Opportunity Title: EPA Fellowship on Spatial Modeling of Ecological Assemblages in US Waterways
Opportunity Reference Code: EPA-ORD-CPHEA-PESD-2022-07

Organization	U.S. Environmental Protection Agency (EPA)
Reference Code	EPA-ORD-CPHEA-PESD-2022-07
How to Apply	***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!

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	1/19/2023 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: A research opportunity is available at the United States Environmental Protection Agency (EPA), Office of Research and Development (ORD), Center for Public Health and Environmental Assessment (CPHEA), Pacific Ecological Systems Division (PESD) located in Corvallis, Oregon.

Research Project: The US EPA's Pacific Ecological Systems Division in Corvallis OR is conducting research in collaboration with EPA National Center for Environmental Economics and EPA Office of Water to improve the way EPA values freshwater ecosystems. Research to date has identified the observed-to-expected (O/E) ratio of taxonomic composition of specified assemblages as a measure of aquatic condition that fits the needs of EPA economists as they seek to estimate the public's willingness to pay for improvements in biotic condition (Hill et al. 2020). However, a critical component of improving the valuation of aquatic resources will include modeling the distributions of aquatic taxa, such as stream macroinvertebrates and lake plankton, to characterize the biological status (O/E) of freshwaters nationally.

This research project will seek to develop models that can spatially predict the distributions of several taxonomic groups

within streams and lakes across the conterminous US based on several thousand sample sites from EPA's National Aquatic Resource Surveys (https://www.epa.gov/national-aquatic-resource-surveys) and StreamCat (Hill et al. 2016) and LakeCat (Hill et al. 2018) datasets. These models could include individual- or multi-taxon niche models with various statistical or machine learning techniques, as well as evaluation of model accuracy. Later phases of the project could focus on developing methods to test the effects of management scenarios on aquatic assemblages, such as through structural equation models.

The participant may be involved in the following activities:

- Assembling NARS and StreamCat/LakeCat data for model development and application;
- Using GIS to develop new spatial predictors of aquatic condition;
- Developing quality assurance and model evaluation approaches for predicting/mapping aquatic condition;
- Collaborating with researchers examining the economics of biological condition and willingness to pay for incremental improvements in biological condition;
- Collaborating on related national mapping activities;
- Conducting scientific synthesis, data analysis, manuscript preparation, literature searches, and presentations to technical and non-technical audiences.

Learning Objectives: The research participant will learn about the use of spatial indicators and watershed data as well as how to develop, test, and apply national-scale models. The research participant will also further develop an expertise in spatial analysis using large national datasets. The participant will have the opportunity to interact with a team of experts collaborating in and across disciplines at EPA.

Mentor(s): The mentor for this opportunity is Ryan Hill (hill.ryan@epa.gov). If you have questions about the nature of the research please contact the mentor(s).

Anticipated Appointment Start Date: December 1, 2022. 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 may 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.

Participant Stipend: The participant will receive a monthly stipend commensurate with educational level and experience. Click **here** for detailed information about full-time stipends.

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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 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 master's or doctoral (preferred) degree in one of the relevant fields (e.g. Aquatic Ecology, Watershed Science), or be currently pursuing one of the degrees with completion before December 31, 2022. Degree must have been received within five years of the appointment start date.

Preferred skills:

- Strong background in spatial analysis and multivariate statistical analysis of ecological communities.
- Experience in watershed or statistical modeling and spatial analyses at broad spatial scales and use of aquatic monitoring data and GIS analyses is strongly preferred.
- Strong background in aquatic ecology and landscape analysis of aquatic systems.
- Experience with ArcGIS, R statistical software, statistical analyses (e.g., regression, multivariate statistics, structural equation modeling), machine learning approaches (e.g., random forest), and large national datasets preferred, along with experience with working with watershed data and the National Hydrography Dataset Plus Version 2.

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- Exceptional communication skills, including writing skills, verbal skills, and public speaking experience.
- Demonstrated skills working as a part of a group.

Eligibility Requirements

- **Citizenship:** U.S. Citizen Only
- **Degree:** Master's Degree or Doctoral Degree received within the last 60 months or anticipated to be received by 12/31/2022 11:59:00 PM.
- **Discipline(s):**
  - **Communications and Graphics Design** (1 👁)
  - **Computer, Information, and Data Sciences** (1 👁)
  - **Earth and Geosciences** (2 👁)
  - **Engineering** (3 👁)
  - **Environmental and Marine Sciences** (8 👁)
  - **Life Health and Medical Sciences** (9 👁)
  - **Mathematics and Statistics** (3 👁)