

cartography bulletin board**New Cartography and Geographic Information Systems (GIS) Lab at the University of Wisconsin-La Crosse**

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This past year, I received a National Science Foundation (NSF) ILI Equipment Grant for the amount of \$38,000, a typical amount for an NSF undergraduate equipment grant. In addition, a related grant of \$5,000 was provided by the Environmental Management Technical Center (EMTC) of the U.S. National Biological Survey in Onalaska, Wisconsin. These two grants with a total of \$43,000 were matched by the University of Wisconsin-La Crosse (UW-L), giving a grand total of \$86,000 as the budget to build a new Cartography/GIS Lab.

The primary function of this proposed lab was to allow the integration of different courses that relate to the mapping sciences into a GIS. These courses include introduction to GIS, remote sensing, aerial photo interpretation, field mapping and Global Positioning System (GPS), cartographic methods (including multimedia cartography), and advanced GIS.

At the time of writing the grant, the goal was to equip the lab with six Sun Sparc stations in a local network to run UNIX-based ARC/INFO, plus other mapping software packages. Additional peripherals would include an e-size plotter, several smaller size digitizers, and a high-quality projector. By the time that the grant money was available, serious reconsideration

was given to the choice of operating systems. UNIX was the original intent, but the cost of updating UNIX operating systems, such as Solaris or Silicon Graphics, is high. The cost of an average UNIX Sun Sparc station that will run ARC/INFO is currently around \$13,000. Six such machines plus the networking cost would easily add up to an amount larger than the budget of the grant. The largest difficulty, however, is the lack of UNIX systems administrative support on campus. This deficiency turned out to be the largest deciding factor in the selection of an operating system.

In October, 1996, Windows NT 4.0 debuted, and in November ARC/INFO for Windows NT 4.0 was released. This timing basically helped make the decision to go to a powerful Pentium 200 Pro server with Windows NT 4.0 as the network server. This Pentium server is configured with 128 MB of RAM, two 4-GB harddrives, CD-ROM, and a 4mm 8-GB tape backup, costing just over \$8,000. A network of fifteen more Pentium Pro client machines were networked, each one having 64 MB RAM, a 4-GB harddrive, CD-ROM, and 17-inch monitor, costing \$3300. This network was ultimately a lot less expensive than the UNIX network that was earlier intended. In addition, with twelve client machines in a classroom/lab setting, our class enrollment can now increase to 24, with two students sharing one machine. Our six licenses of UNIX ARC/INFO were traded in for six licenses of ARC/INFO for Windows NT 4.0.

Other peripherals that were purchased include an INFOCUS 580 projector, an Epson 720dpi color inkjet printer for 17" x 22" output, a color scanner, a digital camera, CD writer, and a 12" x 18" digitizer (in addition to the existing 36" x 48" digitizer). For GPS equipment, the idea was to get as many hand-held receivers as

possible even though the accuracy would not be as good as some expensive units. Again, the aim is to have as many students use the receivers simultaneously as possible in a class field trip. Six Garmin 45 GPS units were selected for the reasons that they were inexpensive and with eight channels they are accurate to within 5 meters. Two beacon receivers and differential software were also purchased so that students may learn how to process differential corrections.

Other software acquired with this grant include ERMMapper 5.5 (for Windows NT 4.0), Digital Chart of the World, ArcView 3.0, ArcScan, ArcPress, Arc/Spatial Analyst, Adobe PhotoShop, CorelDraw 7.0, WebDesigner, and TripMate (a real-time GPS route documentation software).

This new Cartography/GIS lab has been in operation for one semester now. It has served our mapping sciences courses flawlessly. The real advantage is that the Geography Department faculty members are implementing new ideas, new exercises, and new innovative approaches to teaching their classes; these new innovations would not have been possible without the new lab and this grant. Remote sensing data can now be integrated into ARC/INFO, and GPS data are also compatible. Through the Internet, our students may also have access to the EMTC, the U.S. Geological Survey, and to the Wisconsin database managed by the State Cartographer's Office in Madison. After just one semester, this new laboratory has proven to be invaluable to our curriculum and to our department. Additionally, it also attracts a lot of interest and cross-disciplinary use from Biology, Archaeology, and Business majors and faculty.

