State Cartographer's Office

Reporting on Mapping and Land Information in Wisconsin

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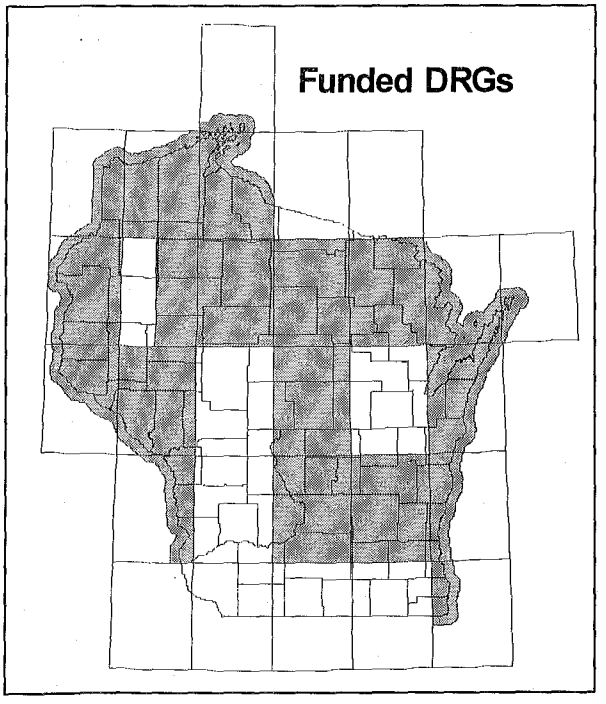
Delivery begins on DRG products

by Bob Gurda

With spring is coming a rebirth in the world of GIS. The USGS topographic maps for Wisconsin are beginning to appear as scanned computer files. While statewide coverage is not quite funded, 20% is completed and available, and another 50% is in production and due before year's end.

The available files cover much of north-central Wisconsin, and deliveries over the next few months will cover the extreme western and eastern portions of the state.

Unfunded areas are primarily in the extreme south and southwestern regions. The status map below shows which areas have been funded.



Status of Wisconsin DRG funding as of April 30, 1996. Tinted blocks of 1° x 1°, or tinted partial blocks, are funded.

(source graphic courtesy of Wis. DNR)

These files, called Digital Raster Graphics (DRGs), are a quick and easy way to integrate our most detailed statewide basemap series with a wide variety of other data. You can also join DRGs, creating a single map out of two or more adjacent digital map sheets. Further, you can manipulate the appearance of the DRG image itself.

Coordination and funding

The USGS arranges DRG production through a private contractor. Costs are borne 50/50 between USGS and various cooperators. In Wisconsin our funding is coordinated under the WISCLAND initiative which is seeking further support for enhancements to the standard DRG product. Recent contributions have come from the Coastal Management Program in the Wis. Department of Administration, the National Park Service, and the Wis. Department of Health & Social Services.

The standard USGS product

There is one DRG file for each USGS topographic quadrangle map sheet—about 1200 files in all for Wisconsin. Each file is 5-8 megabytes in size, in a TIFF format that is easily read by a variety of programs. The files are geo-referenced, to facilitate accurate data overlay as well as to allow adjacent files to be displayed in their correct relative positions.

As computer files created by scanning a paper map, DRGs are in raster format. That is, they are a grid of colored, square cells. Each grid cell represents 8 feet X 8 feet on the ground. A DRG includes the mapped area on the original map plus the map collar.

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WLIB News

by Ted Koch

Board Meetings

The Wisconsin Land Information Board held its most recent meeting on **February 21 in Madison**. Meetings for the remainder of 1996 have been set as follows:

May 13— At the Wisconsin Department of Agriculture, Trade & Consumer Protection's new building on the far east side of Madison. The board will make awards for local government grant funds submitted during the January, 1995 application period.

August 20 in Madison—The board's annual strategic planning session.

November 4 in Madison—Board approval of local government grant funds requested during the July, 1996 application period.

Grants

From the January 1996 application period the board has received 35 local government grant requests totaling $2,795,305. It is expected that the board will have approximately $700,000 available to allocate in response to these requests. Determination of grant awards from these applications will be made at the May 13 meeting.

In March, the WLIB polled the County Land Information Offices regarding a proposal to suspend the July, 1996 grant period in order to develop a new grant process. Based on some negative response to this idea, the Executive Committee has withdrawn its recommendation to suspend the July period. An alternative proposal of suspending the January 1997 grant period will be considered by the board at its May 13 meeting.

Board Rejustification

As last reported in the October 1995 issue of the Bulletin, the 1995-97 state budget bill included a provision for ending the operation of all advisory boards, councils, and commissions attached to executive agencies within state government. The WLIB is included in this group.

Lieutenant Governor Scott McCallum was assigned the responsibility of reviewing these organizations and making recommendations on whether to continue their existence. McCallum's recommendations had been expected to be completed early this year.

However, in a recent letter to the board, the Lieutenant Governor has said his final report and legislative recommendations will not be released until late this year. The co-chairs of the Legislature's Joint Finance Committee,which will take up the recommendations, have indicated that the 1996 legislative session is full, and that adequate time to review the recommendations will not be available until January, 1997.

Board Members reappointed

Ben Niemann, a UW-Madison professor, and Arden "Sandy" Sandsnes, Vice President Royal Oak Engineering, Madison have been reappointed as members of the WLIB by Governor Thompson. Niemann, the board's vice-chair, serves as a representative from a professional land information organization (WLIA), while Sandsnes serves as a representative of private business. Both were reappointed to 6-year terms.

County LIO Council formed

In response to suggestions received at the recent Wisconsin Land Information Association (WLIA) Annual Conference, Doug King, WLIB Executive Director and Mike Hansen, WLIA President have agreed to formalize a council composed of the 72 county Land Information Offices (LIO). The WLIB intends to develop a direct communication link with the council, seeking its suggestions and input on such issues as developing new procedures for preparing county plans, revising the local grant-in-aid requirements, identifying training opportunities, and LIO mentoring arrangements.

Standards work proceeds

The GIS Data Exchange Committee, charged by the Department of Administration (DOA) late last year to recommend a standard for GIS data exchange between Wisconsin State agencies, and a second standard for GIS data exchange between all Wisconsin public agencies has completed its work. The committee's recommended state agency standard is being delivered to the WLIB for approval before being forwarded to the DOA as adoption as a state information technology standard. Meanwhile, the public agency standard has been placed in a draft format for delivery to the Wisconsin Land Information Association Board of Directors for membership comment and review over the next four months.

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Delivery begins on DRG products, continued..

USGS scans topo maps in groups that occupy 1° blocks. There are 64 map sheets for each area of 1° of latitude X 1° of longitude. USGS distributes the resulting computer files on CD-ROM, one disc per block.

Acquiring USGS files

The completed computer files are available directly from USGS, and possibly from other outlets. The USGS price is $32.00 per CD-ROM, each of which has all the DRGs for a 1° X 1° block. Where a block has been funded only partially, the individual files will be available through an alternative but somewhat more costly process. Contact the SCO for details on acquiring copies of the files. (Note that any federally produced file is not copyright and can be copied freely).

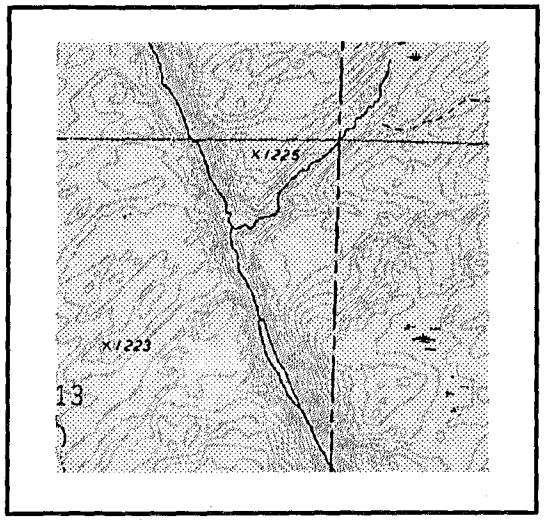
Adding value to the standard DRG

Enhancing the DRGs produced by USGS can make them more useful for specific purposes. One example is conversion from the federal standard UTM coordinate system (UTM) to another such as State Plane or WTM.

