Wednesday, June 9, 2010

Paper and Poster Sessions
Schedule & Abstracts

Marshall University
Memorial Student Center

*student

PAPER ABSTRACTS AND AGENDA

Rm BE-5 **8:30 AM**

Presenter: *William Ayersman, Graduate Student, Division of Forestry and Natural Resources, WVU, William.Ayersman@mail.wvu.edu; Michael P. Strager, Assistant Professor, Division of Forestry and Natural Resources, WVU, mstrager@wvu.edu; Jacquelyn M. Strager, Research Coordinator, Natural Resources Analysis Center, WVU

Title: *Identifying Infestation Probabilities of Emerald Ash Borer(Agrilis planipennis, Fairmaire) in the Mid-Atlantic Region*

Abstract: Emerald Ash Borer (EAB) impacts all species of North American ash trees, and has caused several million dollars (U.S.) in damage to trees across the affected region. EAB is primarily spread through the movement of trees and wood products, such as nursery stock and firewood. This project assessed the potential risk of EAB introduction in the mid-Atlantic region of the U.S., where the species has not yet been as widely reported. Using a Geographic Information Systems-based approach with Maximum Entropy Bayesian modeling, a risk prioritization framework was developed to assess and rank various mapped factors for EAB introduction. Results indicated high risk areas throughout the study region with approximately 30 counties being cited for potential risk. From an analysis of risk versus ash basal area for all counties, three management strategies were derived; quarantine, plan harvest, public outreach and monitoring.

Shawkey Rm **8:30 AM**

Presenter: Craig Neidig, USGS Geospatial Liaison to West Virginia, U.S. Geological Survey, cneidig@usgs.gov

Title: *Recent Geospatial Activities in USGS and the National Map Program*

Abstract: West Virginia is a recognized leader in partnership activities related to the development of The National Map (TNM) program. West Virginia has worked in cooperation with the U.S. Geological Survey to create and improve geospatial data and GIS products for hydrography, elevation, orthoimagery, geographic names, structures, and other framework datasets.

Over the past two years USGS has restructured its geospatial programs to align with the USGS Science Strategy, especially concerning climate change and hazards, and to better support integrated science activities. USGS products and services have been improved to reflect increasing customer expectations, especially for web-based applications. 2009 marked the 125th anniversary of the initiation of national topographic mapping program at USGS and the debut of the new digital Topographic Map Series, or US Topo. This year will see the introduction of a new National Map Viewer and improved capabilities to search data assets and delivery methods such as integrated download services.

Also discussed will be developments in cooperative programs in which West Virginia has been a major contributor, such as the National Hydrographic Dataset (NHD), the Geographic Names Information System (GNIS), and the Homeland Security Infrastructure Program (HSIP), among others. The status of USGS participation in the "for the Nation" initiatives for Imagery, Elevation, and Transportation will also be recapped. USGS geospatial efforts can be considered as they relate to the formulation of the new West Virginia GIS Strategic Plan and the continuation of West Virginia's leadership role in the National Map Program.

Rm 2W22 **8:30 AM**

Presenter: Tyler P. Bragg, GIS Programmer/Analyst, WV State Tax Department, Property Tax Division, Mined Minerals GIS Unit, Tyler.P.Bragg@wv.gov

Title: *Leveraging GIS Technology for the WV Coal Valuation Process*

Abstract: The State Tax Department of West Virginia is responsible for valuing all reserve coal, or coal that has not been or is not currently being mined, throughout the state. In order to accomplish this task, a collaborative effort between the WV Department of Tax and Revenue (WVDTR), the Office of the State GIS Coordinator, the WV Geologic and Economic Survey (WVGES), and West Virginia University (WVU) has been underway to create a statewide GIS in order to inventory all natural resource property, track the location of active and historical coal mines, map the location of the State's coal seams, and capture numerous other features that play a significant role in coal appraisal. Furthermore, a complex modeling system is implemented to analyze the GIS data, along with the various factors that affect coal value in a given location, allowing the State to conduct a mass appraisal at the parcel level. This presentation will give a brief overview of the coal valuation process, highlight the GIS layers used, and outline some of the issues that arise as the State Tax Department continues to build its GIS and put it to work.

Rm BE-5 **8:45 AM**

Presenter: *Xiannian Chen, Student, WV GIS Technical Center, WVU Geology & Geography, xiannianchen@gmail.com

Title: *Building a Distributed Disaster Management System*

Abstract: The recently happened disaster events, such as 911 terrorist attack (2001), Indonesia tsunami (2004), Hurricane Katrina (2005), China Wenchuan earthquake (2008), Haiti earthquake (2010), China Yushu earthquake (2010), etc. All these disaster events indicate that the characteristics of disasters: large scale which means two or more jurisdictions will be involved in the event itself and the disaster response, rescue, recovery, mitigation, and

preparedness; rapid onset which means the events give people no time or short time to prepare for evacuate; dynamic which means disasters evolves as they progress. The traditional geospatial technologies, the standalone technologies and the desktop technologies, provide valuable supports for disaster management. But they are not well suitable to address the characteristics of disaster events, especially in the disaster response, rescue, and recovery phases of the disaster management cycle. The distributed geospatial technologies can be used to better help the disaster management community effectively and efficiently do the jobs. These technologies include the distributed data processing which includes collection, updating, and dissemination; the distributed system which can be accessed anywhere with Internet connections, and the distributed geospatial tools which used to model and simulate the real-time disaster situation and the response, rescue, and recovery efforts. The key of those technologies are distributed geospatial web services.

Shawkey Rm **8:50 AM**

Presenter: Trevor Harris, Department Chair , WVU Department of Geology & Geography, Trevor.Harris@mail.wvu.edu; Frank LaFone, Senior Internet Coordinator, WV GIS Technical Center, WVU Geology & Geography, Frank.LaFone@mail.wvu.edu

Title: *No Data, No Geography?: Augmenting GIS with Volunteered Geographic Information in West Virginia*

Abstract: Volunteered Geographic Information (VGI) has been heralded as the next great frontier in geographic information. VGI, also referred to as citizen sensors, crowd sourced, and user generated content, can fill 'holes' in official data sources by enlisting the very people who are often left out of the traditional data generation loop. Data in VGI can be provided by people acting essentially as independent agents contributing to a system, which collates that information into a complete data source. These user generated data sources have the potential to provide highly detailed, dynamic, and up to date geographic information sources that enhance and augment more traduitional spatial data sources. VGI is not without its criticisms. Issues of reliability, accuracy, and completeness have caused several to question their appropriateness for use in traditional GIS roles. However, before these systemic questions can be considered, it is important to assess the degree to which VGI can be used in any given project. West Virginia would seem an ideal place for VGI use for community spatial data input that will augment GIS and 'official' data sources' priority lists. A general assessment of developments in VGI is provided and an assessment made of the potential contribution of VGI to in GIS projects in the state of West Virginia.

Rm 2W22 **8:50 AM**

Presenter: Connie R. Ervin, GISP, Preston County Assessor's Office, crervin@assessor.state.wv.us

Title: *Parcel Mapping with Today's Technology*

Abstract: This presentation is technological and theological from the TIF image created base maps, seamless in format, used to begin a GIS digital tax mapping system to the experience gained from incorporating professional survey information with AutoCAD Map and desktop ESRI ArcView software programs into a digital tax mapping system. Anyone using the tax parcel overlay in their work would be interested to see how the placement of these tax parcels is determined. The targeted audience of GIS users and managers could benefit from the information and experience regarding the implementation of a digital mapping system. The varying sources of datum used present challenges to geo-reference and rectify current survey descriptions entered into the digital system with co-ordinate geometry along with varying road right of ways and surveyor information. Use of the 2003 WVSAMB aerial photography and the more current statewide 2009 NAIP imagery in mosaic form along with road and hydrographic centerline information has been an essential tool in the development and accuracy of this system. Integration of the current WV State Integrated Assessment System information with the parcel identifier allows instant viewing of the ownership, address, legal and assessment information. One particular challenge is the aesthetic labeling of the tax parcels on a tax map template with the pertinent information of parcel identification numbers, lot, lines, lot numbers, and lot dimensions. The very time consuming process to annotate each parcel is probably the best way to achieve that. This information is the perspectives and challenges we have addressed in our development of a GIS tax mapping system for Preston County.

