United States Department of Agriculture

Water and Climate Update

March 09, 2023

The Natural Resources Conservation Service produces this weekly report using data and products from the National Water and Climate Center and other agencies. The report focuses on seasonal snowpack, precipitation, temperature, and drought conditions in the U.S.

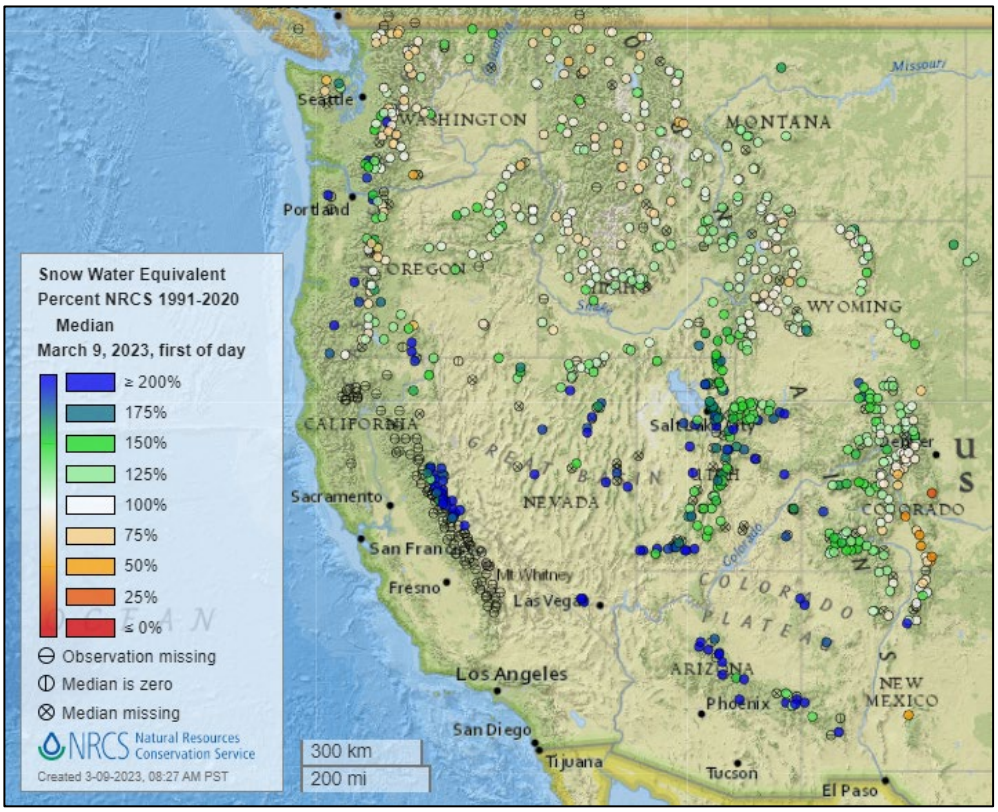
Historic storms bring record California mountain snowpack

NRCS Snow Surveyors Valerie Bullard and Evan Smith sampling Rubicon #1 snow course in CA
Photo by Jeff Anderson, NRCS Snow Survey Nevada

California has seen several major storm events this winter, causing increases in mountain snowpack throughout the region. More than two dozen NRCS SNOTEL sites in California are measuring record or near-record high daily snowpack as of March 9. This recent series of snowstorms has had impacts ranging from impassable roads and highways, stranded residents and motorists, and the closure of some ski areas. The deep snow brings hope for improvement in drought conditions after multiple years of strained water supplies. Californians now brace for warming temperatures, heavy rainfall, and a looming threat of short-term flood risk with another atmospheric river forecasted through March 10.

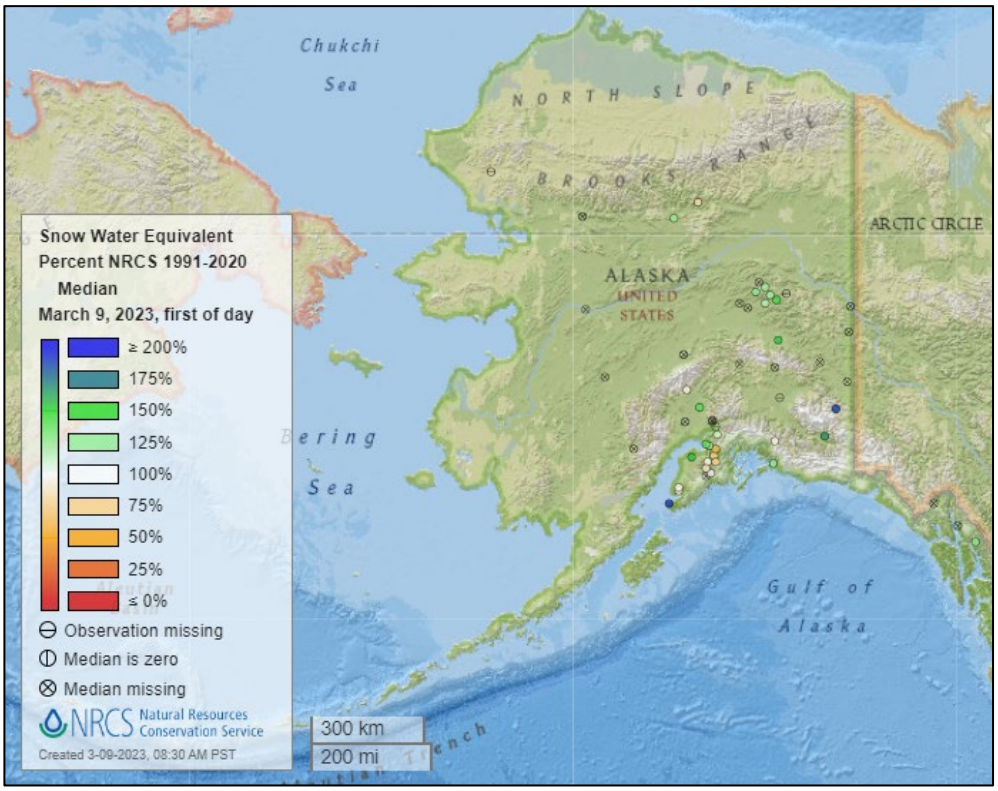
Related:
Residents in Southern California remain trapped by snow as another round of winter weather hits the northern region of the state – CNN
4 CA ski resorts reach 600 inches of snow this season with more on the way – ABC 7 News (CA)
Southern California Residents Trapped by 10 Feet of Snow Could Be Stuck for Another Week. Here's What to Know – Time
California was hit with 12 feet of snow. Is it enough to ease the drought? – Washington Post

Snow



[Snow water equivalent percent of median map]

See also:
[Snow water equivalent values (inches) map]

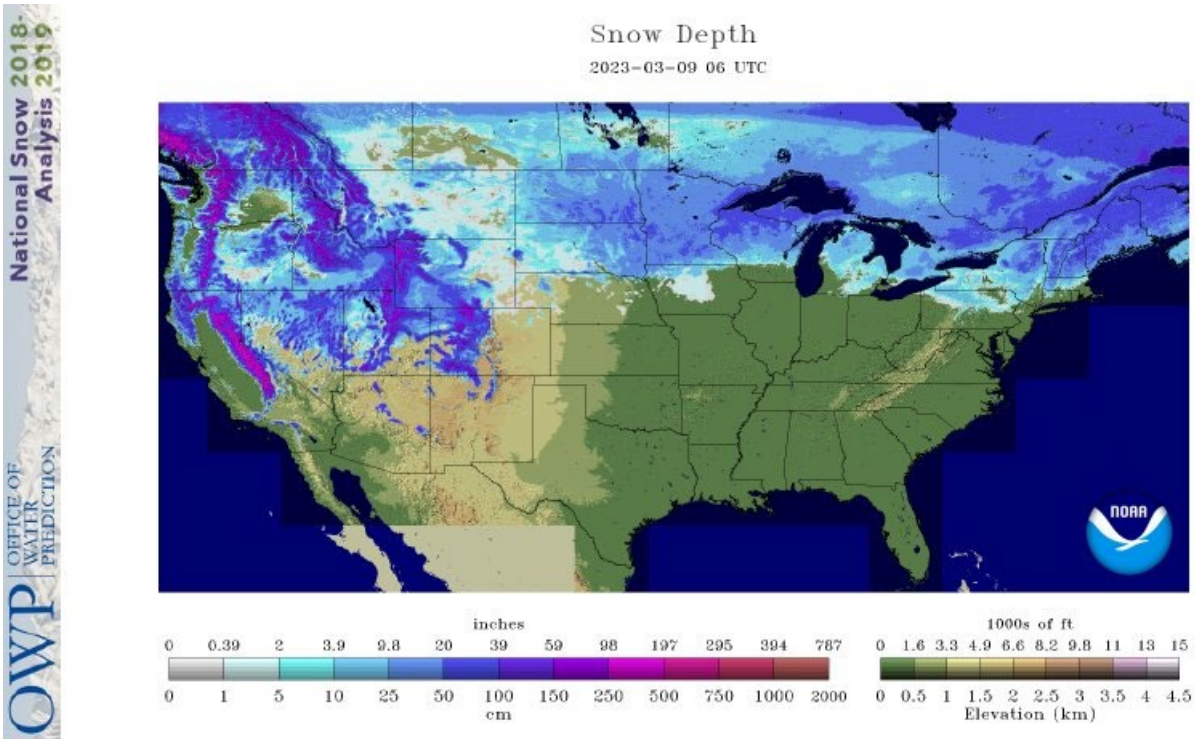


[Alaska snow water equivalent percent of median map]

See also:
[Alaska snow water equivalent values (inches) map]

