

In this Issue, on the web at:

<http://ag.udel.edu/dwrc/news.html>

Fall Water Forum October 2nd at UD	1
Delaware Sierra Club: Perspective on Water Issues	1
2000 – 2003 DWRC Fellow Lynette Ward Studies Environmental Policies for Poultry Industry	4
DWRC Annual Meeting & Intern Poster Session	4
New 2003 – 2004 DWRC Undergraduate Interns	5
Water News You Can Use	6
DWRC History, Goals, and Advisory Panel	8
Water News and DWRC Contact Information	8

In this issue of *Water News*, the Delaware Water Resources Center (**DWRC**) presents the perspective of the Sierra Club, a state environmental advocacy group, on a variety of key water resource issues facing Delaware today. Three members share their views of their role and that of Delaware citizens in improving water resource management.

Look for news of water-wise civic activism by other groups such as the Center for Inland Bays, Longwood Graduate Program, and Delaware Nature Society, in our "Water News You Can Use" on page 6.

Thank you Dorothy Miller



Dorothy Miller, representing the Coalition for Natural Stream Valleys on the **DWRC** Advisory Panel, has stepped down to pursue her many interests in citizen advocacy for the environment. Her energy and passionate respect for natural resource conservation was greatly appreciated and will be missed.

Environmental Reports Available by Zip Code!
Watershed pollution facts, weather, and more. Visit <http://zoomer.sierraclub.org/>

Fall Statewide Water Forum Oct. 2



"Land Use Change and Water Quality: Assessing the Impacts and Planning for the Future" is the theme for a statewide forum to be held Oct. 2nd, 2003 at the Clayton Hall on the University

of Delaware campus. The event will be co-sponsored by the Delaware Water Resources Center, University of Delaware Institute for Public Administration Water Resources Agency, Delaware Geological Society, the Center for the Inland Bays, Delaware Department of Natural Resources and Environmental Control, and Institute of Soil and Environmental Quality. Watch for details at <http://ag.udel.edu/dwrc/calendar.html>.

**Spotlight on Citizen Advocacy
Delaware Sierra Club's Responses to
Water Conservation and Quality Issues**

*Contributed by Debbie Heaton, Conservation Director debbie.heaton@sierraclub.org, Matt Urban, Chapter Chair, matt@mobiusnm.com, and Carl Solberg, Litigation Chair and member, **DWRC** Advisory Panel.
Photos by Gary Heaton and Chris Giaccone
For more information contact **Delaware Sierra Club**, 100 W.10th Street, Suite 1107, Wilmington DE 19801 302-425-4911 <http://delaware.sierraclub.org/>*

Since the mid-1990's, the Delaware chapter of the Sierra Club has focused on state water issues from marine environments on up to the headwaters. We've learned that Delaware needs to start treating water as a valued resource – one that is looking more limited as time goes by. Population growth, economic prosperity, and conversions of vast tracts of farmland into neighborhoods have put more cars on the road and more roads on the map, covering more of the land with impervious cover. Census data (2000) show that 783,600 people now live here, a 75% increase from 1960 census numbers of 446,292. Another 77,400 are expected by 2025! (*continued page 2*)

(Delaware Sierra Club on **Water Conservation and Quality**, continued from page 1)

Surrounding counties in Pa. and Md. have similarly grown, and to varying degrees we are dependent on the same water resources. Sierra Club feels the state needs to re-evaluate its water position -- review the current data statewide and work to fill in the holes. Current investigations are focusing on the Potomac and Columbia aquifers in southern New Castle County, but work is also needed to update the data for Kent and Sussex County aquifers. We need to look at the results, and understand and act on the interrelationships that exist between land use, the business decisions we make, and their effect on water supplies and quality.

Proposed projects investigated and commented on by the Sierra Club have involved dredging, beach armoring and replenishment, farmer-landowner cooperative networks such as the statewide drainage-correcting tax program, the setting of Total Maximum Daily Loads (**TMDLs**) governing stream nutrient loadings, coastal zone regulations, National Pollutant Discharge Elimination System (**NPDES**) permits, and industrial pollution. While working on these issues, members have also become concerned about biodiversity and endangered species as related to water quality and quantity. We know that land use and air quality must also be addressed, since what goes on the land or goes up in the air eventually finds its way into Delaware's waterways.

