

NYS GIS Presentation Abstracts In Program Order

Monday, October 26, 2009

Session 1 A in Grandview A

An Evolving Orthoimagery Program – How Partnerships and Technological Advances Shape the Program

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Multiple factors have influenced the New York Statewide Digital Orthoimagery Program; advances in technology, changing funding opportunities, and a variety of partnerships. Each year has seen progress. The importance of partnerships between the State and local government, between the State and Federal Agencies, and within State government has grown. As the program diversifies its products and solidifies its core goals, the importance of coordination, partnerships, and cost-saving technologies have grown. This presentation will cover the evolution of the program with an eye toward its future. We request that this session be grouped with the presentation on How Partnerships are Improving the NYS Streets & Address Points Data Sets.

How Partnerships are Improving the NYS Streets & Address Points Data Sets

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The New York State Office of Cyber Security & Critical Infrastructure Coordination (CSCIC) has formulated a unique data maintenance partnership involving New York State agencies, local governments, the emergency response community, and leaders in the commercial data provider industry. CSCIC's approach in bringing together such diverse groups to share and maintain street address information through a unique public-private partnership is one that is truly showing benefit to our statewide GIS Streets and Address Points database.

In this presentation we will review the various types of partnerships CSCIC has in place and how these partnerships are improving the data. We'll review the various methods CSCIC has in place to easily share this information with a special focus on local government participation. We'll show how CSCIC's on-site meetings with the local government stakeholders to map out address data flow helps to determine the most efficient method for sharing updates and building an effective partnership. Learn who is already participating in a partnership and how your organization can also work with us to improve the data for everyone's use!

We'll also cover what the change in our commercial data maintenance contractor means to users of the NYS Streets and Address Points data sets including what new data will be available, the revision cycle for submission and return of updates, new data release cycles, and improvements to the NYS Streets Change Logs.

Get to the Point: Enabling Geocoding and Related Geospatial Services Across the Enterprise in Westchester County.

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Location-based data is a critical component of many of Westchester County's applications and workflows. Departments that utilize this type of data in their applications include Public Safety, Emergency Services, and the Department of Health, among others. Public resources such as the "Mapping Westchester County" web site also include location-based data. As a result, geocoding of address data is a common need across the organization. Historically these applications utilized somewhat different tools and approaches for geocoding addresses. These mechanisms worked, however the County faced ongoing issues with performance, reliability and usability of the existing tools.

In early 2009, Westchester County embarked on an innovative project to standardize on single enterprise-wide set of geocoding and related location-based services. The core concept of this "Enterprise Geocoding Service" project was to use web services to provide a common endpoint for all County applications for geocoding and geospatial analysis. The new web services needed to be interoperable (Java / .NET; desktop / web /mobile), reliable, high-performing and well documented. In addition, the Enterprise Geocoding Service needed to operate in batch mode, including processing of large datasets (e.g., 500,000+ records).

During this session, you will learn about the general approach, benefits and challenges of using web services to provide common functionality across an organization. You will also learn about the technology used to create the Enterprise Geocoding Service, which includes Microsoft, ESRI and Pitney Bowes (AddressBroker) components. Various "consumers" of the services will be discussed – including Java applications, Windows desktop applications, and ASP.NET web applications.

The Development and Implementation of a Geodatabase to Support Safety Inspections of New York State Canal Embankments

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This purpose of this project is to provide the New York State Department of Transportation and the New York State Canal Corporation with a geodatabase in which to store canal embankment inspection data, spatial features related to the inspection and images of events associated with them. The geodatabase will also facilitate in the production of reports and maps used to disclose the results of the inspections. The New York State Canal Corporation manages an extensive canal system that in addition to being an historic resource also provides recreational opportunities to the public. The system in use today was constructed from 1905-1918. Portions of it are raised above the surrounding landscape by earthen embankments. While the physical condition of the embankments remains in remarkably good shape given its age, it is subject to erosion and deterioration. Regular inspections and maintenance ensure against canal embankment failure that results flooding and property damage to the surrounding areas. Today embankment inspections are performed by the engineers from the New York State Department of Transportation and the results are submitted in report format to the Canal Corporation. Individual data gathered during inspections are stored in paper format in office folders; county-wide maps indicating the location of inspection segments are also stored in paper format in office folders. The stationing of reportable events along the canal system is interpreted through the use of the county-wide paper maps. This project will modernize embankment inspection data storage and retrieval.

Session 1 B in Library

Tompkins County Enterprise Address Management System (EAMS)- Are We Done Yet?

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In spring of 2007, Tompkins County secured funding through a New York State Office of Real Property Services (ORPS) Tax Administration Improvement Grant (RPTATIP) to standardize and maintain County-wide addressing data in a flexible and efficient structure and make distribution and updates a simple and regular activity.

This presentation will showcase EAMS (Enterprise Address Management System) a multi-layered solution that includes:

- (1) A simple multi-relational address data model to facilitate the creation of a Countywide Master Address Table (MAT),
- (2) A set of desktop GIS tools for reconciling and processing changes to addressing information (address points, building footprints, street centerlines) for every municipality in Tompkins County and;
- (3) A web-based GIS application built on ArcGIS Server 9.2 and Microsoft .NET, that allows municipalities and county staff to look-up point based addresses (within building footprints), submit addressing changes in their jurisdiction (address points, centerlines, and building footprints), create and manage distribution lists to notify municipality and county staff of changes to addressing information in near real-time and create reports and download county-wide addressing details.

The County will share lessons learned from working with 15 municipalities to create a Master Address Table (MAT) and disseminate the resulting address information to support individual municipal LUCA efforts. Fountains Spatial, the developer of the EAMS application, will highlight some of the features of EAMS both on the web and desktop side and discuss some of the challenges and lessons learned in building the core components of EAMS application.

Integrating Document Management with ArcGIS Server for Local Governments

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Fountains Spatial and Astria Solutions (both located in Schenectady, NY) have teamed to integrate the DocSTAR document management system with both ArcGIS Server and ArcGIS Desktop. The integration allows organizations to link digital documents to features in GIS layers or to general geographic areas for future retrieval. A web-based GIS application was developed using ArcGIS Server that allows users to quickly retrieve documents based on geography. This presentation will discuss the integration of DocSTAR with ArcGIS Server, and will demonstrate all components that were developed for a municipal client.

Effective GIS for Smaller Counties and Municipalities in Challenging Economic Times

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Smaller counties and towns typically have constrained staffing, IT support and budgets, and the current economy only exacerbates the situation. But this doesn't mean that GIS can't be effectively deployed. With careful planning and prioritization, smaller communities can build and sustain a useful GIS to serve their staff and the public. This presentation will describe several low-cost GIS solutions that have added value to the government entities that have adopted them.

Session 1 C in Birch Room

Spatial Literacy and Making Real World Connections for Students

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Spatial literacy and Geographic Information Technology is a new approach that the Hannibal School District has been developing over the past three years to support existing New York State curriculum. The goal was not to create a new curriculum but rather infuse spatial literacy and Geographic Information Technology into existing curriculum.

The impact of geospatial technology is everywhere and it will continue to be an important part of the student's future. Teachers in the district are developing unique and existing geospatial activities for the Hannibal School District students in kindergarten through 12th grades. The focus is based geography, spatial thinking, problem solving and Science, Technology, Engineering and Mathematics. The Hannibal School District is in rural northern New York State with a student population of 1763 students. The economic base is poor and the district is dependant upon state aid. The lack of resources has been the motivation to get involved outside the classroom. Several teachers in the district have taken leadership roles in making connections with geospatial leaders, forming partnership with colleges, public agencies and the business community.

