

# DELAWARE WATER RESOURCES CENTER

## AT THE UNIVERSITY OF DELAWARE

### UNDERGRADUATE INTERNSHIPS

#### 2000 – 2005

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, forty-one internships have been funded by the *DWRC*. Undergraduates at Delaware colleges apply by March each year for a \$3500 *DWRC* stipend for 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*



**Nine internships have been funded in 2004 – 2005:**

#### Water Monitoring



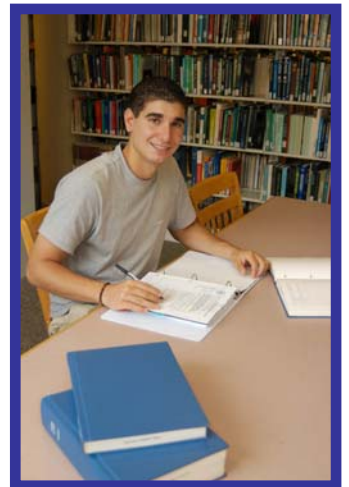
*Carol Carlson's* project is "Monitoring and Assessing the Nutrient Status and Overall Health of Freshwater Wetlands". Her advisor is Dr. Bruce Vasilas of the University of Delaware (*UD*) Department of Plant and Soil Sciences, and the project is co-sponsored by the *UD Department of Plant and Soil Sciences* and the *DWRC*.

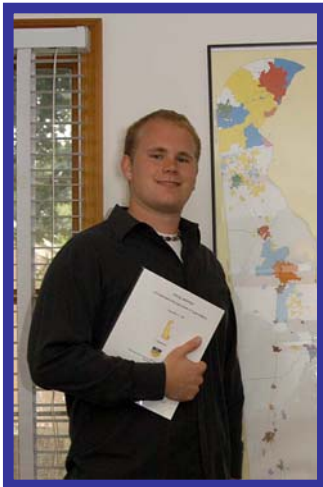
*"Through my internship with DWRC I have been made aware of the different aspects of monitoring and assessing wetlands. I have had the opportunity to participate in soil descriptions at sites that differed in topography, land use, and surrounding geography. I have also been involved in collecting water samples to measure phosphorous and nitrogen levels as well as used equipment to measure soil water temperature and dissolved oxygen. It has been a great learning experience."* – Carol Carlson

#### Water Resources Security

*DWRC* and the *UD College of Arts and Science* co-sponsored *Matthew DeSanctis'* internship evaluating "A Delaware Water Resource Threat Analysis". Matthew is investigating Delaware water supply protection security measures and standards and is assessing current risk. His advisor is Dr. Janet Johnson, *UD* Department of Political Science.

*"My DWRC research project has allowed me to pursue a topic that has long fascinated me. Exploring water security in Delaware has been a challenging undertaking, but I feel understanding the complexities of this issue will help in making recommendations in the future."* – Matthew DeSanctis





### Water Resources Governance

**Steven Ernst's** project explores water resources governance practices and related benefits for the Christina Basin, home to more than half of Delaware's population. His **DWRC/UD Institute for Public Administration Water Resources Agency (WRA)** co-sponsored internship is entitled "An Evaluation of the Economic, Social, Environmental, and Recreation Benefits of the Christina Basin." UD Department of Food and Resource Economics' Dr. Steve Hastings and the **WRA's** Gerald Kauffman are the project advisors.

*"My goal is for Christina Basin residents to experience more effectively coordinated stewardship of their watershed resources. I will recommend approaches to help shareholders best succeed with their proposed conservation programs and policies."*  
-- Steve Ernst



### 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. **Jamie Pool** is evaluating the "Biological Control of Purple Loosestrife at Burrows Run: Preventing Wetlands Degradation by an Invasive Plant," and **Jason Graham** is studying the "Biological Control of Purple Loosestrife at Flat Pond: Reclaiming a Freshwater Pond near the C&D Canal."

*"This project has opened my eyes to the aspects of field research, and it has given me a greater sense of responsibility and diligence."* -- Jamie Pool

*"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 an invasive species."* -- Jason Graham



### Water Quality Monitoring

**Matt King** is advised by Dr. James Glancey of the **UD Departments of Bioresources Engineering and Mechanical Engineering** for his **DWRC/Delaware Department of Natural Resources and Environmental Control (DNREC)** co-sponsored internship project "Enhanced Testing Method for Delaware's Shallow Depth Estuaries." Matt aims to design, build, and field test enhanced features to an existing automated variable depth water quality testing system, focusing on improved communication of data for effective detection of harmful algal blooms.

