Jornada Experimental Range LTAR, Las Cruces, NM

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The Research Unit based at the Jornada Experimental Range (Jornada; http://jornada.nmsu.edu) has a 100-year legacy of addressing issues concerning the management and conservation of arid rangelands. The Unit mission is to develop ecologically based knowledge systems and technologies for management, conservation, monitoring, and assessment of rangelands. The research emphases are employed at multiple spatial and temporal scales. Unit expertise includes rangeland management, landscape ecology, soils, remote sensing, modeling, ruminant nutrition, animal behavior, and molecular biology with experimental capacities from the plant through landscape scales. The program exploits a data intensive scientific method that capitalizes on long-term data sets, some of which are approaching a century of record.

The 778 km^2 Jornada was established from withdrawn public domain by Presidential Executive Order signed in 1912. The field station was established within the USDA's Bureau of Plant Industry, but transferred to the US Forest Service (USFS) in 1915. The USFS quickly established a research program to address the principle objectives cited in the 1912 Executive Order including: 1) quantifying carrying capacity of native rangeland for livestock use, 2) establishing a system of forage utilization consistent with desert environments, and 3) identifying possible livestock forage improvements for degraded sites. These objectives have been addressed. In 1952, the Jornada was transferred to the then newly-created ARS. The ARS has been able to expand the research program from its more narrow beginnings to one with national and international significance for arid lands and their conservation and management.

Two main components of the research program at the Jornada are 1) the ARS based project "Management Technologies for the Conservation of Western Rangelands" (2012-2017), and 2) the NSF Long-term Ecological Research (LTER) project "Long-term research at the Jornada Basin" (2012-2018). The Unit works within this single ARS project and is solely within the USDA ARS National Research Program in Pastures, Forages, and Rangeland Systems. The Jornada's base ARS project has five research objectives: 1) develop data driven, ecologically-based approaches to characterizing land potentials, 2) develop assessment and monitoring approaches for multi-scale resource evaluations, 3) identify key ecological processes that influence potential for restoring degraded landscapes, 4) develop adaptive management strategies with application for desert livestock production systems, and 5) predict system responses to both management dependent and independent drivers. The LTER project is conceptually linked to the ARS project in that key hypotheses have application to the ARS research objectives. The LTER program contributes the foundation science in identifying key processes related to resistance and resilience in these arid systems. Expanding our understanding of these processes has direct application to both the management and restoration of arid rangeland systems in the US, throughout North America, and around the world. These coupled ARS and LTER projects build intensively and extensively upon the lengthy research history at the Jornada. Currently, our research program is deployed on 4 continents.

The Jornada is within the Basin and Range Physiographic Province, the Rio Grande Watershed (USGS Hydrologic Unit Region #13), and on the western edge of the USDA Prairie Gateway Farm Resource Region. The program is part of several networks in addition to LTAR and LTER including the National Ecological Observation Network Southwest Domain (construction in 2013), the NRCS Soil Climate Analysis Network, the NOAA Climate Reference Network, and the USDA UV-B Network.

Principle research emphases of the Jornada related to the LTAR network are:

1. Characterizing quality, quantity, and variability of available resources
2. Identifying metrics and appropriate technologies to assess and monitor these resources
3. Evaluating conservation effects of management practices applied to these resources.