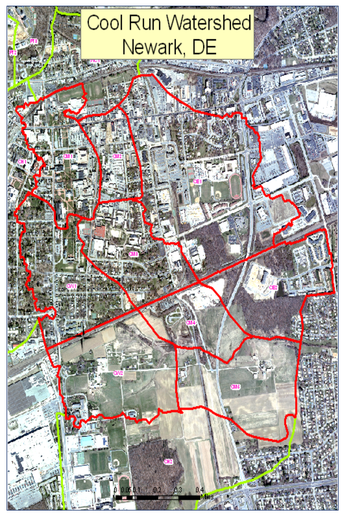
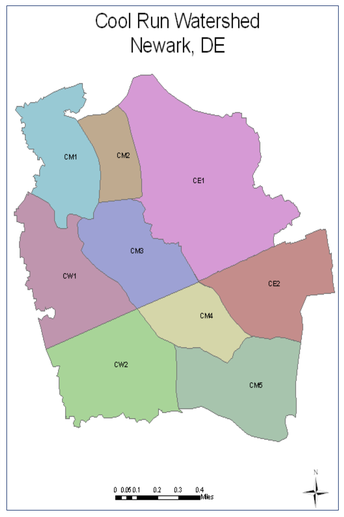
Sustainable UD water

WATERSHED ACTION TEAM FOR ECOLOGICAL RESTORATION





Reference Collection Categorized by Order and Family:

Sampling completed by undergrad Bonnie McDevitt during the Summer of 2010

Order	Family
Non Insects:	
Annelida	Hirudinea
Basommatophora	Physidae
Haplotaxida	Tubificidae
Veneroida	Sphaeriidae
Insects:	
Coleoptera	Dytiscidae
Coleoptera	Scarabaeidae
Coleoptera	Hydrophilidae
Diptera	Chaoboridae
Diptera	Stratiomyidae
Diptera	Syrphidae
Diptera	Chironomidae
Diptera	Culicidae
Diptera	Tipulidae
Ephemeroptera	Baetidae
Hempitera	Gerridae
Hemiptera	Belostomatidae
Hempitera	Corixidae
Hemiptera	Veliidae
Hemiptera	Mesoveliidae
Hempitera	Notonectidae
Odonata	Aeshnidae
Odonata	Coenargrionidae
Odonata	Libellulidae

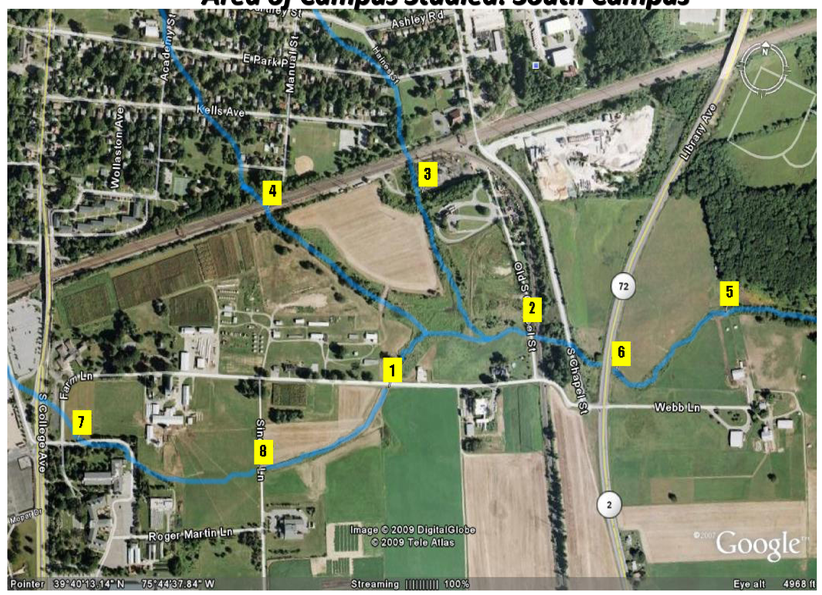

Mesoveliidae


Veliidae


Libellulidae


Belostomatidae

Delaware Water Resources Center
UD WATER Project 2010 – 2011
Melanie Allen
Advisor: Dr. Judith Hough-Goldstein
Area of Campus Studied: South Campus



UD WATER - Project Goals

The goals of the UD WATER project were – for the UD Campus:

(1) Identify major nonpoint sources of pollution in the Cool Run Sub-watershed of the White Clay Creek (a wild and scenic river with tributaries on the campus)

(2) Estimate, using USEPA methods and average pollutant concentrations in runoff, the annual pollutant loads to the Cool Run tributary from different land uses5

(3) Develop recommendations to improve stormwater management, reducing flooding and improving water quality in the White Clay creek watershed

Personal Project Goal:

(1) Create a reference collection of the biodiversity of aquatic macroinvertebrates in the UD Experimental Watershed at Newark Research and Education Center of the University of Delaware College of Agriculture and Natural Resources from samples collected during the Summer of 2010. (credit to Bonnie McDevitt) for future interns to utilize as a baseline of data.

