Opportunity Title: USDA-ARS National Scale Hydrologic Modeling for Water Resources and Food Production Sustainability Fellowship
Opportunity Reference Code: USDA-ARS-PA-2025-0036

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-ARS-PA-2025-0036

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

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

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!"

Application Deadline 4/11/2025 3:00:00 PM Eastern Time Zone

Description ***Applications are reviewed on a rolling-basis.**

ARS Office/Lab and Location: A postdoctoral research opportunity is available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), Grassland Soil and Water Research Laboratory (GSWRL) at Temple, Texas.

The Agricultural Research Service (ARS) is the U.S. Department of Agriculture's chief scientific in-house research agency with a mission to find solutions to agricultural problems that affect Americans every day from field to table. ARS will deliver cutting-edge, scientific tools and innovative solutions for American farmers, producers, industry, and communities to support the nourishment and well-being of all people; sustain our nation's agroecosystems and natural resources; and ensure the economic competitiveness and excellence of our agriculture. The vision of the agency is to provide global leadership in agricultural discoveries through scientific excellence.

The Grassland Soil and Water Research Laboratory is a USDA-ARS research facility located in Temple, Texas. The mission of the Laboratory is to develop technology and solutions that increase efficient use of soil and water resources, enhance forage and crop production, and support sustainable agricultural production in healthy ecosystems. This mission is accomplished by research to 1) enhance decision support tools for crop and forage production and watershed management, 2) develop improved soil, water, and crop management techniques, 3) develop sustainable crop,

forage, and biofuel production systems, 4) increase rangeland productivity and quality, and 5) mitigate effects of drought on agriculture.

Research Project: The Soil & Water Assessment Tool (SWAT+) is a watershed modeling system used internationally to estimate impacts of land management practices on water quality in complex watersheds. Among other applications, it has been used extensively within the USDA Conservation Effects Assessment Program (CEAP) for evaluating the effectiveness of conservation practices to improve water quality in U.S. watersheds. There are also many possible SWAT+ applications using data sets collected within the ARS Long-Term Agroecosystem Research (LTAR) network. Serving as the basis for modeling efforts in CEAP and LTAR, the National Agroecosystem Model (NAM) is an implementation of SWAT+ for the continental U.S., which considers field-scale hydrologic, nutrient, and plant production processes as well as routing of water and nutrient flows through the national watershed system. A goal of the present opportunity is to evaluate and apply the SWAT+ NAM model to address questions on sustainability of water resources and food production systems across the western United States.

Under the guidance of a mentor, the research objectives for this opportunity include:

- Evaluate and improve model simulations of groundwater recharge and evapotranspiration to facilitate future irrigation and water resource assessments,
- Evaluate options for NAM weather input data and assess its ability for accurate representation of reference evapotranspiration,
- Obtain estimates of actual evapotranspiration and standardized reference evapotranspiration from the OpenET remote sensing platform for evaluation of NAM evapotranspiration simulations at various scales,
- Utilize the SWAT+ water allocation module for evaluating NAM-simulated water transfers and reservoir storage, and
- Evaluate outcomes of water management scenarios for achieving groundwater sustainability in the western United States.

Learning Objectives: The SWAT+ research group at Temple provides a highly collaborative environment for the participant to get involved with high-impact hydrologic modeling research. The participant will learn about improvement of SWAT+ model code, use of machine learning methods to facilitate model calibration, ways to integrate SWAT+ with geographic information systems, and use of remote sensing data to parameterize and evaluate the model. The participant will also learn about high performance computing through both the in-house computing systems and the agency-wide SCINet computing infrastructure. The participant will also have the opportunity to take online courses in topics such as R, Python, and statistics, and to learn collaboration and leadership skills through workshop and working group experience.

Mentor(s): The mentor for this opportunity is Kelly Thorp

(kelly.thorp@usda.gov). If you have questions about the nature of the research, please contact the mentor(s).

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

Appointment Length: The appointment will initially be for one year, but may be renewed upon recommendation of ARS 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 anticipated stipend is $6,250 monthly, with a $620.12 monthly health insurance supplement, $1,500 for relocation expenses, and $9,700 for travel and supplies.**

Citizenship Requirements: 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. Foreign national candidates may have a mandatory in-person requirement depending on visa status.

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 ARS. Participants do not become employees of USDA, ARS, 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 ORISE.ARS.Plains@orau.org and include the reference code for this opportunity.

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

Point of Contact Shantra

Eligibility Requirements

- **Degree:** Doctoral Degree received within the last 60 months or currently pursuing.
- **Discipline(s):**
  - **Computer, Information, and Data Sciences** (9 👁)
  - **Earth and Geosciences** (3 👁)

Opportunity Title: USDA-ARS National Scale Hydrologic Modeling for Water Resources and Food Production Sustainability Fellowship
Opportunity Reference Code: USDA-ARS-PA-2025-0036

- **Engineering** (3 👁)
- **Environmental and Marine Sciences** (2 👁)
- **Life Health and Medical Sciences** (3 👁)

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

Affirmation I affirm that:

I am a US Citizen, OR;
I am a non-US citizen currently living in the United States