Opportunity Title: USDA-ARS SCINet/AI-COE Postdoctoral Fellowship in Integrating Multiple Data Streams into Forecasts of Arthropod-Borne Livestock Disease Emergence and Spread
Opportunity Reference Code: USDA-ARS-SCINet-2025-0115

Organization U.S. Department of Agriculture (USDA)

Reference Code USDA-ARS-SCINet-2025-0115

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.

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Application Deadline 12/28/2025 3:00:00 PM Eastern Time Zone

Description **ARS Office/Lab and Location:** A postdoctoral research opportunity is available with the U.S. Department of Agriculture (USDA), Agricultural Research Service (ARS), Center for Grain and Animal Health Research and Arthropod-borne Animal Diseases Research Unit (ABADRU) in Manhattan, Kansas.

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 SCINet/Big Data Research Participation Program of the USDA ARS offers research opportunities to motivated postdoctoral fellows interested in solving agriculture-related problems at a range of spatial and temporal scales, from the genome to the continent, and sub-daily to evolutionary time scales. 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, and analysis of large, diverse datasets that benefit from high-performance computing (HPC) clusters. The objective of these fellowships is to facilitate cross-disciplinary, cross-location research through collaborative research on problems of interest to each applicant and amenable to or requiring the HPC environment. Training will be provided in data science, scientific computing, AI/machine learning, and related topics as needed for the fellow to complete their research. Additional funds are available for supplies and travel essential for the fellow's research.

Research Project: Under the guidance of a mentor, the participant will research towards developing iterative forecasts for the spread of a viral arthropod-borne livestock disease from Mexico into the United States. Vesicular Stomatitis (VS) has a complex ecology with multiple vector species, host species, and a wide geographic range, occurring every year in southern Mexico and semi-periodically spreading northwards to cause outbreaks in the western US. We lack timely forecasts of direction and rate of disease spread during an outbreak event.

Modeling approaches will feature process-based machine learning in high-performance computing (HPC) environments and include data assimilation techniques in a Bayesian framework. Under the guidance of a mentor, the participant will identify and integrate multiple data streams into the model framework, including host and vector distributions, confirmed georeferenced reports of VS cases in the United States and Mexico, and publicly available environmental layers derived from satellites, observational networks, and reanalysis products.

The forecasting model time lag will be paired with the time periods needed for impactful management activity (e.g., increased livestock monitoring, vector surveillance, animal movement and quarantines) at relevant spatial scales. The participant will collaboratively produce forecasts of VS disease emergence and spread meant to be updated iteratively over the outbreak season, with explicit quantification of forecast uncertainty. Findings from this project can be applied to other arthropod-borne disease systems. The participant will also have the opportunity to contribute open and reproducible high-performance computational workflows to the ARS SCINet and AI Center of Excellence (scinet.usda.gov) communities.

Learning Objectives: The participant will learn about developing stakeholder-driven models of livestock disease spread that are widely applicable to a broad range of systems. The participant will also have the opportunity to take online courses and other trainings in coding (e.g., R, Python, HPC) and scientific topics, and to hone interdisciplinary communication, collaboration, and leadership skills through workshop and working group experiences.

USDA-ARS Contact: If you have questions about the nature of the research, please contact Dr. Amy Hudson at amy.hudson@usda.gov.

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Anticipated Appointment Start Date: Start date is flexible, anticipated in January 2026.

Appointment Length: The appointment will initially be for one year but may be renewed for a second year upon recommendation of the mentor and ARS.

Level of Participation: The appointment is full-time.

Participant Stipend: The participant(s) will receive a monthly stipend commensurate with educational level and experience. **The current stipend range for this opportunity is $90,000 - $100,000/year plus a supplement to offset a health insurance premium.**

Citizenship Requirements: This opportunity is available to U.S. citizens and Lawful Permanent Residents (LPR).

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. If you have additional questions about the application process please email ORISE.ARS.SCINet@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.

Preferred skills:

- Experience processing and analyzing diverse geospatial environmental data products.
- Experience developing, testing, and refining machine learning models.
- Experience developing HPC workflows.
- Excellent written and oral communication skills.
- Experience in team and collaborative scientific environments.

Stipend

$90,000.00 – $100,000.00 Yearly

Eligibility Requirements

- **Citizenship:** LPR or U.S. Citizen
- **Degree:** Doctoral Degree.
- **Discipline(s):**
  - **Computer, Information, and Data Sciences** (17 👁)
  - **Earth and Geosciences** (21 👁)
  - **Engineering** (29 👁)

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- **Environmental and Marine Sciences** (14)
- **Life Health and Medical Sciences** (51)
- **Mathematics and Statistics** (11)
- **Other Non-Science & Engineering** (13)
- **Physics** (16)
- **Science & Engineering-related** (2)
- **Social and Behavioral Sciences** (30)