadlines set by the U.S. Environmental Protection Agency (40 Code of Federal Regulations, Part 280), based on tank age, in-use status, and other specified criteria. A typical request requiring graphic and non-graphic data manipulation would be to locate underground storage tanks constructed before 1965 and indicate whether they are still in use, contain less than 25,000 gallons capacity, and have been tested for leaks within the past calendar year.

The system should support multiple geographic coordinate systems to allow selection of user-defined, state plane, UTM, or latitude/longitude coordinates. Support of these multiple geographic formats satisfies reporting requirements as diverse as engineering survey reports, military training plans, and historic preservation documents.

The system should not require extensive commitment of environmental staff for actual data input although it would need the staff's close guidance in the database development for their knowledge about resource distribution and environmental compliance requirements on the Station.

The system should store and display data in a way that is comfortable for professionals from any number of disciplines — engineering, environmental sciences, architecture, planning, archaeology, etc. — since all will use the system to support their various decision-making processes.

The system should be suitable for continuous improvement and enhancement as monies become available, yet be self-contained and productive even in the earliest stages of development in order to gain management support for these future phases.

The system should be able to generate prints and plots suitable for inclusion in various scales and sizes, in black and white or color formats, to accommodate the requirements of diverse uses such as formal and informal presentations. These prints and plots should be easy to photocopy and take into the field at a moment's notice, such as in responding to the report of a hazardous substance spill.

The system should be readily compatible with the most common and accessible software packages used by architectural and engineering firms

A typical request requiring graphic and non-graphic data manipulation would be to locate underground storage tanks constructed before 1965 and indicate whether they are still in use, contain less than 25,000 gallons capacity, and have been tested for leaks within the past calendar year.

that, as consultants, would be hired to work with and add to the database in the future.

DEVELOPMENTAL APPROACH

Given the challenging objectives, constraints, and phasing requirements associated with this project, a unique developmental approach was required which would allow tangible results throughout the life of the project. The steps followed to implement this approach are summarized below:

Evaluation of user requirements

Knowing the environmental requirements of the Station was an essential prerequisite to the actual design and development of the proposed computer-aided environmental mapping system. The project team's knowledge in this area streamlined discussions and fostered early agreement on requirements and desirable features of the proposed system.

A contractor was hired to work in-house to help the project team pilot-test the new system as it evolved. Due to a modest budget, the team utilized a student contractor who was not experienced with the chosen computer system. However, she had a strong environmental knowledge-base as a geography graduate student at the University of Hawai'i, had excellent cartographic skills, some computer proficiency, and previous military experience. While awaiting development of the system and arrival and installation of the equipment, this student became a contractor-in-residence, asked to observe and document the daily program requirements associated with the environmental/natural resources program. Thus she acquired first-hand familiarity with the types and timeliness of environmental data needed for critical management decisions.

Assessment of technology

While user requirements were being analyzed, a survey of mapping technology options was accomplished. This involved extensive review of the technical literature and hands-on evaluation of systems at technical trade shows and vendor locations.

Selection of the Preferred System

Following this technology assessment, an IBM-compatible 80286 microcomputer system was selected as the basic hardware platform for the environmental mapping system, with *AutoCAD* Release 2.52 as the basic software program. The total funds invested in hardware and software at this point was about $10,000.

AutoCAD was selected over other options for several reasons, including ease of use, abundance of third-party software, potential for customization, likelihood of long-term product support, compatibility with *Computervision* and *ARC/INFO*, support of neutral file formats and so-called standards, and popularity among architects and engineers in both the public and private sectors.

Development of the base map

As earlier indicated, the computer system developed for this project was required to be compatible with *Computervision*. To demonstrate compatibility, the base map was digitized in *Computervision* for later translation to *AutoCAD*. An existing photogrammetrically-derived facilities map at 1" = 400' was used as the source of information for the digitization process. Initially a small portion was digitized to determine the

feasibility and accuracy of the translation approach.

Translation of the base map

Translation from *Computervision* to *AutoCAD* was performed for the test area using Initial Graphics Exchange Specifications (ICES). Following successful translation, remaining areas of the Station base map were digitized and translated. Numerous other methods of translation were explored including DXF, Personal Designer, and third-party direct translator software.

Initial development of thematic overlays

Following successful translation of the basemap to *AutoCAD* format, a few thematic overlays were digitized to determine the suitability of *AutoCAD* for map layering.

System delivery and installation

The prototype system was then packaged and delivered to MCAS Kaneohe Bay for installation, on-site training, and further database development.

Basic system training

Since very few of the project sponsors had any prior experience with microcomputers, an introductory training course was provided which reviewed the fundamentals of DOS as well as *AutoCAD* functions and capabilities. Additional training was arranged later when the contractor-in-residence became familiar with the new system. She developed customized operations manuals for use of the system and conducted individual sessions on a tutorial format using real-time decision needs as the basis for training.

On-site development of thematic overlays

Additional thematic overlays were developed on-site by the contractor-in-residence. Subsequently, the contractor's status changed from that of student to full-time consultant. The on-site availability of this resident contractor greatly facilitated mapping of data contained in scattered locations and formats. Clients who would eventually use the system were encouraged to learn by example and to add their ideas and desires into the creation of the system as it was being developed. This generated a pride of ownership in the product and promoted motivation to learn and use the system.

Generation of graphic products for environmental planning and decision support

Almost immediately following the initial development of thematic overlays, simple graphic products were generated for management application. Early graphic products were often time-consuming to develop due to the inexperience of the users. However, they were widely reproduced and distributed to serve an immediate need. They thus demonstrated the tremendous potential of the system for real-time decision support needs.

As users gained more experience on the system, increasingly complex graphic products were generated. An important early example was the development of a historic properties/archaeologically sensitive areas map (Figure 2). Whenever a site is sought to construct a facility or perform a military training exercise on Station, this map is consulted by project planners, engineers, and military commanders to help plan sites

STATION HISTORIC PROPERTIES
MCAS KANEOHE BAY, HAWAII

Site 2883

Site 2884

Site 1432 (Bldg 614)

MŌKAPU BURIAL AREA
(Site 1017)

Site 2885

Site 1433

Site 1431

Site 2886

NATIONAL HISTORIC LANDMARK

Primary source:

Historic Property Inventory
by PACNAVFACENGCOM
April 1986
for MCAS Kaneohe Bay

All Site numbers are Hawaii
State Site Numbers and
begin with prefix 50-80-11-

File Name: \DRAWINGS\HISTORIC.DWG
Edited January 1990

N

500   0   500   1000   1500 feet

MŌKAPU PENINSULA
FISHPOND COMPLEX
(NU'UPIA PONDS)
(Site 1002)

Historic Property

Archeological Zone 1

Archeological Zone 2

● Monument/Marker

★ Skeletal Remains (approx.)

✸ Burial Clusters

— 1928 Shoreline (Rev. 1989)

Known Not Archeologically
Sensitive Zone

IMPORTANT: All areas not included in Historic Properties
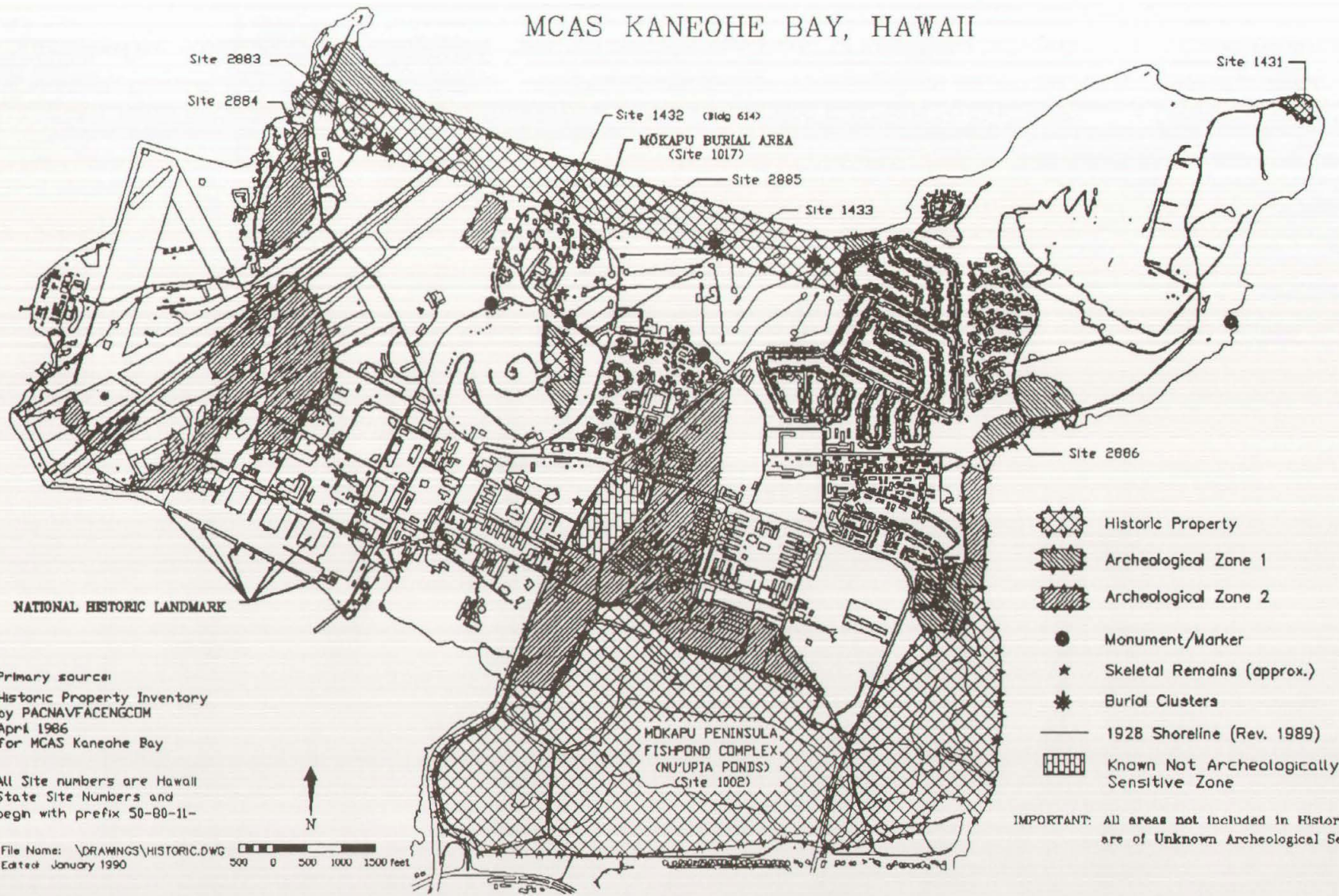are of Unknown Archeological Sensitivity.

Figure 2

and routes in such a manner as to avoid impacts where possible or plan mitigations where impact is unavoidable. This map can be modified readily as new information becomes available.

A more advanced application of graphic outputs to serve a real-time decision support need involved determining the site for a new family housing project on the Station. Off-Station housing and rental units in Hawai'i are among the most limited and costly in the nation and there is a concerted push to provide more attractive on-Station housing options for the military to preserve the morale and retention time of this all voluntary force.

A low-cost housing development project was proposed with tight deadlines for implementation mandated by the enabling legislation (Section 802 of the FY84 Military Construction Authorization Act, as amended, 10 U.S.C. 2821 note). This computer-aided mapping system was utilized to take into account the environmental considerations that would affect the siting of the proposed project. Twelve potential housing sites were chosen.

