Opportunity Title: Postdoctoral Research Opportunity in Water Resources
Opportunity Reference Code: USDA-USFS-2019-0002

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-USFS-2019-0002

How to Apply 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. Proof must be sent to ORISE directly from the academic institution including graduation date and degree awarded. 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

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

Application Deadline 4/1/2019 3:00:00 PM Eastern Time Zone

Description A research opportunity is available with the U.S. Department of Agriculture (USDA), U.S. Forest Service (USFS), Center for Integrated Forest Science in Research Triangle Park, North Carolina.

Forest roads and associated stream crossing structures (e.g. relief culverts, bridges, etc) provide access for forest management. These essential infrastructures need to be properly designed, installed, and maintained for flooding resiliency and ecological benefits purposes. The U.S. Department of Agriculture Forest Service (USFS) manages approximately 370,000 miles of roads and at least 40,000 stream crossings along these roads. Undersized stream crossing structures (i.e. culvert) could cause significant economic losses and could affect stream connectivity, creating barriers to aquatic organisms. It is thus fundamentally important to conduct proper hydraulic design to accommodate extreme flow events impacting design life of these structures. Extreme precipitation events are growing more severe and more frequent in recent years due to increased atmospheric water vapor content resulting from rising air temperatures. As a result, land and water managers, planners, and researchers are increasingly concerned how such extreme precipitation events would affect design discharges and ultimately the road drainage facilities, culverts, bridges, stream crossings and water management structures.

We are looking for a research scientist/engineer who has a good knowledge of extreme precipitation event dynamics due to changing climate and associated impacts on flooding dynamics, including design and risk analysis of road cross-drainage structures and stream crossings. Under the guidance of a mentor, the participant will study effects of extreme precipitation events on forest road cross drainage structures at three US Forest Service long-term experimental forest watersheds (Hubbard-Brook in New Hampshire, Frazier in Colorado, and H.J. Andrews in Washington).

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. The initial appointment is for one year, but may be renewed for an additional year upon recommendation of USFS and is contingent on the availability of funds. The participant will receive a monthly stipend of $6,035,commensurate with educational level and experience, as well as partial coverage (75% of total premium) of

Opportunity Title: Postdoctoral Research Opportunity in Water Resources
Opportunity Reference Code: USDA-USFS-2019-0002

individual health insurance. The participant will also receive a travel stipend for attendance at project meetings and presentations at scientific conferences. Proof of health insurance is required for participation in this program. The appointment is full-time at USFS in the Research Triangle Park, North Carolina, area. Participants do not become employees of USDA, USFS, DOE or the program administrator, and there are no employment-related benefits.

For more information about the USFS Research Participation Program, please visit the **Program Website**.

This opportunity is available to U.S. citizens, Lawful Permanent Residents (LPR), and foreign nationals. Non-U.S. citizen applicants 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.

Anticipated Appointment Start Date: April 1, 2019

Qualifications

The qualified candidate should have received a doctoral degree in a physical science (water resources) or civil/agricultural engineering discipline related to environmental/engineering hydrology/hydraulics. Degree must be completed by the appointment start date.

Preferred Skills:

- Strong quantitative skills that integrate field observations and numerical modeling to understand hydrologic and hydroclimatologic processes and scaling effects, particularly in the context of climate variability and change
- Strong hydrology background, especially rainfall-runoff process
- Background in engineering design and risk analysis that relates to flooding
- Strong analytical and statistical knowledge of tools to analyze and manage large data sets
- Skilled in Geospatial data acquisition, pre-processing, and analysis using ArcGIS, ERDAS Imagine, and other related software
- Skilled in using spatial data from platforms like LiDAR, NexRad, and Satellite/aerial including Landsat, SPOT, and Quickbird, etc. for environmental management applications
- Knowledgeable in geospatial data analysis and modeling for geohazard vulnerability/ susceptibility mapping
- Knowledgeable and skilled in various GIS-based hydrology/hydraulics modeling usage and application including ArcSWAT, RUSLE, ArcHydro, and others

Eligibility Requirements

- **Degree:** Doctoral Degree.
- **Discipline(s):**
  - **Engineering** (3 👁)
  - **Environmental and Marine Sciences** (1 👁)