

Desert Research

NMSU celebrates \$5.88 million Jornada Basin Long Term Ecological Research grant.

by Jay Rodman, New Mexico State University

At a Jan. 18 New Mexico State University (NMSU) Research Rally, the campus celebrated the recent announcement of a \$5.88 million grant from the National Science Foundation to fund the Jornada Basin Long Term Ecological Research (LTER) program for a sixth six-year funding cycle.

The Jornada Basin LTER is a collaborative project involving NMSU's College of Agricultural, Consumer and Environmental Sciences, College of Arts and Sciences and the USDA's Agricultural Research Service (ARS). NMSU administers the grant.

Landscape ecologist Debra Peters is the project's principal investigator. She is a research scientist with the USDA/ARS Jornada Experimental Range (JER) and an affiliated faculty member in NMSU's Department of Plant and Environmental Sciences and Department of Biology. She has been involved in the Jornada Basin LTER research enterprise since she arrived at NMSU in 1998, after working on other LTER projects since graduate school.

Collaborating researchers include eight other faculty members from NMSU and JER, as well as scientists from Arizona State University, the University of Arizona, University of California—Los Angeles, University of Texas—El Paso, University of California—Berkeley and the U.S. Geological Survey.

The Jornada Basin LTER has been continuously funded since 1982 and is one of the seven oldest LTERs in a network that currently includes 25 such sites spread across the United States, the polar regions and the South Pacific. The LTER network was created to allow studies of the dynamics of ecological change that could span decades, expanding our

knowledge of the mechanisms of that change in a representative sample of diverse environments.

The Jornada Basin, a mid-altitude semi-arid desert environment, allows the study of issues common to many deserts around the world.

The Jornada Basin LTER project's research site encompasses more than 250,000 acres of Chihuahuan Desert land comprising NMSU's Chihuahuan Desert Rangeland Research Center (CDRRC) and the USDA's contiguous Jornada Experimental Range north of Las Cruces.

Peters emphasized that she and her colleagues are not only investigating how and why the landscape has changed; they also seek to understand what the consequences of that change have been and what the implications are for the future.

One reason these lands are ideal for long-term research is that there is a wealth of information on which to base analysis. Data collection and experimentation have been central to the mission of both the JER, established in 1912, and the CDRRC, established in 1927. Concerns about degradation of the land and the need to determine the sustainable grazing capacity of the Chihuahuan Desert motivated much of the work. Today's researchers can access data from land surveys dating back as far as 1858.

According to Kris Havstad, the supervisory scientist at the JER, currently available data sets include climate information, such as temperature, rainfall, rainfall chemistry and evaporation rates, as well as soil information, vegetation dynamics and changes in land cover, erosion and changes in soils, and prevalence of various animals, including small mammals, spiders and birds.

Desertification focus

The transition from grassland to shrubland that characterizes what researchers call "desertification" has been a major focus of the Jornada Basin LTER research of the past 30 years.

While the basic priorities of the program have stayed constant — documenting and explaining the ecological changes in the Chihuahuan Desert — both the tools used



NMSU PHOTO BY DARREN PHILLIPS

► Landscape ecologist Debra Peters makes a point at the Jan. 18 NMSU Research Rally celebrating the \$5.88 million National Science Foundation grant funding the Jornada Basin Long Term Ecological Research program. The grant keeps the project going for a sixth six-year funding cycle. The Jornada Basin LTER is a collaborative project involving NMSU's College of Agricultural, Consumer and Environmental Sciences, College of Arts and Sciences and the USDA's Agricultural Research Service. Peters is the principal investigator on the project.

for analysis and the theoretical assumptions about the changing desert environment — have evolved considerably.

Long-term research allows for hypothesis testing that can have an impact on theoretical frameworks. As a result, today's researchers are more comfortable making predictions about the direction and extent of future change and willing to suggest mitigating strategies.

As the Jornada Basin LTER enters the current six-year grant period, Peters said that desertification is recognized as only one of several important types of transition researchers need to focus on in the Jornada Basin.

For instance, data collected during the 2004-2008 period, when wetter-than-normal conditions prevailed, indicate there was actually some reversal of the grass-to-shrub transition. So shrub-to-grass transition is now a second focus of study.

The researchers are also looking at shrub-to-shrub transitions, where, for example, the balance among mesquite, creosote bush and tarbush might shift. There are transitions from current vegetation to new invasive grass species. And there are transitions from natural to human-dominated states due to



expanding human population, expanding demand for ecosystem services, and urbanization in the area.

Application of results

Research from the Jornada Basin LTER has produced tangible benefits for the people of New Mexico. As one example, Havstad cites the fact that the work has been key to the monitoring and evaluation of the U.S. Bureau of Land Management (BLM) “Restore New Mexico” program, helping the BLM understand what strategies have and have not worked on 2 million acres of the 13 million it controls around the state.

The program’s research is also having a substantial impact on science education locally, with programs of the affiliated Asombro Institute for Science Education involving hundreds of science educators and more than

17,000 area K-12 students each year.

Members of the Jornada Basin LTER team have also developed new ways of making data available in more useful form to expanding audiences of scientists, teachers and students around the world.

Just as they did 100 years ago, Southern New Mexico ranchers need to understand as much as they can about carrying capacity and the long-term impact of grazing in the Chihuahuan Desert. The Jornada Basin LTER research continues to contribute to discussions of grazing management policy. For Peters, it is also important that the general public be aware of the research results.

“We have these long-term data showing these dramatic changes in vegetation, and associated changes in air quality and wind and water erosion,” she said. “I think once people understand how it’s changed so

dramatically, then they will have a sense that these landscapes may be very different in the future, as well, and that their own activities could influence those changes. I think their understanding of these human interactions with their environment is really important.”

The Office of the Vice President for Research hosts a series of Research Rallies to inform the university community and stakeholders within the state about NMSU’s research successes and contributions. The purpose of the rallies is to honor faculty and staff investigators for significant, externally funded projects, and they are designed to elevate awareness about NMSU’s research efforts and their impact on the New Mexico community and elsewhere.

For more about the Jornada Basin LTER, visit <http://jornada-www.nmsu.edu/>.

