

TENNESSEE TECH UNIVERSITY | FALL 2022

SOES

School Of Environmental Studies

Newsletter

Message from the Director

Welcome to another edition of the SOES Newsletter! We are always excited to share the good things that are happening within the school and with our alumni. In this edition, you will find updates on departmental changes, exciting research projects, student internships, and career moves for alumni. This fall we also welcomed Samantha Allen, Ph.D. (EVS, 2022) as an instructor and research associate (and editor of this newsletter!) in SOES. Welcome Dr. Allen!



This year, we celebrate 10 years as a unit! The School of Environmental Studies was established in 2012 and has come a long way in just a decade. We are eager to celebrate this milestone with all of our SOES family this spring, so look for announcements about that!

Steve Sharp

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BACHELOR OF SCIENCE

Environmental & Sustainability Studies

Current Student

Lydia Burton is an environmental and sustainability studies major with a concentration in biology. She is in her third year at Tennessee Tech. She has been taking advantage of opportunities on campus for next semester, such as assisting in conservation biology/genetics research. She will also be a teaching assistant in a biology lab, and hopes to play an active role in the relaunch of the Evergreen Society.

In the Summer of 2023, Lydia has plans to intern in San Jose, Costa Rica, for four weeks at the Ostional Wildlife Refuge. After graduating from Tennessee Tech, Lydia plans to enroll in graduate school and earn either an M.S. or a P.S.M. in Environmental Science.



PROFESSIONAL SCIENCE MASTER'S

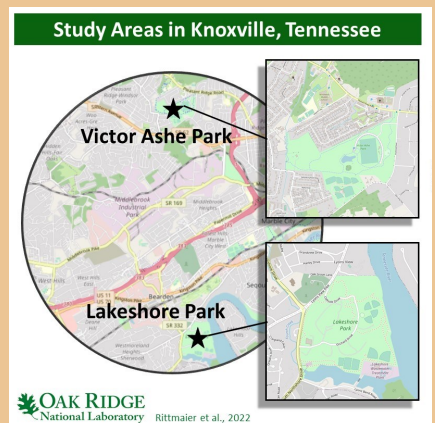
Concentration in Environmental Informatics

Recent Graduate

Chantelle Rittmaier just completed her degree in the PSM-Environmental Informatics program. Her PSM internship project was completed while working at Oak Ridge National Laboratory. Her project was titled “Determining COVID-19’s Impact on Visitor’s Willingness to Travel to Lakeshore Park and Victor Ashe Park in Knoxville, Tennessee, through an Ordinary Least Squares Regression Model.”

During the COVID-19 pandemic, travel patterns and how far people were willing to travel to local amenities were affected due to “safer at home” orders. Green spaces became a necessity because social distancing could be effectively practiced while meeting with friends, family and co-workers. This study analyzes the effect on travel to Lakeshore Park and Victor Ashe from census tracts within the Knoxville area and nearby counties during 2019 and 2020 through an Ordinary Least Squares Regression model. Both parks have similar features (greenways, amenities, sport fields, acreage, etc.) but different pedestrian infrastructure surrounding the park area. The results indicated that distance accounted for 14% - 22% of the variables affecting visitation rates from 2019 to 2020 for Lakeshore Park while Victor Ashe did not have a strong conclusive correlation between the two years for the distance variable. This methodology can be used to determine other variables most important to park visitation rates and can then be used to develop the optimal park for different areas based on the highest weighted variables.

Chantelle is now working at Pilot Company as a Specialist II, GIS for the real estate team.



DOCTOR OF PHILOSOPHY

Environmental Sciences

Concentrations in Agriculture, Biology, Chemistry, Geosciences or Integrated Research

Current Students

Erik Koehler is an environmental sciences – agriculture student. His Dissertation title is “Insect Resistance and Horticultural Trait Evaluation of Acylsugar Tomato Breeding Lines”.

Erik’s research entails evaluating insect resistant tomato lines for their horticultural and resistance traits for protection against silverleaf whitefly (*Bemisia tabaci*) and brown marmorated stink bug (*Halyomorpha halys*). These two invasive insects are responsible for billions of dollars in crop losses each year across the globe. The studied tomato lines were bred to exude acylsugars; sticky, all-purpose plant defense compounds. The stickiness and chemistry of the acylsugars act as insect deterrents. Chemically, acylsugars are glucose or sucrose molecules with esterified fatty acid chains ranging in size from two to sixteen carbons in length. Acylsugars are naturally derived and do not pose acute human health issues. This research hopes to reduce grower reliance on synthetic pesticides which are harmful to the applicator and agricultural environment.