Starting with a "blank map," thematic overlays were employed to illustrate the various disadvantages of building at all of the potential sites such as flooding and tsunami hazards, abandoned underground storage tanks, former disposal sites, archaeologically sensitive zones, endangered wildlife habitats, noise hazards, soil suitability, distance from existing support utilities, and safe distance from potentially explosive munitions storage areas (Figure 3).

Planners narrowed their search to three potential sites and then took a closer look at environmental and other constraints at each. Eventually, this "weeding out" process led to the decision to build on a parade ground/recreational field (Area 8 of Figure 3) instead of other areas that may have met more project criteria but were less desirable because of environmental factors. The decisions were made by managers who lacked detailed knowledge of the environmental constraints on the Station and had little computer experience, yet the availability of the maps and accompanying non-graphic data explaining the pros and cons of development at each site influenced their final decision.

Development, testing, and evaluation of third-party software for database links and coordinate conversion

Recognizing the need for non-graphic as well as graphic data manipulation, we began to explore various options for integration of *AutoCAD* graphics with external database files. Off-the-shelf, third-party software alternatives were explored and evaluated. Most of the third party integration software available at this stage was determined to be powerful, yet too inflexible to meet the project sponsor's requirements.

Design and development of non-graphic database management systems for integration with the graphic system

Using *dBase III +* and taking into consideration sponsor guidelines and recommendations, some very specific non-graphic database management systems were developed for Underground Storage Tank (UST) management, oil/water separator management, and hazardous waste/material tracking. These non-graphic databases were developed to facilitate stand-alone use in a *dBase* environment or integration with graphics in an *AutoCAD* environment.

Integration of graphic and non-graphic database management systems

Functions were developed and customized to facilitate linking of graphic

POTENTIAL HOUSING AREAS IN RELATION TO
FLOOD ZONES
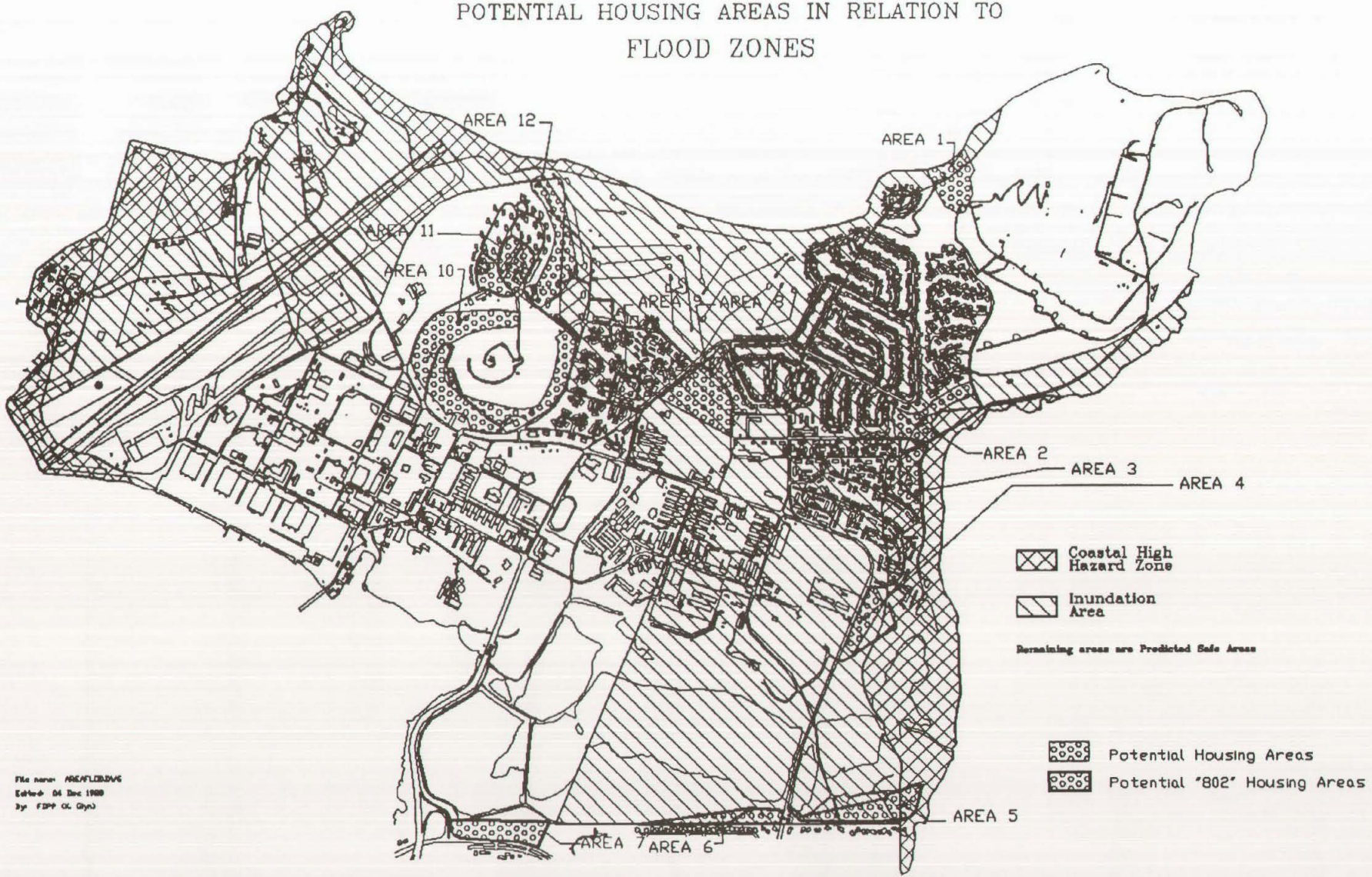
Figure 3: Sample use of thematic overlay in evaluating environmental constraints impacting alternate potential housing areas

and non-graphic database management systems with *AutoCAD*. Probing of graphics in the *AutoCAD* environment could result in display of *AutoCAD* attribute data or external *dBase* data, depending on user preferences. For example, one could call up the map on the computer screen showing underground storage tank (UST) locations, then zoom in and display an enlarged view of one UST and query the data base on the detailed attributes of this tank (Figure 4). Likewise, simple queries in the *dBase* environment could result in graphic highlighting in *AutoCAD*. For example, one could ask for a subset of all active USTs built before 1965 then easily edit the map in *AutoCAD* to highlight the sites with a special symbol or "target." This visual depiction would expedite identification of potentially deteriorating tanks which are located closest to environmentally-sensitive areas. For managers with a large inventory of tanks and limited funds to identify and remove the "worst offenders," the ability to sort priorities on tank condition with graphic and non-graphic data integration assistance is critical.

Although highlighting functions appear rather simplistic when compared to more powerful GIS systems, they greatly enhance the utility of *AutoCAD* for environmental mapping applications. Recently they served a real-time function during a formal audit of the Station's Underground Storage Tank (UST) program by the Government Accounting Office of the U.S. Congress and were used by contractors in implementing a UST leak detection program on Station.

Since these early stages of development of our project, a number of third-party software products have emerged which perform similar linking functions.

Probing of graphics in the AutoCAD environment could result in display of AutoCAD attribute data or external dBase data, depending on user preferences.

Upgrade and enhancement of the Kaneohe mapping system
Since the beginning of this developmental effort, the Kaneohe environmental mapping system has been upgraded and improved several times. The system now runs on an 80386 microcomputer with *AutoCAD* Release 10. An internal 20 Mb Bernoulli cartridge system facilitates data storage and backup of important files. Numerous thematic overlays have now been added to the system, and for the sake of efficiency, have been stored separately from the base map file. The system is currently providing the foundation for numerous other facilities-related applications.

Training and technology transfer
Training and technology transfer, although continuous and always critical, received even greater emphasis during the last several months of this project as the system progressed from developmental to operational status. Personalized training sessions on the customized user manuals were conducted with all members of the environmental staff using real project requirements as the basis for training.

Operational use of the integrated system
for planning and decision support
Today, the customized system serves as an operational workhorse for planning and environmental decision-making. Numerous applications, including many previously unanticipated applications, have already been documented and appreciated by the project sponsors.

During the course of this developmental effort, several positive and negative factors emerged.

With respect to initial base map development, file translation techniques were found to be neither simple nor straightforward.
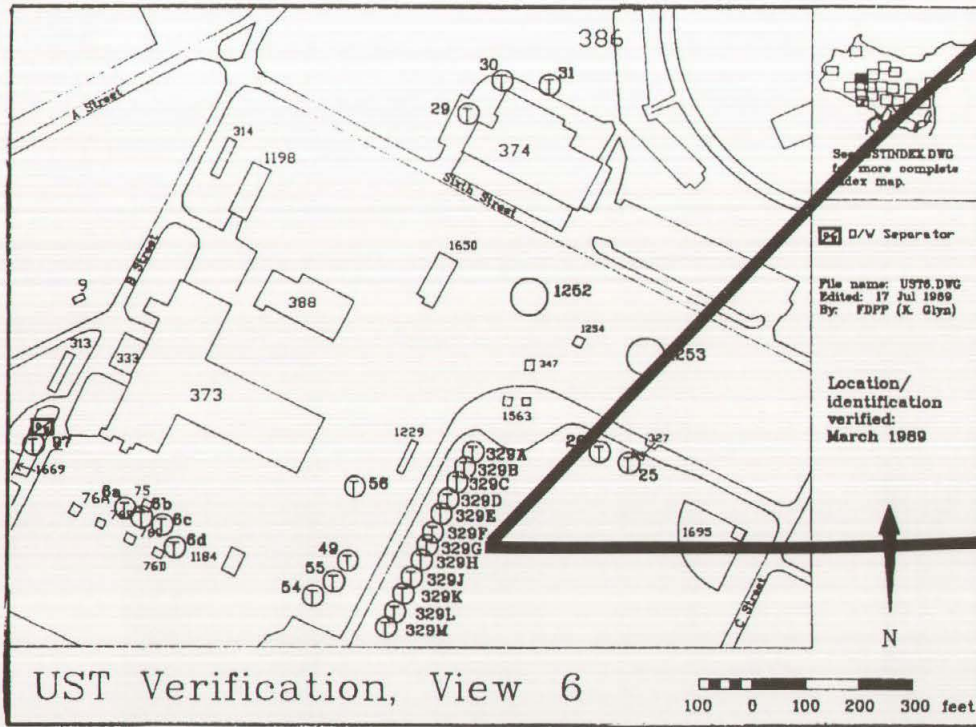
CONCLUSION

Figure 4 Sample of interactive capability between AutoCAD (graphic) and dBase III+ (non-graphic) database queries on underground storage tank locations and attributes.

The various methodologies available for *Computervision* to *AutoCAD* translation were poorly documented and required much trial and error and experimentation to achieve successful and satisfactory results.

Despite her lack of previous computer experience, the presence of an on-site contractor-in-residence was critical to the success of this project. It was more important for her to be a dedicated, full-time worker who, working in close cooperation with other Station personnel, would help develop and teach others about the system.

Despite the simplicity of the system and the widespread interest it generated, initially it was often difficult for in-house personnel to find the time to learn and use the system. Ironically, the early presence of an on-site contractor tended to be a "crutch" which fostered procrastination in those who needed to become familiar with the functions and characteristics of the system. Only later in the project, when it became apparent that the on-site contract would eventually end, did efforts really begin to focus on training and technology transfer.

Numerous decisions were made along the way regarding continued development of the customized system versus purchasing and adopting a third-party commercial mapping package. In retrospect, the developmental approach of a customized system, while characterized by extensive trial and error, offered much more flexibility and adaptability to the Marine Corps sponsort.

