Stormwater and Flood Management

Project Leader: Delaware County Planning Department

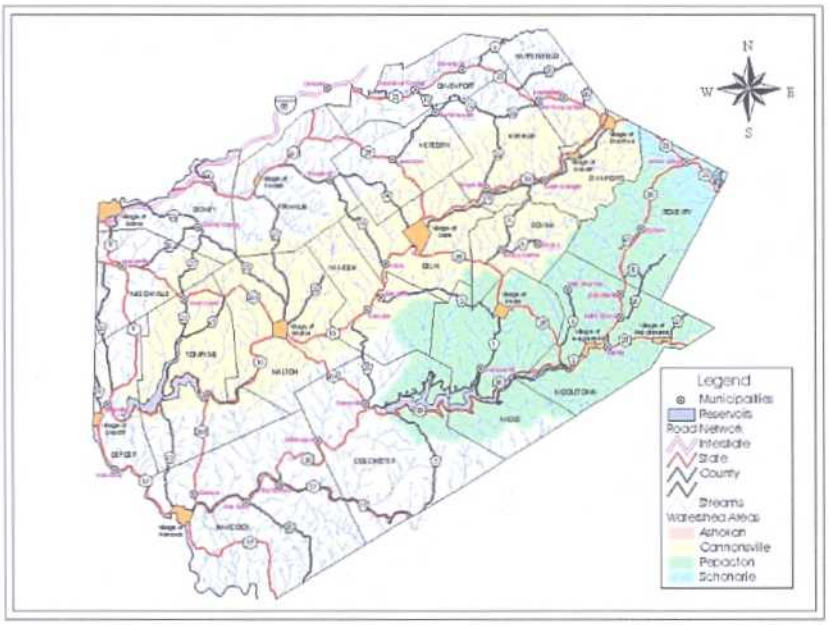
Objective

A significant source of water quality impairment is urban stormwater runoff. Stormwater discharges are generated by runoff from land and impervious areas such as paved streets, parking lots, and building rooftops during rainfall and snowmelt events. This runoff accumulates pollutants such as petroleum hydrocarbons, pesticides, nutrients, metals, and pathogens as it travels across the land in quantities that can adversely affect water quality. For example, it is estimated that stormwater runoff contributes an average of approximately 3200 kg/year or six percent of the entire phosphorus loading to the Cannonsville Reservoir.

To address stormwater runoff in Delaware County, the Planning Department has developed the following long-term management programs:

1. *Inventory, Assessment, and Evaluation of Stormwater Sources and Infrastructure*

The goal is identify all point and nonpoint sources of stormwater in the village and hamlet areas that may pose a threat to water quality and manage them to reduce their impact on water quality. To this end, the Department will locate and assess existing stormwater infrastructure; develop, implement and monitor stormwater Best Management Practices (BMPs); and evaluate problem areas and recommend solutions.



Work Completed

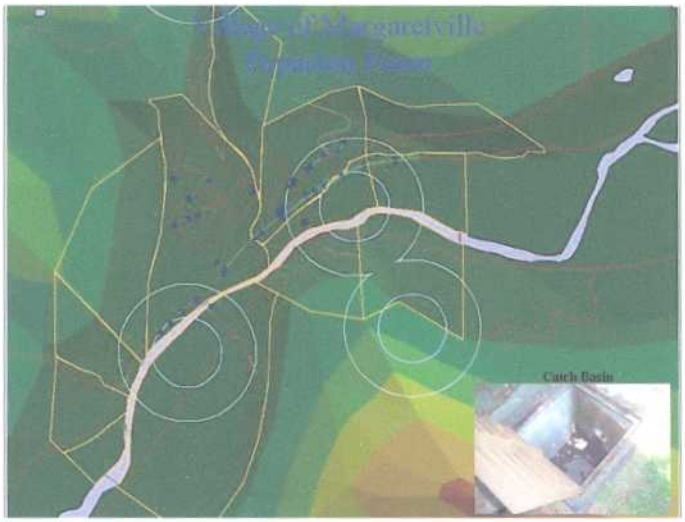
- A detailed evaluation of stormwater sources (business roofs, parking lots, and other large impervious surfaces) and conveyances systems was completed in the Villages of the Cannonsville Basin. Locations and characteristics of these areas were field collected using GPS and layered with other potential fields of interest including soils, land use, and topographic and planemetric maps. Preliminary estimates of sub-basin runoff and pollutant loadings were also calculated.
- A GIS database was created to enable characterization and cross-reference of the stormwater sources with the location of existing municipal stormwater infrastructure in the Cannonsville, Pepacton, Upper Delaware, and Upper Susquehanna watersheds.
- With the help of engineering consultants, stormwater collection, conveyance and treatment methods were implemented in the villages of Delhi, Stamford and Walton.

