

Conference Logo

20th NEW YORK STATE GIS CONFERENCE

GIS -- Connecting By Location

*The 2005 NYGIS Conference will be held at the
Rochester Hyatt in Rochester, NY
on October 17 & 18, 2005.*

October 18-19, 2004

Hudson Valley Resort and Spa
in Kerhonkson, New York

Keynote Presentation by **Hank Garie**, Acting Program Coordinator for The National Map
A Bold Step for the National Spatial Data Infrastructure: The National Geospatial Programs Office

UPDATED May 25, 2005: This page has been modified so that only information that would be of interest people considering going to the NYSGIS Conference '05 is available. Non-essential links have been removed.

[Presentations](#)

PowerPoint and other Presentations from the 2004 NYS GIS Conference.

[Program](#)

The 2004 conference program.

[Workshops](#)

Workshops are offered during all of the concurrent sessions of the conference.

[Posters](#)

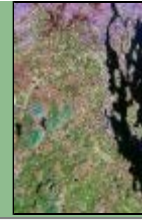
*Posters will be on display during the conference.
The Poster Session is Monday, October 18th, at 5:30pm.*

[Conference T-Shirts/Logo](#)

*This year's conference T-shirt design and logo was created by Eric Herman.
Congratulations Eric!*

LOOK AHEAD --> The 2005 NYGIS Conference will be held at the Rochester Hyatt in Rochester, NY on October 17 & 18, 2005.

Sponsored by the State University of New York, [College of Environmental Science & Forestry](#)



20th New York State Geographic Information Systems
Conference

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2004 Presentations

If you presented at the 2004 NYS GIS Conference, we would like to post your presentation on this page.
To be included, please submit your presentations to nysgisconf@esf.edu.

Topic:	Presenters:	Preseation:
Linear Referencing Systems and Dynamic Segmentation Workshop	Kevin Hunt and Laurie Cooper, New York State Department of Transportation	Power Point (.ppt) Handout (.pdf)
State of the State in GIS	William F. Pelgrin , Director, NYS Office of Cyber Security and Critical Infrastructure Coordination (NYS CSCIC)	View as HTML Download Powerpoint
Using a Spatial Join to Correlate ABGPS Camera Events with Aerial Photo Numbers	Jeffrey Barth, NYSDOT, Photogrammetry Section	Power Point (.ppt)

20th New York State Geographic Information Systems Conference

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Conference Program

Registration Brochure (This is a .pdf of the Registration Brochure. Registration forms are available on the Registration Page)

- [Presentation Abstracts](#)
- [Workshop Abstracts](#)
- [Poster Abstracts](#)
- [Featured Speaker Abstracts](#)

Pre-Conference: Sunday, October 17, 2004

12:00pm	Meet for Golf Tournament
12:30pm	Golf Tournament Tee Off
3:00-5:00pm	Exhibitor Set Up
7:00 - 9:00pm	Social Hour in the Lobby Bar

Day 1: Monday, October 18, 2004

8:00am	Registration and Continental Breakfast				
	Concurrent Sessions and Workshops				
	Duchess	Sullivan	Hudson	Columbia	Ulster
9:00am	<u>Session 1A</u> Vertical Datums Workshop	<u>Session 1B</u> Linear Referencing Systems and Dynamic Segmentation Workshop	<u>Session 1C</u> GIS Grant Funding for Local Governments Workshop	<u>Session 1D</u> Land Use Land Cover	<u>Session 1E</u> Asset Management
10:00am	Exhibits Open The Doctor's Office Opens AM Break in Ballroom B and C (Exhibit Area)				
	Concurrent Sessions and Workshops				

10:30am	Duchess	Sullivan	Hudson	Columbia	Ulster
	<u>Session 2A</u> Horizontal Datums Workshop	<u>Session 2B</u> ALIS	<u>Session 2C</u> Mobile GIS	<u>Session 2D</u> Land Use Land Cover	<u>Session 2E</u> 3D GIS
12:00pm	Lunch and Awards in Ballroom A Presentation on regional highlights by Herb Hekler, former Planning Director for Ulster County				
1:00 - 2:00 pm	<u>Manhattan Theater Keynote and Plenary Sessions:</u> Conference Welcome: Lee Herrington , Chair, NYS GIS Steering Committee Program Highlights: Austin Fisher , Steering Committee Member Keynote Presentation: A Bold Step for the National Spatial Data Infrastructure: The National Geospatial Programs Office by Hank Garie , Acting Program Coordinator for The National Map				
2:00 - 2:15 pm	NYS GIS/LIS Association Presentation , Sam Wear, GIS Manager, Westchester County and Michael Crino, GIS Specialist, Baker Engineering NY, Inc.				
2:15 - 3:00 pm	State of GIS in New York State by William F. Pelgrin , Director, NYS Office of Cyber Security and Critical Infrastructure Coordination (NYS CSCIC)				
3:00pm	PM Break in Ballroom B and C (Exhibit Area)				
	Concurrent Sessions and Workshops				
3:30pm	Duchess	Sullivan	Hudson	Columbia	Ulster
	<u>Session 3A</u> Geocoding Workshop	<u>Session 3B</u> Emergency Management	<u>Session 3C</u> Mixed GIS Topics	<u>Session 3D</u> NYS GIS LIS Meeting	<u>Session 3E</u> Programming Workshop
	LULC Meeting (Orange)				
5:15pm	Reception and Poster Session				
6:30pm	Optional Banquet Dinner (Tickets are \$25 each) in Grand Ballroom A				
7:30pm	Speaker: John Cloud, NOAA, Uncovering the Layers: The Complex Origins of GIS				
8:30pm	Comedian P.J. Walker				

Day 2: Tuesday, October 19, 2004

7:30am	Continental Breakfast in Gallery
8:00am	Exhibits Open The Doctor's Office Opens

Concurrent Sessions and Workshops

8:30am	Duchess	Sullivan	Hudson	Columbia	Ulster
	<u>Session 4A</u> Cartography Workshop	<u>Session 4B</u> GPS Workshop	<u>Session 4C</u> Water	<u>Session 4D</u> Remote Sensing/Imagery	<u>Session 4E</u> Local Government Advisory Meeting

10:00am [AM Break in Ballroom B and C \(Exhibit Area\)](#)

Concurrent Sessions and Workshops

10:30am	Duchess	Sullivan	Hudson	Columbia	Ulster
	<u>Session 5A</u> DEC Workshop: Hydraulic Models	<u>Session 5B</u> Homeland Security Workshop	Session 5C Databases	Session 5D Local Government	<u>Session 5E</u> Standards & Data Coordination Work Group

12:00pm [Lunch in Ballroom A and "Birds of a Feather" Topics](#)

Exhibits CLOSE

Concurrent Sessions and Workshops

1:30pm	Duchess	Sullivan	Hudson	Columbia	Ulster
	<u>Session 6A</u> Census Data Workshop	Session 6B Web Development	<u>Sesion 6C</u> Mixed GIS Topics	<u>Session 6D</u> Vendors Session	<u>Session 6E</u> Cancellation

Education Work Group Meeting (Orange)

3:00pm Conference Concludes

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Workshops

Topic:	Presenters:	Date and time:
Horizontal Datums: What are they and why you should care	Dr. Thomas Meyer, University of Connecticut	10/18/04 10:30-11:50am
Vertical Datums: What does "height" really mean?	Dr. Thomas Meyer, University of Connecticut	10/18/04 9:00-10:00am
GPS Workshop -- Facts and Fundamentals	Jonathan Cobb and Ken Pennock, Waypoint Technology Group, LLC	10/19/04 8:30-10:00am
Linear Referencing Systems and Dynamic Segmentation Workshop	Kevin Hunt and Laurie Cooper, New York State Department of Transportation	10/18/04 9:00-10:00am
Homeland Security Workshop: GIS & Homeland Security War Gaming: Preparing for an Uncertain	Bruce Oswald, NYS Office of Cyber Security & Critical Infrastructure Coordination (CSCIC) and Ed Freeborn, National Law Enforcement and Corrections Technology Center for the Northeast	10/19/04 10:30-11:50am
State Archives Workshop: Workshop on State Archives GIS Grant Funding for Local Governments	Jennifer O'Neil, New York State Archives	10/18/04 9:00-10:00am
Geocoding Workshop	Austin Fisher, Applied GIS, Inc.	10/18/04 3:30-5:10pm
Computer Cartography	John Barge, Lee Herrington, Bill Johnson	10/19/04 8:30-10:00am
Programming Workshop: Custom Application Development using ArcObjects and ArcIMS	Larry Spraker, Applied GIS, Inc. and Liz Arabadjis, Highland Geographic	10/18/04 3:30-5:10pm
Census Data Workshop	Bob Scardamalia, NY State Data Center, Department of Economic Development	10/19/04 1:30-2:50pm
DEC Workshop: Developing Hydraulic Models in a GIS Environment	Christopher O'Conner, Watershed Geographic Information Technology Section, Division of Water, NY DEC	10/19/04 10:30-11:50am

[Workshop Abstracts](#)

POSTERS

Developing Metadata Explorer Tools at Westchester County GIS

Xiaobo Cui, Westchester County GIS, Department of Information Technology

A Multiple Scale Approach to Assessing the Biological Integrity of Rhode Island Streams

Sara da Silva, Nelson, Pope & Voorhis, LLC

Updating USGS DEMS Using High Accuracy Elevation Points

Nathen Harp, NYSDOH

Municipal Government GIS Development in Westchester County, New York

Ana Hiraldo, Westchester County GIS, Department of Information Technology

Raccoon Rabies – A Public Health Response Utilizing Geographic Information Systems

Donald Irwin, Public Health Sanitarian, Nassau County Department of Health, Division of Environmental Health

Croton Bay Watershed Conservation GIS Mapping and Analysis

Cynthia Louie, Westchester County GIS, Department of Information Technology

Use of GIS in Hydrodynamic and Water Quality Modeling of Flushing Bay and Flushing Creek

Sumant Mallavaram and Guy Apicella, Lawler, Matusky & Skelly Engineers

Tracking Rare Wood Turtles with GIS and GPS in Westchester County, New York

Deborah Parker, Westchester County GIS, Department of Information Technology

Design of the Indian Point Emergency GIS (IPEG) Application

Ariane Porter, Westchester County GIS, Department of Information Technology

An OASIS in New York City!

Steven Romalewski and Christina Spielman, NYPIRG's Community Mapping Assistance Project

Integrating Traffic Signal Management Systems with Geographic Information Systems

Kevin Roseman, Westchester County and Cynthia Louie, Westchester County GIS, Department of Information Technology

County-wide Accident Mapping and Analysis

Marybeth Vargha, Otsego County

Customized Data Clipping Tool for ArcMap 8.3 with Visual Basic

Tong Zhou, Westchester County GIS, Department of Information Technology

[Poster Abstracts](#)

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T-Shirt Design Contest

The results of the T-Shirt/Logo design contest are in!

The 2004 NYS GIS Conference logo was designed by:

Eric A. Herman, GISP

GIS Program Manager

New York State Thruway Authority

Eric has received a complementary registration for this year's conference.

Congratulations Eric!



Presentation Abstracts

Abstracts are listed alphabetically by the first listed author's last name.

Providing Secure Imagery to Clients

Larry Alber, NYS DEC GIS Section, lalber@gw.dec.state.ny.us

Eric Shyer, NYS DEC GIS Section

DEC's GIS unit is responsible for providing imagery to the Agency's GIS users across both the LAN and WAN, which includes the Central Office in Albany and all twenty-seven Regional Offices across New York State. Therefore, development of an efficient method of web-based delivery of these large amounts of image data is important.

DEC in conjunction with Davis Associates and the Office for Cyber Security and Critical Infrastructure (CSCIC) have developed a methodology for providing secure imagery using an Earth Resources Mapping (ERM) Image Web Server v2.0 and Microsoft IIS. The images can be viewed in an HTML environment and incorporated into an ArcGIS environment.

Providing secure imagery includes authentication, authorization and encryption in order to make sure that only the clients authorized to view the images actually do, and that the images can not be "sniffed".

To restrict access to an ECW file (native ERM image format) or directory of ECW files using IIS and NTFS file permissions two steps need to be accomplished. First, the ECW file or directory must have anonymous access disabled and only the basic authentication enabled in IIS. To safeguard the user password, Secure Sockets Layer (SSL) encryption should always be used whenever Basic authentication is used. Second, the file permissions for the ECW files must be set so that only the users/groups added have access to the files.

Using the above methods a server can establish an environment where secure encrypted images can be supplied to authenticated, authorized clients.

Good Stuff Cheap: Breaking into ArcGIS without Breaking the Bank

Liz Arabadjis, Highland Geographic, Liz@HighlandGeographic.com

Many municipalities are hesitant to migrate their existing data to the geodatabase model because of fiscal concerns. With rising taxes and less funding from the states, the money to purchase ArcSDE, Oracle or SQL Server, to hire a database administrator, as well as the cost of migrating the data just doesn't exist.

