



# Wisconsin MAPPING BULLETIN

## Land Council Pulled from State Budget

by Ted Koch

The legislature's Joint Committee on Finance has removed the proposed creation of the Wisconsin Land Council from current state budget deliberations. This decision, by Joint Committee chairs, Senator Brian Burke (Dem.-Milwaukee) and Assemblyman Scott Jensen (Rep.-Waukesha), appeared in an April 18 letter to committee membership.

In their letter, the chairs identified a total of 114 budget items that they believe to be nonfiscal policy items that should not be addressed within the budget, but rather should be considered as nonbudget legislation by other standing committees. The chairs recommended that none of these 114 items be considered in the Joint Finance Committee during budget deliberations.

Left in limbo by the Joint Committee on Finance is the companion legislation to the Land Council creation, which calls for the dissolution of the Wisconsin Land Information Board (WLIB). At press time, the proposal to dissolve the WLIB remains within the state budget.

### Issues first appeared in the budget bill

Governor Thompson's budget, which was presented to the Legislature in late February, called for two major changes to land related issues. The first is to centralize land information activities within the Department of Administration (DOA). This includes dissolving the existing Land Information Board and transferring its statutory functions and executive staff to the DOA. The centralization thrust also proposes to attach the Board of Commissioners of Public Lands to the DOA for administrative purposes, and to transfer the Plat Review and Municipal Boundary Review functions from the Department of Revenue.

The second major land action called for in the budget is to create a new Wisconsin Land Council. The purpose of the Council is to identify state land use goals, priorities and procedures for facilitating local land use planning and

to make recommendations for improvements to the Governor. The proposed 16-member Land Council would replace the WLIB. The budget called for the council to have eight full-time staff positions, comprised of the existing 2.5 positions currently with the WLIB plus 5.5 new positions.

### Groups react to the budget

The proposal to dissolve the existing WLIB has created a flurry of reaction from the state land information community. As reported in our lead article in the last issue of the *Bulletin* (January 1997), the WLIB has gone on record as opposed to the proposal to merge the WLIB and the Land Council. This position was further solidified by the board at its April 9, 1997 meeting. At that meeting, the board decided not to take a position on the creation of the Land Council. Instead, it voted to focus its opposition to the ending of the board and transfer of the land information program to the DOA.

As another segment of the state's land information community, the Wisconsin Land Information Association has expressed its urgent concerns on the future of the program

*continued on page 4...*

### Highlights of this issue....

<i>Land information "enterprise" explained....</i>	3
<i>Aerial photography news.....</i>	6&7
<i>Building a common interface .....</i>	11
<i>Outline maps from the SCO .....</i>	13

by Ted Koch

## Board meetings

The Wisconsin Land Information Board has met twice this year, February 18 and most recently April 9. The next scheduled meeting of the board is Tuesday, June 24 at the Wisconsin Department of Agriculture Trade and Consumer Protection's building on Madison's east side.

## Grant program restructured

At its April 9 meeting, the board approved an interim plan to distribute grant funds to local governments until a new grants-in-aid program is in place. The board decided that each county may apply for a July, 1997 grant or grants equal to the amount of money it submitted to the board during the July 1, 1996 through June 30, 1997 period minus any awards made for the July, 1996 period. This grant award is contingent on each application being compliant with current board policies and requirements. The application period will be open from July 1 to July 31, 1997.

Also, at its April 9 meeting, the board approved a revised annual grants-in-aid cycle to begin in January, 1998. First awards would be made by July 1, 1998. The board received, but has not yet acted, on rules for this annual program.

## Base budget support approved

The board has approved the implementation of a county base budget program that will provide an annual subsidy to eligible county land information programs in an amount equal to the difference between retained fees and \$25,000. No application will be required from the counties for this program. The board will distribute funds to eligible counties by the end of April, this year.

Recent statistics show that 27 counties will qualify for an annual subsidy averaging \$8600 per county. The overall subsidy of about \$233,000 will reduce by roughly 15% the resources that the board has available to allocate to grants.

This base budget arrangement represents a transfer of funds from counties collecting higher amounts of fees (due to a high rate of real estate transactions) to the counties that collect much lower amounts.

## Policy on funds for maintenance

At its April 9 meeting, the board confirmed its temporary policy that permits any county to use retained fees for maintenance activities that are consistent with the county's land records modernization plan. However, the board declined to allow the use of grants-in-aid funds for maintenance ac-

tivities until the board defines what activities qualify as maintenance. Further consideration of this issue was referred to the board's Executive Committee.

## Planning instruction revisions

At the April 9 meeting, the board received, but deferred consideration of new comprehensive planning instructions to be used by both counties and state agencies. The instructions were developed last summer by the WLIB Planning Work Group, reviewed by the Wisconsin Land Information Association, and approved by the WLIB Executive Committee. It is anticipated that the instructions will be approved by the board at its next meeting in June.

## Officers elected

Also on April 9th, the board re-elected two of its officers, and elected a new vice-chair. John Laub (Chair) and Les Van Horn (Secretary) were reelected while Ted Koch, State Cartographer, was elected Vice-Chair for the first time. All terms are for one year. Koch replaces Ben Niemann who served as the previous Vice-Chair for several terms. The three officers, along with Mark Wahl, Administrator of the Department of Administration's Division of Technology Management, make up the board's Executive Committee.

### Table of Contents

• <i>State land information news</i> . . . . .	2
• <i>Interview with Doug King</i> . . . . .	3&4
• <i>Statewide data developments</i> . . . . .	5
• <i>GPS</i> . . . . .	6
• <i>Aerial Photography</i> . . . . .	7
• <i>"Q&amp;A"</i> . . . . .	8
• <i>News from the SCO</i> . . . . .	9
• <i>Metadata developments</i> . . . . .	10
• <i>Guest opinion</i> . . . . .	11
• <i>Publications &amp; Products</i> . . . . .	12&13
• <i>Events</i> . . . . .	14
• <i>Conferences, Technical Meetings, &amp; Classes</i> .	15

## Beyond Confederation: A Wisconsin Land Information Enterprise

For this issue we returned to talk with Doug King\* about a concept he has been discussing in several forums. As a person trained in strategic planning and information management, he believes land information is evolving to a place where planning and implementation are managed under an “enterprise model”. This approach is a departure from the “confederation model” that provided the foundation for the program in its earlier years.

**When the legislative dust settles one of these months, how will the land information program be different?**

Doug-

Lots of people would like to know the answer to that one, but no one knows for sure. However, one thing is very clear to me. The land information program has matured beyond a confederation of independent systems. The paradigm is shifting. We are inevitably moving towards an “enterprise.”

