

Program & Abstracts
Minnesota GIS/LIS Consortium



*15th Annual
Conference & Workshops*



October 3 - 5, 2005
Civic Center • St. Cloud, MN
www.mngislis.org

Welcome!

It is my sincere pleasure to welcome you to the 15th annual Minnesota GIS/LIS Consortium Conference and Workshops. I trust you will find the conference a truly enjoyable and worthwhile experience. This is the largest conference of this type in the nation and by attending, you belong to a community of exceptional and dedicated professionals.

This year we celebrate a milestone of sorts, 15 years of consecutive conferences, the first held in 1990. Think back — where were you in 1990? Some of you were attending that first conference as founding members of this Consortium. Most of you have come on board since, and this year we welcome a number of new members to the Consortium.

GIS and LIS technologies have experienced explosive growth in the past 15 years. That first conference saw approximately 300 attendees, now nearly 600 people attend regularly. GIS was a fledgling technology in 1990; now there are now over 2 million GIS users globally, and last year GIS Day events were held in 74 different countries. Currently more than 3,000 universities and 70 different disciplines have adopted GIS as part of their requirements to graduate. Over the past several years geospatial industries have grown from a 3 billion to a 21 billion dollar per year industry and geotechnologies have been named by the U.S. Department of Labor as one of the three top fields for the 21st century.

Take advantage of all the conference has to offer! Attend a selection of more than 100 presentations and product demonstrations. Learn about current trends, future goals and historical practices during the plenary sessions. Visit the exhibit hall to discover the latest geotechnologies, data and software solutions to satisfy a variety of business needs. Sit in on the student competition to meet the best and brightest upcoming GIS professionals. Enjoy the appetizing luncheons where some of the finest talent among us will be recognized for their contributions to the GIS/LIS industry in Minnesota. Network with colleagues, win prizes and make new acquaintances during the vendor reception and other social events. Browse the posters in the exhibit hall and join your peers for the annual meeting at the close of the conference. This booklet provides details on all of the opportunities available to you during the conference.

Organizing a conference of this size requires a tremendous amount of effort. I offer my deepest appreciation to the members of the conference planning committee. Without their assistance, organizing this conference would not be possible. I also offer gratitude to the many volunteers not listed in this program who contributed their time and energy to make this conference great! I also need to thank the staff at St. Cloud State University, especially the Spatial Analysis Research Center (SARC) for arranging the fine facilities for our workshops, the St. Cloud Civic Center who have been amazing as usual, Short Stop Catering for providing our delicious meals and of course, Ewald Consulting whose fine staff helps to manage the Consortium's affairs behind the scenes — not only during the conference but throughout the year! In addition, I offer a special thanks to GeoComm for hosting our annual Beer Tasting Gathering and to our other supportive sponsors, Pro-West and Associates and NAZCA Solutions.

Above all I thank you, the member, for attending this conference. This is truly a member-driven organization and without you, there would be no Consortium. Together we look forward to the next 15 years.

Sally Wakefield
2005 Conference Chair

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Acknowledgements

The Minnesota GIS/LIS Consortium is a volunteer organization dedicated to improving cooperation, communication and coordination among the growing GIS/LIS community in Minnesota. Members of the Board of Directors volunteer their time and energy to oversee the Consortium's numerous activities and publications. Likewise members of the Conference Planning Committee have given generously of their time to make this event a reality.

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Conference Planning Committee

A note of thanks to everyone who helps make this conference a success — and special appreciation to the Conference Planning Committee: Without their help, this event would not be possible.

James Beal, UCIT Inc.

Chris Cialek, Land Management Information Center

Rebecca Foster, City of Edina

Monica Gerberding, Private Consultant (Conference Chair Elect)

Kevin Horne, National Historic GIS, University of Minnesota

Steve Kloiber, Metropolitan Council

Matt Koukol, Minnesota Department of Transportation

Chad Martini, GeoComm

Crystal Phillips-Mustain, Minnesota Department of Transportation

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Ben Verbick, Logis

Sally Wakefield, Minnesota Department of Transportation (Conference Chair)

Ron Wencl, United States Geological Survey

A big thank you to Susan Church and all the others at Ewald Consulting who skillfully help to manage the Mn GIS/LIS Consortium and this conference.

2005 GIS/LIS Conference At-A-Glance

Tuesday, October 4

7:30 a.m. Conference Registration and Materials Pick-Up — Refreshments in Foyer
8:30 a.m. Opening Plenary Session — Karen Siderelis, Associate Director for Geospatial Information at the U.S. Geological Survey

10 a.m. Refreshment Break
Exhibit Hall Opens and Poster Display Begins

10:30 a.m. Concurrent Sessions

Stockinger Suite A	Opportunity Suite A	Stockinger Suite B	Opportunity Suite B	Herberger Suite A	Wilson Suite	Herberger Suite B
Session 1 Management Strategies	Session 2 Data Management	Session 3 Data Modeling	Session 4 Web Mapping	Session 5 Remote Sensing	Session 6 Student Track	Product Demos ESRI

Noon Awards Luncheon

1:30 p.m. Concurrent Sessions

Stockinger Suite A	Opportunity Suite A	Stockinger Suite B	Opportunity Suite B	Herberger Suite A	Wilson Suite	Herberger Suite B
Session 8 Federal Programs	Session 9 Data Management	Session 10 Data Modeling	Session 11 Web Mapping	Session 12 Remote Sensing	Session 13 Undergraduate Student Competition	Product Demos Nazca Solutions, ESRI

3 p.m. Refreshment Break

3:30 p.m. Concurrent Sessions

Stockinger Suite A	Opportunity Suite A	Stockinger Suite B	Opportunity Suite B	Herberger Suite A	Wilson Suite	Herberger Suite B
Session 15 Data Development	Session 16 Data Management	Session 17 Data Modeling	Session 18 Web Mapping	Session 19 Transportation	Session 20 Undergraduate Student Competition	Product Demos MN DNR, ThomTech Design, Inc.

5 p.m. Vendor Reception and Poster Session – Exhibit Hall
 Prize Drawings (must be present to win), Complimentary Hors d'oeuvres and Cash Bar

7:30 p.m. Beer Tasting Gathering — hosted by GeoComm at the Lahr building

Wednesday, October 5

7:30 a.m. Conference Registration and Materials Pick-Up

8 a.m. Exhibit Hall Opens – Refreshments Served

8:30 a.m. Concurrent Sessions

Stockinger Suite A	Opportunity Suite A	Stockinger Suite B	Opportunity Suite B	Herberger Suite A	Wilson Suite	Herberger Suite B
Session 22 Natural Resources	Session 23 Community GIS	Session 24 Parcels	Session 25 Homeland Security	Session 26 Water Resources	Session 27 Graduate Student Competition	Product Demos Pro-West & Associates, Plansight

10 a.m. Refreshment Break

10:30 a.m. Concurrent Sessions

Stockinger Suite A	Opportunity Suite A	Stockinger Suite B	Opportunity Suite B	Herberger Suite A	Wilson Suite	Herberger Suite B
Session 29 Community GIS	Session 30 Remote Sensing	Session 31 Parcels	Session 32 Homeland Security	Session 33 Natural Resources	Session 34 Education	Product Demos Pro-West & Associates, Taylor Technologies, Douglas County

Noon Closing Luncheon (Exhibit Hall closes) — Rob Nurre, The Surly Surveyor

1:30 p.m. Minnesota GIS/LIS Consortium Business Meeting and Year-End Review

2 p.m. Prize Drawings (must be present to win)
 Adjournment

Keynote Speakers

Two dynamic speakers will address this year's conference.

- **8:30 a.m. Tuesday, October 4, 2005 — Karen Siderelis, Associate Director for Geospatial Information at the United States Geological Survey (USGS)**

Karen Siderelis was named the first federal Geospatial Information Officer (GIO) in the nation and currently serves as the Associate Director for Geospatial Information and Chief Information Officer at the USGS. The recent creation of the National Geospatial Programs Office under her direction signals major changes at the USGS, bringing several important GIS programs — The National Map, Geospatial One-Stop, and the Federal Geographic Data Committee — into a single program office. As the largest traditional federal partner of the GIS community, the USGS is experiencing many changes likely to affect its partners. This reorganization aligns the agency to work more fully and directly with state and local governments. Siderelis will discuss current geospatial activities at the USGS and explain how new changes may benefit the Minnesota mapping community. Siderelis will also address the USGS' role in the aftermath of Hurricane Katrina and how spatial information is being used to support that agency's rescue and recovery operations.

- **Noon Wednesday, October 5, 2005 — Rob Nurre, The Surly Surveyor**

Step back in time 150 years, grab your chain and compass, round up your bearing axe and get ready to conduct the first survey of Minnesota. Rob Nurre, Land Records Manager for the State of Wisconsin Board of Commissioners of Public Lands, will close the conference with an entertaining and informative performance assuming the personality of the land surveyor that first mapped the area now known as St. Cloud, Minn. Nurre will explain the difficulties surveyors faced during those years, offer fun facts about St. Cloud and Minnesota, and stress the importance of those original survey records to everyone living in Minnesota today. This is a performance you will not want to miss.

MN GIS/LIS

1000 Westgate Drive, Suite 252 • St. Paul, MN 55114

Phone: 651-203-7242 • Fax: 651-290-2266

www.mngislis.org

GIS/LIS Consortium Awards

Each year the Consortium presents several awards at the annual conference. This year we are pleased to present three different types of awards: The Lifetime Achievement Award, the Polaris Leadership Award and the Student Scholarship and Competition Awards. In addition, the Governor's Council on Geographic Information will also present Gubernatorial Certificates of Commendation. Award winners will be presented with the awards during the Tuesday and Wednesday luncheons.

The recipients of all these awards are to be commended for their exceptional contributions to the fields of GIS and LIS. We thank them.

Student Scholarship Award

The Student Scholarship Awards began in 2000, providing recognition to the best students attending Minnesota educational institutions that offer a qualified program in Geographic Information Science. This year, eleven colleges and universities offer programs that meet the qualifications set by the Consortium's Scholarship Committee, and therefore have students that may be recognized with a Student Scholarship Award. Each institution is responsible for selecting qualified students to receive the awards. Students will be recognized as a scholarship recipient at the conference and awarded a complimentary conference attendance.

This year a competition has been organized offering scholarship recipients an opportunity to compete for substantial cash awards. The presentation portions will take place as part of a dedicated student track. There will be three categories of student competition and three levels of awards, as follows:

- Community College Students - poster competition - 1st Place, \$500.00
- Undergraduate Students - presentation - 1st Place, \$1000.00 - 2nd Place, \$750.00
- Graduate Students - paper and presentation - 1st Place, \$1250.00

Each category will be judged on presentation and substance. Members of the scholarship committee and the board chair-elect will serve as judges.

Student biographies follow and presentation abstracts can be found among the session and poster sections of this program. Good luck and congratulations to all the recognized students!

The students to receive the 2005 Student Scholarship Awards are:

Community college students

Melissa Aho

Anoka Ramsey Community College

Melissa Aho of Lexington, MN is a librarian who loves to learn. Melissa has been interested in maps and geography her entire career and hopes one day to work in a map library in an academic setting.

As a lifelong learner, Melissa will be completing the A.S. in Geographic Information Systems (GIS) & Cartography from Anoka-Ramsey Community College. Melissa started her education with an A.A. from Anoka-Ramsey Community College, followed by a B.A. in Anthropology and History from St. Cloud State University, and later earned an M.L.I.S. from Dominican University. Recently, Melissa completed an internship at East View Cartographic in their Map Library where one of her main assignments was shelving Russian Military maps. Melissa hopes to take more GIS and geography classes in the future, and eventually would like to earn a PhD. She is currently the campus librarian in a small career-college library and is a co-author on a recently published article on career-college librarians.

Russ Jones

Fond du Lac Community College

Russ is going on 52 years of age, and have been a mechanic in the airline industry for over 25 years of my life. After his last layoff at Northwest Airlines, Russ decided it was time to go back to school ton further his education, and possibly find a new career. Russ is glad he did, because he believes he has found a great future in GIS.

Russ wishes to finish a very fruitful and enjoyable career in GIS. He would, preferably, like to do field research and work on lake maps, but believes that there will be great opportunity in other fields of GIS, so plans to not limit himself in just one particular area of the GIS field.

Undergraduate college students

Sonja Christensen

University of Minnesota - Mankato

Sonja Christensen is originally from Bemidji Minnesota and is currently a senior at Minnesota State University, Mankato. Sonja is a Biology major with an emphasis in Ecology and minor in Geography.

Currently, Sonja is an intern for the Minnesota DNR Farmland Wildlife Research Group where she assists in a variety of research studies on white-tailed deer. Sonja hopes to attend graduate school for ecology in the fall of 2006 and pursue a career as a Biology professor at a university.

Sonja is also an active member of the campus community, serving as president of the Biology Club and recently a team captain for the American Cancer Society's Relay for Life. She has developed and presented research projects in the field of Ecology for two Undergraduate Research Conferences.

Sara Dolan

University of Minnesota

Sara Dolan is a Minnesota native who recently graduated from the University of Minnesota with a Bachelor of Arts degree in Geography. Her research interests are broad but typically focus on the ways in which geography relates to social and cultural practices, such as political geography and demographics.

Jon Douver

Bemidji State University

Not received as of deadline.

Ari Ofsevit

Macalester College

Ari Ofsevit is a senior at Macalester College in Saint Paul, where he is pursuing a double major in Geography and Urban Studies. Last fall he studied at the University of Melbourne in Australia, and this past summer he participated in a two-month National Science Foundation funded Research Experience for Undergraduates program surveying geologic formations off the Maine coast through the University of Southern Maine.

Ofsevit is a member of the Macalester nordic ski team and has participated in races throughout the midwest. An avid hiker, Ofsevit has led winter camping trips to Wyoming and Colorado through the Macalester Outing Club. He also enjoys the outdoors, reading and eating — he can make a mean pizza pie. Ofsevit hails from Newton, Massachusetts and is intensely proud of his 2004 World Champion Boston Red Sox.

Krista L. Sandford

St. Thomas University

Krista Sandford is a senior at the University of St. Thomas, with a major in Geography and a minor in Art History. Krista grew up in Columbia Heights, MN, and enjoys watching the Minnesota Twins, going out with friends, spending time with her family, making jewelry, shopping, reading the Economist and walking her dog, Paris.

Krista has worked on many projects over the past year as a lab assistant. Her favorite project was making maps for an immigration case that needed maps to clarify all of the different cities in Thailand that the clients had lived in. She is currently involved in a project for the Boy Scouts, which includes making new maps of the newly combined districts and also analyzing the Boy Scouts' needs for new meeting places. Krista's research interests include urban land use changes, wildlife conservation, and migration issues. Krista plans on attending graduate school next fall.

Graduate college students

Mike Engels

University of Minnesota

Mike Engels graduated from the University of Minnesota MGIS program in July of 2005. While in the program his areas of focus included GIS programming, spatial analysis, and modeling of wildlife populations and habitat.

Past GIS work experience includes registration of aerial photographs and special projects for the Minnesota Department of Natural Resources GIS department, and assisting in a one week GIS course for employees of the Conservation Breeding Specialist Group. Mike is currently doing research for the University of Minnesota involving habitat modeling of wolves and developing local spatial models of land use change for the Twin Cities Metro Area. Prior to coming to the MGIS program, Mike Engels worked both as a high school math teacher in Fairbanks, Alaska and as a consultant for a third party administrator of corporate retirement plans in Seattle, Washington.

Yong-Seuk Park

Minnesota State University, Mankato

Yong-Seuk Park is a graduate student at Minnesota State University, Mankato whose interests include computer databases and the science of geography. With a B.S. in C.I.S. and a minor in Geography from Minnesota State, Yong wants to combine his interest in maps with his computer knowledge (database-SQL, programming-Java, Visual basic, Assembly, etc.).

Recently, Yong was able to incorporate his interests and their applications to include spatial analysis and developing analysis tools in his work as a lab assistant.

During his graduate studies, Yong wants to expand his knowledge of practical applications related to GIS. He hopes that his lifelong interests will eventually earn him a PhD.

Jesse Pearson

St. Mary's

Jesse graduated from Gustavus Adolphus College in 2003 with a double major in Geography and Business Management.

He started the M.S. degree in GIS at St. Mary's University in the fall of 2004 and while attending school has been working full-time as a contractor for the U.S. Army Reserve base at Fort Snelling, MN as the GIS Administrator.

Jesse's hometown is Cambridge, MN, and in his free time, enjoys fishing, tennis and canoeing.

Polaris Leadership Award

Rick Gelbmann – Metropolitan Council

Rick Gelbmann is a leader in developing MetroGIS capacity and promoting GIS utilization within the Metropolitan Council. As GIS Manager at the Council, he saw the value of parcel data and pushed for collaborative activities with the counties that led to the concept of MetroGIS as an active GIS data sharing organization in the Twin Cities. In 1997, he negotiated Metro Council's relationship with The Lawrence Group that made street centerline data available free to all government bodies in the state as well as academic institutions. He championed the development of DataFinder and through the staff he manages serves as the regional custodian for 108 geospatial datasets. Along with Randy Knippel, he serves as co-chair of the MetroGIS Emergency Preparedness Committee. He has successfully encouraged cooperative efforts in acquiring orthophotography. Within Metro Council he helps the various divisions benefit from the capabilities of GIS in such diverse areas as regional planning, transit routing and describing the region's natural resources. He has served for several years on the Governor's Council on Geographic Information and is its newly appointed Chair.

Annette Theroux – Pro-West and Associates, Inc.

Annette Theroux, Pro-West and Associates, Inc., is a leader in providing service to the GIS/LIS Consortium and to state and local agencies. She has been a workshop instructor, a paper presenter, an exhibitor, a member of the Consortium Board, and now serves as chair elect. Last year, when the Consortium faced a financial crisis, she and her co-workers helped raise the money that allowed us to bridge the gap to a successful 2004 Conference by presenting a well-attended workshop at Cabela's in Owatonna. Her work on the 2003 State Parcel Map Inventory set the standard for monitoring local government activities and won the 2004 CTS Research Partnership Award from the University of Minnesota's Center for Transportation Studies. While serving on the Governor's Council on Geographic Information, she co-chaired the Data Committee and helped develop the popular data distribution guide, Making the Most of Geospatial Data Exchange. She has served on the Board of Directors for the Pine to Prairie GIS Users Group and continues to volunteer her services as a member. Annette has taught as an adjunct professor of GIS at Bemidji State University and is well known as a GIS educator in Minnesota.

Randy Knippel – Dakota County

Randy Knippel is a leader in connecting the GIS and Emergency Management communities. He led the effort to get the Minnesota GIS community focused on Emergency Preparedness. Under his leadership, both MetroGIS and the Governor's Council have established standing committees in this area. He chairs the MetroGIS Committee, along with Rick Gelbmann, and has been tireless about increasing appreciation of GIS applications for emergency response and recovery. To this end, he has made many contacts in the Emergency Management community and given many presentations to the GIS community. Randy serves as GIS Manager of Dakota County, one of the most successful GIS operations in the country and the first from Minnesota to have its street centerline data accepted for use by the US Census Bureau. Before he became the manager, he provided the technical expertise that first stitched together the parcel data from seven counties into single layer of 900,000 parcels. He is an active member of the MetroGIS County Data Producers Workgroup and currently serves as Vice Chair of the MetroGIS Coordinating Committee.

Lifetime Achievement Award

Lifetime Achievement Award – Ken Pekarek

Ken Pekarek is a longtime Minnesota GIS user, supporter, teacher and visionary. He has advanced the field of GIS in Minnesota, utilized GIS technology in ways that have improved Minnesota's quality of life and contributed to work that is widely known and utilized across the state. Early in his career, Pekarek helped develop and use computerized techniques to analyze natural and man-made impacts on Minnesota's environment and resources. He worked side by side with GIS pioneers Rod Sando, Les Maki and Al Robinette in developing the MLMIS data base. More recently, Pekarek has tirelessly carried the "GIS vision" to schools, educators and professionals across the state of Minnesota through his work in the design and support of easy-to-use GIS tools.

By far, Pekarek has done more than anyone in Minnesota to directly impact GIS in K-12 education by his tireless commitment to working with educators and delivering numerous presentations and training sessions to education groups of all kinds. In the last four years alone, he has introduced more than 700 teachers to GIS. Two of the teachers he worked with have received national awards: ESRI's national Community Atlas Model Project Award and the National Science Teachers' Toyota Tapestry Grant Award. Working with Tom Eiber, he helped launch Firewise, engaging hundreds of students in modeling risk with GIS and adding local data to enhance the value system to local fireman.

In support of this award, Sara Damon, one of the award winning teachers wrote, "Most valuable to me, personally, has been his guidance and unwavering support. No matter what or when I have requested help, Ken has always been there for me." He was in the audience when her students presented Firewise results to evening meetings of town boards and city councils. Damon continues, "His presence there is the ultimate example of support for students and teachers." Minnesota has been fortunate to have such a committed and hardworking person in the GIS profession.

Mark your calendar!

**The Minnesota GIS-LIS
16th Annual Conference and
Workshops will be
October 4 through 6, 2006
at the St. Cloud Civic Center**

Governor's Commendations

Minnesota Governor's Council on Geographic Information Gubernatorial Commendation for Exceptional Project

Since 1996, the Minnesota Governor's Council on Geographic Information has awarded Certificates of Commendation from the Governor to exemplary projects in Minnesota that exhibit robust, innovative and cost-effective ways to use and manage geographic information and related technologies. In addition, recognized projects must prove far-reaching benefits beyond the originating organization. This award is not given every year, only when exemplary projects merit the award.

Project: MapServer

Recipients: The Department of Forest Resources at the University of Minnesota and Steve Lime, its creator and lead developer

Description: MapServer is an open-source development system for building web-based mapping applications and services. It was developed locally and now some 20 developers from around the world are contributing to the source code. MapServer has revolutionized the world of web-mapping by making commercial quality, high performance software available at no cost. Currently more than 1,500 copies are being downloaded a month. This past June, its third annual user group meeting drew more than 300 people to Minneapolis with the next conference scheduled in Switzerland next year. Users range from nonprofits, to government organizations, to universities, to commercial businesses. More information about MapServer, including a sample gallery of applications, is available at <http://mapserver.gis.umn.edu>.

Workshop and Conference Schedule

Monday Workshops

All workshops will be held Monday, October 3 at the Atwood Memorial Center, Spatial Analysis Research Center (SARC) and the Miller Center Library, all on the St. Cloud State University Campus.

Check-in for workshop participants begins at 7:30 a.m. Monday morning at the St. Cloud Civic Center. Be aware that **all workshop participants (morning and afternoon) must check-in at the Civic Center** prior to going to St. Cloud State University. Please arrive at the St. Cloud Civic Center no later than 1 hour prior to the beginning of your workshop to allow for registration and transportation. Transportation to and from St. Cloud State University will be provided throughout the day. There is no available parking at the University.

- The morning workshops begin at 9 a.m. and will conclude by 12:15 p.m.
- The afternoon workshops begin at 1:15 p.m. and will conclude by 4:30 p.m.

Your registration fee includes lunch. Lunches for all workshop attendees will be provided at the Atwood Memorial Center at 12:15 p.m.

Full-Day Workshops

Getting Started With MapServer (hands-on) — Voyageurs South, Atwood Center

Enterprise Addressing Systems (lecture) — Glacier South, Atwood Center

Spatial Databases (lecture & hands-on) — Granite, Atwood Center

Morning Workshops

Hands-On Overview of ArcGIS 9.1 (hands-on) — SARC #310, Stewart Hall

What's New in AutoDesk Map 3D 2006 (hands-on) — Miller Center, Library

Beginning Programming in ArcGIS 9.1 (hands-on) — SARC #306, Stewart Hall

Introduction to Geodatabases (hands-on) — SARC #314, Stewart Hall

Spatial Statistics (lecture) — Glacier North, Atwood Center

Parcel Management with Geodatabases (lecture) — Voyageurs North, Atwood Center

Integrating CAMA with GIS (lecture) — Ladyslipper, Atwood Center

Getting Started with Crystal Reports (hands-on) — SARC #310A, Stewart Hall

Afternoon Workshops

Cartography and Visualization (lecture) — Glacier North, Atwood Center

Urban & Indoor 3D GIS: Infrastructure for Location-Based Services in Populated Areas (lecture) — Mississippi, Atwood Center

Introduction to Geoprocessing using Models and Scripts (lecture) — Voyageurs North, Atwood Center

GIS for Utilities (lecture) — Ladyslipper, Atwood Center

Working with Topology & Relationship Classes in Geodatabases (hands-on) — SARC #314, Stewart Hall

Intermediate VBA Programming in ArcGIS 9 (hands-on) — SARC #306, Stewart Hall

Advanced Editing in ArcGIS 9.1 (hands-on) — SARC #310, Stewart Hall

- Buses return to St. Cloud Civic Center at 4:45 p.m.
- Monday evening social in the Martini Lounge at the Red Carpet Bar, complimentary appetizers from 5:30 to 6:30 p.m.