This year several teachers planned and implemented a Spatial Superintendent's Staff Development Day. Hannibal staff members used ArcMap to look at global warming issues, used gps units to mark waypoints, project waypoint shapefiles in ArcMap and explored Google Earth lesson plans. GIS Day is also new approach that is bringing the GIS community and education together and has been successful providing career insights.

Building a 4-H Geospatial Program in New York

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Hand held recreational GPS units have taken 4H youth from local clubs, camps and afterschool programs out into the field....and the woods, and their neighborhoods. Whether youth are navigating to geocaches or collecting waypoints for mapping fire hydrants, GPS technology has been their introduction to geospatial science. Cornell Cooperative Extension, with the support of ESRI 4H Grants and the NYS 4-H Geospatial Leadership Team, has expanded its geospatial education offerings to include GIS literacy for New York's

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youth. Training youth and adult volunteers provides a foundation for youth community mapping areas such as farm commodity distribution, "Centennial Agriculture Archeology," and "Healthy Choice" initiatives. Remote sensing is an important addition to the 4H tool kit for community mapping, technology skill building, and fun. Current partnerships in New York include ESRI, National Geographic, New York State 4-H Foundation, New York Geographic Alliance, Operation Military Kids, and Pictometry, Inc.

School Power Naturally Web GIS

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School Power...Naturally is an innovative program from the New York State Energy and Research Development Authority (NYSERDA) that is designed to educate New Yorkers about energy, and, in particular, the role that solar electric power – photovoltaics, can play in providing clean energy for our homes, schools and workplaces. IAGT is working with NYSERDA, Hannibal School District and ESRI to expand the School Power...Naturally program by using geospatial technologies to create statewide and regional educational activities that will help students understand solar and wind energies as power producers.

Geospatially-enabled energy lessons have been developed that utilize photovoltaic and wind power data collected from schools in the School Power...Naturally program, through a web mapping application, allowing teachers to cover concepts of solar and wind energies as continuous phenomena. The lessons focus on the environmental and human characteristics influencing and impacting wind power and power produced through photovoltaic cells.

To facilitate these lessons, a web mapping application was created using ArcGIS Server technology, and ESRI's latest web application template. A web application was created, to help reach a wider audience, i.e. for schools who may not have licenses for the latest ESRI desktop software, and likewise, so that no software need be downloaded/installed/configured which can sometimes be problematic. The web application allows users to: perform analytical/spatial queries and buffer operations, upload their own geographic datasets, download search results, symbolize features, and create basic cartographic map products and hard copy output.

Session 1 C in Sky Room

"FOSS" GIS Review: An Overview of Currently Available Free and Open-Source Software (FOSS) GIS Options

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The Free and Open-Source Software (FOSS) movement that has provided the world with the Linux operating system, OpenOffice productivity suite, and MySQL relational database has also produced GIS solutions. For many budget constrained organizations, these products offer an affordable alternative to

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conventional commercial offerings. For some these products are the ONLY means available to manage and share their geospatial content.

"Free" gives the impression that these products may lack features or stability. The presenter will provide an overview of FOSS and examine projects underway at the federal, state, local government as well as one well-known public company that disprove the notion "you get what you pay for".

The presentation will cover:- What is FOSS?

- Conventional FOSS Products
- Benefits/Limitations of FOSS
- FOSS GIS Products*
- - Data Storage - PostGIS
- - Map Rendering - Minnesota MapServer
- - Web Tools - OpenLayers
- FOSS in Action
- - Commonwealth of Massachusetts
- -MetroGIS (Minneapolis/St. Paul)
- - Dept. of Homeland Security
- - DigitalGlobe
- Conclusion

* Other products/projects can be covered as time permits.

Efforts to Build Low Cost GIS Solutions for the Web – A Case Study

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The ease of use and speed of Internet mapping sites such as Google Maps has popularized the concept of GIS outside its industry. Attempting to adapt to user needs and the level of user comfort, many organizations are increasingly showing an interest in the Internet mapping model from these sites. At Fountains Spatial, we recognize that the need for GIS spatial analysis still necessitates in many cases the use of enterprise solutions such as ESRI's ArcGIS Server. In fact, the emergence of competition from Google and Bing Maps might help revitalize these products. ArcGIS Server has made great improvements in the recent months especially in performance (9.3.1). However, use of freely available APIs for Google and Bing Maps and the emergence of free open source GIS databases might be better fitted to small organizations with limited budget. Such users could include small municipalities.

The challenges and limitations of Google and Bing Maps solutions have been previously outlined. In a perfect world we would like to have 1) the viewing capabilities and performance of Google and Bing Maps (including cross integration such as viewing Bird's eye pictures in Google Maps), 2) the ability to add custom layers to this base map, 3) complex spatial analysis of enterprise solutions such as the ones offered by ESRI and all this at a low cost. In this presentation we use a case study to explore such possibilities and look at challenges, limitations and achievements in building such systems. This presentation describes a specific but yet expandable solution to create Google Maps web applications and integrate them with server-side, open source GIS databases that are customizable to user needs. These solutions, which could address recognized limitations of Google Maps, have the capability of GIS viewing, identifying and analysis even for large amounts of data. The possibility for integration of Google Maps and Bing Maps will also be discussed.

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2009 Map Service Viewing Clients: Affordable and Expanding Geospatial Data Viewers for Government & Industry

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Over the past 12-18 months, the GIS community has witnessed a significant change in how geospatial data is viewed across the internet. The primary agents of this change have been: (1) Continued development of map service viewing clients such as NASA's World Wind, GAIA 3, uDig, Google Earth, and ArcGIS Explorer, and (2) open source map service standards as developed by the Open Geospatial Consortium (OGC) which are now being broadly endorsed by the major GIS software vendors.

Map service viewers (both thin client and desktop products) enable users to consume live services being published by government, academia, not-for-profits, and industry. Such services often contain entire agency data catalogs including the most up-to-date and authoritative datasets. The paper will provide an overview, including pros and cons, of the current map service viewing clients with particular attention to applications in New York State.

Session 2 A in Grandview A

Geographic Information System for Tactical Air Search and Rescue

Presentation

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Management and planning of large scale, tactical Search and Rescue (SAR) operations in the air, and on the ground, requires a high level of real-time spatial situational awareness. GIS systems provide capabilities to integrate sensor based data, real time observations, and airborne and satellite telemetry in order to position and identify targets, ground resources, airborne assets, mission bases, airports, and other relevant terrain and ground features. This presentation describes an evolving prototype system, designed for installation at the CAP NY Wing Operations Center, USAF Auxiliary, which provides a high level of tactical data integration with high resolution digital ortho-imagery and a set of layers for airports, mission bases, and other logistical resources.

In the case of missing aircraft searches, the system provides for the overlay of FAA flight plan data, radar trace data, COSPAS/SARSAT satellite hits, last known position, and weather conditions. Terrain modeling is used, together with archived weather data, to predict high probability areas for intensive search along the missing aircraft route. The system has capabilities to print foldable maps for aircrews, large maps for briefings and debriefings, web based maps for remote access, and small maps for deployment on handheld devices used by aircrews and ground teams.

As SAR sorties are flown, data concerning the actual flight track, altitude, and weather conditions are returned to the Operations Center where Bayesian Inference is utilized to calculate conditional probabilities for Containment and Detection of the target aircraft, which can then be used to help plan additional searches in subsequent operational periods. The use of an integrated GIS system as the foundation for a Tactical Information System supports the spectrum of geographic information and situational awareness needs of Incident Commanders, Air Operations Staff, Aircrews, Ground Operations Staff and Ground Teams.

