U.S. Geological Survey New York Water Science Center – http://ny.usgs.gov

Message from Rafael W. Rodriguez, Director, New York Water Science Center

Since our last newsletter, a new Secretary of the Interior, Dirk Kempthorne was sworn in as the 49th Secretary of the Department of the Interior, replacing outgoing Secretary Gale Norton. Also, Mark Myers has been nominated as the new Director of the U.S. Geological Survey. Although this suggests a lot of changes at the national level, we do not expect much change to programs in New York. There is one change that will affect New York; Assistant NY Director Bob Rogers has decided to retire after almost 30 years of service with the Federal Government. Bob came to the New York USGS from the Bureau of Mines in 1980. In New York, Bob worked as a project scientist and became the New York Water Quality Specialist. He transferred to New Mexico in 1992 to head their Investigations Section but came back to New York as Assistant Director in 1997. Bob has been an outstanding leader of the investigations programs in New York and his contributions to the Water Science Center will be missed. After September 15th please contact Ward Freeman or me with any issues or questions that Bob has handled for you in the past.

I am always interested in hearing from you. Please feel free to contact me about these or any other issues or program opportunities you may wish to discuss. I can be reached at (518) 285-5659 or rrodrigu@usgs.gov.

New York experiences some of the most widespread flooding since Hurricane Agnes (1972)

Figure 1. East Canada Creek at Dolgeville, NY showing restaurant lost to the flood waters (photos courtesy of Aimee O'Connor).

The photos above show a restaurant being lost to the floodwaters of the East Canada Creek at Dolgeville, a tributary to the Mohawk River during the major flooding in the Delaware, Mohawk, and Susquehanna River basins of New York on June 28-29, 2006. These three basins drain about 30% of the State, making this flood the most widespread in New York since Hurricane Agnes, in 1972. New York's streamflow-gaging network performed exceptionally well considering at least seven sites had peak flows that equaled or exceeded 500-year recurrence intervals, and at least twelve additional sites had peak flows that equaled or exceeded 100-year recurrence intervals. See our web page http://ny.usgs.gov for more information.

USGS Annual Cooperator Symposium – NYC Watershed Science & Technical Conference

The USGS New York Water Science Center will co-sponsor the 2006 New York City Watershed Science and Technology Conference in Fishkill New York on September 20-21, 2006. This will serve as our sixth annual Cooperator Symposium providing an opportunity for our scientists to present the results of the research done in cooperation with many of you. The agenda is packed with outstanding presentations from many organizations including the USGS. Please join us in September, in Fishkill NY for what we expect to be an outstanding conference. Register for this conference through the New York Water Environment web page http://www.nywea.org.

Selected Projects – For information on all our active projects, visit our project summary web page.

Forest Health and Water Quality in New York City's Water-Supply Watersheds

The USGS in cooperation with the New York State Department of Environmental Conservation is conducting a study to evaluate the effects of forest management practices on the retention of nitrogen and other nutrients. Retention could result in the reduction of nutrient loads to the streams and reservoirs. Increased nutrient concentrations can cause algal growth in reservoirs resulting in the potential need to treat the water to remove taste and odor problems.

The growth of temperate forests is typically limited by the availability of nitrogen. Elevated concentrations of nitrate in some Catskill Mountain streams, which are tributary to New York City's water-supply reservoirs west of the Hudson River, indicate that the forests of this region are at the early stages of nitrogen saturation.

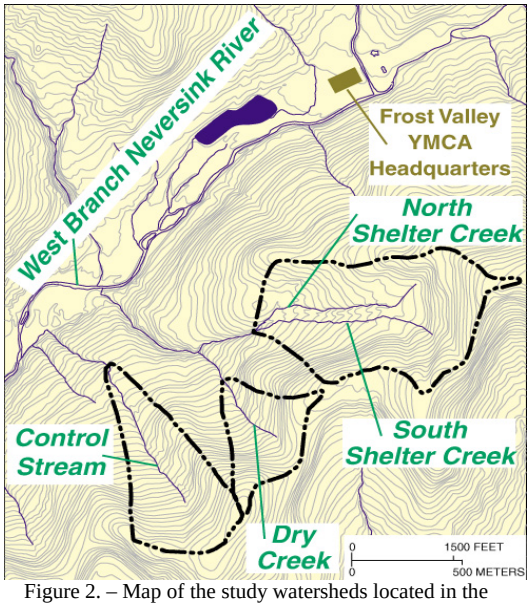

Figure 2. – Map of the study watersheds located in the upper Neversink basin of the Catskill Mountains.

