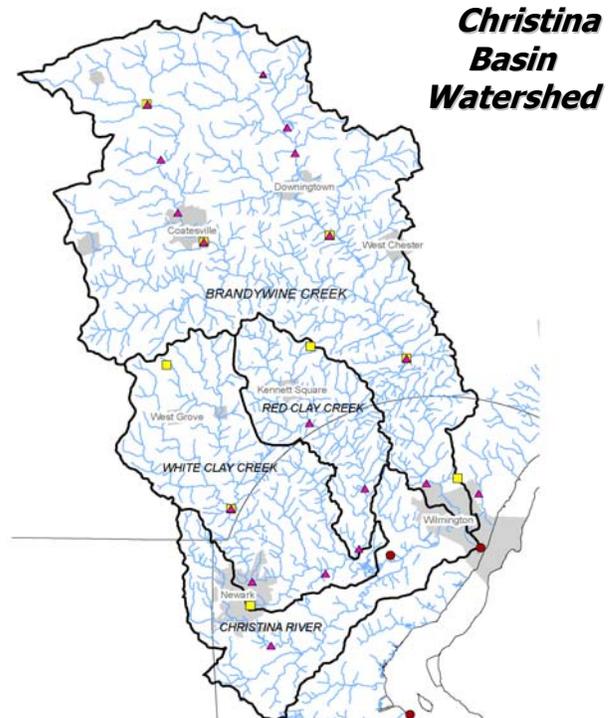


The Historic Christina Basin: "Delaware's First Watershed" Topic of 2004 Delaware Water Policy Forum

For Forum proceedings, contact Gerald Kauffman, Director of Watershed Policy, University of Delaware Water Resources Agency, at jerryk@udel.edu 302-831-4925. Mr. Kauffman's planned Forum luncheon keynote address "**The History of the Christina Basin – George Washington Slept Here**", videotaped later due to the full schedule of excellent speakers, may be seen online after Dec. 21 at <http://www.wr.udel.edu>.

The Delaware Policy Forum titled "*The Historic Christina Basin: Delaware's First Watershed*" was attended by over 200 visitors from government, academia, industry, non-profit organizations, and the general public on October 13, 2004 at the University of Delaware's (UD) Clayton Hall. Fourth in an annual series examining statewide water policy issues, this year's event explored historic water resources concerns in the Christina Basin. The Basin includes the Brandywine Creek, Red Clay Creek, White Clay Creek, and Christina Creek watersheds; it contains 6 trout streams and numerous endangered species, is home to more than half of Delaware's population, and is the largest source of drinking water supply in the state of Delaware. The Forum's presentations, materials, and poster session were free of charge, courtesy the co-sponsors: Delaware Water Resources Center (DWRC), UD Institute for Public Administration (IPA) Water Resources Agency (WRA), Delaware Geological Survey (DGS), and the Delaware Department of Natural Resources and Environmental Control (DNREC).

Following a welcome by IPA Director Jerome Lewis, DWRC Director Tom Sims thanked the other 18 water resources advocates giving talks, many of



DWRC Director Tom Sims



whom have provided guidance to the DWRC through its Advisory Panel member agencies. He explained DWRC's student research and training program, which leverages federal and local co-sponsor funds to find solutions to Delaware's priority water problems, and directed listeners to the DWRC's website and publications for statewide water news.

In this Issue, on the web at: <http://ag.udel.edu/dwrc/news.html>

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(Water Policy Forum Highlights, from p. 1)

Kevin Donnelly, Director of **DNREC's** Division of Water Resources, began by outlining the Christina River's "forgotten" water use history over the last 400 years. Donnelly stressed the need today for cooperation within and among state and national agencies for infrastructure change to preserve and improve the river's water quality. A local example is the \$100 million effort being spent by New Castle County in Brandywine Hundred alone to upgrade its sanitary sewer systems; still needed is systematic retrofitting of Wilmington's antiquated Combined Sewer Overflow system (CSO, see <http://www.wilmingtoncso.com/>) which discharges a combination of stormwater and raw sewage overflow into area water bodies during storm events.