There are, however, many advantages of the new topology functionality and great editing tools available in ArcGIS. For relatively small municipalities, the personal geodatabase option is a perfectly valid alternative. This option utilizes Microsoft Access as its database engine (included with a copy of ArcGIS); no need for any other expensive software. This presentation discusses some of the considerations given to - and lessons taken from - designing and implementing geodatabases in smaller organizations. Real-world examples of how data that exist on mylar and in CAD drawings are migrated to a geodatabase will be shown.

GIS for 3D Visualization

Dr. Rachel Arulraj, Parsons Brinckerhoff Quade & Douglas, arulraj@pbworld.com

Doug Eberhard and Brandon Young, Parsons Brinckerhoff Quade & Douglas

3D visualization has been in use for a variety of architecture, engineering, manufacturing, and planning applications over the last few decades. GIS has also been around in various forms of evolution during the same period. This paper presents the technologies available for bringing together major developments in the fields of GIS and 3D Visualization for real-world 3-dimensional projects. In other words, this paper demonstrates how GIS supports 3D visualization. The authors will cover a range of fundamental aspects for GIS to meet 3D visualization requirements, including - software solutions; hardware considerations; geospatial technologies used – GIS, CAD, remote sensing, photogrammetry, surveying, laser scanning; 3D

visualization techniques available; animated and interactive modeling avenues, etc. Further, examples of planning, construction and engineering projects using these interdisciplinary technologies will be described in this presentation. Samples of work done for projects above ground or underground will convey the intricate processes involved in using emerging technologies for current situations and scenarios.

Asset Management for Financial Reporting

Dr. Rachel Arulraj, Parsons Brinckerhoff Quade & Douglas, arulraj@pbworld.com

John Clemente, Rene Freyman, and Rashmi Mehta, Parsons Brinckerhoff Quade & Douglas

City of New Rochelle has been using GIS for various city projects, and has an extensive and detailed GIS database. The Department of Public Works, City of New Rochelle, maintains several City owned infrastructure assets. The Finance Department wanted to develop an accurate reporting mechanism for the preparation of realistic financial goals for the City. Asset Management became a requirement in the near past as the City initiated the reporting of assets more realistically and accurately for the purposes of financial reporting. "Asset Management" no longer was a buzzword for the City, it was their solution to manage City owned infrastructure with new equipment, update mechanisms, and reporting methods for the benefit of the City.

An early realization was that asset management was not just a technology-driven system. The technology of asset management (i.e., data collection and data analysis technologies) should never determine the do-all-end-all of asset management. Logical reasoning is far more important than just accurate inventory and mathematical formulae. Clearly, the ability to cost-effectively collect, process, and analyze large amounts of information enables a comprehensive asset management approach to become viable, but does not enable the actual implementation of a management strategy.

This paper discusses technical challenges, management strategies, and realistic achievements with physical, temporal and financial constraints. This paper will be useful to those planning to implement an Asset Management system to enable GASB 34 reporting, as well as for general asset management.

Evaluating Management Scenarios in the Croton Watershed

Amy Atamian, GIS Program Leader, Malcolm Pirnie, Inc., Aatamian@Pirnie.com

Kimberlee Kane, New York City Department of Environmental Protection

Cindy How, P.E. and Lee Wordsman, Malcolm Pirnie, Inc.

The Croton Watershed is the oldest portion of New York City's drinking water supply system, and is already heavily developed. To achieve water quality goals, a GIS-based risk assessment methodology was developed to help the NYCDEP optimize watershed management efforts, and focus limited resources on critical areas to achieve maximum water quality benefits.

Specific methodologies were developed for each of several water quality variables, which are dependent upon both the characteristics of the variable and the data available. In addition, watershed characteristics that may enhance or mitigate transport from a source, such as slope or soil type, are considered along with zoning, socio-economic data, and other indicators of development under "fully-developed" conditions. While the analysis was intended to compare risks between subbasins, use of the GIS provides sufficient detail to identify localized areas of concern at the parcel level, and the ability to prioritize areas based on additional user-defined objectives.

A decision support and project tracking application was developed to support the NYCDEP's on-going watershed management activities. With this tool, NYCDEP will be able to prioritize its watershed monitoring, protection and restoration efforts and provide local stakeholders with technical information for their own watershed programs.

Small Town Uses GIS to the Max!

Sandra Avampato, GIS Coordinator, Town of Lloyd, tlpz@townoflloyd.com

In 1997 we incorporated GIS into our land use work. The town board allocated \$40,000 to digitize our tax parcel maps in cooperation with Marlborough and Plattekill. This initiative enabled us to be freestanding, to use GIS maps/data on demand. We demonstrated our ability to directly service projects where the significance was only relevant on the local level, an incredible staff enhancer. The town established a line item in the budget to fund staff training, supplies, program updates, and development. Planning Board, ZBA, Building Department, Code Enforcement, Town Clerk, Water, Sewer, Highway, Assessor are actively engaged in harnessing GIS potential. In 2002 and 2003 our EDC hosted a well-received seminar attracting 100 participants, with GIS as a central focus. In 2003, Lloyd worked with the Wildlife Conservation Society to identify various species in the town. Our Comprehensive Plan employs GIS to illustrate salient points. We interface with UC Information Services, Planning Board, and RPS for information exchanges, equipment sharing: e.g., in Spring 2004 we began mapping our infrastructure using the county's Trimble Mobile unit to map fire hydrants, street lights, catch basins, water and sewer lines.

Using a Spatial Join to Correlate ABGPS Camera Events with Aerial Photo Numbers

Jeffrey Barth, Mapping Technologist, NYSDOT, Photogrammetry Section,
jbarth@dot.state.ny.us

This presentation describes a practical use of a spatial join. The process is used by the NYSDOT Photogrammetry Section to correlate two types of point datasets. Once these datasets are joined, the resulting data can then be used for direct input into the photogrammetric mapping software employed by NYSDOT.

One of these sets of point data is generated from the Airborne Global Positioning System (ABGPS), which is now used on all NYSDOT aerial missions. This represents the actual XYZ locations of each photo center and is recorded as a sequential camera event marker number. The other set of input point data is generated from the photogrammetric software itself and represents the predicted locations of each photograph (based on parameters from flight planning). The numbering of this dataset corresponds to the actual photo numbers from the aerial photographs. The spatial join correlates these actual photo locations to the predicted photo locations and resolves the matching of camera event markers to the actual photo numbers.

This may not seem like a difficult task, but it can get complicated. The use of GIS software to perform a spatial join is very helpful. Especially in some complex cases where strips of aerial photography are flown several times, making manual correlation attempts difficult and time consuming.

Real - Time Mobile Asset Tracking

Jason Baum, Associate Computer Programmer / Analyst, NYSDOH,
jdb09@health.state.ny.us

The goal of the Mobile Asset Tracking (MAT) Project is to retain control of critical emergency assets while they are being transported during a drill or a real emergency. The assets are delivered by truck from a delivery point to a staging area. While inventory control programs are used at the delivery point and staging area, the assets essentially disappear en route. This project allows these trucks to be tracked in real time on an internet mapping application. This project can be applied to any situation where real-time location is important.

The equipment for this project is modest: a cell phone. The firmware of the phone is modified to send its coordinates to a server every minute, where the locations are received and incorporated into a web mapping application. Support for the IT aspects of the application should be exceedingly low once it is set up. We are simply taking advantage of the rapid pace of technological improvement in cell phones, which are virtually GPS enabled mini-laptops. With the low per-unit cost and easy setup, there may be many more applications for this technology in the future.

Streamlining the Municipal Office with Custom Applications

Phillip Bellizia, Highland Geographic, pbellizia@highlandgeographic.com

Highland Geographic developed a suite of applications to save time, increase efficiency, and improve customer service. Developed in Visual Basic for use with ArcGIS, these applications provide powerful tools to perform complex tasks simply. They are designed to be used by anyone from GIS novices to experts.

- “Parcel Search” provides a simplified method of searching a parcel layer by Parcel-ID, Owner, or address.
- “Abutter List” finds the abutting parcels for a selected set of parcels and creates an address list in either a text file or standard mailing labels in Microsoft Word.
- “Parcel Flyer” creates a standard letter-sized information sheet for a selected parcel. The parcel's attribute information is placed at the top of the page with a map at the bottom. This applet is ideal for offices that need to share property information with other departments, realtors, developers, and landowners.
- “Map Book” allows creation of multiple maps (i.e. tax maps) for management within a single ArcMap document.
- “RPS Version 4 Extract” is a standalone application that works whether you have a GIS or not. It extracts data from an RPS Version 4 database and writes them to a manageable number of tables in a Microsoft Access file (.mdb). The RPS Version 4 Extract tool provides quick and easy, up-to-date

access to your RPS data. It allows you distribute your RPS data to those who need it most, when they need it.

This presentation will demonstrate and discuss each of these applications in greater detail.

A Technical Look Inside the ALIS Statewide GIS Data Sets

Cheryl Benjamin, Chair, NYS Office of Cyber Security & Critical Infrastructure
Coordination (CSCIC), cheryl.benjamin@cscic.state.ny.us

New York State recently took delivery of the NYS Accident Location Information System (ALIS) GIS data, often referred to as the new Statewide GIS Roads and Addressing Data. This technical presentation will introduce the NYS GIS user community to the various GIS data sets that were developed as part of the ALIS project, focusing on their data content and structure. We'll look at the street name, address, and route number attributes on the Roads file, including the alternate/alias street name tables and how they are used for geocoding. The vertical integration of the NYS Civil Boundaries with the Roads data will also be examined. Census data users will be especially interested in the new block-level NYS Census Geography data that has been vertically integrated with the roads, railroads, civil boundaries, and hydrography ALIS data sets. Finally, key elements of the documentation that accompanies the data will be highlighted.

Customized ArcObjects Tools for Intelligent Line Tracing and Attribution, and Conflation

Kosta Bidoshi, Applied GIS, Inc., kbidoshi@appliedgis.com

Successful implementation of a GIS often requires the exchange and integration of information across databases. The process of attribute assignment is usually accomplished during the digitization of features. However, many local and government organizations come across the need for assignment or re-assignment of attribute data in their digital maps. We identify two major scenarios in which attribute data is assigned during post-processing:

- 1- Tagging the data with attributes not available during the time of capturing or assigning new attributes to GIS data captured for a different purpose
- 2- Attribute transfer between data of different sources (data conflation).

In this presentation we will provide a summary of two semi-automated modules (built in the ArcGIS environment using ArcObjects) that perform attribute assignment and transfer. We use common characteristics of features (such as location and topology) to automatically assign attributes. Visual representation through animation is used to show progress of the automated procedures. Automation techniques are complemented with an interactive user interface that facilitates decision-making.

Local Government Web Hosting Pilot

John Borst, NYS Office of Cyber Security & Critical Infrastructure, john.borst@cscic.state.ny.us

Under the auspices of the NYS GIS Coordination Program, the NYS Office of Cyber Security & Critical Infrastructure Coordination (CSCIC) is providing funding for a one year Local Government GIS Web Hosting Pilot. The pilot includes the development of an online GIS application for Clinton, Delaware, and Tioga Counties, and the Town of Brunswick as well as web hosting services for a one-year period. The focus for the application is to support everyday business uses for people accessing/utilizing parcel (land records) data. After one year, the pilot will be evaluated for future direction. While CSCIC is providing many of the NYS basemap layers to be used as references points for users, each locality is providing parcel data in addition to any other relevant local datasets they have developed.

Participants in the pilot project will demonstrate the online GIS applications that have been developed and share their insights on the progress of the pilot to date.

GIS as a Key to Intermunicipal Cooperation

Candace Brennan, GIS Specialist, C&S Engineers, cbrennan@cscos.com

Intermunicipal Cooperation (IMC) is the sharing or merging of resources, services, and manpower between multiple governing entities. Municipalities

enter into IMC agreements with each other to save time, money, and raw material without sacrificing the quality of their services. An internet GIS is the best solution for the management of an IMC because it can track and manage all municipal infrastructure, provides a common interface that all involved parties can use, is available anywhere there is an Internet connection, and can act as a pilot phase to test the waters for a full blown IMC.