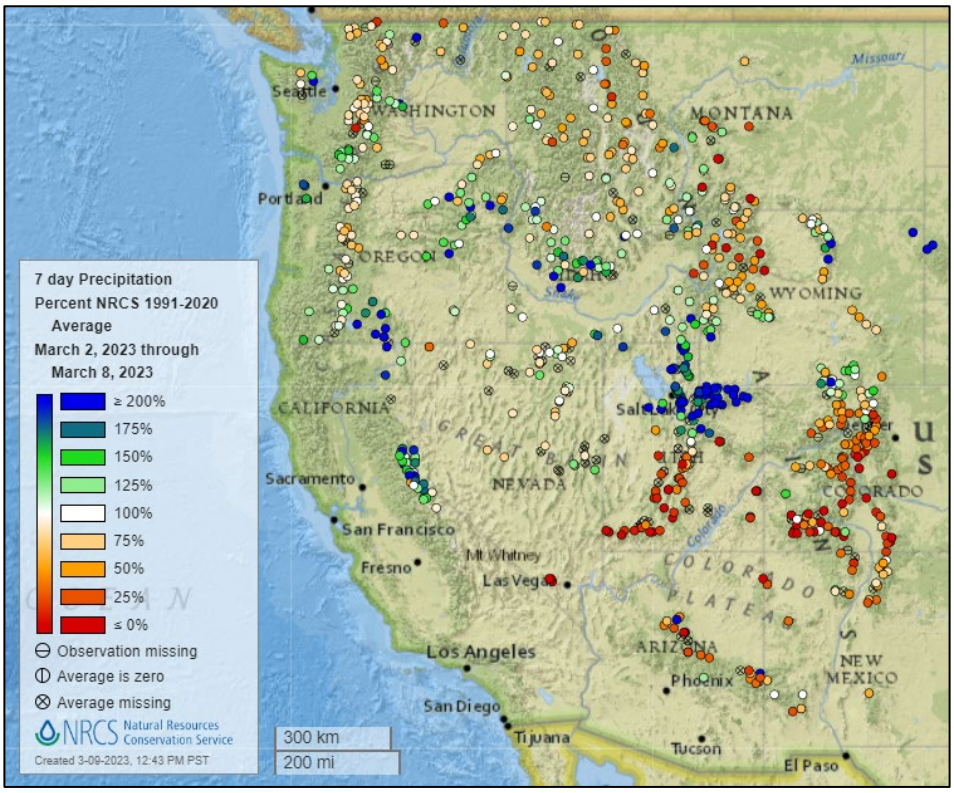
Current Snow Depth, National Weather Service Snow Analysis

Source: NOAA NWS National Operational Hydrologic Remote Sensing Center



Precipitation

Last 7 Days, NRCS SNOTEL Network

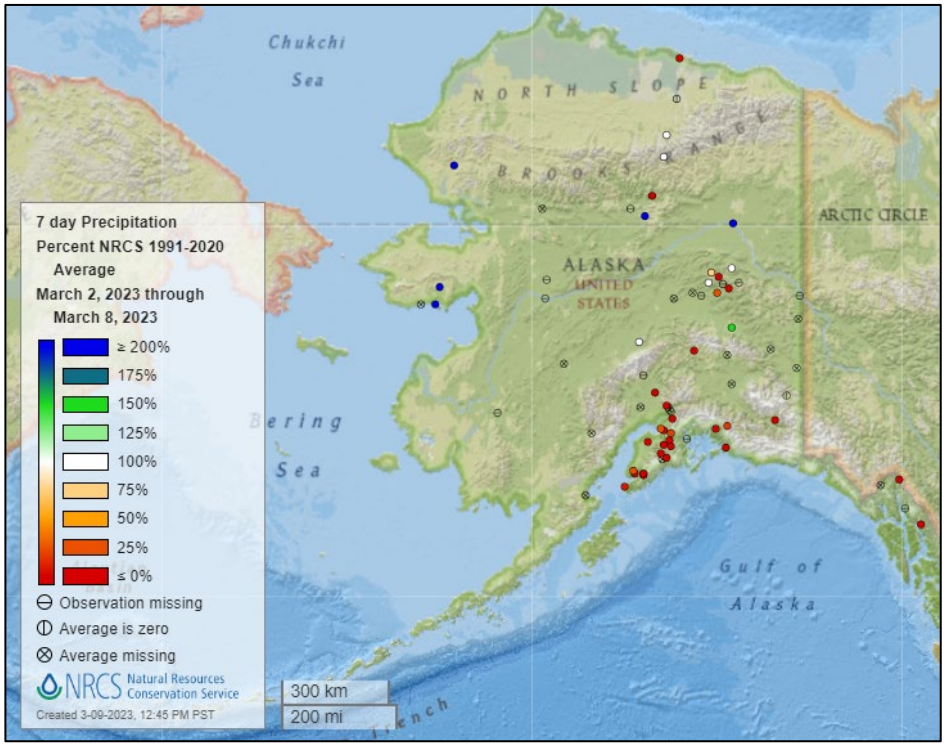


[7-day precipitation percent of average map]

See also:
[7-day total precipitation values (inches) map]

[Alaska 7-day precipitation percent of average map]

See also:
[Alaska 7-day total precipitation values (inches) map]

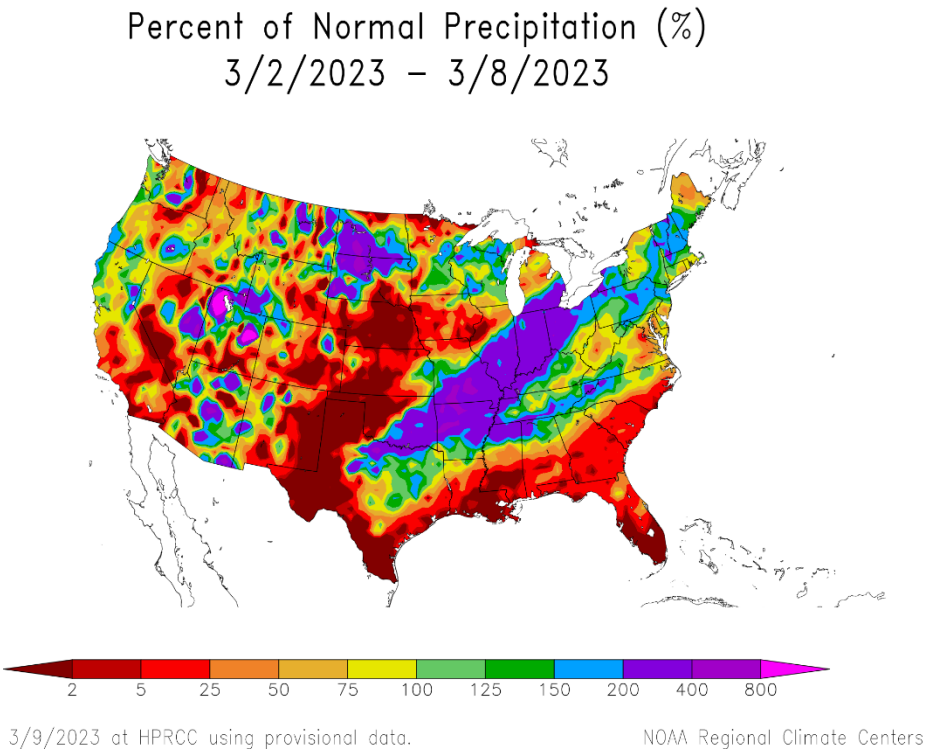


Last 7 Days, National Weather Service (NWS) Networks

Source: Regional Climate Centers

7-day precipitation percent of normal map for the continental U.S.

See also: 7-day total precipitation values (inches) map

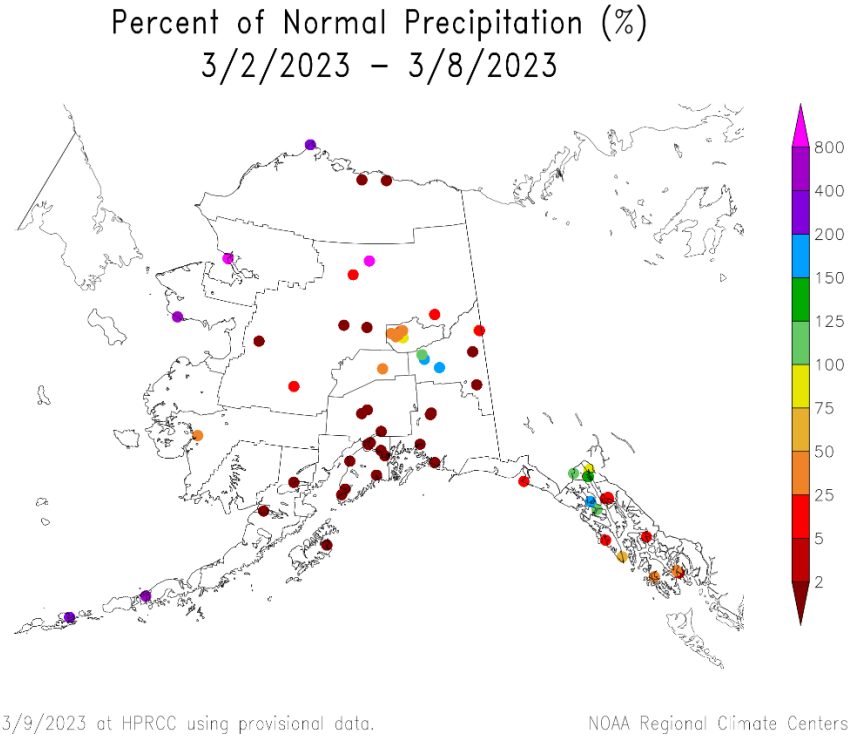


Last 7 Days, National Weather Service (NWS) Networks

Source: Regional Climate Centers

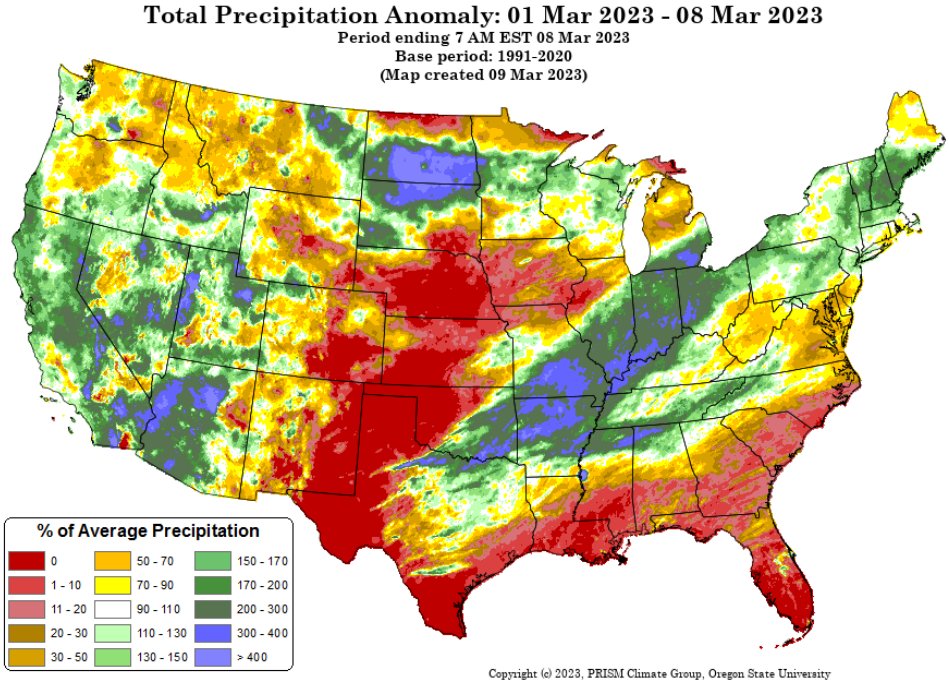
7-day precipitation percent of normal map for Alaska.