Donnelly listed two **DNREC** remediation projects for the Christiana River, one targeting the 200-acre Old Wilmington Marsh, and the other partnering with the Northern Delaware Wetland Rehabilitation Program to restore 10,000 acres of degraded tidal wetlands.



Rick Mickowski of the New Castle County Conservation District

One of many interesting Water Forum displays!

A number of **DNREC** planned initiatives addressing water quality in the entire Christina Basin include:

- developing Polychlorinated Biphenyls (**PCB**) total maximum daily load (**TMDL**) regulations for the **Delaware Estuary** and completing the **Christina River Basin's TMDL** for a variety of potential pollutants;
- reviewing and approving **Wilmington's revised CSO Enhanced Long-Term Control Plan** (LTCP) which would increase the CSO sewage 'capture and treatment' rate to 87% or higher, reduce CSO control costs by more than \$87 million, and accelerate implementation by ten years;
- working with other member agencies in the **Delaware Estuary Program** (<http://www.delep.org/>) in projects such as administering grants encouraging stewardship in local watersheds; and
- administering **DNREC** grants for nonpoint source **pollution monitoring** of the Christina River Basin, and supporting citizen water monitoring and **cleanup** programs.



The Christina Basin is #1! Special guest **Larry Merrill**, **EPA** Region 3 Acting Chief, celebrated the 2003 **EPA** \$1 million grant selection of "The Christina Basin -- **USEPA** Watershed Initiative No. 1 Ranked Watershed in the USA" over 169 competitors nationwide.

"**The Christina Basin Scorecard**", a panel moderated by **Ed O'Donnell**, **WRA** Senior Policy Advisor, discussed **water quality** matters.

DNREC watershed scientist **Sam Myoda** noted that bacteria exceeds recommended levels in all of the Christina Basin and also all other Delaware water bodies except the C&D canal and parts of the Inland Bays. He described how DNA analysis helps to identify sources of bacteria and then to create appropriate total maximum daily load regulations to protect water quality and human health from pathogenic organisms.

Appoquinimink Watershed Coordinator **Sara Wozniak** talked about the value of tracking stream health progress using a watershed "report card". A report card created for seventeen streams in the Christina Basin, based on data collected in 1990-2002, is found online from the "Chapter Three" link at <http://www.wr.udel.edu/publications/> for the report *A Watershed Restoration Action Strategy (WRAS) for the Delaware Portion of the Christina Basin*. Grades for each stream and the overall basin ran the gamut from "A" to "F" for susceptibility to contamination of water supply, habitat quality, impervious cover, population density, and forest cover versus open space, but ongoing watershed conservation efforts are bringing up the watershed "G.P.A."



"Trends in Watershed Imperviousness," comparisons of Christina Basin cover estimates from 1995 to 2004, were presented by **WRA** senior researcher **Kevin Vonck**. Vonck explained how geographic information systems can be used to provide reliable estimates and long term trends in impervious cover. Recent land use maps for Newark and the Upper Brandywine watersheds showed striking increases in impervious surfaces, associated with loss of agricultural lands and increased suburban land usage.

“Streamflow Trends in the Christina Basin” presented by **John Talley**, State Geologist and Director, **DGS**, were based on data from 17 continuously recording stream gages throughout the area. Over the past five years, Wilmington recorded annual rainfalls of over 49” have exceeded the city’s 50-year annual mean of 46.2”. For charts showing basin periodic peak flows due to homebuilding and resulting increased impervious surface, minimum flows in time of drought, and discharge and precipitation levels over the past 5 and 50 years, visit <http://ag.udel.edu/dwrc/Forum2004/talley.pdf>.



* The panel “**Smartyards and Social Attitudes**” featured **John Harrod**, Delaware Nature Society (**DNS**) Backyard Habitat Coordinator speaking on the Christina Basin

Smartyards Program, and also **Dr. Jan Johnson** of the **UD Department of Political Science** describing her five years researching environmental policy values and social attitudes towards stream buffers.