There are many benefits to be reaped through IMC, and many ways in which IMC can be applied. It can be as simple as shared responsibility for snow removal in adjoining towns, or as complex as the full integration of municipal departments. No matter which method municipalities choose, GIS can be of assistance, from initial pilot phase to full implementation. Some of the benefits of using GIS to manage IMC are:

- Provides a common application interface, allowing sharing of manpower with no additional training needed
- Increased operational efficiency
- More efficient sharing of equipment and resources
- Easy evaluation of additional benefits from IMC
- Enables additional members to join the IMC with little effort

Simultaneously Recording Field Data and Location Coordinates Automates an Overland Gamma Radiation Survey with Actual 100%

Francine J. Cohen, Senior Geologist, URS Corporation,
Francine_Cohen@URSCorp.com

URS Corporation (URS) simultaneously recorded radiological field data and location coordinates obtained using a global positioning system (GPS) to minimize data acquisition time requirements for a overland gamma radiation survey at a FUSRAP site located in western Pennsylvania. A geographic information system (GIS) was then used to map and interpret the survey results.

Conventional overland gamma surveys are completed by establishing grids over the survey area and manually collecting one data point at the center of each grid, with the single data point considered to be representative of the entire grid area. Survey data are then manually transcribed and paired with the location data for reduction, mapping, and interpretation.

URS connected the radiation survey instruments to GPS units having auxiliary data recording channels that simultaneously recorded the gamma measurement and associated location. The equipment was mounted in a large-wheeled baby stroller to complete the field traverses. URS used three such setups to acquire the field data across the entire 44-acre site in less than two weeks. The efficiency of the setups allowed the field crews to obtain a sufficient density of data points equivalent to 100% site coverage.

Data files were downloaded in the field to a laptop PC for immediate QA/QC. Data gaps were promptly filled in and areas of poor data quality (for example, malfunctioning radiation survey instruments) were resurveyed. After field approval, data files were transmitted via email to a URS office for further QA/QC and processing. In the office, the data files were directly input to an ArcView GIS for mapping and interpretation. No manual data transcription was required from field data acquisition to final reporting.

FEMA's Map Modernization Program

Michael Crino, Baker Engineering NY, Inc, mcrino@mbakercorp.com

The Federal Emergency Management Administration (FEMA) is embarking on a challenging project to update each of the flood insurance rate maps (FIRMs) to a digital format (DFIRM). This initiative, known as the Map Modernization Program, will update over 100,000 flood map panels nationwide. In New York State, over 1,600 communities participating in the National Flood Insurance Program (NFIP) are scheduled to have their flood insurance rate maps updated over the next five years.

Development of a flood map is an interdisciplinary effort that integrates surveying, hydraulic/hydrologic engineering and mapping. GIS has long been a tool used in varying degrees for each of these steps in creating flood maps. FEMA, with cooperation from its mapping partners, is further integrating GIS into all phases of the flood mapping process. This presentation will introduce some of the key GIS tools, business processes and data standards developed to improve the overall quality of the flood mapping products and to meet the ambitious goals of the program.

GIS at a Medium-Sized Water Utility

Elisabeth DeGironimo, Mohawk Valley Water Authority (MVWA),
edegironimo@mvwa.us

The Mohawk Valley Water Authority (MVWA) is in a multi-year process to update base mapping and provide wireless map and document access to field personnel. This presentation addresses the development of an ArcGIS-based water distribution system basemap, hydraulic model, and ArcIMS site at the MVWA. The MVWA serves more than 125,000 people in the Greater Utica area. Within a service area covering more than 150 square miles, the MVWA maintains approximately 700 miles of pipe, 24 storage tanks, 3 reservoirs, and 22 pumping stations.

Location in Motion – A Crash Course on AVL Technology

Austin Fisher, Applied GIS, Inc., afisher@appliedgis.com

Automatic Vehicle Locator (AVL) technology is used to track and visualize vehicle positions. These systems capture geographic coordinates using GPS and often integrate GIS to display and manage the vehicle location data. AVL is being used in a wide range of applications from fleet management to E911 dispatching and by organizations such as public works departments, emergencies services, utility companies, and many types of private sector businesses.

This presentation will provide an introduction to AVL including: an overview of its primary components; configuration options; application examples; implementation considerations; and system benefits. A demonstration of AVL technology will also be presented and system hardware will be available for viewing.

Visualizing Statistical Relationships Spatially: Underutilized ArcGIS Tools

Joe D. Francis, Cornell University, jdf2@cornell.edu
Antoni Magri, Cornell University

GIS professionals are very creative and effective in portraying, displaying and analyzing relationships among attributes associated with a variety of features in a feature class. An area of neglect has been in the employment of statistical procedures along with other visualization techniques. This presentation illustrates some usages of the graph/charting tools and the Geostatistical Analyst to show the power of spatial modeling over traditional statistical analysis. Traditional statistical analyses have not taken the spatial dimension into consideration sufficiently; doing so not only increases the powerfulness of the analysis of relationships, but also adds pizzazz to a presentation and report.

The Role of the Digital Camera in Emergency Response

Andrew H. Freckmann, EarthData International of Maryland,
afreckmann@earthdata.com

The migration of aerial imaging and mapping into an all-digital environment holds great promise to geospatial data users through improved image quality, positional accuracy and flexibility in product offerings.

2003 was the first year when high resolution digital aerial camera systems were widely used in the geospatial marketplace and over the course of the year, this technology was repeatedly tested and proven as a valuable tool to support planners and emergency managers during natural or man-made disasters.

This presentation will detail the circumstances, the project plan that was developed and the resulting geospatial products that were produced in response to 2 major disasters that occurred during 2003. Both disasters, Hurricane Isabel and the vast wild fires that struck southern California both involved the need to map large areas and to produce and deliver the completed map data very rapidly with both projects exceeding 2,000 square miles and completed within 30 days.

Digital imaging technology also produces a variety of ancillary products that have value in emergency response but are also valuable in disaster preparedness planning and analysis.

The presentation will provide an overview of the technology, a description of the planning and logistics of a disaster response mission and examples of the types of imagery and products that can be produced.

Developing International LULC to Enhance Border Security in NY

Ed Freeborn, Geographic Information Analyst, National Law Enforcement and Corrections Technology Center for the Northeast (NLECTC-NE),
edwin.freeborn@l-3com.com

The Institute for the Application of Geospatial Technology (IAGT) sponsored remote sensing projects for 14 states in the Northeast US. The project sponsored in New York developed LULC data for NY's northern border with Canada, including Ontario and Quebec. This data extends 10 miles (16 km) into Canada and 10 miles into NY, and will be used to enhance border enforcement. A unique partnership of agencies was formed to apply for the grant and develop the data.

Asset Logistics Management System for New York City

Jenny Gnanendran, Ecology and Environment, Inc., jgnanendran@ene.com

NYC Office of Emergency Management (OEM) and Ecology & Environment Inc.'s conjunctive goal was to develop an easily maintained citywide asset and logistics management system (CALMS) with immediate value to the Citywide EOC Logistics Team prior to, during, and after an emergency. The online system incorporated information routinely required by the logistics staff, and reduced inefficiencies in accessing and mapping critical resource information. The Logistics Task Force and OEM's Logistics experts used their experience to identify and determine the main functionality needed from CALMS. It was decided that the secure online system would be used to track and map key Facilities, Fleet, Personnel, and Supplies/Equipment, as these are the most frequently requested assets or needs during an emergency.

MapInfo

Doug Gordon, Managing Director, Product Management, MapInfo

N/A

The utilization of Spatial Analysis and 3-D Visualization to site wind farms in Chautauqua County, New York

Kevin A. Gray, GIS Analyst, Ecology and Environment, Inc., kgray@ene.com

Wind power is an underutilized alternate energy resource that has a high potential to reduce energy costs. Careful and specialized preplanning is necessary to locate ideal wind farm locations. This paper describes how GIS spatial analysis was used to make the Chautauqua County Wind Farm siting process more efficient, and focuses on using 3D visualization as an effective decision making tool. The parameters used to determine suitable locations include: wind speed, land use, slope of terrain, and distance from existing street and power ROWs. 3-D visualization techniques of the proposed wind farm, which took the form of a multi-scenario movie, were used for the final review.

GIS Habitat Models for Spruce Grouse in the Adirondack Park

Sunita Halasz, Environmental Program Specialist, NYS Adirondack Park Agency,
sshalsz@gw.dec.state.ny.us

The Adirondack Park Agency developed two models of potential Spruce Grouse (*Falcapennis canadensis*) habitat to aid Dr. Glenn Johnson of SUNY Potsdam in his ongoing Spruce Grouse research in the Adirondack Park. Spruce Grouse are classified as an Endangered species in New York State, with perhaps only 175-315 individuals left in New York State in very specific lowland boreal habitats in the Adirondacks. The specific habitat type preferred by this species lends itself well to being modeled using Geographic Information Systems (GIS) technology, and therefore GIS is an excellent tool for guiding where the Spruce Grouse research team should conduct additional visits. In addition to being used for identifying future monitoring areas, the habitat model can also be used to measure habitat connectivity and habitat quality which can be used as a basis for a spruce grouse recovery/management plan and/or to identify areas on the landscape requiring further protection.

Dynamic Models of Land Use Change in the NE USA

Myrna Hall, Professor, Faculty of Environmental Studies, SUNY College of Environmental Science and Forestry, mhhall@esf.edu

R. Neil Sampson and Mary Tyrrell, Yale Global Institute for Sustainable Forestry, Yale School of Forestry and Environmental Studies

Contrary to the commonly accepted axiom that forests in the NE are coming back, we have found that the privately-owned "working forest" landscape of this region is increasingly under threat from urban sprawl and other unplanned development. We apply a land use/land cover (LULC) change model, GEOMOD, to analyze those factors that explain past patterns of forest fragmentation in the Catskill/Delaware Region of New York State and the Thames Watershed of Connecticut and Massachusetts. Systematic changes are identified through accounting for persistence of large LULC types, and model validation at multiple scales is explored. Using satellite-derived rates of forest loss we project development in each region to create the most likely landscape 10 and 20 years hence. Additionally, we are able to show that parcelized land holdings are 1.5 times more likely to lead to forest fragmentation than non-parcelized.

Integrating GIS in an Automated Call Center

Graham Hayes, GIS Consultant, Red Oak Consulting, A division of Malcolm Pirnie, Inc, GHayes@PIRNIE.COM

Scott A. Mayers, Red Oak Consulting, A division of Malcolm Pirnie, Inc

World-class customer service is a strategic goal of most forward-looking water and wastewater Utilities. It is often the lens of public perception of the entire Utility's operations. Continuous improvements in customer service and public relations can pay immeasurable dividends in the value that the Public places on their water and wastewater utility providers.

Red Oak Consulting, a division of Malcolm Pirnie, Inc., have combined their experience with GIS as a visualization and analysis tool, with their IT experience setting up Automated Call Centers, to leverage the benefits of both technologies for a unique customer service application.

The primary goals of automating a customer service call center are to:

- Improve customer service by reducing wait time
- Provide self-service options
- Route emergency calls
- Reduce processing time for each call
- Track customer calls by type
- Provide a system to monitor call center employee performance.

Based on an assessment of the manual call center performance statistics it was determined that five new customer self-service applications would be useful:

1. Automated 30-Day Payment Extensions
2. Meter Re-read requests
3. Centralized Main Break reporting
4. Water Quality Complaints
5. Water Pressure Complaints

Three of these applications, the main break, water quality, and pressure complaint tools lend themselves to direct GIS integration. The meter re-reads request will (in the future) be integrated into an existing GIS-based vehicle routing package.

To provide the "hook" between the customer service call records and the GIS, customer service locations were created by geocoding the customer service address to a series of parcel label points created just inside the property line or as offset points from "geocodable" street centerline files. By creating and maintaining customer service locations in the GIS with customer service-IDs, related records from work order tracking, water quality (LIMS), and Leak History can be tied to the customer service location for visualization and analysis.

The integrated GIS functions include zooming to the property address of the caller, displaying call history from the caller and surrounding neighbors. A future integration will include the location of all recent work orders to help recognize changes in the system (i.e. flushing programs, leaks, pressure loss from fire flow, etc.)

The ability to display all active calls on a map within a given time frame allow dispatchers to assess and recognize trends or cluster in call patterns related to a single or multiple outage events. The initial automated message can be immediately updated to acknowledge known problems to lessen the volume of calls. An additional future enhancement includes the use of an automated outbound dialer to proactively warn customers in a region when a series of

calls begin to emanate from a specific neighborhood.

While the independent use of GIS and Automated Call Centers offer increased productivity, the combination of both technologies can offer even greater return on investment.

Using ArcIMS to Study Quality of Traffic Flow at Ramp Junctions

Eric Herman, GIS Program Manager, NY State Thruway Authority,
eric_herman@thruway.state.ny.us

Interchanges, particularly ramp junctions, are frequently among the first places to fail on an expressway. The Level of Service (LOS) at a ramp junction represents the quality of traffic flow at that junction. With an internal, browser-based GIS application, the NY State Thruway Authority is using ArcIMS to harness the power of GIS for analyzing this type of data. Through data from the Authority's Ramp Junction LOS Project, information concerning traffic conditions at each ramp junction is coming to life in all new ways. The application makes it much simpler for data users to perform valuable analyses about the performance of the highway at these critical junctions, and to help plan for improvements in service to all Thruway customers.

