WLIB COUNTY PLANS APPROVED

by Ted Koch

The Wisconsin Land Information Program has recently passed a significant milestone, with a large majority of the state's 72 counties now possessing an approved land records modernization plan. With a flurry of plan approving actions in the month of June, the Wisconsin Land Information Board (WLIB) has now approved a total of 64 county plans, (see map on page 2).

The development of county-wide plans for land records modernization is a centerpiece of the program. Plan approval by the WLIB is a necessary step for local government's continuation in the program; the county can then continue to retain a share of the user filing fee revenue, plus it and/or other local governments within the county can later apply for grant funds from the board.

At a regularly scheduled meeting on June 8, the Board approved 12 plans. Then at a supplemental second meeting held on June 29 it approved another 10 plans raising the total number of approved plans to 64. For most counties in the state, June 30, 1992 was the deadline for plan approval by the WLIB. In addition to the 22 plans in June, the board had earlier given approved to 13 plans in May and another 9 in April.

At this time seven participating counties remain without an approved plan. At its June 29 meeting the WLIB deferred two plans, with final action on these to be taken at a later date. Two of the other five counties without approved plans (Clark and Green) established their land information offices during the fall of 1990, so were not subject to the June 30 deadline. Three other counties did not meet the June 30 deadline; however, all are continuing to work on their plans with submission to the board anticipated within several months.

The WLIB approved the first county plan (Milwaukee) in March, 1991. During the following nine months of 1991, 13 more plans were approved. With the rapid approach of the two year deadline in June, the number of plans submitted for approval increased rapidly. Processing the large number of plans submitted in the past two
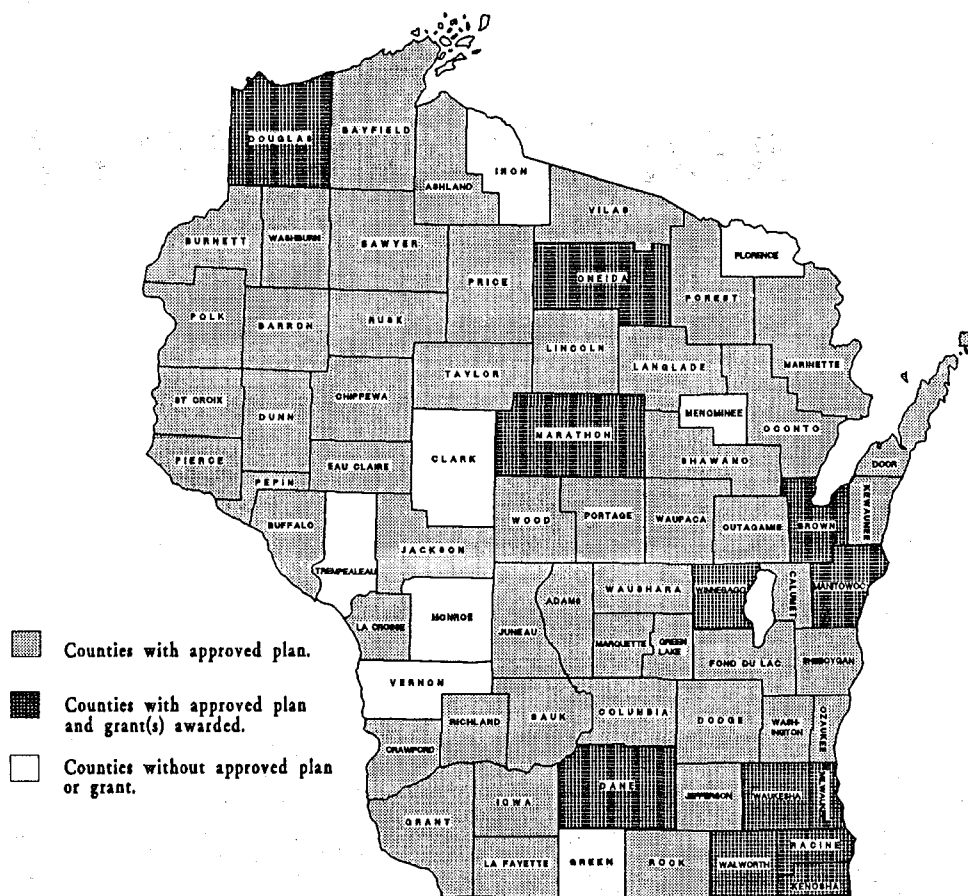
months was extremely time demading for both board members and its executive staff. Most counties provided a draft copy of the plan to the board's executive staff for review. The final plan was reviewed again by executive staff who prepared a written summary for the board prior to the vote for approval. All plans approved by the board have passed unanimously.

In total, the 64 plans contained more than 3600 pages of text, charts, graphs, maps and tables. The briefest plan was a mere 7 pages, while the lengthiest contained 167 pages. On average, each plan totaled more than 57 pages. Thirty-four of the 64 plans were compiled and written by county staff, while 30 of the plans were prepared by outside consultants. Of these 30, 16 were done by regional planning commissions and 14 by private consultants.

With the plan approval phase now largely past, the Board will be concentrating on the awarding and administering of grants-in-aid to local governments, and on the identification and analysis of a variety of technical issues that affect the future of the program. To be eligible for an award, a grant proposal must be specifically related to items identified as priority activities in the county plan. Also, all retained fees in the county must be spent on activites that are consistent with the plan's objectives.

Counties with Approved WLIB Plans and Grants as of June 29, 1992

WLIB News
by Bob Gurda

Meetings
Since our last issue, the Wisconsin Land Information Board has met four times: once each in April and May, and twice in June. Upcoming meetings are schedule for August 17, September 14, and October 12, generally following a pattern of the second Monday of each month.

Countywide Plans
The board's primary work recently has been consideration of plans for land records modernization submitted for approval. For more details, see page 1.

Grants
June was the third open period for submission of grant applications. Only counties with approved plans were eligible. A total of 41 applications, requesting about $3.8 million were submitted. There is only about $900 thousand to distribute.

The entire WLIB ultimately decides on grant allocations. In August its Grant Scoring Committee will evaluate the applications in detail and then make recommendations to the Executive Committee. Board action will not take place before the September meeting.

Clearinghouse Committee
The Clearinghouse Committee, chaired by Ted Koch, submitted an initial report to the Executive Committee in May. At that same time the Executive Committee decided to combine the previous Program Integration Committee with the Clearinghouse Committee, resulting in a new Integration/Clearinghouse Committee, also chaired by Koch.

Revenues
Monthly revenues were as high or higher for each of the first 10 months of the fiscal year, as compared to '90-'91. In particular, there was much increased document filings since January, probably heavily related to mortgage refinancing. As a result, total revenue to the WLIB may reach $2 million, with portion of the collected fees retained by counties then being $4 million.

NAPP
by Ted Koch

On May 11, the State Cartographer's Office received some very welcome news from the administrator of the National Aerial Photography Program (NAPP). That same day he had received notification from the three aerial photography firms under contract to fly Wisconsin that they had just completed 100% statewide coverage.

Having total coverage was very exciting news since weather conditions across the state throughout the month of April had been so poor as to prevent any possibility of acquiring photography, and at the same time tree leaf growth was progressing rapidly. About May 1 however, the weather improved dramatically, the three firms had planes located in the state, and very quickly thousands of flight-line miles were completed.

As has been detailed many times previously in the *Bulletin*, NAPP photos for Wisconsin are panchromatic (black and white) images taken at a flying height of nearly four miles. This gives a photo scale of approximately 1:40,000 or 1"=3333'. A single 9"x 9" photo frame of this imagery will cover an area of approximately 32 square miles. The acquisition of photographs through NAPP does not include any provision for producing orthophoto images, although it is certainly possible to use them for that application. (See the accompanying article at right).

At present, negatives are undergoing quality inspection checks at the NAPP office which is located within the headquarters of the U.S. Geological Survey in Reston, Virginia. It is a virtual certainty that some photos will be rejected due to quality problems. For these images reflights this fall or next spring will be required. At this time the SCO has not received any quality report summaries.

Once the inspection and approval process is completed the original photo negatives will be shipped to Salt Lake City, Utah for duplication in a U.S. Department of Agriculture photographic facility. When the film duplication is complete, the original negatives will then journey to the Earth Resources Observation Systems (EROS) Data Center in Sioux Falls, South Dakota where they will be indexed, archived, and be available for copying and sale to the public. At this time, the best estimate is that NAPP images will not be ready for public sale until later this fall.

In another statewide aerial photo acquisition program, flights have resumed this summer for the Dept. of Natural Resources (DNR) forestry management project. Photographs are being acquired at a scale of 1:15,840 (4'= 1 mile), with black-and-white infrared film. Details on the conditions, prices and method of sale of this photography are currently in the development stages at DNR.

Focus on Digital Orthophotos
by Bob Gurda

Now that the NAPP photography acquisition has happened for Wisconsin, interest is shifting to development of a new product from the photographs: computerized, geometrically corrected images. A national program has been advocated by several federal agencies, whereby coverage of the entire country would eventually be available in digital orthophoto form.

Federal funds to fuel this program are being moved into place, with the earliest possible start to the program being this October. A figure of $36 million for each of five years has been estimated in order to complete the national program the first time over. For a number of technical reasons, subsequent maintenance of the program on a ten-year update cycle would cost considerably less.