See also: 7-day total precipitation values (inches) map



Month-to-Date, All Available Data Including SNOTEL and NWS Networks

Source: PRISM

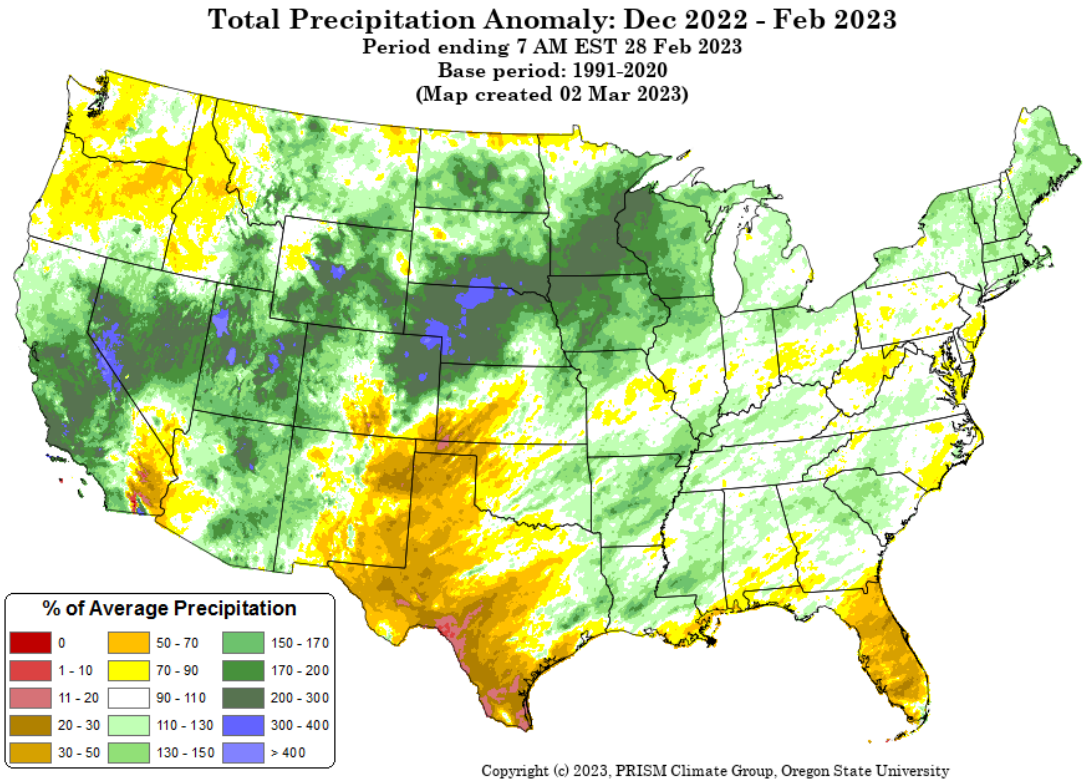


Month-to-date national total precipitation anomaly map

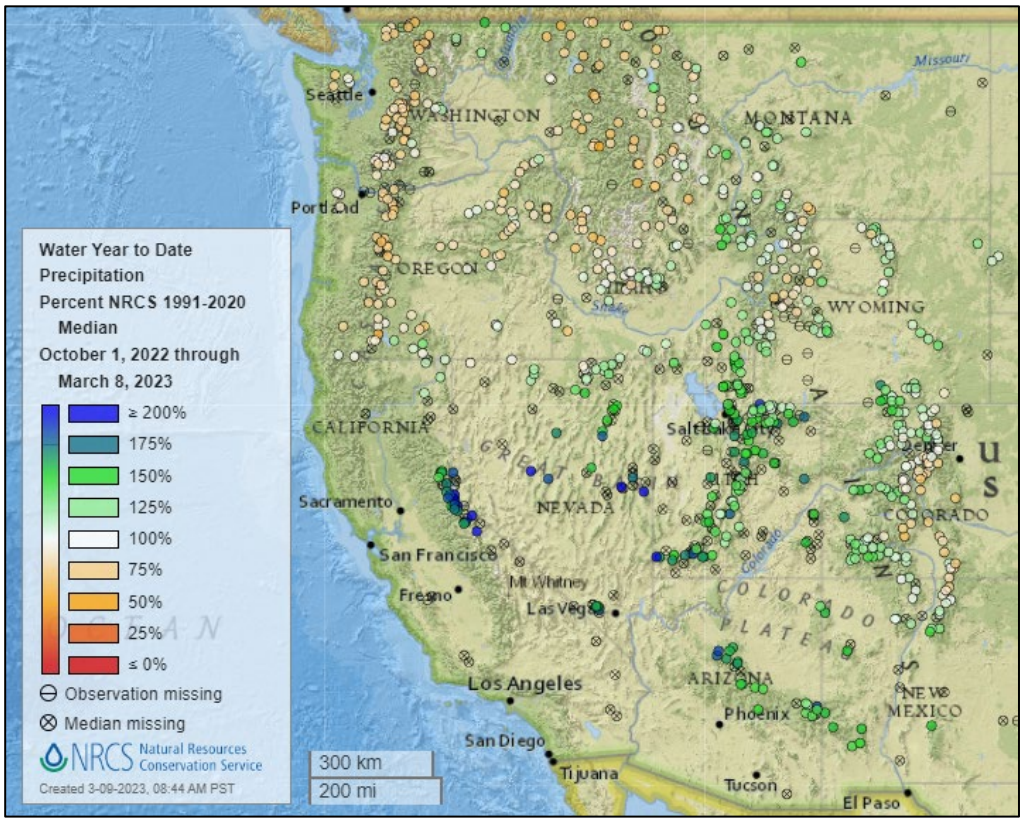
Last 3 Months, All Available Data Including SNOTEL and NWS Networks

Source: PRISM

December 2022 through February 2023 precipitation anomaly map



Water Year-to-Date, NRCS SNOTEL Network

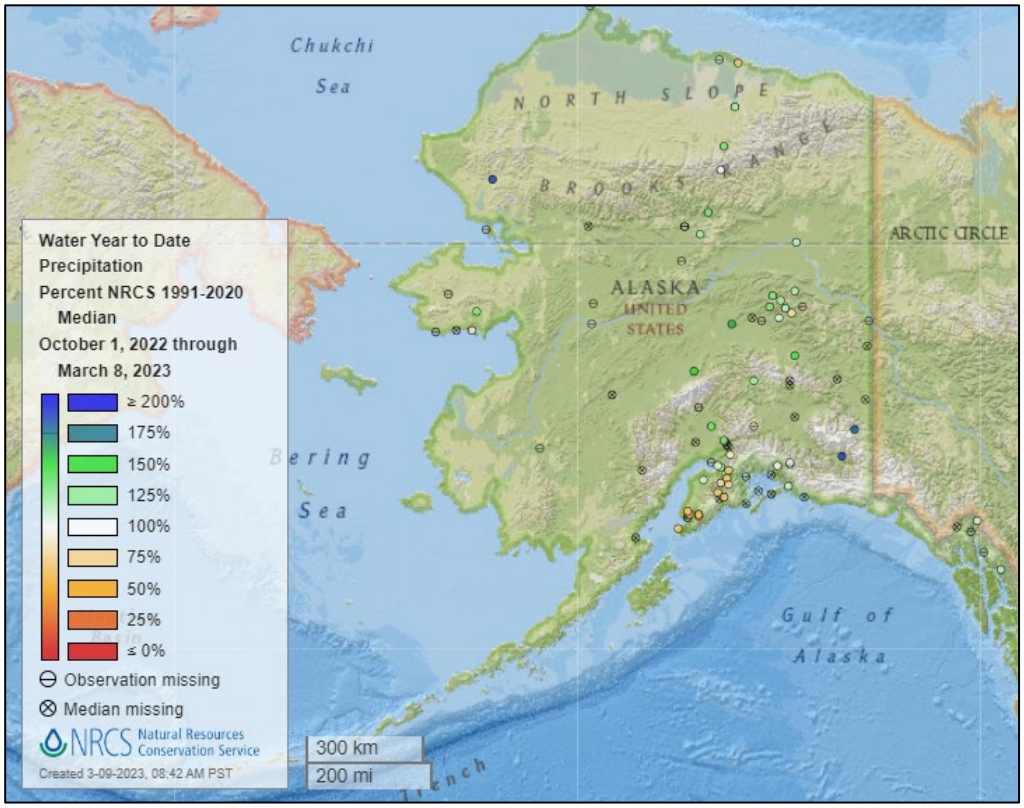


[2023 water year-to-date precipitation percent of median map]

See also:

[2023 water year-to-date precipitation percent of average map]

[2023 water year-to-date precipitation values (inches) map]



[Alaska 2023 water year-to-date precipitation percent of median map]

See also:

[Alaska 2023 water year-to-date precipitation percent of average map]

[Alaska 2023 water year-to-date precipitation values (inches) map]

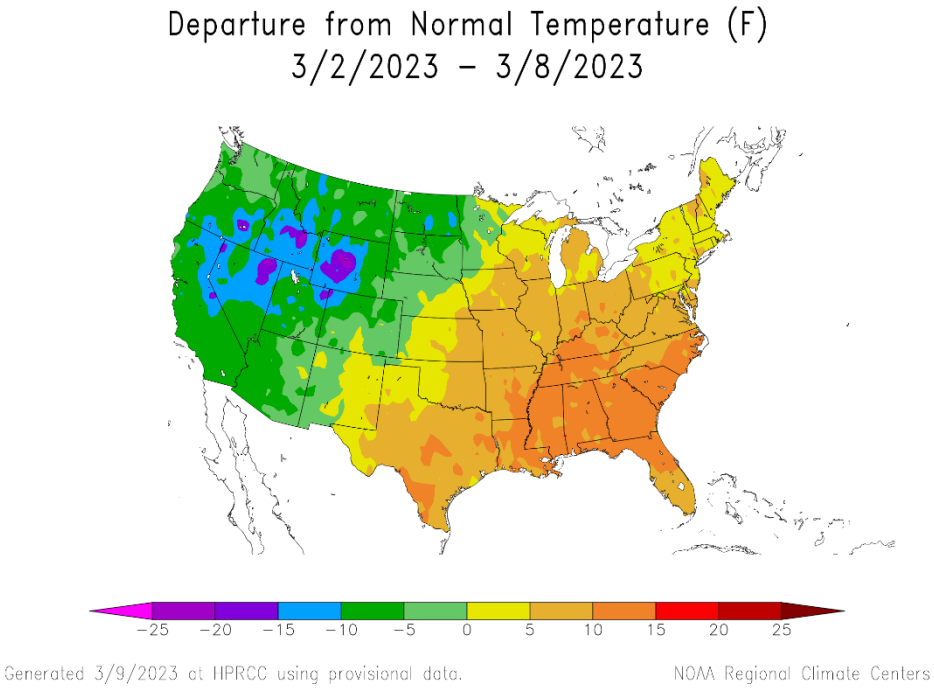
Temperature

Last 7 Days, National Weather Service (NWS) Networks

Source: Regional Climate Centers

7-day temperature anomaly map for the contiguous U.S.

