





A Modern Approach to Drought Early Warning

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Joint Session: Advances in Communicating the Risk of Drought and Cascading Hazards

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Who are we? Meet the Science Team



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California Nevada
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NOAA
National Centers for Environmental Information

CIRES

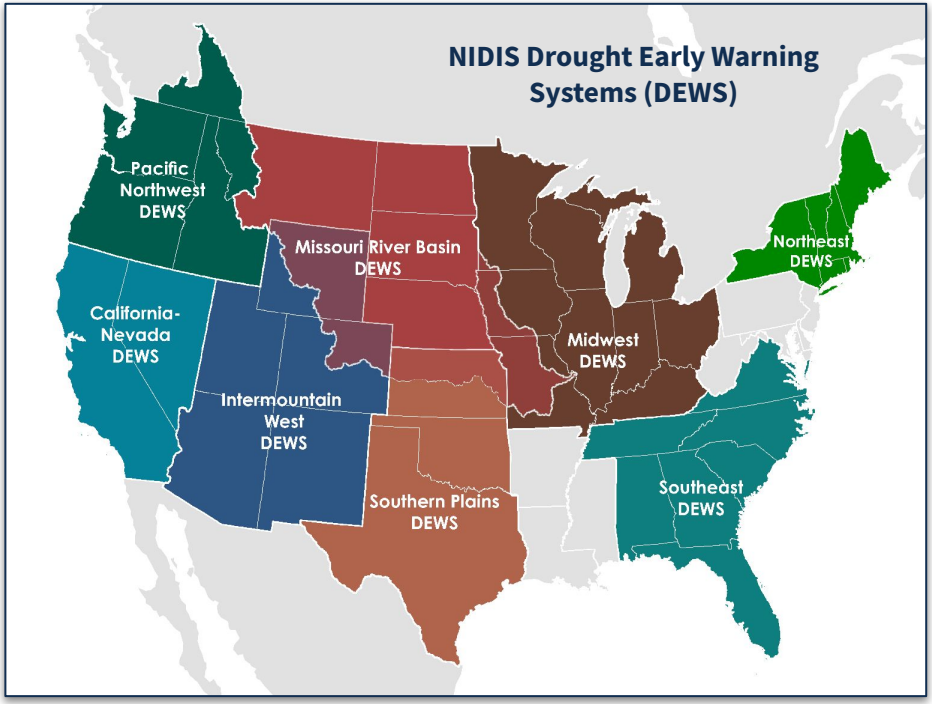
National Integrated Drought Information System (NIDIS)

NIDIS is a multi-agency partnership that coordinates drought monitoring, forecasting, planning, and information at federal, tribal, state, and local levels across the country.

How do we do this work?

- Advancing Regional Drought Early Warning Systems
- Improving drought prediction and forecasting
- Supporting drought planning and preparedness
- Supporting drought impact assessments
- Strengthening collaboration
- Leading the U.S. Drought Portal: www.drought.gov

Enable the Nation to move **from a reactive to a more proactive** approach to managing drought risks and impacts

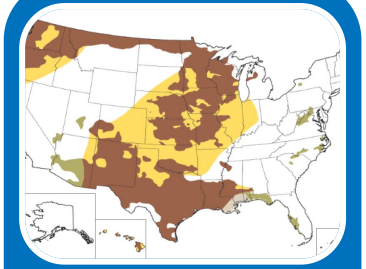


NOAA Capabilities to Serve Drought-Prone Communities

NOAA has a critical role to support our Nation's drought resilience through monitoring, research, and service delivery



World-class Earth system monitoring, modeling, and data repository



Operational drought monitoring and forecasting



Cutting-edge research on drought, water, climate; interagency lead for coordinating drought research



