GIS
GEOGRAPHIC INFORMATION SYSTEMS

New Westchester County Legislative District Map On-Line
Interactive Mapping Application Combines ArcIMS, ArcSDE, and Oracle

Based on the Census 2000 PL-94 data which was released earlier this year, the Westchester County Board of Legislators (BOL) has recently redrawn boundaries for several of the 17 individual County legislative districts. As required by law, the 17 districts must conform to 2000 census geography either at the census tract, block group, or census block level.

While County GIS staff assisted in the first automated redistricting effort after the 1990 census utilizing command line ARC/INFO, the 2001 BOL redistricting effort was accomplished by using commercially available desktop mapping software. After the new district boundaries were adopted by the BOL on May 23, 2001, GIS staff worked quickly to develop one of the region's first on-line and interactive Census 2000 redistricting mapping applications.

In addition to basic road and legislative district boundary geography, many other scale-dependent layers of information are included in the program. As users "zoom" into specific areas, additional layers of census geography are automatically drawn on the screen which help explain (and/or justify) the location of specific legislative district boundaries. The exact location of the new County legislative district boundaries affects local governments because local election district (ED) boundaries must conform to the new County district boundaries. As a result of this recent County legislative redistricting effort, some municipalities have been required to redraw their local ED boundaries.

Using ArcIMS 3.0, the application also provides zoom, pan and identification tools which allow users to find more detailed information about the layer features. The application also provides a basic mapping template for printing and geocoding (address matching) functionality. Application data is stored in ESRI's geodatabase model which is implemented with both Oracle 8.1.6 and ArcSDE 8.1. Both a UNIX Solaris database server and a NT web server are required to support the application. The site can be accessed at *http://giswww.westchestergov.com*. For more information on the application, contact Xiaobo Cui at *xxc1@westchestergov.com*.

In addition to providing detailed information on census geography and County legislative district boundaries, the County's on-line mapping application provides the ability for users to type in an address to determine what County legislative district they reside. As illustrated above, 2 Oriole Rd. in Yonkers is located in Legislative District 16.

Westchester GIS User Group

Westchester County GIS will be hosting the next Westchester County GIS User Group meeting scheduled for Wednesday, Oct. 3 from 10AM-1PM at 85 Court Street (basement) in downtown White Plains. Focus of the meeting will be a display and demonstration of the County's current base mapping project. Examples of both the digital orthophotography and planimetric data being developed as part of the countywide project will be highlighted by Applied Geographics, Inc. (AGI), which is serving as a consultant to the County in the base mapping project. County staff will also provide a brief ArcPad demonstration, and ESRI staff will be on hand to answer ArcView 3.2 to ArcView 8.1 migration questions. Lunch is scheduled to be served, so please RSVP to Ana Hiraldo at (914) 995-4416 or email *aeh2@westchestergov.com* by Oct. 1. Local governments are encouraged to bring maps and posters to display individual projects and other GIS initiatives. Watch our web site for an updated program agenda, directions, and related meeting information at *http://giswww.westchestergov.com*.

GIS & Windsurfing

No, not web surfing, *windsurfing*. What's the connection? The Hudson River Windsurfers recently contacted Westchester County GIS regarding the availability of maps which could be used on their web site to identify public access sites along the Hudson River for members of their organization. While no specific maps will be made, data and images from the current countywide digital orthophotography and basemapping project, when combined with other existing GIS data layers on the County's web site, can provide accurate information on access points along the Hudson River shoreline in Westchester County. Good to see community groups such as the Hudson River Windsurfers using our data! Check out their web site at *http://www.geocities.com/windsurfconsult*.

