

Limiting Arid Region Agricultural and Ecological Vulnerability to a Changing Climate

Friday October 26, 2018

Texas A&M AgriLife Center 8:00 AM – 6:00 PM

[Schedule and Conference Flyer](#)

Today most of the world is experiencing an evolving climate that is influencing agricultural production and ecological health. This is complicated by population and economic growth which generates increasing demand for food, agricultural products and ecological services and drives associated land use changes. The situation is almost certain to continue with severe consequences for biodiversity and food production, among other consequences. Arid areas are particularly vulnerable to these forces with increased competition for productive land and water and real threats to the continued capacity for agricultural and ecological productivity. Ecological consequences include the decline and extinction of many species. To continue our productive use of arid area lands, we need to develop adaptive solutions that maintain productivity as climate, water supply, and human populations evolve. This involves two enterprises. First, we must understand how the climate has changed and what risks it poses to agricultural systems, species and more generally our ecological systems. Second, we must identify the points of vulnerability and generate adaptive strategies to better modify the systems affected by future conditions.

Previous research has focused on individual agricultural or ecological challenges, rather than simultaneously confronting the highly integrated aspects of these two major systems. ***It is essential that these critical vulnerabilities and tradeoffs be scoped and analyzed jointly to inform stakeholders in multiple sectors of appropriate mechanisms to enhance resilience of agricultural systems, natural ecosystems, and rural communities in future climates.*** Development of effective policies, public programs, community engagement, research developments, and targeted outreach programs promoting climate adaptation strategies will lessen the adverse consequences, and capitalize on potential opportunities, associated with increasing climatic variability and extremes. Furthermore, in doing this we must consider ecology and agriculture jointly while protecting vulnerable species, agricultural production systems and water supplies. This workshop will explore this major challenge with a combination of climatological developments, agricultural and ecological vulnerability, adaptive actions, and ways to implement actions that jointly preserve biodiversity, ecological health and agricultural productivity.

The workshop will consist of five interrelated components.

- First, Texas State Climatologist, John Nielsen-Gammon will review past developments in the Texas climate. Then Richard Seager from Columbia University will present future climate projections and developments tailored to the Southern Plains and arid US Southwest.
- Second, we will turn to ecology with speakers addressing vulnerability and factors that limit or restrict actions to adapt to preserve ecosystem composition and associated function. During this some

limited discussion will focus on interrelations with agriculture. Bob Scholes from South Africa who is a foreign member of the US National Academy of Science will speak first. Then, we will hear from Lee Hannah, climate scientist with Conservation International and Wendy Foden, Chair of the IUCN Climate Change Specialist Group.

- Third, we will turn to agriculture with speakers covering the global, national and regional threats and institutional efforts including some adaptation actions. Speakers are: Alex De Pinto from the International Food Policy Institute who will describe the major world wide effort on Climate Smart Agriculture; William Hohenstein, Director of USDA's Climate Change Program Office within the Office of the Chief Economist who will describe threats and adaptation efforts from a national perspective; and Jean Steiner, Director of the USDA Agricultural Research Service's Grazinglands Research Laboratory in El Reno, Oklahoma who will describe regional vulnerability evidence and adaptation initiatives. Then, David Brown, Director of the USDA Southern Plains Climate Hub, will present collaborative work with Mike Langston, the acting Director of the South Central Climate Adaptation Science Center (SC CASC) of the U.S. Geological Survey and Mark Shafer, the Associate State Climatologist for the Oklahoma Climatology Survey and PI for the Southern Climate Impacts Planning Program. Brent Auvermann, Director of TAMU AgriLife Center in Amarillo will discuss climate related issues for confined beef cattle production systems and associated environmental considerations. These presentations will highlight key activities in the Southern Plains and their shared relevance to the Grand Challenge effort.
- Fourth, we turn to the issue of effective adaptation strategies to minimize vulnerability to climate change. This will be discussed by Chris Field and Sonja Klinsky. Field is a professor at Stanford, and a National Academy Member who has worked extensively on national and international scale efforts to advance science and assessment related to global ecology and climate change. Sonja Klinsky is a Senior Sustainability Scientist at Julie Ann Wrigley Global Institute of Sustainability and a professor in the School of Sustainability at Arizona State University. Her work focuses on integrating science into climate policy and the challenges related to social impacts of climate change, centered around justice dilemmas and climate policy decision making.
- Fifth, we will assess the role of TAMUS and its partners in identifying key elements of system vulnerability and developing adaptation strategies to enhance resilience. We propose post-workshop collaborations be conducted to develop scenarios depicting vulnerabilities and adaptation strategies involving the interaction of ecological and agricultural systems in future climates. The organizers envision that this may be the most effective manner to sustain both agricultural productivity and ecological resiliency under the dual threats of accelerating land-use and climate change.

**Contact Aurora Vargas avarga5@tamu.edu or 985-237-5744 for More
Information**