

A large, multi-layered 'DWRC' logo is superimposed over a photograph of a waterfall. The letters are white and semi-transparent, creating a sense of depth. The background shows water cascading over rocks in a natural setting.

DWRC
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DWRC

A scenic photograph of a river flowing through a forest. The water is clear and greenish-blue, surrounded by dark rocks. The trees are lush green with some yellowing, suggesting an autumn setting. The lighting is soft and natural.

Delaware Water
Resources Center
at the University of Delaware

Undergraduate
Internships
2000-2009

The official logo of the University of Delaware, featuring a stylized 'U' and 'D' intertwined, with the words 'UNIVERSITY OF DELAWARE' to the right.

UNIVERSITY OF
DELAWARE

The Delaware Water Resources Center (DWRC) is one of 54 Water Resources Research Institutes created by the 1964 U.S. Water Resources Act in each state, and in Puerto Rico, Guam, the Virgin Islands, and the District of Columbia. The institutes receive their support from the U.S. Geological Survey and from partners within their own states. 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. We work with virtually every organization and agency in the state of Delaware that has an interest or responsibility in the water resources arena. For more information on the DWRC, visit our website: <http://ag.udel.edu/dwrc/>.

DWRC Undergraduate Internship Program

Established in 2000, the DWRC's undergraduate internship program has now supported more than 95 water resources research and education projects. Undergraduate student interns at the University of Delaware (UD) and Delaware State University (DSU), working with faculty advisors, have conducted projects covering a diverse range of water-related topics. Some examples of their research, and a complete list of all internship projects, are provided in this publication. The internships also provide students with the opportunity to learn more about the potential for future research, graduate school opportunities, and careers in water science, policy, and management. Ten DWRC partners provide financial support to the DWRC internship program. Information on how to apply for a DWRC internship can be found at the following website: <http://ag.udel.edu/dwrc/job.html>

DWRC Director, Dr. J. Thomas Sims



Partners:

UD College of Agriculture and Natural Resources
UD College of Arts and Sciences
UD College of Engineering
UD College of Marine and Earth Studies
UD Water Resources Agency
UD Institute of Soil and Environmental Quality
UD Department of Plant and Soil Sciences
Delaware Geological Survey
Delaware State University
Delaware Department of Natural Resources and Environmental Control



Delaware Water Resources Center – Internship Projects

As described below, the DWRC's "hands-on" internships address contemporary water quality concerns and provide students with an opportunity to apply their classroom educational experiences to real-world problems. Financial support from the DWRC and its partners enables interns to have a complete research experience - identifying a topic, conducting a research or education project, analyzing and interpreting results, preparing a final report, and presenting the findings at the annual UD Undergraduate Research Conference.

The UD WATER Project

Stormwater management is one of the major challenges facing the University of Delaware and the City of Newark. Primary areas of concern are that runoff from the UD campus and the City contributes to nonpoint source pollution of area streams and also to downstream flooding.

UD WATER (Watershed Action Team for Ecological Restoration) is a new, university-wide project, conducted in collaboration with the City of Newark, which seeks to develop and implement management measures to mitigate the stormwater runoff problems facing UD and the City. *UD WATER* brings together faculty, professional staff, and students from a wide variety of disciplines and interests.

The project, funded by a state of Delaware NPS 319 grant, the Delaware Water Resources Center, and the UD Water Resources Agency,

focuses primarily on ecological restoration of stream corridors, wetlands, and other natural resource areas on the UD campus. These restoration projects, in conjunction with improved environmental education and more effective land-based nonpoint source pollution control measures, are the keys to improving water quality, enhancing stream health, and minimizing flooding.

The initial focus of the *UD WATER* team is the development of a watershed plan for the Cool Run tributary of the White Clay Creek; larger, campus-wide efforts are planned as well.

Launched in the fall of 2008, the multi-disciplinary *UD WATER* project (see below for current participants) is now supporting the



Pictured left to right - Stracy Redis, Nicole Dobbs, Erik Eggleston, Erin Dilworth, Kelsey Lanan, Samantha Loprinzo

efforts of a six-member undergraduate student intern team to develop a watershed action plan for the Cool Run watershed. If you are interested in joining the *UD WATER* team, contact Dr. J. Thomas Sims (jtsims@udel.edu) for more details.