The mapping system offered, at relatively low cost, far more benefits and applications than were anticipated in the early stages of project conception. Over a four-year time span from 1986-1989, approximately $200,000 was invested in this project, for both services and equipment, which averages to about $50,000 per year.

The presence of an on-site contractor-in-residence was critical to the success of this project.

The developmental approach taken by the Marine Corps Air Station proved to be very effective in fulfilling user objectives and requirements despite formidable bureaucratic constraints often encountered in large government organizations.

The use of an *AutoCAD*-based computer-aided mapping system has advantages and disadvantages. While it has proven to be very effective for general site planning and for rapid feedback, identifying environmentally-sensitive zones, it cannot replace a detailed site survey which is still required once the general area of concern is identified in the initial analysis.

Others interested in developing user-friendly, entry-level, low-cost geographic information systems may benefit from an approach similar to that taken at Kaneohe. Careful thought must be given, however, to both user requirements and constraints to determine the optimal approach. With careful analysis, it may be determined that an expensive solution is not appropriate, even if funding is abundant and available. Functionality, ease-of-use, and flexibility must all be balanced judiciously to insure acceptance and appreciation of any GIS. ℚ

RECOMMENDATIONS FOR OTHERS

ACKNOWLEDGEMENTS

REFERENCES

Brown, D. F. and D. A. Schoen (Spring 1987) Using microcomputer CAD packages in planning. *Planning,* American Planning Association (APA), 53:2, pp. 249-258.

Castle, F. H. III (May 1986) Making supermaps. *Planning* (APA), 52:5, pp. 22-27.

Dueker, K. A. (Summer 1987) Geographic Information Systems and computer-aided mapping. *Journal of the American Planning Association,* 53:3, pp. 383-390.

Elliott, M. and E. Hall (August 1989) Development of environmental data management tools. *Journal of the Society of Military Engineers* 81: 530, pp. 41-44.

Landis, J. D. (June 1986) Desktop mapping. *Planning* (APA), 52:6, pp. 21-26.

Levine, J. and J. D. Landis (Spring 1989) Geographic information systems for local planning. *Journal of the American Planning Association,* 55:2, pp. 209-220.

Petschek, P. and J. R. Phillips (June 1988) Profile of an architect: Land planning with AutoCAD. *Cadence,* Ariel Communications, Inc., 3:6, pp. 36-38.

Un Sistema Cartografíco para el Consentimiento y la Administracion de el Medio Ambiente

Extracto

Translation by Juan José Valdés
National Geographic Society

Con el aumento de requerimientos para el mantenimiento del medio ambiente y la reducción de personal y provisiónes en las oficinas, adminstradores afrontan la necesidad crítica de obtener accesso rapido a los Sistemas de Información Geográfica (SIG) para satisfacer estas demandas. La integracion de un SIG puede satisfacer, con buen éxito, los requerimientos de una municipalidad grande. Pero para los administradores de oficinas pequeñas el uso de estos sistemas frecuentemente excede sus requerimientos y gastos. Tal administradores pueden obtener beneficios similares a esos obtenido de un SIG completo con un minimo de personal, gastos, y la inversión de equipo. Esto puede ser ejecutable con la formulación de un sistema de micro-computadoras que utilizan software CAD/CAM como un paquete cartografíco enlazado a un database management software de un tercer partido. Este resumén explica como una instalación militar en Hawaii, usando Auto CAD y dBaseIII+, construyo con suceso cierto sistema.

PUBLISH A FEATURED ARTICLE IN *CP*
The Editors of *CP* and the Publications Committee of the North American Cartographic Information Society invite you to submit manuscripts for consideration as Featured Articles in future issues of *Cartographic Perspectives.* Three of next year's four Featured Articles will be selected by the Publications Committee and the Editors from manuscripts of papers presented at the NACIS XI conference in Milwaukee, WI, October 20-23, 1991. Six copies of manuscripts may be submitted to the Publications Committee chair at the conference. See *Call for Papers* (p.27, this issue) and *Instructions to Contributors* (p.31) for details.

MAP YOUR LOCAL RECYCLING SITES

Americans are so distracted by the war — and related ecological disasters — that we're having a hard time staying environmentally active.

That's an understandable reaction, but we have to resist it. We can't afford to waste glass, aluminum or other resources any more now than we could a few months ago. Maybe we can afford it less.

How can we stay motivated? One way is to use environmental activism as diversion. This practical, worthwhile and fun community project will make recycling and reusing easier for you and your neighbors. Do it with friends or by yourself; it's equally effective.

The project

Draw up a map of places where things can be recycled or reused in your area.

This was originally done in Albany, California by a woman who created the map for a graduate geography class. She included recycling centers, secondhand stores, used-book stores, used-record stores, etc.

The map was adopted by Albany city government, which used money from its recycling education program to print 5,000 copies.

"People thought about stores they had known for years in an entirely new light," an Albany spokesperson said.

Before you start

Decide how large an area you want to cover. Your map can cover a whole county, a town or just a neighborhood.

You can limit the map to *official* recycling centers, or be more creative and add places where recycled or secondhand merchan-dise is sold. You may want to get a team together for this project or adopt it for a service organization.

What you'll need

A map of the area. Check with your local library or city government for a map you can copy. Many commercially produced maps are copyrighted; you can't photocopy them.

You'll also need an up-to-date Yellow Pages and a list of businesses in the area.

How to do it

Make a list. Using the Yellow Pages and other resources, compile a list of all the recycling centers and/or secondhand dealers you can find.

Visit stores and recycling facilities to pinpoint locations, and learn what materials are accepted, what compensation is offered and hours of operation.

Draw a map. Approach your local Chamber of Commerce, municipal community services department or other civic entity. Ask if it will help support costs for the project. The printed map can be given away or sold as part of a community project.

John Javna's Earthworks column
©1991 Universal Press Syndicate

FEDERAL MAPPING NEWS

Contrary to reported federal budget woes, some federal agency FY '91 budgets survived intact in the areas of surveying, mapping, architectural, and engineering funding.

The U.S. Geological Survey (USGS) National Mapping Program received $48 million for its national map and digital data production. The increase consists of $878,000 to restore the base in cartographic data and map revision, $1.6 million to restore the base for orthophotoquads in thematic and special data, and $1.5 million to restore the base for side-looking airborne radar. USGS estimates that it will contract about $8 million for production-related activities. Of interest in the National Geodetic Survey budget is $2.4 million in grant funds for prototype land information systems.

Congress has delayed U.S. Forest Service plans to acquire a nationwide computer-based geographic information system, estimated to cost $1.2 billion, until a third-party review of the request for proposal (RFP) is performed and reported back to Congress. The General Accounting Office plans to review the contractor's report for Congress. The report analyzing the RFP is due to Congress by late February/early March. Congress budgeted $10.6 million for FY '91. Pending congressional approval of the review, the RFP will be released.

Federal workers should take note of new restrictions on outside income bans that took effect in January. The Ethics Reform Act of 1989 will apply many of the same outside income bans to all federal employees that now apply to senior executive branch officials and appointees.

The new ethics law, as it is being interpreted, would disallow outside income for federal employees for conducting seminars, speaking engagements, writing papers and articles, etc. Travel expenses, however, would be excluded from the ethics ban. Congress is expected to take another look at this issue early in the 102nd Congress.
ACSM Bulletin, February 1991

ASK MARILYN

Marilyn vos Savant is listed in the "Guiness Book of World Records Hall of Fame" for "Highest IQ".

Is there any way a person can straighten out his or her sense of map direction once it has been

turned wrong? (Mine has been turned wrong since grade school, when we faced east and our maps faced north.) I'm always readjusting my senses.
— *Patty Kranz, Richland, WA*

Whew, have you got a chronic case! But let's give it a try, using a method that may work for less long-standing cases and where there isn't an innate problem in orientation.

First, take your desk at home and face it due north. Second, get a big rectangular topographical map of the United States — with as little clutter and detail, including words, as possible. (Certainly nothing cute like pink states and green states and blue states.) Finally, affix the map to the top of your desk, right over the work surface, where you can see it beneath you each time you work. After a few months, replace it with a map of your state and its neighbors, and eventually replace that with a map of your city and its environs.
Parade Magazine, February 24, 1991

cartographic techniques

THE IDEAS OF NU CARTOMAN

Michael P. Peterson, Fulbright Professor/Freie Universität-Berlin, University of Nebraska-Omaha

The following transcript is of a conversation that is reported to have taken place within a corporation that creates video arcade games. The text may be of interest although it has yet to be verified and its origins are in doubt (suffice it to say that there are numerous spies still living in Berlin). While the discussion seems totally plausible, it should be pointed out that the names of the individuals are somewhat suspicious. Appar-

ently, a new video game is being considered that would use digital maps to contribute to the creation of mental maps. A Mr. Nu Cartoman is attempting to convince his boss, a Mr. Al Dinaro, that the game is worth the investment. Joining the discussion is a Dr. Von Morgen, an outside consultant to the company.

Mr. Al Dinaro: "OK, what's the concept?"
Mr. Nu Cartoman: "It occurred to me that in the process of finding their way through the maze of obstacles that we've built into our video games, children develop some fairly complex mental maps."
Mr. Al Dinaro: "Mental maps?"
Dr. Von Morgen: "Internal representations similar to maps that help us navigate through, or otherwise conceive of, our environment — in this case, through video games that have numerous scenes and a variety of obstacles. Indeed, these mental maps so derived are very complex, often three-dimensional. One could say that the games require a form of spatial thinking and memorization on the part of the youth to which their parents have never been exposed."
Mr. Nu Cartoman: "Right. Anyway, when you consider the complexity of these mental maps, it's astounding what these kids have internalized. But, for what? Stupid games. Just think of the brain cells we're wasting on this stuff!"
Mr. Al Dinaro: "Hey, that's not our problem. We're not forcing these kids to play with these games. Besides, an annual profit of $200 million ain't stupid!"
Dr. Von Morgen: "I wouldn't say it's a waste. Perhaps the children who play these games are required to conceive and memorize spatial representations in a whole new way. One never knows what the outcome of that will be."

Mr. Nu Cartoman: "I can tell you what the outcome is. Mr. Dinaro, do you know that a quarter of the freshman students at the University of Miami can't find the United States on a world map?"
Mr. Al Dinaro: "Like I said, that's not our problem. It's the fault of the school system and I can't do anything to change that!"
Dr. Von Morgen: "We probably all have the obligation to contribute to the education of our youth. Schools are just part of an overall educational process. Anyway, Mr. Cartoman, what do you have in mind? Combining maps with video games?"
Mr. Nu Cartoman: "Exactly! Maps that are stored in digital form are pretty common these days. They require quite of bit of disk space but we can use a fast CD-ROM to store different maps and multiple frame buffers to increase the speed of display. The game would actually put the person in different places and present them with a series of obstacles."
Mr. Al Dinaro: "Maybe blow-up countries or something like that?"
Mr. Nu Cartoman: "Well, that's not what I had in mind. It should be a friendly process. The kids should get the impression that they are going inside a country and walking along a road or a railroad line or through a forest or mountain. We could even store maps of cities and have them play the games in their own neighborhoods, on the streets that they know. Imagine the type of long-term mental maps we would be creating — mental maps that people could use their whole lives."
Mr. Al Dinaro: "You mean we could change the maps so that the units we deliver to Chicago, let's say, have a digital map of Chicago and the game would take place on this map?"
Mr. Nu Cartoman: "Exactly!"
Dr. Von Morgen: "The first

concept you had of 'going inside of countries' is also a worthy one. Certainly, if done properly, maps can provide that feeling. This concept could evolve into a separate product. That would leave room for a game based on a regional map between the world and the city games."