See also: 7-day temperature (° F) map

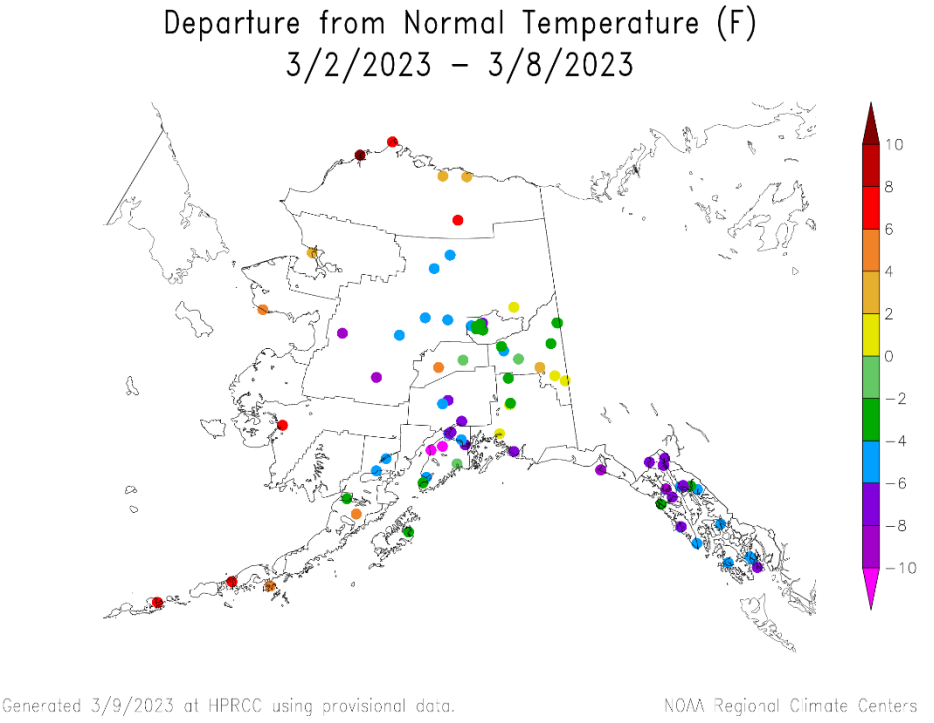


Last 7 Days, National Weather Service (NWS) Networks

Source: Regional Climate Centers

7-day temperature anomaly map for Alaska.

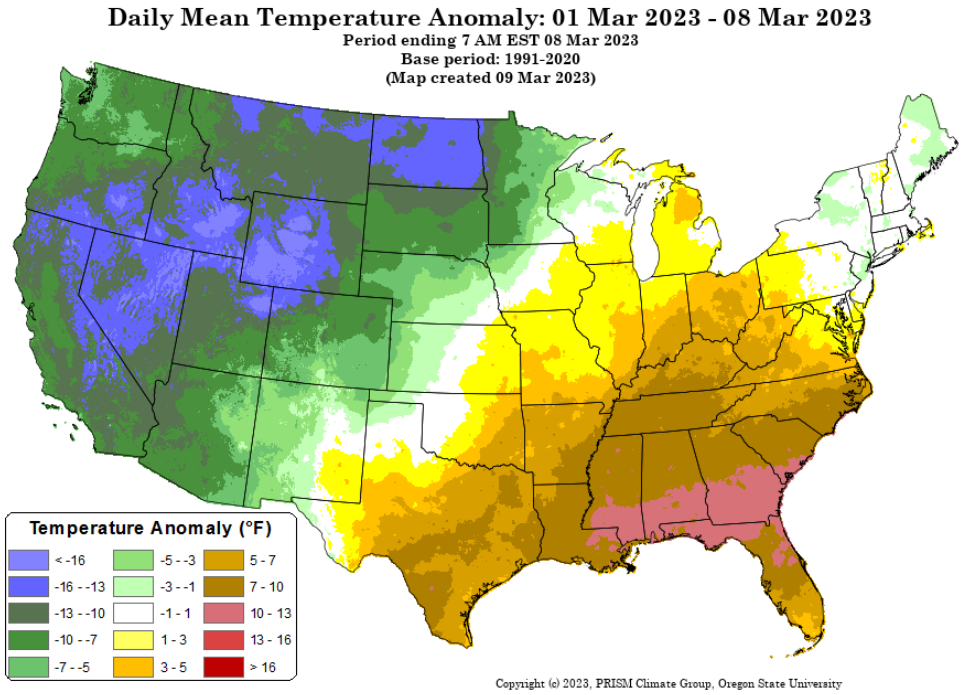
See also: 7-day temperature (° F) map



Month-to-Date, All Available Data Including SNOTEL and NWS Networks

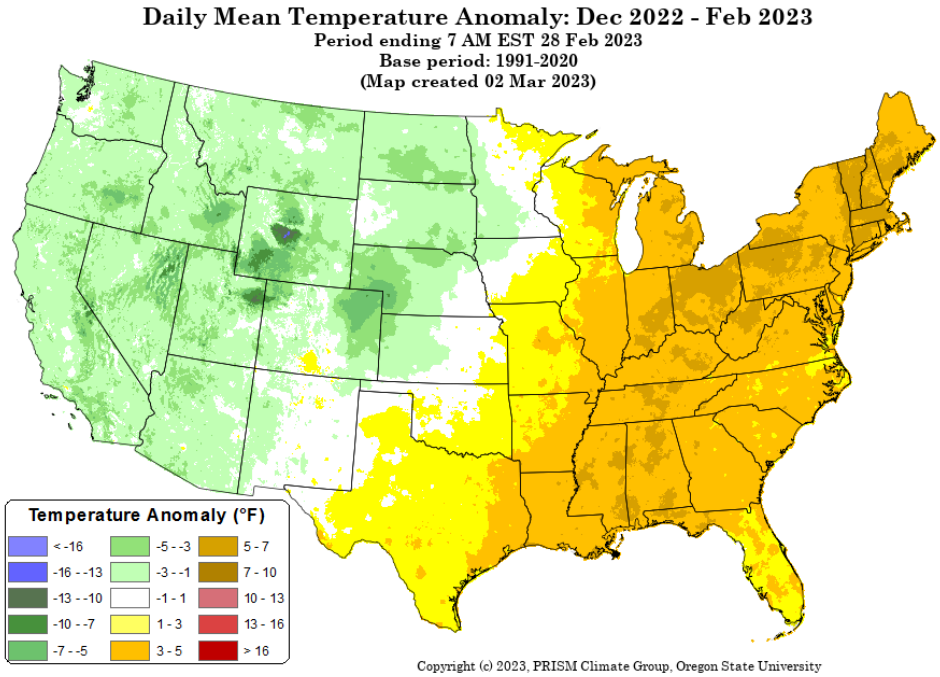
Source: PRISM

[Month-to-date national daily mean temperature anomaly map]