Next Steps

- Expand the GIS database to include the stormwater sources and existing municipal stormwater infrastructure in municipalities of the Upper Susquehanna watershed. (2003-2004)
- Assess and monitor the effectiveness of stormwater treatment units in the Village of Walton and the Vactruck. (2003-2004)
- GPS stormwater outfalls throughout the Cannonsville Basin in order to complete the GIS database for hamlet and village stormwater infrastructure. (2003-2004)
- GPS stormwater outfalls in the Pepacton, Upper Delaware, and Upper Susquehanna watersheds.

2. *Local Implementation and Municipal Plan Development*

This task entails working with each municipality, under the auspices of the Town Planning Advisory Service (TPAS), to develop local initiative regarding water quality protection through stormwater management and to demonstrate the role of water quality in relation to community economic development. Each municipal strategy will analyze and incorporate previous work to develop a prioritized plan to meet current and future needs for repair, expansion, and management of local stormwater infrastructure. Maintenance programs will also be developed to continually assess the condition of the stormwater system, to track sediment by volume and type removed, and to reduce the likelihood of flooding due to clogged collection and conveyance systems.



Stormwater Management Plans (SMPs) will be developed that are consistent with Section 18-81 of the Watershed Regulations and Phase II EPA Stormwater Regulations. These plans will incorporate stormwater considerations into local capital planning and infrastructure management. Based upon the infrastructure inventories and SMPs, each municipality will develop a specific stormwater ordinance to address its future stormwater management requirements.

Work Completed

- A comprehensive stormwater report for the Village of Margaretville used GIS and preliminary runoff modeling to leverage an additional $200,000 in funding to complete stormwater retrofits and BMPs throughout the Village.
- A comprehensive wellhead protection study for the Village of Margaretville to establish protective overlay zones for the municipality's wells and springs.
- Stormwater infrastructure in Bovina Center was assessed and failing components were replaced.
- The Planning Department and a consultant are finalizing the pilot SMP for the Village of Walton.

Next Steps

- A stormwater infrastructure maintenance schedule for the hamlet of Bovina Center is under development. (Summer 2003)
- Comprehensive wellhead protection studies for the Village of Fleischmanns and the hamlet of Roxbury. (Summer - Fall, 2003)
- Use the Walton SMP as a model for the Village of Delhi and other villages in the County.
- Begin comprehensive outreach and education for municipalities and their residents of the impacts of polluted stormwater on water quality.

Highway Management Activities

Project Leader: Delaware County Department of Public Works

Through its Department of Public Works, Delaware County, completed an assessment of highway stormwater impacts in 1999 and continues to maintain a comprehensive highway inventory and assessment program. This program has been recently expanded to fully document, using GIS methods, the location, maintenance, and management of roadway and stormwater infrastructure of the County. Under this program, all major drainage features such as culverts, swales, catch-basins, and bridges have been inventoried, mapped and assessed. Efforts to minimize negative water quality impacts include both ongoing management practices and capital construction projects.

Near Term Capital Construction Projects

These include the stormwater retrofit for County Route 6 in Bovina, and a proposal for stormwater treatment for the Page Avenue parking lot in Delhi. The County Route 6 retrofit is currently in design and scheduled for construction in 2003 and consists of replacement and new installation of stormwater catch basins and structures to manage stormwater adjacent to the Little Delaware River. The Page Avenue parking

lot project, currently in proposal stage, calls for the treatment of stormwater conveyed from the parking lot servicing the Delaware County Probation Office, Office of Veterans Affairs, Board of Elections, and DPW offices. The Page Avenue stormwater collection is to be connected with the Village of Delhi's stormwater treatment system for Bridge Street.

