



ESRI Mid-Atlantic User Group Annual Conference  
Wednesday, December 9, 2009  
Radisson Hotel Valley Forge • Pennsylvania

## ABSTRACTS – USER PRESENTATIONS

1:30 p.m. - 3:00 p.m.

Track 1

### Web Based GIS

#### ***Tools for 2010 Legislative Redistricting***

Author(s): Tamara Manik-Perlman and Dana Bauer — Avencia

Software used for this project: ESRI ArcView

*Census 2010 population data will have a major impact on political boundaries across the U.S., with decennial population totals forming the basis for everything from local ward and legislative boundaries to statewide Congressional districts. Unfortunately, the redistricting process is politically charged and often sullied by the practice of gerrymandering.*

*Ideally, political districts should be comprised of compact and contiguous territory in order to fairly distribute voters of all backgrounds and parties between adjacent districts. While we might think that it is simple to identify a gerrymandered district by its irregular shape, there can be several confounding factors that make such a determination difficult.*

*A new website, **Redistricting the Nation**, is leveraging desktop GIS technology to calculate gerrymandering metrics and make citizens aware of its adverse effects on the election process. Users are able to rank their political districts by compactness and even create sample districts to better understand the redistricting process. This presentation will demonstrate how ArcView GIS was used to rank the compactness of existing political districts based on several metrics and how it can facilitate redistricting efforts that are fair to all citizens.*

Keywords: redistricting, Census 2010, gerrymandering, political districts, elections

#### ***How to Convert Your ArcIMS Website to ArcGIS Server Technology***

Author(s): Russell Minich, Principal Timmons Group

Software used for this project: ArcGIS Server, Flex API, Silverlight API JavaScript API (3 separate project examples)

*Government and private industry have successfully used ArcIMS technology for many years to distribute GIS on the web. Advances in technology since the introduction of ArcIMS has provided new, more robust and user-friendly options for deploying GIS on the web. These include using a variety of Application Programming Interfaces (APIs) such as Flex, Silverlight and JavaScript. This session will focus on some of the differences in the technologies and discuss the pros and cons of each. The goal is to assist with making the right deployment for your organization and constituents. Examples of each technology will be demonstrated along with some key planning steps to help you take advantage of these new and exciting options. This will be an important session for you if you currently have ArcIMS technology in place or are looking to start a new project for web-based mapping.*

Keywords: GIS website, Flex, Silverlight, JavaScript, ArcServer

## Web Based GIS Track: 1:30 p.m. – 3:00 p.m. Track 1 continued

### ***NJ-GeoWeb: NJDEP's New Internet Interactive Mapping Application***

Author(s): Lawrence L. Thornton, MS GISP, NJDEP Manager, Bureau of GIS;

Lou Jacoby, Project Manager, NJDEP, Bureau of GIS;

Software used for this project: ArcSDE, ArcIMS, OnPoint6.1

*NJ-GeoWeb is the NJDEP's new "next generation" Internet mapping application that can provide users with environmental information from a statewide, county or local perspective. With NJ-GeoWeb, users can view and query the best of the NJDEP's GIS data with "live" data reports from NJDEP's Data Miner, giving a new level of transparency to NJDEP's decision-making. An Internet database reporting tool, DataMiner is populated live from the NJDEP's Environmental Management System that houses data from all the large NJDEP media programs. It is NJDEP's hope that NJ-GeoWeb will assist users to become more engaged in decision-making about environmental issues in their communities. NJ-GeoWeb will also help those seeking permits from the NJDEP determine whether their proposed project is in an environmentally sensitive area.*

*NJ-GeoWeb is role based. If users have a specific question about a specific topic, NJDEP can create a customized interface to help users get specific answers to their specific question. In this release, there are specific profiles for Well Drillers, Volunteer Water Monitoring contributors, and a one size fits all profile called GeoWeb.*

*NJ-GeoWeb just won 1st place in the 2009 ESRI International User Conference User Fair as the best Web Based Application, by vote of User Conference attendees.*

Keywords: Internet, Interactive Application, Profile Driven, Integration of Features to Live data, Enterprise Application

1:30 p.m. - 3:00 p.m.