The panel “**Views from the Headwaters**” included **WRA** GIS Services Manager **Andrew Homsey’s** remarkable series of “3D” computer-generated topographic land use images allowing the audience to visually “fly over” the Christina Basin to the headwaters in Chester County, PA. The digital images were created by computerized optimization of data from land use photos and 1970 soil survey maps. **Daniel Greig** of the **Chester County Conservation District** described **CCCD’s** mission of conservation leadership and education promotion. He described conservation projects on three farms in Chester County that have prevented over two tons each of nitrogen and phosphorus from entering streams in the Upper Brandywine watershed.

**Hands Across the Watershed:
Nonprofits Cooperate in Christina Basin**

At the Oct. 13th Water Forum, **Martha Corrozi**, **WRA** watershed analyst, presented the results of her survey of 25 nonprofit groups in the Basin, exploring their relationship with regulating and funding government agencies. Most (80%) groups desired greater access to government agencies with better cohesion and accountability to improve consensus in decision-making; all saw increasing need for their services as public educators, watchdogs, mediators, and lobbyists.

The Forum closed with a featured panel of representatives from cooperative nonprofit management organizations for each of the Christina Basin’s four sub-watersheds. The **Brandywine Valley Association (BVA)** was the first U.S. small watershed association. **Bob Struble**, Executive Director, described ongoing partnerships with conservation advocates who have used best management practices, such as contour strips, industry water re-circulation, and irrigation, to reduce river sediment levels while improving water supplies and groundwater recharge. **Red Clay Valley Association (RCVA)** Deputy Director **Jim Jordan** listed association partnership activities such as water-saving programs at Longwood Gardens, stream pollution studies, greenways and trails funded by local governments, curbside recycling programs, highway and river cleanups, and streamside tree planting. **Linda Stapleford**, River Manager for the **White Clay Creek Wild and Scenic River Committee** with assistance by private landowners and conservation volunteers, works with the National Park Service to oversee and fund projects preserving portions of the upper White Clay Creek, which was designated in 2000 as a NPS Wild and Scenic area. Current projects include preserving land, training to preserve trails and open space, monitoring stream health, and public education. [See April Symposium, p.5]

Defender of the Christina River: One of many “watershed moments” at the 2004 Forum was the presentation of a special “Defender of the Christina River” award to the Christina Conservancy’s president Edward W. Cooch, Jr. (Ned) by the Water Resources Agency in appreciation for his lifelong dedication to conservation practices in the Christina watershed. Cooch highlighted the Conservancy’s cooperative efforts with citizens, governments, and other agencies to bring about river cleanups and sunken boat removal, stream studies, sewer improvements, and state conservation easements along the river giving property control and freedom from maintenance responsibility to landowners. Cooch’s own historic property is now protected in perpetuity as a state conservation easement along the Christina.



Water Forum poster session: DWRC intern and DSU student Alicia Revis tells Mingxin Guo of DSU about her project

**One Year Later: Sept. 28-29, 2004
Tropical Storm Jeanne
Again Floods the Christina Basin**

*Contributors: John H. Talley, Director, Delaware Geological Survey, waterman@udel.edu 302-831-8258, <http://www.udel.edu/dgs> and Dan Leathers, State Climatologist, leathers@udel.edu, 302-831-8764, <http://www.udel.edu/Geography/leathers.htm>
Photos by John Talley; see <http://ag.udel.edu/dwrc/news.html>*

The remnants of Hurricane Jeanne caused widespread flooding in the Red Clay Creek, White Clay Creek, and Christina River drainage basins in northern New Castle County, Delaware on September 28 – 29, 2004. Recorded rainfall in northern Delaware ranged from 8.2" in Ogletown to 3.52" in east Wilmington. Reported rainfall in the Brandywine, Red Clay, and White Clay creek drainage basins in nearby southeastern Pennsylvania ranged from 8.91" in West Chester to 6.56" near Strickersville. According to Dr. Daniel Leathers, State Climatologist, the precipitation exceeded the 100-year return period for the area. The provisional peak stream discharges of 11,600 cubic feet per second recorded on Red Clay Creek at Wooddale, 10,900 cubic feet per second on Red Clay Creek at Stanton, and 12,200 cubic feet per second on White Clay Creek at Newark were the second highest on record.

