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cartographic perspectives

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cartographic perspectives on the news

MAPPING THE IRAQ-KUWAIT BOUNDARY

In February, Miklos Pinther, Chief of the United Nations Cartographic Unit, travelled to the Middle East for a fifth time as Secretary of the United Nations Iraq-Kuwait Boundary Demarcation Commission. The Commission was established in May, 1991 by the Secretary-General to formally demarcate the boundary between the two countries. Iraq-Kuwait boundaries that appear on recent published maps reflect interpretations of a boundary description originally agreed upon in a letter of exchange between the Prime Minister of Iraq and the Ruler of Kuwait in 1932. The description was subsequently confirmed in agreed minutes between the two countries in 1963. The new present demarcation effort was initiated by the Security Council at the conclusion of the Gulf War (Resolution 687 of 3 April 1991) as one of the arrangements to ensure the restoration of international peace and security in the area.

The Boundary Commission consists of five members: representatives of the governments of Iraq and Kuwait and three

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Editor

David DiBiase

Deasy GeoGraphics
Department of Geography
302 Walker Building
Penn State University
University Park, PA 16802
email: dibias@essc.psu.edu

Coeditor

Karl Proehl

C202 Pattee Library
Penn State University

Editorial Assistant

Suzanne Peterson

Deasy GeoGraphics
Penn State University
email: suz@essc.psu.edu

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independent experts, including the Surveyor General of New Zealand, the Technical Director of Swedsurvey (the National Survey of Sweden), and the Commission Chairman, Dr. Mochtar Kusuma-Atmadja, who contributes a background in law. The Commission supervises a ground control survey and aerial photography team consisting of ten surveyors and four photogrammetrists.

Pinther, a United Nations cartographer since 1978, serves as an advisor to the Chairman on technical matters. His responsibilities include logistics and setting agendas for Commission meetings and site visits. His most important duty, however, is to keep detailed minutes of the meetings in order to help the Commission perform its task. He cites his familiarity with mapping

terminology as one of his most important qualifications for the post.

The Commission hopes to finalize the demarcation at its next session in April. After the summer heat abates, construction will begin on a series of intervisible concrete pillars that will give physical expression to the boundary for the first time.

Meanwhile, Pinther believes that the changing world political map will create similar opportunities for other cartographers. He has recently been asked for references, for example, from the International Court of Justice and the Government of Argentina.

about the cover

THE TOUCH OF MAPS

This issue's cover was embossed with the CP logo and the title "Cartographic Perspectives" in braille with the assistance of Dale Gasteiger, Director of Braille Institute Press, 741 North Vermont Avenue, Los Angeles CA 90029. In the following Dale describes Braille Institute's map making activities and solicits the cooperation of the cartographic community.

People who have experienced sight loss use maps in many ways. Tactile maps can provide instruction, direction, mobility assistance, room and area descriptions, campus layouts, bus and train routes and many other kinds of important information. The new Americans with Disabilities Act (ADA) accents the need for reliable, portable tactile maps for blind users. Even though the ADA may cause the installation of wall plaques and signage in braille or large print, these are only useful once a blind person is given directions to the available signs or maps. But since memorizing such

signs and maps is inconvenient and unreliable, there remains a need for good portable maps that can easily be carried and referred to whenever necessary.

Braille Institute is a private, nonprofit organization that offers many services and programs to help blind and visually impaired people achieve independence. The Braille Institute Press is attempting to fill a serious void in the lives of blind people by producing tactile maps at no greater cost than those produced for sighted users.

Although we now have the technical capability to produce good tactile maps, we lack the experience and expertise necessary to design appropriately detailed maps. Therefore, we invite the cartographic community to submit any advice or information possible to help us ensure that our maps are as useful as we can make them. We heartily welcome your interest.

Tactile map production techniques

Until recently, tactile map making at Braille Institute has been a slow, tedious process involving paper, string, glue and other items used to provide various textures and shapes. Tactile maps of this sort are fragile, expensive to construct and inconvenient to use. The Braille Institute has been experimenting with two new techniques for producing portable, durable and easy to use tactile map using computer-assisted methods.

One of our computer-assisted methods involves the Howtek Pixelmaster, a 240 dot-per-inch color ink jet printer attached to a Macintosh computer. We originally acquired the Pixelmaster as a tool to produce print and braille simultaneously on the same page. But in evaluating the machine, I was particularly impressed by the beautiful pictures, with apparently endless variations of color and texture, it could produce. From this observation I felt that the

Pixelmaster could be used to produce maps for visually impaired and blind people. We have since found that the Pixelmaster produces a durable tactile surface when illustrations are imaged repeatedly on the same page. Today we are producing maps for braille social studies and geography textbooks and for private individuals; floor plans of hotels, office buildings and museums; diagrams of paths and walkways for school campuses and individual orientation; and mobility maps for personal use.

Braille Institute Press is also experimenting with a second tactile process — involving the use of “nyloplates” — to print paper maps, graphs and illustration outlines that can be mass-produced for use in braille publications. The nyloplate process is simple, easy to use and requires standard ink printing procedures. A special negative is produced from camera-ready art, then burned into a nyloplate. One difference from ink print is the need for a second plate to complete the embossing process. The second plate is best described as a positive-negative of the image on the first plate. After the second plate is made, the two plates are mated together on the press and the paper passes between them, creating the embossed image.

The nyloplate technique has been used on the graphic illustrations appearing in our annual braille anthology of children's stories, *Expectations*. Every year this publication is distributed worldwide, free of charge, to English speaking blind children and their parents and to institutions that serve them. Initial reactions have been very favorable to the new method of solid raised outlines, as opposed to the old process, which utilized raised dots.

Conclusion

In the past, technological limits and prohibitive costs made it impossible for blind and visually impaired people to own tactile maps, atlases and globes. Now Braille Institute has the technical ability to give blind people useful tools for mobility and independence. We urge interested members of the map making community to contact us with suggestions on how we might further improve our cartographic products.

Dale Gasteiger, Director
Braille Institute Press

another passing

THEORY INTO PRACTICE A Tribute to Brian Harley

Jeremy Crampton
Portsmouth Polytechnic, UK

Lowly graduate students sometimes have a problem relating to faculty, especially a faculty member at the prime of his life and at the top of his form. In recent years Brian Harley had become a big name, but he never forgot “the little guy,” as I can personally attest. The first of six volumes of the *History of Cartography*, which he co-edited with David Woodward, was being published to top-flight reviews. At the same time, however, he was appealing to a new generation of geographers and cartographers through a series of innovative and controversial articles concerned with deconstruction, ideology, secrecy and (in perhaps his last piece published while still alive) an article on ethics for this journal.¹ Indeed, his appeal to this younger generation was so strong that on several different occasions people were openly surprised when they met him to see that he was not in his twenties or thirties!

I myself was surprised. But

then he had a habit of surprising people. In my own case, long before I ever met him, I had read an article co-written with Woodward on the subject of cartography and history. Needing an example of a traditional viewpoint for an essay I was writing, I latched too enthusiastically onto this as an exemplar of traditional cartography, and subsequently learned my first lesson on uncritical and unreflective thinking from this eclectic and generous scholar.

By October 1989, on my way up to Ann Arbor for the NACIS IX conference, I discussed with my fellow passengers his famous paper “Deconstructing the Map.”² I recall a lunch break at some roadside restaurant where we bandied terms like “post-modernism” and “power relations” between forkfuls of scrambled egg and gulps of black coffee. The paper was more than another Harley surprise, however; it was a total revelation.

For me, Harley's greatness was that he brought what he was saying into everyday life and workaday cartography — he didn't just leave it up in the remote realm of philosophy. I have been most affected by his later writings, but you can see a theme of wresting control over cartography from scientism running back at least to the beginning of the last decade, where he said things that challenged the foundations upon which cartography thought it was safely resting — and so brought his theory into practice. He was the gentleman highway robber of cartography; challenging those who had complacency to spare, and giving to those who needed encouragement.

And he *was* a gentleman. Apart from some brief interaction via email (or “evil mail” as he mischievously called it) my first direct contact with him was when I called to ask if he would take part

in a session I was organizing (was it only last year?) at the AAG meetings in Miami. Although already booked to give a paper and as discussant (and rightly suspicious of "spreading yourself too thin" during the conference) he generously agreed to Chair the session. He was more than generous; he was downright bouncy! "Helloooooo Jeremy!" he cried when I got through to him (characteristically, his letter had left a home number for me to call). At this point, he still didn't know me from Adam.

I met him only twice, during the AAG Miami conference and just prior to that when he visited Penn State's Department of Geography as Distinguished Visitor. He prepared four original talks for his week at Penn State (including a preliminary draft of "Can There Be a Cartographic Ethics?" and work which later appeared as "Maps and the Columbian Encounter"). My notes say such things as "cartography has ridden on the coattails of science and technology," and that cartography has sought to civilize people through "the reason" of the map, and that the Enlightenment has "hijacked the history of cartography." My recollections are mixed up, however, with a party later at which he perched on my sofa, beer in hand, grinning a kind of boyish grin (as if he had just stolen a neighbor's apple and was rather pleased about it), while graduate students hovered around him or romped in the snow, where at one point I nearly expired from laughter.

Sometimes he seemed to go too far. He was fervid when it came to challenging "establishment" views. No doubt this was partly intentional, of a piece with his puckish delight in popping balloons of self-righteous hot air. From time to time, though, you got the feeling he didn't always distinguish between the challenge and the insult. To those of us

who had adopted him as our intellectual father, myself included, this was merely icing on the cake. If you reject the hegemony of the scientific paradigm, why not be polemical from time to time? It was all part of the message, plain enough in his academic writings, and plain from his active work; theory and practice coming together.

That Brian's genius and generosity has touched many besides myself was evident in a Royal Geographical Society Memorial held in London on March 17, 1992. It was sad, for obvious reasons, but in the end amazing (in the true sense of the word) to see the variety and number of people who must have memories similar to mine.

I have no doubt that Brian will continue to amaze, surprise, and even delight many more in time to come.

1. Harley, J.B. (1991) Can there be a cartographic ethics? *Cartographic Perspectives* 10, pp. 9-16.

2. Harley, J.B. (1989) Deconstructing the map. *Cartographica* 26:2, pp. 1-20.

cartographic techniques

CREATING UNCLASSSED CHOROPLETH MAPS WITH POSTSCRIPT

Michael P. Peterson, Associate Professor, Department of Geography and Geology, University of Nebraska at Omaha

First introduced in 1973 by Tobler, unclassified choropleth mapping has a tortuous history in cartography. Although the technique of assigning shadings proportional to the data values made it possible to create choropleth maps without classifying the data, the method of mapping has not been widely accepted. The basic objection to

the technique is that the cartographer loses the ability to direct the message of communication (Dent 1990, p. 167).

A more practical reason, however, that the unclassified method is not more widely used is the difficulty in creating a continuum of shadings. Tobler used a coordinate plotter to create a continuum of crossed-line shadings. The introduction of the laser printer and a page description language called PostScript has made it possible to create a white to black continuum of dot shadings. A procedure for creating unclassified choropleth maps with PostScript is described here.

The Shadings

Figure 1 depicts a series of shadings that were created with Adobe *Illustrator*. A percentage ink value was assigned to each rectangle with the 'Style' command. The shadings have been perceptually adjusted using the formula by Williamson (1982):

$$W = P^{.8333} / 0.464$$

where W is the gray tone in percentage of area white and P is the desired perceived value.

value	% ink
100	100.00
90	85.32
80	73.84
70	63.32
60	53.38
50	43.86
40	34.65
30	25.69
20	16.94
10	8.38
0	0.00

Figure 1: A ten shading continuum defined with PostScript.

A desired value of 50 (P) equals a 56.14 percent white or 43.86 percent ink.

Illustrator files are in PostScript text format and can be edited with a text processor. Figure 2 is a listing of part of the file created above. The x, y coordinates that outline the middle rectangle are listed below the '.5614 g' command that defines its shading. The value was entered in *Illustrator* as a percentage black, but was converted to a percentage white in a decimal format (i.e., 1.0 = white; 0.0 = black) in the saved document. The decimal value associated with the PostScript 'g' command can have as many as four places. Thus, gray shadings can be defined between .0001 and .9999, making the definition of 9,999 separate shadings between white and black possible. (Whether 9,999 distinct shadings are actually produced depends upon the resolution of the printer or imagesetter.)

```
0.5614 g      ! =43.86 % ink
254 335.5 m  ! point to move to
254 353.5 L  ! points to draw to
223 353.5 L
223 335.5 L
254 335.5 L  ! end of polygon
b
```

Figure 2: PostScript commands that define a shaded rectangle.

The Base Map

PostScript files containing polygon outlines appropriate for the creation of choropleth maps can be created with *Illustrator* or *FreeHand*. Tools are available in both programs for the conversion of a scanned map to a series of polygon objects, but the process is tedious. The *MapArt* collection from MicroMaps Software (Lambertville, NJ) includes numerous polygon-based files in a PostScript format that can be used with *Illustrator* or *FreeHand*. A portion of the *MapArt* file for the state of Nebraska by county is shown in Figure 3.