The proposed federal program, to be accomplished through private contracts, would produce large computerized image files with a resolution of 1 meter that could be used in various ways. For instance, they could be simply viewed individually on a high resolution computer monitor (just like a satellite image or a scanned airphoto), or used as a backdrop for displaying other computerized information (such as field boundaries, well locations, or buried utilities) or for on-screen digitizing of the boundaries or outlines of obvious ground features; they could be "draped" over a computerized rendition of the land surface; several could be joined "edge-to-edge" to cover larger areas seamlessly; they could be printed with a common desktop laser printer, with an electrostatic plotter, or with a higher resolution device to produce a photographic image on film; they could be enhanced to emphasize and/or subdue certain landscape features; and they could be combined with digital imagery collected at coarser resolution from satellites such as Landsat and SPOT.

What would this program mean for Wisconsin users? First, a core digital product would be available essentially free from which various end products could be generated; this fact provides flexibility for different program emphases and budget capabilities. Second, adjacent scenes could be joined, then simplified, resulting in large area images such as entire cities, watersheds, etc. Third, a standard product covering the entire state would simplify sharing of digital spatial data and would assist in matching existing printed or plotted maps to this more accurate base.

Will this proposed program begin soon? While there is no certainty until the federal budget for the year beginning in October is passed, everything we have heard indicates that the program is moving in the right direction. If and when the program begins, a schedule by state, region, or some other pattern will determine the order that areas get done. Given that Wisconsin has fresh NAPP imagery and contributed a substantial amount toward cost-sharing, we should be in a good position.

Digital Orthophotos, continued

Many people in Wisconsin have seen the sample digital orthophotos created for part of western Dane County. These were developed as part of the pilot project that has now led to a full-scale proposal for national coverage. The SCO is still offering free copies of samples of these computer files. All you need to view them is a pc-compatible computer with VGA or SVGA graphics. The free copies include a display program, data files, and complete instructions. To receive these, send two high-density diskettes in a sturdy mailer to us (see p. 16 for address).

State Cartographer's Commentary
by Ted Koch

Wisconsin's highly innovative Land Information Program is truly achieving some solid accomplishments. With 64 county land records modernization plans now approved, 22 grants-in-aid awarded, and 40-plus grant applications submitted to the WLIB last month (June), we are witnessing true commitment and participation in this program.

As the Board's grant monies are put to use a significant amount of new remonumentation, control densification, aerial photography, and automated mapping of all variety will be in progress across the state. This progress towards more up-to-date and integrated approaches to land records usage is impressive. As we rush headlong into collecting, recording and analyzing so much new information, many are concerned about how we will effectively learn about, understand and share all of this new information.

The WLIB has as one of its responsibilities the development of a state land information clearinghouse. The notion of a clearinghouse seems simple enough. We're all thoroughly familiar with and use information clearinghouses often, which are in the form of libraries. Libraries store a variety of information and provide access to it. So is there a clearinghouse problem as related to land information and GIS/LIS data, and particularly automated data?

Unfortunately, at this time no one seems to have developed a truly efficient, easily used, interactive system to inventory and characterize digitally stored spatial GIS/LIS data. Currently, the concepts, operation and scope of a spatial data clearinghouse are being approached in many states including Wisconsin. At the national level there is important activity in addressing the development of metadata standards, (See page 15). However, the issue of a spatial data clearinghouse is a big one, and one that unfortunately is quite complex. It is an issue that needs more in-depth attention before the sheer volume of existing and new land information data far out-distances or ability or means to understand it.

In Wisconsin the WLIB's Integration/Clearinghouse Committee will be working on developing a centralized land information clearinghouse operation. It will take time to develop, but hopefully will provide a solid means for tracking the vast quantity of information that will soon be available.

News from the SCO
by Bob Gurda

We are in the midst of eventful days here at the SCO. Staff changes, new materials nearing publication, and clearinghouse activities are all keeping us busy (not to mention the usual long list of meetings).

Staff
Those of you who call our office regularly may already have discovered that Brenda Hemstead is out for several months on maternity leave. As this issue goes to print we are expecting news from her any day.

Filling in for Brenda over the summer is Barbara Strassheim, who worked for us part-time for the last year and graduated with a degree in Geography from UW-Madison in May. She will begin graduate school in September.

We have several new part-time graduate students working on various projects. Rob Carnachan, a student in water resources management, has started in on publications with environmental mapping themes. Tim Ruhren, a civil engineer with background in GIS and remote sensing is also joining our staff in July. Martha Berry and Ben Sherman, graduate project assistants this past year, have left the SCO.

Lee Samson continues through the summer as our automated systems manager. Continuing to assist us on surveying and land information topics for a second year is Diann Danielsen, who has been honored with another scholarship—this one from AM/FM International.

We also have two new undergraduate employees: Suzanne Fliege and David Herubin. Helen Yde and Laura Michael left in May.

Publications
We are ready to print our first topical brochure in what will be an extensive series of titles. *Topographic Mapping* has been under development over recent months, coordinated by Martha Berry. This will be a free 12-page publication profiling the past, present, and future of topographic mapping over Wisconsin.

The next brochures to be developed cover geodetic control, magnetic declination, and soil and parcel mapping.

Clearinghouse
Our survey on aerial photography is almost in the mail. If you are one of our targetted recipients, please carefully complete the forms and return them promptly. With your cooperation we will be able to offer preliminary results of the survey at the WLIA meeting in September.

If your organization utilizes or holds aerial photography and has not received a survey by the end of July, please contact the SCO.

PEOPLE & BUSINESS

Views from Dave Fletcher
by Bob Gurda

As noted in the adjoining column, Dave Fletcher is leaving Wisconsin for New Mexico and new challenges. We recently talked with Dave to get his departing perspectives on our state's future in mapping and GIS.

SCO: What do you think are the critical areas still needing attention?

DWF: There are so many things that could benefit from attention, that our first step should be to prioritize carefully. Clearly, data standards is one area of enormous importance, but it also could absorb all of Wisconsin's talent and energy if attacked all at once.

The WLIA's Technical Committee has surveyed people in the state who do/can/could exchange geographically referenced information. I predict that several types of information will show up in that survey as being in high demand for regular exchange: geodetic control and the highway network, at a minimum.

Another issue that could reap big dividends down the road is statewide efforts to standardize the design of GIS databases. There has been some isolated as well as some collaborative work done already in this area, but it could be expanded.

SCO: Are there some areas that may defy attempts to set a single standard?

DWF: Parcels is an area that may be headed this way. In that I mean that land ownership parcels for cadastral purposes (with gaps and overlaps) may end up being separate from the "topologically clean" version of parcel boundaries. A GIS system needs the topology in order to process much of the zoning, permitting, planning functions of government or to support many private sector applications such as real estate; these uses typically do not need the fine and sometimes confusing detail of true property boundariy dimensions.

This raises a question, though. Do we need to maintain two separate renditions of land ownership? Not if we define a logical method to adequately convert the cadastral into the more generalized topological view as needed.

SCO: What conceptual issue concerns you most?

DWF: It's this: who "owns" the network? We've talked a lot about the "Wisconsin Land Information Network" being composed of data, custodians, standards, and a physical communication system. In a broad sense the society owns the network, just like the highway system. But we have yet to clarify all of the rights and responsibilities of various parties in building, maintaining and using the network.

SCO: Any closing thoughts?

DWF: Deciding to leave my many activities and friends in Wisconsin was tough. But it was easier knowing that many good people are here to maintain the momentum. And I'll be taking many Wisconsin people's ideas along with me to apply to new problems. That is satisfying.

News from around the State

Fletcher Heads Southwest
David Fletcher left his position as head of the Wisconsin Dept. of Transportation's GIS operation effective May 1. He has already begun working with the new Alliance for Transportation Research, headquartered in Albuquerque, New Mexico.

In his new position Dave will play a lead role in transportation and information systems, addressing a broad range of research and development issues. The Alliance is associated with Sandia Labs, a federal laboratory with over 2,000 employees. Sandia is in the process of moving from heavily classified military research into areas of domestic concern.

Dave is immediate Past-President of the Wisconsin Land Information Association and has been instrumental in defining the major structures of the Wisconsin Land Information Program. His leadership in DOT's GIS development has drawn international attention. He leaves an indelible mark on our state and we wish him similar success in addressing new challenges.

Bishop Leaves UW-Eau Claire
Mike Bishop, lately of the Geography Department at UW-Eau Claire, has moved on to the Univ. of Nebraska at Omaha. It appears that there is no plan to fill his vacant position, so the continuation of his remote sensing program at Eau Claire is in jeopardy.

Kranz Purchases MSL
Mapping Specialists, Ltd. of Madison has a new owner. Jeffrey Kranz, MSL Business Manager since 1989, and President for the last two years, has purchased the company. MSL is a full service cartography house that has been very active in the encyclopedia, atlas, and textbook arena.

Intelligraphics Delivers WINGS Data
Acting as a subcontractor for Aerial Data Reduction, Inc., Waukesha-based Intelligraphics International has begun to deliver GIS data in Genasys™ for the WINGS Project in Winnebago County.

WLIA Works on a Proposal for a Wisconsin Geodetic Information Clearinghouse

By Diann Danielsen

A technical subcommittee of the Wisconsin Land Information Association (WLIA) was formed in March of this year to study the issue of a state geodetic control information clearinghouse. With global positioning system control network densification and Public Land Survey System (PLSS) remonumentation efforts increasing, a greater and greater amount of information is being generated. This information, if made more readily accessible, will be of great benefit to users at the private, local, and state levels. Geodetic and PLSS control is a vital component of surveying, mapping, and engineering projects and the development of geographic/land information systems.

The goal of the subcommittee is to encourage the coordination of efforts and make recommendations defining the clearinghouse benefits, scope, general structure, and necessary agreements. The establishment of an information clearinghouse will help to assure consistent quality and exchange of data between parties.