*Red Clay Creek
Stanton Area
Garages
high water
marks
(white lines):*

*L. "Henri"
Sept. 15,
2003
(12 blocks)*

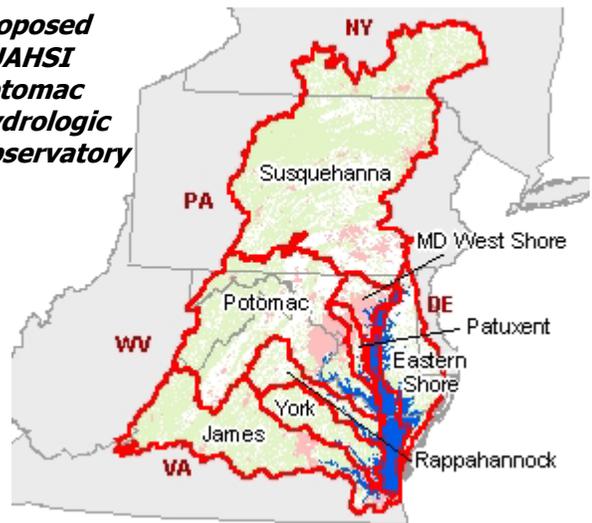
*R. "Jeanne"
Sept. 28,
2004
(10 blocks)*



Peak gage heights were the third highest of record on Red Clay Creek at Wooddale and Stanton and were exceeded only by those associated with Floyd (1999) and Henri (2003). The calculated recurrence intervals were greater than 100 years. Comparisons of precipitation and peak discharge recurrence intervals for Jeanne (2004) as well as Henri (2003), Floyd (1999), and a severe thunderstorm (1989) are presented with Jeanne charts and photos at <http://ag.udel.edu/dwrc/Forum2004/jeanne.pdf>. All four events involved very intense precipitation (4-10") in a relatively short period of time (4-10 hours).

Water News You Can Use

**Proposed
CUAHSI
Potomac
Hydrologic
Observatory**



CUAHSI News: The Consortium of Universities for Advancement of Hydrologic Science, Incorporated (**CUAHSI**) was established in 2001 for the purpose of advancing hydrologic science in the United States. One of the key objectives of **CUAHSI** is to establish a set of long-term hydrologic observatories for conducting research on pressing hydrologic problems. These observatories are expected to operate for a minimum of five years, with the first two observatories (of five total) starting in late 2005. Capital funding for each observatory is expected to be about 10 million dollars, with approximately 3 million dollars for annual operating expenses. A **CUAHSI** workshop attended by Paul Imhoff, **UD** Civil and Environmental Engineering, and David Legates, **UD** Geography, was held at Utah State University in August 2004 to review 24 prospectuses on proposed observatories submitted by university researchers from across the country for early review. Several **UD** faculty participated on the proposal for the Potomac Hydrologic Observatory, which was one of five observatories selected as "most promising." Information on this proposed observatory, which would be located in Maryland, Virginia, Pennsylvania, West Virginia and the entire District of Columbia, is found at <http://www.umbc.edu/cuere/potomac/>. Watch for the NSF program announcement of the first two chosen observatories in January 2005. *Contributor: Paul Imhoff, UD Dept. of Civil and Environmental Engineering, imhoff@ce.udel.edu 302-831-0541*

For coverage of the Nov. 26 oil spill on the Delaware River by the 750-foot tanker *Athos I*, visit <http://delawareonline.com>, search on "oil".



AMERICAN WATER RESOURCES ASSOCIATION

Community, Conversation, Connections

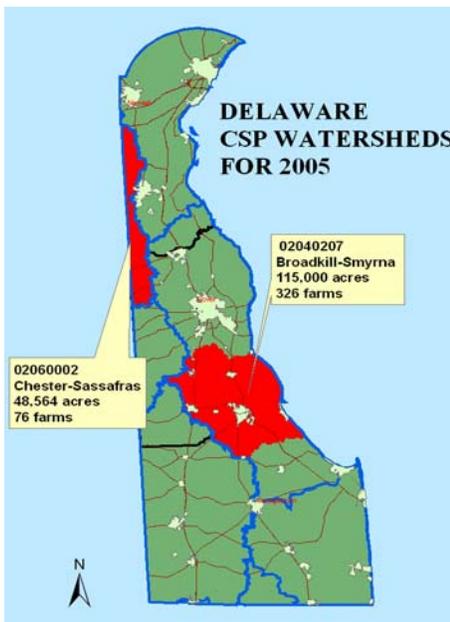
New Delaware State Chapter of the American Water Resources Association Forming:

The **UD** Water Resources Agency



Martha Corrozi at the Water Forum

(**WRA**) and Delaware Water Resources Center (**DWRC**) seek interested professionals and students to form the first Delaware chapter of the American Water Resources Association (**AWRA**). Advantages of membership include (1) the network of fellow water resources aficionados, (2) field trips and social seminars on local water topics (3) scholarships and funding for students, and (4) travel to the national conference (Nov. 6-10, 2005 in Seattle: visit <http://www.awra.org>) to join other chapters in the annual competition for best chapter. The first interest meeting was held Dec. 9, 2004 at the **UD WRA**; more organizational meetings are to come. To express interest in participation or for information, contact Martha Corrozi at the **WRA** at mcorrozi@udel.edu or 302-831-4931. Contributed by Gerald Kauffman, Director, **WRA**, jerryk@udel.edu 302-831-4929 <http://www.wr.udel.edu/>



Historic Expansion of NRCS National Conservation Security Program includes Two Delaware Watersheds:

The Broadkill - Smyrna watershed located in eastern Kent and Sussex counties and the Chester - Sassafras watershed, part of which is in western New Castle and Kent Counties, are among 202 watersheds nationwide invited to participate in a historic new Conservation Security Program (CSP) designed to reward farmers for long-term stewardship. The CSP, administered by the USDA Natural Resources Conservation Service (**NRCS**) as part of the 2002 Farm Bill, is a voluntary program that provides financial and technical assistance to promote the conservation and improvement of soil, water, air, energy, plant and animal life, and other conservation purposes on private cropland, grassland, improved pasture, and range land, as well as forested land that is an incidental part of an agriculture operation. In this first opportunity for farmers from each state to participate, about one-eighth of the nation's eligible farmers will be given the chance to apply each year over an eight-year period. Says Delaware **NRCS** State Conservationist Ginger Murphy, "Payments for demonstrable long-term stewardship will reward many of those who undertook conservation on their own initiative and who care for the resources we all share." Farmers who already protect soil and water quality, according to Murphy, "will also have options to improve nutrient

and pest management activities, improve wildlife habitat, undertake on-farm energy conservation, improve air quality, participate in environmental monitoring, and participate in watershed-wide stewardship programs. NRCS will offer local workshops in the selected watersheds to more fully explain the program to interested potential participants. For more information on CSP and NRCS, see <http://www.nrcs.usda.gov/programs>. Contributor: Paul M. Petrichenko, USDA **NRCS** Assistant State Conservationist, paul.petrichenko@de.usda.gov 302-678-4180 <http://www.de.nrcs.usda.gov/>

White Clay Creek Symposium April 14, 2005: The agenda for this day-long event, co-sponsored by the White Clay Creek Watershed Management Committee, **UD WRA**, and other local groups at **UD's** Clayton Hall is: 1) National Park Service / White Clay Wild and Scenic Program (**WCWSP**) joint activities (Linda Stapleford); 2) Stroud Water Research Center historic and scientific perspectives on the watershed's ecosystem impact on water quality (Bern Sweeney, director); 3) "The Livable Landscape", techniques for aesthetic watershed conservation landscape design (author/photographer Rick Darke); 4) a panel discussion on stormwater runoff planning and management in response to increased watershed development (government and engineering representatives). Registration \$10, luncheon included. For information, contact contributor Linda Stapleford, River Administrator, **WCWSP**, lstaplef@msn.com 302-731-1756 <http://www.whiteclay.org>.