UD WATER Undergraduate Internship Program • Interns Selected for 2008-2009:

Nicole Dobbs

Advisor: Dr. Anastasia Chirnside, UD Department of Bioresources Engineering

Erik Eggleston

Advisor: Mr. Gerald Kauffman, UD Water Resources Agency

Samantha Loprinzo

Advisor: Dr. Tom Sims, Delaware Water Resources Center

Erin Dilworth

Advisor: Mr. Gerald Kauffman, UD Water Resources Agency

Kelsey Lanan

Advisor: Dr. Tom McKenna, Delaware Geological Survey

Stracy Redis

Advisor: Dr. Carmine Balascio, UD Department of Bioresources Engineering

Other UD WATER Team members:

Martha Corrozi Narvaez, UD Water Resources Agency

Kelley Dinsmore, City of Newark

Andrew Homsey, UD Water Resources Agency

Kiersten Joesten, UD Water Resources Agency

Dave Levandoski, UD Occupational Health and Safety

Dan Leathers, UD Department of Geography / Delaware Environmental Observatory System

Mike Loftus, UD Facilities

Jenny McDermott, UD College of Agriculture and Natural Resources

Mike Sistik, City of Newark

Tom Taylor, UD Facilities

Leslie York-Hubbard, UD Occupational Health and Safety

Assisting Small and Underserved Farmers in Meeting Water Quality Objectives; Fish Assemblages as Indicators of Stream Water Quality

Co-Sponsor: Delaware State University

Trevor Knight and **Alicia Revis** were the first DWRC interns from Delaware State University. For her project, "Assisting Small and Underserved Farmers in Meeting Water Quality Objectives," Alicia Revis conducted a survey in Kent County to evaluate farm drinking water samples for possible contaminants. She reported her results in educational workshops that explained the assistance programs available to help small, underserved farmers address water quality issues. Dr. Dennis McIntosh of the Delaware State University Department of Agriculture and Natural Resources advised Alicia. Trevor Knight's project, "Assessing the Feasibility of Using Fish Assemblages as Indicators of Water Quality in Delaware Streams," measured fish health in all three Delaware counties. Trevor's advisors were Dr. Dewayne Fox and Dr. Maria Labreueux, from Delaware State University's Department of Agriculture and Natural Resources. Alicia went on to study the effects of carbon dioxide on algal blooms with Dr. Gulnihal Ozbay at Delaware State University, while Trevor worked toward his M.S. in fisheries science, with an emphasis on aquatic vegetation management, at Texas A&M.

"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

"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



Beneficial Insect Control of Invasive Plants That Damage Delaware Wetlands

Co-Sponsor: UD College of Agriculture and Natural Resources

Jamie Pool and **Jason Graham's** projects, conducted jointly by the two interns and completed over two years, dealt with purple loosestrife, an invasive plant clogging Delaware freshwater ponds. The first year, the interns used *Galerucella* beetles as biological controls for loosestrife at Flat Pond near the Chesapeake & Delaware Canal. They set up an insect release and monitoring project aimed at reducing the size of the loosestrife plant community which would then help to restore the health of the wetlands. The following year, Graham compared the biodiversity of Flat Pond, where a colony of loosestrife-targeting beetles was successfully established, to an Ashland Nature Center site where the beetles did not thrive. Pool's second-year project sought to determine whether greater biodiversity subjects beetle populations to higher predator risks. Jason and Jamie were advised both years by Dr. Judith Hough-Goldstein of the University of Delaware's Department of Entomology and Wildlife Ecology. Additional funding to support their studies was provided by the University of Delaware Office of Undergraduate Research, the Delaware Nature Society, the Delaware Bay Retriever Club, the National Fish and Wildlife Foundation, and the Chesapeake Bay Small Watershed Grants Program. Jason went on to attend graduate school in Entomology at the University of Florida, and Jamie worked for Apple Computer before attending Pace Law School in White Plains, NY, known for its environmental law program.

"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 (left)

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



Links between Land Use and Stream Health in the University of Delaware Experimental Watershed

Co-Sponsor: UD Institute for Public Administration Water Resources Agency

Tara Harrell Sieber

characterized and delineated an "Experimental Watershed" on the University of Delaware campus, developing indicators that could be used to relate stream water quality to local land uses. She used these indicators to prepare a "report card" on the health of the Watershed in 2001, focusing on nitrogen and phosphorus loading from urban and suburban land uses. Her internship project was one of the first steps in an effort by the UD Water Resources Agency and others in UD's "water community" to use the experimental watershed in on-campus education and research projects. Gerald Kauffman of the University of Delaware Water Resources Agency was her advisor. Tara went on to work for the Virginia Department of Environmental Quality.