Thanks to the NSF and to the EMTC, our mapping sciences curriculum in the Department of Geography/Earth Science at the

University of Wisconsin-La Crosse has begun building the bridge into the Twenty-first Century.

reviews

Cartographic Design: Theoretical and Practical Perspectives.

Clifford H. Wood and C. Peter Keller (eds.). Chichester: John Wiley and Sons. 1996. 306 pp. Cloth, price \$110.00. (ISBN: 0-471-96587-1)

Reviewed by:

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What has happened to cartographic design and what is its future? These are the central questions raised through *Cartographic Design: Theoretical and Practical Perspectives*. This book is an anthology of papers from the "Symposium on Cartographic Design and Research" held at the University of Ottawa in August 1994. Each chapter is a paper presented by different cartographers at the symposium and the topics represent a wide range of thought about cartographic design.

In Chapter 1, "Design: its place in cartography," the editors voice concern over the recent neglect of design as a topic in the cartographic literature. They suggest that the quantity and focus of literature on cartographic design have fluctuated over the years, and most recently have been overshadowed by the strong and growing interest in automated cartographic methods and Geographic Information Systems (GIS). The authors suggest that there is an increasing realization among professional cartographers that many non-professionals are making

maps; maps which the authors contend are often inefficient and of poor aesthetic quality. It is also suggested that the technology of map creation has changed so dramatically that the design process itself has changed and is in need of examination.

Chapter 2, "Challenges and response in cartographic design," is Taylor's conference keynote address and, as such, sets the stage for the book. The author reviews a conceptual basis for cartography-based communication, formal techniques, and cognition and analysis. Taylor suggests that cartography must broaden itself beyond a paradigm of positivism into a greater variety of philosophical approaches.

In Chapter 3, "Geography and cartographic design," Krygier provides a brief review of the history of the relationship between geography and cartographic design. By use of a case study, he suggests that cartographic design and geography are linked in thought and practice based on their processes of data synthesis, research theory and philosophy, and the use of a variety of visual forms to communicate geographic ideas.

Huffman reviews some of the 'postmodern' critiques of cartography in Chapter 4, "You can't get here from there: reconstructing the relevancy of design in postmodernism." He points out that these discourses have affected design theory both in and out of cartographic circles. He articulates the view that because cartography and surrounding technologies are not politically or socially neutral, cartographic designers should be fully engaged in social issues in their communities.

Mackaness suggests in Chapter 5, "Automated cartography and the human paradigm," that the hope of automating visualization and GIS techniques by modeling previous human cartographers has

not been as fruitful as previously hoped. He does, however, encourage researchers to continue. In particular, researchers should recognize that computers have altered the design process, and that any design of a new computer system should take advantage of the human elements (e.g., knowledge, skills) of its users.

In Chapter 6, "The practitioner's view? A pilot study into empirical knowledge about cartographic design," Wood and Gilhooly report the results of a pilot study of professional cartographers. Their work suggests that not only academic cartographers contribute to thinking about design, but the practitioner who makes maps influences design as well. They also suggest that cartographic design is not always based on a systematic set of rules; rather, it depends on the feelings and emotions of the designers.

Monmonier illustrates his idea of cartographic complementarity in Chapter 7, "Cartographic complementarity: Objectives, strategies, and examples." Cartographic complementarity is the practice of using additional data, features, or graphic representations to provide the cartographic audience with a more coherent representation of geographic concepts in consistent and coherent ways.

Vasconcellos discusses her research on map design for the visually impaired in Chapter 8, "Tactile mapping design and the visually impaired user." She reviews some of the specific needs of tactile map makers and users. She modifies Bertin's variables by using elevation and texture in place of variables such as color. She also stresses that tactile map design is different from traditional design because it requires feedback between map users and makers.

Anderson examines Quebec's social studies curriculum in