*"My efforts have been iterative and evolving, and I learned that a project of this scope is a real challenge. I look forward to passing on what I have learned with the goal of continued improvement of the design of this water quality monitoring system."* -- Matt King

### Water Quality Study

**Trevor Knight** is studying "Fish Communities and Indicators of Water Quality: Quantifying the Response of Aquatic Systems to Pollutant Inputs in Delaware Headwaters" in his **DWRC** internship, teamed with advisors Dr. Dewayne Fox and Dr. Maria Labreuve of **Delaware State University (DSU)** Department of Agriculture and Natural Resources. Trevor hopes to measure fish health for water quality assessments in all three Delaware counties.



*"This project has given me a better understanding of fish communities in small streams and has allowed me to work with water pollution response in fishes I have never seen before."* -- Trevor Knight

## Water Quality Survey

“Assisting Small and Underserved Farmers in Meeting Water Quality Objectives” is the research topic for **Alicia Revis**’ project, sponsored by the **DWRC**. Her advisor is Dr. Dennis McIntosh of the **Delaware State University (DSU)** Department of Agriculture and Natural Resources. Alicia will evaluate farm drinking water samples for possible contaminants, then report results and explain assistance programs available to address any water quality problems identified.

*“I am working with a number of people, including extension agents and a microbiologist, and learning the value of patience and persistence in gathering data. I am glad to have this opportunity to rise to the challenge of working in the public arena on water quality issues.”*  
-- Alicia Revis



## Chesapeake Bay Water Quality



**Erin Zimich**’s project “Evaluating Land Application of Wastewater as a Nutrient Reduction Strategy for the Chesapeake Bay” is co-sponsored by the **DWRC** and the **UD College of Engineering**. Dr. Bill Ritter of **UD**’s Department of Civil and Environmental Engineering is the project advisor. Erin will inventory current and prospective land application sites and will consider the costs of additional application facilities for potential further nutrient reduction.

*“My internship has given me perspective on the state of water quality in the Chesapeake Bay and made me realize that, in order to maintain this precious resource, drastic measures must be taken.”* --Erin Zimich

## DELAWARE WATER RESOURCES CENTER AT THE UNIVERSITY OF DELAWARE PRIOR UNDERGRADUATE INTERNS 2000 – 2004

Visit <http://ag.udel.edu/dwrc/publications.html> for Project Abstracts

### 2003 – 2004 Intern:

Megan Bielawa

Kathleen Cormier

Justin Glier

Andrew Joslyn

Alice McDermott

Mark Neimeister

Kate Schutte

Kristen Sentoff

Matt Simon

Judith Walker

### Faculty Advisor:

Dr. Jack Gingrich  
UD Dept. of Entomology and  
Applied Ecology  
Martin Wollaston  
UD Water Resources Agency

Dr. Donald Sparks  
UD Dept. of Plant and Soil Sciences

Dr. Steven Dentel  
UD Dept. of Civil & Environmental Eng.  
Anastasia Chirnside  
UD Dept. of Bio-Resources Engineering  
Scott Andres  
Delaware Geological Survey

Dr. Steven Dentel  
UD Dept. of Civil & Environmental Eng.  
Gerald Kauffman  
UD Water Resources Agency

Dr. Eric Wommack, UD Dept. of  
Plant and Soil Sciences / College of Marine Studies  
Gerald Kauffman  
UD Water Resources Agency

### Project:

*Factors Affecting West Nile Virus Transmission  
from Stormwater Retention Ponds and  
Constructed Wetlands*

*Field Measurements of Non Point Source Pollutant  
Removal Efficiencies of Stormwater BMPs at the  
UD Experimental Watershed*

*Role of Urea as the Soil Nitrogen Source in the  
Uptake of Nickel in Allysum Hyperaccumulating  
Species*

*Enhanced Pollutant Biodegradation by Electrode  
Use*

*Biological and Enzymatic Treatment of a Food UD  
Processing Wastewater*

*Nanticoke Watershed Total Maximum Daily Load  
(TMDL) Project*

*Enhanced Pollutant Biodegradation by Electrode  
Use*

*Fairfield Run: An Evaluation of Stream Habitat  
Restoration at the UD Experimental Watershed*

*Characterization of Autochthonous Viral  
Communities in Estuarine Waters*

*Blue Hen Creek: An Evaluation of Stream Habitat  
Restoration at the UD Experimental Watershed*

