

Delaware's Water Quality Problems: Causes and Solutions

Water quality is an issue of vital importance to all of Delaware's citizens. We rely on surface and ground waters for our drinking water supply and value our surface waters for their ecological, recreational, fishing, and commercial uses. Unfortunately, recent reports from the Delaware Department of Natural Resources and Environmental Control (*DNREC*) Watershed Assessment 305(b) program (<http://www.dnrec.state.de.us/water2000/Sections/Watershed/TMDL/305and303.htm>) clearly indicate that the quality of many of our surface waters has been impaired by point and nonpoint source pollution. For example, this report indicated that 99% of Delaware rivers and streams and 87% of our ponds and lakes do not fully support their use for swimming; 64% of Delaware's rivers and streams and 21% of the ponds and lakes do not fully support fish and wildlife uses. The major causes of Delaware's surface water quality problems are pathogenic bacteria, nutrient over-enrichment, toxic compounds, and the physical degradation of stream habitats. Delaware's ground waters have also been impacted by nutrients from fertilizers, animal manures, and septic systems, by leakage of contaminants such as petroleum from underground storage tanks, and by salt water intrusion.

The Delaware Water Resources Center (*DWRC*) asked Kevin Donnelly, Director of the *DNREC* Division of Water Resources, for an update on the state's efforts to protect and improve water quality. His responses follow.

Promoting Delaware Water Quality: DNREC Goals and Achievements

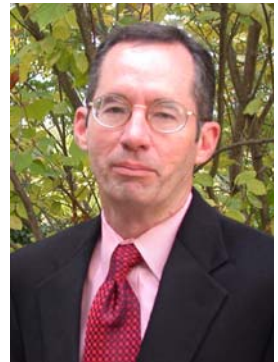
By Kevin Donnelly, Director, Delaware Department of Natural Resources and Environmental Control (DNREC) Division of Water Resources and Member, DWRC Advisory Panel.

Kevin.Donnelly@state.de.us 302 - 739 - 4860

<http://www.dnrec.state.de.us/water2000/>

Photo by Danielle Quigley

In the water quality arena, we fall victim to our own diligence. Delaware has perhaps the most sophisticated and extensive surface water quality-monitoring network in the nation. Our advanced knowledge about the chemical and biological water quality of our watersheds, coupled with genuine water quality problems, results in our rivers, lakes and streams being rated as some of the worst in the nation. Delaware's non-attainment of Clean Water Act standards is addressed by a federal court order requiring the development of "**total maximum daily load**" (**TMDL**) regulations for nearly the entire state, according to a schedule stretching into the next decade. These TMDLs will establish the maximum amount of pollutants a water body can receive daily without violating water quality standards, thereby allowing the use of these waters for swimming, fishing, and drinking water supplies.



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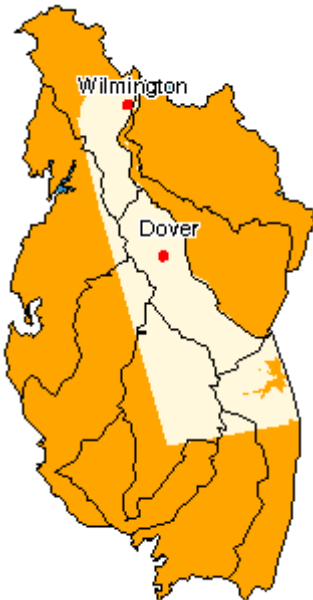
(Kevin Donnelly on **DNREC and Water Quality**, continued from page 1)

Over the past several years, *DNREC* has developed TMDLs for the Inland Bays, the Nanticoke River and Upper Christina watersheds, the Murderkill River, the Appoquinimink, and others. Funding has been provided by the state General Fund, the United States Environmental Protection Agency (*USEPA*), and *DNREC's* penalty fund for this work.

Additional programs are in place to ensure continued compliance with the court order and to achieve Delaware's water quality standards. **Pollution control strategies (PCS)** are required to address how, where and when pollutant loadings are to be curtailed to achieve TMDL levels. *DNREC* has also scheduled a number of improvements to Wilmington's **Combined Sewer Overflow (CSO) system** aimed at better control and public notification of discharges. The City's CSO system, like those found in over 950 of the nation's older Northeast, Great Lakes and Mid-Atlantic cities, permits by design the overflow discharge of raw sewage and stormwater runoff into waterways during heavy rains. A description of the system is found at <http://www.wilmingtoncso.com/>.

DNREC's scheduled activities to meet Delaware's water quality goals are:

- **Develop pollutant Total Maximum Daily Loads (TMDLs):**



- By December, 2003, for nutrient and dissolved oxygen levels in the Inland Bays Tributaries and Little Assawoman Bay, and for Polychlorinated Biphenyls (PCB) levels in the Delaware River. The latter TMDL will be developed in conjunction with the Delaware River Basin Commission (*DRBC*) and the states of Pennsylvania and New Jersey. Over a hundred possible dischargers and additionally hundreds more possible nonpoint PCB sources flowing into the 13,539 square mile Delaware Estuary watershed need to be addressed.
- By December, 2004, for nutrient, PCB, and bacteria levels in the Upper Christina watershed (Red and White Clay, Brandywine and Christina), and for bacteria, nutrient, PCB, and chloridane pesticide levels in the Shellpot Creek; and
- By December 2004 through December 2006, for bacteria levels in Delaware watersheds. *DNREC* is working with the University of Delaware and others to use DNA techniques to determine the sources of bacteria (human versus non-human) and then develop our regulatory and non-regulatory programs accordingly.

