

National Drought Summary for March 14, 2023

Summary

Two atmospheric river events struck California and portions of neighboring states, with the second arriving as the drought-monitoring period ended. Torrential rain in central California caused a levee break along the Pajaro River, flooding the community of Pajaro in Monterey County. Rain, along with melting of lower-elevation snowpack and dam releases, also led to significant water rises along many waterways in California's Central Valley. By March 15, the San Joaquin River at Patterson, California, neared a record crest, with the water rising to within less than a foot of the February 2017 high-water mark. The average mid-March water equivalency of the high-elevation Sierra Nevada snowpack topped 55 inches, more than 220% normal for an entire season, according to the California Department of Water Resources. Most other areas of the West received mostly light to moderately heavy precipitation. Farther east, storms delivered light to moderately heavy snow across the northern Plains and upper Midwest, with some of the most significant precipitation falling on March 11. Meanwhile, a band of heavy showers (locally 2 to 4 inches) stretched from northeastern Texas to the southern Appalachians, before shifting into the Deep South. Notably, northern Florida and environs received much-needed rain, following an extended period of record-setting warmth. Farther north, a powerful coastal storm developed as the monitoring period ended, battering parts of the Northeast with heavy, wet snow and high winds. Mostly dry weather covered the remainder of the country, including the central and southern High Plains, the Rio Grande Valley, and southern Florida. Elsewhere, chilly conditions dominated areas from the Pacific Coast to the northern half of the Plains, while record-setting warmth finally ended cross the Deep South. In fact, freezes were reported for several days, starting on March 14, as far south as Alabama, Georgia, and Mississippi.

Northeast

The Northeast remained free of drought, with less than 2% coverage of abnormal dryness (D0). At the end of the drought-monitoring period, an impressive coastal storm delivered high winds and heavy precipitation from the northern mid-Atlantic into southern New England. Worcester, Massachusetts, which had a season-to-date snowfall deficit of 31.4 inches through March 12, received 14.4 inches of snow—and had a peak wind gust to 44 mph—on March 13-14.

Southeast

There were no changes to the depiction of abnormal dryness (D0) and moderate drought (D1) along and near the middle Atlantic Coast, which received light precipitation and experienced a transition to cooler weather. Farther south, however, there were

several changes. Across northern Florida and environs, heavy showers and thunderstorms provided some relief from D0 and D1. From March 5 to 12, Florida reported a statewide improvement in topsoil moisture rated very short to short, from 61 to 54%, according to the U.S. Department of Agriculture. In contrast, little or no rain fell across southern Florida, where abnormal dryness (D0) and moderate to severe drought (D1 to D2) further expanded. By mid-March, the Keetch-Byram Drought Index—a measure of fire danger—topped 650 (on a scale of 0 to 800) in Collier County, Florida, on average, and exceeded 600 in Lee, Hendry, Palm Beach, and Monroe Counties. Through March 14, year-to-date rainfall in Naples, Florida, totaled just 0.91 inch, 23% of normal.

South

The “hot spot” for drought in South remained the southern tier of the region, across northern, central, and western Oklahoma and roughly the western two-thirds of Texas. According to the U.S. Department of Agriculture, 68% of the rangeland and pastures in Texas were rated in very poor to poor condition on March 12, along with 50% of the winter wheat and 47% of the oats. Additionally, statewide topsoil moisture in Texas was rated 69% very short to short, with values ranging from 92 to 100% very short to short across the Northern and South High Plains, Trans-Pecos, Edwards Plateau, Coastal Bend, and the South region. Meanwhile in Oklahoma, statewide topsoil moisture was categorized as 49% very short to short. Rangeland and pastures in Oklahoma were rated 60% in very poor to poor condition on March 12, while 44% of the state’s winter wheat was rated very poor to poor. Notably, an extremely sharp gradient existed across eastern sections of Oklahoma and Texas between drought-free conditions to the east and moderate to exceptional drought (D1 to D4) to the west. Elsewhere, moderate drought (D1) expanded across southern Louisiana, where New Orleans, reported just 5.72 inches of rain (51% of normal) for the year to date through March 14.