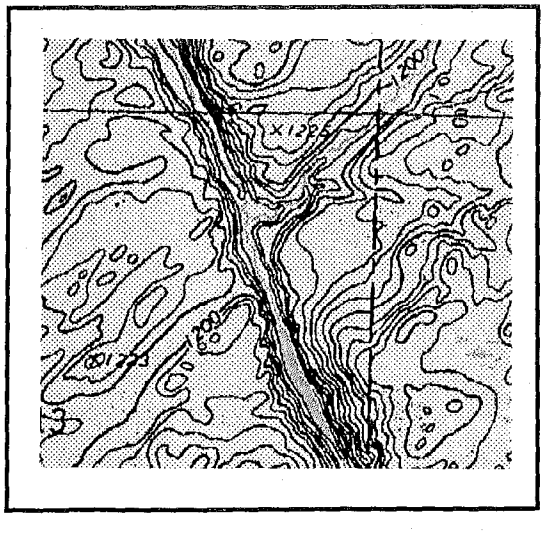
Another enhancement involves recoding the collar portion of the image so that can be selectively hidden. This modification greatly simplifies displaying DRGs for adjacent areas without the collar in one image covering up part of a neighboring image (see illustration below).

In order to process these types of enhancements efficiently, you need a robust computer workstation and advanced software. Under WISCLAND, the Wisconsin Dept. of Natural Resources is performing some of this work as resources allow, and will make copies of these files available under its standard data sharing policy.

Funding for completion of the USGS DRG work, as well as the enhancement process is still being sought. Contact Bob Gurda at the SCO at 608/262-6850 for current information on production and availability.



Changing pixel colors in a DRG (above and below) can accentuate mapped features.



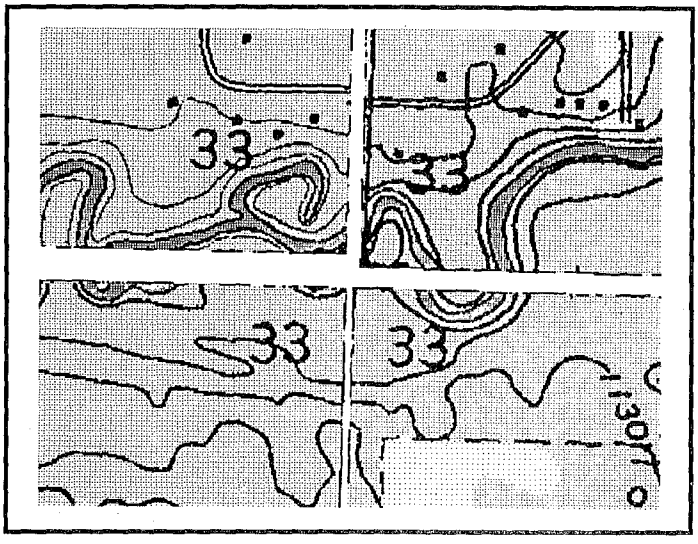
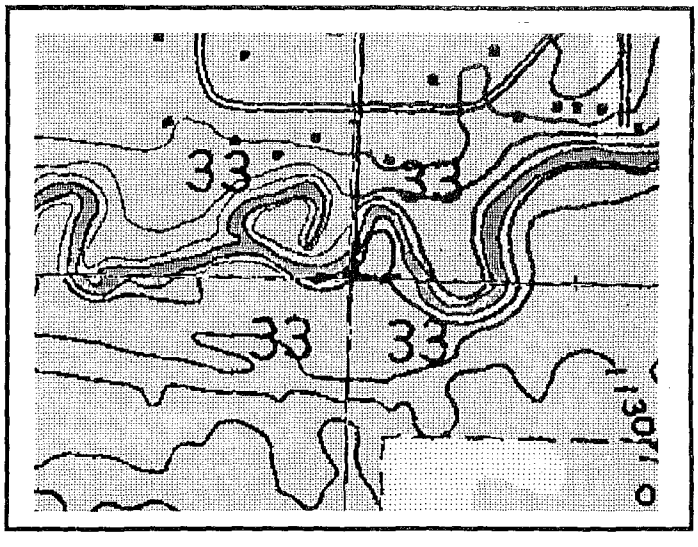


Illustration of the common corner of four DRGs in Douglas County, WI (Section 33 of Town 44 N, Range 10 W). Above: separate DRG images; below: merged images.



Metadata Developments

Standards, exchanges, & tools

Metadata approaches continue to mature

by Hugh Phillips

At the SCO we have been participating in and monitoring developments on the geospatial metadata front for a number of years. This article is a status report along with some recommendations for people wanting to join the growing ranks of the metadata savvy.

For those of you who have missed earlier stories (or who have been trying hard to avoid the subject), metadata simply is information that documents a data set. For example, the metadata for a digital version of a soil map would include information about the source material, how it was converted to digital form, who its custodian is, when it was last updated, what sort of attributes are referenced to the mapped units, etc.

Change is coming to the *Content Standards*

The current version of the *Content Standards for Digital Geospatial Metadata* (the June 8, 1994 version) was developed after considerable input from developers and users of geospatial data. The months since then have been its shake-out period, as agencies actually tried to implement it. The Federal Geographic Data Committee (FGDC) funded projects such as the Wisconsin NSDI Clearinghouse Initiative to provide a 'real world' test of the Standard's workability.

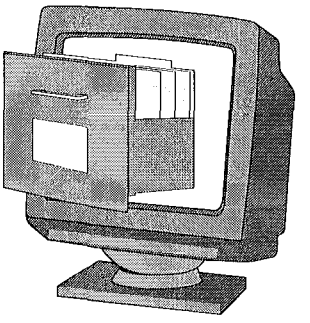
FGDC has urged users of these standards to express their comments and suggestions for its improvement. MITRE Corporation has been retained to coordinate the synthesis of comments into suggestions for a revised *Content Standards* to be considered by the FGDC. The revision will probably be available this year.

There are two vocal camps in this revision discussion: those who feel the *Standards* are too complex and should be simplified, and those who find it difficult to effectively document their data type within the existing elements of the *Standards* and hence would like to have the Standards extended. There is resistance to simplifying the Standards, but work is in progress to define a Minimum Searchable Set of metadata (another MITRE Corporation study). Disciplines whose data cannot be well represented in the current Standards (such as astronomical, biological or cadastral) may not see their specific desired metadata elements become additions to the *Content Standards*, but rather be allowed as optional extensions.

There is no doubt that there will be some changes to the existing standards. One major consideration for these changes is that they don't break (make obsolete) existing metadata. Some of the changes which will probably occur are:

- better support for remotely sensed data
- production rule change for repeatable elements
- allowance for the inclusion of extension elements

Furthermore, people involved in this process recognize that the revision of these Standards will be a continuing process and that a formalized mechanism to suggest, review, and adopt changes must be established.



Making metadata more sharable and usable

As the name implies, the *Content Standards for Digital Geospatial Metadata* deal with the content of geospatial metadata. They say nothing about the format of the metadata. The result of this is that although the geospatial data is often easily exchangeable from organization to organization because of well defined export formats (e.g. .E00 or .DXF), the metadata which accompanies it may not be, even though it is perfectly readable.