South Shore Estuary Reserve Open Space Evaluation Presentation

Jeffrey L. Herter, Division of Coastal Resources, New York State Department of State, jherter@dos.state.ny.us
Peter Lauridsen, NYS Dept of State, Division of Coastal Resources

The New York State Department of State, Division of Coastal Resources, is responsible for providing data and analysis to the South Shore Estuary Reserve (SSER) office for assisting with programs and decision making. Four years ago the Division completed an initial analysis identifying all privately owned parcels greater than 5 acres in size that showed potential open space value in need of protection in the SSER. That analysis resulted in identification of nearly 900 parcels throughout the SSER that met those criteria. Since it is not practical to protect all identified parcels at one time, a method to prioritize the open space was needed. Division staff developed a scoring scheme with a list of variables such as size within a town, proximity to National Heritage Sites, Historic sites, Significant Coastal Fish & Wildlife Habitats, wetlands, land cover, Q3 flood zones, distance to water, etc. Once all variables were identified and scored, Division GIS staff set up a working session with other Division staff and developed an equation that incorporates each variable score. When the equation was agreed upon, it was applied to each candidate open space parcel to derive an overall score which resulted in a prioritized list for open space protection, by town, in the SSER.

Consistency Review Application Presentation

Jeffrey L. Herter, Division of Coastal Resources, New York State Department of State, jherter@dos.state.ny.us
Nikifor Nikiforov and Bridget Kennedy, Division of Coastal Resources, New York State Department of State

The New York State Department of State, Division of Coastal Resources, is responsible for timely review and decision-making involving federal, state, and local actions in the State's coastal area. Currently, the Division reviews approximately 1,200 actions each year. The purpose of this project was to provide a more efficient process to review these 1000+ applications. The Division created a relational database from "flat" spread sheets, converting 8 years of consistency review project records into an MSAccess database. A graphic user interface (gui) was developed to facilitate Division staff access and queries of the database. Finally, the GUI and relational database were tied to a geographic component through a mapping application that provides connectivity to the master database allowing dynamic query capability, mapping of queries and records, and updating database. The project resulted in streamlined application processing procedures and provides a technical tool to analyze tabular and geographic data. Ultimately the project will assist in quantifying cumulative effects of coastal area development on natural systems.

Building an LULC Partnership

Colin Homer, USGS

One of the goals of the partnership formed under the IAGT sponsored grant is to demonstrate the value of LULC data, and to develop the partnership that will be required to ensure ongoing, updated coverage of the border region. An essential member of this partnership will be the USGS and the National Land Cover Dataset (NLCD) program. We have invited Colin Homer, Program Manager of the NLCD program to speak about their approach to developing partnerships with states and other cooperating agencies.

Development of a GIS Template to Assist Forest Stewardship Planning and Reporting for New York

Christine Hopkins, Graduate Student, SUNY-ESF, ChristineHopkins@twcny.rr.com

The USDA Forest Stewardship Program provides technical assistance, through State forestry agency partners, to non-industrial private forest owners to encourage and enable active long-term forest management through the development of comprehensive, multi-resource management plans. The New York State Department of Environmental Conservation (NYSDEC) has committed itself to this task. The desire for data standardization within the NYSDEC has led to the development of the Forest Stewardship Automated Data Entry System (FSADES). SUNY ESF has developed this application to make recording and reporting Stewardship activities more efficient. The application is an extension for ArcView 3.x.

The goal is to standardize Forest Stewardship Plans and manage the associated data in a universal format. This will allow for regional and statewide summarization of lands in the program and at the same time assist foresters in the creation of plan reports. The extension contains a self-explanatory user interface allowing for the creation of data in a guided format. Extensive familiarity with ArcView is not required. NYSDEC field foresters are the target audience for this extension, but considerations have been made for private consultants that may desire to use the extension as well. In creating a standard for Forest Stewardship Plans, it is expected that the development of management plans will become simpler and more efficient, and that the compilation of valuable statistics will be completed in a timely and efficient manner.

An Overview of the New Statewide GIS Roads and Addressing Data Set

William F. Johnson, NYS Office of Cyber Security & Critical Infrastructure
Coordination (CSCIC), william.johnson@cscic.state.ny.us

More commonly known as the NYS Accident Location Information System (ALIS) GIS Roads Data, this presentation will provide an executive overview of the newly available GIS Roads file and the other associated ALIS GIS data layers, why these data layers are important to the NYS GIS user community, and how the user community can assist with data maintenance. It is important that NYS' investment in this data is not lost. NYS is committed to continued maintenance of the data as shown by the ongoing data improvements NYS is performing and the maintenance partnerships being developed with other data stakeholders. The NYS GIS user community is invited to learn how they can join us in the continued improvement of the data by simply sharing their additions, corrections and noted errors in the data sets.

GIS Land Base Development and Data Integration Mapping the Essentials

Brent A. Jones, PE, PLS, Vice President, James W. Sewall Company,
bjones@jws.com

An accurate land base is the geographic foundation to a successful GIS. Given this, why do municipalities, counties, and utilities choose different scales, datums, resolutions, and coordinate systems? What criteria do they use in determining data accuracy and the accuracy they need?

To implement GIS, local government and utilities address questions of accuracy on a daily basis. What is the difference between aerial photography and satellite imagery? What photo scale and pixel resolution are appropriate for a given use? What happens when parcels don't line up with lines of occupation?

How are these conflicts resolved? Why don't the coordinates from the GPS receiver plot on the map correctly? Can this information be used for engineering? How are water lines on linen integrated into the GIS? How do we know if this data is accurate? How accurate should it be?

This session will present comprehensive, practical information on GIS land base development and data integration, identifying current challenges and current practices. Part of the discussion will focus on how to evaluate existing data accuracy and to achieve required accuracies using current technology.

The Evolution of a Web-Based Winter Traveler Advisory System

Marilyn Lamanna, Technology Support Analyst, NYS Department of
Transportation, llamanna@dot.state.ny.us

Early in the winter of 2002-03 the Director of the Transportation Maintenance Division (TMD) of New York State Department of Transportation (NYSDOT), Gary McVoy was appalled to discover that there was no system for providing the traveling public information on winter highway conditions. A team was formed consisting of individuals from: TMD, GIS Bureau, and the Information Services Bureau to develop a system to provide a web based application for the collection and dissemination of winter highway conditions for both internal and

public use.

The presentation will focus on the process developed to capture winter road and visible ambient weather conditions for 2400 segments of NYS highways for input by over 700 highway maintenance workers spread across over 230 physical locations across New York State.

We determined the types of conditions to report on in three categories: road status, pavement conditions and ambient weather conditions. The road status condition drives the color coding on a GIS map that is the primary end user interface. Next, the individual segments of our route system that would be reported on were joined across counties to create a map that would provide useful information for key corridors continuous across the State. Finally, the communications and updating process from the plow operators to the radio watch person who updates the system through a simple web form was established.

ArcGIS 8 and ArcIMS were used to create the real time web based application.

Environmental Remediation and Restoration Information Network

Byoungjae Lee, Department of Geography, SUNY Buffalo, blee4@buffalo.edu

Douglas M. Flewelling, Department of Geography, SUNY Buffalo

A. Scott Weber and Shankar Ram, Department of Civil, Structural, and Environmental Engineering, SUNY Buffalo

The Center for Integrated Waste Management (CIWM) housed at State University of New York at Buffalo has implemented a Web GIS based Environmental Remediation and Restoration Information Network (ERRIN) with funding from the New York State Department of EP. ERRIN is being developed to provide information regarding the New York State Superfund, Voluntary Cleanup, and Brownfield Restoration Programs. ERRIN provides a powerful tool to obtain information on environmental restoration projects in New York State and provides an opportunity to compare and understand the various factors that determine the remediation objectives at different hazardous waste sites.

ERRIN has been built as a three-tier architecture. It is composed of a database, application server, and the client. The database is managed by Oracle 9i database. Oracle 9iAS, Apache-Tomcat, and ArcSDE are used for the link between the database and ArcIMS 4.0 server. The client can access the website through an ArcIMS service. The communication between these tiers is facilitated and enhanced by JavaServlets, JSP, and JDBC.

ERRIN can be accessed through two easy-to-use interfaces (Web Interface and Map Interface) and a SQL Gateway for advanced users. A brief description of the interfaces is given below.

- 1) Web Interface: The Web Interface is primarily a form-based GUI. It has a query page that allows the user to search for sites based on specific criteria.
- 2) Map Interface: The Map Interface includes an interactive Map interface that is tightly integrated with a form-based GUI that allows the user to perform various queries. The map denotes sites that are in the database and is dynamically updated based on query criteria. Hence, in addition to the capabilities of the Web Interface, the Map Interface allows the user to perform spatial queries and represents the query results on a map.
- 3) SQL Gateway: This interface is meant for advanced users who are familiar with the Structured Query Language (SQL). The SQL Gateway includes a Query Builder that greatly simplifies the process of constructing queries.

The importance of this project is to show the way to provide a tool to obtain consolidated environmental information. Even previously created documentations can be successfully integrated with geographic data, and offered through the internet as easily accessible visual source and research tool.

AgViewer: An Internet Based Geographic Information System (GIS) to Query and Analyze NYS Agricultural and Environmental Data.

Arthur Lembo, Senior Research Associate and Senior Lecturer, Cornell University, ajl53@cornell.edu

This is a USDA funded GIS project to develop a user-friendly Internet based GIS tool for the query and analysis of New York State agricultural and environmental data at three distinct scales: State-level, District-level, and Local-level; With regard to applications at variable spatial scales, the State-level component includes data of relevance to NYS Ag & Markets, The district-level component allows users to display and analyze information typically associated with soil and water conservation districts, and the local-level component will include data normally associated at farm scale applications. The system was developed using Manifold GIS, and Internet Map Server and illustrates the potential for a low cost, and powerful GIS tool for organizations focused on agricultural and environmental applications.

An Interactive GIS for Brownfield Redevelopment - A Work in Progress

Sumant Mallavaram, Environmental Engineer, Lawler, Matusky & Skelly
Engineers, SMallavaram@lmseng.com
Patricia Parvis, Lawler, Matusky & Skelly Engineers LLP

A developer client of LMS recently acquired more than 1000 acres of a former industrial site to redevelop one of the largest privately owned brownfield sites in the United States. Several economic and community development agencies, state environmental agencies, the U.S. Environmental Protection Agency, and a regional economic development corporation are involved in a supporting role. In order to facilitate redevelopment activities, LMS designed and implemented an interactive GIS mapping application using ESRI's ArcIMS. The website permits sharing of available geospatial information among the involved parties. Data can be queried using a simple tool bar to answer a variety of questions ranging from basic information gathering to assessing complex relationships among proposed construction activities, existing infrastructure and areas of environmental concern. The main goal of this application is to create and maintain a platform for bringing data from several sources/formats together into a central repository in one consistent format. Further, it would be available to the stakeholders and decision makers with limited or no GIS experience in a simple easy-to-understand interface through the internet. This not only increases the efficiency of work flow significantly but also saves time by serving everyone's mapping needs in a consistent manner. Several enhancements to the application are planned for the near future and include an option for the user to view maps at a scale of his choice, printing the map to a PDF document (reusability), and an interface to perform a host of customized geospatial analyses (currently not available in the out-of-the-box ArcIMS).

LULC Development Capabilities at the Ontario Ministry of Natural Resources (OMNR)

Richard Mussakowski, OMNR,

As one of the partners in the IAGT sponsored international LULC project, OMNR was able to apply image segmentation and modeling analysis to produce a product in a timely and cost-effective manner. This presentation will review the applied approach.

Spatial Data Imaging Pilot Project

Dorothy M. Nash, OMAP Mapping Support Group, dnash@nypd.org

1. The City of New York has been developing spatially-enabled data on Critical Infrastructure, most notably the transit system. The attached document provides an overview of this effort to effectively integrate geo-referenced critical infrastructure data for both planning and operational purposes. This office has initiated a spatial imaging pilot project to begin using advanced mapping tools in managing security during the upcoming Republican National Convention (RNC).
2. Dell has provided an extended evaluation of hardware for this "proof of concept" initiative. ER Mapper, MapInfo, AutoCAD Map and the NYU Center for Advanced Technology are other key partners in an effort to deploy preliminary Critical Infrastructure Initiative work product at the earliest possible date prior to the RNC.
3. The project will require network support to make surface and sub-surface (transit) imagery resources available to NYPD personnel involved in planning and managing RNC security. This initiative will also enable the Department to use the most recent aerial photography of the RNC area compressed and served as a single image. Pictometry oblique angle imagery will be geo-referenced to these "mosaiced" digital orthophotos.

