As first responders to fires, public safety and medical emergencies, disasters and terrorist acts, Fire Department City of New York (FDNY) protects the lives and property of New York City residents and visitors. The Department advances public safety through its fire prevention, investigation and education programs. The timely delivery of these services enables the FDNY to make significant contributions to the safety of New York City and homeland security efforts.

Since 09/11/2001, the FDNY has been re-evaluating response procedures to large-scale incidents. Based on requirements that have been determined from a number of various sources, Geographic Information Systems (GIS) technology and the associated data have become an increasingly valuable resource to the Department’s individual Bureaus and Units. Accurate and informative mapping of current conditions, structures and infrastructure is now required as essential visual aids by the Incident Commander and Incident Command Structure, whether the response is to a natural or man-made catastrophic event that affects a large area or number of people, involves fire, structure collapse, severe weather conditions, or a Weapon of Mass Destruction/Terrorism related incident.

There is a growing demand for Geographic Information Systems technology in the FDNY, especially with regard to Fire and Emergency Medical Service (EMS) response-related GIS data assets, dispatch operations, building inspections and the integration of operational data for analysis, planning, mapping and distribution through the Department’s intranet.

The FDNY GIS Unit maintains the following Mission Statement:

- Obtain and maintain up to date information on assets and infrastructure
- Develop and implement data specific to FDNY needs
- Provide customized mapping, analysis and reporting solutions to support FDNY Emergency responders of all ranks
- Research, promote and support the use of GIS Technology
- Inter-agency liaison to Local, State and Federal GIS Organizations

(Continued on page 2)
The FDNY GIS Unit has been working continuously to provide mapping and coordinated aerial photography products and FDNY specific geospatial data to Bureaus and Units operating throughout the Department. The FDNY GIS Unit continues to work on projects to support first responder dispatching such as: fire alarm box geo-code verification, fire response area mapping, hydrant verification, FDNY administrative areas verification, Fire and EMS Computer Aided Dispatch (CAD), Automated Vehicle Location (AVL) project, Oblique Angle Aerial Photography, Special Events and Dignitary Protection Incident Action Plans (IAPs), Emergency Action Plans for Commercial High Rise Buildings/Digital Blueprints, Fire Prevention Building Violations, Fire Investigation Fatal Fires and Arson incidents, Safety Command’s Accident Investigations, collaborative projects with Special Operations Command HazMat, Rescue and Marine Units, as well as ad-hoc field requests from Borough Commanders and Company Officers.

The FDNY GIS Unit has an extensive Geo-Database with FDNY specific datasets which are enhanced by shared datasets from various key city, state, federal and private sector agencies including: DOITT, OEM, City Planning, NYPD, DEP, DOT, MTA, Parks, Con-Ed, National Grid, NYS-GIS, NYS Emergency Management Organization (SEMO), US DHS, National Geo-Intelligence Agency (NGA), Mutual Aid Partners (New Jersey, Nassau and Westchester Counties), etc. The FDNY has various applications that utilize state-of-the-art technology that can be incorporated with the current and future geospatial datasets.

One of the FDNY’s key goals is the integration of upgraded technology that will allow for a greater distribution of information throughout the department and to other city agencies. However, significant challenges exist with regard to FDNY Operations and the widespread adoption and dissemination of GIS information within the agency. The FDNY GIS Unit is currently focused on addressing this issue as described on the following page:

(Continued on page 3)
Centralizing and standardizing the GIS data within the FDNY, ensuring that all FDNY applications access the most current data by integrating the GIS server into our existing systems utilizing a Homeland Security Standard Data Model consisting of FDNY geospatial datasets and geospatial data obtained from non-FDNY resources.

Creating a means for FDNY personnel to readily access the current geospatial data that is created and maintained by the FDNY GIS Unit and geospatial data that is obtained from other government, public and private agencies.

Instituting a process for users to provide GIS data updates and corrections based on field observations or utilizing mobile technology to the FDNY’s geospatial repository and/or to the appropriate GIS custodial external authorities.

The FDNY GIS Unit is currently working to build on and improve the effectiveness of its utilization of GIS technology by taking the following measures:

- Evolving its existing geo-database resources managed by the FDNY GIS Unit into a centralized enterprise-wide geospatial data repository and to incorporate non-geospatial data to form a Common Operating Picture.

- Providing a customized Web Map and Search/Explorer tool to accommodate specific workflows for the usage of GIS technology within the FDNY’s Operations Center. Some of the custom ideas to enhance daily workflows include longitude/latitude lookups, fire alarm box lookup and enhanced queries developed for models involving plumes, bomb blast buffer zone and a natural disaster zone to identify critical infrastructures, FDNY resources, hospitals, etc. within the various zones. This would include password protected map services, globe services and Geoprocessing service models.

- In the future, the FDNY GIS Unit seeks to implement a secure automated GIS data exchange solution between the FDNY and external agencies. A primary focus of these proposed enhancements is to further assist the FDNY’s high-level decision makers, Operations Center staff and first responder operations during a crisis situation. A secondary focus of these proposed enhancements is assisting daily workflows of personnel involved in our Strategic Planning, Fire Prevention, Fire Investigation, Safety Command, Building/Hydrant Inspection activities, and Terrorism/Disaster Preparedness.

The FDNY has been working to incorporate systems for efficient and accurate sharing of information department-wide so that all designated users will have access to the GIS Unit’s general Geospatial Repository and identified secure users will have access to Critical Infrastructure Datasets.

