



**USDA-ARS Range Management Research Unit,
Jornada Experimental Range, Las Cruces, NM**

News from the Jornada

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Science-based knowledge for sustainability of drylands

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COVID-19 Response

We are following State, USDA, and University guidelines in our response to the Coronavirus epidemic. Most Jornada staff and students continue their efforts via teleworking, with a focus on analysis and writing, which is common for this time of year. A few staff with the essential functions of protecting property and animal welfare continue their efforts with added safety precautions. Through this difficult period, the Jornada and its scientists will continue to produce and provide cutting-edge research.

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The Jornada

Science-based knowledge for sustainability of drylands.

Our mission is to conduct long-term, collaborative research to sustain agriculture and other land uses in rangelands. Our research group a collaboration of the USDA Agricultural Research Service and New Mexico State University in Las Cruces, New Mexico. We link site-based research on ecological processes, innovative livestock production systems, and ecosystem restoration with national and global research on land monitoring and decision support tools. We are a part of the USDA Long-Term Agroecosystem Research and Long-Term Ecological Research Networks. We host the USDA Southwest Climate Hub. [See our website](#)

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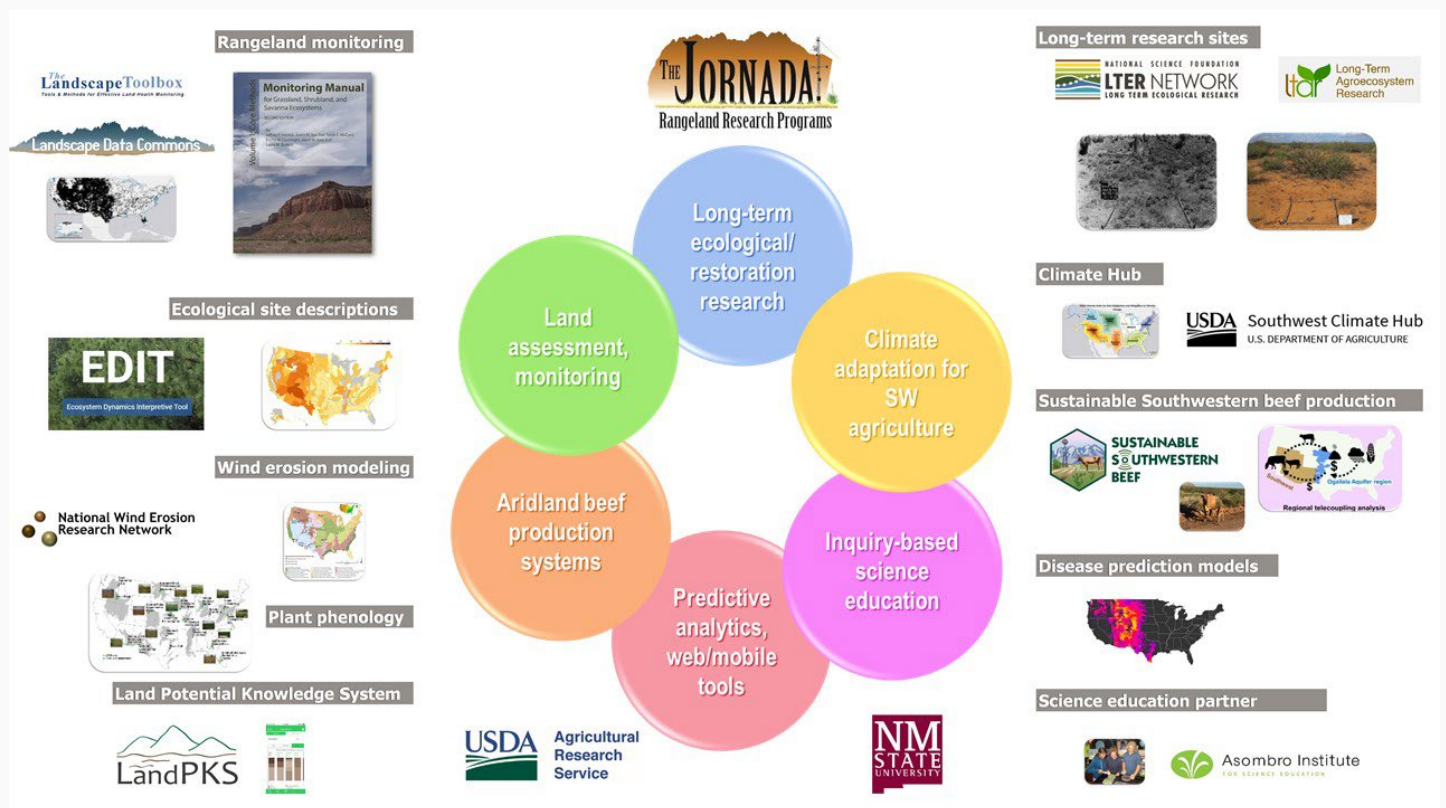
Research Priorities

