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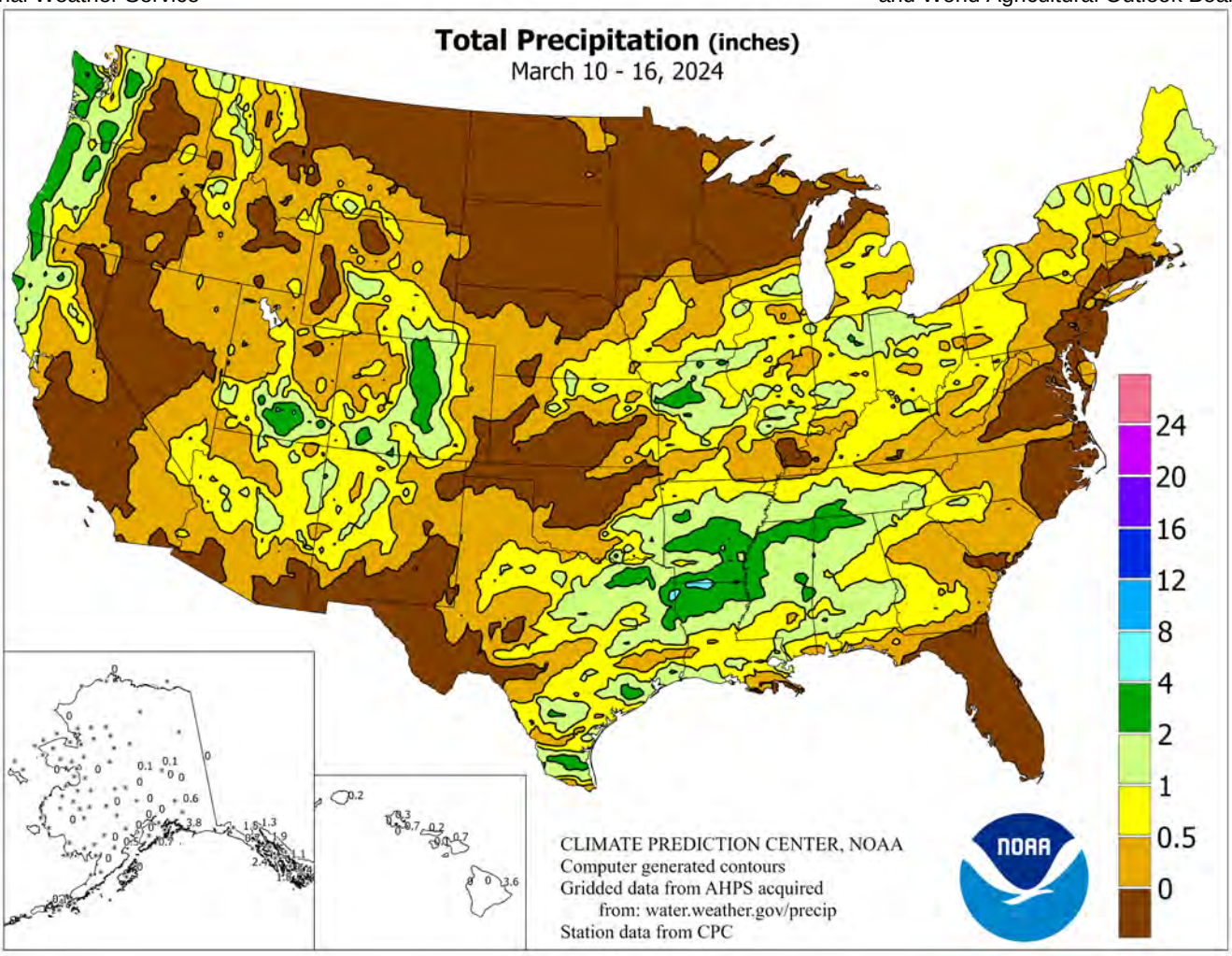
WEEKLY WEATHER AND CROP BULLETIN

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Weather Service

U.S. DEPARTMENT OF AGRICULTURE
National Agricultural Statistics Service
and World Agricultural Outlook Board



HIGHLIGHTS

March 10 – 16, 2024

Highlights provided by USDA/WAOB

Active weather gradually shifted southward during the second half of the week, starting across the **Midwest** and **central sections of the Rockies and Plains** before ending in the **Deep South**. Locally severe thunderstorms preceded and accompanied a push of drier air, with activity peaking from **southeastern Oklahoma and Texas into the Ohio and Tennessee Valleys** on March 14-15. Based on preliminary reports, the outbreak included more than two dozen tornadoes, one of which resulted in three fatalities in **western Ohio**. Significant precipitation also

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Water Supply Forecast for the Western United States

Highlights

Stormy weather, a late-season contribution from El Niño, battered southern California in early March. Storminess later spread to other areas, including the Sierra Nevada, where snowpack overcame early-season deficits to effectively reach normal levels by mid-March. Meanwhile, winter and early-spring dryness across the northern tier of the western U.S. was also consistent with El Niño-driven patterns.

