3-D animated video simulates landscape changes over 150 years

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This 1912 photo of the Jornada Basin shows grass and tarbush. New Mexico State University student Carlos Tejeda created a 3-D animated simulation of this area's landscape changes over 150 years. Credit: Jornada Basin LTER

If you see photos of the Jornada Basin from the early 1900s, the vegetation is quite different than it is now. But explaining the story of how and why the vegetation changed on the land northeast of Las Cruces is difficult with just words and pictures.

Debra Peters, Jornada Basin Long Term Ecological Research Principal Investigator and a research scientist with the U.S. Department of Agriculture, Agricultural Research Service, reached out to the New Mexico State University Creative Media Institute to help bring the landscape history to life.

"We have a lot of data that looks at the history of our landscape, and we try to visualize it from maps and from long-term data," Peters said. "But it's hard for us to put the story together in our minds, so we asked people from the Creative Media Institute to make that story come alive through an animation."

Supported by the National Science Foundation, the project was funded by Jornada Basin LTER as part of the Research Experience for Undergraduates program.

NMSU senior Carlos Tejeda spent the summer designing a 3-D animated video that simulates changes on the Jornada Basin from the 1850s to the present.

"I created a time-lapse of more than a hundred years, including how plants and the ecosystem and grass changed through those years," Tejeda said.

Tejeda is a student in the NMSU Creative Media Institute Animation and Visual Effects academic program.

Accuracy was both important to and a challenge for Tejeda. He had

several meetings with Peters and others at the Jornada LTER regarding the history of the rangeland and their hypotheses about vegetation changes. He sorted through many long-term data documents. He also took his own pictures at the Jornada Range.

And Peters now has a teaching tool to present the findings from long-term data. Not only does she want to demonstrate that the vegetation changed from grassland to shrubs, she hopes to convey a more recent discovery: Part of the landscape has a different species of plant life that's separated by elevation and soil texture.

"The shrub species have gone through some very dynamic transitions, and that information was really new for us," she said. "They're on different soil textures now, but they started out growing together with grasses on similar soil. In order for that to happen, you had to have a lot of soil erosion and movement, and a lot of things really had to change in order to get to the landscape we see today, which seems to be very stable. So we asked Carlos to animate those time periods and the part of the landscape that we haven't studied very well."

Peters said most of those changes probably occurred between the 1850s and about 1900.

For Tejeda, the entire process was a fulfilling experience, especially knowing the magnitude of the LTER project and the fact that its historical data dates back to 1850.

He also enjoyed the unique partnership between him – as a 3-D animator – and LTER researchers.

"It was a great experience working with someone in a different career," he said. "I don't know much about their field, and they didn't know much about my field, so both parties had to learn how to explain things in a

simplified way. And it was really fun as well."

Peters plans for the Jornada LTER to continue to collaborate with different departments at NMSU.

"We're trying to reach out to more departments on campus with the LTER, so it was good to get a different perspective and different types of talent involved," she said. "Carlos was great to work with. We hadn't worked with a creative media person before. He was attentive, he listened really well and he wanted to do things right."

Tejeda is expected to receive his bachelor's of creative media in animation and visual effects with a minor in film production in May.

Provided by New Mexico State University