Rm BE-5 **9:00 AM**

Presenter: *Ishwar Dhami, Graduate Research Assistant, Division of Forestry, West Virginia University, idhami@mix.wvu.edu; Jinyang Deng, Assistant Professor, Division of Forestry, West Virginia University, jinyang.deng@mail.wvu.edu

Title: *Recreation Opportunity Spectrum Mapping Using GIS*

Abstract: Recreation Opportunity Spectrum (ROS) framework helps recreation managers to determine the existing supply of opportunities available in an area. ROS framework, used by the Forest Service is based on physical, social and managerial components of a landscape and contributes to the ROS classification of six settings along a continuum of opportunities ranging from Primitive to Urban. A number of studies have applied ROS for recreational planning. However, ROS classifications have not been fully demonstrated using spatial technologies. Recent advancements in technology have allowed researchers and managers to take advantage of the GIS mapping tools in place of the traditional digitization of manual overlays of information on maps. Thus, the objective of this study is to map the ROS using GIS in Pocahontas County of West Virginia. This study

will adopt physical component of ROS criteria used by Forest Service for delineation of different classes within the study area. The result of this study will be a map that will show the location and size of different classes of ROS. The visual depiction would be helpful in providing recommendations to the visitors on the type of site they should target based on their preference. The results would also benefit agencies responsible for resource planning and management to assess activities that can be conducted within the area in context of the overall setting and available resources. Finally, a GIS database to be prepared for this study will help the future researchers to evaluate the changes in the ROS map over time.

Shawkey Rm **9:10 AM**

Presenter: Dave Arnold, GISP, U.S. Geological Survey, darnold@usgs.gov

Title: *The National Hydrography Dataset (NHD) Stewardship Process and the Inclusion of Local Resolution Data*

Abstract: The United States Geological Survey (USGS) created, maintains, and distributes the NHD through partnerships with stewards in most states. In the last decade, through the labor of this partnership, the NHD has grown from a low resolution dataset maintained in nearly obsolete GIS technology, to a high resolution, multi-relational geodatabase stored in an enterprise GIS environment. The NHD data model has hydrography features, including surface water streams and water bodies. It also includes hydrologic units, which will soon be replaced with the certified Watershed Boundary Dataset (WBD), as well as a number of tables defining relationships and metadata. The NHD Stewardship Process is comprised of three primary entities. The USGS coordinates, defines, and distributes the data model. The principal steward is the primary NHD contact within their respective state and has overall responsibility for the NHD. Finally, there are potential sub-stewards that may assist with editing and general input. The NHD was originally developed at a scale of 1:100,000, known as medium resolution, from USGS Digital Line Graphs (DLG) and the Environmental Protection Agency (EPA) Reach File Version 3 (RF3). After completion, work began to improve the NHD to a resolution of 1:24,000, known as high resolution. This was accomplished by adding features found on the USGS Topographic Maps. Current stewardship activities on the NHD involve inclusion of local resolution data, and refinement of high resolution data. Local resolution data is defined as a scale larger than 1:24,000 and takes many forms ranging from statewide hydrography to small watersheds.

Rm 2W22 **9:10 AM**

Presenter: Robb Shaffer, Mapping Supervisor, Wood County Assessor's Office, robshaffer@woodcountywv.com

Title: *Working with Map Book to Generate Paper Tax Maps from ArcGIS*

Abstract: Information system (GIS). There are a few different ways to print maps or pictures from a GIS one way would be to just print a screen shot but there are problems with this that keep it from being a Tax Map one it would be very difficult to maintain a set scale. If your system is not cut out to a set grid you would either show parcels from another map or not show all of the parcels from the subject map. The method we use is a product called map book. With the map book we can solve these problems. We can set up a template and print only the parcels on the subject map at a set scale. In my presentation I will cover using the map book to print out tax maps.

Rm BE-5 **9:15 AM**

Presenter: *Dan Servian, WVU, Division Of Forestry, Recreation, Park, Tourism, Resource Management Program, dservian@direwolf.org

Title: *An Exploration of the Spatial Distribution of National Park Units*

Abstract: The creation of a National Park will leave that generation's mark on time revealing a glimpse into their morals and values. There are 392 National Park units spread throughout America and its territories. The National Park units are structured into one of thirty-six specific designations. What persuades the United States Congress or the President of the United States in the designation process? What makes one particular location more appropriate than another similar site? The question that must be asked is what is the measure of a places importance? This research explores the prior questions by compiling and examining the spatial facets of the National Park unit designation process.

The purpose of this study is to investigate the National Park designation process. This research utilizes exploratory data analysis and exploratory spatial data analysis to observe trends that reside in National Park designation process. The analysis will show that there are other factors that influence the National Park designation process other than the importance of the resource. The exploration of the spatial data looks into the distribution of the National Park units nationally and regionally. As well as delving into the distribution, the analysis uses Global Moran's I and Local Indicators of Spatial Autocorrelation (LISA) to observe clustering of univariate and bivariate spatial data. The bivariate analysis will utilize variables such as: location, visitor statistics, time, unit type, date, census data, and political affiliation of local representative at time of designation. The analysis is conducted with ESRI ArcMap and GeoDa.

Rm BE-5 **9:30 AM**

Presenter: *Kenneth R. Sheehan, Doctoral Student/Graduate Research Assistant, West Virginia University, grizzlya22@yahoo.com; Michael P. Strager, Assistant Professor, Division of Forestry and Natural Resources, West Virginia University, mstrager@wvu.edu; Stuart A. Welsh, U.S. Geological Survey, West Virginia Cooperative Fish and Wildlife Research Unit,

swelsh@wvu.edu

Title: *Advantages of Geographically Weighted Regression for Modeling Substrate in Streams*

Abstract: Stream habitat variables collected for fisheries studies are often examined using ordinary linear regression to predict and observe relationships between them for management purposes. However, stream habitat data contains spatial attributes which are ignored or removed from datasets during standard regression analysis. Failure to address spatial correlation within a data set has been shown to cause ambiguous results in various disciplines. Therefore, the same action may inhibit meaningful interpretation of many stream habitat studies. Recent advances within geographic information systems allow for creative analysis when using data with inherent spatial qualities.

Geographically weighted regression is one tool which has shown promise in medicine, real estate, and other fields of study, but its use and potential impact is lacking in stream habitat analysis. Therefore, this study compares the use of geographically weighted and ordinary least squares regression for evaluating the relationship of substrate, depth, and flow velocity on two streams in the Greater Yellowstone Ecosystem. Analysis with geographically weighted regression provided adjusted r^2 values of 0.75-0.94, while OLS values ranged from 0.52-0.69. Geographically weighted regression provided better model fit in all cases over ordinary least squares regression. Comparison of predicted values for datasets with 3,630, and 4,950 coordinates were highest (up to 94%) in GWR models. Geographically weighted regression addresses spatial qualities of stream habitat data and provides more accurate stream habitat prediction., Failure to address spatial qualities of stream habitat variables may deflate linear regression r^2 values and lead to inaccurate interpretation of lotic data analysis.

Shawkey Rm **9:30 AM**

Presenter: Evan Fedorko, GIS Specialist, West Virginia GIS Technical Center, WVU Department of Geology & Geography, Evan.Fedorko@mail.wvu.edu; Jackie Strager, Research Coordinator, Natural Resources Analysis Center, West Virginia University; Tony Simental, West Virginia Office of GIS Coordination

Title: *NHD Stewardship in West Virginia*

Abstract: An effective NHD Stewardship program in West Virginia will benefit users of the dataset at all levels – from the National Map down to local watershed groups. This presentation describes steps completed so far in the establishment of West Virginia's NHD Stewardship program and outlines next steps. We will discuss details of planned edits, the framework of the stewardship program, future funding opportunities and our burgeoning plans for editing and maintaining spatial data for streams in areas of high change, such as the southern coalfields and rapidly urbanizing areas.

Rm 2W22 **9:30 AM**

Presenter: Maria N. Gray, West Virginia State Tax Department Mined Mineral GIS, Maria.N.Gray@wv.gov

Title: *Embarking in the Digital Monitoring and Tax Map Sales for the New Era of GIS*

Abstract: As more and more counties in West Virginia convert from good – old fashion paper maps into digital formats, there should be standards in the monitoring and in the sales of these products. As the West Virginia Department of Tax and Revenue Tax Mapping Technician (TMTs) start to do their monitoring, what are they looking for on the digital maps and how can creating a standard style file for the symbology help improve the overall standards of uniformity. Also, how much should the public is charged for the reproduction of the digital maps and/or shapefiles? Will the pricing standards from Title 189 Series 5-2, apply to shapefiles? A disclaimer is placed on all tax maps and along with a restriction, should we now have the public sign the disclaimer or should the disclaimer be placed in as a text file on the CD? These are some questions and concerns that are coming to light as we move into the Digital Age.

