

Farmer Decision-Making and Agro-ecological Systems with Spatial Analysis and Cloud Computing

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Project Description. The Panel Farmer Survey research team at Michigan State University seeks a summer 2019 Research Experience for Undergraduates (REU) student for a project involving a panel farmer survey, geocoding and spatial analysis, and cloud computing. Farmers are making decisions in the context of environmental change and uncertainty, which has both short and long-term consequences for ecological systems including soil health and water quality. Many factors, like prices, risk, and environmental conditions, shape farmer decisions. We have improved our understanding of which information sources farmers consult, whether (and how) farmers adopt technologies and biologically based practices on their operations, and how climate change may affect crop choice and crop management. However, we could make further knowledge gains by placing farmer decisions in an agro-ecological systems-based framework that also takes into account spatial and temporal variability.

This project has three main components: 1) working with multiple years of survey data of 3,000+ farmers in the US Midwest, 2) geocoding physical locations, and 3) assisting with developing and improving the online data collection and validation platform for a farmer panel survey. This research team has been working to create a panel, systems-based dataset that accounts for spatial and temporal factors that may shape farmer decision-making including information, economic and market-based factors, biophysical variables, and weather and climate measures. This REU project will build on these efforts, validating and extending them with geocoding, Google Earth Engine (GEE), and other data including MSU's [Kellogg Biological Station's Long-Term Ecological Research](#) (KBS LTER).

Fellowship Description. The ideal candidate will have experience working with quantitative data, general statistical software packages (e.g. R, SAS), and may have some experience with scripting languages (e.g. Python). The candidate must be eager to learn new techniques for data management and analysis. We will provide opportunities for learning new software and a collaborative community focused on similar topics and methods. Our research team is active and growing. The position will be for 11 weeks, from May 20 – August 3, 2019, and will be based at MSU in East Lansing, MI. The student will need to find housing on campus or nearby campus. The student will work, on average, 40 hours a week and receive a stipend of \$8000 to cover housing, living expenses, travel to MSU, and up to \$500 in research supplies. The stipend will be paid in two payments, June 15 and July 15, 2019. Travel for field research, presentations, or academic meetings off campus will be covered by the research mentor's lab. The student will be responsible for 1) meeting all requirements of their mentor, 2) writing a [blog post](#) about their research for the [KBS LTER](#) website, 3) attending a professional development seminar at KBS, and 4) presenting a professional research poster at the KBS summer research symposium on Wednesday, July 31, 2019 at KBS.

Apply by sending your CV or resume and a 1-page statement of interest describing your interest in and qualifications for this opportunity to Dr. Marquart-Pyatt at marqua41@msu.edu. Apply by March 1, 2019 for full consideration. Please email Dr. Marquart-Pyatt (marqua41@msu.edu) with any questions.

This project is funded by the National Science Foundation's Kellogg Biological Station Long-term Ecological Research (KBS LTER) program. **Priority will be given to non-MSU students who may not have many research opportunities at their college or university and under-represented minority students. Please note, students must be a U.S. citizen to apply.**