How Location-based Technology Impacts Community Policing: Intranet-based crime analysis and mapping application helps officers analyze criminal activities in near real-time

Sabby Nayar, Strategic Industry Manager, Government, MapInfo
Corporation/City of Troy Police Dept. Representative, sabby.nayar@mapinfo.com

This session will highlight how the Troy, NY Community Policing Unit is using an intranet-based mapping application to police more effectively and better protect the community and its citizens. Troy's Community Police Unit was established in 1995 on the principle that interaction with community residents can reduce crime and increases the quality of life of Troy's citizens. Community police officers patrol the city on bicycles, foot and on horseback, which provides the officers with the opportunity to interact closely with community members. The community policing application built with MapInfo technology and data enables Troy police officers to quickly and easily perform searches based on various criteria, such as police zone, date range and type of police incident or city code complaint. Searchable offenses include assault, prostitution, homicide, cruelty to animals and excessive noise. Using this data, police officers can generate several types of maps and reports to help them analyze what types of crimes and violations are

happening in certain neighborhoods, or even at specific street addresses, so that they can more effectively respond to situations and take steps to reduce crime. Officers analyze the occurrence of crime incidents and complaints about violations of the city's codes in near real-time, this helps them spend less time manually reviewing and analyzing data, and more time patrolling the neighborhoods, interacting with residents and keeping Troy safe for its citizens and visitors. During this session, you will learn how mapping technology is making a valuable difference in keeping communities secure.

ESRI Technology Update

Chris Nickola, NYS Account Manager - State Government and Private Accounts,
ESRI-Boston, cnickola@esri.com

ESRI has recently released its latest version of the ArcGIS family of products, version 9. ArcGIS is an integrated collection of GIS software products for building a complete GIS for your organization. The ArcGIS framework enables you to deploy GIS functionality and business logic wherever it is needed—in desktops, servers (including the Web), or mobile devices. This architecture, coupled with the geodatabase, gives you the tools to assemble intelligent geographic information systems. This presentation will provide an update on ESRI technology that has been recently released and highlight some future development efforts.

Status and Future of the New York Statewide Digital Orthoimagery

Tim Ruhren, NYS CSCIC, Tim.Ruhren@cscic.state.ny.us

The current Annual Lot of the NYSDOP marks several key firsts which will be key in shaping the program's future. Sixteen counties were re-flown in April 2004, making these the first counties, originally flown in 2000 and 2001, to be re-visited as part of the NYSDOP. (The program was created with the goal of updating all areas at least every 4 or 5 years.) In addition, several technical changes were introduced in year 4 including the first use of multi-spectral (4-band) digital cameras. These cameras could make obtaining multiple image types for a given area more feasible within the NYSDOP. Finally, user feedback received over the first 4 years will be discussed relative to how it will help shape the NYSDOP's future.

Mobile GIS Implementation for the Enterprise Database

Steven Russell, Jr., Information Technology Engineer, Erie County Department of Environment & Planning – Division of Sewerage Management, russells@erie.gov

Erie County Department of Environment & Planning - Division of Sewerage Management (DSM) initiated a GIS program in 2002 with the goal of mapping all existing assets and creating a database of asset information. After two years of data collection, it was time to give the database information to field staff for detailed verification and collection of asset information.

Mobile GIS can be thought of as a way of bringing the information of the enterprise database to all members of an organization. From the decision makers in the office to the field staff, all employees have the ability to view and edit asset information.

Mobile GIS consists of three key components; GPS technology, GIS software, and Pocket PC devices, as well as other types of computer hardware such as ruggedized data collectors, digital cameras, and digital video. Integration of these components allows field staff to query, add, and change data directly in the field. The DSM utilizes Trimble GPS hardware and software, ESRI software, and HP iPAQs.

This presentation will discuss the good, the bad, and the ugly aspects of Mobile GIS implementation. It will demonstrate how the DSM uses Trimble GPS products and HP iPAQs to integrate with custom e-forms in ArcPad to edit and locate sewer asset information for the Enterprise GIS. Problems associated with rolling out the Mobile GIS project to a technology challenged workforce will also be presented.

Geographic Information Technology for the Assessment and Management of Storm Water in Rural Settings

Dave Scherf, Ulster County Environmental Management, dscherf@frostvalley.org
Rick Fritschler and Myra Fedyniak, Ulster County Environmental Management

This presentation will discuss the circumstances and challenges involved in the mapping of rural highway storm water infrastructure.

GIS Leadership – A Closer Look at the “S”

Jim Schoenberg, GIS Business Segment Leader, Bergmann Associates,
jschoenberg@bergmannpc.com

As GIS technology has become more prevalent and mainstream, there has been a tremendous amount of press and coverage regarding topics such as data, maps, websites, databases, software and applications. Oddly enough, these types of issues can be directly correlated to “G” and “I” components in the acronym GIS. They are, in fact, geographic and information based issues. However, the third element in the acronym GIS (the S) is probably the most difficult to understand and causes a majority of the derailments relative to GIS lifecycles, sustainability and support. Using Systems and Leadership Theory a thorough exploration regarding the nature of systems will be addressed with a goal to help educate GIS users, administrators and politicians on balancing the funding and support given to the G, the I and the S in a technology-based environment.

Improving Asset Management: Integrating Hansen Asset Management Systems with ArcGIS

Jim Schoenberg, GIS Business Segment Leader, Bergmann Associates,
jschoenberg@bergmannpc.com
Paul Schenkel, Monroe County GIS Services Division

Monroe County, New York has a tremendous amount of assets to maintain, update and report on. This includes utility infrastructure (fiber, interconnect ducts, sewer systems), roadways, intersections, Intelligent Transportation Systems (ITS) infrastructure, etc. Maintaining these assets has been a two-tiered and cumbersome approach up until this point. That is, Monroe County staff would update and maintain the GIS data within ArcGIS and then update and maintain the Oracle 9i tables within Hansen with attribute data and information. This approach involved double entries and inefficient data management practices. Monroe County realized the need to become more efficient with asset data management.

This presentation will cover how Monroe County synchronized the data flow between the Hansen Asset Management System and ArcGIS to become a centralized and GIS-based asset management system. Using an ArcSDE-based approach, the County migrated all of their asset and GIS data to an Oracle-based ArcSDE system. Linkages to the County’s Hansen system was established through GeoAdministrator, a Hansen Database Connection Product. Through this integration, all asset data updates are now occurring in ArcGIS (ArcInfo or ArcEditor) and GeoAdministrator will make the necessary connections to keep the synchronicity in the Oracle 9i tables. This has allowed County staff the ability to work with the most updated asset information. Instead of waiting for assets to be updated in both systems, a synchronized approach has allowed data maintenance to be more efficient and allow the Hansen tables to be automatically updated within ArcGIS. This strategy has proven that the asset data updates are never double-keyed (a.k.a. double-entry) and that the database tables are not competing.

"AHEC Tools" A User-Friendly Data Resource

Steven Schreiber, New York State Area Health Education Center System,
schreis@mail.amc.edu

The New York State Area Health Education Center System (AHEC) is a state and federally funded program that focuses on improving the supply and quality of the healthcare workforce in medically underserved communities. The Eastern Regional Office of AHEC, located at Albany Medical College, serves as a data resource center for the statewide AHECsystem. “AHEC Tools” is an intranet website with an easy-to-use GIS application by which users can select, analyze, and present a wide range of socio-demographic, health, and educational data. The data support such activities as strategic planning, grants development and Health Professional Shortage Area designations. The user accesses data by first selecting on the map, the geographic area of interest, for example a ZIP code. A census or health variable is then selected, for example, population over age 65 or low birth weight rate. Results are presented as raw data or percentages and compared to statewide averages and percentile ranges. Users can also create new areas by selecting multiple geographic units, for example, three ZIP codes that make up a particular community. New totals and rates will be computed for that community, and compared to statewide figures. Point data showing the location of physician and dentist’s practices; hospitals; clinics; nursing homes; public and private schools; and higher educational institutions with health professions training can also be selected for all geographic areas. Another feature of the website allows the user to define and analyze service areas based on actual driving times from hospitals and clinics.

GIS & ArcPad Studio: Managing & investigating Forest Health

Margaret Shyer, Forest Health and Protection, NYS DEC Division of Lands and Forests, mlshyer@gw.dec.state.ny.us
Jerry Carlson and Jason Denham, Forest Health and Protection, NYS DEC Division of Lands and Forests

The Forest Health and Protection Section of the Division of Lands and Forests within NYS DEC is a cooperative program between State and Federal Agencies. New York is a densely populated State with a highly mobile population and our international ports are among the largest on the Continent. These factors contribute significantly to the frequency, intensity and dispersal of introduced organisms. The State's forests are relatively young and still recovering from several hundred years of industrial and societal neglect. One of our largest challenges in forest health protection is to efficiently understand the susceptibility of our forests to both introduced and native pests. Our primary goal is to identify areas of the state that are at high risk to health affecting agents and to increase the public's awareness of forest ecosystem health.

A good deal of the first part of our goal is accomplished through GIS and related technologies. These are important to our unit because current data on forest health is limited and/or obsolete. We are currently using various ESRI programs along with mobile mapping to identify and characterize high-risk areas. Our mobile mapping and data entry systems are used to conduct ground and aerial surveys to annually monitor forest health. Field data summaries and analyses help us make key decisions about funding priorities and they allow us to identify and refine high-risk areas.

Our field data entry forms are constructed with ArcPad Application Builder and VBA. Our mobile devices are Hp-iPaqs operating with ArcPad linked to Magellan GPS units. This presentation will describe our progress in mobile mapping, data collection and real-time analyses.

Integrating Multi-Resolution Data Sources to Update and Improve Land Cover and Land Use Classifications for NYC's 2,000 Square Mile

Terry Spies, GIS Coordinator - Watershed Lands and Community Planning,
Bureau of Water Supply, New York City Department of Environmental
Protection, tspies@dep.nyc.gov

George Washburn, Geospatial Software and Modeling Division, PAR Government Systems

The New York City Department of Environmental Protection (NYCDEP) identified the need for updated and refined land cover and land use products for its upstate watershed to serve a myriad of applications at the Bureau of Water Supply, including: City-owned water supply land management, land acquisition planning, hydrologic runoff modeling, permitting, and build-out analysis. PAR Government Systems Corporation (PAR), in tight collaboration with NYCDEP remote sensing and GIS staff, developed a suite of land cover/land use data products to meet this need using semi-automated techniques. The initial base product was an Anderson level 1-2 land cover derived through supervised classification of Landsat 7 ETM+ imagery. Next, an impervious surface feature extraction layer was derived using machine learning image-processing techniques (pattern recognition) applied to high-resolution (1 ft.) orthoimagery collected by Emerge and NYS. Finally, a 10-meter resolution Anderson Level 4 land use/land cover classification was produced, consisting of 50 land use classes derived through the introduction of ancillary data layers (tax parcels, wetlands, impervious surfaces and crops) and the employment of semi-automated spatial processing techniques.

Geospatial Analysis of the Effectiveness of the WTC Residential Dust Cleanup Program

William Thayer, P.E., Syracuse Research Corporation, thayer@syrres.com

Following the collapse of the WTC buildings, EPA and its federal, state and city partners arranged for the cleanup of residential units, using certified contractors, with follow-up testing for airborne asbestos. In a subset of residences, data on contaminant loading in settled dust (mass / sampled surface area) were also collected prior to and following cleanup. As part of the assessment of the effectiveness of the cleanup effort, we analyzed the data, using methods from spatial statistics (e.g., point pattern analysis and spatial autoregression) to determine if the asbestos data exhibited any spatial pattern that might support the hypothesis that contamination levels measured after cleanup were attributable to residual contamination from the collapse of the WTC buildings. We tested the hypothesis using Monte Carlo-type statistical tests that were appropriate for data that were not collected using random sampling methods (cleanups and sampling were performed at the request of residents of Lower Manhattan); the tests considered the geographic location of the sampled buildings, and the number of samples collected from each building. The point pattern analysis was performed using GeoSEM: GIS software that was developed by SRC for the application of spatial statistics in human and ecological risk assessment. The results of our analysis did not support the hypothesis that exceedance of the health-based benchmarks were related to the collapse of the WTC buildings.

3D or bust: Lessons Learned Working with 3D data in ArcGIS

John Thomack, GIS Coordinator, jthomack@dot.state.ny.us

At NYSDOT we are finding an increasing need to use various 3D source data to build terrain surfaces for many applications from visualization to hydrology. The purpose of this presentation is to demonstrate the essential elements of working with DEMs, DRGs, contours, TINs, and breaklines to

create 3D surfaces using the tools available in ArcGIS. Although this presentation is oriented to a specific software, many of the principles discussed are universal. This presentation will address the following issues related to 3D source data layers:

- 1) Resolution/Scale – 100 m, 30 m, 10 m or better. How much is too much or what is good enough?
- 2) Densify or Simplify – resampling the 3D source data. Why resample and how resampling affects the resulting surface.
- 3) Project/reproject 3D data – State Plane to UTM and back. Some suggestions on navigating around the vector vs. raster reprojection issues.
- 4) Merge/mosaic 3D data layers – building out the AOI. How to pull all the pieces together into a single surface.
- 5) Clipping 3D surfaces – 2D and 3D polygon clips. Hard clip vs. soft clip issues.
- 6) Multi-resolution 3D surfaces – deliberately combining different resolution 3D data. Understanding the problems and resolving the conflicts.

