Wittenberg Environmental Science

March 2020

LET'S NURTURE THE NATURE, SO THAT WE CAN HAVE A BETTER FUTURE.
~ANONYMOUS

ESCI 100: Global Climate Change

Students from all majors participated in Global Climate Change this semester. They mentored high school students at the Global Impact STEM Academy in the local climate impacts underway in Clark County including amplified spring rainfall and increased erosion. Wittenberg students engaged students in perception surveys, water quality monitoring, land use-erosion demos, and heat island monitoring. Other students engaged their families, friends, sororities and more building climate literacy in our community.

ESCI 101: Introductory Environmental Science

This year's Introductory Environmental Science students completed a midterm project in collaboration with Freshwater Farms. They diagrammed the temperature, oxygen, and nutrient

ESCI 250: Environmental Science Research Methods

This year students in our methods course (Shannon Cody, Rachel Corsello, Jordan Dawson, Jacob Deady, Cooper Harris, Cameron Kettler, Dana Messer, Emory Schweitzer, Marquea Schwing, Zion Thomas, and Victoria Toetz) collaborated with local health agencies, the Springfield Promise Neighborhood, and Dr. Elena Dahl's art students to host a lead testing and art advocacy empowerment event. The American Geophysical Union funded their work and a Black and STEM after school program at the Ark Rescue Center organized by independent research students Asharee Jones and Jubileen Kombe. In total, the project engaged hundreds of residents through soil testing at the event, art, and canvassing in the Promise

Neighborhood to announce the event as well as around Springfield to sample soil for ongoing lead mapping. Many of the results from this year and previous years were shared through a campus civic teach-in and at Antioch's Bootcamp for Activism. Next year the project will officially become a multi-program effort with mapping, health justice advocacy, and nutrition education. Environmental Science, Nursing, Philosophy have already joined forces with the Clark County Combined Health Department and the Springfield Promise Neighborhood to engage after school programs at Kenwood and Lincoln Elementary year round. We

have also submitted a grant to collaborate more fully around the nexus of lead health and food security with Tyra Jackson, Executive Director of Second Harvest Food Bank, and a Wittenberg graduate. The Clark County Land Revitalization Bank has also been impressed with our project and seeks a student intern over the summer to improve vacant property and test lead remediation strategies. We continue to evolve our project in ways that inform land use decisions and policy. This year's mapping effort explored the intersection of lead pollution and the legacy of discriminatory zoning practices by the Home Owner's Loan Association in the the 1920s, that have led to persistent or even amplified challenges for "redlined" neighborhoods, or those that once designated as risky for mortgages based on race and housing condition. This designation set up a cycle of mortgage defaults and neighborhood divestment that overlaps with housing vacancy and lead risk, especially for black children in our community today. If you have interest in seeing more of their work, please check out the class website which includes links to some of their project work and the results of the lead testing we have conducted since 2014.

Biology 148: Biology in a Changing World and Biology 242: Conservation Biology

Students from these two courses (general education course (148) and upper level majors course (242) work collaboratively with Donna Lewis from the Clark County Park District to organize and staff the Semi-annual BioBlitz. In 2018, the BioBlitz was held at the Leadingham prairie where students from Biol 242 were paired with students from Biol 148 as well as a taxonomic expert to conduct surveys to locate, count, and identify as many species as possible in a 24 hour period. Taxonomic experts included individuals from Ohio State Biodiversity survey, the US Fish and Wildlife Service, Ohio Department of Natural Resources, and local volunteers. Students from Biol 148 worked on developing educational materials for younger kids that were encouraged to attend on the Saturday morning of the BioBlitz. Biol 242 students used the data from the BioBlitz to generate metrics of biodiversity and modeling throughout the rest of the semester.

Students working with Donny Knight and Jeromy Applegate from the USFWS to conduct electroshocking on the Mad River to assess species diversity of fish.

Students displaying the BioBlitz totals for 2018 at the Leadingham Prairie.


Students working with Sarah Stankavich from the Ohio Division of Wildlife to conduct a bat acoustic survey of Estel Wenrick Wetland behind the Leadingham Prairie.

Alumni Spotlight – Victoria Simek '17

What is your current position and some of the things you are working on?

I am an Environmental Officer for Camp McCain Training Center (National Guard Post) under the Mississippi Military Department. My main job is to ensure the training center is following all environmental policies. I update permits, I complete quarterly environmental assessments throughout the shops, and I answer questions on hazardous material storage and disposal. I also assist the Natural Resources officer on a number of tasks. For example; completing wildlife surveys, prescribed burns, maintaining recreational activities on post.

What things did you learn in our program that you use in your current role?

There a many things I learned from Wittenberg that help me in my day to day job. A few things in particular is needing to research and create a protocol for something. Wittenberg helped me organize an entire project and put it into action. I do that a lot with my job. I research a topic, take what others have done and create my own protocol for something. One other thing would be taking a scientific subject and be able to explain it to the general public. Outreach is big in the environmental field and the ability to take a complicated subject and make it easy for the public to understand is very important.

What advice do you have for Environmental Science Majors?

Don't be afraid to get experience in any way possible! Internships, volunteer opportunities, side jobs, all of it. Apply to jobs and positions even if you don't think you are qualified, you may surprise yourself. Any experience is good experience, at the very least, you figure out what you do and don't like within a position. I have worked across the country doing everything from planning beach clean-ups in Florida to pulling scales off of Pacific Salmon in Alaska. Don't be afraid to take the leap and try something completely new!

Research Spotlight– Kaity Seitz '20

For many environmental scientists, two of the most important datasets for analyzing landscape change are orthophotographic and digital elevation models. Structure from motion (SfM) is a photogrammetric technique to approximate 3D features (i.e., the structure) from two-dimensional images or photos taken of the feature but from different locations (i.e., the motion). The 3D rendering of a study site, such as an eroding streambank or excavation of an archeology site, is critical because it yields high resolution imagery and elevation models that can be used to both characterize the site as well as study magnitude, frequency, and rate of change.

This past summer, Kaity Seitz '20, an environmental science major and marine science minor, worked with John Ritter in the Mojave Desert this past summer to study the relation between resolution of 3D models based on ground- and pole-based versus photography taken using a drone. The ground- and

pole-based photography provide higher resolution because the camera is closest to the feature, but the drone, flown at higher elevations, is able to capture larger areas. Processing photographs from ground, pole, and drone using SfM provides both the resolution and the extent required of many studies. The relatively minor cost of acquiring photos means that new models can be generated

to illustrate and analyze frequent change. For Kaity, the desert was a far cry from shallow marine and reef systems, but the SfM techniques are being applied to reefs to study the health of the reef ecosystem due to climate and sea level changes. Their work formed the basis for a special fall course offering in GIS applications utilizing the SfM technique.