Last 3 Months, All Available Data Including SNOTEL and NWS Networks

Source: PRISM

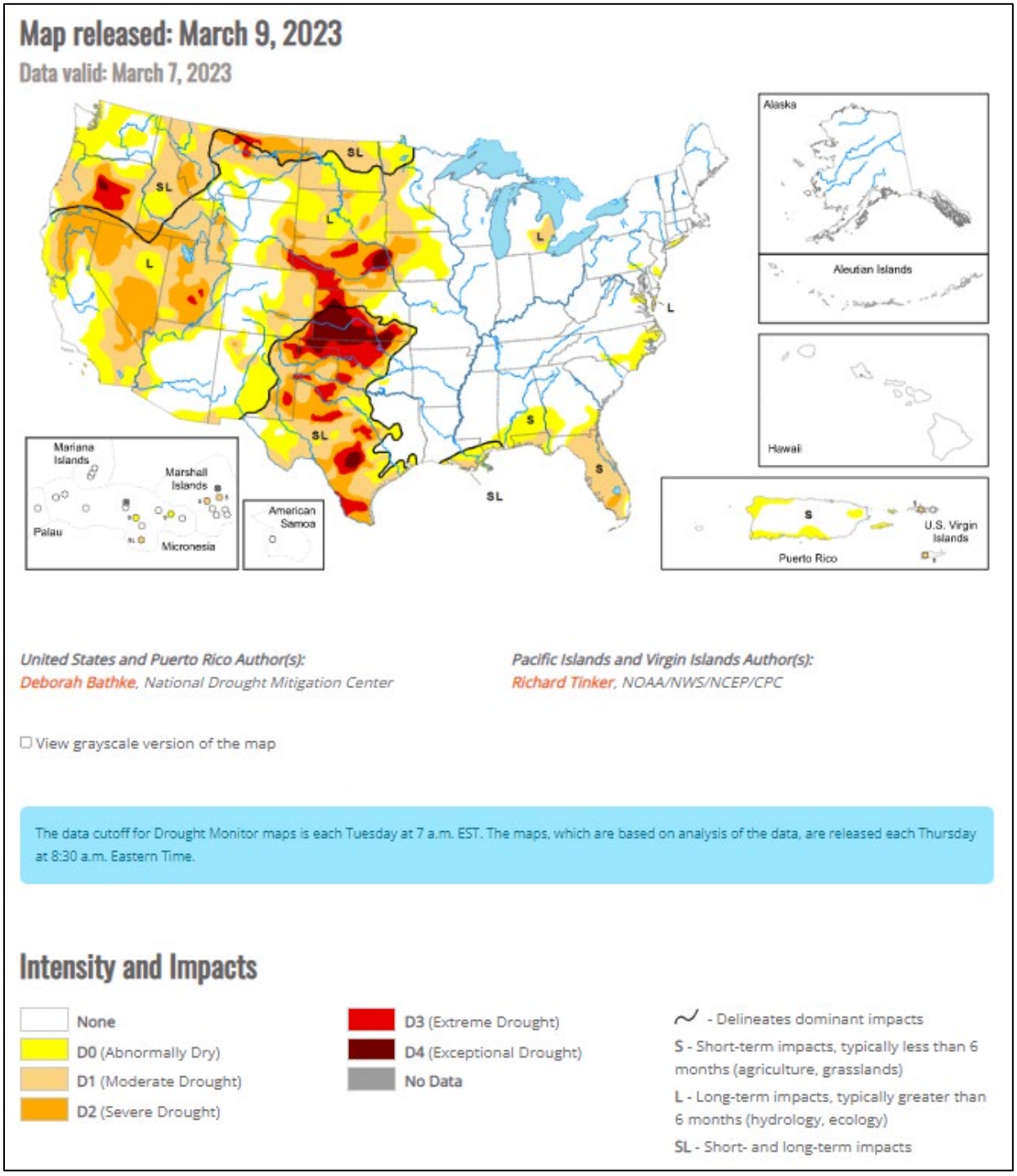


[December 2022 through February 2023 daily mean temperature anomaly map]

Drought

U.S. Drought Monitor
Source: National Drought Mitigation Center

U.S. Drought Portal
Source: NOAA



Current National Drought Summary, March 07, 2023

Source: National Drought Mitigation Center

“A series of severe weather events moved across the South and Southeast this week, bringing damaging winds, tornados and heavy rainfall. As these storms moved through the Midwest, many locations experienced record daily rainfall. This same storm brought snow to the upper Great Lakes and parts of the Northeast. Precipitation was scarce across other areas of the country, including parts of the West, the High Plains and Deep South. Drought and dryness expanded in parts of the Pacific Northwest, southern Texas and the Gulf and Atlantic coasts. Drought improvements were seen across the West from prior weeks’ precipitation events. In addition, parts of the southern Plains, Great Lakes and mid-Northeast regions also saw improvements.”

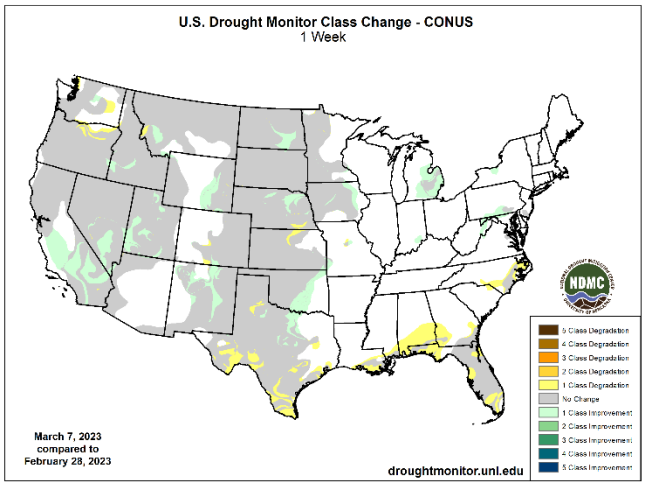
National Drought Summary – West

“This week, additional rounds of rain and snow added to the ample precipitation received across the West since December 2022. Continued analysis of the effects of the season’s moisture resulted in continued improvements to long-term drought conditions in many parts in the West. California saw improvements to severe (D2) and moderate (D1) drought, as well as abnormal dryness (D0) along the central coast and in the San Joaquin Valley and southern California. National Weather Service offices in the area report extremely wet conditions. Water-year-to-date (WYTD) precipitation is 150% of normal or higher, and nearly every indicator shows improvement with all but the longest timescales (24-to-36-month precipitation) showing above-normal conditions. Similarly, the season’s precipitation chipped away at long-term drought areas in southern Nevada (D2 and D3), parts of Utah (D2 and D3) and western New Mexico (D1, D2 and D3). Precipitation deficits, soil moisture and streamflow show recovery. Groundwater levels and reservoir storage, which takes longer to recover, however, remain low. Precipitation in the Pacific Northwest helped improve severe drought (D1) in western Idaho and abnormal dryness (D0) in southwest Montana. Precipitation indicators in these areas are wet out to 12 months. In the rest of the Northwest, recent precipitation wasn’t enough to warrant improvement. Moderate drought (D1) expanded in north central and northeast Oregon where WYTD precipitation, streamflow and soil moisture is low. The Oregon state climatologist notes that “This water year has been surprisingly dry across the state despite the near-normal snowpack. Approximately 70% of the state only has 75% of normal WYTD precipitation, and about 25% is below 50% of average.” In Montana, severe drought (D2) expanded in response to low snow accumulations and its effect on streamflow and soil moisture.”

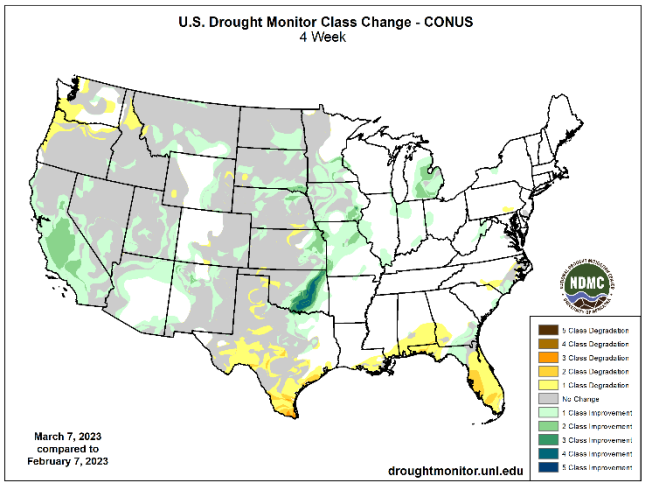
Changes in Drought Monitor Categories over Time