In his *Executive Order on Information Technology*, Governor Thompson directed:

*“It is my intent that the state plan and administer its information technologies on an enterprise basis, emulating the management of a private enterprise in that the state’s strategic planning efforts will be focused on the Wisconsin state government as a single corporate enterprise and not the many separate agencies.”*

Wisconsin state agencies have already begun changing their business operations. A few of many examples are merger of major state agency mainframe computing centers, shared helpdesk supporting state-standard technologies, and a common format for exchange of GIS data.

As a state agency, the Wisconsin Land Information Board is part and parcel of this emerging information technology enterprise. We must be willing to change or become a hostage to history. Our future is in a migration from a *confederation* of independent systems engaged in a coordinated effort to modernize land records to an *enterprise* of interdependent systems engaged in a collaborative effort to achieve broader social purposes.

**On the surface, this doesn’t sound particularly different from the program as it has evolved over the last eight years. What are the key differences as you see them?**

Doug-

What’s new here may seem subtle, but it isn’t. Fundamentally, we all need to be more proactive in working together. For instance, imagine the performance benefits that would arise from *collaborative* acquisition, construction and sharing of land data, information, systems, services, expertise, support, education, training, and *even budgets and staffs* on a *statewide* basis among local, state and federal governments, public utilities and the private sector *for the benefit of all*. The difference between confederation and collaboration may seem like a fine line. But in terms of a land information enterprise, it is a fundamental difference.

**Can you be more specific?**

Doug-

Moving beyond confederation to a collaborative enterprise means more than cooperation among WLIP participants. It means two things.

First, it means aggressive vertical joint ventures even more proactive than the successful horizontal consortiums which have developed such as the S.W. Wisc. Consortium. For example, a state agency and a local unit of government working together to actually revise their position descriptions, reallocate their staff time and co-mingle their budgets to do work on each other’s behalf. Local government use of agency helpdesks and agency production of county datasets illustrates the concept.

Second, it means deferring to the needs of others in order to achieve a greater social purpose. For example, not only refraining from competing for limited resources so that something else can be accomplished elsewhere in the state, but also even going beyond that and contributing your own resources to that effort “for the benefit of all,” as the theme of this year’s WLIA Conference suggests. Offers of funding from wealthier counties to provide a guaranteed base budget for counties unable to retain sufficient fees to maintain a local LIP illustrates the collaborative concept and contrasts with a confederation of competitors.

**How has the Land Information Board embraced these concepts?**

Doug-

I would point to the board’s first *Strategic Business and Information Technology Plan* which it adopted earlier this year. In addition to committing itself to statewide completion of its original eight foundational elements (geographic frameworks; parcels; zoning; wetlands; soils; public access; institutional arrangements; and communications, education, training), there are new directions such as:

- *base budget grant awards to 27 counties were approved by the Board and will ensure the creation of basic infrastructure in all counties;*
- *a statewide reconciled election and administrative boundary system;*
- *a statewide reconciled street address and street network system;*
- *synthesis of existing and new foundational elements to support new social purposes of emerging importance to Wisconsin’s citizens such as emergency management and delivery; re-districting; tourism promotion; agricultural land preservation planning; industrial and commercial development; and land use planning.*

....continued on page 4

*\*Dr. Doug King has been Executive Director of the Wisconsin Land Information Board since November, 1995.*

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## Beyond Confederation: A Wisconsin Land Information Enterprise

The strategic plan also invokes an array of new processes to accomplish our goals:

- *noncompetitive funding targeted on an initiatives list of priority land records modernization activities;*
- *common modernization/integration plan format shared by all counties and state agencies enabling collaborative preparation, borrowing of materials and ideas and easy comparative review;*
- *peer review of county plans by colleagues in other counties and especially by colleagues in other state agencies including problem reporting to WLIB on an exception basis;*
- *peer review of state agency plans by colleagues in other state agencies and especially by colleagues in other counties including problem reporting to WLIB on an exception basis;*
- *a list of additional activities, too long for this interview, which provide tools and forums for land information practitioners to help each other with knowledge transfer, data acquisition, contracting, purchasing, auditing, development, planning, info-brokering data format conversion, and data and metadata distribution just to name a few.*

***This sounds as though there will need to be many more meetings than all of us already have on a regular basis. How will this be efficient?***

Doug-

Collaboration will work if we develop an *enterprise-wide* shared framework of visions, goals, and tasks. This doesn't have to take a great deal of time, if we use the leverage of information technology to electronically interconnect our community of knowledge, data and people to help each other.

Our work together will have great benefits *if* in coming to a common vision we focus our efforts on the larger picture and ultimately the *great social purposes* that we can help address.

Each of us surely has everyday needs to satisfy in our respective roles, but the benefit of working together will come from long-term successes that are more visible, overarching, and meaningful to the citizens and their elected representatives.

I'm not suggesting that day-to-day needs in our offices to support various users aren't critical. But, if we design our systems also to contribute to Wisconsin's *longer* needs we will finally be able to truly meet our obligations and attract the support we want.

This is the flavor of a land information enterprise. The alternative—continuing a confederation—will only lead us to discover how costly it is in the end to do everything separately, "buy it done" and then try to cooperate with each other to make it all fit together. It is my strong belief that we do not have the money or the time to justify this choice. We are inevitably evolving "beyond confederation" to a land information enterprise.

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## Land issues pulled from state budget

in an April 8, 1997-letter to all members of Wisconsin Legislature from David Moyer, WLIA President. The WLIA is primarily concerned that a merged WLIB and Land Council will severely damage the successful WLIP which the WLIA claims will have the effect of jeopardizing the tens of millions of dollars in state investments made by the WLIP over the last six years.

### Lt. Gov.'s proposal also in the mix

In a report unrelated to the governor's Budget Bill, Lieutenant Governor Scott McCallum has released the *Wisconsin Evaluation Survey Report* which is an analysis of state councils, offices, boards and commissions, with recommendations on the continuation, termination or transfer of their functions. In regard to the WLIB, the Lt. Governor's report state that the board has had ample time and funding to achieve its mission, and that the board has not made significant progress toward its stated goals. However, to allow the board to complete its work, the report recommends the board continue, with a "sunset" on its activities in the year 2001. At its April 9 meeting, the WLIB approved sending a letter to the Lt. Governor pointing out several serious errors concerning the WLIB in the report.

### Future of the grant program

As reaction to both the proposed DOA assumption of the WLIB's role and the creation of the Land Council has swirled about, activity has continued, albeit somewhat out of the limelight, on issues concerning the future existence of the board's local Grants-in-Aid Program. At present, nearly \$2 million annually in real estate transaction fees collected at the county level are sent to the board for board administrative operations and the balance then returned by the board to local government in the form of project grants. A variety of positions on the grant program have been taken by the WLIB, WLIA, the county Land Information Offices and the Wisconsin Counties Association.

In a proposal to change the grants-in-aid program, Racine County and other southeastern Wisconsin Counties are supporting a draft legislative bill that plans to allow all counties to keep 90% of locally collected fees in the county, and to abolish the board administered grants-in-aid program.