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LiDAR Data Acquisition Best Practices and QA/QC Procedures to Insure a Quality LiDAR Product to The End User

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The presentation will cover all aspects of best practices for LiDAR data acquisition. The data acquisition of LiDAR is pivotal in providing a quality LiDAR product but it is important to have the necessary tools and knowledge to assess the qualitative and quantitative aspects of your delivered data set. The presentation will cover the best processes and procedures of a successful data collection and the necessary collection of control data for accuracy assessment. In addition, aspects of qualitative and quantitative assessment will be addressed to provide a better understanding of how to verify a LiDAR data set. It is necessary to have assurances that the LiDAR data delivered meets the requirements of the desired applications and specifications. This will be discussed. Lastly, a discussion of relative and absolute accuracies, their relationship to each other and the importance of assessing these accuracies as they relate to the quality your LiDAR project will be covered.

3D Now Showing at a Small Screen Near You – Stereo Mapping in the ArcGIS Environment

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Recent advances in software and hardware make it possible, practical, and more affordable to view, manage, and analyze stereo aerial imagery within a familiar GIS interface. This paper will look at system design and costs required to set up a digital stereo mapping system within the context of natural resource mapping.

One example of a digital softcopy workflow uses StereoAnalyst extension for ArcGIS. This software with additional hardware has made digital stereo visualization relatively affordable and efficient. New information can be heads-up digitized in the stereo viewer with existing map layers projected onto the stereo landscape for reference. New and existing features can be edited in the stereo viewer and output to a real-world projection without photo displacement.

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Readily available and affordable imagery is vital to a stereo system. New York State has a rich inventory of recent stereo imagery in digital format as a result of the statewide Orthoimagery Program. Associated camera and flight orientation information is available to properly import photo pairs for analysis. Historical aerial photography can also be scanned and geocorrected.

The New York State Adirondack Park Agency (APA) uses a stereo system for mapping wetlands in the Park while SUNY Plattsburgh has purchased a similar system for teaching and data collection. Paul Smiths College helped the APA in setting up their system and is in the process of establishing their own system. We will present an overview of the value of this technology along with our experiences with hardware, software, data, training and costs. Examples of both analog and digital stereo interpretation techniques will be demonstrated.

Session 2B in Library

Development of a New York State Conservation Lands Geodatabase

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A comprehensive spatial database of protected open-space in New York State (NYS) is a crucial tool for conservation and land-use planning. Currently no such database exists, creating a void in data necessary for making many important decisions on the protection and management of NYS lands. Many components of a conservation lands database do however exist, but are either known only within the agency or organization which manages the lands, or only to small user communities having specific interests in the data. Working with partner agencies and organizations including NYS Department of Environmental Conservation, NYS Office of Parks, Recreation and Historic Preservation, The Nature Conservancy and local land trusts, the New York Natural Heritage Program (NYNHP) is developing a comprehensive conservation lands database.

By working with these organizations, NYNHP will assemble and standardize the attributes of conservation lands data throughout the state into a single hierarchical geodatabase. The geodatabase will allow decision-makers in open space planning and land management to better understand the location, ownership, and management intent of properties, as well as other attributes of open-space that may be impacted by their decisions. The conservation lands geodatabase will also provide a means to better understand the spatial relationship of open space, allowing users to collaborate when making decisions through an increased ability look beyond ownership or political boundaries. The conservation lands geodatabase will also be incorporated into various national efforts to collect and assemble open-space data such as LandScope and the Protected Areas Database of the United States.

A decadal spatial analysis of nationwide forest change

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In the 1990s intense urbanization and agricultural needs have changed the forest landscape. We study the 48 conterminous states to assess forest changes between 1991 and 2000 using the National Land Cover

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Change Dataset. The methods were applied on the county level and our results indicate disproportional forest losses along the coastline, especially on the west coast. The spatial statistics employed also reveal a strong presence of spatial autocorrelation in forest loss, in other words one county's behavior is similar to its adjacent counties. In addition to forest loss we evaluate changes in the average forest distance within each county in an attempt to capture not only changes within each county but also adjacent changes influencing that county.

Anticipating and Accounting for Ecological Change

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Since human habitat is part of a dynamic and integrated system, it is reasonable to forecast change and design accommodations for it. In the past, that meant fighting the forces of nature and putting into place protective structures to combat environmental change. However, faced with changes on the magnitude of the ocean, a combative approach may not be best. By examining the topography of coastal lands, it is possible to forecast the development of components of the ecosystem and account for the human cost of the transition. As sea level continues to rise, coastal land will eventually become sea floor. In addition, ecosystems that support a wide variety of productive wildlife are faced with the same forces of change. Areas along the south shore of Nassau County have been identified as potential candidates for the formation of future marsh islands, with concomitant assessed valuations. It is expected that by amortizing the asset values over the period of time coinciding with the projected sea level rise, the cost to the general public will be minimized. It is also expected ancillary benefits to the regional ecosystem will result. The significance of this work is to provide a method to obtain optimal outcomes for the regional population by anticipating and accounting for the economic impact of ecosystem change.

Geotracking invasive species with iMapInvasives:

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Invasive species are non-native plants, animals and pathogens that survive and spread outside of cultivation. These species often have a negative impact on biodiversity, agriculture, human health and the economy. A major challenge in the successful management and prevention of invasive species is an effective mechanism allowing for the sharing and aggregation of invasive species data between multiple users. iMapInvasives is designed to provide a collaborative venue for the comprehensive exchange of invasive species data using the latest GIS and web-based technologies. iMapInvasives (iMap) is an online, all-taxa mapping tool allowing for the aggregation and display of invasive species location data through user-generated content, from multiple sources.

iMap is designed to allow anyone with invasive species responsibilities, whether it be natural resource managers, Partnerships for Regional Invasive Species Management, national, state, regional or local agencies/organizations, the ability to contribute, view, and query invasive species data. A particular emphasis of iMap will be placed on Early Detection/Rapid Response. iMap will be released in three phases. Phase I, a demonstration site (<http://www.imapinvasives.org/map.html>) allows users to view and query state-wide invasive plant data. Phase II, will allow users to input and query point data for all-taxa of invasive species, as well as receive early detection alerts via e-mail. Phase III, will integrate polygon and polyline data into iMap allowing for users to track management of invasive species. Future plans for iMap include the development of a field or mobile application and modeling capabilities. Training will be available on iMapInvasives beginning in 2010.

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Session 2 C in Birch Room

Enterprise GIS at the New York State Office of Children & Family Services

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While serving the 19.5 million people of New York State each day, the Office of Children & Family Services (OCFS) collects and maintains a staggering amount of geographic information. OCFS has leveraged its investment in departmental systems by spatially enabling the data and making it an agency-wide resource. Using the Web 2.0 features we've come to expect, OCFS delivered its employees a tool that addresses strategic and operational needs such as identifying underserved populations, locating programs/services and emergency response.

This session will discuss how OCFS aggregates data from seemingly disparate systems into an invaluable asset.

Improving the Accuracy of Municipal Boundaries in GIS; Some Pennsylvania Experiences

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GIS representations of municipal boundaries have become incompatible with the accuracy of other foundation data such as imagery, roads, and hydrology. In many cases it is impossible to even assess the accuracy given that the exact origin of GIS data for municipal lines is unknown. With more citizens utilizing GIS data directly it is inevitable that they will question the validity of municipal lines more often than in the past. The expense of a complete re-survey is prohibitive. Two adjoining Counties in PA have researched and inventoried their boundaries and created new GIS representations based directly on the legal record. Although the laws and legal record in Pennsylvania are different there are useful lessons from just south of the state line.

The presentation will include:

- breadth and scope of effort
- condition of legal records
- database design considerations
- typical magnitude of spatial adjustment proposed
- brief discussion of NY-specific considerations

Workshop - Using Databases in GIS and ArcGIS Desktop

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The intent of this workshop is to describe database design in a general and theoretical way, and subsequently demonstrate how appropriately designed databases can be built and utilized within ArcGIS Desktop. The audience will be brought through the thought process of designing a database from scratch, as well as how the evolution from a flat database structure to a one-to-many structure can be achieved. Throughout the workshop the theoretical design and use concepts will be reinforced with practical examples within the ArcGIS Desktop environment. In particular, the tools available for creating, viewing and querying one-to-many relationships will be demonstrated and described.

