DELAWARE WATER RESOURCES CENTER

WATER NEWS

UNIVERSITY OF DELAWARE

Summer – Fall 2010
Volume 11 Issue 1

Features

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THE *UD WATER* PROJECT

The ***UD WATER*** Project (Watershed Action Team for Ecological Restoration) was formed in 2008 as a collaborative initiative with the long-term goal of merging and facilitating university-wide efforts to minimize the environmental impacts of stormwater runoff from the University of Delaware campus. The ***UD WATER*** initiative is synergistic with the University's Path to Prominence strategic goal to become a Green Campus. ***UD WATER*** brings together a consortium of faculty, staff, and students from various disciplines across campus to work collaboratively to implement creative and innovative storm water management techniques. The ultimate goal for this team is to reduce the quantity and increase the quality of storm runoff from campus properties, which will ultimately benefit our local waterways and is consistent with the mission of EPA regulations requiring the University and City of Newark to have a National Pollutant Discharge Elimination System (NPDES) permit. The objectives of the 2010-2011 ***UD WATER*** project are to (1) assemble a team of interns from different disciplines to assist in the initiation of implementation of BMP's that will protect water quality in the White Clay Creek and (2) conduct monitoring and environmental education programs that demonstrate the value of ecologically-based stormwater management practices. More information, and project progress, can be found on the ***UD WATER*** website, http://www.udel.edu/water.

***UD WATER* Team**
Tom Sims, Delaware Water Resources Center (Project Coordinator; jtsims@udel.edu)
Jerry Kauffman, UD Water Resources Agency (Project Coordinator; jerryk@udel.edu)
Carmine Balascio, UD Department of Bioresources Engineering
Stacey Chirnside, UD Department of Bioresources Engineering
Kelley Dinsmore, City of Newark
Andrew Homsey, UD Water Resources Agency
Dan Leathers, UD Department of Geography / Delaware Environmental Observatory System
Mike Loftus, UD Facilities
Jenny McDermott, UD College of Agriculture and Natural Resources
Tom McKenna, Delaware Geological Survey
Martha Narvaez, UD Water Resources Agency
Mike Sistek, City of Newark
Jennifer Pyle, UD Occupational Health and Safety

***2010-2011 UD WATER* Interns** *(pictured above; photo by M. Pautler)*
Melanie Allen – Wildlife Conservation
Rina Binder-Macleod – Environmental Engineering
Dakota Laidman – Environmental Engineering
Melissa Luxemberg – Natural Resources Management
Kimberly Teoli – Environmental Engineering

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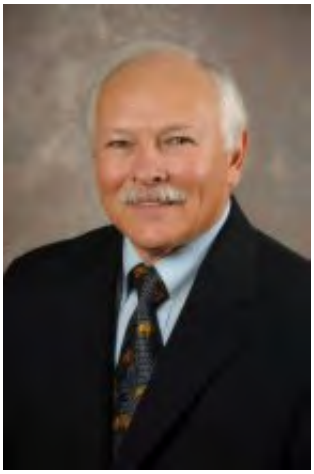
DWRC Spotlight on 2010-11 Undergraduate Internships

(Photo courtesy of UD Geological Sciences personnel)

DWRC intern Kevin Myers describes his internship, "Characterization of Submarine Groundwater Discharge Sites in a Coastal Lagoon," directed by A. Scott Andres of the Delaware Geological Survey: "Within the Indian River Bay natural submarine groundwater discharge (SGD) occurs, allowing fresh water and added nutrients into the surrounding saltwater that composes the bay. For my internship I worked at Holts Landing State Park in Sussex County, Delaware. I worked closely with DGS's Scott Andres and Steve McCreary; UD Department of Geological Sciences graduate students Chris Russoniello and Christina Fernandez and faculty member Dr. Holly Michael; and fellow undergraduate Andrew Musetto to learn more about the SGD occurring in the Indian River Bay and to try to quantify it."