Some agencies use the section numbering from the *Content Standards* to identify sections; others use indentation to indicate subsection level. Some agencies use separated words for section headings (e.g., 'West Bounding Coordinate'); others string the words of a heading together with underlines ('West_Bounding_Coordinate'). Unfortunately, such formatting differences can result in hours of work when an organization wants to incorporate 'outside' metadata into its internal system, or to make it accessible through a clearinghouse.

A consistent and defined metadata exchange format would simplify these operations. At the present time the most likely form for this is based on the use of Standard Generalized Markup Language (SGML).

SGML has been used in the publishing industry for years. A document marked up with SGML looks much like a document marked up with Hypertext Markup Language (HTML) which is the basis for text formatting on the Internet's World Wide Web; in fact, HTML is a subset of SGML.

In applying SGML to geospatial metadata, tags (either eight character or numeric) will be used to indicate each metadata element. At the present time, only Peter Schweitzer's (USGS) metadata parser called *mp* will produce metadata marked up in SGML. This software rapidly processes any input metadata which is both compliant with the *Standards* and satisfies the requirements of the parser (hierarchical indentation).

Besides exchangeability, there is another reason why SGML is a useful form for metadata to take: it allows a user to choose from among several views of metadata, all supported from a single base metadata document, a feature that will be supported in the next generation of NSDI

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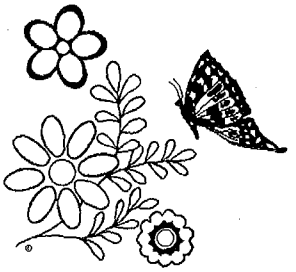

Metadata Developments continued...

geospatial data/metadata clearinghouse servers. Different views of metadata (catalog, full, discipline-dependent) are possible when the SGML document is accompanied by two others: a Document Type Definition (DTD) which encodes the production rules of the metadata and extensions, and a Document Style Semantics and Specification Language (DSSSL) document which controls display formatting. The FGDC is working to provide examples of the SGML related documents to clearinghouse participants.

Metadata tools

The complexity of the *Content Standards* create an obstacle to the creation of metadata, so naturally any tools that aid in producing or validating the metadata are most welcome. During the course of our Wisconsin NSDI Clearinghouse Initiative and since, we evaluated ten metadata software tools in DOS, Windows, and UNIX environments. Commentary on some of the tools the SCO has evaluated can be found in the project's final report, available through the WISCLINC website.

The FGDC has commissioned MITRE Corporation to evaluate submitted metadata tools for compliance with the *Content Standards* and for their useability. That report is expected to be made available in April. In the meantime, the SCO recommends Gerry Daumiller 's (Montana State Library) *Data Dictionary* to workstation Arc/Info users and Peter Schweitzer's *xtme* to other UNIX users. Although there are a number of promising DOS and Windows based metadata tools under development, we don't recommend any of them yet (except a WordPerfect template). Contact the SCO for the latest metadata tool information.

All in all, geospatial metadata continues to grow in importance as a way to preserve and leverage the value of the many databases that continue to be developed. The standards, approaches, and tools that support this infrastructure are evolving none too soon.

(sources: Denver metadata summit (February 1996), NSDI-L and clearhs_wg listserver traffic, March 1996 FGDC Newsletter, Eric van Herwijnen Practical SGML 2nd Ed.)

To combine military & intelligence work

New federal mapping agency proposed

by Ted Koch

In an effort to consolidate and streamline a variety of national security related mapping and imagery intelligence gathering systems, the Director of the Central Intelligence, the Secretary of Defense, and the Chair of the Joint Chiefs of Staff have agreed to form a new federal agency to be called the National Imagery and Mapping Agency (NIMA).

The current NIMA plan calls for combining five existing organizations. These are the Defense Mapping Agency, the CIA's National Photographic Interpretation Center, the Central Imagery Office, the Defense Intelligence Agency's imagery offices, and the Air Force's Defense Dissemination Program, plus adding parts of five other agencies to form the NIMA operation.

Taken together, NIMA would manage approximately 25 percent of the imagery and geospatial information activities of US defense and intelligence programs, with a staff of over 9000 employees. NIMA will also have the authority to review the plans, budgets, and acquisitions of the remaining 75 percent of the defense imagery and mapping systems operations to assure compliance with policy, data standards and architectures.

NIMA is being formed around three primary goals: improved customer support through deeper data bases and expanded information capability, the joining of existing and new technology systems, and improved program management through better use of people and budget resources. NIMA's operating concepts, management systems, and organizational structure has been laid out in an April, 1996 draft plan. The next step is to develop a transition plan, with the expectation that NIMA will begin actual operations late this year.

Despite the "national" word in its name, it is not intended that NIMA will assume any involvement in programs currently conducted by the federal domestic mapping agencies such as the US Geological Survey (USGS) and the National Oceanic and Atmospheric Administration (NOAA).

(source: NIMA, Draft Report, April, 1996)

Federal budget funds mapping

In late April President Clinton and Congress finally agreed on a federal budget for the current fiscal year which is more than half over. This budget sets spending levels for departments and agencies through September.

Although threatened earlier in the year with cuts ranging from 20% across-the-board to complete abolition of its mapping and surveying activities, the US Geological Survey (USGS) received funding at a level slightly above the 1995 amount. Included in the budget passage was a provision to dissolve the National Biological Service, a relatively new federal agency, and move its functions to USGS the as a new Biologic Research Division.

Wisconsin Land Information: Charting the Course

For this issue, we visited Professor James Clapp to discuss his views on where land information has come in the ten years since the Wisconsin Land Records Committee (WLRC) which he chaired was in the midst of its work. (See the story on Jim's recent retirement on page 7)

In 1987 the WLRC made a number of specific recommendations in its Final Report, many of which have become part of our institutional fabric. For several years now we have had the Wisconsin Land Information Board (WLIB), all 72 counties have Land Information Offices (LIOs), and the Wisconsin Land Information Association (WLIA) recently held its 9th Annual Conference. Our state program has raised many millions of dollars to be invested in modernization. How does this look to you, in retrospect?

Jim—

The WLRC, in my admittedly biased opinion, accomplished some landmark work. The institutional successes you mention are testimony to the broad representation we had on the WLRC and its subcommittees. So, I would have been very disappointed if the quality and depth of their work had not been translated into real changes.

However, going back and looking at the *Final Report*, I see several specific recommendations that have not been addressed in any substantive way. These should be reviewed to see if they remain relevant today. Perhaps this review could be wrapped into the work plans for one or more of the groups that Doug King is proposing as parts of the restructuring of the Wisconsin Land Information Program.

The WLRC discovered over 600 references to land information, many of which were inconsistent or incompatible.

Could you cite a couple of these unaddressed recommendations?

Jim—

The WRLC helped support a search of the Wisconsin Statutes as they relate to land information. We discovered over 600 references to land information, many of which were inconsistent or incompatible.

As a result, the WLRC recommended that this analysis be continued and broadened to include state administrative rules as well as federal provisions. The idea was to identify and attempt to resolve language problems that cause various public organizations to perpetuate land information that is difficult to modernize and impossible to coordinate.

On another front, the WLRC thought that property assessment would gain a benefit from modernized land information. I'm not aware that the connection has been clearly delineated nor that a coherent plan has been designed to ensure that this benefit in fact accrues.

Unless we deal with the underlying institutional fabric, part of which is embedded in these laws, regulations, connections, and rules, we run a great risk of simply computerizing the inefficiencies and inconsistencies that we've been living with.

There is no question that institutional change is much tougher to accomplish than implementing information technology to better handle the current fabric. But it's essential in order to achieve the real benefits.