Track 2

## Mobile GIS Applications & Data

### ***Supporting Non-GIS Users with a Sophisticated GIS Field Collection Tool***

Author(s): Patrick McLoughlin, Spatial Systems Associates, Inc.

Keith Appler, Fairfax Maintenance & Stormwater Management Division

Software used for this project: ArcMap VB.Net

*Under EPA's NPDES permitting requirements, Fairfax County Virginia's Maintenance and Stormwater Management Division inspects each asset of the stormwater system. MSMD printed out tax maps that field inspectors would mark up, with which the GIS staff would add to the GIS data. The Department wanted to move away from its reliance on paper maps and have the GIS data updated on Tablet PCs in the field. MSMD contracted SSA to develop a customized GIS field data collection tool that does not require GIS experience to use and gives the inspector the tools to complete the permitting process.*

Keywords: Stormwater, Field, Collection, NPDES, Tablet PC

## Mobile GIS Applications & Data 1:30 - 3:00 p.m. Track 2 continued

### ***Working Smarter In the Field with ADAMobile***

Author(s): Jeanne Ruthloff, Director of Business Development , JMT Technology Group  
Software used for this project: ArcGIS Server and ArcGIS Mobile

*To ensure accessibility for individuals with disabilities along our nation's transportation networks, the JMT Technology Group has developed ADAMobile, a field solution that provides government agencies with the ability to collect information about pedestrian facilities based on the ADA Standards for Accessible Design.*

*This mobile collection tool can be tailored to suit an agency's specific needs and guidelines. Whether you are collecting information for the first time or maintaining an existing inventory, ADAMobile can keep your inventory current. Built on ArcGIS® Mobile technology, ADAMobile provides the capability to perform real-time updates from the field to the office - and back to the field. If real-time updates are not required, your workforce can collect information in a disconnected environment and provide that data at the end of the day, end of the week or whatever your business process allows.*

*This session will demonstrate the functionality of ADAMobile and its deployment for the Delaware Department of Transportation as well as how the use of the application can benefit government agencies and the communities they serve.*

Keywords: Mobile, Transportation, GIS, Field, Mobility

### ***Mobile LiDAR: Surveys at the Speed of Business***

Author(s): Brenda Burroughs, Steven Clancy, Chris Holmes — Michael Baker Jr. Inc.  
Software used for this project: ArcGIS, Spatial Analyst

*The ubiquitous application of LiDAR (Light Detection and Ranging) technology within the Geospatial industry over the past decade has revolved around aerial applications. Today, technological advancements have facilitated accurate LiDAR capture from mobile terrestrial platforms (van, boat, ATV, rail, etc.). Recent evolutions in sensor design have yielded systems capable of producing survey/engineering grade accuracy on-the-fly, while blanketing areas within 200+ meters of the vehicle with up to 1.6 million laser returns per second. By coupling the advantages of both proximity-to-target and ground-based viewing perspectives, mobile LiDAR delivers far greater accuracy and point-densities than airborne platforms, while providing the framework for new applications and uses.*

*This presentation will provide an overview of Mobile LiDAR technology and demonstrate its practical application for: roadway design, asset inventory, bridge / road inspections, corridor mapping and 3D modeling/animation. Additionally, the presentation will review current methodology for rapid feature extraction and point-cloud rasterization, as well as the examination of benefits over traditional surveying and data collection methods.*

Keywords: Survey, engineering, terrestrial, feature extraction, contours, data collection

1:30 p.m. - 3:00 p.m.  
Track 3

**Transportation / Mobile**

***Revisiting GIS Interoperability: How to Interoperate Transportation Applications and GIS***

Author(s): Simon Lewis, ESRI Philadelphia Transportation SIG, AgileAssets, Inc.  
Software used for this project: ArcGIS Transportaiton applications

*Transportation agencies have invested significant amounts of resources into IT. This includes generic tools such as GIS, and core support applications, such as for pavement, maintenance, safety, traffic, etc. GIS is relatively limited in direct transportation application functionality, so it's often necessary to link or interoperate GIS with dedicated transportation applications. How to best interoperate GIS and other transportation applications is far from being a well-laid out issue for transportation agency decision-makers and managers. While perhaps deemed by some a basic or perhaps a "technical issue", the reality is there is a set of options that involve important trade-offs technically, cost-wise and also institutionally. These issues are not unique to the transportation field.*