Authoritative sources of information from national to local levels



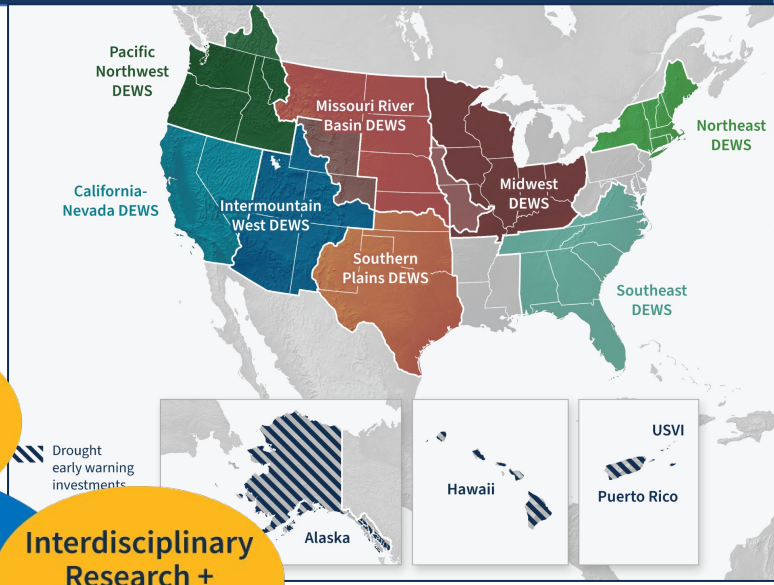
Lead regional drought networks that integrate science into decision making

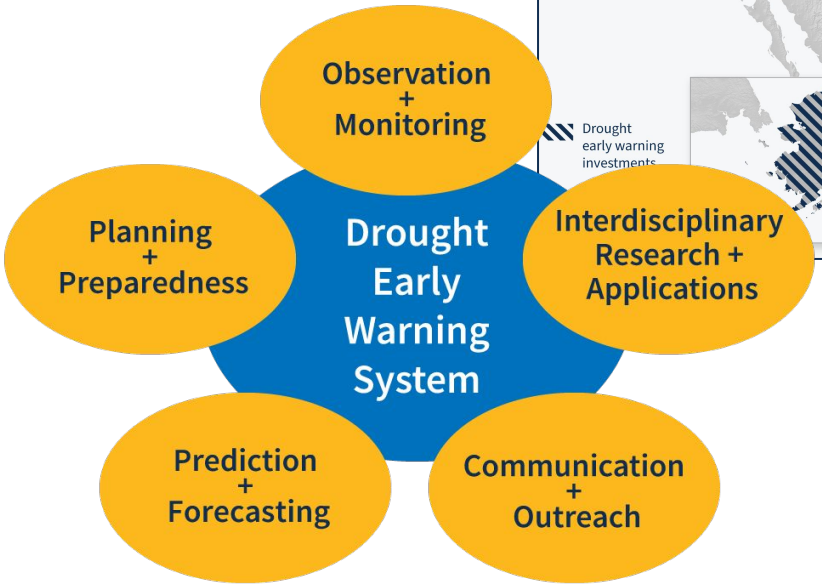
National Centers for Environmental Information

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NIDIS Drought Early Warning Systems

A **Drought Early Warning System** (DEWS) is a network of regional and national partners that share information and coordinate actions to help communities in the region cope with drought.





How can we modernize our approach to drought early warning?

Vision	Drought resilience for the Nation's economic sectors.
Mission	Inform early warning decision-making based on co-developed, sector-specific, and evidence-based drought intelligence.
Process	Deliver monthly sector-specific drought scenarios based on integrated and tailored monitoring and forecasting information.

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How are we adding value to the existing NIDIS Drought Early Warning Systems?

Pilot designed to support discovery of the feasibility, opportunities, and barriers to delivery targeted drought early warning information and determine scalability to other regions

Improve sector-specific preparedness and shift users to a more proactive drought response.

Incorporate and evaluate new information, and improve upon the Outlooks in real time.

User centric, modern approach geared towards helping users make decisions and navigate drought progression and extremes.

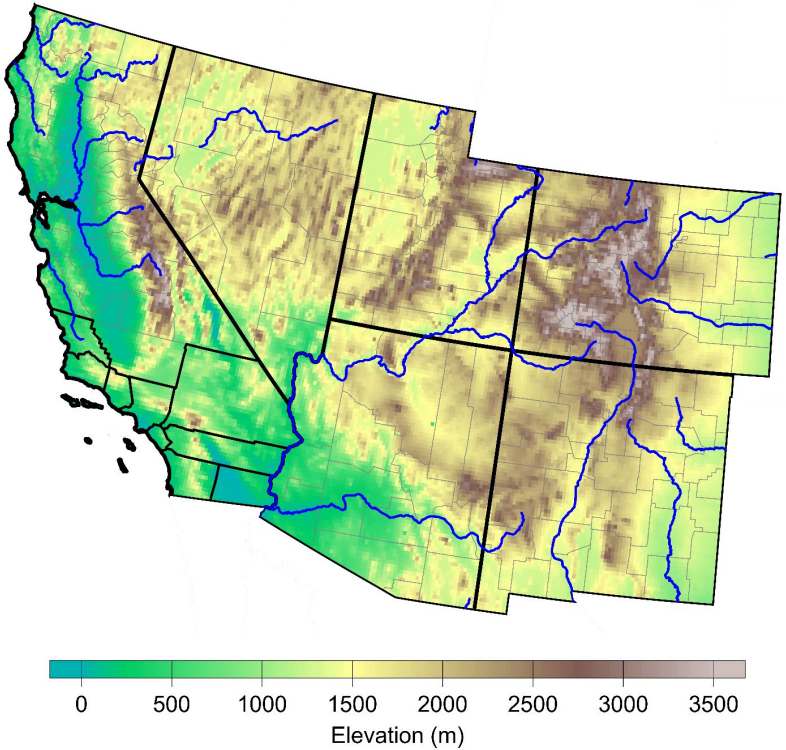
Opportunity to educate users on available data and information through regular communication.