Based on our research into water issues, the Sierra Club offers recommended courses of action related to water supply and quality. Water is understood to be a state responsibility, so these should fall under state purview.



*Conservation Director
Debbie Heaton*

Water supply:

1. Follow and enforce usage rules already on the books. Encourage conservation wherever possible.
2. Bring all of the state offices charged with a portion of water management together as one entity under the Department of Natural Resources and Environmental Control (**DNREC**).
3. Work with the regional water authority (the Delaware River Basin Commission, **DRBC**) to seek solutions on how to equitably share the region's surface water.
4. Separate drinking water from non-potable, ground "gray" water targeted for purposes such as outdoor watering.
5. Determine sources and levels of sustainable volumes from ground water or other means.
6. Locate all remaining Delaware water recharge areas and assemble a statewide comprehensive program to protect these areas. Ground water is slower to respond to demands, but the supply in this "water savings account" is compromised by current pumping rates and runoff. Studies have indicated that watersheds with more than 15% impervious surface coverage and resulting runoff start to see both water quantity and quality problems.
7. Identify and inventory capacity of the many permitted types of wells both on a daily and seasonal basis. Maintain this data electronically to consult when conservation actions are needed.
8. Implement conservation-based pricing by water utilities, giving credits to those who conserve.

Water quality:

1. Follow and enforce existing water quality rules to preserve public health and wildlife habitat.
2. Work to change the narrative state water quality standards to numeric standards.
3. Establish the Total Maximum Daily Load (**TMDL**) specifications for all Delaware water bodies required by a legal settlement six years ago. This work is still not complete.
4. Challenge government to ensure new businesses won't put a burden on our water resources.
5. Support further studies at local universities to better understand how our aquifers work.
6. Identify, map, and isolate aquifers degraded beyond use for drinking water. The state has already taken at least three aquifers off the useful list – one below Delaware City, another located below the Delaware Solid Waste Authority (**DSWA**) landfill along the Delaware River, and one that runs under the City of Dover.
7. Protect water recharge areas by limiting impervious surface coverage over water recharge areas with appropriate zoning changes.
8. Map and identify movement of saltwater and other non point source pollution that threatens our coastal and inland communities. Investigate what can be done to stop or slow this intrusion.
9. Identify all of the point (localized) pollution sources along waterways utilized for drinking water and find ways to stop their output or greatly improve their treatment capabilities. This includes the combined sewer overflow problem in Wilmington.

(continued. page 3)

(Delaware Sierra Club on **Water Conservation and Quality**, continued from page 2)

Sierra Club believes we need to plan the long-term health of Delaware's business and residential communities around these recommendations. The time has come for the hard decisions to be made. What is really important to us? If we can answer that question, the other details should fall into place.

Making a difference as private citizens

We encourage one another and Delaware's citizens to identify a water issue with personal meaning and pursue it. Here are examples of how Sierra Club members are working on actions described above.

▪ **Get Involved in Water Resource Issues.** Our litigation chair, Carl Solberg, is interested in non point pollution reduction. He serves on the state Nutrient Management Commission and as a private citizen in Delaware's Conservation Reserve Enhancement Program (CREP), a joint Federal USDA Farm Bill-State land retirement conservation program. The program permits enrollment of up to 6,000 acres of environmentally sensitive agricultural land to a conserving use. By enrolling his own land and installing conservation practices such as tree plantings as buffers against runoff, Solberg is improving the water quality of streams and increasing wildlife habitat.



*Chapter Chair
Matt Urban*

▪ **Pay attention to policy effects in your back yard.**

During the drought of August 2002, the Delaware River Basin Commission ordered the damming of freshwater flow down the wild and scenic White Clay Creek which could impact the habitat of threatened species such as the bald eagle and bog turtle. Club members wrote to the **DRBC** citing its failure to consult with federal

wildlife agencies as required by the Endangered Species Act before taking actions affecting listed species and critical habitat.