New GIS Databases

Several GIS layers have recently been either created or updated. These GIS databases include:

New
- Unconsolidated Aquifers
- Information Technology Companies
- Hurricane Inundation Zones
- Public and Private Beaches
- Marinas, Boat Yards and Launches
- County Agricultural Districts
- County Farms, Stables and Nurseries

Updated
- Gaging Stations for Stream Flow
- National Wetlands Inventory (NWI)
- Lakes, Reservoirs and Ponds
- Streams and Rivers
- Hotel and Motel Locations
- U.S. Post Offices
- Movie Theaters and Performing Arts Centers
- Emergency Medical Services Districts
- Fire Districts
- County Inventory of Historic Places
- National Register of Historic Sites

Specific information pertaining to each coverage can be found in the metadata for each coverage and can be accessed at the NYS GIS Clearinghouse (*http://www.nysgis.state.ny.us/*). There is also a link to the Westchester County GIS web page at: *http://giswww.westchester-gov.com/wcgis/data.htm*.

GIS.Com

GIS.Com is a gateway to a wide range of GIS information which is particularly useful to novice and beginner GIS users. Developed and hosted by ESRI, the site provides the "basics" of GIS technology, useful training and educational materials, sample projects and user stories, overview on GIS software and data, and links to many other GIS applications. Visit the web site today at *http://www.gis.com*.

Westchester County Land Cover Map

Remotely sensed data and geographic information systems are increasingly being used together for a wide range of government applications including land use mapping, emergency management, change detection, and the monitoring of environmental and human health conditions. Working in partnership with the Center for International Earth Science Information Network (CIESIN), a research center at Columbia University's Lamont Doherty Earth Observatory, Westchester County GIS has recently developed a modified land cover classification (30-meter resolution) for the entire County.

The remote sensing data used in development of the land cover map included NASA Landsat 7 (Enhanced Thematic Mapper Plus) ETM+ images covering the New York City Metropolitan area including Westchester County. The first image was acquired on September 23, 1999, and the winter image was acquired on January 29, 2000. The spatial resolution (ground cell or pixel size) is estimated at approximately 30 meters and allows detection and mapping of features such as vegetation abundance, presence of standing water, forest clearing, agricultural usage and other basic land cover changes. In working with the September 1999 scene, CIESIN performed a supervised land cover classification using the maximum likelihood algorithm and ENVI 3.4 image processing software. Classifications were also developed by referring to ancillary vector datasets available from Westchester County GIS. For a better distinction between the deciduous and evergreen vegetation, the winter image was used to identify the regions of interests for evergreen vegetation after an image-to-image co-registration.

Upon final interpretation and processing of the data, the following generalized classes of land cover were established:

- Infrastructure (high-density residential, commercial, transportation)
- Low- and medium-density residential
- Deciduous forests
- Evergreen (and mixed) forests
- Grass
- Water
- Exposed Rock/Bare Soil

Future plans of this project and continued work with CEISIN include acquisition and classification of fall 1989 scenes to produce a similar land cover map. By applying the land use classifications derived from the 1999 imagery to 1989 imagery, general development and land use changes throughout the County can be identified. Over time, County GIS staff will be reviewing and monitoring advancements in remote sensing technology as both spatial and spectral resolutions of satellite data improve and can be applied to urban GIS applications.

