



JORNADA BASIN LTER

LONG TERM ECOLOGICAL RESEARCH

Research Experience for Undergraduates (REU)

The NSF-supported Jornada Basin Long-Term Ecological Research (LTER) program has opportunities for undergraduate students to participate in research during the summer of 2024. Each participant will develop a personalized project under the guidance of a suitable mentor associated with the Jornada LTER and/or New Mexico State University.

Successful applicants will be awarded a stipend of \$6,500 for the summer field season (approximately 5/27 – 8/9) to cover stipend, living, and travel expenses.

Students will be expected to provide their own living accommodations.

Activities will include fieldwork at the Jornada research site northeast of Las Cruces, NM.

How to Apply

Applications will be evaluated upon submission, with priority given to those received before the deadline, and positions being filled as long as funding is available. Applications from underrepresented minorities are particularly encouraged. Based on their interests, applicants can select one or more of the research projects below, or work with a Jornada mentor to develop their own ideas. Complete applications should include:

- Completed Application Form
- Resume or Curriculum Vitae
- Unofficial Undergraduate Transcripts

About the Jornada LTER

The Jornada Basin Long-Term Ecological Research Program is focused on the ecology of drylands in the southwest USA, including the causes and consequences of alternative ecosystem states and expansion of woody plants into grasslands.

We are interested in spatial and temporal variation in ecosystem dynamics, and how historic legacies, geomorphology, wind, water, climate, and land use interact with vegetation, soils, microbes, and animals to determine past, present, and future ecosystem states across different scales. We use a large suite of long-term ecological and climatic data to understand and predict these dynamics.

More information on the LTER program is available at <https://lter.jornada.nmsu.edu>.

Applications Due: March 18th, 2024

To apply, send all application materials compiled into a single file (e.g. PDF) to: Madeleine Soss (msoss@nmsu.edu)



JORNADA LTER RESEARCH EXPERIENCE FOR UNDERGRADUATES

Due March 18, 2024 to Madeleine Soss



General Information			
Last Name:	First:	M.I.	Date:
Street Address:	Apartment/Unit #:		
City:	State:	ZIP:	
Phone:	E-mail Address:		
Undergraduate Major/Minor:			
Expected Graduation Date:		University Name/Location:	
Project number(s) you are interested in:			

PLEASE ATTACH RESUME AND UNOFFICIAL UNDERGRADUATE TRANSCRIPTS

REFERENCES (can include your proposed JRN-REU mentor or other)	
1. Full Name:	Relationship:
Affiliation:	Email:
Phone Number:	
2. Full Name:	Relationship:
Affiliation:	Email:
Phone Number:	

Applicants are encouraged (not required) to contact the REU mentors to ask questions about summer research. Provide a short description of your research interests and preferred research themes for your work with the Jornada LTER below.

DISCLAIMER AND SIGNATURE	
The information included in this application is true and is representative of my work and past experiences.	
Name	Date

2024 Jornada Potential LTER REU Projects

Please look over the lab/project descriptions below and indicate the Project Number(s) (Ex: #1, #2, etc.) that you are most interested in on the attached application form. You are encouraged to reach out to advisors with any questions. The selected students will work with advisors to develop and complete individualized research projects over the summer.

1. Exploring Chihuahua Desert Soil Microbial Diversity and Ecological Roles

In the Pietrasiak Dryland Microbes Lab we 1) quantify and discover dryland microbial diversity (we especially are fascinated by cyanobacteria and other algae); 2) investigate the roles of microbes in dryland ecosystem functioning and soil health especially when they form biological soil crusts (biocrust); and 3) identify key microbial ecosystem players and traits important for bioprospecting and resource management. We apply a variety of diverse approaches including cutting edge DNA based techniques and bioinformatics, advanced microscopy, traditional microbial isolation, and culturing methods, as well as soil ecological, field biological, and landscape ecological methods to study dryland microbes. Our research is highly interdisciplinary and addresses questions in resource management, ecology, biogeography, and systematics of microbes in the most arid soils and rock substrates of the Americas. Anticipated 2024 summer projects involving dryland soil microbes and biocrust will focus on:

- Characterizing the cyanobacterial diversity of Chihuahua Desert soils
- Assessing the microbial composition of soils obtained from locations reflecting diverse dryland management practices
- Identifying the roles of biocrust microbes in carbon cycling and soil stability in the Chihuahuan Desert

Student must be willing to conduct the research in-person on University of Nevada Las Vegas (UNLV) campus.

