

# GEOGRAPHIC INFORMATION SYSTEMS

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## County Initiates Fire Hydrant and Building Address Inventory Project

*Collaborative work with Fire Districts set to improve key emergency services databases*

Westchester County GIS is currently working with several local fire departments to verify and inventory fire hydrant locations and building addresses as part of an effort to improve important countywide emergency services databases.

The project is being coordinated through the Department of Emergency Services which provides primary dispatch services for 42 fire departments and 18 EMS agencies in the county. Two project "kick-off" workshops entitled "GIS Mapping for Fire Departments" were held this spring at the county's fire training center for local fire district personnel.

Work is initiated by creating individual district-wide hardcopy maps which incorporate fire hydrant data from the county's 2004 base map project, augmented by any data/information held by the local district (hardcopy maps, fire hydrant inventories in Excel spreadsheets, or digital X,Y data

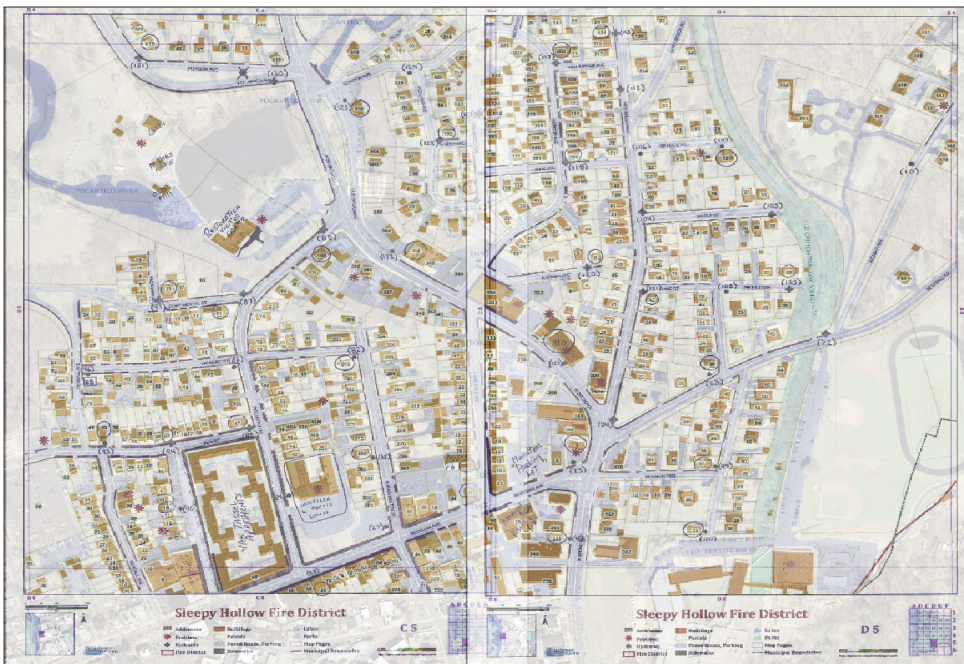
collected from various infrastructure mapping projects). Using all of these sources, GIS staff is compiling a 'map series' or map books, which each district will review and annotate in the field based on a set of predefined symbols developed by county GIS staff. Maps include building footprints, paved roads, parking lots, sidewalks, parcels, water features, parks, as well as fire district and municipal boundaries.

Local fire district personnel validated hydrant locations, building addresses and any local special addresses or common place names. In the process, individual districts can also capture or verify information such as cap color, size and number of connections, flow rate (gallons per minute), and other important characteristics of the hydrants.

Sleepy Hollow Fire District was selected as the pilot project and was provided with

hardcopy maps which were then taken into the field for feature validation. Maps were returned to county staff to review and reconcile the updates. The annotated maps were scanned and georeferenced to facilitate and expedite the update process. Once the data collection is completed, final map books are delivered to local fire departments in PDF format, along with the updated hydrant database in tabular format, to support their critical operations. Each inventory and verification project will greatly enhance the content of each district's fire hydrant inventory and at the same time be spatially consistent (in the right relative location) with other local and county GIS datasets. County GIS staff is currently working with the Armonk and Valhalla fire districts.

For more information, contact Deputy Commissioner, John E. Jackson at [jej5@westchestergov.com](mailto:jej5@westchestergov.com) or Ilir Tota [iat2@westchestergov.com](mailto:iat2@westchestergov.com).