There are many GIS projects currently underway within the FDNY, such as an Intranet Web Mapping application, Multi-agency Data-sharing Cooperative, Automatic Vehicle Locators, FDNY Subway Radio Repeater mapping, FDNY Deployment Site Modeling project, NYC Department of Information Technology & Telecommunications GIS Committees, the Citywide Street Centerline Project (Geofile Project), Critical Infrastructure Project, Center for Terrorism and Disaster Preparedness Exercise Design Team, Plume Modeling, Nautical Modeling, Digital Blueprints/Emergency Action Plans, etc. All of these activities will greatly benefit from the Common Operational Picture and a centralized geospatial repository currently under development.

(Continued on page 4)
Establishing a centralized geospatial repository to support FDNY geospatial data will further assist the Department to:

- Maintain and update geospatial data associated with FDNY assets (for example, fire alarm call boxes, EMS response district polygon overlays (“atoms”), etc.).

- Provide a means for FDNY users to access the repository data. The FDNY GIS Portal will be enhanced to support the repository. Field units must be enabled to access the repository.

- Standardize GIS data structures, formats and domains shared by FDNY units. For example, the FDNY Bureaus and Units will develop a standardized data structure for alarm boxes, which contains the set of required attributes (e.g., common key, circuit number, borough, box number, administrative unit).

- Apply City-wide GIS standards to the geospatial data provided to FDNY units.

- Provide easy access to GIS technology within the FDNY by supporting simple to use, pre-configured interfaces. This enables high-level decision makers including the Chief of Department, high-ranking Staff Chiefs and Operations Center Staff to easily and consistently access agency-wide data.

- Review FDNY application requirements to ensure that the geospatial components are compatible with FDNY GIS standards.

- Serve as the FDNY coordinator to obtain and verify GIS-related data from other organizations needed by FDNY units, and to monitor and provide data updates when they become available.

- Provide GIS technical consulting and support for geographic analysis, and FDNY GIS product development.

The FDNY GIS Unit is also in the process of developing and implementing a data exchange solution between the FDNY geospatial repository and other organizations that provide data to the repository, such as City Agencies, New York State Agencies, Federal Agencies, Regional GIS Data Sharing Cooperative and the Citywide Street Centerline Project (GeoFile Project). This solution will facilitate the provision of geographic information (e.g., streets and addresses) that is observed by FDNY field personnel to such organizations.

- This solution requires a staging area in the repository to temporarily store the missing or corrected geospatial data and make it accessible to FDNY GIS applications.

- Send the temporary data to the appropriate organizations to update their custodial data (e.g. hydrants for Department of Environmental Protection). Once the custodial organization updates their data to incorporate a geographic addition or correction, the FDNY will implement the change into the repository.

This methodology for developing data and applications will improve the internal knowledge base, enhance decision support and extend GIS throughout the FDNY enterprise. The Common Operational Picture application will enable FDNY to achieve integration within the FDNY and widespread use of GIS.

**Units of Measure for Determining Success**

The GIS Unit expects that the updated information afforded by these collective efforts will further enhance the FDNY’s responses at emergencies and further increase efficiency. In order to measure the effectiveness of this new technology, the FDNY will observe any productivity increases that may occur due to the new GIS resources and tools under development. The FDNY will monitor operations where GIS played a role in developing critical decisions during emergencies.
(FDNY...Continued from page 4)

Time savings will also be an important measure, as the new tools will allow for greater access to pertinent information at emergencies at a faster rate as evident by GIS’ support at the recent Manhattan crane collapses. Units will be equipped with more complete and expansive knowledge of their surroundings to help them during operations. These new tools will also assist in the development of pre-incident plans for specific types of structures and events.

The FDNY is one of the largest fire departments in the world, and protects one of the largest cities as well. The ever-changing landscape of New York City often makes it difficult to maintain current information on structures and roadways, which could pose problems for our first responders. However, because of our dedication to incorporating the latest technology, such as GIS in our daily operations, we consistently aim to further enhance our response to emergencies.

The FDNY is a major government agency with a strong existing GIS Program. The GIS Unit is dedicated to further developing its GIS enterprise to broaden its applications within various bureaus in the department and to expand access of this essential information to the field.

In summary, the overall perceived benefits and return on investment for a sophisticated state-of-the-art GIS Unit within the FDNY will only further improve the safety measures of Firefighters and EMS personnel, as well as other emergency responders and New York City residents that we are sworn to protect.

Submitted by Captain Steven Pollackov, Commanding Officer FDNY GIS Unit, pollacks@fdny.nyc.gov.

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NYS GIS Help Desk

The New York State GIS Help Desk is administered by the NYS Office of Cyber Security & Critical Infrastructure Coordination and sponsored by the New York State GIS Coordination Program. This web-based help desk is intended to provide support for both general GIS questions and specific questions regarding the technical use of the following GIS software products:

- ArcGIS Desktop: ArcView
- ArcGIS Desktop: ArcEditor
- ArcGIS Desktop: ArcInfo
- ArcInfo Workstation
- ArcView GIS 3.x
- ArcIMS (v 9.1 and later)
- MapInfo Professional
- MapXtreme (2005 and Windows)

Visitors can search the Knowledge Base to view previously submitted questions and answers or view the most Frequently Asked Questions. Residents of New York State may Submit GIS technical questions which will be answered within one (1) business day. All questions and answers will also be included in the searchable knowledge base.

http://www.gishost.com/gishelpdesk/

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GIS Communications and Outreach

Looking to find a local GIS Users Group? Interested in contributing to GIS-related electronic discussion lists? Then the NYS GIS Clearinghouse Communications webpage has the information that you are looking for. Here, you will find links to many different electronic discussion email lists, as well as links to and contact information for the many GIS user groups across New York State.

http://www.nyngis.state.ny.us/comm.htm
Dutchess County GIS Web Solutions for DPW

By Joe Rutkowski

Dutchess County has been successfully developing GIS web solutions for a number of years. These applications have followed the model of accessing information from a central warehouse intended for end-user consumption.

