

National Drought Summary for April 9, 2024

Summary

Following the El Nino winter and an active early spring pattern, drought coverage is at its lowest since the spring 2020. A strengthening low pressure system and trailing cold front progressed east from the Mississippi Valley to the East Coast at the beginning of April. This storm brought heavy snow (6 to 18 inches, locally more than 2 feet) to the Upper Peninsula of Michigan, Wisconsin, and northern New England. The recent precipitation (rain and snow) during the past few weeks continued to ease drought conditions across the Upper Midwest. From April 5 to 7, a strong storm system tracked east from the Rockies to the Great Plains. Heavy snowfall (6 to 12 inches, locally more) occurred across parts of Idaho, Montana, and Wyoming. Total precipitation amounts of 1 to 2 inches, liquid equivalent, resulted in drought improvement from the north-central Rockies to western South Dakota. Drought continued to develop or intensify across parts of the southern Great Plains and lower Ohio Valley along with Hawaii. Please note that heavy rainfall across the South, occurring after April 9th at 8am EDT, will be considered in next weeks U.S. Drought Monitor.

Northeast

Based on recent precipitation and the NDMC drought blends, the drought impact for western New York was changed to long-term drought only. No changes were made to the moderate drought (D1) area for Nantucket since the heaviest precipitation amounts were to the west. The remainder of the Northeast remains drought-free.

Southeast

The Southeast became drought-free this week as the moderate drought (D1) in eastern North Carolina was discontinued. Based on a reassessment including the 90-day SPI and more favorable 28-day streamflows, there was a lack of support to maintain that D1 area. Overall, 28-day streamflows and soil moisture are at or above-normal for much of the Southeast. As of April 9th, short-term dryness had started to develop in the southern Appalachians where 30-day precipitation deficits were 2 to 3 inches.

South

Major drought relief, associated with El Nino, occurred this past winter across the lower Mississippi Valley. Precipitation from April 2-8 led to a small decrease in abnormal

dryness (D0) and moderate drought (D1) to parts of this region. Heavy precipitation that occurred after 7am CT Tuesday, April 9th, will be factored into next weeks depiction. A strengthening low pressure system on April 6 and 7 brought high winds and elevated wildfire danger to the southern Great Plains which dried out topsoil, especially across northwestern Oklahoma. 30 to 90-day SPEI along with the lack of vegetation green up supported an expansion of D0 and D1 across parts of Oklahoma. Northern Arkansas and northwestern Tennessee also had an increase in D0 and D1 coverage as short-term precipitation deficits became larger dating back to 60 days.

Midwest

On April 2nd, a swath of heavy precipitation (1 to 2 inches, liquid equivalent) was observed across eastern Iowa, northwestern Illinois, and parts of Wisconsin. This recent precipitation along with considerations of long-term indicators supported a 1-category improvement to these areas. Moderate drought (D1) and abnormal dryness (D0) was reduced across the Upper Peninsula of Michigan along with the northern shore of Lake Superior in northeastern Minnesota as shorter term SPIs are either neutral or positive. More precipitation overspread the Upper Midwest on April 6 and 7 which also supports the decreasing coverage and intensity of drought across this region since mid-March. Following frequent precipitation this past month, D1 coverage was nearly eliminated from southwestern Indiana. Southern Missouri and western Kentucky continue to miss out on precipitation and based on 60-day SPI and NDMC short-term blends, D0 and D1 were expanded for those areas. Following heavy precipitation during the first week of April, improvements were justified near to the north of St Louis.

High Plains

Widespread rain and snow (1 to 2 inches of precipitation, liquid equivalent) on April 7 led to a 1-category improvement across parts of northeastern Wyoming and western South Dakota. Despite the recent heavy precipitation, 6-month SPI along with 28-day average streamflow support a continuation of moderate drought (D1) across the High Plains. Following another week of precipitation along with considerations of soil moisture and SPI values of neutral to positive, abnormal dryness (D0) coverage was reduced throughout the Dakotas. A strengthening low pressure system on April 6 and 7 brought high winds to the Great Plains which dried out topsoil especially across Kansas and southeastern Colorado. A reassessment of SPIs at various time scales and given snow water equivalent is slightly above average, D1 coverage was reduced for southern Colorado.

