Postdoc Researcher: Spatial Modeling & Causal Inference for U.S. Agricultural Land Use Change

Position Description: We are seeking a postdoc researcher at the University of Delaware, to work on an interdisciplinary project examining spatiotemporal patterns of the persistent application of cover crops (as an example of high-priority, sustainable agricultural land use practices) across the continental U.S. The goal is to understand how individual-level sustainable land use decisions aggregate to form large-scale landscape patterns that can yield environmental benefits. Starting with an exploratory data analysis of publicly available spatial data on cover crops and related natural and human systems, the project will generate new insights identifying associations between persistence of the sustainable practice and related environmental and social factors. Using spatial modeling and machine learning methods, we aim to explain the mechanisms that cause the landscape evolution. Creative extensions and co-development of new directions are encouraged.

The position offers an attractive salary and benefit package. Initial contract is for two years with the potential to renew.

Responsibilities: The researcher will be expected to (1) identify, obtain, and manage appropriate datasets, (2) conduct exploratory data analyses, (3) build, calibrate, and validate empirical models of spatiotemporal patterns, (4) design and implement data-driven experiments, (5) carefully document data metadata and analytical procedures for reproducible science, (6) analyze, visualize, and interpret modeling and experiment results, (7) work collaboratively with a multidisciplinary team to incorporate diverse feedback, and (8) publish in peer-reviewed scientific journals.

Opportunities: The position is funded by an NSF HEGS grant and is also related to the NSF-EPSCoR Project WiCCED (Water in the Changing Coastal Environment of Delaware). The researcher will be mentored by Dr. Jing Gao (leading the Geospatial Data Science and Human Dimensions of Global Change lab) and Dr. Kent Messer (directing the Center for Experimental & Applied Economics), while working with interdisciplinary experts. There will be diverse opportunities to engage with the UD Data Science Institute (DSI) and the Center for Behavioral & Experimental Agri-Environmental Research (CBEAR), a USDA Center of Excellence. The University of Delaware is a tier-1 research university and ranks among the top 100 universities in federal R&D support for science and engineering.

Minimum Qualifications: (1) PhD in a related field before starting, (2) solid background in geospatial analysis and modeling using quantitative and computational methods, (3) attention to detail with data manipulation and analyses, (4) proficiency with one or more scientific programming language (e.g., Python, R), (5) excellent written and oral communication skills with demonstrated ability to publish scientific manuscripts, and (6) strong motivation and work ethics.

Preferred Qualifications: Research experience/familiarity with (1) geospatial applications of machine learning, data science, spatial statistics, (2) publicly available datasets on U.S. agricultural, environmental, and socioeconomic variables, (3) data-driven spatiotemporal analyses integrating diverse data sources, and (4) causal inference for agricultural or environmental issues, especially, agricultural land use practices. Experience with grant proposal writing is welcomed, but not required.

Application: Email a CV, a research statement highlighting relevant experiences and skillsets, unofficial transcripts, an example publication, and contact information for three references, to Dr. Jing Gao (jinggao@udel.edu), with the subject line “Cover Crop Postdoc Application - [Full Name]”.

Review of applications will begin on May 30, 2022, and will continue until a suitable candidate is identified. Shortlisted candidates will be contacted and interviewed virtually. Start date is negotiable (ideally no later than September 1, 2022).

The University of Delaware is an Equal Opportunity Employer. Individuals from under-represented backgrounds are strongly encouraged to apply.