Recently, we have taken a new approach in our development of GIS web technology by building applications that allow non-GIS professionals to create and maintain their own spatial data without GIS software or training.

The first of these applications is the Road Inventory Management System (R.I.M.S.). R.I.M.S. is built on ESRI ArcMap Server and utilizes dynamic segmentation of the county’s route system. Layers such as signs, bridges, passing zones, traffic counts, culverts and other highway related data are all created and managed within the application. The goal of R.I.M.S. is to move data management away from multiple paper and/or digital mediums to this new centralized platform. Integrated security allows data managers to control viewing and editing access for each specific dataset. The Public Works department is continually migrating new data into the system and the ability exists to link to the county’s other GIS applications to utilize additional data and functionalities.

The second of these new solutions is the Highway Activity Tracking System (H.A.T.S.). This application is also built on ArcMap Server and its purpose is to track incidents and public complaints on the county’s roads, monitor vehicle movement, automatically dispatch incidents to the appropriate field crews, record precipitation and storm related activity and document daily transactions. The central office enters the incidents into the system, while superintendents and field personnel stationed throughout the county have access to the application for immediate notification and response. Multiple security levels are built into the application allowing various departments to view this data without risk to data integrity. In addition to managing the life cycle of incidents, a complete reporting solution is incorporated into the system, thus making H.A.T.S. an integral component for many of the DPW Highway staff.

The implementation of R.I.M.S. and H.A.T.S. was a large-scale business model change for the Public Works department and the benefits of their in-house management of centralized map-based data has proved invaluable.

Submitted by Joe Rutkowski, Dutchess County OCIS, JRutkowski@co.dutchess.ny.us.
GIS Exhibit at the New York State Museum in Albany

By Susan Winchell-Sweeney

A new exhibit highlighting the use of Geographic Information Systems (GIS) in historical archaeology is now mounted in the Current Research gallery at the New York State Museum.

The exhibit, entitled “Where Did They Come From, and Where Are They Now? The Artifacts of the South Street Seaport Museum,” originated as a poster presented at the 2007 NYS GIS conference in Albany.

The South Street Seaport Museum archaeological collection from New York City resulted from some of the largest professionally conducted urban excavations in North America. Spanning over 300 years of Manhattan history, the two million artifacts constitute the greatest extant collection of archaeological materials from 17th-century Dutch New Amsterdam and includes remains from 18th-century English Colonial and early 19th-century American Republic periods as well.

Now under the stewardship of the New York State Museum in Albany, the collection is undergoing extensive processing so that it may be utilized for archaeological and historical research. While this preparation is underway (a task likely to take more than ten years to complete), GIS is aiding management of inventory and current artifact location as well as providing context for the original buried artifact sites.

The New York State Museum is open daily from 9:30 a.m. to 5:00 p.m. in the Cultural Education Center at the south end of the Empire State Plaza, Madison Avenue, Albany, NY.

Submitted by Susan Winchell-Sweeney, Cultural Education Center, New York State Museum, swinchel@mail.nysed.gov.
New Interactive Map from the *Long Island Index* and CUNY Provides Fresh Perspective on Solving Regional Challenges

By Steven Romalewski

The *Long Island Index*, in collaboration with the CUNY Mapping Service at the Center for Urban Research, CUNY Graduate Center, has developed a new interactive map at its website that displays local and regional trends in new and revealing ways. The map is accessible at [www.longislandindex.org](http://www.longislandindex.org).

A key feature of the map is the orthoimagery web map service from the Office of Cyber Security and Critical Infrastructure Coordination (CSCIC). The orthophotos are integrated with parcel-level land use data across both counties that has never been mapped online before, Census demographics, downtown surveys, and much more to create detailed neighborhood maps and give users a bird’s eye view on critical housing, transportation, and development issues facing the region.

The *Long Island Index* project of the Rauch Foundation, a Long Island-based family foundation, created this online resource to help foster a regional approach to addressing Long Island’s challenges, while giving all Long Islanders a new way of seeing and understanding their communities. The *Index* has been monitoring and measuring community indicators for several years, and its new interactive map makes it easier for the public to put that information to use, letting users zoom in on any community or the entire Island and map specific trends and patterns of interest to them.

The Center for Urban Research (CUR) at the CUNY Graduate Center developed the application using the following technologies:

- ESRI ArcGIS Desktop (to create MXD files for the transportation and reference layers, land use maps, demographics, and regional views) and ArcSDE/SQL Server to manage the data sources;
- ESRI ArcGIS Server to generate web map services from the MXD files. We also use ArcGIS Server to generate cached tiles for the land use map layer;
- The open source mapping platform OpenLayers consumes the WMS resources, manages and displays the map layers, and provides map navigation tools;
- Dynamic data feeds are also provided via REST web services (such as village-specific statistics and comparison statistics); and
- Ext.js – an open source JavaScript framework – provides the overall structure for the website itself, and enabled us to relatively easily integrate AJAX-style tools such as dynamic transparencies, collapsible panels, floating windows populated with dynamic data and charts, etc.

Note that with the exception of the satellite/aerial photos, the map layers for this project are all hosted by CUR. There was too much data to simply mash it up with a basemap from Google Maps or Microsoft, for example, and we wanted to use our own cartographic styles.

The map allows users to choose which data elements they want to see in relation to each other, mixing and matching data to suit their individual needs and reveal complex relationships in easily understood ways. The visualization tools allow users to quickly find information without having to search multiple sites and resources.