Source: National Drought Mitigation Center

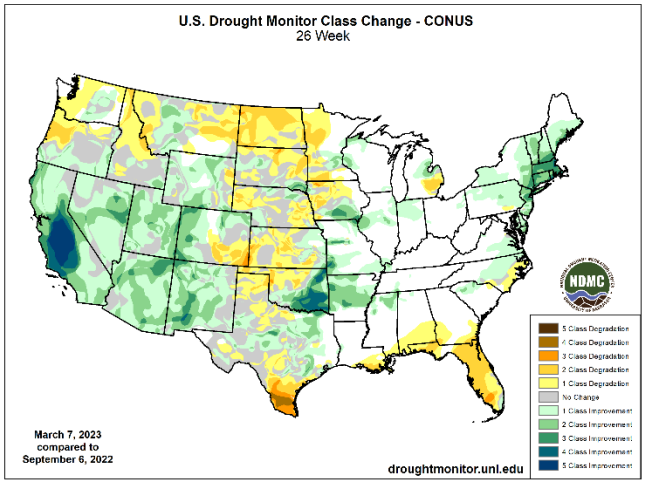
1 Week



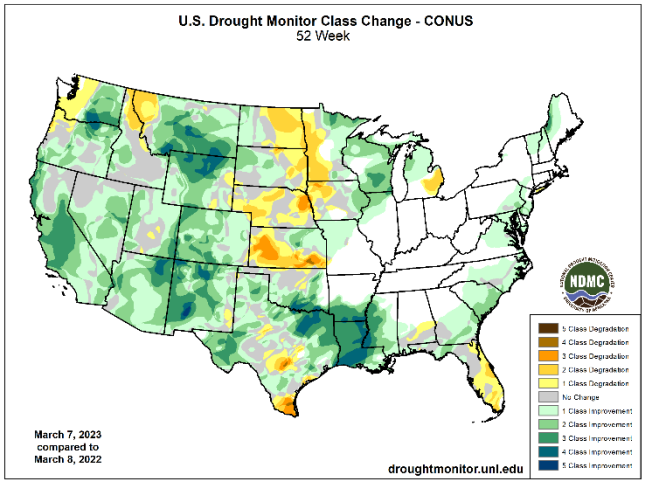
1 Month



6 Months



1 Year



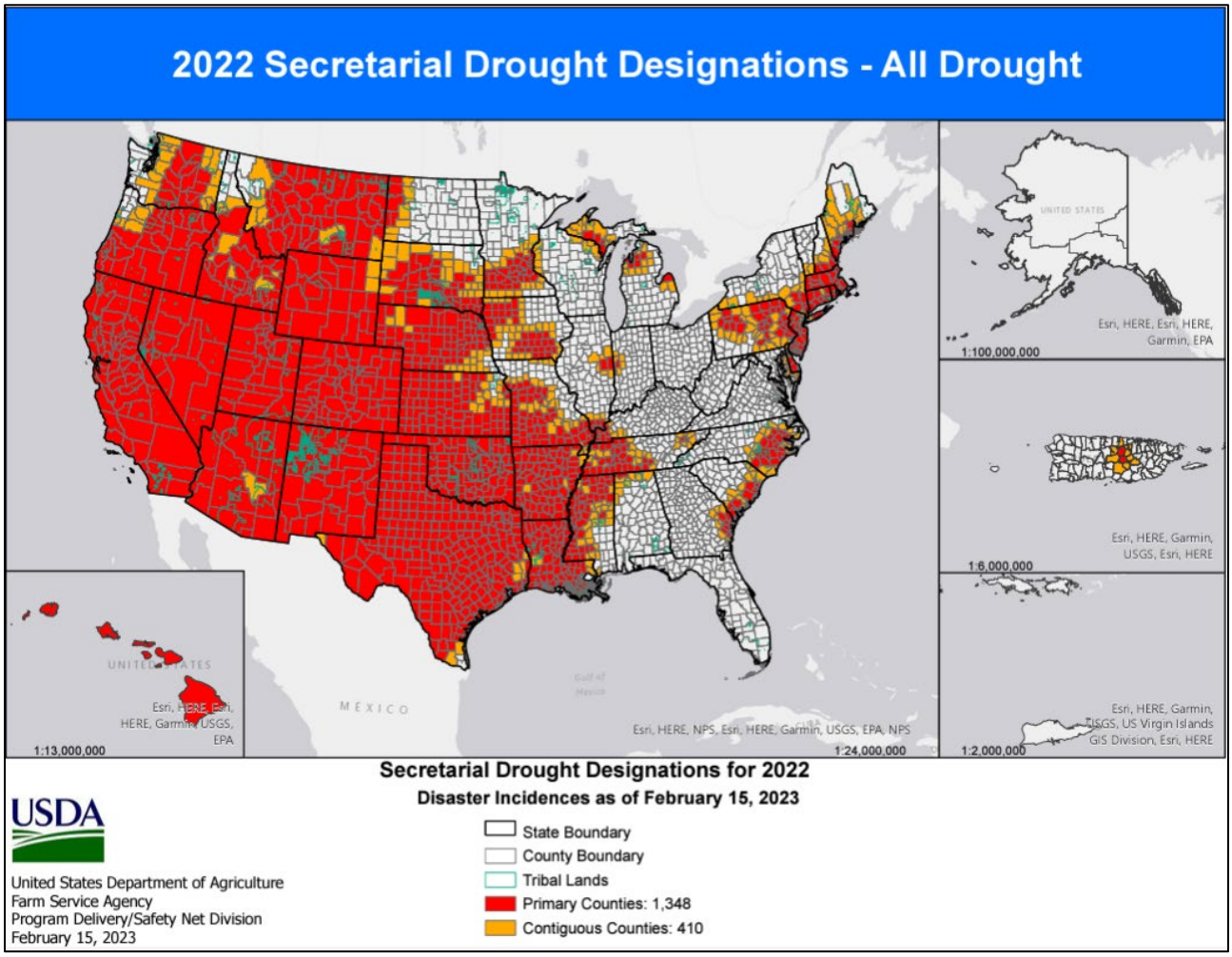
Changes in drought conditions over the last 12 months for the contiguous U.S.

Highlighted Drought Resources

- Drought Impact Reporter
- Quarterly Regional Climate Impacts and Outlook
- U.S. Drought Portal Indicators and Monitoring
- U.S. Population in Drought, Weekly Comparison
- USDA Disaster and Drought Information

USDA Secretarial Drought Designations

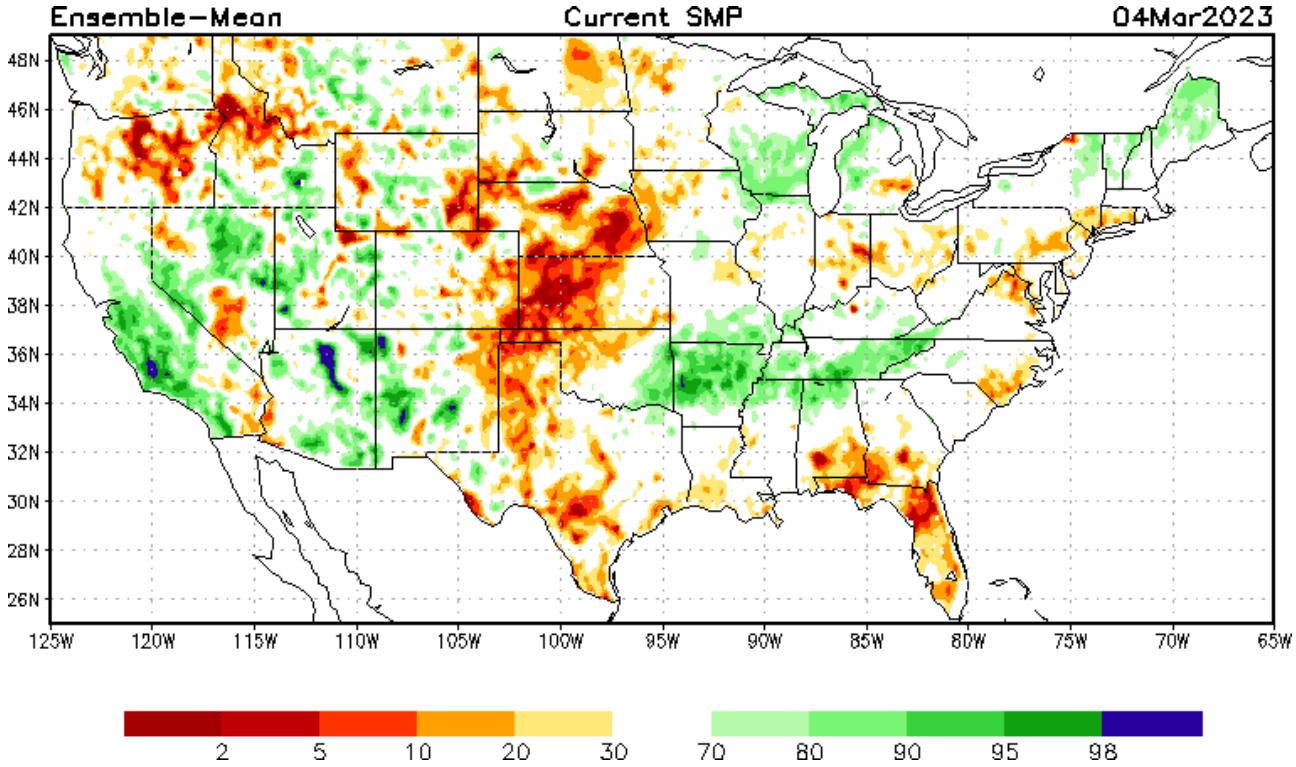
Source: USDA Farm Service Agency



Other Climatic and Water Supply Indicators

Soil Moisture

Source: NOAA National Centers for Environmental Prediction

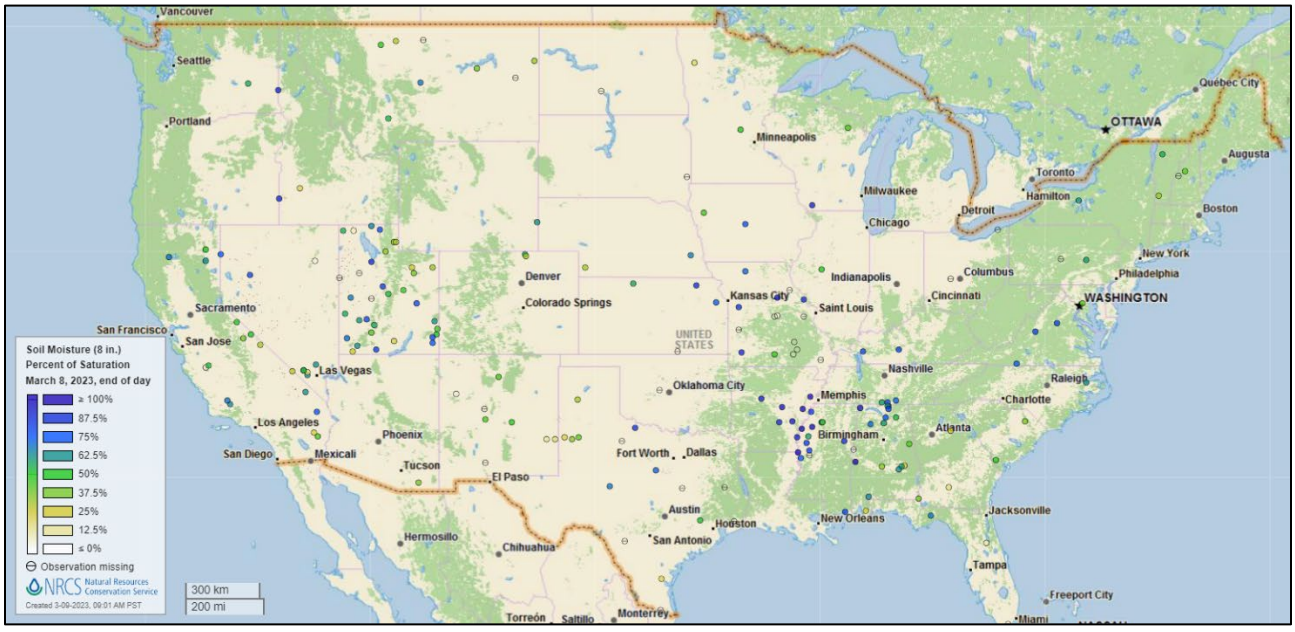


Modeled soil moisture percentiles as of March 04, 2023

Soil Moisture Percent of Saturation

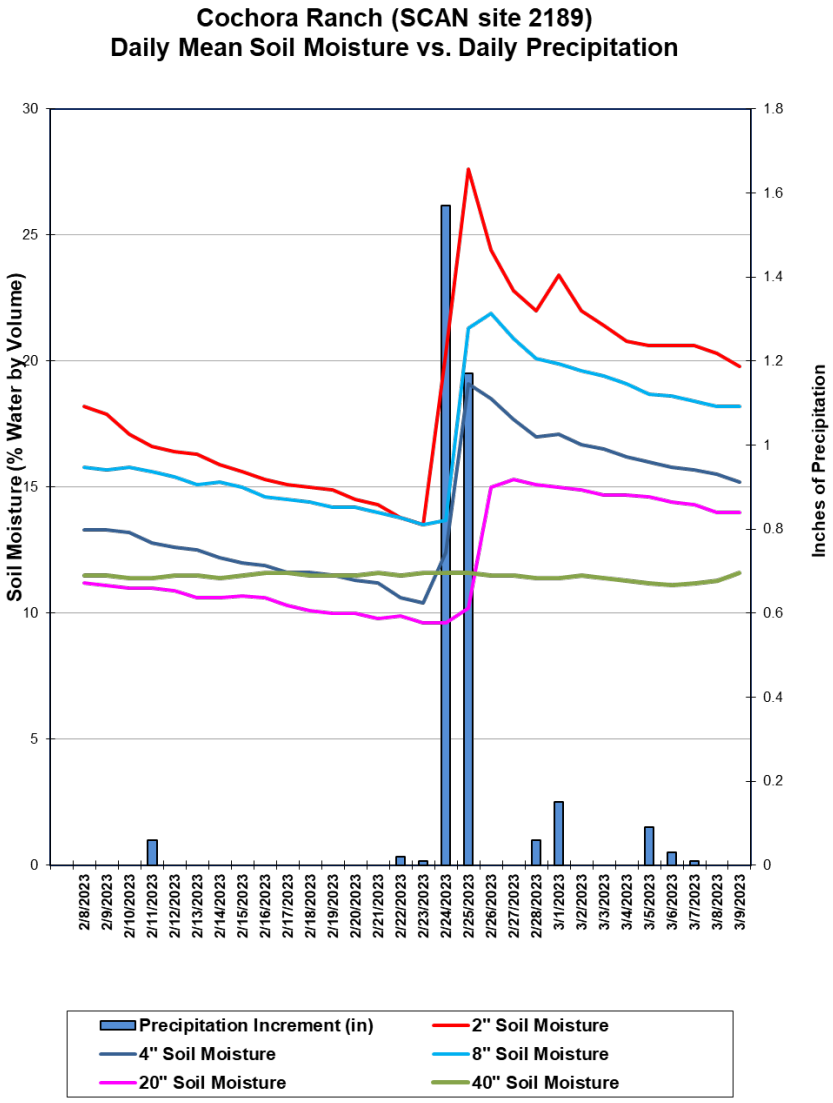
Source: NRCS SNOTEL and Soil Climate Analysis Network (SCAN)