Tuesday

7:30 a.m. Conference Registration and Materials Pick-Up

8:30 a.m. Opening Plenary Session

**10:00 a.m. Refreshment Break
Exhibit Hall Opens and Poster Display Begins**

10:30 a.m. Concurrent Sessions

Session 1 — Management Strategies

- Panel Discussion: The role of GIS in a Statewide Service-Oriented IT Architecture - *Linda Finley, Minnesota Department of Administration; David Arbeit, Minnesota Department of Administration; Robert Maki, Minnesota Department of Natural Resources*

Session 2 — Data Management

- Streamlining Wetland Management with GIS - *John Mackiewicz, WSB & Associates Inc*
- One-Button Migration - *Mark Kemper, The Sidwell Company*
- Geographic Marketing and Analysis for Rural Business - *Jim Ramstrom, LMIC*

Session 3 — Data Modeling

- Predicting forest dynamics: moving from stand to landscape simulation models - *John Snyder, Voyageurs National Park*
- Calculating Total Water Volume for Lake Embayments Using GIS-Derived Bathymetry Data: An Evaluation of Spatial Data Uncertainty - *James Quinn, Computer Sciences Corporation*
- Evaluating Variability in Stream Slope Estimates - *Matthew Kocian, University of Minnesota Department of Fisheries, Wildlife and Conservation Biology*

Session 4 — Web Mapping

- ArcIMS Acetate Rendering: Displaying Multi-Jurisdictional Police Data Live - *Zachary Christoff, LOGIS*
- Centralized Data Serving using Web Mapping Services and Web Feature Services - *Tim Loesch, Minnesota Department of Natural Resources*
- Introduction to Web-based editing using ArcGIS Server - *Ryan Kiefer, GeoSpatial Services*

Session 5 — Remote Sensing

- Estimating and Mapping Percent of Impervious Surface Area: A Comparison of Different Methods - *Fei Yuan, Minnesota State University-Mankato*
- Statewide Estimation and Mapping of Impervious Surface Area by Landsat Remote Sensing - *Brian Loeffelholz, University of Minnesota*
- Land Cover Assessment Using High-Resolution, Multi-Spectral Digital Aerial Imagery: A Comparison of Object-Based and Pixel-Based Classification - *Steve Kloiber, Metropolitan Council*

Session 6 — Student Track

- Supporting Humanitarian Relief Operations with GIS - *Jay Meehl, Saint Mary's University of Minnesota*
- Spatial Decision Support Integration to Current GIS for Location Analysis and Strategic Planning in Minneapolis-St. Paul Metro Area - *Piush Mani Dabal, Minnesota State University-Mankato*
- Bedrock Mapping Techniques in GIS Used for Future Aggregate Resources Forecasting - *Ross Hoffmann, Minnesota Department of Natural Resources-Lands and Minerals*

Session 7 — Product Demos

- Panel Discussion: Mobile Applications in GIS - *ESRI, Trimble Navigation, Bullberry Systems and Pro West*

Noon Awards Luncheon

1:30 p.m. Concurrent Sessions

Session 8 — Federal Programs

- The National Geospatial Programs Office and Geospatial One-Stop - *Ronald Wencl, U.S. Geological Survey*
- MAF/TIGER Accuracy Improvement Program Update - *Craig Best, U.S. Census Bureau*
- Implementation of a Cohesive GIS at the U.S. EPA Mid-Continent Ecology Division, Duluth, Minn.: An ArcSDE/Oracle Approach - *James Quinn, Computer Sciences Corporation*

Session 9 — Data Management

- Soil Survey Information-accessing digital and tabular soils data - *Kim Steffen, U.S. Department of Agriculture-Natural Resource Conservation Service*
- Real-time data connections between a Geodatabase and AS/400 - *Mark Sloan, Clay County*
- Minnesota's Geographic Data Clearinghouse - *Chris Cialek, LMIC*

Session 10 — Data Modeling

- Identifying Potential Wetland Restoration Sites in Ramsey County - *David Bauer, Ramsey Conservation District*
- Resource Suitability Model, Stearns County - *Susan McGuire, Stearns County Environmental Services*
- The study of the balance between jobs and housing in GIS framework: The case of the seven county metropolitan area in Minnesota - *Woo Jang, Minnesota State University-Mankato*

Session 11 — Web Mapping

- Internet Mapping Application Presentation — Manifold GIS - *Jim Dahl, Douglas County*
- Internet Mapping Application Presentation — MapServer - *Brian Fisher, Houston Engineering*

Session 12 — Remote Sensing

- National Wetlands Inventory Delineation and Classification Using eCognition Remote Sensing Software - *Jeff Knopf, GeoSpatial Services of St. Mary's University of Minnesota*
- NEXTMap USA - *Robert Eadie, Intermap Technologies, Inc.*
- Use of Remote Sensing Imagery for Assessment of Minnesota's Water Resources - *Leif Olmanson, University of Minnesota*

Session 13 — Undergraduate Student Competition

- Redrawing Permit Area Boundaries Based on Habitat Type Using GIS - *Sonja A. Christensen, Minnesota State University, Mankato*
- Environmental Amenities and Residential Property Values in the Twin Cities Metro Area, 2004 - *Krista Sandford, University of St. Thomas*
- Performance of Three Garmin 76 GPS units - *Jon Douvier, Bemidji State University*

Session 14 — Product Demos

- Nazca Property Management Portal - *Ted Mondale, Nazca Solutions*
- What's New in ArcGIS 9.1 and Network Analyst - *Dan Falbo, ESRI*

3 p.m. Refreshment Break

3:30 p.m. Concurrent Sessions

Session 15 — Data Development

- A Standardized, Official Address and Point for Every Occupiable Unit? Metro Wide? Are we Nuts? - *Mark Kotz, Metropolitan Council*
- Wireless and Mobile Technologies in Agriculture - *Josh Marsh, Pro-West & Associates*
- Washington County ISTS Program and GIS/GPS - *Chris LeClair, Washington County*

Session 16 — Data Management

- Mapping Easements in GIS - *John Mackiewicz, WSB & Associates Inc*
- Geoids, Ellipsoids, Datums and Projects - *Chuck Bryant, Minnesota Department of Transportation*
- Minnesota Department of Transportation's Geodetic Control Database - *Chuck Bryant, Minnesota Department of Transportation*

Session 17 — Data Modeling

- Student Enrollment Study - *Charles Parson*
- Using GIS to Find Optimal Locations for New Ethanol Plants in Southern Minnesota - *Lyle Petrick, Minnesota State University-Mankato*
- Site Location Decision for Chain Restaurants Using GIS and Spatial Analysis - *Sajan Dhakal, Minnesota State University-Mankato*

Session 18 — Web Mapping

- Internet Mapping Application Presentation-ArcIMS - *Rick Moore, MMDC*
- Internet Mapping Application Presentation — Autodesk - *Carl Dunn, City of Williston*

Session 19 — Transportation

- Travel Demand Forecasting in a GIS-T Context - *Changjoo Kim, Minnesota State University-Mankato*
- GIS Opportunities in Design Build at Minnesota Department of Transportation - *Brad Henry, URS*
- Was that a robot driving that machine? (What does GIS have to do with Machine Control in Construction) - *Brad Henry, URS*

Session 20 — Undergraduate Student Competition

- Current Recruiting Patterns of the United States Army - *Sara Dolan, University of Minnesota*
- Four People, Two Ropes and an Aluminum Pole: Large-Scale Aerial Mapping - *Ari Ofsevit, Macalester College*

Session 21 — Product Demos

- Department of Natural Resources Garmin Version 5.0 Software - *Chris Pouliot, Minnesota Department of Natural Resources*
- Wildlife Survey Extension - *Chris Pouliot, Minnesota Department of Natural Resources*
- Real Time Automated Vehicle Location using OpenSource Web-based Technology - *Bruce Shriver, ThomTech Design, Inc.*

5 p.m. Vendor Reception and Poster Session — Exhibit Hall
Prize Drawings (must be present to win), Complimentary Hors d'oeuvres and Cash Bar

7:30 p.m. Beer Tasting Gathering — hosted by GeoComm at the Lahr building

Wednesday

7:30 a.m. Conference Registration and Materials Pick-Up

8:00 a.m. Exhibits Open – Refreshments Served

8:30 a.m. Concurrent Sessions

Session 22 — Natural Resources

- Habitat Improvement GIS: Examples from the Minnesota Department of Natural Resources - *Paul Wickman, Minnesota Department of Natural Resources Fish and Wildlife*
- Minnesota GAP Analysis: Utilizing GIS to Establish Gaps in Biodiversity - *Bruce Anderson, Minnesota Department of Natural Resources-Fish and Wildlife*
- GIS Approach in Determining Factors of Ring-necked Pheasant (*Phasianus colchicus*) Populations - *Michelle Imes, Minnesota State University-Mankato*

Session 23 — Community GIS

- GIS for Everyone - *Richard Rice, City of Chanhassen*
- Panel Discussion: Promotion of GIS in Broad Based County Government - *Judson Freed, Emergency Services Director, Ramsey County; Mary Hagerman, Dakota County GIS Specialist, Dakota County Office of GIS; Bill Swing, IT Director, Wright County*

Session 24 — Parcels

- Panel Discussion: Examining the Parcel Management Workflow - *Dan Falbo, ESRI*

Session 25 — Homeland Security

- Emergency Preparedness: Are You Prepared? - *Todd Lusk, Dakota County*
- MetroGIS and GCGI Emergency Preparedness Committees - Recent Activities - *Randy Knippel, Dakota County*
- A Collaborative Model For Capturing Local Emergency Preparedness Knowledge And Data - A Twin Cities Metropolitan Area Example - *Keith Anderson, LOGIS*

Session 26 — Water Resources

- Building a Repository to Share Hydrologic Event Data - *Mark Olsen, Minnesota Pollution Control Agency*
- EPA's Uses of the National Hydrography Dataset - *Thomas Dewald, U.S. Environmental Protection Agency*
- Using the National Hydrography Dataset - *Jeff Simley, U.S. Geological Survey*

Session 27 — Graduate Student Competition

- Wolves in Minnesota: Developing a Spatially Explicit Model of Abundance and Dispersal — *Jon Michael Engels, University of Minnesota*
- Zoning for School District Using GIS Approach - *Yong-Seuk Park, Minnesota State University, Mankato*
- Analysis of troops activated per state in the 88th Regional Readiness Command from 2003-2005, and the building of a GIS system from the ground-up at Fort Snelling Army Reserve HQ - *Jesse Pearson, Department of Resource Analysis, Saint Mary's University of Minnesota*

Session 28 — Product Demos

- Custom Cost Effective Aerial Photography - *Lee Westfield, Pro-West & Associates*
- Plat Book Professional 3.0 - *Jerry Happel, Plansight*
- CivXplorer - *Suzanne Fliege, Plansight*

10 a.m. Refreshment Break

10:30 a.m. Concurrent Sessions

Session 29 — Community GIS

- Minnesota 3-D: An Online GIS Application for Economic Development - *Jeff Matson, University of Minnesota*
- Integrating Enterprise GIS for your Community - *Paul Weinberger, City of Minneapolis*
- Minneapolis Snow Emergency IMS Web site - *Jeff Schroeder, City of Minneapolis*

Session 30 — Remote Sensing

- Imagery On Demand - Storing and Delivering Large Raster Datasets - *Jim Dickerson, LMIC*
- Panel Discussion: The latest news from Remote Sensing - *Dr. Bill Befort, Minnesota Department of Natural Resources; Dr. Marvin Bauer, University of Minnesota; Dave Fuhr, Airborne Data Systems; Ron Wencl, U.S. Geological Survey*

Session 31 — Parcels

- Mapping Without a Net: GIS Compilation Strategies - *Mark Kemper, The Sidwell Company*
- Developing and Implementing the Geodatabase Parcel Data Model - *Richard Bunten, City of Duluth*
- Aligning GIS data to the New Anoka County Parcels - *Blaine Hackett, GIS Rangers*

Session 32 — Homeland Security

- Emergency Preparedness and Homeland Security: A Practical Perspective ~ *Dan Falbo, ESRI*
- The Holistic Nature of GIS and its Application to 911 Dispatch and Emergency Management Operations ~ *Mark Luther, BullBerry Systems, Inc.*
- Grant Writing for GIS-Based Homeland Security Initiatives ~ *Jenifer Sorensen, BullBerry Systems, Inc.*

Session 33 — Natural Resources

- Alaska Fire Season 2004 - Mapping the Millions ~ *Paul Olson, Minnesota Department of Natural Resources-Forestry*
- Assessment of Oak Wilt Incidence and Distribution ~ *Susan Burks, Minnesota Department of Natural Resources*
- Presenting GIS data to the public for natural resource conservation: three case studies ~ *Kim Alan Chapman, Applied Ecological Services*

Session 34 — Education

- Panel Discussion: Minnesota State Colleges and Universities - ESRI Site License ~ *Mark Thomas, ESRI Site License Administrator, MnSCU; Angela Lee, Libraries and Museums, ESRI; Todd Harmening, Planning, Academic and Student Affairs, MnSCU; Tim Fox, GIS/Geography Coordinator, Itasca Community College; Charlie Parson, Geography Professor, Bemidji State University; Marty Mitchell, Geography Professor, Minnesota State University-Mankato*

Session 35 — Product Demos

- Introducing WebFusion GIS ~ *Greg Proper, Pro-West & Associates*
- mPower Integrator - Web GIS ~ *Scott Hameister, mPower Technologies*
- Manifold GIS ~ *Jim Dahl, Douglas County*

Noon Closing Luncheon (Exhibit Hall Closes)

1:30 p.m. Minnesota GIS/LIS Consortium Business Meeting and Year-End Review

**2 p.m. Prize Drawings (must be present to win)
Adjournment**

Poster Gallery

The following posters will be on display in the Exhibit Hall throughout the conference. Poster presenters, including student competitors, will be on hand to answer questions regarding their posters during the vendor reception and poster gallery at 6 p.m. Tuesday, October 4.

- 150 Years of Land Use and Land Cover Change in the St. Cloud Area — **Chad Yost, St. Cloud State University**
- A Restaurant Location Problem in the Twin Cities — **Christina Freiberg, University of St. Thomas**
- Alaska Fire Season 2004 — Mapping the Millions — **Paul Olson, Minnesota Department of Natural Resources-Forestry**
- City of Minneapolis GIS Map Gallery — **John Janzen, City of Minneapolis**
- Conservation Planning for Minnesota's Shallow Lake — **Ann Zdroik, Ducks Unlimited, Inc.**
- Displaying Stream Sampling Data for Managed Streams in Minnesota — **Jamie Schulz, Department of Natural Resources Fisheries**
- Indexing Features to the 24K National Hydrography — **Sandi Kuitunen, LMIC**
- LaCrosse Encephalitis Prevention using GIS — **Chris Stevens, Metro Mosquito Control District**
- Minnesota's Geographic Data Clearinghouse — **Nancy Rader, LMIC**
- The North Ottawa Project, Bois de Sioux Watershed — **Mark Reineke, JOR Engineering, Inc**
- Using GIS to Balance Wetland Preservation and Public Drainage Rights within the Rice Creek Watershed District — **Jason Naber, Emmons and Olivier Resources**
- What's In My Neighborhood? Agricultural, Interactive Ag-Chem Incident Investigation Mapping — **Gary Elsner, Minnesota Department of Agriculture APPD**
- Minnesota: Land of Too Many Wildfires — **Melissa Aho, Anoka Ramsey Community College (student poster)**
- Boulder Lake (Student Competition Poster) — **Russ Jones, Fond du Lac Community College (student poster)**

Miscellaneous

Job Fair Board

Are you an employer with an open GIS position? Are you an individual looking for a GIS job? A job fair board will be located near the registration desk during the conference so employers can post job descriptions and individuals can post their resumes. Bring several copies and check the board throughout the conference for new additions.

Monday Night Social

Join fellow conference-goers on Monday evening in the Martini Lounge at the Red Carpet Bar and Restaurant, located within walking distance of the St. Cloud Civic Center. The Martini Lounge serves a full selection of beer and wine in addition to specialty drinks (martini's of course) coffee and soda in a cozy, up-scale, and smoke-free environment with an attached outdoor patio. The Minnesota GIS/LIS Consortium will have space designated for conference attendees and will provide complementary appetizers. Free pool will also be available. So, whether you're just pulling into town, or finishing up a day of workshops, come by and see old friends or meet some new ones.

Tuesday Night Beer-Tasting Social

Please join us for what has become a tradition at the conference, the GIS/LIS beer-tasting event. For the 2005 beer sampling social, GeoComm will be hosting the event at the historically renovated Lahr building. As always, the Boreal Brewers Club of Bemidji is kind enough to provide the fruit of their labors to be sampled by those present. In addition, samples from commercial breweries will be provided, as available. Home brewers are strongly encouraged to bring their own fermented beverages to share with others, but a designated GIS/LIS host will do all pouring. Along with many delicious brews of beer, snacks will be provided. You must be at least 21 years of age to attend this event and identification will be checked at the door.

The Lahr building is within easy walking distance of the civic center and will provide a wonderful atmosphere for the beer tasting. Thank you to the Boreal Brewers, Ayres Associates and GeoComm for their generous donations to the Mn GIS/LIS Conference entertainment fund and helping to put on great events for 2005!

Door Prizes

Drawings for door prizes will be conducted at the Exhibitors Reception and Poster Gallery on Tuesday at 6 and 7, and at the Closing Plenary Session on Friday. Door Prizes will be drawn from entry slips deposited in the drum placed at the entrance for each event. Two entry slips are provided in your conference packet, one for Tuesday and one for Wednesday.

Prize Allocation Policy – the Minnesota GIS/LIS Consortium reserves the right to provide prizes and honoraria at GIS and geographic related functions. Articles are delivered as non-refundable for monetary value. Articles are delivered as exchangeable in so far as the donor is not subjected to undue hardship. Articles may be transferred to another willing party. If an article has an expiration date, it must be honored in order to redeem the article.

Exhibitors

Exhibitors

Aerial Services, Inc.

2120 Center Street, Cedar Falls , IA 50613

Aerial Services, Inc. is an employee-owned, veteran-owned, professional geo-spatial services company that has been providing professional services since 1967. Based in the Midwest, Aerial Services offers: conventional photogrammetry, aerial photography, LiDAR, orthophotography, topographic mapping, geodetic surveying, photo control GPS surveying, GPS equipment sales and consultations as a top Midwest Thales Navigation affiliate, 3D laser scanning services, and GIS services like E-Docs and asset management while being an ESRI business partner. It's Aerial Services mission to provide it's clients focused, high-quality affordable products and services to best meet their high expectations in a timely manner.

Applied Data Consultants

2985 58th Street, Eau Claire, WI 54703

With a staff of over thirty GIS professionals providing the framework, Applied Data Consultants (ADC) provides a complete range of GIS services to local, state, and federal governments and private companies. Technical services provided include rural addressing, digital mapping, data development, web hosting, training and support. As an ESRI® Business Partner, ADC provides custom application development services in a variety of environments including ArcGIS and ArcIMS. Our goal at ADC is to consistently provide our clients with high quality GIS products and services in the most cost-effective manner. www.adc4gis.com

Ayres Associates

1802 Pankratz, Madison, WI 53704

Ayres Associates is an employee-owned architectural/engineering consulting firm providing services from a network of offices. Ayres Associates provides professional photogrammetric services that are tailored to our clients' needs. In addition to providing quality photogrammetric mapping, GIS and remote sensing services, Ayres Associates has successfully helped numerous clients build consortiums, develop cost sharing agreements and create data distribution systems throughout the nation.

BullBerry Systems, Inc.

BullBerry Systems, Inc. (BBSI) is a company focused on the delivery of spatial (location-based) solutions meeting the demanding needs of emergency and crisis management personnel. As a provider of innovative computer software, needs assessment and implementation services, GIS data building and conversion, training services, and 24/7 support — BBSI is committed to bringing advanced and sustainable solutions to a growing community of clients and is dedicated to providing our customers with stable, easily maintained solutions that accommodate a wide range of both budgetary and personnel constraints.

ESRI

880 Blue Gentian Road, Suite 200, St Paul, MN 55121

With annual sales of more than \$469 million, ESRI remains the world leader in the geographic information system (GIS) software industry. Our business involves the development and support of GIS software for all types of organizations--from the one-person office to multinational corporations to innovative Internet GIS solutions. www.esri.com

Frontier Precision

1906 7th St N, St. Cloud, MN 56303

Frontier Precision is a leading supplier of Trimble GPS equipment and accessories. With a regional office in St. Cloud, Trimble Certified Trainers, and Trimble Certified Repair Facility, they have won several awards for excellence in sales and service from Trimble.

GeoAnalytics, Inc.

1716 Fordem Ave., Madison, WI 53704

GeoAnalytics is a GIS consulting firm that specializes in the planning, design, and implementation of custom, enterprise-level information systems. The firm offers unique technical capabilities and expertise in Land Records, Transportation, Utilities, Business Geographics, and Environmental Management. Varion Systems, the software development and value-added reseller division of GeoAnalytics, provides Land Management, Asset Management, Automated Vehicle Location Systems, and Web-GIS solutions for local government.

GeoComm

601 W St. Germain Street, St Cloud, MN 56301

GeoComm provides turnkey, start-to-finish wireline and wireless E9-1-1 engineering and project management services. These services include the technical engineering and design of communications networks, the development of text and graphic databases, radio engineering, the acquisition of communications equipment, the design and installation of Geographic Information Systems (GIS), and the task of GPS rural addressing and digital mapping in support of the E9-1-1 project. In addition, GeoComm also provides ongoing, professional project management services in close association with your local project staff.

Horizons, Inc.

6125 Blue Circle Dr, Minnetonka, MN 55343

Aerial photography, LIDAR collection, digital mapping services, digital orthophotos and all photogrammetry mapping to support GIS projects. Horizons Inc. now has seven aircraft, two LEICA ADS 40 Digital Cameras and 15 ZEISS film cameras to serve all of your aerial photography needs.

Houston Engineering, Inc.

10900 73rd AVE N, Suite 106, Maple Grove, MN 55369

Houston Engineering, Inc. (HEI) is recognized as a regional leader in water resources management. HEI is also known for superior engineering, environmental, surveying, and GIS services. Our GIS specialty services include Web GIS development, customization, programming, training and hosting using MapServer. HEI also specializes in floodplain mapping, digital flood insurance rate map (DFIRM) production, FEMA Map Modernization projects, and GIS for water resources, environmental, and engineering applications. HEI has offices in Maple Grove, Thief River Falls, Fargo and Bismarck.

Kunde Company, Inc.

2489 Rice St. #160, Roseville, MN 55113

Kunde Company, Inc. is a dealer of GPS/GIS products from Leica Geosystems, a provider of mapping services and a leading natural resource consultant to clients throughout the upper Midwest.

Land Management Information Center (LMIC)

300 Centennial Building, 658 Cedar St., St. Paul, MN 55155

LMIC (Department of Administration) promotes the effective use of geographic information in Minnesota. Projects that will be showcased at this year's booth include: Web mapping services developed to clip and download raster data; decision support tool demonstrations including statewide 2003 FSA photography on external hard drives, new Atlas (GDS) software, GeoAnalysis tools and new demographic mapping and downloading capabilities. Samples of client-based projects include creating electric utility service area boundaries, wind resource infrastructure data, standardized maps for emergency preparedness programs and Web-based parcel inventory applications. Learn about a new grant opportunity for Regional Development Offices. Visit LMIC at the conference and on the Web at: www.lmic.state.mn.us.

Markhurd

13400 68th Ave N, Maple Grove, MN 55311

Markhurd is a pioneer in the acquisition of aerial photography, in both conventional film and digital mediums, digital orthophotos, planimetric feature, contour/DTM and LiDAR mapping, GPS survey ground control, GIS services and photo reprographics. MARKHURD, since 1922, serves a national market, has worked in every state in the U.S.A., except Hawaii, and in 35 foreign countries. We provide Minnesota cities and counties, whether for engineers, planners, or GIS users, with the finest photogrammetric products and services available. MARKHURD's home base is Maple Grove, MN.

Martinez Corporation

2910 Waters Road, Suite 190, St Paul, MN 55121

Martinez Corporation provides project initiation and mapping standards consulting, aerial photography, digital scanning and mapping, orthophoto production, CADD/GIS translating, aero triangulation, and planimetric and topographic mapping, among other services. The markets they serve grow daily, and include multi-modal transportation, municipal, environmental, and GIS.

Minnesota Governor's Council

658 Cedar Street, Room 300, St Paul, MN 55075

The Governor's Council on Geographic Information exists to promote efficient and effective development of geographic information technology among academic, state, local and federal government entities. At the council's booth you will find useful articles and publications related to coordinated geographic information technology development, GIS data standards and accuracy, data sharing and distribution, information from the Federal Geographic Data Committee and more. Also, council members will be on-hand to discuss issues that are important to you and answer any questions you might have.

