DELAWARE WATER RESOURCES CENTER
AT THE UNIVERSITY OF DELAWARE
UNDERGRADUATE INTERNSHIPS
2005 – 2006

The **Delaware Water Resources Center** (***DWRC***) is one of 54 institutes created by the 1964 Water Resources Act at land-grant universities in each state, Puerto Rico, Guam, the Virgin Islands and the District of Columbia. Its funding, administered by the U.S. Geological Survey, was established in Section 104 of the 1984 Water Resources Research Act. The ***DWRC's*** primary goals 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. The ***DWRC's*** website may be found at **http://ag.udel.edu/dwrc/.**

DWRC Undergraduate Internship Program: Since 2000, fifty-one internships have been funded by the ***DWRC.*** Undergraduates at Delaware colleges apply by March each year to earn up to $3500 in ***DWRC*** internships in water-related research and education taking place from June of the same year through March of the following year. A financial match of 2-to-1 is required from the interns' faculty advisors' department in terms of faculty and administrative time dedicated to the project. The "hands on" internship projects address contemporary regional water quality concerns. The interns learn more about their potential for future research, graduate school, and possible careers in water science, policy, and management.

DWRC Director, Dr. J. Thomas Sims

Ten internships have been funded in March 2005 for Summer 2005:

Watershed Assessment

Christi DeSisto is researching measurable environmental indicators for a new "*Delaware River Basin State of the Basin Report Card*" in collaboration with researchers at water resources institutes at Cornell, Rutgers, and Penn State. She is shown at the installed wetland at the University of Delaware (***UD***) Institute for Public Administration Water Resources Agency (***WRA***), where she works with her advisor Gerald Kauffman. The project is co-sponsored by the ***WRA*** and the ***DWRC***.

"This internship has given me the opportunity to apply classroom knowledge to real-world applications. As a Civil Engineer this project has opened my eyes to the importance of environmental engineering in today's society."
– Christi DeSisto

Groundwater Characteristics Mapping

DWRC and the ***Delaware Geological Survey (DGS)*** co-sponsored ***Bailey Dugan's*** internship evaluating the "*Hydrogeology of the Unconfined Aquifer in Sussex County.*" Domestic water use by approximately two-thirds of Delaware's population, and also water use for most of agriculture, Delaware's largest industry, and for self-supplied industrial use, is derived from groundwater sources. Bailey is investigating aspects of groundwater found in shallow aquifers susceptible to pollution. Her advisors are A. Scott Andres and Andrew Klingbeil of the ***DGS.***

"I gained experience in field work and research and learned to compile and interpret large amounts of data through the creation of spreadsheets, contour maps, and cross-sections and the use of Geographic Information Systems." – Bailey Dugan

Freshwater Invasive Plants: Impacts and Biological Controls

Two ***DWRC / UD College of Agriculture and Natural Resources*** co-sponsored internships, both advised by Dr. Judith Hough-Goldstein of the ***UD*** Department of Entomology and Wildlife Ecology**,** deal with purple loosestrife, an invasive plant clogging Delaware freshwater ponds. ***Jason Graham's*** internship is titled "*The Purple Loosestrife Project,"* and ***Jamie Pool*** is evaluating the "*Biological Control of Purple Loosestrife: Preventing Wetlands Degradation by an Invasive Plant."* The interns are hopeful that beetle biological controls they have applied to loosestrife at Flat Pond near the Chesapeake & Delaware canal will reduce these stands significantly.

"It was very rewarding to research in greater depth some of the observations made last summer working with the Purple Loosestrife Project. Our efficiency increased, allowing us to make a greater impact in preserving the biodiversity of the wetlands." -- Jason Graham (left) ***"I feel that this internship has greatly benefited me. It has allowed me to experience first-hand what it is like to work in the field and in an academic research environment. Even more, it has allowed me to do something that I love --- help the environment." -- Jamie Pool (right)***

Water Quality Regulations Perceptions

Matthew Lee is advised by Dr. Joshua Duke and Dr. Rhonda Aull Hyde of the ***UD*** Department of Food and Resource Economics for his ***DWRC/Institute of Soil and Environmental Quality at the University of Delaware*** co-sponsored internship project "*Landowner Perceptions of the Stringency of Water Quality Regulations in Delaware*." Matthew will survey perceptions of policies to investigate landowner compliance costs that may suggest new policies or perhaps new concepts, goals, or enforcement for existing laws.