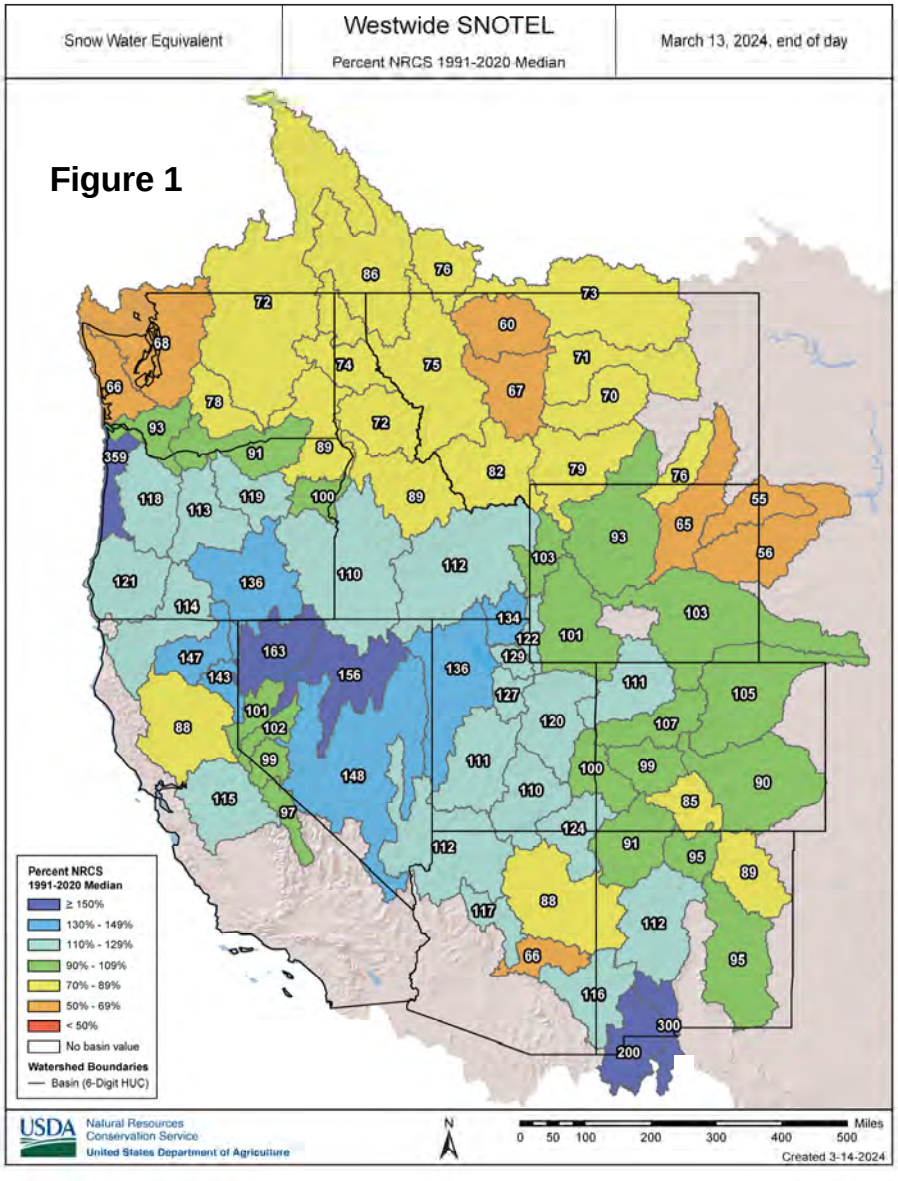
Despite a mostly favorable Western hydrological situation, there were still vestiges of long-term drought. For example, basin-wide storage in the Colorado River system stood at 60 percent of average (and 38 percent of capacity) by February 29, 2024, despite the surface elevation of Lake Mead having risen 35.60 feet (to 1,076.52 feet) since setting an end-of-month record low of 1,040.92 feet in July 2022.

According to the California Department of Water Resources, the water equivalency of the Sierra Nevada snowpack topped 18 inches by the end of February—and further improved to greater than 26 inches during an early-March storm siege. That value was very close to the seasonal average, following the record-setting accumulation of more than 60 inches in 2022-23.

According to the *U.S. Drought Monitor*, drought coverage in the 11-state Western region remained nearly steady between October 2023 and February 2024, ranging from 24 to 32 percent. Modest drought improvement in parts of the Southwest and Pacific Northwest was generally offset by developing drought in parts of the northern Rockies.

Snowpack and Precipitation

By mid-March snow-water equivalencies were mostly near or above normal in drainage basins across the southern two-thirds of the western U.S., along and south a line from Oregon to western and southern Wyoming (figure 1). By March 13, some of the most impressive snowpack (locally greater than 150 percent of average) had accumulated across higher elevations of the Great Basin, as well as neighboring areas of the Intermountain West. A significant Southwestern snowstorm underway by the middle of March could further boost some of the basin-average snowpack numbers in portions of the Four Corners States. Meanwhile, sub-par snowpack encompassed the northern tier of the West, including much of Montana, Washington, northern Idaho, and northeastern Wyoming.



Season-to-date (October 1, 2023 – March 13, 2024) precipitation was 70 to 90 percent of normal in many basins in Washington, Montana, and northern Idaho. Elsewhere, near- or above-normal precipitation was noted, except in northeastern Wyoming and several basins in the Four Corners region (figure 2). Season-to-date precipitation topped 110 of normal in large sections of Oregon and the Great Basin, as well as portions of the Intermountain West.

Spring and Summer Streamflow Forecasts

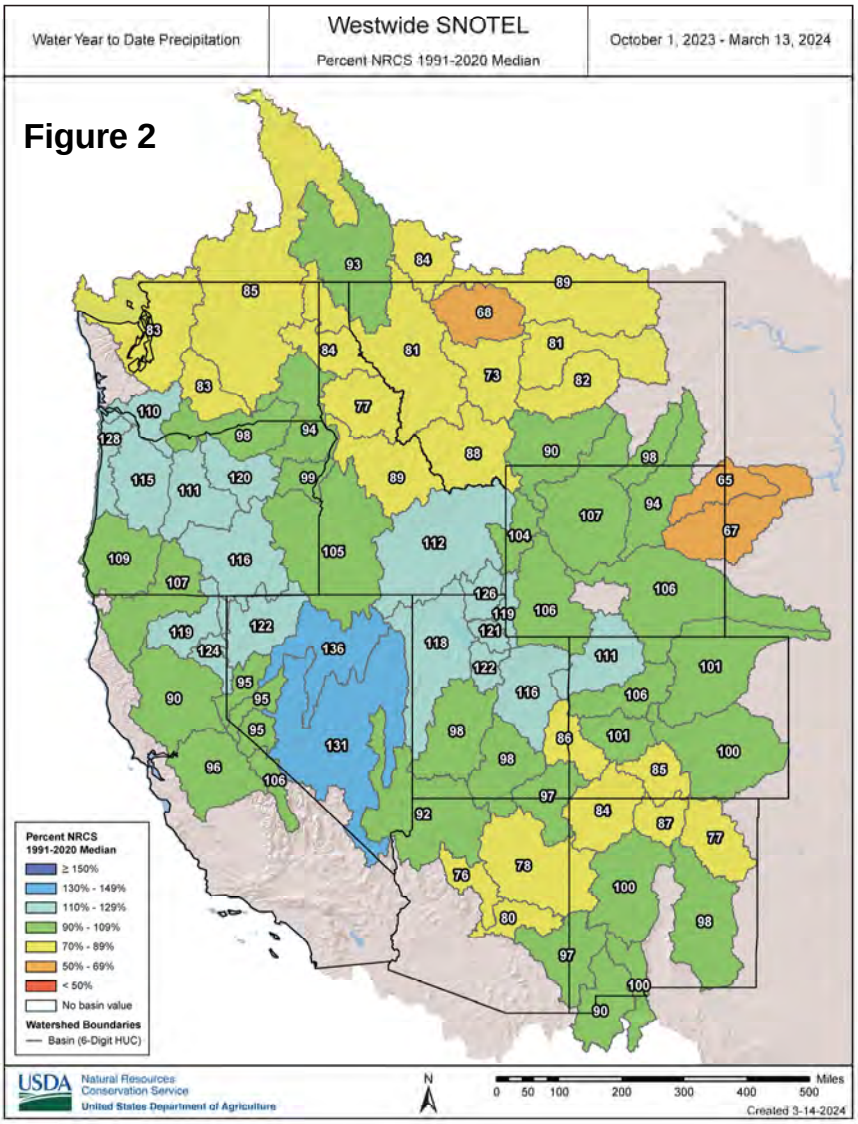
By March 1, 2024, projections for spring and summer streamflow were indicating concerns regarding runoff potential across the northern tier of the West. In contrast, expectations for spring and summer runoff continued to improve in many areas along and south of a line from Oregon to Colorado. Despite the generally favorable outlook, some runoff potential has been lost due to periods of warmth, which has led to locally poor snowpack retention, especially at lower and middle elevations.