The 'Note' statement includes a combination of the state (31) and county (077) FIPS codes and the name of the county. The following six coordinates outline Greeley County ('m' indicates a move; 'L' is for a line).

The Data

Computing the shading value for a polygon is simply a matter of re-scaling the data on a 0 to 100 scale:

$$P = (z_i - z_{Min}) * (100. / zRange)$$

where, *P* is the perceived value to be used in the perceptual adjustment formula, z_i is the data value, *zMin* is the minimum data value and *zRange* is the difference between the maximum and minimum data values.

Assigning a shading value to a polygon is possible within *Illustrator* or *FreeHand* by selecting a polygon and specifying a shading value as a percentage ink. However, shadings can be assigned more quickly with a text processor. This is done by simply inserting the 'g' command along with the corresponding shading value expressed as percentage white (as computed with the perceptual adjustment formula) following the 'Note' statement. The 's' at the end of the polygon in the unshaded file must also be changed to a 'b' (last line) to have the shading take effect. The listing in Figure 4 depicts the addition of a shading value for Greeley County, Nebraska.

```
%%Note:31077,Greeley,NE      ! id of county
367.9533 385.0322 m          ! move to point
403.29 385.631 1             ! line to point
403.29 358.0805 1
403.29 348.4977 1
368.5523 348.4977 1
367.9533 385.0322 1
s                               ! end
```

Figure 3: Greeley County, Nebraska in PostScript

```
0.6543 g      !the shading value
%AI3_Note:31077,Greeley,NE
280.1552 53.6423 m
312.1679 54.1848 1
312.1679 29.2257 1
312.1679 20.5443 1
280.6977 20.5443 1
280.1552 53.6423 1
b
```

Figure 4: Greeley County with shading value

The Map

Figure 5 is an unclassed choropleth map of Nebraska depicting median housing value. The shadings were assigned using a text processor (*MacWrite II*) and the file saved in text format. *Illustrator* was used to add the lettering, legend and neat line of the map.

The Program

A utility program that assigns shadings to polygons for the creation of unclassed choropleth maps is available from the author. The program, called *PostShade*, incorporates a spreadsheet for data entry, a graphics window for the display of the map and an editor window to view the PostScript text files (Figure 6). The program works with base maps in a PostScript polygon format that include a 'Note' statement for each polygon. Once the PostScript file is opened, the area names are displayed in the first column and up to 50 columns of data may then be entered and saved as a file. A 'data' palette menu (Figure 7) incorporates a number of spreadsheet functions: 1) the display of

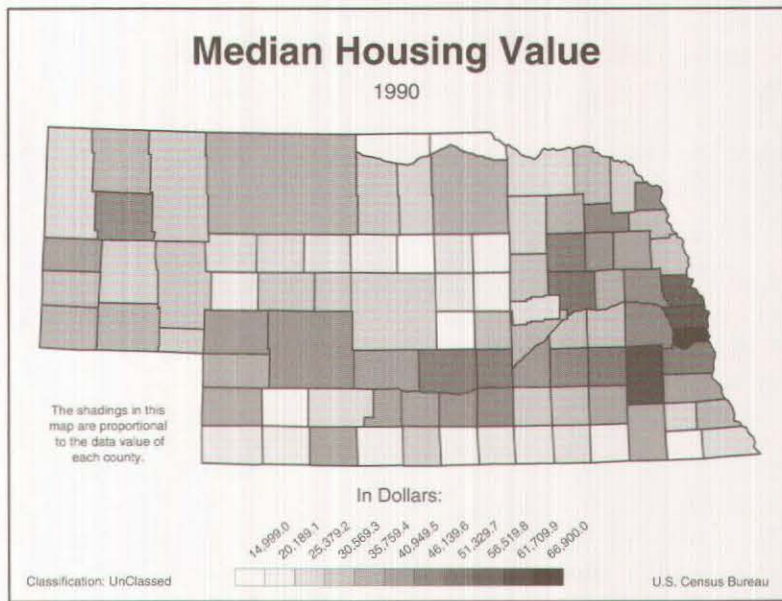


Figure 5: Unclassed choropleth map created from basemap produced with MacChoro II by editing PostScript code with a text processor.

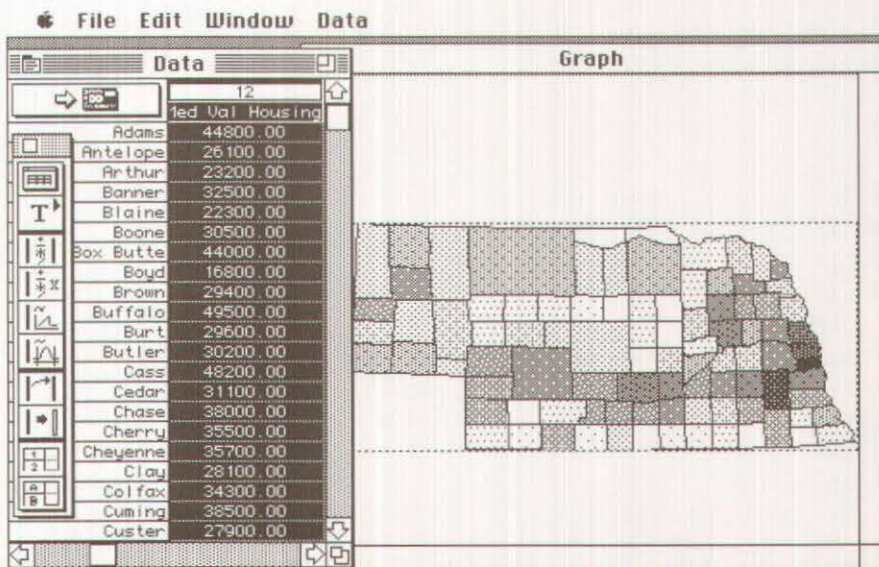


Figure 6: PostShade program with map and spreadsheet windows.

the spreadsheet; 2) the addition of descriptive text for each column of data; 3) modifying a column of data through division, multiplication, subtraction or addition by another variable; or 4) a constant; 5) setting upper and lower thresholds in the data; 6) a logarithmic or square root transformation of a column of data; 7) moving a column of data; 8) deleting a column of data; and 9) the display of the numeric identifications (i.e., 31077); or 10) the character identi-

cations (i.e., Greeley) for each separate statistical area. The unclassed choropleth map is created by selecting a column of data and the PostScript map file. The program then creates another PostScript map file that defines the shadings for each polygon and includes a legend. The lettering of the map is left to programs such as *Illustrator* or *FreeHand*.

Summary

The PostScript page description

language provides a method for defining a continuum of dot shadings between white and black for the creation of unclassed choropleth maps. The procedure outlined here involves the insertion of a PostScript statement that defines the gray value, as percentage white, for a polygon. Modification of the PostScript file in this way can be done with a text processor, although adding the legend and text elements would require a program such as *Illustrator* or *FreeHand*. A utility program is available to automate the computation of shadings, their assignment to polygons and the creation of the legend.

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Williamson, Glen R., (1982) The equal contrast gray scale, *The American Cartographer* 9, pp. 131-139.

Tobler, W. (1973) Choropleth maps without class intervals? *Geographical Analysis* 3, pp. 262-265.

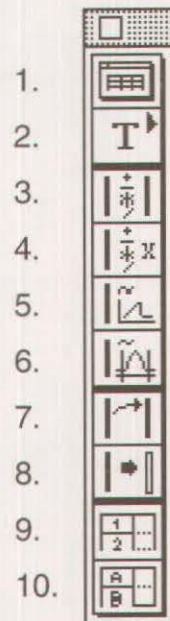


Figure 7. Data palette menu from PostShade program.

cartographic artifacts

HYPERMEDIA REVIEW

Interactive Color: A Guide for Color in Computer Graphics
Version 1.0 San Diego
Supercomputer Center.

Reviewed by Cynthia A. Brewer
Department of Geography
San Diego State University

Interactive Color is an excellent hypermedia application about color produced by the San Diego Supercomputer Center. It is available free over Internet and runs on color Apple Macintosh computers (the Appendix lists information on obtaining the application). The application is structured into ten chapters on color with each chapter offering explanation of four to sixteen topics. Most topic discussions are described on one card (one screen-size display of text, sound and graphics). Interactive portions of cards allow you to elaborate on specific aspects of a topic by changing the coloring of a graphic or revealing further written description. *Interactive Color* runs as a stand-alone SuperCard application and thus requires no additional software for its use. This is a big file (3,680K with a 798K sound file), so throw away all those silly inits, novelty fonts, and years-old manuscripts that are clogging up your hard disk and set yourself up for some serious learning.



The application includes a nicely designed help screen that explains buttons and check boxes (places on the screen to which you move the cursor and click the mouse to initiate a change, animation, or presentation of a new card). The application is well structured and that structure is made obvious to you by the series of chapter icons arranged in an ever-present strip at the bottom of the display. This menu ensures that you are always aware of which chapter you are examining and allows you to move to another chapter without having to view all cards in the current chapter. Each chapter begins with a table-of-contents card displaying buttons for major topics in the chapter. Thus, you can step through the cards in sequence using arrow buttons or you can move directly to a topic of interest. The cards are designed with a consistent format such that you always know what objects and buttons are interactive and you don't have to try clicking on everything.

The application offers chapters on both technical and perceptual topics. All presentations of topics are summary in nature, roughly equal in depth. The suite of information establishes a complete context within which a novice student of color may decide what aspects need further attention to satisfy her curiosity or address a specific color-use problem. If you are more experienced with color, the project will help you fill some of those inevitable holes in your knowledge. The technical chapters on **Color Models**, **Color Physics**, and **Color Media** present objective information useful to cartographers. The chapters on **Color Attributes**, **Color Illusions**, and **Color Harmony** provide information on the subjective aspects of color, with which cartographers must also grapple. The **Color Perception** chapter provides information on the workings of

the human visual system. The chapters titled **Design Principles** and **Color Examples** are primarily a forum for presentation of elaborate graphics produced at the San Diego Supercomputer Center and serve a secondary gee-whiz purpose to teaching color. The graphics of the **Examples** chapter are wide-ranging in topic and color use. Of fifteen discussions of **Design Principles**, only three (harmony, dominance, and light) include explicit mention of color use. This final chapter strays off the topic of the project and I feel it should have been omitted (with the advantage of reducing the size of the application on disk).

The **Color Models** chapter provides a good example of using hypermedia to trace logical paths through a structured collection of information. The contents card for the chapter lists the following topics: primary and secondary colors, additive colors, RGB color model, HLS color model, CIE color model, subtractive colors, Munsell color model, and process color. The discussion of primary and secondary colors includes buttons that take you directly to the cards on additive colors and subtractive colors. The subtractive-colors card includes button links to cards on printing primaries and on painters' primaries (don't miss the goofy paint-mixing sound effect). The printing-primaries card includes a button that takes you to the color printing card in the **Media** chapter. The printing-primaries card at the end of the **Models** chapter is great. You can click on patches of yellow, magenta, and cyan primaries and drag them around on the screen to see the correct mixture results where they overlap. This ability to interact with full color images is available throughout the application and drives home the advantage of learning color in an interactive, color environment. This demonstration is much more memorable than the overused

text-book diagram of three intersecting circles with color names typeset in each partition (because the publisher is too cheap to spring for color printing). My shelf is loaded with books on color that include only a narrow signature of color images stuck conveniently, but out of context, between signatures (true to its medium, my dissertation on color also contains no color images).

The four models presented in the **Color Models** chapter are RGB, HLS, CIE, and Munsell. Red-Green-Blue and Hue-Lightness-Saturation cards offer demonstrations with interactive mixture bars that let you set amounts of RGB or HLS to see resulting colors. The CIE and Munsell cards offer static portrayals of these color systems. The CIE description could be improved by providing an indication of the three-dimensional nature of CIE-xyY and mention of the useful, perceptually-scaled derivatives of the system (CIELAB and CIELUV). Otherwise, the basic set of models, of which cartographers should be aware, are summarized.

The brief chapter on **Color Physics** includes a dramatic interactive split of a beam of 'sunlight' through a prism followed by a listing of wavelengths associated with hues. The electromagnetic spectrum is demonstrated with a scrolling sequence that extends from radio waves to gamma rays to set the context of the narrow range of visible radiation. The discussion of reflection and absorption is nicely augmented with an interactively changing surface that alters the combination of wavelengths reflected to a viewer. An advantage of this sort of interaction is that you can use it as you might use flash cards. You click on a button next to the surface-color name to show the wavelengths reflected and absorbed by an appropriately colored surface,

and thus you may pause to predict the result and test your understanding. This advantage for learning is more difficult to obtain with a printed demonstration.