Rm BE-5 **9:45 AM**

Presenter: *Tu H. Tran, Department of Physical Science, Marshall University, tu.tran@marshall.edu; Seungjin Lim, Department of Integrated Science and Technology, Marshall University

Title: *Bridging the Digital Divide in WV GIS Systems*

Abstract: Many government agencies in WV such as the Raleigh County Assessor's office, Dept. of Revenue, and Rahall Transportation Institute, have difficulties in sharing and reusing information across their GIS systems due to the lack of interoperability both at the application and the database layers.

This study focuses on developing an efficient and cost effective solution to the aforementioned problem by which the agencies can share data easily and henceforth provide the public access to information at convenient locations. As a result, we present a data management solution based on the OpenGIS standard at the database layer and a middleware based application development. This approach enables us to save time and storage space. Based on our study, Raleigh County in Beckley launched a new distributed, replicated Metro GIS system in 2009 which allowed the EMS Center, the Raleigh County Assessor's office, and the County Commission Board to share GIS information efficiently. As a result, the employees at these agencies can access any shared GIS data at their locations.

In addition, we will migrate the backend platform to open source technologies to save the ownership cost of the system, provide a GIS Web-based application layer to allow the public to access and process information through the internet at home, and add customizable middleware for developers to have a greater flexibility in developing user interfaces and applications using open source libraries such as Proj4, GEOS, and PostGIS while securing a high degree of interoperability and information share.

Rm BE-5 **10:45 AM**

Presenter: Jayson Brennen, GISP Associate, CDM, brennenjd@cdm.com

Title: *ArcGIS Server – New and Exciting Trends in WebGIS Technology*

Abstract: Times are changing. With the maturation of ArcGIS Server, governmental agencies and utilities now have an abundance of ways in which "desktop-like" GIS capabilities can be made available to users via a simplified WebGIS interface. Through implementation and customization of these technologies, agencies are able to open-up their GIS environment to new sets of users and implement applications that maximize investments in GIS technology and benefit all levels of an organization.

This presentation will detail new and exciting trends in WebGIS technology and highlight the implementation of .NET, Flex, and Silverlight-based ArcGIS Server web applications for governmental agencies and utilities. In addition, this presentation will also cover the process an agency may go through to migrate an existing web application to a new technology, review the benefits and pitfalls of the process, and provide development tips-and-tricks. Real world case studies and speed/functionality benchmarking between old and new applications will be demonstrated.

Shawkey Rm **10:45 AM**

Presenter: Ross Mackay, Kentucky Geodetic Advisor, NOAA National Geodetic Survey, ross.mackay@noaa.gov

Title: *Accessing the National Spatial Reference System*

Abstract: NOAA's National Geodetic Survey (NGS) defines, maintains, and provides access to the National Spatial Reference System (NSRS) - a consistent coordinate system that defines latitude, longitude, and height throughout the United States and is designed to meet our nation's economic, social, and environmental needs. The reference stations form a network used to accurately position other points of interest. Surveyors and mapping professionals use the NSRS to ensure their positional coordinates are compatible with those determined by others. In this way, when individuals create maps; mark property boundaries; and plan, design, and build roads, bridges, and other structures, everything matches up.

The backbone of the NSRS is a network of Continuously Operating Reference Stations (CORS) which provide Global Positioning System (GPS) data to support three-dimensional positioning. NGS provides simplified access to high-accuracy NSRS coordinates via a Web service called the Online Positioning User Service (OPUS). A user may submit to OPUS a GPS data file collected with a survey-grade receiver and obtain a NSRS position via email. OPUS requires minimal user input and uses software which computes coordinates for NGS' CORS network. The resulting positions are accurate and consistent with other NSRS users.

Rm 2W22 **10:45 AM**

Presenter: Jinyang Deng, Assistant Professor, Division of Forestry, West Virginia University, jinyang.deng@mail.wvu.edu; David Dyre; Ishwar Dhami, Graduate Research Assistant, Division of Forestry, West Virginia University, idhami@mix.wvu.edu

Title: *Linking Tourism Resource and Local Economic Benefits: A Spatial Analysis in West Virginia*

Abstract: Tourism has been playing an increasingly important role in the economic development of West Virginia. However, information on spatial distribution of tourism resources across the state has not received much attention. Thus, the objective of this study is to create a tourism resource database at the county level and spatially examine distribution patterns of tourism resource based on size, length, or number, as well as on the quality determined by the Analytic Hierarchy Process through surveys of 191 visitors. Based on the data collected, four-level amenity index is created in GIS using the standard deviation method. The result of the study shows that nature-based tourism resources are largely concentrated in the eastern or central eastern part of West Virginia centering around Pocahontas County, while cultural resources do not exhibit a distinct clustering pattern. In addition, the cultural resource distribution pattern is not only associated with visitors' travel spending, but also has a statistically significant correlation with travel spending after controlling the spatial dependence. Also, no relationship found between natural tourism resources and travel spending indicates that more efforts are needed to develop and market nature-based tourism counties with higher levels of natural tourism resources but has lower levels of visitor spending. It also implies that natural tourism is not a major contributor to the local economy for most counties. Rather, other forms of tourism activities such as gambling generated a large portion of travel/tourism related revenues, despite this contribution being only limited to a few counties.

Rm BE-5 **11:05 AM**

Presenter: John M. Bocan, GIS Programmer/Analyst, West Virginia Geological and Economic Survey, bocan@geosrv.wvnet.edu

Title: *The Many Interactive Maps of the Geological and Economic Survey*

Abstract: Since its inception in 1897, the West Virginia Geological and Economic Survey (WVGES) was charged with the

creation and distribution of geological and economic maps and reports to illustrate the resources of the state. Information dissemination has changed exponentially since then, and even within the past few decades, there has been a revolution in data delivery with various information technologies. Interactive mapping (server and services, IMS) via the Web is one of those technologies that has had rapid innovation and development in just under the past 10 years. Almost from the beginning of that period, WVGES has provided IMS services and applications to the public—now, totaling around 100! These maps have been viewed by mining, petroleum, geological and educational professionals as well as the general public. One can answer such questions as: "Is there possibly a mine under my house?" "Where are the boundaries and what are the net thicknesses of the Pittsburgh Coal Seam in Monongalia County?" "What combination (oil and gas) wells are in Kanawha County and can I easily access further info on those?" "I need a topo map for the Stonewall Jackson Lake area but I don't know the quad name, can I find or view one?" This talk will illustrate all of the IMS applications offered by WVGES, discuss some of the technology used and perhaps give a peek of things to come.

Shawkey Rm **11:05 AM**

Presenter: York Grow, Earth Vector Systems LLC, York_Grow@evsgps.com

Title: *WV Division of Highways GPS Base Station Network*

Abstract: Over the past 8 months, the WV Division of Highways has initiated a comprehensive plan to cover the State of West Virginia with a VRS Network (Virtual Reference Station). When fully deployed, the Network will provide mapping and survey-grade GPS users access to real-time, differential/kinematic corrections anywhere in West Virginia with no base line degradation. There are also many advantages for post-processing mapping-grade GPS data. There are currently 11 base stations on-line with another half dozen partner stations from adjacent states. There is no fee for using the VRS which is unusual compared to other Networks in other parts of the country. This session will describe the status of the Network and capabilities for both mapping and survey-grade GPS within the Network. The session will also describe how users can configure and access the data from the field. Although the base stations are Trimble NetR5 CORS stations, the VRS is completely open and not manufacturer specific. For mapping GPS applications, it becomes a powerful, in-field tool for accurate GPS. For survey applications, it will be a required technology for performing work for many WV State Agencies.

(See E-mail for annotations by author on presentations)

Rm 2W22 **11:05 AM**

Presenter: Samuel R. Lammie, GIS Program Manager, Monongahela National Forest, slammie@fs.fed.us

Title: *Red Spruce: Management Value in the Heights*

Abstract: The author characterizes the high elevation red spruce community in a mid-Appalachian landscape and the value to management in a time of climate change. Geospatial tools enable staff to inventory and monitor biotic landscape components in the spruce ecosystem. Stakeholder agreements facilitate and help to coordinate scientific land management on the Monongahela National Forest. Current and future restorative efforts are discussed with an eye to the inevitable change – in climate and ecosystem.

