



## USDA Regional Climate Hubs: Southern Plains

Effects of Drought on Forests and Rangelands in the United States: A Comprehensive Science Synthesis

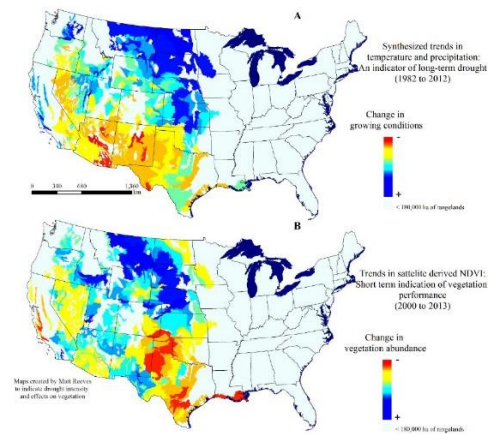


### Drought Impacts on the Southern Plains Rangelands

#### Overview:

The Southern Plains states (Kansas, Oklahoma, and Texas) rangelands are at the arid end of the spectrum of wildland ecosystems encompassing woodland, shrubland, and grassland ecosystems, and moisture deficits may be expressed on much shorter time scales in rangelands than in forest ecosystems (Figure 1). Large scale, persistent droughts have periodically occurred across North American rangelands and are not unusual. Highly variable weather has been a benchmark of life and agriculture in the Southern Great Plains. In addition to drought, the Southern Plains States experience high levels of other extreme events including heat waves, floods, high wind speeds, hail, and tornados. One of the most harmful droughts impacting American rangelands and farmlands was the drought of the 1930s known as the Dust Bowl. The Southern Plains were highly impacted by this drought. The drought's direct effect is remembered as both agricultural and socioeconomic, with damage to crops, livestock, soils, ecosystems, and ultimately humans.

Over the last 15 years, the Southern Plains have experienced an increasing frequency of extreme events including extensive drought, ended by record-breaking downpours and flooding. Additionally, agricultural systems are challenged by “unseasonable” late-spring hard freezes, “unseasonable” cold snaps cycling with “unseasonable” warm spells through summer and winter, as well as heavier rainfalls when the rains do fall. Weather volatility is at a new high compared to the last 30 years of the 20th century.



#### Drought Impacts on Rangelands:

- Accelerates the pace of invasion by non-native plants into rangelands and grasslands.
- Contributes to the invasive annual grass-wildfire loop that threatens ecosystems not adapted to fire.
- Increased frequency of wildfires, and burned sites are more likely to be invaded by non-native plants, especially annual grasses.
- Reduced forage and water available for livestock grazing and native ungulates.
- Reduced vegetative cover can lead to wind and water erosion.
- Decreased water availability, soil integrity, habitat and stresses on wildlife populations, livestock and humans.

#### Adaptation to Drought in Rangelands:

Management options include:

- Balancing available forage with respect to grazing duration and intensity.
- Using native seed sources with strong resilience to drought for plant restoration efforts.

#### Conclusions:

- It is important to understand and monitor the early ecological indicators of impacts of drought on rangelands.
- Drought often requires adjustments in methods for managing livestock and restoring plant communities.

To learn more about USDA Climate Hubs visit: <http://climatehubs.oce.usda.gov/southernplains>

To see the full report *Effects of Drought on Forests and Rangelands in the United States: A Comprehensive Science Synthesis* visit <http://go.usa.gov/cEtd9>