The presentation will also include a demonstration of rendering 3D surfaces, extruding objects on the 3D surface, draping images over 3D surfaces, and exaggerating the elevation of a 3D surface. If time permits, the presentation will also include fundamentals of navigating around a 3D scene and creating scene animation.

Implementing GIS Technology within the Gates Fire District

Jeff Volpe, GIS Business Segment Manager, Bergmann Associates,
jvolpe@bergmannpc.com

Fire districts have a tremendous amount of responsibility with tracking, analyzing and reporting on fire incidents, calls for service and fire district analysis. The use of GIS technology has vastly improved fire district's analytical needs as well as help improve pre-planning for emergency response scenarios. This presentation will focus on how fire districts are implementing GIS technology. Case studies and examples of fire districts in New York (Gates Fire District, Spencerport Fire District) and other states (City of Boulder, Colorado Fire District) will be discussed. Specific examples of how GIS is being used within fire districts will be discussed including GIS applications that were custom built for developing box maps and pre-plans, index mapping and integrating plume models within ArcGIS software.

NLCD 2001 Tree Canopy Mapping in New York

Jeff Walton, USDA Forest Service, jeffreawalton@fs.fed.us

As part of the NLCD 2001 mapping project, the USDA Forest Service research unit in Syracuse is developing the sub-pixel tree canopy and impervious surface maps for New York State and southern New England. After a description of the classification process, the data layers of New York will be presented along with accuracy assessment results. A brief description of an application of this data to urban forestry will also be presented.

GIS Implementation for Villages and Towns: Strategies to Get Started (and keep it going)

Sam Wear, GIS Manager, Westchester County GIS, Department of Information
Technology, stw1@westchestergov.com

Even with the increased availability of GIS data and consulting support, more readily available training courses (classroom and online), decreased hardware and software costs, more focused industry third-party software programs, easier integration with CAD and/or other legacy systems, and overall general acceptance of GIS as a mainstream government enterprise information management strategy - many small towns and villages throughout New York continue to struggle with both implementing and maintaining GIS programs. While the literature is replete with many generic "checklists" or "procedures" on how to get programs started, two areas in particular which continue to inhibit GIS development in smaller New York state government include: (1) lack of direct funding, and (2) managing the organizational change which is necessary to build and maintain the GIS program over time.

Since the late 1980's, Westchester County GIS has taken a "partnership" approach with municipalities in building local government GIS programs. Early partnership and outreach efforts included developing municipal implementation plans, providing GIS software and metadata training courses, establishing informal GIS data sharing agreements, GPS demonstrations, and general ad-hoc technical support for desktop GIS development. Today, the county's partnership with local governments is more focused in the program areas of joint data and application development. If properly designed, these joint efforts can be implemented to augment the business functions of both levels of government - with significant cost savings and less administrative overhead.

This presentation will provide an overview of the current Westchester County GIS outreach and support program for local governments. Data sharing, joint application development (web and desktop) efforts, technical support services and case studies from villages and towns in the county will be presented.

Audience participation will be encouraged.

Mapping and Delineating Wetlands of Huntington Wildlife Forest using Very High Digital Color-Infrared Imagery

Mehmet Yavuz, SUNY College of Environmental Science and Forestry,
myavuz@syr.edu

Dr. Lee P. Herrington, SUNY College of Environmental Science and Forestry

There is no question that wetlands are in a volatile state worldwide and conterminous US. Detecting changes and trends of the wetlands over the time is another difficult yet challenging job. In this study, the effectiveness of off-site wetland delineation methods compared to the traditional on-site wetland delineation methods is investigated using very high resolution digital color-infrared (CIR) aerial imagery. National Wetland Inventory (NWI) delineation results are compared to four mapping techniques; heads-up digitizing, hybrid classification, GIS-ruled base, and unsupervised classification from same image source. Then each mapping techniques are applied to seasonal images for both CIR imagery and Landsat7 imagery. Pair-wise significant tests indicated that heads-up digitizing is significantly better than other classification techniques for very high resolution CIR imagery, but no significant difference for Landsat7 Satellite imagery. Combination of GIS-ruled model and hybrid model showed that emergent wetland and scrub-shrub wetlands can be identifiable without visiting the ground using very high resolution digital CIR imagery.

Workshop Abstracts

Abstracts are listed alphabetically by the first listed author's last name.

Cartography Workshop

John Barge
Dr. Lee P. Herrington, SUNY College of Environmental Science and Forestry
Bill Johnson

GPS Workshop – Facts and Fundamentals

Jonathan Cobb, Waypoint Technology Group, LLC, jcobb@waypointtech.com
Ken Pennock, Waypoint Technology Group, LLC, kpennock@waypointtech.com

The Global Positioning System ("GPS") is a powerful public "utility" that provides highly accurate positional information for use in a broad range of applications, including geospatial data development and verification. This workshop will present a comprehensive overview of how the GPS determines positions, and the presenters will de-bunk some of the myths about GPS accuracy, explore the full range of GPS solutions available for professional GIS applications, identify the primary criteria to consider when identifying a solution, and preview emerging trends in the GPS industry. This session is designed to acquaint new and/or prospective GPS users with fundamental GPS concepts, and to provide insight into equipment and software functionality and limitations. Questions and discussion are welcome and encouraged.

Geocoding Workshop

Austin Fisher, Applied GIS, Inc., afisher@appliedgis.com

This training will introduce GIS users to the basic concepts and processes of data improvement, address geocoding and illustrating how positional error caused by geocoding may affect the results of a GIS project. Particular attention will be given to the long term effects (i.e. cost savings) of data and attribute improvement. In addition, attendees will learn about current CSCIC programs and available resources to facilitate data improvement and geocoding.

Linear Referencing Systems and Dynamic Segmentation Workshop

Kevin Hunt and Laurie Cooper, New York State Department of Transportation

A linear referencing system (LRS) is used to encode a systematic measuring scheme on line features. The NYS Department of Transportation (NYSDOT) has been using LRS technology in GIS for over ten years to provide a mechanism to associate business data which is referenced to a measure along a road with the GIS base mapping. This workshop will explain linear referencing systems and the dynamic segmentation technology that allows display and analysis of business data. It will include a demonstration of constructing and editing LRS route features in ESRI's ArcGIS and will also cover how NYSDOT uses the latest dynamic segmentation technology to streamline a wide variety of workflows.

Horizontal Datums: What are they and why you should care

Dr. Thomas Meyer, University of Connecticut

Everyone who uses a GIS is using horizontal geodetic datums whether they are aware of this or not. Horizontal geodetic datums are used to assign "horizontal coordinates," such as latitude and longitude, to everywhere. If there was only one horizontal datum, then there would probably not need to be a workshop on them. However, there is more than one and thereby enters the confusion. Many GIS users have confronted mixing data sets in various horizontal datums, leading to offset features. This workshop presents a history of horizontal datums, explains why there is more than one of them, and shows you what to do to make sure your spatial data are being used consistently.

Vertical Datums: What does "height" really mean?

Dr. Thomas Meyer, University of Connecticut

"Height" is a common, ordinary everyday word and everyone knows what it means. Or, more likely, everyone has an idea of what it means, but nailing down an exact definition is surprisingly tricky. This workshop is the complement of the horizontal datums workshop; it provides the third dimension. It explores the origins of vertical datums, discusses the role of gravity, provides distinctions between mean sea gauges and datums such as the North American Vertical Datum of 1988 to clarify the question, "What does 'height' really mean?"

Workshop: Developing Hydraulic Models in a GIS Environment

Christopher O'Conner, Watershed Geographic Information Technology Section,
Division of Water, NY DEC, cxoconno@gw.dec.state.ny.us

This workshop will present an example of the datasets, tools, and processes involved in developing a hydraulic study for a stream. These studies are used in applications ranging from stream water quality determination to bridge pier scouring. The GIS environment described will include standard and custom tools developed for ESRI's ArcView 3.x software package. The hydraulic modeling environment described will include HEC-RAS, a software package developed by and distributed freely from the US Army Corps of Engineers. The following topics will be covered:

1. Required Datasets and Related Issues
2. Stream Bank Delineation
3. Elevation Model Development
4. HEC-RAS Input Stack Creation
5. Remarks on the Development of Water Surface Elevations in HEC-RAS
6. Importing and Mapping HEC-RAS Output in ArcView
7. Remarks on more Sophisticated Hydraulic Models

State Archives Workshop:

Workshop on State Archives GIS Grant Funding for Local Governments

Jennifer O'Neil, New York State Archives, JONEILL@mail.nysed.gov

GIS can be an effective and efficient tool for government, but its complexity makes it difficult for governments to develop and fund. This presentation will focus on creating a successful application to develop and implement a GIS through the State Archives' grant program.

Homeland Security Workshop:

GIS & Homeland Security War Gaming: Preparing for an Uncertain

Bruce Oswald, Assistant Director/CIO, NYS Office of Cyber Security & Critical Infrastructure Coordination (CSCIC), Bruce.Oswald@cscic.state.ny.us

Ed Freeborn, National Law Enforcement and Corrections Technology Center for the Northeast

Applying proven war gaming techniques to GIS use for Homeland Security and Emergency Response provides a valuable tool to analyze and improve an organization's GIS capabilities. In this session, Bruce Oswald of the NYS Office of Cyber Security and Critical Infrastructure Coordination (CSCIC) and Ed Freeborn of the National Law Enforcement and Corrections Technology Center for the Northeast (NLECTC-NE) will conduct a fun seminar style demonstration game to illustrate how war gaming can be used to explore many issues associated with the use of GIS for incident response and lead to a better understanding of the problems many organizations are facing in the use of GIS. The audience will be asked to respond to a scenario and engage in discussions and analysis of the many factors impacting the situation. The scenario will present information regarding a postulated threat or incident (man-made or natural) that may be related to wider Emergency Response or Homeland Security issues. As the scenario unfolds, the an expert panel will be asked to respond to the audience's discussion and provide insight as to how their organization(s) might respond to the available information regarding the incident and address what kinds of information or actions are needed to best respond to the threat. The game is not meant to be predictive or proscriptive, but is intended to demonstrate how State, County and municipal governments can use this technique to examine organizational approaches and discover new methods for dealing with these challenges. The specifics of the scenario will be announced at the session; audience participation is planned.

Census Data Workshop

Bob Scardamalia, NY State Data Center, Department of Economic Development, RSCARDAMALIA@EMPIRE.STATE.NY.US

The Census Bureau has just begun implementation of the nationwide American Community Survey. The ACS will replace traditional Census long form data available only once every decade. This session will provide an overview of the survey process, data products, and availability. The session will also update users on changes to the Census Bureau's TIGER database and efforts to insure an accurate count in the 2010 Census.

**Programming Workshop:
Custom Application Development using ArcObjects and ArcIMS**

Larry Spraker, Applied GIS, Inc., lspraker@appliedgis.com
Liz Arabadjis, Highland Geographic

There are many ways of tailoring ESRI's software to create custom solutions. This workshop will focus on discussing and demonstrating how to customize ArcGIS using ArcObjects as well as how to develop custom websites using ArcIMS.

ArcGIS: Although developers have a choice of development environments when Customizing ArcGIS including VB, C++, .NET, we will discuss concentrate on VB using ArcObjects. Real world analogies and examples (with props!!) will be used to help understand the basics of object-oriented programming: classes, properties, methods, events and interfaces, and how to get started in ArcObjects. We will also address how to build a standalone executable using ArcGIS Engine.

ArcIMS: We will compare and contrast the different deployment options such as the default HTML Viewer, ASP, JSP, Cold Fusion, etc. We will also show how to customize the default HTML viewer, and how to build a server-side application in ASP using the ActiveX Connector object model.

Poster Abstracts

Abstracts are listed alphabetically by the first listed author's last name.

Developing Metadata Explorer Tools at Westchester County GIS

Xiaobo Cui, Assistant GIS Manager, Westchester County GIS, Department of Information Technology, xxc1@westchestergov.com

To more effectively share and disseminate metadata over the internet, Westchester County is working with both ESRI and FGDC in building browser tools which can search and harvest the county's metadata records. Initial work has resulted in the development of a Metadata Explorer service which can be launched from the county's GIS website at <http://giswww.westchestergov.com/metadataexplorer>. This service allows users to search and browse metadata by generic parameters or specific themes. The Westchester County Metadata Explorer service is also integrated with the Geospatial One-Stop (GOS) portal at <http://www.geodata.gov>. Future design and development of the Metadata Explorer service is intended to include functions for local governments to post metadata records directly to the county's metadata repository which can be harvested from the GOS portal.