MGIS Program, University of Minnesota

The Master of Geographic Information Science (MGIS) program, launched in fall 1997, is a unique professional masters degree associated with the Department of Geography at the University of Minnesota in Minneapolis. The department is one of the oldest geography departments in the United States with a strong tradition in cartography and GIS. University units affiliated with the MGIS program include Forest Resources, Computer Science, the Center for Urban and Regional Affairs (CURA), and Soil, Water and Climate. The MGIS program is designed to meet the needs of both part-time and full-time students with varying degrees of experience as well as students from a variety of academic and professional backgrounds. The objective of the program is to provide a comprehensive GIS degree that balances work in the theoretical aspects of GIS, the technical side of the discipline, and the applications domain in order to prepare our graduates to become successful GIS professionals.

mPower Technologies

501 S. Nicolet Rd., Appleton, WI 53226

mPower Technologies, developer of mPower Integrator™ for ESRI ArcIMS® and Autodesk MapGuide®, is dedicated to finding the best GIS solution to fit their client's current and future needs. mPower Technologies professionals help their clients maximize their software investment by providing expert knowledge from consulting to training. They empower GIS software users by freeing them from relying on costly consultation and proprietary development provided by many consultants and software providers.

Nazca Solutions

400 1st Ave N, Suite 640, Minneapolis, MN 55401

The Nazca Property Management Portal generates land records data in real-time from disparate county databases and presents it securely to end users via a web-based portal. In our integrated environment, the customer describes what information it wants and how it will be displayed, without the expense of data warehousing.

Pro-West & Associates, Inc.

8239 State 371 NW, PO Box 812, Walker, MN 56484

Pro-West & Associates provides assistance to county and city governments and resource management industries. Our services include technical advising, conversion of paper maps to digital data, customized computer programming, software training and support, aerial photography and photography interpretation, and GIS design. The goal for each client is increased efficiency and productivity to integrating technology and information.

Rowekamp Associates, Inc.

10800 Lyndale Avenue South, Suite 110, Bloomington, MN 55420

Rowekamp Associates, Inc. is a full-service GIS consulting firm. We are ESRI® business partners, approved to sell their complete line of desktop software solutions. We are award-winning teachers of ESRI's training curriculum, and we provide application development services in a variety of environments including ArcGIS, ArcIMS, MapObjects and ArcView/Avenue. Turn to us to help you migrate to ArcGIS®. You can count on us to stay on the job until all your needs are satisfied.

St. Mary's University of Minnesota

700 Terrace Heights, #10, Winona, MN 55987

Students can choose an MS degree in Geographic Information Science offered at either the main campus in Winona, MN or at the Twin Cities campus in Minneapolis, MN. The hands-on curriculum includes a choice of concentration areas including natural resource management, business management, criminal justice, project management or policy administration/local government. Curriculum options include a traditional 37 credit masters degree, a one year accelerated masters degree, and a 12 credit GIS certificate program.

Spatial Analysis Research Center (SARC), St Cloud State University

Stewart Hall 328, 720 4th Ave. S., St Cloud, MN 56301-4498

Taylor Technologies

5353 Gamble Dr. Ste 110, St. Louis Park, MN 55416

1100 S Carpenter Avenue, Kingsford, WI 49802

Taylor Technologies (TTI) is an Autodesk Authorized Value Added Reseller. Autodesk has recognized TTI as a Government, Civil Solutions, and Mapping Premier Service Provider (in Kingsford, MI). Products offered include AutoCAD, Land Desktop, Map 3D, Civil 3D, FMDesktop, and more. TTI also provides CAD software training, support, and related services (GSA pricing available for select services).

The Sidwell Company

675 Sidwell Court, St Charles, IL 60174

The Sidwell Company is a provider of comprehensive GIS and mapping services, including GIS planning, design, and implementation; data conversion and cadastral database development; aerial photography; software development; photogrammetric services including topographic, planimetric, and digital orthophoto mapping; project management, and training and technical support services such as Web hosting for GIS data. Sidwell is an ESRI Business Partner.

URS

700 3rd St. S, #600, Minneapolis, MN 55415

URS Corporation is a multi disciplinary engineering consulting firm providing professional consulting services in the areas of civil and structural engineering, site design, utilities design, landscape architectural design, environmental analysis, transportation and traffic engineering, Intelligent Transportation Systems (ITS), cultural resources, and Geographic Information Systems (GIS).

U.S. Geological Survey (USGS–Minnesota office)

2280 Woodale Dr., Mounds View, MN 55112

USGS EROS Data Center

Mundt Federal Building, Sioux Falls, SD 57198

The Earth Resources Observation Systems (EROS) Data Center is a field center for many programs and activities of the USGS National Mapping Program. The EROS Data Center is a national repository of remotely sensed data on the Earth's land surface. The Center operates an archive with more than 9 million photographs of the United States taken from aircraft and more than 4 million worldwide images acquired by sensors aboard several satellites. <http://edcwww.cr.usgs.gov>

Minnesota GIS/LIS Consortium Sponsors

The Minnesota GIS/LIS Consortium would like to recognize and thank organizations that are supporting the consortium this year as sponsors. At this time, sponsors include the organizations listed below.

Bronze Sponsor: **Nazca Solutions**

Silver Sponsor: **Pro-West & Associates, Inc.**

Abstracts

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Oral Presentations

*

Panel Discussions

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*Product
Demonstrations*

Session 1 – Management Strategies

Tuesday, 10:30 a.m. to Noon, Stockinger Suite A

Panel Discussion: The Role of GIS in a Statewide Service-Oriented IT Architecture

(Presentation supported by the Governor's Council on Geographic Information)

Linda Finley

MN Office of Enterprise Technology

658 Cedar St.

St. Paul, MN 55155

Phone: 651-215-1997

Linda.finley@state.mn.us

David Arbeit

MN Department of Administration

658 Cedar St.

St. Paul, MN 55155

Phone: 651-201-2460

david.arbeit@state.mn.us

Robert Maki

Minnesota Department of Natural Resources

500 Lafayette Rd.

St. Paul, MN 55155

Phone: 651-297-2329

robert.maki@dnr.state.mn.us

Gov. Tim Pawlenty's "Drive to Excellence" initiative commits state agencies to improvements in IT efficiency. A critical strategy for delivering more cost-effective services to Minnesota's citizens and businesses is the development of a common service-oriented IT architecture. This technological approach provides opportunities for sharing common data and application resources. How can GIS contribute to a more integrated architecture based on these principles? The federal government has explored the concept of sharing map services through the deployment of the Geospatial One-Stop portal. The Minnesota Governor's Council on Geographic Information has developed a strategic plan — the Minnesota Spatial Data Infrastructure — that suggests policies, standards, and practices for an improved GIS infrastructure. The council has recently expanded on that infrastructure by advocating a conceptual plan for a GIS enterprise IT architecture that embodies the tenants of both the Drive to Excellence and the MSDI. This session will review these three efforts and discuss how state and local efforts fit into and can flourish in this environment.

Presentation: "How the Drive to Excellence will Change the Way the State Delivers Services" — Linda Finley, Director, Minnesota Office of Enterprise Technology

Presentation: "A Foundation for Coordinated GIS: Minnesota's Spatial Data Infrastructure" — David Arbeit; Director, Land Management Information Center; Minnesota Department of Administration

Presentation: Minnesota State GIS Enterprise Conceptual Architecture Design; Robert Maki; GIS Infrastructure Supervisor; Minnesota Department of Natural Resources

Session 2 – Data Management

Tuesday, 10:30 a.m. to Noon, Opportunity Suite A

Streamlining Wetland Management with GIS

John Mackiewicz
GIS Consultant
WSB & Associates Inc.
701 Xenia Ave. S., Suite 300
Minneapolis, MN 55416
Phone: 763-287-7194 Fax: 763-541-1700
jmackiewicz@wsbeng.com

Andrea Moffatt
Environmental Scientist
WSB & Associates Inc.
701 Xenia Ave. S., Suite 300
Minneapolis, MN 55416
Phone: 763-287-7196 Fax: 763-541-1700
amoffatt@wsbeng.com

As the Local Government Unit (LGU), the City of Prior Lake is responsible for tracking wetland delineations, wetland impact areas, and wetland mitigation for the Wetland Conservation Act (WCA). Typically, this is a paper-tracking exercise that consumes valuable time for city staff. In an effort to streamline this process, a GIS database was developed to track this information.

The database was designed to track all information submitted during the development process. First, when wetland delineation reports are submitted, the delineation line is added to the GIS database. Then, as a project moves forward, if impacts are proposed, these impacts are also added to the database. Finally, the wetland mitigation areas are added to the database.

Each feature is linked to the available information about the wetland. This includes the date of the delineation, photos of the site, monitoring reports, and the type of vegetation present at the mitigation site. By compiling all of this data into one database, the city can more efficiently track wetland resource data and generate annual reports.

This presentation will detail the database design process, developer requirements, data collection methods, update procedures, and the implementation plan developed to meet user and regulatory requirements.

One-Button Migration

Mark Kemper
GIS Project Manager
The Sidwell Company
675 Sidwell Ct.
St. Charles, Illinois 60174
Phone: 630-549-1000 Fax: 630-549-1111
mkemper@sidwellco.com

Everyone seems to want a “one-button” solution. Currently there is no one-button migration tool available for moving your data from a coverage format, shapefiles, or CAD to a Geodatabase. But knowing the pitfalls of the process and how to prepare your data in advance can make the job feel more like a one-button migration. This session will review suggested workflows and tips and tricks for streamlining the migration process.

Session 2 – Data Management

Tuesday, 10:30 a.m. to Noon, Opportunity Suite A

Geographic Marketing and Analysis for Rural Business

Jim Ramstrom

*MN Environmental Atlas (Next Generation), Project Manager
Land Management Information Center, Department of
Administration*

Room 300

658 Cedar St.

St. Paul, MN 55155

Phone: 651-295-2559 Fax: 651-296-1212

Jim.ramstrom@state.mn.us

Rural businesses need fast and efficient access to business planning and development data. “Technologies that seemed accessible only by researchers and scientists — such as geographic information systems and complex database programs — are now much more user-friendly. Their everyday use can empower communities and nurture local knowledge, rather than treat citizens passively with standard solutions. Yet these tools remain hidden from view, not used on a widespread basis for lack of statewide coordination and visibility” — MN Rural Partners-Digital Junction Conference.

This presentation will look at a series of new tools to search, analyze, map, query and download Minnesota demographic data. Attendees will learn about online GIS mapping of block group and tract census data. Mapping features allow custom data selection, legend design, color adjustment and variable weighting. Data can be downloaded or displayed in reports, spreadsheets or alternative mapping packages.

Online tools allow rural businesses to select sub-sets of census geography based on conditions they deem important. More than 400 demographic variables for the selected sub-set of jurisdictions can be mapped online or downloaded with sufficient detail and annotation to make business decisions.

A new analysis feature in the next generation of the Minnesota Environmental Atlas tabulates census data for any point on a map using a radius. For instance, a circle based on the radius would be drawn over block group data and results for each block group would be displayed in a report along with the total. Individual block groups (and their data values) can be added or deleted. The radius features works with county, minor civil division, tract and block group data.

While these capabilities have been free to Minnesota government agencies, LMIC is exploring new arrangements with the Minnesota rural partners to bring software and data to rural businesses.

Session 3 – Data Modeling

Tuesday, 10:30 a.m. to Noon, Stockinger Suite B

Predicting Forest Dynamics: Moving From Stand to Landscape Simulation Models

John Snyder

GIS Specialist

Voyageurs National Park

3131 Hwy. 53

International Falls, MN 56649

Phone: 218-283-9107 ext. 6162 Fax: 218-285-7407

john_s_snyder@nps.gov

Mark Fulton

Associate Professor

Bemidji State University

291 Sattgast Hall

Bemidji State University

Bemidji, MN 56601

Phone: 218-755-2787 Fax: 218-755-4107

mfulton@bemidjistate.edu

Scaling up from a stand to a landscape simulation entails a loss of detail for reasons of both computational efficiency and parameter reliability. A frame-based model, in which forest development is characterized by simple dynamics within “frames” associated with dominant species, is a minimal stand simulation model that is well suited for scaling up to a landscape.

The adaptation of a frame-based model to the landscapes of Voyageurs National Park, Minnesota, is presented here as a case study to highlight the challenges involved in model re-scaling. This project involved adapting a model designed to predict changes in a stand over centuries to one that predicts changes in a landscape over decades. The first challenge arose from the fact that input data suitable for model initialization and testing were collected at very different scales, from detailed plot data to coarse vegetation maps. Solutions to this problem were opportunistic. For example, a coarse scale 1:250000 soil map was augmented with a topographic curvature index calculated from a digital elevation model to produce a generalized map of soil quality.

The second challenge arose from the fact that forest processes act at different scales. The model, depending on the scale, handles these processes differently. Stand-scale variables are managed as stand attributes, whereas landscape variables can be managed either as stand attributes or as boundary conditions specified in the code. The model was tested with simulations based on a variety of historical data sets including permanent plot data and vegetation maps. The model effectively predicts vegetation change over temporal scales of 20 to 60 years, a time scale of particular relevance to park managers. With proper attention to scaling issues, landscape vegetation changes can be predicted with a simulation model originally designed for use at very different spatial and temporal scales.

Calculating Total Water Volume for Lake Embayments Using GIS-Derived

James W. Quinn

GIS Specialist

Computer Sciences Corporation

c/o US EPA Mid-Continent Ecology Division

6201 Congdon Blvd.

Duluth, MN 55804

Phone: 218-529-5214 Fax: 218-529-5003

quinn.james@epa.gov

Tatiana B. Nawrocki

GIS Project Lead

Computer Sciences Corporation

c/o US EPA Mid-Continent Ecology Division

6201 Congdon Blvd.

Duluth, MN 55804

Phone: 218-529-5231 Fax: 218-529-5003

nawrocki.tatiana@epa.gov

The ability to acquire accurate estimates of total water volume within lake embayments is critical, given that such information helps to support research efforts to characterize the relative sensitivity of freshwater ecosystems to cumulative stress, devise diagnostic landscape and habitat indicators, and derive relationships of landscape structure and corresponding land use activities to the sustainability of freshwater ecosystems. This presentation outlines GIS methods employed to estimate total water volume within selected Lake Superior embayments using bathymetry grids derived from published data known as Electronic Navigational Charts, or ENCs, produced by NOAA (<http://nauticalcharts.noaa.gov/>). Each ENC is a complex vector database containing ~180 possible data layers which have proven useful for coastal GIS projects.

ENC SoundingFeature and DepthLineFeature feature datasets were used to interpolate bathymetry grids, which were merged to produce a seamless surface of the study area. Embayment boundaries were delineated based on researcher’s guidelines, ENC DepthAreaFeature feature datasets, and digital raster graphics (DRG). These delineations were used to extract summary statistics from the bathymetry grids, including total water volume within each embayment.

Vector to raster interpolation required a thorough understanding of the spatial data. Recognizing that uncertainty is an inherent quality of spatial data, efforts were made to identify and measure that uncertainty and assumptions were made regarding an appropriate raster cell size corresponding to a compilation vector map scale. For the purposes of spatial hypothesis testing, assessing the uncertainties with ENC data, and exploring ways to best represent non-uniform vector data resolutions via a continuous raster

Session 3 – Data Modeling

Tuesday, 10:30 a.m. to Noon, Stockinger Suite B

surface, the bathymetry grids were interpolated using a range of alternative cell sizes with ESRI's Topo-to-Raster interpolation process. Calculating volume results based on a range of raster cell sizes allowed the evaluation of stability of the interpolated digital elevation models. Impacts of input data resolution on the output summary statistics were also evaluated.

Evaluating Variability in Stream Slope Estimates using GIS

Matthew Kocian
Research Specialist
Department of Fisheries, Wildlife, and Conservation Biology,
University of Minnesota
200 Hodson Hall
1980 Folwell Ave.
St. Paul, MN 55108
Phone: 612-624-2228
kocia001@umn.edu

Chris Sanocki
District GIS Specialist
U.S. Geological Survey
2280 Woodale Dr.
Mounds View, MN 55122
Phone: 763-783-3151
sanocki@usgs.gov

Bruce Vondracek, Assistant Leader
Minnesota Cooperative Fish and Wildlife Research Unit
U.S. Geological Survey
1980 Folwell Ave.
St. Paul, MN 55108
bvondrac@umn.edu
Phone: 612-624-8748 Fax: 612-625-5299

Bruce N. Wilson, Professor
Biosystems and Agricultural Engineering Department
1390 Eckles Ave.
University of Minnesota
St. Paul, Minnesota 55108
Phone: 612-625-6770 Fax: 612-624-3005
email: wilson@umn.edu

Stream slope is used in research and management at several different levels, including the calculation of stream power, estimation of flood flow frequency, and as an indicator of fish and invertebrate habitat type. While methods for measuring stream slope in the field have been standardized, methods for estimating stream slope using Geographic Information Systems (GIS) vary. The main differences in methods usually lie in the measurement of elevation. At a broad level, GIS can estimate elevation change using either a topographic map, or a digital elevation model (DEM). However, both the topographic map and the DEM can be used in different ways and with different modifications. Also, different topographic maps and DEMs can dictate the use of different lengths of stream segment. Previous studies have routinely used different stream slope estimates as a variable during data analysis. A preliminary analysis of two methods for estimating stream slope using GIS indicates a significant difference ($p=0.03$,

Session 3 – Data Modeling

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n=62). Without a standardized method for estimating stream slope in GIS, drawing meaningful results from the data analysis can be difficult. In addition, studies comparing field surveyed slope values (“truth”) with GIS estimates are very rare, and those that do exist have not capitalized on new GIS tools and technology. We will compare multiple GIS estimates of stream slope, using both topographic maps and DEM to measure elevation, with values collected during stream surveys to determine which method corresponds best to measured values.

Session 4 – Web Mapping

Tuesday, 10:30 a.m. to Noon, Opportunity Suite B

ArcIMS Acetate Rendering: Displaying Multi-Jurisdictional Police Data Live

Zachary Christoff

GIS Master

LOGIS GIS

5750 Duluth Street

Golden Valley, MN 55442

Phone: 763-543-2600 Fax: 763-543-2699

zchristoff@logis.org

This presentation will examine the use of Acetate Rendering using ESRI's ARCIMS 9.1 in an Active Server Pages (ASP) environment. The presentation will include setting up a database capture using near "real-time" police incident data between Microsoft SQL Server and Microsoft Access, utilizing ESRI's TrueType Font symbolization within ArcIMS, and posting acetate symbols to an ArcIMS/ASP environment.

This presentation will also include a short walk through of a current LOGIS GIS intranet-based application utilizing the above mentioned methodology along with creative ideas for the expansion of Acetate Rendering in other Web-based applications.

Note: A prior knowledge of ArcIMS, ActiveX, ASP, VBA may be helpful, as the presentation will be demonstrating various programming techniques.

Centralized Data Serving using Web Mapping Services and Web Feature Services

Tim Loesch

GIS Operations Manager

Minnesota Dept. of Natural Resources

500 Lafayette Rd, Box 11

St Paul, MN 55155

Phone: 651-296-0654 Fax: 651-297-4946

tim.loesch@dnr.state.mn.us

The Minnesota Department of Natural Resources GIS section has been serving several hundred gigabytes worth of image data to more than 600 Department of Natural Resources staff across the state from a central storage location using open source data transfer protocols. Using this technology has reduced the cost of providing large image-based data to the users by reducing staff overhead to distribute the data and computing resources to store it.

This talk will present an overview of Web mapping and Web feature services technology and concepts, present tools to use for accessing these services and also review a number of existing services that are available for data access including the Department of Natural Resources Data Deli.

Session 4 – Web Mapping

Tuesday, 10:30 a.m. to Noon, Opportunity Suite B

Introduction to Web-based editing using ArcGIS Server™

Ryan Kiefer

GIS Analyst

GeoSpatial Services

360 Vila St.

box 7

Winona, MN 55987

Phone: 507-457-8751 Fax: 507-457-6604

rkiefer@smumn.edu

Lane Urtel

GIS Analyst

GeoSpatial Services

360 Vila St.

Box 7

Winona, MN 55987

Phone: 507-457-8750 Fax: 507-457-6604

lsurte02@smumn.edu

With the release of ArcGIS 9.0, ArcGIS Server™ technology was introduced by ESRI® as a way of providing complete GIS functionality through a Web-based environment. “ArcGIS Server™ is a platform for building enterprise GIS applications that are centrally managed, support multiple users, include advanced GIS functionality and are built using industry standards.”

ArcGIS Server™ allows for the creation of widely accessible applications from a central location accessible by users through Web browsers, ArcMap™, or custom ArcGIS Engine™ applications. Advanced geoprocessing is available for applications developed with ArcGIS Server™, allowing applications to be created using spatial and 3D analyses, linear referencing, geocoding, and more. The topics covered in this presentation highlight a few basic capabilities of ArcGIS Server™; however, they are by no means exhaustive.

The purpose of this presentation is to examine multiple user editing, quality assurance of edits, the ability to generate current maps, and the performance ArcGIS Server™ functionality over the Internet. The capability of having a centrally managed GIS distributed over the Internet minimizes the costs due to licensing and training, allows for a more standardized input/output, and provides the ability for users to immediately see edits being made in “real time.” This presentation highlights some of the pros and cons of working with ArcGIS Server™, including a brief demonstration of functionality only available in ArcGIS Server™.

Session 5 – Remote Sensing

Tuesday, 10:30 a.m. to Noon, Herberger Suite A

Estimating and Mapping Percent of Impervious Surface Area: A Comparison of Different Methods

Fei Yuan
Assistant Professor
Minnesota State University-Mankato
7 Armstrong Hall, Department of Geography
Mankato, MN 56001
Phone: 507-389-2617 Fax: 507-389-2980
fay.yuan@gmail.com

Marvin E. Bauer
Professor
University of Minnesota
Green Hall, Department of Forest Resources
1530 Cleveland Ave. N.
St. Paul, MN 55108
Phone: 612-624-3703 Fax: 612-625-5212
mbauer@umn.edu

Impervious surface area, a key indicator of environmental quality, is related to runoff of storm water, water quality of lakes and streams, the urban heat island effect, and the aesthetics of landscapes. This study investigates different remote sensing methods for estimating and mapping percent of impervious surface area. Three techniques are compared, using Ramsey County, Minn. as the study site: (1) a regression model which relates percent impervious surface area to “tasseled cap” greenness, (2) a subpixel classifier which uses an intelligent background estimation process to remove other materials in the pixel and calculate the amount of impervious surface percent, and (3) a linear spectral mixture model which estimates percent impervious surface by analyzing end members (vegetation-impervious-soil). Overall accuracies, seasonal effects, local variations, time and cost of image processing for different methods are analyzed and evaluated using 2000 Landsat images of different seasons. The results provide information for further improvement and selection of impervious surface classification techniques

Statewide Estimation and Mapping of Impervious Surface Area by Landsat Remote Sensing

Brian Loeffelholz
Research Fellow
University of Minnesota
1530 Cleveland Ave. N.
115 Green Hall
St. Paul, MN 55108-6112
Phone: 612-625-1703 Fax: 612-625-5212
loef0018@umn.edu

Marvin Bauer
Professor
University of Minnesota
1530 Cleveland Ave. N.
115 Green Hall
St. Paul, MN 55108-6112
Phone: 612-624-3703 Fax: 612-625-5212
mbauer@umn.edu

Bruce Wilson
Minnesota Pollution Control Agency

Landsat TM/ETM+ data for 1990 and 2000 are being classified to map the percentage of impervious surface area for approximately 200 cities and towns across Minnesota. This work follows and builds on previous classifications of the seven-county Twin City metropolitan area in 1986, 1991, 1998 and 2002. The classifications are based on regression modeling of the relationship between impervious surface area and the greenness component of the “tasseled cap” transformation of Landsat multispectral data. It provides a means to estimate impervious area as a continuous variable from 0 to 100 percent and to generate maps as GIS data layers. Agreement between the Landsat estimates and measurements from DOQ’s is 80 to 90 percent with standard errors of 8 to 12 percent. The GIS data layers are being used by the Minnesota Pollution Control Agency to quantify imperviousness by lake and stream drainage areas, model runoff characteristics, and to begin to develop best management practices for rehabilitation and protection of lakes and streams in Minnesota. It provides a cost effective way to accurately assess the spatial patterns and trends in the degree of imperiousness over large geographic areas and by municipality.