*(Continued on page 9)*
The interactive map was launched in December 2008. Since then thousands of individuals, local officials, community leaders, and industry representatives worldwide have used it. Access is free, and people can sign up for updates as the feature is expanded. Tutorials are available online for quick reference on how to navigate the maps and access the data.

The online maps provide:

- **Detailed property-level patterns** of residential, commercial, industrial, and other land use types within each village and across Long Island. This data – provided under license by the Nassau and Suffolk planning departments – has not been mapped online before. It provides a rich picture of each of Long Island’s neighborhoods.

- **Key population and housing characteristics** plus statistics listed dynamically as users zoom in to each community.

- **Transportation & reference features** such as satellite photos (large scale orthophotos are provided via the CSCIC web service, and small scale orthophotos are provided via ESRI’s “World Imagery” online service), bus & Long Island Rail Road (LIRR) routes, incorporated and unincorporated villages, special districts (such as fire, police, and sewer), and legislative districts.

- Bar charts comparing [Census statistics from 1990 through 2006](#).

- **Regional views** showing villages that meet certain characteristics, such as all the villages across Long Island with more than 10% population growth from 1990 to 2000.

- **New mapping tools such as a “dynamic transparency slider”** to reveal land use patterns or aerial photos underneath Census maps and Microsoft’s “bird’s eye view” photos integrated directly into the maps (accessible with the click of a mouse).

New information from the *Long Island Index 2009* is being added to maps. In addition to updates on the downtown data collected in the 2008 report, this data includes:

- **Education statistics**, including district size and statistics on affluence, finances and obstacles.

- **Brownfield information**, showing the locations of 278 brownfield sites plus information for each on clean-up expenditures.

- **Child Care program locations**, plus child care capacity by school district.

The mapping feature already has been described as “an incredible resource” and a “data gold mine” by users who have ranged from high school students to industry experts to local newspapers to government officials across both counties as well as in New York City, San Francisco, Washington State, Oregon, Maryland, and Michigan. The maps have also attracted international attention. They have been accessed by mapping consultants and government representatives from Australia, France, Germany and Japan, as well as the “geographic information officer” for the United Nations.

Submitted by Steven Romalewski, CUNY Mapping Service at the Center for Urban Research The Graduate Center / CUNY, sromalewski@gc.cuny.edu.
Four teachers and the Superintendent from Hannibal Central Schools attended this year’s New York State GeoSpatial Summit in Schenectady, New York on May 20, 2009. Carol Burch, Physics Teacher; Robert Jones, Technology Teacher; Greg Bailey, Technology Teacher; Tom O’Neil, Earth Science Teacher and Mike DiFabio, Superintendent represented the district. The event was targeted for GIS professionals who want to look beyond the technical issues and hear what's really shaping GIS in NYS and around the country. This was a great opportunity to hear the perspectives of top geospatial leaders and to be able to network with other GIS professionals. The organizations and companies represented this year at the Geo-Spatial Summit included, Booz Allen Hamilton, Environmental Systems Research Institute (ESRI), U.S. Geological Survey (USGS), Pictometry International, Microsoft and Directions Magazine.

Spatial literacy and Geographic Information Technology is a new approach that the Hannibal School District has been developing over the past three years. One area of study is Geographic Information System (GIS), which is an example that teachers can use with students to apply spatial thinking. This method can easily be applied to any curricular area. Several teachers have been involved in training using mapping software, gps units, Google Earth, and data from around the world to use with Hannibal students.

Mike DiFabio, Superintendent says, “The Geospatial Summit was a great experience for me. It instilled in me a better understanding as to how important it is for our students to have access to and a true understanding of the power of Geospatial knowledge as they compete in the real world.”

Robert Jones, Technology Teacher said, “I have the privilege of working with organizations outside the school district. For the past three years Entergy Corporation has provided support through a grant to enable me to conduct geospatial activities in my classroom and supported me in attending the GeoSpatial Summit yearly.” Jones continued to say, “As a classroom teacher attending this conference, it has provided me insights into our complex technological world. It also makes connections from the real world that I can bring to the classroom. I use geospatial technology in the classroom as a way to model the world looking at issues, problems and data. This experience will provide students with a tool to look at broad complex issues in a simple way and make informed decisions in the future.”

Carol Burch, Physics Teacher said, “The Geospatial Summit is a unique opportunity to hear a diverse group of GIS leaders from across the nation speak about future trends and policy issues in geospatial technology, see how GIS is a powerful tool for environmental conservation, and learn about innovative applications of GIS technology to solve real problems across all fields.”

Greg Bailey, Technology Teacher said, “By attending the Geospatial Summit I received a better understanding of how cutting edge this technology is. It was interesting to learn how the federal government is currently working on Geospatial legislation. The information gathered at this conference will definitely help me improve our current GIS curriculum at Kenney Middle School.”

Career growth in the geospatial industry is advancing fast. GIS is found in public and private industries, government agencies and educational institutions. There will be many career opportunities for students that choose this field either with a two year or four year degree.

Submitted by Robert Jones, Retired Technology Teacher, Kenney Middle School, rjones08@twcny.rr.com.
In 2006, the New York State Department of Environmental Conservation (NYSDEC) and the U.S. Geological Survey (USGS) cooperatively funded a Brownfield and Groundwater GIS Program as required by the 2003 legislation that established a Brownfield Cleanup Program (NYS Assembly Bill 9120). The NYSDEC developed an implementation plan for the Brownfield and Groundwater GIS Program, and two actions identified in that plan were the development of spatial datasets of the aquifer maps published by the USGS Upstate Detailed Aquifer Mapping Program and the mapped sand and gravel aquifers and confining units of the published USGS Long Island Hydrologic Framework.