Avoiding this approach also has a cost. By merely addressing the status quo through a technological fix, we may make it harder to deal with the underlying problems because their solutions may require a substantially different technical solution. Fixing, then rebuilding, means repeating the investment many times.

Are there some technologies that have emerged or that have blossomed beyond what the WLRC could forsee, that have made any of the committee's recommendations obsolete?

Jim—

Probably the most obvious example would be GPS. We saw it coming, and some of my collegues were experimenting with it. We knew the potential was there. But the cost factors have come down so fast and so steeply that the whole situation has been revolutionized.

We can come up with technological solutions to many land information manipulations, but that may not be our best investment.

However, this technology has not in and of itself changed the WLRC recommendation that the potential conversion of *existing* coordinate information from NAD 27 to NAD 83 be studied in terms of costs and benefits. We believed that a single datum for all uses would have a benefit, but we realized that there would be conversion costs---another institutional issue. It is clear that much new land information work will be done in reference to NAD 83, but the question of the mass of older information still referenced to NAD 27 has not been put to rest. Without a good model of how to handle the issue this time, will we be prepared when another datum change comes along in, say, the year 2027?

Here technology offers a partial solution again---we can convert coordinates and even GIS data between datums. However, the content and format may still be incompatible between organizations: yet another institutional issue.

It's no secret to your colleagues that you have a keen eye for instituitional matters. In your view, where does technology fit in?

Jim—

I consider most of our land information problems to be fundamentally institutional. We can come up with technological solutions to many land information manipulations, but that may not be our best investment. As Peter Drucker has said, "There are few things as useless or as downright dangerous as the right answer to the wrong question".

If we really step back and take in a broad view, it may become clearer. For instance, scanning and database linking of publicly recorded documents can make land title searches much more efficient; that's clear. Information can be faxed to buyers, sell-

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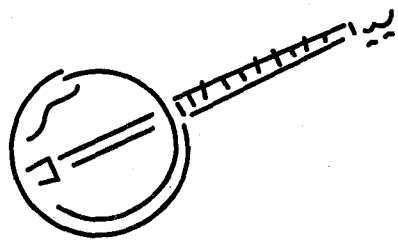


— Guest Interview, continued —

ers, lenders, etc. However, our entire land title registry system in this country continues to be an anachronism, in my view. Countless millions of dollars are extracted every year from people and organizations to support an outdated system. Isn't this the real problem?

How are these institutional issues best addressed?

Jim—

Two things. First, you need a diverse group of people to sit down and get to understand each other; this was one of the strengths of the WLRC. There are always different perspectives arising from a mix of disciplines, and this is both a challenge as well as an opportunity.

A series of studies over time are often more useful than anything else. Has a problem persisted over time? Has it vanished? Has it been solved? Has it been replaced by another problem?

Then, that group should see what similar groups may have concluded in the past. There were a series of WLRC subcommittee reports, and these almost surely have some value even after ten years. If we always write down our observations, they will be available to the next group.

In fact, as an academic, I suggest that a series of studies over time are often more useful than anything else. Has a problem persisted over time? Has it vanished? Has it been solved? Has it been replaced by another problem?

Now that ten years have passed since the WLRC work, it would be a good time for the land information community to review that work and use it to help reset our goals. What we've built in Wisconsin so far is the envy of many other states. But we should not be satisfied, and should constantly work for fundamental improvements.

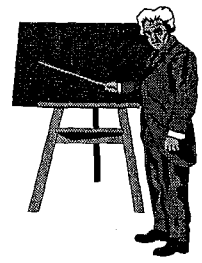
How are today's students responding to the idea that land information issues cross discplines?

Jim—

I'm seeing an increasing number who realize the power of, for example, a combined background in civil engineering and law, or anthropology and remote sensing. I have hope that people like these will help us resolve some of our institutional problems in the future. I'm even coming to realize myself that there is a relationship between music and banjo playing.

In Transition

But keep on teaching



Clapp and Kiefer retire from UW

They're retired but still welcoming students to popular courses at UW-Madison! Both Jim Clapp and Ralph Kiefer decided to return to some teaching despite officially retiring from full faculty status in the Department of Civil and Environmental Engineering (CEE) last year.

Now they concentrate efforts in the classroom and leave other campus matters to younger colleagues. Both have been honored by the American Congress on Surveying and Mapping (ACSM) with the Earle J. Fennell Awared for Outstanding Education, the highest award nationally in the field, and both earned teaching awards selected by students.

Professor James Clapp

Between 1964 and 1995, Jim was a professor at UW-Madison, except for 1978-84 when he served as Dean of the University of Maine's College of Enginnering and Science. Shortly after his return to Madison from Maine, Jim chaired the Wisconsin Land Records Committee (1985-87).

Clapp also served as his department chair in Madison (1986-1990), and was elected President of ACSM in 1988. He served as director of several additional activities on the Madison campus. Jim is also the self-proclaimed "world's greatest banjo player".

Professor Ralph Kiefer

At various points during his 30-plus years with CEE, Ralph chaired the Environmental Monitoring Program and the overall Instructional Program in the Institute for Environmental Studies, directed the Environmental Remote Sensing Center, and earned an undergraduate teaching award.

In wider spheres, Kiefer co-authored the textbook *Remote Sensing and Image Interpretation* with Thomas Lillesand, and wrote articles for numerous publications.

(source: Engineering Perspectives)

Satellite Mapping

Different sensors provide new options

Satellite remote sensing goes commercial

by Jim Jordan

The recent launches of Canada's Radarsat and the Indian Remote Sensing (IRS-1C) satellites mark a significant step in the trend toward commercialization of space-based remote sensing. By the year 2000 there will be several civilian-operated satellites in orbit acquiring data at spatial resolutions in the 1-5m range. This type of data has been unavailable outside the military community until the past year, and its widespread availability in the future will mean fundamental changes for the mapping and surveying sciences.

Radar imaging is increasingly used to monitor the earth's surface under variable weather and illumination conditions, offering spatial resolutions of 10-100m. Radarsat International, of Canada, is leading the way in developing a commercial market for this type of data. (See the January 1996 issue of *Earth Observation Magazine* for a look at the first published Radarsat image).

In addition to its applicability to resource monitoring and exploration, the combined use of synthetic aperture radar (SAR) and interferometric radar (IFSAR) has the potential for producing digital elevation models (DEMs) accurate enough to support elevation delineation at medium to small scales.

The Indian Remote Sensing Agency has announced that its IRS-1C satellite is operational following a December 1995 launch. Collecting multispectral and panchromatic data (23m and 6m spatial resolution, respectively), IRS-1C is the third of eight satellites in the constellation that IRS plans to have in operation during the next decade.

The U.S. Environmental Protection Agency is currently using IRS data for environmental management of lands affected by past mining activities in southwest Colorado. EOSAT Corporation has agreed to receive and process IRS imagery (EOSAT also handles Landsat data), and will be its sole distributor during the next 10 years.

Many in the remote sensing industry predict that the technological advances of satellite imaging systems and commercial availability of imagery will eventually replace most airborne photographic systems because of the dependence of the latter on weather, and high cost of repeat coverage and data acquisition in remote areas.

For the present, however, aerial photography remains the dominant source of remote sensing data for most mapping and resource management applications, and offers an archival record much older than space-based imagery. But keep an eye on the trade journals; bargain-basement satellite scenes of your back yard are bound to be just around the corner.

(sources: Photogrammetric Engineering and Remote Sensing, November 1995; GIS World, January 1996; Earth Observation Magazine, January 1996).

Public can now browse online

Spy satellite images begin to emerge

by Bob Gurda

The U.S. Geological Survey has begun distributing film negative, positives, and paper prints from declassified satellite photographs collected by the federal intelligence community during the 1960's and early 1970's. All standard products are priced at the cost of reproduction.

