

CAMPUS SUSTAINABILITY GRANT PROGRAM

“Using Service Learning to Monitor and Improve Poor Water Quality on Campus”

Keri Ann Lydon

Project Description

During the Spring 2014 semester a hands on active learning special topics Environmental Health Course (EHSC 3700) and Internship Opportunity (EHSC 3910) were offered to undergraduate students focusing on water quality of campus streams. The course/internship opportunities were taught and led by Keri Ann Lydon under the direction and help of Dr. Erin Lipp. Five students came together and named their classroom based research group UGAqua.

The student learning objectives were to: 1) Demonstrate understanding of microbial water quality laboratory methods and regulations for recreational water bodies; 2) Identify, innovate and implement public outreach strategies; 3) Communicate importance of sustainability through development of atmosphere of environmental responsibility; 4) Develop leadership skills through planning and implementation of sampling/outreach; 5) Perceive themselves as active-engaged contributors towards environmental issues in their communities; and, 6) Formulate useful questions for ways to improve impaired streams for public recreational use.

Specific Work Completed:

1. Students sampled water from campus streams, Tanyard Creek and Lily Branch, as weather permitted. *Escherichia coli* levels were enumerated by students using EPA standard methods to determine levels of impairment in comparison with recreational water quality criteria set by the Environmental Protection Agency.
 - a. Attempts were made to collect dry vs. rain samples.
 - b. Transects of streams were completed during dry conditions to assess point source impairment.
 - c. Lake Herrick was sampled once; levels of fecal indicator *E. coli* bacteria were low.
 - d. Issues with weather and access to media sterilization materials slowed project plans.
2. Students volunteered with UOWN for the Winter Quarterly and Spring River Rendezvous events that evaluated stream health in the Oconee Watershed to evaluate stream health. Students utilized microbiological methods and concepts taught in class to process samples.
3. Three outreach events were designed and implemented by students to communicate findings and importance of sustainable campus watersheds. Two of these were tabling events at the Tate Center that reached a large number of students and promoted social media communications on the UGAqua facebook page: <https://www.facebook.com/ugaqua>. The final outreach event was a water quality seminar entitled “Water Works?” with presentations from UGAqua, Athens-Clarke County Stormwater and Tawfiq Bhuiyan, a graduate student studying pervious pavement. Topics covered included pervious pavement, sustainability, watersheds at UGA, point source vs. non-point source pollution, and more!

The overall project contributed to UGA’s 2020 Strategic Plan by incorporating sustainability into the student experience and enhancing the awareness of these issues on campus (Direction VII of The University of Georgia 2020 Strategic Plan: Strategic Priorities D and E). This project is still ongoing and more students are currently being recruited for the Fall 2014 semester. The class will be modified slightly with communication efforts focused on hosting another water quality seminar and continuing to teach the importance of sustainable watersheds while offering laboratory experience to undergraduates.

Project Expenses

Microbiological Media	\$1311.00
Microbiological Lab Supplies	\$355.00
Event hosting Expenses	\$106.00
Student Final Project Poster Printing	\$60.00

Academic Impact

There were many positive outcomes from this project in regards to academic impact! The biggest was the creation of internship and course offerings for students from the Department of Environmental Health Science (EHSC 3700 taught by Keri Lydon and EHSC 3910 directed by Dr. Anne Marie Zimeri). Throughout the semester, students gained valuable laboratory and research experience that has placed them above and beyond their peers.