West

As a low pressure system shifted inland, widespread precipitation (rain and high-elevation snow) overspread the West from April 3 to 6. Heavy precipitation (more than 1.5 inches, liquid equivalent) along with snow water equivalent (SWE) amounts near average supported a 1-category improvement to western Idaho and northeastern Oregon. Parts of western Montana also had a 1-category improvement due to a wet week and considerations such as SWE and SPIs at various time scales. The current depiction of moderate to severe drought across Idaho and western Montana lines up well with the 6 to 9-month SPI. On April 5 and 6, a major storm developed across the northern Rockies and high Plains with precipitation amounts exceeding 1.5 inches (liquid equivalent) across southern Montana. Based on this heavy precipitation and lack of support from SPIs at various time scales, a 1-category improvement was made to this region. Neutral to positive SPIs at multiple time scales and SWE near to slightly above normal supported the removal of D0 (abnormal dryness) from western Nevada and adjacent areas of California. Farther to the north, low snowpack resulted in a second week of D0 and D1 expansion across north-central and northeastern Washington. Although it was a mostly dry week for the Southwest, a reassessment of SPIs at various time scales led to targeted improvements for parts of New Mexico.

Caribbean

Heavy rainfall this past week and considerations of 28-day average streamflow led to a 1-category improvement to parts of northeastern Puerto Rico.

Southeasterly winds transported deep moisture across the region early in the drought week (Wed 4/3-Tue 4/9, 2024), along with some increase in shower activity and warmer temperatures. By the middle to latter portions of the period, a frontal boundary extending from the western Caribbean to the western Atlantic sank southward towards and across the Islands, promoting substantial shower activity and pleasantly cooler temperatures with northeasterly surface winds.

On the island of St. Croix, rainfall accumulations from the past week ranged from 0.00-inch at Henry Rohlsen Airport (unverified) to 1.82 inches at CoCoRaHS station VI-SC-30 (Christiansted 1.7 SW). Intermediate values included 0.04-inch at station VI-SC-9 (Christiansted 4.1 ESE), 0.06-inch at VI-SC-35 (Frederiksted 1.3 ENE), a tenth of an inch at VI-SC-24 (Christiansted 2.1 ENE), 0.22-inch at VI-SC-34 (Frederiksted 1.9 NE), 0.39-inch at East Hill, 0.68-inch at VI-SC-10 (Christiansted 1.6 E), 1.23 inches at VI-SC-20 (Frederiksted 1.7 ESE), and 1.27 inches of rain at VI-SC-25 (Christiansted 4.4 W). The Adventure 28 Well water levels ranged between 30.65 feet below the land surface (April 3rd, 8am) and 30.74 feet below the land surface (April 9th, 8am), indicating a slight fall during the drought week. The Standardized Precipitation Index (SPI) values for East Hill, St. Croix (station 672560) are: -1.04 (1-mo), -0.22 (3-mo), -0.79 (6-mo), -0.84 (9-mo), and -0.92 (12-mo). St. Croix remains free of dryness and drought this week.

On St. John, rainfall amounts ranged from 0.07-inch at VI-SJ-3 (Windswept Beach) to 0.28-inch at VI-SJ-5 (Cruz Bay 1.6 E). The water level at the Susannaberg DPW3 Well fell from 11.23 feet below the land surface (April 3rd, 8am) to 11.62 feet below the land surface (April 9th, 8am). The Standardized Precipitation Index (SPI) values for Windswept Beach, St. John are: -1.52 (1-mo), +0.76 (3-mo), +0.11 (6-mo), +0.50 (9-mo), and +0.23 (12-mo). The island of St. John continues to be free of dryness and drought.

On St. Thomas, rainfall totals this week ranged from 0.28-inch at VI-ST-13 (Charlotte Amalie 1.2 NNW) to 1.98 inches at VI-ST-14 (Nadir 0.3 E (Tropical Marine)). This value at Tropical Marine was the highest reported total for the 3 U.S. Virgin Islands this week. A couple of intermediate precipitation amounts include 0.37-inch at VI-ST-15 (Charlotte Amalie West 1.3 N) and just under an inch (0.98-inch) at VI-ST-5 (Charlotte Amalie West 4.2 WNW). The Grade School 3 Well water level dropped nearly 1.4 feet this week, from 7.99 feet below the land surface (April 3rd, 8am) to 9.38 feet below the land surface (April 9th, 8am). The station depiction at St. Thomas remains unchanged at D0(L).