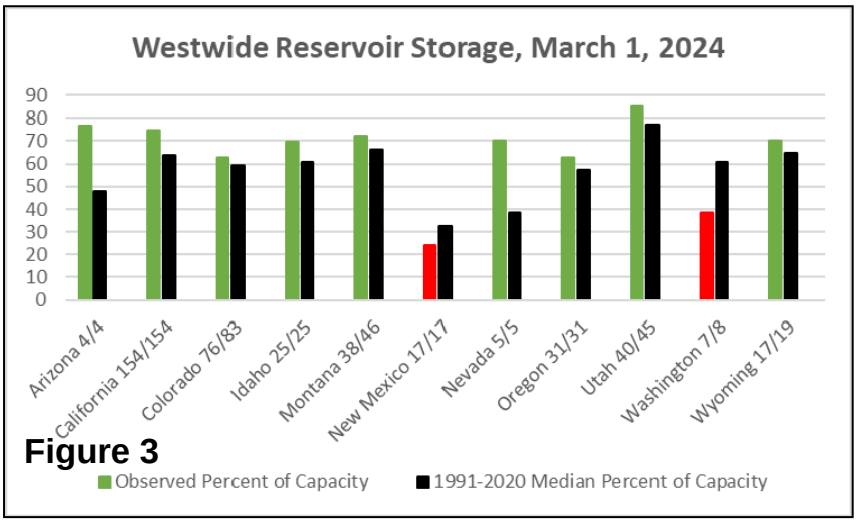
Reservoir Storage

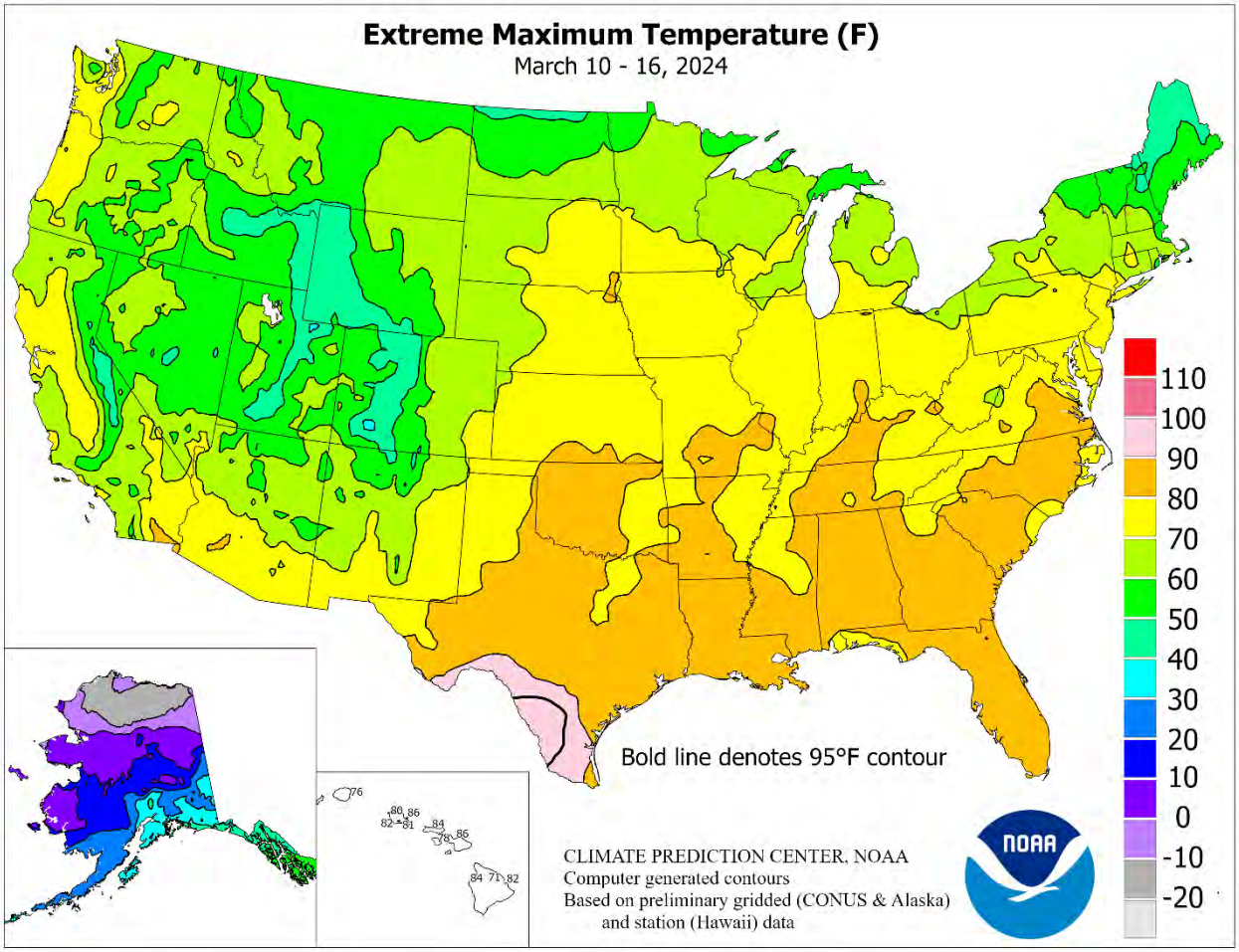
On March 1, 2024, statewide reservoir storage as a percent of average for the date primarily reflected the ongoing benefit of the abundant wet season of 2022-23, with only New Mexico and Washington reporting below-average storage (figure 3). As March began, California's 154 primary intrastate reservoirs held 28.5 million acre-feet of water, 118 percent of average. However, storage at the end of February in the Colorado River basin was 19.9 million acre-feet, just 60 percent of average.