Midwest

Precipitation during the first half of March further eroded any remaining drought—mainly across southeastern Michigan and parts of Minnesota and Iowa. In Michigan, west of the existing area of moderate drought (D1), Grand Rapids received a daily-record snowfall of 8.7 inches on March 10. A day later, Des Moines, Iowa, netted a daily-record snowfall of 6.4 inches. In many areas of the far upper Midwest, snow has been on the ground since November. Specifically, Minneapolis-St. Paul, Minnesota, has had a continuous snow cover since November 29, with the depth peaking at 16 inches in early January. By March 14, the Twin Cities still had 11 inches of snow on the ground.

High Plains

Some of the nation's most serious drought conditions persisted across southern sections of the High Plains region, mainly across Kansas and Nebraska. Kansas, like other areas of the central and southern Plains, has an impressive gradient between drought-free conditions (in the east) and extreme to exceptional drought, D3 to D4 (in southern and western sections of the state). On March 12, according to the U.S. Department of Agriculture, topsoil moisture in Kansas was rated 66% very short to short, while more than half (52%) of the winter wheat was rated in very poor to poor condition. Some of the D4 areas in Kansas received record-low annual precipitation totals during 2022 and have not received much, if any, cold-season drought relief. In the hardest-hit areas, drought impacts—besides damaged rangeland/pastures and poor winter wheat conditions—include frequent episodes of blowing dust and limited surface water supplies in streams and ponds. Farther north, snow has been on the ground since November in much of North Dakota and portions of neighboring states, with recent cold weather maintaining impressive snow depths even as snow continues to fall. Bismarck, North Dakota, reported at least a trace of snow on 11 of the first 13 days of March, totaling 22.5 inches.

West

Broad reductions in drought coverage and intensity were noted again this week in California and neighboring areas. By March 13, season-to-date snowfall at the Central Sierra Snow Lab at California's Donner Pass exceeded 650 inches, compared to a normal full-season total around 360 inches. Meanwhile, Bishop, California (2.06 inches on the 10th), experienced its wettest March day on record, surpassing 1.75 inches on March 4, 1991. Closer to the Pacific Coast, the Pajaro River at Chittenden, California, achieved its highest crest (on March 11) since February 1998. In California's Salinas River drainage basin, a record crest was set on March 10 along the Nacimiento River below Nacimiento Lake, with the water level edging the February 1969 high-water mark by 1.51 feet. The Salinas River near Spreckels, California, rose 3.89 feet above flood stage on March 13, second only to the March 1995 high-water mark (7.29 feet above flood stage)—and 2.29 feet above the level reached on January 13, 2023. Precipitation spread across southern California after the drought-monitoring period ended and will be reflected on next week's assessment. Looking more broadly at the western U.S., snow-water equivalency values greater than 200% of normal extend from the Sierra Nevada across much of the Great Basin and into parts of Utah. Similarly impressive snowpack values also cover much of Arizona and western New Mexico. Conversely, snow-water equivalency is closer to normal—and even below normal in some drainage basins—across the northern tier of the West, as well as some areas on the east side of the Continental Divide. Many smaller lakes have rebounded, with California's 154 primary intrastate reservoirs gaining 9.9 million acre-feet of water between November 30, 2022, and February 28, 2023. California's storage at the end of February, 23.2 million acre-feet, was 96% of the historical average for this time of year. However, in the Colorado

River system, storage on February 28 stood at 15.1 million acre-feet, just 46% of average and 29% of capacity.

Caribbean

In Puerto Rico, a late-winter and early-spring dry spell worsened, with moderate drought (D1) developing in the northwest and abnormal dryness (D0) expanding to cover much of the remainder of the commonwealth. Puerto Rico's dry conditions are being manifested in a variety of ways, including poor vegetation health and spotty low streamflow values.