Session 5 – Remote Sensing

Tuesday, 10:30 a.m. to Noon, Herberger Suite A

Land Cover Assessment Using High-Resolution, Multi-Spectral Digital Aerial Imagery: A Comparison of Object-Based and Pixel-Based Classification

Steve Kloiber

Environmental Analyst

Metropolitan Council

230 E. Fifth St.

St. Paul, MN 55101

Phone: 651-602-1056

steve.kloiber@metc.state.mn.us

Marvin Bauer

Professor

Remote Sensing and Geospatial Analysis Laboratory,

University of Minnesota

1530 N. Cleveland Ave.

St. Paul, MN 55108

Fei Yuan

Remote Sensing and Geospatial Analysis Laboratory

University of Minnesota

1530 N. Cleveland Ave.

St. Paul, MN 55108

Many management and policy decisions of local, county, and regional agencies require timely, accurate land information. The decreasing costs and increasing availability of digital imagery can help lead to more effective land monitoring programs. One important new application of this technology is the use of digital imagery to map changes in urban development and imperviousness. In this application, we evaluate the potential to use automated image processing techniques, including a new object-based classifier, to map the extent of urban land and imperviousness using high-resolution (0.6 meter), multi-spectral digital aerial photographs acquired for the Twin Cities Metropolitan Area in late-Spring 2004. The spectral bands from a color-infrared image and a standard color image were combined to create a four-band multi-spectral image that was used for a comparison of two automated classification procedures. Training areas were developed from the image objects delineated using the object-based classifier so that the same training areas could be applied in both methods. The automated classification procedures were applied to the imagery to stratify the data into generalized land cover classes, which were then reclassified into impervious/pervious cover data sets. The r-squared values between the automated and manually delineated imperviousness were essentially equal for the two methods (r-squared = 0.9) and the slopes were comparable. The pixel-based classification showed some considerable speckling of impervious areas throughout the study area. Whereas, the object-based classification map showed less noise, but processing time was longer for this method.

Session 6 – Student Track

Tuesday, 10:30 a.m. to Noon, Wilson Suite

Supporting Humanitarian Relief Operations with GIS

Jay Meehl

Adjunct Instructor

Saint Mary's University of Minnesota

RA Department

700 Terrace Heights

Winona, MN 55987

Phone: 612-396-2671

jmeehl@smumn.edu

How would you like to use your GIS skills to help emergency relief operations in Southeast Asia? Feel like giving back to your local community by mapping recreational bike trails? Interested in using GIS to assist in a village-addressing project in Peru? There are a growing number of GIS volunteers who use their talents and technology to make the world a better place. This presentation will introduce GISCorps of URISA, an organization that coordinates short-term volunteer GIS services to underserved communities worldwide. GISCorps activities support humanitarian relief, economic development, sustainable development, indigenous capacity building, aboriginal rights, health and education. The presentation will conclude with a detailed account of the tsunami relief operations from a volunteer who spent three months in Sumatra.

Spatial Decision Support Integration to Current Geographic Information System (GIS) for Location Analysis and Strategic Planning in Minneapolis-St. Paul Metro Area

Piush Mani Dahal

Department of Geography, Minnesota State

University, Mankato

7 Armstrong Hall

Minnesota State University

Mankato, MN 56001

Phone: 507-351-1942 Fax: 507-389-2980

piush.dahal@mnsu.edu

Changjoo Kim

Assistant Professor

Department of Geography, Minnesota State

University, Mankato

7 Armstrong Hall

Minnesota State University

Mankato, MN 56001

Phone: 507-389-1324 Fax: 507-389-2980

changjoo.kim@mnsu.edu

Although the U.S. Census Bureau has provided a wide range of free census data like demographic, economic and transportation data, they require specific skills for analysis and interpretation. In real world most executives, market analysts, entrepreneurs or small investors have limited geographic background thereby sometimes leading to these great census resources to be almost unreachable.

The bigger organizations can afford GIS analysts or such services from vendors. However, small organizations and general people who are willing to invest their savings to buy houses or to open retail business, have to completely rely on various secondary agents like real estates and consultancies. By developing integrated GIS Web services for location analysis and strategic planning using publicly available census data, such organizations or people can be greatly benefited.

This study examines the current Geographic Information System (GIS) framework to integrate it for spatial decision support ability. The goal of this system is to assist users in their decision-making process with census data rather than replacing real estates or consultancies' jobs. The study regions are Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington counties of Minneapolis-St. Paul metro area.

Session 6 – Student Track

Tuesday, 10:30 a.m. to Noon, Wilson Suite

Bedrock Mapping Techniques in GIS Used For Future Aggregate Resource Forecasting

Ross Hoffmann

Student Worker

*Minnesota Department of Natural Resources Lands and Minerals
2300 Silver Creek Rd. N.E.*

Rochester, MN 55906

Phone: 507-280-5590 Fax: 507-285-7144

Ross.Hoffman@dnr.state.mn.us

In 2002, Olmsted County requested aggregate mapping for future aggregate resource planning under the Aggregate Resource Mapping Program of the Department of Natural Resources, Division of Lands and Minerals. This program, intended to benefit local planners, produced a surficial geology and aggregate potential plate for Olmsted County. A higher resolution 1:24,000 bedrock map of the county was first needed to facilitate the construction of the final two plates.

Bedrock mapping began by gathering available digital data. This includes administrative data, DRGs, DOQs, the current geological map, and county well index (CWI) data. This data was compiled into a preliminary dataset that was used in GIS to conduct fieldwork. Fieldwork was conducted with a laptop computer that is loaded with GIS and all the necessary data for faster synthesis of field observations. Field observations yielded data on bedrock contacts through comparison of DOQs and DRGs to direct interpretations of the physical exposure.

Once complete, the dataset was compiled and displayed in GIS. Available bedrock information from CWI data and the current geological map, in addition to field data, was used to digitize the higher resolution 1:24,000 bedrock map. This higher resolution map was ultimately used to produce the final surficial geology and aggregate potential plates. All data and observations used in the creation of these plates were assembled in a database that can be queried in GIS. In addition to the above, products from both spatial and 3-D analyst are also provided additional avenues for viewing raw data.

Product Demonstrations

Tuesday, 10:30 to Noon, Herberger Suite B

Panel Discussion: Mobile Applications in GIS

Dan Falbo

ESRI

880 Blue Gentian Road

Suite 200

St. Paul, MN 55121

Phone: 651-454-0600 Fax: 651-454-0705

nparipovich@esri.com

Field applications are becoming increasingly important in supporting an organization's business needs. The ability to remotely utilize an organization's investment in GIS data has aided in increasing productivity, timely updates, and enhanced application development. Three vendors — Trimble Navigation, Bullberry Systems and ProWest will demonstrate mobile GIS application's for asset management, emergency management, and real-time editing using mobile computing environments. They will also discuss pertinent issues and considerations in implementing mobile GIS.

Organizations Participating: Trimble Navigation, Bullberry Systems, and ProWest Inc.

Session 8 – Federal Programs

Tuesday, 1:30 to 3 p.m., Stockinger Suite A

The National Geospatial Programs Office and Geospatial One-Stop

Ronald Wencl

NSDI Liaison

USGS

2280 Woodale Dr.

Mounds View, MN 55112

Phone: 763-783-3207 Fax: 763-783-3103

rwenc1@usgs.gov

The National Geospatial Programs Office (NGPO), created by the USGS in August 2004, will oversee the portfolio of national geospatial programs that are housed within the USGS and managed on behalf of the federal government. This portfolio includes the Federal Geographic Data Committee (FGDC), the Geospatial One-Stop (GOS) project, the Department of the Interior Enterprise GIS activity (DOI EGIM), and the Cooperative Topographic Mapping Program (CTM), which is the anchor program of the National Map. The formation of this office will provide a leadership focal point and assure a unified and integrated presence from the USGS with their partners and customers in the geospatial data and technology arena. The primary purpose of the NGPO is to advance the development of the National Spatial Data Infrastructure (NSDI) for the nation. As such, the Office will guide a strategic approach for providing geospatial information to support science, decision-making, and the business of government with the intent of achieving the benefits of a robust NSDI to the economy, environment and security of our nation.

Recent developments in the Geospatial One-Stop Portal have been designed to allow improved access to geospatial information. The GOS Portal provides metadata publishing and documentation tools to support the discovery and access to data and Web services related to the NSDI. Improvements include improved search routines, establishing user “communities” for data and applications, creating a “marketplace” for project planning, and integrated Web mapping services.

MAF/TIGER Accuracy Improvement Program Update

Craig Best

Supervisory Geographer

US Census Bureau

1211 N. Eighth St.

Kansas City, KS 66101

Phone: 913-551-6833 Fax: 913-551-6780

cbest@census.gov

In 1980s, the Census Bureau developed the Topologically Integrated Geographic Encoding and Referencing system (TIGER) to support our mapping needs for the 1990 Census. In the 1990s, we developed the Master Address File (MAF) as a complete and current list of all addresses and locations where people live or work, covering an estimated 115 million residences, as well as 60 million businesses and other structures in the U.S. The 2000's will be the decade of the MAF/TIGER Accuracy Improvement. We plan to improve the coordinate accuracy of TIGER to at least 7.6 meters CE95 for every county in the U.S.

In this session, we will discuss the methodology for MAF/TIGER Accuracy Improvement, the expansion of partnership programs, and our testing of mobile computing devices with GPS for Census 2010.

Session 8 – Federal Programs

Tuesday, 1:30 to 3 p.m., Stockinger Suite A

Implementation of a Cohesive GIS at the U.S. EPA Mid-Continent Ecology Division, Duluth, Minnesota: An ArcSDE/Oracle Approach

James W. Quinn

GIS Specialist

Computer Sciences Corporation

c/o US EPA Mid-Continent Ecology Division

6201 Congdon Blvd.

Duluth, MN 55804

Phone: 218-529-5214 Fax: 218-529-5003

quinn.james@epa.gov

Tatiana B. Nawrocki

GIS Project Lead

Computer Sciences Corporation

c/o US EPA Mid-Continent Ecology Division

6201 Congdon Blvd.

Duluth, MN 55804

Phone: 218-529-5231 Fax: 218-529-5003

nawrocki.tatiana@epa.gov

Matthew Starry

GIS Specialist

Computer Sciences Corporation

c/o US EPA Mid-Continent Ecology Division

6201 Congdon Blvd.

Duluth, MN 55804

Phone: 218-529-5213 Fax: 218-529-5003

starry.matthew@epa.gov

Roger Meyer

GIS Specialist

Computer Sciences Corporation

c/o US EPA Mid-Continent Ecology Division

6201 Congdon Blvd.

Duluth, MN 55804

Phone: 218-529-5417 Fax: 218-529-5003

meyer.roger@epa.gov

Eric Bond

System Administrator

Computer Sciences Corporation

c/o US EPA Mid-Continent Ecology Division

6201 Congdon Boulevard

Duluth, MN 55804

Phone: 218-529-5129 Fax: 218-529-5003

bond.eric@epa.gov

The U.S. EPA Mid-Continent Ecology (MED) Division in Duluth, Minn., maintains a GIS Laboratory, which supports approximately 15 hands-on users and 40 research scientists, whose mission is to provide scientific information for use in pre-

dicting and assessing the effects of pollutants and other stressors on our nation's freshwater ecosystems. The innovative research techniques used in monitoring these freshwater ecosystems requires the storage and management of spatial datasets for large geographical regions at multiple temporal and spatial scales. ArcSDE's use and augmentation of a relational database is the key to providing a central, scalable, and robust system for storing large and diverse spatial datasets.

This presentation outlines the steps taken to create a cohesive GIS at the U.S. EPA-MED by implementation of ArcSDE 9 with Oracle 9i. The discussion covers the general implementation workflow process, which includes initial project objectives, preparation and setup, establishment of a database design, and identification of the DBTUNE parameters that have the greatest influence on performance. Complementary to that are the importing, storing, and retrieval of geographic data using ArcSDE geodatabases. The presentation concludes with a discussion of problems encountered and lessons learned while migrating to the ArcSDE geodatabase environment and solutions to those problems.

Session 9 – Data Management

Tuesday, 1:30 to 3 p.m., Opportunity Suite A

Soil Survey Information – Accessing Digital and Tabular Soils Data

Kim Steffen
Soil Scientist
USDA-NRCS
375 Jackson St.
Suite 600
St. Paul, MN 55101
Phone: 651-602-7891 Fax: 651-602-7914
kim.steffen@mn.usda.gov

Danielle Evans
GIS Specialist
USDA-NRCS
375 Jackson St.
Suite 600
St. Paul, MN 55101
Phone: 651-602-7895 Fax: 651-602-7914
danielle.evans@mn.usda.gov

This session is designed to show users of soil survey information how and where to access the most up-to-date soils data. It will focus on three major delivery points of soils data — the soil data mart; Web soil survey; and Soil Survey Geographic Databases (a.k.a. SSURGO).

The Soil Data Mart

The purpose of the Soil Data Mart is to provide a single point of delivery of the USDA - Natural Resources Conservation Service (NRCS) official soil survey information. It will house all official digital and tabular soils data for the entire country.

The Soil Data Mart allows you to: Determine where soil tabular and spatial data is available. Download data for one soil survey area at a time. (Download requests for more than one survey area at a time can be submitted through the Geospatial Data Gateway. Going through the Geospatial Data Gateway also provides the option to obtain data on CD or DVD.) Download a template Microsoft Access® database for working with downloaded data. Generate a variety of reports for one soil survey area at a time. Find out who to contact for information about soil data for a particular state. “Subscribe” or “unsubscribe” to a soil survey area. A person who is subscribed will automatically be notified whenever data for that soil survey area is updated. You must register and login before doing this.

Web Soil Survey

NRCS has stopped publishing paper copies of soil survey reports -- this information is now distributed on CDs and on the Web.

This session will discuss the status of soils surveys on the Web, the information available, and where the information can be found.

SSURGO

SSURGO is the most detailed soils geographic database. It contains digital data developed from detailed soil survey maps that are generally at scales of 1:12,000 or 1:24,000. It consists of: spatial data, such as the digital soil survey map, and attribute data, such as the soil survey area map unit record data from the National Soil Information System (NASIS) and associated source information (metadata). SSURGO soil surveys meet NRCS National Cooperative Soil Survey standards and NRCS digitizing map standards.

Session 9 – Data Management

Tuesday, 1:30 to 3 p.m., Opportunity Suite A

Real-time data connections between a Geodatabase and AS/400

Mark Sloan

GIS Coordinator

Clay County

807 11th St. N.

Moorhead, MN 56560

Phone: 218-299-7518 Fax: 218-291-5838

mark.sloan@co.clay.mn.us

Carol Wickenheiser

GIS Database Administrator

Clay County

807 11th St. N.

Moorhead, MN 56560

Phone: 218-299-7681 Fax: 218-291-5838

carol.wickenheiser@co.clay.mn.us

This presentation will describe the efforts of Clay County, Minn., to integrate AS/400-based data into the geodatabase. Simply copying data to the geodatabase was a possibility, but it would create a duplication of data that would be obsolete. Plus, data dumps would not allow GIS-based systems the ability to edit data on the AS/400. A solution was pursued that would solve all of these issues and create a real-time link between the AS/400 and geodatabase. Details of methods, solutions, status and problems will be given.

Minnesota's Geographic Data Clearinghouse

(Presentation supported by the Governor's Council on Geographic Information)

Chris Cialek

Geographic Information Supervisor

Land Management Information Center

330 Centennial Office Building

658 Cedar Street

St. Paul, MN 55155

Phone: 651-297-2488 Fax: 651-296-1212

chris.cialek@state.mn.us

Let's face it, the term "one-stop shopping" is getting a little over-used these days. But, when it comes to finding GIS data online, Minnesotans can visit just one Web site to learn about and access nearly 4000 GIS data sets. The Minnesota Geographic Data Clearinghouse (MGDC) is a cooperative of more than 20 data publishing organizations — federal, state, regional and local — that provides instant access to information about terabytes of data covering our state. This presentation will introduce you, — or maybe reintroduce you — to the clearinghouse: its services, partners, and benefits. Learn about the new Clearinghouse Web site design, data offerings through ftp and Web mapping services, "first-stop" pages that provide in-depth information on selected themes, interfaces with most major data providers and plans for the future. All organizations are welcome to participate in the MGDC; we will discuss how you, too can become a partner.

Session 10 – Data Modeling

Tuesday, 1:30 to 3 p.m., Stockinger Suite B

Identifying Potential Wetland Restoration Sites in Ramsey Co.

David Bauer
Conservation Technologies Specialist
Ramsey Conservation District
1425 Paul Kirkwold Dr.
Arden Hills, MN 55112
Phone: 651-266-7274 Fax: 651-266-7276
david.w.bauer@co.ramsey.mn.us

Ramsey County is a fully urban county in Minnesota whose largest municipality is St. Paul. Over 80 percent of the wetlands have been drained or filled in many parts of the county. Finding successful restoration and mitigation sites is a priority for organizations, including the Ramsey Conservation District. Soil surveys, historical photos, and old survey logs were used to map old wetland locations. Current information, such as the Ramsey County GIS Users Group 4-inch pixel aerial photography, was used to prioritize the feasibility of sites in many parts of the county. Vacant lots, topography, structures, and current drainage were evaluated for each historic wetland. The result was a simple GIS layer made into a map for local units of government to use in their planning processes.

Resource Suitability Model, Stearns County

Susan McGuire
Environmental Specialist
Stearns County Environmental Services
Room 343, Administration Center
705 Courthouse Sq.
St. Cloud, MN 56303
Phone: 320-656-3613 Fax: 320-656-6484
susan.mcguire@co.stearns.mn.us

Rose Erickson
Programming Unit Manager
Pro-West & Associates, Inc.
8239 State 371 NW
PO Box 812
Walker, MN 56484
Phone: 218-547-3374 Ex 104 Fax: 218-547-3375
rerick@prowestgis.com

Stearns County is experiencing significant development pressure. The Landuse and Waters Division of the Stearns County Environmental Services Department wanted to utilize GIS to make better decisions on which land should receive a higher degree of protection from development and which land is most suitable for development. The Landuse and Waters Division already was using a significant number of GIS coverages including parcels, soils, County Biological Survey, and a nitrate probability map, but realized that GIS was not being used to its full potential as a tool to facilitate good decision-making.

The County contracted with Pro-West & Associates, Inc. to develop a GIS-based model that will assign a numeric score to any selected area of land. An area with a low score is most suitable for development and, conversely, an area with a high score should be afforded the maximum amount of protection from development.

A committee composed of a number of different agencies and commissions met to determine which factors are most important. These thirteen factors are each given an individual score, and then the thirteen scores are summed to get the final score. The factors used are value as farmland, County Biological Survey, feedlots, growth boundaries, groundwater sensitivity, lakes, nitrate probability, wetlands, roads, land slope, soils, special areas of protection, rivers and streams, and wellhead protection areas.

Pro-West used the available coverages and created a grid-based model using ArcView Model Builder. Spatial Analyst was used to create countywide grids for each of the factors. The grid scores are then added together to create one final suitability grid for the county. A custom report tool was created in ArcView 9.X to select a parcel, intersect with the suitability grid and print a distribution of land area by scores.

Session 10 – Data Modeling

Tuesday, 1:30 to 3 p.m., Stockinger Suite B

The Study of the Balance Between Jobs and Housing in GIS Framework: The Case of the Seven-County Metropolitan Area in Minnesota

Woo Jang

Graduate Assistant

Minnesota State University, Mankato

Department of Geography

11-B Armstrong Hall

Mankato, MN 56001

Phone: 507-389-2833 Fax: 507-389-2980

woojang@yahoo.com

Changjoo Kim

Assistant Professor

Minnesota State University, Mankato

Department of Geography

7 Armstrong Hall

Mankato, MN 56001

Phone: 507-389-1324 Fax: 507-389-2980

changjoo.kim@mnsu.edu

Metropolitan areas in U.S. have changed their city structures because of spatial imbalance between jobs and housing. During last decade, the population of Twin Cities has been increased. Twin Cities expanded their boundaries towards the suburban areas to provide housing for the increased population.

To study the spatial mismatch, GIS is used to visualize and to analyze the commuting flows. The Census Transportation Planning (CTPP) data is used for the analysis. Moreover, VRML (Virtual Reality Modeling Language) is used to visualize and identify the pattern of county-to-county flows. The study compares the current flow patterns to the proposed solution, which provides the optimal flow between jobs and housing to minimize the total travel distance.

Results can be used as a transportation planning perspective. For example, planners can anticipate which areas will have significant problems based on the results and the proposed solutions.

Session 11 – Web Mapping

Tuesday, 1:30 to 3 p.m., Opportunity Suite B

Purpose of Web Mapping sessions (11 and 18)

The purpose for the I-MAP series of presentations is NOT to sell a product, but to give a presentation on the products pros and cons from a user perspective. As potential users, we want to know the facts about the products so as to make informed decisions about implementing them for the organizations we represent. Therefore, required topics and questions will be implemented as a means of standardizing presentation content and for breeding presentation objectivity. Each presenter is expected to address each of the listed topics and required questions; beyond that, presenters are free to fill their time with whatever they deem most appropriate or important. The required topics and questions follow:

Topic

Application Costs
Basic Configurations (standard out-of-the-box implementations)
Advanced Configurations (When is an expert required?)
Application Use Examples (DEMO)
Product Service and Support

Questions

What, if any, are the limitations of the application in terms of Web browser compatibility? Discuss the ability of the product to be developed out-of-the-box for browser interoperability.

What time commitment is required for up front out-of-the-box development in order to deploy a fully functioning Internet mapping application system for any entity? Please expand your comments to include time required for ongoing system maintenance.

Compare hosting an Internet-based mapping application system locally to off site through a hosting vendor, including justification through identified cost benefit ratios.

Will this product require development for functionality beyond out-of-the-box capabilities and if so, please site examples and the area of needed expertise: Programming, Database Mgmt., Network Administration, etc.

Internet Mapping Application Presentation – Manifold GIS (45-minute session)

Doug Bartels

GIS Coordinator

Richland County

413 3 Ave. N.

Wahpeton, ND 58075

Phone: 701-642-7860 Fax: 701-642-7701

dbartels@co.richland.nd.us

Jim Dahl

GIS Coordinator

Douglas County

305 Eighth Ave. W.

Alexandria, MN 56308

Phone: 320-762-2933 Fax: 320-762-2389

jim.dahl@mail.co.douglas.mn.us

Manifold System Release 6.50 Professional Edition

Manifold System Release 6.50 Professional Edition is the most comprehensive, the most powerful and the easiest to use GIS and mapping system ever created. Nothing else, at any price, even comes close.

Release 6.50 Professional includes a fabulous array of features while being easier to use and providing rock-solid reliability. The new 6.50 release delivers 630 upgrades to the previous release and incorporates over 3500 suggestions made by Manifold users and GIS dealers through the world. The program includes over a million and a half lines of code and has been thoroughly debugged in the hands of thousands of users in over 80 countries during an extensive 6.50 release campaign.

Session 11 – Web Mapping

Tuesday, 1:30 to 3 p.m., Opportunity Suite B

Internet Mapping Application Presentation – MapServer (45-minute session)

Brian Fisher

GIS/Web Specialist

Houston Engineering

10900 73 Ave. N.

Suite 106

Maple Grove, MN 55369-5400

Phone: 763-493-4522 Fax: 763-493-5572

bfisher@houstonengineeringinc.com

Christy Shostal

GIS Specialist

Houston Engineering

10900 73 Ave. N.

Suite 106

Maple Grove, MN 55369-5400

Phone: 763-493-4522 Fax: 763-493-5572

cshostal@houstonengineeringinc.com

MapServer is an OpenSource development environment for constructing spatially enabled Internet-web applications. The software builds upon other popular OpenSource or freeware systems including Shapelib, FreeType, Proj.4, GDAL/OGR. The basic MapServer CGI application provides a significant number of “out-of-the-box” features, including: fully customizable, template driven output; feature selection by item/value, point, area or another feature; scale dependent feature drawing and application execution; and many more. MapServer also supports several Open Geospatial Consortium web specifications: WMS (client/server), non-transactional WFS (client/server), WCS (server only), WMC, SLD, GML and Filter Encoding. For more information please visit <http://mapserver.gis.umn.edu/>. Source: MapServer Homepage.

Session 12 – Remote Sensing

Tuesday, 1:30 to 3 p.m., Herberger Suite A

National Wetlands Inventory Delineation and Classification Using eCognition Remote Sensing Software

Jeff Knopf
GIS Analyst
GeoSpatial Services of Saint Mary's University of Minnesota
360 Vila
Winona, MN 55987
Phone: 507-452-3267
jcknop01@smumn.edu

Andy Robertson
Manager, Natural Resources
GeoSpatial Services of Saint Mary's University of Minnesota
360 Vila
Winona, MN 55987
Phone: 507-457-8746
aroberts@smumn.edu

The National Wetlands Inventory (NWI) of the U.S. Fish and Wildlife Service has produced large-scale wetlands maps for approximately 35 percent of Alaska. Mapping by NWI is conducted under the mandates of The Clean Water Act of 1977 and the Emergency Wetlands Resources Act of 1986. To date, these wetland maps have been produced by traditional manual photo interpretation and mapping processes.

The eCognition software package from Definiens Imaging of Germany has been used to successfully automate the classification of a variety of landscape and land use features from digital aerial photo and satellite images. The purpose of this project was to apply eCognition software to the task of delineating and classifying NWI polygons within the National Petroleum Reserve Area of Alaska. This presentation will report on the procedures, processes and results of this joint project between the U.S. Fish and Wildlife Service and Saint Mary's University of Minnesota. Preliminary results indicate that eCognition can be used to significantly reduce the amount of manual photo interpretation time required to complete NWI mapping in Alaska.