Author previously gave this presentation at the 2010 Annual Meeting of the American Association of Geographers (AAG) in Washington, DC in April of 2010.

Rm BE-5 **11:25 AM**

Presenter: Zahid S. Chaudhry, GIS Programmer/Analyst II, West Virginia Department of Environmental Protection, Zahid.Chaudhry@wv.gov

Title: *Designing a Digital Asset Management (DAM) System Using ArcGIS API for Flex and PHP*

Abstract: This talk will relate design goals and philosophy utilized in building an ArcGIS Server application (ArcGIS API for FLEX and PHP) that allow users to upload a collection of geotagged digital photos taken in the field to an Oracle-based database. Upon login, the Digital Asset Management (DAM) system establishes a persistent cookie that stores user ID. PHP scripts extract EXIF header coordinates. End users can then view their photos as point data in the mapping application and as a larger thumbnail with all the data in the EXIF header in a pop up infowindow. The application allows data filtering using project name, uploader's ID, photo date range, map navigation, and printing maps.

Shawkey Rm **11:25 AM**

Presenter: Barbara MacLennan, Outreach Coordinator, Monongalia County Solid Waste Authority, barbmaclennan@gmail.com; Susan Bergeron, GIS Specialist, Monongalia County Solid Waste Authority; David Dial, Chair of the Board, Monongalia County Solid Waste Authority, moncoswa@verizon.net; Laura J. Stiller, Recycling Coordinator, Monongalia County Solid Waste Authority, moncoswa@verizon.net;

Title: *Solid Waste: A Vital Forgotten Layer*

Abstract: Solid waste management, including recycling, is a vital local service that is part of the day to day economic development, public health, and general functioning of a community. On a broader scale, local recycling efforts link communities of all sizes with regional and global markets for recycled materials. However, because of the rural nature of Appalachian communities, which are often geographically isolated and lack resources and

expertise, little or no infrastructure exists for long-term solid waste management. Consequently, the implementation of advanced information management technologies , such as GIS, present a number of issues for many West Virginia communities.

The Monongalia County and Marion County Solid Waste Authorities faced a number of obstacles when they began creating a GIS in 2008 to identify and map recycling resources and waste hauler territories. Solid waste hauling is regulated as a utility through the West Virginia Public Service Commission (PSC) using route tariffs that exist only in narrative form. The MCSWA was faced with interpreting these narratives into useable GIS data layers. As the MCSWA grows the role of the GIS grows to assist with planning and managing recycling pickup, transportation of materials to regional markets, and planning new facilities, including the development of a small scale digital city initiative. Developing and implementing a solid waste GIS makes solid waste "real", thus bringing it to the attention of stakeholders and demonstrating that solid waste is an integral, if often overlooked, part of day-to-day public service and should also be integral in sustainable planning.

Rm 2W22 **11:25 AM**

Presenter: Charles Yuill, Associate Professor, Division of Resource Management, West Virginia University, cyuill@wvu.edu

Title: *An Integrated Visualization Framework for Environmental Planning, Design, and Management*

Abstract: This presentation discusses development of an integrated software and workflow environment integrating GIS, remote sensing, high precision visualization and ancillary software such as AutoDesk REVET for comprehensive environmental planning and management. The software components revolve around visualization software that links directly with the data management functions available in ArcGIS together with Internet resources available from sources such as GOOGLE Maps providing integrated information management/ visualization functionality. The system may also be used to link to other Internet data providers such as weather and climate sites as well as specific resources such as traffic cameras. The presentation will focus on applications ranging from surface mine restoration to urban situational analysis.

Rm BE-5 **1:30 PM**

Presenter: Ron Belcastro, Senior Civil Engineer, Mid-Atlantic Technical Engineering LLC, ron.belcastro@mate-engr.com

Title: *State of West Virginia Comprehensive Planning Study for Water, Wastewater, and Stormwater*

Abstract: The West Virginia Water Development Authority (WDA) and the Infrastructure and Jobs Development Council (IJDC) anticipate that over the next five years, $200 - $325 million dollars will be available annually for funding West Virginia water, wastewater, and stormwater infrastructure projects. WDA and IJDC estimate that it currently takes, on average, over five years to begin construction on projects that receive a commitment of funds. To reduce this timeframe to a maximum of 18 months, and allow the unserved and underserved residents of West Virginia to fully recognize the benefit of upcoming funding, WDA and IJDC must reinvent their existing funding process and apply technology to help them identify, prioritize, manage, track, and accelerate these projects in a cost-effective and efficient manner.

To accomplish these objectives, the WDA and IJDC has embarked on a State of West Virginia Comprehensive Planning Study (WVCPS) for Water, Wastewater, and Stormwater. The WVCPS, which will be complete in late 2010, is an 18 month project which is contains two phases:

Phase 1 – Assessment or Data Collection Plan

Phase 2 – Geographic Information System

WDA and IJDC has engaged the services of Camp, Dresser, and McKee Inc. (CDM) – a global environmental engineering firm which will assemble and organize the data to support the funding process into a central GIS data environment and develop a series of WebGIS applications to access the data.

This presentation will focus on the use of GIS in not only providing graphical depictions, but also providing a decision making framework for both the WDA and IJDC.

Shawkey Rm **1:30 PM**

Presenter: Scott T. Yoder, Regional Technical Manager – Northern Region, Pictometry, scott.yoder@pictometry.net

Title: *Oblique Imagery Capture of the State of West Virginia*

Abstract: This presentation will review the imagery capture project currently underway in the state of West Virginia by Pictometry International.

Rm 2W22 **1:30 PM**

Presenter: Jeffrey J. Mihalik, GIS Manager, Wallace & Pancher Inc., JMihalik@wallacepancher.com

Title: *Headwaters of Technology: Integrating a GPS Mobile Workforce with GIS Data Collection and Management*

Abstract: Wallace & Pancher, Inc. (WPI) has developed an innovative approach to integrate a mobile work force with environmental GIS data collection and management. WPI was recently awarded a service contract from two major long-wall mining operations to monitor stream condition and flow of hundreds of miles of stream located above their underground long-wall mining operations. The goal of the project is to monitor and predict potential physical and/or biological variations to surface waters pre and post mining. Immediate needs to implement this project necessitated a very tight schedule to obtain sound and practical solutions in a timely

manner. WPI's engineers and biologists, along with WPI's and the mines' GIS departments and management, worked closely to develop an effective data collection and management system.

The ability to have almost instantaneous access to data provided the client with the ability to foresee problems before they arise (change detection), have current geo-spatial data in hand to answer complex questions, and visually assess environmental concerns and state/federal permitting issues in almost real time. The development and implementation of this methodology has enabled the client to provide a quick response to environmental concerns.

Mr. Mihalik will present a powerpoint presentation detailing the methodology, tools and equipment, and processes used to implement this project. He will also detail how this implementation provides benefits to both the client and ultimately to the environment.

OBJECTIVES: 1. Innovative approach for near real time environmental field data collection/delivery; 2. Benefits to client and environment by reducing lag time between data collection and data utilization; 3. Illustrate extent of monitoring (time/money) required to meet environmental obligations for coal extraction.

Rm BE-5 **1:50 PM**

Presenter: Marshall Burgess, Geospatial Transportation Information Section, Programming Planning and Administration Division, West Virginia Department of Transportation, Marshall.L.Burgess@wv.gov; Kyle S. Weatherholt, WVDOT/DOH Program Planning & Administration Division, Geospatial Transportation Information Section, Kyle.S.Weatherholt@wv.gov

Title: *Snow Removal and Ice Conditions Project at the West Virginia Department of Transportation*

Abstract: This presentation is a summary of the progress of the Snow Removal and Ice Conditions (SRIC) Project at the West Virginia Department of Transportation (WVDOT). In 2009 a request was made to replace the current SRIC report with an interactive map showing the road conditions for individual snow route corridors and the counties overall road condition. Taking advantage of the current data collection process we geo enabled the SQL database and set color codes based on certain conditions that could be reported. We used ESRI ArcGIS API for flex and ArcGIS server to create the web mapping application. This provided a very easily recognizable visual representation of the conditions of the roads as the information was reported into the database from the 10 districts and 55 counties. During the 2009-2010 SRIC season we averaged between 200,000 and 300,000 hits a month with peaks of 20,000-30,000 hits an hour during certain storms. There are several planned improvements to include weather conditions and possibly displaying near real-time locations of snow plows using the new fleet management GPS system.