Pacific

Southern parts of southeastern Alaska have been drier-than-normal since January and abnormal dryness (D0) was added to reflect the inadequate precipitation the past few months.

Persistently strong trade winds continue a drying trend for the leeward side of the Hawaiian Islands. A 1-category degradation was made to the eastern tip of Oahu, central Lanai, and the lower elevations of the southeastern Big Island.

Weak trade wind surface troughs passed over the Marianas during the past drought week, Wed April 3rd Tue April 9th, 2024. Guam International Airports Keetch-Byram Drought Index (KBDI) dipped slightly to near 680 by mid-week, and slightly higher humidity helped to offset fire danger to a modest degree, but fire danger remains very high. A Fire Weather Watch remains in effect, though the latest Red Flag Warning was discontinued on April 9th. An approaching trade-wind surge is poised to move into the area just beyond the end of this drought week, and could bring a modest uptick in shower activity and isolated thunderstorms to Saipan and Tinian. However, confidence for wetting rain has diminished compared to yesterday. Across the eastern Federated States of Micronesia (FSM), trade convergence produced scattered showers and isolated thunderstorms near 5N latitude, with a dry trade-wind pattern dominating most islands. This region is currently in the convectively suppressed phase of the Madden-Julian Oscillation (MJO). A Trade-Wind Convergence Zone (TWCZ) helped to initiate some convection over the region by mid-week, but most of the associated rainfall has remained offshore. Towards the end of the period, a broad trade-wind disturbance between Pohnpei and Kosrae helped to generate isolated thunderstorms and scattered

to numerous showers across this area. The western portion of the FSM experienced a broad trough, which was part of the now closed JTWC Invest 94W. As it passed south of Palau, scattered showers fell on the Republic, but only isolated showers were reported across the vicinity of Yap Proper. As the trough continued to move west of Palau, a dry trade-wind pattern ensued. Very little rainfall was observed across the western FSM this week, in part due to the previously noted trade-wind disturbance near Pohnpei (and the associated Near-Equatorial Trough) remaining well east of this drought-stricken region. South of the equator, a surface trough brought showers and thundershowers to the territory of American Samoa, with surface high pressure building south of that region.

Satellite-based (IMERG) precipitation estimates for the past 7-days show light precipitation (<1-inch) over the Commonwealth of the Northern Mariana Islands (CNMI), the FSM, and the Republic of the Marshall Islands (RMI), with a large fraction of this area depicting no rainfall for the week. Heavier amounts (2-4 inches) were confined to the region between 6 degrees N latitude and the equator, including Kapingamarangi and Nukuoro. Across the South Pacific, the vicinity of American Samoa received anywhere from 2-5 inches of rain this past week.

Preliminary March 2024 Precipitation Totals have been adjusted at a handful of stations to include the latest data. These stations/amounts are: Kosrae (15.34 inches), Lukunor (14.20 inches), Mwoakilloa (10.17 inches), Pingelap (9.95 inches), Pago Pago (7.61 inches).

In the RMI, the National Disaster Management Office (NDMO) deployed Reverse Osmosis Units (ROs) to nine of the 16 atolls affected by drought conditions ([link shown below](#)). Immediate assistance is urgently required to mitigate dire shortages of potable water and food, with a particular emphasis on safeguarding children in communities afflicted by saltwater intrusion and agricultural degradation. It is important to promote water conservation and adopt practices that mitigate the risk of diseases like cholera and diarrhea. In the FSM, many of these same problems exist. The local government, working in tandem with international organizations, has distributed vital hygiene supplies to approximately 13% of the population, which highlights the scale of the challenge and urgent requirement for additional support. Please refer to this [link](#) for additional information: Drought Emergency Response .

Across the Republic of the Marshall Islands (RMI), rainfall totals for the past drought week remained under a quarter-inch, with the exception of Jaluit, which reported a significant 1.45 inches of rain. Given this late-week rally, and the March rainfall total of 6.39 inches (significant, though still dry), it was decided to leave Jaluits depiction unchanged at D0(S). Ailinglaplap recorded the second highest amount of rainfall (0.20-inch) across the RMI this week. The last 6 weeks and last 2 months have been dry. Using the guideline of a 1-category deterioration for every 3 consecutive dry weeks, the station depiction at Ailinglaplap was degraded from D0(S) to D1(S) this week. Kwajalein came in third this week with a meager 0.11-inch of rain. This now marks the third consecutive dry week and fourth consecutive dry month at this station, where received