Wastewater Application and Chesapeake Bay Water Quality

Co-Sponsor: UD College of Engineering

Erin Zimich's internship research focused on understanding the extent to which land application of wastewater from municipalities, as opposed to point source discharge to streams, could help reduce nutrient loads to the Chesapeake Bay. She inventoried current and prospective land application sites in all six states in this watershed and characterized their suitability for wastewater irrigation based on soil properties, hydrology, and other site factors. Erin also investigated the costs and benefits of increasing the use of this best management practice throughout the watershed. Dr. William Ritter, University of Delaware's Department of Bioresources Engineering, served as her advisor.

"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



Eelgrass - A Key to Restoration of Water Quality in Coastal Bays

Co-Sponsor: UD College of Marine and Earth Studies

Finding ways to mass-produce eelgrass for large-scale coastal bay water quality restoration projects was the goal of **Katherine Tigani's** internship project. Tigani, advised by Dr. John L. Gallagher of the University of Delaware's College of Marine and Earth Studies, built upon the research she had done previously in the University of Delaware Halophyte Biotechnology Laboratory. In her internship research, she worked to devise a micro-propagation methodology that could regenerate eelgrass in large volumes for use in restoration projects. After completing her undergraduate degree, Katherine enrolled in graduate school at the University of Delaware's College of Marine and Earth Studies, where, funded by a two-year grant from CICEET, she extended the work she did as an intern.

"This DWRC internship has been an amazing experience. Not only has it led to some exciting results in the lab, but the project has developed into a thesis for my Master's degree at the College of Marine Studies. Through the internship, I was able to gain valuable contacts in the field and have now arranged to begin field collections along both coasts of the U.S."

– Katherine Tigani



Managing Mosquitoes in Storm Water Ponds to Prevent Spread of West Nile Virus

Co-Sponsor: UD College of Agriculture and Natural Resources

Nancy Scott researched sustainable, non-toxic methods to manage mosquito populations in ponds constructed to retain storm water runoff in urban and suburban landscapes. This public health oriented research focused on practical means to control the mosquitoes that are vectors of West Nile virus, a well-known threat to human and animal health, as well as nuisance mosquito species. Nancy worked with Dr. Jack B. Gingrich of the University of Delaware's Department of Entomology and Wildlife Conservation to design and test mosquito management methods that were environmentally safe, cost-effective, and require minimal human resource inputs to implement. Since graduating from the University of Delaware with her B.S. in environmental science in 2006, Nancy has worked as a contractor to the U.S. Army Center for Health Promotion and Preventive Medicine, first at Ft. Meade, MD and then at the Landstuhl Regional Medical Center in Germany, where she set up a new diagnostic lab for detecting pathogens transmitted by arthropods.

"Our project surveyed the distribution of mosquitoes throughout Delaware and experimented with ways to control their populations in storm water 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



Rain Gardens and Environmental Landscaping

Co-Sponsor: UD Department of Plant and Soil Sciences

Leslie Carter's internship focused on educating the public about the water quality value of environmental landscaping through her efforts to promote the use of "Rain Gardens" as a runoff control best management practice. She initially began working on rain gardens as a University of Delaware Science and Engineering Scholar and expanded upon these efforts during her DWRC internship. Her project involved disseminating information on how to design and install rain gardens to the public. She also worked on the creation of interpretive signage for a large rain garden located at the University of Delaware Water Resources Agency. Dr. Susan Barton of the University of Delaware's Department of Plant and Soil Sciences served as Leslie's advisor. In 2007, Leslie finished a project at St. Andrew's School, in which she redesigned a courtyard space between dormitories and wrote interpretive signs for the rain garden and meadow. Leslie also served as a Continuing Education Intern at Longwood Gardens in 2007 and plans to study landscape architecture in graduate school.

"For the DWRC internship I studied rain gardens. It was a great opportunity to work on a long term and in-depth project on a topic of my interest. The contacts I made during this internship with cooperative extension agents, master gardeners, and other horticulturists provided one of the first steps in developing a professional network. The internship also helped me develop skills in communication, research, and design which have since proved to be very helpful in accomplishing my goals in horticulture. The project I worked on is an interesting topic and people still ask me about rain gardens rather frequently. I continually use the knowledge, connections, and skills that I gained from the DWRC internship." – Leslie Carter



Heavy Metal-Contaminated Soils and Water Quality

Co-Sponsor: UD Department of Plant and Soil Sciences

Brian Rosen studied the rate of heavy metal reactions with iron oxides, an important soil constituent. He investigated how the methodology used to quantify nickel sorption in contaminated soils would improve our ability to predict the movement of heavy metals from soils to ground and surface waters.