NEXTMap USA

Robert Eadie
Manager, Northeast US
Intermap Technologies, Inc.
400 Inverness Pkwy.
Suite 330
Englewood, CO 80112-5824
Phone: 720-974-3282
readie@intermap.com

There has long been a need by terrain data users for current, accurate, large coverage area DEM (Digital Elevation Model) data for consistent mapping, planning, and feature analysis. To fulfill this need, a comprehensive US national mapping program commenced in 2004. This program, called NEXTMap USA, will provide the GIS market with high-resolution, high-accuracy, elevation and image data using IFSAR mapping technology and will cover over three million square miles in a five-year program.

NEXTMap data products have been successfully used in the United States and United Kingdom for a wide variety of applications including floodplain mapping, terrain analysis, watershed management, ortho image rectification, 3D visualization, and transportation planning, all at national, regional, and local levels.

This presentation will be targeted to the geospatial data user community that already have a basic understanding of aerial mapping but are not yet familiar with IFSAR mapping data and its applications. It will also provide an update on the current program status and plans for the future.

Session 12 – Remote Sensing

Tuesday, 1:30 to 3 p.m., Herberger Suite A

Use of Remote Sensing Imagery for Assessment of Minnesota's Water Resources

Leif Olmanson

Scientist

U of M

1530 Cleveland Ave. N.

St. Paul, MN 55108

Phone: 651-405-8081

olman002@umn.edu

Marvin E. Bauer

Professor

University of Minnesota

Green Hall, Department of Forest Resources

1530 Cleveland Ave. N.

St. Paul, MN 55108

Phone: 612-624-3703 Fax: 612-625-5212

mbauer@umn.edu

Patrick L. Brezonik

brezo001@umn.edu

The University of Minnesota Water Resources Center and Remote Sensing and Geospatial Analysis Laboratory are working on a number of applications using remote, airborne and satellite-based sensing that can assist state, local agencies and citizen groups to gather information needed for effective environmental planning and management. An overview and update of our research using remote sensing for local and regional water resource assessments will be presented. The applications include: 1) lake water clarity assessments using high (IKONOS and QuickBird), moderate (Landsat) and low (MODIS) resolution imagery. This will include an overview and statistical comparison of: 1) Landsat-derived Minnesota state-wide historical water clarity database for 1990 and 2000, 2) Water quality assessment of rivers using airborne hyperspectral imagery, 3) Aquatic plant classification and wetland health assessment using high resolution satellite and airborne hyperspectral imagery, and 4) Assessment of shoreland impacts using high resolution satellite imagery

Session 13 – Undergraduate Student Competitions

Tuesday, 1:30 to 3 p.m., Wilson Suite

Redrawing Permit Area Boundaries Based on Habitat Type Using GIS

Sonja A. Christensen, Minnesota State University, Mankato

The Minnesota Department of Natural Resources manages resident white-tailed deer populations with specified permit areas in which population estimates are quantified. Currently, the boundaries of these permit areas are defined primarily on a political basis and do not accurately reflect the habitat structure and thus habitat preference of the white-tailed deer population. Permit area boundaries must be redrawn based on habitat type to reduce error in population estimates of permit areas and to manage the white-tailed deer on a biological basis. The prairie southwest deer management sub-unit was the area of focus for this project. To redraw permit area boundaries, a land cover theme was analyzed for the specified study area. Geoprocessing functions, such as dissolve and intersect, were used to create habitat composition information for each permit area. A cluster analysis was then used to group permit areas based on habitat relatedness. Permit area boundaries were redrawn to reflect the areas most similar in habitat type. New permit areas will more accurately indicate the number of deer in each area based on the habitat that exists there. Redrawing permit areas in this way will be helpful for white-tailed deer populations and for the humans that manage these populations.

Performance of Three Garmin 76 GPS units

Jon Dowie, Bemidji State University

My project will be comparing the performance of three Garmin 76 GPS units that were tested at the same time on the same day, and trying to see if there is a difference in performance. I will try and show if there is a difference between units of the same exact type, to see if the accuracy depends on the specific unit, or if it depends on the type of unit only.

Environmental Amenities and Residential Property Values in the Twin Cities Metro Area, 2004

Krista Sandford, University of St. Thomas

Environmental amenities can promote growth by attracting high wage workers, retirees and tourists. Past research demonstrated that the presence of national parks is associated with population growth in the Rocky Mountains, while the presence of wilderness is associated with economic diversification and employment growth in Vermont. While most studies on the economic value of amenities focus on federal lands and regional economies, this research explores the relationship between real estate values and environmental amenities in the seven county Twin Cities Metropolitan area. It hypothesizes that proximity to lakes and parkways is positively and significantly correlated with relatively high residential property values.

This analysis was conducted using ArcGis 9.1. Multiple data sets were used, including the 100k Rivers and Lakes layer from the Minnesota DNR and the most recent versions of the Regional Parcel Datasets and the Generalized Land Use for the Twin Cities Metropolitan Area from MetroGIS. After controlling for variables including housing type, housing density, square footage and year built, Pearson's Correlation Coefficient was used to quantify the relationship between property values and distance from lakes and parkways.

This analysis demonstrates that, in addition to being valuable for open space and recreational opportunities, lakes and parkways in the Twin Cities enhance the value of adjacent housing stock. Associated benefits may include a strengthened tax base, relatively stable urban neighborhoods, and may also suggest one way for urban areas to limit the loss of high income households to the suburbs.

Product Demonstrations

Tuesday, 1:30 to 3 p.m., Herberger Suite B

Nazca Property Management Portal

Ted Mondale
CEO

Nazca Solutions

400 First Ave. N. Suite 640

Minneapolis, MN 55401

Phone: 612-279-6112 Fax: 612-279-6113

tmondale@nazcainc.com

Dave Kregness

Director, Client Solutions

Nazca Solutions

400 First Ave. N. Suite 640

Minneapolis, MN 55401

Phone: 612-279-6128 Fax: 612-279-6129

dkregness.com

The Nazca Property Management Portal generates land records data in real time from disparate county databases and presents it securely to end users via a Web-based portal. In our user defined, integrated environment, the customer decides what information it wants and how it will be displayed, without the expense of data warehousing.

What's new in ArcGIS 9.1

Dan Falbo
ESRI

880 Blue Gentian Road, Ste 200

St. Paul, MN 55121

tel: 651-454-0600

fax: 651-454-0705

nparipovich@esri.com

ArcGIS 9.1 is the next major release from ESRI. This workshop will focus on key enhancements to the product including tools to enhance geoprocessing, merge data and improve productivity. A significant amount of time will be spent reviewing the new release ArcGIS Network Analyst. The Network Analyst extension offers technology to model real world networks and provides solutions for matters of routing, travel directions, and service area analysis. It enables users to dynamically model realistic network conditions including turn restrictions, speed limits, height restrictions and traffic conditions at different times of the day.

Session 15 – Data Development

Tuesday, 3:30 to 5 p.m., Stockinger Suite A

A Standardized, Official Address and Point for Every Occupiable Unit? Metrowide? Are we Nuts?

Mark Kotz

GIS Database Administrator

Metropolitan Council

230 East Fifth Street

St. Paul, MN 55101-1626

Phone: 651-602-1644 Fax: 651-602-1674

mark.kotz@metc.state.mn.us

The MetroGIS community has good data for roads. We have metro wide parcel data with an address for each parcel. What about spatial data and attributes for buildings and even individual occupiable units (apartments, office suites, stores in a strip mall)? All government agencies at all levels seem to want this data, not the least of which is the emergency response community. How can this type of data be created and maintained in a standardized format for the seven-county Twin Cities metropolitan area? Can this be done even though the addressing process and workflow in every city is different?

A MetroGIS workgroup, with members from 15 different municipal, county and regional organizations, has been focusing on this topic since March of 2004. Work of the group included interviewing local government addressing authorities, modeling address data flow in all seven counties, reviewing and documenting applicable address data standards and developing a preliminary vision that was approved by the MetroGIS Policy Board.

This work has allowed the group to develop a white paper outlining the needs for this type of geographic information, the issues involved with creating and maintaining it, and a roadmap for the eventual implementation of a shared, metrowide occupiable units point dataset, which will ultimately be created and maintained at the local municipal level.

This presentation will describe the implementation road map and ask for feedback and review. Copies of the white paper will be available. Are the recommendations realistic? Is the need really there? Are we completely out of our tree? This vision will only be realized if it is realistic and sufficiently important to local governments to want to participate.

Wireless and Mobile Technologies in Agriculture

Josh Marsh

Senior Systems Programmer

Pro-West & Associates

8239 State 371 N.W.

Walker, MN 56484

Phone: 218-547-3374 Fax: 218-547-3375

jmarsh@prowestgis.com

Jody Steffel

Administrative Assistant

Southern Minnesota Beet Sugar Cooperative

83550 County Rd. 21

Renville, MN 56284

Phone: 320-329-8305 Fax: 320-329-3252

info@smbisc.com

The emergence of reliable and affordable mobile technology has caused many agencies to re-evaluate their current methodology for GIS use in the field. Southern Minnesota Beet Sugar Cooperative has integrated wireless and mobile technology into their agriculture process in an effort to standardize data collection, entry and distribution. With mobile technology, data entry is virtually eliminated. Growers receive detailed scouting reports on-site instead of waiting for days, and automated database routines ensure that users always have the most up-to-date information.

Session 15 – Data Development

Tuesday, 3:30 to 5 p.m., Stockinger Suite A

Washington County ISTS Program and GIS/GPS

Chris LeClair

Senior Environmental Specialist

Washington County

14949 62nd St.

Stillwater, MN 55082

Phone: 651-430-6673

Chris.LeClair@co.washington.mn.us

Adam Snegosky

GIS Analyst

Washington County

14949 62nd St.

Stillwater, MN 55082

Phone: 651-430-6412

adam.snegosky@co.washington.mn.us

In 2004, the Washington County Department of Public Health and Environment's Individual Sewage Treatment System (ISTS) Program decided to explore the idea of using ArcPad to conduct GIS work in the field. Since 1998, the department has relied heavily on GIS for doing preliminary field review of proposed soil treatment areas of ISTS. The GIS work conducted was limited to the office working on a desktop computer. In July 2004, the Department purchased two iPaq PocketPCs. Now all of the GIS information on the desktop including lot lines, easements, road right-of-ways, water features, aerial photography, 2-foot contours and other parcel information that is used to ensure the proposed soil treatment area of the ISTS met current codes is now carried out into the field.

In 2005, we took this new tool to the next level by purchasing Compact Flash (CF) card GPS antennas. This simplified a number of navigational issues encountered out in the field. The iPaq/ArcPad/GPS setup has allowed the Department to begin collecting GPS points during field reviews and during ISTS inspections. With this combination, field staff are able to collect septic tank, soil treatment area, soil boring and well locations. It also allows verification of the lot the user is standing on.

During the presentation, lessons learned, advantages of using GPS to collect field data during ISTS inspections, and problems encountered will be discussed.

Session 16 – Data Management

Tuesday, 3:30 to 5 p.m., Opportunity Suite A

Mapping Easements in GIS

John Mackiewicz
GIS Consultant
WSB & Associates Inc.
701 Xenia Ave. S.
Suite 300
Minneapolis, MN 55416
Phone: 763-287-7194 Fax: 763-541-1700
jmackiewicz@wsbeng.com

Eric Eckman
Engineering Technician
City of Golden Valley
7800 Golden Valley Rd.
Golden Valley, MN 55427
Phone: 763-593-8030
eeckman@ci.golden-valley.mn.us

Efficient management, retrieval and display of existing easement information is critical in day to day public works and engineering operations in city government. The City of Golden Valley partnered with WSB & Associates Inc. to deliver an accurate map of all easements where the city is listed as grantee on a recorded easement document.

Both accuracy and timely completion were essential to successful completion of the project. With this in mind, Independent Abstracting Services Inc. was selected as a sub-consultant to complete the title research portion of the project because of their extensive experience in this area.

During the mapping process, the legal documents were verified, scanned, and then drawn as closed polylines with dimensions in AutoCAD per legal description of the easement. All attribute information was entered into an Access database to link to each scanned document to the spatial data in ArcGIS.

This presentation will detail the strategies used to overcome the challenges posed by this unique project, changes made for Phase II, and the final implementation plan.

Geoids, Ellipsoids, Datums and Projections

Chuck Bryant
395 John Ireland Blvd. MS 641
St. Paul, MN 55155
Phone: 651-296-1768 Fax: 651-297-1518
Chuck.Bryant@dot.state.mn.us

What surveyors use and what GIS types need. Differences in how surveyors think about things: Distances, position and accuracy verses georeference, shape files and projections.

Session 16 – Data Management

Tuesday, 3:30 to 5 p.m., Opportunity Suite A

Mn/DOT's Geodetic Control Database

Chuck Bryant

395 John Ireland Blvd. MS 641

St. Paul, MN 55155

Phone: 651-296-1768 Fax: 651-297-1518

Chuck.Bryant@dot.state.mn.us

This is a look at the Geodetic Control Database. What kind of control information is available across the state, both horizontal and vertical? How to locate it in the database and find it on the ground. The various projections and their use by different government agencies. Vertical data, where are Minnesota's problem areas and why. How to provide recovery information. Who to contact with Geodetic Control questions. Common mistakes made when using coordinate information.

Session 17 – Data Modeling

Tuesday, 3:30 to 5 p.m., Stockinger Suite B

Student Enrollment Study

Dr. Charlie Parson
Professor Emeritus of Geography
Geographical Technology Transfer Inc.
3571 Mud River Rd.
Puposky, MN 56667
Phone: 218-243-2450
CParson@bemidjistate.edu

Minnesota State Colleges and Universities enroll approximately 330,000 students each year. Based on successful address matching 176,046 of them were assigned coordinates along with their basic student record data which included the institution in which they were enrolled, and their Classification of Instructional Program (CIP) code. This enabled enrollment patterns to be discerned and scenarios to be run, involving hypothetical additions and deletions of program sites. We will demonstrate an ArcGis9 tool and the use of Thiessen Polygons to examine patterns and scenarios for potential enrollment management. Of additional interest is the variation in overall patterns of enrollment among the four-year institutions of MnScu, which we will also display.

Using GIS to Find Optimal Locations for New Ethanol Plants in Southern Minnesota

Lyle Petrick
Graduate Assistant
Minnesota State University, Mankato
Department of Geography
1 Armstrong Hall
Mankato, MN 56001
Phone: 507-351-1700 Fax: 507-389-2980
lylex@mnsu.edu

Changjoo Kim
Assistant Professor
Minnesota State University, Mankato
Department of Geography
7 Armstrong Hall
Mankato, MN 56001
Phone: 507-389-1324 Fax: 507-389-2980
changjoo.kim@mnsu.edu

Ethanol is the most popular oxygenate additive to gasoline fuel in the United States. Currently most states have a 10 percent ethanol gasoline mixture. This new demand plus recent legislative action that will increase the percentage of ethanol in Minnesota's gasoline to an E20 mixture (20 percent ethanol-80 percent gasoline) will increase the need for ethanol production. Minnesota could position itself to take full advantage of this situation. In 2004 Minnesota had a crop of 1,120,950,000 bushels of corn. Of this, 60 million bushels were processed into ethanol (14 percent of Minnesota's corn crop). Minnesota has currently 14 ethanol plants and three new ones are under construction. Locating these ethanol plants becomes very important to minimize cost and keep them competitive. A location near a railroad is a must to cut transportation costs for finished product. A major road or near a junction of two major roads would be an optimal site for a larger plant since grain could be hauled in from a longer distance if necessary; so would having a location far enough from other ethanol plants so not to have to compete for corn in a bad harvest situation. Also potential sites should be situated for possible expansion if the need arises. These would be major factors in finding an ideal location for an ethanol plant. GIS can be used to find optimal location using the above factors plus other criteria that investors would be looking at when preparing to locate the optimal site for their ethanol plant.

Session 17 – Data Modeling

Tuesday, 3:30 to 5 p.m., Stockinger Suite B

Site Location Decision for Chain Restaurants Using GIS and Spatial Analysis

Sajan Dhakal

*Department of Geography, Minnesota State
University, Mankato*

7 Armstrong Hall

Mankato, MN 56001

Phone: 913-558 4317 Fax: 507-389-2980

sajan.dhakal@mnsu.edu

Dr. Changjoo Kim

*Department of Geography, Minnesota State
University, Mankato*

7 Armstrong Hall

Mankato, MN 56001

Phone: 507-389-1324 Fax: 507-389-2980

Changjoo.Kim@mnsu.edu

Retail location with GIS technology is fairly a new area. Spatial analysis of a region is important in site selection for a business because site location has many critical spatial components. The study focuses on locating Olive Garden in Mankato, Minnesota. In order to locate a site for Olive Garden, location strategies used by Red Lobster are benchmarked. The study compares the two family chain restaurants that are found in most of the major cities in the United States and Canada. The methodology incorporates following considerations: convenience, proximity, competition, accessibility, visibility, demographic characteristics and social characteristics.

Session 18 – Web Mapping

Tuesday, 3:30 to 5 p.m., Opportunity Suite B

Purpose of Web Mapping sessions (11 and 18)

The purpose for the I-MAP series of presentations is NOT to sell a product, but to give a presentation on the products pros and cons from a user perspective. As potential users, we want to know the facts about the products so as to make informed decisions about implementing them for the organizations we represent. Therefore, required topics and questions will be implemented as a means of standardizing presentation content and for breeding presentation objectivity. Each presenter is expected to address each of the listed topics and required questions; beyond that, presenters are free to fill their time with whatever they deem most appropriate or important. The required topics and questions follow:

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Application Costs
Basic Configurations (standard out-of-the-box implementations)
Advanced Configurations (When is an expert required?)
Application Use Examples (DEMO)
Product Service and Support

Questions

What, if any, are the limitations of the application in terms of Web browser compatibility? Discuss the ability of the product to be developed out-of-the-box for browser interoperability.

What time commitment is required for up front out-of-the-box development in order to deploy a fully functioning Internet mapping application system for any entity? Please expand your comments to include time required for ongoing system maintenance.

Compare hosting an Internet-based mapping application system locally to off site through a hosting vendor, including justification through identified cost benefit ratios.

Will this product require development for functionality beyond out-of-the-box capabilities and if so, please site examples and the area of needed expertise: Programming, Database Mgmt., Network Administration, etc.

Internet Mapping Application Presentation – ArcIMS (45-minute session)

Rick Moore

GIS Planner

Mid-Minnesota Development Commission

333 Sixth St. S.W.

Suite 2

Willmar, MN 56201

Phone: 320-235-8504 x31 Fax: 320-235-4329

rick.moore@mnrdc.org

In this presentation, ArcIMS will be evaluated and presented using examples from the presenter. ArcIMS is the solution for delivering dynamic maps and GIS data and services via the Web. It provides a highly scalable framework for GIS Web publishing that meets the needs of corporate Intranets and demands of worldwide Internet access. ArcIMS services can be used by a wide range of clients including custom Web applications, the ArcGIS Desktop, and mobile and wireless devices. Using ArcIMS, city and local

Session 18 – Web Mapping

Tuesday, 3:30 to 5 p.m., Opportunity Suite B

Internet Mapping Application Presentation – Autodesk (45-minute session)

Carl Dunn

Engineering Tech II

City of Williston, ND

809 Fifth St. E.

P.O. Box 2437

Williston, ND 58801

Phone: 701-577-6368 Fax: 701-577-6360

carld@ci.williston.nd.us

Autodesk MapGuide® software helps you develop, manage, and distribute GIS and design applications on the Internet or your intranet, broadening your access to your mission-critical geospatial and digital design data.

Session 19 – Transportation

Tuesday, 3:30 to 5 p.m., Herberger Suite A

Travel Demand Forecasting in a GIS-T Context

Changjoo Kim
Assistant Professor
Minnesota State University
7 Armstrong Hall
Mankato, MN 56001
Phone: 507-389-1324 Fax: 507-389-2980
changjoo.kim@mnsu.edu

GIS has become an essential tool for transportation planning and travel demand forecasting. In this study, travel forecasting models are used to predict changes in travel and utilization for the transportation system in response to changes in regional development, demographics and transportation supply. The study proposes an integrated framework through which transportation analysts can use spatial optimization to forecast travel demand. The developed approach is applied to both aggregated and disaggregated data. The results show that GIS-based approach to transportation modeling is a fundamental means of improving demand forecasting.

GIS Opportunities in Design Build at Mn/DOT

Brad Henry
Senior Engineer
URS
700 Third St. S., #600
Minneapolis, MN 55415
Phone: 612-373-6850
brad_henry@urscorp.com

Sean Delmore
Metro Design Build Traffic Engineer
Mn/DOT
5929 Baker Rd., #490
Minnetonka, MN 55343
Phone: 952-908-2947
sean.delmore@dot.state.mn.us

Mn/DOT is undertaking a radically new method of project delivery for large transportation projects, Design Build. Three of the characteristics of Design Build projects are a) changed relationships between the owner, the contractor and the designer; b) dramatically speeded up schedules and decision-making, and c) innovation.

In the traditional engineering design, GIS does not always play a large role. However, in Design Build new relationships, new timetables and new ways of doing business tend to be uppermost in all participants' minds.

In particular, as Mn/DOT engineers start to understand how the information needs and inter-relationships of Design Build project and the power of GIS, they are starting to see how the relatively new technology of GIS can be used enhance the new project delivery method of Design Build.

The presentation will include a quick overview of the Mn/DOT I-494 Design Build project, of the objectives of the GIS class in the University of Minnesota ISE program for Engineers and how lessons learned in that class can be applied to real-world Design Build projects.

Session 19 – Transportation

Tuesday, 3:30 to 5 p.m., Herberger Suite A

Was That a Robot Driving That Machine? (What Does GIS Have to do With Machine Control in Construction?)

Brad Henry
Senior Engineer
URS
700 S. Third St., #600
Minneapolis, MN 55415
Phone: 612-373-6850
brad_henry@urscorp.com

Terry Ward
ROC 52 Project Manager
Mn/DOT
2900 48th St. N.W.
Rochester, MN 55901
Phone: 507-280-2857
terry.ward@dot.state.mn.us

Mn/DOT is undertaking a fundamentally new method of project delivery for large transportation projects, Design Build. The first large Design Build project that Mn/DOT undertook was the \$240M ROC 52 Design Build in Rochester, Minn.

Two objectives of Design Build are speeding up project delivery and reducing project cost. In order to accomplish those objectives, a spirit of innovation needs to be uppermost in the minds of all the players, including the owner (Mn/DOT), the constructor, and the designer.

While the ROC 52 project is not yet complete, it has already been successful in that construction was speeded up by almost one year. Several things were responsible for that speed-up, but nothing was more successful than implementing “machine control.”

Machine control is the automated guidance of construction equipment incorporating several technologies that also used in GIS; including GPS, automated maps, and 3-D model creation. Also much like GIS, in order to implement machine control, certain ‘out-of-the-box’ thinking has to be undertaken by the organization.

The presentation will include an overview of the ROC 52 Design Build project and of demonstration machine control; a description of the decisions that had to be made by Mn/DOT in order to implement machine control; and the relationship of machine control to GIS.

Session 20 – Undergraduate Student Competition

Tuesday, 3:30 to 5 p.m., Wilson Suite

Four People, Two Ropes and an Aluminum Pole: Large-Scale Aerial Mapping

Ari Ofsevit, Macalester College

Aerial photography is an extremely important tool in GIS and remote sensing fields. While GPS units can be used to show points, lines and polygons on the ground, photographs from the air can both speed up the digitizing process and provide for better visualization of ground features. Aerial photography does have downsides, particularly in regards to cost. While many photos are provided for free by government agencies, they are at fixed resolutions and heights and often are not appropriate for large-scale mapping. While a special flight and photo could be arranged, it would exceed the budgets of most such projects. Using conventional techniques from the air, it is nearly impossible to create centimeter or better ground resolutions from air photos. During a National Science Foundation-funded Research Experience for Undergraduates, a method with a camera mounted on a long aluminum pole was used to capture images of outcrops along the Maine coast, which were then manipulated and digitized in the lab in several ways. The single images were first mosaicked in to much larger files and then digitized and draped over 3-D points to create a "virtual outcrop."

The photos do have some distortion, but they can be digitized in ArcMap to an extent that they become very useful tools in bringing precision imagery to the digital age. The process is, however, quite time consuming. The "camera pole" is operated by a minimum of four people and pictures must be taken at precise intervals in order to create a seamless final product. Once in the lab, the photo files are large enough that it takes hours of processing time, some of it active and some of it passive, to create a photo-mosaic, and these files become so unruly that ArcMap often crashes, or distorts the image beyond usefulness. The technique has promise to be useful in many fields, and as computer processing is improved may become much less time — and energy — consuming.

Current Recruiting Patterns of the United States Army

Sara Dolan, University of Minnesota

The purpose of this paper is to provide geographic insight into the existing locations of United States Army recruiting offices within the Twin Cities metro area. In addition, an overview of recruiting patterns is discussed to better understand if and how certain members of the population are targeted for Army recruitment. A combination of Geographic Information Systems (GIS) and United States Census data will be utilized in order to accomplish the geographic spatial analysis portion of this project. These tools provide a clear visualization of an existing correlation (if any) between the physical location of recruitment offices and selected socio-economic characteristics. Such characteristics include income levels, age, and racial minority populations, all which are provided from Census data. The zip codes and census tracts pertaining to the various recruiting offices are analyzed to discover if these characteristics hold any significant value or correlation to the location of the offices.