Representatives from county government, the Dept. of Transportation, the Dept. of Natural Resources, the State Cartographer's Office, and the National Geodetic Survey make up the subcommittee. Thus far, the subcommittee has inventoried the types and sources of available geodetic control in the state, identified data users and typical inquiries, discussed the unique nature and needs of geodetic and PLSS databases, and reviewed other state and federal database developments. Work has also begun on the preparation of database guidelines for field definition, structure, security, access, and updates. The group needs additional comments and participation from the private sector, utilities, professional societies, and counties as these guidelines are developed.

Final recommendations for a geodetic control information clearinghouse are expected to be made to WLIA at their annual meeting in March 1993 for later presentation to the Wisconsin Land Information Board. If you want more information on the committee's efforts or to participate in future discussions, contact WLIA Geodetic Control Clearinghouse Committee Chair, Tim Fox (WiDNR) at (608)267-9798.

Vertical Datum News FEMA Adopts NAVD 88

The National Flood Insurance Program (NFIP), administered by the Federal Emergency Management Agency (FEMA), will soon require use of the new NAVD 88 vertical datum. Beginning with contracts awarded after October 1, 1992, all new flood studies and maps will be on this datum. Additionally, revisions after this date may include a datum conversion, depending upon the project. Those requesting revisions will need to supply data in both NGVD 29 and NAVD 88.

NFIP currently has 80,000 map products on the NGVD 29 datum. NFIP products are used by flood insurance agents, floodplain managers, banks, and mortgagers. The dates for conversion to use of the new datum may vary depending upon the progress of NGS, USGS, and other federal, state, and local agencies in its adoption.
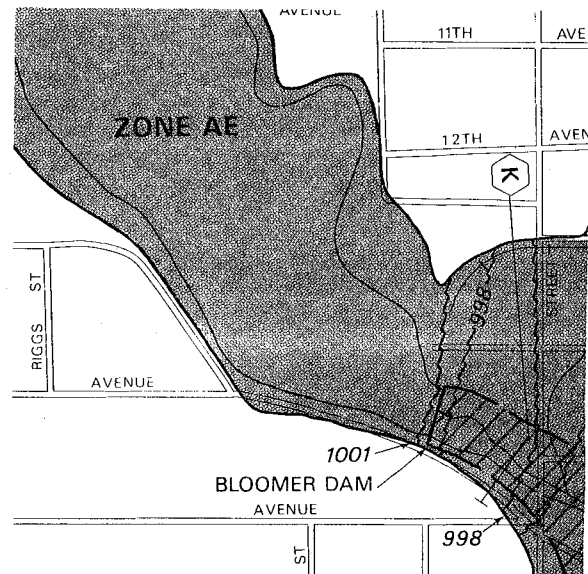
National Flood Insurance Program

Conversion of Historical Federal Vertical Control Data

The US Geological Survey has begun a 10 year program to convert its leveling data into the NAVD 88 datum. The data will then become a part of the NGRS database and be available through NGS. Similarly, the US Army Corps of Engineers has plans to bring its historical data into NAVD 88.

(source: ACSM Bulletin, May/June 1992)

GEODETIC CONTROL

HARNs: High Accuracy Reference Networks

by Diann Danielsen

The National Geodetic Survey (NGS) is establishing a number of high accuracy reference networks in cooperation with state and local agencies and private industry. These networks take advantage of current global positioning system (GPS) and computing technology to upgrade the North American Datum of 1983 (NAD 83). High accuracy networks are based on GPS-observed geodetic control stations located 15 to 60 miles apart and offer relative positional accuracy in the 1 to 3 cm range.

The HARN's grew out of a response to a number of needs in the surveying, mapping, and scientific communities. Higher accuracy networks are necessary for crustal motion studies, subsidence studies, kinematic surveying, GPS-controlled photogrammetry, and to improve the usefulness of GPS for establishing vertical control. Higher accuracy networks also simplify use of GPS positioning technology and provide freedom from the inaccessible control stations of the past. Geodetic control stations can now be established in easily accessible places and in areas of greatest surveying activity.

Wisconsin's WHPGN project was one of the first such state-wide networks. In 1988, NGS and the Wisconsin Dept. of Transportation began work on the Wisconsin High Precision Geodetic Network, comprised of 98 GPS-observed stations. The data were subsequently sent to NGS for a network re-adjustment and upgrade. The WHPGN adjusted coordinates were received in December 1991 and the upgraded NAD 83 coordinates were released in March 1992. The upgraded datum is referred to as the NAD 83 (1991) datum and the older NAD 83 network is now known in Wisconsin as NAD 83 (1986). Wisconsin's high precision network is being used extensively by WDOT as well as by several counties establishing geodetic frameworks for land information programs.

Approximately half of the US states have completed high accuracy networks or have them underway. Other states are satisfied with the published NAD 83 (1986) data and do not plan a state-wide upgrade. The primary reasons cited for not upgrading are: 1) current accuracy is sufficient for the state's needs, 2) the potential for confusion and a loss of confidence in the network by introducing too much change, and 3) the preference to spend scare funds on control network desification rather than upgrades.

In 1989 NGS released a policy statement regarding network upgrades which stated that while NAD 83 provided a sufficient datum for the foreseeable future, control network coordinates are variable and subject to change based on data quality and public interests. NGS's primary concern regarding network upgrades was that states choosing not to upgrade their networks should not be negatively affected.

States with high accuracy reference networks in place:
California, Colorado, Delaware, Florida, Idaho, Maryland, Montana, New Mexico, Oregon, Tennessee, Washington, Wisconsin

States with adjustments in progress:
Alabama, Alaska, Arizona, Louisiana

States with field surveys underway:
Conneticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont

States Planning to initiate upgrade activities:
Kentucky, Nevada, Texas, Virginia, Wyoming, West Virginia

States interested in high accuracy reference networks:
Georgia, Indiana, Mississippi, Utah

Status of High Accuracy Reference Networks
(NGS Information Center - June 1992)

Their current policy balances the need for a stable reference framework system with the demands arising from technological advances.

There is controversy over how far to carry accuracy upgrades. Using the combined HARN networks, NGS would have enough information for another nation-wide re-adjustment. It is also possible that following in the footsteps of electronic distance measurement (NAD 27 ⇒ NAD 83) and global positioning systems (NAD 83 ⇒ HARN), another major technological advancement will provide the potential for a geodetic datum with even greater accuracy.

Just how accurate do we need to be? And where does this all end? One solution is suggested by Ed McKay, Chief, NGS Vertical Branch:

> Geodesists studying plate tectonics will always want the highest accuracy they can attain to perform their investigations. But should the surveying and mapping community be on the same system for GIS and mapping applications? Maybe it's time for a system similar to the one in the United Kingdom where there's a scientific datum whose coordinate values change frequently and a surveying and mapping datum whose coordinate values rarely change.
> .... *(ACSM Bulletin, May/June 1992)*

(sources: ACSM Bulletin, June 1991 & May/June 1992; NGS Information Center)

Questions & Answers

?

I heard someone mention UTM and WTM coordinates? Are these different, or was this person possibily confused by a misspelling?

UTM and WTM *are* different, but closely related.

UTM (or Universal Transverse Mercator) is a commonly used coordinate grid system based on the transverse mercator map projection. It was developed by the Defense Mapping Agency to serve their needs worldwide. There are 60 UTM zones, each 6° wide in longitude (east-west), and extending almost to the north and south poles. Under this sytem, Wisconsin is split east and west nearly in half, into zones 15 and 16 which meet at the 90° W meridian.

In order to make a single UTM-like coordinate grid system that serves the entire state, The Wisconsin Dept. of Natural Resources developed the Wisconsin Transverse Mercator (WTM) coordinate system. It is based on a 6° wide transverse mercator zone *centered* on 90° W. Another difference with WTM is that its false northing (or zero baseline for Y coordinates) is 4.5 million meters (about 2,800 miles) north of the equator.

WTM has several advantages over both standard UTM and the State Plane Coordinate System (that has three Wisconsin zones with a separate coordinate system for each). First, it provides a single coordinate system statewide; this fact simplifies digital mapping and large area analyses done with a geographic information system. Second, its distortion is least down the middle of the state and most near the edges. Third, the false northing results in much smaller (and more manageable) coordinates over the state than with UTM which is measured all the way from the equator.

A disadvantage is that conversion of digital data to or from WTM is impossible with computer mapping or GIS software systems that do not support definition of custom coordinate systems..Note that a number of computer programs including some GIS packages are capable of converting data between WTM and other coordinate systems.

For more details, you may request a free four-page SCO publication providing details on the projections and coordinate systems for both UTM and WTM.

?

Do you have a current map of magnetic declination for Wisconsin? The one in my files is from 1985.

The SCO has published such a map every five years since 1975. The one most current is as of 1985.

We are currently developing a free brochure on magnetic declination in Wisconsin; this publication will contain a new map showing the revised location of isogonic lines along with information about the historical and predicted drift of these lines. Also included will be instructions for downloading current magnetic information via modem from a USGS office in Colorado.

?

Where can I get a navigation map for the lower Wisconsin River?

We are not aware of any traditional navigation maps (usually called "charts") for any part of the Wisconsin River. Due to the number of dams (most or which are at waterfall sites, and which do not have locks) on the upper river and the shifting sand bars on the lower river, there is little modern commercial vessel traffic. This kind of activity is what usually prompts federal mapping offices to publish navigation charts.

For the lower Wisconsin, a canoeing guide would be one source of navigation advice. Standard maps such as 1:24,000-scale topographic quadrangles would be another choice; about 15 such map sheets would cover the free-flowing section of the river downstream from Prairie du Sac. A smaller-scale series would require fewer sheets but would show less detail. Another option would be a set of aerial photographs. But don't expect any of these sources to depict a current arrangement of sandbars.

