

Opportunity Title: USDA-FS Air Quality Bioindicators
Opportunity Reference Code: USDA-FS-PNWRS-2025-0024

Organization U.S. Department of Agriculture (USDA)

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How to Apply *To submit your application, scroll to the bottom of this opportunity and click **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. 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. At least one recommendation must be submitted in order for the mentor to view your application.

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

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Application Deadline 6/27/2025 3:00:00 PM Eastern Time Zone

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

USDA-FS Office/Lab and Location: A research opportunity is available with the US Forest Service (USFS) located in Washington or Oregon.

At the heart of the U.S. Forest Service's mission is their purpose. Everything they do is intended to help sustain forests and grasslands for present and future generations. Why? Because their stewardship work supports nature in sustaining life. This is the purpose that drives the agency's mission and motivates their work across the agency. It's been there from the agency's very beginning, and it still drives them. To advance the mission and serve their purpose, the U.S. Forest Service balances the short and long-term needs of people and nature by: working in collaboration with communities and our partners; providing access to resources and experiences that promote economic, ecological, and social vitality; connecting people to the land and one another; and delivering world-class science, technology and land management.

Research Project: The ability to characterize air quality at neighborhood-scales is a critical need for understanding its potential impacts. Conventional air monitoring instruments are too expensive and logistically difficult to deploy at a sufficient density. Trees in the Pacific Northwest region, including urban areas, support an unusually high abundance of the stress-tolerant bioindicator moss, *Orthotrichum spp.* This well-tested



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species has been used by several researchers to provide a valuable snapshot of air quality in fine detail. As moss accumulates different atmospheric particles and gases, one can use concentrations of different elements in their tissues to map and serve as a screening tool for understanding air quality.

One of the barriers to wider adoption of this approach is the need for specialized lab facilities and equipment to determine the concentrations of different elements in the moss. Building upon prior research by UW scientists, it may be possible to use a portable XRF tool to gain quick or instantaneous 'ballpark estimates' of elements accumulated in moss.

The fellow will collaborate with the Mentor on designing and testing such a methodology using a top-of-the-line Bruker hand-held XRF. Under that broad aim, the fellow has the flexibility to tailor their participation to suit their own research interests and capacities. The overall mission of this project is to explore intersections between multiple scientific approaches and perspectives on air quality characterization, with a focus on more efficient application of moss bioindicators.

Learning Objectives: A major part of the learning experience includes frequent interaction with the Mentor and potentially other scientists or stakeholders engaged in related projects. In addition to these networking opportunities, the participant will gain experience with operating an XRF, study design, taking field measurements, statistical analysis, with the potential to co-author any results in manuscript documenting the XRF methodology.

Mentor(s): The mentor for this opportunity is Sarah Jovan (sarah.jovan@usda.gov). If you have questions about the nature of the research please contact the mentor.

Anticipated Appointment Start Date: 2025. Start date is flexible and negotiable, and will depend on a variety of factors.

Appointment Length: The appointment will end on 9/30/2025.

Level of Participation: The appointment is full-time (40 hours per week).

Participant Stipend: The participant will receive a monthly stipend commensurate with educational level and experience.

Citizenship Requirements: This opportunity is available to U.S. citizens only.

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 USFS. Participants do not become employees of USDA, USDA-FS, DOE or the program administrator, and there are no employment-related benefits. Proof of health insurance is required for participation in this program. Health

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insurance can be obtained through ORISE.

Questions: Please visit our [Program Website](#). After reading, if you have additional questions about the application process please email ORISE.USFS.PNWRS@orau.org and include the reference code for this opportunity.

Qualifications The qualified candidate should have received or be currently pursuing a bachelor's, master's or a doctoral degree in one of the relevant fields. Degree must have been received within the past five years or be currently pursuing.

Preferred skills:

- experience with statistical analysis of bioindicator datasets
- experience conducting literature reviews on bioindicator or air quality-related issues
- experience in both a field and laboratory setting, including using and maintaining expensive equipment
- experience collecting and organizing scientific datasets, maintaining clear records

Point of Contact [Justina](#)

Eligibility • **Citizenship:** U.S. Citizen Only

Requirements • **Degree:** Bachelor's Degree, Master's Degree, or Doctoral Degree received within the last 60 months or currently pursuing.

• **Discipline(s):**

- **Earth and Geosciences** ([2](#) 👁)
- **Environmental and Marine Sciences** ([2](#) 👁)
- **Life Health and Medical Sciences** ([5](#) 👁)

• **Veteran Status:** Veterans Preference, degree received within the last 120 month(s).