- **Complete the creation of Pollution Control Strategies (PCS):**

- By September, 2003, for the Inland Bays;
- By September, 2003, for the Appoquinimink River; and
- In 2004, for the Nanticoke-Broad Creek and Murderkill River.

- **Address Wilmington's Combined Sewer Overflows (CSO) concerns:**

On an ongoing basis, work with Wilmington and *USEPA* to increase water quality testing and public notices of discharges; work with the City to revise its draft CSO Long Term Control Plan to shorten the implementation period from 19 to 10 years.

- By July 2003, work with the City to obtain federal funding for and also monitor the start of construction on CSO 27(Lancaster Ave.); and
- By September 2003, monitor completion of construction of improved controls, featuring a series of below ground storage chambers that will capture and store overflow events and then slowly release them for treatment by the City's wastewater treatment plant. Actual construction at CSOs 28 and 29 in the Canby Park area started in the summer of 2002.

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Other DNREC Water Quality Initiatives include:

Delaware's Water Quality Standards: Updating these by February 2003 to include the latest technical information and to address issues presented by the *USEPA*. Adopting the new standards by summer 2003.

Sediments and Stormwater: Updating regulations to better address water quality concerns associated with site development and to enhance opportunities to include conservation design principles into stormwater plans. Draft regulations have been prepared and informational workshops are being held. Our goal is to promulgate the revised regulations by next summer.

Non-Point Source (NPS) Pollution: Reducing this by enhancing our coordination of the Division of Soil and Water's Conservation Cost Share Program with the *USEPA's* NPS Management 319 Program and of the National Oceanic and Atmospheric Administration's (*NOAA's*) Coastal NPS Management 6217 program with the Delaware Nutrient Management Commission's (*DNMC's*) program through Delaware's Department of Agriculture (*DDA*). This effort will direct almost 5 million dollars toward a comprehensive NPS program aimed at reducing pollutant loads, restoring streams and riparian buffers, and installing Best Management Practices such as cover crops, nutrient management plans, manure storage structures, and manure relocation efforts, within TMDL watersheds.



Stream Restoration: Rehabilitating stream corridors, stabilizing stream banks, decreasing erosion, improving biological water quality and providing buffers along the stream for riparian habitat. We have two projects scheduled for next year: one along the Perkins Run in northern New Castle County, and another on Pike Creek at Three Little Bakers; both are scheduled for completion by December, 2003.

On-site septic systems: Regulations were revised in spring 2002, and we look forward to passing legislation creating a Licensed Septic Inspector Program. This year we are using grant funds from the Division of Soil and Water to conduct a septic inspection and pump-out program in the Inland Bays watershed. Last year we used grant funds from the

General Assembly and Sussex County to inspect over 300 holding tanks in Sussex County.

Cooperative efforts: Almost everything we do requires the cooperative efforts of citizens, other state and federal agencies, universities, county and municipal governments, conservation districts, and non-governmental organizations (NGOs). PCS development and implementation is driven by Tributary Action Teams (TAT) comprised of interested citizens and representatives from agencies and NGOs. Currently four TATs are focused on the Inland Bays, Nanticoke, Appoquinimink and Murderkill watersheds. The Center for the Inland Bays, the University of Delaware's Cooperative Extension, the Nutrient Management Commission, New Castle, Kent and Sussex County governments, Sierra Club, the county conservation districts, *USDA*, other *DNREC* divisions and many others have also been vital contributors to PCS development.

The University's of Delaware's Water Resources Agency has been one of the lead groups working on the **Upper Christina TMDL**. This interstate TMDL partners Delaware and Pennsylvania agencies with federal affiliates from *USEPA*, the United States Geologic Survey (*USGS*), and the United States Department of Agriculture (*USDA*). Additional active participants include the Delaware River Basin Commission (*DRBC*), the City of Wilmington and groups such as the Delaware Nature Society.

The scientific complexity of the DNA technology in *DNREC's* bacteria source-tracking laboratory requires us to develop a matching laboratory at the University of Delaware for quality control and quality assurance purposes. New agreements with the University of Georgia and University of Washington allow us access to their extensive libraries of genetic samples. The need to update our water quality standard regulations is based upon the refinement and development of better science by *USEPA* and upon the needs of our surrounding states. The Division of Soil and Water Conservation's efforts to revise their stormwater regulations have included close contacts with New Castle County, the building and development community, and the conservation districts.

Developing and implementing new TMDLS has been the most difficult task because it will require greater regulatory controls, more innovative solutions to pollution problems and additional financial resources on the part of government, industry, and citizens in reducing pollution loadings. One thing is clear, all sectors will be required to contribute to the solutions – as they are all part of the problem.