Developing best-management practices (BMPs) for forested watersheds should include harvesting practices that are designed with regard to soil nutrient status. To develop such practices, the nutrient cycling processes that control water quality in forested watersheds must be understood through scientific studies. Contact: Peter Murdoch (518) 285-5663, pmurdoch@usgs.gov.

Hydrogeology of the Lloyd Aquifer – A summary of USGS Investigations

The Lloyd aquifer, the deepest of the four main aquifers on Long Island (fig. 3), has supplied as much as 1.1 billion gallons (Bgal) of public-supply water per year from Kings County, 3 Bgal from central Queens County, and 6.4 Bgal from shoreline communities in Nassau County. Studies dating as far back as 1903 have provided the data needed to describe the hydrogeologic framework of the Lloyd. Several localized studies have made significant contributions to the refinement of the regional hydrogeologic framework.

Only 3.1 percent of recharge on Long Island enters the Lloyd aquifer. Traveltime from the water table to the top of the Lloyd aquifer is several hundred years. The age of water in the Lloyd aquifer ranges from 2,000 years at the northern shore to 8,000 years at the southern shore. Contact: Anthony Chu (631) 736-0783 ext 121, achu@usgs.gov.

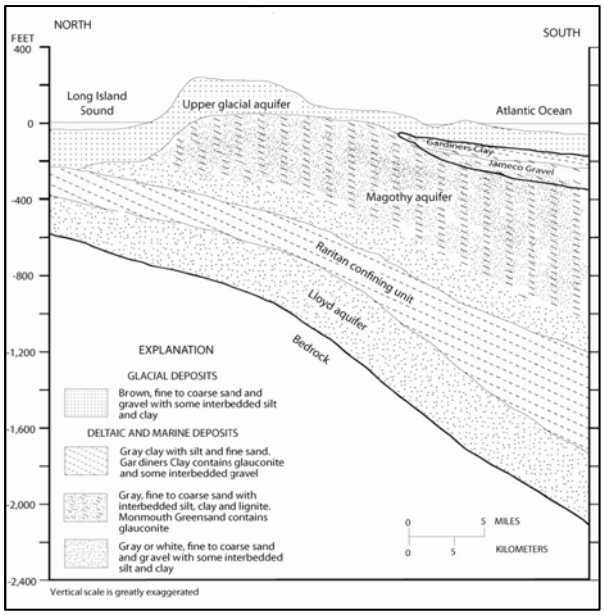

Figure 3. – Cross section showing the hydrogeologic units underlying Long Island.

20-year Program to Map Unconsolidated Glacial Aquifers in Tompkins County continues

The USGS, in cooperation with the Tompkins County Planning Department and various Towns in the county, is characterizing the hydrogeology of valley-fill aquifers in Tompkins County.

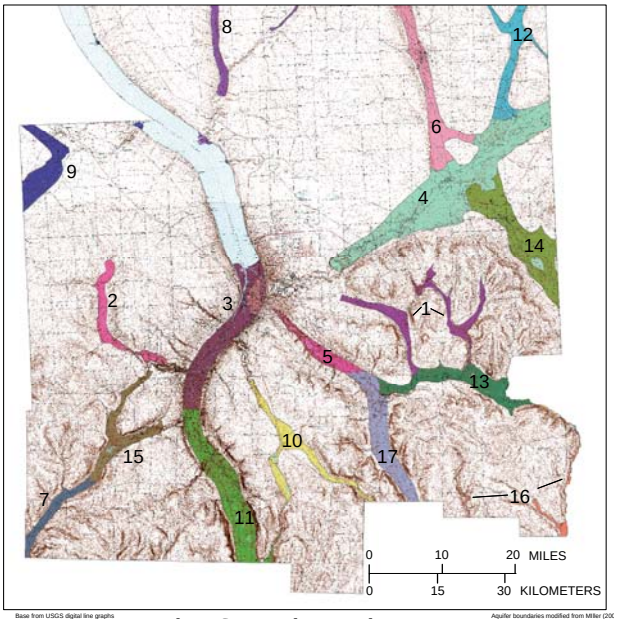

Figure 4. – Tompkins County showing the seventeen planned unconsolidated aquifer studies.