Color Media presents an interesting collection of technical information. The description of how computer-monitor colors are created with red, green, and blue is well done. You click on color examples to see demonstrations of the mesh of phosphor dots that produce the monitor color. The problems of transferring monitor colors to video and the different mixes of primaries needed to approximate desired colors is demonstrated with many examples. On the film structure card, added depth of information is available; as you click on each of nine layers within the cross-section of color film, different descriptions appear in a window on the card. Additional information on color film and discussion of color printing and film recorders complete this chapter.

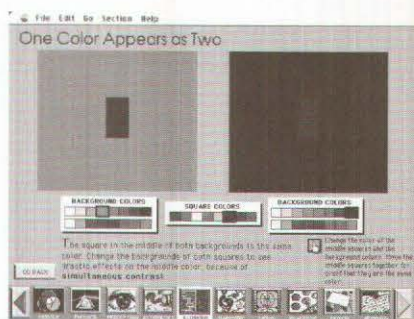
Accuracy is weakest in the **Color Perception** chapter. The topics summarized are the eye, rods and cones, color shift, color blindness, chromodynamics, and color psychology. Scenes are altered in an inviting manner to show rod vision with high and low levels of illumination, cone vision with high and low illumination, and perceptions for different categories deficient color vision. However, rods function only at low levels of illumination and cones function only with adequate illumination. The over-simplistic graphic presentation of the distinctions between these receptor systems is misleading. Likewise, color blind people with protanopia do have faulty long-wavelength sensitive cones but that does not render them literally red-blind, as suggested in the altered color scene (and neither are deuteranopes green-blind). Both protanopes and deuteranopes are termed red-

green deficient, meaning sets of reds and greens look the same to them. A correctly altered full-color scene would be very interesting because it is not only reds and greens that are confused by people with color deficient vision (color vision deficiencies are commonly described by families of lines radiating across the entire CIE-xy chromaticity diagram and involving all hues, not just red and green). An opportunity was missed to surprise us with an intriguing look through another's eyes. With the discussion of color shift you learn of the importance of illumination for hue perception with an opportunity to change scene illuminants.

The **Color Attributes** and **Color Harmony** chapters present an interesting suite of descriptions. Color attributes are numerous and the chapter deals with a reasonable subset: hue, saturation, value, color temperature (warm-cool), complementary colors, monochromatic colors, achromatic colors, analogous colors, neutralized colors, and color and line. Color harmony concepts are equally varied and adequately summarized with a focus on the work of Johannes Itten. Color dyads and triads are presented with an interactive additive color wheel and Itten's color wheel is the basis of the presentation of harmonies of contrast in hue, saturation, extension, light-dark, cool-warm, complementarity, and simultaneous contrast. In these two chapters, both additive complements and Itten's complements are presented, and a link back to the additive color card in the **Models** chapter is provided. An additional card distinguishing the different definitions of complementarity associated with the numerous color systems would be an appropriate addition to the application. Likewise, a distinction between lightness and brightness and a more accurate

definition of saturation (they use the limited white-to-intense definition from HLS) would be useful. The majority of cards in the **Attributes** and **Harmony** chapters allow you to select combinations of colors to compare contrast effects and color combinations.

The **Color Illusions** chapter is fascinating. Afterimages are demonstrated with a variety of colored forms that you stare at and then click to replace the image with a gray screen that lets you see a vivid complementary afterimage. Afterimages are also seen in the contrast reversal demonstrations. Simultaneous contrast effects are demonstrated with two identical grey lines on two colored patches. You are able to change the background colors and also drag one line over to the other to confirm that the hues induced into the gray are perceptual effects. Simultaneous contrast effects of black-and-white surrounds and black-and-white outlines are demonstrated under the heading of Bezold effects and simultaneous contrast is also used to make 'one color appear as two' (the demonstration offers the ability to change both background and center colors and move the affected squares to watch the instant effects of simultaneous contrast on color perception). The demonstration of spatial effects lets you experiment with advancing and receding hues, and the effects of area on color perception are investigated with the interactive contrast-of-extension card. All



of the illusion cards are interactive and allow you to try many color combinations that produce different magnitudes of effect. Your curiosity will be both piqued and sated by these flexible demonstrations. Being able to move affected colors into and out of their surroundings and experience the onset of the perceptual changes has a big advantage over demonstrating the effects on a static page (where you are likely to wonder if it really is the same color printed there). Adjust your room illumination to keep glare off your screen as you experiment with these sometimes-subtle perceptual illusions.

Finally, the application is blessed with an index we all wish every book could have. In the **Appendix** a scrolling alphabetical glossary presents words that you click on for a brief definition and you then have the option to find out more by clicking a button that takes you right to the appropriate card in the project. The bibliography card that complements the glossary is brief but includes a good cross-section of technical, psychological, and art references.

Summary

Interactive Color provides an even treatment of both scientific and artistic approaches to color. This hypermedia application has a consistent interface and good scripting (I encountered no programming bugs). It includes sophisticated graphics and opportunities for enlightening interaction. Turn the sound off from the control panel if you are using it in a public facility or everyone will be staring at you as the melodic earcons that introduce each chapter interrupt their train of thought. Then again, turn the sound up and maybe folk will come over to find out what this neat thing is that you are working with.

Details

System requirements to run *Interactive Color*: System 6.0.2 or later versions of Apple's system software, 4 megabytes (4096K) of memory minimum or more, 4.5 megabytes of free space on the hard disk, an 8-bit video card (256 colors). Recommended: fonts Avant Garde and Geneva, Adobe Type Manager or TrueType.

You can obtain *Interactive Color* via Internet or from SDSC directly. Download the application by anonymous ftp to sdsc.edu (132.249.20.22), login as "anonymous" and use your own name as the password. Then type the following:

```
cd [.sdscpub.applemac.graphics]
get interactive_color.hqx
```

The file "interactive_color.hqx" is a *Binhex* file containing the application and its support files. Copy it to your Mac using any file transfer program. Then launch *Stuffit*, or *BinHex* (version 4.0 or later), to uncompress the file and expand it onto your hard drive. There is no fee for your use and distribution of *Interactive Color* (they only ask that you do not sell it). Alternatively, SDSC will send you *Interactive Color* on two 3 1/2" high-density diskettes for \$10.00 to cover copying and handling (\$15.00 to Canada or international destinations). For more information, contact SDSC: Software Product Information, San Diego Supercomputer Center, PO Box 85608, San Diego, CA 92186-9784; (619) 534-5100, email: info@sdsc.edu

MAP REVIEW

Michelin's Central Washington DC Street Map

Reviewed by Sally S. Summerall,
National Geographic Society

As a map designer at the National Geographic Society and a Washingtonian, I find myself in the unique position of reviewing Michelin's new map *Central Washington DC* and comparing it to two well-known maps of the area — Travel Vision's *Washington, DC and Vicinity Road Map* and National Geographic's *Tourist Washington, DC*.

Michelin has done an admirable job producing its first map of a city in the United States. *Central Washington DC* is a big map (43" x 39"). It is informative to the point of symbolizing all the one-way rush-hour streets. The design isn't overly innovative. This map can stand alone or be used in conjunction with Michelin's *Green Guide to Washington, DC* which is informative and, in the Michelin tradition, guides the traveler to points both interesting and unusual.

When comparing it to its counterparts, there are similarities and differences in graphic treatment, paper size, map scale, and typography. The geographic facts of Washington, DC are for the most part a constant so it is up to the map designer, researcher, and/or compiler to create a visually appealing product that invites the user's interest and ensures readability. By exploring the various graphic and cartographic elements we can evaluate and compare how each of the maps succeeds, or fails, in delivering clear and concise information yet remain strong visually.

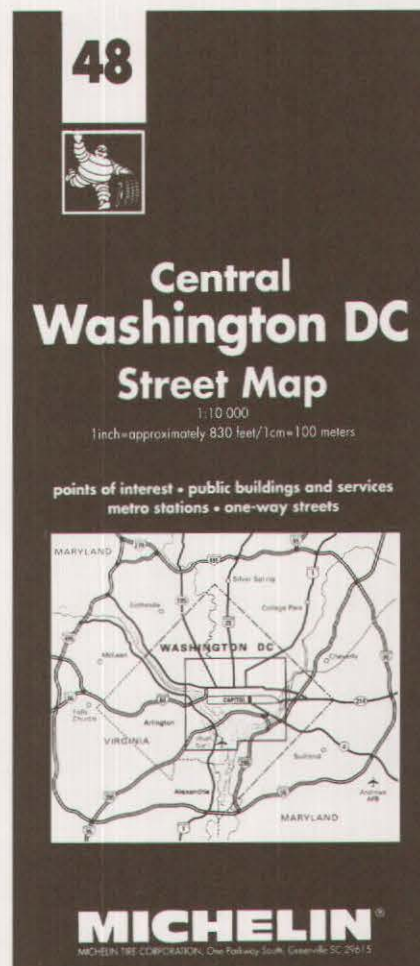
Michelin's *Central Washington DC* and Travel Vision's *Washington, DC and Vicinity Road Map* are similar in graphic treatment and paper size. Both are printed on large sheets of paper, although

Michelin's map — disappointingly — is printed only on one side. Although each shows downtown Washington, Travel Vision uses both sides of the paper to include a large map of the areas in and around the Virginia/Maryland Beltway. Michelin's inset map of the beltway is too small and difficult to read mainly because all of the roads are printed in the same red color with very little distinction between line weights.

The maps depict outlined city blocks and use similar pastel color schemes for background fills. Michelin's *Central Washington DC* does go one step further than Travel Vision's map — Points of Interest, Other Buildings, Parks and Cemeteries are also color coded. Both maps incorporate detailed line drawings of key government buildings. And both use a variety of symbols to depict various sites.

Symbols on maps can either be very helpful or just plain 'cartographic noise.' Travel Vision's map works very hard at naming each site represented by a symbol. In contrast, the user must study the legend more closely on the Michelin map in order to understand the symbolization. One symbol on the Michelin map that is an example of cartographic noise is the cemetery symbol. It is used as if it were a pattern instead of labeling a site. It just doesn't work. Arlington National Cemetery clearly designated in a bold face type should be enough to guide prospective visitors to this historic landmark.

The graphic treatment and size of National Geographic's *Tourist Washington, DC* is distinctly different from the Michelin and Travel Vision maps. *Downtown Washington, DC* is depicted in tones of gray, green, and red along with white for roads and blue for water areas. The other side, *Metropolitan Washington, DC* is designed using the same colors



with the addition of yellow-orange to clearly indicate the District of Columbia. The symbol design is conservative, limited to black squares, dots or triangles.

Designed to fold down to pocket size, when opened the National Geographic map shows downtown Washington, DC at almost the same scale as the much larger Travel Vision map, which in turn, is half as large as the Michelin map. In this case, one wonders why Michelin chose to use such a large format. And, in this day and age, why didn't they choose to utilize both sides of the paper? This map is too big to handle in the car while simultaneously maneuvering around all the DC traffic circles and one-way rush hour streets. It is also unwieldy when trying to refold.

Map typography is a real art, and a dying art. Many a cartophile

will tell you it's the typography that sets the great maps apart from the average ones. Selecting appropriate typestyles when designing and compiling a map should, therefore, not be taken lightly. Not all typestyles work well on maps. For that very reason, early in the history of National Geographic's Cartographic Division, Charles Riddeford designed typefaces exclusively for use on National Geographic's maps to give them character and an identity. The rest of the map-making world, it seems, is resolved to use such typefaces as Helvetica and Franklin Gothic.

Unlike its counterparts, Michelin uses predominantly Helvetica and members of its font family such as Helvetica Condensed. Overall, it's used well. But if, as on Travel Vision's map, they had used a few serif typefaces such as Times Roman, New Century Schoolbook or Memphis for drainage, water or large land features, Michelin could have presented us with an award winner. When only sans serif typestyles are used, the map can take on a 'produced on a computer' look. And, unfortunately, there are too many maps made today that have that similar look.

In conclusion, except for the size, I enjoyed using Michelin's new map *Central Washington DC*. I'd like to add that as more and more cartographers are designing, compiling and producing maps on computers they are faced with the challenge of remembering that the computer is only a tool. Strong typographic skills, a good sense of color, and a keen visual mind are paramount. It is the mapmaker's creative energy that produces useful, informative and beautiful maps.

Editor's note: Michelin's Central Washington DC Street Map earned a Best of Category Map Series award at the 1992 Map Design Competition of the American Congress on Surveying and Mapping.

BOOK REVIEW

Abrams, L.N. (1991) *Our Secret Little War*. Bethesda, MD: International Geographic Information Foundation, 87 pp. Softcover \$35. ISBN 0-944426-47-6. Library of Congress Catalog No. 91-071237

Reviewed by Michael Russell Rip, Michigan State University.