rainfall amounts were woefully inadequate to meet weekly and monthly minimums required to meet most water needs (2 inches and 8 inches, respectively). Having received a significant (though still dry) 4.61 inches of rain in March, and having unimpressive rankings of 50th, 34th, and 24th driest March, Feb-Mar, and Jan-Mar periods, respectively, (over a 72-year period of record from 1952-2024), it was decided to leave Kwajaleins drought depiction at D1(S) this week. Wotje and Majuro both reported zero precipitation this week. For the former station, this marks the 11th consecutive dry week, and the driest March in 41 years (usable data within the period 1981-2024) with zero rainfall reported. A few other statistics include this being Wotjes fifth driest Feb-Mar period on record (1981-2024), and the previous five months (Nov 2023-Mar 2024) were dry. Incidentally, the last time precipitation was measured at this station was during the week ending Feb 20th, when 0.34-inch of rain fell. Finally, in nearly the past year from May 2023 through March 2024, only one month registered wet at Wotje; October 2023 when 8.24 inches of rain was measured. Within this period (May 2023-Mar 2024), no monthly total has even come close to the minimum water requirement of 8 inches. Therefore, Wotjes depiction is degraded from D3(SL) this week to D4(SL). At Majuro, this is now the ninth consecutive dry week and third consecutive dry month, since although December 2023 was technically dry with 7.96 inches of rain, it was barely shy of the 8-inch minimum requirement. Only 1.08 inches of rain fell in March at Majuro. In terms of precipitation rankings, this was the fifth driest March in 70 years (1954-2024) and eighth driest Feb-Mar period on record. Though these statistics speak for themselves, an even more important (and tangible) consideration is the steady decline of the Majuro reservoir water level throughout March and early April. As of April 5th, storage was 19.1 million gallons, which is approximately half of its maximum capacity of 36 million gallons. Given these factors, it was decided to degrade Majuros drought depiction this week from D2(S) to D3(S). No data was available for analysis at either Mili or Utirik this past drought week.

South of the equator, American Samoa continued to enjoy drought-free conditions. A nearby surface trough contributed to showers and thundershowers across the territory and surrounding waters this past week. Pago Pago measured 4.08 inches of rain, which exceeds even its monthly minimum threshold of 4 inches. The higher elevation sites of Siufaga and Toa Ridges received 4.44 inches and 2.71 inches of rain, respectively. These locations easily surpassed the 1-inch weekly minimum requirement to meet most water needs, with another drought-free week procured for Tutuila.

Another dry week ensued across most of the CNMI in the post-peak El Nino period, though Rota did attain the 1-inch weekly minimum requirement with 1.06 inches of rain. This weeks rain, in addition to last weeks measured 0.64-inch of rain, helps to somewhat offset what is now the 7th consecutive dry week in Rota. Its depiction remains D1(S) this week. In Saipan, recorded rainfall measurements this week ranged from 0.39-inch at the National Park Service site to 0.70-inch (1-day missing) at the ASOS location. Saipan International Airports manual gauge reported an intermediate precipitation value of 0.62-inch. This marks the seventh consecutive dry week, and the March 2024 accumulation of 1.57 inches is less than half of the monthly minimum requirement of 4 inches. For now, Saipans depiction is maintained at D2(S). Other

rainfall amounts reported across the Marianas this week were surprisingly evenly distributed and included Agat (0.77-inch), Dededo (0.75-inch) and Tinian (0.49-inch, 2-days missing). At Guam, 0.48-inch of rain fell, making this the 11th consecutive dry week. The last three months (Jan-Mar) were also dry. Precipitation rankings for Jan-Mar, Feb-Mar, and March, are 6th, 9th, and 14th driest periods within the 67 year period of record (1957-2024). Given that the last 11 dry weeks reported nowhere near the 1-inch minimum rainfall requirement, and the rainfall totals of the last 3 months were nowhere near the 4-inch minimum requirement, as well as the prolonged period of very high fire danger (including the posting of another Red Flag Warning), it is reasoned that Guams drought depiction is nearing the D2(S)/D3(S) threshold. For the time being, Guams depiction is maintained at D2(S).

