SAMANTHA A. ALLEN

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EDUCATION

Ph.D., Environmental Sciences, Tennessee Technological University, December 2022
Concentration: Integrated Research
Dissertation: Integrated Analysis of Hydrologic Features, Land-Use Relationships and Anthropogenic Threats within Stream Ecosystems of a Major Military Base
Dissertation Advisors: Hayden Mattingly, Ph.D., Tania Datta, Ph.D., Kit Wheeler, Ph.D., Evan Hart, Ph.D., Justin Murdock, Ph.D.

P.S.M., Environmental Informatics, Tennessee Technological University, 2018
Areas of Study: Geographic Information Systems, Statistics, Business
Project Title: Developing a Web-Based Geodatabase for the Falling Water River Watershed
Research Advisors: Tania Datta, Ph.D., Alfred Kalyanapu, Ph.D
Faculty Advisor: Hayden Mattingly, Ph.D.

B.S., Biology, Tennessee Technological University, 2014
Concentration: Environmental Biology
Minors: Spanish and Chemistry

RESEARCH EXPERIENCE

Tennessee Technological University

- School of Environmental Studies — Cookeville, TN
  Lecturer — July 2023 - Present
  - ❑ Collaborate with faculty and student research projects to write grant proposals, provide technical GIS support, water quality field work and contribute to deliverables for projects such as: Nashville Highland Rim conservation group, United States Fish & Wildlife Service, Tennessee State Parks, and Tennessee Department of Forestry.
  - ❑ Provide research support to the Watershed Dynamics and Evolution (WaDE) project led by Oak Ridge National Laboratory (ORNL)
- Center for the Management, Utilization and Protection of Water Resources — Cookeville, TN
  Research Associate — August 2022-May 2023
  - ❑ Collaborate with other faculty, key stakeholders, and the funding agency in order to develop a watershed plan for the Falling Water River Watershed. Duties include: assessing current data availability, characterizing the watershed's condition, working with key stakeholders to determine action steps that will best aid in the sustainability and

improvement of the watershed's biotic integrity and water quality, provide technical GIS support, conduct remote sensing projects, characterize human threats to aquatic systems and use spatial modeling to assess watershed dynamics and water quality, and maintain project database and supporting data.

- School of Environmental Studies Cookeville, TN
  Research Assistant - Arnold Air Force Base Project 2018- December 2022
  - ❏ Collaborate on the project in order to create a biological assessment for the Arnold Air Force Base, located in Tullahoma, Tennessee. Provide technical GIS support, conduct remote sensing projects, characterize human threats to aquatic systems and use spatial modeling to create species distribution models and watershed management prioritization maps. Use MaxEnt modeling, LiDAR data and environmental variables to model Karst geomorphological features across a landscape. Maintain project database and supporting data.
- School of Environmental Studies Cookeville, TN
  Research Assistant - Pygmy Madtom Project 2017-2022
  - ❏ Collaborate on the project "*A Large-scale Habitat Model for the Endangered Pygmy Madtom, Noturus stanauli" by u*sing geographic information systems and the MaxEnt statistical model to determine the probability of occurrence of the Pygmy Madtom.
- School of Environmental Studies Cookeville, TN
  Research Assistant – Bluemask Darter Research Project August 2017 – Present
  - ❏ Use geographic information systems and the maxEnt statistical model to research habitat characteristics of the endangered bluemask darter
- Center for the Management, Utilization and Protection of Water Resource Cookeville, TN
  Research Assistant – Falling Water River Watershed Project January 2017 – Present
  - ❏ Aid in the Development of a web-based geodatabase for the purpose of data sharing and collaboration within the Falling Water River Watershed

Oak Ridge National Laboratory – Environmental Sciences Division Oak Ridge, TN
Science Undergraduate Laboratory Intern Summer 2014
Higher Education Research Experience (HERE) Post-Bachelors Intern May 2015- Nov. 2015

