



USDA Regional Climate Hubs: Managing your risk in a changing climate.



Climate Risks in the Southern Plains

What type of agricultural production is in the Southern Plains?

The Southern Plains region contributes significantly to the nation's wheat and beef production. Winter wheat is the principal annual crop, with much of it serving dual-use as a cool-season annual forage in addition to grain production. Cattle are raised on extensive pasture and rangelands across the region.

How are climate change and weather variability affecting Southern Plains producers?

Agricultural production and farm income in the Southern Plains are very sensitive to weather variability. For example, the severe 2010/2011 drought resulted in the loss of billions of dollars in the agriculture sector. Agricultural losses were estimated to exceed \$1.7 billion in Okla. and \$5.2 billion in Texas, with over half the Texas losses attributed to livestock and hay enterprises. Examples of climate and weather-related events in this region include:

- **Drought:** In 2011 alone, drought resulted in \$10 billion in direct agricultural losses in the region. While 2012 and 2013 brought welcome relief to many areas, drought persists into 2014 in places like southwestern Oklahoma. The search is on for ways to adapt, survive, and succeed despite the weather.
- **Temperature changes:** Another region-wide change is in overnight low temperatures, especially in the winter during a series of consecutive warm days. The average winter lows are significantly warmer than seen in 1960-1990, or even 1970-2000. This is another aspect of climate change that is expected to continue and worsen. Impacts on winter crops include insufficient vernalization for some winter wheat varieties, and an increased vulnerability of winter crops to late hard freezes. Generally, winter crop productivity has become less dependable, especially when exacerbated by drought.
- **Pests and diseases:** With warmer temperatures, insects, weeds, and crop diseases have moved north and to higher elevations, or are surviving winters that used to keep them in check. Pest, weed, and disease pressures on crops are expected to continue and intensify as well.

What is USDA doing about it?

USDA has established the Southern Plains Regional Climate Hub (SPRCH) in El Reno, Okla. This multi-agency effort (Agricultural Research Service, Forest Service, Natural Resources Conservation Service) is being led by Jeanne Schneider, Research Meteorologist with the USDA Agricultural Research Service. The Hub will deliver science-based knowledge and practical information to farmers, ranchers, and forest landowners that will help them to adapt to climate change and weather variability by coordinating with local and regional partners in Federal and state agencies, universities, NGO's, private companies, and Tribes.

The Hub will provide:

- Technical support for land managers to respond to drought, heat stress, floods, pests, and changes in growing season.
- Regional assessments and forecasts for hazard and adaptation planning.
- Outreach and education for land managers on ways to mitigate risks and thrive despite change.

Building on success stories

Natural Resource Management: The Natural Resources Conservation Service (NRCS) continues to develop and deliver tools and management practices to make our soils, crops, water quality, and endangered species more resilient under climate variations. For example, landowners can calculate how much carbon their conservation practices can remove from the atmosphere with the Agricultural Policy Environmental Extender (APEX) tool. APEX was developed in partnership with Texas Agrilife Research, Texas A&M, Agricultural Research Service and NRCS. The tool will be used by NRCS conservation planners and private technical service providers to assist landowners with resource management. Tools like APEX will help maintain soil organic matter and health, meet production goals, and reduce impacts on water quality while also reducing carbon emissions.

Fire and Fuel Management: The Forest Service has compiled information and tools for land managers related to wildfires, invasive plants, forest disease, resource stewardship, wildlife, aquatic ecosystems, grasslands, water resources, vegetation distribution, ecosystem services and biodiversity at their [Climate Change Resource Center](#) website. One example is LANDFIRE (Landscape Fire and Resource Management Planning Tools). This vegetation, fire and fuel characteristics mapping program is designed to be used at a landscape scale to support resource management initiatives.

Modeling Future Soil Conditions: The Agricultural Research Service (ARS) continues to conduct research to mitigate and adapt to climate and weather-related impacts on agriculture and natural resources at laboratories across Kansas, Oklahoma, and Texas. One study in west central Oklahoma is working to develop better information for land managers and producers on [soil and water conservation in a changing climate](#). Using data on the effects of past climate variation on soils in Fort Cobb Reservoir watershed, ARS scientists are modeling the potential effects of future climate variation on soils. From there, they are identifying and then testing management practices for effectiveness at enhancing resilience to climate change in agricultural landscapes.

Need more information?

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