This poster will present an overview of the Westchester County GIS Metadata Explorer and GOS development strategy. In addition to providing an overview of required hardware and software components at the county level, strategies to include smaller units of governments, not-for-profits, and other organizations will also be discussed. Once fully implemented, Westchester County GIS will serve as a model as to how similar government structures throughout the country can contribute to the GOS program.

A MULTIPLE SCALE APPROACH TO ASSESSING THE BIOLOGICAL INTEGRITY OF RHODE ISLAND STREAMS

Sara da Silva, Environmental Scientist, Nelson, Pope & Voorhis, LLC, sdasilva@nelsonpope.com

Land use and geomorphology within watersheds affect the biological, physical, and chemical conditions in streams at multiple scales. This study assessed how well indices of biological integrity relate to landscape variables and explored which spatial scales are most useful for assessment of Rhode Island's streams and rivers. From 1991 to 2001, we sampled stream benthic macroinvertebrates at 41 sites in first through fifth order streams. The bioassessment data suggests that declining stream health occurs at thresholds as low as 5% impervious cover. The use of GIS landscape data (geomorphic and land use variables) in addition to observed reach data (bank disturbance and habitat assessment scores) at the local riparian scale was the most powerful suite of predictive measures and explained as much 65% of the variation in biological score ($p < 0.001$). Long-term biological monitoring revealed significant change in 4 of the 41 sites over the past eleven years. Physico-chemical monitoring revealed change in 10 of 24 sites, with most changes indicating improving water quality. Because of the covariance between scales, this study cannot recommend a specific scale for focusing land management efforts. However, my findings indicate that very localized scales of watershed and in-stream observations can be beneficial for focusing efforts relating to the sustainability or restoration of stream biological integrity.

Updating USGS DEMS Using High Accuracy Elevation Points

Nathen Harp, GIS Analyst, NYSDOH, nmh02@health.state.ny.us

Accuracy of digital elevation models (DEM) is under critical investigation for errors and uncertainties. Often, it is impossible to acquire higher accuracy information to reduce the amount of error and uncertainty over large geographic areas.

New York State has an enhanced accuracy Level-2 DEM with a horizontal accuracy of +/- 10 m and a vertical accuracy of +/- 6 - 8 m. In addition, New York State has recently completed a comprehensive digital orthoimagery program (NYDOP) which required the collection of a new digital terrain model (DTM).

While highly accurate (horizontal and vertical accuracy of +/- 0.6 m), the data spacing is too sparse (75 - 200 m) to support production of a complete terrain model for other purposes. This research focuses on methods to identify and update specific areas of the USGS DEM using the sparse network of

NYDOP data. In addition, understanding the spatial and statistical nature of erroneous high and low values will identify anomalies in the original USGS DEM.

Municipal Government GIS Development in Westchester County, New

Ana Hiraldo, GIS Specialist III, Westchester County GIS, Department of Information Technology, aeh2@westchestergov.com

Westchester County GIS staff continues to provide technical support, consulting services, training, and other GIS related services to local municipalities. There are over twenty municipalities which have entered into a data sharing agreement with the County. Many municipalities use the county for technical support and assistance. This conference poster is a composite of examples of recent work by Westchester County GIS in support of local government GIS projects. Examples of work to be illustrated include cities of Peekskill, New Rochelle and Mt. Vernon, the villages of Hastings-on-Hudson, Croton-on-Hudson and Pelham Manor.

Croton Bay Watershed Conservation GIS Mapping and Analysis

Cynthia Louie, Staff Assistant (GIS), Westchester County GIS, Department of Information Technology, llc4@westchestergov.com

As part of a project to protect and preserve the Hudson River Estuary, Westchester County Department of Planning has received funding from the New York State Department of Environmental Conservation (DEC) to produce a watershed conservation plan for Croton Bay which covers five municipalities in the county.

Westchester County GIS staff are assisting planning department staff in producing a series of maps and for the Croton Bay Watershed and its two sub-watersheds - Croton Gorge and Indian Brook. Maps and tables produced as part of the project highlight land use classifications, parcels identified by land uses of concern, impervious surface areas, a natural resource inventory, and storm water drainage infrastructure.

Use of GIS in Hydrodynamic and Water Quality Modeling of Flushing Bay and Flushing Creek

Sumant Mallavaram, Environmental Engineer, Lawler, Matusky & Skelly Engineers, SMallavaram@lmseng.com

Guy Apicella, Lawler, Matusky and Skelly Engineers LLP

GIS serves as a powerful analytical and visualization tool in water resources modeling and assessment. As part of New York City Department of Environmental Protection's in-kind services for the Flushing Bay and Creek Ecosystem Restoration project sponsored by the New York District of the U.S. Army Corps of Engineers, Lawler, Matusky and Skelly Engineers LLP (LMS) developed a model of the Flushing Bay and Creek system in Queens, NY. GIS was used at several stages during the study in conjunction with a 3-dimensional finite element hydrodynamic and water quality model to visualize and evaluate changes to the bathymetry based on several projection scenarios. Bathymetric data obtained from a survey that utilized a Differential Global Positioning System (DGPS) formed the foundation upon which a surface model of the entire Flushing Bay/Creek was built. This was used to define a model geometry that represents the real world system as closely as possible in accordance with hydrodynamic modeling practices. Several model projection scenarios including partial/complete removal of the breakwater near LaGuardia Airport and dredging the Inner Bay and Flushing Creek in conjunction with Combined Sewer Overflow (CSO) abatement alternatives were graphically viewed using GIS before carrying out the actual simulations. Elevation changes made within the GIS and verified using a surface model were translated into a geometry file for the model. This ease and flexibility in transferring data between the model and GIS proved to be invaluable in evaluating many "what-if" scenarios and their long-term impacts on water quality in Flushing Bay/Creek system.

Tracking Rare Wood Turtles with GIS and GPS in Westchester County, New York

Deborah Parker, GIS Specialist, Westchester County GIS, Department of Information Technology, dape@westchestergov.com

GIS staff worked with Park Superintendent Beth Herr to launch desktop GIS at Westchester County's

Ward Pound Ridge Reservation, installing Arc View3.2 software and establishing a link to base map data on the County's fiber optical network. Staff also scanned and geo-referenced a mid-1980s mylar drawing of the park that shows trails, geographic features and identifies park structures.

This effort was initiated to support the reservation's ongoing mission to monitor and protect a resident population of rare and endangered wood turtles (*Clemmys insculpta*). Fitted with radio transmitters, the turtles can be tracked with a special antenna and receiver.

During the turtle's active season, from late February until late November, parks naturalists note time, weather conditions, habitat, and details of feeding, mating and nesting behaviors, while also capturing the turtles' geographical location with a hand-held GPS unit. With the radio transmitters, GPS, and GIS/IT support, park staff are able to observe and monitor turtle movement - even under the ice in a swollen winter river.

GIS staff convert the GPS-acquired coordinates of the turtle sightings which can then be draped on top of the county's color orthophotography. Over a period of years, these observations will establish the turtles' habits and the limits and extent of their territory, helping Parks staff protect each season's crop of eggs, and ensure the continued presence of this threatened species in Westchester.

Design of the Indian Point Emergency GIS (IPEG) Application

Ariane Porter, Software Architect, Westchester County GIS, Department of Information Technology, agp1@westchestergov.com

Westchester County GIS is working with ESRI to build a desktop application that will support the support high-level decision making associated with emergency response plan at the Indian Point nuclear power facility. Named the Indian Point Emergency GIS (IPEG), the intended users of IPEG will be emergency planners working in the county's emergency operations center (EOC).

Designed using ESRI's ArcEngine technology and written in Java, IPEG is designed to provide robust spatial analysis tools and other core GIS functionality in a user-friendly environment. The IPEG application includes spatial analysis functions such as buffering point and polygon features, plume modeling and other ad-hoc queries. A report is generated following each query which will contain a screen capture of the map and list of all data layers involved in the query.

It is intended for the application to be integrated with other state and local government GIS applications which are being built associated with the Indian Point emergency response and evacuation plans.

An OASIS in New York City!

Steven Romalewski, NYPIRG's Community Mapping Assistance Project, sromalewski@nypirg.org
Christina Spielman, NYPIRG's Community Mapping Assistance Project, cspielman@nypirg.org

The Open Accessible Space Information System (OASIS) for the New York City metropolitan area is a coalition of nonprofit organizations, government agencies, businesses, grassroots groups, educational institutions, and individuals. The members of this coalition have pooled their resources to create an online repository and delivery vehicle for spatial data, in particular data that is in some way important to people advocating for more and better open space in and around New York City.

The first product of this collaborative is a website (www.oasisnyc.net) for the New York City region that provides a common, free, online, spatial data inventory using interactive mapping technology. No other single source provides access to all of the information found on OASIS - almost four-dozen layers of spatial data from a wide variety of data sources. Using OASIS, people can do the following and much more:

- create interactive maps of open space by neighborhood;
- identify the elected officials who represent parks and community gardens;
- view high resolution aerial imagery to locate trees and recreation areas;
- identify detailed land use data (including potential open spaces such as vacant lots);
- portray wetlands, wildlife areas, and historic landmarks; and
- compare Census demographics with open space land use patterns.

The OASIS website helps people see and understand their neighborhood by visualizing spatial patterns. It makes valuable information available to average citizens, neighborhood planning groups, and others who cannot afford expensive mapping tools and/or who do not have access to the complex pool of government and private sources of data. OASIS partners are also actively creating new data where other sources are inadequate or do not exist - especially at community scales.

Integrating Traffic Signal Management Systems with Geographic Information Systems

Kevin Roseman, Traffic Engineer, Westchester County,
Cynthia Louie, Westchester County GIS, Department of Information Technology

Westchester County's Department of Public Works has recently completed the installation of a computerized traffic signal system. This Intelligent Transportation System (ITS) includes 15 replacement traffic signals and 6 traffic signal upgrades. The 21 County signals are located along the Bronx River Parkway (9 signals), Mamaroneck Avenue (6 signals) and Columbus Ave/Kensico Road (6 signals). The traffic signals are controlled by NYS Model 179 Controllers in Model 330 Cabinets running BI Tran Systems Firmware and utilizing an enhanced version of BI Tran Systems's QuicNet 4 with GIS datasets.

Integrating Westchester County's spatially accurate GIS datasets (1:100) and aerial photography (Image Resolution of .5ft) with real time data from QuicNet4 produces an extremely precise ITS. Adding the GIS datasets introduces features that aren't available through bitmap displays such as labeling, panning and zooming. Other features include layer visibility based on zoom level and retrieving traffic signal information (intersection name, alarm, etc.) by placing cursor over traffic signal point.

County-wide Accident Mapping and Analysis

Marybeth Vargha, GIS Coordinator, Otsego County, vargham@otsegocounty.com

Otsego County Stop DWI/Traffic Safety, GIS Office, and Bassett Hospital, with funding from the Governor's Committee for Traffic Safety, has created a GIS database of accidents reported within the county from 1998 to 2003. There are many lessons learned about how to map the records, how the data can be used and what are the shortcomings of these methods for use in analysis. This poster will show illustrations of the methodology, samples of applications and results of some more specific analysis – including locations of accidents by cause/injuries/time of day/etc, changes in types of accidents along high development corridors, ambulance response and transport to emergency facilities, and models for improving DWI/speed enforcement.

Customized Data Clipping Tool for ArcMap 8.3 with Visual Basic

Tong Zhou, Software Architect, Westchester County GIS, Department of Information Technology, taz2@westchestergov.com

With GIS applications and use expanding throughout county government, users are increasingly showing interests in data clipping functionality. Although the out-of-the-box clip function with ArcMap and the ArcToolbox is available, it is sometimes difficult to learn for users with no GIS background and often does not meet individual user requirements.

To solve these problems, a customized data clipping tool was developed. It was developed in the ArcObjects development environment with Visual Basic as the programming language. It can be easily distributed and deployed to workstations as a dll file. The customized application includes many features including:

- Allowing the user to select interested polygons in a polygon layer as the clipping boundary (and/or extending the boundary by specifying a distance).
- An easy-to-browse file structure which adds or removes data to be clipped.
- It will define the spatial reference, which is required for clipping, on the fly if the data has no spatial reference defined.
- It allows clipping many layers at a time and will filter out the result layers with no record.
- It allows users to select the fields they want to include in the result layers
- Incorporates an error checking mechanism to ensure the process runs smoothly.

