Dates of undergraduate research opportunities: **June 1, 2020 – August 7, 2020**

Location: **Carpenter Hall, Wesley College, Dover, DE**

Number of positions available: **1-2** (*undergraduates from any eligible institution and 5-year M.S./B.S. students from Wesley College*)

Faculty Mentor: **Stephanie Stotts, PhD**

Professional Staff Mentor: **Kristopher Roeske, MS**

**Project Titles:**

Dendroecology: Exploring changes in Delaware’s coastal forrest using dendroecology

**Research Description:**

Forrest habitat is an essential resource because trees create wildlife habitat, store carbon, and reduce excess sediment, nutrients, pesticides, and pollutants in both surface and shallow groundwater. Unfortunately, the state has lost 70% of the original forest habitat, and what remains is highly threatened through inundation and salinfication of ground and surface water. The focus of this research project is to understand and predict how land use and salinfication impact coastal forests using dendroecology.

**Research Questions:**In what way is salinification reflected in the tree ring record?

Subquestions specific to Summer 2020

1. What are the climate drivers of non-salt stressed Eastern red cedar along the St. Jones River?
2. How do the drivers of growth for Eastern red cedar growing without salt stress differ from Eastern red cedar growing with salt stress (found in summer 2019).

**Student Learning Objectives: Professional and Research Skills**

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

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| 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 interdisciplinary background. |
| Broad Scientific Research Skills | **Specific Skills** |
| Understand scientific terms  | Mechanistic and applied concepts in biology, ecology, environmental science, and dendroecology |
| Literature analysis | Ability to effectively find and utilize scientific manuscripts related to biology, ecology, and dendroecology |
| Use scientific tools | In the dendro project, students will be trained in filed techniques, including tree coring, tree cross sectioning, andobtaining standard forestry measurments. Students will also learn how to measure tree rings using a linear encoder. |
| Recognize simple patterns in research data and data analysis | Dendro project: Students will process the tree ring data using COFECHA and ARSTAN. Analysis with Excel, SPSS, and GIS will also be included. |
| Understand, apply, and explain scientific concepts and theories | Freedom to form questions and plan methods for addressing challenges. Learning to effectively communicate results through oral presentations and manuscript writing |

**Prerequisites:**

STEM major with an introductory experience with biology and/or environmental science and completed Pre-Calc. I

**Work Environment and Expectations:**

Laboratory environment for Dendroecology: Carpenter Hall, Wesley College. Hours are flexibly determined between student and mentor. Students will work part time during the fall and spring semesters, and full time during the summer internship program, June 1 -August 7, 2020. Students are required to register for 1-2 Directed Research Credits (CH265/365) and will also participate in a retreat, communications workshop, Scholars Day, and end of summer-internship symposium.

**Stipend:**

$5,000 in summer; $10/hour during the academic year for undergraduates; $15/hour during the academic year for 5-year M.S./B.S. students. Direct deposit is required.

**Funding Source:**

National Science Foundation, Delaware EPSCoR Threat 4

**How to apply:** <https://wesley.edu/academics/undergrad-research> (EPSCoR link) or email: Stephanie.Stotts@wesley.edu.