

NITES National Integrated Drought Information System Drought.gov

# **IMPACT ASSESSMENTS OF THE 2017-2018 DROUGHT IN THE SOUTHWEST**

MAY 2019



COLORADO Colorado Water **Conservation Board** Department of Natural Resources



THE UNIVERSITY OF ARIZONA





Photo: Dave DuBois



USDA Southwest Climate Hub U.S. DEPARTMENT OF AGRICULTURE

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## Background: The 2017-2018 Drought in the Southwest

According to the U.S. Drought Monitor's drought severity designations, "Abnormally Dry" conditions crept into the Southwest region in October 2017 and deepened into widespread "Moderate Drought" in November 2017. The region was in "Severe Drought" by January 2018; "Extreme Drought" by March 2018; and "Exceptional Drought" by May 2018 (Figure 1). The "Exceptional Drought" lingered in the region until January 2019. In 2018, the region experienced more than 45 weeks in drought (Figure 2).



 Figure 1. Maximum weekly U.S. Drought Monitor category reached during 2018

▲ Figure 2. Number of weeks during 2018 in U.S. Drought Monitor category D1 or greater

SOUTHWEST DROUGHT IMPACT ASSESSMENTS

Drought can lead to a wide range of negative economic impacts across numerous sectors. In addition, the economic impacts of drought often extend well beyond immediate and direct impacts as impacts ripple across the broader economy over time. These ripple effects may include, for example, input supply chains related to the directly-affected sectors.

During and after the 2017-2018 drought in the Southwest, the states of Colorado, Arizona, New Mexico and Utah sought to understand the impacts of the drought in order to inform state- and regional-level drought planning, response, and mitigation efforts and to reduce the negative impacts and costs of future droughts. NOAA's National Integrated Drought Information System (NIDIS) and the USDA Southwest Climate Hub are providing support for five drought economic impact assessments: a Southwest regional impact assessment and state-level assessments for Arizona, Colorado, New Mexico and Utah. Each assessment is described in more detail below. These drought impact assessments build on and extend previous impact assessments to provide a more comprehensive understanding of the range of drought impacts throughout the southwestern United States. In addition, collaboration among the states and universities in the region and with Federal partners to implement the assessments strengthens learning and effective drought responses at multiple scales. It is anticipated that the assessments will be completed by the end of 2020.

### **Regional and State Assessments**

#### Southwest Regional Drought Economic Impact Assessment

The Southwest regional study compares the scope and severity of the 2017-2018 drought to previous droughts to understand if drought conditions influenced economic, health, and crime outcomes. The assessment estimates impacts of the 2017-2018 drought in each state and the region as a whole in relation to sectors that were directly affected (e.g., agriculture, tourism and recreation) and indirectly affected by drought (e.g., decreased government sales tax revenues resulting from reduced tourism) and it seeks to identify differences in the marginal and absolute impacts across the region.

Lead research agency: Colorado State University



## Arizona: Economic Impacts of Drought on Agriculture, Recreational Tourism, and Rural Communities

The Arizona study focuses on the impacts of drought on agriculture, recreational tourism, and rural communities. The study seeks to understand how drought impacts agricultural production and agricultural production costs; whether commonly used measures of drought accurately predict agricultural and livestock losses; and how well crop insurance indemnity and livestock disaster payments match economic losses. The study will then seek to understand how drought-related shocks to agricultural sectors impact rural communities and the Arizona economy overall. Drought-related shocks to agricultural sectors may include increased costs of production, such as increased spending on purchased feed when range conditions deteriorate and/or increased groundwater-pumping costs. Other drought-related shocks to agricultural sectors may include changes in production related to agricultural water supply reductions. This could include, for example, potential water supply reductions under the Arizona Drought Contingency Plan resulting from a shortage declaration for the Colorado River. In addition, the study will examine the impacts of drought on tourism, including national park and state park visitation and visitor spending impacts. Finally, the study will characterize the nature of different costs of wildfire (e.g. suppression costs, restoration costs, property damage, etc.), evaluating the availability and reliability of reported estimates, and reviewing methods used to derive cost estimates.

<u>Co-Lead state agency:</u> Arizona Department of Water Resources <u>Co-Lead state agency:</u> Arizona Department of Emergency and Military Affairs <u>Lead research agency:</u> University of Arizona

## Colorado: Assessing the Impacts of Recent Drought on Ecosystem Service-based Sectors, Criminal Activity, and Health Outcomes

The Colorado study focuses on the impacts of the 2017-2018 drought in Colorado in relation to agricultural sector outcomes, non-agricultural sector outcomes, economy-wide outcomes, state government and tax revenues and expenditures, crime and health outcomes, and simulated impacts associated with prolonged drought. The study also compares the magnitude, scope and severity of the 2017-2018 drought to other recent Colorado droughts.

The study will utilize state- and county-level data from western U.S. states to estimate the impact of the 2017-2018 drought in Colorado. The study will focus on a broad range of sectors directly (e.g., agriculture, tourism) and indirectly (e.g., hotels, food services) impacted by the drought as well as a wide range of relevant outcomes, including wages, employment, retail sales, tax revenue, and tourist visitor days. The study will also explore the extent to which severe drought events influence criminal and health outcomes in areas where rural economies depend heavily on agriculture.

<u>Lead state agency:</u> Colorado Water Conservation Board, Department of Natural Resources <u>Lead research agency:</u> Colorado State University

## New Mexico: Economic Impacts of Drought to Various Sectors

The New Mexico study assesses direct economic losses and impacts on New Mexico farms and ranches due to the drought, and also indirect and induced impacts to sectors linked to farms and ranches. Indirect and induced impacts may include, for example, employment and agricultural input purchases. The study also examines the economic impacts of drought on other sectors, including public water supply, industry (e.g., mining, oil and gas production), tourism and recreation, and Tribes and Pueblos. These impacts include direct, indirect, and induced effects. The study results will assist New Mexico with drought impact mitigation efforts as well as preparation for future drought response actions.

<u>Lead state agency:</u> New Mexico Office of the State Engineer <u>Lead research agency:</u> New Mexico State University





#### Utah: Assessing the Economic Impacts of Drought

The Utah study is comprised of three interrelated drought assessments: a behavioral economics assessment focuses on agricultural producers' responses to drought and the triggers that initiated those responses; an economic assessment examines direct and induced economic impacts of drought at the county level and in relation to the primary industries of the Utah economy; and an impact assessment examines the impacts and risks of drought to agriculture in Utah.

<u>Lead state agency:</u> Utah Division of Water Resources, Department of Natural Resources <u>Lead research agency:</u> Utah State University