*In this context, a brief review of the role of GIS in supporting transportation analysis activities and current field developments related to GIS is made. This paper lays out the case that: 1) it is currently a key field transportation agency issue, 2) preferred strategies and techniques are not clear and well-laid out, 3) there are a number of distinct options for integration, and 4) the integration of field applications is a valid and important one, including for further non-vendor led research and investigation. Recommendations on potential forgoing research and development are made. The paper summarizes the results of a one-day workshop on this topic held by the ESRI Philadelphia Transportation SIG held on Oct 15 2009.*

Keywords: transportation, interoperability, TransSIG, applications, OpenGIS

***Transportation Data Integration and Distribution***

Author(s): Thomas W. Tiner, CP, GISP, Michael Baker Jr

*The NJDOT Straight Line Diagrams Roadway Inventory Videolog application is an internal client\server tool for planners and engineers with access to NJDOT internal network. The application displays four roadway photos, roughly every 40 feet along state and county routes and includes two sets of archive photos from 2004 and 2007. A variety of roadway attributes are displayed and specific to each photo position (i.e. street name, county, municipality, etc.). New for 2009 is the inclusion of an overview map, utilizing ArcGIS Online services, and nearby available photos within either a street map view or aerial photo view. Also new for 2009 is the inclusion of a stick diagram automatically generated using scalable vector graphics (SVG) allowing users to view their current position, cross streets, nearby intersections and ramp photos. Users now have the ability to create and export a photo "book" report with detail for up to a ½ mile stretch of the current roadway to a pdf document for printing and distribution.*

***Philadelphia SWEEP Code Enforcement Field Application with ArcGIS Mobile***

Author(s): Jesse Stauffer, geographIT; Grant Ervin, City of Philadelphia  
Software used for this project: Windows Mobile 6.1, .Net Compact Framework, SQL

*The Philadelphia Department of Streets, Sanitation Division Streets & Walkways Education and Enforcement Program (SWEEP) enforces regulations governing municipal collections. Using handheld devices, GPS and ArcGIS Mobile, the SWEEP application can issue violation notices, auto fill data on property address and owners, and review violation history. As a means of increasing enforceability, officers have the ability to capture photos and print violations in the field. Grant Ervin, City of Philadelphia, and Jesse Stauffer, geographIT, will provide a demonstration of the application and its architecture.*

Keywords: Mobile, Software, Wireless, ArcGIS, Ruggedized

3:30 p.m. – 5:00 p.m.  
Track 1

## Economic Development / Education

### ***GIS Quick Start for Municipal Comprehensive Plan Preparation***

Author(s): Eric Stetser, GISP, Vice President, Spatial Systems Associates, Inc.  
Catherine Burroughs, GIS Technician, Spatial Systems Associates, Inc.  
Software used for this project: ArcGIS 9.3 - ArcInfo

*The Town of La Plata, MD, population 8,879, faced a state mandated update to its 2002 Comprehensive Plan. The town realized that their 2002's plan, which contained no maps, would not be acceptable to the Maryland Department of Planning or the Town Council. The town turned to Spatial Systems Associates, Inc. to assist them. The town needed maps to: assist in the comprehensive planning process, use as graphic inserts into the plan document, and to carry forward as GIS layers in coming years. Draft maps were needed within 2 weeks!*

Keywords: Comprehensive, Plan, Cartography, Municipal, Quick

### ***Impact of Building Information Modeling (BIM) Tools on GIS for Government Planners***

Author(s): Gary Siorek, Senior Solutions Engineer, VISTA Technology Services, Inc.  
Software used for this project: ESRI ArcGIS ArcEditor, ESRI Network Analyst, AutoCAD Revit, Onuma Planning System, Google Sketchup, Google Earth, ARCHIBUS FM

*Use of BIM tools, such as AutoCAD Revit, Onuma, and ARCHIBUS, integrating site, architectural and floor plan models into ESRI ArcGIS and Google Earth for planning studies. A summary of possible data models, such as IFC, COBIE and ESRI's BISDM. Lessons learned during a Base Realignment and Closure (BRAC) study in Alexandria, Virginia. Examples include use of current federal anti-terrorism perimeter requirements for DoD, DHS, and GSA agencies, as they apply to GIS practice. In particular, the discussion will also focus on BIM and GIS analysis workflows for public safety considerations as it relates to use of NFPA (National Fire Protection Association) 1710 response rules.*