"Through my DWRC research project I have become aware of current efforts to protect Delaware and Maryland's surface water quality through federal, state, and county regulations. I have had the opportunity to communicate with environmental agency policy-makers to develop a survey testing landowner's perceptions of these regulations. I feel that understanding these perceptions will help in making future recommendations to policy-makers." -- Matthew Lee

Wetlands Legislation Impact Study

Matthew Loiacono is studying "*The Impact of the* **Solid Waste** *Decision on Isolated Wetlands in Delaware*" in his ***DWRC*** internship, teamed with advisors Dr. Joshua Duke and Dr. Steven Hastings of the ***UD*** Department of Food and Resource Economics. His project is co-sponsored by the ***UD College of Agriculture and Natural Resources*** and the ***DWRC***.

"This internship has been a great opportunity for me to explore how wetlands work and what they do for the environment. My research over the summer has allowed me to gain better insight into how wetlands are being protected since the 2001 **Solid Waste** ***decision." – Matthew Loiacono***

Water Quality Testing Accuracy

"The Surface Reactivity of Inert Organic Buffers" is the research topic investigated by ***Brian Rosen*** with his advisor Dr. Donald Sparks of the ***UD Department of Plant and Soil Sciences (PLSC).*** The ***PLSC / DWRC*** co-sponsored project will study what effect, if any, the use of an acid commonly assumed valuable in environmental pollution testing may have on the accuracy of experiments assessing water contamination.

"My DWRC project allows me to take an engineering approach to solve for sorption mechanisms. I have learned how to design batch experiments in order to reveal the sorption kinetics of M.E.S (acid) and Nickel to the mineral goethite and have gained experience in using the analytical equipment needed to monitor my experiments." -- Brian Rosen

Poultry Feed Effects on Water Quality

Carolyn Schnek's project "*The Effect of Dietary Level and Source of Copper (Cu) on Broiler Cu Excretion and Movement of Cu Through Broiler Excreta Amended Soils*" is co-sponsored by the ***DWRC*** and the ***UD College of Agriculture and Natural Resources (CANR).*** The project advisor is Dr. William W. Saylor, joined by additional project investigators Michael Persia and James Skaggs, all of ***UD***'s Department of Animal and Food Science. Carolyn will study the fate and water quality impact of metal nutritional amendments in poultry feed.

"Through my internship with DWRC I have been made aware of the complexities of avian nutrition and management as well as the soil/water interface. I have had the opportunity to participate in a small bird trial as well as a small soil science experiment. This allows me to envision the many aspects of poultry management that affect water quality. Overall, this has been a wonderful learning experience both academically and practically." – Carolyn Schnek

Mosquito Control Water Quality Effect

Nancy Scott will study *"Self-Sustaining, Least-toxic Methods for Managing Mosquito Populations in Stormwater Ponds,"* advised by Dr. Jack B. Gingrich of ***UD***'s Department of Entomology and Wildlife Conservation. In this ***DWRC/CANR*** co-sponsored internship, as an extension to a previous ***DWRC*** public health research project studying West Nile virus-carrying mosquito populations in stormwater retention ponds, Nancy will seek mosquito management methods that are environmentally safe and also cost-effective, requiring minimal human resource inputs to implement.

"Our project surveyed the distribution of mosquitoes throughout Delaware and experimented with ways to control their populations in stormwater retention ponds. Through this internship, I am more aware of the complex communities that are a part of these ponds and the impacts that human activities have on them. " -- Nancy Scott

Coastal Bay Water Quality Restoration

"Restoring Coastal Bay Water Quality via Native Eelgrass Micropropagation" is the title of ***Katherine Tigani's*** internship, co-sponsored by the ***DWRC*** and ***UD College of Marine Studies*** under the advisement of Dr. John L. Gallagher of the UD College of Marine Studies, Lewes, Delaware. Katherine worked during summer 2004 in the ***UD*** Halophyte Biotechnology Laboratory, Lewes, with plant tissue cultures, and now will use that experience to attempt to devise a methodology that can regenerate eelgrass in volume.