

## Coastal Critical Zone Summer Undergraduate Internship

Dates of internship: June 5 – August 10, 2023

Location: Michael Lab, University of Delaware, Newark, DE 19716

Number of positions available: 1

Faculty Mentor: Holly Michael, hmichael@udel.edu

Graduate Student Mentor: Amanda Sprague-Getsy, amandasg@udel.edu

**Overview:** The Coastal Critical Zone Network is an interdisciplinary team project researching the effects of changing climate and sea level rise on the Delmarva Peninsula, which includes Delaware and parts of Maryland and Virginia. The project is funded by the National Science Foundation, a prestigious, taxpayer-supported federal science agency. The Critical Zone team is inviting applications for paid undergraduate research internships for summer 2023; interns will be part of sub-teams in hydrology, biogeochemistry or ecosystem research. Research will involve a combination of laboratory, outdoor field work and/or computational environments. We seek a diverse group of undergraduate students to join our team in a welcoming, collaborative environment.

**Project Title: Coastal Critical Zone: Carbon flux out of salt marshes**

**Project Sub-team:** Hydrology

### **Research Description:**

Salt marshes provide vital ecosystem services locally and globally by their ability to sequester and cycle large quantities of carbon, store and filter out pollutants and excess nutrients, and host critical biogeochemical activity. The transition zone between upland and marsh ecosystems is an area of great importance as sea-level rise (SLR) causes ecosystem change and salt-marsh migration. Intertidal salt marshes can serve as important sources and sinks of carbon for oceans. Carbon outwelling can represent an important but often neglected carbon sequestration mechanism in salt marshes. The DELMARVA Peninsula is especially vulnerable to sea level rise (SLR) because of its low lying topography. Understanding the drivers behind these processes in the transition zone are essential to understand the impact of SLR. The student will seek to understand the hydrological drivers behind carbon flux in salt marshes but the project itself can be tailored to match research goals of the student. The student will also be trained in time and data management and fieldwork skills.

### **Research Questions:**

1. How do tidally influenced salt marsh creeks contribute to the total carbon export?
2. What hydrologic drivers impact the carbon flux out of salt marshes?

## Student Learning Objectives: Professional and Research Skills

This internship focuses on the development of the following professional and scientific skills.

Broad Professional Skills	Specific Skills
Planning and time management	Ability to set and complete specific goals of varying scope
Work independently	Independent work ethic - work independently to problem-solve
Collaborative skills	Learning to complete tasks efficiently and effectively with others
Express ideas in writing and verbally	Communicate with diverse audiences - Development of impactful poster and oral presentations. Honing ability to deliver scientific results/impacts to people of multidisciplinary backgrounds.
Broad Scientific Research Skills	Specific Skills
Understand relationships between levels of biological organization	Make connections between biological processes at the organismal, population, and community scales
Recognize simple patterns in research data	Comparing hydrological responses (over time, across gradients)
Build skills in field research	Contribute to research at field sites.
Understand, apply, and explain scientific concepts and theories	Express questions and plan methods for answering them. Learning to communicate results through oral presentations and posters.

### Prerequisites:

A background in hydrology or related fields is preferred. Fieldwork outdoors during summer will be required, and therefore, prior outdoors experience (scientific or professional) is preferred.

### Work Environment and Expectations:

Laboratory environment: Penny Hall, University of Delaware Newark, DE

Field work environment: Delmarva Peninsula sites, 1-3 hr drive from University of Delaware (transportation provided).

Computational environment: Familiarity with Word and Excel.

The internship is full-time, with exact hours and expectations determined between student and mentor. Students will also participate in a June 2023 Critical Zone group orientation in person, weekly Zoom team meetings, and end of internship poster session.

### Stipend:

\$4,500 - Direct deposit is required. In addition, for undergraduate researchers who do not live locally up to \$1,500 per research intern may be available in housing assistance.

### Funding Source:

National Science Foundation Coastal Critical Zone Network

**Application deadline: Friday, February 24, 2023**

**How to apply:** [https://ugresearch.udel.edu/PUB\\_Program.aspx](https://ugresearch.udel.edu/PUB_Program.aspx)