Shawkey Rm **1:50 PM**

Presenter: Tim Prescott, NRCS, Timothy.Prescott@wv.usda.gov

Title: *NRCS LiDAR applications in West Virginia*

Abstract: Algorithms for processing digital elevation model (DEM) data and generating elevation derivatives are well understood and documented. Their use with high resolution LiDAR data gives NRCS new capabilities to deliver sophisticated and highly detailed products for conservation planning, soil survey, and engineering applications. Conservation Planners use elevation derivatives like topographic wetness to design soil conservation practices to minimize erosion. Soil Scientists analyze geomorphometric surfaces to disaggregate Soil Survey Geographic database (SSURGO) map units to locate constituent components. Engineers use LiDAR derived contours to design solutions for acid mine drainage mitigation, stream corridor restoration, and dam rehabilitation. The enhanced analytic products made possible by high resolution LiDAR will increase the efficiency and efficacy of resource investigation, planning and management.

Rm 2W22 **1:50 PM**

Presenter: Yueming Wu, GIS Manager, Geospatial Transportation Information Section, Programming Planning and Administration Division, West Virginia Department of Transportation, yueming.wu@wv.gov; James Mitchell, GIS Analyst, Environmental Engineering Division, Office of Environmental Health Services, Bureau for Public Health, WV Department of Health and Human Resources, james.e.mitchell@wv.gov

Title: *Managing a Many to Many Relationship in a Geospatially Enabled Data Warehouse*

Abstract: In 1996 Congress required all states to develop and implement program elements to protect the sources for all public water supplies by adopting Amendments to the Safe Drinking Water Act. In West Virginia, the Department of Health and Human Resources (DHHR) is developing the Source Water Assessment and Protection (SWAP) program, which is responsible for assessing all of West Virginia's public drinking water systems. Part of the work includes delineating the source areas or where water used for public drinking water supplies comes from and inventorying potential contamination sources (PCS) that may impact public drinking water sources. A challenge to this work is how to describe a many to many relationship that exists among public drinking water systems, public drinking water supplies, and PCSs in the SWAP's geospatially enabled data warehouse by using available geospatial technology. The description is required for determining the spatial extent and the number of PCSs affecting a public drinking water system and its drinking water sources. A methodology was developed to address this problem. One of its key components was extending ArcGIS

Desktop's functionality to split the relationship. In the Microsoft Access environment two junction tables were created to represent the relationship and three tables set up to store data of public drinking water systems, public drinking water supplies, and PCSs. Correspondingly a replication of the Access database was built into the SWAP ArcSDE geodatabase, which serves as the core of the SWAP enterprise GIS.

Rm BE-5 **2:10 PM**

Presenter: Zahid S. Chaudhry, GIS Programmer/Analyst II, West Virginia Department of Environmental Protection, Zahid.Chaudhry@wv.gov

Title: *My Flexible GIS – A Developer Approach*

Abstract: The West Virginia Department of Environmental Protection (WVDEP) began providing public access to Agency environmental data via our GIS Public Empowerment Program (GIS PEP) in 1995. GIS PEP was powered using Unix-based workstation ArcInfo hardware/software by in-house staff running CGI scripting as the basis of the initiative. GIS PEP was the earliest statewide scale interactive mapping application on the WWW. Evolving over the years to more contemporary framework, WVDEP implemented several Adobe Flex based web applications. This talk will highlight some of our web development work and our future goals in moving toward a true web based GIS System.

Shawkey Rm **2:10 PM**

Presenter: Larry Evans

Title: *WV DEP LiDAR Applications*

Abstract: In December of 2009 WVDEP's Division of Mining and Reclamation entered into a contract with West Virginia University to significantly expand the State's LiDAR coverage. This spring (2010) from April 9th through April 18th WVU Natural Resource Analysis Center's Piper Navajo twin-engine aircraft with onboard Optech ALTM-3100 LiDAR system collected up to four returns over more than 1.277 million acres (1,995 square miles) of the State's southern coal fields. This included the entire Coal River watershed and 80% of the Upper Guyandotte watershed. Mission parameters include 1 meter posting (X,Y) with a 15cm or better vertical accuracy (Z). This fall additional work is expected to expand LiDAR coverage in West Virginia to approximately 45 percent of the State. Once the data is received from NRAC, independent quality control review processing will be performed by TAGIS/ITO and possibly by FEMA via its quality control review contract process. Once this review is complete, TAGIS will produce derived products including an elevation grid, hillshade, intensity image and possibly 2 foot elevation contours standing up new geoservices accessible via the Internet.

Rm 2W22 **2:10 PM**

Presenter: Kyle S. Weatherholt, WVDOT/DOH Program Planning & Administration Division, Geospatial Transportation Information Section, Kyle.S.Weatherholt@wv.gov; Karl A. Epps, WVDOT/DOH Program Planning & Administration Division, Geospatial Transportation Information Section, Karl.A.Epps@wv.gov

Title: *WVDOT MS4 Storm Water Inventory*

Abstract: Recent additions to the Clean Water Act have mandated that storm water management practices be undertaken by the West Virginia Department of Transportation (WVDOT) within "municipal separate storm sewer systems" (MS4) areas. An inventory of the storm water collection systems along state maintained roadways is needed to meet these requirements. The WVDOT Geospatial Transportation Information (GTI) Section and Highway District 2 have conducted a pilot project to develop this inventory. Utilizing Global Positioning System (GPS) and Geographic Information Systems (GIS) technology, an inventory of the storm water collection system in the Wayne County MS4 area has been created. The end product is a GIS database containing the location, photographs, and descriptive information for each storm water collection feature. This information can then be displayed on maps, a web mapping portal, or in the GPS devices for future field assessments. The results of the pilot project were presented to the West Virginia Department of Environmental Protection and given approval as meeting the permit requirements. The project is being expanded and a statewide data collection will begin this summer.

Rm BE-5 **2:30 PM**

Presenter: Joe Seppi, Woolpert Inc., Joseph.Seppi@woolpert.com

Title: *A Middle-tier MAF/Tiger Voter District Editing Tool for State & Local Governments*

Abstract: Coordinating voter district updates requires state governments to manage inputs from counties using a variety of different GIS data and procedures. But, both the state and counties potentially waste resources attempting to integrate various forms of data, preparing reports required for approval, and resolving conflicts. A simple and secure middle-tier editing program provides all participants with a common tool based on the MAF/Tiger dataset enabling a single point of submission, visualization, review, and authorization for Secretaries of State and Boards of Elections.

This presentation will examine a VTDEditor application developed for a state government that provides a proposal, approval, and commit protocol to edit voting districts and census blocks necessary to update MAF/Tiger VTD

and TABBLOCK tables.

The application leverages Oracle Spatial, Oracle Maps, and open-source tools such as MyFaces/Trinidad and Java Persistence Architecture (JPA) to provide a secure and scalable tool suitable for applications that require incidental updates by a large number of independent users. The approach sidesteps the burdensome issues of merging independent datasets and completely automates the creation of before and after reports necessary to review and authorize changes to voting districts. The same approach could be applied to managing proposed changes to state legislative and congressional districts.

This presentation will explore the underlying technologies including the Object Relational Mapping (ORM) of MAF/Tiger data into JPA beans, the use of Java Server Faces (JSF) component implementations such as Trinidad and Oracle's ADF RichClient, and the use of JavaScript as a graphic editing tool.

Shawkey Rm **2:30 PM**

Presenter: Tony Simental, WV State GIS Coordinator, Tony.A.Simental@wv.gov

Title: *Statewide Imagery and LiDAR Business Plans*

Abstract: The best publicly available "statewide" leaf-off imagery and elevation data were captured photogrammetrically in 2003 at a 1:4800 map scale as part of the Statewide Addressing and Mapping Board (SAMB) project. Although these SAMB base mapping layers have been very useful to many organizations, West Virginia stakeholders are interested in obtaining a more current statewide coverage of high-resolution imagery and elevation data. The State GIS Coordinator will lead an informal discussion to develop future strategies and business plans to accomplish this goal.