Keywords: BIM, Architectural, COBIE, BRAC, FM

### ***Helping to put the Fire Out: A GIS Service Learning Project***

Author(s): Jessica Wright, Thomas R. Mueller, California University of Pennsylvania  
Software used for this project: ArcGIS, ArcExplorer

*Geographic Information Systems have been an important tool in the public safety sector for years. Recently California University of Pennsylvania (Cal U) and the Springdale Volunteer Fire Department (SVFD) collaborated on creating a GIS that would assist the fire department during calls. The fire department surveyed their residences on many issues, including number of householders, pets, and the name of their gas company. Then Cal U students entered this data into a parcel map and added a fire hydrant layer using ArcGIS. Both layers were then added into the Arc Explorer Java Edition (AEJEE) program so that they could be utilized on a laptop. Finally a tutorial and workshop were created for the SVFD to illustrate the uses of the GIS. Now when a call comes in, the fire department has the necessary information on the location to make informed decisions. This presentation will discuss the processes, successes, and problems of this GIS service based learning project.*

Keywords: Fire, GIS Education, Partnerships

## Economic Development / Education Track 1 continued

### ***Using GIS to Cover News at the Philadelphia Inquirer***

Author(s): John Duchneski, Graphics Editor, The Philadelphia Inquirer

*The humble locator map is a fixture of just about every newspaper, and the bane of the graphic artists who are asked to draw them every night. But what if we want to know more than just where something happened? What if we would like to know why the police commissioner decided to send more officers to some districts but not others. Or why the communications company is extending its fiber-optic network to some selected towns in the region? Why does a politician campaign heavily in one area? What neighborhoods are hit hardest by the recession? If Ryan Howard's home runs one year were laid end to end, how far from home plate at Citizens Bank Park would they reach? (Answer: Terminal D at Philadelphia International Airport.)*

*The answers to these questions are found once you marry the raw data with the spatial world, and start asking questions of its offspring. That's what working in GIS is all about, and that's what journalists do regularly at the Philadelphia Inquirer. We use ArcView, Spatial Analyst and 3-D Analyst, Flash, and other tools to visualize raw data, analyze trends, and determine where to send reporters for their stories. We publish our work in the newspaper and on philly.com, our website. This presentation will show how GIS is used at a newspaper to give its readers more than just locator maps, providing context, analysis and perspective of our region and our world.*

**3:30 p.m. – 5:00 p.m.**  
Track 2

## Natural Resources / Public Works

### ***New Jersey's Local Resolution NHD Conflation Project***

Author(s): Seth Hackman - NJDEP

Software used for this project: ArcGIS v9.2-current

*The New Jersey Department of Environmental Protection has entered into a stewardship agreement with the United States Geological Survey (USGS) to update the State's 1:2,400 scale hydrography to the National Hydrography Dataset (NHD) standard. New Jersey is attempting to conflate its hydrographic features to the highest resolution NHD dataset in the Nation.*

*When completed, the statewide NHD dataset will be used for the National Map - governed by USGS - as well as for internal purposes using NJ's newest web-based mapping application: NJ-GeoWeb. Employees of NJDEP will soon report critical water quality statistics to federal government using the resulting flow network and reach code/ComID system of water addressing.*

*This presentation will discuss steps taken from original delineation of the 1:2,400 scale hydrography data, to the decision to use NHD as the network model. Toolsets will also be demonstrated to show how ESRI products are used for attribute conflation in this project.*

Keywords: NHD, hydrography, environment, federal, conflation

## Natural Resources / Public Works Track 2 continued

### **GIS and Modeling: Providing Cost- Effective Solutions**

Author(s): Jean-Paul Bell, GISP, Senior Scientist, Princeton Hydro

Software used for this project: ESRI's ArcView 9.2, 3D Analyst, Spatial Analyst

*An initial round of soil sampling on farmland in New Jersey revealed levels of Arsenic and Dieldrin over the Non-Residential Soil Cleanup Criteria standards set by NJDEP. After abandoning soil remediation plans that called for two feet of excavation across the entire site, Princeton Hydro was hired to provide a cost effective solution.*