As of early April, about 15% of the total 18,000 rolls of film slated for delivery to the USGS from the CIA have become accessible to the public. By the end of this summer, the entire collection should be available. An online catalog will be updated daily to reflect new deliveries.

Because over 40% of the images on these film rolls have significant cloud cover, you should browse the images before making purchases. By using the Internet, you can view scanned images of the photographs. This service, part of the Global Land Information System (GLIS), is accessible via Telnet.

For background on GLIS, consult the following web address: http://edcwww.cr.usgs.gov/glis/glis.html. For details on satellite missions, dates, resolution, and available products, consult the online user guide at: http://edcwww.cr.usgs.gov/glis/hyper/guide/disp.

(source: USGS)

Designed to bolster commercial uses

President sets policy to make GPS signals serve wider range of users

Vice President Al Gore announced in March that the Clinton administration had approved a policy that will lead to open civilian access to GPS signals currently encrypted to support military needs.

The specific process and timetable that will effect this change has not been revealed, but the intent is to accomplish it within ten years. Apparently, there are several reasons for an extended transition period. First, the military needs time to develop alternative technology. Second, industry needs time to customize devices built for military uses to fit various civilian niches. The administration expects 100,000 high tech jobs to develop around new civilian uses of GPS.

Currently, precise positioning using GPS requires differential correction using two receivers, one fixed and the other roving. Removing the encryption would allow a single roving receiver to collect superior position information very rapidly. Already, 11,000 city buses are using GPS, and the Coast Guard has reduced by 90% the time it needs to place buoys. These types of benefits would be further enhanced under the new policy.

(source: PERS)

New, Revised, The Land Records Modernization Blues

by Jerry Sullivan

Got the mod-er-ni-za-tion Blues,
Oh Lord, we're up to date!
Wisconsin's got it together,
faster than any state!

G-P-S the P-L-S;
fly, and make D-O-Qs;
get the D-E-Ms and contours,
centerlines, hydro, too!

Gonna capture all the parcels,
and make 'em fit the base;
grab the wetlands, soils, and floodplains--
we'll really be someplace!

And now we stop and ponder thus--
and just what have we wrought?
We've gotten grants, we've made our stance,
but just what have we bought?

This stuff is much more than layers--
We've organized the players!

Images, surfaces, networks;
control, and planar graphs--
the points, the lines, the polygons,
have got to make us laugh.

What are all these many features,
and how do they relate?
Topology is forever;
must keep it up to date.

The data model is the key,
let us explore it now;
layers alone don't do it all,
we need some more, some how.

Vertical theme integration,
with permanent ids,
a long term view of transactions,
can you dig it, please?

We drive across the county line,
nearly every day--
the landscape doesn't end, then start;
it just ain't made that way.

What we've done here, & they've done there,
has got to start to fit--
We've gotten by for far too long;
standards aren't half of it.

There has got to be a vision,
so we do not get caught;
the pieces must now be joined,
but this is just a thought.

Quantity prices reduced by USGS

Federal CD-ROMs becoming common

by Bob Gurda

Large data volumes. Easy transport. Permanent storage. Readable on multiple systems. Inexpensive to produce.

The CD-ROM has all these benefits, and as a result it is fast becoming the medium of choice for distributing large amounts of geographically referenced data. In recent months particularly, the federal government has released a number of CDs holding data referenced to Wisconsin, and more are on the way.

New titles from USGS

One new product is the Digital Line Graph (DLG) from USGS, based on its 1:2,000,000-scale regional map series. This single disc holds data for the entire country. Actually, this is a second version of the "2 million scale" DLG on CD. The files have been enhanced to edge-match better across boundaries, and source materials no more than 5 years old were used to update the content (the first edition was based on 1970 information). Additionally, the files are broken into state units. Also on this disc is viewing software for both map files as well as documentation.

Specific to Wisconsin, Digital Orthophoto Quarter Quadrangles are now available in compressed form for several more counties: Menominee, Fond du Lac, and Green Lake (in addition to Pierce, Dunn, and Pepin which were issued earlier).

By the time we go to print for this issue, the first CDs holding USGS Digital Raster Graphics for areas in Wisconsin may also be available. (See article beginning on page 1 for background).

All USGS CDs sell for $32 per single disc plus a modest shipping charge. A recent change in policy provides price breaks for multi-disc sets as well as volume orders of 25 copies of a single disc. Contact the SCO for details.

Other federal sources

A variety of other federal information, including TIGER line files (the mapping base supporting Census data) and STATSGO (generalized maps and related data on soil associations), are also available on CD for the entire country. Geodetic control information has been available on CD for the last two years.

At the state level

The CD is also emerging as a data sharing medium at the state agency level. One disc holding census data is already available, and the Wis. Dept. of Natural Resources is considering developing a CD of its most commonly requested GIS data sets.

Performance/cost ratio keeps on rising

It's easier than ever to retrieve data from CDs. Prices for CD players continue to decline and their speed continues to rise. Even multi-disc players are reasonably priced and record-your-own units have dropped to about $1000. Further, an emerging standard for the next generation of CDs promises a capacity increase of 8-32 times the current ceiling of about 600 MB.

News from the SCO

Web sites continue to proliferate

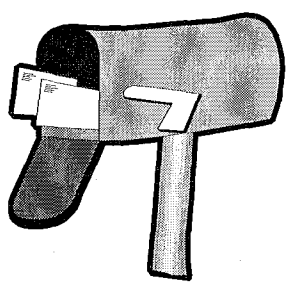
More Internet points of interest

by Bob Gurda

We've added some new addresses to our "netsites" annotated listing of interesting places to visit on the World Wide Web. Look for the link to "netsites" in the SCO's home page (see page 16 for address).

Among the resources viewable at the web sites we've added to our list are:

- a striking shaded relief hypsometric tint image of Wisconsin (other states available, too);
- a national status map for USGS production of their new Digital Raster Graphic (DRG) product;
- background information on 1960's and 1970's satellite photographs recently released by the CIA;
- *status information on soil mapping in Wisconsin, courtesy of NRCS.*



...from your editor

Thanks for helping us shrink our mailing list

Many hundreds of you faithfully returned the subscription cards contained in our recent issues, and we have incorporated the many changes to names and addresses which you submitted. This will help us deliver the *Bulletin* to you more efficiently.

Special thanks to those offices who volunteered to consolidate several previous addresses in order that we can send mail a single copy of the *Bulletin* which you then circulate after delivery.

We are analyzing the answers that many of you provided on the response cards. While this work is still in process, I can say that as a group you represent a great variety of interests. This comes as no surprise, since it mirrors our experience in answering inquiries that come in primarily by telephone.

In developing each issue of the *Bulletin*, we continually struggle to cover all of these many different topical areas that you care about. If you have a specific idea of something you'd like to see us address, please contact us by phone, mail, or fax.

More activities than ever

SCO staff working in many directions

by Bob Gurda

Here's a brief update on some of the newer projects the SCO has become involved in. Sometimes we get pulled very thin between all of our activities, but it's always fun!

Aerial photography catalog revision

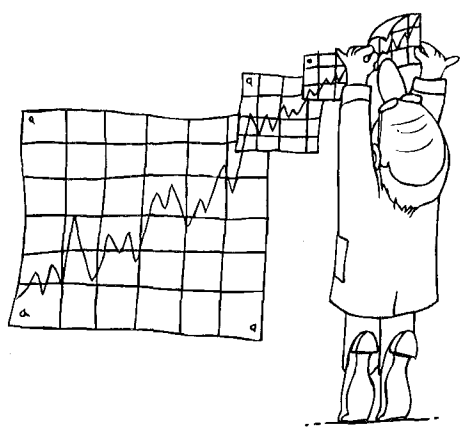
We're updating our 3-year old catalog of aerial photography to reflect both recent projects as well as changes to contact information. Thanks to those of you who have helped provide us with information that will go into the final product. We are going to change the delivery medium for the catalog, placing it on our Internet web site. But more on that in our next issue!