Rm 2W22 **2:30 PM**

Presenter: Brad Fugate, Woolpert Inc., Brad.Fugate@Woolpert.com

Title: *Automated Feature Extraction Using Digital Camera Imagery*

Abstract: Until recently, feature extraction has been labor intensive and time consuming—both of which drive project budgets up and timelines out. But, recent advances in technology now allow for the fusion of multi-spectral data to become a cost-effective and accurate means of deriving geospatial information. By using automated remote sensing techniques and orthoimagery derived from digital camera technology, GIS professionals can now produce more consistent data, such as impervious surfaces, buildings, and land use/land cover classifications, on a shorter timeline and smaller budget. With this automated feature extraction, these data sets are at the forefront of this advance in technology. This presentation will show how technicians can extract, classify, and deliver data into a GIS database this more cost-effective and efficient automated feature process. The presentation will also demonstrate, through a case study, how one municipality increased their storm water utility revenue by using the accurate impervious surface data produced by this process.

Rm BE-5 **3:10 PM**

Presenter: Jerry Workman, PE, Mountain CAD, jerry@mtncad.com

Title: *Open Source Web GIS Solutions*

Abstract: This presentation will cover Web Mapping technologies for publishing map data on the Internet or on your company Intranet. The emphasis will be on Open Source web based clients for displaying publicly available mapping data.

Several examples will be demonstrated in the use of web based services as Google, Bing (Virtual Earth), and Open StreetMap. In addition techniques will be reviewed on finding and displaying mapping data from West Virginia providers (WVGIS, WVDEP, WVDNR, and WVDOT).

Using the Raleigh County Assessor's Web Portal as our example a discussion on the use of technologies such as MapFish, GeoExt, ExtJs, OpenLayers, TileCache, to consume ArcGIS Server, ArcIMS, Mapserver, and GeoServer map layers.

Shawkey Rm **3:10 PM**

Presenter: Marshall Burgess, Geospatial Transportation Information Section, Programming Planning and Administration Division, West Virginia Department of Transportation, Marshall.L.Burgess@wv.gov; Everett D. Perry, Geospatial Transportation Information Section, Programming Planning and Administration Division, West Virginia Department of Transportation, Everett.D.Perry@wv.gov; Kyle S. Weatherholt, Geospatial Transportation Information Section, Programming Planning and Administration Division, West Virginia Department of Transportation, Kyle.S.Weatherholt@wv.gov

Title: *Progress of the Railroad Crossings Project at the West Virginia Department of Transportation*

Abstract: This presentation is a summary of the progress of the Railroad Crossings Project at the West Virginia Department of Transportation (WVDOT). In 2009, the Federal Railroad Administration (FRA) changed the voluntary reporting requirements to mandatory laws that require yearly updating with GIS information added with a deadline of October 2010 for initial compliance. The railroad crossings database maintained by the WVDOT had been originally based on Railroad track charts and old street names and contains inaccurate GPS information supplied by FRA. To address this problem the WVDOT used a collection of source data sets, including Aerial photography, the State Address Mapping Board (SAMB) railroad layer and the Rahall

Transportation Institute (RTI) railroad layer, to build a more accurate railroad layer for the state. The SAMB railroad layer in conjunction with the aerial photography was used in digitizing track location to build the WVDOT railroad layer. The RTI railroad layer has attribute data useful to the WVDOT such as ownership, functional class, and if the tracks were active or abandoned. After the railroad layer was created a railroad crossing layer was generated by intersecting it with the WVDOT route layer. Attributes for the new crossing layer are being populated and the crossing locations and federal crossing numbers are being field verified with GPS. This new design will allow us to match Railroad Company and WVDOT information into the federal database and allow our utility and safety programs better integration with FRA safety programs.

Rm 2W22 **3:10 PM**

Presenter: Michael Clifford, GIS Programmer/Analyst, West Virginia Geological and Economic Survey, mclifford@geosrv.wvnet.edu

Title: *The West Virginia Broadband Mapping Program*

Abstract: The West Virginia Broadband Mapping Program is funded by federal stimulus monies from the American Recovery and Reinvestment Act, as part of a nationwide program to inventory and map broadband availability and service speeds within the states. Analysis of this data will be done in order to provide a comprehensive picture of current infrastructure deployment and an accurate depiction of unserved and underserved areas. This work is being performed by the West Virginia Geological and Economic Survey in conjunction with the West Virginia Division of Homeland Security and Emergency Management and other partners. Data are being collected on a census block level from 49 broadband providers within the state, normalized and analyzed, and verified by a third party contractor. The compiled data will then be available on a state-hosted GIS web portal. The National Telecommunications and Information Administration will be including this data on the National Broadband Map. This presentation will give details on the current progress and methodologies of the project, as well as future plans for broadband mapping in West Virginia.

Rm BE-5 **3:30 PM**

Presenter: John M. Bocan, GIS Programmer/Analyst, WV Geological and Economic Survey, bocan@geosrv.wvnet.edu

Title: *A Basic Introduction to Free and Open Source GIS Software – What It Is and Isn't*

Abstract: What is Free and Open Source Software (FOSS) for GIS? It's free as in "speech" and "beer"! This talk will help to introduce one to FOSS/GIS and will also dispel some of its misnomers and other misunderstandings, for instance: yes, many applications can now run on Windows and no, it is not all command-line—actually, quite the opposite. The past several years have seen marked growth in FOSS desktop, server and web applications. With user-friendly GUIs, this software may be helpful for small organizations that may need some rudimentary GIS or for the curious individual to explore GIS on his/her own. *Disclaimer: For this session, the speech will hopefully be free, but unfortunately we won't have any free beer!*

Shawkey Rm **3:30 PM**

Presenter: Brandie Yalniz, GIS Programmer Analyst I, West Virginia Department of Transportation, Brandie.S.Yalniz@wv.gov

Title: *Transportation Symbology Standardization*

Abstract: Since the late '70s, the guidelines for symbolizing transportation Information on maps have not been updated with the changing times at the West Virginia Department of Transportation (WVDOT). These guidelines were set forth for primarily Computer-Aided Design (CAD) maps. As the department moves into the Geographic Information Systems (GIS) style mapping, decisions have to be made on where to go from this point. The problem found is that there are no current procedures that standardize the symbols across the various departments of the WVDOT.

Deciding on a standard set of symbols and label shields will greatly assist the WVDOT in many ways. These conventions will allow for standardization across the WVDOT, which will make map production quicker and more efficient and will improve communication from map to map.

This presentation will look at other organizations that have researched the same topic in their fields, and especially, transportation groups and/or entities that have researched, or are currently researching, transportation symbology standards. What has been found is that most agencies have developed their own procedures that do not correspond with each other across the industry. Most agencies do use some options available from industry leaders such as ESRI, but even some of them are not used across the board. We will also look into the WVDOT's own past standards and what symbology is used today in our CAD maps and possible options for future symbology standards and conventions.

Rm 2W22 **3:30 PM**

Presenter: Eric Hopkins, Lead GIS Specialist, WV GIS Technical Center, WVU Department of Geology & Geography, Eric.Hopkins@mail.wvu.edu; Evan Fedorko, GIS Specialist, WV GIS Technical Center, WVU Department of Geology & Geography, Evan.Fedorko@mail.wvu.edu

Title: *The West Virginia Flood Hazard Determination Tool: History and Progress*

Abstract: The West Virginia GIS Technical Center (WVGISTC) developed the Flood Hazard Determination Tool (Flood Tool) web mapping application in 2006 with the support of FEMA and West Virginia state NFIP administrators. The

Flood Tool was conceived as a simple and direct means by which stakeholders could rapidly obtain information regarding the floodplain status of a given property. The WVGISTC built the application using its existing MapWV.gov ArcIMS/ArcSDE framework.

The current mapping status of all counties (i.e. Effective DFIRM, Provisional/Preliminary DFIRM, Q3, No Data) is shown in the index map when the Flood Tool is first opened. Quick links to West Virginia counties and communities are provided in the user interface, along with site and street based address locating services. Reference GIS data layers can be turned on and off, and have links to metadata and download locations. Data layer display is scale dependent, which helps preserve cartographic clarity. Elevation contours (20-foot) are available for a general depiction of local topography. In addition to In/Out status, the Flood Tool will return a warning for locations nominally outside, but within 75 feet of the regulatory (100-year) floodplain, emphasizing the need to consult an actual FIRM or local survey as well as local floodplain managers.