Session 2 D in Sky Room

Point Pattern Analysis of Parcel Based Land Information Data

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Many cities have developed extensive land information systems that contain a wealth of information at the parcel level. Many of these systems are intended to identify at-risk properties and characterize neighborhood condition. GIS based applications generally focus on creating choropleth maps to facilitate visualization of underlying patterns in the data, generally for a sub area or neighborhood within the jurisdiction. For example, neighborhood maps showing land use, vacancy status, sales, assessed value, and code violations are common outputs from a GIS that serve as input to developing revitalization policy. This research demonstrates how different point pattern analysis techniques to evaluate dispersion and separation may be used to delineate subareas within a region that exhibit specific tendencies as well as evaluate nearest neighbor coincidence among multiple variables. Grid-based, block-based and kernel density approaches are reviewed. Surfaces created using these methods are used to develop contours and overlays. Use of the G-function for single and multiple variable applications is also presented.

Geographic Aggregation of Health Data

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Health outcome maps with fine geographic resolution can mislead due to random fluctuations in disease rates due to the small numbers of cases and can also inadvertently disclose confidential data. To overcome these limitations we developed a tool which can join neighboring geographic areas together until a user defined population or number of cases is reached. This tool will facilitate the production of maps for the public at the finest geographic resolution practicable. The tool was first used to create ZIP code aggregation areas for mapping birth outcome prevalence maps. In 2008 legislation was enacted in New York State to map cancer incidence data at the census block level for the public except in cases where such maps could reveal the identity of any cancer case. Due to concerns over inadvertent disclosure of confidential information at such a fine resolution, we modified the tool to aggregate block level data. The tool was used with cancer data which had been geocoded to the census block. The tool was successfully used to aggregate the 300,000 census blocks in New York State in to block aggregation areas; each aggregation area contained at least 6 male cancer cases and 6 female cancer cases. This presentation will describe the process used to determine which blocks are merged, and the measures used to evaluate the results of aggregation.

Spatial Decision-Making System for Positioning Regionally Distributed Power Sources

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Location is a critical factor in determining the costs of building and operating a power plant. Finding the optimal location for a new power plant is a real-world problem that is based on population distribution and other geographical features. A GIS can be employed to examine this distribution and to visualize its relationship with the geographic characteristics of the surrounding area. We have created a system that combines the visual tools of a GIS with the analytical capabilities of an optimization algorithm to produce a visual representation of a quantitative analysis of the best possible locations for low-capacity power plants embedded in a microgrid. This is a spatial decision-making system which, based on factors such as a plant's power generation capacity and reliability, places the plant in its optimal location within the population distribution. The results of our preliminary tests indicate that if generation cost is not too high, the power plants should be built in the most densely populated regions of the distribution. We are currently upgrading the algorithm to run a more sophisticated and realistic optimization with a larger number of generators and a continuous population distribution.

GIS in Census Work: Last review of the 2010 Census Master Address File

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The accuracy and completeness of the Master Address File (MAF) is very important to the Census Bureau.

- The MAF determines who gets a Census questionnaire at home.
- The MAF serves as the sample frame for the American Community Survey.
- The exact location of each address is very important when it comes to redistricting.

With the 2010 Census three MAF-review activities are undertaken: (1) LUCA by local governments, (2) canvassing by temporary Census Bureau workers, and (3) a final review undertaken by state representatives under auspices of the Federal-State Cooperative Program on Population Estimates (FSCPE). This paper will focus on review activities undertaken by the FSCPE and the uses of GIS connected with producing as complete a set of addresses as possible.

Early 2010 state representatives compare a state generated address list with the MAF and in August they review preliminary Group Quarters population counts. Those review sessions require a thorough preparation: the state representatives need to assemble an address list of housing units for the first session and of Group Quarters for the second.

Latitude and longitude will be used in the matching and review sessions, which will rely heavily on GIS tools. This paper will highlight the activities carried out by the Cornell Program on Applied Demographics, which is the New York representative at the FSCPE. We looked at different data sources and used several means to improve accuracy including several ArcGIS tools and internet mapping.

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Tuesday, October 27, 2009

Session 3A

Map Critique in Grandview A

Session 3B in Library

Experiences using Flood Modeling for Emergency Planning and Mitigation for Local Governments

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The Otsego County GIS program has used various flooding models to assist county emergency services and planning mitigation projects. This presentation will describe ways to use these models and what results to expect. The FEMA HazUS-MH software will be shown using different scenarios - flood returns, dam breaks, mitigation plans. Other models shown include the FLDWAV (flood wave), HEC-RAS (Army Corps), and the FIT extension (Flood Information Tool).

In 2003 the county emergency services was required to create an emergency plan for Larchwood Lake Dam (a private lake). Using the FLDWAV modeling software and Arcview3.3, the extent and timing of the flooding was created and a summary of evacuation plans with maps were included in the report. Currently an update to the East Sidney Lake Dam emergency plan is required. Using HASUS-MH, FIT and information about the potential dam break flooding from Army Corps of Engineering report, a more comprehensive plan can be done. The steps taken to use the software in ArcMap will be demonstrated. Results of the analysis will be shown with examples of how to incorporate local data.

The county Planning Department is currently assisting local municipalities with their hazard mitigation plans. Examples of how these modeling tools are being used for mitigation planning will be shown. Note to Riverine Flood researchers -- this is not intended to be a discussion on the details of the science but rather a review of how these tools can be helpful to local government applications.

The Earthquake Model: A Tool for Emergency Managers. The need of Inspection of Bridges after an Earthquake Event. Automatic notification of earthquake from USGS. Spatial data at DOT to provide information on the epicenter and facilities impacted.

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The model started out as simply to inform us as to what DOT Region and DOT Residency, the earthquake was in and what bridges were near by. The model, over the next few weeks, started to grow, as I thought of things that should be added to the model; and continues to grow. The model works basically like this. We receive an E-Mail notification telling us the Latitude and Longitude of an earthquake. We then put that information into a spreadsheet and run the model. Once the model has run, we are informed as to what Town, Village, City, County, DOT Region and DOT Residency the earthquake was in. But also what Towns, Villages, Cities, Counties, DOT Regions, and DOT Residencies are within a 5 mile radius of the epicenter. Also, it can also tell us what Bridges and dams are within the 5 mile radius. Then, using Network Analyst, the model can tell us what DOT Facilities, Government Offices, Hospitals, and Fairgrounds are near the epicenter. The model can also provide Demographic information, and "local" Radio and TV stations that covers the area of the quake. One of the latest additions came about from the thought of how steep slopes could impact our infrastructure. The model can now tell us what bridges, dams, and roads that are in the 5

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mile radius, of the epicenter that are near steep slopes. With this model anyone can provide emergency managers, this information in less than 10 minutes, versus having to call in GIS personnel, and having them trying to generate this information. Also, even though this model was originally set up for an earthquake event, which is a point event, it could be modified to be used for any point event such as a terrorist act, or hazardous material contamination. This model could also be modified to work with a linear or a polygon event, such as a flooding event.

Departmental Mash Up: Using ArcMap and a little Access Glue To Deliver Real Time Regional Solutions

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This project started with a compelling need. The wrong folks were being woken up in the middle of the night for an emergency.

The Regional Maintenance Group and the Hudson Valley Transportation Management Center (HVTMC) collaborated to develop a new way to get up to date emergency callout information for state and local staff to the HVTMC. The solution needed to be implemented quickly and at no cost.