# Statewide Data Developments

## Statewide completion in sight



### **DRGs head for the finish line**

by Bob Gurda

By May we expect to have statewide coverage of Digital Raster Graphics (DRGs),

which are scanned versions of USGS topographic maps.

Produced by a contractor for the USGS with cost sharing between USGS and various cooperators (coordinated under our state's WISLAND initiative), these files will have a wide range of uses. They will be available in native USGS format for less than \$1 per map sheet file in block groups of 64 files, in TIFF format.

WISLAND is also enhancing DRGs within a few months of their initial release by USGS. These derivative files are already available for most of the state with completion due by the end of summer if not earlier. The enhancements make it easier to abut adjacent images using a computer, and convert the federal standard coordinate system (UTM) to a more commonly used statewide coordinate system (WTM).

For details on DRG costs and how to order copies, see our previous issue (January '97, page 9. Information is also available on our website (see p. 16 for address).

## Various projects moving forward

### **WISCLAND Update**

by Bob Gurda

Land cover data in a consistent format statewide is likely statewide by the end of 1997. The interpretation of Landsat Thematic Mapper imagery continue at a steady pace at the Wis. Dept. of Natural Resources under collaborative funding from a group of organizations under WISCLAND (the Wisconsin Initiative for Statewide Cooperation on Landscape Analysis and Data).

A robust data model for a hydrography GIS database is also just about complete, with production work set to move into high gear this summer.

On a new front, WISCLAND is sponsoring an effort to delineate public land ownership based on the 1:24,000-scale "Landnet" GIS database developed earlier. Not a substitute for detailed cadastral mapping and database development, this initiative will attempt to develop information needed by the cooperating organizations for various management functions until such time as true cadastral data is available across the state. For details on this emerging direction, contact Brad Duncan at 608/267-5182.

For general information on WISCLAND, contact Bob Gurda at 608/262-6850.

## Coming to an orbit near you!

### **High resolution satellites to orbit by 2000**

by John Walkey

Planning on drilling a well? Making an insurance claim on crop damage? Routing a gas transmission line, locating a bank branch, assessing markets, or studying human health statistics?

If so, chances today are that you will be using geospatial information technologies to integrate, analyze and present your spatial data. The need for timely data covering many areas is prompting a "gold rush" for high spatial resolution satellite systems, and a growing number of "49'ers" have stepped forward to provide that data.

With the end of the Cold War came the emergence of once classified surveillance technologies into the civilian marketplace. Aerospace firms exploring new customer bases as military spending is reduced have formed subsidiary companies or joined together in consortia to cater to those clients who require current, detailed imagery of the earth's surface.

At least five US companies have plans to launch high resolution imaging satellites within the next two years. "We are entering an era of tremendous growth in the development and application of geospatial technologies in general, and satellite remote sensing in particular," remarks Prof. Thomas Lillesand, the Director of UW-Madison's Environmental Remote Sensing Center, and the president-elect of the American Society of Photogrammetry and Remote Sensing (ASPRS). Lillesand sees the potential markets for these data as ranging widely from utility companies and environmental firms, to risk management concerns, farm cooperatives, real estate companies, to news, travel, and navigation industries, and all levels of government.

Of the new satellites scheduled to be in orbit before the end of the century, most have spatial ground resolutions ranging from 0.8 to 3 meters with a revisit time for any point on the earth ranging from 1 to 11 days.

For more information about these satellites visit the Environmental Remote Sensing Center's home page:

<http://www.ersc.wisc.edu/ersc>

or the following commercial sites:

<http://www.digitalglobe.com>,

<http://www.orbimage.com>,

<http://www.spaceimage.com>.

*Provides navigation and control*

## GPS aids aerial photography and mapping

by Ted Koch

Aerial photography and mapping from aerial photographs are both beginning to benefit from GPS (Global Positioning System). The GPS satellite constellation, launched and maintained by the U.S. Department of Defense for the military purposes of precise navigation and location, is being used for more and more civilian purposes every day.

Imagine being able to determine a position on the ground to within 4 inches. With good quality survey instruments and procedures, whether using traditional devices or state-of-the-art GPS receivers, this level of accuracy may not seem so remarkable.

However, determining a ground position to that accuracy from a rapidly moving aircraft may be somewhat more difficult to believe.

Yet with a GPS receiver mounted in an aircraft, and a second receiver on the ground in the same general vicinity, attaining this degree of ground positional accuracy is possible.

### How GPS can help

Airborne GPS (ABGPS), that is, the rigging of an airplane with one or more GPS receivers, offers the potential of significant cost savings in two areas of aerial photography and mapping: in-flight aircraft navigation and camera control, and the collection of the equivalent of a survey control point coordinate at the center of every photo. An accurate GPS derived value at each photo center can then be later used to support mapping requirements.

In contrast to the more traditional aerial photography collection procedures, ABGPS can provide improved guidance and control to and on the photo flight lines, aerial camera shutter release at predefined positions, annotation of position on the aerial film at exposure, and a record of exposure position if reflights are required in the future.

Use of GPS in this manner requires a second receiver on the ground for determining differential GPS positions which provides data for to processing and correcting the normally degraded GPS signal. Effective use of ABGPS also requires a flight system that has GPS fully integrated into flight planning and navigation.

The collection of an accurate GPS derived coordinate at each photo center allows these points to be part of the control network needed to produce mapping that is precisely tied to ground locations and accurately scaled. The GPS de-

rived coordinates are used in the aerial triangulation procedures to derive accurate photos positions for subsequent map compilation.

In all ABGPS projects, some ground control will be still be required, although less than in the past, yielding a savings in labor and materials associated with placing targets and providing high accuracy coordinates on these control points.

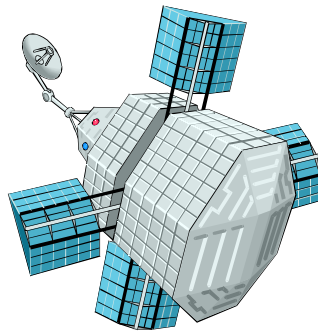
### Savings add up for large projects, remote sites

ABGPS can provide potentially substantial opportunity for savings in photography acquisition and map production for medium to large sized projects, due to less time spent researching and acquiring conventional ground control, or over terrain where it may be difficult or impossible to get control from traditional ground survey methods.

It should be noted however, that there are also risks associated with ABGPS. Since the GPS signals have to be recorded at the instant of film exposure, mishaps such as lack of proper communication between the aircraft and the ground, loss of signal reception from the GPS satellites, and incorrect configuration of various system components can jeopardize the entire project. This could potentially lead to losing all or part of the control data which could significantly increase the length and cost of an aerial photo and mapping project.