Future floodplain data updates will incorporate more accurate and precise data to replace current Approximate A Zones. The current ArcIMS application will migrate in the near future to the ESRI ArcGIS Server platform.

Rm BE-5 **3:50 PM**

Presenter: Yueming Wu, GIS Manager, Geospatial Transportation Information Section, Programming Planning and Administration Division, West Virginia Department of Transportation, yueming.wu@wv.gov; Brandie Yalniz, WVDOT/DOH Program Planning & Administration Division, Brandie.S.Yalniz@wv.gov

Title: *Smart Map Templates – A Pragmatic Solution to Help Average ArcGIS Desktop Users*

Abstract: Average ArcGIS Desktop users are defined as those who had training in ArcGIS Desktop but do not use it frequently. Typically, these people, as opposed to Geographic Information System (GIS) practitioners and GIS power users who rely on GIS technology to perform their daily duties, constitute the majority of the ArcGIS user base in an organization. Due to the fast evolution of GIS software but lack of enough practices or timely training to maintain their skills, it is necessary for the average ArcGIS Desktop users to utilize more efficient ways leveraging GIS technology. This presentation will introduce a solution targeting at these users, which, basically, is sets of smart map templates designed for groups of the users who perform similar routine tasks. A map template is composed of standardized layers, customized tools, a standardized layout view, and other elements such as scale dependency and coordinate system definition. The layers are built on standardized symbology and various data sources, including Internet GIS resources. Smart rules are embedded in the tools to address the users' business needs. The layout view contains major items such as title, legend, north arrow, scale bar, logo, and map disclaimer, which can be further modified. Both the templates and the layers stay in a central location accessible to the users. Finally before the templates delivered a prompt training is offered. The solution has been proved successful in some West Virginia state agencies, resulting in improved productivity and continuous growth of user base.

Shawkey Rm **3:50 PM**

Presenter: Mark Holmes, Senior Consultant, L.R. Kimball, mark.holmes@lrkimball.com

Title: *The Journey to Next Generation 9-1-1 – A Spotlight on Your GIS Data*

Abstract: With the evolution of 9-1-1 technology to Emergency Services Internet Protocol (IP) networks (ESInet) as the foundation of Next Generation 9-1-1 (NG 9-1-1), GIS data plays a much more prevalent and crucial role in the call routing of 9-1-1 calls. This presentation will provide an in-depth overview of how GIS data function in the current decades old technology and how it will function within the ESInet framework. The presentation will also provide information on the steps GIS staff can be taking today to prepare GIS data for a NG 9-1-1 environment and some of the policy and governance decisions that need to be considered.

Rm BE-5 **4:10 PM**

Presenter: York Grow, Earth Vector Systems LLC, York_Grow@evsgps.com

Title: *CartoPac Field Software – A Mobile GIS Option*

Abstract: The use of mobile GIS is expanding greatly. This arena is characterized by greater amounts of digital information, increasing numbers of field users, and improvements in hardware platforms. CartoPac Field Software is an option that capitalizes on these characteristics. It takes the strengths of ArcPad and TerraSync to a different level to provide an easy-to-use field interface with a direct backbone of SDE, Oracle or a mixture of spatial and non-spatial databases. This session will review these characteristics as a robust option for mobile GIS. (See E-mail for annotations by author on presentations)

Shawkey Rm **4:10 PM**

Presenter: Kevin Kuhn, GIS Analyst, West Virginia GIS Technical Center, Department of Geology & Geography, WVU, kkuhn2@wvu.edu

Title: *Integration of WV DOT Road Data and Addressing Data*

Abstract: The West Virginia Department of Transportation (WVDOT) has completed a project to create a linear referenced road network, using the West Virginia State Addressing and Mapping (WVSAM) unattributed centerline data. High-quality road centerline data is a foundation layer for many GIS-related projects. The same centerline base data was also used in a separate application for the WV Department of Homeland Security and Emergency

Management to create a statewide, addressed street data. This addressed dataset consists of all roads in the state, including roads not owned by WV DOT. This data could provide WV DOT with expanded capabilities, such as routing, geocoding, direction and mapping applications. However, the two datasets currently exist in different locations, maintained separately and use different geometric formats.

The WV GIS Technical Center and the Rahall Transportation Institute have teamed up to solve some of the incompatibilities between the existing WV DOT road data and the WV SAM addressed data. The objective of the study is to review technical issues regarding the feasibility of road network integration in West Virginia which incorporates linear referencing, addressing, and routing capabilities. The projects goals of this study will identify and review existing transportation models, as well as WV DOT data needs; create an integrated road network pilot study; and identify requirements for data integration. We will present lessons learned and comments on the process of integrating datasets of this nature.

POSTER ABSTRACTS AND AGENDA, 10:00 - 10:45 Wednesday June 9

Memorial Student Center, 1st Floor Lobby

Presenter: Marshall Burgess, Geospatial Transportation Information Section, Programming Planning and Administration Division, West Virginia Department of Transportation, Marshall.L.Burgess@wv.gov; Everett D. Perry, Geospatial Transportation Information Section, Programming Planning and Administration Division, West Virginia Department of Transportation, Everett.D.Perry@wv.gov; Kyle S. Weatherholt, Geospatial Transportation Information Section, Programming Planning and Administration Division, West Virginia Department of Transportation, Kyle.S.Weatherholt@wv.gov

Title: ***Progress of the Railroad Crossings Project at the West Virginia Department of Transportation***

Abstract: This poster will illustrate the progress of the Railroad Crossings Project at the West Virginia Department of Transportation (WVDOT). To address the railroad crossing project the WVDOT used a collection of source data sets, including Aerial photography, the State Address Mapping Board (SAMB) railroad layer and the Rahall Transportation Institute (RTI) railroad layer, to build a more accurate railroad layer for the state. This poster will illustrate the various states the data was in and what was needed to manipulate this data into a cohesive format that is allowing WVDOT to meet the Federal Railroad requirements.

Presenter: Roger Dorsey, Geospatial Transportation Information Section, Program Planning and Administration Division, Division of Highway, West Virginia Department of Transportation, roger.b.dorsey@wv.gov

Title: ***West Virginia General Highway State Map***

Abstract: The General Highway Map serves many purposes for statewide and national highway planning. All interstate, U.S. numbered routes and W.V numbered routes are depicted along with a limited number of connecting local service roads. Most national and state parks and forests along with principal rivers and lakes are shown. Over 1000 incorporated and unincorporated place names are shown as space permits. It is also called the wall map as the name implies that it is generally placed on a wall and readable from distance. It is a very popular map in the West Virginia Department of Transportation (WVDOT).

Presenter: Roger Dorsey, Geospatial Transportation Information Section, Program Planning and Administration Division, Division of Highway, West Virginia Department of Transportation, roger.b.dorsey@wv.gov

Title: ***West Virginia Road Location and Length Project***

Abstract: This project is to provide accurate location and length of the road system maintained by the West Virginia Department of Transportation (WVDOT). The project takes into account almost eight decades of information and locates each road to its place on the map using many sources of information new or very old. Temporary help was hired in creating the road base layer. Now road data errors are being fixed.

Presenter: *Arthur Elmes, Graduate Research Assistant, Department of Geology & Geography, WVU, Arthur.elmes@gmail.com

Title: ***Modeling the Spread of Ailanthus altissima using Remotely Sensed Data and Agent-Based Modeling***

Abstract: The utility of remotely sensed data and agent-based modeling was explored for predicting the dispersal and establishment of seeds from the invasive tree, Ailanthus altissima. This species produces up to 300,000 windborne seeds, which move and establish on surfaces differentially, depending on surface roughness, slope, and establishment suitability. The agent-based approach allows each seed to be accounted for individually, and to move across a complex environment comprising multiple remotely sensed datasets. The resulting pattern of dispersal is the result of (1) wind controlled primary dispersal, (2) wind and surface friction controlled secondary dispersal, and (3) establishment suitability. Datasets used as movement and establishment controls included lidar data, color infrared aerial imagery, multispectral Landsat imagery, and a 3 meter digital elevation model. Once parameterized, the model was run multiple times for each tree, allowing a qualitative analysis of dispersal patterns. The major focus of this study was a critical analysis of the effectiveness and utility of agent-based modeling and remotely sensed data for seed dispersal modeling.