U.S. soil moisture map at 8-inch depth:



Soil Moisture

Source: NRCS Soil Climate Analysis Network (SCAN)



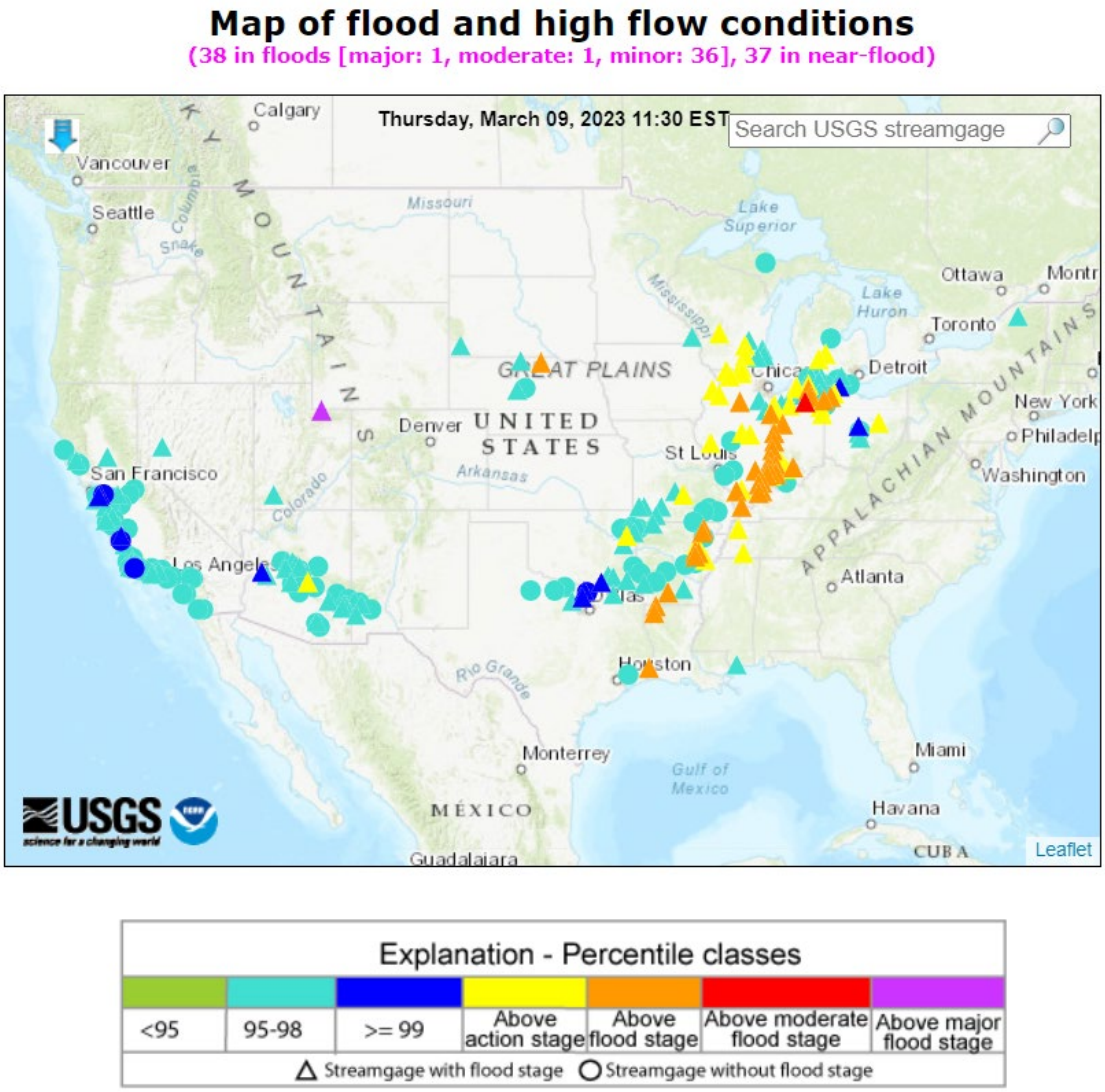
This chart shows the precipitation and soil moisture for the last 30 days at the Cochora Ranch SCAN site in California. Storm activity on February 24-25 brought 2.74 inches of precipitation to the station with the -2, -4, -8 and 20-inch soil sensors reporting an increase in soil moisture during the events. Total precipitation for the 30-day period was 3.17 inches.

Soil Moisture Data Portals

- USCRN Soil Moisture
- National Soil Moisture Network
- NOAA Climate Prediction Center Soil Moisture
- NASA Grace

Streamflow, Drought, Flood, and Runoff

Source: U.S. Geological Survey [WaterWatch Streamflow Map]



Explanation - Percentile classes						
<95	95-98	>= 99	Above action stage	Above flood stage	Above moderate flood stage	Above major flood stage
△ Streamgage with flood stage ○ Streamgage without flood stage						

[WaterWatch: Streamflow, drought, flood, and runoff conditions]

Reservoir Storage

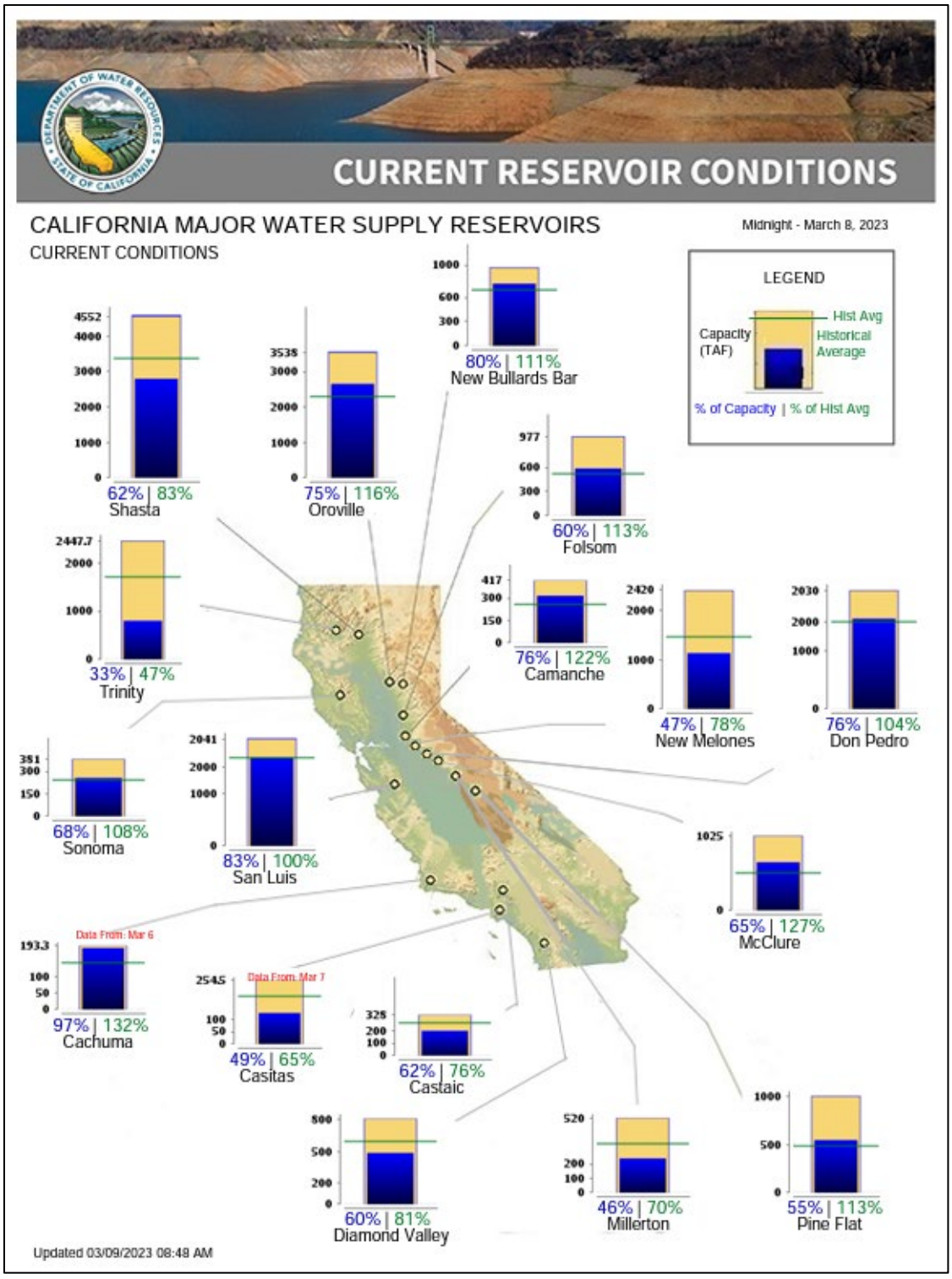
Hydromet Teacup Reservoir Depictions

Source: U.S. Bureau of Reclamation

- [Upper Colorado]
- [Pacific Northwest/Snake/Columbia]
- [Sevier River Water, Utah]
- [Upper Missouri, Kansas, Oklahoma, Texas]

Current California Reservoir Conditions

Source: California Department of Water Resources



Current California Reservoir Conditions

Agricultural Weather Highlights

Author: Brad Rippey, Agricultural Meteorologist, USDA/OCE/WAOB

National Outlook, Thursday March 09, 2023: "A storm system traversing the Midwestern and mid-Atlantic States will produce widespread snow in the northern Corn Belt, starting today and ending tonight or early Friday. Farther south, thundershowers in the mid-South will shift eastward toward the Atlantic Coast. Meanwhile, a powerful storm near the northern Pacific Coast will drift inland over the next couple of days, with heavy precipitation falling across northern and central California. A brief surge of warmth accompanying the Western storm will melt some lower- and middle-elevation snow in the Sierra Nevada, contributing to runoff that may lead to flooding in parts of California's Central Valley, especially south of Sacramento. During the weekend, rain and snow showers will linger across the northern two-thirds of the western U.S., while an organized area of snow will spread across the North. Late in the weekend and early next week, showers and thunderstorms will return across the South, although southern sections of Texas and Florida should remain mostly dry. The NWS 6- to 10-day outlook for March 14 – 18 calls for the likelihood of near- or below-normal temperatures nationwide, except for warmer-than-normal weather across southern sections of the Rockies and Plains. Meanwhile, near- or below-normal precipitation from the middle and upper Mississippi Valley to the middle and northern Atlantic States should contrast with wetter-than-normal conditions in the South and from the Pacific Coast to the Plains."

