

## One funded MS or PhD Research Assistantship

**Discipline Areas:** Forest Ecology

**Research Topic:** Indigenous forest management in a non-stationary climate

**Start Date:** 2024

Opportunity for an MS or PhD Research Assistantship position in the Wildland Resources Department, Utah State University, to participate in a National Science Foundation-funded project entitled “Indigenous forest management in a non-stationary climate.”

**Position:** Research Assistantship with at least three years of funding. This student will work with Dr. DeRose (<https://qcnr.usu.edu/labs/derose/index>) and closely with Dr. Kevin Anchukaitis (<http://www.u.arizona.edu/~kanchukaitis/people.html>), will be involved in all aspects of the research, and will lead a focus on the forest assessment, dendrochronological reconstruction of disturbance regimes and their cause and consequences with respect to climate and management. Research will include incorporation of Indigenous Knowledge, and integration with other project graduate students that are studying cultural and ethnographic aspects. The research will involve working in Guatemalan forests with few foot paths and where steep slopes prevail. Dr. DeRose is a part of the Wildland Resources Department (WILD), made up of 30 full-time faculty. Located in the Quinney College of Natural Resources, WILD has a strong graduate student program (<https://qcnr.usu.edu/wild/programs/graduate/index>) with degree options in Ecology or Forest Ecology (<https://www.usu.edu/ecology/>). Competitive pay, full tuition/fees waiver, and health insurance are provided.

The following skills and experience are desired, and listed in order of importance:

1. Experience in forestry and/or dendrochronology, with understanding of tree physiology, climate, statistics, and data management
2. Ability to spend long periods of time in the field in Guatemala in rural communities of Totoncapán and Todos Santos
3. Ability to work in a team with physical and cultural scientists
4. Completed thesis or research paper that demonstrates your ability to carry out and communicate scientific research
5. Written and/or spoken Spanish would be helpful, Quiché and Mam fluency is an added bonus
6. English Language Proficiency: Official scores from the Test of English as a Foreign Language (TOEFL), International English Language Testing System (IELTS) or C1 Advanced are required of all graduate applicants, regardless of citizenship status, whose native language is not English or who have been educated in countries where English is not the native language.

To apply, please email the following to Justin DeRose ([justin.derose@usu.edu](mailto:justin.derose@usu.edu)): 1) a cover letter describing your experience and interests, 2) a CV or resume, 3) unofficial transcripts, 4) GRE scores, and 5) a list of three professional references and their contact information.

Review of candidates will begin immediately and continue until one is chosen.

### **Project Description:**

National Science Foundation, DISES: Indigenous forest management in a non-stationary climate  
Forests have provided shelter, sustain, and provide ecosystem goods and services, including carbon sequestration, nourishment, and water resources for human societies for millennia. Forests reflect a complex mix of human management, extraction, and conservation interactions, and they face a myriad of threats from both economic forces and global environmental change. This award will explore how forests have been managed and sustained over millennia through exploring the human knowledge of these interactions. This award will explore the forest's dynamics using: formal technical or 'Western' scientific and Indigenous Knowledge (defined here by local ancestral knowledge held by Indigenous communities) approaches and understanding. This study will rigorously assess forest disturbance history and model forest climate sensitivity in neotropical conifer forests using western methods from tree-ring studies and understanding how climatic risks are perceived by indigenous forest managers, the forest management systems in place led by indigenous communities, to understand how Indigenous Knowledge is applied to forest management in these communities and how this knowledge acquisition and transmission could be modified by social changes including migration, and how this relates to the existing body of Indigenous Knowledge. The project includes a range of broader impacts related to education, training, and co-production of knowledge focused on building local capacity and generating information that can be applied to study the range of variability in the coupled socio-environmental system of forests conserved by Indigenous communities.

Forest ecosystems are a critical component of the biosphere and play an important role in coupling the atmosphere to the land surface and carbon cycle. These environments also shelter, sustain, and provide ecosystem goods and services, including carbon sequestration and water resources, for human societies at scales from local to global. Forests are fully integrated socio-environmental systems that reflect reciprocal interactions, exchanges, and feedbacks between biosphere, atmosphere, and human society. Terrestrial protected areas and ecologically intact landscapes are conserved and managed by indigenous peoples, but imminent climate disruption and changes in forest disturbance regimes threaten the state of ecosystems and the human livelihoods that both depend on and affect them. Indigenous Knowledge reflects holistic accumulated understanding of the system by indigenous communities; however, migration and other social and cultural changes have altered the modes of transmission of environmental knowledge in these communities. How does modern Indigenous Knowledge integrate centuries of socio-environmental interactions and experiences and how will that knowledge system change in the face of social and environmental systems that will imminently shift beyond the variability of the last several centuries? This research approach combines a long-term understanding of past, present, and future forest history and disturbance from dendrochronology, novel insights into indigenous management and conservation practices through time, an understanding of traditional environmental knowledge dynamics, scale, and change, and forecasts of future socio-ecological change. This project seeks to understand how indigenous knowledge of forest dynamics reflect centuries of ecosystem variability and how non-stationarity in both the human and ecological components of this coupled system will affect management, conservation, and preservation of this socio-ecological system.