**DENIN Environmental Scholars Internships**

Dates of internship: January – May 2021

Location: Penny Hall, University of Delaware, Newark, DE, 19711

Number of Positions available: 1

Faculty Mentor: Holly A. Michael

Postdoctoral Mentor: Anner Paldor

**Project Title:** Environmental controls on the vulnerability of coastal aquifers to storm-surge salinization.

**Research Description:**

Due to their proximity to the ocean, coastal aquifers are under continuous risk of salinization, which may compromise freshwater supply and ecosystem services. One of the processes by which saltwater may intrude coastal aquifers is the vertical infiltration that may follow ocean surge inundation events. This process has been recognized only recently, and there is currently limited knowledge on the factors that control the rate of salinization through this process. In this project, we aim to classify different types of coasts (e.g., agricultural fields, urbanized areas, wetlands, etc.) based on their vulnerability to storm-surge salinization. To that end, this project will include data assimilation and processing of different hydrological parameters along the mid-Atlantic, including land-use, freshwater recharge rates, and surface topography. The undergraduate researcher will be responsible for the acquisition of the data, processing, and synthesizing the information in a spatial context to identify places that are most vulnerable. Extensive use of geospatial software (Arc GIS Pro) is anticipated, and basic proficiency with it is strongly preferred. This is an excellent opportunity to gain experience with one of the fundamental tools in geoscientific research. There will also be an opportunity to participate in numerical modeling (to some extent), but no experience is necessary.

**Research Questions:**

1. What types of coasts are most vulnerable to storm surge-salinization?
2. Which areas along the mid-Atlantic are threatened by extensive salinization?

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

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

Professional

1. **Planning and time management**. Setting research goals, building a plan and a time table.
2. **Independency**.Taking the initiativein conducting the research and executing the plan.
3. **Collaboration**. Working with the mentor to coordinate efforts and combine results.
4. **Communication**. Both verbal and written communication, presentation and discussion of results.

Scientific

1. **Terminology**. Getting acquainted with key terms in the field (recharge, hydraulic conductivity).
2. **Scientific reading**. Being able to review and summarize existing literature on the matter.
3. **Tools**. Using spatial information systems, data analysis tools, data acquisition resources.
4. **Data interpretation**. Post-analysis interpretation, “making sense” of the results.
5. **Hydrologic modeling**. Understanding concepts in modeling, approaches and limitations.

**Prerequisites:**

Basic knowledge in geospatial/geographic information software (e.g. Arc GIS, AutoCAD).

**Work Environment and Expectations:**

Penny hall, room 106 (hydrogeologic modeling and calibration lab). Hours are flexible and will be determined with the mentor. The anticipation is for an in-person research program. If the COVID circumstances will not allow in-person meetings and presence in the lab is impossible, remote work and meetings will be adopted. Our current experience with an undergrad working remotely has been successful so far.

**Stipend:**

**Funding Source:**

**How to apply:**