NSGIC & the NDOP

Ted Koch, the State Cartographer, continues to be active as the only non-federal member of the National Digital Orthophoto Program (NDOP) Steering Committee, representing the National States Geographic Information Council (NSGIC). As with many other aspects of the federal establishment, this program is evolving, particularly its relationship with the National Aerial Photography Program (NAPP). Plans are in development to change the frequency of NAPP acquisition, and to more closely align the NAPP and the NDOP beginning next year.

State land use policy

In recent weeks, we have been involved with a group of state agency staff who are doing background and analysis work related to forthcoming proposals on how Wisconsin might address land use issues. A group of state agency secretaries, convened by the governor as an Interagency Land Use Council, will be forwarding their recommendations to the governor at the end of June. There are significant implications and opportunities for developing mapping, land information, and GIS since they can play a key role in supporting land use analysis.



Questions & Answers

? *I'm getting interested in using some of the digital geographic data being produced by the USGS. How can I keep updated on the production status of these DRGs, DEMs, DLGs, and DOQQs?*

We've gotten an increasing number of calls at the SCO on this subject. More and more people are acquiring the tools to use this kind of information.

Luckily, the amount of available information continues to grow, too. However, that presents a challenge: to keep track of a burgeoning production activity.

There are more categories of information than in the past, too. Initially, there were a few DLGs (Digital Line Graphs--- simply, point, line, or area features digitized from USGS maps) and a few DEMs (Digital Elevation Models --- regularly gridded elevation listings).

Now, both DLGs and DEMs are being produced in greater numbers, plus we have DOQQs (Digital Orthophoto Quarter Quads) and DRGs (Digital Raster Graphics). Except for a few medium-scale DLG layers, none of these products is yet available statewide, but all have some areas completed.

On top of that complexity, various organizations are acquiring these federal data files and enhancing them in one way or another. The production schedule/availability of these derivatives demands tracking, too.

At the SCO, we try to keep our fingers on the pulses of all these activities. Until recently, we were aided by national index maps produced by the USGS. These paper maps have now been supplanted by indexes posted on the Internet's World Wide Web. By keeping the index updated and posting it routinely on the Internet, USGS can provide a more current picture than before. Look for links to these addresses in the "netsites" list which is linked to the SCO home page (see page 16 for our address).

We hope to provide a similar service, focused on Wisconsin. For one idea of how this might be done, look at a Minnesota web site *(http://www.lmic.state.mn.us/bmap90/bmap90.htm)*

In the interim, we can advise you by telephone, can fax index maps, and can track down specific production information that is difficult to depict on the index maps.

? *I need to change some coordinates from State Plane to UTM. Can NADCON or CORPSCON software handle this, or do I need WISCON? And what if my coordinates are in a GIS?*

First, let's determine whether or not you need to change reference datums. NADCON is designed primarily for this purpose, and its most recent version supports all three horizontal datums most commonly used in Wisconsin, including NAD 83 (1991). Rather than working with grid coordinates, NADCON uses latitude and longitude.

CORPSCON utilizes an older version of NADCON which doesn't support NAD 83 (1991), but it is more user friendly and does directly handle both the coordinate systems you mention in your question.

If you need to transform the coordinates for either a small number of points, or for a larger number that you can input in a batch from a generic file, CORPSCON software is an easy tool to use. But, to go from, say, State Plane based on NAD 27 to UTM based on NAD 83 (1991), you would have to first use CORPSCON, then NADCON, then CORPSCON again. Both of these DOS software packages can be downloaded from the SCO BBS.

WISCON, the new Windows-based commercial software package available through the SCO, provides a number of advantages over either of the other packages. It is very user-friendly, it supports a wide variety of coordinate systems (including the new county coordinate systems), it operates between NAD 27 and both adjustments of NAD 83, and it handles input/output in several formats.

None of these packages handles data structured for mapping, such as CAD or GIS formats. WISCPROJ is a program module that works under UNIX-based Arc/Info software; it is available free from either the SCO BBS or web site. Work is beginning on a parallel approach to address this issue for ArcView users.

Some commercial third-party products also convert coordinates built into GIS data, although apparently not once the files have been topologically structured, nor after they have had attributes attached. These products may also allow a user to define a special coordinate system such as the new Wisconsin County Coordinate Systems.

? *Where can I get a current state road map?*

As you no doubt have heard through recent widespread publicity, the Wisconsin Department of Transportation has exhausted its supply of the 1995-96 edition of the state highway map. Even though DOT has printed over 2.5 million copies in the past year, the voracious appetite of legislators to provide maps to constituents, and high public demands have exhausted the supply.

The DOT expects to print 380,000 additional copies this June; however, that quantity will not last long due to summer travel demand. The DOT and the new Department of Tourism plan to have a newly revised edition available in January, 1997. Meanwhile, if you need a map immediately, the American Automobile Association reportedly is offering free state road maps to anyone who requests one.

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.

Allows geocoding to support programs

State agencies select street/address database

by Bob Gurda

Several state agencies have joined forces to acquire working copies of a commercial product to support geocoding. With this type of tool, they can generate an approximate geographic position from a street name and number anywhere in the state in order to map and analyze various factors in support of agency programs.

The Department of Natural Resources, with input from the other state agencies, evaluated characteristics of three major commercial data products that contain street centerlines with their names and address ranges.

Each product had a strong suit, and no product was perfect. For instance, one had superior depiction of the road configurations. Another had the best match between known streets and their addresses. Another could not be used directly with the agencies' GIS software, but had to be converted first.

None of the products contained full addressing in rural areas, and all products failed to reach 100% addressing in urban/surburban areas. Even considering this limited functionality, the analysis showed that geocoding would be greatly accelerated as compared to alternative methods.

After considering technical factors and pricing, the agencies decided to acquire a group license for DynaMap 2000 product from Geographic Data Technology, under which a number of users at different sites can access individual copies of the data from a set of CD-ROMs. A total of 25 licenses will be distributed among the cooperating departments: Natural Resources; Transportation; Health and Social Services; and Agriculture, Trade, & Consumer Protection.

(source: Wis. DNR)

Takes on another challenge

Lillesand set to head ASPRS

UW-Madison professor Thomas Lillesand has been elected Vice President of ASPRS (the American Society for Photogrammetry and Remote Sensing). Next spring he will succeed to a one-year term as President.

In addition to being a member of three departments on the Madison campus, Lillesand directs the Environmental Remote Sensing Center and chairs the Environmental Monitoring graduate program.

(source: ASPRS)

Waukesha firm joins Colorado company

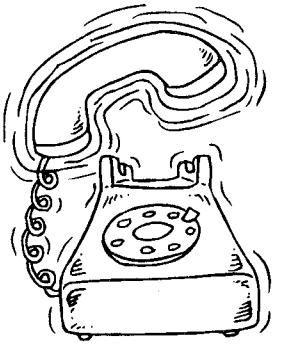
Intelligraphics becomes division of ASI

Intelligraphics International, a geographic data conversion company located in Waukesha, was sold in December to Analytical Surveys, Inc. (ASI). ASI is a publicly held corporation headquartered in Colorado Springs, CO, that began as a supplier of photogrammetry and digital orthophotography services.

Intelligraphics had estimated revenues in 1995 of $8 million. It has done conversion work for clients internationally, and has done work in Wisconsin for Waupaca, Winnebago, and Jefferson Counties among others.

The operation in Waukesha will continue functioning as a wholly owned division of ASI, according to Bill Nantell, formerly President of Intelligraphics.

