Opportunity Title: USFS Stream Flow Permanence Data Analysis and Modeling Internship
Opportunity Reference Code: USDA-USFS-2021-0042

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-USFS-2021-0042

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 package 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. Selected candidate must provide proof of completion of the degree before the appointment can start. All transcripts must be in English or include an official English translation. Click **Here** for detailed information about acceptable transcripts.
- A current resume/CV
- Two educational or professional recommendations

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

Application Deadline 2/19/2021 10:00:00 AM Eastern Time Zone

Description

***Applications may be reviewed on a rolling-basis.**

USFS Office/Lab and Location: A research training opportunity is available at the USDA Forest Service, Pacific Northwest Research Station, Corvallis Forestry Sciences Laboratory in Corvallis, Oregon.

Research Project: Forest managers in Oregon and in the Pacific Northwest are required to conduct stream surveys to understand the extent of perennially flowing streams to inform management practices, specifically, the size of stream-side harvest buffers which influence harvest methods as well as value estimates. Federal, state, and private entities spend thousands to millions of dollars to fund these surveys, yet the scope of monitoring is limited to a local project area and does not enhance the broader regional understanding of stream flow permanence. This interdisciplinary research project combines approaches to compile and analyze data derived from the National Hydrology Dataset (NHD) and high-resolution digital terrain models (DTMs) derived from Light Detection and Ranging (LIDAR) data compiled by Oregon Department of Geology and Mineral Industries (DOGAMI).

The goal of this research project is to develop a spatial model of stream flow permanence for the NHD flow line network for western Oregon by using flow permanence observations housed in an internally developed database, in conjunction with predictor variables derived from terrain, hydo-topographical, and environmental data. This research aims to improve the

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understanding of how climate, landscape, geological, and terrain conditions interact to influence stream flow permanence and will provide a state-of-the-art map of stream flow permanence for western Oregon at a very fine grain (<10 m).

With guidance from the mentor, the research participant may be involved in any or all of the following research activities:

1. Assembling a database of covariates known or thought to be associated with stream flow permanence
2. Developing R and Python scripts to facilitate processing and analysis of geo-spatial data
3. Use GIS to examine relationships among environmental, hydro-topographical, and observational data.
4. Using complex models in R and Python to examine the relationships between stream flow permanence observations and the covariates of interest
5. Presentation of findings at a conference or workshop
6. Collaborating with federal partners on research and database improvement activities
7. Conducting scientific synthesis, data analysis, manuscript preparation, and literature searches.

Learning Objectives: The research participant will be mentored by USDA Forest Service scientists and have the opportunity to work along side USGS scientists as well as USFS and BLM managers as part of a regionally focused collaborative to better understand drivers and influential factors on stream flow permanence in geomorphic headwater channels. The research participant will have the opportunity to learn about USDA PNW Research station research, conduct research on national geospatial data sets, develop models based on locally sourced field observations, and apply these to conduct watershed analyses to inform forest management objectives. Over the course of the internship the participant will refine their scientific inquiry to produce a report or manuscript from the data collected and assembled during this project.

Mentor(s): The mentors for this opportunity are Jonathan Burnett (jonathan.burnett@usda.gov) and Sherri Johnson (sherri.johnson2@usda.gov). If you have questions about the nature of the research please contact the mentor(s).

Anticipated Appointment Start Date: February 2021. Start date is flexible and will depend on a variety of factors.

Appointment Length: The appointment will initially be for nine months, but may be renewed up to a total of five years upon recommendation of USFS and is contingent on the availability of funds.

Level of Participation: The appointment can be full-time or part-time depending on the candidates qualifications and availability.

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, Lawful Permanent Residents (LPR), and foreign nationals. Non-U.S. citizen applicants

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should refer to the Guidelines for Non-U.S. Citizens Details page of the program website for information about the valid immigration statuses that are acceptable for program participation.

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, USFS, 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.

Questions: Please visit our Program Website. After reading, if you have additional questions about the application process please email USForestService@orise.orau.gov and include the reference code for this opportunity.

Qualifications

The qualified candidate should have received a bachelor's or master's degree in a field related to forestry, hydrology, environmental remote sensing, or GIS. Degree must have been received within five years of the appointment start date.

Candidates who are currently pursuing a master's degree are also encouraged to apply.

Preferred skills:

- Experience with ArcGIS 10+ or ArcGIS Pro, Python programming, and R programming
- Experience with the following: Statistical analysis, spatial modeling, manipulation of terrain models and/or LIDAR derived data for topics related to environmental monitoring and assessment
- Academic course work in hydrology, forest management, remote sensing, and spatial modeling
- Experience with manuscript writing and scientific presentations

Eligibility Requirements

- **Degree:** Bachelor's Degree or Master's Degree.
- **Overall GPA:** 3.00
- **Discipline(s):**
  - **Computer, Information, and Data Sciences** (1 👁)
  - **Earth and Geosciences** (1 👁)
  - **Environmental and Marine Sciences** (8 👁)
  - **Mathematics and Statistics** (1 👁)
- **Age:** Must be 18 years of age
- **Veteran Status:** Veterans Preference, degree received within the last 120 month(s).

Affirmation

I have received a bachelor's or master's degree within the past 5 years, OR am currently pursuing a master's degree.