Water Resources Fellowships, Grants and Internships for 2005

- Applications are due **January 15, 2005** for 40 **EPA National Network for Environmental Management Studies (NNEMS) Undergraduate and Graduate Fellowships** earning **\$6,900 to \$11,000** working 3-months full-time this coming summer or fall for the EPA. **NNEMS** fellowships provide both undergraduate and graduate students with practical research or training experiences involving environmental issues of current public interest, linked directly to their field of undergraduate or graduate study. No match or cost-sharing required. <http://www.epa.gov/enviroed/students.html> is the site, or call 1-800-358-8769. Program catalog: <http://www.epa.gov/enviroed/NNEMS/pdf/catalog2004.pdf>. The local contact is Dr. Tom Sims (jtsims@udel.edu) or phone 302-831-6757.

- **National Institute for Water Resources' (NIWR) – U.S.G.S. National Competitive Grants RFP** is online at



https://niwr.org/2005_104G_RFP; for successfully funded 1996–2004 projects, visit <http://water.usgs.gov/wrri/projects.html>. Show your interest now with no obligation by registering on NIWR's site <https://niwr.org/NIWR/>. Any investigator at an institution of higher learning in the United States is eligible to request up to **\$250,000** in federal funds for projects of 1 to 3 years in duration supporting water research on the following topics: water supply and water availability; water quality trends in raw water supplies; physical dimensions, role of economics, or role of institutions in water supply and demand; and institutional arrangements for tracking and reporting water supply and availability or for coping with extreme hydrologic conditions. Successful applicants must match each dollar of the federal grant with one dollar from non-federal sources. File proposals on the web site by 5 PM EST, **February 22, 2005**. The local contact is Dr. Tom Sims, Director, Delaware Water Resources Center, 113 Townsend Hall, University of Delaware, Newark, DE 19716-2103 (302-831-6757; FAX 302-831-6758; jtsims@udel.edu).

At the Oct. 13 state Water Forum, L to R: DSU's DWRC intern Trevor Knight explains his project to former DWRC Fellow Jen Jennings and former DWRC Interns Jennifer Campagnini and Bob Ehemann



- Application deadline is **March 25, 2005** for 2005-2006 **\$3500 Delaware Water Resources Center undergraduate internships** co-sponsored by the **Delaware Geological Survey, Delaware Department of Natural Resources and Environmental Control, UD College of Agriculture and Natural Resources, College of Arts and Science, College of Engineering, College of Marine Studies, and Department of Plant and Soil Sciences, and the UD Water Resources Agency**. All undergraduates enrolled at any institution of higher learning in the state of Delaware are eligible to apply, except for those graduating in the Spring of 2005. All students must have the active support of an advisor and a minimum GPA of 3.0. Details on the 41 current and past projects funded since 2000, current faculty advisors, application materials to submit, and report and poster requirements, can be found at the DWRC website: <http://ag.udel.edu/dwrc/jobs.html>.
- **Delaware State University** Department of Agriculture and Natural Resources, Natural Resources Program: \$15,000 - \$20,000 graduate assistantships, \$5,000 undergraduate internships, and \$2,000 - \$4,000 undergraduate scholarships are available. <http://cars.desu.edu/faculty/mreiter/opportunities.htm>.
- **UD College of Marine Studies** offers graduate scholarship awards and fellowships. For information: <http://www.ocean.udel.edu/graduate/scholarships.html>. Submit applications by February 1, 2005 for Fall 2005.

Thank you Bruce Richards, Jenny McDermott, and Lori Spagnolo; Welcome, Jen Gochenaur



Three members of the **DWRC** Advisory Panel have stepped down after many years of service. Bruce Richards, formerly executive director of the **Center for the Inland Bays**, and Jenny McDermott, formerly of **DNREC** and now employed in the **UD** College of Agriculture and Natural Resources, represented their organizations on the Panel since 1999. Lori Spagnolo joined the Panel in 2002 while Associate Director for Natural Resources Conservation at Ashland Nature Center. Her successor Jen Gochenaur joined our Panel in September 2004. We thank them all for their energies prioritizing **DWRC's** water research efforts.