Presenter: Karl A. Epps, WVDOT/DOH Program Planning & Administration Division, Geospatial Transportation Information Section, Karl.A.Epps@wv.gov

Title: ***2008 National Highway Functional Classification, Mercer County, West Virginia***

Abstract: Functional classification is the process by which streets and highways are grouped into classes, or systems, according to the character of service they are intended to provide. Basic to this process is the recognition that individual roads and streets do not serve travel independently in any major way. Rather, most travel involves movement through a network of roads. It becomes necessary then to determine how this travel can be channelized within the network in a logical and efficient manner. There are three highway functional classifications: arterial, collector, and local roads. All streets and highways are grouped into one of these classes, depending on the character of the traffic (i.e., local or long distance) and the degree of land access that they allow.

This map shows the functional classification of highways for Mercer County, West Virginia, and is typical of the functional classification of a WV county.

Presenter: Michelle Frame, Transportation Engineering Technician, West Virginia Department of Transportation, michelle.l.frame@wv.gov; CONTACT: Brandie.S.Yalniz@wv.gov

Title: ***2008 HPMS Standard Samples***

Abstract: This map was produced for the primary purpose of displaying the locations of the 2008 HPMS Standard Samples. It is part of a series of maps that were created for all 55 counties in West Virginia. The Highway Performance Monitoring System (HPMS) is an annual roadway inventory data submittal to the Federal Highway Administration with up to 98 different data items that can be reported for each sample. The production of this series of maps has also assisted with preparation for the 2010 mandate by FHWA requiring the states to submit the HPMS data via a Geodatabase format with minimum GIS network requirements through Federal Aid Roadways.

The National Functional Classification Distribution is displayed, as well as pertinent roadway data such as, beginning and end mile point, AADT (Average Annual Daily Traffic), and its rural or urban classification. This map has been an instrumental tool for the Highway Data Services Section of the Division of Highways in analyzing and maintaining our Standard Sample Panel. Additionally we are able to quickly view how our standard sample concentration and functional classification/volume group distribution.

Presenter: Barbara L. MacLennan, Susan J. Bergeron, and Laura J. Stiller Monongalia County Solid Waste Authority, barbmaclennan@gmail.com

Title: ***From Narrative to Polygon: Mapping Waste Hauler Territories in Monongalia and Marion Counties, WV***

Abstract: This poster will illustrate the challenges of generating a GIS vector data set from narrative descriptions used by the West Virginia PSC to define territories of operation for waste haulers. The poster will also offer an assessment of the resulting data set, and discuss possible methods to improve accuracy via the utilization of service address information.

Presenter: *Jessica Randall, Doctoral Student/Graduate Teaching Assistant, Department of Geology & Geography, West Virginia University, jddrandall@gmail.com

Title: ***Estimation of crop residue in the Maumee River Watershed Using Imagery from Landsat Thematic Mapper***

Abstract: The Maumee Watershed in Northwest Ohio is an intensely crop cultivated region that experiences considerable erosion due to conventional tillage practices. Eroded sediment enters the river and causes a multitude of problems. Over the past few decades tillage practices termed 'conservation tillage' have been proposed to decrease erosion and incentives exist to encourage farmers to institute these. Methods of ensuring that farmers abide by the incentive rules are inadequate, and usually involve time-consuming driven windshield surveys. The implementation of remote sensing methods to quantify crop residue ground cover throughout the watershed can vastly improve the current methods of residue estimation. This study examines the feasibility of estimating corn and soybean crop residue using a supervised classification on Landsat 5 TM imagery. The supervised classification is performed on the entire May 28, 2008 image using USDA NRCS transect data to identify training sets and as validation data. A combined classification is performed first and results in poor class separability, standard deviation, and overall accuracy. Next ArcMap is used to divide the classification and separately address soybeans and corn, improving class separability, class statistics, and overall accuracy. Finally, an alternate method using AVIRIS hyperspectral airplane-flown imagery is proposed for future studies.

Presenter: Melissa Scott, Grennbrier County GIS Coordinator, Melissa.scott@greenbriercounty.net

Title: ***Visualizing Countywide Land Development Issues in Greenbrier County***

Abstract: A series of posters (4 or 5 maps 24x36) that illustrate the land transfer and development trends in Greenbrier County. These thematic maps are based on the information pulled from the state assessment database (IAS), and County database of building permits linked to the GIS parcel geodatabase. These maps were created to illustrate the trends of land ownership, land transfer, and development in Greenbrier County.

Presenter: *Jennifer L. Smith, Graduate Teaching Assistant, Department of Geology & Geography, West Virginia University, jenn.smith11@gmail.com; Aaron A. High, West Virginia University, aaron.a.high@gmail.com; Jessica Brewer, Graduate Research Assistant, Department of Geology & Geography, West Virginia University, jbrewer98@gmail.com

Title: ***Updating the Geographic Names Information System: Methods and Implementation***

Abstract: The Geographic Names Information System is an important component of the National Map produced by the United States Geologic Survey. Updating the system to reflect current features and changes to structural and cultural features such schools, churches, and cemeteries are important to maintain map accuracy. Similarly, the U.S. Board on Geographic Names works with the Geographic Names Information System to maintain standardization of naming conventions for the National Map. A variety of organizations at the federal, state, and local levels contribute to these updates. The West Virginia GIS Technical Center, at West Virginia University, in partnership with the United States Geologic Survey has completed several updates to the Geographic Names Information System for West Virginia, over several years. This poster illustrates the methods and implementation of updates completed by the West Virginia GIS Technical Center to aid in the continued standardization and revision of structural and cultural features throughout the state. The methods employed for data collection, validation, and submission will be highlighted and compared as well as the advantages of using local agencies with local knowledge to complete these feature updates.

Presenter: Kyle S. Weatherholt, WVDOT/DOH Program Planning & Administration Division, Geospatial Transportation Information Section, Kyle.S.Weatherholt@wv.gov; Brandie Yalniz, WVDOT/DOH Program Planning & Administration, Geospatial Transportation Information Section, Brandie.S.Yalniz@wv.gov

Title: ***WVDOT Geospatial Transportation Information Section, Internet Mapping Applications***

Abstract: The WVDOT Geospatial Transportation Information Section is committed to providing accurate and current information and making it as accessible to our customers as possible. In order to achieve this goal, GTI has produced numerous internet mapping applications to disseminate geographic information to the public as well as internally throughout our organization. This poster highlights several sites already put into production and widely used, as well as some that are currently in the development stage.

Presenter: *Nathaniel Williamson, Geography Department, Marshall University, Williamson70@gmail.com or nathanielwilliamson@gmail.com

Title: ***West Virginia Landslide Overlay Analysis***

Abstract: The natural disposition of West Virginia terrain is described by the USGS as being mountainous. Reported in the Charleston Daily, 2004 an estimated 1,500 landslips occur each year inside of the state, costing an approximate 20 million dollars in damages. Most damages are reported by personal property owners, many of which are unaware that the property is located inside a zone of high landslide probability. The objective of this study was to better understand the relationship between landslide occurrences and the synthetic alteration of a landscape (e.g. rivers, roads, acreage exposed to wildfires). The study focused on the causes of slope instability and its direct relationship to the reported landslide locations. Using ArcGIS 9.0 county shapefiles with recorded landslide occurrence were overlaid with maps of different triggering mechanisms, examining the correlations. The results show counties with high densities of rivers, roads, and exposed soil are related to the clustering of landslide locations. The importance of this project lies in its cost-effectiveness and feasibility. It is extremely important to inform people living near susceptible areas so that they may react and prevent a catastrophic landslide from happening.

Presenter: Brandie Yalniz, WVDOT/DOH Program Planning & Administration Division, Brandie.S.Yalniz@wv.gov

Title: ***Natural Connections for Sustainable Tourism***

Abstract: The Natural Connections for Sustainable Tourism map was a collaboration between the West Virginia Development Office and the West Virginia Department of Transportation's Geospatial Transportation Information Section in 2007. The map was designed for the West Virginia Legislation Trails Day at the Capitol in Charleston, WV. The intention was to garner support from the Legislation for Trail and Recreation Projects such as the Outdoor Heritage Fund.

To do this, the map highlights how Trails and Byways can be used to connect the West Virginia Main Streets and Parks to each other and in essence create corridors on which visitors can easily traverse between the many cultural and recreational features of the state. The map also emphasizes how these features can be used to boost the local economy and create new jobs.

* student