Automated mission planning and rehearsal systems (MP&RS) saw widespread use during Operation Desert Storm. The US Air Force, Navy, and Marine Corps credit such computerized systems with saving many aircraft and pilots from destruction by minimizing the number of sorties flown and ordnance delivered to achieve the desired objective. In fact, MP&RS enabled F-117A Stealth Fighters to plan their critical missions over the heavily-defended Iraqi capital, Baghdad. Rehearsing a mission prior to leaving the ground enabled pilots to develop a familiarity with the target area and decide on appropriate attack strategies and how best to use terrain to mask their approach and exit. Pilots employed these terrain visualization techniques to better understand the target and surrounding area, and plan flight information, routes, and produce flight maps. How this was achieved using MP&RS is one of the better kept 'secrets' of the 1991 Persian Gulf conflict. Two commercial remote sensing satellites, as well as a number of military satellite and aerial platforms, provided digital imagery at various spatial and spectral resolutions. LANDSAT and SPOT satellite imagery combined with digital terrain elevation data provided by the Defense Mapping Agency (DMA) within a MP&RS environment allowed for the development of three-dimensional perspective views along specific flightpaths and pilots were able to

interactively 'walk/fly through' areas of interest.

If military targets are visualized, and aerial bombing missions and attacks planned and practiced this way using digital computers in 1991, what techniques were used in earlier times, especially the military campaign waged against Western Europe during World War II? This is the subject of Abrams' book *Our Secret Little War*; something that appears to have been neglected in the plethora of titles dealing with the history of the Second World War.

In a capsule, this interesting 87-page book is the story of Leonard Abrams and his career — and those of many Allied men and women — in the model shop, officially referred to as V-Section. This joint British-American team were responsible for constructing accurate and highly detailed scale models of strategic and tactical targets and battlefields from aerial reconnaissance photographs. Many of the most important land, sea, and air attacks undertaken in western Europe during World War II were planned using these models. For example, a scale model of Peenemunde not only enabled intelligence experts to infer the real purpose of the site — the testing of the secret German V-weapons — but also became a briefing model for planning the successful heavy bomber attack.

Happily, this book is profusely illustrated with 32 pages of interesting, and in many cases never before seen black and white photographs of the three-dimensional scale models, including the only color photograph of the 1:5,000 scale Normandy (Cabourg-sur-Dives) model used in planning the D-Day invasion. From these pictures and text, the reader will come to respect the modelers' skills and techniques. In fact, the scale models were so detailed that it is difficult to distinguish the photograph of a model from a

reconnaissance photograph. In a time before the advent of modern two- and three-dimensional computer graphics and solid modeling, not to mention digital image processing systems, the construction of scale models by the V-Section extended the insights provided by traditional photo interpretation into the third dimension.

The book contains eleven chapters, covering the period from October 1942 to November 1945, a complete index and a fascinating illustrated glossary of model making that details the scale model production process using actual black and white photographs taken during the war.

Priced at \$35 and only available in softcover this volume is a relatively expensive item. Nevertheless, I can readily recommend *Our Secret Little War* to anyone with an interest in the history and uses of aerial photography, as well as those who build and/or use scale models.

LANDFORM MAPS AVAILABLE

The 1:3,500,000 scale shaded relief image of the United States described in Richard Pike's and Gail Thelin's featured article "Mapping the Nation's Physiography by Computer" (*Cartographic Perspectives* Number 8, Winter 1990-91) is now available. The 55.5" x 35.5" black and white sheet can be purchased for \$5 from U.S. Geological Survey Map Sales, Federal Center, Box 25286, Denver, CO 80225; (303) 236-7477.

Watch for a review of the Pike and Thelin relief image by Peirce Lewis in a forthcoming issue of the *Annals of the Association of American Geographers*.

Two value-added map products based on the Pike and Thelin image are available from Raven Maps and Images, 34 North Central, Medford, OR 97501;

(800) 237-0798. "The United States except Alaska and Hawaii" overlays color hypsometric tints, hydrography, roads, county seats and state boundaries (derived from USGS 1:2,000,000 National Atlas sheets) on the landform image. "Landforms and Drainage of the 48 States" is a black and white sheet that superimposes named hydrography. Both maps are 58" x 37" and are priced at \$35 (\$60 laminated) plus shipping. As we have come to expect from Raven, the maps are exquisitely printed.

U.S. TOPOGRAPHY DATA FOR PERSONAL COMPUTERS

The National Geophysical Data Center has developed a digital topography data and software package designed for personal computers. The package contains a complete 30-second resolution point topography data base for the conterminous United States and a set of software for accessing the data.

The data were originally developed by the Defense Mapping Agency Topographic Center and revised by the National Telecommunications Information Administration. The topography data set spans the entire United States (excluding Alaska and Hawaii) and a small portion of the bordering areas. Elevations are given for every 30-second by 30-second coordinate cell (approximately one square kilometer).

Access software which enables the user to select and extract data from any area within the data base is included. Menu-driven screens allow the user to choose the coordinate boundaries of the area to be extracted and select from columnar, array, or undelimited file format options. The program operates in DOS with no additional software needed. A separate user manual details software usage and data base information.

The price for the entire data set

and access software is \$310. Specify product number 168-A25-001. Regional subsets available for \$50 each. Call for details.

Data contributors and academic researchers should call (303) 497-6764 for information about obtaining data by special arrangement.

Make checks and money orders payable to COMMERCE/NOAA/NGDC. All foreign orders must be in U.S. Dollars drawn on a USA bank. A \$10 handling fee is required on all non-USA orders.

Orders may be charged to American Express, MasterCard, or VISA by telephone or letter; please include credit card account number, expiration date, telephone number, and your signature with the order.

Please direct telephone inquiries about these data to (303) 497-6764 or fax (303) 497-6513; internet: info@ngdc1.colorado.edu. Inquiries, orders and payment should be addressed to National Geophysical Data Center, NOAA, Code E/GC1, 325 Broadway, Boulder, CO 80303.

REFERENCE MATERIALS AWARDS

The National Endowment for the Humanities Reference Materials Program supports projects to prepare reference works that will improve access to information and resources. Support is available for the creation of dictionaries, historical or linguistic atlases, encyclopedias, concordances, reference grammars, data bases, text bases, and other projects that will provide essential scholarly tools for the advancement of research or for general reference purposes. Grants also may support projects that will assist scholars and researchers to locate information about humanities documentation. Such projects result in scholarly guides that allow researchers to determine the usefulness or relevance of specific materials for their work. Eligible

for support are such projects as bibliographies, bibliographic data bases, catalogues raisonnés, other descriptive catalogues, indexes, union lists, and other guides to materials in the humanities. In both areas, support is also available for projects that address important issues related to the design or accessibility of reference works. The application deadline is September 1, 1992 for projects beginning after July 1, 1993. For more information, contact: Reference Materials, Room 318, NEH, Washington, DC 20506.

MORE BIG MAP IDEAS

Young map makers tackle the United States

Sending out more than 200,000 TRIP-PLANS each year means a lot of mapmaking for the Allstate Motor Club. But the motor club has never tackled a U.S. map as large as the one recently made by 65 fourth-graders at Grove Avenue School in Barrington, Illinois.

The students, under the direction of teacher Jeff Andruss, used chalk to painstakingly sketch and color a 50'x85' map of the United States on the suburban Chicago school's playground blacktop.

"We created the map so kids could see all 50 of our states and where they were," Andruss says. Many educators have lamented children's lack of geographical knowledge.

"Any time kids can have a hands-on experience, the more rich it is," says Principal Cindy Kalogeropoulos. "We're trying to instill a sense of respect for different cultures in our country and throughout the world."

The Allstate Motor Club visited the fourth-graders shortly after they had completed the two-month project. Representatives from the motor club talked with the students and gave each of them a TRIP-PLAN to trace a route

from Chicago to Orlando, Florida. Grove Avenue is one of many Chicago-area schools that the motor club will visit this year to give students an early start in learning how to read and understand the kind of maps they will encounter in everyday life.

Andruss, who conceived the map project, also appreciated the smaller maps the motor club provided. "The kids got a greater sense of where the highways are, not just the state lines," he says. "I think they realize they have a whole world they haven't learned about yet." Andruss encouraged the students' learning by incorporating the map into outdoor games.

"Who can be the first one to Missouri?" Andruss asks, and students immediately dash to stand inside the state's border. Everyone involved in the project hopes that the students' enthusiasm will carry over into a real exploration of at least some of the 50 states.

Discovery Magazine, Spring 1992

Professional Playground Maps

An outfit named USA Designs (4855 W. 159 St., Oak Forest, IL 60452; (708) 535-2400) will professionally stencil a variety of large (typically 60'x30') multicolored maps on your asphalt or concrete surface. Customers can choose from world, continental and U.S. maps. Prices range from \$495 to \$1,895. The company states that map data are derived from standards set by USGS.

GENIP News, Fall/Winter 1991-92

map librarian bulletin board

MAP AVAILABILITY RECORDS ON GPO CATALOGING TAPES

GPO (the Government Printing Office) has been receiving feed-

back from vendors and the depository library community concerning the cataloging records for availability versions of map records as they appear on the GPO Cataloging Tapes. GPO's practice has been to produce multiple availability records with the same OCLC control number. This practice, combined with the normal duplication process performed by the Library of Congress, Cataloging Distribution Service (CDS), makes it difficult for many local systems to identify and process these records.

Current Procedure: GPO creates an availability record for each individual map quadrangle of a particular state by using the collected set records for the entire state. The collected set record is modified to reflect and identify each specific quadrangle, the record is then produced, which creates a bibliographic entry in the Monthly Catalog and on the GPO Cataloging Tapes. Each quadrangle in a state has the same OCLC control number, the OCLC control number of the collected set record. The availability records that identify each individual quadrangle do not appear on the OCLC database. The collected set record remains unchanged on the OCLC database.

GPO currently distributes collective and availability records for maps on the GPO Cataloging Tapes distributed by CDS. Only a portion of the map availability records are distributed following the deduplication process at GPO and the Library of Congress. A deduplication check is performed using the 001 field (OCLC control number) and the 005 field (date and time of latest transaction). If a single month's data contain multiple transactions with the same OCLC control number, only the latest iteration of a record is retained and distributed by CDS.

New Procedure: On December 9, 1991, GPO will begin to provide

permanent map availability records by creating a separate cataloging record for each quadrangle with its own unique OCLC control number. The start-up date for this procedure has been selected so that cataloging records reflecting the change in procedure will appear in the January 1992 GPO Cataloging Tapes. These cataloging records will appear in the March 1992 issue of the Monthly Catalog.

Cataloging for individual quadrangles will change to reflect more specific bibliographic identification of each quadrangle on the piece level. GPO will no longer use the existing collective set records for maps as the basis for the creation of map availability records. The use of a unique OCLC control number for each availability record will allow CDS to distribute all of the map availability records to GPO Cataloging Tape users. The permanent availability records will also be included on the OCLC database.

Users will be able to identify map availability records through the 949 Mark field. GPO will code subfield "a" of the 949 field as "AVR" to identify the record as an availability record.

For those GPO Cataloging Tape users who prefer not to select the map availability records, GPO will provide a one-time dissemination of the collective set records for each state. These records will appear on the January 1992 GPO Cataloging Tape only. They will not be available in the Monthly Catalog.

GPO will not change its current deduplication process for eliminating availability versions of serials and multi-part monographs. GPO will perform deduplication based on the 001 and 005 fields and these non-map availability records will not be sent to CDS for distribution.

If you have questions about this change in procedure contact: Laurie Beyer Hall, Chief, Catalog-

ing Branch (SLLC), U.S. Government Printing Office, Washington, DC 20401.

*Federal Depository Library Program
Administrative Notes
September 15, 1991.*

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.

Seavey, Charles A. (1992) Ranking and evaluating ARL library map collections. *College & Research Libraries* 53:1, pp. 31-43.

This study measures and analyzes the map collections of the Association of Research Libraries (ARL) using data from 1984 and 1988. The nature of the cartographic format means that the size of a map collection can, within limits, be viewed as a measure of information content. Problems with the collected map data are noted. Size of collections and growth rates are computed and elements of change noted. A composite index, based on size and growth figures, is developed and used to rank the ARL map collections. Cartographic collection ranks are compared to ARL library index ranks and found to have a weak correlation. Directions for future research are suggested.

Kain, Roger, J.P. (1991) Extending the agenda of historical inquiry: computer processing of tithe survey data. *History and Computing* 3:1, pp. 23-35.

Simple computer processing procedures are being employed in three projects in Exeter University Geography Department. These

have extended the range of questions which can be asked about a major historical source, the tithe surveys of mid-nineteenth century England and Wales. The projects concern the reconstruction of land ownership and occupation, the compilation of a national atlas of land use and farming systems in England and Wales, and the compilation of a comprehensive index to the cartographic characteristics and topographical contents of the whole body of tithe maps. The techniques employed include the sorting and merging of nominal data files, computer graphics and database management.

Gray, Dale M. (1991) Which way did they go? Tracing the mountain man's contribution to Rocky Mountain cartography. *Idaho Yesterdays* 35, Summer, pp. 2-15.