The result was a technique using the ArcMap event tool and Access macros and links to transfer the needed information across platforms. Variations on the technique have allowed us to display "real time" data on bridges, signals and variable message signs, all sourcing from very different independent systems. Two unintended benefits: First: the source data owners are now connected to their users in a way they never were before. The map shows how, despite the intercession of main office systems, that all departmental data is created and consumed within the region. Second: The use of these techniques decouples the IT backend infrastructure from the user interface. Main Office is free to change data storage practices on individual systems and it can be done transparently to these regional users. The "real time" event can be re-pointed to the new source allowing the user functionality in the map to remain unchanged. The HVTMC has extended their after hour coverage service from three counties to the entire region.

Session 3C in the Birch Room

The Federal Critical Infrastructure Protection Program for New York State

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Alan Leidner, former GIS director of NYC currently serves as the HIFLD to the Regions (HTTR) Information Exchange Broker (IEB) to the Northeast Region which includes NY, NJ and the New England states. Alan's presentation will describe the HIFLD and HIFLD to the Regions programs (HIFLD = Homeland Infrastructure Foundation Level Data) and explore the various offices and functions in the Department of Homeland Security's Office of Infrastructure Protection.

Alan will discuss Federal DHS information resources available to state and local governments through the HIFLD program including access to the Homeland Security Information Network (HSIN) and the HIFLD website. Instructions for getting permission to download HSIP Freedom and to view HSIP Gold, will be provided. Also described will be the roles played by Protective Security Agents (PSA) and State Homeland Security Agents (HSA); the importance of the State's Infrastructure Asset List, and efforts to increase collaboration between government and private sector GIS managers. Evolving relationships with USGS, FEMA, EPA, ACE, and others, will be described.

Mr. Leidner will further talk about key homeland security analytic and intelligence products that require state and local information. He will describe the PCII program which can be used by state and local governments to protect their highly sensitive infrastructure data from public release. New initiatives will

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be outlined including efforts to make Federal RS data available to state and local government and a pilot project to collect state and local infrastructure data for use by DHS, with the intent of then sharing back the risk and threat analyses produced.

Fleet / Asset Tracking (AVL) with ArcGIS Server – York County, SC

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Managing mobile assets and emergency responders via web-GIS brings with it the challenge of unifying multiple technologies and the promise of flexible, cost-efficient information and data. Using their existing Motorola Astro25 radio network, York County, SC chose ArcGIS Server to form the hub of their server, GIS-based AVL system. Learn more about the challenges and triumphs the county encountered in hardware, data management and software development.

New York City Economic Development Corporation Waterfront Facilities Mapping Program and the Waterfront Facilities Maintenance Management System

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With hundreds of miles of City-owned waterfront spread across its five boroughs, New York City has one of the most diverse waterfront environments in the world. The New York City Economic Development Corporation (EDC), which manages over 100 of the City's waterfront properties, has recently completed a comprehensive waterfront data collection and developed a custom facilities management system to manage inspections, recommendations, budgeting, procurement and capital project execution.

The Waterfront Facilities Mapping Program involved performing a complete inventory of the City's waterfront infrastructure. Bowne Management Systems, in partnership with Ocean and Coastal Consultants Engineering (OCC) and EDC, mapped waterfront facilities using GPS data collection technology. Field survey crews performed both land-based and underwater investigation, capturing and photographing the locations, features, and conditions of the City's waterfront infrastructure.

After completion of this extensive data collection effort, Bowne and OCC developed the Waterfront Facilities Maintenance Management System (WFMMS), a cutting-edge technology solution that supports web browser-based query and maintenance of GIS and tabular data. WFMMS is available to users at EDC and several partner organizations. It is also accessible to real estate developers and the contractor community, thus helping to promote economic growth throughout the City.

Session 3D in Sky Room

3D GIS - Now or Later?

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Until recently, the use of 3D in a GIS environment has often placed the user on the bleeding edge of the technology, producing some very interesting successes and a share of disappointing experiences. While this condition still exists, more main street paths are beginning to emerge. Even more exciting is the increasing shift from simply creating a 3D visualization to performing 3D analysis and even simulation. This paper will present and discuss ways communities can employ affordable main stream technologies to begin

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participating in the 3D GIS environment. Particular emphasis will be placed on solutions that use ESRI's ArcGIS software and the multipatch data format. Examples from the new ArcGIS 9.4 (in beta testing) will be presented using the newly update ArcScene environment. Transition of this work into other display environments, like Google Earth, Bing Maps or ArcGIS Explorer will be included. Also gaining traction is the creation of Building Information Models (BIM) for the management, maintenance and planning of individual structures. Are these models able to be included in 3D GIS applications? All of this activity, when displayed in 3D can devour graphic resources. Fortunately, new ways to utilize the Graphic Processing Unit (GPU) on the new generation graphic cards appears provide the necessary graphic "muscle" to meet the demanding, 3D GIS user needs. In the end, should communities joint the 3D GIS bandwagon? Yes, the time is right and the technology is ready. This presentation will show you how.

Future of 3D GIS visualization: Integrating the GPU and the Web

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This presentation will discuss the recent advancements in video card technology and their contribution to Web GIS 3D visualization. Rapid, accurate, and robust 3D visualizations can now be generated on demand from GIS data. Today's Graphics Processing Unit (GPU) technology, most notably driven by the game industry, provides the performance and throughput to visualize and analyze native geospatial data.

Integrating these modern visualization techniques with Web GIS is at its relative infancy. The exponential growth of geospatial data served by the web will continue. Frameworks to mash, discover, analyze, serve, and integrate these datasets continue to mature at a rapid pace. Having visualization technologies that can readily keep pace with these independent advancements will be achieved through adherence to standards and proper integration of GPU technology.

GIS will continue to advance to its native 3D and 4D environment with full analytical and editing capabilities. Web GIS visualization must be ready to embrace this. Examples of rendering and symbolizing datasets, ranging from the realistic to the thematic, will be provided.

Planning in 3D: Digital Planning Review

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Planning in the Town of Big Flats has gone beyond flat paper maps. In a town which serves as the development hub of Chemung County, it is often difficult for planning board and zoning board members to keep track of all of the variables at any given location. As planners in the town, we developed a 3D model which our board members can use to ascertain existing conditions and even to get a sneak peak of the finished product. 3D GIS is becoming an important tool in every planning and zoning review. Neither staff member had been formally trained by ESRI in the use of 3D Analyst, Spatial Analyst or ArcScene. Through a combination of reading, idea bouncing and self-teaching we were able to use LiDAR to create a very accurate DEM and ultimately a 3D

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model. We have also discovered innovative techniques in constructing a complete 3D world for our board members to study in.

Session 3E in High Peaks Room (second floor)

Impervious Surface Mapping Approaches

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Local government agencies and utilities are increasingly interested in mapping impervious surfaces to support stormwater management, watershed and development planning and analysis and green infrastructure mapping.

This presentation will outline various approaches to mapping impervious surfaces. It will include a description of automated, semi-automated remote sensing processes, as well as a description of current photogrammetric and LiDAR based practices. Advantages and disadvantages of each approach, and technical considerations will also be described.

Predicting susceptibility to invasive species establishment at landscape scale

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Both rule-based and probabilistic spatial models were used to predict the establishment of an invasive weed species in central New York using presence-only field data. The rule-based model used biophysical factors of ecological land type, elevation, slope aspect, soil, and parking area location. Three probabilistic spatial models were evaluated, including maximum entropy (MaxEnt), Boosted Regression Trees (BRT), and Bioclim DIVA GIS using biophysical spatial variables of soil type, elevation, slope aspect, and slope gradient. Model predictions and comparisons will be presented and areas of potential applications will be discussed.

