

Visiting Scientists



Leticia Ríos Casanova received her PhD from the National University of Mexico (UNAM), studying the ecology of ant communities. She is currently a postdoctoral fellow working

with Brandon Bestelmeyer in the analysis of soil and plant productivity effects on species richness and dominance of ants in the Jornada Experimental Range.

Hector Octavio

Godinez Alvarez is a professor at the National University of Mexico (UNAM), where he teaches undergraduate and graduate courses, and conducts ecological research on semiarid



ecosystems. He is working with Jeff Herrick during his sabbatical because of his interest in the status of ecological processes and integrity of these ecosystems, through the assessment and monitoring of indicators.

Lucina Hernández

is a senior researcher with the Instituto de Ecología, A.C. Durango Regional Office, Durango, Mexico. She is also the coordinator of the Mexico LTER project on impacts of climate change on plant and animal communities at Mapimi in the Chihuahuan Desert, Mexico. This project is the “sister” to the LTER projects concurrently being conducted at Jornada and Sevilleta LTER sites. Her sabbatical is providing her an exciting opportunity to collaborate with research-



ers on studies examining long-term small mammal community dynamics.

John Laundré

is a senior researcher with the Instituto de Ecología, A.C. Durango Regional Office, Durango, Mexico. As part of the Mapimi LTER team, he is responsible for the monitoring of predators. He is spending his sabbatical getting to know another part of the Chihuahuan Desert and analyzing various data sets on carnivores in Mapimi. He is also working with Lucina Hernández to test if the landscape of fear model for predator-prey relationships can explain differences in rodent abundance between different habitats at the Jornada. This study may be expanded to Mapimi and the Sevilleta LTER in the future.



JORNADA TRAILS



Jornada Basin Long-Term Ecological Research Program

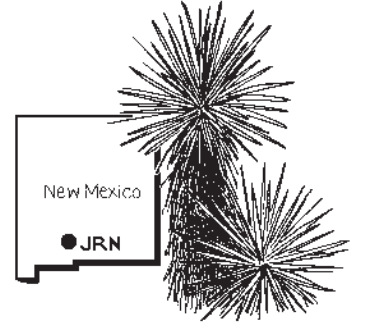
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Jornada Basin Rapid Pulse-Effects Landscape Inventory (JRN-RPLI) by Brandon Bestelmeyer



Sporobolus (dropseed) grass recruits in the interspaces of a mesquite duneland in 2007: can this result in restoration?

Monitoring data can be used to develop hypotheses regarding plant establishment and vegetation community dynamics in distinct landscape situations. We are collecting new data from the Jornada in order to exploit successive years of high rainfall that may catalyze significant, long-term effects on the trajectory of arid ecosystems. We conducted a rapid landscape-wide inventory to document the occurrence of perennial grass-dominated areas and establishment patterns of grasses and shrubs following the unprecedented rains of 2006 and relatively wet spring of 2007. The inventory will be used to build models of the current states of Jornada ecosystems and serve as a basis to monitor and model where recent changes are permanent, transient, or did not occur in relation to soil-geomorphic and landscape characteristics. A rapid assessment of a large number of plots can be used to quantify the contributions of landscape variables to the characteristics and occurrence of vegetation states and serve as a framework for experimentation. Long-term monitor-



The Jornada Basin LTER Program is a NSF funded and USDA Agricultural Research Service supported project.

ing data collected at the plot scale will be coupled with analysis of high-resolution imagery of shrub and perennial grass patch structure at landform and basin scales. We expect these analyses will identify landscape variables influencing vegetation dynamics. These variables can then be examined to see how they may be utilized for restoring degraded areas.

NMSU graduate student Darroc Goolsby is working on this project.