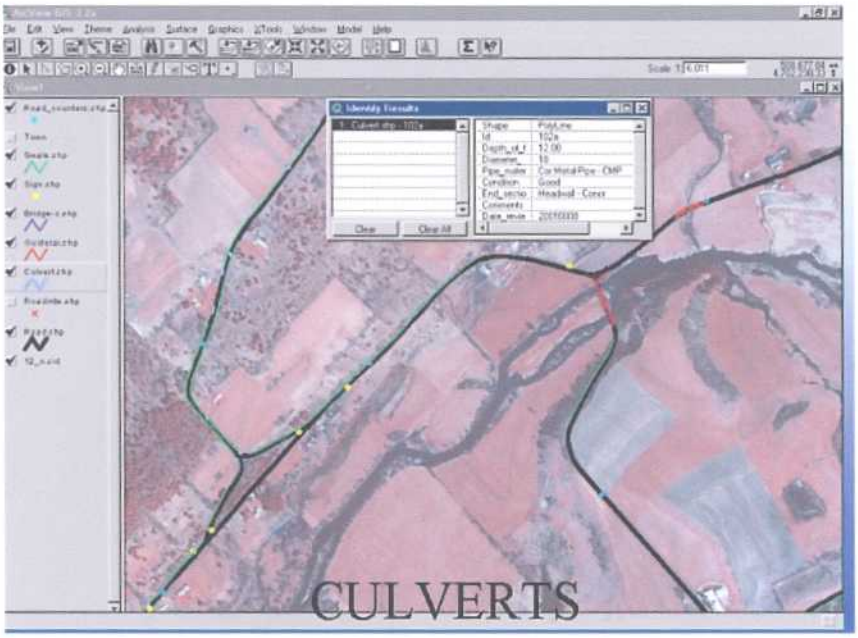
Ongoing management practices include:

- Sediment removal: With the critical financial support of the Catskill Watershed Corporation, the DPW recently purchased and put into service a vacuum truck capable of removing sediment from culverts and catch basins with a 30 foot pipe reach and 12 cubic yard sediment holding capacity. This truck is being used to remove sediment throughout the County and is eligible for use in neighboring Watershed counties on an "as-needed / as-available" basis. Approximately 700 cf of sediment has been removed during the first month of operations. This sediment removed from drainage systems is disposed of securely, thereby eliminating this contaminant source to the Cannonsville and Pepacton reservoirs. The County proposes to sample removed sediment in order to quantify the specific volume of phosphorus and other contaminants removed. Should the County acquire a second vacuum truck, the rate sediment removal and culvert and catch basin maintenance would be performed on a 5-year rotating cycle. This 5 year cleaning cycle is believed to be sufficient for long term maintenance of these drainage structures.

- Culvert stabilization: Extensive visual inspection conducted by the vacuum truck crew has identified culverts needing repair or replacement. Culvert failure is a source of water quality degrading sediment infiltration requiring stabilization to mitigate against these sediment inputs. Traditional culvert replacement requires the physical excavation, placement in kind, and backfilling of culverts; with a resulting soil surface disturbance and short term aggravated sediment during this procedure. The County proposes to slip line failed culverts wherever possible as a preferred method of culvert stabilization absent the sediment creation during traditional excavation. Where applicable, slip lining affords a fast, environmentally preferable and financially competitive method of repair.