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Modernizing Drought Early Warning Pilot

Agriculture, Water Utilities, and Public Health Sectors in Southern California

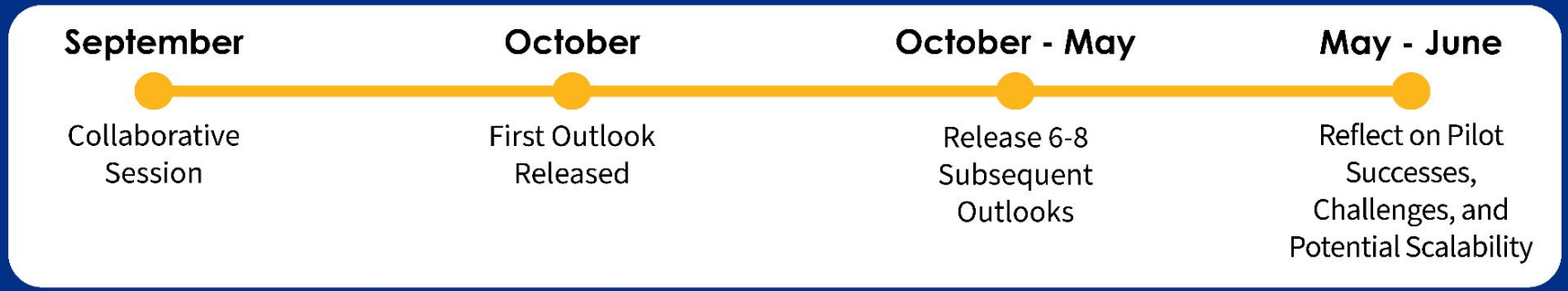


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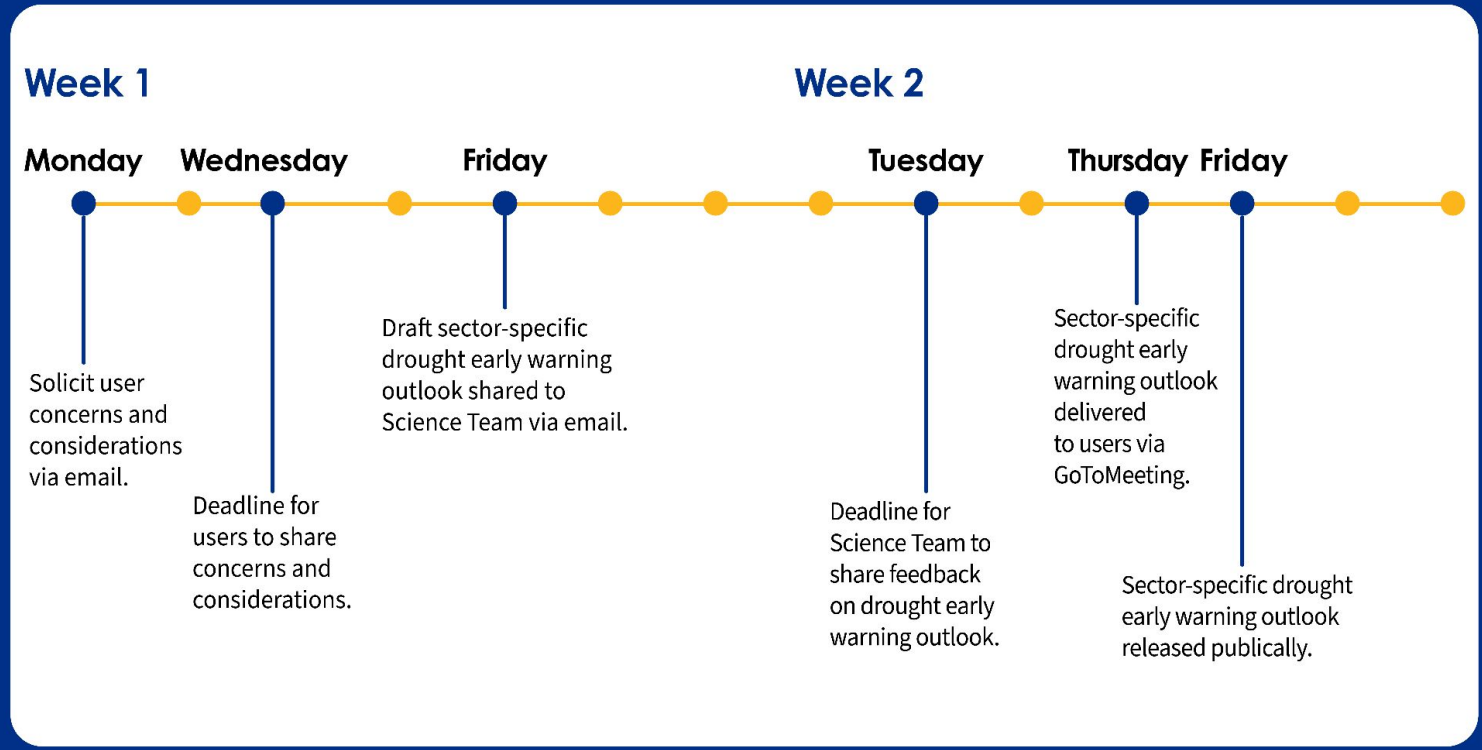
User-Centric Approach

