

Opportunity Title: Socio-Dynamic Modeling - Graduate Research Fellow

Opportunity Reference Code: ERDC-CHL-2021-0009

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.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/>.

This project will be in support of a larger effort between ERDC-CHL and the University of Alabama to develop hazard forecasting and coastal societal resilience models. This research involves assessing compound flooding hazards along the US coast (due, for example, to extreme events such as hurricanes), and developing models and tools to better understand compound threats, hazard characterization, flood risk communication, and associated community and societal behaviors.

What will I be doing?

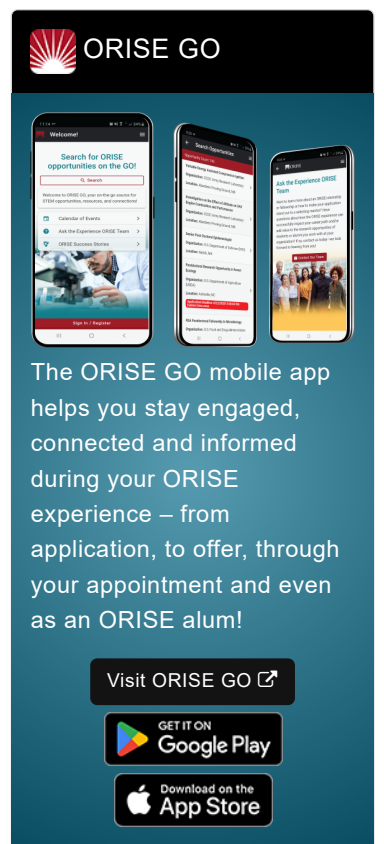
Under the guidance of a mentor, you will join a cohort of ERDC-CHL and the University of Alabama researchers to investigate behavior and perceptions of the public around flood risk. The research involves investigating individual and group (social) psychology and social psychology with respect to risk, risk communication, and risk understanding as they relate to associated behaviors, actions, and population dynamics within computational models. You will participate in the gathering, assessment, evaluation, and simulation/generation of hydrologic data, climate data, and social and psychological data that may inform such models towards improved characterization, understanding, and forecasting of how people contend with flood risk (including decisions to do with preparation and/or evacuation, for example).

Where will I be located? Location Varies

Why should I apply?


This fellowship will provide you the opportunity for and benefit from exposure to a multi-disciplinary team, as well as the opportunity to learn about applied research within the agency.


What is the anticipated start date?




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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 full-time 12 month opportunity. Appointments may be extended depending on funding availability, project assignment, program rules, and availability of the participant. We are willing to discuss possible appointment lengths that might best correspond with desired degree or postdoctoral objectives.

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 You should be a current student or graduate of a Master's or PhD level graduate program in ecology, physics, and applied math, or perhaps engineering.

Relevant interests and skills (desired but not required):

- Coding in Python or R, e.g., including with Monte Carlo and related methods, and including considerations of speed/efficiency (e.g. on multiple processors).

- Complexity science and nonlinear dynamics (qualitatively and quantitatively, including formulation, solution, and analysis of systems of ordinary and perhaps partial differential equations that might represent bulk behavior of collections of stochastically behaving individuals), statistical physics, formulation of analytical expressions and solutions as well as model space analysis of statistical "agent-based", e.g., models.

- Social, voter, and/or ecological math modeling.

- Various statistical fitting or "machine learning" techniques (regressions or more sophisticated approaches) and methods to contend with limited data.

A complete application consists of:

- Zintellect profile
- Educational and Employment History
- Essay Questions - The application includes questions specific to the opportunity
- Academic Records - For this opportunity, 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.
- Current Resume/CV
- Two(2) Recommendations - Applicants are required to provide contact information for at least

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two recommendations. 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. All documents must be in English or include an official English translation. If you have questions, send an email to usace@orise.orau.gov. Please list the reference code of this opportunity ERDC-CHL-2021-0009 in the subject line of the email.

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**Eligibility
Requirements**

- **Degree:** Master's Degree or Doctoral Degree received within the last 60 months or currently pursuing.
- **Overall GPA:** 3.00
- **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](#) )
 - **Social and Behavioral Sciences** ([29](#) )