Developing accurate methods to study metal movement in soils is important to modeling and remediation efforts at sites polluted by industrial sources of nickel and other heavy metals. Dr. Donald Sparks, of the University of Delaware's Department of Plant and Soil Sciences, was Brian's advisor. Brian earned his B.S. in chemical engineering at the University of Delaware.

"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



Nutrient Status and Ecological Health of Freshwater Wetlands

Co-Sponsor: UD Department of Plant and Soil Sciences

Carol Carlson's internship project focused on monitoring and assessing the nutrient status and overall health of freshwater wetlands. Using six freshwater wetlands located in Delaware, Maryland, and Pennsylvania, she conducted extensive sampling for pollutants and stressors, such as nutrients (nitrogen and phosphorus), heavy metals, sediment, organics, pathogens, pesticides, extreme pH, and biological oxygen demand. Biological indicators, like salamanders and plant community diversity, were also investigated and used to characterize overall wetland health, based on hydrology, habitat status, soils, and water quality. Carol's advisor was Dr. Bruce Vasilas of the University of Delaware's Department of Plant and Soil Sciences, and she graduated from the University of Delaware in Plant Science.

"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



Animal Nutrition – Links to Water Quality

Co-Sponsor: UD Institute of Soil and Environmental Quality

Jarvon Tobias's project investigated how copper used in poultry feed affected the fate of copper in manures applied to cropland. Preventing copper transport from manured soils to surface waters is important to ecosystem health and to protect aquatic life. Her research contributed to an understanding of how animal diets can be formulated to optimize poultry health while protecting water quality. Dr. William Saylor of the University of Delaware's Department of Animal and Food Sciences advised Jarvon, who went on to Veterinary School at Tuskegee University.



Characterizing the Hydrologic Properties of Delaware Aquifers

Co-Sponsor: Delaware Geological Survey

Ground water aquifers in southern New Castle County are the main water sources for domestic, irrigation, and public well use, the source of all base flow in local streams, and a conduit to all ground water in deeper confined aquifers.

Elizabeth Wolff's project involved measuring the saturated hydraulic conductivity of these important Delaware aquifers, to allow future quantitative analysis of water availability, sustainable pumping rates, and contaminant transport. Scott Andres of the Delaware Geological Survey served as Elizabeth's advisor.

Elizabeth graduated from the University of Delaware in May 2007 and worked for DGS before beginning a hydrologist position with DNREC Tanks Management Branch in New Castle, DE.



Innovative Strategies for Bioremediation of Wastewaters

Co-Sponsor: UD College of Engineering

Bret Strogon researched the design and use of bioremediation systems to clean up wastewaters. He worked on the development of a novel pollution removal system that showed how a microbial "bioreactor" used to purify wastewaters and sludges could also be designed to generate electricity. Dr. Steven Dentel and Dr. Pei Chiu of the University of Delaware's Civil and Environmental Engineering Department advised Bret. After earning his B.S. in environmental engineering at the University of Delaware, Bret completed an M.S. in environmental engineering at the University of California at Berkeley and became a Project Engineer at Weston Solutions in West Chester, PA. Bret, a Morris K. Udall scholarship recipient while an undergraduate, served as a Biofuels Event Coordinator for the Udall Ten-Year anniversary bus tour (udall.gov), educating his group and the public about the use of alternative fuels.



"My reactor obtains a current by connecting anaerobic wastewater sludge to an aerated water zone. This research may shed light on new ways to accelerate pollution removal, or even to provide small amounts of useful electricity." – Bret Strogon

Streamside Buffers in the Chesapeake Bay Watershed

Co-Sponsor: UD College of Arts and Sciences

Alexander DeWire's internship project examined factors affecting the implementation of riparian buffers in Southeastern Pennsylvania, Delaware, and Eastern Maryland. Under the advisement of Dr. Janet Johnson of the University of Delaware's Department of Political Science, Alex measured the extent of streamside reforestation undertaken by property owners in the Chesapeake Bay Watershed to reduce nonpoint pollution. His project also involved developing a means for organizations involved in nonpoint pollution control to track homeowners' efforts to improve water quality. After graduating from the University of Delaware, Alex graduated from Yale's School of Forestry and Environmental Management with a Master's in environmental management and worked for Tetra Tech, Inc., a water resources consulting firm in Fairfax, VA.