2024 - 2025 Anticipated Pilot Milestones



User-Centric Approach

Decision Support Cycle



Sector-Specific Drought Briefing Outline

1 **Global Perspective**
Remote conditions relevant to southern California sectors

2 **Regional Perspective**
Southwest U.S. conditions relevant to southern California sectors

3 **Sector-Specific Drought Outlook**
Water Utilities, Agriculture, and Public Health

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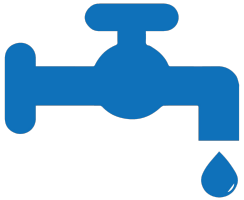
Lines of Evidence for Sector-Specific Scenarios

Observed Conditions	Current state of the region from observations as of outlook virtual meeting date at 10 a.m. PT.
Predictions	Expert interpretation of many types of forecasts to anticipate the future.
End-of-Season Outcomes	Combination of season-to-date observations and similar historical periods to project chances of outcomes.

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Water Utilities Scenario Example

(From December 2024)



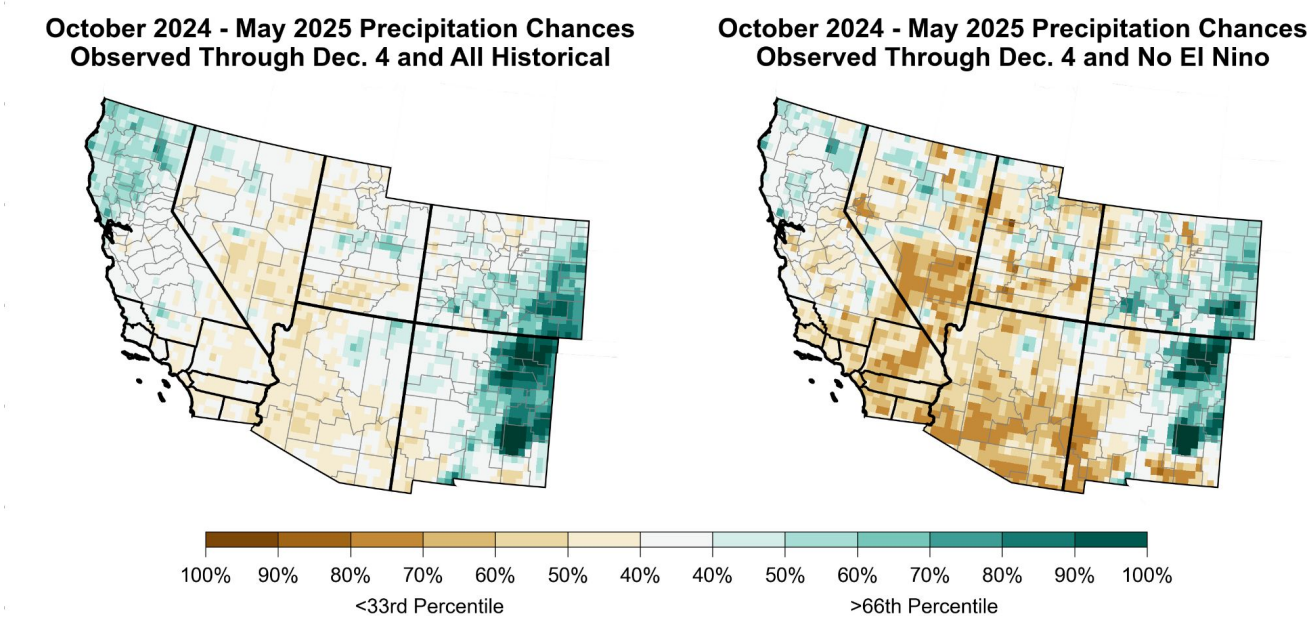
Reservoir storage and groundwater levels are expected to be lower in October 2025 compared to December 2024 (high confidence).

