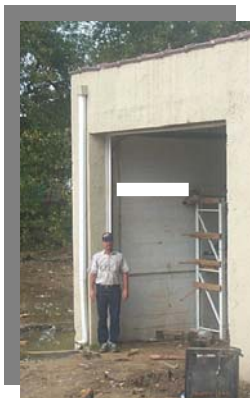


**One Year Later: Sept. 28-29, 2004
Tropical Storm Jeanne
Again Floods the Christina Basin**

*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>*

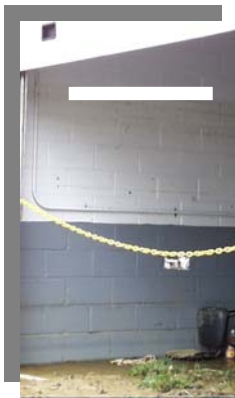
The remnants of Hurricane Jeanne caused widespread flooding in the Red Clay Creek, White Clay Creek, and Christina River drainage basins in northern New Castle County, Delaware on September 28 – 29, 2004. Recorded rainfall in northern Delaware ranged from 8.2" in Ogletown to 3.52" in east Wilmington. 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)*

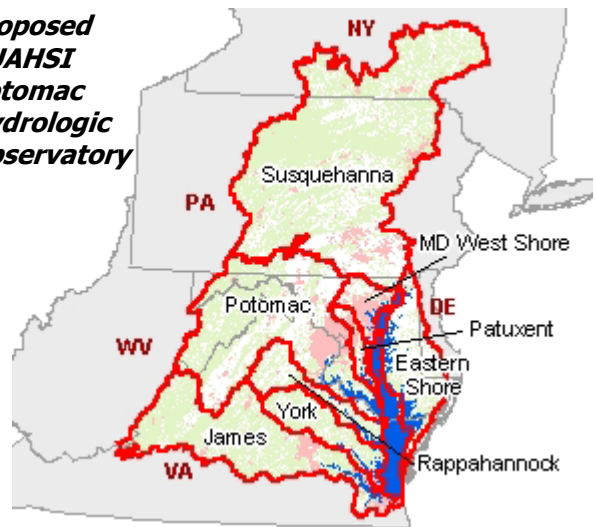
*R. "Jeanne"
Sept. 28,
2004
(10 blocks)*



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

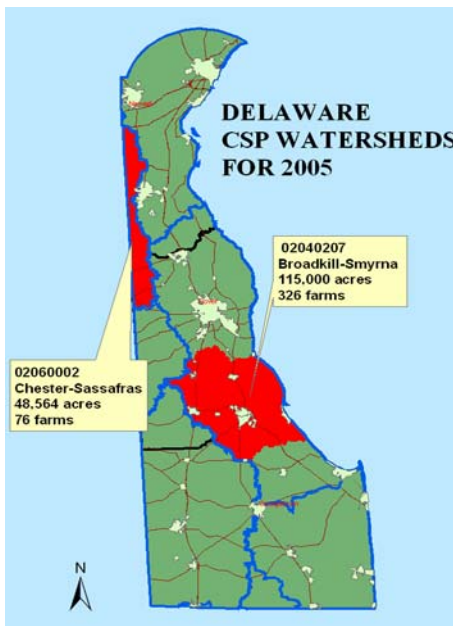
New Delaware State Chapter of the American Water Resources Association Forming:

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/>

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Delaware Geological Survey

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Environmental Engineering*

Judith Denver

U.S. Geological Survey

Kevin Donnelly

*DNREC
Division of Water Resources*

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Delaware Nature Society

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WATER NEWS – FALL 2004

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