This image displays two scanned and georeferenced maps from the Sleepy Hollow Fire District map book series. Information entered by fire district personnel was automated with ArcGIS 9.3 Desktop and Georeferencing tools.

### 2009 NACo Award

The Police District Locator application, which was developed by GIS staff, recently received a 2009 NACo Achievement Award. The Police District Locator was developed for the Department of Probation to quickly determine which local police jurisdiction should receive an "Order of Protection" as issued by the Family Court system. Such Orders of Protection are issued to support and protect victims of domestic violence. GIS staff also contributed significantly to the Formal Asset Mapping for Livable Communities program which also won a NACo award. Coordinated through the Department of Senior Services, the online mapping application (<http://giswww.westchestergov.com/gismap>) assists senior citizens to identify and locate human, social, civic, health, and other quality of life services in their community.

## ***Intro to ArcGIS 9.3 by DCJS***

GIS staff recently assisted Westchester County Department of Public Safety and New York State Division of Criminal Justice Services (DCJS) with an Intro to ArcGIS 9.3 course designed specifically for law enforcement and public safety professionals. Two separate 2-day courses were taught at the Westchester County Training Academy's computer lab in July. The course covered basic GIS mapping concepts with a specific focus on crime analysis. County GIS staff supported software installations as well as providing county GIS datasets which were used in the training. Over 20 students were trained representing nine regional agencies. For more information, contact Ilir Tota at [iat2@westchestergov.com](mailto:iat2@westchestergov.com) or John Conte, NYS Division of Criminal Justice Services (DCJS) at [John.Conte@dcjs.state.ny.us](mailto:John.Conte@dcjs.state.ny.us).

## ***CELF Workshop***

GIS staff participated in the Educating for a Sustainable Future Workshop on July 8 at Manhattanville College in Purchase. Hosted by the Children's Environmental Literacy Foundation (CELF), attendees for the week-long workshop included middle and high school teachers from across the country. GIS staff demonstrated to teachers the Westchester County Mapping web application as a resource tool for data research and analysis. GIS staff also showed examples of how to search and locate geospatial datasets from local, regional, state, and federal agencies. The use of GIS data in Google Earth was also showcased. For additional information contact Cindy Marx at [llc4@westchestergov.com](mailto:llc4@westchestergov.com) or at the CELF website at <http://www.celffoundation.org>.

## ***Upcoming GIS Events***

### ***NYS GIS Conference***

The 25th Silver Anniversary of the New York State GIS Conference will be held at the Crowne Plaza, Lake Placid, NY, October 25-27, 2009. Events include a wide range of user and vendor presentations, poster sessions (several Westchester County GIS posters will be displayed) and pre-conference workshops and training classes. For more information and registration visit the conference website at [www.esf.edu/nys-gisconf](http://www.esf.edu/nys-gisconf).

### ***NEARC***

The 24th Annual Northeast Arc Users Group conference will be held at the Radisson Hotel, in Nashua, New Hampshire October 4-7, 2009. Scheduled sessions will include topics such as facilities and infrastructure management, natural resources, web mapping, public safety and health, and mobile GIS. The ESRI "Doctor's Office" will also be featured. For more information visit [www.northeastarc.org](http://www.northeastarc.org).

## ***Stormwater Infrastructure Inventory Underway***

### ***Mapping Outfalls and Storm Drains with GPS***

As part of the county's ongoing efforts to implement municipal separate storm sewer systems (MS4) management practices, GIS staff is working to inventory and map stormwater infrastructure features on county-owned facilities, parks/golf courses, and roadways. The inventory will capture drainage features such as outfalls, culverts, catch basins and open drains. In addition to recording the location and structural characteristics of the features (shape, size, material, condition, etc.), observations are entered of volume and clarity of any running or standing water.

The mapping effort was initiated early in the summer, as interns from the Departments of Public Works (DPW) and Parks, Recreation and Conservation and GIS were provided with an in-field overview of the different categories of stormwater infrastructure features by Public Works engineer Anthony Ventarola. The primary purpose of the joint field work was to standardize identification and classification of stormwater conveyances. Interns were also trained on mapping-grade Trimble® ProXR GPS equipment. These first-generation GPS devices remain an excellent data collection resource, with powerful receivers and high-quality signal resolution. The field mapping teams also photographed each feature with a Ricoh 500SE GPS camera, adding valuable visual documentation to each feature record. The

camera offers several output data formats including JPG, KML, and a point shapefile with X,Y, Z coordinates, a timestamp, and the compass bearing of the image (i.e., looking NE).