Habitat Classification for Ecological Risk Assessment Using Aerial Photography and GIS Data in a Two-stage Expert System

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There are many challenges in performing a land cover classification that can be used for habitat suitability analysis of multiple species in ecological risk assessments. The classification scheme must be detailed enough to allow for use to several different habitat requirements, as well as flexible enough to be applicable to different species. Because habitat suitability often has minimum area requirements, but does not require regular shapes of contiguous cover, high spatial resolution is often necessary. We present the results of a land cover classification designed to allow for the modeling of habitat suitability for a variety of animals, such as shrews, robins, and deer. A hybrid remote sensing / GIS approach was developed that uses both aerial photography and ancillary GIS data. A two-stage expert system is used to bring together different data sources. The result is a land cover classification with fourteen classes, a minimum mapping unit of 1/20 acre, and distinct polygons that can be as narrow as four feet wide in places. Ground reference data from field visits showed an overall accuracy of approximately 80% for qualitatively different classes and 60% for the full classification scheme containing quantitative class divisions, such as those between closed, intermediate, and open canopy cover classes.

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Session 4 in Grandview A

Mapping the Economic Recovery

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The Office of Cyber Security and Critical Infrastructure Coordination (CSCIC) collaborated with the Office for Technology in developing a mapping application to help keep the public informed about the locations and status of certified stimulus projects across the State.

When the American Recovery and Reinvestment Act was announced, the State created an Economic Recovery Cabinet. That Cabinet quickly convened a GIS workgroup to coordinate data on individual economic recovery projects. The resulting economic recovery mapping application displays certified projects which have been reported to CSCIC by State agencies. The application provides an information box showing a brief description of the project, the amount of the approved funding and the lead agency. Where appropriate, the information box also contains links to the contact agency web pages for more details and to the Office of the State Comptroller's website for contract details. Also includes links to the State's Department of Labor Job Bank to allow users to locate job opening near the project site.

The map uses Google Maps for map display and searches, as well as integration with Google Earth for more advanced functions.

New York's Broadband Mapping Initiative

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Deployment of Broadband Internet access to households and businesses in all areas of the State is a high priority and is also part of a nationwide Broadband initiative funded by the federal economic stimulus legislation. New York State has a Broadband Development and Deployment Council created by Governor's Executive Order #22. The NYS Office of Cyber Security & Critical Infrastructure Coordination (CSCIC) has been performing the broadband mapping in support of the Council. This presentation will show the innovative methods being used to produce the state's first coverage of broadband availability. The methods do not rely on use of proprietary information from broadband provider companies and the maps are therefore free of restrictions on use of the mapping information. A predictive model was created to map the likely availability of cable and DSL broadband and the predictive coverage maps were then reviewed by County CIOs and provider companies to edit and validate the maps. The review and validation process was facilitated with the use of Google Maps and the My Maps editing feature. The resulting broadband mapping is expected to be used in the selection of stimulus-funded broadband deployment projects. We request that this session be grouped with the presentation on Mapping the Economic Recovery.

A new OASIS for the New York metro area

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The Open Accessible Space Information System (OASIS) website provides the richest source of community maps for the New York City area – free and all in one place online. Since 2000 it's received an average of 400,000 annual visits from residents, students, city staff, professional planners, and others who use it to make 1.5 million customized maps a year.

OASIS's current maps were created using now-outdated technology, but the Center for Urban Research at the CUNY Graduate Center has completely transformed the site. A beta version is at www.urbanresearchmaps.org/oasis/map.aspx .

We have:

- leveraged the latest ESRI software with open source tools (OpenLayers and Ext JS);
- added new data: environmental stewardship "turfs" (from the Forest Service), historical land use for Manhattan and the Bronx River (from the Wildlife Conservation Society), Census data, remediation sites, and more;
- integrated Yahoo! Local search results;
- added the latest property data, harbor habitats, public waterfront access, schools, and more; and
- developed new features:
 - o a timeline slider to seamlessly transition between aerial photos from 1996 and 2006;
 - o a dynamic transparency control that sets each map layer's transparency level to reveal what's underneath; and
 - o Microsoft's bird's eye views of any spot on the map.

The presentation will include:

- a discussion of the many data layers and partnerships that make OASIS unique; and
- a review of the technologies involved in the project, plus new tools that are enabled by a creative application of AJAX data visualization techniques.

Session 4B in Library

Recommended Best Practices for Creation of NYS Hydrography Framework Updates and Opportunities for Collaboration

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The GIS Section of the NYSDEC Division of Water is in charge of coordinating the maintenance of the Hydrography Framework Layer in NYS, which doubles as the National Hydrography Dataset (NHD) NSDI layer within the State. The layer is published by and available for download from USGS (nhd.usgs.gov) through an agreement between NYSDEC and USGS.

Data maintenance is carried out through distributed governance in which Data Stewards agree to coordinate and/or resource update and improvement activities. A Steward (e.g. NYSDEC) can delegate its authority to any willing and able sub-steward, enabling the local (and more knowledgeable) entity to create/update data in their area of interest. Chautauqua and Dutchess Counties are in the process of becoming sub-stewards and submitting updates.

Hydrography updates need to follow NHD data model guidelines and be ready for smooth connection to contiguous, neighboring features. Anyone can contribute updates to the (sub-) steward if they are appropriately documented. Updates may be submitted in one of three forms:

- Integrated within the current NHD, with full formatting and attribution,
- Conflation-ready, including a continuous drainage network and attribution of all features according to the NHD schema, or
- Raw vector geometry.

Tools are available to facilitate any level of contribution.

We are interested in identifying interested sub-stewards. The possibility of jointly funded USGS-NYS-Sub-steward projects exists. Please contact the NYS Hydrography Stewardship Program at watergis@gw.dec.state.ny.us.

Highlighting Watershed Improvement Activities in the Finger Lakes – Lake Ontario Basin

NYS GIS Presentation Abstracts In Program Order

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The Finger Lakes – Lake Ontario Watershed Protection Alliance (FL-LOWPA) has released a new system for providing access to information and data about the wide range of watershed improvement projects it sponsors within the Finger Lakes – Lake Ontario Basin. The FL-LOWPA Interactive Mapping System (FIMS) is a web-based public information tool that serves to showcase the breadth and depth of FL-LOWPA projects undertaken at the local level. FIMS allows project review and information exchange between FL-LOWPA member counties, project partners, and the interested public. It provides a visual reference to the regional distribution of projects, and a simple interface for accessing project descriptions and other more detailed information such as reports, tabular data, photos, partner and resource links, geospatial data, and other media.

FIMS consists of a public map-based interface built on top of the Microsoft Bing Maps mapping platform, and a private database-driven administrative interface. In addition to project locations, the FIMS map includes custom map layers that can be displayed along with the Bing Maps base layers to show additional features such as watershed boundaries, public lands, land cover, and NYS priority water bodies. The administrative interface allows FL-LOWPA staff to easily update project information and resources accessed through the project points. Location marker symbols reflect the various categories of projects undertaken in the region, and are neatly managed to allow access to multiple projects at the same location and to intelligently handle marker display and multi-project access for project clusters when viewing at wider regional scales.

Using GIS Modeling to Develop Municipal Greenprints

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Municipalities continually face development pressures and municipal planning and environmental agencies must make land use decisions that have long-term implications on the character of their community and its environmental health. Greenprinting is the practice of identifying and assessing functionally valuable greenspace, such as public and privately owned parks, riparian corridors, wetlands, and other public and private open space within a municipality, and planning for its long-term, sustainable management. The document that outlines such a plan provides a design (like a blueprint) for sustainable, or "green" management, and is therefore called a greenprint. Greenprinting is often implemented as part of an integrated municipal sustainability plan, or as part of a municipality's Master Planning process, and greatly simplifies planning and environmental agencies' decision making. GIS plays an important role in the development of a greenprint.