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Prairie Dog-Livestock Interactions by Ed L. Fredrickson

In the northern Chihuahuan Desert, two keystone species, black-tailed prairie dogs and banner-tailed kangaroo rats, were the target of eradication campaigns at the beginning of the 20th century. These campaigns occurred when some Chihuahuan Desert grasslands were undergoing rapid transitions to shrub dominated desert shrub conditions. Recent studies in Chihuahua, Mexico are being used to determine if livestock can be used

to affect the distribution of prairie dogs, and to help control expanding mesquite populations in order to preserve existing grasslands. Doctoral student Rodrigo Sierra Corona and advisors Gerardo Ceballos and Ed Fredrickson, are conducting experiments to see if cattle form “grazing associations” with prairie dogs. Results show that when grasses are dormant, cattle prefer grazing on prairie dog colonies in large pastures. In smaller 60 x

60 m plots, cattle prefer the edges of prairie dog colonies. Because prairie dogs prefer grazed areas with low stature vegetation, targeted cattle grazing impacts may affect prairie dog distributions in ways that can control further mesquite expansion.

Rodrigo Sierra Corona is a graduate student at both Universidad Nacional Autonoma de Mexico and University of California Berkeley.

Nitrogen In Creosotebush by Vince Gutschick

One dramatic response in the Chihuahuan Desert is the dense, very green regrowth of creosotebush (*Larrea tridentata*) after defoliation. This response led Vince Gutschick and his students Randy Fowler, Jeanne Tenorio, Mark Robertson, and Shigang Liu to try tracing the N reserves in these plants. Using pulse-labeling with N^{15} on 36 adult plants, they found extremely high N content in all parts of the shrub, typically five-fold higher than in mesic plants - e.g., 2% N in coarse roots. This fit with earlier findings of Gutschick, technician Connie

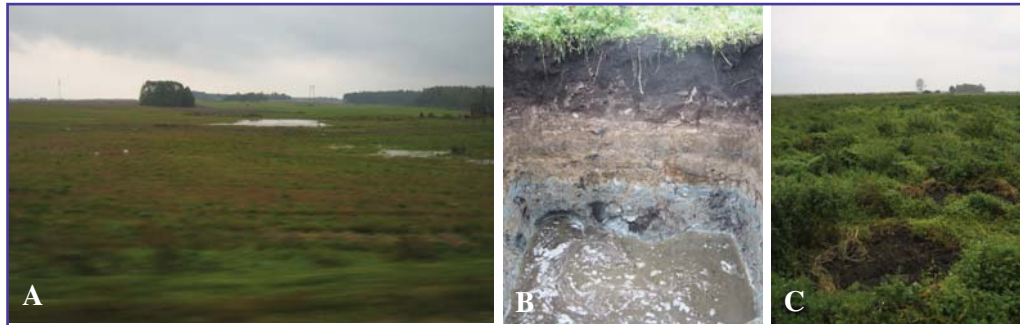
Maxwell, and a series of students that *Larrea* leaves have five times as much N per leaf area as other plants deploy for the same rate of photosynthesis. It also fit with studies in 2003 by Walvoord et al. from New Mexico Tech, showing that the soils in all three hot deserts of North America have very high nitrate content at 1-2 m depth. The desert is truly N-rich . . . at least for the shrubs whose roots tap this largesse. While the details of N transfer after defoliation remained hidden in the interplant variability, the pulse-labeling revealed rapid movement of newly-

applied soil N (even at low levels) to the leaves. This information can be combined with the pattern of natural abundance of N^{15} in all the different plant tissues. One concludes that soil nitrate - the dominant N form in these soils - moves to the leaves, is reduced there, and then gets distributed to the rest of the plant. Nitrate reduction in leaves is not very common in woody plants . . . but, then, *Larrea* is so uncommon in so many traits of physiology and development.

Land Degradation Assessment and Landscape Linkages in Latvia by Jeff Herrick

Europe is struggling with many of the same land management, assessment, and monitoring issues that we face in the United States. There are a number of parallels between their efforts to develop protocols that are acceptable to all countries and Jornada efforts to develop protocols that are acceptable to different agencies, regions, and states, and the increasing awareness of the importance of landscape linkages to resource redistribution. There are also some significant differences associated with the politics of the EU, the lack of consistent data (national soil surveys cannot be easily compared) and lack of large-scale soil conservation programs supported by science, such as those supported by the Soil Conservation Service (now NRCS) in the United States. Latvia in particular is quite interesting because it highlights the importance of differences between perceptions (which are often politically and economically driven) and realities of land degradation.

