

# Abstract

## **Sevilleta LTER III: Long Term Ecological Research in a Biome Transition Zone**

The Sevilleta Long Term Ecological Research (LTER) Program, established in 1988, conducts research on ecological processes and responses to climate dynamics in a biome transition zone in central New Mexico. The major research site is the Sevilleta National Wildlife Refuge, operated by the U.S. Fish & Wildlife Service (FWS). The multi-disciplinary research group comprises 34 scientists from 10 universities and numerous research agencies, including FWS, The Nature Conservancy, U.S. Geological Service, USDA Forest Service, USDA Agriculture Research Service, DOE Los Alamos National Laboratory, and DOE Sandia National Laboratory. The primary goal of the LTER Program is to develop and test a hierarchical model of controls and constraints on the movements of biotic assemblages at the edges of their distributions. These movements occur as a result of complex interactions among a large number of abiotic and biotic variables, at a wide range of spatial scales, and over time periods ranging from minutes to centuries. The Sevilleta LTER models and experiments address the relative roles of the major controlling variables, and allow predictions of changes in the structure and functioning of biome transition zones that would result from natural (e.g., climate) and anthropogenic (landuse, grazing, fire) perturbations. Of particular interest is the role of moisture availability (drought cycles, El Nino/La Nina episodes, Pacific Decadal Oscillations) in driving the distributional expansion and contraction of C3 and C4 plant species (trees, shrubs, grasses) over decadal time frames, and the resulting changes in local and landscape level ecological processes. The results of these studies will provide a greater understanding of the physical and biological processes that govern the dynamics of the major ecosystems in central New Mexico, factors that lead to desertification processes, and contribute to improved understanding and management of the environment for sustainable human use and development.