"I want to gain insight about the difficulties, advantages, and methods of researching a political and environmental issue, such as riparian buffering, which is timely and also interesting. My goal is to educate landowners about the advantages of riparian buffering, including whom to contact for information and how to get funding for this best management practice." – Alex DeWire



Delaware Water Resources Center at the University of Delaware

Undergraduate Interns: 2000 – 2009

Intern

Advisor(s)

Department(s)

Project title

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

Undergraduate Interns 2008-2009

Alexandra Barnard

Dr. William Saylor

UD Department of Animal and Food Sciences

Assessing the Presence of Natural Hormones in Litter and Excreta from Broiler Chickens

Christen Dillard

Dr. Gulnihal Ozbay

Delaware State University Department of Agriculture and Natural Resources

Water Quality and Bacterial Monitoring at Delaware Inland Bays Oyster Gardening Sites, Delaware

Erin Dilworth

Dr. Chris Williams

UD Department of Entomology and Wildlife Ecology

The Effect of Riparian Forested Corridors on Fish Biodiversity in Suburban and Agricultural Landscapes

Cristina Fernandez

Dr. Kyungsoo Yoo

UD Department of Plant and Soil Sciences

Spatial and Temporal Integration of Pollution History in the Christina River Basin Using Sediment Cores from Bread and Cheese Island

Aaron Gibson

Dr. Gulnihal Ozbay

Delaware State University Department of Agriculture and Natural Resources

Effects of Water Quality on Oyster Growth (Crassostrea virginica) in the Floating Oyster Aquaculture Gear in Delaware's Inland Bays

Erin McVey

Dr. Steven Hastings

UD Department of Food and Resource Economics

Delaware Coastal Zone Act's Impact on Water Quality

Rachael Vaicunas

Dr. Pei Chiu

UD Department of Civil and Environmental Engineering

Zero-valent Iron and Other Additives to Enhance Biofiltration of Water

Caitlin Wilson

Dr. Steven Dentel

UD Department of Civil and Environmental Engineering

Exploring Direct Contact Membrane Distillation (DCMD) as for Water Purification

Edwin Wong

Dr. Steven Dentel

UD Department of Civil and Environmental Engineering

Direct Contact Membrane Distillation of Brackish and Contaminated Water Sources for Sourcing Potable Water

Adam Yoskowitz

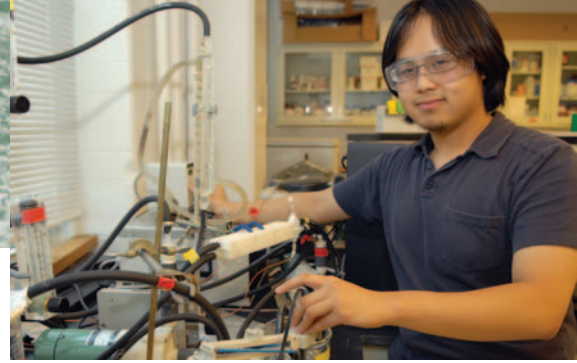
Dr. Kalmia Kniel

UD Department of Animal and Food Sciences

Removal and Inactivation of Pathogenic Enteric Viruses and Parasites from Water Using Zero-valent Iron



Belinda Gao



Edwin Wong

Undergraduate Interns 2007-2008

Sarah Chatterson

Dr. Joshua Duke

UD Department of Food and Resource Economics

Willingness to Pay for Sustainable Agricultural Practices in an Urbanizing Region

Jennifer Handlin

Dr. Yan Jin

UD Department of Plant and Soil Sciences

Evaluating the Use of Zerovalent Iron to Remove Pathogens from Water

Nathan Kiracofe

Dr. Shreeram Inamdar

UD Department of Bioresources Engineering

Assessment of Baseline Water Quality and Influent Pollutant Source Identification in the Noxontown Pond Watershed, Middletown, DE

Stephen Mayer

Dr. Joshua Duke

UD Department of Food and Resource Economics

Benefit-Cost Analysis of Pelletized Broiler Litter in Agronomic Crop Production and Turf Grass Management

Oluchi Ukaegbu

Dr. Gulnihal Ozbay

DSU Department of Agriculture and Natural Resources

*Viability of a Freshwater Mussel (*Elliptio complanata*) as a Biological Filter for Aquaculture Pond Water Quality*

Laura Yayac

Gerald Kauffman

UD Water Resources Agency

Stream Restoration of a Piedmont Headwater Stream in the White Clay Creek Wild and Scenic Watershed