▪ **Be aware of public hearings, workshops, expert testimony.** When preparing for a hearing, we research the permit application and consider the materials available. Members and friends of Sierra Club's Southern Delaware Group (**SDG**), for example, are continually raising concerns about new development projects in designated "environmentally sensitive" areas such as the Inland Bays that support fish, wildlife and outdoor recreation. Participating in updating Sussex County's land use plan offers an

opportunity to re-direct growth in the county to existing towns rather than in new developments outside of towns which create sprawl. Engaging expert research and testimony on environmental and economic impacts helps allow more informed decision making when considering the dredging of the Assawoman Canal, building jetties at North Shores, and protecting Gordon's Pond at Cape Henlopen.

▪ **Be an informed voter.** A club member generated a helpful environmental voting "report card" in 2000 for candidates for state assembly and a 2002 questionnaire for the candidates for U. S. Senate. Our 2000 report "The Costs of Sprawl in Delaware" helped make sprawl an issue during the gubernatorial race that year.

▪ **Call or write your state and US governmental representatives with your concerns.** Phone calls to Gov. Minner and members of the General Assembly sharing concerns about the need for Motiva and other polluters to address hazards to public health and to install the best, most protective pollution control equipment, have made an effective impression within our governmental system. Ask that the current laws be enforced. Citizen's phone calls have lasting positive effect, as seen in Sen. Carper's, Senator Biden's, and Rep. Castle's budgeting acquisition for buffer lands adjacent to the Prime Hook Wildlife Refuge.

▪ **Explore and learn.** Recent trips with a focus on water quality and supply included a bus trip with the Society of Natural History to the Purdue Pelletizing plant in Sussex County, which provides a profitable fertilizer-generation alternative for poultry litter disposal, and hikes in wild and scenic White Clay Creek State Park, scene of last summer's drought-induced controlled flow. We also have resumed holding periodic membership informational meetings again, after discontinuing these for several years.

We are grassroots activism at its finest, a small chapter in a state with big water problems. Add your voice to those effecting positive change.

Delaware Sierra Club's 2,000 members are among approximately 786,200 Club members nationwide. In addition to operating committees, the state chapter has several conservation sub-committees that focus on water, land use, and anti-pollution. The Delaware Chapter's newsletter, published five times a year and found on the web at <http://delaware.sierraclub.org/>, reports the Club's activities investigating a broad range of recent and current topics in water resources.

Environmental Policies for a Sustainable Poultry Industry in Sussex County, Delaware

**Lynette Ward, DWRC 2000-2003 Fellow
Advisors at the University of Delaware:
Dr. William F. Ritter, Bioresources Engineering
Dr. John Byrne and Dr. Young-Doo Wang,
Center for Energy and Environmental Policy**

Photo by Danielle Quigley

Delaware's poultry industry plays a vital role in the state's agricultural economy. However, in recent years, concerns have increased about the potential impacts of land application of poultry manures generated by this industry on ground and surface water quality in southern Delaware. Economically viable alternatives to application of poultry manures to agricultural cropland are now being sought. **DWRC** graduate fellow Lynette Ward's research has focused on the development of "Environmental Policies for a Sustainable Poultry Industry in Sussex County, Delaware." Ward has evaluated several recent ideas for ways to improve the efficiency of manure management, in terms of their economic feasibility and practical effectiveness, such as the use of low phytate (high available P) corn and phytase enzymes in poultry rations, bioenergy production using manure as a renewable fuel source, composting or pelletizing manures for transport to other areas for use as a fertilizer for agronomic, vegetable, and horticultural crops, and use as a cattle feed supplement.



*Lynette Ward modeling
Sussex County industries*

Ward conducted her economic analysis using IMPLAN, a PC-based software system designed to create regional models. IMPLAN assisted in Ward's economic analysis of the alternative uses for poultry litter, and in her ability to measure the economic and social impacts of any changes needed to ensure a sustainable poultry industry in Sussex County in terms of factors such as revenue, tax issues, environmental regulatory compliance costs, impact on tourism revenues, and jobs created.

"In the first phase of my research, my advisors Dr. William Ritter, Dr. John Byrne and Dr. Young-Doo Wang suggested approaches for analyzing the technical feasibility of the alternative strategies. I searched the literature and internet, finding the work

of industry experts there or at technical conferences. For example, power companies and engineering firms which had already implemented existing biogas facilities provided useful data on which to base a model for Sussex County," Ward explains. "In the second phase, I added new findings about each option to the base information in IMPLAN. Now it was possible to extrapolate figures from existing use of these strategies to match Sussex County's manure production characteristics over a given time period and predict production costs and revenues. Some of the more promising options included composting, pelletizing, and improving nutrient use efficiency by modifying animal diets to reduce phosphorus excretion."