Contact Information:

Dr. Nicole Pietrasiak

nicole.pietrasiak@unlv.edu

<https://www.unlv.edu/people/nicole-pietrasiak> X/

Twitter: @DrylandAlgae

2. The Lavery Lab at New Mexico State University is focused on studying biotic and abiotic factors that structure wildlife communities. This REU project will involve ~10 weeks of fieldwork at the Jornada Basin Long-term Ecological Research site, north of Las Cruces, New Mexico. Here, the Lavery Lab is beginning a new project investigating how bat communities differ across grass and shrub gradients and studying how bat predation on insects may indirectly alter vegetation communities. Duties will include vegetation surveys, deploying acoustic detectors, reviewing acoustic data, and may involve bat captures. Applicants should be prepared for a variety of environmental conditions—hot days and monsoon storms—and must have the rabies pre-exposure vaccination prior to any bat handling.

Contact Information:

Dr. Theresa M. Lavery, *she/her/hers*

Assistant Professor

Department of Fish, Wildlife and Conservation Ecology

New Mexico State University

Email: tlavery@nmsu.edu

Website: <https://lavertylab.org/>

3. Dr. Browning is a plant ecologist using remote sensing and geospatial tools to better understand how vegetation change influences carbon uptake and storage in arid ecosystems. Dr. Browning and the team recently established a network of eddy-covariance towers to measure water and carbon dynamics at three sites along a gradient of vegetation change (including grasses and shrubs). We'd welcome and support an REU with shared interests on a project we'd design together that would involve ~10 weeks of fieldwork at the Jornada Basin Long-term Ecological Research site, near Las Cruces, New Mexico. One idea we want to explore involves measuring and comparing rates of photosynthesis, stomatal conductance, and whole plant photosynthesis following summer rain events for grass and shrub species. The ideal candidate would be curious, open to fieldwork in the desert, and have experience (or proficiency) working with data in R open platform software. This project is expecting to produce data insights into the timing of daily patterns of photosynthesis and the magnitude of carbon dioxide (CO₂) uptake for grasses and shrubs and support broader interpretations of CO₂ fluxes at these sites that represent rangeland ecosystems over much of the western U.S. We welcome input from the student in project logistics and implementation.

Contact Information:

Dawn Browning, Ph.D. (*she/her/hers*)

Research Ecologist

USDA – ARS Jornada Experimental Range

Las Cruces, NM 88003

dawn.browning@usda.gov

4. The Mauritz lab at UTEP focuses on capturing spatial and temporal drivers of ecosystem-level carbon, water, and energy exchange in the Chihuahuan Desert. We use a variety of instrument platforms to understand how vegetation and weather interact to control carbon, water, and energy exchange and ultimately to learn how vulnerable the system is to climate change. In the last decade the scientific community has learned that dryland systems are far more important for global carbon storage than previously thought. Yet, most carbon models still rely on theories developed from research in cool, wet temperature ecosystems. More research is needed to improve representation of dryland systems, particularly responses to the extreme and highly variable rainfall patterns. Potential projects will incorporate long-term data sets and coding in R to explore some fundamental questions about how vegetation dynamics relate to ecosystem-level fluxes. Projects will be developed with interest and input from the student.

Research Topics:

Ecosystem-level carbon, water, and energy exchange dynamics in the Chihuahuan Desert.

Contact Information:

Dr. Marguerite Mauritz-Tozer

Assistant Professor

The University of Texas at El Paso (UTEP)

[Faculty — Systems Ecology Lab \(squarespace.com\)](https://www.squarespace.com)

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