Our research, extension, and education efforts are diverse and are shaped by interactions with our stakeholders. Some of our research lines directly respond to information needs communicated to us, while others are forward-looking, creative, and, we hope, creates innovations of the future. Our research also matches topics with our long-term capabilities, and feedback from our stakeholders has led to expansion of our capabilities in new directions through training and new hires. The list below includes topics, in no order other than alphabetical, that our stakeholders have communicated to us in recent months. We have worked on some of these topics for many decades, others we are just beginning to about.

The graphic also provides a summary of our main research areas and major initiatives. We welcome any feedback you might have on the research lines or topics we should consider.

Topics of stakeholder interest

- Factors controlling dust emissions and their impacts on human health
- Future scenarios as a consequence of climate change, urbanization, new technologies, and changes to rural livelihoods
- How to use “big data” to predict the spread of diseases and other regional phenomena
- How to use new technologies to increase public participation in science
- Making long-term monitoring data useful and available to support management decisions
- New grassland restoration technologies
- Predictions of forage production responses to weather variations
- Site-specific (precision) science information delivery (mobile technologies, ecological site descriptions)
- Strategies to sustain ranch-based livelihoods that improve environmental outcomes
- The availability of science results for land management decision-making
- The relationship between land cover and atmospheric processes
- Understanding how climate, management, and ecological processes control vegetation change (especially drought, fire, and brush management)
- Understanding stakeholder perceptions of restoration actions



2020 Jornada Research Programs

Research Results

Four recently published papers are highlighted below. We constantly update our papers and abstracts--over 3,300 of them-[here](#). Most papers are available for download.

Deciphering the past to inform the future: preparing for the next (“really big”) extreme event

Climate change will bring more extremes in temperature and precipitation that will impact productivity and ecosystem resilience throughout agroecosystems worldwide. This paper uses “big data” to provide new insights to the historical US Dust Bowl, and illustrates how broad-scale data can be used to interpret and manage for catastrophic events. See the paper. See the paper [here](#)

Traversing the Wasteland: A Framework for Assessing Ecological Threats to Drylands

Drylands cover 41% of the Earth’s terrestrial surface, play a critical role in global ecosystem function, and are home to over two billion people. Their limited but variable precipitation, low soil fertility, and low productivity have given rise to a perception that drylands are “wastelands”. In this paper, we propose a framework for assessing threats to dryland ecosystems and suggest we must also combat the negative perceptions of drylands in order to preserve the ecosystem services that they offer. See the paper here. See the paper [here](#)

Collaborative Approaches to Strengthen the Role of Science in Rangeland Conservation

In this paper we review an approach to collaborative science to improve brush management outcomes in rangelands in the Chihuahuan Desert. We argue that expanding the use and utility of collaborative science requires stable support via targeted funding and technical expertise, as well as web-based tools and mobile applications that link specific locations to science information and conservation practice guidelines. See the paper [here](#)

Targeted livestock grazing: Prescription for healthy rangelands

This paper reviews targeted livestock grazing as a tool for manipulating rangeland vegetation. Future research should address the potential to select more adapted and effective livestock for targeted grazing and the associated animal welfare concerns with this practice. See the paper [here](#)