This project has been ongoing for 5 years and the goal is to map the extent and determine the hydrologic characteristics of the aquifers in valleys across the county. These aquifers are the only source of water for thousands of people, and county and town planners will use the information from these studies to help make decisions to manage and protect the water supplies in these areas. The valley-fill aquifers were segmented into seventeen reaches (fig. 4). Each reach will take 3 to 4 years to study

The well records from the NYSDEC well permitting program have been the most valuable source of ground-water data. Where information is lacking, the USGS is conducting test drilling and seismic profiles. In addition, selected wells are sampled for basic ions, nutrients, and environmental tracers. In highly-used aquifers, numerical ground-water-flow models are also constructed for use by managers. Contact: Todd S. Miller (607) 266-0217 ext 3011, tsmiller@usgs.gov.

Hydrologic Conditions

Surface Water in New York, February 2006 to July 2006

February 2006 streamflow conditions were in the normal to wet ranges but very limited snow fall amounts and associated runoff moved surface-water conditions in March into the dry to very-dry range across much of the State. Three long-term sites showed new record monthly lows for March (one of these sites has been in operation since 1902). April and May conditions remained in the dry to very-dry ranges, although some sites in eastern New York increased into the normal range by May. According to the National Weather Service, precipitation in June set new records for the month at several sites in south and east central New York which resulted in record flooding (See article on widespread flooding, above). New record-high monthly mean discharges were recorded at 11 sites in June. Summer storms in July kept most streams in the wet range – four sites set new record-high July monthly mean discharges. For more information, our web page displays real time and historic data; visit the surface-water-watch page for hydrologic conditions across the country; and the Center's monthly summary of hydrologic conditions in New York.

Figure 5. – Graph of index streamflow for NY, since June 2006, based on 70 sites with more than 30-years of record.

Ground Water in New York, February 2006 to July 2006

Water levels in February 2006 were primarily in the normal to wet range, but March saw the beginning of a decline in water levels as wells throughout the State moved into the dry and very dry range. This decline continued until June at most sites. In June water levels began to recover and most moved into the normal to wet range. This recovery continued through July (figure 6). Our web page displays real time and historic ground-water data for these and other wells, in addition to a monthly summary of hydrologic conditions. Another useful resource for data on hydrologic conditions in New York and the rest of the country is the USGS ground-water watch page.

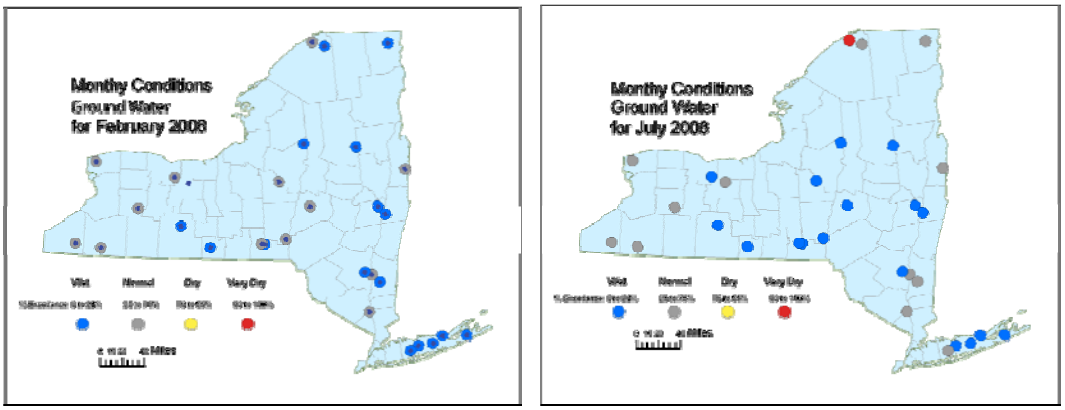

Figure 6. – Drought monitoring wells with greater than 10 years of record, showing the percent exceedance for February and July 2006. Note many additional network wells exist with less than 10 years of record. Only a small subset of the wells on Long Island is included because of long-term impacts from sewering and water supply pumping that obscures the natural climatic effects.