Brooke Grubb is an environmental sciences – biology student. Her research is titled “An interdisciplinary approach to understanding ecology and genetics of a narrowly endemic crayfish species, *Faxonius wrighti*, for conservation management.” Crayfishes are a diverse group of crustaceans with ~77% of its diversity found within the southeastern United States. Conservation management decisions are difficult to provide since many crayfish lack demographic distributional, and genetic information including the Hardin Crayfish (*Faxonius wrighti*).



The Hardin Crayfish is a narrow endemic species that resides within ~25 km of western tributaries of the Tennessee River. The Hardin Crayfish, like many aquatic organisms, are imperiled with little known about their biology. Previous survey efforts have indicated that habitat degradation is leading to a decline in the Hardin Crayfish populations, prompting a need for conservation action. Preliminary genetic analyses highlight a close relationship with two other broadly distributed crayfish species within the Tennessee River raising questions about the Hardin Crayfish’s recognition as a species. Brooke’s work will provide information on the habitat needs, watershed threats, and genetic diversity for the Hardin Crayfish and determine if they should continue to be recognized as a species. Lastly, Brooke will explore how watershed variables have shaped the genetic make-up of the Hardin



Crayfish to understand how microevolutionary processes will influence the Hardin Crayfish’s ability to persist under different climate scenarios. Brooke’s work will be incorporated into a species status assessment document that is used by the United States Fish and Wildlife Service to make an Endangered Species Act listing decision.



AWARDS & RECOGNITION

Community Engagement and Research & Creative Inquiry Day Winners

Community Engagement

Faculty members Hayden Mattingly, environmental studies professor; Michael Harrison, earth sciences professor; Benjamin Clark, academic advisor for the Whitson-Hester School of Nursing; and Tech alumnus Andrew Griswold, GIS analyst for the state of Tennessee, recently released the album titled “The Next Moonlight.”



It features 10 songs with Mattingly on vocals and guitars, Clark on bass guitar, Harrison on drums, and producer Griswold on keys, backing vocals and guitars. Their album can be found on Spotify, Apple Music, iTunes, Amazon, Pandora, Deezer or directly from the artists at <https://haydenmattingly.hearnow.com>

Joe Cook submitted an entry to the TN-GIC Conference Map Contest and won Best Student & Most Innovative for his project: “Spatial Analysis of Boating Incidents: 2011-2021 (Chickamauga & Watts Bar Reservoirs).”

Alum Grady Wells was interviewed by the Kentucky Academy of Science reporting on the observed occurrence of red alga on parasitic copepods that occur on minnows within the Obion Creek Watershed. The interview can be found on Youtube with the name “A talk with Dr. Grady Wells about his article in the Journal of the Kentucky Academy of Science.”

PhD student Samantha Allen, alum Grady Wells, and Hayden Mattingly’s work has been accepted for publication in Journal of Fish and Wildlife Management. The publication is titled: “A Large-Scale MaxEnt Model for the Distribution of the Endangered Pygmy Madtom.”

Research & Creative Inquiry Day Win-

Research and Creative Inquiry Day is an annual event designed to promote student research and creative inquiry and provide a venue for presenting that work. This event is open to undergraduate and graduate students from all departments who want to display their research and creative projects.



Congratulations to all our SOES winners below!

Daniel Adams (Co-Author: Peter Li) “Estimating the Condition of Streams & Rivers: An Approach using Supervised Learning Methodologies”

Bryant Davis (Advisor: Andrew Callender) “Geochemical Fingerprinting of Natural Waters in Tennessee”

Mary Mahan (Co-Authors: Dennis Duncan, Ciana Bowhay) “Knowledge, Perceptions, and Attitudes of AGRN 1110 Students on GM (Genetically Modified) Crops: A Survey”

Madison Moffitt (Advisor: Peter Li) “A Method for Mapping Environmental Justice Factors by Watershed”

Rachel Reed (Co-Authors: Samantha Snyder, Luke Fraley, Ashley Daniel; Advisor: Steve Sharp) “Solar Energy for Bridgestone Nature Reserve at Chestnut Mountain”

ALUMNI UPDATES

Juan Sanez (Ph.D. '10) is a visiting fellow at UNILA (Universidade Federal da Integração Latinoamericana, Paraná, Brazil) since June, 2022. The university is located near the Foz do Iguaçu city, the Iguaçu Falls and the Itaipu Dam, closer to Argentina and Paraguay.

