

Fear to Hope

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Community Partner: An Achievable Dream

Introduction:

- *Fear to Hope* is a public science project, where CNU students and faculty collaborate with high schools across the Coastal Plains region of Virginia.
- Our fellowship partners with students at **An Achievable Dream**, a local combined high school and middle school in NN.
- The research addresses the impacts of **climate change**, specifically the effect of sea level rise on **Atlantic white cedar (AWC) (*Chamaecyparis thyoides*)** through the process of **saltwater intrusion**.
- This project aims to expand the scope of our research while also engaging students in authentic research and peaking interest in **STEM careers**.

Literature Review:

- Our project functions much like a Course-Based Undergraduate Research Experience (CURE) on a smaller scale.
- CUREs provide opportunities to develop new research experiences and enhance STEM career success and engagement.
- Hands-on research experience provides more engagement with in-lab and in-field science through direct application of scientific knowledge, facilitating the scientific thought process and how they view their own personal research and its importance.¹
- These forms of research experiences increase scientific opportunity and thus inclusivity, eventually promoting greater diversity in higher education faculty in the process.²
- In pursuit of other careers, students still improve their ability to understand how scientists conduct research and better prepare them to evaluate scientific claims in their day-to-day lives.³

Literature Cited:

Auchincloss LC, Laursen SL, Branchaw JL, *et al.* 2014. Assessment of course-based undergraduate research experiences: A meeting report. *CBE—Life Sciences Education*, 13(1): 29–40.

Bangera G, Brownell SE. 2014. Course-based undergraduate research experiences can make scientific research more inclusive. *CBE—Life Sciences Education*, 13(4): 602–606.

American Association for the Advancement of Science (AAAS). 2011. *Vision and Change in Undergraduate Biology Education: A Call to Action*. Washington, DC.



CNU professionals and alumni collected at the Coastal Resilience Symposium



AAD students with their poster at the Coastal Resilience 2022 Symposium



Ghost forests caused by saltwater intrusion along Eastern U.S. coastal wetlands

Project Plan:

1. Introduce Students to the Study and Experimental Design
2. Set Up the Experiment:
 - Plant AWC saplings
 - Assign treatments (0, 2, and 4 ppt salinity)
 - Practice taking measurements
3. Conduct the Experiment:
 - 4-week exposure
 - weekly measurements of the height and diameter of the seedling stems using rulers and calipers
 - reapplication of salt each week
 - 12-week recovery
 - final measurements of heightdiameter , diameter, and photosynthesis using the Li-Cor 6400XT
4. Analyze the Results:
 - Statistical testing, Designing tables , Answering questions
5. Poster Development
6. Symposium:
 - Students present their posters
 - Opportunities for networking with environmental professionals ensue

Research Experiences for Students:

- Working with live specimens in an outdoor environment
- Collecting morphological measurements
- Collecting photosynthetic rates using professional instrumentation
- Conducting data analysis and producing figures
- Presenting at a professional symposium

Future Steps:

- Expanding research to include other species
- Partnering with more schools and age groups
- Conducting interactive assessments to determine impact

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