Changes to the USGS network – The USGS, in cooperation with the New York State Department of Environmental Conservation (NYSDEC), is adding real-time telemetry to 28 ground-water sites. It also is continuing to add additional ground-water monitoring wells to the network, in cooperation with NYSDEC. The USGS is converting most of our telephone telemetered sites to satellite – a much more dependable means of communication during natural disasters, which can knock phone lines out. A new streamflow and temperature gage has been installed on the Delaware River at Lordville, NY (01427207), in cooperation with the Delaware River Basin Commission, the U.S. Army Corps of Engineers, and the NYSDEC. If you are interested in providing funding to help support these or other sites in the network, please contact Ward Freeman, wfreeman@usgs.gov.

New Reports from the New York Water Science Center

–Listed below are some of the reports written by scientists in the USGS New York WSC that were released in recent months. A complete list of New York WSC publications can by found on our publication search page.

- Burns, D.A., McHale, M.R., Driscoll, C.T., and Roy, K.M., 2006, Response of surface water chemistry to reduced levels of acid precipitation -- Comparison of trends in two regions of New York, USA: Journal of Hydrological Processes, v. 20, no. 7 (4/30/06), p. 1611-1627.
- Chu, Anthony, 2006, Hydrogeology of the Lloyd Aquifer on Long Island, New York - a brief summary of USGS Investigations: in Geology of Long Island and Metropolitan New York, April 22, 2006, Program with Abstracts: Stony Brook, N.Y., Long Island Geologists.
- Mulvihill, C.I., Ernst, A.G., and Baldigo, B.P., 2006, Regionalized Equations for Bankfull-Discharge and Channel Characteristics of Streams in New York State: Hydrologic Region 7 in Western New York: U.S. Geological Survey Scientific Investigations Report 2006-5075, 14 p., online only.
- Heisig, P.M. and Phillips, P.J., 2005, Hydrogeology and water quality of the Pepacton Reservoir Watershed in Southeastern New York. Part 3. Responses of stream base-flow chemistry to hydrogeologic factors and nonpoint-sources of contamination: U.S. Geological Survey Scientific Investigations Report 2004-5008, 31 p.
- Hetcher-Aguila, K.K. and Miller, T.S., 2005, Geohydrology of the Valley-Fill Aquifers between the Village of Greene, Chenango County, and Chenango Valley State Park, Broome County, New York: U.S. Geological Survey Scientific Investigations Map 2005-2914, 8 plates, 1:24,000 scale, online only.
- Hetcher-Aguila, K.K. and Eckhardt, D.A.V., 2006, Ground-water quality in the upper Susquehanna River Basin, New York, 2004-05: U.S. Geological Survey Open-File Report 2006-1161, 20 p., online only.

The USGS Water Resources Discipline (WRD) has the principal responsibility within the Federal Government to provide the hydrologic information and interpretation needed by others to achieve the best use and management of the Nation's water resources. WRD actively promotes the use of its information products by decision makers to:

- Minimize loss of life and property as a result of water-related natural hazards, such as floods, droughts, and land movement.
- Effectively manage ground-water and surface-water resources for domestic, agricultural, commercial, industrial, recreational, and ecological uses.
- Protect and enhance water resources for human health, aquatic health, and environmental quality.
- Contribute to wise physical and economic development of the Nation's resources for the benefit of present and future generations.

If you have an environmental or resource-management issue in which you would like to partner with the USGS to investigate, please contact any of our senior management staff (listed below). Projects are supported primarily through the Cooperative Water Program. This is a program through which any State, County, or local agency may work with the USGS to fund and conduct a monitoring or investigation project.

- Nystrom, E.A., 2006, Ground-water quality in the Lake Champlain Basin, New York, 2004: U.S. Geological Survey Open-File Report 2006-1088, 21 p. (online only).
- Schubert, C.E., Sullivan, T.M., and Medeiros, W.H., 2006, Analysis of mid- and high-stage conditions for the Peconic River at the eastern boundary of Brookhaven National Laboratory, Suffolk County, New York: U.S. Geological Survey Scientific Investigations Report 2005-5292, 18 p., online only.
- Sherwood, D.A., 2006, Water resources of Monroe County, New York, water years 2000-02 -- Atmospheric deposition, ground water, streamflow, trends in water quality, and chemical loads in streams: U.S. Geological Survey Scientific Investigations Report 2005-5107, 55 p.
- Stackelberg, P.E., Gilliom, R.J., Wolock, D.M., and Hitt, K.J., 2006, Development and application of a regression equation for estimating the occurrence of atrazine in shallow ground water beneath agricultural areas of the United States: U.S. Geological Survey Scientific Investigations Report 2005-5287, 12 p., online only.

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