(source: Intelligraphics)



A new area code in Missouri

USGS changes phone numbers at MCMC

by Bob Gurda

More telephones, fax machines, and modems --- it all means increased demand for telephone numbers, and when they are exhausted, new area codes. This fact of life in the 90's has hit the U.S. Geological Survey's Mid-Continent Mapping Center (MCMC) in Rolla, Missouri.

The Rolla area has been assigned a new area code, 573. In addition, the MCMC has completely new telephone numbers for the entire staff. For instance, Customer Orders at the ESIC office should now go to (573) 308-3500. Bob Lemen, the Chief of Coordination and Requirements, is now at (573) 308-3736.

Note that this new area code, unlike the many such codes that we've used over the years, has neither a 0 or 1 as its middle digit. As a result, if you forget to dial your long distance access code (e.g., 1 or 8 or 9) before the area code, you could end up calling a local exchange number (e.g., 573-3085) rather than Missouri.

Publications and Products

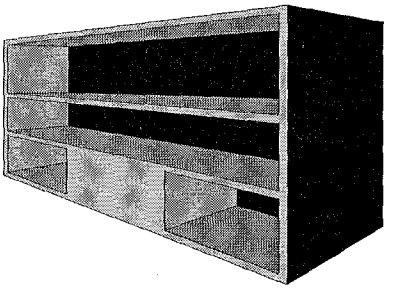
Covers maps, atlases, globes, and charts

New mapping magazine begun

Anyone fascinated with maps is the audience that Aster Publishing has in mind for its new magazine *Mercator's World*. Issued every two months, this new periodical has regular features on antique, historical, military, scientific, and future maps.

Charter subscriptions were being offered for $30/year. Contact Aster at 800/840-3810 for details.

(source: Aster Publishing)



Many diverse themes covered

Authors turning out GIS books

by Bob Gurda

Publications on various aspects of GIS are more numerous and diverse than ever before. Especially evident recently are new books that address very specific themes

Among the new titles are a series of books in the "GIS-DATA Series" from Taylor & Francis. These publications arise from specialist meetings sponsored by the European Science Foundation, and take the form of peer reviewed specially commissioned studies.

The first four volumes, each over 200 pages, are:

- *GIS and Generalization: Methodology and Practice*
- *Geographic Objects with Indeterminate Boundaries*
- *GIS Diffusion*
- *Spatial Analytical Perspectives on GIS in the Environmental and Socio-Economic Sciences*

Taylor & Francis has over a dozen additional titles dealing with GIS, published since 1989, and also publishes the *International Journal of Geographic Information Systems*. You can contact them in the U.S. at 800/821-8312 for details.

(sources: vendor literature)

Combines international data into world views

Poster shows 14 views of earth's relief

The U.S. National Geophysical Data Center is offering a new poster that shows fourteen images of hemispheric views of global relief. The images are spaced every 90 degrees of longitude and every 45 degrees of latitude (i.e., four over the equator, four over the 45th parallel north, four along the 45th parallel south, and one each over the north and south poles.

Digital elevation data from several countries around the world was combined and analyzed to produce the images. The color palette helps distinguish dry land relief from submerged relief.

This poster measures 24 inches square and sells for $16.00. Call 303/497-6338 for product and ordering details, or visit the following URL on the World Wide Web: http://www.ngdc.noaa.gov/mgg/announcements/announce_posters.html.

(source: NGDC)

Includes maps for state & local trails

Wis. bicycling guide published

Full color maps of official state bike trails, plus local bike trails, are now available in a new 80-page guide, *Bicycling Wisconsin*. This publication includes commentaries on the trails, photographs, and lists information on dining and accommodations.

The guide will be available in bookstores and bike shops this spring, with a sales price of $14.95. Contact Milwaukee Map Service for details at 800/525-3822 (or 774-1300 locally).

(source: Milwaukee Map Service)

Covers digital aspects

Photogrammetry manual gets addendum

The first update in fifteen years to the *Manual of Photogrammetry* is scheduled for publication this fall. Comprised of ten chapters with contributions from over 40 of the world's leading experts in the field, this book will cover the digital photogrammetry process from data acquisition to the final product.

The *Manual* is published by the American Society for Photogrammetry and Remote Sensing (ASPRS) which is offering a reduced prepublication price through May 31 ($35 for members and students, $55 for others). For ordering details, contact ASPRS by phone (412/741-1495) or fax (412/740-0609).

(source: ASPRS)

Publications

Coordinate & datum transformation software

WISCON software released

WISCON, a coordinate and datum transformation software package, is now available for purchase from the State Cartographer's Office. Produced by a private software development firm under contract with the Wisconsin Department of Transportation, WISCON is being released as Version 1.40.

WISCON is designed to transform coordinate values between State Plane (SPC), Universal Transverse Mercator (UTM), Wisconsin Transverse Mercator (WTM), and the new Wisconsin County Coordinate Systems, to convert units (feet to meters or meters to feet); and to transform values between any of the above coordinate systems and latitude/longitude. WISCON also features on-line documentation, handles ASCII file reformatting, and supports transformations for bordering states.

The program, which runs under the Windows operating system on PC equipment, is intended for use by surveyors, engineers, mappers, and others who have a need to transform single coordinate values or point files from one mapping system to another. For transformations between horizontal datums such as NAD 27 and NAD 83 or NAD 83 (91), WISCON incorporates NADCON, the federally produced program that computes an approximate modeled value. For vertical transformation between the NGVD 29 and NAVD 88 datums, WISCON employs VERTCON, another federal package, which computes an approximate modeled difference in orthometric height.

Note: WISCON does not handle structured GIS data files. See information on WISCPROJ below.

WISCON is available for $165. Contact the SCO for more information and an order form.

Events

WLIA Conferences

by Ted Koch

The Wisconsin Land Information Association (WLIA) held its ninth annual conference in Oshkosh on March 3-5. Over 475 people attended the event, including 35 exhibitors displaying GIS related hardware, software, services and information.

Focused around the theme, "Weathering the Elements, A Forecast for Land Records", the conference featured workshops, presentations and discussions on the state's land information program, digital orthophotography, land records modernization at the local level, and recent technological advances.

Get set for June

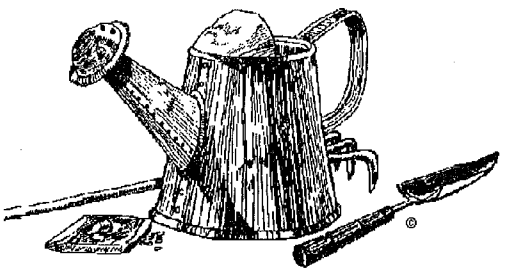
The next WLIA gathering is the summer quarterly meeting scheduled for the Point Hotel in Minocqua on June 6-7. This will be the most northerly location yet for a WLIA meeting.

The Thursday evening program will feature an open discussion on defining the vision and goals of the state's land information program. This session is designed to continue the discussions begun on this topic at the annual meeting in Oshkosh.

Friday morning's program will feature a presentation and demonstration on the Digital Raster Graphic products (digitally scanned and processed 7.5-minute quadrangles) currently being produced by the US Geological Survey through cost-sharing provided by various organizations throughout the state.

Looking toward September

WLIA is also planning its following meeting to be held in the northwestern part of the state (Hayward) September 5-6.



Selected* Conferences, Technical Meetings, and Classes

May 13-14. **Global Solutions for a Variety of GIS Applications** will be held at the Marriott Griffin Gate Resort, Lexington, KY. Contact: Ter Ross, EOSAT, 216/642-1446; fax: 216/447-8884.

Call: 410/531-6034; fax: 410-531-1013.