The information contained in the sketch maps and journals of 19th century fur trappers was used by cartographers to produce the first published maps of portions of the American west. Government mapping expeditions in the 1840s and 1850s relied on mountain men as guides. Their maps were used by Congress to help formulate western policy.

Charbonneau, Robert (1991) Satellite catch, *IDRC Reports* 19:2, pp. 12-13.

The NOAA-H satellite provides fishing information that is essential to small communities along the coast of Chile. Fishermen receive maps showing ocean surface temperatures. This information is provided through the SATAL project run by Catholic University of Valparaiso's School of Oceanography.

(continued on page 34)

featured article

Traditional and automated cartographic methods were used to compile a comprehensive map of environmental problems in Mexico. The map is part of the recently published *Atlas Nacional de México*. This paper outlines the procedures followed during the collection and analysis of data through to its cartographic expression. The recent increase in the publication of environmental maps at regional, national and global scales may increase awareness of the threatening effects of man-induced environmental disturbances.

Presently, land degradation is a popular issue because it is one of the principal problems that modern societies have to face the world over. It is commonly argued that man's technological ability to bring about great changes in the environment has in many cases overwhelmed nature's system. Natural sources of pollution such as dust particles from volcanic eruptions, methane and hydrogen sulfide gases produced by decay in marshes, and cyclic forest fires are considered minor threatening factors, since these pollutants are maintained at a level that allows regulation by complex dynamic ecosystem processes (Purdom and Anderson 1980).

Environmental problems increased dramatically in Mexico during the 1950's. However, it was not until twenty years later that several institutions undertook serious projects to study and solve these problems. Information on pollution and land degradation in Mexico at national (Toledo et al 1989), state or regional levels (SEDUE 1983-1986) is often either fragmented or too general. Environmental information is published mainly in papers, books, and a profusion of brochures, but it is rarely presented in maps (SAHOP 1976).

The Environment section of the 1990 *Atlas Nacional de México* is likely to be the first extensive attempt to cartographically describe the current situation of environmental problems and policies of the country at a national level. The Ministry of Agriculture published a map on environmental problems at a very general level (SAHOP 1976). *The Atlas del Golfo y del Caribe de México* (Centro de Ecodesarrollo y Secretaria de Pesca 1988), concerned with the problems derived from oil extraction and oil spillage, is an example of a regional environmental atlas.

Devoting a special section to environmental problems in a national atlas is a new phenomenon. Czechoslovakia in 1983 and Cuba in 1989 published national atlases containing sections on environmental issues. Other atlases treat these topics but include them within several sections, as for example the *National Atlas of the United States of America* (U.S. Geological Survey 1970), and the *Hydrological Atlas of Canada* (Ministry of Supply and Environment of Canada 1978). There are some examples of regional environmental atlases such as the *Environmental Atlas of the Greater Anchorage Area Borough, Alaska* (Selkregg 1976) and of atlases on more specific environmental topics like *Recognition of Air Pollution Injury to Vegetation: A Pictorial Atlas* (Air Pollution Control Association 1970). Finally it is important to mention the recently published *Atlas of the Environment: The Most Up-to-Date Report on the Ecological State of the World* (Geoffrey 1990).

More than 300 Mexican specialists from several universities and governmental institutions have contributed to the *Atlas Nacional de México*. This atlas consists of three volumes, with 163 sheets (92 x 66 cm) and 600 color maps. Topics are divided into seven sections: General Maps, History,

Mapping Land Degradation Factors in Mexico

María C. García
and Graciela Pérez

INTRODUCTION

María C. García is a graduate student in the Department of Forestry and Natural Resources, Purdue University

Graciela Pérez is a researcher in the Instituto de Geografía, Universidad Nacional Autónoma de México

THE ATLAS NACIONAL
DE MÉXICO

Society, Nature, Environment, Economy and Mexico in the World. Map scales include 1:4,000,000; 1:8,000,000; 1:12,000,000 to 1:16,000,000.

Volume I consists of a general introduction to the country in several general maps. The section on History describes the main events of the prehispanic, colonial, and the 19th century up to the Mexican revolution of 1910. Maps of the distribution of present population and of its main features (migration, urban systems, housing, education, culture and health) are grouped in the Society section.

Volume II is divided into Nature and Environment sections. The former section outlines the physical and biotic characteristics of the country. The latter shows the influence of man on the environment. It depicts the present level of disturbance of the main constituents of the environment (soil, water and vegetation). Some maps in this section describe the relationship between population and environment; others represent an evaluation of the impact on historically valued resources (cultural patrimony). Finally, one composite map evaluates the current conditions of the natural components of the environment.

Finally, **Volume III** deals with the most important economic activities of the country including agriculture, livestock raising, forestry, the oil industry and tourism. The last section of the atlas — Mexico in the World — depicts the international relations of the country.

This article describes the cartographic procedure followed during the production of the 1:4,000,000 scale Land Degradation Map which appears in the the Environment section of Volume II in the 1990 *Atlas Nacional de México*. It focuses on man's impact on the land while other maps in this section address hydrologic and atmospheric pollution.

Environmental degradation brought on by deforestation, forest fires, erosion, livestock grazing, oil, thermoelectric, chemical and other industries, as well as the effect produced by the infrastructure of human settlements and tourism have been mapped. The distribution of these elements and their environmental impact are addressed in cartographic form for the entire Mexican Republic.

METHODOLOGY

Evaluating land degradation factors and their consequences requires a holistic consideration of multiple interrelations between nature and society. However, owing to the complexity of the topic and the national scale at which it was to be treated we found it became necessary to select only the main factors affecting natural resources. Quality and amount of available information determined which factors were included and which had to be ignored.

Statistical data were provided by several governmental institutions including the Ministry of Ecology and Urban Development (SEDUE), Ministry of Agriculture and Water Resources (SARH), Institute of Forestry Research (INIF), and the Oil Company (PEMEX). Cartographic sources included various thematic maps dealing with industry (Perez 1984), transport (Chias *et al* 1989) and population (Gutierrez and Gonzalez 1989) as well as the analysis of information provided by newspapers on this topic covering a five year period.

Available information was analyzed, processed, and compiled on four main maps: a base map, a vegetation map, a point symbol map, and a polygon map representing degradation factors. Selection of the type of cartographic symbol to use for the different factors was based on the amount and accuracy of the available data and was constrained by a concern for visual clarity. During the printing process, these four maps were integrated into one.

Computer-assisted methods were used in several stages: to draw the vegetation map, to analyze the effect of several disturbance factors on a specific area, and to measure deforested and eroded areas, as well as the surface occupied by different vegetation types. The main software used was MICROMAP and AU220. However, the final map was produced conventionally.

Description of maps

To reduce complexity, we decided to depict only state boundaries and major main rivers on the base map.

Vegetation map

Existing recent vegetation maps of Mexico contained serious contradictions, owing mainly to the variety of scales and classification criteria. Taking into account that it was not possible to update vegetation data in a short term, and that there were no valid criteria for selecting a primary map source, we decided to compile a new map from information derived from other existing map sources: Flores *et al* 1971; Rzedowski 1978; SAHOP 1981; INEGI 1980-1985; and SARH 1976. These maps were digitized to standardize scale and to make comparison possible. Subsequently they were analyzed and a new version of the vegetation map at a scale of 1:4,000,000 was compiled. The vegetation classification used for this new map consisted of: rainforest; tropical subdeciduous forest; dry deciduous forest; thorny forest; xerophytic shrub; temperate forest; grassland; and low evergreen cloud forest (after Rzedowski 1978). Crops, grasslands, and secondary vegetation are also indicated on this map since they are important indicators of vegetation disturbance.

Point symbol degradation map

This map contains information on the distribution and magnitude of forest fires, industry, and the main urban settlements of Mexico. Forest fires are considered a direct impact factor (affecting land cover directly) while industry and urban settlements are indirect factors.

Forest fires

The available data on forest fires was so detailed (at the county level) and important to highlight, we decided to represent the distribution of fires as well as their level of impact on the forest.

Dot symbols were used to represent this factor; the size of the dots indicates the number of forest fires per year (1-10, 11-100 and 101-300) and colors show the surface affected (5-500, 501-10,000 and 10,000-30,000 hectares). Combining these data affords the user a general overview of the effect of fire. One can easily appreciate that most of the fires of Mexico have a low to medium impact on resources. Colors were selected such that lighter tones represent low impact and darker tones represent high levels of impact (Figures 2 and 4).

Industrial impacts

Different types of symbols were used to represent the distribution of highly polluting industries. In order to be systematic and for the sake of clarity, the same color gradient used for forest fires was used for the industry map legend (pink for low, orange for medium and red for a high level of impact). Oil, thermoelectric and nuclear power industries are indicated in black since they represent the most hazardous type of industry.

Available information was analyzed, processed, and compiled on four main maps. During the printing process these were integrated into one.

The evaluation of the three levels of degradation (low, medium and high) was based on records of emission volume and the number of industries. Industry types were selected according to the type of pollutant they were discharging into the environment.

Urban settlements

The impact of urban settlements is expressed by graduated circles (numbers of inhabitants in 1980, the year of the last census). The area of these settlements is indicated by two tones of blue.

Area symbols/degradation map

This map contains information on the environmental impact of erosion, atmospheric pollution and tourism. Of these three elements, the erosion problem was the most difficult to represent since it affects about 75 percent of the country. A fine hachure pattern was thus chosen to identify

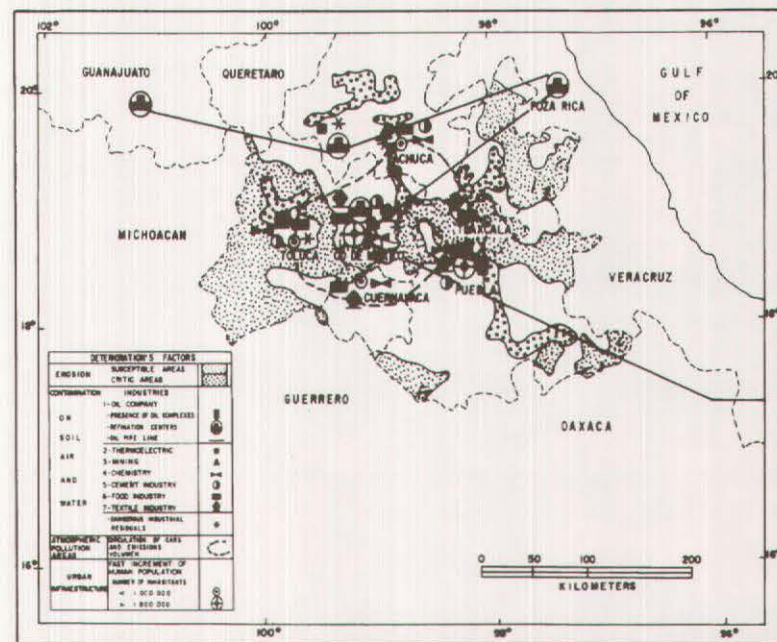


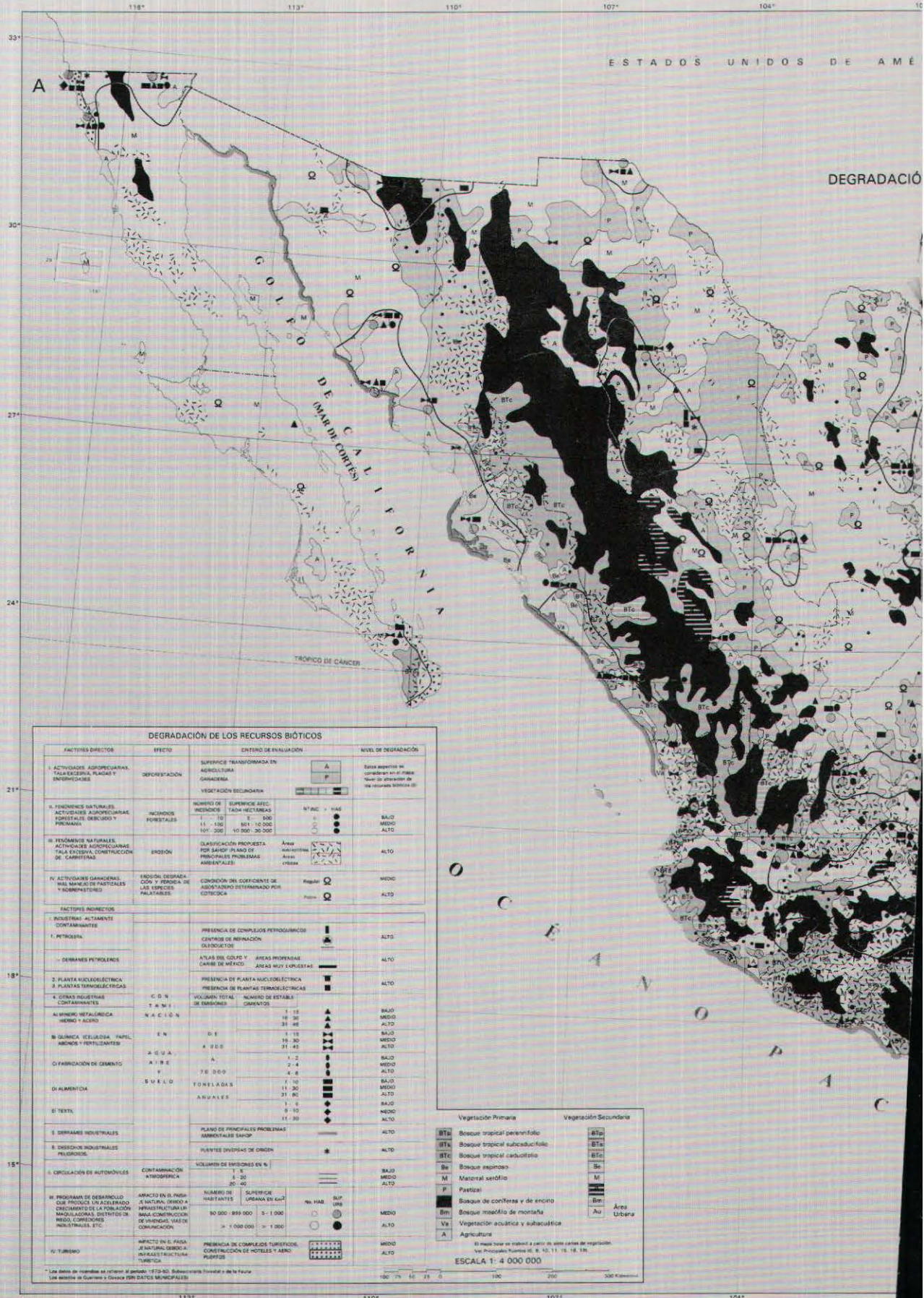
Figure 1: Compilation worksheet of erosion susceptibility, industrial impacts, atmospheric pollution and urban population in central Mexico.

eroded areas (Figures 1 and 3). Two different tones of brown were used to indicate either moderate or strong impact on the landscape.