**DELAWARE WATER RESOURCES CENTER AT THE UNIVERSITY OF DELAWARE**  
**PRIOR UNDERGRADUATE INTERNS 2000 – 2004**

Visit <http://ag.udel.edu/dwrc/publications.html> for Project Abstracts

**2002 – 2003 Intern:**

**Laura Boyer**

**Alexander M. DeWire**

**Michael League**

**Kristen A. Sentoff**

**Aditya Sharma and  
Bret Strogon**

**Kerrie Smith**

**Faculty Advisor:**

Dr. Tom Sims  
UD Dept. of Plant and Soil Sciences  
Dr. Janet B. Johnson  
UD Dept. of Political Science  
Dr. John L. Gallagher  
UD College of Marine Studies  
Dr. Joshua Duke  
UD Dept. of Food & Resource Economics  
Dr. Steven Dentel and  
Dr. Pei Chiu, UD Dept. of  
Civil and Environmental Engineering  
Dr. James Glancey  
UD Dept. of Mechanical Engineering  
and Dept. of Bioresource Engineering

**Project:**

*Chemistry of Phosphorus in the Erodible Fraction of Delaware Soils*  
*Implementation of Riparian Buffers in Southeastern Pennsylvania, Delaware, and Eastern Maryland*  
*Understanding the Mechanisms of the Spread of Phragmites: For Better or For Worse*  
*Regulating Wetlands in Delaware in a Changing Legal Environment*  
*Accelerated Bioremediation of Wastewater using Electrode-Reducing Microorganisms*  
  
*An Autonomous Full Water Column Environmental Monitoring System with Telemetry*

**2001 – 2002 Intern:**

**Christina Eckstrand**

**Tara Harrell**

**Katie Lemon**

**Kirsten Lloyd**

**John Place**

**Lindsay Scanlon**

**Kristin Staats**

**Faculty Advisor:**

Dr. Bill Saylor  
UD Dept. of Animal and Food Sciences  
Mr. Gerald Kauffman  
UD Water Resources Agency  
  
Dr. Joshua Duke  
UD Dept. of Food and Resource Economics  
Dr. Bruce Vasilas  
UD Dept. of Plant and Soil Sciences  
Ms. Susan Truehart Garey  
Kent County Cooperative Extension  
Dr. Ron Martin  
UD Dept. of Geology  
Dr. Bruce Vasilas  
UD Dept. of Plant and Soil Sciences

**Project:**

*Fate of Microbial Phytase in the Gastrointestinal Tract of Chicks and Effects on Phosphorus Solubility*  
*Connecting the Link Between Land Use and Stream Health in the University of Delaware Experimental Watershed*  
*An Analysis of Delaware's Groundwater Allocation Laws: Proposing a Plan*  
*Functional Assessment of Wetlands for Mitigation Purposes*  
*A Nutrient Management Education Program for Delaware Youth*  
*Stratigraphic Analysis of the St. Jones River Estuary*  
  
*Ectomycorrhizae as a Hydrologic Indicator in Wetland Identification*

**2000 – 2001 Intern:**

**Gregory Buckmaster**

**Jennifer Campagnini**

**Maeve Desmond**

**Robert Ehemann**

**Emily Gonce**

**Jason Hetrick**

**Leigh Johnson**

**Anna Palermo**

**Melissa Weitz**

**Faculty Advisor:**

Dr. Jeffrey Fuhrmann  
UD Dept. of Plant and Soil Sciences  
Mr. Gerald Kauffman  
UD Water Resources Agency  
Dr. Bruce Vasilas  
UD Dept. of Plant and Soil Sciences  
Dr. Joshua Duke  
UD Dept. of Food and Resource Economics  
Dr. James Morrison and  
Dr. Hye-Shin Kim  
UD Dept. of Consumer Studies  
Anastasia Chirnside  
UD Dept. of Bioresources Engineering  
Dr. William Ritter  
UD Dept. of Bioresources Engineering  
  
Dr. Bruce Vasilas  
UD Dept. of Plant and Soil Sciences  
Dr. Mark Radosevich  
UD Dept. of Plant and Soil Sciences

**Project:**

*The Impact of Alum on Pathogen Survival in Poultry Litter*  
*The University of Delaware Experimental Watershed Project*  
*Functional Assessment of Wetlands Using a Hydrogeomorphic Model*  
*A Spatial Analysis of the Distributional Effects of Water Quantity Management*  
*Attitudes of Consumers Towards Bottled Water*  
  
*Feasibility of Using a Fungal Bioreactor In Treating Industrial Wastewater*  
*Feasibility of Composting Poultry Litter and Food Residuals for Use as a Soil Amendment and Potting Medium*  
*Ectomycorrhizal Mantles as Indicators of Historic Hydric Soils*  
*Biodiversity of the atrazine chlorohydrolase (atzA) gene in Soil Microbial Communities as a Function of Triazine Treatment History*