*A new round of soil samples was ordered and the results were stored as point features in GIS. The goal of the contamination modeling was twofold. First, delineate areas of the site that contained contamination over the NJDEP standards and then accurately calculate volumes of contaminated soil that need to be excavated and transported off-site for further processing. According to NJDEP sampling regulations, if a sample is over state limits, a second sample must be taken at the same location 6' lower than the first. In this project, some sampling went as low as 30' from the surface. To delineate areas over state standards, TINs were created for each sampling depth, then RECLASSIFIED to show only areas under and over state standard limits. The TINs were converted to vector data and the areas under the contamination limits were simply deleted.*

*A survey of the site was provided by the client. Since soil sampling had occurred at intervals of 6' down to 30', TINs were created for each sampling level. The modeled areas of contamination were converted to 3D features with each sampling level TIN, giving them proper NGVD88 elevations. These 3D features were then utilized to create new TINs that contained only the modeled contamination areas for each sampling level. A CUT/FILL was done between the ground surface model and the contamination TINs for excavation volumes.*

*All work as exported and handed to contractors who uploaded it to their on-board GPS units, allowing them to excavate precise areas and depths, thus saving the client tens of thousands of dollars in remediation and disposal fees.*

Keywords: modeling, contamination, remediation, delineation, excavation

### **Impervious Surface Calculations for Urban Stormwater Management**

Author(s): Sean McGinnis, Avencia; Eric Werfel, Philadelphia Water Department

Software used for this project: ArcGIS Server, ArcObjects

*Stormwater management in urban environments presents many challenges. Increased stormwater runoff caused by roads, parking lots and other impervious surfaces must be properly channeled and treated in order to reduce its impact on local waterways, and this can be a costly process. The Philadelphia Water Department is leveraging GIS technology to create a billing system based on the amount of impervious surface cover on commercial properties, which distributes the cost of managing stormwater more equitably and creates incentives for property owners to implement best management practices for mitigating stormwater runoff on-site. The bill calculation is performed using a series of GIS models assembled using ArcObjects, python scripts and a geoprocessing queuing system. The resulting datasets are then made available to Water Department customers via an ArcGIS Server application. In addition to searching and mapping, the application supports the billing appeals process and enable users to calculate the estimated financial benefits of implementing various roof, yard and pavement mitigation activities they might be considering. This presentation will showcase the Philadelphia Water Department application and outline the benefits and challenges of using GIS technology for stormwater management and impervious surface area calculations in urban environments.*

Keywords: stormwater management, impervious surfaces, urban stormwater management, GIS models, surface calculations

## Track 2 continued Natural Resources / Public Works

### ***Building a Spatial Data Infrastructure at the Nature Conservancy***

Author(s): Brian R. Embley, GISP, Senior Spatial Infrastructure Engineer, Technology & Information Systems, The Nature Conservancy

*The Nature Conservancy (TNC) has defined an aggressive goal of protecting 10% of all habitats by the year 2015. In support of this enormous effort, TNC understands that geospatial information is critical in prioritizing conservation efforts towards this goal as well as measuring progress. TNC boasts 800+ loosely connected GIS professionals working at dozens of office locations across 4 continents. As much of the information needed to support TNC's aggressive conservation goal is created and maintained at local field offices, a means to share discover and share data is being developed in the form of TNC's international, distributed data sharing infrastructure.*

*This presentation will look at TNC's current status of a multi-node geodatabase strategy including data flow, data access, solution hosting and challenges inherent in a large, federated organization.*

**3:30 p.m. – 5:00 p.m.**

**Track 3**

## Enterprise Information

### ***The Application of GIS and ECM to Create a Fully Interactive and Automated Customer Service Request (CSR) Tracking and Mapping System for a Public Utility***

Author(s): Steve Beck, GISP, Senior Associate of the JMT Technology Group  
Software used for this project: OnBase and ESRI's ArcGIS Server