**Upstate Detailed Aquifer Mapping Program**

In 1980 the U.S. Geological Survey began the Detailed Aquifer Mapping Program in upstate New York, in cooperation with the New York State Department of Health. The objective of this program was to define the hydrogeology of 21 extensively used (primary) stratified-drift aquifers in upstate New York, and to present the information as individual sets of maps at 1:24,000-scale. Each published report from this program describes the hydrogeology of a specific aquifer or segment of aquifer, and depicts selected hydrogeologic characteristics.

As a continuation of this program, a second project was begun in 1983 by the USGS in cooperation with the NYSDEC to define the hydrogeology of the remaining 6 primary aquifers. From 1983 to 1990, reports covering 5 of these primary aquifers were published by the USGS. In 1987, a companion project was begun in cooperation with the NYSDEC to define the hydrogeology of eight additional extensively used (principal) aquifers in New York.

As of 2008, the USGS mapped over 30 sand and gravel aquifers in upstate New York at the 1:24,000-scale. The surficial geology and aquifer maps from 34 aquifer mapping reports were converted into spatial datasets. The following enhancements were made in the creation of the georeferenced map layers:

1) The surficial-geology mapping units were standardized to New York State Geological Survey nomenclature,

2) The aquifer boundaries were redrawn to include adjacent areas of permeable material hydraulically connected to the primary or principal aquifer, and

3) Adjacent maps were edgematched, preserving the original geologic interpretations from over 25 authors. An effort was made to standardize codes of adjacent and overlapping map units. However, in some cases inconsistencies in standard codes exist across edge-matched areas in order to preserve the author's original geologic interpretation.

To further increase applicability, the map layers contain original mapping units and aquifer boundaries as well as the new standardized mapping units and updated aquifer boundaries. The original published aquifer maps contain (Continued on page 12)
additional base and geologic information not included in these map layers. The published aquifer maps are available for download in their entirety from the USGS Publications Warehouse (http://infotrek.cr.usgs.gov/pubs/)

Long Island Hydrologic Framework

Since the 1980s, the USGS has mapped sand and gravel aquifers and confining units for Long Island, New York at a scale of 1:250,000. To further increase applicability of the maps, consistent mapping units were developed, delineated, and presented in relation to the aquifer framework and hydrology. The result was consistent spatial datasets of surficial geology and aquifer boundaries from published maps of selected unconsolidated aquifers in Long Island New York.

These shapefiles depict the upper surface altitude of seven of the eight hydrogeologic units, which, in ascending order are: consolidated bedrock, Lloyd aquifer, Raritan confining unit, Magothy aquifer, Monmouth greensand, Jameco aquifer, and Gardiners Clay. The upper glacial aquifer—the uppermost unit—is at land surface over most of Long Island and is therefore not included.

Download and Supporting Documentation

These datasets, metadata, and supporting documentation are available at the NYS GIS Clearinghouse as well as the USGS and NYSDEC websites.

NYS GIS Clearinghouse: (http://www.nysgis.state.ny.us/)

USGS NY Water Science Center: (http://ny.water.usgs.gov/infodata/gisdata.html)


Submitted by Douglas A. Freehafer, USGS New York Water Science Center, dfreehaf@usgs.gov.

New York State GIS Data Sharing Cooperative Still Growing

Membership in the NYS Data Sharing Cooperative has shown a steady increase with more and more governmental entities, not-for-profits, and academic institutions signing the Data Sharing Agreement, allowing each other to share their GIS data sets. The number of Cooperative Members is at the time of this publication an all-time high of 812. A breakdown of Cooperative members by sector is illustrated in the neighboring chart. To learn more about benefits of participating in the NYS GIS Data Sharing Cooperative, visit the NYS GIS Clearinghouse or contact Sharon Oskam at the NYS Office of Cyber Security and Critical Infrastructure Coordination at (518) 474-5212 or at nysgis@escic.state.ny.us.
The Annual New York State Geographic Information System (GIS) Conference has become a major GIS professional development opportunity for hundreds of GIS users across the State. This year, the 25th Annual NYS GIS Conference is being held in Lake Placid, NY at the Crowne Plaza Hotel. The conference is a great place to discover how New York businesses, government organizations, academic institutions, and not-for-profit entities are using GIS to accomplish important objectives. The conference will commence with a Sunday evening reception, allowing you to get to know other conference goers and begin your networking. The next two days will feature technical presentations by working professionals willing to share their GIS experiences and solutions in dealing with real world problems and detailed presentations by the state’s academics, which will provide a deeper understanding of the technology. Monday evening will find you at a poster contest with a reception and then a banquet with a unique and unexpected speaker. In the exhibit area, GIS vendors and consultants will display the latest in GIS hardware, software, analytical techniques, and services. End your conference experience with the Tuesday luncheon and a fun raffle for prizes. You have to be there to win!

Important dates to remember:
- **Wednesday, September 9** - Maps and poster abstracts are due
- **Friday, September 25** - Discounted hotel room rate period ends
- **Wednesday, September 30** - Early conference registration with reduced fees ends

The NYS GIS conference has a long standing tradition of providing attendees with an opportunity to meet fellow New Yorkers active in the GIS field, exchange information and real experiences, and seek solutions to your geographic data management needs.

As one 2008 NYS GIS attendee stated, “I always appreciate the ability to network and see colleagues from across the state. The conference always has a good draw and interacting with all the talented individuals really brings good value for me.”