Ward, who on May 6th successfully defended her PhD thesis based on this research, says of her **DWRC** fellowship experience, "Working directly with Dr. Ritter, who has been a knowledgeable and personable mentor, was the educational highlight of my four-year PhD experience. I am deeply indebted to the **DWRC** for funding my research through this fellowship." Ward has received a contract to work in Pennsylvania for the Environmental Defense Fund as a livestock manure consultant studying agricultural nutrient management for watershed planning.

For more information on this project, contact Lynette Ward at lward@udel.edu, or her advisors by email at william.ritter@udel.edu, jbyrne@udel.edu, or youngdoo@udel.edu.

2003 DWRC Annual Meeting and Undergraduate Interns Poster Session

The 17-member **DWRC** Advisory Panel convened for lunch and their annual meeting on the UD campus April 25th. **DWRC** Director Tom Sims described the Center's plans for 2003 research and public education through WATER NEWS and our web presence. The panel discussed ways to enlist community support for research and training of new water scientists.

Following the lunch meeting, the **DWRC**'s six 2002 undergraduate interns presented posters of their project findings with their advisors at an informal session sponsored by the University of Delaware's Undergraduate Research Program to a crowd of nearly 500 visitors.

2003 – 2004 Undergraduate Interns Announced

Ten undergraduate students were selected in April by the **Delaware Water Resources Center (DWRC)** Advisory Panel to participate in the 2003 **DWRC** internship program. Now in its third year, the **DWRC's** unique program permits students, faculty, and other water resources professionals from a variety of disciplines to work together in research and education programs addressing water resource related issues of critical importance to Delaware and the Mid-Atlantic region. Students at all Delaware institutions of higher learning are eligible to apply. A greater number of internship opportunities were made available for the coming year through co-sponsor support from the **University of Delaware's** College of Agriculture and Natural Resources (**CANR**), College of Engineering (**CENG**), College of Marine Studies (**CMS**), Department of Plant and Soil Sciences (**PLSC**), Water Resources Agency (**WRA**), and also the Delaware Geological Survey (**DGS**) and Delaware Division of Natural Resources and Environmental Control (**DNREC**). Two internships were also fully funded by the **DWRC**.

Sophomore Chemical Engineering major **Aimee Knauss** will study "*Enhanced Pollutant Biodegradation by Electrode Use*" in order to optimize the practical usage of a reactor to improve water quality while potentially generating electrical energy at the same time. **Andrew Joslyn**, a junior Environmental Engineering major, will undertake the **DWRC/ CENG** co-sponsored project, "*Characterization and Improvement of Electrode-Biomass Interactions in a Water Pollutant Removal Process*". Andrew aims to explore wastewater reactor configurations that will optimize the growth of particular bacterial microorganisms responsible for biodegradation of water pollutants. Both projects extend the work of 2002 **DWRC** interns Aditya Sharma and Bret Stroger under the advisement of Dr. Steven Dentel of the UD Department of Civil and Environmental Engineering.

Kristen Sentoff, a 2002 **DWRC** intern and junior Natural Resource Management major, will research "*Fairfield Run: An Evaluation of Stream Habitat Restoration at the UD Experimental Watershed*". "*Blue Hen Creek: An Evaluation of Stream Habitat Restoration at the UD Experimental Watershed*" is the research topic for **Judith Walker's DWRC/WRA** co-sponsored project. Judith is a junior Natural Resources Management major with minors in Legal Studies and Resource Economics. Both will be advised by Mr. Gerald Kauffman of the UD Water Resources Agency. They will recommend habitat restoration techniques for areas along Fairfield Run and Blue Hen Creek respectively. These are two of three streams in the watershed classified by **DWRC** 2001 intern Jennifer Campagnini and 2002 intern Tara Harrell as impaired by bank erosion due to watershed urbanization.