Supporting Evidence:

- Lower reservoir storage due to:
  - Increased chances of below-average precipitation and above-average temperatures in the 2024-2025 wet season, and
  - Below-average snow water equivalent in spring 2025.
- Lower groundwater levels due to:
  - Chances of recharge are low through October 2025 due to forecast below-average precipitation in the 2025 wet season amid continued use.
  - Several areas in southern California are reporting low groundwater.

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Increased Chances of Below-Average Precipitation During October 2024 - May 2025

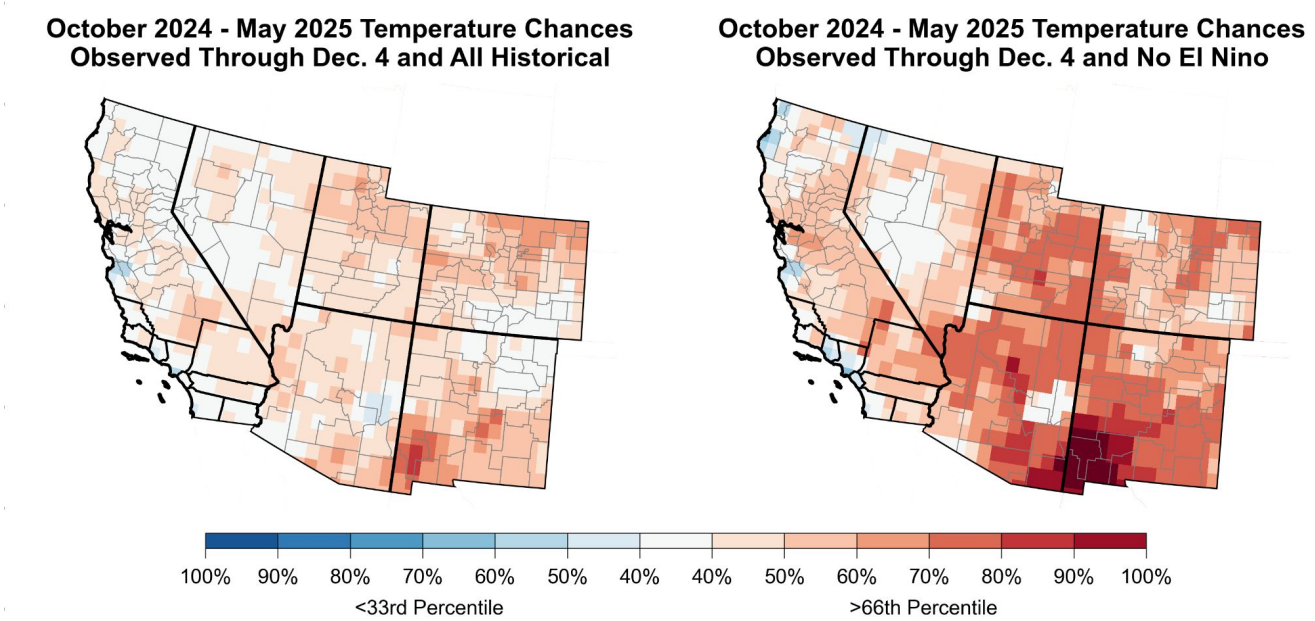


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No El Niño: 2000, 2001, 2005, 2007, 2008, 2010, 2011, 2013, 2014, 2016, 2017, 2020, 2021, 2022