GIS interns concentrated first on mapping stormwater features in the 17 parks and golf courses inside the Croton Watershed, while DPW interns mapped features along County roadways. Preparatory research for each facility was performed by reviewing available DPW plan drawings, facility maps, and GIS photogrammetric base maps. To date, interns have inventoried 16 facilities, including the county's largest parks, and over 75 miles of roadway in the county. In addition to supporting the county's efforts to reduce pollutant inflow into county waterways, the updated maps will be used by the county in conjunction with its programs to improve stormwater quality, including flagging outfalls that need to be sampled for stormwater pollution, evaluating stormwater infrastructure for maintenance and repair, and identifying opportunities for drainage system improvement projects.

For more information on the Federal MS4 Stormwater Program Overview and Requirements or the County's MS4 program, contact David Kvinge, Department of Planning at [dsk2@westchestergov.com](mailto:dsk2@westchestergov.com). For questions about the mapping project, contact Deborah Parker [dape@westchestergov.co](mailto:dape@westchestergov.co).



*Public Works engineer Anthony Ventarola (right), helped train GIS and DPW interns to classify stormwater conveyance features. This summer, the two intern teams worked in parks, golf courses and along County roads, to inventory and photograph hundreds of storm drains, culverts, and outfalls.*

# Summer Mapping Efforts in County Parks

*Interns inventory ecological communities and recreational features*

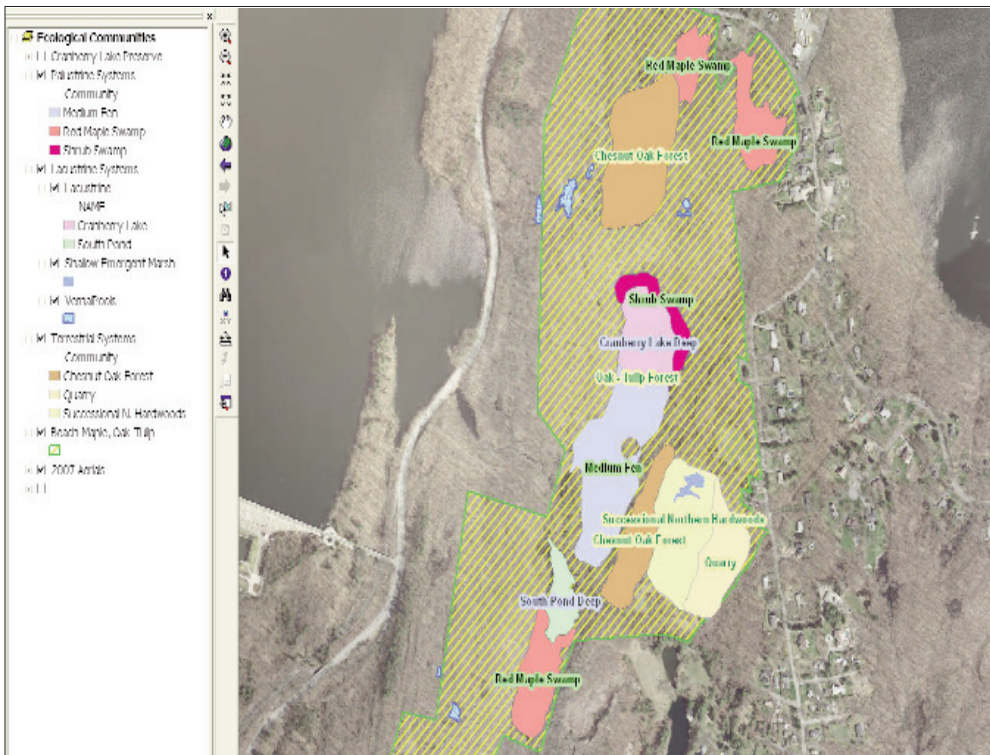
This summer, the Westchester County Department of Parks, Recreation, and Conservation (PRC) spent eight weeks researching, organizing, and creating spatial data throughout the county park system. Eli Walkley, a Lewisboro resident and a senior this fall at the SUNY School of Environmental Studies and Forestry (ESF) at Syracuse University, coordinated field data collection with Global Positioning System (GPS) units. The summer data collection work contributed significantly to the department's goal of developing spatial information which promotes an awareness and understanding of the county's natural ecological communities. Under the guidance of the PRC naturalists and with support from county GIS staff, Eli used a variety of data sources to prepare for in-field data collection. These sources included county photogrammetric GIS base map data, legacy GIS data and ESRI ArcGIS software, historic maps hand-drawn by previous park curators, Trimble Global Positioning System (GPS) equipment and software, and extensive field work to locate and define these communities.