"*Factors Affecting West Nile Virus Transmission from Storm Water Retention Ponds and Constructed Wetlands*" is the title of **Megan Bielawa's DWRC/CANR** co-sponsored research project. A junior Biology major, Megan will periodically evaluate samples of mosquito species to determine virus predictors by location over time. Her advisor is Dr. Jack Gingrich of the UD Department of Entomology and Applied Ecology.

A second **DWRC/CANR** co-sponsored internship is **Alice McDermott's** proposed study of the "*Biological and Enzymatic Treatment of a Food Processing Wastewater*". Alice is a freshman in the College of Arts and Science and research assistant in the UD Department of Bio-Resources Engineering; she will be advised by Anastasia Chirside of that Department. Her research will build on that of 2001 **DWRC** intern Jason Hetrick and will investigate both the effectiveness of adjusting pH and of using an enzyme culture in wastewater treatment.

Matt Simon, a junior biology major minoring in psychology, will team with advisor Dr. Eric Wommack of the UD Department of Plant and Soil Sciences and College of Marine Studies to study the "*Characterization of Autochthonous Viral Communities in Estuarine Waters*". During his **DWRC/CMS** co-sponsored internship, Matt hopes to better characterize viruses, which are now known to be the most abundant life-form in natural waters and capable of efficiently transforming bacteria and plankton via infections into dissolved organic matter.

Junior Environmental Soil Science major **Justin Glier** is minoring in Geology and is a past bioremediation laboratory assistant for the Environmental Protection Agency and intern with Dr. Donald Sparks of the UD Department of Plant and Soil Sciences. Dr. Sparks will serve as advisor for Justin's **DWRC/ PLSC** co-sponsored internship studying the "*Role of Urea as the Soil Nitrogen Source in the Uptake of Nickel in Allium Hyperaccumulating Species*". The project will explore the effect of nitrogen as an effective and affordable amendment to enhance plant-based cleanup of nickel-contaminated soils. **(continued, page 6)**

2003 Interns Announced (continued from p. 5)

The **DWRC/DGS** co-sponsored internship project titled "Nanticoke Watershed Total Maximum Daily Load (TMDL) Project" has been awarded to junior Geology major and **DGS** intern **Mark Neimeister**. The project advisor is Mr. Scott Andres of the Delaware Geological Survey. Mark will be collecting and statistically evaluating water samples with the goal of developing improved methods for computing watershed pollutant loads.

Kathleen Cormier will conduct "Field Measurements of Non Point Source Pollutant Removal Efficiencies of Stormwater BMPs at the UD Experimental Watershed" for her **DWRC/DE DNREC** co-sponsored internship under the advisement of Mr. Martin Wollaston of the UD Water Resources Agency. A junior Natural Resource Management major with minors in Biology and Resource Economics, Kathleen proposes to monitor the quality of stormwater inflow to and outflow from several stormwater ponds and wetlands installed on the University of Delaware campus. She then hopes to estimate the pollutant removal efficiency of these stormwater Best Management Practices.

Water News You Can Use

The Center for the Inland Bays (CIB), Dr. Bruce Richards, Executive Director, is a private, nonprofit organization. Its newsletter "**Inland Bays Journal**" provides open and informative dialogue on issues related to Delaware's Inland Bays and is distributed throughout "The First State" with more than 70,000 copies published each quarter as an insert to the News Journal. The Spring issue, available online at <http://www.inlandbays.org/newsletter.html> or by calling the **CIB** at 302-645-7325, features State of the Bays reports, Sussex Conservation District and James Farm updates, invasive species news, Birding Day highlights, a **CIB** Science Coordinator position posting, and an announcement of the third annual Governor's Wade-In June 14.

The "**Responsible Water Use in the Garden**" symposium co-hosted by the Longwood Graduate Program and Winterthur's Garden Division Mar. 29th featured experts in water policy, landscape architecture, ornamentals, xeriscapes, irrigation, and sustainable designs. Introductory speaker Gerald Kauffman, Delaware State Water Coordinator, told listeners that water-wise gardening ranges "from selecting plants and proper garden design to

choosing easy maintenance techniques for conserving water. Outdoor water use is the single largest component of our domestic water budget, thus the potential water savings are high." Among **water-wise tips** presented throughout the day:

- Cultivate Delaware native and drought-tolerant plants, not thirsty Kentucky Bluegrass.
- Save hundreds of gallons by watering lawns in the morning; better yet, let summer lawns go dormant.
- Use your dehumidifier water on houseplants or porch container plants.
- Install rainbarrels to conserve water (a source on the internet is www.rainbarrelsandmore.com).
- Make your own ideal compost and mulch from dried leaves shredded by a leaf blower on the vacuum setting. Soils amended with this organic matter will absorb more water and drain better. Studies show dried grass clippings and shredded fall leaves are superior mulches to prevent weed growth and retain soil moisture, even better than black plastic. Straw (not weedy hay) and even carefully arranged stones are also good at moisture retention.
- No pruning /fertilizing plants under drought stress.
- Do not mound mulch around tree trunks.
- Plant parking lot islands and streetside strips with drought tolerant groundcovers such as junipers; no maintenance, mowing, or watering is needed, and adjacent pavement lasts longer without excess water working in the cracks.
- Target your watering with slow-release systems.
- Plant and establish (water) trees and shrubs properly for drought survival.

The **DWRC** surveyed Delaware residents attending the symposium for their **favored actions during droughts** to lower water demand. **Establishing drought emergency water rates** was among the three actions tied for first place as "most favored". The other popular options were establishing mandatory reductions for all customers and rationing outdoor water use by odd/even addresses. The least favored option was the use of 2002's policy of restricting all lawn watering and car washing. Delaware resident comments included:

*" Establish conservation-friendly rates, increasing with increasing water use, on a permanent basis"...
Grey water issues for water saving must be addressed and put into use"...
"Educate the public that our climate is not like Great Britain's! American lawns are not the best use of our water resources."...
"Enhance public education to empower property owners, managers and contractors to use water wisely for new plantings and minimally for established turf... [avoid] unjust & unjustifiable economic damage to green industry businesses & institutions."*

Christina Watershed Reports are now available: Monthly data collected by volunteers in the **Delaware Nature Society's** Technical Monitoring program during 1995-2000 have now been summarized and are available to the general public. Separate reports have been prepared for each of the watersheds that make up the Christina Basin: the Brandywine Creek, Red Clay Creek, White Clay Creek, and Christina River. The findings are consistent with **DNREC's**, indicating that low levels of dissolved oxygen resulting from excess nutrients imposed by increased development, additional impervious surface, and the daily activities of residents/citizens are of greatest concern for the watershed. To learn more about how you can reduce nonpoint source pollution through the Backyard Habitat program, please visit the **DNS** web page at <http://www.delawarenaturesociety.org/>. These reports are available by contacting Ginger North at 302-239-2334 ext. 100 or ginger@dnsashland.org.

Delaware HB 118 Water Pricing Legislation Out of Committee May 15, 2003: Legislation introduced by Representatives Smith and Valihura on May 8, 2003 would amend the Water Supply Self-Sufficiency Act of 2003 to ensure a continued, adequate water supply in northern New Castle County by requiring investor-owned and larger municipal water utilities to adopt conservation water rates, proven throughout the country to reduce water use. It would also require these utilities to certify every three years that they will be able to meet the projected demand for their service area during the following three-year period. Further, it would require utilities to establish equitable bulk wholesale rates for inter-utility water purchases and to provide water, if they have excess capacity, to a drought-sensitive area if necessary. By 2010, these utilities would need to show they have adequate sources of supply within the State of Delaware to weather an acute drought such as that which occurred in 2002. Besides securing an adequate water supply, it is the intent of this legislation to avert the severe water-use restrictions that were imposed in 2002 because of the drought emergency. In conjunction with this legislation, a Drinking Water Well Replacement and Rehabilitation Loan/Grant Program would be established to provide low-interest loans and/or hardship grants throughout the State to individuals with older, leaking plumbing systems that cause water loss, or failed domestic wells. **Cosponsors** of the legislation include: Senators Henry and Cloutier; Representatives DiPinto, B. Ennis, Gilligan, Hudson, Keeley, Lavelle, Mulrooney, Van Sant, and Viola; and Senators Amick, Blevins, Copeland, DeLuca, and Sorenson.