*The integration of technologies such as geographic information systems (GIS) and enterprise content management (ECM) can be extremely powerful in creating interactive and automated tools for enabling public utility agencies to improve customer service. This is particularly true in cases where the agency must respond to service requests from the general public in a timely and helpful manner. Whether it be a clogged storm water inlet that is causing properties to flood or a broken sewer main that is flooding basements with sewerage, the ability of the responsible agency to respond quickly and effectively becomes paramount and can substantially influence the way in which private citizens perceive the quality of local government services.*

*This session will examine a real-world application developed for a public infrastructure agency in a large municipality that is addressing numerous management and operational problems through the application of an integrated GIS/ECM solution.*

*Primary aspects of the system to be addressed will include:*

- 1. The use of electronic forms (E-Forms) to improve the efficiency and accuracy of critical data collected both in the office and in the field.*
- 2. The design and development of automated workflows to ensure the proper and timely processing of CSRs to meet established performance criteria.*
- 3. The application of triggers, timers, and automated email notifications to support the tracking and management of CSR cases as they are investigated and processed.*
- 4. The use of ECM tools such as automated document and forms templates to reduce time and resources needed to create and distribute documents critical to the resolution of each CSR case.*
- 5. The integration of the ECM solution with a ArcGIS Server GIS application that enables users to interact with all of the components of the ECM directly from within ArcGIS Server.*

**Keywords:** Enterprise Content Management, ArcGIS, OnBase, GIS, Solution

## Enterprise Information Track 3 continued

### **Quality Control Collaboration Tools and Techniques**

Author(s): Heidi L. Hammel, PMP, GISP and Kate Sontag, GISP - KCI Technologies

Software used for this project: ESRI's ArcGIS 9.x, ESRI's PLTS Data Reviewer

*A comprehensive Quality Assurance and Quality Control (QA/QC) plan and procedures are an integral part to a successful GIS data production process. Quality Assurance is performed by personnel directly involved in the production and has the goal of preventing errors before they occur, or quickly identifying them and making adjustments to the production process before delivery. The goal of QC is to independently verify that the product or service complies with the original specification.*

*Several QA/QC workflows were designed and developed for clients receiving data from independent vendors as well as for in-house developed products. The workflows involve both automated routines and visual inspections of the data product. In order to streamline the process, the data vendor, QA/QC consultant and client collaborated together to develop a set of acceptance criteria as well as QA/QC procedures. QA/QC was done using ESRI's Production Line Toolset (PLTS) Data Reviewer in order to create automated routines and a comprehensive error reporting database for use by all parties in the process. Utilization of common tools and techniques served to reduce costs, time and feedback cycles. This presentation will present the final workflow as well as key success factors and lessons learned.*

Keywords: Quality Control, PLTS, acceptance criteria, workflows

### **Philadelphia Map Plug-in**

Author(s): Sreejith Parthasarathy, City of Philadelphia

Software used for this project: flex and actionsript

*Philadelphia City Departments often lack the technological means of sharing spatial data online; out-of-the-box solutions lack customized functionality, while ad-hoc applications are costly & time-consuming to produce, and often duplicate aspects of previous development efforts. By modifying the flashVars, the ESRI's Flex Viewer with customized functionalities and (map-)content can be added to any web page. A single install of this application can support multiple business needs. The Map Plugin enables departments to efficiently share development efforts, ArcGIS services, and various data resources on an enterprise level.*

Keywords: Flex,Widget,ESRI,Plugin,Flash

### **Bergen County Health Operations**

Author(s): Richard Rehmann, VP, Civil Solutions

*The Bergen County Department of Health Services typically generates approximately 20,000 inspections a year either through routine, scheduled visits or individual calls for service. The County set out to improve its collection of data related to the inspections, enhance the downstream use and analysis of the data, and connect its operating units through the implementation of an Enterprise Solution. This presentation highlights the process by which Bergen County transitioned its in-house and primarily paper-centric data collection procedure to a web-based, geospatially enhanced application called Environmental and Consumer Health Operations (ECHO). One of the project's primary objectives was to bring the Department's two (2) essentially independently operating sections together into a single consistent case management system. The Bergen County ECHO application achieved this goal and supports internal operations as well as mobile, disconnected use. It evolved through a series of discovery meetings, work flow analyses, dissection of existing methodologies and systems, user input and inspection form replication. Our discussion will highlight the application architecture, integration of geospatial functionality, and issue resolution with the intent of helping the audience with similar implementations.*