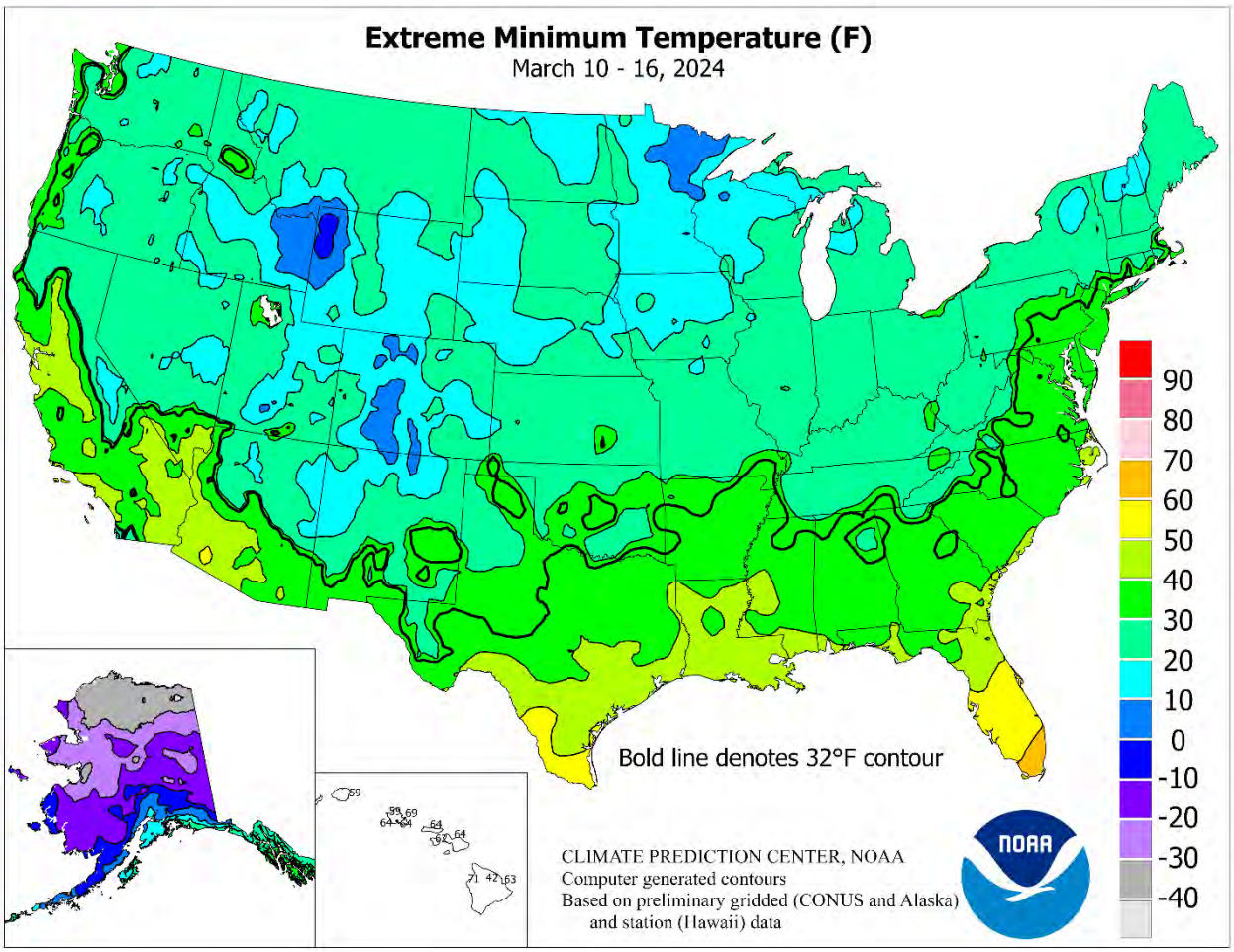
For More Information

The National Water and Climate Center homepage provides the latest available snowpack and water supply information. Please visit: http://www.wcc.nrcs.usda.gov



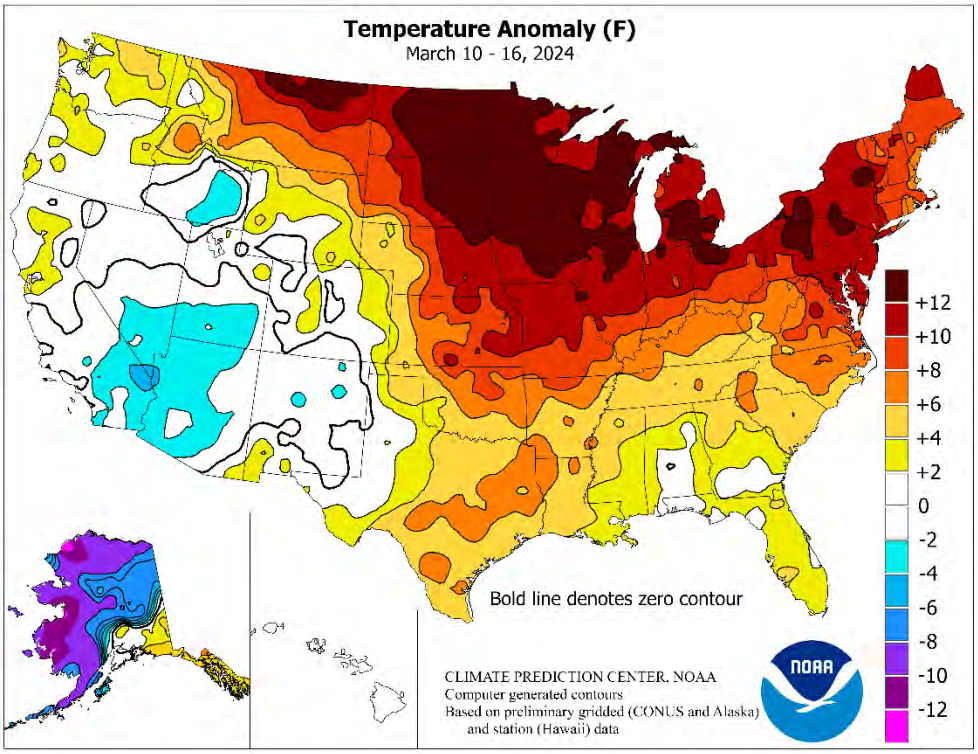



Extreme Maximum Temperature (F)
March 10 - 16, 2024
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
Bold line denotes 95°F contour
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS & Alaska)
and station (Hawaii) data
NOAA


Extreme Minimum Temperature (F)
March 10 - 16, 2024
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
Bold line denotes 32°F contour
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS and Alaska)
and station (Hawaii) data
NOAA