Mr. Nu Cartoman: "Imagine the sense of realism that the children would experience."

Mr. Al Dinaro: "I'm not sure realism is what kids want. Dr. Morgen, would we get a return on our investment? This technology ain't gonna be cheap!"

Dr. Von Morgen: "I would think so. And you can't forget the publicity factor. This would make quite a impression, especially games that are localized to a city or provide the sense of 'opening up' individual countries."

Mr. Al Dinaro: "What about people who make and study maps? What are they called? Aren't they working on more interactive ways of presenting information? Don't they see the potential of the technology? Certainly, they must be conceiving of new ways of presenting information in map form that would dwarf the ideas we have."

Dr. Von Morgen: "You mean 'cartographers.' I don't think you have anything to worry about there. While at one time there was a strong interest by academic cartographers in the process of cartographic communication, that general concern for the map user has disappeared because associated psychophysical empirical research produced few hard results. From what I can tell, maps are now viewed as simply part of a data-base — in a sense, a non-graphical cartography. The results of the empirical work in this area are more difficult to judge and so one simply assumes that it's all leading to something. I have my doubts. They might succeed in helping a few people make maps

better, but where does that leave the rest of us."

Mr. Nu Cartoman: "That's the sense I get. The computer has had a big influence on the construction of maps on paper and this database view of maps. It seems that computer technology has been used to make map construction easier but not to improve the quantity or quality of the information that we get from maps, and certainly not to improve our mental maps. I think the concept of a map as a visual medium is fast disappearing. We can capitalize on that."

Dr. Von Morgen: "The level of computer expertise in cartography is also pretty low. The extent of instruction with computers is simply the use of existing programs that have horrible user-interfaces. One or two semesters of instruction will be wasted just to explain the program before the students are able to create a meaningful map. Of course, the pre-occupation with existing programs is destroying any kind of creativity in the discipline. The students are never challenged to explore the potential of the computer for mapping. And, of course, they are not taught the tools to make such exploration fruitful."

Mr. Nu Cartoman: "I would like to stress one final point. We are considering a whole new way of interacting with maps. The user will be able to move through the map, change the scale and perspective. The user will control what is presented and how and it will all be done intuitively as part of the gaming process. Imagine when these people are presented with a printed map? They'll look at it and say: 'What's this supposed to be — some sort of crude representation of the earth? You mean people used to use these things and thought they were getting some useful information?' Then we'll be sitting there with this

technology. The demand for these type of maps will be so great that we'll be able to capitalize on it, perhaps create a spin-off — a whole new company."

Dr. Von Morgan: "Good point! The advantages of this new form of mapping are so great that maps on paper simply can't compete. Most of the rules and practices of traditional map-making will have to be thrown out — they simply won't be valid anymore. People won't want to use maps in the sense that we conceive of them today."

Mr. Al Dinaro: "You mean there might be more money in it in 5 or 10 years? Something really big."

Dr. Von Morgen: "Yes, I believe, something really big."

OCEAN VIDEO

Unlike MTV (music television), F-TV (fish television) won't be there for your kids. But it will be there for your favorite oceanographer — thanks to Jules Jaffe.

An oceanographer at the University of California at San Diego, Jaffe has gotten $483,000 from the National Science Foundation to create a computer environment that will map the movement of fish and other sealife — anything larger than half an inch — into a three-dimensional, moving image of the marine community. It will consist of sixteen high-frequency sonar units. Their signals, once processed, should produce a computer image that can be electronically rotated to create a three-dimensional display of fish going about their business — kind of like an underwater C-SPAN.

Until now, biologists have lacked sophisticated instruments for mapping ocean fish populations. They have had to rely on "towing nets around," says Jaffe, a technique that only reveals the amount of biomass in a given volume of ocean water. In contrast

F-TV will allow marine biologists for the first time to view the ocean "as scientists view land with a pair of binoculars."

Eventually, Jaffe hopes F-TV will help marine researchers understand how pollution and natural environmental changes alter the dynamics of marine populations. He's developed a prototype system in a 5,000 gallon fish tank at UCSD and hopes with two years to deploy and test the system at sea.
Briefings, August 1990

BAD FORM

For some it is not a great leap from concern for the utility of maps to a similar concern for visual information in general. The following piece suggests that the design of forms (printed documents with blank spaces for the insertion of requested information) is a problem that demands informed attention.

A pair of researchers just made it official: Americans are being buried beneath an avalanche of poorly designed and often inscrutable forms, letters and notices. The worst offenders? In many cases the government.

"People are being tortured by forms that are written in a language you cannot understand and presented in a way you cannot comprehend," says Carolyn Boccella Bagin, director of the nonprofit Document Design Center at the American institutes for Research in Washington. "It is a plague."

Bagin and colleague Andrew Rose did a simple survey. They asked the readers of *Modern Maturity* magazine to send in their worst forms and notices. "We were overwhelmed by the response," Bagin says. More than 3,800 readers responded.

Because the readers of *Modern Maturity* tend to be senior citizens, Bagin and Rose received thou-

sands of inscrutable medical forms from hospitals, doctors and commercial insurers. Medicare forms and notices seemed to bring *Modern Maturity* readers to their knees.

Bagin and Rose were also inundated with computer-generated notices and forms mailed by the Social Security Administration and Department of Veterans Affairs, plus assorted phone bills, loan applications, credit card statements, pension amendments and the odd prescription drug warning.

The problems came in all shapes and sizes. A voter registration form containing printed instructions in tiny 4-point type. A notice from the Postal Service, giving postal rates, is in even tinier 3-point type. Very efficient.

Computers seem especially fond of generating letters in all capital letters in single spaced lines that run completely across a page, making reading — let alone comprehension — difficult. Many forms, especially health insurance forms, were printed in green ink on green paper. Or blue ink on blue paper. "Impossible, even in good light, to read," Bagin says.

A credit card application asks — fairly — for credit history. But an applicant is required to supply the name of his or her bank, its address, its phone number and the respondent's bank account number. The space available? A box measuring 1.2 inches by 0.1 inches.

"At first it was funny," Bagin says of the findings, "then it started to seem horrifying." She says some people may get two or three bad notices and forms a week. One woman responded that she received 13 letters from Medicare in one day. "Some people actually try to read and understand this stuff," Bagin says.

Respondents said bad forms made them feel frustrated, confused, angry and intimidated. Many thoughts themselves to

blame. Some failed to file insurance claims because they were too complicated. A few put off needed medical care for fear of the paperwork.

Bagin argues that bad forms cost the taxpayer and business. The Association of Human Resource Development in New York estimates that 28 percent of clerical staff time is wasted due to bad forms.
©1991 The Washington Post
Reprinted with permission

cart lab bulletin board

This forum is offered to encourage communication among practitioners at a time of rapid technological transition. Questions, comments, and announcements are invited.

MANIPULATING *MAPMAKER* MAPS IN *FREEHAND 3.0*
David DiBiase, Penn State

Say you've mapped U.S. population density by county with *MapMaker*. Now you wish to export the map to a PostScript-based illustration package to customize it and generate process color separations for printing. Aldus *FreeHand* will open a PICT-format file generated by *MapMaker*. But how do you replace *MapMaker*'s pattern fills with process color specifications without selecting, ungrouping and editing thousands of closed paths one by one? This note describes a way to edit *MapMaker* fill patterns globally in *FreeHand 3.0*.

In *MapMaker:*

1. Assign a unique black-and-white fill pattern to each data division. Leave no blank (white) categories.

2. In the Map Display Options dialogue box, set **Draw Boundaries As:** to **Polygons**. This is how you get closed (fillable)

PostScript paths in *FreeHand*, instead of a passel of disconnected line segments.

3. In the Base Map Options dialogue box, choose **Fills/Dots Only**. If you skip this step you will get two superimposed maps in *FreeHand*: one with lines and no fills, another with fills and no lines. You need only the fills now. It is easy to add the lines in *FreeHand* without increasing the size of your file (and slowing down the performance of your computer) unnecessarily.

4. Save your *MapMaker* map as a PICT-format file with a unique filename.

In *FreeHand 3.0*:
1. Open the PICT-format file you just created. *FreeHand* automatically converts the PICT file to a new, untitled document. Pattern fills created in *MapMaker* will be preserved in the converted document.

2. Drag a selection box to select all the polygons in the map. Set *FreeHand's* Colors Palette to **Lines**, then choose **Black** in the Colors Palette. This step strokes the closed, filled paths with black lines.

In *FreeHand 3.0* fill and line attributes are called "styles." Styles are named. Style names appear in a Styles Palette. To assign a style to a drawing element in *FreeHand* you just select the element, then click the style name in the palette. All elements assigned to one style can be modified simultaneously simply by editing the style.

Your goal is to create a named style for each data division of your map. For example, if the data range of one division is 0 to 100, you would create a style in *Free-Hand* called "0 to 100." Once you match the style to the fill pattern representing that division in the

imported *MapMaker* map you can easily change the style for all the polygons in that division. Here we go.

3. Double-click on the default style named **Normal** in the Styles Palette to edit the style.

4. In the Styles dialogue box, rename the style to match one of the data divisions of your map.

5. Click the **Fill and Line** button to call up the Fill and Line dialogue box.

6. Choose **Patterned** in the **Fill:** pop-up menu. Choose the *Free-Hand* fill pattern that matches the *MapMaker* fill pattern used for the current data division. Close the Fill and Line dialogue box.

At this point you have created one style for one data division. Now let's create the rest.

7. Click to select a polygon whose mapped value falls in another data division.

8. Create a new style by choosing **New** in the Styles Palette menu. The Styles dialogue box will appear.

9. Name the new style for the data division of the selected polygon. The line and fill attributes of the selected polygon will automatically be assigned to the new style.

Create new styles for the remaining data divisions on the map in the same way. After the fill patterns of each division have been assigned to a style, you can change the attributes of all the polygons associated with one style by editing the style from the fill and line dialogue box.

Note: A detailed tutorial on Aldus FreeHand 3.0 is available from the author.

fugitive cartographic literature

Interesting articles about cartographic information often appear in unexpected outlets. The goal of this section is to bring those publications to the attention of our readership. We invite synopses of papers appearing in journals other than those devoted to cartography, geography, and map librarianship.

Wurman, Richard Saul (1989) Hats. *Design Quarterly* No. 145, pp. 1-33.
Reviewed by Jeffrey C. Patton, University of North Carolina– Greensboro

This entire issue of *Design Quarterly* is a single free flowing guide to the organization and graphic presentation of information. Entitled "Hats," it was written by Richard Saul Wurman, an architect by training, who has devoted much of his career to making visual information more understandable, through such projects as innovative maps, city guidebooks, and Pacific Bell's *Smart Yellow Pages*. It should be of great interest to graphic designers, including cartographers, and to educators.

Wurman utilizes the hat rack as a model of how information can be organized, and to develop the types of relationships existing among information. For the organization of information he states that there are five "ultimate hat racks" upon which **all** information can be hooked: the alphabet, time, location, continuum or magnitude, and category. Using the analogy of a hat check clerk organizing hats in his care, Wurman shows that hats can be arranged alphabetically (bowler, fedora, sombrero. . .), chronologically (according to the time each hat was given into the clerk's care), by location (manufactured in France, Japan, Egypt. . .), by continuum or magnitude (hat size), or by category (military, with feathers, male, female. . .). The

decision of which hat rack to place or organize the hats is critical because it determines the informational patterns that will be built. The juxtaposition of these patterns can lead to new understandings of the information. Effective graphic design is related to the selection of the appropriate hat rack, the one "which most easily reveals the aspect of a subject that you want to communicate."

