**Coastal Critical Zone Summer Undergraduate Internship**

Dates of internship: June 9 – August 15, 2025

Location: Gedan Lab, George Washington University, 800 22nd St. NW, Washington, DC 20052

Number of positions available: 2

Faculty Mentor: Keryn Gedan, kgedan@gwu.edu

Graduate Student Mentor: Juan Martinez, juan.martinez@gwmail.gwu.edu

Professional Staff Mentor: Jane Callaghan, j.callaghan@gwu.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 2025; interns will be part of sub-teams in hydrology, biogeochemistry or ecology research. Research will involve mostly outdoor field work and/or lab and computational efforts. We seek a diverse group of undergraduate students to join our team in a welcoming, collaborative environment.

**Project Title:** Seed banks of transitioning forests

**Project Sub-team:** Ecology

**Research Description:**

As trees succumb to salinity stress, light reaches the forest floor, understory species and soil seed banks spring to life, and the understory community of plant species changes. In a new, large-scale forest disturbance experiment, we have girdled trees in forest plots to mimic the canopy opening of ghost forest formation, in plots spanning a coastal salinity gradient. In summer 2025, we will study the physiology of these dying trees and the ecological changes and water cycling occurring in the forest understory as a result. We will embed small scale experiments within the large forest plots and conduct greenhouse studies to isolate plant responses to changing environmental conditions.

The Gedan Lab at George Washington University (GWU) is studying ecological change at the forest boundary due to saltwater exposure. We use tools from community ecology, forestry, and plant physiology to investigate changes at the organismal, population, and community scale in coastal forest, forest-marsh transition, and salt marsh that are due to sea level rise, saltwater intrusion, and saltwater flooding associated with storms and high tides.

**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 |
| Literature analysis | Ability to find and use scientific manuscripts related to salinity stress and community assembly |
| Maintain scientific tools and facilities | Corers, sieves, climate-controlled greenhouse, plant husbandary |
| Recognize simple patterns in research data | Comparing biological responses (over time, across gradients) between species, sites, and environmental conditions |
| Build skills in field research | Contribute to research at field sites. Learn natural history, plant identification, and ecological survey methods. |
| Analyze research data | Excel, R, and instrument-specific software utilization to manipulate and summarize data |
| 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:**

Introductory experience in Excel and R required. Extensive time in the outdoors during summer will be required, and therefore, prior outdoors experience (scientific or professional) is preferred.

**Work Environment and Expectations:**

Laboratory environment: Coastal ecology lab, Science and Engineering Hall, 6th floor, George Washington University, Washington, DC

Field work environment: Delmarva Peninsula sites, 2 to 4 hour drive from GWU

Computational environment: A lab computer or tablet will be available to the student for shared use.

The internship is full-time, with exact hours and expectations determined between student and mentor. Students will also participate in our Coastal CZ annual team meeting, usually held in June, and bi-weekly Zoom team meetings, and create an end-of-internship poster session.

**Stipend:**

$6,000 - Direct deposit is required. In addition, for undergraduate researchers who do not live locally up to $2,000 per research intern may be available in housing assistance.

**Funding Source:**

National Science Foundation Coastal Critical Zone Network

**Application deadline: Friday, February 27, 2025**

**How to apply:** <https://docs.google.com/forms/d/e/1FAIpQLSei7KPKvywiRJnENc73ZSfBYXsjktfKDOyINcpWPJlSPlM7pA/viewform?usp=header>