Joe Martin (P.S.M. '14) and his family have moved back to TN as of September, 2020. They are living in Blount county and Joe is working for LDA Engineering. He uses GIS every day, primarily assisting the engineering process in developing and maintaining infrastructure for Stronger, Happier Communities. He and his family enjoy biking and walking on the Blount county greenway network and try to get into the mountains as often as they can.

Russ Skoglund (Ph.D. '15) After retiring the end of March 2022, Russ and his wife spent the month of July with his son and his wife in Germany and France. This photo is from the Black Forest in Triberg, Germany. They then continued through other parts of Europe including Normandy; Paris; Soufflenheim; Strasbourg, France; Luxembourg, Austria; and multiple cities in Germany.



Grady Wells (Ph.D. '19) is continuing his work at Sewanee as a visiting assistant professor of biology. He is teaching courses in Ichthyology and Field Biology. He has two recent publications:

Allen, S. A., **W. G. Wells**, and H. T. Mattingly. 2022. A large-scale maxent model for the distribution of the endangered pygmy madtom. *Journal of Fish and Wildlife Management*. *Accepted*.

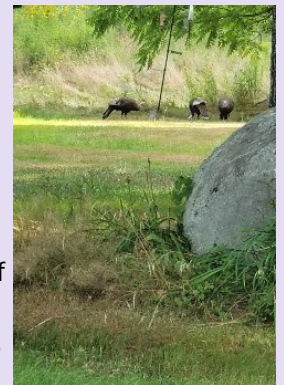
Wells, W. G. and J. Alvarez. 2021. Occurrence of *Compsopogon coeruleus* on *Lernaea* from Fishes in the Obion Creek Drainage, Hickman County, Kentucky. *Journal of the Kentucky Academy of Science* 82 (1): 42-44.

Daniel Adams (P.S.M. '19) has begun the EVS-Integrated Research PhD program in the Fall of 2021. His research will be centered around study into intelligent information systems and their application to better understanding human dynamics in natural and artificial environments.

Jessi Vannatta (Ph.D. '19) continues to work as an environmental scientist for California State Parks at Hungry Valley State Vehicular Recreation Area. This summer she began to monitor bats in the park by capturing them in mist nets. She has been collecting data about the resident bats in the park and collecting tissue, swab and guano samples to contribute to other bat research projects. Jessi is also working with her colleague to radio track horned lizards in the park to better understand their habitat usage. She is still teaching part-time as an adjunct professor at College of the Canyons (COC). This will be her fifth semester teaching an Introduction to Environmental Science course. In Spring 2022, Jessi was able to teach the lab in person for the first time, and she had a great experience interacting with students in the classroom again. She also enjoyed teaching a five-week, fast-paced course on Introduction to Environmental Studies during the Winter 2022 semester!



Roger D. Applegate (Ph.D. '19) is working on a variety of projects in Maine. Last year he retired from state employment in Tennessee and relocated to his in-laws' farm in Bangor, Maine. There he lives on a portion of a large former dairy farm located within a conservation area that includes forest and park land owned by the Town and Municipality of Bangor, the Town of Orono, Orono Land Trust, University of Maine, and Maine Audubon Society. He is managing his property as a part of the conservation area. He is active in the Maine Chapter TWS, and is developing a wildlife training program for conservation law enforcement officers. In addition, he has editing responsibilities for the book *North American Furbearer Conservation and Management* and for a special issue of the MDPI journal *Animals* on wildlife movements and behavior in relation to wildlife diseases.