While information may be hung on the five ultimate hat racks, the understanding of that information can only occur when the new information can be related to something you already understand. For example, most people do not have an accurate concept of how large an acre is. However, once shown that an acre is about the size of an American football field (minus the end zones), it becomes understandable. Wurman points out that too often in our graphic design and in our educational system there has been a failure to relate new information to what is already understood. According to Wurman, simplification or minimalization of information, rather than organization and clarification have become the norm, leading to what he calls the "dumbing of America." For example, maps designed for young children have often been designed to be "simpler," which has only made them more abstract and more difficult for the child to comprehend. The inability of the child to relate the map information to spatial concepts that they already understand also makes the maps less interesting to the child. Wurman stresses that it is interest that is the key to understanding. "Memory, interest, and learning to define our existence. Learning is remembering what you are interested in." Wurman feels that interesting design comes from illumination of the pattern and organization of the information, not from graphic decorations or

the addition of color to "spice up" a map (what he calls "rainbow worship"). The goal of graphic design should be "to let the data become information — to become active and expressive."

The remainder of the article summarizes Wurman's ideas on how to present information, much of it reminiscent of work done in the late 60's and early 70's by cartographers on cartographic communication. However, his viewpoint and insight may be fresh to most cartographers, particularly his comments on the use and abuse of color, and on how technological change effects not only how the design is created but also what the design looks like and its interpretation.

This article is not a scientific report based on extensive research, rather it is a mix of philosophy and anecdotes from 30 years of experience in graphic design. As should be expected, some of Wurman's most compelling arguments are made not with his words but through carefully selected illustrations. The article makes for thought provoking reading and viewing.

cartographic artifacts

NEW MAP PROJECTIONS BOOKLET

The American Congress on Surveying and Mapping (ACSM) has recently published a thirty-page booklet entitled *Matching the Map Projection to the Need*. The third in a series, it was prepared under the auspices of the Committee on Map Projections of the American Cartographic Association, a member organization of ACSM. The booklet addresses ways in which map projections can help make clear various geographic relationships and objectives, whether for technical or

popular presentations.

The text is non-mathematical, and more than seventy illustrations show numerous projections for world and regional maps. Edited by Arthur H. Robinson and John P. Snyder, twelve two-page chapters by ten leading cartographers are included in an 8.5 x 11 format. Common and rare map projections are used for a variety of different purposes, such as displaying continental drift, viewing Earth from space, showing routes for globe circlers, and enlarging the heart of a map.

Copies may be obtained from ACSM at a cost of $15 for members and students and $20 for nonmembers. Contact ACSM Publications, 5410 Grosvenor Lane, Bethesda, MD 20814-2122; (301) 493-0200, fax (301) 493-8245.

NETWORK RESOURCES FOR MAP PEOPLE
Jeremy Crampton (ele@psuvm), *Penn State*

Ever had a problem that your local library couldn't deal with and you needed some immediate help? Or, as a librarian, ever had a user ask you a question that got you stumped? And what about keeping up with the latest map information in a timely manner and keeping in touch with other cartographers? Interested in a quick and reliable resource that could give you an answer in hours rather than days or weeks?

In the past few years several network discussion and information groups have sprung up that allow cartographers and geographers to send in questions and answers and generally discuss topics as diverse as GIS, mapping, graphics and geography. Snag: you must have electronic mail capabilities (generally a computer account at your university or library, or a PC and modem). Once you've acquired these, you

can enter the 'net,' a colloquial name for the groups, news sources and email connections that exist in a variety of forums.

Say you're interested in GIS. The State University of New York, Buffalo (actually Ezra Zubrow of the Department of Anthropology and NCGIA-Buffalo) launched an electronic GIS discussion group (called a 'listserv') in June, 1988. Now co-owned with David Mark of the Geography Department, the more than 500 members currently exchange about five messages per day. GIS-L (as it is known) is made up of academics (about half its members), the public sector and the private sector, including ESRI, proprieters of the well-known ARC/INFO system. It is also strongly international, with about 40 percent non-US membership.

Another list, called GEOGRAPH, describes itself as being for and by geographers, and has over 300 members. Based in Finland, it was launched in the late eighties, and is easily accessible via the net. My own listserv, INGRAFX, which covers issues in information graphics, was launched in March 1991, and now has 250-300 members.

As of April 5, 1991, there is another electronic source of GIS information. *GIS World*, a trade magazine from Fort Collins, CO, now offers a "a worldwide information service . . . on the GIS industry, applications and people" (*GIS World*, 4, p. 81). Dubbed G/O (GIS Online), the service is available to people with a computer and modem . . . and the means to pay $39 a quarter and $14 per hour of connect time ($25 outside the US). The service is only available to *GIS World* subscribers.

The forum which may be most interesting to NACIS members, however, is MAPS-L. It was set up earlier this year by map librarian and NACIS member John Sutherland at the University of Georgia. MAPS-L has over two

hundred members, comprised of map librarians (about 60 percent) and academic cartographers (about 20 percent), as well as a mixture of commercial firms, government employees and others interested in mapping who make up the balance. In the introductory file members receive when they sign on, MAPS-L is "dedicated to discussing ways of effectively and efficiently exploiting cartographic resources." With the advent of computer 'email' of course, this effort is made far easier, and many members can be reached easily and cheaply. Sutherland says that over "the last 3-5 years I have been trying to get a BB [bulletin board] or computer conference started for map information people." He said he spent time at various meetings satisfying himself that map information people had access to email before he set up the group, which was opened to subscribers in February 1991.

According to John, "the majority of topics [on MAPS-L] deal with reference, cataloging, or other technical questions that arise in map collections (or map information organizations)." But he emphasizes that issues of interest to cartographers as a whole are also part of MAPS-L. "Anything to do with cartography and cartographic information, from concrete cows to red tractors, from historic maps to GIS." Although anybody is welcome to join, he did add that "the list is not set up to be a discussion of theories." As moderator, he has not had any problems with "inappropriate" discussions.

As for the future, John says that "I would like to see MAPS-L become **the** quick map information source and connection for the map information community. I would like to see a weekly/monthly newsletter go out over MAPS-L. Email, electronic communications, and electronic publications will

change greatly in the near future. If MAPS-L provides a good communication channel for a few years and is then replaced by something from newer systems it will still have done the basic job I planned."

These kinds of resources are made possible by cheap and efficient network communications which enable them to pass ideas and information to each other over great distances. Network communication means that you don't have to be close to large metropolitan centers any longer in order to be well informed — the 'tyranny of distance' is effectively annulled.

On the other hand these developments raise crucial ethical issues relating to access and freedom of expression. Not everyone can afford a computer and modem (although prices are constantly falling), nor, more pertinently, is everyone who is interested in mapping and GIS located at a university or company with network access. And sometimes resources require a technical familiarity that may be time-consuming and effortful to acquire. Even those who may be able to afford the resources may find that the resources are simply not available in their part of the world. For example, the net, while being well developed in Europe and the Americas, has only marginally penetrated Africa and Asia. Is it 'fair' that western academics and a few companies can pass around information that will only reach other interested parties much later (if ever)? In other words, is this information, by virtue of being accessible only to those who can afford it and access it, privileged in some way? If so, what can be done that would alleviate this situation?

Most resources accessible from universities are available without charge. But like other private companies, *GIS World* charges for access to G/O, at rates it calls a

"pittance" but which in fact are higher than other popular networks such as Compuserve and Prodigy. Beyond the issue of charges however is that of the limits to what can be said on private networks. Criticism of a company's products or policy is sometimes discouraged or censored, such as a recent controversy at Prodigy, a network jointly owned by IBM and Sears, which ended up terminating some people's membership over a dispute involving 'censoring' of email. Prodigy is now under investigation by the Los Angeles County District Attorney for deceptive trade practices. From a company's point of view, such actions may seem necessary, but it does raise pertinent issues of free speech and censorship. Potential users of these systems should bear in mind that their money does not buy them the ability to deviate from company policy.

What can we look forward to in the future? I think a variety of network resources will be useful to cartographers. Some will come with restrictions, while others will be more open and critical. And network access will presumably become cheaper and more widespread. It is hard to believe that access will never involve some kind of 'start-up' costs, where potential users will have to familiarize themselves with computer systems, although graphical user interfaces may help. Costs will continue to decrease (for example, the new IBM PS/1 comes with an onboard modem for under $1,000). An informed choice will be essential, so cartographers should not shy away from what may be a very significant development. And as I personally found, if the resource is not there, it is always possible to create it yourself.

How to join the groups mentioned: Send an email note containing the message SUBSCRIBE <group name> <your name> to

the following addresses, for GIS-L send to LISTSERV@UBVM, for MAPS-L send to LISTSERV@UGA, for GEOGRAPH send to LISTSERV@FINHUTC, and for INGRAFX send to LISTSERV@PSUVM. For example, if your name is John Q Cartographer and you wish to join MAPS-L, send an email note to LISTSERV@UGA with the message SUBSCRIBE MAPS-L John Q Cartographer.

To join G/O call 1-800-GIS-WRLD.

NTIS CITATIONS

Atlas of Eastern Europe. Central Intelligence Agency, Washington, DC. August 1990, 102pp. CPAS-90-10002. Color illustrations reproduced in black and white. Paper copy available on Standing Order, deposit account required, U.S., Canada, and Mexico, minimum deposit $100; all others $200. This series offers a reduction in price as a standing order , PB91-928000. PB91-928001/WNR — Standing Order.

Eastern Europe is in transition. As the eight nations that have composed this region since World War II emerge from communist regimes, they will have problems such as demands for autonomy by ethnic minorities, cultural diversity, economic reform, and in the case of East Germany, reunification. The atlas describes in maps and charts a variety of geographical, political, historical and economic information to profile the region in the post-Cold War era. Maps are included in color with the report.

Atlas of Air Quality and Deposition in or Near Forests of the Western United States.
M. Boehm and T. Vandetta. NSI Technology Services Corp., Corvallis, OR. September 1990,

465pp. EPA/600/3-90/081. PB91-106229/WNR; price code: PC A20/MF A20.

An atlas of air quality and deposition data has been compiled to make air pollution data and information more accessible to biologists and ecologists working in western forests. Data from the 1985 National Acid Precipitation Assessment Program Emission inventory are used to characterize emissions of sulphur dioxide and nitrogen oxides across the West. Maps illustrating location, type, and magnitude of major point source emissions together with pie charts of the percent contribution by source category are presented alphabetically by state. Data from the Environmental Protection Agency databases AIRS and SAROAD are used to characterize ambient levels of sulphur dioxide and ozone for three averaging periods: annual etc. . ., May through October or growing season, and monthly. Data for 20 sulphur dioxide and 70 ozone sites in or near western forests are presented by state. Biographic information together with standard summary statistics are given for each site.

Selected Papers in the Applied Computer Sciences, 1990. D. A. Wiltshire. Geological Survey, Denver, CO. 1990, 73pp. USGA-BULL-1908. Also available from Superintendent of Documents. Portions of this document are not fully legible. Color illustrations reproduced in black and white. PB91-141689/WNR; price code: PC A04/MF A01.

The compendium of papers reports on the technical advances in the applied computer sciences that were developed to support earth science research. The second volume, published in the U.S. Geological Survey Bulletin series, comprises short papers that

address the following aspects of the applied computer sciences: Contents: Applications of User-Supplied Transformations in Computer-Graphics Programs; Linking Digital Technology to Printing Technology for Producing Publication-Quality Color Graphics; Generating Color Separations of Geologic Maps on the Computer; Digital Spatial Data Technology and Applications; Radon Potential Defined by Exploratory Data Analysis and Geographic Information Systems; Automation of Data Systems — Minnesota's Approach for Water-Use Data.