- Completed Research Project: "Calibration of Thermal Dissipation Probes used to Monitor Sap Flow in *Picea mariana* and *Larix laricina* Trees Within a Southern Boreal Peatland Forest" and presented on research at the end of the summer 2014 term.
- Assisted in the analysis of microbial ecology through performing DNA extractions, Quantitative Polymerase Chain Reactions, incubation experiment maintenance, Gas Chromatography & field sampling for the Spruce and Peatland Responses Under Climatic and Environmental Change (SPRUCE) project. (2015)
- Full Time, 40 Hours/Week

TEACHING & OUTREACH EXPERIENCE

Lecturer Cookeville, TN
Tennessee Tech University, School of Environmental Studies August 2023-present

- Fundamentals of Environmental Spatial Analysis; Remote Sensing & Field Applications of GIS; Introduction to Environmental Studies; Field Based Learning in Scotland; Capstone Internship Experience
- Member of the Graduate Faculty

Instructor Cookeville, TN
Tennessee Tech University, School of Environmental Studies 2022-present

- Field Applications of GIS; Introduction to Environmental Studies

Guest Lecturer Cookeville, TN
Advanced GIS & Programming GIS 2020-2021

- Organize, plan, and instruct guest lectures for the Advanced GIS course and the Programming GIS courses as needed, under the supervision and mentorship of Dr. Peter Li (PLi@tntech.edu)

Science Field Instructor – Cookeville, TN
Leader & Instructor 2018-present

- Organize, plan, and instruct science-related education courses and field trips for K-12 students in the local Upper Cumberland Area
- Instructional material focused on modern mapping & spatial analysis techniques, geologic processes, karst formations, and biodiversity in the region

Tennessee Technological University – Cookeville, TN
School of Environmental Studies
Teaching Assistant – Environmental Studies Senior Capstone 2016-2017

- Taught classroom lectures, supervised undergraduate research and graded classroom assignments
- Student research focused on community outreach and landscape-scale GIS analysis related to the endangered Bluemask Darter, *Etheostoma akatulo*.

Oak Ridge National Laboratory Science Fair Volunteer

- Aided in children's science activities at a booth for the Spruce and Peatland Response Under Changing Environments (SPRUCE) experiment at the Oak Ridge National Laboratory Science Fair.

Tennessee Technological University – Office of Biology Cookeville, TN
Teaching Assistant – Microbiology, Zoology, & General Biology Fall 2012 – December 2014

- Taught laboratory lectures, aided in laboratory setup, facilitated classroom experiments, and graded classroom assignments related to various animal taxonomy, biological processes, animal anatomy and classification, cell structure and function, and plant physiology.

PUBLICATIONS

Kluber, L.A., E.R. Johnston, S.A. Allen, J.N. Hendershot, P.J. Hanson, and C.W. Schadt. 2020. Constraints on microbial communities, decomposition and methane production in deep peat deposits. PLoS One 15(2): e0223744
doi:https://doi.org/10.1371/journal.pone.0223744

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.

IN PREPARATION AND REVISION

Allen, S.A. Testing the Ability of LiDAR Data and MaxEnt Modeling to Predict Karst Spring Locations: A Case Study from South-Central Tennessee. *Submitted and In Revision to Water.*

Allen, S.A., H. Mattingly, K. Wheeler, J. Murdock, K. Gibbs, P. Blum, K. Irwin-Womble, J. Caudle, Prioritization of Stream Catchments At Risk to Anthropogenic Threats at a Major Military Base in Tennessee. *In Preparation.*

Allen, S.A., H. Mattingly, K. Wheeler, J. Murdock, K. Gibbs, P. Blum, K. Irwin-Womble, J. Caudle, Relationships Between Catchment and Riparian Land-Use Patterns, Water Qualtiym and Biotic Integrity for Aquatic Resources at a Major Military Base in Tennessee. *In Preparation.*

PRESENTATIONS

ORAL PRESENTATIONS

Allen, S.A. and H.T. Mattingly. 2022. Using GIS and MaxEnt Modeling to Predict Spring Locations and Assess Aquatic Resources in the Karst Landscape surrounding Arnold Air Force Base, Tullahoma, TN. Tennessee Geographic Information Council Annual Conference 2022, Montgomery Bell State Park- Burns, TN.