Graduates & Alumni Updates

2021-2022 Graduates

Bachelor of Science

Macklin Allan	Chloe Green	Hayley Reed
Spencer Brantley	Devin Hudgins	Rachel Reed
Hannah Ruth Brown	Evan Langley	Riley Roberts
Timothy Cooper	Jonah Lawson	Samantha Snyder
Kyle Evans	Troy Melton	Andrew Williamson
Megan Flynn	Jamie Ownby	

Professional Science Master's

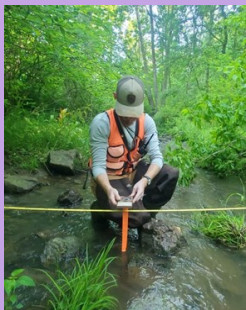
Olivia Dixon
Lori Nabors
Brandon Yates

Doctor of Philosophy

Cody Godwin
Chioma Onwuchekwa
Sunil Rawal

Continuation of Alumni Updates

Will Ponder (B.S. '20) has begun working as the Mid-Atlantic NEON mammalogist. Training and managing field crews has been an exciting and rewarding challenge. He has been enjoying watching recent college graduates grow in their professionalism and gain confidence in their marketable skills.



Will has also begun volunteering with the Warren County Fire and Rescue department to continue pursuing his interest in emergency medicine and management.

Jamie Ownby (B.S. '21) has begun working for AmeriCorps at Seven Islands State Birding Park. She helps implement habitat management plans which aim to restore and maintain native grasslands for the endangered Bobwhite Quail. These plans include controlled burns, removal of invasive species, and planting native wildflowers/grasses. She also does trail maintenance, assists with programs and other management activities. After her seasonal position ends, she plans to continue looking for opportunities within state parks and natural areas that focus on habitat management and restoration.



Ethan Flowers (B.S. '21) accepted a position as a laboratory technician at Pace Analytical in Mt. Juliet. There, he works in the organic prep department where he performs extractions on various soil and water samples.



Mikayla Wood (B.S. '21) lives in Knoxville, TN, and is in the final year of the Master of Science in Information Sciences at UT Knoxville. She is working as the graduate teaching assistant for UT libraries teaching & learning programs department. Some of her duties include helping plan workshop series, co-teaching workshops, and providing research assistance to students. Upon graduation in May 2023, she hopes to find work in an academic library, with a primary interest in



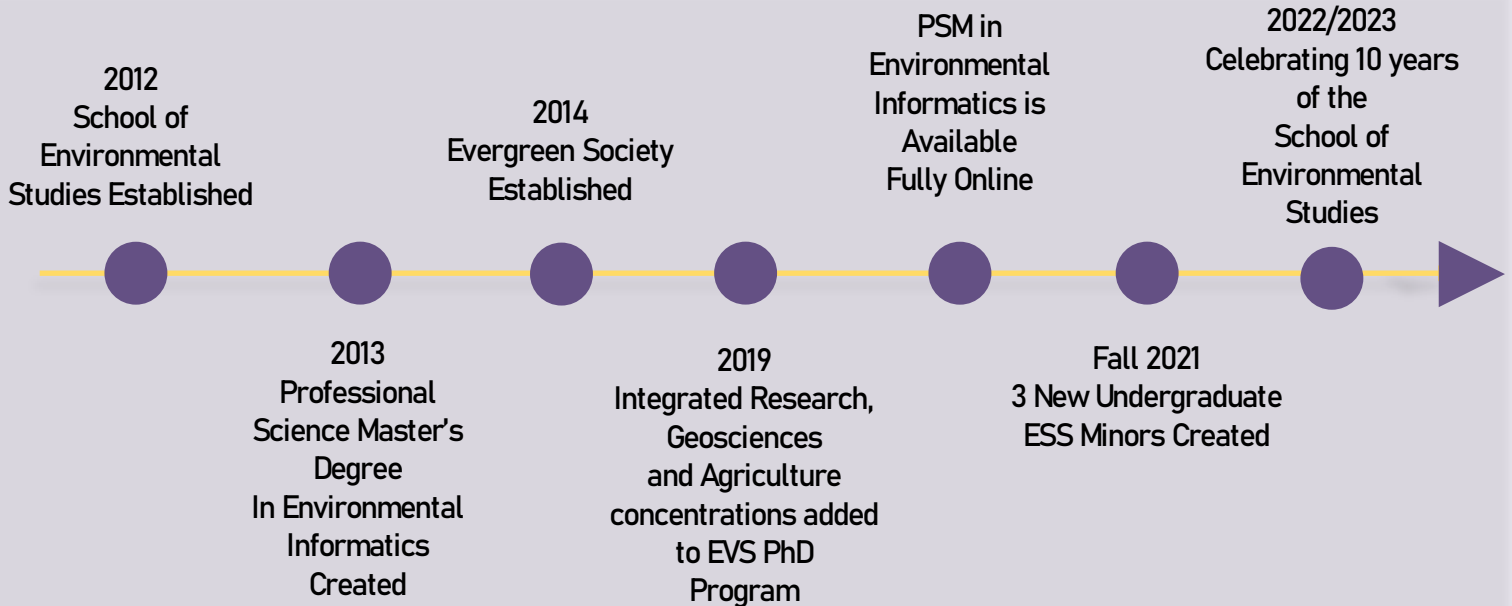
Chioma Onwuchekwa (Ph.D. '22) currently works for Cummins Inc. as an environmental strategist to help the organization reduce emissions and environmental impacts from operations. Cummins is on a mission to drive change for a healthier planet and aspires to be carbon neutral by 2050 – an initiative collectively known as PLANET2050. In her role, Chioma works remotely and leads several projects supporting PLANET2050. She enjoys the opportunity to travel with work and will be moving to Canada with her husband next month.