Members of CIESIN will present this new map at a poster exhibit at the National States Geographic Information Council (NSGIC) annual meeting in St. Louis, Missouri, September 7-11 and with County GIS staff at the NYS GIS conference in Albany in October. The new land cover map can be viewed and downloaded from the County's web site at *http://giswww.westchestergov.com*. For more information contact Carrie Keneally at *cek1@westchestergov.com* or Francesca Pozzi at CIESIN *fpozzi@ciesin.columbia.edu*.
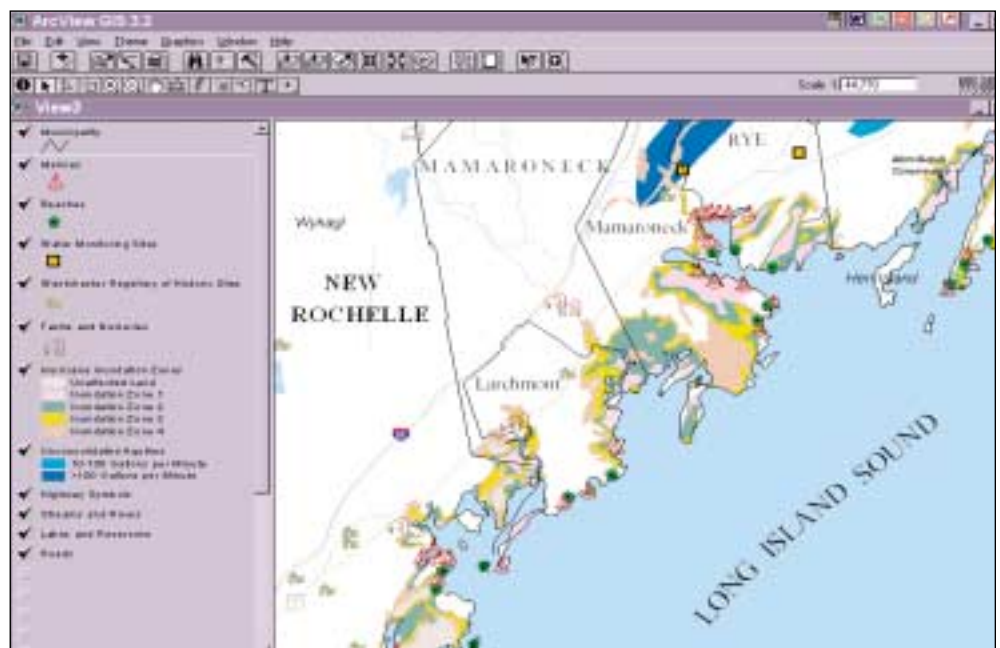
Over the past several months, several coverages have been either added or updated in the central GIS database. This view along the Long Island Sound highlights newly acquired data from federal and state sources, as well as data developed by Westchester County GIS and the Department of Planning.

Local Government News

Westchester County GIS staff continues to provide valuable assistance to local governments on a wide range of GIS projects throughout the County.

Recently, GIS staff met with representatives from the **City of Peekskill** (2001 SARA grant recipient) to begin working with the city on a needs assessment and implementation plan. In addition to reviewing a wide range of potential GIS applications throughout city government, a key component of the Peekskill study will be to review the benefits of integrating the city's GIS program with Westchester County GIS via the County-wide Telecom Project. The Telecom Project is a high-speed fiber optic network that will link to more than 500 public buildings throughout the County providing integrated voice, video and data services (*http://www.westchestergov.com/economic*). County staff will also begin this fall assisting the **Town/Village of Harrison** in a similar study which is being coordinated by the town's Department of Public Works. County staff completed a user needs assessment and implementation plan for the **Village of Hastings-on-Hudson** in June.

The **City of Mt. Vernon** continues to work with the County in its first phase of GIS implementation which is anticipated to include conversion of tax maps, hardware and software configurations, training, and building initial desktop applications. On-going work with the **City of Yonkers** continues in the Assessor's office with delivery of the town's digital tax map and planimetric data. Additional services including database and application development, as well as software training, are also being reviewed. County staff designed and delivered an ArcView desktop application to the **Village of Irvington** which included data and coverages from both the County and local sources. The application included digital tax parcel data which the village received from the **Town of Greenburgh**.

GIS staff recently met with representatives from the **Village of Scarsdale** and the towns of **North Salem** and **Cortlandt** to discuss GIS applications and recommendations on how to move forward on GIS development. The County continues to help facilitate conversion of the **Town of Somers** tax maps with New York City Department of Environmental Protection as part of the Croton Watershed project and will be providing Quality Assurance/Quality Control (QA/QC) services in this effort. Work continues with the **Town of Lewisboro** on GPS development, greenway mapping and tax map reconciliation. The **Town of New Castle** recently requested digital orthophotography and planimetric data from the County's current base mapping project to support a planning study in the downtown Chappaqua area.