### Vendors are becoming equipped

Most all aerial photography firms have now acquired integrated ABGPS capability into their procedures, and have tested and used it on enough projects to now offer it as a standard service. ABGPS is definitely an option to consider when acquiring aerial photography for traditional planimetric or topographic mapping projects or for production of digital orthophotos.



# Aerial Photography

*Variety of work set for 1997*

## Groups set aerial photo plans

by Bob Gurda

This year will be typical in the realm of aerial photography over Wisconsin. A number of projects are slated, and interested parties will be anxiously watching for clear skies to coincide with their ideal time window for capturing the images.

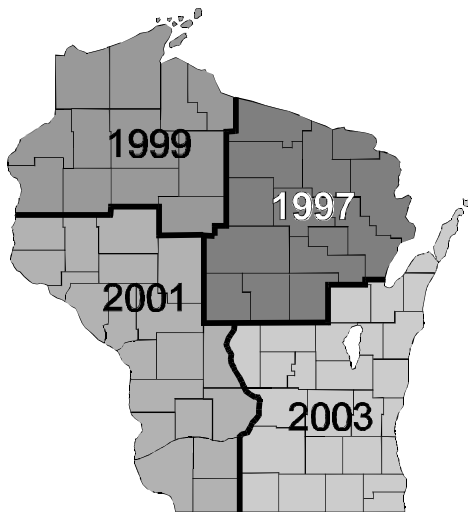
While there are no full state coverages planned for this year, a number of full county or multi-county projects are in the works. Below is a brief annotated listing compiled from reports to us from vendors and agencies.

As we become aware of successfully completed projects, we will post that new information to the *Wisconsin Catalog of Aerial Photography* section of our Internet web site.

### Statewide forestry survey resumes

The Wisconsin Department of Natural Resources (DNR) will be initiating a regular photography acquisition process this summer, planning to accomplish statewide coverage over the next 7 years. One quadrant (approximately one quarter) of the state is slated for coverage every other summer (see map showing quadrants and acquisition years).

This work carries similar specifications to the statewide project that DNR conducted over the summers of 1991-1993. That is, film will be black-and-white infrared, scale of 1:15,840 (4" = 1 mile), on east-west flight lines.



*Planned acquisition sequence for DNR Forestry photography*

### County-based projects

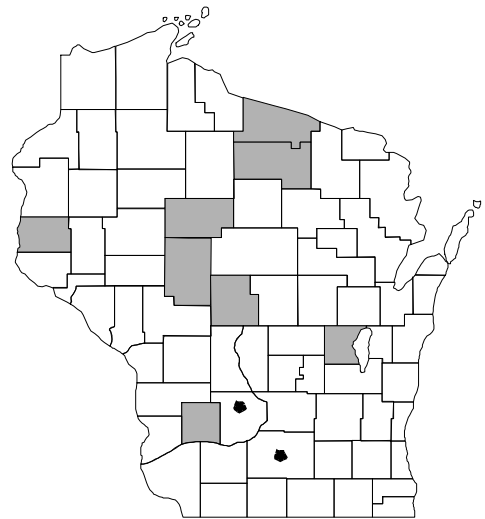
Each spring the DNR's Wisconsin Wetlands Inventory acquires photographs over several counties as the source for updating wetland maps. These are acquired at two scales, the larger for interpretation and the smaller as the image base for final products. This year, coverage is planned for the counties of Oneida and Vilas; last spring Chippewa, Clark, Eau Claire, and Jackson were flown.

Several counties have contracted for spring aerial photography to support mapping and land information needs. These include Winnebago, Taylor, and Clark.

The federal Natural Resources Conservation Service plans to acquire color photographs over three counties this spring: St. Croix, Wood, and Richland.

### Cities and small areas

Sources reporting to us indicate that the cities of Madison and Baraboo are contracting for spring photographs.



*County and city photography expected in 1997*

### Updates to the SCO's catalog

We will be tracking the projects listed above, and others we become aware of, and posting them to our on-line Catalog of Aerial Photography.

**?** *Are there any sites on the Internet where I may view copies of existing maps?*

Yes, there is a wide variety, far too many to list or describe here. However, several may be worth a visit, and because these have extensive links to other related sites, your search and viewing time can become quite lengthy.

One of the better sites for viewing, printing or downloading exiting maps for your own enjoyment and use is the Perry-Castaneda Library map collection at the University of Texas at: <http://www.lib.utexas.edu>. This site contains over 2,100 scanned images of published, non-copyrighted, public-domain maps. The coverage is world wide, with over 300 maps for the United States alone. There is something available for every state, which for Wisconsin is a U.S. Census Bureau state outline map. To assist the viewer there is a Frequently Asked Questions section with instructions on viewing and printing the images. Also included is a section of Maps of Current Interest, which lately contains several maps of Albania and Zaire.

The other site you may wish to check-out is Oddens's Book Marks at: <http://kartosever.frw.ruu.ni/HTML/staff/oddens/oddens.html>. This site does not contain map images per se, but rather is a list of links to over 1400 other sites of cartographic interest. The linked sites are classified into nearly 40 different categories. Many of the referenced sites contain viewable images of scanned maps.

**?** *Can you direct me to a simple computer file that has the names and positions of the HARN stations in Wisconsin?*

There is no publicly available file that, all in one place, provides what you are seeking. However, as part of one of the geodetic control information products that we have available from the SCO, you can access this information through a two-step process.

Among the files that we have packaged with our *NGS/SCO Geodetic Control Data Sheets and Retrieval Software for WI-1996* are two ASCII files that list the HARN (High Accuracy Reference Network) stations. One file is arranged by county with each county's station(s) listed, and the other file is arranged alphabetically by station name with the county noted.

Neither of these files provides the position of the stations. To find this information you need to search the individual county datasheet files produced by NGS (and included in the SCO product mentioned above). While this second step is clumsy compared to having the information available all through a single file, it ensures that you are accessing the literal NGS data and not something derived from it.

As an aid to understanding the distribution of HARN stations, we also provide a state map (in several graphics formats) showing their locations.

**?** *Where do I get a map of lake water depths that will help me be more successful in fishing this summer?*

Most of the larger lakes in the state have been mapped for depths. This means that bathymetric contours (lines showing equal depth) have been interpreted from a collection of depth measurement points. Some of these maps also show lake bottom material at selected points.

However, many smaller lakes have not had a bathymetric survey.

So, you first need to determine if a lake depth map has been constructed. The Wisconsin Department of Natural Resources has a publication "Wisconsin Lakes" that lists lakes by county, and indicates among other things which have been mapped. This publication is free to pick up, or can be ordered for a nominal amount to cover mailing.

The nearest DNR field office to the lake in question (particularly the Area Fish Management staff) can probably also help with this kind of search, as can we at the SCO.