There are numerous navigation charts available for the waters of the Great Lakes, the Mississipi River, and the lower Fox River. These vary in scale and area covered. For more information on these charts, how to access an index, or a listing of dealers, contact the SCO.

?

How far it is it in a straight line to Mayville from my house in the Town of Dunn? The Postmaster in Mayville found a letter that had been on my dining room table on June 17; it disappeared that day when a tornado destroyed my house.

Your letter went on quite a trip- via air mail. The straight line distance is approximately 55 miles in a northeasterly direction. (The Town of Dunn is just southeast of Madison; Mayville is on the east side of the Horicon Marsh). However, your letter may have been carried through many loops and curves along the way. We understand that the storm that day was heading on a northeast course.

We roughly estimated the distance from a 1:500,000-scale map of the entire state. You could calculate a more precise distance from larger scale maps while ground measurements with surveying instruments would provide the most precise answer—but precision measurement issues aside, you're probably simply happy to have survived the tornado!

Editor's Note: If you have a question, or had a question for which you found an answer that might be of interest to others, please let us know.

COUNTY LAND INFORMATION OFFICE DATA

County	Type of Office	Contact Person	Address	Phone Number
Adams	County Board Planning and Zoning Committee	Alma Thurber Register of Deeds	P.O. Box 219 Friendship, WI 53934	(608) 339-4206
Ashland	Register of Deeds	Wendell R. Friske Register of Deeds	206 W. 2nd St. Ashland, WI 54806	(715) 682-7008
Barron	Land Information Office Register of Deeds	Steve Johnson Barron County Surveyor 1220 Wickre Drive Cumberland, WI 54829	Courthouse Rm 238, 330 E. LaSalle Ave. Barron, WI 54812	(715) 537-6212
Bayfield	Land Information Office Register of Deeds	Otto Korpela Register of Deeds	P.O. Box 813 Courthouse Washburn, WI 54891	(715) 373-6119
Brown	Committee	B.F. Paruleski, Executive Director, Planning Commission	100 N. Jefferson St. P.O. Box 1600 Green Bay, WI 54305-5600	(414) 448-3400 (414) 448-3123 (fax)
Buffalo	Land Information Committee	Patricia Wodele County Treasurer	Buffalo County Courthouse 407 2nd Street Alma, WI 54601	(608) 685-6215
Burnett	Committee	Kathy Swingle Surveyor/Land Records Supervisor	Burnett County Government Center 7410 County Road K. #103 Siren, WI 54872	(715) 349-2599
Calumet	County Board Land Information Study Committee	Patricia Wettstein Real Property Lister	206 Court St. Chilton, WI 53014	(414) 849-2361 x204
Chippewa	Committee	Dennis G. Mickesh, Land Information Coordinator	711 N. Bridge Street Chippewa Falls, WI 54729	(715) 723-5121
Clark	Register of Deeds	Eugene Oberle Register of Deeds	Room 303 517 Court Street Neillsville, WI 54456	(715) 743-5162
Columbia	Land Information Study Committee	Penny Judd Register of Deeds	400 DeWitt St. P.O. Box 177 Portage, WI 53901	(608) 742-2191 x246
Crawford	Land Conservation Committee	Delores Bonney Register of Deeds	220 N. Beaumont Road Prairie du Chien, WI 53821	(608) 326-0221
Dane	Committee	Howard Braunschweig, Dir. of Information Management	210 Martin Luther King Blvd. Room 524 Madison, WI 53709	(608) 266-5663
Dodge	Committee	Garland G. Lichtenberg Board of Supervisors	Dodge County Courthouse 127 E. Oak St. Juneau, WI 53039	(414) 386-3531
Door	Committee	Joseph LeClair Data Processing Manager	Door County Courthouse Box 67, 138 S. 4th Ave. Sturgeon Bay, WI 54235	(414) 743-5511
Douglas	Land Information Office County Clerk	Raymond H. Sommerville County Clerk	Douglas County 1313 Belknap Street Superior, WI 54880	(715) 394-0341

County	Type of Office	Contact Person	Address	Phone Number
Dunn	Committee	James M. Mrdutt Register of Deeds	800 Wilson Avenue Menomonie, WI 54751	(715) 232-1228
Eau Claire	Land Information Office Dept. Planning & Development	Richard A. DeVriend Supervisor	Eau Claire County Courthouse Room A180, 721 Oxford Ave Eau Claire, WI 54703	(715) 839-4743
Florence	Committee	Mary M. Jessen	501 Lake Avenue P.O. Box 410 Florence, WI 54121	(715) 528-4252
Fond du Lac	Committee	Mary A. Brickle Register of Deeds	P.O. Box 509 160 S. Macy St. Fond du Lac, WI 54936-0509	(414) 929-3018
Forest	Land Information Office	Paul Aschenbrenner Register of Deeds	Forest County Courthouse Crandon, WI 54520	(715) 478-3823
Grant	Committee	Marilyn Pierce Register of Deeds	P.O. Box 391 Lancaster, WI 53813	(608) 723-2727
Green	Register of Deeds	Marilyn Neuenschwander Register of Deeds	Green County Courthouse 1016 16th Ave. Monroe, WI 53566	(608) 328-9439 (608) 328-2835 (fax)
Green Lake	Committee	James A. Hebbe County Conservationist	492 Hill St. Green Lake, WI 54941	(414) 294-4051
Iowa	Land Records Committee	Marion Raess Acting Register of Deeds	Iowa County Courthouse 222 N. Iowa Street Dodgeville, WI 53533	(608) 935-5628
Iron	Register of Deeds	Bob Traczyk Register of Deeds	Iron County Courthouse 300 Taconite St. Hurley, WI 54534	(715) 561-2945
Jackson	Land Information Office	John Ellingson Land Information Coordinator	Courthouse 307 Main Street Black River Falls, WI 54615	(715) 284-0221
Jefferson	Real Estate Description	Andrew J. Erdman Supv. Real Estate Descrip.	320 S. Main Street Jefferson, WI 53549	(414) 674-2500 x124
Juneau	Register of Deeds	Jerilynn Kolba Register of Deeds	Juneau County Courthouse Mauston, WI 53948	(608) 847-9325
Kenosha	Land Information Office County Planning & Development	George Melcher, Director Kenosha County Planning & Development	912-56th Street Kenosha, WI 53140	(414) 653-6550
Kewaunee	Register of Deeds	Marilyn G. Mueller Register of Deeds	613 Dodge St. Kewaunee County Courthouse Kewaunee, WI 54216	(414) 388-4410 x126
LaCrosse	Land Information Office	Jeffrey M. Bluske, Land Information Coordinator	Land Title and Mapping Department/Land Information Office 400 North 4th Street, Room 105 County Courthouse LaCrosse, WI 54601	(608) 785-9637 (608) 785-9704 (fax)
Lafayette	Committee	Joseph Boll Register of Deeds	P.O. Box 170 Darlington, WI 53530	(608) 776-4838
Langlade	Land Records and Regulations Dept.	Rebecca J. Frisch Zoning Administrator	Langlade County Courthouse 800 Vermont St. Antigo, WI 54409	(715) 627-6206

County	Type of Office	Contact Person	Address	Phone Number
Lincoln	Committee (of County Board)	Michael M. Dailey	Lincoln County Computer Services 1110 E. Main Street Merrill, WI 54452	(715) 536-0301
Manitowoc	Committee	Preston F. Jones Register of Deeds	P.O. Box 421 Manitowoc, WI 54452	(414) 683-4012
Marathon	Committee	Lorraine Beyersdorf County Treasurer	Marathon County Courthouse 500 Forest Street Wausau, WI 54401	(715) 847-5246
Marinette	Committee	Florence Magnuson Register of Deeds	Marinette County Courthouse 1926 Hall Ave., P.O. Box 320 Marinette, WI 54143	(715) 732-7551 x273
Marquette	Committee	Bernice M. Wegner Register of Deeds	Marquette County Courthouse P.O. Box 236 Montello, WI 53949	(608) 297-9132
Menominee	Land Information Office Office of County Coordinator	Rich Depary, Office of County Coordinator	P.O. Box 428 Keshena, WI 54135	(715) 799-3024
Milwaukee	Register of Deeds	Walter R. Barczak Register of Deeds	Register of Deeds Office Courthouse, Rm. 103 901 N. 9th St. Milwaukee, WI 53233	(414) 278-4021
Monroe	Committee	Lorraine A. Mattheisen	P.O. Box 195 Sparta, WI 54656	(608) 269-8730
Oconto	Land Information Office	Charles Fleischman, Land in Force Agent	300 Washington Street Oconto, WI 54153	(414) 834-5322 x302
Oneida	Department	Michael J. Romportl County Cartographer	Courthouse Building P.O. Box 400 Rhinelander, WI 54501	(715) 369-6179
Outagamie	Committee	Gerald Tate, Assistant Planning Director	Outgamie County Courthouse 410 S. Walnut Street Appleton, WI 54911	(414) 832-5255
Ozaukee	Committee	Ronald A. Voigt Register of Deeds	121 W. Main St. P.O. Box 994 Port Washington, WI 53074-0994	(414) 284-9411
Pepin	Land Information Office	Betty A. Plummer	Register of Deeds Office P.O. Box 39 Durand, WI 54736	(715) 672-8665
Pierce	Department of Land Management and Records	Jim Hulbert Administrator	Dept. of Land Management & Records Planning Office P.O. Box 647 Ellsworth, WI 54011	(715) 273-3531 x334
Polk	Land Information Office	Ron Hoffman County Surveyor	Polk County Treasurer's Office Courthouse Balsam Lake, WI 54810	(715) 485-3161
Portage	Committee	Charles P. Kell County Planning	1516 Church Street Stevens Point, WI 54481	(715) 346-1334
Price	Committee	Judy Chizek Register of Deeds	Price County Courthouse Phillips, WI 54555	(715) 339-2515
Racine	Land Information Office	Helen M. Schutten Register of Deeds	730 Wisconsin Ave. Racine, WI 53403	(414) 636-3709 (414) 636-3851 (fax)

