Graduate Teaching/Research Assistantship (PhD) Opportunity with the Ecological Restoration Institute at Northern Arizona University and the Jones Center at Ichauway

Are you interested in a PhD program utilizing new technologies (e.g., remote sensing, artificial intelligence, spatial statistics) to improve the restoration of frequent fire forests across the U.S.? In ponderosa pine forests of the Southwest and longleaf pine forests of the Southeast, changes in land use and fire exclusion have led to widespread alteration in forest structure, composition, and function. As a result, large-scale programs have been enacted to restore these landscapes to sustain the biodiversity and ecosystem services they support. For example, earlier this year the USDA Forest Service launched its 10-year strategy, called "Confronting the Wildfire Crisis: A Strategy for Protecting Communities and Improving Resilience in America's Forests," which combines unprecedented investments of congressional funding with years of scientific research and planning into a national effort targeting a dramatically increase in scale (20M ha) of forest restoration treatments in the US West over the next decade. Meanwhile America's Longleaf Restoration Initiative (ALRI) maintains a conservation plan to increase longleaf pine by 2M ha across its historic range. Successful restoration requires a precise understanding of how forests change over time, and how processes such as competition, disturbance, growth, and recruitment lead to stand development. Understanding these processes requires resource intensive and spatially explicit data. Remote sensing data products (e.g., lidar), coupled with advanced forest inventory and data analysis techniques can quantify existing forest conditions, support broad-scale analysis, and provide a means for improving restoration in these important ecosystems.

A PhD teaching/graduate assistantship is available in School of Forestry at Northern Arizona University, Flagstaff, AZ with Dr. Andrew Sanchez Meador (School of Forestry, Northern Arizona University) and Dr. Jeffery Cannon (Landscape Ecology Lab, Jones Center at Ichauway). The selected candidate will focus on the development of advanced remote sensing techniques using terrestrial and mobile lidar platforms to better understand the structure and development of ponderosa pine and longleaf pine ecosystems. The work will address ecological questions that inform restoration and management of these systems. Portions of the field work will take place at The Jones Center, a 11,000ha research and conservation center in Newton, Georgia and on NAU's Centennial Forest, a 20,000 ha research, teaching, and demonstration forest.

The selected student will:

- Assess and validate algorithms for identifying individual trees from remote sensing data using new and existing data collected in stem-mapped stands of ponderosa pine and longleaf pine.
- Assess the accuracy, precision, and statistical properties of forest resource estimates such as bias, consistency, error, spatial uncertainty, and use these to provide improved information for land management decision making.
- Apply point pattern and geostatistical methods to stem-mapped data to test hypotheses related to competition, facilitation, recruitment, and/or mortality.
- Design, develop, and implement original research questions of the student's interest in the context of the overall project.

Minimum Qualifications

- Bachelor's degree in forestry, geography, ecology, computer science, or related fields.
- Demonstrable research experience, collaboration abilities, and English (written and oral) communication skills.
- Competitive GRE scores (top 40th percentile).
- Occasional travel between field sites in Georgia and Arizona may be required

Preferred Qualifications

- Master's degree in forestry, geography, ecology, computer science, or related fields.
- Previous experience with research, data analysis and management, especially spatial analysis
- Experience processing large remote sensing and inventory datasets using C++, R, and/or Python is preferred.

Information about NAU's graduate program, including eligibility requirements, is available at http://nau.edu/CEFNS/Forestry/Degrees. Our preferred start date is Fall 2022; and interested candidates are encouraged to contact with Dr. Sanchez Meador and Dr. Cannon as soon as possible using the information provided below or submit your CV, a brief written statement of interest, and copies of unofficial degree transcripts to initiate a dialogue via e-mail. Andrew.SanchezMeador@nau.edu and Jeffery.Cannon@jonesctr.org

Contact Information:

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