Increased Chances of Above-Average Temperatures During October 2024 - May 2025

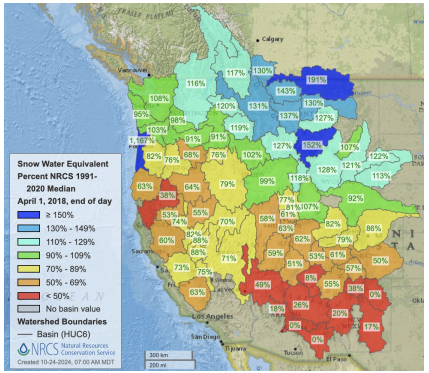


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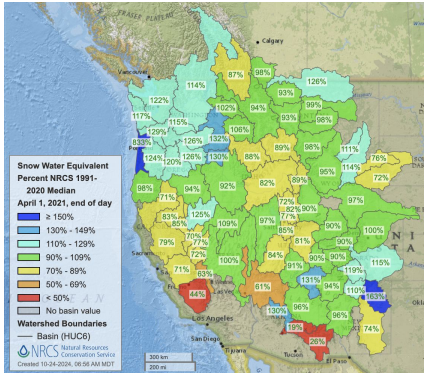
Below-Average Snow Water Equivalent Expected Based on Precipitation and Temperature Forecasts

April 1 Snow Water Equivalent During Last Four La Niña Events

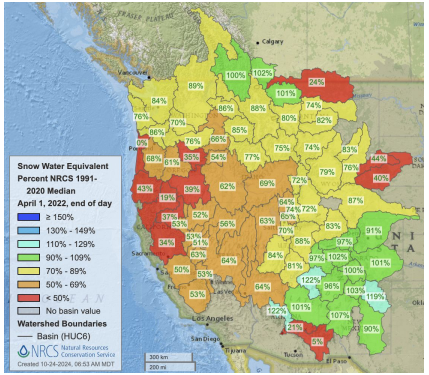
2018



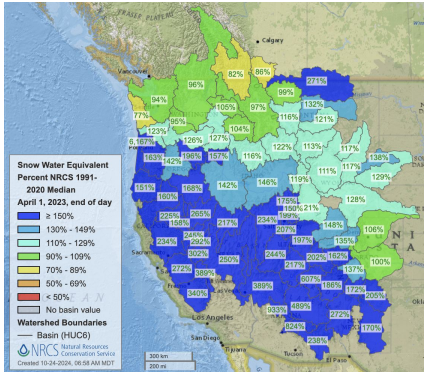
2021



2022



2023

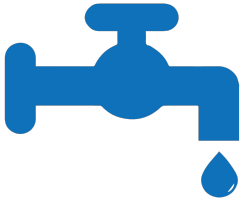


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Public Health Scenario Example

(From December 2024)



Intermittent poor air quality is expected during winter and spring 2025 in southern California due to wildfire smoke and blowing dust (high confidence).

Supporting Evidence:

- In winter and spring 2025, air quality will likely be reduced by smoke from wildland fires burning in the southwest United States.
- In spring 2025, air quality will likely be reduced by airborne particulates due to intermittent strong winds from the north and west blowing over the dry land surface caused by below-average precipitation during the 2024-2025 wet season.

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How are we adding value to the existing NIDIS Drought Early Warning Systems? *Reflections Thus Far*

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Opportunity to educate users on available data and information through regular communication.

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Thank You

For more information, email amanda.sheffield@noaa.gov and andrew.hoell@noaa.gov.

www.drought.gov

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Extra Slides

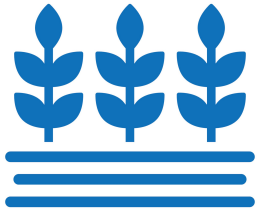
Interpreting Sector-Specific Scenarios

High Confidence	Close agreement among several robust sources of evidence.
Medium Confidence	Modest agreement among several robust sources of evidence.
Low Confidence	Little agreement among several sources of evidence.

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Agriculture Scenario



Crop stress, which may reduce agricultural productivity, is expected through spring 2025 in southern California (high confidence).

Supporting Evidence:

- Below-average precipitation in southern California is most likely due to increases in the number of days with no precipitation.
- Above-average seasonal temperatures are most likely in southern California.
- La Niña, and conditions that resemble it, are related to intermittent cold air outbreaks in the United States that lead to below-freezing temperatures in southern California.