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Events

The [National Agricultural Research, Extension, Education, and Economics Advisory Board](#) (NAREEE Board) met in Las Cruces, NM on January 28-30, 2020. NAREEE is federal advisory committee created to provide advice and recommendations to USDA on long- and short-term policies and priorities for food and agricultural research, education, extension and economics. The Board is made up of 15 private citizens who represent the organizations and groups that make up our agricultural enterprise. The Jornada was chosen as the venue as the Board focused its meeting on resources needed for Agricultural Climate Adaptation. Board members, leaders from USDA research agencies, and USDA Deputy Under Secretary Scott Hutchins learned about climate adaption research at the Jornada, including long-term ecological research to inform desert grassland restoration, the potential of Raramuri Criollo cattle for beef production in increasingly variable climates, and how climate adaptation information is reflected in the K-12 programs of the Asombro Institute for Science Education. They also learned how the Southwest Climate Hub synthesizes and delivers research and education products to producers and managers across the Southwest region. We were pleased to showcase the interests of our stakeholders and the collaboration between federal research, university partners, and extension and education entities.



Dr. Stephanie Bestelmeyer discussing Asombro programs with the NAREEE board members during their visit to the Jornada.

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Below is a list of presentations delivered at the Society for Range Management meeting in Denver, CO this past February with links to abstracts or videos where they exist

[LandPKS Soil Id: A Smartphone-Based Soil Identification Tool for Rangeland Management](#) Maynard J., Herrick J.E., Salley S.W., Dylan E., Beaudette D., O'Green A.T.

[Land of Encroachment: A multi-stakeholder assessment of brush control efforts in New Mexico](#) Dinan, M. Cutts B.

[Defining thresholds for wind erosion in desert rangeland STMs](#) Webb N., Edwards B., Burke R., McCord S.E., VanZee J.W., Courtright EM, Cooper B.

[LandPKS App for Planning and Monitoring Outcome-Based Grazing: New Features](#) Herrick J.E., Salley S.W., Neff J., Murph R., Mize M., Maynard J.J., Bestelmeyer B.T.

[Spatial prediction of ecosystem state transitions on the Taos Plateau](#) Heller A., Webb N., Bestelmeyer BT, McCord S.E.

[Monitoring plant community change at the Jornada Experimental Range: 100 Years of quadrat sampling](#) Christensen E., Bestelmeyer BT, Maxwell C., Slaughter A.L., James D.K., Romig KB, Havstad K.M.

[Terradactyl: an example of modularity and ontologies to ensure the sustainability of open source software](#) Sarah McCord, Nelson Stauffer

[Ecosystem service tradeoffs associated with agricultural intensification of grazinglands](#) Sheri Spiegall.

[Multiple Stakeholder Perceptions of Brush Control Efforts in the Southwest Region](#) Maude Dinan

[fDNA-based diet selection by Raramuri Criollo and Angus crossbreds in the Chihuahuan Desert](#) Darren James

[Big Data, Local Science: Not an Oxymoron](#) - Brandon Bestelmeyer, Leticia Lister, Zoe Davidson (BLM). YouTube video of talk is [here](#)

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The Southwest Climate Hub Planning a Drought Learning Network

The severe 2018 drought centered on the Four Corners brought into sharp focus the need for more proactive drought planning in the southwest region. More than 30 resource managers and drought service providers convened in Las Cruces, New Mexico in February to envision a drought learning network for the Southwest. See more about their plans [here](#).

Sustainable Southwest Beef Project Kickoff Event

The Sustainable Southwest Beef Project team and USDA Southwest Climate Hub held an event at the Southwest Beef Symposium in January that will help guide this new project in the coming years. See more about the event [here](#).

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Tools

The LandPKS team produced a new video series to teach users how to better understand the land around where you live, keep records, and monitor changes in soil health and vegetation using LandPKS mobile apps.

These videos can serve as a resource for students of all ages, families, and teachers. See more [here](#).

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