As was the case last week, the southern portions of the Federated States of Micronesia (FSM) continued to receive the lions share of the precipitation, with Nukuoro and Kapingamarangi measuring 3.54 inches of rain and 3.71 inches of rain, respectively. Both of these stations continue to be free of dryness and drought. Lukunor, Pohnpei and Kosrae received 0.03-inch of rain (2-days missing), 0.93-inch, and 2.40 inches (1-day missing), respectively, which shows considerable variation this week. During March 2024, these stations received plenty of precipitation, with respective amounts of 10.45 inches, 12.03 inches, and 12.70 inches of rain, easily surpassing the monthly minimum requirement of 8 inches. Therefore, these stations remain free of dryness and drought. Pingelap was one of the FSM stations that rallied late in the week, receiving 2.42 inches of precipitation. Its depiction remains unchanged at D0(S). In Chuuk, just over an inch of rain (1.05 inches) fell this week (1-day missing). The last six consecutive weeks, and last two months, have been dry, with Chuuk not receiving adequate rainfall needed to maintain agreed-upon water minimums. This March (2024) ranks as the seventh driest March in 73 years (1951-2024) and the ninth driest Feb-Mar period. Having received 0.60-inch of rain last week, and 3.30 inches of rain in March, its thought that this is a borderline D1(S)-D2(S) situation. For now, Chuuk is left at D1(S), though if dryness persists next week, there is really no reason not to degrade its depiction to D2(S). No data was available for analysis this week at Fananu. The western FSM continues to experience deteriorating conditions with little relief in sight. Yap again received a trivial amount of rain this week (0.03-inch, 1 day missing), with this March being the second driest March in 73 years (1951-2024) and this Feb-Mar period ranking as the 7th driest. The last month that Yap received enough rainfall to meet its minimum water needs was October 2023 with 10.74 inches. The last ten consecutive weeks have been dry. The depiction at Yap seems to be ripe this week for additional deterioration, from D3(S) to D4(S). Ulithi and Woleai are also primed for deterioration this week. Both stations reported very little rainfall this week, Ulithi 0.02-inch and Woleai 0.13-inch. For the month of March, Ulithi reported only 1.20 inches of rain, while Woleai received about double that amount (2.44 inches). Regardless, both monthly totals are woefully inadequate and fall far short of the 8-inch minimum. Both locations are also experiencing their tenth consecutive dry week. March 2024 was the 4th driest March at Ulithi in 41 years (1981-2024), and the 10th driest Feb-Mar period. Woleais rankings for the same time periods include 6th driest March in 42 years (the amount of usable data within the period of record, 1968-2024) and the 6th driest Feb-Mar period. An official on

Ulithi reported the island has about a weeks worth of water left. Given these considerations, Ulithis drought designation was degraded from D2(S) to D3(S) and Woleais designation was degraded from D1(S) to D2(S). A couple of other rainfall measurements taken within the FSM include Rumung (0.03-inch, 2 days missing) and North Fanif (0.09-inch).

In the Republic of Palau, a Water Shortage Watch was declared by the National Emergency Committee on March 26, 2024. Water levels at Ngerimel and Ngerikiil reservoirs (in Airai) have significantly dropped due to insufficient rainfall and heightened water consumption. This week, the Palau International Airport (Airai) measured 0.48-inch of rain, while the Koror COOP measured a significantly higher 0.87-inch of rain (1-day missing). In either case, the rainfall amounts fall well short of the 2-inch weekly minimum. This past March (2024) saw 3.56 inches of rain reported at Palau, which makes it the first dry month in almost a year. Parts of Babeldaob were experiencing more yellowing of vegetation and drier conditions. For now, Palau retains its D0(S) designation.

Looking Ahead

During the next five days (April 11-15, 2024), a low pressure system and trailing cold front will move offshore of the East Coast on April 11th. Locally heavy rainfall (more than 1 inch) is forecast to accompany this cold front. From April 12 to the 14th, much drier weather is forecast throughout the eastern and central U.S. By April 14th, another low pressure system is expected to track inland to the West with additional rain and high-elevation snow. Later on April 15th, another round of wet weather is anticipated for the northern Great Plains and Midwest.

The Climate Prediction Centers 6-10 day outlook (valid April 16-20, 2024) favors above-normal temperatures across the eastern and southern contiguous U.S. (CONUS) with below-normal temperatures most likely across the northern Great Plains, northern to central Rockies, and Pacific Northwest. Increased above-normal precipitation probabilities are forecast for most of the eastern and central CONUS excluding Florida where below-normal precipitation is slightly favored. Below-normal precipitation is also more likely along the West Coast.

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