Beta Splines Interpolation for DEM's. Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil). March 1990, 13pp. N91-11415/7/WNR; price code: PC A03/MF A01.

The interpolators used for the densification of Digital Elevation Models normally do not take into account additional information known to the operator, like rivers, lakes (flat areas), or mountain ridges. They interpolate based on the control points only. The Beta-splines curves, on the other hand, have properties that enable the operator to modify the bias and the tension for each cell by assigning values to the parameters beta 1 and beta 2. Thus, it is possible to force the resulting three dimensional surface to acquire a desirable shape. The disadvantage is the relatively large amount of extra calculations, but with the now available faster, and cheaper microcomputers, this disadvantage can be overcome. This work tests the use of Beta-splines interpolators for DEM's running on an IBM-PC-like environment.

AVAILABILITY OF INTERNATIONAL TOPOGRAPHIC MAPS
Russell E. Guy,
Geoscience Resources

One of the benefits of the political upheaval in Eastern Europe has been the lifting of restrictions on cartographic products, particularly topographic maps. Topographic maps available to the public are newly printed, sanitized versions of military topographic maps. Unfortunately, the Polish and Hungarian topographic maps lack latitude and longitude information, because the maps are based on internal grid systems unique to their countries.

Hungary was the first Eastern bloc country to release topographic maps since World War II. These included maps at scales from 1:10,000 to 1:200,000, at $22 to $29 a sheet. For many years Hungary had public access to geologic and other non-topographic maps through Cartographica, a quasi-governmental publishing and export agency, but the release of topographic maps was a real breakthrough.

In early spring, Poland and the German Democratic Republic also released their topographic maps to the public. Both countries released map series at scales from 1:25,000 to 1:200,000 at about $15 a sheet. Ironically, after becoming available, the East German maps were temporarily unavailable after reunification, due to the consolidation of East and West German ministries.

In late summer Czechoslovakia became the fourth Eastern bloc country to release its topographic maps to the public. These maps also are available at scales from 1:25,000 to 1:200,000 at $13 to $16 a sheet.

The Soviet Union also has released its topographic maps for public sale. Although the USSR is completely mapped at the scale of 1:100,000 (26,000 sheets) and

1:50,000 (90,000 sheets), only 99 of the 5,500-sheet series at 1:200,000, and 55 of the 180-sheet 1:1,000,000 series are available. Additional sheets are due to be printed this year. Due to the severe paper shortage in the USSR, only limited numbers of sheets have been printed in non-military versions. Unfortunately, GUGK (Glavnoe Upravlenie Geodezii i Kartografii) has priced the maps at an astronomical $100 to $125 a sheet to try to acquire hard currency from the major oil and mining companies. The current prices preclude most customers buying more than a few sheets and puts buying complete sets well beyond any library's budget. Eventually GUGK will have to lower their prices if they are to have any sales volume at all.

The other Eastern bloc countries — Albania, Bulgaria, Romania, and Yugoslavia — have not yet released their topographic maps to the public. Ethnic unrest in these regions has made the governments slow to follow the regional trend. However, travel, tourist, and a few geologic maps are now available for Bulgaria, Romania, and Yugoslavia.

Countries in South America are continuing to publish new topographic maps on a regular basis. Bolivia is leading the way, with nearly 200 new topographic sheets in 1990. Uruguay offers 41 sheets at 1:50,000. Several other countries have printed new sheets, including Brazil and Venezuela, while the PAIGH Commission (Pan American Institute of Geography and History, a body within the Organization of American States) printed new sheets for Venezuela, Argentina, and Chile. But obtaining maps from South America continues to be quite difficult. Several of these countries require prepayment in their own currency, which is difficult to obtain, and take several months to fill an order.

Geotimes, February 1991

Taylor, D.R.F. (editor) (1991).
Geographic Information Systems: The Microcomputer and Modern Cartography (Modern Cartography, Volume One). Pergamon Press, 251pp. ISBN 0-08-040277-1 (Softcover $39) ISBN 0-08-040278-X (Hardcover $100)
Reviewed by John B. Krygier, Penn State

The preface of *Geographic Information Systems: The Microcomputer and Modern Cartography* succinctly explains the book's intent: to consider the impact of the microcomputer and Geographical Information Systems on cartography. In a surficial way the emphasis of this volume is GIS. The title proclaims it in brash letters; the Library of Congress subject classification is under 'Geographic Information Systems' (no mention is made of cartography); and 'GIS' is referred to countless times in the twelve chapters in the book. Yet this is not a book about GIS. Or is it? This quandary is touched on in the introductory essay by D. R. Fraser Taylor, the editor of the book. Is GIS part of cartography, or is cartography part of GIS, or are they somehow separate? The quandary is left unresolved, and the book, while providing some excellent reviews of the current status of various areas of cartography, is a reflection of a discipline that is itself a bit confused about exactly what it is and where it is going.

Taylor, in the volume's engaging introductory essay, makes the case for re-examining and redefining the nature of the discipline of cartography. In the process he manages to touch on many of the current questions which have been raised regarding the impact of the microcomputer and GIS, as well as some broader foundational debates. Taylor's opinion about GIS and cartography is clear: GIS is a technique, cartography is a discipline. Taylor laments the reenchantment with formalism and positivism — a result of the current technological focus in the field — and sees such an approach as 'sterile and limiting.' This technological focus does not, Taylor argues, hold much promise as a future for cartography. Instead, Taylor suggests, we need to concoct anew a 'cartographic theory.' Citing the work of Brian Harley, who has urged sensitivity to the social context within which maps and cartography and cartographers are inextricably nestled, and Theodore Roszak, who has forcefully argued against the "cult of information" and for a focus on "relevance, coherence, and insight," Taylor urges a new focus on three concepts: cognition, communication, and visualization. We do not know enough, Taylor argues, about the cognition of maps. The glut of data which is piling up all around us is useless unless we can find ways to expand understanding with it. Understanding does not just "emerge" from heaps of data. A renewed focus on how to communicate the information we have is also important. New products, new displays, and new forms of geographic information presentation must be established and we must seek to understand how people communicate with and work with such media. Visualization, which involves high technology linked to issues of communication and cognition, is, argues Taylor, a fertile meeting ground for all aspects of cartography. In the end, Taylor concludes, cartography will be judged by the value society attaches to the products it produces. These products must be intriguing, imaginative, useful, and interesting — these, Taylor argues, are human and not technological problems.

Chapter two, by Y.C. Lee, **Cartographic data capture and storage** provides a review of the current status of total stations, global positioning systems, photogrammetry, remote sensing, digitizing, and the various digital data storage media. While providing a valuable review of the aforementioned topics, the chapter is marred by its strict focus on physical geographical data; cartography and GIS are not only tools for physical geographers.

Chapter three, by David Coll, **Developments in equipment and techniques: Microcomputer graphics environments** reviews general microcomputer graphics principles and the current status of graphics hardware and software. While comprehensive for what it does cover, the chapter is limited by its focus on DOS-based graphic environments. The chapter could have been improved by the thinning out of some of the DOS details and the addition of information on alternative graphics environments. The following chapter by Bengt Rystedt, **The cartographic workstation** adds to Coll's discussion by briefly expanding upon the notion of the microcomputer workstation in cartography.

Chapter five, by Donna Peuquet, **Methods for structuring digital cartographic data in a personal computer environment** is an adaptation of an article published in *Cartographica* (21:4, pp. 66-113). Basic concepts and definitions, cartographic data models, the nature of cartographic data, and basic cartographic data models are discussed.

Chapter six, by C. Peter Keller and Nigel Waters, **Mapping software for microcomputers** provides a relatively comprehensive review of software of interest to cartographers. Software is grouped into nine categories: paint, CAD, thematic mapping, GIS, image analysis, locational analysis/electronic atlases, projection packages, application software, and digital charting. Each category of software is described

and examples noted; an eleven page table summarizes several hundred software packages, available reviews, cost, and company. Notable exceptions from the categorization scheme include graphic design software and multimedia software.

Chapter seven, by Barbara Buttenfield and David Mark, **Expert systems in cartographic design,** provides a status report on what we know about expert systems in the production of locational and navigational maps. Other types of maps are excluded, since the rules structuring these maps have "seldom been addressed in the literature" and are, well, not easy to figure out: "where formalized descriptions of rules are not common, alternative approaches may substitute for, or perhaps augment the expert systems approach." With that out of the way, a useful review of expert systems terms and definitions is provided along with a detailed description of progress on and potential for expert systems in cartography. The application areas include **generalization**: simplification (reduction, selection, reposition), classification (aggregation, partition, overlay), enhancement (interpolation, smoothing, generalization), **symbolization** (encoding strategy, conceptual constraints, situational constraints), and **production** (plotting, layout, displacement, label placement, and visual contrast). The chapter provides a proposal of where work needs to be done and where there is potential for progress in cartographic expert systems as well as an extensive bibliography of sources.

Chapter eight, by Timothy Evangelatos, **Digital geographic interchange standards**, takes a detailed look at why digital standards have not been successful to date and provides a review of current national and international standards activities. Evangelatos

provides an interesting discussion of the myriad of technical, political, and human problems surrounding the creation (or lack of creation) of digital data standards. While many problems are evident, Evangelatos is optimistic that agreement on standards will come in the not so distant future. He assumes that a true "spatial science" is emerging and solidifying and that this will provide "good standards."

Chapter nine, by Terry Slocum and Stephen Egbert, **Cartographic data display,** provides a review of developments in cartographic display hardware and software, and reviews new techniques in static, interactive, and animated mapping. The chapter notes several important developments including the continuing development of software packages which allow non-programmers to construct complex cartographic representations and the increasing emphasis on developing new cartographic display and analysis methods (as opposed to just attempting to replicate traditional cartographic techniques). Developments in static maps (univariate and bivariate choropleth maps, continuous data maps, 3D maps), interactive mapping (interactive choropleth maps, interactive multimedia systems, electronic atlases), and animated mapping (3D maps, spatio-temporal representations, vehicular navigation systems, and visualization) are reviewed. The chapter concludes with comments on the implications of new data display techniques on cartographic research and education. In sum, the chapter provides a good starting point for those interested in the new media (and adaptations of more traditional media) in cartographic display and their possible implications.

Chapter ten, by Jean-L. Raveneau, and others, **Micro-Atlases and the diffusion of geographic information: An**

experiment with Hypercard, details two projects the authors undertook using the HyperCard software environment. The authors argue (as Taylor and Slocum and Egbert in their respective chapters also argued) that there must be more effort put into devising new methods of communicating geographic information. The notion of hypertext, the 'nonsequential disposition of information' is seen as a way to enhance multiple associations between different pieces of information. A fine line between unstructured and structured information must be maintained, giving the user maximum freedom of navigation while not allowing them to get mired down and lost. The integration of maps, graphs, pictures and text as well as links to digital data bases and video disks is discussed. While the details and subtleties of HyperCard programming and project construction are not detailed, the chapter provides a solid introduction to the possibilities of HyperCard and related hypertext software for cartography.

Chapter eleven, by Hinrich Claussen, **Vehicle navigation systems,** details progress to date on vehicle navigation, route planning, and associated software and hardware.