County	Type of Office	Contact Person	Address	Phone Number
Richland	Committee	Paul Klawiter Real Property Lister	Richland County Courthouse P.O. Box 348 Richland Center, WI 53581	(608) 647-3658
Rock	Committee	Mark Mader, Assistant to the County Admin.	Rock County Courthouse 51 S. Main Street Janesville, WI 53545	(608) 757-5510
Rusk	Register of Deeds	Clarence Glodfelty Zoning Administrator	311 Miner Ave. East Ladysmith, WI 54848	(715) 532-2156
Sauk	Exec. & Legis. Committee of County Board	J. Thomas McCarty Administrative Coordinator	515 Oak Street Baraboo, WI 53913	(608) 356-558
Sawyer	Land Information Office Register of Deeds	E. Louis Lindholm Register of Deeds	Sawyer County Courthouse 406 Main, P.O. Box 686 Hayward, WI 54843	(715) 634-4867
Shawano	Land Information Office	Ron Ostrowski, Land Conservation Office	Shawano County Courthouse Room 107, 311 N. Main St. Shawano, WI 54166	(715) 526-9239
Sheboygan	Land Information Office	Darlene Navis Register of Deeds	Sheboygan County Courthouse 615 N. Sixth Street, Rm. 106 Sheboygan, WI 53081	(414) 459-3023
St. Croix	Land Information Office	David Fodroczi Planning Department	St. Croix County Planning Dept. 911 Fourth Street Hudson, WI 54016	(715) 386-4672
Taylor	Committee	Sally Strassburger Register of Deeds	Taylor County Courthouse 224 S. 2nd Street Medford, WI 54451	(715) 748-3131 x126
Trempeleau	Committee	Janet Peterson Register of Deeds	Trempeleau County Courthouse 1720 Main St. Whitehall, WI 54773-9430	(715) 538-2311 x244
Vilas	Committee	Coureen Rogers Mapping Coordinator	P.O. Box 369 Eagle River, WI 54521	(715) 479-3655
Walworth	Committee	Lois Ketterhagen Register of Deeds	P.O. Box 995 Elkhorn, WI 53121	(414) 741-4214
Washburn	Land Information Office Land Records Office	Craig Conroy Zoning Administrator	Zoning 110 W. Fourth St. P.O. Box 338 Shell Lake, WI 54871	(715) 468-2666
Washington	Land Information Office	Dorothy C. Gonnering Register of Deeds	432 E. Washington St. P.O. Box 1986 West Bend, WI 53095-7986	(414) 335-4318
Waukesha	Register of Deeds	Michael J. Hasslinger Register of Deeds	515 W. Moreland Blvd., Room 109 Waukesha, WI 53188-2485	(414) 548-7583
Waupaca	Land Information Board	Clyde Tellock, Land Information Board	P.O. Box 307 Waupaca, WI 54981	(715) 258-6215
Waushara	Committee	Orville W. Lehr Register of Deeds	Courthouse P.O. Box 338 Wautoma, WI 54982	(414) 787-4631 x252
Winnebago	Land Information Office Planning & Zoning Department	David Schmidt, Dir. Planning & Zoning	415 Jackson Street P.O. Box 2808 Oshkosh, WI 54903-2808	(414) 236-4837 (414) 236-4799 (fax)
Wood	Register of Deeds	Rene L. Krause Register of Deeds	P.O. Box 8095 Wisconsin Rapids, WI 54495-8095	(715) 421-8455

GIS/LIS Data Sharing
— The Missing Links —

by Paul A. Tessar*

It is a privilege to have this opportunity to communicate with the growing Geographic and Land Information Systems (GIS/LIS) community in Wisconsin. In some respects, Wisconsin is a leader in advancing this technology. In others, we have a lot of work ahead of us. My topic here focuses on one of the future areas of accomplishment: GIS/LIS data exchange, one of the underpinning elements of the Wisconsin Land Information Program (WLIP).

In the afterglow of the passage of legislation to establish the WLIP, and successful formation of organizational structures to guide development in numerous counties, it is very easy, and well deserved, to stop and pat ourselves on the back. We have accomplished a great deal. We have, however, just begun.

The Challenge
The current situation with regards to data exchange standards does not give me a "warm and fuzzy" feeling. Rather, it leaves me with a sinking feeling in the pit of my stomach. Over the next few years, millions of dollars are to be spent developing digital GIS/LIS databases in local government agencies throughout Wisconsin. Many staff responsible for overseeing this endeavor have an inadequate understanding of what it REALLY takes to do this job in a fashion that promotes data integrity, supports data sharing, and provides for the meeting of future, unanticipated needs. Many data conversion vendors, who will actually be doing much of the GIS/LIS database development for the WLIP, have so far failed to demonstrate an understanding of the importance of topological data structures in their products. In the press to meet statutory guidelines, the volunteer members of the policy-oriented Wisconsin Land Information Board (WLIB) have not had time to properly deal with the "technical" issues of data exchange and data structure standards. This issue represents a ticking time bomb.

The WLIP has escalated the launch of a wide variety of initiatives in GIS/LIS implementation in Wisconsin local government. True to our heritage, these initiatives are locally-based, with a high degree of autonomy to better meet local needs. The good news is that there is a serious attempt to coordinate this endeavour, and many creative, intelligent people are actively involved. The bad news is that there is a serious lack of technical standards vital to the guidance of system implementors to assure true data interchangability, and a general ignorance on this topic.

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> *It is imperative that we move quickly to develop common data exchange formats...*

However, this is not an impossible task. The interested reader is referred to the GIS/LIS data standards developed by the North Carolina Dept. of Community Development[1] and the Minnesota GIS/LIS Consortium[2] for examples of two successful attempts to meet this need.

My hope here and beyond is to contribute to maximizing the return on investment to Wisconsin taxpayers, and to keep program participants from learning many lessons "the hard way". I hope to stimulate discussion and understanding of the issues involved in developing a true GIS/LIS confederation. This is not something that will occur naturally, no matter how many times we "click our heels together" and say "Confederation of Land Information Systems". It will be the result of conscious efforts to develop explicit technical standards to enable true data sharing. These standards must be broad, and deep if we are to succeed. They must be technically sound, and enforced as a matter of policy.

A Conceptual Model of GIS/LIS Data Exchange
With inspiration from the authors of the Open Systems Interconnect model of data communications standards, I would like to formulate a multi-layered model of standards required for successful GIS/LIS data exchange (Figure 1). Each layer represents a successively more complex construct, at a higher level of abstraction. A fully successful data exchange requires standardization at all levels. A recognized protocol at each level must be observed in writing the exchange file, and correctly interpreted in reading it. The alternative is a failed or partially successful exchange. In the discussion below, I will pro-
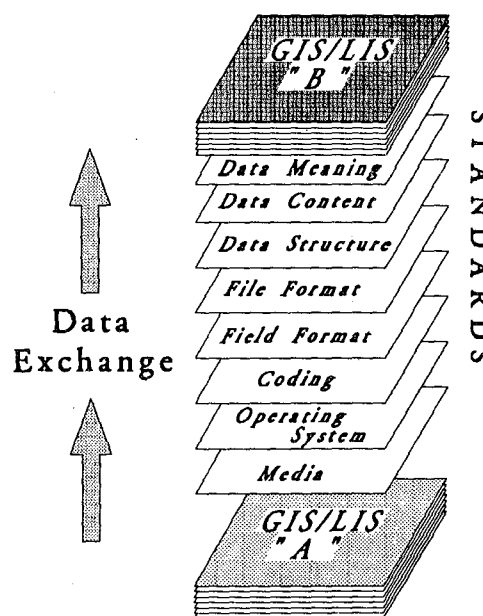

Figure 1.

ceed from the lowest to the highest level of this model. As we trace through the data exchange conundrum, I will describe standards in use and identify missing links at each of the levels.

Media
At the lowest level are specifications that allow the same media to be utilized on many platforms. Examples include magnetic tape (9 track "round", 0.25" cartridge or QIC), magnetic diskette (5.25" floppy, 3.5" flexy, Bernoulli™ cartridge), and optical disc (CD-ROM).

Operating System
The same media can, in many cases, be used on different brand computers and/or with different operating systems (OS). Once written, however, they cannot necessarily be read by another brand system or OS. Anyone who has tried to read a 3.5" Apple™ disk on a DOS™ PC has probably discovered this the hard way. And guess what? Unix 3.5" disks utilize a third format on the same media! Specialized hardware and/or software is required to translate between these native OS formats.

Coding
This media/OS translation, however, may not be sufficient if the coding employed is not standardized. For character data (including numeric characters), there are two widely used standards: ASCII[3] and EBCDIC[4]. These are the "alphabets" of digital data exchange. If the same coding is used on both ends, or a translation capability is available, character data can be easily exchanged. For binary data, the picture is much less clear. The order of bit and byte storage as well as many other technical protocols vary between systems. Reconciliation of these layered complexities is so difficult that we often translate binary data to character format to exchange it between brands/operating systems, to assure a successful transfer. Binary exchange is much more compact and efficient, but it is entirely too problematic to rely on in many cases. This means extra processing steps, storage space and costs, but it works!