We have developed greenprints for a number of municipalities, and will highlight one case study as an example of how we developed GIS layers that could be overlaid in a variety of ways to identify natural and cultural resources that were important to the protection of local water quality, community open space and character, and local and regional biodiversity and ecosystem health. We will also demonstrate the tools we developed for municipal planning and environmental agencies to help them review environmental impact assessments under New York State's Environmental Quality Review Act (SEQRA) more effectively. GIS allows municipalities to create greenprints, enabling them to plan for and protect long-term community character and environmental conservation.

Session 4C in Birch Room

Kids' Well-being Indicators Clearinghouse (KWIC) Thematic Mapping Demonstration

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The Council on Children and Families manages the NYS Kids' Well-being Indicators Clearinghouse website also referred to as KWIC (www.nyskwic.org). KWIC is a data warehouse that allows users to gather, plot and monitor NYS children's health, education and well-being indicator data in order to improve outcomes for children and families.

KWIC includes a Flash/ArcGIS mapping component that presents county-level thematic maps with foreground proportional circles representing county-relative numbers for the selected indicator or for selected demographic characteristics. The mapping interface is very user-friendly and allows users many options for customizing maps.

One of the more powerful features of the KWIC mapping component is the ability to create custom county regions where indicator data for each region are aggregated and displayed in a thematic map as well as in a data table that is easily exportable. KWIC mapping also includes overlays for major NYS highways, NYS Senate, Assembly and Congressional districts, as well as the ability to lock intervals and compare maps over time.

This session will include a brief overview of the KWIC website as well as a demonstration of the KWIC mapping component. Participants will learn how to: select indicators to create thematic maps; view selected demographic numbers along with KWIC indicators; compare maps over time; create custom county regions with aggregated indicator data and export those data; save custom regions; as well as view NYS Senate, Assembly and Congressional District overlays.

Mobile 3D Laser Scanning: What's in it for me? Implications for GIS and data consumers

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This presentation covers the considerations that GIS users, data consumers and operators might wish to make when evaluating the capabilities and outputs from 3D mobile LIDAR systems. A discussion of the current state of the technology with a focus on the economics and improved resolution and fidelity of the built environment will be held. Differentiating the capabilities of the wide assortment of hardware is of concern to the data consumer: you need to know what you're getting.

The effect of this technology on surface and 3D models, navigation, GIS data bases and visualization is substantial. As this technology evolves and becomes commonplace, thereby rendering massive amounts of data, considerations regarding the utility and efficacy of its use need to be understood. What are the key technology elements which produce a good, useable data product?

A comparison of the essential elements in integrating a productive system will be outlined. As well, the practical implications of the operation of these systems, with respect to their architectures, will be evaluated. The essential elements of a suitable architecture will be discussed.

What can the data user expect to see from the service contractors? Data are large and users will want to know how to make decision-worthy information from raw LIDAR data. This presentation will review the current state of the technology to assist the user community in understanding the technology and in extracting actionable information from the data products.

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Web GIS Usability: Web GIS is not Desktop GIS on the web!

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The major commercial mapping providers have all gotten the message. Usability is the key to getting traffic on your site and creating user satisfaction. So why is your GIS site still hard to use and confusing. The goal of this presentation is to discuss what users want and expect, and then how to provide this user experience to them. Examples will be shown of sites which provide a modern user friendly interface while still providing the necessary information users expect. Examples will use JavaScript, Flex, and Silverlight in combination with ESRI's ArcGIS Server and ArcGIS Online.

Session 4D in Sky Room

Integrating Web Map Services with ESRI & Bing Maps (Microsoft Virtual Earth) *A look at where GIS technology is headed...*

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This presentation will address some of the new capabilities for integrating GIS data from ESRI Geodatabases with web based services provided by Microsoft's Bing Maps for the Enterprise (formerly Microsoft Virtual Earth). The partnership between ESRI and Microsoft is expanding, providing new capabilities for data integration on the web. How can you and your company take advantage of the tools and techniques that are emerging from this integration? What are the best methods for integration and when is it most appropriate? How can this technology partnership be used to provide better business value to the client? How are data and web services being used with internet based maps?

Manifold IMS: a tour of three internet mapping applications

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This presentation will first show what a Manifold GIS Internet Map Server application looks like "out-of-the-box". It will be followed by a look at three customized applications: 1) interactive snowmobile trail webmap, 2) feature-rich municipality IMS, and 3) chamber of commerce webmap. Dreamweaver and Javascript will be used to view and customize the underlying code. This overview is appropriate for any level GIS end user or developer.

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Building effective GIS applications using Google Maps

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Rapid development and popularity of the online mapping systems such as Google Maps and Microsoft Bing Maps has had a significant impact on GIS industry. Many attributes of these systems, such as public appeal and relatively low costs, prove them to be an attractive alternative to some of the traditional GIS approaches. At the same time, functional limitations, as well as limited expertise in this area, raise valid concerns among GIS professionals. In this presentation we will discuss how Google Maps technology could be successfully employed to create relatively simple but effective GIS applications.

This presentation looks at some examples of applications that traditionally utilize a GIS-centric approach, but were implemented using the Google Maps technology. We are going to look at the Google Maps applications utilized by NYS local government and talk about approaches, successful solutions as well as challenges. We are going to discuss limitations and even potential road blocks users may encounter when using Google Maps to present spatial information. Other topics include data considerations, technical expertise as well as system requirements and potential future developments in this area.

Lunch Presentation: Special Session

Adventures in China - Capturing More of the “Experience” Through the Use of Geospatial and Other Technologies

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This presentation will focus on the continually expanding collection of geospatial and other technologies available to record real world experiences, both professional and leisure (e.g., travel). A range of tools and resources will be discussed including GPS tracking, geotagging photos, web-based photo albums, Google Maps, and Google Earth. Examples will be given using the presenters' recent trip to China.

Session 5A in Grandview A

Making Geographic-based Information Available to the Public: A New York City Approach

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In January, 2009 the Citywide GIS Group of the New York City Department of Information Technology and Telecommunications (DoITT) launched the newest version of NYCityMap, the City's web-based interactive

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mapping application. From a single search, NYCityMap provides access to a wealth of NYC geographic data and systems that is continually expanded upon. NYCityMap version 2.0 has an improved user interface and presents a number of new data layers, including the City's current capital construction projects, City agency walk-in service centers and Federal Stimulus Projects. Added application functionality includes search history, distance measuring, and the ability of users to save and export their maps. These improvements enhance the previously-available NYCityMap offerings such as aerial photos of the city, building and property information, links to poll site locations, census data, neighborhood health profiles and statistics, restaurant inspection information, locations of educational facilities and transportation hubs, and much more. The new version of NYCityMap is built around a custom framework developed in house by DoITT and leverages the open source server technology, GeoServer.

GIS on the Web in the Vineyard Industry

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The Institute for the Application of Geospatial Technologies (IAGT) is a nonprofit organization in Auburn, NY that is dedicated to accelerating the application of geospatial information technology across government, education, and commercial sectors. Geographic Information Systems (GIS) is a powerful tool that can help growers visualize and manage agricultural data.

IAGT has been collaborating with the Cornell Agricultural Experiment Station to provide GIS services and information in a web format so that researchers and public users have easy access to the data. Examples of the following GIS based websites will be presented:

- (1) The public oriented Vineyard Scorecard website www.nyvineyardsite.org, which is a one stop shop for educational and geospatial information pertaining to locating a vineyard in NYS, and
- (2) the research oriented Temperature Sensor database site, <http://arcserver2.iagt.org/vineyardtemps>, which shows the location of temperature sensors located in vineyards throughout NYS and provides access to the temperature data.