For more information on local government GIS activity and municipal contacts, refer to the County's GIS Web site at *http://giswww.westchestergov.com* or contact Ana Hiraldo at *aeh2@westchestergov.com*.
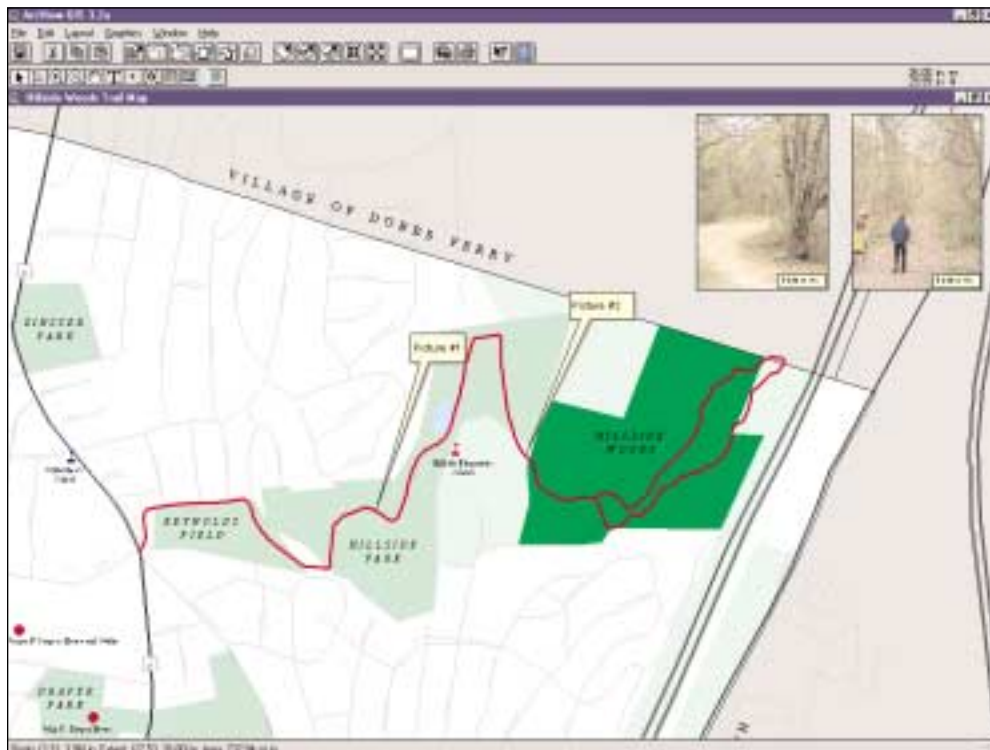
As part of the County's work with the Village of Hastings in developing a demonstration project and a strategic GIS implementation plan, County staff used GPS to map trails in Hillside Woods park. Using ArcView, the GPS data can be combined with photographs and other GIS data layers for on-line analysis and the production of hardcopy maps.

GPS Base Station

Westchester County GIS is currently working with Waypoint Technology Group (Albany, New York) on development of a GPS base station which will be located on top of a County building in downtown White Plains. Initially, the proposed Trimble GPS 5700 Reference Station will provide reference station data for postprocessed surveys. Currently, GPS users in Westchester County and surrounding areas must download base station data for post processing from other reference stations in Trenton and Sandy Hook, New Jersey. Expanding the base station to support real-time surveying and AVL (Automated Vehicle Locator) applications is under review. It is anticipated the new base station will be established by the end of this year. For more information on the base station, contact Laura McGinty at *lam7@westchestergov.com*.

Upcoming GIS Events

NEARC
The 16th NEARC Users Group Conference will be held in Worcester, MA from September 23-26, 2001. The conference will feature keynote sessions, vendor demonstrations, poster displays and over 60 technical workshops and user presentations. For more information visit *http://www.northeastarc.org*.

