TEXAS TECH UNIVERSITY
Climate Science Center™

Sandhill Crane Behavioral Research

NRM graduate student researching sand hill crane migratory patterns to create baseline understanding of behavior

The Fish and Wildlife Service has chosen sandhill cranes as the representative species for the High Plains to better understand the effect climate change is having on wildlife in the region. However, there is very little data currently that can tell researchers what is considered normal behavior for sandhills, making it incredibly difficult to establish with existing data how their behavior may be changing.

Sandhill cranes are excellent migrators. They are tall, light birds that migrate from Canada down to Texas throughout the year. They have hollow bones and weigh in around 5 pounds, but can be up to 6 feet tall. Sandhills can adapt to different populations if separated from their own. They can navigate the landscape using key features on the land?? and in the stars, and they can detect magnetism from the poles in their cerebral cortex.

In the absence of an understanding of how sandhills use the landscape, research is needed to establish baseline behavioral expectations before factoring in adaptations to climate change.

Enter Justin Bosler, a graduate student working under Dr. Blake Grisham in Natural Resource Management. Justin is conducting research at the playa lakes in the Muleshoe Wildlife Preserve, where sandhills spend a few weeks along their migratory route. Justin and his colleagues have developed a safe and effective way to trap the elusive sandhills at these lakes and fit them with transmitters for tracking.

These transmitters send 4 locations per bird per day and are solar powered, with a 5-year battery life. Each transmitter costs around $3,750. Justin has 26 to fit to birds for his research.

Sandhills are typically baited with corn, but the abundance of corn in this area means having to be more tactful to entice them. Despite wintering on the milo and cornfields in the area, they do not threaten the profit of farmers.

Dr. Jung-Hee Ryu

Jung-Hee Ryu received her PhD in Atmospheric Sciences from Pusan National University, South Korea in 2001. She spent several years as a post-doc and research associate at Penn State and the University of Colorado. Dr. Ryu joined the Texas Tech Climate Science Center in 2010 and is currently a research assistant professor.

Her most recent research has focused on regional influences on seasonal and inter-decadal variability in surface air temperature over the Caribbean. Dr. Ryu is assessing the ability of existing climate models to recreate the influence of global temperature and regional and remote climate indices. Her most current research interests focus on climate extremes across the South Central U.S.

Summary of December Climate Science Seminar Speakers

Dr. Warren Conway
Department of Natural Resource Management
Texas Tech University

"Snowy Plovers and Salinas – Regional Sentinels of Changing Landscapes"

There are ~40 large basic saline lakes in the Southern High Plains, all spring fed and good indicators of the condition of the Ogallala Aquifer. Water levels fluctuate over millenniums in ideal cycles, but still have been essential to life in the SHP for thousands of years. This includes usage by sandhill cranes, for paleo Indian sites. It is universally agreed upon that regardless of the state of groundwater levels in the past, the lake surfaces have always remained wet and muddy. Currently, increased aridity is leaving them dry. Now there are 2-4 functional spring fed lakes, the rest are filled strictly by precipitation.

Dr. Sara Spurgeon
English

"Literature, Water, and Public Discourse in the Arid West"

Environmental authors have often been essential in shaping the public opinion towards environmental issues throughout the decades. There have often been questions about how heavily this literature should be weighted considering most is not scientifically-based, but it will continue to shape the public mentality regardless. Much of the language in environmental literature, as well as the opposing side, tends to be polarizing and can further increase disagreement. Authors like John Muir and Edward Abbey have informed many public debates, and a deeper understanding of their role in debates could aid policy makers in water management strategies.

Dr. Tim Dallas
Electrical Engineering
Texas Tech University

"Shining Light on Solar Energy Generation"

Solar panels work by converting photons to electrons or phonons. Solar panels can be PV or thermal, and most research currently focuses on finding the manufacturing materials that are most efficient at trapping as many photons as possible. Solar energy is concerned with trade-offs, and details of the ecosystems they are present in will aid in understanding usage and finances. The higher the competing electricity prices, the more competitive and the faster the payback time for solar. Currently the drawbacks are the intermittency, as well as lack of storage. The primary question currently is whether or not the grid can handle the energy fluctuations.

February 3rd Seminar Speakers Included:
Annette Sobel – "The Complexity of One Health"
Michael San Fransisco – "Atmospheric Transport of Microbes – Emerging Disease"
Veronica Acosta-Martinez – "Climatic Stress Effects on Soil Microbial Communities Under Agroecosystems"
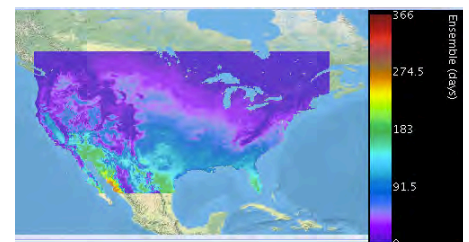
Upcoming March 3rd Seminar Speakers:
Joey Young – Department of Plant and Soil Sciences
Dustin Sweet – Geosciences
John Barkdull – Political Science

CSC Featured Dataset

The high-resolution climate projections generated by the TTU CSC are now online as part of the USGS GeoData Portal. They can be used to make interactive climate maps of a host of variables (shown: days per year with maximum temperatures above 90°F)
http://goo.gl/OF49Ep

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