Good News and Map Help from USGS: A May 7th press release (see <http://md.water.usgs.gov>) reported **normal levels** for groundwater and streamflows across Maryland and Delaware by USGS hydrologists in Baltimore for the month of April. During the same period last year, well levels were at record lows below normal. The site also links to **Delaware DataMIL**, part of the USGS National Map program, which allows citizens to create maps and download GIS data for any location in Delaware.

Storm Drain Labeling

Projects: Delaware's Dept. of Transportation (**DeIDOT**, 1-800-652-5600) and the City of Newark have begun



implementing regulations under the Clean Water Act's National Pollutant Discharge Elimination System (**NPDES**) program in an effort to minimize the introduction of pollutants from storm drains into Delaware's waterways. Two drain labeling projects remind citizens to avoid dumping in storm drains. **DeIDOT's** program, administered under its Trust Fund with hired crews applying labels as drains are inventoried during 2003-2005, is already active in New Castle County and awaits permits to conduct similar projects in urbanized areas in Kent / Sussex such as Dover, Camden-Wyoming and Delmar starting in early June. Newark's program is co-funded by **DNREC** and the **USEPA** in support of the Delaware Estuary Program.

Volunteer groups there may call Kelley Dinsmore at 302-366-7040 to be assigned to mark some of the city's 2,200 drains. The programs offer this advice for clean waterways:

- Service your car to repair leaks. Recycle antifreeze and motor oil. Only rain should go down the drain!
- Fertilize lawns lightly, never just before a rainstorm.
- Drop off household hazardous waste at collection sites (posted at www.dswa.com)
- Wash your car on the lawn, keeping soapy water out of the storm drain.
- Dispose of litter, recyclables, yard and pet waste properly.
- Notify **DeIDOT** if you see storm drains needing maintenance: 302-323-1111. The City of Newark asks that you clean off clogged drains or call their Public Works Department at 302-366-7040.
- Call **DNREC** if you see illegal dumping: 1-800-662-8802.



Newark Boy Scout labels a storm drain

**The Delaware Water
Resources Center**

The Delaware Water Resources Center (DWRC), established in 1965, is part of a network of 54 Water Resources Research institutes throughout the nation. The DWRC receives funding through Section 104 of the Water Resources Research Act of 1984. The U.S. Geological Survey administers the provisions of the Act and provides oversight of the nation's Water Resources Centers. The primary goals of the DWRC are: to support research that will provide solutions to Delaware's priority water problems, to promote the training and education of future water scientists, engineers, and policymakers, and to disseminate research results to water managers and the public. For further information, visit our website:

<http://ag.udel.edu/dwrc/>

**Delaware Water
Resources Center
Advisory Panel**

Scott Andres

Delaware Geological Survey

Steven K. Dentel

*UD Dept. of Civil &
Environmental Engineering*

Judith Denver

U.S. Geological Survey

Kevin Donnelly

DNREC Division of Water Resources

Bernard Dworsky

Delaware Water Resources Agency

Mark Isaacs

UD Research and Education Center

Ed Jones

*DSU Dept. of Agriculture &
Natural Resources*

Ken Lomax

UD Dept. of Bioresources Engineering

**Delaware Water
Resources Center
Advisory Panel**

Jenny McDermott

DNREC Div. of Soil & Water Conservation

Dorothy Miller

Coalition for Natural Stream Valleys

Paul Petrichenko

*USDA Natural Resources &
Conservation Service*

Kent Price

UD College of Marine Studies

Bruce Richards

Center for the Inland Bays

Bill Saylor

UD Dept. of Animal and Food Sciences

Carl Solberg

Sierra Club

Lori Spagnolo

Delaware Nature Society

William Vanderwende

Del. Nutrient Management Commission

WATER NEWS is published biannually by the University of Delaware Water Resources Center, **Dr. J. Thomas Sims**, Director. **Amy Boyd**, Editor, welcomes materials for publication, including news articles and letters to the editor. To submit material or request future issues, please address your correspondence to the address below or contact the editor by email at aboyd@udel.edu or phone (302) 831-1392.

Delaware Water Resources Center
Department of Plant and Soil Sciences
College of Agriculture and Natural Resources
University of Delaware
152 Townsend Hall
Newark, DE 19717-1303

<http://ag.udel.edu/dwrc/>

Address Service Requested