More information about the NYS GIS Conference can be found online at [http://www.esf.edu/nysgisconf/](http://www.esf.edu/nysgisconf/)

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**Who's Who in GIS**

The “Who's Who in GIS directory” is a listing of GIS professionals and their contact information. It is the intent of the "Who's Who in GIS" directory to promote coordination and professional development for GIS activities in New York State. If you would like to be added to this directory, or if you are currently listed in this directory and wish to update your contact information, please visit the following URL:

[http://www.nysgis.state.ny.us/outreach/whoswho/](http://www.nysgis.state.ny.us/outreach/whoswho/)
The cities of Albany, Cohoes, Rensselaer, Troy and Watervliet, along with the Village of Green Island are 6 of 772 communities identified by the U.S. Environmental Protection Agency (EPA) as needing to address Combined Sewer Overflows (CSOs). CSOs are a result of Combined Sewer Systems, which are remnants of the country's early infrastructure. Combined Sewer Systems (CSS) were designed to collect rainwater runoff, domestic sewage, and industrial wastewater in the same pipe system. A CSO occurs during certain wet weather events, when untreated wastewater is discharged directly into surface bodies of water before it reaches the treatment plant.

The Albany Pool of the Hudson River currently has 92 CSO points, which need to be addressed to meet federal policy adopted in 1994. The six Albany Pool Communities, in coordination with the Capital District Regional Planning Commission (CDRPC), have hired local engineers and begun working with community groups and citizens to look at ways to meet federal CSO regulations. A comprehensive inter-municipal Phase I Long-Term Control Plan for CSOs discharging into the Hudson River Estuary is currently being developed with an anticipated completion date of 2009.

With six communities and three engineering firms operating from multiple offices throughout the country, this project gave new meaning to the term “collaboration”! The Join Venture Team was tasked early on with developing and maintaining a system for managing the immense amount of data, which was gathered from numerous disparate sources. This data included:

- Sewer System Shapefiles
- Raster Maps
- CAD Drawings
- Scanned As-Built drawings
- Field Notes
- Survey Data & GPS Points
- CSO Structure Photos

The various technology solutions which were uniquely integrated to tackle this project are outlined below.

The team implemented a powerful Collaboration Website Application, CHA Files, to serve as a structured central repository for project information, files and deliverables, allowing project team members to connect, collaborate and communicate digitally. Leveraging the Internet as a Project Management tool allows each team member to have authenticated access to project related information without the need for granting access to secure corporate networks. Key features of CHA Files include:

- Secure, Centralized Data Storage with Scalable Access
- Automated Email Notification of File Uploads & Revisions
- Flexible Full Search Functionality
- Version Control through a Check-in/Check-out feature or by creating sequential versions to reflect update

As the project progressed and more people realized the need to access spatial data, a web based mapping front end was developed to complement the Project Collaboration Website. The Albany Pool CSS Mapping Application functions as a “mashup” combining both geographic and non-geographic data from various sources in a single, user friendly mapping environment.

(Continued on page 15)
Google Maps was chosen as an appropriate platform based on the following key criteria:

- **Usability**
  - User friendly, familiar interface; virtually no training required for end users
- **Accessibility**
  - No server side software or licensing fees required (API free for commercial use)
  - Basemap data (roads, aerial imagery, terrain) hosted by Google
- **Advanced Features**
  - Advanced Data Filtering
  - Driving Directions and Local Search
  - 3D visualization with plugin
  - Coordinate Readout and Search
  - Google Street View and select Pictometry Imagery

**Putting It All Together**

Combined Sewer Overflow Structures were located by CHA's survey crew and field checked by environmental engineers. Measurements and conditions were recorded and logged on data sheets, which were entered into a database. Field sketches and as built drawings were checked and updated as required and photographs of the structures were taken. Everything was uploaded to the CHA Files site and linked to the appropriate feature on the map. Users now had two options for accessing critical project related data; they could navigate the folder tree structure in CHA Files or click a point on the map. This was especially helpful for modelers who were tasked with modeling the various parts of the system. A second phase in the project included CSS and water sampling and flow monitoring during typical dry and wet weather events. Sampling teams were established and their routes were mapped out using the application. Google Street View and Pictometry oblique aerial imagery were combined and dynamically linked via a single embedded control within the application. The sampling teams utilized this functionality for mission planning and logistics. They located boat launching sites.

**Conclusion**

The integration of open mapping APIs and other web services with local data to develop mashups or hybrid web applications is becoming much more prevalent in our industry. These “lightweight” mapping applications allow developers to quickly integrate data from various sources, in different formats without the overhead of a full-scale Internet Map Server (IMS). The Albany Pool CSS Mapping Application is hosted on a generic web server and was developed entirely with open source software. GIS data was converted into xml format, which is hosted locally, while Google's servers do the heavy lifting serving up tiled basemaps and handling geocoding requests. Complex datasets are handled efficiently on the client side by limiting feature rendering to the users current viewport. This combination of flexibility and portability was critical for this project as application ownership may be transferred following the completion of the study.

Submitted by Bryan R. McBride, CHA, Inc., bmcbride@chacompanies.com.
By Tracy Montoni and Linda Rockwood

The Mohawk Valley Heritage Corridor Commission (MVHCC) is a public benefit corporation created by the New York State Legislature in 1997. MVHCC’s mission is to preserve, promote, and celebrate our natural, cultural, and historic assets in order to enhance the quality of life and stimulate economic vitality throughout the corridor.

MVHCC recently won an Explore NY grant for an interactive tourism mapping website project. Visitors to this new site are welcomed to “begin [their] adventure by exploring our interactive map using the navigational tools, various searches, and sample itineraries to help [them] learn more about our region.”