Product Demonstrations

Tuesday, 3:30 to 5 p.m., Herberger Suite B

DNR Garmin Version 5.0 Software Updates

Chris Pouliot
GIS Applications Programmer
Minnesota Department of Natural Resources
500 Lafayette Rd.
St. Paul, MN 55155
Phone: 651-297-2916
chris.pouliot@dnr.state.mn.us

Tim Loesch
GIS Operations Supervisor
Minnesota Department of Natural Resources
500 Lafayette Rd.
St. Paul, MN 55155
Phone: 651-296-0654 Fax: 651-297-4946
tim.loesch@dnr.state.mn.us

The Department of Natural Resources Garmin program integrates GIS Software (ESRI's ArcView 3.x and ArcMap, Minnesota Department of Natural Resources' Landview) with most types of Garmin brand GPSs. The extension uses a VB program that interacts with Garmin GPS via a serial or USB port allowing GIS users to transfer waypoints, tracks and routes from a Garmin GPS to ArcView, ArcMap or Landview and store them as points, lines or polygons. Information can also be uploaded from ArcView/ArcMap graphics or shapefiles to the GPS and used as tracks or waypoints.

The presentation will highlight a number of updates, enhancements, and bug fixes included in the latest version.

Wildlife Survey Extension

Chris Pouliot
GIS Applications Programmer
MN Department of Natural Resources
500 Lafayette Rd.
St. Paul, MN 55155
Phone: 651-297-2916
chris.pouliot@dnr.state.mn.us

Bob Wright
Wildlife GIS Specialist
Minnesota Department of Natural Resources
5463-C W. Broadway
Forest Lake, MN 55025
Phone: 651-296-3292 Fax: 651-296-5202
robert.wright@dnr.state.mn.us

Bob Osborn
Wildlife Research Biologist
Minnesota Department of Natural Resources
bob.osborn@dnr.state.mn.us

Mike Trenholm
Conservation Officer / Chief Pilot
Minnesota Department of Natural Resources
michael.trenholm@dnr.state.mn.us

Wildlife biologists often need to locate and count free-ranging animals to estimate populations, identify population trends, determine the importance of various habitats or identify significant concentrations. Aircraft are frequently used to conduct these surveys because they offer enhanced ground visibility and the ability to cover large areas efficiently. These aerial surveys are conducted under controlled spatial protocols such as along transect lines or within specifically defined boundaries. Until the advent of GPS technology, pilots and biologists relied on ground features and compasses to navigate these protocols and plot animal locations. While GPS technology offers vast improvements in conducting these surveys, biologists still rely on aerial photos and topographic maps to orient themselves in the air and must either accept animal locations as being along the flight path, or record them on paper maps, for later transcription. Minnesota Department of Natural Resources GIS staff has developed a Wildlife Survey extension that allows ArcView 3.x GIS software to directly capture GPS data in real time. In addition, recent technological advances have resulted in powerful computers compact enough to meet the confines of the cockpit. These advances now allow aircraft occupants to observe their flight path directly over aerial photography, and record animal locations into an ArcView shapefile, in real time.

This presentation will demonstrate the functionality of the Wildlife Survey extension and give some examples of how it is being used within the Department of Natural Resources.

Product Demonstrations

Tuesday, 3:30 to 5 p.m., Herberger Suite B

Real Time Automated Vehicle Location using OpenSource Web-based Technology

Bruce Shriver

Senior Technologist

ThomTech Design, Inc.

3830 Rustic Pl.

St. Paul, MN 55126

Phone: 651-482-9680 Fax: 651-482-9469

bruce@thomtechdesign.com

Jeff Coate

Vice-President

GIS Rangers

2434 Virginia Cir.

Roseville, MN 55113

Phone: 651-303-8490

jeff@gisrangers.com

There are many Vehicle Tracking products on the market. However, few of them use actual GIS data with the capacity to do real geoprocessing that many clients want and need. Most of the time if they have this capability, it is a desktop product and not Web-based.

Products that have reached this level of sophistication are cost prohibitive to the point that only large government bodies are able to afford them. This demonstration will show the use of OpenSource technology to achieve this missing GIS link and bring down the cost to an attainable rate for almost anyone.

The demonstration will start with an introduction to the wireless GPS equipment and the sensors that record information such as speed, air temperature, surface temperature, etc.

This equipment will then be transferred to a vehicle and a live demonstration of the Web-based, real-time tracking application will follow.

Session 22 – Natural Resources

Wednesday, 8:30 to 10 a.m., Stockinger Suite A

Habitat Improvement GIS: Examples from the Minnesota Department of Natural Resources

Paul Wickman

Fisheries GIS

Minnesota DNR, Division of Fish & Wildlife

500 Lafayette Rd.

St. Paul, MN 55155-4040

Phone: 651-282-9812 Fax: 651-297-4916

Paul.Wickman@dnr.state.mn.us

John Hiebert

Shoreland Habitat Manager

Minnesota DNR, Division of Fish & Wildlife

500 Lafayette Rd.

St. Paul, MN 55155-4040

Phone: 651-296-2548 Fax: 651-297-4916

John.Hiebert@dnr.state.mn.us

Many divisions within the Minnesota Department of Natural Resources are increasingly applying GIS to support various programs. This presentation will illustrate recent efforts by the Division of Fish & Wildlife to add two warm water habitat improvement programs to the Department of Natural Resources GIS. GIS application and data development for each program will be presented and various challenges discussed.

The Shoreline Habitat Restoration and Lake Aeration System programs are part of an overall goal of improving warm water habitat for fish and wildlife. In order to add these programs to the central DNR GIS repository, three primary challenges needed to be met. First, as the DNR moves steadily from ArcView 3.3 to ArcGIS 9.x, some amount of compatibility between these two platforms must be maintained. Each project met this requirement in fundamentally different ways. Second, certain spatial attributes for each program can easily be queried from other GIS layers such as county name, watershed number and lake identifier. However, it could not be assumed that all users of the data would have access to these ancillary layers, nor to a GIS application needed to make such queries. As such, a decision was made regarding how much spatial information to include in the data and how much to acquire via spatial operations. Third, in order to facilitate open access to all DNR staff and the general public, the data must be integrated with and made available via the DNR Web-mapping infrastructure.

The presentation will conclude with a summary of other programs to be added in the future including stream bank stabilization, fishing piers, dam removal, and artificial spawning reefs. By integrating these programs with the DNR GIS, a clearer picture of overall costs, geographic distribution, maintenance needs and future staffing allocation requirements will emerge.

Minnesota GAP Analysis: Utilizing GIS to Establish Gaps in Biodiversity

Bruce Anderson

GIS Support Specialist

MN DNR Fish and Wildlife

1201 E. Hwy. 2

Grand Rapids, MN 55744

Phone: 218-327-4105 Fax: 218-327-4263

Bruce.Anderson@dnr.state.mn.us

Steve Benson

GIS Coordinator

MN DNR Fish and Wildlife

1201 E. Hwy. 2

Grand Rapids, MN 55744

Phone: 218-327-4149 Fax: 218-327-4263

Steve.Benson@dnr.state.mn.us

The Minnesota GAP Analysis (MN-GAP) project being conducted by the Minnesota Department of Natural Resources (MNDNR) is part of a nationwide GAP Analysis program of the USGS Biological Resources Division. Its mission is to provide statewide assessment of the conservation status of native vertebrate species and natural land cover types and to utilize this information for land management activities. This is a landscape scale project that applies a coarse filter approach to biodiversity protection and preventing more species from becoming threatened or endangered.

As part of the project, statewide GIS coverages have been created for land cover types, species range extents and land stewardship. Predicted species distribution maps are then created from the range extent and land cover type coverages and put before expert review to determine accuracy. The predicted species distribution is intersected with the land stewardship layer to determine protection status.

Analysis is then conducted on this combined coverage to determine the land management status coincident with the predicted presence of each species. The analysis focuses on where “gaps” occur in conservation lands for biota. Biodiversity conservation can be mapped from the intersection of the species range extent and the management status. The resulting analysis will be used to provide information to agencies responsible for land management as well as the public. The information will be used for land management, planning, policy setting, and research for landscape level resource management.

This presentation will discuss the processes of GIS coverage creation, modeling and analysis used for the MN-GAP project. We will also discuss the final products of the project such as species distribution grids, data tables and species richness.

Session 22 – Natural Resources

Wednesday, 8:30 to 10 a.m., Stockinger Suite A

GIS Approach in Determining Factors of Ring-necked Pheasant (*Phasianus colchicus*) Populations

Michelle Imes

Student

Minnesota State University, Mankato

514 1/2 N. Second St.

Mankato, MN 56001

Phone: 507-382-0629

michelle.imes@mnsu.edu

Changjoo Kim

Assistant Professor

Minnesota State University, Mankato

7 Armstrong Hall

Mankato, MN 56001

Phone: 507-389-1324

chanjoo.kim@mnsu.edu

In this study, GIS is mainly used to predict the pheasant population. The Department of Natural Resources in Madelia, Minn., is conducting a five-year study to determine the amount of winter habitat that is needed for pheasants in Midwest. Factors such as temperature, precipitation, elevation, soil type, and land use are tested to determine the total pheasant population in study areas. The results are based on spring and summer pheasant population sample data in year 2003 collected from 36 study areas in southern Minnesota. The statistical analysis is incorporated to investigate the relationship between pheasant population and tested factors.

Session 23 – Community GIS

Wednesday, 8:30 to 10 a.m., Opportunity Suite A

GIS for Everyone

Richard Rice
MIS Coordinator
City of Chanhassen, Minn.
7700 Market Blvd.
Chanhassen, MN 55317-0147
Phone: 952-227-1111
rrice@ci.chanhassen.mn.us

Joleen Devens
GIS Specialist, Engineering Dept.
City of Chanhassen

The City of Chanhassen has long invested in GIS, but like most small communities, there are often not enough funds or available staff time to spread GIS to all who could benefit from its use. That is, until now.

Chanhassen has grown its GIS user base from five to 25 in the last 18 months through the use of a GIS viewer tool called RoweMap, from Rowekamp Associates, Inc. RoweMap was specifically designed for staff members that need to view and manipulate their GIS data without a significant investment in training. It is inexpensive, customizable by the end user, and it gets the job done.

As a result, all of the department heads are now routinely using GIS in some capacity. Other city staff is now able to create their own maps for use in departmental reports and PowerPoint presentations. They can also create buffers, generate mailing labels, search for properties by resident, owner or address and add annotation to their maps. Scanned images of as-built drawings, photographs, audio files, video files and other related data can easily be linked and accessed from a GIS interface. The city has begun leveraging the power of GIS to gain efficiencies in daily operations.

Panel Discussion: Promotion of GIS in Broad-Based County Government

(Presentation supported by the Governor's Council on Geographic Information)

William J. Swing
IT Director
Wright County Government Center
10 Second St. N.W., Room 151
Buffalo, MN 55313
Phone: 763-682-7316

Judson Freed
Emergency Services Director
Ramsey County

Mary Hagerman
Dakota County GIS Specialist
Dakota County Office of GIS

While GIS is well entrenched in the traditional mapping disciplines, such as surveying and public works, it has made limited headway into other areas of county government. Greater than 80 percent of governmental records have a spatial component, so the value of deploying GIS in these nontraditional areas is well acknowledged. Yet few stakeholders in these non-GIS areas have come to embrace GIS.

Three panelists will provide their perspective on how this gap may be bridged. Applications of GIS in two nontraditional GIS areas, emergency preparedness and law enforcement, will be discussed. Panelists will discuss the pros and cons of planning, promoting, and deploying GIS in these nontraditional areas and speculate on how future deployments of GIS in these areas may be improved. Emerging technologies anticipated to further promote GIS in these areas will be also be discussed, specifically, Web portal technology and the "MN State GIS Enterprise Conceptual Architecture Design" that was recently endorsed by the Governor's Council on GIS.

Session 24 – Parcels

Wednesday, 8:30 to 10 a.m., Stockinger Suite B

Panel Discussion: Examining the Parcel Management Workflow

Dan Falbo

ESRI

880 Blue Gentian Rd.

Suite 200

St. Paul, MN 55121

Phone: 651-454-0600 Fax: 651-454-0705

nparipovich@esri.com

This panel discussion will focus on strategies used in creating and managing parcels in local government. Representative from three organizations will discuss their work flow issues and considerations in supporting existing business processes.

Session 25 – Homeland Security

Wednesday, 8:30 to 10 a.m., Opportunity Suite B

Emergency Preparedness: Are You Prepared?

Todd Lusk
GIS Specialist
Dakota County
14955 Galaxie Ave.
Suite 355
Apple Valley, MN 55124
Phone: 952-891-7084 Fax: 952-891-7097
todd.lusk@co.dakota.mn.us

Joe Sapletal
GIS Specialist
Dakota County
14955 Galaxie Ave.
Suite 355
Apple Valley, MN 55124
Phone: 952-891-7096 Fax: 952-891-7097
joe.sapletal@co.dakota.mn.us

At 4 a.m. on a weekday morning, a tanker truck carrying some type of liquid flips over on a major road running through your community and you get a phone call. On the other end of the line is your emergency manager asking for help. What do you do first? Do you and your fellow GIS professionals have the tools and data you need to help your emergency manager out? How would you respond to such a scenario? Dakota County posed exactly such a scenario to test our readiness to respond. This presentation will cover what we did, how we did it, and what we learned in the process.

MetroGIS and GCGI Emergency Preparedness Committees – Recent Activities

(Presentation supported by the Governor's Council on Geographic Information)

Randy Knippel
GIS Manager
Dakota County
14955 Galaxie Ave.
Apple Valley, MN 55124
Phone: 952-891-7080 Fax: 952-891-7097
randy.knippel@co.dakota.mn.us

John Hoshal
GIS Consulting Services Supervisor
Land Management Information Center
Minnesota Dept. of Administration
Suite 300, 658 Cedar St.
St. Paul, MN 55155-1603
Phone: 651-201-2482 Fax: 651-296-3698
john.hoshal@state.mn.us

MetroGIS and the Governor's Council for Geographic Information have each created committees that focus on emergency preparedness issues. These committees have identified three primary areas of interest: promoting GIS data development and data standards to support effective emergency response, building stronger relationships with the emergency management community and promoting/providing emergency preparedness education for the GIS community. This presentation will provide an overview of recent activities in each of these three areas of interest.

Session 25 – Homeland Security

Wednesday, 8:30 to 10 a.m., Opportunity Suite B

A Collaborative Model For Capturing Local Emergency Preparedness Knowledge And Data – A Twin Cities Metropolitan Area Example

Keith Anderson

GIS Technician

LOGIS

5750 Duluth St.

Golden Valley, MN 55422

Phone: 763-543-2641

kanderson@logis.org

Rick Gelbmann

Metropolitan Council

rick.gelbmann@metc.state.mn.us

The MetroGIS emergency preparedness workgroup has developed a model for creating and maintaining GIS data for emergency preparedness and response. This model relies on a collaborative approach to leverage local and county knowledge, GIS technical capabilities and data, thereby distributing the workload. This presentation will discuss how the model works and how it potentially could be extended to include any and all willing participants.

Session 26 – Water Resources

Wednesday, 8:30 to 10 a.m., Herberger Suite A

Building a Repository to Share Hydrologic Event Data

(Presentation supported by the Governor's Council on Geographic Information)

Mark Olsen

MN Pollution Control Agency

520 Lafayette Rd. N.

St. Paul, MN 55155

Phone: 651-296-3412 Fax: 651-282-5446

mark.olsen@pca.state.mn.us

Susanne Maeder

Land Management Information Center

658 Cedar St.

St. Paul, MN 55155

Phone: 651-297-4986 Fax: 651-296-1212

susanne.maeder@state.mn.us

The Minnesota Pollution Control Agency (MPCA), partnering with the Minnesota Department of Administration's Land Management Information Center (LMIC) and working through the Minnesota Governor's Council on Geographic Information Hydrography Committee, are working cooperatively with the U.S. EPA to research and develop the systems and methodologies necessary to support hydrologic-related geospatial data flows via the National Environmental Information Exchange Network.

Through this project, Minnesota is developing a common repository of features and activities that geographically relate to or affect surface waters as represented by the 1:24,000 National Hydrography Dataset (NHD) data. The Exchange Network will then be used as the mechanism for exchanging these data among local, state and federal partners. These data will be available to the Network through Web services in an eXtensible Markup Language (XML) format. The XML schema being developed to exchange these data will be based upon and consistent with the FGDC's Hydrographic Data Content Standard.

Another significant aspect of this system is that it will also serve as the mechanism through which Minnesota can manage updates and enhancements to the 1:24,000 NHD data. This will allow local changes to be managed through a single point and insuring that all features and activities are referenced to a consistent source that is accessible to all users. It is also important to Minnesota users by insuring that all changes are properly integrated into the national repository maintained by the USGS. This repository will allow Minnesota to consolidate and coordinate updates through a single process and authority.

This presentation will provide a general overview of the project as well as a more detailed description of the progress to date.

EPA's Uses of the National Hydrography Dataset

Thomas G. Dewald

U.S. EPA

c/o Mark Olsen, MPCA

520 Lafayette Rd. N.

St. Paul, MN 55155

Phone: 651-296-3412 Fax: 651-282-5446

mark.olsen@pca.state.mn.us

EPA's WATERS (Watershed Assessment, Tracking and Environmental Results) integrates water program data through linkages to the surface water drainage network within the National Hydrography Dataset. This presentation will highlight the latest uses of this integrated framework (strategic measures, congressional reports), enhancements to the framework (data quality documentation, watersheds, stream flow volume and velocity), and connections to the EPA and Federal enterprise architectures (data exchange, services).

Session 26 – Water Resources

Wednesday, 8:30 to 10 a.m., Herberger Suite A

Using the National Hydrography Dataset

Jeff Simley
Cartographer
U.S. Geological Survey
PO Box 25046, MS-507
Denver Federal Center
Denver, Colorado 80225
Phone: 303-202-4131
jdsimley@usgs.gov

The National Hydrography Dataset is a partnership between the USGS and over 50 government agencies to produce a GIS dataset of the Nation's surface water. This dataset is designed to allow the analysis of water related events within the surface water network, such as the upstream/downstream relationship of permitted discharges, water quality monitoring stations and drinking water intakes. The NHD provides the surface water geospatial framework upon which the events can be addressed and related through the flow network. The NHD is also designed for use in mapping, allowing the user to construct customized surface water maps. The dataset is available nationwide at 1:100,000-scale, and is nearing completion at 1:24,000-scale, with this scale now available for all of Minnesota. The NHD is also designed for continuous maintenance through a stewardship program made up of data users and the USGS. Minnesota will be one of the early pioneers of this program.

Session 27 – Graduate Student Competition

Wednesday, 8:30 to 10 a.m., Wilson Suite

Wolves in Minnesota: Developing a Spatially Explicit Model of Abundance and Dispersal

By Jon Michael Engels, University of Minnesota

Since the wolf's designation as an endangered species, many studies have given us insight into the species and management plans suited to its protection. The development of improved models that aid in the determination of dispersal and abundance is critical to the ongoing management of the species, particularly as the legal status of the wolf remains in flux. Although there are many examples of animal population modeling in general and wolf population models in particular, few fully consider geographic space as a critical component. Geographically Weighted Regression (GWR) is a recent innovation in statistical modeling that offers much promise to the development of these population models. This study uses GWR to develop a series of logistic regression models at multiple seed sizes using wolf census data and a set of habitat variables. This research demonstrates that GWR offers advantages over traditional approaches.

Zoning for School District Using GIS Approach

Yong-Seuk Park, Minnesota State University, Mankato

School location and district play an important role in residential decisions. The school-age population is a major portion of the population. The school district is classified to different levels of districts: elementary, middle, and high school. This study focuses on re-zoning the elementary school district. The current elementary school district is widely distributed across the city. However, not every parent sends their children to the nearest school. For example, students are allocated to schools far away where the closer school is available to them. In the study, the current school district is analyzed, and the optimal district is proposed as a solution using GIS. Moreover, the study includes the survey to how parents and students feel about the current zoning plan and what they perceive as a problem. The results show that about 20% of children under current system are not allocated to the nearest school. The results can be also used as a planning perspective: [1] the proposed solution reduces the travel distance of children, and [2] the proposed one decreases the mileage of school bus.

Session 27 – Graduate Student Competition

Wednesday, 8:30 to 10 a.m., Wilson Suite

Analysis of troops activated per state in the 88th Regional Readiness Command from 2003–2005, and the building of a GIS system from the ground-up at Fort Snelling Army Reserve HQ

*Jesse Pearson, Department of Resource Analysis,
Saint Mary's University of Minnesota*

This project involves the building of a GIS enterprise architecture at Fort Snelling Army Reserve HQ and the analysis of troops activated by state in the 88th Regional Readiness Command from 2003-2005. The project consists of 5 phases. These phases include: preparation, GIS steering committee development, initial GIS project creation, system expansion, and moving towards enterprise GIS. The goals of the troops activation project are to determine the simplest yet effective method to map troop activation. The expectation of this analysis is that it will identify states which have had high troop activation levels in relation to population levels as well as the converse. It is hoped that an analysis such as this can help create equality in troop deployment and help identify an orderly scheme for rotating troop activation amongst the states of the 88th Regional Readiness Command.

Product Demonstrations

Wednesday, 8:30 to 10 a.m., Herberger Suite B

Custom Cost Effective Aerial Photography

Lee Westfield

Vice President

Pro-West & Associates

8239 State 371 N.W.

Walker, MN 56482

Phone: 218-547-3374 Fax: 218-547-3375

lwest@prowestgis.com

Brian Schaefer

Aerial Photographer/GIS Specialist

Pro-West & Associates

8239 State 371 N.W.

Walker, MN 56482

Phone: 218-547-3374 Fax: 218-547-3375

bschaefer@prowestgis.com

For most public agencies, aerial photography fills a crucial niche in the planning and management process. Orthorectified photography is on everyone's wish-list, but most often agencies are dealing with reduced budgets, minimal funds or shared funds between agencies that make orthorectified photography an unaffordable choice or the agencies are constrained by a orthophotography cycle with large periodic gaps.

This demonstration will discuss cost effective digitally rectified photography. Aerial photography of this type allows for more photography cycles, patch updating of existing aerial photography and more customized options. Parameters in the design of custom photography flights for scale, season, film type and project size will be explored.

Plat Book Professional 3.0

Jerry Happel

President

PlanSight

PO Box 128

Rumely, MI 49826

Phone: 906-439-5871

jerry@plansight.com

Several counties in Minnesota are already taking advantage of PlanSight's automated Plat Book software. PlatBook Pro 3.0 allows you to edit and republish Plat Books yourself! By combining PlanSight's smart labeling and mapping processes with ESRI's industry leading ArcView® GIS software, you can now use GIS parcel data to maintain your own Plat Books in-house. This presentation will provide a general overview of the software and focus on new functionality available in version 3.0. PlanSight will also discuss real world examples of the substantial return on investment made possible with this software.

Product Demonstrations

Wednesday, 8:30 to 10 a.m., Herberger Suite B

CivXplorer Pro

Suzanne Fliege

Senior Internet Mapping Developer

PlanSight

PO Box 128

Rumely, MI 49826

Phone: 906-439-5871

suzanne@plansight.com

Many Minnesota Cities and Counties have already discovered the best bang for your buck in Internet mapping: CivXplorer Pro.

CivXplorer Pro is a powerful, low-cost custom interface to ArcIMS designed exclusively for local governments. Rich in functionality, yet easy to use; CivXplorer is the ideal interface for communities big and small. Designed for speed and stability, CivXplorer is the perfect solution for making GIS available to everyone. This presentation will focus on demonstrating the robust functionality of CivXplorer Pro and will cover pricing options.

Session 29 – Community GIS

Wednesday, 10:30 a.m. to Noon, Stockinger Suite A

Minnesota 3-D: An Online GIS Application for Economic Development

Jeff Matson
Program Director
University of Minnesota
301 19th Ave. S.
330 HHH Ctr.
Minneapolis, MN 55455
Phone: 612-625-0081
jmatson@umn.edu

Jessica Deegan
Research Analyst
MN Dept. of Employment & Econ. Development
1st National Bank Building
332 Minnesota St., Suite E200
St. Paul, MN 55101-1351
Phone: 651-296-3739 Fax: 651-282-5429
jessica.deegan@state.mn.us

Minnesota 3-D is a federally funded three-year project whose centerpiece is a dynamic Internet-based GIS application that brings together labor market, housing and development information and analysis for the Twin Cities metro area into one easy-to-use tool for economic and community developers. By combining new and existing labor market and origin-destination data on Minnesota jobs and workers and data on land ownership, planning and development, transportation and many other data sources, this tool will provide all the information needed to make good planning and business decisions.

M3D involves a network of multi-sector partners from state, regional, county, municipal, to community agencies and the University of Minnesota. Government agencies will provide access to administrative data relevant to community development planning and analysis, as well as use the resulting GIS analysis to inform policy and programmatic decisions. Community level organizations will use the M3D applications to increase their capacity to plan and develop housing and economic development programs to narrow the growing spatial mismatch between housing and employment in the Twin Cities region. The University will bring these entities together to share best practices and build capacity.