DWRC 2004 Internship Update

Photos by Danielle Quigley

Christina Basin Governance Analysis

Second-year **UD** Resource Economics major **Steven Ernst** is evaluating the economic, environmental, social, and recreational benefits of the Christina Basin in a **DWRC/UD WRA** co-funded internship project under the advisement of Dr. Steven Hastings of the **UD** Department of Food and Resource Economics and **UD WRA's** Gerald Kauffman. Hastings explains that "Steve is looking at how other watersheds are governed across multiple states and making observations on how diverse government, private, industry, and nonprofit agencies can best collaborate to meet new water management challenges." Ernst has focused most on Mid-Atlantic watersheds such as the Delaware Estuary, Susquehanna River, and Chesapeake Bay Basins where water resource issues are similar to the Christina's. He says "I will recommend cooperative approaches that can work or be modified to help Christina watershed shareholders best succeed with their proposed conservation programs and policies." Advisor Kauffman adds, "Steve's goal is making Christina Basin residents beneficiaries of more effective coordination and better watershed stewardship."



Beneficial Insect Control For Wetland Restoration

Purple loosestrife is a perennial European plant invading marshes and lakeshores in Delaware and throughout North America, replacing cattails and other native wetland plants. With each plant capable of producing millions of seeds annually, dense stands can form that are unsuitable as cover, food, or nesting sites for a wide range of native wetland animals. Because it places many rare and endangered wetland plants and animals at risk, purple loosestrife has been declared a noxious weed in at least 23 states.

Biological control agents have been sought among purple loosestrife – feeding insect species from the plant's native European range. Following rigorous safety testing, four species of beetles were approved for control use in the U. S. These species have been released in various parts of the U.S. since 1992, including several sites in Delaware, and have in some areas dramatically reduced purple loosestrife stands.

Two **UD** undergraduate Delaware Water Resources Center interns have undertaken a hands-on insect release and monitoring project with an aim toward understanding and increasing the insects' impact on purple loosestrife and encouraging the restoration of healthy wetland communities. The **DWRC** interns team first-year Entomology and Wildlife Conservation major **Jason Graham** and second-year Wildlife Conservation major **Jamie Pool** with advisor Dr. Judith Hough-Goldstein of the **UD** Department of Entomology & Wildlife Ecology and are co-sponsored by the **UD** College of Agriculture and Natural Resources and **UD** Office of Undergraduate Research with funds for the specialized leaf-eating beetles provided by the Delaware Nature Society (**DNS**) and Del Bay Retriever Club.

Jason Graham, Jamie Pool and Dr. Judith Hough-Goldstein release beetles in a purple loosestrife measured quadrant at Flat Pond



In June 2004, the interns released about 3,000 beetles at Burrows Run near the Ashland Nature Center, Hockessin, and another 5,000 at Flat Pond in the C & D canal lands. At both sites, purple loosestrife infestations are beyond mechanical or herbicidal control. Within two weeks at the Flat Pond location, a reduction in percent purple loosestrife coverage in the release quadrant was seen; beetles were still in evidence by summer's end.

Says Pool of his internship experience, "This project has opened my eyes to the aspects of field research, and it has given me a greater sense of responsibility and diligence." Graham agrees and adds, "I learned this is the type of work I would like to do after graduate school. It was an exciting opportunity to use fieldwork and scientific research to make a positive difference in the control of purple loosestrife as an invasive species."

The Del Bay Retriever Club has received a grant from the National Fish & Wildlife Foundation's Chesapeake Bay Small Watershed Grants Program to fund release of more purple loosestrife eating beetles for new **DWRC** interns in 2005. For more details, visit "Horizons": <http://ag.udel.edu/agtoday/>



Purple loosestrife – eating beetles

***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

*UD Institute for Public
Administration*

Jen Gochenaur

Delaware Nature Society

Mark Isaacs

UD Research & Education Center

***Delaware Water
Resources Center
Advisory Panel***

Maria Labreveux

Delaware State University

Ken Lomax

*UD Dept. of
Bioresources Engineering*

Paul Petrichenko

*USDA Natural Resources &
Conservation Service*

Bill Saylor

*UD Dept. of
Animal and Food Sciences*

Carl Solberg

Sierra Club

William Vanderwende

*Delaware Nutrient
Management Commission*

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WATER NEWS – FALL 2004

Delaware Water Resources Center
College of Agriculture and Natural Resources
University of Delaware
113 Townsend Hall
Newark, DE 19716-2103

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

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