Users click the regional map to begin exploring the area and planning their visit. The user is greeted with an eleven-county map image, stretching from the Syracuse to Albany airports, bounded by the Rt. 20 corridor counties to the south and the Adirondack Park to the north. Locations of attractions, accommodations, dining, recreation and shopping opportunities are displayed along with the region’s major transportation offerings.

Common map navigation and informational tools are included along the top of the map. The Trip Planner section features numerous searches that help the user find attractions and amenities or discover new adventures.

Combination searches allow the user to find restaurants within 5 miles of the Syracuse Airport, or lodging within 3 miles of the Erie Canal bike path, or attractions within 10 miles of the Stanley Theater in Utica, for instance.

Ten sample itineraries are included in this initial release of the website. The tours feature travel by Amtrak and the Erie Canal bike path and also include two tours based on a Revolutionary War theme. A PDF document describing the tour with images of area attractions are included for each itinerary. If a user clicks the check box
next to an itinerary, the stops along the way are highlighted on the map. Depending on the itinerary, the actual travel route may also be highlighted.

The search result table displays below the map and includes all name, address and contact information for each location, along with links to websites if available. A lengthy description paragraph is also included when possible, to the right of the website data column. The user can control what data layers are displayed on the map. Preset map views are also available and include: Syracuse, Albany, Saratoga Springs, Cooperstown and the Utica/Rome area. Maps may be printed from any zoom level to achieve the amount of mapping detail needed.

The site has been developed using GIS software from Manifold Systems. A database of attractions and amenities was created using several sources and continues to be a “work in progress.” The biggest challenge in developing the application was geocoding the addresses. Numerous street addresses were incomplete or incorrect and required considerable research time, both before and after geocoding. The site runs under all commonly used browsers, including Internet Explorer, Firefox, Opera, Safari and Netscape.

Visit the site at [http://www.tourmohawkvalleyny.com](http://www.tourmohawkvalleyny.com) or from the agency’s website at [http://www.mvhcc.org/](http://www.mvhcc.org/explore). Several enhancements are being planned for the site. Please send any suggestions for new functionality or any attractions or amenities that should be added to Tracy Montoni at MVHCC.

We would like to formally thank those who helped financially and those who partnered with supportive materials on this project: The Erie Canalway National Heritage Corridor; and the Office of Parks, Recreation and Historic Preservation, I Love New York, NYS Canal Corporation, Parks & Trails NY, Amtrak and the NYS Thruway Authority.

Submitted by Tracy Montoni, Mohawk Valley Heritage Corridor Commission, [Tourism@mvhcc.org](mailto:Tourism@mvhcc.org) and by Linda Rockwood, Montoni, Mohawk Valley GIS, [www.mohawkvalleygis.com](http://www.mohawkvalleygis.com).
By Kevin Hunt, GISP

During emergencies, it is critical for the NYS Department of Transportation (NYSDOT) to be able to collect and report current road status and damage assessments in a consistent and timely manner. This information enables NYSDOT supervisors and managers to deploy limited Department resources most effectively. In addition, NYSDOT has a responsibility to provide current road status information and report on the progress of our response activities.

NYSDOT’s GIS group developed and deployed a Road Status and Damage Assessment (RSDA) application to enable NYSDOT to meet the data collection requirements associated with emergency management. RSDA is a standalone application developed in cooperation with a local GIS consultant that uses ESRI’s ArcGIS components and “geodatabase.” The user interface includes the map, basic navigation tools and separate interfaces for coding road status on the street network and point-located damage assessments.

**Figure 1**
The Road Status/Damage Assessment Tool. The ‘Road Status’ and ‘Damage Assessment’ buttons each open a separate interface at the bottom of the application that allow the user to interact with the map using pull down menus. Large buttons with bold text provide easier use outdoors on a tablet or laptop computer.

A major goal for the project was to minimize the lag time between obtaining a report in the field and providing that report to decision makers in the command centers. The RSDA application is built to collect road status and damage information in an offline mode (without depending on a network connection), and is also capable of automatically transferring new and revised reports to the centralized Oracle database when a NYSDOT network connection is detected. This capability greatly improves reporting speed.

The first true test of the Road Status/Damage Assessment Tool came in December 2008 when an ice storm severely crippled the Capital District and surrounding areas. Columbia County was especially hard hit with downed trees and power lines, effectively shutting down much of the state and local highway system. The Emergency Operations Center (EOC) began sending out assessment teams with RSDA on Sunday, December 14, 2008. Comprehensive information on the status of the highway system as well as detailed damage assessments were uploaded to the central database, and the road status was continually updated during the week. Decision makers in the Main Office Incident Command Center and the local EOC could easily view this information in the ArcGIS Server based RSDA Viewer.
The browser based RSDA Viewer. The RSDA Viewer provided complete road status and damage assessment information to emergency operations staff in the NYSDOT Main Office, Regional Office and Emergency Operations Center.

The NYSDOT Emergency Operations Center used information collected by RSDA to prioritize repair and cleanup work. The map-based view of damage assessments provided crews a view of problems nearby, allowing more work to be accomplished on a single trip. The RSDA Viewer was provided (via Citrix) to Columbia County’s Emergency Operations Center and by using the same operational picture at both locations, the State and County were better able to coordinate their response activities. RSDA reports also allowed NYSDOT to communicate the condition of the highway system to emergency services, utility providers and the community. For example, the EOC helped school superintendents make decisions on school closings by providing summaries of road closures and conditions for each school district.

After the event, emergency operations staff gave RSDA high marks for assisting in their emergency response efforts. The EOC reported that new teams with no RSDA or GIS experience had a working familiarity with the application with just 5-10 minutes of instruction. Almost 100 damage assessments and road status updates for every public road in Columbia County were successfully uploaded to the enterprise database.