Erosion problems in Mexico are related to the strongly dissected topography that dominates the country (about 75 percent of the landscape is volcanic). Climate, the mismanagement of crops and grazing activities, and highway construction also contribute to the problem.

The impact of tourism is closely related to urban settlements. This element has hardly been addressed as an important degradation factor in environmental literature. However, the recent trend to build giant resort centers has adversely affected the environment and thus this element was included in the map.

Finally, a general estimate of atmospheric pollution was included to focus attention on the lethal effects of some of these pollutants on the health of population. Areas immediately affected by atmospheric pollutants produced by cars and industries are depicted by three different types of lines. Considering that the reported emission volumes are not very



Original in color, 92cm x 66cm.

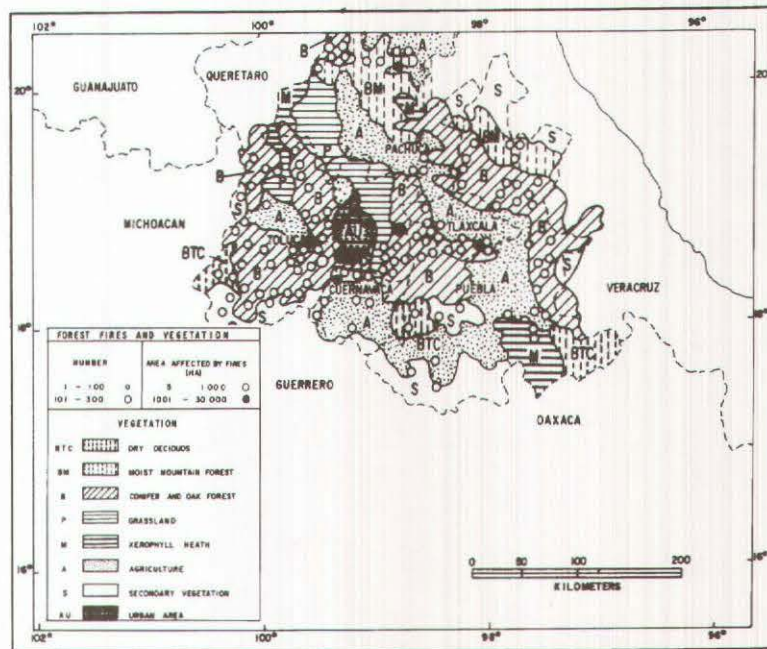


Figure 2: Compilation worksheet depicting vegetation types and forest fire locations in central Mexico.

accurate, an estimate was made on the basis of size of the urban settlements and the number of industries therein (Figures 1 and 3).

Integration of the land degradation map

As indicated above, these four maps were integrated during the printing process. A black and white halftone version of the final color map is reproduced as an insert to this publication at forty percent of original size.

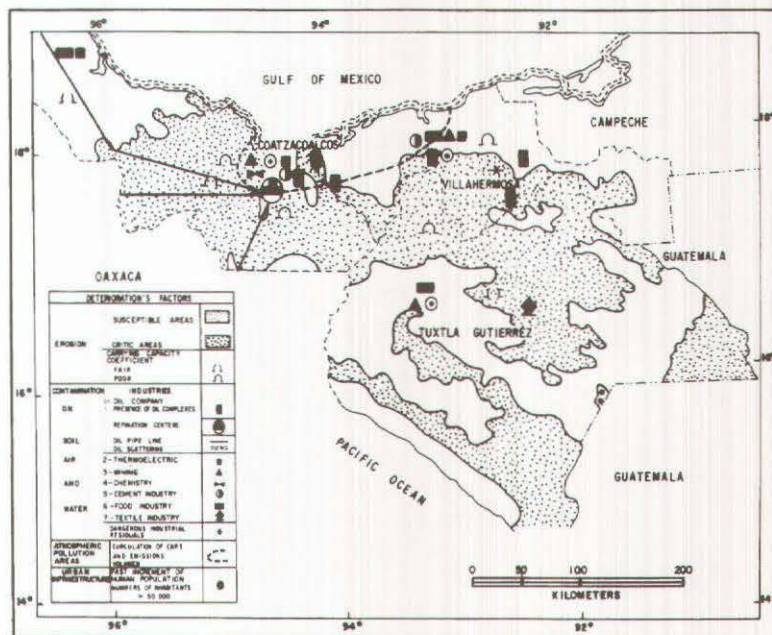


Figure 3: Compilation worksheet of erosion susceptibility, industrial impacts, atmospheric pollution and urban population in the isthmian area of Mexico.

The Central and the Isthmian regions of Mexico are most affected by human activities. Figure 1 shows the major industrial complexes of the country that are concentrated near the capital. Figure 2 shows the distribution of forest fires in this area and the type of vegetation they affect.

The main oil industry complexes are located in the Isthmian region (Figure 3). The impact of this industry is a more important environmental deteriorating factor in this area than forest fires (Figure 4).

CONCLUSIONS

The increasing awareness of environmental impact problems has brought about a major demand for information on this topic. This paper describes how this task can be accomplished cartographically.

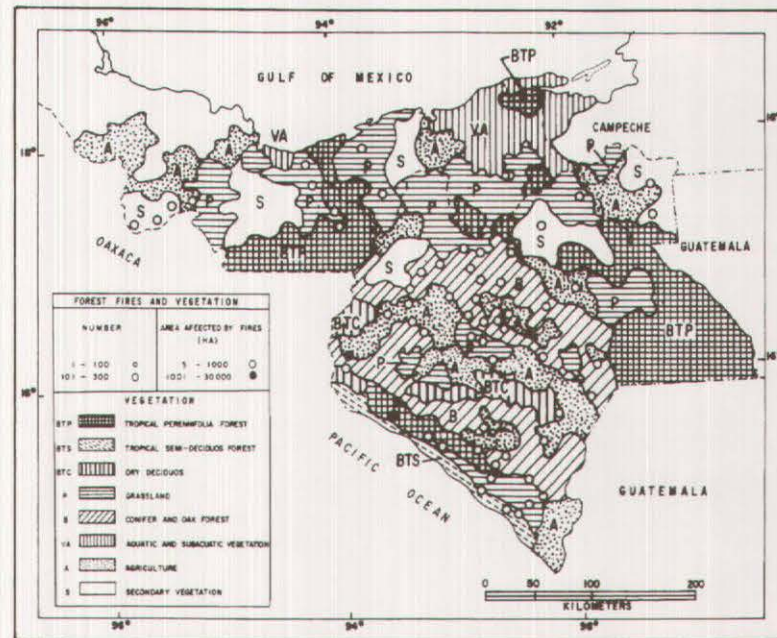


Figure 4: Compilation worksheet depicting vegetation types and forest fire locations in the isthmian area of Mexico.

Environmental maps are suitable both for informing general users about threatening agents and helping local and regional planning committees and environmental groups to identify the regions that require immediate attention.

The recent development of geographic information systems may be very helpful in the collection, ordering and analysis of data. This technology is especially useful for analyzing environmental problems that require a comprehensive approach to the multiple interrelationships between nature and mankind. However, in some cases computer generated maps have not been able to provide the same level of detail and information as those produced by conventional means. Therefore both automated and conventional methods of production were utilized for mapping land degradation factors in Mexico. Φ

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Un mapa de los problemas ambientales en México fue elaborado utilizando métodos cartográficos tradicionales y computarizados. Dicho mapa forma parte del nuevo Atlas Nacional de México, recientemente publicado. El presente artículo señala el procedimiento seguido desde la colección y análisis de la información hasta el momento de su expresión cartográfica. La difusión amplia de mapas ambientales a escala regional, nacional y global que se observa en los últimos años, puede influir de manera determinante en una mayor concientización de los efectos negativos en el medio ambiente debido al uso inadecuado de los recursos naturales.

RESUMEN

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featured article abstracts

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Automated Radar Video Map Production at NOS*Ronald M. Bolton & Russell A. Hoover*

The Aeronautical Charting Division (ACD), National Ocean Service (NOS), National Oceanic and Atmospheric Administration (NOAA) produces the Radar Video Maps (RVM's) used by air traffic controllers to monitor and control the Nation's airspace. These complex maps depict the local Federal Aviation Administration (FAA) airspace definition and show airways, intersections, holding patterns, selected navigational aids, special-use airspace boundaries, and other radar display elements critical to the traffic controller's radar scope displays. Previously produced by tedious manual methods, the ACD's Aeronautical Chart Automated Production (ACAP) system now provides the tools for automated production of this integral part of the FAA air traffic control system.

Produccion de Mapas Automatizados por Radar Video en la NOS

La División de Carta Aeronáutica (ACD), del Servicio Océano Nacional (NOS), de la Administración Atmosférica y Oceánica Nacional (NOAA) de los Estados Unidos de America produce los Mapas por el Radar Video (RVM) usado por los contralores de tráfico aéreo. Estos compuestos de mapas retratan la definición local de la Administración de Aviación Federal (FAA) y definen vías aéreas, intersecciones aéreas, separaciones de vías aéreas, selecciones de auxiliares de navegación, limites de espacio aéreo para usos específicos, y otros elementos de presentación radar en las pantallas usadas por los contralores. Previamente producido por métodos manual tedioso, el systema de Producción de Carta Aeronáutica Automatizada de la ACD ahora provee los instrumentos para la producción de mapas automatizados y forma una parte integral del systema de control de trafico aéreo de la FAA.

The Librarian's Dilemma: A Map Librarian's Access to Machine-Readable Information*Patrick McGlamery*

The paper addresses how a map librarian gains entree to the fast track world of computer cartography. The history of machine-readable information in libraries has been rocky. As information resides more frequently on tape or disk, libraries will need to embrace the technology. By obtaining seed money from a Federal Library Services and Construction Act grant, the Map Library at the University of Connecticut procured hardware, software and boundary files. With the aid of a research assistant, the librarian wrote a SAS program, PTOLEMY, which allows users to map their data. PTOLEMY is a menued environment running on the mainframe. Users may access the mapping system from remote sites.

El dilema del bibliotecario de mapas; su acceso a la información computarizado

Este artículo trata sobre cómo un bibliotecario de mapas consiguió entrar al versátil mundo de la cartografía por computador. Aunque la evolución de información computarizada en bibliotecas ha sido intermitente, a medida que mas información es almacenada en cinta odisco las bibliotecas

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tendrán que asimilar la tecnología e incorporarla en sus operaciones. Atravez de una subvención del Acta Federal de Servicios y Construcción de Bibliotecas, la biblioteca de mapas de la Universidad de Connecticut obtuvo equipos de computador, paquetes y programas, y archivos de frontera. Con la ayuda de un asistente de investigación, el bibliotecario escribió un programa en SAS, llamado PTOLEMY, que permite a usuarios trazar mapas con sus datos. PTOLEMY funciona a base de menús en el "mainframe," y los usuarios pueden entrar al programa desde puntos remotos.