Allen, S.A., W.G. Wells, and H.T. Mattingly. 2020. A Large-Scale MaxEnt Model for the Distribution of the Endangered Pygmy Madtom, *Noturus Stanauli*. Catfish 2020, Little Rock, AR.

Allen, S.A., C. Guy-Baker, T. Datta, and A. Kalyanapu. 2018. Web-Based Geodatabase for the Characterization and Management of a Karst Watershed. American Water Resources Association 2018 Spring Specialty Conference: GIS and Water Resources, Orlando, FL.

Allen, S.A., C. Guy-Baker, T. Datta, and A. Kalyanapu. 2018. Developing a Web-Based Geodatabase for Data Sharing and Collaboration within the Falling Water River Watershed. 27th Tennessee Water Resources Symposium, Montgomery Bell State Park- Burns, TN.

Kluber, L.A., J.N. Hendershot, S.A. Allen, D.Z. Yip, Z. Yang, P.J. Hanson, and C.W. Schadt. 2016 Microbial community responses and limitations to deep peat heating at the SPRUCE experiment in Northern Minnesota. Ecological Society of America Annual Meeting, Ft. Lauderdale, FL.

POSTER PRESENTATIONS

Blum, P.W., J. Murdock, J. Asante, S.A. Allen, B. Bajo, R. Brown, F. Hoogakker, A. Padget, V. Wesley, T. Wright. Stream Water Quality Responses in a Tornado-Damaged Residential Watershed. Society for Freshwater Sciences Annual Meeting 2021, Virtual.

Kluber, L.A., J. N. Hendershot, S.A. Allen, D. Yip, Z. Yang, P. Hanson, and C.W. Schadt. 2016. Microbial Response to the SPRUCE Deep Peat Heating Experiment. Environmental System Science PI Meeting, Potomac, MD.

Kluber, L.A., S.A. Allen, J.N. Hendershot, C.W. Schadt. 2015. Understanding the microbial community responses to the SPRUCE Deep Peat Heat experiment. 7th Annual Argonne Soil Metagenomics Meeting, Naperville, IL.

GIS COLLABORATIONS

Rine, M. 2024 - present. Spatiotemporal Fish Assemblage Patterns Associated with Fluctuating Flow in a Cumberland River Watershed in Tennessee.

Swain, H. 2024 - present. Species distribution and habitat analysis for duskytail darter, *Etheostoma percnurum*.

Allen, S.A., R. Kaiser, T. Datta, and A. Kalyanapu. Towards the Establishment of a Watershed Management Plan for Falling Water River Watershed. *An ArcGIS Story Map:* https://storymaps.arcgis.com/stories/4216d72edf56445196ad41700ce8d79a

Onwuchekwa, C.O. 2022. Adsorption of Methamphetamine on Select Microplastics and the Evaluation of Microplastic Content in Center Hill Lake and Cookeville Wastewater Treatment Plant. *A Dissertation for a Doctor of Philosophy in Environmental Sciences - Chemistry from Tennessee Tech University*.

Wells, W. G. and H. T. Mattingly. 2019. Evaluation of benthic fish communities in the Clinch and Duck rivers as habitat indicators for the endangered pygmy madtom, *Noturus stanauli*. Southeastern Fishes Council Proceedings *In-Press*

Wells, W. G. and H. T. Mattingly. 2019. Evaluation of microhabitat habitat conditions used by the pygmy madtom, *Noturus stanauli.*Southeastern Naturalist.

Wells, W.G. 2019. Aspects of Life History, Species-Habitat Associations, Species-Community Associations, and Distribution of the Pygmy Madtom, *Noturus stanauli*. Tennessee Technological University, ProQuest Dissertations Publishing.