(Continued from front cover)

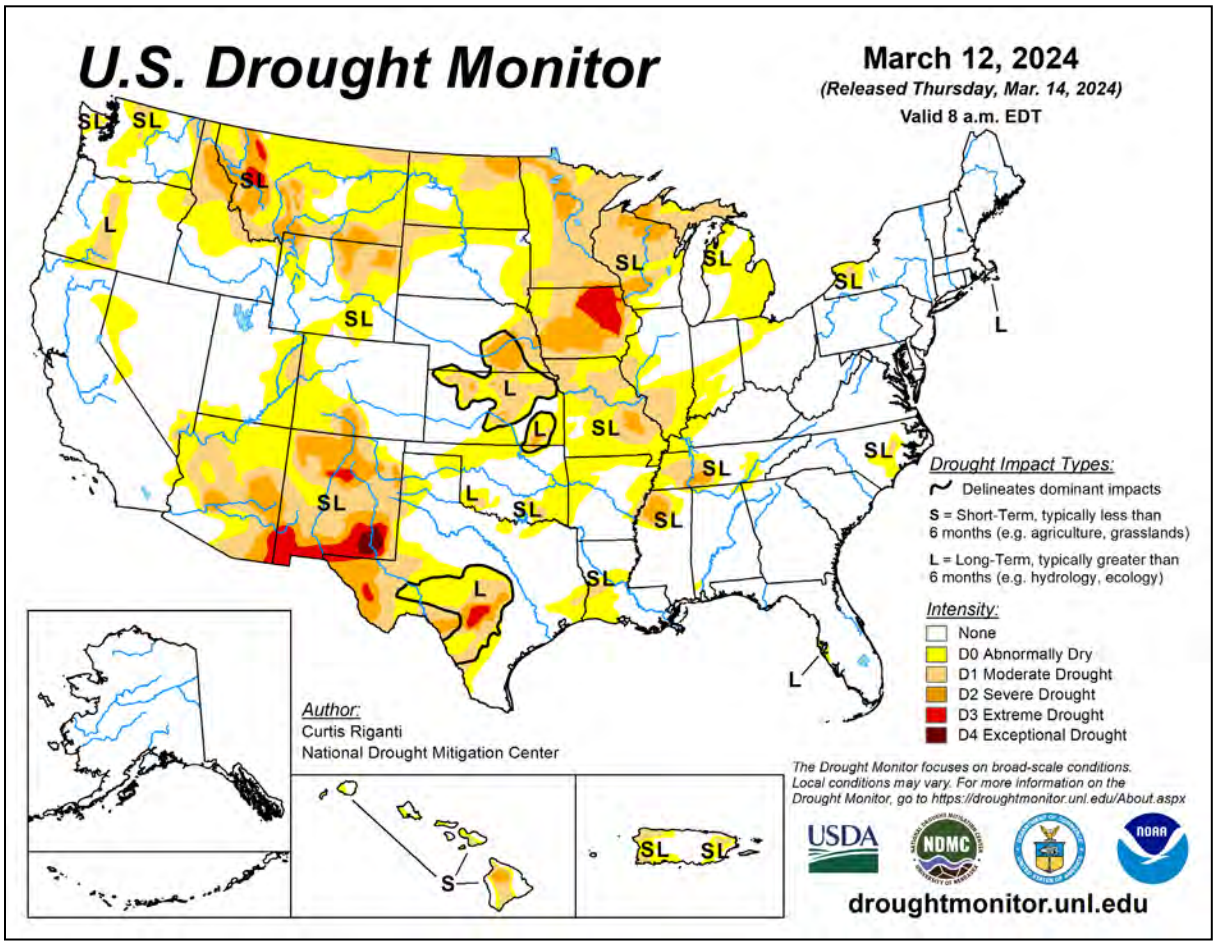
fell in other areas—early-week rainfall in the **East** and late-week mountain snow in the **Southwest**—but the **northern Plains** and **upper Midwest** experienced mostly dry weather. Precipitation also occurred in the **Pacific Northwest**, mainly from the **Cascades westward**. Elsewhere, the **southern High Plains** escaped a short-lived round of windy, dry weather without any major wildfires, unlike the late-February episode. Recovery efforts continued in fire-affected areas, primarily across the **Texas Panhandle**, but extending to other areas on the **central and southern Plains**. Above-normal temperatures prevailed from the **Plains eastward**, with weekly readings averaging at least 10°F above normal in most locations from the **upper Midwest into the Great Lakes region**. Cooler-than-normal conditions, with temperatures locally averaging as much as 5°F below normal, were generally confined to the **Southwest**.