May 20-24. **ESRI 16th Annual User Conference** will be held at the Wyndham Hotel and Palm Springs Convention Center, Palm Springs, CA. Contact: ESRI at 909/793-2853, fax: 909/793-5953.

May 21-23. **Second International Symposium on Spatial Accuracy Assessment in Natural Resources and Environmental Sciences** will be held in Fort Collins, CO. Contact: H. Todd Mowrer at 970/498-1100, fax: 970/498-1010.

May 27-31. **1996 International Geoscience and Remote Sensing Symposium** will be held at the Burnham Yates Conference Center, Cornhusker Hotel, Lincoln, NE. Call: 402/472-2844; fax: 402/472-9688; Internet: accp@unl.edu.

May 28-30. **Fifth Annual Natural Resources GIS/GPS Training, Conference & Exhibition** will be held in Columbia, CA. Contact: Tracey, Condor Earth Technologies, at 209/532-0361.

May 28-31. **Fifth Annual Business Geographics Conference and Exposition** will be held in Chicago, IL. Contact: Conference Dept. at 970/223-4848, fax: 970-223-5700.

June 3. **1996 GPS Conference** will be held at the Earle Brown Continuing Education Center, University of Minnesota, St. Paul Campus, MN. Contact: Dunwoody Institude at 612-374-5800; fax 612-374-4128.

June 4-7. **Ninth Annual Towson State University GIS Conference (TSUGIS '96)** will be held in Baltimore, MD. Contact: Jay Morgan at 410/830-2964, fax: 410/830-3888.

June 6, **WISCLAND Steering Committee Meeting** will be held in Minocqua, WI. Call: Bob Gurda at 608/262-6850; fax: 608/262-5205.

June 6-7. **Wisconsin Land Information Association Quarterly Meeting** will be held at the Point Hotel in Minocqua, WI. Contact: WLIA at 800/344-0421.

June 10-14. **GIS/LIS '96 Central Europe** will be held in Budapest, Hungary. Contact North American Secretariat at 301/951-0480, fax: 301/951-0499.

June 12. **Introduction to Global Positioning Systems (GPS)** will be held at the Center for Remote Sensing and Spatial Analysis, Cook College, New Brunswick, NJ. Contact: Registration Desk at 908/932-9271; fax 908/932-8726; email: ocpe@aesop.rutgers.edu.

June 16-18. **1996 Kentucky GIS Conference** will be held at the Commonwealth Convention Center, Louisville, KY. Contact: Susan Carson Lambert at 502/573-1450; fax: 502/573-1458, email: slambert.kirm@msmail.state.ky.us.

June 18-20. **The Institute of Navigation - 52nd Annual Meeting** will be held at the Royal Sonesta Hotel in Cambridge, MA. Contact Dr. Alison Brown, General Chair at 719/481-4877, fax: 719/481-4908.

June 22-28. **6th International GPS/GIS Conference** will be held in Billings, MT and Yellowstone National Park. Contact: GeoResearch at 301/320-0911; fax 301/320-0922.

June 24-27. **Second International Airborne Remote Sensing Conference and Exhibition: Technology, Measurements and Analysis** will be held in San Francisco, CA. Contact: Wendy Raeder at 313/994-1200 ext. 3453, fax: 313/994-5123.

July 7-9. 8th Annual Colloquim on Geographical Information Systems & Spatial Information Research will be held at the University of Otago, Dunedin, New Zealand. Contact: +64 3 4798386.

July 9-27. **18th Congress of the International Society for Photogrammetry and Remote Sensing** will be held in Vienna, Austria. Contact: Peter Waldhaeusl, fax: 43 1 505-5268.

July 27-August 1. **URISA Annual Conference** will be held at the Salt Palace Convention Center, Salt Lake City, UT. Contact: URISA at 202/289-1685, fax: 202/842-1850.

August 4-9. **Multispectral Imaging for Terrestrial Applications** will be held at the Denver Convention Center, Denver, CO. Contact: John Smith at 360/647-1445.

August 20, **Wisconsin Land Information Board's Annual Strategic Planning Session** will be held in Madison, WI. Contact: WLIB at 608/267-2707

August 20-22. **Pecora 13 Symposium** will be held at the Ramkota Inn, Sioux Falls, SD. Contact the Technical Program Chair at 605/594-6040; fax 605/594-6083; email: pecora13@edcserver1.cr.usgs.gov.

September 5-6. **Wisconsin Land Information Association Quarterly Meeting** will be held at the Country Inn Suites in Hayward, WI. Contact: WLIA at 800/344-0421.

September 14-18. **National States Geographic Information Council (NSGIC)** will be held at the Doubletree Hotel, Tucson, AZ. Contact: Ammie Collins at 603/643-1600; fax: 603/643-1444; email: nsgic@aol.com.

September 17-20. **Institute of Navigation (ION) GPS '96 Conference** will be held at the Kansas City Convention Center. Contact: Dr. Penina Axelrad, Program Chair at 303-492-6872; fax 303-492-2825.

September 22-26. **32nd Annual Conference & Symposium: "GIS and Water Resources"** will be held in Fort Lauderdale, FL. Contact: American Water Resources Association at 703/904-1228.

October 2-4. **Trimble '96 Surveying & Maping Users Conference & Exposition** will be held at the San Jose Convention Center. Contact: 408-481-8465; fax 408-481-8488.

October 2-5. **NACIS XVI** will be held at the Menger Hotel in San Antonio, TX. Contact: Michael P. Peterson at 402/554-4805; fax 402/554-3518; email: geolib@cwis.unomaha.edu.

October 28-31. **Geological Society of America Annual Meeting and Exposition** will be held at the Colorado Convention Center, Denver, CO. Contact: GSA at 303/447-2020, fax: 303/447-0648.

November 4, **Wisconsin Land Information Board Meeting** will be held in Madison, WI. Contact: WLIB at 608/267-2707

November 11-13. **International Conference on Land Tenure and Administration** will be held in Orlando, FL. Contact: Prof. Grenville Barnes at 352/392-4998; fax: 352/392-4957; email: GBARN@CE.UFL.EDU.

November 16-22. **ACSM/ASPRS Fall Meeting and GIS/LIS '96** will be held at the Denver Convention Center, Denver, CO. Contact: GIS/LIS at 301/493-0200; fax 301/493-8245.

December 5-6. **Wisconsin Land Information Association Quarterly Meeting** will be held at the Concourse Hotel in Madison, WI. Contact: WLIA at 800/344-0421.

1997

March 4-7. **Wisconsin Land Information Association's Annual Conference** will be held at the Grand Geneva Conference Center in Lake Geneva, WI. Contact: WLIA at 800/344-0421.

**For much more extensive and/or more current listings, grouped into Foreign, National, and Wisconsin, consult the SCO's BBS (see p. 16)*

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 (608/262-3065), 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 BBS...

The SCO has an electronic bulletin board system (BBS), as another means of making information available. You can use it to browse standard information, check on late-breaking news and upcoming events, download copies of our files and free software, and interact with other BBS users on various mapping-related topics as they emerge.

Our BBS number is 608/265-2807, and your modem settings need to be N, 8, 1; the modem on our end operates up to 14.4 K baud. Don't try calling the BBS directly from your telephone!! If you need help getting started, contact us at 608/262-3065.

About our homepage...

We have implemented a "homepage" on the Internet. We encourage those of you with Internet access and browsing software, i.e., Mosaic or Netscape, to check out the SCO's homepage at ***http://feature.geography.wisc.edu/sco/sco.html***

About the WISCLINC homepage...

A second Internet resource we have developed 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

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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 June 20, 1996.

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
bbs: 608/265-2807
email: sco@facstaff.wisc.edu

State Cartographer's Office
Univ. of Wisconsin-Madison
Rm. 160 Science Hall
550 N. Park Street
Madison, WI 53706-1491

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