An integral component of the M3D program is the involvement of various community partners in the planning, development and ultimate application of this Internet GIS. Community partners include members of the Minneapolis Neighborhood Information System, the St. Paul Community GIS Consortium and both inner-ring and outlying suburban communities facing challenging planning issues during the coming years.

This presentation will provide background information and a general outline of the project goals, the roles of community partners and the University and the application currently being designed by the state Department of Employment and Economic Development. A discussion of how the project fits into other state and local GIS initiatives will also be presented.

Session 29 – Community GIS

Wednesday, 10:30 a.m. to Noon, Stockinger Suite A

Integrating Enterprise GIS for your Community

Paul Weinberger
GIS Coordinator
City of Minneapolis
331 Second Ave. S.
Suite 220

Minneapolis, MN 55401
Phone: 612-673-2574 Fax: 612-673-3662
paul.weinberger@ci.minneapolis.mn.us

Many communities have invested in GIS software at the departmental or division level, but are still trying to determine the best way to leverage their investment to benefit the entire organization. This session is designed to discuss strategies to integrate “Enterprise GIS” solutions for municipalities, including how it can improve everyday business.

Enterprise GIS is an approach for implementing GIS across an organization. The result is shared data, resources and services. This will allow your GIS to advance beyond a project and analysis oriented tool to an enterprise system designed to support decision-making and enhance business processes. Regardless of the size and investment in your GIS, an Enterprise GIS solution is a reality for any community.

Minneapolis Snow Emergency IMS Web Site

Jeff Schroeder
GIS Analyst
City of Minneapolis
331 Second Ave. S.
Room 220

Minneapolis, MN 55401
Phone: 612-673-2166 Fax: 612-673-3662
jeffrey.schroeder@ci.minneapolis.mn.us

This session is intended to show how the City of Minneapolis is using a public ArcIMS viewer to represent complex parking rules in an easy to understand interface and discuss the lessons learned in the creation of the viewer. The Snow Emergency IMS Web site is an interactive tool that allows citizens to view up to the minute parking restrictions on a block-by-block or neighborhood level throughout the City of Minneapolis. By putting this complex set of parking information into graphical (map) form, it becomes much more understandable to the citizens. Each parking polygon displayed on the Web site represents about two paragraphs of parking rules and restrictions text. The three primary objectives of the snow emergency Web site are to inform the public in a clear and concise manner areas where they are allowed and not allowed to park during a snow emergency; to allow citizens to plan for parking in future days of the snow emergency; and to notify the citizens of the dates and times the parking restrictions will go into effect and when they will expire for each day of the snow emergency.

Session 30 – Remote Sensing

Wednesday, 10:30 a.m. to Noon, Opportunity Suite A

Imagery On Demand – Storing and Delivering Large Raster Datasets

Jim Dickerson
Data Coordinator
Land Management Information Center
658 Cedar St.
St. Paul, MN 55155
Phone: 651-297-2754 Fax: 651-296-1212
jim.dickerson@state.mn.us

Pete Olson
System Analyst
Land Management Information Center
658 Cedar St.
St. Paul, MN 55155
Phone: 651-296-1204
pete.olson@state.mn.us

An increase in the amount of available high-resolution digital imagery over the last decade has produced datasets close to a terabyte in size, outpacing the ability to download and store large amounts of it on the desktop. Such datasets are usually housed on centralized servers for distribution. One solution has been to offer small tiles of imagery for download and re-assembly into a mosaic. This process incurs the overhead of determining correct tiles, many downloads and dealing with boundary effects such as “no data” areas that overlap and hide adjoining tiles. Another solution is to provide a seamless mosaic of imagery that allows the download of just the area of interest and delivers a GIS-ready product. This presentation is about the research LMIC has conducted into such solutions.

Under a grant from the Institute for the Application of Geospatial Technology, the Land Management Information Center undertook to develop and implement an efficient application that allows a user to specify a sub-scene region of one or more raster data layers and, together with other relevant data, download them as a single zip file.

The problems addressed included how to store large raster datasets in a seamless mosaic, how to extract sub-regions of it and how to combine the GIS layers, with accompanying metadata, into a single file for downloading.

The result is a Web application using ArcIMS and ArcSDE called the Raster Clipping Pilot Project, which is being used to deliver 2003 NAIP imagery for most of Minnesota. This has led to other research, using open source components, to improve the efficiency of raster storage in databases and the increase the speed of raster delivery over networks. The presentation will discuss technical aspects of these solutions and the lessons learned along the way.

Panel Discussion: The Latest News From Remote Sensing

Brian Huberty
NWI Coordinator
U.S. Fish & Wildlife Service
1 Federal Dr.
MS 4056
Ft Snelling, MN 55111
Phone: 612-713-5332 Fax: 612-713-5285
brian_huberty@fws.gov

Yes, it is time again to assemble our panel of experts (tentatively scheduled to appear: Dr. Bill Befort, Minnesota Department of Natural Resources; Dr. Marvin Bauer, University of Minnesota; Dave Fuhr, Airborne Data Systems; Ron Wencl, USGS) to see what has happened in the world of remote sensing.

Did the USDA get funding for NAIP coverage for Minnesota in 2005?

Will Landsat ever get fixed?

What is CRSSP?

Who is PECORA?

Are there UAVs in our future?

Session 31 – Parcels

Wednesday, 10:30 a.m. to Noon, Stockinger Suite B

Mapping Without a Net: GIS Compilation Strategies

Mark Kemper
GIS Project Manager
The Sidwell Company
675 Sidwell Ct.
St. Charles, Illinois 60174
Phone: 630-549-1000 Fax: 630-549-1111
mkemper@sidwellco.com

Many local government entities still use outdated, inaccurate or even nonexistent parcel maps. The needs of their user communities often warrant or demand a highly accurate GIS parcel data model, supported by digital orthophotography. In these conditions a scan and warp workflow is not sufficient.

This session addresses the requirements and methodology needed to reconstruct a GIS cadastral parcel base from original land records; the “from scratch” approach. Topics include determination and evaluation of source records, orthophotography, parcel compilation methods and philosophies, research issues, recommended GIS data model, and parcel maintenance issues.

Developing and Implementing the Geodatabase Parcel Data Model

Richard Bunten
GIS Specialist
City of Duluth
Duluth City Hall
411 W. First St., Room 210a
Duluth, MN 55802
Phone: 218-730-5137
rbunten@ci.duluth.mn.us

Lisa Schaefer
Parcel Development Manager
Pro-West & Associates
8239 State 371 N.W.
Walker, MN 56482
Phone: 218-547-3374 Fax: 320-329-3252
lschaefer@prowestgis.com

The City of Duluth is among the first in Minnesota to develop parcel data in an enterprise geodatabase format. The city’s parcel data model evolved from the ESRI Land Parcel Data Model. Many items were considered while developing and implementing this parcel data model that would allow the city to accurately and efficiently enter and retrieve the parcel data.

The city had to consider data priorities, project objectives, funding and geodatabase multi-user editing in their model development. Data priorities centered on creating workable feature classes for various cadastral layers, precision parameters and developing an efficient workflow. The project’s objectives and funding required the city to take an active part in the data development. All parcel data was developed within the geodatabase format to be integrated into the city’s SDE enterprise GIS. Multi-user editing was utilized to facilitate concurrent data development between the city and Pro-West & Associates, Inc.

Session 31 – Parcels

Wednesday, 10:30 a.m. to Noon, Stockinger Suite B

Aligning GIS data to the New Anoka County Parcels

Blaine Hackett

President

GIS Rangers

2434 Virginia Cir.

Roseville, MN 55113

Phone: 651 483-9811

blaine@gisrangers.com

John Slusarczyk

Anoka County GIS Coordinator

Anoka County

2100 Third Ave.

Anoka, MN 55303

Phone: 763-323-5503

John.Slusarczyk@co.anoka.mn.us

Over the past several years, Anoka County has been using COGO to create a high accuracy parcel base. Many cities in Anoka County and around the state are still using old, digitized base data, which is not accurate.

To take advantage of the new, accurate data local government GIS departments will need to undertake the process of porting their old data to match it. This process can be complicated and time-consuming. This session will address the many obstacles and solutions to those obstacles using the City of Andover as a test case.

Session 32 – Homeland Security

Wednesday, 10:30 a.m. to Noon, Opportunity Suite B

Emergency Preparedness and Homeland Security: A Practical Perspective

Dan Falbo

ESRI

880 Blue Gentian Rd.

Suite 200

St. Paul, MN 55121

Phone: 651-454-0600 Fax: 651-454-0707

dfalbo@esri.com

Today's homeland security initiatives build upon existing emergency management and public safety practices and infrastructure. In doing so, these initiatives leverage their organization's existing subject-matter expertise to expand a geographic information system's role in supporting strategic and tactical objectives. The GIS has become an accepted and valuable tool for documenting critical and vulnerable assets, planning for mitigation, assisting in response, aiding in recovery management, and facilitating inter-departmental and intergovernmental cooperation.

This presentation will outline homeland security in the context of Department of Homeland Security prerequisites and will focus on a GIS facilitating the Common Operating Picture outlined in the National Incident Management System (NIMS) and related documents.

The Holistic Nature of GIS and its Application to 911 Dispatch and Emergency Management Operations

Mark Luther

BullBerry Systems, Inc.

128 Soo Line Dr.

Bismarck, ND 58501

Phone: 701-355-8710 Fax: 701-355-8715

mark.luther@bullberrysystems.com

While there is a core set of map data (analog or digital) required to achieve a minimum required level of response to emergency situations, response can be greatly enhanced by the addition of GIS datasets created and maintained by a variety of departments not directly involved with 911/Emergency Management. This presentation will highlight the benefits of interagency cooperation to enhance emergency response activities, as well as the shortcomings of standalone, map-based dispatch systems.

Grant Writing for GIS-Based Homeland Security Initiatives

Jenifer L. Sorensen

BullBerry Systems, Inc.

330 Knollwood Dr.

PO Box 3416

Rapid City, SD 57709-3416

Phone: 605-721-5553 Fax: 605-721-5575

jenifer.sorensen@bullberrysystems.com

Mark Luther

BullBerry Systems, Inc.

128 Soo Line Dr.

Bismarck, ND 58501

Phone: 701-355-8710 Fax: 701-355-8715

mark.luther@bullberrysystems.com

Several homeland security initiatives, including the National Strategy for Homeland Security, the National Preparedness Goal, the National Response Plan, and the Homeland Security Grant Program, either directly specify or imply that geospatial tools are an important component of information management and help to create a common operating picture in which all levels of government can function before, during, and after emergencies.

About \$3 billion will be distributed in 2005 through a variety of homeland security funding programs. The State Homeland Security Grant Program is geared toward funding rural terrorism prevention and provides funds for county homeland security activities. Grant program guidelines specifically justify the funding of geospatial technologies and data (p. 42-43 and Appendix I) and the 2005 Authorized Equipment List allows the purchase of GIS software and data, computer hardware, and GPS equipment.

This presentation describes reasons for using GIS in emergency management, outlines the homeland security initiatives that have led to local funding opportunities, and characterizes the grant programs that are available. Examples of GIS-based emergency management projects, with details on how to write grants to get these projects funded, are also presented.

Session 33 – Natural Resources

Wednesday, 10:30 a.m. to Noon, Herberger Suite A

Alaska Fire Season 2004 – Mapping the Millions (Or How Poor Map Symbology Contributed to Citizen Unrest)

Paul Olson
GIS Specialist
MN Department of Natural Resources-Forestry
1201 E. Hwy. 2
Grand Rapids, MN 55744
Phone: 218-999-7840 Fax: 218-327-4391
paul.olson@dnr.state.mn.us

During the 2004 fire season, Alaska experienced a record-setting fire season with over 6.5 million acres burned. This is 8.6 times the 10-year average for acres burned in a season. Mapping and assessing the fires for suppression efforts, damage assessments, and rehabilitation planning was a monumental process. Satellite imaging, high altitude fixed wing imaging and low-level rotor wing GPS tracking were used to map and assess the fires. This presentation will show how these three techniques were used to map and assess the million acres of fire burning along the Taylor Highway in the east interior region of Alaska.

Assessment of Oak Wilt Incidence and Distribution Using Aerial Sketch Mapping, CIR and CIR/Logistic Regression Methods

Susan Burks
Forest Health Specialist
Minnesota Department of Natural Resources
1200 Warner Rd.
St. Paul, MN 55106
Phone: 651-772-7927 Fax: 651-772-7563
susan.burks@dnr.state.mn.us

Kathleen Ward
Forester
USFS North Central Research Station
St. Paul, MN 55108
Phone: 651-649-5100
kward01@fs.fed.us

Oak wilt is a disease of oaks (*Quercus* spp.) caused by the fungus *Ceratocystis fagacearum*. Oak wilt kills northern red and pin oaks and causes decline of white and bur oaks. The disease occurs throughout the southeast and central portion of the state of Minnesota. It is of special concern in the seven-county Minneapolis/St. Paul metropolitan area where sandy soils and development-associated wounding promote the disease. The federally funded oak wilt suppression program generated a variety of needs for spatial data, including annual detection, annual assessment, and change detection over time in the incidence and distribution of oak wilt infection centers. In response, three methods were applied to detect and map oak wilt across central Minnesota. Point data obtained from aerial sketch mapping were used as a means of detection to serve communities participating in the suppression program. Polygon data interpreted from color infrared photography (CIR) were used to estimate numbers of affected acres and to serve as a baseline to measure program accomplishments. The costs and benefits of these two methods of mapping new infection centers will be compared during the summer of 2005. For the change detection study, paired points interpreted from two sets of CIR photographs acquired approximately 10 years apart were combined with community and site variables. Logistic regression was applied to determine the change in incidence and distribution of oak wilt over time, to assess the impact of the suppression program, and to describe the influence of selected variables on oak wilt incidence. Results of the change detection indicate that the incidence of oak wilt has been significantly affected by land use and soil characteristics, and that the current oak wilt suppression program has been generally effective. Information gained from the three methods will guide future oak wilt suppression efforts.

Session 33 – Natural Resources

Wednesday, 10:30 a.m. to Noon, Herberger Suite A

Presenting GIS Data to the Public for Natural Resource Conservation: Three Case Studies

Kim Alan Chapman
Principal Ecologist
Applied Ecological Services
21938 Mushtown Rd.
Prior Lake, MN 55372
Phone: 952-447-1919
kim@appliedeco.com

Rio Roland
GIS Specialist
Applied Ecological Services
17921 Smith Rd.
Brodhead, WI 53520
Phone: 608-897-8641
rio.roland@appliedeco.com

Applied Ecological Services (AES) uses GIS data to stimulate public discussion and initiate conservation measures at broad scales. A challenge in using GIS data for natural resource planning and conservation is to present large amounts of data in a format and at a level of detail that citizens, elected officials, and municipal staff can understand. In one project, AES partnered with the Kansas City planning organization, Mid-America Regional Council and Patty Banks Associates to create a framework for regional decision-making regarding stormwater management, natural resource protection, and habitat restoration. In another project, AES collaborated with St. John's University and The Nature Conservancy to create a GIS-based vision for public discussion about zoning, stormwater management, and conservation. In a third project AES joined Dahlgren, Shardlow and Uban (DSU) and the City of Lino Lakes to complete an AUAR (a regional environmental impact assessment) for public discussion of future development scenarios.

In these projects AES used detailed and general natural resource data in a hierarchy of information. General data provided a context for detailed data. Detailed data often indicated locations of conservation importance. Drainage features (drainageways, hydric soils), wetlands, streams and lakes were evaluated for their role in a regional stormwater management system.

The approach has four elements:

1. Detailed natural resource data become a focal point for regional conservation work and important locations are protected within the regional stormwater management system whenever possible;
2. General natural resource data provide a context for higher quality natural resource locations;
3. Local stormwater management is addressed in a regional sys-

tem for stormwater treatment, beginning with upland swales (often created), created and existing wetlands, lakes, and streams.

4. Presentation of information is simplified to facilitate public participation and comprehension.

AES staff will present details of these projects to exemplify the approach.

Session 34 – Education

Wednesday, 10:30 a.m. to Noon, Wilson Suite

Panel: Minnesota State Colleges & Universities – ESRI Site License

Mark Thomas

Emerging Technology Architect

Minnesota State Colleges and Universities

3010 Memorial Library

Mankato, MN 56001

Phone: 507-389-6915 Fax: 507-389-2845

mark.thomas@so.mnscu.edu

Angela Lee

Schools and Museums

ESRI

880 Blue Gentian Rd.

Suite 200

St. Paul, MN 55121

Phone: 651-994-0823 Fax: 651-454-0705

alee@esri.com

A panel discussion focusing on Minnesota State Colleges and Universities — Systemwide ESRI Site License.

Since the establishment of a systemwide ESRI site license, in 2002, institutions across Minnesota State Colleges and Universities have increasingly used GIS in both academics and administration. This panel will describe how the ESRI site license has fostered the growth of GIS for programs, projects, research and administration across the system. We will also discuss the transition of funding from grants to campus-funding for the site license.

Panel Members:

- Mark Thomas, ESRI Site License Administrator, MnSCU
- Angela Lee, Libraries & Museums, ESRI
- Todd Harmening, Planning, Academic and Student Affairs, MnSCU
- Tim Fox, GIS/Geography Coordinator, Itasca Community College
- Charlie Parson, Geography Professor, Bemidji State University
- Marty Mitchell, Geography Professor, Minnesota State University, Mankato

Mark Thomas will provide an overview of the ESRI Systemwide License and how it is being used at participating schools across the system. Todd Harmening will discuss how the Office of the Chancellor uses GIS for planning. Angela Lee, of ESRI has a broad knowledge of the many ways that GIS is used in academics, across the U.S., and will brief us on her role in supporting our efforts moving forward. Charlie Parson, Tim Fox and Marty Mitchell will brief us on how the ESRI Site License has fostered the growth of GIS on their campuses and what they see for the future of GIS at their respective institutions.

Audience members will be welcome to participate in the discussion and to join forces with us in helping to sustain the ESRI site license for Minnesota State Colleges and Universities.

Product Demonstrations

Wednesday, 10:30 a.m. to Noon, Herberger Suite B

Introducing WebFusion GIS

Greg Proper, P.E.

Director of Operations

Pro-West & Associates

8239 State 371 N.W.

Walker, MN 56484

Phone: 218-547-3374 Fax: 218-547-3375

gproper@prowestgis.com

Galen Neste

Senior Systems Programmer

Pro-West & Associates

8239 State 371 N.W.

Walker, MN 56484

Phone: 218-547-3374 Fax: 218-547-3375

gneste@prowestgis.com

WebFusion is built on ESRI server-side technology and integrates GIS with new or legacy programs, such as Tax Parcel and CAMA Databases, Building Permit and Special Assessment Programs, One-Call Locate Systems and Infrastructure Management Systems. WebFusion is platform independent and requires only a thin browser client and Adobe Reader on the client side.

WebFusion is built on solid architecture, highly customizable, and a perfect solution for integrating spatial data with the newer Web-based databases and programs. Because of WebFusion's small-client footprint, and economical data stream, WebFusion is also the perfect product for taking your applications mobile in real-time. PWA will demonstrate a number of applications that have integrated GIS data into their applications via PWA's WebFusion solution.

mPower Integrator™ – Web GIS

Scott Hameister

GIS Applications Engineer

mPower Technologies

1100 S. Carpenter Ave.

Kingsford, MI 49802

Phone: 800-236-2070

shameister@taylor-tech.com

Corey Jenness

GIS Applications Engineer

Taylor Technologies, Inc.

1100 S. Carpenter Ave.

Kingsford, MI 49802

Phone: 800-236-2070

cjenness@taylor-tech.com

mPower Technologies has developed a multi-platform GIS data distribution tool for ESRI® ArcIMS® or Autodesk®

MapGuide®, known as mPower Integrator™, that helps to facilitate the data or information side of maintaining and developing Web browser-based GIS. mPower Integrator is now compatible with ESRI arcSDE. mPower Integrator will speed up the publication of GIS/FM data for the Web!

Manifold GIS product demonstration by Jim Dahl, GIS Coordinator, Douglas County, Minn.

Jim Dahl, GISP

GIS Coordinator

Douglas County Information Systems

305 Eighth Ave. W.

Alexandria MN 56308

Phone: 320-762-2933 Fax: 320-762-2389

Douglas County was looking for an alternative solution for serving maps on the Internet. Could Manifold (Registered trademark of CDA International LTD.) GIS be that alternative? We are evaluating that along with some of the claims by the distributor www.manifold.net.

One program for all of your GIS needs — Manifold System 6.00 is an integrated system that simultaneously works with vector drawings, satellite and aerial photos, other raster images, raster data, multichannel remote sensing images, 2D and 3D surfaces and terrain simulations, multilayered maps, user supplied or automatically generated labels and a vast range of database table formats. Manifold does it all in one seamlessly integrated, high performance package. Manifold 6.00 even includes a sophisticated, fast, powerful Internet map server that's built right into Manifold so you can publish your maps to the Web for browsing by anyone.

We have not finished evaluation at this time, but there is a quick take near the page bottom at <http://www.geoplacement.com/uploads/featurearticle/2004/0405/0405qt.asp>.

I am impressed with the potential of this system, which is a GIS GUI and Map Server in one package for under \$300. Of course, if you are a programmer, it can be customized with queries, scripts, and code as much as you want, but I hope to show what can be done out of the box. It can do most of the tasks you would expect of GIS software, plus it can serve maps.

Poster Abstracts

Poster Abstracts

Presenters will be available for discussion Tuesday from 6 to 7 p.m. in the Exhibit Hall

150 Years of Land Use and Land Cover Change in the St. Cloud Area

Chad Yost
St Cloud State University
720 Fourth Ave. S.
St. Cloud, MN 56301
yoch0303@stcloudstate.edu

Kavitha Jayabalan
St Cloud State University
819 13 St. S., Apt. 101
St Cloud, MN 56301
Phone: 320-282-8056
jaka0501@stcloudstate.edu

The study presents the land use change in the city of St. Cloud over a period of 150 years, in three stages starting from the mid-19th century approximately for every 75 years. GIS and image processing techniques are effectively used to prepare the land use change map.

The greatest challenge was the collection of the data for the different time periods and finding a suitable way to compare the change. Considering the scale of the study and the limitations of the available data sets, performing the landuse classification manually was regarded as the best option.

The data sets used for this comparison include

1. Pre-settlement vegetation of Minnesota-based on Marschner's analysis of Land Survey notes of mid 19th century. The metadata cautions that the data exhibits significant positional offsets, of up to one thousand feet in places. To make the data usable and accurate they were adjusted using the spatial adjustment in ArcGIS. As the offsets were not uniform, shifting the whole shape file didn't yield accurate results. To overcome this complication, center points of prominent water features common to both the 2003 FSA and the Marschner's map were used to spatially adjust the map.
2. 1938 Air photos. These are the scanned photos available in the jpeg format, which were not geo-referenced. Using ArcGIS these photos were geo-referenced based on 2003 FSA. The difficulty encountered here was in the identification of control points as there was enormous change between these two time periods. The boundary lines of farms were used in cases where identifying other common features gets complicated. Then all the geo-referenced images were mosaiced using ERDAS Imagine.
3. NAIP 2003 (National Agricultural Imagery Program) aerial photography in MrSID format.

It is difficult to do any automated classification on the 1938 air photos, so each land use type in both the 1938 and 2003 air photos were manually digitized as coverages using Arc-Info Workstation. Due to the limitation of the manual digitization, a broader landuse classification is followed. The Marshner's system of classification is also modified to match the classification pattern followed on the air photos. Based on this classification, landuse change analysis is performed over the three time periods. Surprisingly, it was found that there was not much change in the forest cover between 1938 and 2003. Interesting results pertaining to the land use were obtained, which creates better understanding on the pattern of land use change

A Restaurant Location Problem in the Twin Cities

Christina Freiberg
University of St. Thomas c/o Robert Werner
JRC 432
2115 Summit Ave.
St. Paul, MN 55105-1096
Phone: 651-962-5565
cffreiberg@stthomas.edu

Robert Werner
Professor
University of St. Thomas
JRC 432
2115 Summit Ave.
St. Paul, MN 55105-1096
Phone: 651-962-5565
rjwerner@stthomas.edu

A client plans to open four New York style deli restaurants in the Twin Cities over the next few years. The client anticipates that the customers will have a demographic profile like that of two successful D'Amico restaurants, one in Minneapolis and the other in St. Paul. The client also expects customers to be affluent females at home.

The authors constructed a demographic profile of people living 1, 1.5, and 2 miles from the two successful D'Amico restaurants. The values of relevant demographic attributes, which approximate affluent females at home, were then used to search for similar areas of the Twin Cities.

Competing restaurants were downloaded from ReferenceUSA, and then culled by the client to identify those restaurants he thinks would compete with his. Likely areas for his new restaurants are those with the right demography and little existing competition.