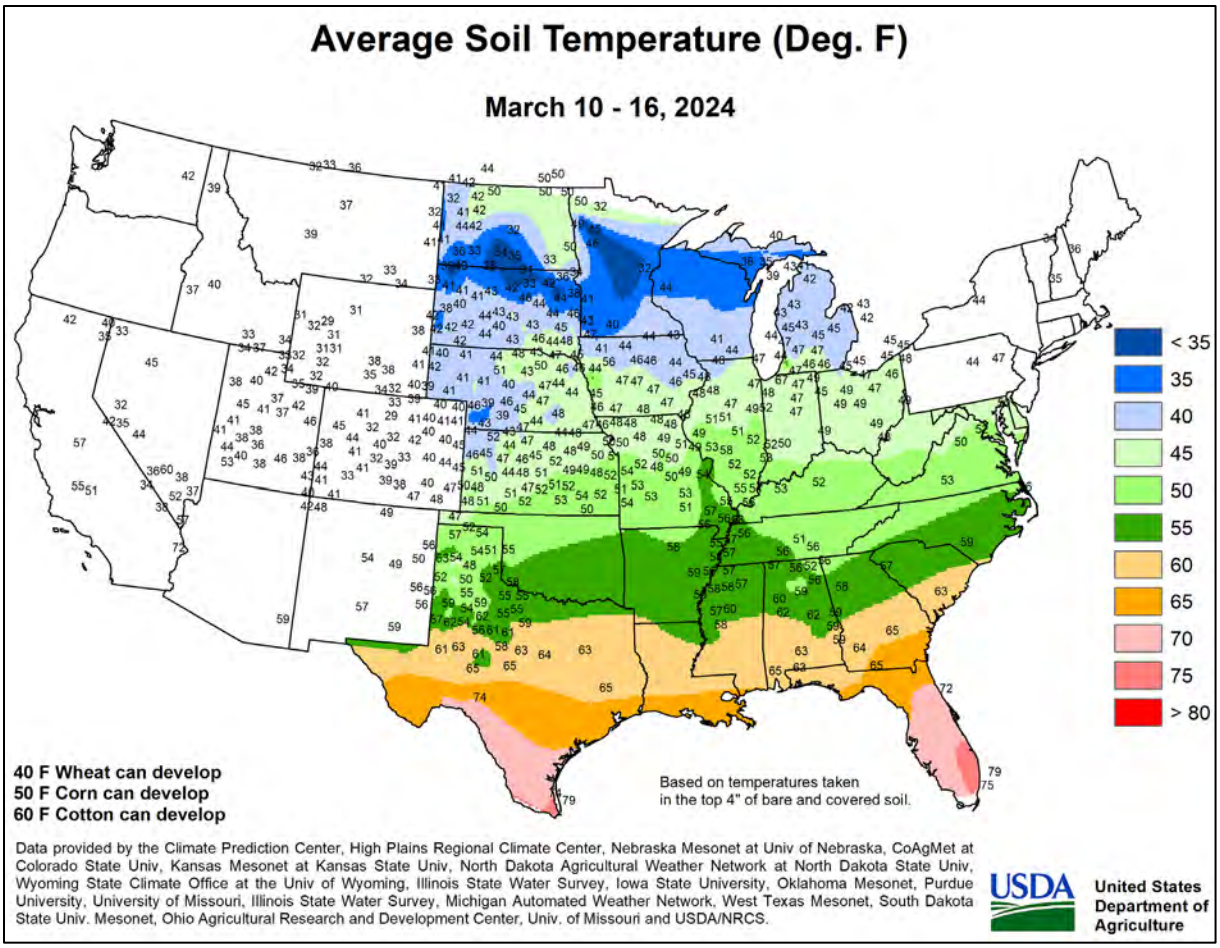


March 11 featured a high of 70°F in **Fargo, ND**—the earliest 70-degree reading in that location (previously, 75°F on March 15, 2015). On the same date, high temperatures surged to 80°F in **Sioux City, IA**, and **Sioux Falls, SD**. Those were not the earliest 80-degree readings, but very close, as records remain March 6, 2017, in **Sioux City**, and March 7, 2000, in **Sioux Falls**. Elsewhere on the 11th, daily-record highs included 79°F in **Norfolk, NE**, and 74°F in **Rochester, MN**. By March 12, warmth reached the **Great Lakes region**, where daily-record highs soared to 72°F in **Green Bay, WI**, and 70°F in **Gaylord, MI**. Elsewhere in **Michigan**, record-setting highs for March 13 included 73°F in **Detroit** and 72°F in **Muskegon**. Warmth also briefly shifted into the **Northeast**, where daily-record highs in **New York** for March 13 rose to 72°F in **Syracuse** and 62°F in **Watertown**. Lingering warmth in the **upper Midwest** allowed **Rochester, MN**, to tally a trio of daily-record highs (74, 69, and 68°F) from March 11-13. During the second half of week, however, record-setting temperatures retreated into the **South**. By March 14, daily-record highs included 89°F in **Shreveport, LA**, and 85°F in **Montgomery, AL**. With a high of 87°F, **Savannah, GA**, posted a daily-record high for March 15. At week's end, unusual warmth appeared in the **Northwest**, where consecutive daily-record highs occurred on March 15-16 in **Washington** locations such as **Quillayute** (73 and 80°F) and **Olympia** (64 and 74°F). **Quillayute's** 80-degree reading was also a monthly record, surpassing 79°F on March 20, 2019.

Heavy rain lingered through March 10 in **Maine**, where daily-record totals included 2.39 inches in **Portland** and 1.56 inches in **Augusta**. Windy weather trailed the departing **Eastern** storm system, with **mid-Atlantic** wind gusts on March 10 clocked to 58 mph in **Roanoke, VA**, and 53 mph in **Baltimore, MD**. The next day, a gust to 55 mph was recorded in **Binghamton, NY**. Meanwhile, there was a final round of precipitation in the **Pacific Northwest**, with **North Bend, OR**, netting a daily-record sum (1.88 inches on March 10). At mid-week, wet snow developed across the **central Rockies** and adjacent **High Plains**. In **Colorado**, March 13-15 snowfall totaled 12.9 inches in **Colorado Springs** and 5.7 inches in **Denver**. On the 14th, as rain changed to snow, **Pueblo, CO**, experienced its wettest March day on record, with 1.53 inches (and 2.5 inches of snow). Previously, **Pueblo's** wettest day during March had been March 18, 1998, with 1.26 inches. Numerous 3- to 5-foot snowfall totals were noted in the **Colorado Rockies**, with **Aspen Springs in Gilpin County** receiving 61.5 inches. Meanwhile, **Flagstaff, AZ**, received snowfall totaling 11.4 inches from March 13-16. On March 14, heavy rain erupted across the **mid-South** and **lower Midwest**, with daily-record totals in Arkansas topping 3 inches in **Little Rock** (3.59 inches) and **Jacksonville** (3.40 inches). **Burlington, IA**, also collected a record-setting sum for March 14, with 2.63 inches. Farther east, an EF-3 tornado with a path length of more than 25 miles cut across portions of **Indiana's Delaware and Randolph Counties** on March 14, with winds in **Winchester, IN**, estimated as high as 165 mph. The tornado, on the ground for at least 36 minutes from 7:37 to 8:13 pm EDT, also resulted in more than three dozen injuries before crossing into **Ohio** and lifting. The previously mentioned deadly tornado in **western Ohio** was also rated EF-3, with the fatalities and some of the most significant damage observed in the **Lakeview** area of **northwestern Logan County**. On March 15, **El Dorado, AR**, endured its wettest March day on record, with the daily total of 6.31 inches surpassing the mark of 5.85 inches set on March 28, 1914. Elsewhere, as snow blanketed higher elevations of the **Southwest**, **Las Vegas, NV**, closed the week on March 15-16 with consecutive daily-record rainfall totals of 0.35 and 0.36 inch, respectively.

Frigid weather engulfed much of **northern, western, and interior Alaska**, while unusually mild weather covered the **southeastern part of the state**. In **Kotzebue**, minimum temperatures dipped below -10°F each day from March 7-17, with a reading of -28°F occurring on the 12th. In contrast, daily-record highs in **southeastern Alaska** included 48°F (on March 14) in **Juneau** and 56°F (on March 16) in **Ketchikan**. From March 10-15, **Ketchikan** received precipitation totaling 5.42 inches. Elsewhere in **southeastern Alaska**, Yakutat netted a daily-record total of 2.65 inches on March 15 and a weekly sum of 5.39 inches. Farther south, scattered **Hawaiian** showers provided limited relief from pervasive short-term dryness. However, windward areas of the **Big Island** remained quite wet, with **Hilo's** month-to-date rainfall through March 16 climbing to 14.48 inches (213 percent of normal). At the state's other major airport observation sites, March 1-16 rainfall ranged from 0.21 inch (14 percent of normal) in **Honolulu, Oahu**, to 0.83 inch (58 percent) in **Kahului, Maui**. On the 15th, Kahului's high temperature (69°F) stayed below the 70-degree mark for the first time ever in March and for the first time since January 20, 1994.


