

Opportunity Title: Ecological Numerical Modeling Research - Postgraduate

Opportunity Reference Code: ERDC-CHL-2021-0004

Organization U.S. Department of Defense (DOD)

Reference Code ERDC-CHL-2021-0004

How to Apply Components of the online application are as follows:

- Profile Information
- Educational and Employment History
- Essay Questions (goals, experiences, and skills relevant to the opportunity)
- Resume (PDF)
- Transcripts/Academic Records - [Click here for detailed information about acceptable transcripts](#)
- Recommendations

Submitted documents must have all social security numbers, student identification numbers, and/or dates of birth removed (blacked out, blackened out, made illegible, etc.) prior to uploading into the application system.

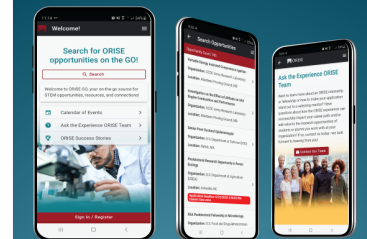
If you have questions, send an email to usace@orise.orau.gov. Please list the reference code of this opportunity in the subject line of the email.

All documents must be in English or include an official English translation.

Description The U.S. Army Engineer Research and Development Center's Coastal & Hydraulics Laboratory (CHL) performs research on ocean, estuarine, riverine, and watershed systems in support of the U.S. Army Corps of Engineers (USACE) and the Department of Defense (DOD) Task Force in support of the Ocean Commission. A multi-disciplinary team of scientists, engineers, and support personnel work in CHL's internationally known, unique facilities. This team has developed state-of-the-art experimental and computational models for solving water resource problems worldwide. Physical facilities of approximately 1.7 million square feet and high-performance computing facilities at the DOD Supercomputing Research Center (<http://www.erdchpc.mil>) are the basic infrastructure for producing cutting-edge products for successful coastal, inland water resources, and navigation management. CHL work, although primarily in support of the DOD and the Corp's districts, also interfaces with other federal, state and local agencies, academia, conservation groups, and the general public, as appropriate. The Research Participation Program for USACE-ERDC-CHL provides opportunities to participate in new and on-going applied research and development projects. Research projects range from design guidance to three-dimensional computational models. Focus is placed on inland and coastal navigation, military logistics over the shore, dredging, flood control, storm and erosion protection, waterway restoration, fish passage, hydro-environmental modeling, water/land management, and other water and sediment-related issues facing the nation. For more information about USACE-ERDC-CHL, please visit <https://www.erdchpc.usace.army.mil/Locations/CHL/>.

Under the guidance of a mentor, the selected candidate will participate in developing, evaluating and applying integrated ecogeomorphic models. This internship is part of a project that focuses specifically on evaluation and application of a salt marsh accretion model to be integrated with related ecological and hydrodynamic models. As part of the research team, the participant's research experience will include the following:

- (1) Quantifying and evaluating the major physical, ecological and biological drivers of salt marsh productivity;
- (2) Identifying major knowledge gaps and design simulation experiments to quantify model

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uncertainty;

(3) Conducting model simulations to quantify the effects of management and restoration actions on salt marsh properties;

(4) Advising the planning of and participating in related field work to determine relevant model inputs as needed;

(5) Developing of a quantitative framework for integrating ecogeomorphic with related ecological and hydrodynamics models across temporal and spatial scales to address questions related to salt marsh management and restoration; and

(6) Analyzing modeling results and writing peer-reviewed journal articles.

Location: *Columbia, South Carolina*

Appointment Length

This ORISE appointment is for a 12 month period. Appointments may be extended depending on funding availability, project assignment, program rules, and availability of the participant.

Participant Benefits

Participants will receive a stipend to be determined by ERDC-CHL. Stipends are typically based on the participant's academic standing, discipline, experience, and research facility location. Other benefits may include the following:

- Health Insurance Supplement. *Participants are eligible to purchase health insurance through ORISE.*
- Relocation Allowance
- Training and Travel Allowance

Nature of Appointment

The participant will not enter into an employee/employer relationship with ORISE, ORAU, DOD, or any other office or agency. Instead, the participant will be affiliated with ORISE for the administration of the appointment through the ORISE appointment letter and Terms of Appointment.

Qualifications The candidate will participate a multi-disciplinary team in model development and application including collection of relevant field data for model parameterization and validation, analysis of model outputs, and application of models to real planning and management scenarios. Actual participation will depend on agreed direction and area of interest but will include scientific research on salt marsh dynamics; the linking of physical and ecological models, and computer coding in a collaborative environment. Experience in ecological and/or hydrological data collection in salt marsh environments desired but not mandatory. Areas of interest include, but are not limited to integrated modeling, ecological modeling, coastal evolution modeling, model evaluation, among others.

Minimum requirements:

- Master's or Doctorate Degree in biology, coastal ecology, oceanography, geology, coastal engineering, or closely related field
- Python programming proficiency
- demonstrated data analysis skills
- demonstrated understanding of ecogeomorphic principles
- strong history of published works

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Additional consideration will be given to the candidates with experience in the following:

- ecological innovation
- integrating multidisciplinary datasets
- experience working in salt marsh systems

**Eligibility
Requirements**

- **Degree:** Master's Degree or Doctoral Degree received within the last 60 months or currently pursuing.
- **Discipline(s):**
 - **Chemistry and Materials Sciences** ([12](#))
 - **Communications and Graphics Design** ([1](#))
 - **Computer, Information, and Data Sciences** ([17](#))
 - **Earth and Geosciences** ([21](#))
 - **Engineering** ([27](#))
 - **Environmental and Marine Sciences** ([14](#))
 - **Life Health and Medical Sciences** ([45](#))
 - **Mathematics and Statistics** ([10](#))
 - **Physics** ([16](#))
 - **Science & Engineering-related** ([1](#))
- **Age:** Must be 18 years of age