A recent visit showed that the chal-



Upland and lowland (A) landscapes in Latvia experience drainage problems associated with soil structure degradation. Peat soil on coastal plain (B) located in a temporarily abandoned agricultural field (C) has already lost at least 1m of soil due to wind erosion and increased oxidation rates associated with drainage.

lenges in the uplands are similar to those we encounter in the Mesilla Valley and throughout much of the Midwestern US, despite the fact that the two countries have different land tenure issues. Though excessive moisture and European agricultural policies overwhelm many of the parallels between Latvia and the US, our assessment technologies developed for US landscapes have application to Latvia and

other regions around the world.

Jeff Herrick's visit to Latvia was supported by the UNDP, which organized an "International Workshop on Land Degradation Risk Assessment and Criteria Development Methodologies in Europe". The workshop resulted in a draft farmer soil quality assessment kit.

New Staff - LTER Technician Lisa Schauer

We are very pleased to welcome Lisa Schauer as our newest field research assistant with the Jornada LTER program. Lisa began as a temporary full time research assistant in the middle of May before becoming a permanent staff member this August. She hit the ground running with Net Primary Production field measurements in May, bringing to bear her very strong background in plant

taxonomy. Lisa worked for 2 1/2 years in the NMSU Biology Department herbarium. She essentially ran the herbarium for that period, maintaining the herbarium collection database, preparing and processing voucher loans, along with preparing and repairing specimens. Though a native of the southwest, Lisa also did a tour of duty with the Harvard Forest Summer Research Program in

ecology during the summer of 2006 assisting with a study investigating the relationship between human disturbance, environmental factors, and invasive species distributions.



Chihuahuan Desert Nature Park Bounces Back From Vandalism

by Stephanie Bestelmeyer

During a five month period in 2007, vandals destroyed a section of rock wall around the parking area, burned two shade structures, and incinerated the storage tanks under the restrooms. In total, damages exceed \$100,000 at the CDNP located north of Las Cruces.

While the staff and volunteers were devastated by this senseless destruction, we have already bounced back with the determination and enthusiasm that has become a symbol of our organization. We quickly established surveillance and gates and worked with Crime Stoppers to offer a reward for information leading to arrests (no one has yet been charged). Metal-frame shade structures will be installed

this fall, and restroom facilities will be constructed in early 2008. We are also progressing on schedule with new additions to the Park, including an educational soil pit display and a shade structure over part of the 150-seat amphitheater.

Thanks to the dedication of the Nature Park staff and volunteers and generous donations from the community, our Schoolyard LTER and other education programs have continued without interruption during this turmoil. Nothing can stop us from ensuring that the Nature Park remains a place to experience the excitement of science for more than 12,000 K-12 students and 5,000 adults we reach annually.

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Jornada Trails also appears on the World Wide Web at <http://jornada.nmsu.edu>

Newsletter by Valerie K. LaPlante and Kris M. Havstad

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Vince Gutschick Retiring by Connie Maxwell

Well, Vince has finally done it. He's retiring from New Mexico State University on January 1, 2008, after over 22 years of service to students and the university. His plans for retirement? Just to sit back and go fishing---not Vince!

Vince began his Jornada Basin LTER association in 1994 and in 2006 was co-author of the LTER book chapter, *Water and Energy Balances*. In: *Structure and Function of a Chihuahuan Desert Ecosystem*. His research has centered on plant adaptations in photosynthesis and water use, and he has passed on his vast knowledge to graduate and undergraduate



students in the many classes he has taught in plant physiology, plant ecology, biophysics, and mathematical modeling.

Vince's work in ecophysiology has taken him near and far and he hopes to maintain his numerous contacts in his retirement. He calls it retirement, but it's

actually a change of career and focus. His current interest in global change prompted him to start a consulting firm that will draw on the talents and knowledge of his many colleagues, both nationally and internationally.