Lake maps can be purchased either from from Clarkson Map Company in Kaukauna (phone 414/766-3000), typically for less than \$3.00 each. In addition, specialized businesses such as Fishing Hot Spots (telephone 800/338-5957) sell enhanced maps of certain lakes which show important features relating to fishing. Local businesses such as sporting goods shops may carry lake maps for the immediate area.

Of course, even if you arm yourself with the best lake map and the latest fishing equipment, we can't guarantee that you'll be successful in landing your limit or a lunker!!



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*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.*



# News from the SCO

*Notes from the net*

## SCO web page updates

by John Walkey

The SCO web page continues to evolve to better serve the needs of the spatial data users of Wisconsin. A number of additions have been incorporated onto the page, including a link to the Wisconsin Land Information Clearinghouse (WISCLINC) which itself has recently undergone some changes.

We have expanded our education and information pages to include a section on geodetic control. Background material on what is geodetic control and how it is used in the state is provided, as well as information on where to get geodetic data, related software and publications.

And speaking of publications... The copy of the *Mapping Bulletin* you now hold in your hands will soon be available on-line as a .PDF format file. These .PDF files allow you to print out a document at home exactly as it looks in published form. The Adobe Acrobat viewing software is available on-line for downloading and is free. Instructions on how to download and use the reader are available on our home page.

We have recently put a job postings page on-line. Here you can find notices of mapping-related jobs in the state which have been sent to us. There are also a number of links to other useful job search pages for those in the spatial data field.

Finally, we have linked to the WISCLINC page, where you will find metadata search tools, on-line data, links to pages of interest in the state, and, of course, the SCO's Calendar, which we constantly update based on your input to reflect news on the latest events in Wisconsin.

As always, if you know of some information or service we can provide over either the SCO or WISCLINC home pages, please contact us and let us know! Your input is needed to make these internet resources better serve you, the mapping community of Wisconsin.

Check out WISCLINC at:

<http://badger.state.wi.us/agencies/wlib/sco/pages/wisclinc.html> and the SCO home page at:

<http://feature.geography.wisc.edu/sco.html>.



*significant turnover in the works*

## SCO student staff in flux

by Bob Gurda

The SCO staff is about to undergo major change in the upcoming months. We're not yet certain how we will adapt to cover our losses, but several options are open.

### Metadata crew is changing

Hugh Phillips is heading to Florida early this summer. Hugh began work with us while still in graduate school and then became full-time last summer. He has become one of the nation's leading practitioners and educators in the specialized area of geospatial metadata, and has been instrumental in developing the WISCLINC web site and the metadata that it serves.

Hugh has also been working with the campus library system to help them build an internal capacity to support GIS through teaching labs.

Scott Wallace, a graduate student in Civil and Environmental Engineering who has been working for us the last several months under Hugh's guidance, will also be leaving by summer.

### Website support changes

John Walkey, another graduate student, is finishing his Master's Degree in Environmental Monitoring and will be leaving Madison soon. We are working to replace his considerable talents in the design and function of Internet web pages.

### Undergraduate staff adjusts, too

A fourth person is leaving our staff, upon finishing his Bachelor's Degree in Cartography. Lason Laux is headed to a position with a local firm. He has worked on numerous projects over his time with us, most notably the collection and encoding of data on recent aerial photography which we used to update our *Catalog of Aerial Photography* which is now accessible over the Internet.

We have hired Jeff Bogenscheider to be part of our staff for the next year. Jeff is majoring in cartography.

*View our products & website*

## SCO unveils public access terminal

by Bob Gurda

We have a new service that you can check out when you visit our office: a computer terminal dedicated to public use, with our various digital products ready to run, and connected to the Internet for visiting our website.

If you plan on visiting us, keep in mind that while we try to keep the office open virtually every business day from 8:00 am to 4:30 pm, there are rare times when schedules or meetings make it impossible to meet that goal. So, it's always a good idea to contact us in advance!!

# Metadata Developments

See it on the Internet

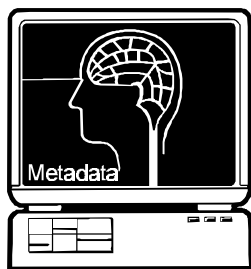
## Metadata "Primer" now available

by Hugh Phillips

A draft of the *Metadata Primer* created as part of the 1995 NSGIC CCAP project is now available for use and comment at <http://localis2.lic.wisc.edu/~dhart/metaprim.htm>.

The primer provides a systematic approach for learning about metadata and how to produce it. It is targeted at agencies interested in producing metadata, but who need a fuller understanding of the federal metadata standard, the processes necessary to produce it, and its potential benefits.

This primer will be the framework for a satellite video conference on metadata to be presented October 15, 1997.



## Metadata Tool summary available

A summary of metadata tools completed as part of Wisconsin NSDI Clearinghouse activities, and in support of the 1995 NSGIC CCAP project is available at:

<http://badger.state.wi.us/agencies/wlib/sco/metatool/mtools.htm>. The summary contains information on where to obtain the tools, a brief description of each, and samples of the interface and output.

## Metadata Encoding Standard drafted

A draft Encoding Standard (<http://www.fgdc.gov/clearinghouse/docs/encoding.html>) for CSDGM metadata was presented to the FGDC Coordination Working Group in October. The proposed standard will address some of the metadata exchange problems (described in the April 1996 Mapping Bulletin) resulting from the lack of metadata formatting requirements in the Content Standards for Digital Geospatial Metadata (CSDGM). The proposed metadata encoding (exchange) format is based on SGML and uses the tags and structure defined in an accompanying Document Type Declaration.

## Clearinghouse Developments

Wisconsin has established an Isite based NSDI Clearinghouse (see note) in parallel with its existing freeWAIS-sf based node. This and other Isite servers are being used by FGDC and its contractors to test and refine the FGDC's new Clearinghouse model. Isite server based Clearinghouses promise greater flexibility and speed for geospatial data searching than the older freeWAIS-sf based implementation. The HTML and Java based search query interface for Isite is near completion. When the query interface is available, it will be possible to search any or all Isite based NSDI Clearinghouses simultaneously in a single query through a USGS gateway or one of its mirror gateways.

at recent WLIA conference

## Metadata workshop is a full house

by Hugh Phillips

A Metadata Mentoring workshop was held during the WLIA Annual Meeting in Lake Geneva in early March. This workshop paired nine metadata mentors with a like number of attendees for a hands-on metadata production exercise using currently available metadata tools.

The workshop was the timely vision of the WLIA Metadata Task Force. Based on the workshop feedback, similar and more advanced metadata workshops may be held in the future.

See a summary of the workshop and an enhanced version of the workshop background material and exercise at: <http://badger.state.wi.us/agencies/wlib/sco/metex/>

## MetaMaker updated

*MetaMaker*, the Microsoft Access-based Windows metadata entry / manager tool developed by David Hansen at the Environmental Management Technical Center in Onalaska, has been updated to version 2.10. This tool now incorporates the National Biological Information Infrastructure extensions to the *Content Standards for Digital Geospatial Metadata*. Its output has been improved to be more compliant with the latter.