U.S. Drought Monitor
March 12, 2024
(Released Thursday, Mar. 14, 2024)
Valid 8 a.m. EDT
Drought Impact Types:
Delineates dominant impacts
S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)
Intensity:
None
D0 Abnormally Dry
D1 Moderate Drought
D2 Severe Drought
D3 Extreme Drought
D4 Exceptional Drought
Author:
Curtis Riganti
National Drought Mitigation Center
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx
droughtmonitor.unl.edu


Average Soil Temperature (Deg. F)
March 10 - 16, 2024
< 35
35
40
45
50
55
60
65
70
75
> 80
40 F Wheat can develop
50 F Corn can develop
60 F Cotton can develop
Based on temperatures taken in the top 4" of bare and covered soil.
Data provided by the Climate Prediction Center, High Plains Regional Climate Center, Nebraska Mesonet at Univ of Nebraska, CoAgMet at Colorado State Univ, Kansas Mesonet at Kansas State Univ, North Dakota Agricultural Weather Network at North Dakota State Univ, Wyoming State Climate Office at the Univ of Wyoming, Illinois State Water Survey, Iowa State University, Oklahoma Mesonet, Purdue University, University of Missouri, Illinois State Water Survey, Michigan Automated Weather Network, West Texas Mesonet, South Dakota State Univ. Mesonet, Ohio Agricultural Research and Development Center, Univ. of Missouri and USDA/NRCS.
USDA
United States Department of Agriculture