Undergraduate Interns 2006-2007

Jennifer Boutin

Dr. David Legates

UD Department of Geography

The Effect of Proposed Climatic Warming on the Hydrological Cycle

Belinda Gao

Dr. Steven Dentel

UD Department of Civil and Environmental Engineering

Enhanced Pollutant Biodegradation by Electrode Use

Jason Graham

Dr. Judith Hough-Goldstein

UD Department of Entomology and Wildlife Ecology

Predators of Galerucella Beetles, Biocontrol Agents of Purple Loosestrife

Garrett Peters

Dr. William Ullman and Dr. Douglas Miller

UD College of Marine and Earth Studies, Lewes, DE

Groundwater Seepage at Roosevelt Inlet, Delaware

Samantha Smith

Dr. Diane Herson

UD Department of Biological Sciences

Detection of Salmonella in Biosolids Using PCR

Le'Sasha Stewart

Dr. Gulnihal Ozbay

DSU Department of Agriculture and Natural Resources

*Assessment of Sediment Macro-infaunal Communities Associated with Eastern Oyster (*Crassostrea virginica*) in Delaware Indian River Bay*



Maia Tatinclaux

Sarah Sturtz

Dr. John Gingrich
UD Department of Entomology and Wildlife Ecology
Sustainable Mosquito Control for Stormwater Ponds

Jarvon Tobias

Dr. William Saylor
UD Department of Animal and Food Sciences
The Effect of Dietary Level and Source of Copper on Chemically-defined Fractions of Copper in Broiler Excreta

Elizabeth Wolff

Scott Andres
Delaware Geological Survey
Hydraulic Properties of the Unconfined Aquifer in Southern New Castle County

Undergraduate Interns 2005-2006

Leslie Carter

Dr. Susan Barton
UD Department of Plant and Soil Sciences
Rain Gardens

Christi DeSisto

Gerald Kauffman
UD Water Resources Agency
Delaware River State of the Basin Report 2006: Development of Environmental Indicators

Bailey Dugan

Scott Andres and Andrew Klingbeil
Delaware Geological Survey
Hydrogeology of the Near-surface Aquifers in Sussex County

Jason Graham

Dr. Judith Hough-Goldstein
UD Department of Entomology and Wildlife Ecology
The Impact of Predation on the Galerucella Beetle, a Purple Loosestribe Biocontrol Agent

Leslie Howe

Dr. Mingxin Guo and Dr. Maria Labreveau
DSU Department of Agriculture and Natural Resources
Nutrient Release from Mineralization of Poultry Litter under Simulated Field Conditions

Lydia Leclair

Dr. Delphis Levia
UD Department of Geography
Winter Needle Conductance Rates of Pinus strobus L. (Eastern White Pine): Meteorological Conditions and Intraspecific Variability

Matthew Lee

Dr. Joshua Duke and Dr. Rhonda Aull Hyde
UD Department of Food and Resource Economics
Landowner Perceptions of the Stringency of Water Quality Regulations in Delaware

Matthew Loiacono

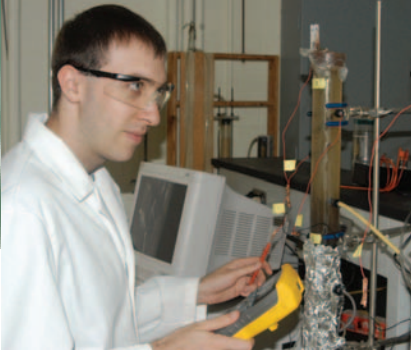
Dr. Joshua Duke and Dr. Steven Hastings
UD Department of Food and Resource Economics
The Impact of the Solid Waste Decision on Isolated Wetlands

Jimit Modi

Dr. Herbert Allen
UD Department of Civil and Environmental Engineering
Kinetics Model for Soil

Bailey Dugan





Andrew Joslyn

Jamie Pool

Dr. Judith Hough-Goldstein

UD Department of Entomology and Wildlife Ecology

Biological Control of Purple Loosestrife: Preventing Wetlands Degradation by an Invasive Plant

Brian Rosen

Dr. Donald Sparks

UD Department of Plant and Soil Sciences

Nickel Sorption Kinetics at the Geothite/Water Interface: Effects of Ionic Strength and 2-[N-Morpholino]-ethanesulfonic Acid (MES)

Carolyn Schnek

Dr. William Saylor, Michael Persia, and James Skaggs

UD Department of Animal and Food Sciences

The Effect of Dietary Level and Source of Copper (Cu) on Broiler Cu Excretion and Movement of Cu through Broiler Excreta Amended Soils

