Opportunity Title: USFS Postdoctoral Fellowship in Subalpine Fir Decline
Opportunity Reference Code: USDA-USFS-2021-0154

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-USFS-2021-0154

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. Applications need at least one recommendation submitted in order to be viewed by the mentor.

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

Application Deadline 9/30/2021 3:00:00 PM Eastern Time Zone

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

USFS Office/Lab and Location: A research opportunity is available with the US Forest Service (USFS), Pacific Northwest Research Station located in Corvallis, Oregon.

The Pacific Northwest (PNW) Research Station is a leader in the scientific study of natural resources. We generate and communicate impartial knowledge to help people understand and make informed choices about natural resource management and sustainability. The Station has 11 laboratories and research centers in Alaska, Oregon, and Washington, as well as 12 active experimental forests, ranges, and watersheds. The PNW Research Station is an integral component of USDA Forest Service Research and Development (R&D), which is the most extensive natural resources research organization in the world. Forest Service R&D is comprised of five regional research stations, the Forest Products Laboratory, and the International Institute of Tropical Forestry. For more information about the PNW Research Station, go to https://www.fs.usda.gov/pnw/

Research Project: The Fellow will collaborate with a team of PNW Research Station scientists (Harold Zald, David Bell, and Andrew Gray) to develop a understanding of the status, trends, and vulnerability of subalpine fir (Abies lasiocarpa) forests in the western U.S. Due to their distribution at high elevations and low use for extractive ecosystem services, the status and trends in subalpine fir have received less attention compared to more commercially valuable and accessible species. However, subalpine fir provides critical regulatory and supporting services in high elevation subalpine ecosystems. Recent evidence suggests subalpine fir is

experiencing high levels of mortality, but the drivers of this mortality remain unclear. Additionally, climate change is expected to increase temperatures in high elevation ecosystems, increasing the vulnerability of subalpine fir to the invasive balsam wooly adelgid (Adelges piceae) whose expansion into fir forests of western North America is currently believed to be thermally limited. Since the adelgid's distribution is currently restricted by cold winter temperatures, subalpine fire exposure to the insect may increase as climate warms. The fellow will collaborate with the PNW Research Station team listed above to 1) assess the current status and trends of subalpine fir in the continental U.S. (CONUS) using field data from the Forest Inventory and Analysis (FIA) Program, 2) quantify disturbance history within CONUS subalpine fir forests using satellite times series imagery and other geospatial data, and 3) develop a vulnerability assessment of subalpine fir forests in the CONUS to balsam wooly adelgid in the context of climate change.

Learning Objectives: The participant will learn advanced techniques in analysis of the FIA database, satellite imagery, and climate data to understand the recent status and trends, drivers of decline, and potential vulnerability to future decline of subalpine fir forests of the western U.S. These techniques may include:

- Query and statistical analysis of the FIA database to determine recent status and trends in subalpine fir, and what environmental and biological factors are related to observed subalpine fir mortality.
- Geospatial processing and time series analysis of the Landsat time series and aerial detection surveys in Google Earth Engine (GEE) to quantify disturbance agents (wildfire, insect mortality) within subalpine fir forests.
- Integration of current subalpine fir status with climate data and projected future climate to assess future potential vulnerability of subalpine fir to the invasive balsam wooly adelgid.

The project will provide several opportunities to gain exposure and develop professionally. The fellow will collaborate closely with the mentors and other scientists at the Corvallis Forest Science Laboratory, a USFS facility housing USFS, Oregon State University, and USGS scientists in Corvallis OR. This multi-institutional environment will allow the fellow to consider different career paths, including government research. The fellow will have the opportunity to present at academic conferences, as well as gain regional, national and international exposure. This will allow them to make key connections with researchers working in different forest types around the world and provide broader exposure to forest disturbance, invasive pests, and climate change research. The fellow will also have the opportunity to collaborate with and share findings with key state and federal land managers engaged in issues surrounding forest health and protection, and climate change impacts in the western U.S. This opportunity will allow the participant to develop skills in co-production, communication and science delivery.

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Mentor(s): The mentors for this opportunity are Harold Zald (harold.zald@usda.gov), David Bell (david.bell@usda.gov) and Andrew Gray (andrew.gray@usda.gov). If you have questions about the nature of the research please contact the mentors.

Anticipated Appointment Start Date: between September 1, 2021 and January 1, 2022. Start date is flexible and negotiable, and will depend on a variety of factors.

Appointment Length: The appointment will initially be for one year, but may be extended upon recommendation of USFS and is contingent on the availability of funds.

Level of Participation: The appointment is full-time.

Participant Stipend: The participant will receive a monthly stipend commensurate with educational level and experience. **The annual stipend will be $68,992, plus a health insurance stipend. A travel and supplies stipend, and computer will also be provided.**

Citizenship Requirements: This opportunity is available to U.S. citizens and Lawful Permanent Residents (LPR) 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, 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 doctoral degree in one of the relevant fields, or be currently pursuing the degree with completion by December 31, 2021. Degree must have been received within the past five years.

Candidates must have a valid driver's license.

Preferred skills:

- Demonstrated experience processing and analyzing satellite imagery
- Demonstrated experience with statistical analyses in R
- Demonstrated experience conducting large database queries and analysis
- Expertise with FIA data and the FIA database
- Evidence of scientific and technical writing for peer-reviewed publication
- Experience communicating with diverse partners and stakeholders

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Eligibility Requirements

- **Citizenship:** LPR or U.S. Citizen
- **Degree:** Doctoral Degree received within the last 60 months or anticipated to be received by 12/31/2021 11:59:00 PM.
- **Overall GPA:** 3.00
- **Discipline(s):**
  - **Computer, Information, and Data Sciences** (3 👁)
  - **Earth and Geosciences** (3 👁)
  - **Environmental and Marine Sciences** (5 👁)
- **Veteran Status:** Veterans Preference, degree received within the last 120 month(s).