ANNIVERSARY CELEBRATION

School of Environmental Studies 10th Anniversary

A Few Highlights



Join us in celebrating 10 years of the School of Environmental Studies! Established in 2012, we have since created the Professional Science Master's Degree in Environmental Informatics, which is now fully online! Additionally, the undergraduate Environmental & Sustainability Studies program has increased in enrollment and now has 3 minors approved. Students now more than ever have the opportunity to be involved in real-life problems through internship experiences, research, the Evergreen Society and the senior Capstone course. The PhD program now has 5 concentration options and has received Carnegie funding for additional assistantship positions and research opportunities. We can't wait to see what the years to come will hold!

**Mark your calendars
for our
10 year Celebration
on
Friday, March 24th, 2023!**

**Follow along on
Social Media and Email
for more details on upcoming
news and events!**



@TNTECHENVIRONMENTALSTUDIES

FACULTY INTERVIEW

SAMANTHA ALLEN, Ph.D.

INSTRUCTOR & RESEARCH ASSOCIATE



Tell us a bit about your professional and educational background.

I completed my undergraduate degree at Tennessee Tech in environmental biology with minors in chemistry and Spanish. During that time, I worked with a variety of the professors in the biology department conducting undergraduate research and assisting with labs. During the summer between my junior and senior year, I participated in the Student Undergraduate Laboratory Internship (SULI) at Oak Ridge National Laboratory on the Spruce and Peatland Responses Under Changing Environments (SPRUCE) project. Much of my work was looking at tree sap flow patterns among the spruce and tamarack trees. I then returned to the project as a Post-Bachelor's Intern after graduation and aided with characterizing soil microbial communities. The time spent at Oak Ridge and the mentors and colleagues that I had really shaped my path and gave me hands-on experience with research and the application of science to real-world problems.

I returned the following year in 2016 to begin the PSM in Environmental Informatics program, allowing me to merge GIS and spatial analysis to Environmental Biology. After finishing my master's in 2018, I began the PhD in Environmental Sciences with a concentration in Integrated Research. Throughout my master's and doctoral programs, my research has been focused on mapping and analyzing the patterns and relationships among watershed dynamics, stream ecosystems, land use patterns, endangered species distributions and karst landscapes.

What are your roles in the School of Environmental Studies?

I am currently teaching one class per semester as well as aiding in administrative duties for the School of Environmental Studies. With our growing number of students, we hope to grow our presence on campus and throughout our community and to provide more opportunities for our students to get involved with personal and career development.

In addition to that, I am involved with research alongside Tania Datta and Alfred Kalyanapu for developing a watershed plan for the Falling Water River Watershed.

What is a fun fact about yourself?

My family and I love traveling and spending time outdoors. My husband, Daniel, and I currently have Tucker (age 5), Jack (age 3) and Emory (age 1) with another girl, Mallie, on the way. It brings us a lot of joy to introduce them to new places and explore them together. Our kids have become pretty resilient and adventurous, and it gives us a fun perspective seeing it through their eyes.

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