Field Format
In the above context, "works" is a relative term. It is possible to translate lots of characters successfully, but still end up with gibberish (as far as the receiver is concerned). For example, one can listen to a speaker of an unfamiliar foreign language, hear every syllable, and still not understand a single word. Standard field definitions are, in this case, analogous to commonly recognized words. The WLIP parcel identifier standard represents one attempt to develop a standard field definition. Many more will be needed to facilitate data exchange, and fill in this missing link. Until that time, each recipient will have to translate functionally similar but structurally different fields to link datasets, an often cumbersome, laborious process.

File Format
Words, on their own, are nice, but only convey simple meanings. A higher level construct is required to transfer higher level meanings. As Dave Fletcher stated so eloquently in the inaugural run of this column, "We are truly evolving a digital, symbolic language, rich in its content and structure." Syntax and grammar are used to transfer thoughts, not just words, in natural languages. **These constructs currently have no analog in the WLIP.** Standard data exchange protocols are a missing link in the data interchange process of the program.

In some other states, this problem has been resolved by specifying one or more of the existing, GIS/LIS-functional data exchange formats as a required software capability. It didn't take teams of rocket scientists to come up with workable interim solutions, either. Some of these formats include AutoCAD™ DXF (Drawing eXchange Format), Intergraph™ DGN (Design file), USGS DLG-3 (Digital Line Graph, level 3), and ARC/INFO™ generate or export formats[5]. Any or all can be employed to successfully exchange non-structured graphic data between computer platforms and software systems. In most cases, attribute relational keys can also be exchanged. Any software system "worth its salt" supports one or more of these formats. Unfortunately, not all packages do so.

The federal Spatial Data Transfer Specification (SDTS) holds out promise as a future interchange format. It is a very complex protocol, however, and it will be many years before it is commonly supported and reliably utilized.

Data Structure
At the highest levels of communication, our culture provides commonly accepted communications structures (e.g., a business letter, a report, or a briefing) to facilitate the transfer of concepts. We need to develop data structure standards to accomplish the analogous functionality in the GIS/LIS world, supplying another missing link. To date, this has been problematic. When many users first become interested in GIS/LIS technology, they tend to see their applications in basic terms, say as computer-generated maps. At the next level of sophistication, they begin to understand the need to link geographic and tabular data. After awhile, the need for analytic functionality becomes clear. At this point the need for topological data structures becomes mandatory[6]. Unfortunately, all too often many database development and software purchasing decisions are made early in this learning curve. The need for topological data structures and analytical software capabilities may not be considered, or may be dismissed as unnecessary "luxuries". This is folly. A topological data model is not a required feature of the WLIP. This is unfortunate. It may cost an additional 10% or 15% to deliver topologically structured data, but it will cost as much as double to clean up the data after the fact, once the need for such structure is made painfully obvious. Fortunately, changing software to acquire analytical functionality may well be much easier, if the requisite topological data structure is present in the database.

Data Content

At the next level of the layered model is data content. Once data is physically readable, written with a compatible recording technique by the OS, logically coded with acceptable field definitions, in an understood data format, and in appropriate data structures, we can begin to worry about CONTENT. It was a long journey to get here, but this is where the payoff for data exchange lies. If the data content is understandable to a secondary user, it can actually be used for a purpose beyond its original one! At this level, there are many dimensions to content, including but not limited to map projection, coordinate system, accuracy, minimum mapping unit, generalization/level of detail, and classification. Some of these content issues can be worked around. For example, cartographically intelligent software can translate between map projections and coordinate systems. (Good luck, CAD users!) Other content issues are intrinsic to the data, and must be lived with (or without).

The current focus of many standards efforts is on classification systems. This is indeed a thorny problem, and it begins to intrude on the sovereignty of data developers in ways which may make the primary use less productive. Programmatic needs and budgets generally determine classification systems within an organization. To make external demands to change the preferred classification systems might significantly raise costs and/or lower utility for the intended purpose. All things being equal, standard classification systems are desirable, but I personally get a little nervous telling people how to implement their applications. Data formats and data structures are one thing, as they are independent of applications, and really are simply good design and common sense. Content is quite another, as it is at the heart of usability which is why the secondary users are so interested in it!

This is a political question, and I will leave its resolution to the policy makers. Many years can be spent wrestling with these issues, so I will leave it to others more expert than I. Witness the twenty-five year "dialogue" at the federal level on a land use classification system, now in its third or fourth incarnation. There are partisans in this battle still fighting over definitions and terms, trying to decide whether trees in wetlands belong in the "Forested Wetlands" or "Wetlands-Forested" category! To each group I say, whatever works for you! I'll be happy to use whatever you pick, if only I can get it in a standard exchange format, and it is topologically structured.

Data Meaning

At the "top of the heap", occupying the highest conceptual level, is the issue of deep meaning. The acceptance of commonly agreed meanings is a semantic topic beyond the scope of this column. This is yet another problem that must be overcome to facilitate complete data sharing.

Recommendations

To facilitate data sharing within the WLIP, I recommend the following actions: 1) At the three lowest levels of ex-

change protocols (media, operating systems and coding) adopt official or de facto industry standards.

2) Through the Wisconsin Land Information Association (WLIA), identify needed field formats, and develop standard layouts. Some of these items require discussion and consensus before they are fully developed. They should, however, be relatively straight-forward, and short term in their results.

3) Through the WLIA, charter committees to deal with each data classification functional area. This will be a long term effort, but it must be done.

4) Through the WLIB, specify standard data exchange formats and data structure requirements. These are well defined, with very limited options available. Education, then ACTION, is needed. As the WLIA develops standard field layouts and classification systems, these should also be formally adopted.

Conclusion

It is imperative that we move quickly to develop common data exchange formats and data structure standards. The consequence of not doing so will be GIS/LIS islands amongst which data cannot be exported or imported. Even if they can *exchange* data, they may be unable to *utilize* the data because of structural problems.

Major investments of taxpayer dollars are occurring, and we have a collective responsibility to make sure this is done wisely. It's time to "get off the dime", before it is too late to take advantage of this "once in a technology" opportunity to truly link our independent, distributed GIS/LIS databases into a coordinated, compatible and functional model of our state. We will be living with this/these database/s for a generation, so we better get it right the first time! To do anything less would be a disservice to our customers, the citizens of Wisconsin.

References

(1) Technical Specifications for Base, Cadastral and Digital Mapping, November, 1987. Available from: North Carolina Department of Natural Resources and Community Development, Land Records Management Program, 512 North Salisbury St., Raleigh, NC 27611.

(2) Recommended GIS Standards, Guidelines and Procedures: Building a Minnesota GIS Map Library, August, 1989. Available from: Land Management Information Center, 658 Cedar St., Suite 330, St. Paul, MN 55155.

(3) American Standard Code for Information Interchange.

(4) Extended Binary Coded Decimal Interchange Code.

(5) "Sharing Graphic Data Files in an Open Systems Environment", Journal of the Urban and Regional Information Systems Associations, Craig, et. al. Spring, 1991. Vol. 3, No. 1.

(6) For a good, brief explanation of topology as applied to GIS/LIS, see pps. 35-39 of Introduction to Local Land Information Systems for Wisconsin's Future, Vonderohe, et. al., 1991. Available from: State Geologic and Natural History Survey, 3817 Mineral Point Rd., Madison, WI 53705.

UNDERSTANDING GIS: A Digital Encyclopedia
by Lee Samson

Understanding GIS, from Understanding Systems, is a Windows 3.0 based interactive introduction to Geographic Information Systems (GIS). It uses a mix of text and graphics to inform users on the hardware, software, people and data involved in a GIS. It is aimed at people which have some familiarity with computer systems but little experience with the basic ideas involved in a GIS.

The software requires a DOS 3.0 or better 386 or 486 system with Windows 3.0 and VGA video with 256 colors. The software needs about 10MB of hard disk space.

Understanding GIS starts up in a window with a menu bar at the top, a text and graphics window in the lower left and buttons on the right side. The menu bar contains the system controls as well as the subject buttons: overview, hardware, software, people and data.

The system is organized into roughly 250 one page text and graphics screens. These screens are organized by subject in a hierarchical manner. The subject buttons start you at the top of the heirarchy and the windows buttons allow you to go through the hierarchy branch by branch. The system also allows you to bypass the hierarchical structure of the data by using the glossary or topics list. The glossary will give context specific information on any subject in the system. The topic list allows the user to jump into any point in the subject hierarchy.

The system also allows users to record which subjects they have looked at by using the tracking feature or the recording feature. The tracking feature creates an individual log of which subjects have been read. This allows many users to proceed through the system at their own pace. The software also has a topic recorder that can save topics so they can be reviewed or presented at a later time.

To test this system the State Cartographer's Office ran it on a 486/33 with Windows 3.0 running under a Super VGA (1024x768, 256 colors). There were some minor problems with the software running under Super VGA. The text was slightly shifted off the windows and buttons. The people at Understanding Systems, Inc. said this problem with the super VGA video will be solved in the Windows 3.1 version of *Understanding GIS*.

Otherwise, the video part of the system worked quite well. The multicolored text was easy to read and the system controls were always visible and accessible. The graphics screens were used effectively to display maps, charts and photographs. The only problem with the graphics was the text on the charts, which was hard to read.

A minor complaint is that a surprising number of words were misspelled. These and other rough points need to be addressed to give the product more complete credibility.

