**Opportunity Title:** EPA Postdoctoral Fellowship on Legacy Nutrient Modeling Across Large River Basins
**Opportunity Reference Code:** EPA-ORD-CEMM-WECD-2023-04

**Organization** U.S. Environmental Protection Agency (EPA)

**Reference Code** EPA-ORD-CEMM-WECD-2023-04

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

A complete application consists of:

- An application
- Transcript(s) – 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. All transcripts must be in English or include an official English translation. Click here for detailed information about acceptable transcripts.
- A current resume/CV, including academic history, employment history, relevant experiences, and publication list
- Two educational or professional recommendations. Click here for detailed information about recommendations.

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

**Application Deadline** 1/5/2024 3:00:00 PM Eastern Time Zone

**Description** ***Applications may be reviewed on a rolling-basis and this posting could close before the deadline.** Click **here** for information about the selection process.

**EPA Office/Lab and Location:** There is a research opportunity available at the U.S. Environmental Protection Agency (EPA), Office of Research and Development (ORD), Center for Environmental Measurements and Modeling Division (CEMM). The appointment is with the Watershed and Ecosystem Characterization Division (WECD), Ecosystem Condition Branch (ECB) in Cincinnati, Ohio. The participant is expected to relocate to Cincinnati and/or be in the office once a week, as per current ORISE requirements.

**Research Project:** Legacy nitrogen (N) storage in soils and groundwater, as well as groundwater transport lags, are concerns across agricultural landscapes. Yet we are just beginning to learn the extent and complexity of legacy N dynamics across large US river basins. This research projects aims to use a process-based watershed modeling simulation approach to project (1) potential legacy-based lags in downstream N responses to wetland restoration and (2) the overarching role that legacy N plays in the Upper Mississippi River Basin (~0.5 million km2 covering eight states) source, transport, and fate of nitrate, a top Mississippi River/Gulf of Mexico Hypoxia Task Force research priority.

We will leverage and further adapt an existing modified SWAT model for the Upper Mississippi River Basin (UMRB) – potentially linking it to a groundwater transport model – to simulate N storage and transit times across both UMRB sub basins and at the river basin scale. This research will help elucidate the impact of lags (e.g., seasonal, annual, decadal) in conservation practice effectiveness due to legacy N in the Mississippi River

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Basin and how these lags affect improvements in water quality.

The research participant may be involved with the following activities:

- Applying and modifying process-based watershed models (e.g., SWAT) and groundwater models to answer key research questions
- Analyzing and interpreting model outputs in the context of current literature
- Developing research manuscripts and presentations at professional society conferences
- Collaborating with research scientists in other federal agencies and academia
- Developing new research questions and directions related to the project's goals

**Learning Objectives:** The research participant will join a research team of watershed hydrologists, biogeochemists, and systems ecologists for an one-year postdoctoral research appointment with the potential for two- to three extensions of appointment. The research participant will gain experience with cross-agency (e.g., with US Department of Agriculture (USDA), Natural Resources Conservation Service) and intra-agency (e.g., EPA Regions, Office of Water) collaborations. The research participant will (co-)lead multiple publications of the study outcomes in leading scientific journals, as well as present research findings at multiple professional conferences.

**Mentor(s):** The mentor(s) for this opportunity are Jay Christensen (christensen.jay@epa.gov), Heather Golden(golden.heather@epa.gov), and Charles Lane(lane.charles@epa.gov). If you have questions about the nature of the research please contact the mentor(s).

**Anticipated Appointment Start Date: December 4, 2023.** All start dates are flexible and vary depending on numerous factors. Click **here** for detailed information about start dates.

**Appointment Length:** The appointment will initially be for one year and may be renewed upon EPA recommendation and subject to availability of funding.

**Level of Participation:** The appointment is full-time or part-time and is negotiable. Those currently pursuing a doctoral degree may begin this appointment part-time and transition to full-time participation upon receiving the degree.

**Participant Stipend:** The participant will receive a monthly stipend, commensurate with educational level and experience. The estimated monthly stipend range for this opportunity is **$4,958 - $7,190**. Click **here** for detailed information about full-time stipends.

**EPA Security Clearance:** Completion of a successful background investigation by the Office of Personnel Management (OPM) is required for an applicant to be on-boarded at EPA.

**ORISE Information:** This program, administered by ORAU through its

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contract with the U.S. Department of Energy (DOE) to manage the Oak Ridge Institute for Science and Education (ORISE), was established through an interagency agreement between DOE and EPA. Participants do not become employees of EPA, DOE or the program administrator, and there are no employment-related benefits. Proof of health insurance is required for participation in this program. Health insurance can be obtained through ORISE.

ORISE offers all ORISE EPA graduate students and Postdocs a free 5 year membership to the National Postdoctoral Association (NPA).

The successful applicant(s) will be required to comply with Environmental, Safety and Health (ES&H) requirements of the hosting facility, including but not limited to, COVID-19 requirements (e.g. facial covering, physical distancing, testing, vaccination).

**Questions:** Please see the FAQ section of our website. After reading, if you have additional questions about the application process please email ORISE.EPA.ORD@orau.org and include the reference code for this opportunity.

**Qualifications**

The qualified candidate should have received a doctoral degree or be currently pursuing the degree in one of the relevant fields (i.e. Hydrology, Environmental Engineering, Environmental Science, Geography, Geology). Degree must have been received within five years of the appointment start date.

Preferred skills:

- Experience in process-based watershed hydrological and fate/transport models (e.g., SWAT, APEX, APEX/SWAT, or other similar models).
- Experience with GIS/remote-sensing software and applications.
- Experience in watershed hydrology and nutrient biogeochemistry.
- Experience in scripting (e.g., R, Python, MATLAB) languages.
- Experience in groundwater modeling concepts and applications (e.g. using MODFLOW).

**Eligibility Requirements**

- **Citizenship:** U.S. Citizen Only
- **Degree:** Doctoral Degree received within the last 60 months or currently pursuing.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (1)
  - **Communications and Graphics Design** (1)
  - **Earth and Geosciences** (5)
  - **Engineering** (27)
  - **Environmental and Marine Sciences** (14)
  - **Life Health and Medical Sciences** (2)
  - **Mathematics and Statistics** (11)
  - **Physics** (1)