NYS GIS Conference
This year the 17th annual New York State GIS Conference will be held October 29-30 in Albany, NY. There will be many workshops and presentations including *Introduction to GIS/GPS,* and *Deploying GIS on the Internet/Intranet.* Westchester County staff will be presenting several posters at the conference which highlight current GIS projects in the County including the base mapping project and data from the 2000 Census. To register for the conference, visit *http://www.esf.edu/outreach/conted/conferences/nysgis2001.htm.*

Rockland County GIS

In developing and designing GIS applications which support Westchester County's mapping, surveillance and analysis of the West Nile Virus during 2001, County GIS staff have been working closely with Rockland County GIS. Over the past two years, Rockland County has designed and hosted a variety of web enabled GIS applications which include thematic mapping, interactive geocoding, and GPS/vehicle tracking. These Rockland County GIS programs have been instrumental in helping Westchester County GIS build and design similar Internet applications. Westchester County GIS acknowledges Rockland County's assistance and support in this important public health issue. Many thanks to GIS Manager Doug Schuetz, Sonia Tatlock (GPS) and other Rockland County staff!

Managing Bridge Information In GIS
## ArcView Application Developed for County Engineers

Over the past several months, GIS staff have been working closely with the Westchester County Department of Public Works to design an ArcView application which will provide information management tools for engineers responsible for managing a total of 304 bridges (vehicular and foot) throughout the County.

Customized with the Dialog Designer extension of ArcView GIS 3.2, the Bridge Management System (BMS) application provides users with easy access to Westchester County and New York State Department of Transportation (NYS DOT) data, including existing digital photographs, as-built drawings, and Bridge Inspection Reports for individual bridges. In addition to storing data such as location, name, and year built, the application is also being designed to maintain data in several County and NYSDOT database files on elements such as average daily traffic volume, number of lanes/approaches, maintenance responsibilities, structural materials, and current construction projects. Various 'rating conditions' on bank protection and approach drainage will also be included.

The accompanying figure illustrates the BMS interface. Selecting a bridge using the bridge icon allows users to view a Bridge Information Retrieval Dialog box which provides viewing options to data stored in related application files: County Data, DOT Data, View As-Builts, View Bridge Inspection Reports, and a Photo Tour. For more information on the application, contact Jennifer Baudille, Westchester County Department of Public Works at 995-3361 or at *jdh3@westchestergov.com*.
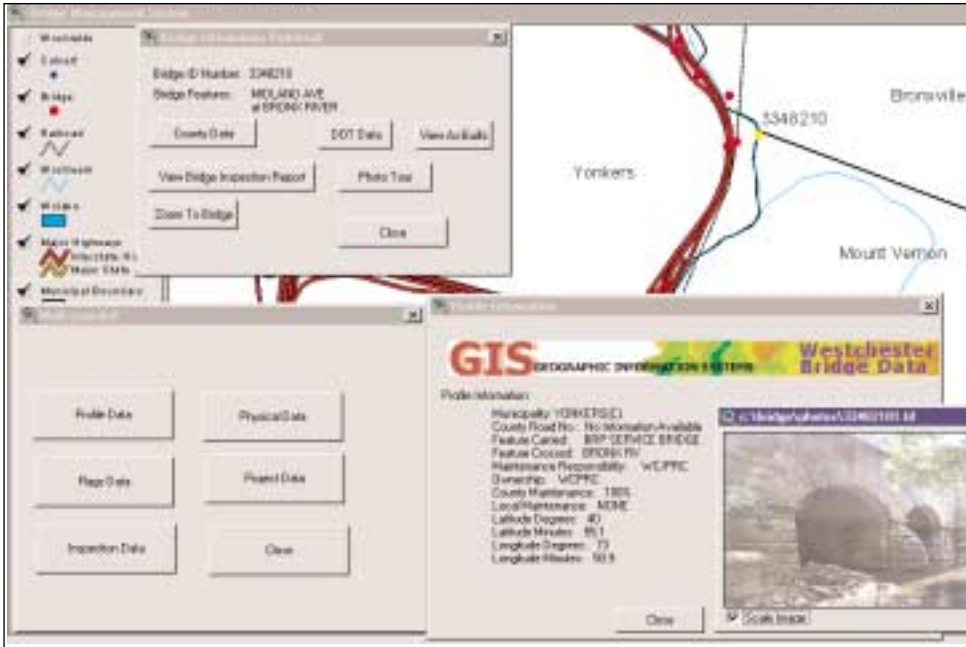
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