Opportunity Title: Engineering: Hurricane Rainfall Research - Doctoral Student
Opportunity Reference Code: ERDC-CHL-2021-0012

Organization U.S. Department of Defense (DOD)

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How to Apply Click on *Apply* now to start your application.

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.erdc.hpc.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.erdc.usace.army.mil/Locations/CHL/.

What will I be doing?

Under the guidance of a mentor, you will join the US Army Corps of Engineers' Coastal Hazards Group (CHG) on integrating the Tropical Cyclone Rainfall (TCR) model into an extended version of the the Coastal Hazards System's (CHS) Probabilistic Coastal Hazard Analysis (PCHA) Framework, intended for assessing compound flooding risks along US coastlines. There are three primary goals for this study that will be documented in a brief report at the conclusion of the fellowship.

You will gain knowledge in the following:

Goal 1: Evaluation of parameterized hurricane rainfall model performance by comparison with observations.

Analyze precipitation frequency estimates from hurricane rainfall models and empirical observations: Collect radar and gauge observations to one. Derive empirical quantiles and collaborate the CHG to compare to hurricane rainfall models' synthetic tropical cyclone precipitation frequency estimates. Explore uncertainties, discrepancies and potential causes and collaborate on bias assessment methods. Research regionalization techniques that can be used to expand precipitation frequency information.

Goal 2: Assessment of hurricane rainfall models temporal and spatial accuracy.

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Assess the accuracy of hurricane rainfall model estimates as relates to pre- and post-landfall physics and quantitative validations, exploring this approach from a spatial perspective instead of the typical averaged assessment. Compare hurricane rainfall models with another method to highlight strengths of the models after landfall. Review literature and compare spatial distribution of the model result with precipitation estimate for recent tropical cyclones.

Goal 3: Application of hurricane rainfall models in Compound Flooding Coupled Modeling Frameworks.

Review methodologies and coupled modeling frameworks for compound flooding simulations and participate in a review of the coupled model system (AdCirc+HEC-RAS+HEC-HMS) and configurations for selected pilot sites, identifying physical factors that may influence its accuracy.

Where will I be located? Location to be determined

Why should I apply?

This fellowship provides the opportunity to utilize your skills and learn from experts in hurricane rainfall research.

What is the anticipated stat date?

ERDC-CHL is ready to make an appointment immediately. Exact start date will be determined at the time of selection and in coordination with the selected candidates.

What are the benefits?

You 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

This ORISE appointment is a part-time twelve month opportunity. Appointments may be extended depending on funding availability, project assignment, program rules, and availability of the participant.

Nature of the Appointment

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

Qualifications

As a Engineering doctoral student, you should have knowledge in coastal engineering, risk assessment, and/or tropical cyclone rainfall hazards.

A complete application consists of:

- Zintellect profile

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- Essay Questions - The application includes questions specific to the opportunity
- Academic Records - An official transcript or copy of the student academic records printed by the applicant or by academic advisors from internal institution systems may be submitted.
- One (1) recommendation - You are encouraged to request a recommendation from a professional who can speak to your abilities and potential for success as well as your scientific capabilities and personal characteristics. Recommendation requests must be sent through the Zintellect application system. Recommenders will be asked to complete a recommendation in Zintellect. Letters of recommendation submitted via email will not be accepted.

Submitted documents must have all social security numbers, student identification numbers, and/or dates of birth removed (blanked 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.

Connect with ORISE...on the GO! Download the new ORISE GO mobile app in the Apple App Store or Google Play Store to help you stay engaged, connected, and informed during your ORISE experience and beyond!

Eligibility Requirements

- **Degree:** Doctoral Degree received within the last 60 months or currently pursuing.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (12 👁)
  - **Communications and Graphics Design** (6 👁)
  - **Computer, Information, and Data Sciences** (17 👁)
  - **Earth and Geosciences** (21 👁)
  - **Engineering** (27 👁)
  - **Environmental and Marine Sciences** (14 👁)
  - **Life Health and Medical Sciences** (46 👁)
  - **Mathematics and Statistics** (10 👁)
  - **Physics** (16 👁)