Desktop Mapping at Temple University

Mark Mattson

In 1986 Temple University began applying desktop mapping and publishing software developed for the Apple Macintosh microcomputer as alternative tools for cartographic production. Our experience indicates that these tools can significantly reduce the costs associated with photo-mechanical production of thematic atlases while actually resulting in superior products. This article presents an overview of Temple's desktop mapping activities with the intent of stimulating wider discussion of this important alternative approach to map design and production.

Las Actividades Cartográficas de la Temple University

El desarrollo de la aplicación de paquetes de software para la publicación de mapas por la Temple University fue instigado en 1986 por la necesidad de buscar una alternativa para la producción de mapas por la micro-computadora Apple Macintosh. Nuestra experiencia indica que estos aperos pueden reducir significamente los costos asociados con el diseño y producción de atlases tematicos sin sacrificar la calidad de los gráficos. Este articulo presenta concisamente las actividades cartográficas de la Temple University con el proposito de estimular discursos pláticos sobre formas alternativas para el diseño y producción de mapas.

Color Chart Use in Map Design

Cynthia A. Brewer

Ten process-printed color charts based on the perceptually ordered Munsell system were previously developed. Sixteen cartographers with experience in color map design were mailed copies of the chart and were subsequently interviewed by telephone. The objectives of the interviews were to gather background information on the cartographers' general use of color charts and to examine the perceived usefulness of the Munsell-based charts as aids for map color selection. Approximately half of the interviewees were not satisfied with the color charts they were currently using. Over half of the cartographers had difficulties with differences between printed map and chart colors. As a summary of the interviews, eleven recommendations are made for the design of yellow-magenta-cyan charts of the conventional lithographers' format. Twelve of the cartographers judged the Munsell-based charts as potentially useful aids for map color selection, especially for the design of

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thematic color progressions. Likewise, the cartographers' solutions to difficulties with the layouts of their conventional charts indicated that a different chart organization, possibly perceptual, would be useful to cartographic designers. Overall, the interviews revealed a surprising diversity of opinions about and requirements of color charts that are used in map design.

La Utilización de Cartas de Colores en el Diseño Cartográfico

Diez cartas de colores de proceso de imprenta, basado en el sistema de orden perceptual Munsell, fueron desarrolladas. Se despacharon copias de estas cartas a diez y seis cartógrafos con práctica en el diseño de mapas coloreados, y subsiguientemente fueron entrevistados por teléfono. El objetivo de las entrevistas fue para obtener un historial de el uso percibido de la carta base Munsell para asistir en la selección de colores. Sobre un mediano de los entrevistados no estaban satisfechos con la carta de color que usaban corrientemente. El otro grupo, tuvo dificultad con la diferenciación de los colores entre los mapas impresos y los colores de la carta. Sumariamente, once cartógrafos recomendaron el diseño de una carta para los colores amarillo, azul, y rojo en un formato convencional litográfico. Doce cartógrafos votaron por la carta base Munsell como un auxiliar útil en la selección de colores, especialmente en el diseño temático de la progresión de colores. Igualmente, estos cartógrafos indicaron que las dificultades que tuvieron con el modelo convencional pudiera ser corregido por una reorganización de la carta, posiblemente perceptual, que sería más útil para los diseños cartográficos. Sobretodo, las entrevistas revelaron una diversidad de opiniones sobre los requerimientos para el uso de las cartas de colores en el diseño cartográfico.

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Choosing Tools: Nine Metaphors of Four-Dimensional Cartography

Philip J. Gersmehl

Animated maps are now technically and economically feasible. Like other forms of cartography, map animation has some unique design considerations, which involve a variety of tradeoffs. Making these tradeoff decisions is easier if we acknowledge that different animation software packages seem to embody a number of different perspectives — a 'flipbook' style of animation, for example, is suited to different tasks than a 'stage-and-actor' or a 'model-and-camera' program. This paper contrasts nine different animation metaphors, with special attention to the degree to which a given tool allows a cartographer to make particular kinds of revisions.

**Nueve Metáforas de la Cartografía Cuádimensional —
La Selección de Aperos**

Corrientemente la cartografía animada es económica y técnicamente factible. Como otras expresiones cartográficas, la animación de mapas exige que el cartógrafo considere un diseño específico y conceda la posibilidad de su alteración. El decidir la forma de alteración es más sencillo si uno reconoce que distintos paquetes de software de animación contienen distintas perspectivas — por ejemplo, el estilo de animación "flipbook" acomoda una distinta tarea que el programa de "actor y

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escenario" o el de "la camera y el modelo." Este escrito compara nueve metáforas de animación distintas, con un énfasis a los aperos que asisten al cartógrafo a hacer cambios específicos a su diseño cartográfico.

Maps in Children's Literature

Jeffrey C. Patton & Nancy B. Ryckman

This paper reports the findings of a survey conducted to determine the frequency and use of maps in two categories of children's fiction books: those aimed at children just beginning to read and those intended for readers at the third to sixth grade level. The number of maps, type, purpose and general scale were noted. Results from the two samples were compared to similar information gathered for the Newbery and Caldecott award and honor winning books. While books for older children had twice as many maps as those for beginning readers the Newbery and Caldecott books had the highest percentage. Large scale maps were used more frequently than small scale maps and the number of fantasy maps and real maps was about equal. Maps tended to be used to explain the spatial events of the story but also many were employed as props or as general locational illustrations with little reference to the story.

El Uso de Mapas en la Literatura Infantil

Este escrito expone las encuestas de un reconocimiento producido para determinar la frecuencia de el uso de los mapas en dos categorías de la literatura novelesca infantil: esos diseñados para niños que empiezan a leer y esos diseñados para los lectores a el nivel del tercero al sexto grados. La frecuencia de uso, el tipo, el propósito, y la escala general de los mapas fueron notados. Los resultados de las dos pruebas fueron comparado con información similar buscada en los libros aclamados de Newbery y Caldecott. Mientras los libros diseñados para los niños mayores contenían el doble de los mapas que esos diseñados para los niños menores, generalmente los libros de Newbery y Caldecott contienen un gran por ciento. Mapas con escalas grandes fueron utilizados con más frecuencia que esos conteniendo escalas pequeñas y el uso de mapas de fantasía y de mapas efectivos fue uniforme. En los cuentos, los mapas fueron usado para explicar acontecimientos especiales y igualmente fueron utilizados como ilustraciones generales con poca referencia a la historia.

Ethical Problems in Cartography

*Patrick McHaffie, Sona Karentz Andrews, Michael Dobson
& Two anonymous employees of a federal mapping agency*

The problem of defining and actualizing standards of ethical conduct troubles many professions, including cartography. In an attempt to formalize the ethical discourse in cartography the editors of *Cartographic Perspectives* invited five contributors to discuss what they perceive as important ethical problems in the discipline. The contributors were selected from the three major sectors of the cartographic enterprise: commercial mapping organizations, government mapping agencies,

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and university geography departments offering cartography programs. The contributors identify personal and institutional vigilance in product quality assurance, map plagiarism through violation of copyright law, and conflicts of interest as important ethical issues.

The commentary concludes by questioning the nature and validity of cartography's claim to truth ("accuracy"), and asserts that cartographic ethics cannot be extricated from the values of the larger society which commissions the production of cartographic information.

Los Problema Éticos en la Cartografía

El problema de determinar y formular una medida de conducta ético causa dificultad en muchas profesiones, incluyendo la profesión cartográfica. Para procurar y formalizar un discurso ético en la profesión cartográfica, los redactores de *Cartographic Perspectives* invitaron a cinco contribuidores a que examinaran sus percepciones de los problemas éticos en esta doctrina. Los contribuidores fueron seleccionados de los tres mayores sectores de la empresa cartográfica: organizaciones cartográficas comerciantes, agencias cartográficas del gobierno nacional, y universidades con departamentos de geografía que ofrecen cursos de cartografía. Los contribuidores identificaron la vigilancia que ellos y sus instituciones siguieron en asegurar la calidad del producto cartográfico, el plagio cartográfico a través de la violación de la propiedad de una obra cartográfica, y el conflicto de intereses como temas éticos importantes.

El comentario concluye por cuestionar la inclinación y validez de la pretensión cartográfica a la exactitud, y afirma que los éticos cartográficos no pueden estar desconectados del significado exacto de nuestra sociedad que comisiona la producción de la información cartográfica.

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Mapping the Nation's Physiography by Computer

Richard J. Pike & Gail P. Thelin

Recent advances in computer technology present opportunities for the machine visualization of topography. A new shaded-relief map of the conterminous United States is the first one-sheet graphic of U.S. landforms larger than Erwin Raisz's classic 1939 hand-drawn panorama. The 1:3,500,000-scale digital image (about 4.5' long), reproduced here at 1:10,000,000, has greater fidelity and detail than portrayals of this large area by artistic (manual) techniques. The new map also shows synoptic topography more clearly than contoured elevations, satellite images, or radar mosaics. We created the map by processing 12,000,000 elevations (digitized from 1:250,000-scale topographic sheets at a grid resolution of 0.8 km) on a VAX-11/780 computer, using proprietary software, a modified Lambert photometric function, 255 gray tones, and the method of Pinhas Yoeli as implemented by Raymond Batson and others.

La Construcción de un mapa fisiográfico de los Estados Unidos por computadora

Recientes avances en la tecnología de computadoras presenta nuevas oportunidades para la formación de modelos topográficos. Un reciente mapa de relieve matizado de los Estados Unidos contermino es el primer modelo gráfico de sola lamina que detalla la topografía Americana en un

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formato mas grande que el del clásico panorama de 1939 dibujado por Erwin Raisz. El imagen digital, a una escala de 1:3,500,000 (mediendo aproximadamente 11.43 centímetros de largo), reproducido a una escala de 1:10,000,000, contiene mejor detalles y una veracidad superior sobre otras representaciones producidas manualmente. La topografía sinóptica de este mapa es mas detallada que esas de elevaciones contornas, imagenes satélicas, y mosaicos por radar. Este mapa fue producido procesando 12,000,000 puntos de elevaciones (digitizados de laminas topograficas con una escala de 1:250,000, conteniendo una resolución triangular de 0.8 kilómetros) en una computadora VAX-11/780, usando software propietaria, una función fotométrica modificada de la proyección Lambert, 255 tonos grises, y el método Pinhas Yoeli implementado por Raymond Baston y otros.

Computer-aided Mapping for Facilities Management and Environmental Compliance

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

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+*.

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

Con el aumento de requerimientos para el mantenimiento del medio ambiente y la reducción de personal y provisiones en las oficinas, administradores afrontan la necesidad crítica de obtener acceso rapido a los Sistmeas 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 cartográfico enlazado a un database management software de un tercer partido. Este resumen explica como una instalación militar en Hawaii, usando *AutoCAD* y *dBase III+*, construyo con suceso cierto sistema.

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Ethics and Map Design

Six Strategies for Confronting the Traditional One-Map Solution

Mark Monmonier

Traditional, positivist approaches to map design usually yield a single map. These one-map solutions foster a highly selective, authored view reflecting consciously manipulative or ill-conceived design decisions about many factors, such as map scale, geographic scope, feature content, map title, classification of data, and the crispness or fuzziness of symbols representing uncertain features. As a result, the rightfully skeptical map viewer ought to question whether (a) an ulterior motive led to a biased view of reality favoring the author's philosophical or political biases or economic goals, or (b) a lazy map author failed to explore designs offering a more coherent or complete picture of reality. Technology has aggravated the problem of one-map solutions by placing powerful mapping software at the disposal of amateur cartographers who can generate convincing-looking graphics with little or no understanding of their data or the principles of mapping. And technology also allows devious map makers to perfect designs that support their points. But technology can also foster greater openness and more complete understanding of maps and their meaning, and thereby provide a more ethical approach to cartographic analysis and communication. After discussing the problem of single cartographic views, I present six strategies for a more open and overtly critical cartography in which one-map solutions are both rare and suspect.

Eticos y el Diseño Cartográfico

Seis Estrategias para Confrontar Las Tradiciones de Producir Un Mapa

Tradicionalmente, el curso inherente de un diseño cartográfico es la producción de un mapa. Esta tradición es creada por una perspectiva selectiva reflejando una manipulación consiente o la mal formulación de ideas y decisiones que afectan un diseño cartográfico como la escala, el objeto geográfico, el contenido de el mapa, el título, la clasificación de la data, y el nivel de detalle de esos símbolos que representan facciones que dirigen a una interpelación. Como resultado, el excéptico y recto veedor cartográfico debe poner en cuestión si (a.) el motivo ulterior talla a un aspecto que tuerce la realidad favoraciendo las opiniones filosóficas o politacas, o motivos económicos de el autor, o (b.) si un disidioso cartógrafo fallo de examinar diseños ofreciendos un retrato mas coherente o completo de la realidad. Hoy en dia la tecnología ha agravado el problema de delinear un mapa por que el cartógrafo aficionado, sin tener entendimiento de la data o de los fundamentos de cartografía, tiene a su desposición software que puede producir gráficos convincentes. La tecnología tambien permite que los cartógrafos errados perfecciónen sus diseños para atestiguar sus casos. Pero la tecnología tambien puede nutrir mas ingenuidad y mas comprensión completa de los mapas y sus intenciones, y por este medio proporcionar un acceso etico a la comunicación y el análisis cartográfico. Despues de examinar el problema de un concepto cartográfico, este escrito presenta seis estrategias para críticamente examinar los fundamentos cartográficos donde los objetivos y las producciones de mapas que a la misma vez son cuestionable y poco común.

