



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



Climate Risks in the Southwest

What type of agricultural production is in the Southwest?

Southwestern agriculture is as diverse as its landscape and culture. Agricultural crops include field crops, vegetables and specialty crops, and perennial tree crops. Different regions within the Southwest feature unique cropland activities and products – such as the green chile fields or pecan orchards of New Mexico, the dryland farming in the Navajo and Hopi Nations, the cherry orchards of Utah or the large fields of cotton in Arizona. Cropland and orchard agriculture in southwest region relies on irrigation more heavily than any other region in the U.S. Surface water supplies, primarily driven by winter snowfall in the Rocky Mountains, are critical to meeting irrigation needs in the Southwest. Groundwater is also an essential source of water for agriculture, both in areas where surface water is unavailable, and when farmers need to supplement surface water supplies. Livestock raising is an important economic and cultural activity in the Southwest. Livestock account for around one-third of the agricultural profits in the region. Unlike the cropland producers, many ranchers are dependent on Spring and Summer rainfall to supply moisture to their warm season grasses.

How are climate change and weather variability affecting Southwestern Producers?

Producers in the Southwestern U.S. are already learning to operate in a changing climate and under more extreme weather conditions. These changes are impacting producers' day-to-day decisions. Farmers and ranchers are currently coping with climate- and weather-related issues including:

- Rising temperatures and less reliable precipitation
- Prolonged, extreme drought persisting over several years.
- Severe declines in reservoir water supplies across the region to previously unseen levels.
- Extreme heat events and an increasing number of days in excess of 100°C
- Large, destructive and catastrophic wildfires that have taken both lives and property.

Changing climatic conditions in the Southwest that impact temperatures, alter growing seasons, increase plant moisture stress, and have the potential to trigger extreme events directly contribute to these recent regional catastrophes and water scarcities. Water is a scarce and vital resource to farmers and ranchers in the region. Models predict that drought and increased competition for water will be a more frequent reality in the coming years. This means reduced soil moisture and grazing productivity. Combined with warmer temperatures, farmers will face a longer frost-free season, which can reduce yields of tree fruit, and wine grapes, and increase agricultural water demand.



What is USDA doing about it?

USDA has established the Southwest Climate Hub in Las Cruces, NM. The southwest Hub is part of a multi-agency effort (Agricultural Research Service, Forest Service, Natural Resources Conservation Service) and is being led by Emile Elias (SW). The Southwest Hub delivers 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, NGOs, 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

The Drought Learning Network

In 2018, exceptional drought persisted over the Four Corners region. During this time we witnessed not only the devastating impacts on tribal and other communities, but also the extraordinary responses that were possible when people collaborated in finding solutions. Institutions and agencies from diverse sectors are working on drought prediction, monitoring, and response. However, aside from coordination with Drought Monitor authors, there has historically been limited interaction and collaboration between agencies. To improve access to drought resources and to support all agencies working with drought, the Southwest Hub partnered with NIDIS and the NDMC to create the Drought Learning Network(DLN). The DLN now has 66 partners, representing 34+ institutions and agencies. In 2020, the DLN hosted 10 public webinars (reaching >700 stakeholders) and 3 quarterly team meetings. The DLN are also building a database of case studies and best practices to support peer-to-peer learning.

Learn more: <https://www.climatehubs.usda.gov/hubs/southwest/topic/drought-learning-network-updates>

Supporting K-12 Climate Curricula Development

Helping the next generation of farmers and land managers to learn how climate change will affect them and how they can respond, is an essential part of promoting sustainability in the southwest. The SW Hub partnered with the Asombro Institute for Science Education to design education units aligned with Common Core State Standards and Next Generation Science Standards. Three units are now available: Climate change and the Water Cycle, The Effects on Climate Change on Agricultural Systems, and Climate change and the Carbon Cycle. These education units are intended to be engaging, fun, and scientifically rigorous. In collaboration with the NRCS and the Asombro, the Hub also produced the Spanish version of Climate Change and the Water Cycle.

Learn more: <https://www.climatehubs.usda.gov/hubs/southwest/topic/supporting-climate-change-mitigation-through-k-12-student-education>

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