"One method we used to quantify SGD was use of seepage meters to capture water samples from within the bay floor; we then tested the salinities and compared them to the salinities of the natural bay water. The data showed areas that were more prone to SGD by finding areas with lower conductivities than that of the bay conductivity. Another important method that was, and will be used to quantify SGD within this region, is recording and continuously monitoring data from offshore wells. We outfitted a pontoon boat with the necessary equipment and drilled monitoring wells and CMT wells into the bay floor at many different sites. These wells will continue to be used to monitor salinity, temperature, and other water and nutrient tests. The work I contributed to this summer will be used to better understand submarine groundwater discharge and how it is affecting the Indian River Bay."

John H. Talley, Director of the Delaware Geological Survey and State Geologist of Delaware, has announced his retirement effective June 30, 2011. He has been with the Survey since 1972. John is a long-time member of NGWA-AGWSE, a Registered Professional Geologist in Delaware and Pennsylvania, a Certified Professional Geologist of the AIPG, a licensed water well driller in Delaware, and has served on the Delaware Water Well Contractors Licensing Board for more than two decades. An open search is now underway for a new Director. Review of applications will begin **February 1, 2011**. Details can be found at http://www.dgs.udel.edu/director-search.



(Photo courtesy of DGS staff)

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DWRC Partner Passages ~~

Michael P. Totten, chief advisor on climate, water and green technologies at the Center for Environmental Leadership in Business of Conservation International, delivered the 2010 DENIN Dialogue lecture on November 30, 2010 in UD's Mitchell Hall, speaking on the topic "Water in an Uncertain Climate Future."
The podcast is found at:
http://deimos3.apple.com/WebObjects/Core.woa/Browse/udel.edu.3795329742
The slides are found at:
http://denin.udel.edu/sites/denin.udel.edu/files/Water%20in%20an%20Uncertain%20Climate%20Future.pdf

Judith Denver of the Delaware Office of the Maryland-Delaware-DC Water Science Center of the USGS shares the following article about a report recently published by her office:

Occurrence and Distribution of Organic Chemicals and Nutrients and Comparison of Water-Quality Data from Public Drinking-Water Supplies in the Columbia Aquifer in Delaware, 2000–08
by Betzaida Reyes

"The U.S. Geological Survey, in cooperation with the Delaware Department of Natural Resources and Environmental Control and the Delaware Geological Survey, conducted a groundwater-quality investigation to (a) describe the occurrence and distribution of selected contaminants, and (b) document any changes in groundwater quality in the Columbia aquifer public water-supply wells in the Coastal Plain in Delaware between 2000 and 2008. Thirty public water-supply wells located throughout the Columbia aquifer of the Delaware Coastal Plain were sampled from August through November of 2008. Twenty-two of the wells in the sampling network for this project were previously sampled in 2000. Eight new wells were selected to replace wells no longer in use. Groundwater collected from the wells was analyzed for the occurrence and distribution of selected pesticides, pesticide degradates, volatile organic compounds, nutrients, and major inorganic ions. Nine of the wells were analyzed for radioactive elements (radium-226, radium-228, and radon). Groundwater quality data were compared for sites sampled in both 2000 and 2008 to document any changes in water quality."

Find the full report at http://md.water.usgs.gov/publications/sir-2010-5206/index.html.

DWRC Partner Passages ~~

Hollings Undergraduate Scholarship Program

The Hollings Scholarship Program provides successful undergraduate applicants with awards that include academic assistance (up to a maximum of $8,000 per year) for full-time study during the 9-month academic year; a 10-week, full-time internship position ($650 per week) during the summer at a NOAA facility; and, if reappointed, academic assistance (up to a maximum of $8,000) for full-time study during a second 9-month academic year. The internship between the first and second years of the award provides the scholars with "hands-on"/practical educational training experience in NOAA-related science, research, technology, policy, management, and education activities. Awards also include travel expenses to attend a mandatory Hollings Scholarship Program orientation, conferences where scholars present a paper or poster, and a housing subsidy for scholars who do not reside at home during the summer internship. The deadline for application is **Friday, February 4, 2011**.