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**A Content Analysis and Comparison
of Three Cartographic Journals: 1964-1989**

*Pat Gilmartin (with commentaries by Bernard Gutsell, David Fairbairn
and Robert B. McMaster)*

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The contents of three major English-language cartographic journals from Great Britain, Canada, and the United States were analyzed and compared to determine if there are significant differences among them. Results show considerable similarities in the publication of user-oriented research and articles related to automated cartography. The three journals varied considerably in their publication record for historical cartography and several other relatively minor categories. The question of editors' influence on journal content was considered and input sought from representatives of the three journals in the study.

**Una Comparasion y Análisis de el Contenido
de Tres Jornales Cartográficos**

El contenido de tres influenciales jornales cartográficos Británico, Canadiense, y Norte Americano fueron comparados y analizados para determinar si existen diferencias en sus contenido. Los resultados indican considerable semejanzas entre la publicación de artículos sobre la cartografía asistida por el uso de computadoras y en los procedimientos en las investigaciones cartográficas. Los tres jornales variaron considerablemente en la cantidad de artículos sobre la historia de la cartografía y otras menores categorías. La cuestión de la influencia de los editores sobre el contenido de los jornales fue considerado y el comentario de representativos de estas publicaciones fue procurado.

Mapping Land Degradation Factors in Mexico

María C. García and Graciela Pérez

Φ 12 Spring 1992

Traditional and automated cartographic methods were used to compile a comprehensive map of environmental problems in Mexico. This map is part of the recently published *Atlas Nacional de México*. This paper outlines the procedures followed during the collection and analysis of data through to its cartographic expression. The recent increase in the publication of environmental maps at regional, national and global scales may increase awareness of the threatening effects of man-induced environmental disturbances.

Un mapa de los problemas ambientales en México fue elaborado utilizando métodos cartográficos tradicionales y computarizados. Dicho mapa forma parte del nuevo *Atlas Nacional de México*, recientemente publicado. El presente artículo señala el procedimiento seguido desde la colección y análisis de la información hasta el momento de su expresión cartográfica. La difusión amplia de mapas ambientales a escala regional, nacional y global que se observa en los últimos años, puede influir de manera determinante en una mayor concientización de los efectos negativos en el medio ambiente debido al uso inadecuado de los recursos naturales.

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Surface temperature is one of the key factors indicating the presence of white tuna and swordfish. Satellite maps have enabled fishermen to identify the fishing grounds more easily. The satellite's radiometer records and transmits the information to the University of Chile's Space Research Center. From there the information is relayed to Valparaiso; the maps are then interpreted and transposed into forms that can be easily read by the fishermen.

One of the visible effects of the use of satellite maps has been the steady migration of fishing grounds. Since the maps were introduced the fishermen have ventured farther offshore and extended their fishing grounds. Also, the fishing season for tuna and swordfish has been extended by four months.

Plans call for improving data analysis, map production, and the dissemination of the information to larger number of fishermen. At the same time, attention must be given to mechanisms for making such a service pay for itself; the maps cost \$70 and the cost will eventually have to be passed on to the users.

Editor's note: IDRC stands for International Development Research Centre of Canada.

cartographic events

EVENTS CALENDAR 1992

June 2-6: **Canadian Cartographic Association and Carto-Quebec Joint Annual Conference**, Montreal, Canada. Contact: Norman Drummond, Geography Department, McGill University, 805 rue Sherbrooke Ouest, Montreal, Quebec H3A 2K6; (514) 398-4939, fax (514) 398-7437.

June 15-18: **Computer Vision & Pattern Recognition**, Chancellor Hotel and Convention Center, Champaign, IL. Contact: Azriel Rosenfeld, e-mail: ar@alv.umd.edu

July 12-16: **Urban and Regional Information Systems Association '92 Annual Conference**. Washington, DC. Contact: URISA, 900 Second St. N.E., Suite 302, Washington, DC 20002; (202) 289-1685.

August 2-14: **17th International Society for Photogrammetry and Remote Sensing Congress**, Washington, DC. Contact: 17th ISPRS Congress Secretariat, Box 7147, Reston, VA 22091; (703) 648-5110, fax (703) 648-5585.

August 3-7: **5th International Symposium on Spatial Data Handling**. Charleston, SC. Contact: David J. Cowan, University of South Carolina, Columbia, SC 29208; (803) 777-6803. Email: Cowen@Otis.HSS.SCarolina.EDU

August 9-14: **27th International Geographical Congress**, Washington, DC. Contact: Anthony de Sousa, 27th IGC, 17th and M Sts. NW, Washington, DC 20036, (202) 828-6688.

September 14-17: **1st Australian Conference on Mapping and Charting**, Adelaide, Australia. Contact: Australia Key Centre in Land Information Studies, GPO Box 2434, Brisbane, Australia 4001; (617) 864-2900, fax (617) 229-2659.

September 30-October 4: **24th Annual Conference of the International Visual Literacy Association Imagery in Science and the Arts**, Pittsburgh, PA. Contact: Dr. Barbara Seels, Instructional Design and Technology, 4A16 Forbes Quadrangle, University of Pittsburgh, Pittsburgh, PA 15260; (412) 648-7338, fax (412) 648-5911.

October 6-9: **GISDEX, the Geographic Information Systems Conference and Exposition, Focusing on the use of GIS in the Federal Government**, The Washington Hilton, Washington, DC. Contact: USPDI, Inc. (301) 445-4000, fax (301) 445-5722.

October 14-17: **North American Cartographic Information Society XII Annual Meeting**. The North American Cartographic Information Society (NACIS) will hold its twelfth annual meeting at the Ramada Inn in St. Paul, MN.

The program for this year's meeting will include such topics as cartographic activities in Latin America and Canada, spatial development in children, cartographic education, design, mapping software, geographic information systems,

navigation, and map library technology. There will be a mixture of contributed papers, invited papers, keynote speakers, poster displays, panel discussions, exhibits, and field trips. In addition a full day workshop on animated cartography will be offered (registration for this workshop is limited). Persons interested in presenting papers should submit an abstract by July 1, 1992. For program and registration information contact: Dr. Jeffrey C. Patton, Department of Geography, University of North Carolina at Greensboro, Greensboro, NC 27412; (919) 334-5388.

November 6-12: **GIS/LIS 1992 Annual Conference and Exposition**, San Jose, CA. Contact: ACSM, 5410 Grosvenor Lane, Bethesda, MD 20814; (301) 493-0200, fax (301) 493-8245.

1993

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

April 6-9: **Association of American Geographers Annual Meeting**, Atlanta, GA. Contact: Kevin Klug, AAG, 1710 16th St. N.W., Washington, DC 20009-3198; (202) 234-1450.

CALL FOR PAPERS

16th International Cartographic Conference — ICC '93.

Cologne, Germany, May 3-9, 1993.

The U.S. National Committee for the International Cartographic Association solicits papers from U.S. authors for presentation at the 16th International Cartographic Conference in Cologne, Germany, May 3-9, 1993. Abstracts of 300-500 words are due by June 1, 1992.

The cartographic conference will be held concurrently with the 42nd Annual Meeting of the German Society of Cartography. Coinciding with the cartographic meetings will be the 2nd geotechnica — an international trade fair and congress for geosciences and technology. This trade fair is expected to draw 20,000 technical visitors to exhibits from 500 vendors.

The theme of ICC '93 is **Maps for Knowledge, Action and Development**.

The Organizing Committee for the Conference states that papers should fit into one or more of the following categories:

§ **Maps for Knowledge**

Representation. New Tasks, New Techniques, New Terms; Space and Map Perception and Language Representation; Atlas Cartography; Map Based Information Systems (National, Regional, Urban, Utilities, etc); Interactive and Educational

Cartography; Multimedia Displays and Hypermapping.

§ Maps for Action and

Movement. Navigation Systems; Maps for Protection and Disaster Prevention; Tourism Cartography; Mass Media Cartography; Maps for Public Relations and Advertising.

§ Maps for Development and Planning.

Mapping Statistics for Development; Mapping Land Use; Mapping Across Borders; Marketing Cartographic Data. To receive the Preliminary Program with proper forms for submitting an abstract write: AKM, Congress Service, Clarastrasse 57, CH-4005 Basel, Switzerland. Copies are also available from Robert Marx, Chair, USNC Papers Committee, 8312 Oakford Drive, Springfield, VA 22152. Authors who want to apply for funding through the U.S. National Committee should 1) write for the Preliminary Program with the forms for the abstract; 2) submit an abstract to Germany on the forms provided by June 1, 1992; 3) submit a copy of that abstract by June 1 to Robert Marx, Chair, USNC Papers Committee.

NACIS news

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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.

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*REQUEST FOR NOMINATIONS

Those positions marked by an asterisk are open for nomination for 1992-93. Three Directors-at-large, the Vice President and Treasurer must be elected by our next annual meeting. Please forward nominations to: James F. Fryman, Geography Department, University of Northern Iowa, Cedar Falls, Iowa 50614-0416. When forwarding nominations include a letter of

acceptance and a short vita for use on the annual ballot. Nominations should be made of individuals who are currently members of NACIS in good standing.

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; (301) 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, Middlesex, EN3 4SF, England.

Cartouche. 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, P.O. Box 8000, Lindsay, Ontario K9V 5E6 Canada; (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, M3H 5T8 Canada; (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, Lynton, 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 newsletter of the Association of Map Memorabilia Collectors offers a unique mix of feature articles, news, puzzles, and announcements of interest to cartophiles. ISSN 0894-2595. Contact: Siegfried Feller, publisher/editor, 8 Amherst Road, Pelham, MA 01002; (413) 253-3115.

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

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

Information design journal. Triannual publication of the Information Design Unit. Features research articles reporting on a wide range of problems concerning 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 education are featured. Contact: NCGE, Leonard 16A, Indiana University of Pennsylvania, Indiana, PA 15705; bitnet: CLMCCARD@IUP.

FEATURED PAPERS

Each issue of *Cartographic Perspectives* includes a featured paper, which is a refereed article reporting original work of interest to NACIS' diverse membership. Papers ranging from theoretical to applied topics are welcome. Prospective authors are encouraged to submit manuscripts to the Editor or to the Chairperson of the NACIS Publications Committee. Papers may also be solicited by the Editor from presenters at the annual meeting and from other sources. Papers should be prepared exclusively for publication in *CP*, with no major portion previously published elsewhere. All contributions will be reviewed by the Publications Committee, whose members will advise the Editor as to whether a manuscript is appropriate for publication. Final publication decisions rest with the Editor, who reserves the right to make editorial changes to ensure clarity and consistency of style. No house style is imposed, but spelling, references, and notes must be consistent within papers.

REVIEWS

Book reviews, map reviews, and mapping software reviews are welcome. The Editor will solicit reviews for artifacts received from publishers. Prospective reviewers are also invited to contact the Editor directly; review copies of new books, maps and software can often be acquired at no cost.

FUGITIVE CARTOGRAPHIC LITERATURE

Information of interest to map makers, librarians, and educators appears in diverse publications. We invite synopses of reviews, news, and papers found in outlets not usually associated with cartography, map librarianship, or geography.

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Cartographic Perspectives is designed and produced in a microcomputer environment. Therefore, contributions to *CP* should be submitted in digital form on 3.5" or 5.25" diskettes. Please send paper copy along with the disk, in case it is damaged in transit.

Text documents processed with Macintosh software such as *WriteNow*, *WordPerfect*, *Word*, and *MacWrite* are preferred, as well as documents generated on IBM PCs and compatibles using *WordPerfect* or *Word*. ASCII text files are also acceptable.

PostScript graphics generated with *Adobe Illustrator* or *Aldus FreeHand* for the Macintosh or Corel Systems' *Corel Draw* for DOS computers are preferred, but generic PICT or TIFF format graphics files are usually compatible as well.

For those lacking access to microcomputers, typed submissions will be cheerfully accepted. Manually produced graphics should be no larger than 11 by 17 inches, designed for scanning at 600 dpi resolution (avoid fine-grained tint screens). Continuous-tone photographs will also be scanned.

Submissions may be sent to: David DiBiase, Department of Geography, 302 Walker Building, Pennsylvania State University, University Park, PA 16802; (814) 863-4562; email: dibiasi@essc.psu.edu.

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For membership in the North American Cartographic Information Society please send your name, address, name of your organization, your position and mention your cartographic interests along with a check payable to NACIS to Edward J. Hall, Treasurer, Map Library, 410 McGilvrey Hall, Kent State University, Kent, OH 44242-0001. Membership fees for the calendar year are as follows:

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Department of Geography
302 Walker Building
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