

Opportunity Title: Engineering Postdoc: Stochastic Weather Generator Research

Opportunity Reference Code: ERDC-EL-2020-0034

Organization U.S. Department of Defense (DOD)

Reference Code ERDC-EL-2020-0034

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 - For this opportunity, an unofficial transcript or copy of the student academic records printed by the applicant or by academic advisors from internal institution systems may be submitted. [Click here for detailed information about acceptable transcripts.](#)
- 2 Recommendation(s)

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.

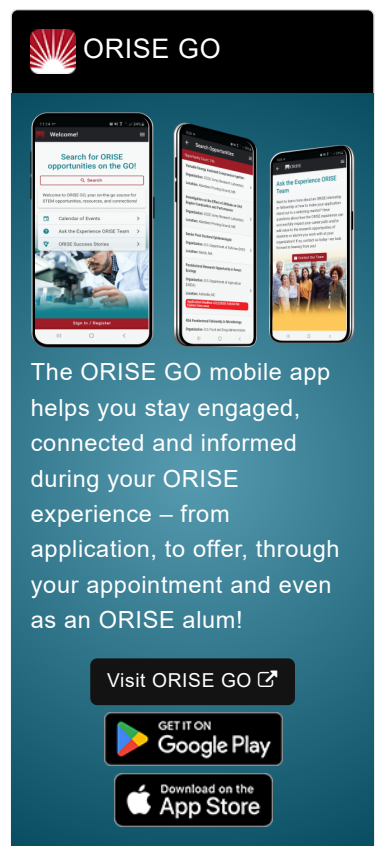
Letter of Recommendation: While a letter of recommendation is not required to be considered, applicants are required to provide contact information for one recommendation in order to submit the application. Applicants are encouraged to request a letter of recommendation before submission as this may help reviewers have a better understanding of the applicant's qualifications and interests. If selected, a letter of recommendation must be submitted on your behalf upon acceptance of the appointment.

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

Description The Environmental Laboratory (EL) provides relevant, value-added technology supporting the environmental mission of the US Army Corps of Engineers, the Army, the Department of Defense (DoD), and the Nation. Headquartered in Vicksburg, Mississippi, the EL's interdisciplinary staff of over 220 engineers, scientists, technicians, and support personnel plans and executes all phases of the technology development process, from basic research to field implementation to commercialization. The EL staff consists of problem solvers who use research, development, experimentation, special studies, and technical support to address the needs of national and international business development partners. Partnering with Federal and State agencies, academia, and the private sector, the EL uses its distinctive technical capabilities to resolve complex, multi-disciplinary environmental sustainability problems.

The candidate will participate in stochastic weather generator research. Some specific research projects are described below.

(1) The candidate will, under the guidance of their mentor, enhance the methods and algorithms implemented in an existing hierarchical, multi-site weather generator capable of producing ensembles of stochastic multi-variant meteorological data for integrated water resource



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management and climate vulnerability studies. Tasks related to this item will include the exploration of: (a) classification algorithms for synoptic scale atmospheric states known as weather regimes; (b) various Markov methods to simulate transitions between weather regimes; (c) methods for simulating low frequency variability in precipitation records.

(2) The candidate will document and improve the existing weather generator's usability by producing, for example, a series of Jupyter notebooks containing: (a) a descriptions of its methods; (b) code executing the weather generator modules; (c) stepwise instructions for parameterizing and running the model; (d) links to external resources for further research; and (e) visualization aids (such as plots, tables, graphs, etc.) to help users understand the model inputs, errors and intermediate or final outputs.

(3) The candidate will carry out extensive tests of: (a) the weather generator, (b) specific enhancements described in above, and (c) Jupyter notebooks or similar usability tools (also described above) for a number of watersheds with varying hydro-climatological conditions.

It is expected that this research will lead to one or more published journal articles that will be co-authored by the candidate and mentor.

Length of Appointment

This appointment is a full-time twelve month research appointment, with the possibility to be renewed for additional research periods. 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 **USACE**. 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 Candidate should have complete his/her PhD in Engineering, Hydrology or a related field of study.

Useful skills, knowledge and experiences that a candidate could bring to this opportunity include: statistical analysis of climatological, meteorological and hydrological datasets, including spatial analyses; familiarity with stochastic weather generators; proficiency in working with large datasets; experience programming in the R and Python computer languages; strong technical writing skills.

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- Eligibility Requirements**
- **Degree:** Doctoral Degree received within the last 60 month(s).
 - **Academic Level(s):** Postdoctoral.
 - **Discipline(s):**
 - **Chemistry and Materials Sciences** ([12](#))
 - **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](#))
 - **Other Non-Science & Engineering** ([1](#))
 - **Physics** ([16](#))
 - **Social and Behavioral Sciences** ([13](#))
 - **Age:** Must be 18 years of age