DE-ICING

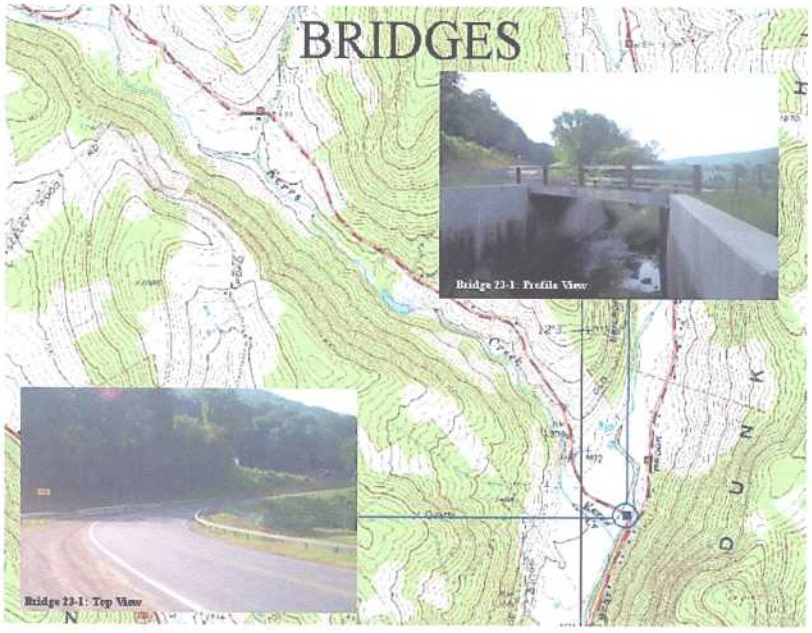
- Deicing material control: Implemented for the first time during the 2001/2002 winter, DPW has been achieving improved control and limits on the application of roadway deicing materials through the installation of DICKEY-John (tm) controllers on plow trucks. These low cost control units, used for conveyor/spinner systems on grit and salt trucks used for winter maintenance, allow the truck operator to apply granular deicing material precisely. Excess is eliminated by synchronizing the application rate with truck speed. As the truck speeds up or slows down, the conveyor/auger rate adjusts to match truck speed. When the truck stops, the material application stops. To date, three plow trucks have been retrofitted with the DICKEY-John controller. An additional 25 plow trucks remain in the DPW fleet to be retrofitted.



CULVERTS

Highway Management Plans for Towns

The County's 1999 highway assessment identified 60 percent of roads in the Cannonsville Basin as being Town roads. Therefore, to be comprehensive, highway stormwater efforts require including Town roads. DPW proposes to extend the highway management program to Towns to address inventorying and assessment of Town roads, identification of priority stormwater management practices (SMPs), capacity building through the provision of expertise and training to Town Highway Superintendents for the SMP management practices and installations, and evaluation and monitoring of these SMPs. The first phase of the Highway Management Plan program includes the initial development of inventorying and assessment procedures, coupled with internal training and experience with SMP projects, as DPW is currently doing. To extend the Highway Management Plan to the Towns as a next phase will require hiring a dedicated stormwater / highway engineer responsible for providing the leadership and expertise to meet the demands of the program. A primary function of the highway engineer will be to assist towns with prioritizing their highway capital projects. Many of the areas identified as critical areas for redesign are being repeatedly damaged by poor drainage; however many towns don't have a dedicated budget for Stormwater projects. The stormwater engineer will be responsible for accessing the funding available through the CWC Stormwater Retrofit Program and matching those funds with the annual regular capital planning in the town highway budgets. This will maximize the investment of the towns by targeting the areas most in need of redesign, repair and rebuilding, and will also maximize the CWC funds by allocating those funds to the most critical areas in regards to water quality.



Research and Demonstration Projects

Dissolved Phosphorus Removal in Stormwater

DPW, with financial assistance from the USACOE, has sponsored research with the State University of New York College of Environmental Science and Forestry to evaluate the potential use of high iron content materials for the removal of dissolved phosphorus in stormwater. Use of chipped passenger tires as an iron source, and monitoring phosphorus laden stormwater under controlled laboratory conditions, research indicates a potential dissolved phosphorus removal rate upwards of 50 percent. A promising stormwater treatment advancement, continued research will focus on an expanded analysis of sustainability and life cycle of the DP removal process, ancillary water quality impacts from use of tire chips, and field based constructability.

Oxbow Hollow Wetlands Bank

In an effort to increase wetland habitat and environs with the County, DPW has recently constructed 2 acres of palustrine wetland on County owned property adjacent to the Delaware River West Branch. The existing two acre Oxbow Hollow Wetland Bank contains many "obligate" and "facultative+" wetland species, including: pondweed, cattail, red top, water carpet, spearmint, watercress, soft rush, and jewel weed. Consultation and support is provided by the Soil & Water Conservation District and construction has been done with County staff. Up to twenty acres of new wetland creation is planned for the property and provides an important environmental enhancement and construction training ground for equipment operators and facility designers.

For more information on the Delaware County Action Plan contact:
Delaware County Department of Watershed Affairs
97 Main Street • Delhi, NY 13753
Tel: 607-746-8914