See a review of this latest release of *MetaMaker* at: <http://badger.state.wi.us/agencies/wlib/sco/meta-tool/metama kr.htm>

## Swan song release of *Document.aml*

Version 7.1.1 of *Document.aml*, the metadata entry tool for 7.0+ versions of workstation Arc/Info, has been released by ESRI. The noted improvement for this release is better compliance with the metadata parser (mp) and the content standards.

This is to be the last release of *Document.aml* by ESRI as the company is working on other new metadata documentation tools. More information and the 7.1.1 release of *Document.aml* are available from:

<http://www.esri.com/base/products/arcinfo/docaml711.html>

## New software from private firm

*Meta Data Manager Professional* version 2.0 is a metadata entry / storage / export tool available from Blue Angel Technologies. It runs under Windows 95 and NT and supports metadata in CSDGM, DIF (Directory Interchange Format), and GILS (Government Information Locator Service) forms. The *Meta Data Manager* is complemented by *Meta Data Server* and *Meta Data Client* packages for Internet and Intranet serving and searching of metadata using Z39.50 protocol.

The SCO has not yet had the opportunity to review this tool. See Blue Angel's website (<http://www.bluangel.com>) for further information.

# Let's build a common window back into land history

by Michael Paus\*

Several years ago the *Mapping Bulletin* carried articles about a project conducted by the federal Bureau of Land Management (BLM) that involved scanning original land patent records, thereby making them much more accessible to the public. That work was built on a database published on CD-ROM which could be searched, although the images were not directly accessible.

I would like to update readers on that subject and propose a way to make much more information accessible. We

**...these records are a gold mine of information about the lands in our state.**

have an opportunity to cooperatively build a multi-functional interface that would serve land information professionals, people casually investigating land history, and students.

## Digital files are proliferating

The Board of Commissioners of Public Lands (BCPL)\*\*, the state agency I work for, will, hopefully, conclude scanning the 94,000 state land patents this fall, beyond the 260,000 scanned earlier by the BLM. We intend to merge these images and the database that organizes them and allow a single method of accessing them, using the Internet.

We have also scanned in color the 2,000 original plat maps and will begin to scan the original surveyors' field notes (the state budget permitting). Together, these records are a gold mine of information about the lands in our state. Making these records accessible while protecting the original copies is one of our office's mandates.

Together with land information being developed by various other organizations, the amount of computer-based resources becoming available for people wanting to better understand our lands is growing rapidly. We face the possibility that a novice users could easily be overwhelmed by the sheer volume of information unless an easy access system is available to them.

## The power of integration

While each set of information is valuable in itself, real power arrives when a person can easily assemble various sets of information from a single legal description or over a larger area.

*\*\*BCPL generates \$16-18 million annually in net revenues from its Trust Fund Loan earnings and forestry operations. These funds are distributed as direct aid to public schools throughout the state, thereby helping hold down property taxes.*

We have a great opportunity right now to build access tools cooperatively that work statewide, and that work even for people who are not part of the GIS or IS "intelligensia". But, if we wait too long, a variety of

**We face the possibility that a novice users could easily be overwhelmed by the sheer volume of information...**

access tools will inevitably emerge, and it is certain that they will be different, thus forcing a user to learn several different ways of accessing what is essentially the same information from different parts of the state.

## Who benefits?

A well-designed interface, ideally accessible through the Internet, would benefit a wide range of people and organizations including schools, universities, libraries, genealogists, title companies, and land surveyors. A broad-based approach that considers the needs of a spectrum of users could result in a very successful access system.

Our agency cannot alone take on the task of building such a system, but would like to see it happen and want to participate as we can. We would benefit from it as would other land records managers.

## Another modernization phase

Now that substantial amounts of computerized land information are starting to emerge, we who are managers of that information need to begin dealing with the issue of access. It is the time for action so that we stay ahead of

**Land information managers need to begin dealing with the issue of access.**

the curve. Broad access that helps to integrate a variety of land information will have the greatest pay off for everyone.

I encourage those interested in collaborating to build a land information access tool to contact me by phone at 715/356-7317 or email at MPaus1@mail.state.wi.us.

*\*Michael Paus is the District Office Administrator for the BCPL working out of Woodruff. He is past president of the Eastern Lands and Resources Council, and the BCPL Imaging Project Director.*

# Publications and Products

Geoid96 reduces uncertainties

## GPS for vertical moves ahead

by Bob Gurda

GPS is great for horizontal positioning but it's problematic for vertical, right?

Well, that used to be the case, with far better results for latitude and longitude than for elevation. But, thanks to something called "Geoid96", using GPS to establish useful elevations is now dramatically easier.

### What is "Geoid96"?

In simple terms, Geoid96 is an improved national model that strengthens the linkage between GPS (which provides distances from the center of the earth) and elevations above sea level. This model was developed by the National Geodetic Survey (NGS).

More specifically, this new model is a grid with a spacing of 2-minutes by 2-minutes of latitude and longitude that is based on almost 3,000 GPS heights on known benchmarks (about 18 in Wisconsin). By tying the model to these benchmarks, a much tighter link has been forged between GPS measurements and traditional levelling surveys.

NGS provides a computer program, GEOID, to interpolate within the grid to a specific point.

### How much improvement can you expect?

The previous geoid model, Geoid93, commonly produced errors on the order of 1 meter. The newer model reduces this to around 6 centimeters (about 0.2 feet). This dramatically improved performance opens a new avenue for GPS.

Dixon Hoyle, NGS Advisor for Minnesota, said "I was amazed at how well it fit in Minnesota: plus or minus 6 cm across the state".

### How do I find out more?

The new model and related information are available from various sources. All products are in the public domain.

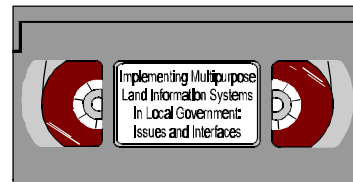
On the Internet, try the NGS web site (<http://www.ngs.noaa.gov>), the NGS FTP site (<ftp.ngs.noaa.gov>), or the NGS Bulletin Board (301/713-4181). NGS also sells a CD-ROM containing the information (call 301/713-3242).

(source: *Professional Surveyor*, Jan/Feb 1997)

edited from session held in 1995

## LICGF offers seminar via tape

Learning about the modernization of land information systems on your own schedule is now easier thanks to a set of video tapes released recently by the University of Wisconsin-Madison's Land Information and Computer Graphics Facility (LICGF).



*Implementing Multipurpose Land Information Systems in Local Government: Issues and Interfaces* comes as two modules, the first of which is aimed at elected officials who need for and the benefits of land records modernization. This module runs about 75 minutes.