Weather Hazards Outlook: March 11 – 15, 2023

Source: NOAA Weather Prediction Center

U.S. Day 3-7 Hazards Outlook

About the Hazards Outlook

Created March 08, 2023

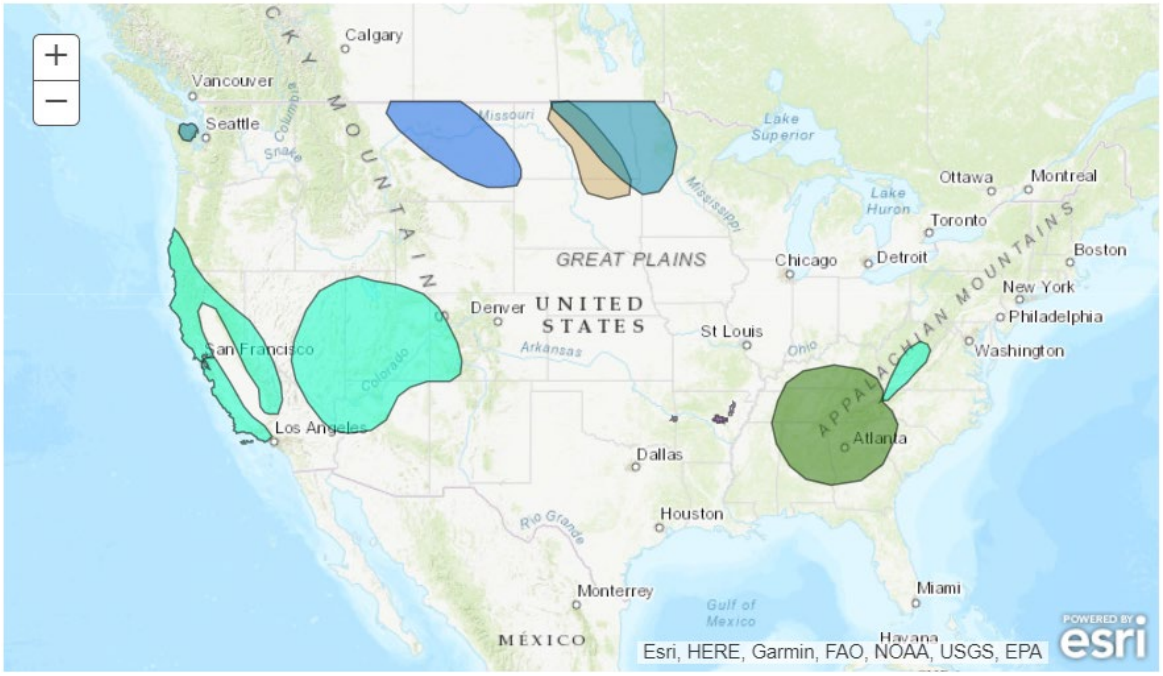
NOTE: These products are only created Monday through Friday. Please exercise caution using this outlook during the weekend.

Precipitation	☑
Temperature	☑
Soils	☐

Valid March 11, 2023 - March 15, 2023

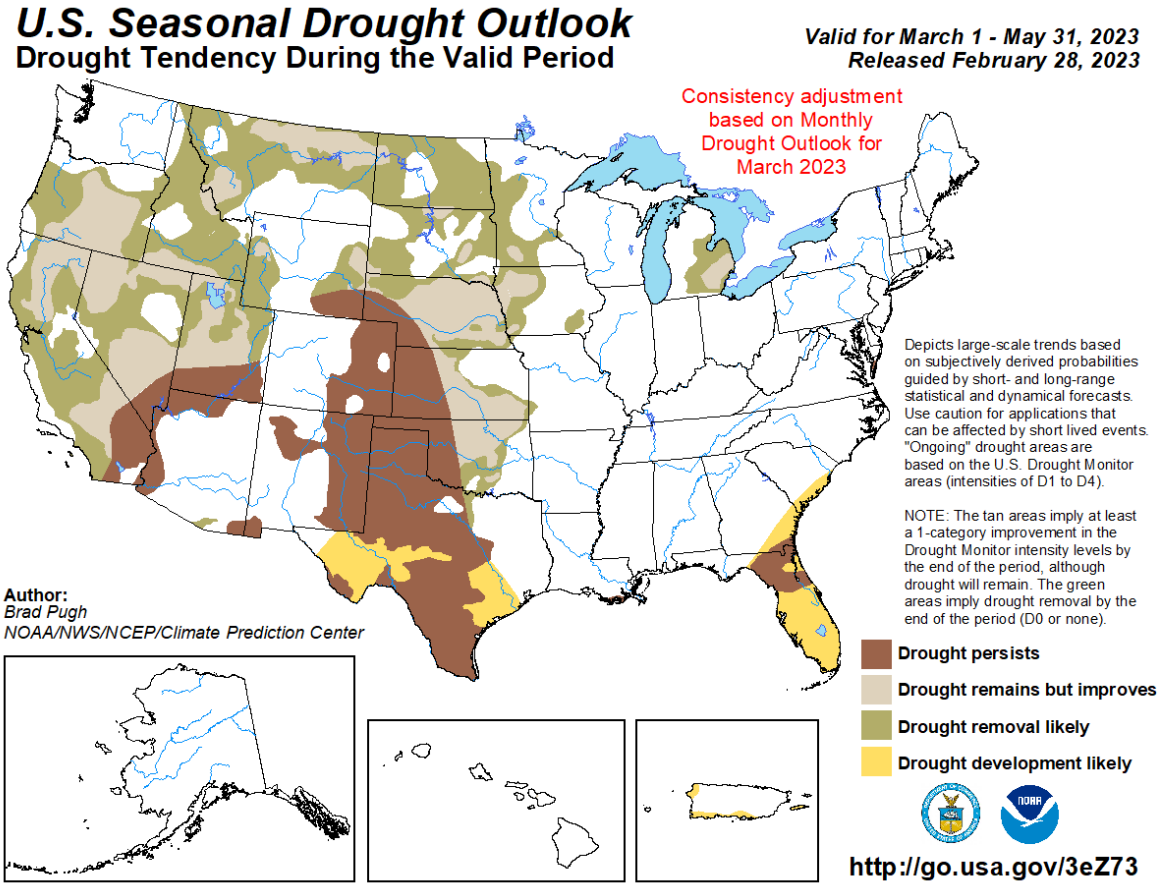
Legend

- Flooding Likely
- Flooding Occurring or Imminent
- Flooding Possible
- Freezing Rain
- Heavy Ice
- Heavy Precipitation
- Heavy Rain
- Heavy Snow
- Severe Weather
- Excessive Heat
- High Winds
- Much Above Normal Temperatures
- Much Below Normal Temperatures
- Significant Waves
- Enhanced Wildfire Risk
- Severe Drought



Seasonal Drought Outlook: March 01 – May 31, 2023

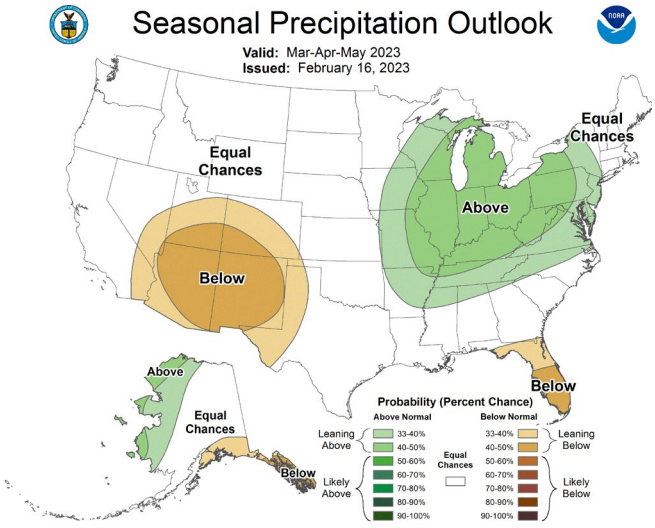
Source: National Weather Service



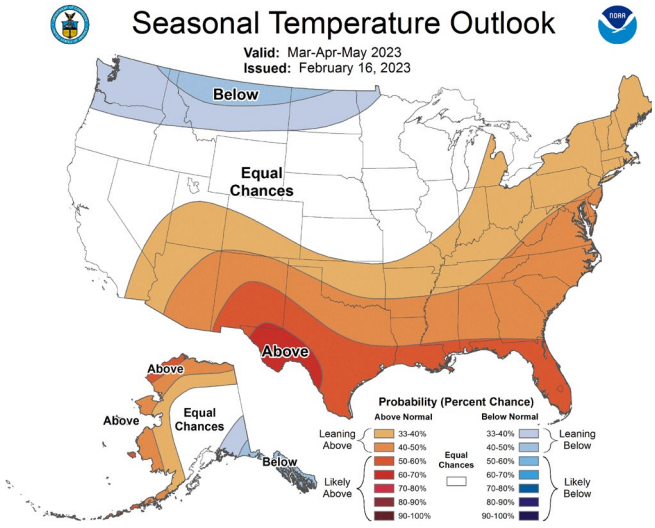
Climate Prediction Center Three-month Outlook

Source: National Weather Service

Precipitation



Temperature



March-April-May 2023 precipitation and temperature outlook summaries

More Information

The NRCS National Water and Climate Center publishes this weekly report. We welcome your feedback. If you have questions or comments, please contact us.