A Web Based Geospatial Solution for Infrastructure / Project Management

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This presentation centers around a Downstate NY International manufacturing company that hitched on to a local municipal GIS success story to develop an infrastructure and project management solution. The system utilizes infrastructure data such as Water San Storm Electric Bld Structures and Security for field work as well as allow for paperless engineering review markup of project documentation.

This presentation discusses this project from its inception 7 years ago to today which brings GeospatialTechnology together with modern CAD and Building Information Modeling. The tools used to bring this Website together including Autodesk Civil 3D/Map, Design Review, ESRI's ArcGIS, Autodesk Mapguide Enterprise and Studio will be demonstrated. The presentation will cover the huge productivity gains achievable with a methodology such as this that allows for accurate field data verification and maintenance as well as a project collaboration strategy that allows for streamlined communication.

Session 5B in Library

The Development and Implementation of a Geodatabase to Support Safety Inspections of New York State Canal Embankments

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This purpose of this project is to provide the New York State Department of Transportation and the New York State Canal Corporation with a geodatabase in which to store canal embankment inspection data, spatial features related to the inspection and images of events associated with them. The geodatabase will also facilitate in the production of reports and maps used to disclose the results of the inspections.

The New York State Canal Corporation manages an extensive canal system that in addition to being an historic resource also provides recreational opportunities to the public. The system in use today was constructed from 1905-1918. Portions of it are raised above the surrounding landscape by earthen embankments. While the physical condition of the embankments remains in remarkably good shape given its age, it is subject to erosion and deterioration. Regular inspections and maintenance ensure against canal embankment failure that results flooding and property damage to the surrounding areas.

Today embankment inspections are performed by the engineers from the New York State Department of Transportation and the results are submitted in report format to the Canal Corporation. Individual data gathered during inspections are stored in paper format in office folders; county-wide maps indicating the location of inspection segments are also stored in paper format in office folders. The stationing of reportable events along the canal system is interpreted through the use of the county-wide paper maps. This project will modernize embankment inspection data storage and retrieval.

Optimized and adaptive snowplow routing using best-first search artificial intelligence algorithm

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Snow is a fact of life in New York - one of the principal functions of local government is removing snow from roads. Developing optimal/efficient routes for snow plows is a considerable challenge involving large data sets and multiple goals and constraints. Planners seek to minimize deadheading (time when a truck is moving but the plow blade is not in service), balance workloads, prioritize arterial roads, and adapt routes to varying snowstorm durations and intensities. In this talk I will present a GIS-based heuristic search algorithm which generates efficient plow routes for given fleet sizes, cycle times, and local priorities. The routing process is based upon a high-quality GIS roads data set (for example NYS Streets from the NYS GIS Clearinghouse). ArcMap use the roads data set to generate an attribute-rich link and node data set, representing road segments and intersections, respectively. The link and node data set is processed through a beam search (an optimization of the best-first search algorithm) to generate a scheme that minimizes travel time while obeying relevant constraints. The resulting scheme is imported back into ArcMap where it is used to create traditional route maps for plow operators.

Tool Suite for Transportation

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Fountains Spatial and the Adirondack Glens Falls Transportation Council (AGFTC), the MPO for Warren, Washington, and northern Saratoga Counties, have completed an exciting and diverse project. As a small organization managing a vast geographic area, the AGFTC is in need of easy-to-use tools to better accomplish its mission to facilitate a cooperative transportation planning and decision making process. The AGFTC prioritizes transportation policies, programs and projects for the area's highway, bridge and public

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transportation facilities. The AGFTC also strives to ensure that the public is involved in the transportation decision making process.

As part of the project, a suite of custom GIS-based tools was developed. Different approaches were applied to each application area, including desktop based, web-based and mobile GIS applications as listed below:

1. Desktop GIS Data and MXD Viewer Application implemented as an ArcGIS toolbar.
2. Web Viewer for Public Access to Transportation Data implemented as a Google-based application to allow quick exploration of transportation improvement projects throughout the MPO.
3. Ridership Data Collector Tool implemented as a mobile application to calculate average riders per mile along bus routes.
4. Pavement Collector Tool implemented as a mobile application to capture pavement conditions.

We will discuss each application in greater detail, including selected technology and functionality. We will also talk about the challenges regarding the ever-changing technology as it relates to transportation planning.

Session 5C in Birch Room

ROI Assessment of Hamburg's ArcGIS Server Assessment Site

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The Town of Hamburg's Assessor, envisioned a public self-serve website to resolve questions about property assessments in an open and transparent venue. The Town applied for and was awarded funding through a New York State Office of Real Property Services technology grant. Wendel Duchscherer was contracted by the Town to develop an ArcGIS Server-based web-mapping application to provide residents, appraisers, realtors, surveyors, and town employees with a simple display of property information, photos, comparable sales, tax bill information, tax rate history and assessment information from the Town's tightly coupled Real Property Tax and GIS databases.

<http://www1.wd-gis.com/hamburg/UserForms/Hamburg/Home.aspx>

Links to State forms, publications, and online tax bill payment were also built into the website. The long-term view of this site is not just to provide Assessment data to the public, but to leverage the Town's investment in GIS technology to maximize the benefits of presenting Assessment data within the Town's spatial data framework.

There were several factors which prompted and motivated the development of the public website – cost-savings and cost-avoidance was just one.

A typical day for the five employees in the Town of Hamburg Assessor's office involves fielding 50-100 individual visits per day as well as 100-150 phone calls per day with each visit/call requiring 10-20 minutes of staff time to address the individual's questions. An individual coming into the Assessor's office will spend approximately 10-20 minutes traveling to the Town Hall, 10-20 minutes resolving their questions and 10-20 minutes returning home (plus transportation costs).

A Statewide GIS Cadastral Parcel Layer

John Trimmer
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This presentation will first provide a brief summary of the recent NYS GIS Strategic Plan and then focus on a statewide cadastral parcel layer, the top priority recommendation from the GIS Strategic planning process. The NYS GIS Coordinating Body formed a Cadastral Data Work Group (CDWG) in 2004 and assigned the task of developing a cadastral parcel standard. The goal was to facilitate the exchange of GIS parcel data by adopting a standard data structure. A parcel standard was adopted by the Coordinating Body in 2007 and subsequently implemented by many cities and counties.

The Strategic Planning process showed that although all of the tax maps in New York are now digital, access to those digital files is still problematic. The effort required by regional and state agencies to collect and standardize digital tax parcel data is significant.

Current technology will now allow automated replication of parcel data to a centralized Web Map Service on a regular basis. The goals envisioned by the Coordinating Body are to adopt a more complete cadastral parcel standard that, identify strategies to assist counties in voluntarily adopting the new standard, develop procedures for on-going data maintenance, and provide the replicated parcel data as a statewide GIS cadastral parcel web service.

This session will consist of a 30 minute presentation, followed by a 30 minute panel discussion. Panelist will include stakeholders from the Coordinating Body, the Cadastral Data work Group, the State Agency Advisory Group, and county and local government parcel data custodians.

Session 5 D in Sky Room

2009 ESRI User Conference Highlights

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Please join us for a special presentation of the highlights from our 29th Annual International User Conference held in San Diego, CA this past July. In this session, we will discuss the latest trends, the direction of ESRI, and our vision for GIS, focusing on the following topics:

- Key areas of development across the ArcGIS platform for
 - Asset Management
 - Planning & Analysis
 - Mobility
 - Operational Awareness
- An update on solution products like ArcLogistics, Business Analyst, and others
- New options for online data and services and the role they play
- New online resource centers, which provide
 - Information about ESRI technologies and communities
 - Best practice templates for workflows, applications, data models, and cartography.