Featured Speakers

Uncovering the Layers: The Complex Origins of GIS

John Cloud, Geographer/Writer/Editor, NOAA Central Library,
John.Cloud@noaa.gov

Geographic information systems (GIS) considered as technologies and practices have a curious history, or rather lack of history. GIS is generally considered to have sprung to life as a rather well developed assemblage of computer mapping and database software and hardware around the late 1950s or a decade or so later. From that point forward, GIS has evolved continuously-- but what about from that same point backward, into the supposed "pre-history" of GIS?

There are two fascinating origins to GIS hidden underneath the nominal story. The digital implementation of GIS is a legacy of the Cold War, as was almost all development of pioneering digital computer systems. The Army's Topographic Engineers implemented an earlier project for computer mapping and spatial analysis for tactical mobility studies, called Military Geographic Intelligence Systems (MGIS), which was used extensively in the Vietnam War. Later, the "M" was erased, and geographic information systems (GIS) emerged into civilian application. One of the first of these was LUNR, the first NY GIS system, which linked the Systems Development Corporation, a major player in Cold War classified military science, to off-site Cornell research labs and civilian computer mapping designers at Harvard's Laboratory for Spatial Analysis.

But there is an even deeper, more interesting, and far darker story yet to tell about GIS. Systems such as LUNR implemented cartographic practices and database and spatial analysis structures that had themselves been invented and developed over a human generation earlier, in a golden era of translucent and transparent analog map overlay invention, now long forgotten, that is the real origins of GIS. Attention to the beginnings is critical, as the complexly inter-twined possibilities and pitfalls of GIS can be glimpsed in its earliest applications. I will consider the case of the Roosevelt Administration's national exercise to deal with the urban housing crisis of the Great Depression. This began with progressive social planning, but, as the overlays were piled upon one other, culminated in the infamous red-lining maps. Every contemporary urban GIS application now addresses the consequences of what happened in that primordial era, whether today's GIS practitioners realize the legacy, or not.

USGS's National Map: A New and Effective Way to Obtain GIS Data

Hank Garie, Executive Director, U.S. Geological Survey - Geospatial One Stop Project

State of GIS in New York State

William F. Pelgrin, Director, NYS Office of Cyber Security and Critical Infrastructure Coordination (NYS CSCIC)

As Director of the New York State Office of Cyber Security and Critical Infrastructure Coordination (CSCIC), William Pelgrin is responsible for leading and coordinating New York State's efforts regarding cyber readiness and resilience. Under Director Pelgrin's leadership, the CSCIC has established a 7x24 Cyber Security Center; deployed intrusion detection architecture for critical segments of the State's network and computing infrastructure; conducted risk assessments for state agencies; and released three statewide cyber security polices on cyber alert level protocols, incident reporting and baseline cyber security requirements.

As part of his duties, Mr. Pelgrin also chairs the New York State Public/Private Sector Cyber Security Workgroup, comprising a talented cadre of representatives from State and local government, academia, the private sector, as well as the federal government. The Workgroup is charged with a number of tasks to help better ensure New York State's cyber readiness, including developing standards of preparedness and methods to inventory and assess critical infrastructure assets contained within industry sectors. Mr. Pelgrin has identified leaders from the public and private sector to serve as leads for a number of critical industry sectors, including the chemical, education, financial, food, health, public safety, telecommunications, and utility sectors. The Workgroup is conducting outreach to inventory and assess the state of cyber-readiness for the critical assets within these sectors. The sector leads report in on a weekly basis to NYS CSCIC, providing updates on current status within those sectors.

Mr. Pelgrin also Chairs the [Multi-State Information Sharing and Analysis Center \(MS-ISAC\)](#) which currently includes participation from 49 states and the District of Columbia to share important cyber security information. The MS-ISAC was recently recognized by the Department of Homeland Security for its proactive role in bringing the states together.

In November 2003, Mr. Pelgrin was appointed as a charter member of the Global Council of CSOs (Cyber Security Officers), a think tank comprising a group of influential corporate, government and academic security experts dedicated to raising the awareness of online security issues.

William Pelgrin has more than twenty years of experience in New York State government, holding a variety of executive leadership positions in a number of agencies. He enjoys the challenges and rewards of making New York State government more effective and responsive. He is a graduate of Albany Law School and Union University, and resides in Upstate New York.

Concurrent Sessions and Workshops 1

	Columbia
	<u>Session 1D</u> Land Use Land Cover
9:00-9:20am	Developing International LULC to Enhance Border Security in NY Ed Freeborn, National Law Enforcement and Corrections Technology Center for the Northeast (NLECTC-NE)
9:20-9:40am	LULC Development Capabilities at the Ontario Ministry of Natural Resources (OMNR) Richard Mussakowski, OMNR
9:40-10:00am	Building an LULC Partnership Colin Homer, USGS

Session Moderator: Clark Burdick

Concurrent Sessions and Workshops 1

	Ulster
	<u>Session 1E</u> Asset Management
9:00-9:20am	Improving Asset Management: Integrating Hansen Asset Management Systems with ArcGIS Jim Schoenberg, Bergmann Associates Paul Schenkel, Monroe County GIS Services Division
9:20-9:40am	Asset Logistics Management System for New York City Jenny Gnanendran, Ecology and Environment, Inc.
9:40-10:00am	Asset Management for Financial Reporting Dr. Rachel Arulraj, John Clemente, Rene Freyman, and Rashmi Mehta, Parsons Brinckerhoff Quade and Douglas

Session Moderator: Horace Shaw

Concurrent Sessions and Workshops 2

	Sullivan
	<u>Session 2B</u> ALIS
10:30-10:50am	An Overview of the New Statewide GIS Roads and Addressing Data Set William F. Johnson, NYS Office of Cyber Security & Critical Infrastructure Coordination (CSCIC)
10:50-11:10am	
11:10-11:30am	A Technical Look Inside the ALIS Statewide GIS Data Sets Cheryl Benjamin, NYS Office of Cyber Security & Critical Infrastructure Coordination (CSCIC)
11:30-11:50am	

Session Moderator: Lee Herrington

Concurrent Sessions and Workshops 2

	Hudson II & III
	Session 2C Mobile GIS
10:30- 10:50am	Location in Motion – A Crash Course on AVL Technology Austin Fisher, Applied GIS, Inc.
10:50- 11:10am	GIS & ArcPad Studio: Managing & investigating Forest Health Margaret Shyer, Jerry Carlson, and Jason Denham Forest Health and Protection, NYS DEC Division of Lands and Forests
11:10- 11:30am	The Evolution of a Web-Based Winter Traveler Advisory System Marilyn Lamanna, NYS Department of Transportation
11:30- 11:50am	Mobile GIS Implementation for the Enterprise Database Steven Russell, Jr., Erie County Department of Environment & Planning – Division of Sewerage Management

Session Moderator: Mike Courneen

Concurrent Sessions and Workshops 2

	Columbia
	<u>Session 2D</u> Land Use Land Cover
10:30-10:50am	GIS Habitat Models for Spruce Grouse in the Adirondack Park Sunita Halasz, NYS Adirondack Park Agency
10:50-11:10am	South Shore Estuary Reserve Open Space Evaluation Presentation Jeffrey L. Herter and Peter Lauridsen, Division of Coastal Resources, New York State Department of State
11:10-11:30am	NLCD 2001 Tree Canopy Mapping in New York Jeff Walton, USDA Forest Service
11:30-11:50am	Mapping and Delineating Wetlands of Huntington Wildlife Forest using Very High Digital Color-Infrared Imagery Mehmet Yavuz and Dr. Lee P. Herrington, SUNY College of Environmental Science and Forestry

Session Moderator: Mark Wheeler

Concurrent Sessions and Workshops 2

	Ulster
	<u>Session 2E</u> 3D GIS
10:30-10:50am	3D or bust: Lessons Learned Working with 3D data in ArcGIS John Thomack
10:50-11:10am	
11:10-11:30am	The utilization of Spatial Analysis and 3-D Visualization to site wind farms in Chautauqua County, New York Kevin A. Gray, Ecology and Environment, Inc.
11:30-11:50am	GIS for 3D Visualization Dr. Rachel Arulraj, Doug Eberhard, and Brandon Young Parsons Brinckerhoff Quade and Douglas

Session Moderator: Ed Freeborn

Concurrent Sessions and Workshops 3

	Hudson II & III
	Session 3C Mixed GIS Topics
3:30-3:50pm	Dynamic Models of Land Use Change in the NE USA Myrna Hall, SUNY College of Environmental Science and Forestry, R. Neil Sampson and Mary Tyrrell, Yale Global Institute for Sustainable Forestry, Yale School of Forestry and Environmental Studies
3:50-4:10pm	Customized ArcObjects Tools for Intelligent Line Tracing and Attribution, and Conflation Kosta Bidoshi, Applied GIS, Inc.
4:10-4:30pm	Geospatial Analysis of the Effectiveness of the WTC Residential Dust Cleanup Program William Thayer, Syracuse Research Corporation
4:30-4:50pm	<i>Cancellation</i>
4:50-5:10pm	GIS Leadership – A Closer Look at the “S” Jim Schoenberg, Bergmann Associates

Session Moderator: Sara Frankenfeld

Concurrent Sessions and Workshops 4

	Hudson II & III
	<u>Session 4C</u> Water
8:30-9:00am	Integrating GIS in an Automated Call Center Graham Hayes and Scott A. Mayers, Red Oak Consulting, A division of Malcolm Pirnie, Inc
9:00-9:20am	FEMA's Map Modernization Program Michael Crino, Baker Engineering NY, Inc
9:20-9:40am	GIS at a Medium-Sized Water Utility Elisabeth DeGironimo, Mohawk Valley Water Authority (MVWA)
9:40-10:00am	Geographic Information Technology for the Assessment and Management of Storm Water in Rural Settings Dave Scherf, Rick Fritschler, and Myra Fedyniak Ulster County Environmental Management

Session Moderator: Jeff Volpe

Concurrent Sessions and Workshops 4

	Columbia
	<u>Session 4D</u> Remote Sensing/Imagery
8:30-9:00am	Integrating Multi-Resolution Data Sources to Update and Improve Land Cover and Land Use Classifications for NYC's 2,000 Square Mile Watershed Terry Spies, Bureau of Water Supply, New York City Department of Environmental Protection George Washburn, Geospatial Software and Modeling Division, PAR Government Systems Corporation
9:00-9:20am	Providing Secure Imagery to Clients Larry Alber and Eric Shyer, NYS DEC GIS Section
9:20-9:40am	Using a Spatial Join to Correlate ABGPS Camera Events with Aerial Photo Numbers Jeffrey Barth, NYSDOT, Photogrammetry Section
9:40-10:00am	Status and Future of the New York Statewide Digital Orthoimagery Program Tim Ruhren, NYS CSCIC

Session Moderator: Horace Shaw

Concurrent Sessions and Workshops 6

	Sullivan
	Session 6B Web Development
1:30-1:50pm	An Interactive GIS for Brownfield Redevelopment - A Work in Progress Sumant Mallavaram and Patricia Parvis, Lawler, Matusky & Skelly Engineers
1:50-2:10pm	Environmental Remediation and Restoration Information Network (ERRIN) Byoungjae Lee and Douglas M. Flewelling, Department of Geography, SUNY Buffalo A. Scott Weber and Shankar Ram, Department of Civil, Structural, and Environmental Engineering, SUNY Buffalo
2:10-2:30pm	Using ArcIMS to Study Quality of Traffic Flow at Ramp Junctions Eric Herman, NY State Thruway Authority
2:30-2:50pm	"AHEC Tools" A User-Friendly Data Resource Steven Schreiber, New York State Area Health Education Center System

Session Moderator: Larry Spraker

Concurrent Sessions and Workshops 6

	Hudson II & III
	Session 6C Mixed GIS Topics
1:30- 1:50pm	AgViewer: An Internet Based Geographic Information System (GIS) to Query and Analyze NYS Agricultural and Environmental Data. Arthur Lembo, Cornell University
1:50- 2:10pm	Real - Time Mobile Asset Tracking Jason Baum, NYSDOH
2:10- 2:30pm	Evaluating Management Scenarios In The Croton Watershed Amy Atamian, Cindy How, P.E., and Lee Wordsman, Malcolm Pirnie, Inc. Kimberlee Kane, New York City Department of Environmental Protection
2:30- 3:00pm	Web-based GIS – 2 approaches to building a customized GIS application Candace Brennan Paulman, C&S Engineers, Inc.

Session Moderator: Sam Wear

Concurrent Sessions and Workshops 6

	Columbia
	<u>Session 6D</u> Vendors Session
1:30-2:00pm	Streamlining the Municipal Office with Custom Applications Phillip Bellizia, Highland Geographic
2:00-2:30pm	ESRI Technology Update Chris Nickola, ESRI-Boston
2:30-3:00pm	MapInfo Doug Gordon, Managing Director, Product Management, MapInfo

Session Moderator: Liz Arabadjis