It is difficult to find any other software that compares with this system. Most online documentation and tutorial systems for GIS software fail to go into as great detail as *Understanding GIS*. In most cases, the online documentation or help facilities only covers command syntax for that particular GIS. GIS tutorial systems tend to concentrate on the software and hardware and rarely include information on the people or data involved in the GIS.

Understanding GIS is similar to an introductory textbook. The system has roughly 95 pages of text and many illustrations. Most introductory text books have two to three times as much textual information and many more illustrations. Understanding GIS's only advantage over textbooks is that it covers a lot of information but it is brief and easy to get through.

In general this system is appropriate for people who need to know about GIS systems and the basic issues involved, but do not need to know the details on how to use and implement a GIS system This makes *Understanding GIS* useful for a local government trying to inform people on what a GIS is an what it can do for them. It would also be useful for managers who supervise people that work with or would like to implement a GIS.

Understanding GIS: $149.00 + $10 shipping/handling
Understanding Systems, Inc
10300 Globe Road
Morrisville, N.C. 27560
(919)-544-9434

Geologic Mapping Act of 1992
by Ted Koch

During the past two decades the production of up-to-date geologic maps nationwide has been neglected. In an effort to correct this situation, Congress passed, and President Bush signed into law on May 15, the "National Geologic Mapping Act of 1992". The purpose of this act is to expedite the production of a geologic-map data base for the nation, and to place it under the control of the US Geological Survey (USGS).

Under conditions of the act, USGS has a variety of responsibilities including coordinating an implementation plan, establishing goals, managing the program, and defining the role of private mapping firms. A newly created sixteen member geologic mapping advisory committee will assist USGS on program direction.

What, if any, impact this act will have on Wisconsin geologic mapping is difficult to tell at this time. The act requires 50 percent federal/state cost sharing on all projects. Moreover, the signed bill does not provide any appropriated funds for USGS to spend on this program. Congressional decisions on the amount of funding support will be made this fall at the start of the new federal fiscal year in October.

State Geographic Information Activities Compendium Available

by Rob Carnachan

An impressive new catalog covering the geographic information activities of each of the fifty states has recently been published by the Council of State Governments. The document, principally authored by Lisa Warnecke, contains a wealth of information within its 600 pages and serves as a comprehensive guide to the approaches and strategies for application of geographic information technologies across the states.

At the heart of the document is the series of 50 state profiles, each of which is based upon an extensive survey of public sector GIS implementers and users. Each state profile provides the following information: (1) a historical overview of that particular state's GIS initiatives; (2) a discussion of past and present coordination efforts, groups, and activities; (3) a detailed listing of all GIS-related applications and/or duties at every level of the state's government; and (4) a list of reference documents from which additional information regarding that state's GIS involvement can be drawn. This final section often includes reproductions of key state statutes governing GIS applications.

The third section of each profile is particularly insightful in that it identifies the central information technology office in the state's government, the state's largest GIS-utilizing agency, and includes reports on the array of GIS research and/or usage in the state's functional agencies and academic institutions. Where available, hardware and software listings are provided.

For ease of reference, a series of tables summarizing the most salient information presented in the state profiles is provided at the rear of the compendium. A pair of these tables provides some basis for comparison of the states' GIS initiatives by ranking them on a common scale with respect to both degree of centralization and level of importance placed upon a variety of related subjects, including aerial photography and land records.

Wisconsin is well represented in the compendium, having the lengthiest of the state profiles devoted to its GIS/LIS activities. Wisconsin's "bottom up", data-intensive approach is cited as unique among the states and a model for other states to observe and evaluate.

A directory at the back of the document contains the names, addresses, and telephone numbers of over 2,000 individuals who either use or influence the use of GIS in each state. A central GIS survey coordinator is also identified for each state. In most cases, this individual was the central source for the information collected by the authors in the compendium.

A major concern with a reference document covering a relatively young and rapidly growing field such as GIS is its currency. The compendium was in preparation from 1990-1992 and the state profiles are current to late 1991. For those wishing to remain fully up to date concerning the

"who" and the "where" of state GIS activity, the directory portion of the compendium is available in electronic format for use with IBM-compatible computers using Ashton-Tate's dBase™ III+ and compatible programs. The directory is also available in a WordPerfect™ text format. Directory entries in the electronic version are updated frequently, with new categories added from time to time to reflect the latest information available from the Council.

The State Geographic Information Activities Compendium is priced at $79; the directory alone in electronic form is $300 ($210 for state officials). For an order form or additional information, contact:

Order Department
The Council of State Governments
Iron Works Pike
P.O. Box 11910
Lexington, KY 40578-1910
Phone: (800) 800-1910 (orders)
          (606) 231-1850 (customer service)
Fax: (606) 231-1858

GIS in Business Proceedings

The First Annual Conference & Exposition on GIS in Business and Commerce was held in Denver from May 11-13. The over 1000 attendees were able to examine and listen to the 43 exhibits and 80 presenters demonstrating GIS applications in finance and insurance, regulatory compliance, utilities and communications and a host of others.

Proceedings of this year's conference may be obtained from GIS World, Inc., 155 E. Boardwalk Drive, Fort Collins, CO 80525, for $20; telephone 303/223-4848.

USGS Publications

The Miscellaneous Investigations Series Maps that are published by the USGS include maps on planimetric or topographic bases, can have regular and irregular areas; various scales, and a wide variety of format and subject matter. To order, contact the U.S. Geological Survey, Books and Open-File Reports sections, Federal Center, Box 25425, Denver, CO 80225, phone 303/236-7476. When ordering, use the I number preceding the item.

I-2185. WISCONSIN, MICHIGAN. Geologic map of Precambrian rocks, southern Lake Superior region, Wisconsin and northern Michigan, by P.K. Sims, 1992. Two sheets. Sheet 1, lat 43° to 48°, long 87° to 92°. Sheet 1, scale 1:500,000 (1 inch = about 8 miles). Sheet 1, 40 by 58 inches; sheet 2, 36 by 34 inches (all in color). $7.

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Note: For all USGS orders, make checks payable to "Department of the Interior - USGS". For all map orders less than $10, include an additional $1 for postage & handling.

CONFERENCES, TECHNICAL MEETINGS, AND CLASSES

July 12-16, URISA '92 Annual Conference will be held in Washington, D.C. Contact: Urban & Regional Information Systems Association, 900 Second St., N.E., Ste. 302, Washington, D.C. 20002, 202/289-1685.

July 20-22, Spatial Analysis Using GIS (class) will be held in Denver, CO. Call: 301/445-4400, fax 301/445-5722.

July 20-22, Spatial Data Transfer Standard Implementation Workshop will be held in Reston Vrigina. Contact: Janette Cascio, U.S. Geological Survey, 510 National Center, Reston, VA 22092, 703/648-4591.

August 3-7, 1992 ASPRS/ACSM/RT92 Convention will be held in Washington,DC in conjunction with XVII ISPRS Congress listed below.

August 2-14, International Society for Photogrammetry and Remote Sensing XVII Congress will be held in Washington, DC. Contact: XVII ISPRS Congress Secretariat, P.O. Box 7147, Reston, VA 22091.

August 3-7, International Symposium on Spatial Data Handling will be held at the Mills House Hotel in Charleston, SC. Contact: David J. Cowen, Humanities & Social Sciences Computing Lab, Univ. of South Carolina, Columbia, SC 29208, 803/777-6803.

August 9-14, International Geographical Union (IGU) will hold its 27th Congress in Washington, DC. Contact: USNC/IGU Exhibits Committee at 202/707-8525.

August 17-20, Satellite Remote Sensing for Resource Management, Environmental Assessment, and Global Change Studies: Needs and Applications in Developing Countries will be held in Boulder, CO in cooperation with the United Nation's International Space Year. Contact: UN/ISY Conference, WT Chen & Company Inc., 1745 Jefferson Davis Highway, Suite 500, Arlington VA 22202, fax 703/769-1803.

August 19-21, Remote Sensing & Image Processing (class) will be held in Denver, CO. Call: 301/445-4400, fax 301/445-5722.

August 25-September 3, 6th Annual United Nations Conference on Geographical Names will be held in New York City. Contact: Defense Mapping Agency at: 8613 Lee Highway, Fairfax, VA 22031, 703/258-9518.

September 10, AM/FM Wisconsin Chapter Membership Meeting will be held in the Milwaukee area. The topic of this meeting will be Global Positioning Satellites. Contact: Jerry Laatsch at 414/291-6927.

September 10-11, Wisconsin Land Information Association (WLIA) Quarterly Membership Meeting will be held in Rhinelander. Contact: WLIA at 800/344-0421.

October 2-3, 46th Annual Wisconsin Geographical Society Meeting will be held at UW-River Falls. Contact Paul Stoelting, Department of Geography, UW-La Crosse, La Crosse, WI 54601.

October 5-7, Sixth Annual Midwest/Great Lakes Arc/Info User Conference will be held at the Radisson Columbus Airport in Columbus, OH. Contact: David Crecelius, Div. of Soil & Water Conservation, ODNR, 1939 Fountain Square Ct., Bldg E-2, Columbus, OH 43224.

October 6-9, GISDEX '92, will be held at the Washington Hilton, Washington, DC. Contact: GISDEX '92, 1734 Elton Road, Suite 221, Silver Spring, MD 20903-1724, 301/445-4400.

October 12-14, Effective Application of Advanced Surveying Technology will be held in Madison, WI. Will also be available via both satellite and audiographics. Call 800/462-0876, fax 608/263-3160.

October 14-17, North American Cartographic Information Society's Twelfth Annual Convention (NACIS XII) will be held at the Ramada Inn in St. Paul, MN. Contact: Dr. Jeffrey C. Patton, Program chair NACIS XII, Dept. of Geography, Univ. of North Carolina at Greensboro, NC 27412, 919/334-5388.