Nancy Scott

Dr. John Gingrich

UD Department of Entomology and Wildlife Ecology

Sustainable, Low-impact Methods for Managing Mosquitoes in Storm Water Ponds

Samantha Smith

Dr. Diane Herson

UD Department of Biological Sciences

Detection of Salmonella in Biosolids Using a Combination of Cultural, Molecular, and Immunological Methods

Maia Tatinclaux

Dr. John Gallagher and Dr. Denise Seliskar

UD College of Marine Studies, Lewes, DE

Location and Evaluation of Coastal and Inland Brackish Aquifers for the Support of Halophyte (Kosteletzkya) Oil Production for Biodiesel Fuel Conversion

Katherine Tigani

Dr. John Gallagher

UD College of Marine Studies, Lewes, DE

Restoring Coastal Bay Water Quality via Native Eelgrass Micropropagation

Michael Zuk

Dr. John Frett

UD Department of Plant and Soil Sciences

Diversity, Function, and Benefits of Plants Adapted to Flood-prone and Poorly Drained Environments

Undergraduate Interns 2004-2005

Carol Carlson

Dr. Bruce Vasilas

UD Department of Plant and Soil Sciences

Monitoring and Assessing the Nutrient Status and Overall Health of Freshwater Wetlands

Matthew DeSanctis

Dr. Janet Johnson

UD Department of Political Science

An Evaluation of Water Supply Security in the State of Delaware after September 11, 2001



Aaron Gibson



Steven Ernst

Steven Ernst

Dr. Steven Hastings and Gerald Kauffman
UD Department of Food and Resource Economics and UD
Water Resources Agency

An Analysis of Transboundary Resource Governance
Structure in Relation to the Christina River Basin

Jason Graham

Dr. Judith Hough-Goldstein
UD Department of Entomology and Wildlife Conservation
Biological Control of Purple Loosestrife at Flat Pond:
Reclaiming a Freshwater Pond near the Ce3D Canal

Matthew King

Dr. James Glancey
UD Department of Bioresources Engineering
Design and Field Testing of Advanced Surveillance Systems
for Delaware's Shallow Depth Estuaries

David Kleinot (USGS)

Judith Denver and Mark Nardi
USGS MD-DE-DC Water Science Center
Potomac River Basin / Delmarva Peninsula Data Retrieval
Program (USGS National Water-Quality Assessment Program)

Trevor Knight

Dr. Dewayne Fox and Dr. Maria Labreux
DSU Department of Agriculture and Natural Resources
Assessing the Feasibility of Using Fish Assemblages as
Indicators of Water Quality in Delaware Streams

Jamie Pool

Dr. Judith Hough-Goldstein
UD Department of Entomology and Wildlife Conservation
Biological Control of Purple Loosestrife: Preventing Wetlands
Degradation by an Invasive Plant

Alicia Revis

Dr. Dennis McIntosh
DSU Department of Agriculture and Natural Resources
Assisting Small and Underserved Farmers in Meeting Water
Quality Objectives

Erin Zimich

Dr. William Ritter
UD Department of Civil and Environmental Engineering
Land Application of Wastewater in the Chesapeake Bay

Undergraduate Interns 2003-2004

Megan Bielawa

Dr. Jack Gingrich
UD Department of Entomology and Applied Ecology
Breeding of Potential West Nile Virus Vectors in Stormwater
Ponds and Constructed Wetlands

Kathleen Cormier

Martin Wollaston
UD Water Resources Agency
Field Measurements of Non Point Source Pollutant Removal
Efficiencies of Stormwater BMPs at the UD Experimental
Watershed



Sarah Sturtz

Justin Glier

Dr. Donald Sparks

UD Department of Plant and Soil Sciences

*Influences of Nitrogen Form on Nickel Accumulation by
Alyssum murale*

Andrew Joslyn

Dr. Steven Dentel

UD Department of Civil and Environmental Engineering

*Enhanced Degradation of Benzoate by Electrode-utilizing
Microorganisms*

Eric Lang (USGS)

Judith Denver and Marie Stewart

USGS, DE Subdistrict

Mapping the Base of Kent County's Unconfined Surface Aquifer

Alice McDermott

Anastasia Chirnside

UD Department of Bioresources Engineering

*Biological and Enzymatic Treatment of a Food Processing
Wastewater*

Mark Neimeister

Scott Andres

Delaware Geological Survey

*Nanticoke River Watershed: Total Maximum Daily Loads
(TMDL) Program*

Kate Schutte

Dr. Steven Dentel

UD Department of Civil and Environmental Engineering

Enhanced Pollutant Biodegradation by Electrode Use

Kristen Sentoff

Gerald Kauffman

UD Water Resources Agency

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

Matt Simon

Dr. Eric Wommack

**UD Department of Plant and Soil Sciences/College of
Marine Studies**

Enumeration of Aquatic RNA Viruses from a Mixed Viral Sample

Judith Walker

Gerald Kauffman

UD Water Resources Agency

*Blue Hen Creek: An Evaluation of Stream Habitat
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Undergraduate Interns 2002-2003

