Opportunity Title: USDA-ARS Geospatial Analyses of Agroecosystem Dynamics Fellowship
Opportunity Reference Code: USDA-ARS-2022-0072

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-ARS-2022-0072

How to Apply

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

Application Deadline 9/30/2022 3:00:00 PM Eastern Time Zone

Description

***Applications will be reviewed on a rolling-basis and this posting will remain open until filled.**

ARS Office/Lab and Location: Multiple master's level research opportunities are currently available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS) located at multiple ARS units across the country.

This research opportunity is part of the SCINet Fellowship program at ARS. All fellows will spend time at headquarters for some of their training, but will be based in another ARS research unit for more specific training. The SCINet/Big Data Program at ARS offers research opportunities to motivated participants interested in solving agricultural- and natural resource-related problems at a range of spatial and temporal scales, from the genome to the continent, and sub-daily to evolutionary time scales, as well as metadata enhancement for data discovery. One of the goals of the SCINet Initiative is to develop and apply new technologies, including artificial intelligence (AI) and machine learning, to help solve complex agricultural problems that also depend on collaboration across scientific disciplines and geographic locations. In addition, many of these technologies rely on the synthesis, integration, linkage, and analysis of large, diverse datasets that benefit from high performance computers (HPC). The objective of these opportunities is to facilitate cross-disciplinary, cross-location research through collaborative research on problems of interest to each participant and amenable to or required by the HPC environment. Training will be provided in specific AI, machine learning, deep learning, and statistical software needed for the HPC.

Research Project: Agro-ecosystem dynamics across multiple spatial and temporal scales need to account for interactions within and among spatial units, such as movement of animals that can spread disease, spatial heterogeneity in soils leading

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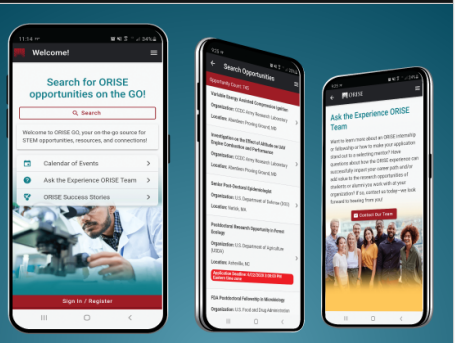

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to variability in crop yield, and extreme weather resulting in large pulses in production in one year followed by losses in the next year. Machine learning, deep learning, and other AI technologies combined with geospatial software for analysis (e.g., ArcGIS) provide promise to reduce uncertainty in predictions of agricultural production under these highly variable spatial and temporal conditions.

Learning Objectives: The successful candidate will have the opportunity to learn about the challenges in predicting dynamics of agro-ecosystems while learning a range of computational skills needed to conduct complex geospatial analyses in an HPC and cloud-based environment. The successful candidate will also learn AI technologies relevant to these problems. The successful candidate will also have the opportunity to collaborate with multiple USDA ARS scientists on data analysis projects, and to write collaborative scientific papers dealing with geospatial analyses across multiple spatial and temporal scales.

Mentor(s): The mentor for this opportunity is Dr. Debra Peters (deb.peters@usda.gov). If you have questions about the nature of the research please contact the mentor(s).

Anticipated Appointment Start Date: As soon as qualified candidates are identified. 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(s) 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 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 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 USDA-ARS@orau.org and include the reference code for this opportunity.

Qualifications

The qualified candidate should have received a master's degree in one of the relevant fields.

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Preferred skills:

- Experience modeling spatial data using ArcGIS
- Experience with analysis of time series data
- Experience working with large, diverse datasets and data mining approaches
- Proficiency in R or python
- Strong computational skills
- Strong oral and written communication skills

Eligibility Requirements

- **Degree:** Master's Degree.
- **Discipline(s):**
  - **Computer, Information, and Data Sciences** (4 👁)
  - **Earth and Geosciences** (1 👁)
  - **Environmental and Marine Sciences** (5 👁)
  - **Life Health and Medical Sciences** (10 👁)
  - **Mathematics and Statistics** (1 👁)