The second module (160 minutes) focuses on technical issues encountered by those whose job it is to implement the systems.

Both modules are derived from a satellite downlink broadcast held in October of 1995.

Module 1 and 2 are available separately or as a package (for a \$25 savings). Prices range from \$50 to \$300 depending on affiliation of the purchasing organization. Call 608/262-3346 for ordering specifics.

(source: LICGF)

Use to search geographic names

## New GNIS CD available

by Bob Gurda

A new version of the Geographic Names Information System (GNIS) has been released by the U.S. Geological Survey. It is available on CD-ROM along with searching software.

GNIS contains names of map features recognized by the U.S. Board on Geographic Names. These names are the ones used on maps published by the federal government.

Features are classified into groups such as settlements ("populated places"), rivers, valleys, schools, parks, et al. Searching software allows a user to select a feature or group of features by name, type, or location.

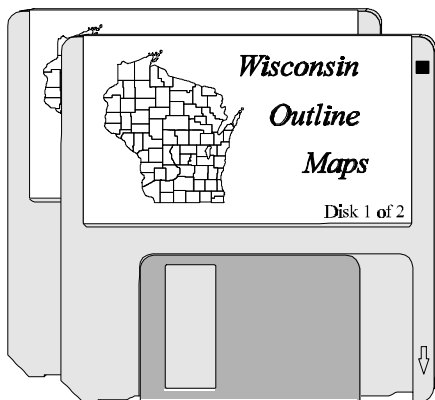
This new version of GNIS includes not only name changes approved since the previous version, but also population count as of 1990 for populated places as well as decimalized latitude and longitude for features.

The December, 1996 edition of GNIS on CD-ROM can be ordered for \$57.00 plus \$3.50 shipping from :

USGS-ESIC, 507 National Center, Reston, VA 20192. VISA or Mastercard orders can be faxed to 703/648-5548.

(source: USGS)

# Publications and Products



*Illustration basemaps on diskette*

## SCO offers Wis. outline maps

by Bob Gurda

How often have you wanted to make a simple map of the state, showing some characteristic by county? And, how often have you thought that you would need to scan or digitize a simple outline map as part of your task in order to take advantage of your publishing, drawing, or paint program?

In response to an increasing number of requests for digital outline maps, we have just developed a set of maps for use on PC computers, in three popular formats: TIFF, WMF, and CDR.

These map graphic files come compressed on a pair of 1.44 MB diskettes, for \$10.00 plus tax and shipping. A total of 56 map files of the state are included in this new product. These maps are intended for reproduction up to standard page size (8.5 X 11 inches).

In each of the the three formats you have your choice of a range of scales and a selection of content: state outline, county boundaries, major hydrography, county names, and county seat names.

These maps are not directly usable in a GIS since they are not referenced to a standard coordinate system. However, using illustration software you can "fill" any county to illustrate a theme, and can add your own features or annotation, or can clip out a portion of the state rather than using the entire image.

TIFF is a widely used raster (gridded) format. WMF is a generic Windows format for vector files. And CDR is used in Corel Draw, one of the more popular graphics packages. Conversion programs can export yet other formats.

This outline map package is available now. To place an order, please ask for a copy of our latest order form.

*New 3-D bathymetric map & CD available*

## Lake Michigan's lake bed emerges

by Bob Gurda

A new map of the bottom relief of Lake Michigan has just been published, both as a full color poster as well as in digital form. These products come from the National Geophysical Data Center (NGDC).

Based on data integrated from a variety of sources, this new view of Lake Michigan reveals previously known physiographic features with more detail and unveils some features previously unknown. Over 6,000 bathymetric soundings form the basis for the interpreted features.

The printed map poster, measuring 34 X 45 inches, comes with diffracting glasses for viewing in 3-D. This map sells for \$18.

The CD-ROM (\$75) contains not only images but also gridded data from which the bathymetric contours were interpreted. The images, in EPS and JPEG formats, are large files.

Work is in progress on similar products for the other Great Lakes.

### View samples on-line

NGDC has extensive offerings through their web site, including GIF samples of the images from the Bathymetry of Lake Michigan CD. Ordering information for either the map or CD is also available on line The address is:

<http://www.ngdc.noaa.gov/mgg/greatlakes/greatlakes.html>

Anyone without Internet access who wants further information can contact Robin Warnken, NGDC, NOAA/NGDC E/GCe, 325 Broadway, Boulder, CO 80303-3288, phone 303/497-6338, fax 303/497-6513.

(source: NGDC)

*update to software and data*

## New NGS data available from SCO

by Bob Gurda

We are happy to announce our first annual update of geodetic control information from the National Geodetic Survey (NGS). Like last year's product, we have packaged NGS "datasheets" for all Wisconsin counties along with NGS software and other support files, then added our own program to enhance functionality. These computer files occupy 6 diskettes.

### Price stays the same as last year

Prices for the NGS CD-ROM and the NGS-SCO package for Wisconsin remain the same as last year, \$50 for either. Both are available from the SCO.

Contact us for details or an order form.

# Events

## WLIA Conferences

by Brenda Hemstead

The Wisconsin Land Information Association (WLIA) held its 10th annual conference at the Grand Geneva Hotel located in the City of Lake Geneva on March 4-7. Over 494 people attended the event, including 33 exhibitors displaying GIS related hardware, software, services and information as well as 74 first time attendees.

Focused around the theme, "Wisconsin Land Information: For the Benefit of All" the conference began on Tuesday with a series of pre-conference workshops. The workshops included half-day sessions each on metadata and GIS applications for coastal zone areas and a full-day workshop on the potential applications of commercially-available high resolution satellite imagery. An "opening reception" held in the exhibit area officially kicked-off the conference from 5 pm to 7 pm.

Wednesday began with a Land Records Forum that provided updates on three major policy areas that could impact the Wisconsin Land Information Program followed by luncheon keynote speaker, David Zach. Zach, a futurist from the Milwaukee area, addressed the group by taking a down-to-earth tour of key trends and current issues in technology, business, education, and society in general that was well received. The afternoon launched off the general sessions from program management and evaluation, orthophotography and mapping, applications and local experiences, to technical issues.

### Get set for June

The next WLIA gathering is the summer quarterly meeting at the Holiday Inn Sunspree in Oconomowoc on June 5-6.

Scheduled for Thursday, June 5th, is the popular workshop "GIS for Shoreland Zoning" presented by Dave Hart, LICGF, UW-Madison. This workshop will be "hands-on" examining the use of desktop GIS software to build a shoreland zoning GIS application "from scratch". **A pre-registration fee of \$35 is required no later than May 23, 1997**, contact the WLIA at 800/344-0421. The evening program will be announced as soon as it becomes finalized.