Eligibility Requirements:
- U.S. citizenship;
- Full-time status as a college sophomore at an accredited college or university within the United States or U.S. Territories;
- Cumulative and semester/quarter GPA of 3.0 (based on a 4.0 scale) in all completed undergraduate courses and in the major field of study;
- Majoring in a discipline area related to oceanic and atmospheric science, research, technology, or education, and supportive of the purposes of NOAA's programs and mission, e.g., biological, social and physical sciences; mathematics; engineering; computer and information sciences; and teacher education.

Visit http://www.oesd.noaa.gov/Hollings_info.html for frequently asked questions and the online application.

Water Resources Research - National Competitive Grants Program
Request for Proposals – FY 2011 / Announcement No. 11HQPA0008

The U.S. Geological Survey, in cooperation with the National Institutes for Water Resources, requests proposals for matching grants to support research on the topic of improving and enhancing the nation's water supply, including (but not limited to) enhancement of water supply infrastructure, development and evaluation of warning systems for extreme hydrological events, integrated management of ground and surface waters, and the resilience of public water supplies. Proposals are sought in not only the physical dimensions of supply, but also the role of economics and institutions in water supply and in coping with extreme hydrologic conditions. Any investigator at an accredited institution of higher learning in the U.S. is eligible to apply for a grant through a Water Research Institute or Center established under the provisions of the Water Resources Research Act of 1984, as amended (http://water.usgs.gov/wrri/institutes.html). Proposals involving substantial collaboration between the USGS and university scientists are encouraged. Proposals may be for projects of one to three years in duration and may request up to $250,000 in federal funds. Successful applicants must match each dollar of the federal grant with one dollar from non-federal sources. Proposals must be filed… at https://niwr.net/ by 4 PM, EST, **Thursday, February 24, 2011** and must be approved for submission to the National Competitive Grants Program not later than 4 PM, EST, Thursday, March 10, 2011 by the Institute or Center through which they were submitted. The SF-424 (Application for Federal Assistance) and SF-424B (Assurances) portion of the application package must be submitted… at http://www.grants.gov not later than 4 PM, EST, Thursday, March 10, 2011 by the university at which the Institute or Center is located… The Government's obligation under this program is contingent upon the availability of funds.

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DWRC Spotlight on Graduate Research

DWRC graduate fellow Claudia Velez Zullo is finishing her Ph.D. studies at UD, working on the project, "Hydrogeologic Characterization of the Potomac Aquifer, Delaware," under the co-supervision of Dr. Susan McGeary, UD Geological Sciences and Dr. Peter McLaughlin, Delaware Geological Survey. For the 2009-10 academic year, Claudia summarized her work as follows:

Claudia Velez Zullo explains her research project on April 23, 2010. (Photo by M. Pautler)

"The purpose of this study is to develop a better understanding of the geologic framework of the Potomac aquifer in the area of the Chesapeake and Delaware Canal through a multidisciplinary investigation that integrates geophysical and geological data. This study will delineate the distribution and extent of aquifer sands, and thereby help to better understand aquifer connectivity and fluid flow pathways. The methodology will employ a novel combination of tools, combining seismic reflection imaging of subsurface geology with analysis of wireline geophysical data from boreholes, collection of core data from the subsurface geologic units, and application of the concepts of sequence stratigraphy. The resulting geologic framework will be tested against hydrological data and observations from the Potomac aquifer. The resulting understanding of aquifer architecture will have significant application to issues in *water supply*, notably a framework of aquifer volume and connectivity for water-use allocations, and in *water quality*, particularly the identification of potential groundwater contaminant pathways below industrial sites in the Delaware City, Delaware area. A number of significant scientific accomplishments were made during the past year:

Seismic data processing completed. Processing was completed at the beginning of the fall semester (2009). The theoretical resolution for these data is 2 m to 4 m, with frequencies ranging from 130 Hz to 160 Hz and velocities from 1650 m/s to 1900 m/s, which is sufficient to resolve aquifer sands in the Potomac Formation ranging from 10 m to 20 m thick.

Drilling of corehole completed. A 152-m-deep corehole was drilled in August 2009 at the Summit Marina, C&D Canal area. The location of the corehole was 70 m away from one of the seismic lines. A complete set of geophysical logs, including a sonic log, was obtained.