(2) Complete a Winter sampling to add to the reference collection.

Locations of Sampling completed on March 2, 2011 by Melanie Allen

Site 1: located on one of the Cool Run tributaries that travels through agricultural land containing dairy pastures and cropland
Site 2: located along Old South Chapel Street near the intersection with Farm Lane.
Site 3: located near the power transfer station where one of the Cool Run tributaries crosses under the Amtrak access road.
Site 4 located next to the Amtrak tracks as Cool Run tributary enters UD property.
Site 5: :located at the east end of the cattle pasture on the Webb Farm.
Site 6 : located on the east side of Route 72 near the entrance to the Webb Farm.

Methodology:

I followed a protocol for sampling aquatic macroinvertebrates in freshwater wetlands developed by the Maine Department of Environmental Protection. When sampling, I used the dip net measured sweep, which is the primary method used to collect aquatic macroinvertebrates in wetlands. A micron D-frame net is swept against the bottom substrate three times to remove and collect organisms from the sediment, keeping sure that the net is submerged during the entire sweep. All of the collected material is transferred into a sieve bucket, where water is drained and materials were transferred into individual specimens containers filled with ethyl alcohol, where they would be preserved until identification.

Results:

Negative. Found little to no biological biodiversity.
This was potentially due to the time of year as well as low oxygen levels. The Protocol practiced by the Maine Department of Environmental Protection that I followed recommended completing sampling during June-July, however due to time restraints I was only able to get a sampling in early March when specimens were minute or dormant. During early summer, aquatic invertebrate are much more developed and easier to identify. Dissolved oxygen analysis measures the amount of gaseous oxygen (O2) dissolved in a water solution. Below is a comparison of Dissolved Oxygen levels measured in mg/L from the Summer of 2010 and March 2011 (Table 1). The oxygen levels for a majority of the sites was lower in March, influencing its ability to support life.

Sources:
McCafferty, Patrick. *Aquatic Entomology: The Fishermen's and Ecologists' Illustrated Guide to Insects and Their Relatives*. Science Books International. Boston, Massachusetts.
1981.
Dept. of Environmental Protection: State of Maine. Protocols for Sampling Macroinvertebrates in Freshwater Wetlands: Division of Environmental Assessment Biological Monitoring Program

Table 1

	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6
June	1.64	5.94	10.41	10.01	8.90	5.83
July	7.29	5.43	9.48	9.69	7.95	6.22
August	7.88	6.82	9.57	10.12	10.59	7.77
March	0.87	6.71	8.58	7.94	7.20	6.27

What is "UD WATER"?

The UD WATER Project (Watershed Action Team for Ecological Restoration) was formed in early 2008 as a collaborative initiative with the long-term goal of merging and facilitating university-wide efforts to minimize the environmental impacts of storm water runoff from our campus. The UD WATER initiative is synergistic with the University's Path to Prominence strategic goal to become a Green Campus.

The UD WATER team brings together a consortium of faculty, staff, and students from various departments and disciplines across campus to work collaboratively to implement creative and innovative storm water management techniques in the most holistic and efficient manner achievable. 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. Membership on this team include faculty and staff from Occupational Health and Safety, Facilities Planning and Construction, Facilities Grounds Maintenance Services, Delaware Water Resources Center and the Departments of Bioresources Engineering and Plant & Soil Sciences within the College of Agriculture and Natural Resources, the Delaware Geological Survey, the UD Water Resources Agency within the Institute for Public Administration in the College of Education and Public Policy, and stormwater specialists from the City of Newark. UD WATER has also funded 6 undergraduate interns to work with UD faculty and staff and develop a watershed management plan for the UD campus.

In the future, the UD WATER team hopes to add other faculty and students at UD with an interest in water resource management to participate in our efforts to use the UD campus as a storm water research laboratory for multiple disciplines. For more details, or to join the UD WATER project, contact one of the project co-directors, Dr. Tom Sims (Delaware Water Resources Center; jtsims@udel.edu) , Jerry Kauffman (UD Water Resources Agency, jerryk@udel.edu) or Leslie York-Hubbard (Occupational Health and Safety; leslieyh@udel.edu).