

June 2016

## Earth's grasslands laboratory

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### Recommended Citation

Davis, Trevor (2011) "Earth's grasslands laboratory," *Seek*: Vol. 1: Iss. 3.

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# Earth's grasslands laboratory

Researchers unlock the secrets of nature at the Konza

An endless sea of grass in the Flint Hills of northeastern Kansas serves as a laboratory to uncover the mysteries of the environment. Experiments by Kansas State University researchers at the Konza Prairie Biological Station help provide a better understanding of global issues like climate change, water quality and land conservation.

The Konza Prairie Biological Station spans about 8,600 acres, with 93 percent of the prairie having never been plowed. It was first developed as an ecological research site in 1971 under the leadership of the late Lloyd Hulbert, a biology professor at Kansas State University. The Nature Conservancy and Kansas State University own the station, while the university's Division of Biology manages it. National Geographic magazine has called the Konza "the nation's last great expanse of tallgrass prairie."

Five University Distinguished Professors study temperate grasslands, one of the most endangered ecosystems in the world. The researchers include biology professors John Blair, Tony Joern, Walter Dodds and David Hartnett, and agronomy professor Chuck Rice.

"We each bring different perspectives and expertise to a project," Blair said. "Having all of us collaborate on grasslands research means that we have the most comprehensive grasslands program around."

The professors are some of the world's most renowned ecological scientists and include a member of a research group that won the Nobel Peace Prize.

"Here at Kansas State University you don't study just your little piece of the puzzle," Joern said. "You get to see what other people are doing and put your own work into the context of a bigger story."



John Blair

**Areas of study:** Terrestrial ecosystem ecology and grassland ecosystems.

**Kudos:** He leads the National Science Foundation-funded Long-Term Ecological Research program at Kansas State's Konza Prairie Biological Station.

**Why it matters:** Understanding grassland dynamics helps to develop management practices to conserve grasslands and provide insight to global climate change.

**Quotable:** "Scientific discovery ultimately enriches all of our lives whether the results are immediately applicable or not. I think one of the things that's happened in science in general, that is good and bad, is that everybody focuses on what are the short-term human benefits that will be derived from scientific discovery: How will this make my life better tomorrow? What we do is directly relevant to making human lives better, but there's also a lot of value in scientific discovery because it's important to understand how the universe and nature work — to advance ecological theory."



Walter Dodds

**Areas of study:** Nitrogen contamination in stream waters, and the effects of stream drying and flooding on habitat and species.

**Kudos:** He is the coordinator of aquatic and hydrological research at the Konza Prairie Biological Station and a co-principal investigator on the Long Term Ecological Research Grant.

**Why it matters:** Clean streams and rivers are indispensable resources because everyone is dependent on them for drinking, recreation, irrigation, industry and fishing. Dodds' research provides better understanding into how water quality can be improved.

**Quotable:** "Freshwaters provide valuable ecosystem goods and services that have a positive monetary effect on citizens. Clean water is a valuable resource that we want now and to preserve for the future. The goal of my research is to understand how we can harmonize the human relationship to our environment to maximize benefits provided by freshwaters."



David Hartnett

**Areas of study:** North American and African grasslands, with an emphasis on plant population biology, plant-herbivore interactions and symbiotic relationships between plants and fungi.

**Kudos:** He has conducted ecological research at the Konza Prairie since 1986 and in southern Africa since 2000.

**Why it matters:** Rules for managing grasslands in the Konza Prairie of Kansas need to be tested throughout the world to see if the methods can help preserve other grasslands.

**Quotable:** "The invasion of grasslands by woody plants and exotic plants is a key issue in North America, particularly in the Flint Hills. That's one of the key conservation issues in our grasslands here in Kansas. Over the past several decades the number of shrubs and trees has been increasing while the aerial coverage of grasslands has been decreasing."



Tony Joern

**Areas of study:** Grassland ecology, plant-herbivore interactions, insect population and community ecology, and insect and plant interactions.

**Kudos:** At the Institute for Grassland Studies Joern contributes to one of the leading grassland research programs in the country.

**Why it matters:** Understanding grassland dynamics and herbivores like cattle, bison and grasshoppers helps develop management practices to conserve grasslands.

**Quotable:** "Grazing animals are a major driving force for grasslands all over the world, but how they actually use space and their effects on other species is poorly understood. Understanding how bison and cattle select areas to graze on native grasslands will provide new management opportunities for grassland conservation efforts, as well as develop better basic ecological understanding of alternate grazing options for grassland managers interested in promoting grassland function and biodiversity."



Chuck Rice

**Areas of study:** Soil microbiology, soil and global climate change, and carbon sequestration.

**Kudos:** He was a member of the United Nations' Intergovernmental Panel on Climate Change that received the Nobel Peace Prize in 2007.

**Why it matters:** Soil takes in carbon dioxide from the air, but soil microorganisms release carbon as the Earth warms. Carbon sequestration can mitigate greenhouse gases.

**Quotable:** "I try to explain climate change, but some people are convinced and set in their ways and believe that climate change is not happening or is a natural phenomenon. I do my best to show people the evidence, provide the interpretation and the science, and suggest ways to help reduce the impact."

## By the numbers

30<sup>+</sup> Years of research and data

1,300<sup>+</sup> Publications

210<sup>+</sup> Student dissertations

8,600 Acres

10 Miles from campus

1971 Year founded