Laura Boyer

Dr. Tom Sims

UD Department of Plant and Soil Sciences

*The Chemistry of Phosphorus in the Erodeable Fraction of
Delaware Soils*

*Katherine Cormier
and Kristen Sentoff*



Alexander DeWire

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Riparian Buffering Program Implementation Analysis for the Mid-Atlantic Region

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Dr. John Gallagher

UD College of Marine Studies

*Understanding the Mechanisms of the Spread of *Phragmites australis*: For Better or for Worse*

Kristen Sentoff

Dr. Joshua Duke

UD Department of Food and Resource Economics

Regulating Wetlands in Delaware in a Changing Legal Environment

Aditya Sharma and Bret Strogon

Dr. Steven Dentel and Dr. Pei Chiu

UD Department of Civil and Environmental Engineering

Accelerated Bioremediation of Wastewater Using Electrode-reducing Microorganisms

Kerrie Smith

Dr. James Glancey

UD Departments of Mechanical Engineering and Bioresources Engineering

An Autonomous Full Water Column Environmental Monitoring System with Telemetry

Undergraduate Interns 2001-2002

Christina Eckstrand

Dr. William Saylor

UD Department of Animal and Food Sciences

Fate of Microbial Phytase in the Gastrointestinal Tract of Chicks, and Effects on Phosphorus Solubility

Tara Harrell

Gerald Kauffman

UD Water Resources Agency

Links between Land Use and Stream Health in the University of Delaware Experimental Watershed

Katie Lemon

Dr. Joshua Duke

UD Department of Food and Resource Economics

An Analysis of Delaware's Groundwater Allocation Laws: Proposing a Plan

Kirsten Lloyd

Dr. Bruce Vasilas

UD Department of Plant and Soil Sciences

Functional Assessment of Wetlands for Mitigation Purposes

John Place

Susan Truehart Garey

Kent County Cooperative Extension

A Nutrient Management Program for Delaware Youth



Michael League



Megan Bielawa

Lindsay Scanlon
Dr. Ronald Martin
UD Department of Geology
Stratigraphic Analysis of the St. Jones Estuary

Kristin Staats
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UD Department of Plant and Soil Sciences
*Ectomycorrhizal Mantles as Indicators of
Historic Hydric Soils*

Undergraduate Interns 2000-2001

Gregory Buckmaster
Dr. Jeff Fuhrmann
UD Department of Plant and Soil Sciences
The Impact of Alum on Pathogen Survival in Poultry Litter

Jennifer Campagnini
Gerald Kauffman
UD Water Resources Agency
The University of Delaware Experimental Watershed Project

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*Functional Assessment of Wetlands Using a
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**Dr. James Morrison and
Dr. Hye-Shin Kim**
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Attitudes of Consumers toward Bottled Water

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*Use of Ectomycorrhiza as a Soil Hydrology Indicator for
Wetland Assessments*

Melissa Weitz
Dr. Mark Radosevich
UD Department of Plant and
Soil Sciences
*Biodiversity of the Atrazine
Chlorohydrolase (atzA)
Gene in Soil Microbial
Communities as a Function
of Triazine Treatment History*



Matt Loiacono



Delaware Water Resources Center

Dr. J. Thomas Sims, Director
113 Townsend Hall
Newark, DE 19716-2103
Phone: (302) 831 – 6757
Fax: (302) 831 – 6758
E-mail: jtsims@udel.edu

Member Agency,



Advisory Panel

Steven Abbott
*USDA Natural Resources
Conservation Service*

Scott Andres
Delaware Geological Survey

Katherine Bunting-Howarth
DNREC Division of Water Resources

Martha Corrozi Narvaez
UD IPA Water Resources Agency

Judith Denver
US Geological Survey

Jen Gochenaur
Delaware Nature Society

Mingxin Guo
Delaware State University

David Hansen
UD Research & Education Center

Paul Imhoff
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UD Bioresources Engineering

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Edward Lewandowski
Center for the Inland Bays

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The Nature Conservancy

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UD College of Marine & Earth Studies

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