Visualizing existing data from the county's GIS database (wetlands and soils data, topology, bedrock and surficial geology) in new ways along with the new community boundaries in a map can reveal relationships between inorganic resources and species habitat: the oak tulip's preference for wetter

soil, and the chestnut oak's for a high rocky ridge, for example. Or assist in evaluating the relationships between recreation use and conservation efforts. One effort included the mapping of successional northern hardwoods, red maple swamps, medium fen, shallow emergent swamps, chestnut oak forests, beach maple and oak tulip, were mapped at Cranberry Lake Preserve.

Additionally, the intern created new recreational maps for the public, including a map of trails and campsites in Croton Point Park - unique in Westchester - with a recreational vehicle (RV) park and tent camping sites, as well as a rich historical legacy. The map shows information about the historical sites, trails, roads, and park services. New maps were also produced of trails around Cranberry Lake, and the high ropes course at Mountain Lakes.

This summer's work is another step forward in the department's ongoing effort to locate, identify and conserve individual plants and animals, native and transient species, and the unique and complex combinations of species which comprise an ecological community. Once identified, PRC naturalists can monitor and protect the health of these communities (or combat dangerous invasive species), track changes over time, and help visitors learn about, enjoy, and value this valuable county resources. For more information, contact Beth Herr at [bbh8@westchestergov.com](mailto:bbh8@westchestergov.com).



*New habitat boundaries in Cranberry Lake Preserve were developed from GIS data and field research by Parks, Recreation and Conservation (PRC)'s Jack Robbins Biodiversity intern. Now these ecological communities, species and individuals can be monitored and protected.*

## 2009 Ortho & LiDAR Data

A recent NYC Dept. of Environmental Protection (NYCDEP) photogrammetric project will provide the basis for new countywide one-foot resolution digital orthophotography. Though the project "geographic" footprint originally only included NYCDEP water supply and aqueduct lands throughout the county, GIS staff were able to supplement the project with funding from the U.S. Geological Survey, (Reston, VA) to include both orthophotography and LiDAR data capture for all remaining areas of the county (486 square miles). County staff are also reviewing options to update selected 2004 countywide planimetric datasets from the 2009 NYCDEP project. Release dates for both datasets are still being determined. For more information, contact Sam Wear at [stw1@westchestergov.com](mailto:stw1@westchestergov.com).

## Search GeoData.gov

County GIS recently added the Geospatial One-Stop (GOS) Search Widget to the Data Warehouse page on the GIS website. By clicking on the "Search geodata.gov" link and entering a keyword into the "Find" box, users can search geospatial information currently in the federal Geospatial One-Stop portal. Search results are limited to areas which cover all or part of the Westchester County "geographic footprint." This tool makes geospatial information accessible from the county's website that is not necessarily published or made available by Westchester County GIS. (For example, geospatial datasets or map services from regional, state, or federal agencies which cover Westchester County and have accompanying metadata in the GOS catalog can be identified). Geodata.gov (<http://www.geodata.gov>) is a GIS portal that serves as a public gateway to share geographic data and resources. For more information, contact Cindy Marx at [llc4@westchestergov.com](mailto:llc4@westchestergov.com).