Friday morning's program will include updates on the Wisconsin Land Information Program and the governor's budget. Presentations will feature GIS training and education, applications, and development status updates from Fond du Lac, Jefferson and Racine Counties. Scheduled for the afternoon will be a presentation by Jim Gage of UW-Madison's Environmental Remote Sensing Center, on NASA-funded research into the commercialization of land remote sensing and related spatial technologies.

### Looking toward September

WLIA is also planning its fall meeting to be held at the Radisson Inn in LaCrosse on September 4-5.

## Satellite video-conference set for October

### Metadata to ride the airwaves

by Ted Koch

Mark your calendars for the afternoon of Wednesday, October 15, 1997 as this will be your opportunity to attend a nationally broadcast satellite video-conference on metadata. Entitled *A Practical Guide to Metadata Implementation for GIS/LIS Professionals*, this two-hour program will cover a variety of current metadata issues, problems and solutions.

Conference presenters include six experts from state and federal government and universities. Fax and phone questions from the audience will be accepted during the broadcast, with two 15-minute question and answer periods.

Topics covered will include: what is metadata and why is it important?, the Content Standard for Digital Geospatial Metadata, getting started with metadata collection, metadata software tools, and other issues.

The conference will be broadcast by the University of Wisconsin-Extension in Madison. Development support is being provided by the National States Geographic Information Council through a federal Geographic Data Committee Cooperative agreements Program award.

For more information, or to register as a satellite downlink site contact:

David Hart  
Land Information and Computer Graphics Facility  
UW-Madison  
phone: (608) 263-5534

## ACSM selects top award

### Cultural Map honored

by Bob Gurda

The *Cultural Map of Wisconsin* recently earned the "Outstanding Achievement" award from the American Congress on Surveying and Mapping (ACSM). This is the highest level of recognition from ACSM as part of its annual map design competition.

The award was formally presented at ACSM's Annual Convention held in early April in Seattle. Onno Brouwer, Associate Director of UW-Madison's Cartographic Laboratory, was on hand to receive the award.



## Selected Conferences, Technical Meetings, and Classes

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May 14, 1997, **Bay-Lake Regional GIS User's Group** will be meeting at 10:00 am in Green Bay, WI. Contact: Mark Walter at (414) 448-2820.

May 22, 1997, **East Central Wisconsin Regional Land Information Advisory Committee** will be meeting in Menasha. Contact: Tom Faella at (414) 751-4770.

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June 5-6, 1997, **Wisconsin Land Information Association Quarterly Meeting** will be held at the Holiday Inn Sunspree in Oconomowoc, WI. Contact: WLIA at (800) 344-0421.

June 18, 1997, **Bay-Lake Regional GIS User's Group** will be meeting at 1:15 pm in Green Bay, WI. Contact: Mark Walter at (414) 448-2820.

June 24, 1997, **Wisconsin Land Information Board Meeting** will be held from 10:00 a.m. to 2:00 p.m. at the Dept. of Trade and Consumer Protection in Madison, WI. Contact: WLIB at (608) 267-2707.

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August 6, 1997, **Northland Area GIS Users Group** will be held at the Land Information and Computer Graphics Facility (LICGF), B102 Steenbock Library in Madison, WI. Contact: Tom McClintock at (608) 263-5534.

September 4-5, 1997, **Wisconsin Land Information Association Quarterly Meeting** will be held at the Radisson Inn in LaCrosse, WI. Contact: WLIA at (800) 344-0421.

September 30, 1997, **Wisconsin Land Information Board Meeting** will be held from 10:00 a.m. to 2:00 p.m. at the Dept. of Trade and Consumer Protection in Madison, WI. Contact: WLIB at (608) 267-2707.

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October 15, 1997, **A Practical Guide to Metadata Implementation for GIS/LIS Professionals**, *A National Satellite Video-Conference* will be held from 1:00 to 3:00 p.m. Contact David Hart at (608) 263-5534; email: dhart@macc.wisc.edu on registering as a downlink site for the satellite conference.

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December 4-5, 1997, **Wisconsin Land Information Association Quarterly Meeting** will be held at the Paper Valley Inn in Appleton, WI. Contact: WLIA at (800) 344-0421.

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January 21-23, 1998, **Wisconsin Society of Land Surveyors Annual Conference** will be held at the Holiday Inn in Stevens Point, WI. Contact: WSLs at 414/549-1533.

*For Bulletin and web site*

### Send us your calendar items

We are now focusing our calendar listing on events scheduled in Wisconsin and the nearby region. When you keep us informed of your organization's meetings, workshops, classes, etc. we can help spread the word to several thousand people.

Even if you are not seeking additional people to attend an event, announcing it keeps others informed and helps us all coordinate our schedules.

Often, events are scheduled and then occur in time frame that is too short to get them listed here before they have taken place. To deal with this problem, we also maintain a list of scheduled events on our web site.

To deal with the events outside our region which we formerly included in the *Bulletin* calendar, we now provide links through our web site to national and international calendars maintained by other organizations. These listings are similar to what has been carried for years in several publications that serve the mapping and GIS fields, but which many people in our state may not have seen regularly.

Between the *Bulletin* and our web site, plus the linked sites, you now have access to much more information about events than previously.

## 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 permanent staff consists of five people—Ted Koch, State Cartographer (608/262-6852), Bob Gurda, Assistant State Cartographer (608/262-6850), Hugh Phillips, Information Processing Consultant (608/262-8776), Brenda Hemstead, Administrative Assistant (608/263-4371), and Liz Krug, 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.

## About our Internet Web site...

We maintain a "homepage" on the World Wide Web.

Here, you will find information on a wide range of mapping topics, news items, functions and activities of the SCO, our on-line aerial photography catalog, a calendar of events, and links to related web sites. We encourage those of you with Internet access and browsing software to check out the SCO's homepage at

<http://feature.geography.wisc.edu/sco/sco.html>



## About the WISCLINC Web site...

A second Internet resource is the on-line Wisconsin Land Information Clearinghouse (WISCLINC). Its address is:

<http://badger.state.wi.us/agencies/wlib/sco/pages/wisclinc.html>

At this site you can search prototype metadata files, learn about our continuing work in this area, and link to other state clearinghouses.

## Wisconsin Mapping Bulletin

Published quarterly by the Wisconsin 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, or conferences/workshops. Local and regional information is especially encouraged. The editor makes all decisions on content. Deadline for the next issue is April 2, 1997.

Editor: Bob Gurda  
Illustrations: Brenda Hemstead  
Desktop publishing: Brenda Hemstead  
Mailing: UW-Extension Bulk Mail

Please send all comments, corrections, and news items to:

State Cartographer's Office  
Room 160 Science Hall  
550 N. Park Street  
Madison, WI 53706-1491  
phone: 608/262-3065  
fax: 608/262-5205  
email: sco@facstaff.wisc.edu