Much of the success of the RSDA implementation may be credited to the iterative development process. Samples of the user interface were built in the first three weeks, enabling the team to make good early decisions about workflow and usability. A few weeks later, a prototype was provided to a pilot group of individuals responsible for emergency operations for their comments and feedback and incorporation into subsequent development. Before a final version of the tool was accepted and deployed, NYSDOT’s Emergency Operations used a pre-release version of RSDA in a full scale, statewide drill. Again, the project team evaluated and incorporated comments from the user community in the final version.

Developing applications for emergency response is a special challenge. The application must be easy to deploy, easy to use, and work as designed under difficult circumstances. The ice storm response demonstrated that NYSDOT achieved its goals for the Road Status/Damage Assessment Tool.

Submitted by Kevin Hunt, GISP, NYS Department of Transportation, khunt@dot.state.ny.us.
The NYS Office of Cyber Security & Critical Infrastructure Coordination (CSCIC) continues to maintain the State’s NYS Streets and Address data sets containing over 135,000 miles of streets and more than 3.1 million address points. A March 2009 release of the NYS Streets data is currently available through the NYS GIS Clearinghouse at http://www.nysgis.state.ny.us/gisdata/inventories/member.cfm?organizationID=522.

In addition to having a version of the NYS Streets data publically available, CSCIC recently made many of the other data sets created during the original Accident Location Information System (ALIS) project available to the public including Census Boundaries, Civil Boundaries, Hydrography, and Zip Codes. These can be downloaded from the NYS GIS Clearinghouse at http://www.nysgis.state.ny.us/gisdata/inventories/member.cfm?organizationID=522.

Data Maintenance Program
CSCIC’s data maintenance partnership with Tele Atlas contractually ended in March 2008, at which time CSCIC issued a draft RFP for comments to engage a partner to perform edits.

In consideration of the State’s fiscal situation and the vendor’s comments on the draft RFP, the RFP requirements were scaled back to reduce costs. CSCIC released the official RFP in June. Four proposals from three vendors were received and evaluated over the summer with tentative contract award going to NAVTEQ. State Control Agencies approved the final contract in late January 2009.

The data model will remain the same and the NYS Streets Change Logs will continue to be provided with each delivery. Two key contractual changes to be aware of are that Street and Address Point data deliveries will only be quarterly and Address Point deliveries will now include two types of points: Arrival Location (e.g. street frontage; mailbox location) and General Location (e.g. parcel centroid).

During the procurement process, CSCIC edited the data directly, concentrating on attribute edits and populating the highway shield and numbers on all County routes, traffic circles, roundabouts, and major ramps. In addition, all shielding on State and US routes was verified. In total, CSCIC made updates to 128,301 of the 1,204,934 segments during this time period.

On March 16, 2009, editing responsibility was turned over to NAVTEQ. GIS Solutions, one of NAVTEQ’s subcontractors, will be editing the NYS Streets data set directly with edits provided by CSCIC and our state and local government partners. GIS Solutions will also incorporate new streets and attribute information that exists in NAVTEQ’s commercial NAVSTREETS product but is missing in the NYS Streets data set. We expect to release the first quarterly delivery under the new contract in July.

Map Maintenance, Notification and Tracking (MMNT) application
CSCIC has also started to roll out our web-based application that allows authorized local government partners to view the most up-to-date data and submit street, address point and municipal boundary changes affecting their municipality (county, city, town, and village).
Typical Change Request submissions may include:

- Track the progress of change requests;
- Accurately draw geometry changes using MMNT map tools and the NYSDOP orthoimagery available in the application;
- Attach official documentation, scanned maps, tabular data, etc. to further support the change request;
- Have others in the organization or at a different level of government approve a Change Request prior to its submission to CSCIC;
- Refer change requests to other authorities as a simple notification or for verification/information about the area in question.

Unique features of MMNT include the ability to:

- Adding/deleting streets
- Adding/deleting/correcting street names
- Adding alternate/alias street names
- Adding/deleting/correcting highway route numbers
- Changing street classification
- Adding/deleting/correcting address points locations and attributes
- Adding/correcting address ranges
- Relocating municipal boundaries

MMNT is free and provides an excellent tool for government offices to communicate address information between each other as well as share that information with CSCIC for incorporation into the State’s Streets and Address Point data sets. Users only need an Internet connection to access the application.

Since address assignment and maintenance is done differently in every county, CSCIC first meets with the County and/or local government to discuss and document address data flow in their County/local government. All government organizations that generate or use addresses as part of their daily activities are included in the discussions. Typical attendees include, at a minimum, the GIS office, Assessment, E911, Sheriffs Office, Highways, and Planning. CSCIC facilitates the discussion and by the end of the session all attendees agree as to who should have access to MMNT and their role.

County and local governments that would like more information about MMNT or would like to discuss potential data maintenance partnerships should contact Cheryl Benjamin at (cheryl.benjamin@cscic.state.ny.us).
By Ray Faught

- 2008 Orthoimagery is now available on the NYSGIS Clearinghouse and Interactive Mapping Gateway. It will be delivered to the USGS EROS Data Center this summer for inclusion in the WMS.
- All leaf-off orthoimagery and LIDAR collection areas were flown successfully this spring for imagery that will be available next spring.
- All of the raw imagery has been received by CSCIC.
- Survey fieldwork has been completed.
- Current funding includes partnership with New York City Department of Environmental Protection, USGS, Dutchess County and NYS Thruway Authority.
- The DEP watershed and aqueduct areas will be flown again in July-August for leaf-on coverage to be delivered to NYC DEP.

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