## Westchester Green Map

GIS staff continue to maintain the online Westchester County Green Map which was launched in 2008 and continues to be the definitive source of green products, services, and programs throughout the county. The Green Map program database is constantly being updated and reflects the input from schools, industry, governments, and community groups. Aligned with the international Open Green Map program ([www.opengreenmap.org](http://www.opengreenmap.org)), the county's implementation of the Green Map also supports the County Executive's Climate Change Advisory Council. County residents are encouraged to recommend adding additional sites to the countywide map, which can be accessed at <http://giswww.westchestergov.com/green-map>, by emailing Cindy Marx at [llc4@westchestergov.com](mailto:llc4@westchestergov.com).

Articles and graphics in this newsletter prepared by: Xiaobo Cui, Ana Hiraldo-Gomez, Cynthia Marx, Deborah Parker, Dongming Tang, Ilir Tota, Sam Wear, and Zhenglu Zhang.



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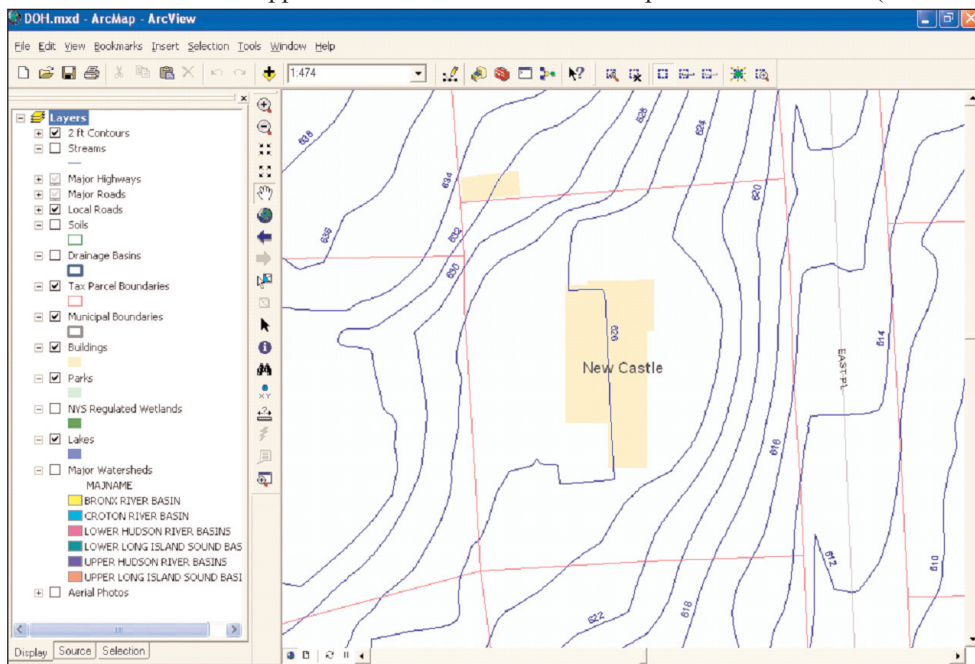
## GIS for DOH Environmental Engineers

County GIS continues to support varied Department of Health (DOH) programs through the implementation of GIS technologies. GIS staff recently developed a standalone ArcReader application for field

environmental engineers in the Mt. Kisco DOH office. The application is configured for Toughbook laptops and allows DOH staff to access and reference important environmental and planimetric datasets (contours,

soils, wetlands, building footprints, roads, tax parcel boundaries, orthophotography, etc) while conducting field investigations. The application was designed to enable DOH users to find specific properties being reviewed or inspected as part of regulatory programs. Individual properties are located by using a "composite address locator" which combines tax parcel data (as shared by local municipalities) and Navteq street centerline files which contain address ranges. The application has a friendly user interface and provides functions to measure, identify, print maps, pan/zoom, create markups as well as seamless map display capability. In addition, the application's processing speed was dramatically improved by converting 79 individual ARC/INFO 2-foot contour coverages, which originally required 33 gigabyte (GB) of disk space, to a ESRI file-based geodatabase which requires only 4.6 GB of disk space. The two-foot contour data has also been loaded to the ESRI enterprise ArcSDE/Oracle geodatabase to support central GIS applications.

The ArcReader deployment provides DOH engineers with powerful mapping and analysis tools previously unavailable. For more information, please contact Xiaobo Cui at [xxc1@westchestergov.com](mailto:xxc1@westchestergov.com).



The new DOH ArcReader application provides environmental engineers and technicians with a wide range of data to support project reviews and in-field investigations. For the first time, both contour and soils datasets are available on field laptops.