The final chapter, by Jean-Philippe Grelot, **Cartographers and microcomputers**, concludes the book with a discussion of the impact of technology on cartography, on the shift to the "image-less map," the recomposition of cartographic knowledge, and the market context of cartography. Grelot sees the microcomputer, satellite data, and data processing techniques as democratizing cartography, of making it available to "a large number of individuals." A shift to the image-less map — the virtual map — is evident as is the associated shift in interest away from the image and toward the cartographic object in the

database. Increasingly we focus on knowing how to use software as opposed to knowing how to work through map projection equations or classification algorithms — they are encoded in the computer. More "thematic" specialists, cartographers with some application area who use cartographic software, are evident; the "technique is not an end in itself."

In sum, I found myself feeling a bit confused by *Geographic Information Systems: The Microcomputer and Modern Cartography*. On one hand, the book provides a series of informative chapters which provide reasonably complete reviews of important developments in cartography. Cartographic practitioners and students interested in cartography will be interested in the reviews and their bibliographies. On the other hand, I was intrigued by the seeming contradictions in the book as a whole. The outward GIS camouflage of a book about cartography (I assume it won't sell if it just says cartography) is curious. More interesting is the fact that the editor defined a three part focus for the future of cartography in the introductory chapter: cognition, communication, and visualization. Communication was part of the focus of chapters nine, ten, and eleven; cognition was generally ignored, and visualization mentioned only briefly. Taylor also detailed the problems with neo-positivism and neo-formalism, problems which have also been attacked in the larger arena of the philosophy of science. Yet much of the book is about as positivistic and formalistic as you can get: in chapter two we hear of "improvements in the visibility, resolution, and accuracy of space sensors and transmitters", in chapter five we hear about "the more perfectly the model represents reality"; in chapter seven we hear that the development of a "full expert

system" which can replace the human cartographer "may be a problem which can be effectively addressed only by a multi-investigator team over a period of several to many years"; in chapter eight we hear that an all-inclusive set of spatial data standards is just around the corner; and in the final chapter we are told of the fact that geographical research can be done at home and "it is no longer necessary to go into the field" — this asserts that modern technologies have essentially made the map into the landscape. Borges and Baudrillard would blush. I am intrigued by these contradictions, and how they reflect upon cartography as a discipline. Do we accept Taylor's and Harley's critical approaches to formalism, positivism, and scientism or do we accept these to be the most practical and popular means of many cartographer's endeavors? Can both exist at the same time within cartography? Can either 'side' learn something from the other? Can there even be a dialogue? Does anyone even care? Interesting questions raised by an interesting book.

cartographic events

COLUMBIAN ENCOUNTER
The University of Wisconsin-Milwaukee is to be the home of a major exhibition of rare maps for the 1992 Columbus Quincentennial. Including research, exhibitions, and public programs, this regional project will be directed by Professor J. Brian Harley of the Department of Geography and the Office for Map History in the American Geographical Society Collection of the Golda Meir Library.

The Exhibition will highlight many rare maps of the age of Columbus. The themes which will

structure the exhibition and guide the presentation of the maps include 1) the geographic realities and misconceptions in the maps of the Encounter period, 2) the science and technology of map-making in the fourteenth, fifteenth, and sixteenth centuries, 3) the Encounter as a religious crusade, 4) the wealth of the New World as a force behind the Encounter, 5) the geopolitics of maps in the Encounter, and 6) the way maps reflect the Old World's and the New World's growing awareness of each other.

Seeking to answer not only the question "What does the map show?" the Exhibition also asks, "What did the maps mean to the men and women of the Encounter period?" and "What do they mean to modern Americans?" Through its extensive interpretation the Exhibition will present maps as documents of human interaction. For further information, please contact: Mark Warhus, Program Manager, The Office for Map History, American Geographical Society Collection, University of Wisconsin-Milwaukee, P.O. Box 399, Milwaukee, Wisconsin 53201. (414) 229-4101.
GENIP News, November 1990

ORDNANCE SURVEY BICENTENARY
The Ordnance Survey will celebrate its bicentenary in 1991, in hopes of raising public awareness of the Survey and its activities. The key event will be an evening function in the Tower of London on June 21. The Tower, where the Ordnance Survey was located for its first 50 years, will also provide the site of a major exhibition of Ordnance Survey past, present and future, between May and September 1991. The Royal Mail is to issue a set of commemorative stamps in honor of the Survey.

Moving forward into the 21st century the Survey will be aiming to: maintain the National Data

archive up-to-date; give high priority to creating digital topographic and cartographic databases; increase revenue by meeting user needs and expanding the market; and achieve progressive improvements in the quality and efficiency of the services provided. *IMDA Newsletter, January 1991*

MAPPING ASSOCIATION INCORPORATED IN VIRGINIA

The Virginia Association for Mapping and Land Information Systems was recently incorporated in the Commonwealth of Virginia. The non-profit membership association is dedicated to encouraging a high standard of professionalism throughout Virginia in the areas of cartography, surveying, engineering, land information systems, geographic information systems, photogrammetry, geography, geodesy, and land records management.

The association is also dedicated to:

§ promoting the free exchange of knowledge and information in the areas of mapping and land/geographic information systems

§ promoting educational, instructional, communications, and legislative programs

§ providing advice and assistance to federal, state, and local agencies and private companies

§ working with allied associations at the national, state, and local levels

The association was a co-sponsor of Virginia LIS/GIS '90 held in Fredericksburg in October, and the organization has developed a comprehensive resource directory for those individuals, public agencies, and private companies that have a need for mapping and LIS/GIS information.

Membership in the association is open to any individual or organization that supports the objectives of the association. For additional

information, contact: Virginia Association for Mapping and Land Information Systems, 8752 Landmark Road, Richmond, VA 23228.

EVENTS CALENDAR
1991

August 11-15: **URISA '91.** San Francisco, CA. Information and technology: gateway to solutions. Contact: Urban & Regional Information Systems Association, 900 Second Street, N.E., Suite 304, Washington, DC 20002; (202) 289-1685.

September 2-6: **Eurographics '91, Annual Conference of the European Association for Computer Graphics**, Vienna, Austria. Contact: Eurographics '91 Conference Secretariat % Interconvention, Austria Center Vienna, A-1450 Vienna, Austria; +43(1) 2369-2640, fax: +43(1) 2369-648.

September 23-October 1: **Mapping the Nations — 15th Conference of the International Cartographic Association,** Bournemouth International Centre, Bournemouth, England. Contact: Conference Services Limited, Congress House, 55 New Cavendish St., London W1M 7RE, England, 01-4860531, fax: 01-935-7559, telex: 934346CONFAS G.

October 19-23: North American Cartographic Information Society
Eleventh Annual Meeting, Milwaukee, WI. Contact: Sona Andrews, Department of Geography, University of Wisconsin — Milwaukee, Milwaukee, WI 53201; (414) 229-4872. Sona@csd4.csd.uwm.edu

call for papers

nacis xi

Annual Convention Milwaukee, Wisconsin October 19-23, 1991

Send abstract, limit 150 words:

Jack L. Dodd (NACIS)
TVA Maps and Surveys
HB1A
1101 Market Street
Chattanooga, TN 37402-2801

October 27-30: **GIS/LIS 1991 Annual Conference and Exposition and ACSM/ASPRS Fall Convention**, Atlanta, GA. Contact: ACSM, 5410 Grosvenor Lane, Bethesda, MD 20814, (301) 493-0200; fax: (301)493-8245.

November 14-15: **Geomatics III — A Present Bursting with Activities**, Montreal, Canada. Contact: Francois Dutil; (514) 342-9581.

1992

March 22-28: **ACSM/ASPRS Annual Convention**, Albuquerque, NM. Contact: ACSM, 5410 Grosvenor Lane, Bethesda, MD 20814, (301) 493-0200.

Summer: **Fifth International Symposium on Spatial Data Handling**, USA. Contact: Prof. Duane F. Marble, Department of Geography, The Ohio State University, Columbus, OH 43210, (614) 292-2250, telex: (650) 218-4975 MCI.

August 9-16: **27th International Geographical Congress**, Washington, DC. Contact: Anthony de Sousa, 27th IGC, 17th and M Sts. N.W., Washington, DC 20036, (202) 828-6688.

October: **North American Cartographic Information Society,** Twelfth Annual Meeting, Minneapolis, MN.

November 6-12: **GIS/LIS 1992 Annual Conference and Exposition and ACSM/ASPRS Fall Convention,** San Jose, CA. Contact: ACSM, 5410 Grosvenor Lane, Bethesda, MD 20814, (301) 493-0200.

1993
February 15-18: **ACSM/ASPRS Annual Convention**, New Orleans, Louisiana. Contact: ACSM, 5410 Grosvenor Lane, Bethesda, MD 20814, (301) 493-0200.

NACIS news

NACIS OFFICERS
President: **James F. Fryman,** Department of Geography, University of Northern Iowa, Cedar Falls, IA 50613; (319) 273-6245

Vice President: **Jack L. Dodd,** 101 Haney Building, Tennessee Valley Authority, Chattanooga, TN 37402-2801; (615) 751-MAPS

Secretary: **James R. Anderson, Jr.,** Florida Resources and Environment Analysis Center, Florida State University, Tallahassee, FL 32306; (904) 644-2883

Treasurer: **Edward J. Hall,** 410 McGilvrey Hall, Kent State University, Kent, OH 44240-0001; (216) 672-2017

NACIS EXECUTIVE OFFICER
Chris Baruth, NACIS, American Geographic Society Collection, P.O. 399, Milwaukee, WI 53201; (800) 558-8993 or (414) 229-6282

BOARD OF DIRECTORS
Ron Bolton, 6010 Executive Blvd, Room 1013, Rockville, MD 20852; (301) 443-8075

Will Fontanez, Department of Geography, 408 G & G Building, University of Tennessee, Knoxville, TN 37996; (615) 974-2418

Patrick McHaffie, Department of Geography, University of Kentucky, Lexington, KY 40506-0027; (606) 257-6956

Hull McLean, 1602 Society Court, Herndon, VA 22070; (703) 834-3123

Craig Remington, Department of Geography, Box 870322, University of Alabama, Tuscaloosa, AL 35487, (205) 348-1536

Nancy Ryckman, Reference Department, 152 Jackson Library, University of North Carolina at Greensboro, Greensboro, NC 27412; (919) 334-5419

John Sutherland, Map Collection, Science Library, University of Georgia Libraries, Athens, GA 30602; (404) 542-0690

CARTOGRAPHIC PERSPECTIVES
Editor: **David DiBiase,** Department of Geography, 302 Walker Building, Penn State University, University Park, PA 16802; (814) 863-4562; email: dibiase@essc.psu.edu. *Coeditor:* **Karl Proehl,** C202 Pattee Library, Penn State University, University Park, PA 16802; (814) 863-0094

INTER-AMERICAN COMMITTEE
Chair: **Jerry Thornton,** Map Room,

Harlan Hatcher Graduate Library, University of Michigan, Ann Arbor, MI 48103

MEMBERSHIP COMMITTEE
Chair: **Sona Karentz Andrews,** Department of Geography, University of Wisconsin — Milwaukee, Milwaukee, WI 53201; (414) 229-4872

NOMINATIONS COMMITTEE
Chair: **Juan José Valdés,** Cartographic Division, National Geographic Society, 1615 M Street, N.W., Washington, DC 20036; (202) 775-7873

PUBLICATIONS COMMITTEE
Chair: **Jeff Patton,** Department of Geography, University of North Carolina-Greensboro, Greensboro, NC 27412, (919) 334-5388

CARTOGRAPHIC PERSPEC-TIVES: UN NOUVEAU BULLETIN D'INFORMATION CARTOGRAPHIQUE.
*The following notice about Cartographic Perspectives will appear in the "Nouvelles Brèves" section of a forthcoming issue of the quarterly journal **Mappemonde**. The notice was submitted by Sylvie Rimbert, author of **Carto-graphies** (see review in CP7, Fall, 1990).*

Le N°1 de ce bulletin trimestriel est paru le 1er mars 1989. Il est une émanation du NACIS (North American Cartographic Information Society). Il est publié par le Department of Geography, The Pennsylvania State University, University Park, PA 16802, USA. Il est caractérisé par un souci d'information professionnelle: une bonne place est faite aux présentations de nombreux laboratoires de cartographie, à celles de techniques, de logiciels, de colloques et congrès à venir, de publications d'atlas, de cartes, de produits satellitaires ainsi que

d'ouvrages et d'articles particulièrement significatifs des tendances contemporaines. Il débute toujours par un "feature article" qui traite d'un problème cartographique actuel.