The U.S. Virgin Islands received very little rain in the first half of March. The St. Thomas and St. Croix airports received 0.12 and 0.01 inches, respectively for the first two weeks of March, while Windswept Beach on St. John collected just 0.09 inches in the rain gauge.

St. Thomas and St. Croix have been at D1-S for at least a month as supported by SPIs. This week, the one month SPI for St. John dropped low enough to warrant the introduction of abnormal dryness for the island.

Well depths benefited from the fall precipitation, but the distance from the land surface to the water level has begun to increase again for wells for St. Croix and St. John.

Pacific

Alaska remained free of dryness and drought, following some extraordinary storminess in the western part of the state in early March. Both Cold Bay (in the Aleutians) and Nome (on Norton Sound in the Bering Sea) reported record-high precipitation for any calendar day in March over the last 80 years. Cold Bay received 2.98 inches of rain on March 5, while Nome netted 0.71 inch (in the form of rain, freezing rain, and snow) on March 6. Hawaii experienced a reprieve from stormy weather that occurred from mid-February into the first few days of March, although the island chain remained completely free of dryness and drought for a third consecutive week.

Hawaii's recent wet spell peaked in late February, with several Big Island locations—including Glenwood (54.49 inches) and Mountain View (51.44 inches)—receiving monthly rainfall totals greater than 50 inches.

The Republic of Palau received ample rain with 3.28 inches for Palau IAP and 2.25 inches for Koror COOP.

The Mariana Islands have received enough rain to keep them quite green. Guam received 2.27 inches, while Rota reported 0.54 inches. Saipan received from 0.61 to 0.72 inches at the three reporting locations. A few fires have burned across southern Guam recently, but have been easy to contain. These islands need an inch weekly to meet minimum water needs.

The Federal States of Micronesia have been getting a few showers with rain expected to continue, per a NOAA weather official. Kapingamarangi remained at D1 and received 1.4 inches for the week, while Lukunor and Pingelap remained abnormally dry, and received 1.90 and 1.40 inches, respectively. Kosrae received 1.49 inches; Woleai, 2.13 inches; and Yap, just 0.33 inches.

The Republic of the Marshall Islands mostly received good rains in the past week, except for Jaluit with 1.41 inches and Wotje reporting no rain and remaining in moderate drought. Kwajalein, also at D1, collected 2.55 inches in the rain gauge, which was needed after several dry weeks. Mili received 3.91 inches, Ailinglaplap got 4.64 inches, and Majuro received 5.00 inches. The Majuro reservoirs held 25.62 million gallons on March 10. Some RMI islands' water supplies have been inadequate, although occasional showers have reached most islands at times.

American Samoa remained free of dryness. Pago Pago, Siufaga Ridge and Toa Ridge received from 2.65 inches to 3.59 inches of rain. These islands need 1 inch weekly to meet minimum water needs.

Looking Ahead

A storm system that previously hammered California with heavy precipitation and high winds will cross the central Plains on March 16 and reach the Great Lakes States a day later. A band of accumulating snow can be expected on March 16-17 from parts of Nebraska into the upper Great Lakes region. Storm-related rainfall across the South could become locally heavy, with 1 to 3 inches possible. In the storm's wake, cold weather will return across much of the central and eastern U.S. Late in the weekend and early next week, freezes could again reach deep into the South, including parts of Mississippi, Alabama, and Georgia. Sub-0°F temperatures may occur during the weekend in portions of the north-central U.S. During the next few days, much of the West will get a reprieve from stormy conditions, although rain and snow showers will return during the weekend across the Pacific Coast States and the Southwest. The NWS 6- to 10-day outlook for March 21 – 25 calls for the likelihood of near- or below-normal temperatures and near- or above-normal temperatures across most of the country. Warmer-than-normal weather will be confined to peninsular Florida and portions of the Great Lakes region, while drier-than-normal conditions should be limited to parts of the south-central U.S., mainly in Texas.

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