Poster Abstracts

Presenters will be available for discussion Tuesday from 6 to 7 p.m. in the Exhibit Hall

Alaska Fire Season 2004 – Mapping the Millions

Paul Olson
GIS Specialist
MN Department of Natural Resources - Forestry
1201 E. Hwy 2
Grand Rapids, MN 55744
Phone: 218-999-7840 Fax: 218-327-4391
paul.olson@dnr.state.mn.us

During the 2004 fire season Alaska experienced a record setting fire season with over 6.5 million acres burned. This is 8.6 times the 10-year average for acres burned in a season. Mapping and assessing the fires for suppression efforts, damage assessments, and rehabilitation planning was a monumental process. Satellite imaging, high altitude fixed wing imaging and low-level rotor wing GPS tracking were used to map and assess the fires. These posters show how the MODIS satellites were used to map the fires at a course resolution and track fire progression for the million acres of fire burning along the Taylor Highway in the east interior region of Alaska.

City of Minneapolis GIS Map Gallery

John Janzen
GIS Analyst
City of Minneapolis
331 2nd Ave S
Suite 220
Minneapolis, MN 55401
Phone: 612-673-3306 Fax: 612-673-3662
john.janzen@ci.minneapolis.mn.us

This map set represented here shows how GIS is used by various city of Minneapolis departments.

The Minneapolis Public Works, Traffic Division uses the map titled Traffic Counts as a representation of daily traffic flow on city-maintained streets. They use this information to manage street maintenance activities. The data displayed on this map can also be accessed by other city departments to support their decision making as it relates to traffic counts. Contact: James Murphy 612-673-3605 or james.murphy@ci.minneapolis.mn.us.

The map series titled Ward 5 Comparison shows how moving a City Council Ward Boundary will greatly influence demographic and economic aspects of the ward. This information will provide valuable information to policy makers to help them better understand and make informed decisions for the people and businesses represented in Ward 5. Contact: John Janzen 612-673-3306 or john.janzen@ci.minneapolis.mn.us.

The map titled CSO Master Map was created by the

Minneapolis Public Works Department for managing the Combined Sewer Overflow (CSO) Program. The CSO Program is a long-term project designed to eliminate storm water runoff from entering the sanitary sewer system. It also cross references all 115 identified CSO areas against future capital projects, as well as identified flood areas. Contact: Lane Christianson at 612-673-2522 or lane.christianson@ci.minneapolis.mn.us.

The Minneapolis downtown map displays the common names and notable landmarks of the major downtown features. Contact: Jeff Schroeder at 612-673-2040 or jeffrey.schroeder@ci.minneapolis.mn.us.

The Minneapolis Bike and Walking Trails map indicates bicycle trails within the City of Minneapolis. The background information is accented by using a hillshade, derived from the DTM. Minneapolis has a fairly flat topology and the hillshade is not exaggerated on this map. Contact: John Janzen at 612-673-3306 or john.janzen@ci.minneapolis.mn.us.

Conservation Planning for Minnesota's Shallow Lake Systems

Ann R. Zdroik
GIS Technician
Ducks Unlimited, Inc.
2525 River Rd.
Bismarck, ND 58503
Phone: 701-355-3500
azdroik@ducks.org

Darin R. Blunck
GIS and RS Manager
Ducks Unlimited, Inc.
2525 River Rd.
Bismarck, ND 58503
Phone: 701-355-3500
dblunck@ducks.org

Minnesota's shallow lakes are large wetland basins that provide migration and brood-rearing habitat for a variety of wetland-dependent wildlife and provide water quality benefits and recreational opportunities for Minnesota's citizens. Shallow lakes are subject to a wide variety of degrading pressures including drainage, sediment and nutrient loading, and presence of undesirable fishes. In response, Ducks Unlimited has developed a Living Lakes Initiative designed to deliver conservation projects that will restore and protect the functions of altered shallow lake systems. Through the Living Lakes Initiative, Ducks Unlimited is challenged to raise \$10 million dollars over the next 10 years for shallow lake restoration.

Poster Abstracts

Presenters will be available for discussion Tuesday from 6 to 7 p.m. in the Exhibit Hall

GIS-based conservation planning tools have been developed to focus the conservation efforts of Ducks Unlimited and our partners. A series of watershed-based emphasis areas have been established in which conservation projects would be targeted. The emphasis areas are distributed across the state to provide “stepping stones” of quality habitat for migrating water birds. Monitoring protocols within the emphasis areas are established to track the biological and environmental responses of Ducks Unlimited conservation programs. Within Minnesota, the presence of lesser scaup (*Aythya affinis*), a species of diving duck, is thought to indicate quality habitat in terms of macro-invertebrate food availability and water quality. Therefore, monitoring changes in relative abundance of lesser scaup through time will determine the efficacy of the types of conservation projects DU is delivering, thus allowing Ducks Unlimited to adapt our management and restoration prescriptions through time.

Displaying Stream Sampling Data for Managed Streams in Minnesota

Jamie Schulz
GIS Specialist
Department of Natural Resources Fisheries
2300 Silver Creek Rd. N.E.
Rochester, MN 55906
Phone: 507-285-7130
jamie.schulz@dnr.state.mn.us

For some Department of Natural Resources Fisheries Offices, stream management is a major part of their responsibility. In order to better understand the stream resource in Minnesota, a project has begun to add the capability to graphically represent data collected on the streams. A new stream survey manual is currently under development that will create a statewide database of stream information. Other data, including information collected using the current stream survey manual, areas where habitat improvement has been completed, special fishing regulations, stocking locations and volunteer sampling sites are also available in different formats and desirable to display along a stream.

Because data that is collected on streams is measured in river miles from the mouth, dynamic segmentation is used to display much of the data. By creating routes for managed streams we are able to display both point and linear data on the streams by adding event themes. Because event themes instantly reflect updates to the database, they are easily maintained. Distribution is accomplished by creating a shapefile of the event theme, with the knowledge that the event theme is updated periodically and this shapefile needs to be updated regularly.

Indexing Features to the 24K National Hydrography Dataset (NHD)

Sandi Kuitunen
GIS Project Manager
Land Management Information Center (LMIC)
658 Cedar St., Suite 300
St. Paul, MN 55155
Phone: 651-297-2615 Fax: 651-296-1212
sandi.kuitunen@state.mn.us

Funded through a grant from the U. S. Environmental Protection Agency, the Land Management Information Center (LMIC) and the Minnesota Pollution Control Agency (MPCA) are cooperating on a “Hydrographic Event Indexing Project.” This project will build upon the high-resolution (1:24,000) National Hydrography Dataset (NHD). Using the “Reach Indexing Tool”, developed by EPA, information associated with rivers or lakes such as stream gage locations, ditches or habitat improvement corridors will be referenced to the appropriate placement along the NHD features. This reference is called an index or event. By creating this link between the various databases and the NHD, easier data use and analysis is possible.

This poster will illustrate events that have been created for the project.

The key points to be shown about the events are:

1. The features and attributes in the original database are unchanged.
2. A separate event table is created that contains the key ID from the original database.
3. The event table contains the NHD key identifier called a reach code.
4. Events along a linear feature contain a measure to indicate where it is located along the NHD.
5. The events allow data from separate databases to now be compared.

LaCrosse Encephalitis Prevention using GIS

Chris Stevens
Metro. Mosquito Control District
2099 University Ave. W.
St. Paul, MN 55113
Phone: 651-999-1432
cstevens@mmcd.org

Kirk Johnson
Vector Ecologist
Metro. Mosquito Control District
2099 University Ave. W.

Poster Abstracts

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St. Paul, MN 55113
Phone: 651-643-8370
kirkjohnson@visi.com

Nancy Read
Technical Leader
Metro. Mosquito Control District
2099 University Ave. W.
St. Paul, MN 55113
Phone: 651-643-8386
nancread@mmcd.org

LaCrosse encephalitis is a potentially serious disease transmitted by the eastern treehole mosquito, *Ochlerotatus triseriatus*. MMCD is improving prevention efforts in the metro area by using GIS to integrate historic and real-time mosquito collection data with maps to target larval control. Adult *Oc. triseriatus* presence is monitored in mapped woodlots, which in turn can be inspected for artificial containers and natural treeholes that serve as larval habitat. Typically MMCD employees search for areas with a high *Oc. triseriatus* adult population, and then remove or treat breeding sources with larvicide at the time of inspection. However, if some habitat cannot be removed or is continually being generated in a location, the next rainfall will likely hatch more *Oc. triseriatus* larvae. GIS applications, FSA aerial photos, and MetroGIS Parcel data are used to display current monitoring results and areas previously inspected and/or needing scheduled clean up and treatments. In addition, chronic *Oc. triseriatus* trouble spots can be identified and inspected, and habitats containing overwintering eggs can be cleaned up before the first larval hatch in spring to break the cycle of continued infestation.

Minnesota's Geographic Data Clearinghouse

Nancy Rader
GIS Data Coordination Specialist
Land Management Information Center
330 Centennial Office Building
658 Cedar St.
St. Paul, MN 55155
Phone: 651-297-3281 Fax: 651-296-1212
nancy.rader@state.mn.us

Let's face it, the term one-stop shopping is a little overused these days. But, when it comes to finding GIS data online, Minnesotans can visit just one Web site to learn about and access nearly 4,000 GIS data sets. The Minnesota Geographic Data Clearinghouse (MGDC) is a cooperative of more than 20 data publishing organizations — federal, state, regional and local — that provides instant access to information about terabytes of data covering our state. This poster will introduce you, maybe reintroduce you, to the Clearinghouse, its services, partners and benefits. Learn about the new Clearinghouse Web site design,

data offerings through ftp, Web mapping services, “first-stop” pages that provide in-depth information on selected themes, interfaces with most major data providers and plans for the future. All organizations are welcome to participate in the MGDC; the poster will describe how you too can become a partner.

The North Ottawa Project, Bois de Sioux Watershed

Mark Reineke
GIS Analyst
JOR Engineering, Inc
PO Box 1084
Alexandria, MN 56308
Phone: 320-762-9740 Fax: 320-762-9741
mark.reineke@joreng.com

Due to the flood prone nature of the Red River Basin, impoundment sites are designed to hold flood waters until they can be released at a later date. The North Ottawa Project is such a site and is being built in the Bois de Sioux Watershed in western Minnesota. This poster is a culmination of graphics showing the design, benefits and geographic importance of this project.

Using GIS to Balance Wetland Preservation and Public Drainage Rights within the Rice Creek Watershed District

Jason Naber
Natural Resource Specialist
Emmons and Olivier Resources
651 Hale Avenue
Oakdale, MN 55128
Phone: 651-203-6028 Fax: 651-770-2552
jnaber@eorinc.com

Jonathan Hoekenga
GIS Specialist
Emmons and Olivier Resources
651 Hale Ave.
Oakdale, MN 55128
Phone: 651-203-6040 Fax: 651-770-2552
jhoekenga@eorinc.com

Emmons & Olivier Resources has been working with the Rice Creek Watershed District (RCWD) to develop Comprehensive Wetland Management Plans (CWMPs) for many of the public ditch systems throughout the watershed district. These CWMPs meet the RCWD's statutory requirements under the Minnesota Wetland Conservation Act (WCA) and Drainage Law.

The Minnesota Routine Assessment Methodology for Wetlands

Poster Abstracts

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(MNRAM) Version 3.0 was adapted into a GIS platform. The GIS was used to define high quality wetland preservation areas through a series of geoprocessing protocols. The GIS was instrumental in analyzing spatial questions such as wetland fragmentation and interspersions throughout the entire planning area. Information from this GIS analysis was used to shape land use by defining areas suitable for development and at the same time protecting high quality natural resources.

GIS played a key role in fulfilling RCWD's obligation under Minnesota drainage law. Many of the ditches in RCWD were constructed in the late 1800s to early 1900s. These aged systems, originally constructed for agricultural purposes, are now relied upon for conveyance of stormwater from rapidly developing watersheds. Because of the age and change of use of these systems, the RCWD is evaluating whether or not their ditches are in need of repair. One of the drainage law obligations RCWD must perform is a cost-benefit analysis for the repair project. In these projects the largest costs are estimated when dewatering resulting from the repaired ditch triggers wetland mitigation. The benefits are defined by the amount of existing wetland converted to upland as a result of the drainage and the lowering of floodplain elevations. Using hydrologic and groundwater modeling programs coupled with a GIS, repaired ditch conditions could be modeled to determine the acreage of drained wetland requiring mitigation, the acreage of developable upland produced and future floodplain elevations.

What's In My Neighborhood? Agricultural, Interactive Ag-Chem Incident Investigation Mapping

Gary Elsner
Soil Scientist
MN Dept. of Ag, APPD
90 Plato Blvd W
St Paul, MN 55107
Phone: 651-297-7268 Fax: 651-297-2271
gary.elsner@state.mn.us

The Minnesota Department of Agriculture (MDA), Incident Response Unit (IRU) is the Minnesota State lead agency for response to and investigation of incidents involving Agricultural Chemicals (Ag-Chem). To assist individuals looking for information about Ag-Chem Incidents, the IRU recently updated our Web page to include several sources of information for use in determining if there are any Ag-Chem incidents related to a site or parcel. This information includes a list of incidents in our database for each county, a copy of our Ag-Chem Incident Priority list and an interactive ArcIMS Incident Investigation Mapping application called "What's In My Neighborhood? - Agricultural." The mapping application is similar to the

Minnesota Pollution Control Agency "What's In My Neighborhood" application. Users of this site have included consultants, property owners and potential buyers, lenders, public employees and private citizens. The spatial data for incidents that the IRU displays on this site includes a point layer for small incidents, a point layer for Old Emergencies (unverified locations), a polygon layers for large spills and/or investigations and a polygon layer for sites that are closed with soil and/or ground water contingencies.

In addition to the publicly available ArcIMS application, the MDA IRU uses an internal password protected version of the "What's In My Neighborhood? - Agricultural" application for access to and creation of spatial data related to Ag-Chem Incidents. The internal version of our application includes all of our incident location data and data from external sources, such as the Minnesota Department of Health Wellhead Protection area layer. This application assists our on call team, incident project staff and other MDA staff in evaluating site risk. For new incidents, the internal site includes a tool for field or office staff, which is responding to incidents, to create points representing the locations of reported incident. This tool creates a point(s) at the location the user clicks on with their mouse. Clicking on the location they want to map pops up a form, pre-populated with the date and coordinates of the location they clicked on and has text fields for site-specific information about the incident. These points, which are displayed on-screen as soon as they are created, are stored in a DB2 spatial database. The DB2 database is then used in ArcEditor by office staff to create the spatial data associated with new incident case files.

Minnesota: Land of Too Many Wildfires

Melissa Aho, Ramsey Community College

Minnesota may be the land of 10,000 lakes, but it is also home to thousands of wildfires annually. The Minnesota Department of Natural Resources (DNR) keeps track of wildfires in the state of Minnesota that fall under their jurisdiction. While it is important to look at where these wildfires occur, it is equally important to look at when they take place in the year. Maps, created with GIS technology, can be easily interpreted by the public, helping them to understand the potential for wildfires in their area, and may even prevent future occurrences.

Boulder Lake (Student Competition Poster)

Russ Jones, Fond du Lac Community College

I like fishing, so for a GIS practical applications class I decided to do a project that I have interest in. I decided to make a fishing lake map of Boulder Lake. There are not many detailed maps of lakes like Boulder Lake, unlike the more popular large fishing

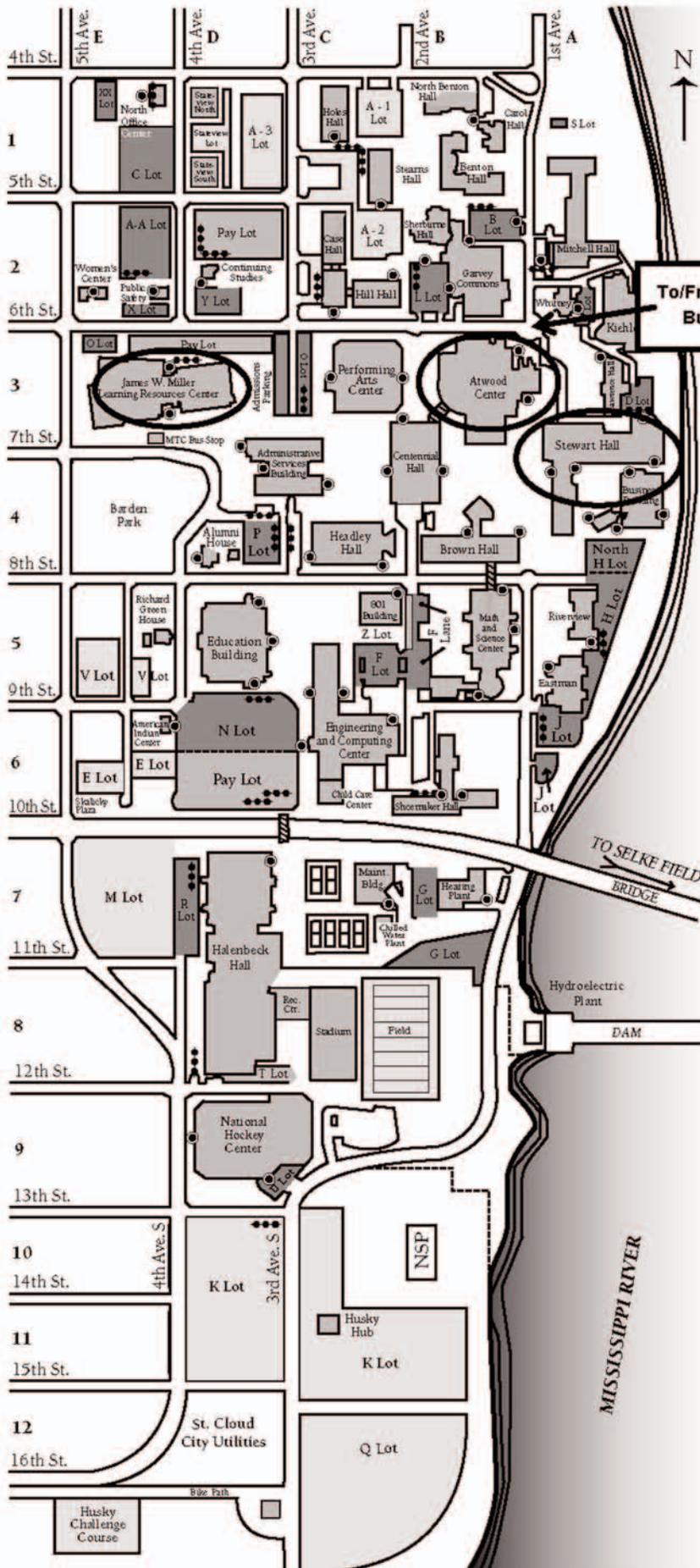
Poster Abstracts

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lakes. When you do find a lake map of one of these lakes it's usually just a depth contour map, who knows when it's been last updated. I picked Boulder Lake because it is one of my favorite fishing lakes in my area. I found that depth contour has not been updated since 1967.

I wanted to jazz up the look on fishing maps. I utilized free map downloads for my project and georeferenced them. I field surveyed the GPS waypoints and installed them on the lake. After producing this map I have felt the urge to try and market it, but there is much work to correct and add data to it. I have more ideas for this map, but I found ideas sometimes take time, and trial and error. There is a need for more information on lakes such as Boulder Lake, because they are usually uncharted and have many obstacles for boaters. Boulder Lake was named for a very just reason.

Map of SCSU



ST. CLOUD STATE UNIVERSITY CAMPUS MAP

Visit www.StCloudState.edu/campusmap/

TO REACH THE CAMPUS

- From Interstate 94: Use Exit 171, take County Road 75 into city, follow signs.
- From Highway 10: Exit at Highway 23 intersection, cross river, turn left at Fourth Avenue South, follow signs.
- From the Southwest (Highway 15, 23; County Road 75): All routes link with Division Street; turn right at Fifth Avenue South, follow signs.
- From the East (Highway 23): Cross river, turn left at Fourth Avenue South, follow signs.

LEGEND

AS	Administrative Services	C4
AH	Alumni House	D4
AIC	American Indian Center	E6
AMC	Atwood Memorial Center	B3
BH	Benton Hall	B1
BH	Brown Hall	B4
BG	Buildings and Grounds	E1
BB	Business Building (G.R. Herberger College of Business)	A4
CRH	Carol Hall	B1
CSH	Case Hall	C2
CH	Centennial Hall	B4
CCS	Continuing Studies	D2
ECC	Engineering & Computing Center	C6
EH	Eastman Hall	A5
EB	Education Building	D5
FLD	Field	B8
GC	Garvey Commons	B2
HaH	Halenbeck Hall	D7
HH	Headley Hall	C4
HiHH	Health Center	C2
HP	Heating Plant	B7
HiH	Hill Hall	C2
HoH	Holes Hall	C1
Huh	Husky Hub	C10
MC	James W Miller Learning Resources Center (library)	D3
KVAC	Kiehle Visual Arts Center	A2
LH	Lawrence Hall	A3
MB	Maintenance Building	C7
MS	Mathematics & Science Center	B5
MH	Mitchell Hall	A2
NHC	National Hockey Center	D9
NOC	North Office Center	E1
NSP	NSP Building	B10
PA	Performing Arts Center	C3
PS	Public Safety	E2
REC	Recreation Center	C8
RGH	Richard Green House	E5
R	Ritsche Auditorium (Stewart Hall)	A4
R	Riverview	A5
SBH	Sherburne Hall	B2
SMH	Shoemaker Hall	B6
STA	Stadium	C8
SVN	Stateview North	D1
SVS	Stateview South	D1
STH	Stearns Hall	C1
SH	Stewart Hall (Ritsche Auditorium)	A4
WH	Whitney House	A2
WC	Women's Center	E2
801B	801 Building	C5

Handicapped Parking
Wheelchair Accessible Entrance



2005 GIS/LIS Conference At-A-Glance

Tuesday, October 4

7:30 a.m. Conference Registration and Materials Pick-Up — Refreshments in Foyer
8:30 a.m. Opening Plenary Session — Karen Siderelis, Associate Director for Geospatial Information at the U.S. Geological Survey

10 a.m. Refreshment Break
Exhibit Hall Opens and Poster Display Begins

10:30 a.m. Concurrent Sessions

Stockinger Suite A	Opportunity Suite A	Stockinger Suite B	Opportunity Suite B	Herberger Suite A	Wilson Suite	Herberger Suite B
Session 1 Management Strategies	Session 2 Data Management	Session 3 Data Modeling	Session 4 Web Mapping	Session 5 Remote Sensing	Session 6 Student Track	Product Demos ESRI

Noon Awards Luncheon

1:30 p.m. Concurrent Sessions

Stockinger Suite A	Opportunity Suite A	Stockinger Suite B	Opportunity Suite B	Herberger Suite A	Wilson Suite	Herberger Suite B
Session 8 Federal Programs	Session 9 Data Management	Session 10 Data Modeling	Session 11 Web Mapping	Session 12 Remote Sensing	Session 13 Undergraduate Student Competition	Product Demos Nazca Solutions, ESRI

3 p.m. Refreshment Break

3:30 p.m. Concurrent Sessions

Stockinger Suite A	Opportunity Suite A	Stockinger Suite B	Opportunity Suite B	Herberger Suite A	Wilson Suite	Herberger Suite B
Session 15 Data Development	Session 16 Data Management	Session 17 Data Modeling	Session 18 Web Mapping	Session 19 Transportation	Session 20 Undergraduate Student Competition	Product Demos MN DNR, ThomTech Design, Inc.

5 p.m. Vendor Reception and Poster Session – Exhibit Hall
 Prize Drawings (must be present to win), Complimentary Hors d'oeuvres and Cash Bar

7:30 p.m. Beer Tasting Gathering — hosted by GeoComm at the Lahr building

Wednesday, October 5

7:30 a.m. Conference Registration and Materials Pick-Up

8 a.m. Exhibit Hall Opens – Refreshments Served

8:30 a.m. Concurrent Sessions

Stockinger Suite A	Opportunity Suite A	Stockinger Suite B	Opportunity Suite B	Herberger Suite A	Wilson Suite	Herberger Suite B
Session 22 Natural Resources	Session 23 Community GIS	Session 24 Parcels	Session 25 Homeland Security	Session 26 Water Resources	Session 27 Graduate Student Competition	Product Demos Pro-West & Associates, Plansight

10 a.m. Refreshment Break

10:30 a.m. Concurrent Sessions

Stockinger Suite A	Opportunity Suite A	Stockinger Suite B	Opportunity Suite B	Herberger Suite A	Wilson Suite	Herberger Suite B
Session 29 Community GIS	Session 30 Remote Sensing	Session 31 Parcels	Session 32 Homeland Security	Session 33 Natural Resources	Session 34 Education	Product Demos Pro-West & Associates, Taylor Technologies, Douglas County

Noon Closing Luncheon (Exhibit Hall closes) — Rob Nurre, The Surly Surveyor

1:30 p.m. Minnesota GIS/LIS Consortium Business Meeting and Year-End Review

2 p.m. Prize Drawings (must be present to win)
 Adjournment