Facies classification completed. During the fall semester I made a facies classification of the core samples and made a classification of geophysical log patterns corresponding to those facies. Six facies were identified: paleosols, lake, frequently flooded lake/abandoned channel, levee/splay, splay channel, and active channel.

Core-seismic tie completed. At the beginning of 2010, the sonic log was used to produce a synthetic seismogram to correlate the seismic data and the core. The synthetic seismogram is an important tool for interpretation, providing ground truth for the interpretation of the seismic section. On the basis of this tie, I made a preliminary seismic attribute characterization.

Seismic section interpretation underway. I am tracing seismic horizons to subsequently identify seismic facies bounded by a given set of horizons. We are evaluating seismic interpretation software for this purpose.

Selection of existing geophysical logs for maps and cross sections. Gamma, resistivity, and spontaneous potential logs of wells more than 60 m deep will be selected.

Two presentations have been made at national scientific meetings in technical poster sessions:

Velez, C.C., McLaughlin, P.P., McGeary, S.E., and Sargent, S.L. (2009), Land streamer seismic data from northern Delaware: A viable alternative for imaging aquifers in suburban areas, Eos Trans. AGU, 90(52), Fall Meet. Suppl., Abstract NS13A-1136.

Velez, C., McLaughlin, P.P., McGeary, S., and Sargent, S.L. (2010), Seismic imaging of a cretaceous fluvial system, AAPG Annual Convention and Exhibition, Abstracts Volume, Abstract 728937, p. 264."

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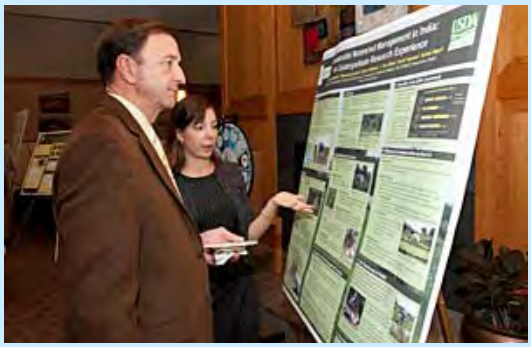
At the 2010 American Water Resources Association annual meeting, held in Philadelphia, PA from November 1-4, former ***DWRC*** undergraduate intern and current UD graduate student Rachael Vaicunas won the best student poster award for her poster, **Sustainable watershed management in India: An undergraduate research experience**. The meeting proceedings can be downloaded at http://www.awra.org/Philadelphia2010/.

(*Photo left by S.Choudhari; photo right by K. Atkinson)*



DWRC Notices and Calendar

UPCOMING MEETINGS

Delaware Section of the American Water Resources Association (AWRA) & the Delaware Student Section of the AWRA

Visit http://www.deawra.org/ or contact de.awra@gmail.com for information and updates

Thursday, Feb. 3, 2011 – DE AWRA annual dinner, 6 PM, Aqua Sol Restaurant, Bear, DE. 302-365-6490.

Jan. 30 – Feb. 2, 2011 – The Delaware Estuary Science and Environmental Summit, "Connections – Land to Sea, Shore to Shore & Science to Outreach," will be held in Cape May, NJ. Visit http://www.delawareestuary.org/news_pde_science_conference.asp.

Mar. 10, 2011 – Delaware River Basin Drinking Water Protection Forum is being planned. Visit http://www.state.nj.us/drbc/.

May 1-5, 2011 – The 2011 conference, "Meeting Groundwater Challenges in Uncertain Times," will be held in Baltimore, MD. Visit http://www.ngwa.org/summit2011/.

WATER NEWS editor Maria Pautler *(in green shirt, right)* had the opportunity to both give and receive input into science-based lessons for youth at the 4-H Science Leadership Academy, held December 7-9, 2010 in Chevy Chase, MD. Graduate students funded by the ***DWRC*** often develop and teach lessons in environmental topics at the 8- through 12-year-old level for summer camp programs coordinated by Delaware 4-H. (*Photo by E. Lopez)*

Delaware Water Resources Center Advisory Panel

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 US 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 more information, visit our website: http://ag.udel.edu/dwrc/

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