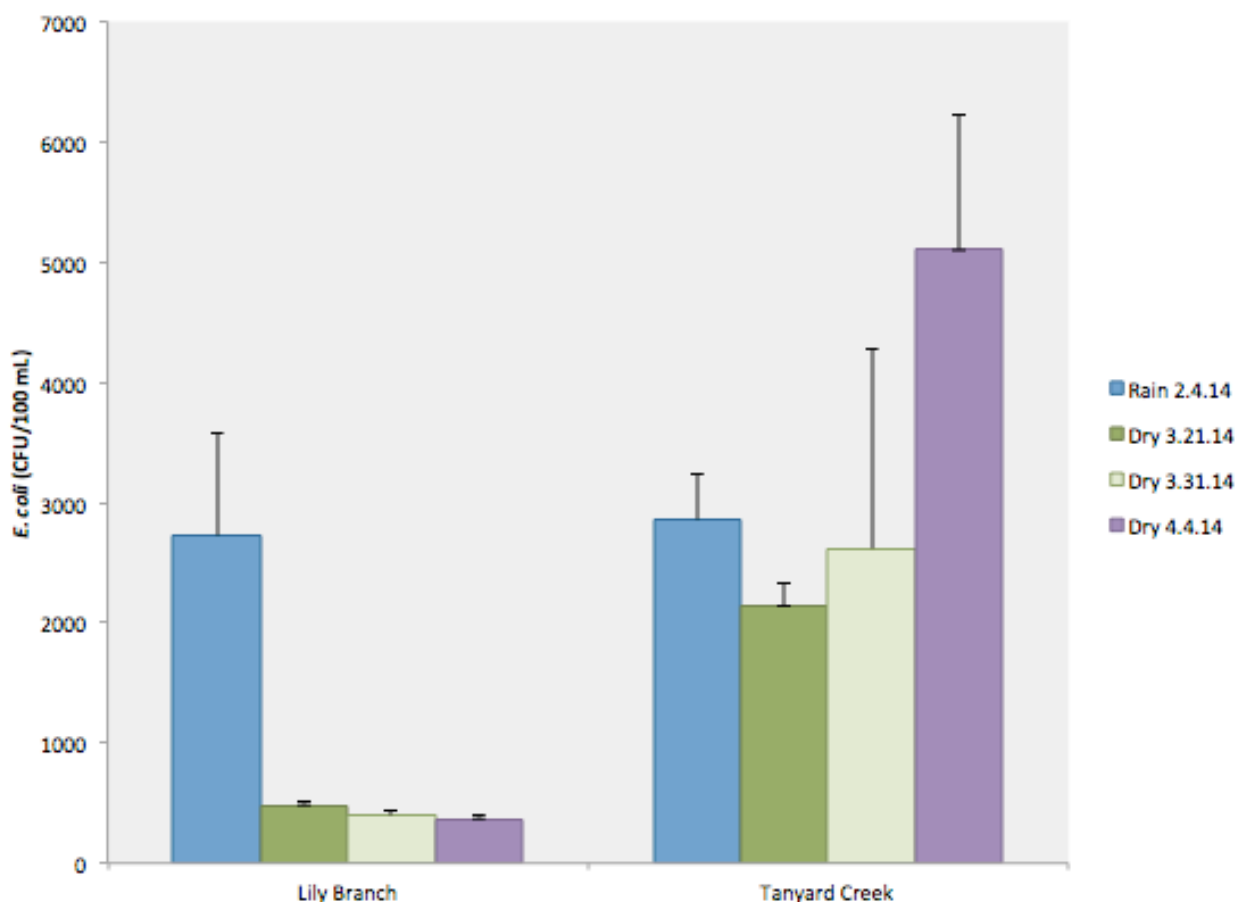
Students who participated in the course also used their research projects to develop final semester projects that are usually only offered at the graduate level, including writing research grant proposals and creating scientific posters. One student presented their poster that the UGA Office of Sustainability Semester in Review. This student has submitted their poster into a competition for a statewide environmental organization and has received another water quality internship based on participation in this activity. A second intern received the prestigious Irving Bell Scholarship from the Georgia Environmental Health Association for participating with UGAqua.

Others in the course were inspired to think about options for continuing in graduate school and potentially apply to UGA sustainability grants themselves. Finally, for continuing semesters of the program, one student was selected to act as a senior leader and develop their leadership and science research experience further.

Specific Research Questions Addressed

1. What are the levels of bacterial contamination in streams/creeks on UGA's campus over seasonal time frames? Are rain events indicative of increased contamination?

The levels of bacterial contamination in streams/creeks on UGA's campus remained high throughout the spring semester. Though there does seem to be trend of levels increasing during rain events. The 2012 EPA statistical threshold value for *E. coli* monitoring is 410 CFU/100 mL. Most sampling days were near or above this value indicating an increased risk of illness from recreational use of these creeks.



2. Can increased education and awareness of water quality on campus lead towards efforts to improve and clean up streams? Can student lead investigations of water quality lead to improved water quality?

Although we do not have research data to address these questions, observations of student attitudes and events during the semester lead me to think that this is possible to improve streams if more people are educated, but has not happened yet. I also believe that these student projects can lead to improving water quality by providing data on water quality to the UGA Office of Sustainability that can be forwarded to the appropriate persons to begin making and impact.

Engagement

Partnerships Formed and Enhanced through this Project

1. Office of Sustainability- Tyra Byers
2. Athens-Clarke County Stormwater Management- Kathryn Shepard, Christine Fox
3. Tawfiq Bhuiyan- UGA Graduate Student studying pervious pavement
4. Upper Oconee Watershed Network- Bruno Giri, Reid Brown

Beneficiaries of Project

1. Five students enrolled in EHSC 3700 & EHSC 3910
2. UGA Office of Sustainability
3. Department of Environmental Health Science
4. Upper Oconee Watershed Network

Places Grant Featured

Media

1. “Sustainability grants help fund student projects” by Jeanette Kazmierczak, The Red & Black, January 22, 2014
2. “Chew Crew goat herd comes back for spring forage on campus” by Melissa Gogo, The Red & Black, March 18, 2014
3. UGAqua social media page- <https://www.facebook.com/ugaqua>
- Currently at 155 likes, photos posted have up to 400 views.

Events

1. Tate Center Tabling Event, January 31, 2014
 - 100 students
2. Water Quality Seminar, “Water Works?” February 28, 2014
 - 25 students in attendance
3. Tate Center Tabling Event, “Wheel of Water” March 28, 2014
 - 150 students
4. Earth Day Tabling Event, April 22, 2014
5. River Clean Up for Earth Week, April 25, 2014
6. UGA Office of Sustainability Semester in Review, April 29, 2014

Project-specific Metrics

1. Five students gained research and leadership experience in the field of water quality and microbiology
2. 300 or more students reached about the issues of water quality on campus
3. Data collected for two on campus streams throughout the spring semester
4. Implementation of an ongoing program for students to investigate water quality
5. Community partner UOWN benefitted with two stream health assessments





Campus Sustainability Grants Program (2013-2014)