Mattingly, H, C. Hurt, G. Wells, and R. Paine. 2018. Environmental DNA Detection, Population Status, and Habitat Use of the Pygmy Madtom, *Noturus stanauli.* Final report to Tennessee Wildlife Resources Agency. 95pp.

Tennessee Technological University. 2018. Determining Bluemask Darter Ecological Requirements at Multiple Spatial Scales to Support Reintroductions in the Calfkiller River System (Cooperative Agreement Award No. F17AC00592). Interim Performance Report: August 1, 2018. Submitted to U.S. Fish and Wildlife Service – Tennessee Ecological Services Office. Prepared by: Hayden Mattingly, Samantha Allen, and Valerie Jones, School of Environmental Studies. 10 pp.

FUNDING AND FELLOWSHIPS

- Tennessee Department of Environment & Conservation (TDEC) Falling Water River Watershed Plan; Principal Investigator: Tania Datta
  2022- 2023
- AEDC Bat-Related Aquatic Resources Study - Evaluation of Aquatic Resources to Support Bat Foraging Habitat at Arnold Engineering Development Center, Arnold Air Force Base, with an Emphasis on Rare, Threatened and Endangered Aquatic Species, Cooperative Agreement Award F18AC00549; Principal Investigators: Hayden Mattingly, Justin Murdock, Christopher Wheeler, and Keith Gibbs
  2018-2022
- Tennessee Technological University Diversity Fellowship
  2016-2017

UNIVERSITY SERVICE EXPERIENCE

- Tennessee Tech University Tech-infused Courses Committee (2023-present)
- Serve on the School of Environmental Studies Professional Science Master's Degree in Environmental Informatics Academic Self-Study Report Committee (2023-2024)
- Serve on the School of Environmental Studies undergraduate, Environmental & Sustainability Studies Academic Self-Study Report Committee (2022-2023)
- Undergraduate Advisor for the Environmental & Sustainability Studies program (2018 - 2022)

- Serve on the Environmental & Sustainability Studies Curriculum Committee & Academic Self-Study Report Committee (2018 - 2019)
- Aid in the research and development of additional articulation agreements between Tennessee Tech University and surrounding community colleges (2017-2018)
- Lead prospective and new student recruitment efforts for the School of Environmental Studies undergraduate and graduate programs (2016 - 2018; 2022-present)
- Assist in the layout and editing of the School of Environmental Studies bi-annual newsletter (2017-2018; 2022-present)

PROFESSIONAL MEMBERSHIPS & SERVICE

American Water Resources Association 2018-present
Tennessee American Water Resources Association 2018- present
Tennessee Geographic Information Council 2016-present
Member of the TNGIC Education Committee
Member of the Board of Directors 2024 - present

GRADUATE STUDENTS (CHAIR)

- Vennela Vakapalli, P.S.M. Environmental Informatics, expected graduation July 2024
- Karoz J. Mittagadapa, P.S.M. Environmental Informatics, expected graduation July 2024
- Mackenzie Garner, P.S.M. Environmental Informatics, expected graduation December 2024
- Hannah Stowers, P.S.M. Environmental Informatics, expected graduation May 2025
- Joshua Loiacono, P.S.M. Environmental Informatics, expected graduation December 2025

GRADUATE STUDENT COMMITTEES (NON-CHAIR)

- Jessee Griffith, P.S.M. Environmental Informatics, National Science Foundation Fellow, expected graduation May 2025
- Creek Anderson, P.S.M. Environmental Informatics, National Science Foundation Fellow, expected graduation May 2025

LANGUAGES

Professional Working Proficiency in Spanish

PROFESSIONAL SKILLS

PADI Open Water SCUBA Certified
Adobe Lightroom, Photoshop, & Illustrator
DSLR Photography
Microsoft Office Products
ESRI Suite of Programs including ArcMap, ArcGIS Pro & ArcGIS Online
ENVI