October 26-29, 104th Annual Meeting & Exposition by the Geological Society of America presents "The Voyage Continues" will be held in Cincinnati, OH. Call: 303/447-2020, fax 303/447-1133.

November 6-12, GIS/LIS '92 will be held in San Jose, CA. Contact: GIS/LIS '92, 5410 Grosvenor Lane, Suite 100, Bethesda, MD 20814-2122, 301/493-0200.

November 12, AM/FM Wisconsin Chapter Membership Meeting will be held in the Madison area. Contact: Jerry Laatsch at 414/291-6927.

December 10-11, Wisconsin Land Information Association (WLIA) Quarterly Membership Meeting will be held in Southeastern Wisconsin. Contact: WLIA at 800/344-0421.

December 15-17, High Accuracy GPS Techniques & Applications Including Surveying, Geographic Information Systems (GIS), Positioning of Moving Platforms & Movement Monitoring will be held in San Diego, CA. Contact: Navtech Seminars Inc., 2775 S. Quincy St., Suite 610, Arlington, VA 22206-2204, 800/NAV-0885, fax 703/931-0503.

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January 14, AM/FM Wisconsin Chapter Membership Meeting will be held in the Milwaukee area. Contact: Jerry Laatsch at 414/291-6927.

February 8-11, Ninth Thematic Conference Geologic Remote Sensing will be held in Pasadena, CA. Contact: ERIM/Thematic Conferences, Nancy J. Wallman, P.O. Box 134001, Ann Arbor, MI 48113-4001, 313/994-1200, fax 313/994-5123, telex 4940991 ERIMARB.

February 16-18, 1993 ACSM/ASPRS Annual Convention & Exposition will be held in New Orleans, LA. Contact: ACSM/ASPRS, 5410 Grosvenor Lane, Bethesda, MD 20814.

February 15-18, 1993, 7th Annual Symposium: Geographic Information Systems in Forestry, Environmental and Natural Resources Management will be held in Vancouver, British Columbia, Canada. Contact: Symposium Office, Suite 305, 1040 Hamilton Street, Vancouver, British Columbia, Canada V6B 2R9, 604/688-1573.

Spring 1993, GIS in Business '93, will be held in Boston, MA. Contact: Derry Eynon, GIS World, 155 E. Boardwalk Drive, Suite 250, Fort Collins, CO 80525, 301/223-4848.

March 3-5, Wisconsin Land Information Association Annual Conference will be held in Madison, WI at the Holdiay Inn (West), 1313 John Q. Hammonds Drive, Middleton, WI. Contact: WLIA at 800/344-0421.

March 22-25, 1993, AM/FM Conference XVI will be held in Orlando Florida. 14456 E. Evans Avenue, Aurora, CO 80014, 303/337-0513.

April 6-9, 1993, AAG Annual Meeting will be held in Atlanta, GA. Contact Kevin Klug 202/234-1450.

July 25-29, 1993, URISA '93 Annual conference. will be held in Atlanta, GA. Urban and Regional Information Systems Association, 900 Second Street N.E., Suite 304, Washington, DC 20002, 202/289-1685.

October 29-November 6, 1993, GIS/LIS '93 Annual Conference & Expo. & ACSM/ASPRS Fall Convention will be held in Minneapolis, MN. Contact: ACSM, 5410 Grosvenor Lane, Bethesda, MD 20814-2122, 301/493-8245

WLIA Meets in Eau Claire; Plans September Meeting
by Bob Gurda

The Wisconsin Land Information Association met on June 11-12 in Eau Claire. For the first time, WLIA held a quarterly meeting spanning two days, a model that will continue to be followed.

On Thursday afternoon, a workshop on multi-county efforts in coordinating land information modernization was held. Representatives from several regional planning commissions and resource conservation & development councils made up a panel that explored opportunities and impediments to regional cooperation. At this time, the primary direction of these efforts is toward densification of geodetic control, aerial photography, and regular forums for sharing of professional expertise.

WLIA committees and task forces held meetings first thing on Friday morning, and made reports on their activities at a noon business meeting. The latter part of the morning was devoted to presentations on systems in Minnesota for documenting and accessing information on geodetic control and Public Land Survey System corners.

The association will next meet on September 10 & 11 in Rhinelander. Again, there will be a Thursday afternoon workshop (at least one on preparation of grant applications to the Wisconsin Land Information Board, and possibly a second topic). The main subject for the Friday portion of the meeting will be aerial photography: what it is, who has it, how to purchase it, and how to use it.

For further WLIA information, call 1-800-344-0421.

Summer Calendar Full of Conferences

The summer of '92 brings several major conferences devoted to mapping topics. The fall continues this trend.

Very soon are the URISA (July) and ACSM/ASPRS/ISPRS (August) meetings, all in Washington, D.C. We expect to carry various attendees' reports on these events in our next issue. Later in the year the annual GIS/LIS conference will be in San Jose, CA.

Metadata Gains New Exposure at National Standards Meeting
by Bob Gurda

Over 100 people from across the country gathered in mid-June in Reston, VA to discuss standardization of spatial metadata. I attended as the dual representative of the State Cartographer's Office and the Wisconsin Land Information Board's Clearinghouse Committee. The primary result of the forum was a new fast-track plan to produce a proposal for comment and later adoption as a standard.

Metadata is most easily described as "data about data". A library card catalog is similar, being an organized way to build, maintain, and access condensed but useful descriptions of the contents of a library.

In the arena of spatial information, metadata would describe such things as area of geographic coverage, theme or subject, vintage, source, structure, accuracy, and name and contact information of the custodian. While some people working in this area have concentrated their efforts on catalogue descriptions for digital (computerized) data files, there are many common characteristics among other kinds of spatial data, such as aerial photographs, maps, geodetic control, property records, reports, etc.

There is a rapidly growing realization that without an effective way to describe spatial data we will end up with more data than we can keep organized and accessible. In order to have truly effective interorganizational data sharing, a metadata system must be built and maintained. In fact, at least a dozen states have attempted inventories, mostly at the state level.

Several states have built computerized systems to hold, update, and search for particular data sets. In addition, several federal agencies have similar systems to document some of their holdings. These systems, while addresssing a common problem, are all different, since there has been no standard model to follow.

The primary purpose of the meeting, which was called by the Federal Geographic Data Committee, was to determine if and how everyone interested could agree on a standard. After two days of presentations and discussions, there was good consensus that a standard was needed and that it could be achieved. Another meeting has been scheduled for July, with the goal of having an initial proposal out for comment by August.

In Wisconsin, metadata reporting and access will have a slightly different dimension than in many other states, since each county Land Information Office is charged with being a local clearinghouse for land information. As such, federal, state, *and* local metadata should ultimately be accessible at each of these levels. This arrangement will provide an excellent testbed for work leading toward a broad-scale spatial information infrastructure.

ABOUT THE SCO.......

The State Cartographer's Office (SCO), established in 1973, is a unit of the University of Wisconsin-Madison. The SCO is located on the 1st Floor of Science Hall.

Our staff presently consists of two full-time academic staff—Ted Koch, State Cartographer (608/262-6852), Bob Gurda, Assistant State Cartographer (608/262-6850), and one full-time classified staff—Brenda Hemstead, Program Assistant (608/262-3065), plus several part-time graduate and undergraduate students.

The State Cartographer's position and mission is described in Wis. Statute 36.25 (12m). In addressing this role, the SCO functions in a number of ways:

- publishes the Wisconsin Mapping Bulletin, catalogs, guides, brochures, and other documents to inform the mapping community.
- inventories mapping practices, methods, accomplishments, experience, and expertise, and further acts as a clearinghouse by providing information and advice in support of sound mapping practices and map use.
- participates on committees, task forces, boards, etc. The State Cartographer is one of the 13 voting members of the Wisconsin Land Information Board.
- develops experimental and prototype products.
- serves as the state's affiliate for cartographic information in the U.S. Geological Survey's Earth Science Information Center (ESIC) network.

The Office answers a wide range of inquiries ranging from simple to complex, in the following general categories:

1. Geodetic Control—Requests for surveying information which as been established by some office or agency, and upon which the requestor wishes to base a survey or map.
2. Aerial Photographic Coverage—These are requests for information about existing or planned aerial photographic coverage which can be utilized for a variety of projects. These requests, in many instances, are motivated by the desire to avoid the exceedingly more costly option of acquiring specifically flown photography.
3. General Map Coverage—The requestor is seeking map coverage to fulfill a specific need, from utilization as a base map upon which other information can be compiled, to determination of location or extent of a resource such as wetlands, to use as a recreation guide.
4. Specific Unique Data—These types of requests change as various programs are implemented. Examples include Magnetic Declination (for land surveying), and Latitude/Longitude (federal requirement for placement of sending satellite dishes or radio towers).
5. General Requests—Such as size of an area, height of a particular feature, location of a named feature, explaining contours, digital methods, software, hardware, etc.
6. Activities of Others—This provides access to publications, news, anecdotal information, and referrals to appropriate agencies, programs, organizations, or individuals who may be able to provide the information being sought.

For more information, call the SCO at 608/262-3065. You can request a free brochure profiling the SCO in more detail, and listing available publications.

Wisconsin Mapping Bulletin

Published quarterly by the State Cartographer's Office. A University of Wisconsin-Madison outreach publication distributed free upon request.

News is welcome on completed or ongoing projects, published maps or reports, conferences/workshops. Local and regional information is especially encouraged. The Editor makes all decisions on content. Deadline for the next issue is September 14, 1992.

Editor: Bob Gurda
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