Opportunity Title: Evaluation of Wetland Restoration Benefits to Ecosystems in Tile Drained Agricultural Systems
Opportunity Reference Code: EPA-ORD-NRMRL-GWERD-2020-01

Organization U.S. Environmental Protection Agency (EPA)

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How to Apply 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

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

If you have questions, send an email to EPArpp@orau.org. Please include the reference code for this opportunity in your email.

Application Deadline 4/10/2020 3:00:00 PM Eastern Time Zone

Description ***Applications will be reviewed on a rolling-basis.**

A research opportunity is currently available at the Environmental Protection Agency (EPA), Office of Research and Development (ORD), National Risk Management Research Laboratory (NRMRL), Groundwater, Watershed, and Ecosystem Remediation Division (GWERD) located in Ada, Oklahoma.

This research will assess the benefits of restored wetlands in tile drained agricultural systems in the upper Midwest and evaluate floodplain restoration sites. This will be accomplished by employing both a literature review, the application of GIS and models of scenarios of wetland restoration and changes to tile drainage currently being used or proposed for the management of nutrient pollution. A goal of this research is to provide insight for the region, state, and landowners on how to support and encourage voluntarily adopted nutrient reduction strategies while simultaneously informing landowners of the benefits and tradeoffs of these nutrient remediation strategies. Agricultural productivity relies on ecosystem service and any strategy adapted for these landscapes will need to a) meet needs of landowners, b) reduce the loadings of nutrients to local streams, and c) maintain and conserve ecosystem functions. Therefore, a collaborative effort to develop a demonstration study is proposed to begin understanding how landowners might improve the ecosystem services of these agricultural landscapes while reducing excess nutrients in streams, reservoirs, and groundwater.

The research participant may conduct research to assess the benefits of restored wetlands in tile drained agricultural systems in the upper Midwest and evaluate floodplain restoration approaches. This will be accomplished by employing both a literature survey, applying GIS and models of

scenarios of wetland restoration and changes to tile drainage currently being used or proposed for the management of nutrient pollution. The research participant will have opportunities to participate and learn from other ongoing collaboration with stakeholders to demonstrate the value of restored wetlands to decrease nutrient in the upper Midwest as well as ongoing floodplain restoration research. With guidance from the mentor, the research participant will have the opportunity to develop original research and participate in collaborative research projects. The participant may present their findings through scientific presentations and publishing.

The research participant will learn about the application of innovative approaches to implement natural infrastructure to reduce the impacts nutrient pollution, support emerging environmental restoration approaches that include the potential impacts of excess nutrients on water quality. The research participant will gain experience in government research and stakeholder collaboration and applications of restoration to support water quality.

- Researching methods used in the evaluation of restoration of wetlands, particularly around water quality and ecosystem services.
- Approaches used to quantify the loads and fate transport of nutrients from nutrient rich systems to wetlands. Develop an understanding of the potential benefits of wetland restoration under different scenarios.
- Developing and applying statistical methods to analyze data; applying GIS and models to assess ecosystem service benefits and water quality effects of wetland restoration.

The research participant will have an opportunity to learn from ecologists, environmental engineers, and physical scientists in Ada, OK and Cincinnati, OH, as well as staff at multiple EPA Regions who are engaged in wetlands and ecosystem services research. The participant will communicate their research to Agency personnel and the broader scientific community through presentations and papers. The research participant will be involved in cutting-edge environmental research that will help prepare the individual for pursuing their future career endeavors.

Nutrient (N and P) loads from agricultural lands in the upper Midwest continue to contribute to gulf coast hypoxia due to insufficient retention of nutrients from agricultural fertilizer and soils. Though multiple mitigation strategies exist, they have not had sufficient impact to reduce nutrient loadings from agriculture, particularly in areas with extensive tile drainage. An ambitious “Iowa Nutrient Reduction Strategy”, updated in December 2017, establishes the goal of at least a 45% reduction in N and P which is aligned with the 2008 Gulf Hypoxia Action Plan. This plan emphasizes that better applications of existing and novel approaches are needed to enable Iowa’s 92,000 farmers to maximize their crop yields, retain nutrients, and capitalize on ecosystem functions and services for improved environmental outcomes. In this project, we intend to identify the relevant ecosystem service benefits and tradeoffs of nutrient retention practices to support landowner and land management decisions by working with regional, state, and local stakeholders. As such, this project is important to protection of

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our national waterways, mitigating harmful algal blooms, preventing fish kills, and improving ecological integrity. Wetlands are important elements of landscapes and watersheds, providing key ecosystem services that are central to sustainable ecosystems and communities and vital to the health and well-being of our nation. In some regions, restored wetlands and floodplains are incorporated into plans to support the mitigation of excess nutrients (Nitrogen and Phosphorus) in management of tile drained fields but also creates an the expectation of other ecosystem service benefits. This restoration practice has potential to create multiple lines of benefit that may be useful for decision makers to support future wetland or floodplain restoration. Unfortunately the aggregation of services and mixed benefits are not always well described or realized. Through collaboration with agencies and stakeholders, likely scenarios of possible restoration practices can be identified and used to begin quantifying the benefits of wetlands used to collect tile drain and other floodplain restoration activities. This has important Clean Water Act (CWA) implications and may influence the development and future of restoration efforts.

Anticipated Appointment Start Date: May 1, 2020

This program, administered by ORAU through its contract with the U.S. Department of Energy to manage the Oak Ridge Institute for Science and Education, was established through an interagency agreement between DOE and EPA. The initial appointment is for one year, but may be renewed upon recommendation of EPA contingent on the availability of funds. The participant will receive a monthly stipend commensurate with educational level and experience. Proof of health insurance is required for participation in this program. The appointment is full-time at EPA in the Ada, OK, area. Participants do not become employees of EPA, DOE or the program administrator, and there are no employment-related benefits.

Completion of a successful background investigation by the Office of Personnel Management (OPM) is required for an applicant to be on-boarded at EPA. OPM can complete a background investigation only for individuals, including non-US citizens, who have resided in the US for the past three years.

If you are interested in this opportunity, please join us for the ORISE Virtual Outreach Fair on March 25 from 12:00-3:00pm (Eastern)!

There will be ORISE representatives and EPA mentors in the EPA booth.

Qualifications

The qualified candidate should be currently pursuing or have received a doctoral degree in one of the relevant fields. Degree must have been received within five years of the appointment start date.

Preferred skills:

- Background in Statistical Data Analysis, GIS and Modeling
- Previous research experiences in Wetlands, Ecosystem Services, Biogeochemistry/Environmental Chemistry and/or Environmental Science/Engineering

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- Experience and interest collaborating as part of a research team
- Ability to demonstrate excellent written and oral communication skills
- Writing and organizing research

Eligibility Requirements

- **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** (1 👁)
  - **Engineering** (2 👁)
  - **Environmental and Marine Sciences** (4 👁)
  - **Life Health and Medical Sciences** (11 👁)
  - **Mathematics and Statistics** (4 👁)
  - **Other Non-Science & Engineering** (1 👁)
  - **Social and Behavioral Sciences** (3 👁)
- **Veteran Status:** Veterans Preference, degree received within the last 120 month(s).

Affirmation I certify that I have lived in the United States for the past three years.