Malgré sa taille volontairement réduite pour en faciliter la consultation (équivalente à celle de Mappemonde), il est ouvert sur le monde; (dans N°3 et sous la plume de Peter Gould, on trouve une mention très favorable des activités de la Maison dela Géographie de Montpellier!).

Pour une inscription à la NACIS (qui selon que l'on est étudiant ou que l'on dirige une "institution", varie de 8 à 58 US dollars), le rapport qualité-prix est excellent; (envoyer un chèque à NACIS c/o Edward J. Hall, University Libraries, 410 McGilvrey Hall, Kent State University, Kent, OH 44242-0001, USA).

NACIS BOARD MEETING MINUTES, MARCH 2, 1991

President Fryman called the board meeting to order at 2:00 p.m. The following members were present: Ron Bolton, Fred Fryman, Diana Rivera, Sona Andrews, Ed Hall, Hull McLean, Chris Baruth, Jack Dodd, Craig Remington, Jim Anderson.

Meeting was called to order by President Fryman who called on Sona Andrews to make presentation on NACIS XI to be held in Milwaukee at the Astor Hotel. The meeting will begin on October 19 with a pre-conference social. A Sunday afternoon tour is planned with the opening session on Sunday night. A cartography lab poster session and a cash bar will be held after the opening session. The luncheon will be on Monday with a choice of entrees. Concurrent sessions in the morning and afternoon are planned for Monday. Monday evening is a possible

reception at the AGS collection. Anderson suggested an extra charge to cover food for those attending this event. Andrews will explore it further and a decision will be made later. Two concurrent paper sessions are planned for Tuesday morning. Tuesday afternoon would be for field trips. Possibilities are a Great Lakes tour, City of Milwaukee Planning, BLM, Intelligraphics, U.S. Forest Service district office, and a walking tour of downtown. Tuesday evening there will be a banquet and a cash bar. Concurrent sessions will be held on Wednesday morning. A Board Meeting has been tentatively scheduled for Sunday morning. Possible speakers that were discussed included Professor Bill Huxholt (Architecture Dept. at Wisconsin-Milwaukee), Professor Brian Harley (History of Cartography Project), Michael Dobson (Rand McNally), Kenneth Nebenzal (Antique Map Dealer), and Chris Baruth (Mapping of the Great Lakes). Andrews, Dodd, and Baruth will be in communication concerning individual responsibilities. Dodd presented a schedule for "Call for Papers" and receipt of abstracts. Theme for this year's meeting will center around NACIS second decade.

OLD BUSINESS

Bolton moved that the minutes be approved. Second by Dodd. Unanimous.

Anderson presented report on NACIS X. He felt that the meeting was a success based on attendance and finances. Our required room block was met with no difficulty. Fryman commented that he had received about 25 comments about Orlando meeting. Sentiment was to have a hospitality suite. The Milwaukee local arrangements committee and Jack Dodd will take comments into account when planning the Milwaukee meeting. Fryman presented results of site

survey conducted by Jeff Patton. Preferred sites will be investigated but cost will continue to be the overriding concern.

David DiBiase submitted a report on the status of *Cartographic Perspectives* outlining costs and suggested procedures. Also, DiBiase has requested to be replaced by January 1992.

Ed Hall felt that NACIS had tax-exempt status. He felt that we might have a problem getting non-profit status from the post office and that we need to add more educational goals to our objectives. Hall raised the question of our incorporation status. Baruth will investigate. Rivera asked what the savings would be on postage if we changed our objectives and was it worth it. Fryman and Baruth will study the mission statement.

Fryman circulated a job description for the executive director.

NEW BUSINESS

Hall presented the Treasurer's Report. Hall stated that $15,626 had been transferred from the previous treasurer and that $22,411.47 was currently in the account. Expenses of $3,080.89 have been accrued since Hall became Treasurer. Hall reported that the previous account had not yet been closed. Hall estimated that *Cartographic Perspectives* would cost approximately $14,000 for next year. Hall mentioned problem with Faxon subscriptions. Hall asked about proceeding with membership campaign. Hall also stated that making long distance phone calls from his office was a problem. Bolton made motion to acquire a telephone calling card issued to NACIS with Hall reporting on monthly costs. Second by Fryman. Rivera asked about NACIS ability to cover these costs. Bolton didn't feel we could continue to ask people to incur all of these costs. Seven for and one against the motion.

Dan Seldin asked for reimburse-

ment of $50 to CUAC. Rivera stated that it had been approved at a previous meeting. Anderson asked that CUAC representative make a report at the annual business meeting. Hall suggested report be published in *Cartographic Perspectives*.

Nancy Kandoian wrote letter to Fryman requesting that NACIS donate a book each year to a library. Fryman made motion. Remington seconded. Anderson stated that this was not a bad idea but that NACIS should look at a more comprehensive approach to expanding NACIS educational outreach. Fryman amended his motion to create committee to study educational outreach opportunities for NACIS. Second by McLean. Unanimous.

Rivera asked what nominations would be needed for next year.

Rivera reported on concept of mini-conference with Mexican cartographers. The Mexicans have suggested that NACIS send one person to present a seminar on cartographic issues. Rivera asked for guidance. McLean supported the concept. Bolton felt that Board needed to approve any activity that would use NACIS name. Rivera made motion that Inter-American committee be authorized to continue discussions with Mexican Institute and present candidate to the Board to represent NACIS. McLean second. Unanimous with one abstention.

Bolton reported on future meeting sites. Minneapolis has submitted bids in the $60-$70 range for 1992. Bolton reported that Philadelphia and San Antonio bids were unacceptable. Bolton recommended that we abandon Philadelphia. Bolton stated that rates were less in San Antonio but that local arrangements could be a problem. Bolton stated that he had received an unsolicited bid from Washington. Sentiment was expressed by Dodd, Rivera, and McLean to look at Canada or

Mexico. Anderson moved that Washington be looked at for 1993 and that Rivera look at sites outside the U.S. Second by McLean. Unanimous. McLean stated that October was a bad month for federal employees to attend meeting due to uncertainties with the budget process. No action was taken.

Bolton stated that a teller's committee needed to be appointed. Fryman will handle.

There being no further business to discuss the meeting was adjourned at 6:00 p.m.
— *James R. Anderson, Jr., Secretary*

EXCHANGE PUBLICATIONS
Cartographic Perspectives gratefully acknowledges the publications listed below, with which we enjoy exchange agreements. We continue to seek agreements with other publications.

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; (3012) 493-0200.

Bulletin of the Society of 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, Engield, 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 Speciality Group Newsletter. Biannual publication of the Cartography Speciality Group of the Association of American Geographers. Features news, announcements and comics. Contact: Ellen White, Editor, CSG Central Office, Department of Geography, Michigan State University, East Lansing, MI 48824; (517) 355-4658.

Cartomania. This quarterly news-letter of the Association of Map Memorabilia Collectors offers a unique mix of feature articles, news, puzzles, and announce-ments 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.

Information design journal. Triannual publication of the Information Design Unit. Features research articles reporting on a wide range of problems concern-ing the design and use of visual information. Contact: Information design journal, P.O. Box 185, Milton Keynes MK7 6BL, England.

Perspective. This newsletter of the National Council for Geographic Education (NCGE) is published five times a year in October, December, February, April and June. News items related to NCGE activities and geographic educa-tion are featured. Contact: NCGE, Leonard 16A, Indiana University of Pennyslvania, Indiana, PA 15705; bitnet: CLMCCARD@IUP.

FEATURED PAPERS

All featured papers will be *solicited* by the NACIS Publications Com-mittee. The goals of the solicita-tion procedure will be to select high quality papers that provide a balanced representation of the diverse interests of the member-ship. The primary mechanism for soliciting featured papers will be a paper competition held in conjunc-tion with the Annual Meeting. All papers prepared for the meeting and submitted in written and/or digital form will be considered. Three of these will be selected to appear in *Cartographic Perspectives* during the next year.

In addition to the competition winners, the Publications Commit-tee (in consultation with the editors) will solicit one or more papers each year from other sources. The goal here is to ensure that all aspects of the membership are served and to attract some thought-provoking ideas from authors who may not be able to attend the annual meeting.

Authors of selected papers will be given an opportunity to re-spond to suggestions of the Publications Committee before submitting a final version. The writing quality must adhere to high professional standards. Due to the interdisciplinary nature of the organization, it is particularly important that papers are carefully structured with ideas presented succinctly. The editors reserve the right to make editorial changes to ensure clarity and consistency of style.

Papers ranging from the theoretical/philosophical to methodological/applied topics will be considered providing that ideas are presented in a manner that will interest more than a narrow spectrum of members.

To be considered for the paper competition, papers should be prepared exclusively for NACIS, with no major portion previously published elsewhere.

NACIS membership form

North American Cartographic Information Society
Sociedad de Información Cartográfica Norte Americana

Name/Nombre:

Address/Dirección:

Organization/Afiliación profesional:

Your position/Posición:

Cartographic interests/Intereses cartografíco:

Professional memberships/Socio de organización:

Membership Fees for the Calendar Year*/
Valor de nomina de socios para el año:
Individual/Regular: $28.00 U.S./E.U.
Students/Estudiantes: $8.00 U.S./E.U.
Institutional/Miembros institucionales:
$58.00 U.S./E.U.

Make all checks payable to/
Hagan sus cheques a:
NACIS
c/o Edward J. Hall, Treasurer
Map Library
410 McGilvrey Hall
Kent State University
Kent, OH 44242-0001

*Membership fees include subscription to *Cartographic Perspectives* and are due
January 1.

The North American Cartographic Information Society

(NACIS) was founded in 1980 in response to the need for a multidisciplinary organization to facilitate communication in the map information community. Principal objectives of NACIS are:

§ to promote communication, coordination, and cooperation among the producers, disseminators, curators, and users of cartographic information;

§ to support and coordinate activities with other professional organizations and institutions involved with cartographic information;

§ to improve the use of cartographic materials through education and to promote graphicacy;

§ to promote and coordinate the acquisition, preservation, and automated retrieval of all types of cartographic material;

§ to influence government policy on cartographic information.

NACIS is a professional society open to specialists from private, academic, and government organizations throughout North America. The society provides an opportunity for Map Makers, Map Keepers, Map Users, Map Educators, and Map Distributors to exchange ideas, coordinate activities, and improve map materials and map use. *Cartographic Perspectives*, the organization's Bulletin, provides a mechanism to facilitate timely dissemination of cartographic information to this diverse constituency. It includes solicited feature articles, synopses of articles appearing in obscure or non-cartographic publications, software reviews, news features, reports (conferences, map exhibits, new map series, government policy, new degree programs, etc.), and listings of published maps and atlases, new computer software, and software reviews.