National Weather Data for Selected Cities

Weather Data for the Week Ending March 16, 2024

Data Provided by Climate Prediction Center

STATES AND STATIONS		TEMPERATURE ˚F						PRECIPITATION							RELATIVE HUMIDITY PERCENT		NUMBER OF DAYS TEMP. ˚F		NUMBER OF DAYS PRECIP	
		AVERAGE MAXIMUM	AVERAGE MINIMUM	EXTREME HIGH	EXTREME LOW	AVERAGE	DEPARTURE FROM NORMAL	WEEKLY TOTAL, IN.	DEPARTURE FROM NORMAL	GREATEST IN 24-HOUR, IN.	TOTAL, IN., SINCE MAR 1	PCT. NORMAL SINCE MAR 1	TOTAL, IN., SINCE JAN 1	PCT. NORMAL SINCE JAN 1	AVERAGE MAXIMUM	AVERAGE MINIMUM	90 AND ABOVE	32 AND BELOW	.01 INCH OR MORE	.50 INCH OR MORE
AK	ANCHORAGE	32	20	37	14	26	2	0.12	-0.04	0.07	0.12	31	2.20	108	84	53	0	7	2	0
	BARROW	-19	-30	-11	-35	-25	0	0.00	-0.04	0.00	0.00	0	0.00	0	85	64	0	7	0	0
	FAIRBANKS	10	-5	15	-16	2	-6	0.11	0.01	0.07	0.13	57	0.71	52	73	50	0	7	3	0
	JUNEAU	43	32	49	26	38	6	1.89	1.07	0.63	2.56	129	14.76	118	92	64	0	4	6	3
	KODIAK	33	25	37	23	29	-4	0.04	-0.96	0.04	1.34	55	15.95	92	80	62	0	7	1	0
	NOME	6	-18	11	-24	-6	-15	0.00	-0.16	0.00	0.45	110	2.78	117	70	52	0	7	0	0
AL	BIRMINGHAM	71	46	82	34	59	3	0.61	-0.67	0.61	3.37	110	14.24	107	82	38	0	0	1	1
	HUNTSVILLE	69	44	82	33	56	3	1.04	-0.17	1.00	2.15	76	12.88	98	94	43	0	0	2	1
	MOBILE	76	51	84	41	63	3	0.19	-0.97	0.17	3.89	139	13.63	104	91	46	0	0	2	0
	MONTGOMERY	73	46	85	36	60	1	0.87	-0.32	0.87	6.04	209	21.54	171	91	43	0	0	1	1
AR	FORT SMITH	72	47	81	35	60	7	2.05	1.18	2.05	2.84	147	7.55	98	90	45	0	0	1	1
	LITTLE ROCK	73	48	81	37	60	9	4.14	3.04	3.58	5.31	204	17.52	171	85	47	0	0	2	2
AZ	FLAGSTAFF	46	25	55	19	35	-2	1.04	0.58	0.77	1.08	95	6.56	120	85	43	0	7	4	1
	PHOENIX	75	53	82	46	64	-2	0.19	-0.01	0.19	0.42	82	2.46	107	62	21	0	0	1	0
	PRESCOTT	54	32	63	26	43	-4	0.54	0.31	0.40	0.67	115	2.99	96	81	32	0	3	4	0
	TUCSON	73	47	77	42	60	-1	0.01	-0.12	0.01	0.56	181	3.67	181	69	22	0	0	1	0
CA	BAKERSFIELD	68	46	72	42	57	-1	0.00	-0.28	0.00	0.26	40	3.93	128	82	34	0	0	0	0
	EUREKA	58	41	69	34	49	0	0.88	-0.46	0.50	3.78	121	20.83	133	93	55	0	0	3	1
	FRESNO	69	47	73	42	58	1	0.04	-0.42	0.04	0.87	84	6.06	116	82	34	0	0	1	0
	LOS ANGELES	65	53	70	49	59	0	0.00	-0.42	0.00	0.99	91	12.49	177	88	47	0	0	0	0
	REDDING	66	49	78	44	58	3	1.13	0.00	0.47	3.01	113	15.94	111	71	37	0	0	3	0
	SACRAMENTO	66	47	73	43	56	1	0.17	-0.48	0.14	1.02	64	9.19	104	81	39	0	0	2	0
	SAN DIEGO	65	53	66	51	59	-1	0.06	-0.29	0.03	0.78	86	8.86	171	86	56	0	0	2	0
	SAN FRANCISCO	64	52	73	47	58	3	0.24	-0.42	0.12	2.02	126	11.25	117	76	45	0	0	2	0
	STOCKTON	69	47	76	44	58	2	0.07	-0.38	0.07	0.78	73	7.28	115	81	33	0	0	1	0
CO	ALAMOSA	48	20	57	11	34	0	0.45	0.33	0.41	0.86	351	1.56	182	91	37	0	7	3	0
	CO SPRINGS	51	30	64	24	41	0	1.46	1.28	1.11	1.50	408	3.50	349	75	38	0	4	3	1
	DENVER INTL	54	31	66	27	42	1	1.46	1.28	0.74	1.54	416	3.26	277	74	39	0	5	3	2
	GRAND JUNCTION	56	34	65	29	45	0	0.25	0.08	0.18	0.72	191	1.38	90	75	37	0	2	2	0
	PUEBLO	57	29	68	18	43	0	1.84	1.66	1.50	1.87	517	3.65	366	82	34	0	4	3	1
CT	BRIDGEPORT	60	38	72	34	49	10	0.09	-0.83	0.09	5.74	270	13.51	158	81	39	0	0	1	0
	HARTFORD	59	33	72	31	46	9	0.31	-0.54	0.31	4.69	236	14.84	174	81	35	0	4	1	0
DC	WASHINGTON	68	45	77	40	57	10	0.03	-0.78	0.02	2.35	133	9.50	129	75	27	0	0	2	0
DE	WILMINGTON	66	39	77	34	53	10	0.01	-0.96	0.01	3.78	179	11.80	142	72	31	0	0	1	0
FL	DAYTONA BEACH	78	58	85	51	68	3	1.36	0.55	1.36	2.37	130	7.85	112	99	50	0	0	1	1
	JACKSONVILLE	78	51	88	43	64	2	0.00	-0.73	0.00	2.88	164	9.26	115	95	39	0	0	0	0
	KEY WEST	83	74	84	69	78	4	0.00	-0.36	0.00	0.31	37	6.37	150	84	66	0	0	0	0
	MIAMI	83	68	88	65	76	3	0.00	-0.53	0.00	0.39	33	4.32	82	83	54	0	0	0	0
	ORLANDO	83	60	88	53	71	4	0.01	-0.67	0.01	0.42	28	4.38	72	93	41	0	0	1	0
	PENSACOLA	72	53	78	42	62	1	0.26	-0.84	0.26	3.96	146	11.42	90	88	44	0	0	1	0
	TALLAHASSEE	79	48	88	36	63	2	0.04	-1.20	0.04	2.08	68	9.22	77	93	32	0	0	1	0
	TAMPA	80	63	84	57	71	3	0.06	-0.48	0.04	0.60	47	6.88	104	89	49	0	0	2	0
	WEST PALM BEACH	82	66	87	61	74	3	0.00	-0.77	0.00	4.36	260	10.05	127	88	55	0	0	0	0
GA	ATHENS	72	44	80	33	58	4	0.12	-0.89	0.12	4.81	199	19.97	177	82	31	0	0	1	0
	ATLANTA	72	48	81	38	60	5	0.36	-0.71	0.36	6.69	262	16.30	137	73	33	0	0	1	0
	AUGUSTA	74	43	83	32	58	2	0.05	-0.88	0.05	2.61	119	8.46	85	90	26	0	1	1	0
	COLUMBUS	74	48	83	38	61	3	0.65	-0.47	0.65	7.02	262	19.28	182	86	35	0	0	1	1
	MACON	73	44	82	34	59	2	0.51	-0.44	0.51	5.24	228	16.15	147	91	36	0	0	1	1
	SAVANNAH	77	50	87	40	63	4	0.12	-0.68	0.11	2.23	121	7.46	93	84	27	0	0	2	0
HI	HILO	77	65	82	63	71	0	3.58	0.64	2.04	14.33	211	23.19	91	99	70	0	0	6	2
	HONOLULU	79	69	81	64	74	0	0.01	-0.60	0.01	0.22	16	3.10	59	79	55	0	0	1	0
	KAHULUI	77	66	86	64	72	-2	0.65	-0.02	0.40	0.83	57	5.74	96	93	64	0	0	3	0
	LIHUE	73	64	76	59	68	-5	0.20	-1.17	0.07	0.62	20	5.10	53	96	72	0	0	4	0
IA	BURLINGTON	63	39	72	27	51	11	2.96	2.43	2.65	4.86	404	6.83	154	82	43	0	1	2	1
	CEDAR RAPIDS	62	35	75	19	48	13	0.38	-0.06	0.38	0.62	64	1.22	38	86	38	0	2	1	0
	DES MOINES	64	40	76	23	52	14	0.44	-0.02	0.44	0.68	67	4.99	143	77	37	0	1	1	0
	DUBUQUE	59	35	71	23	47	13	1.09	0.63	1.09	1.71	161	3.68	91	83	39	0	2	1	1
	SIOUX CITY	64	30	80	14	47	12	0.18	-0.17	0.18	0.18	24	1.81	77	78	31	0	5	1	0
	WATERLOO	63	32	77	16	47	12	0.34	-0.07	0.34	0.67	74	2.19	68	73	28	0	2	1	0
ID	BOISE	56	33	63	26	45	0	0.10	-0.19	0.10	1.01	159	5.34	173	77	31	0	3	1	0
	LEWISTON	56	37	65	32	47	2	0.06	-0.24	0.03	0.19	30	2.92	103	79	40	0	1	3	0
	POCATELLO	47	24	56	11	35	-3	0.17	-0.11	0.17	2.56	403	6.11	222	91	50	0	7	1	0
IL	CHICAGO/O_HARE	61	39	71	30	50	12	0.42	-0.10	0.42	2.15	175	6.14	116	74	38	0	1	1	0
	MOLINE	63	38	73	24	50	12	0.67	0.09	0.67	1.62	120	4.64	94	79	39	0	1	1	1
	PEORIA	66	39	73	29	52	12	0.83	0.24	0.67	1.77	132	5.44	99	80	34	0	2	2	1
	ROCKFORD	62	35	73	25	48	12	0.37	-0.15	0.37	1.18	103	3.72	83	81	36	0	2	1	0
	SPRINGFIELD	66	39	74	29	53	11	0.94	0.33	0.91	2.99	221	7.64	145	81	38	0	2	2	1
IN	EVANSVILLE	67	40	79	26	53	8	0.37	-0.65	0.37	1.56	66	8.41	92	84	41	0	2	1	0
	FORT WAYNE	61	36	73	25	48	11	2.14	1.53	2.12	2.86	210	7.73	127	83	45	0	2	2	1
	INDIANAPOLIS	64	39	74	27	51	10	0.12	-0.69	0.12	1.42	80	7.50	100	84	39	0	2	1	0
	SOUTH BEND	60	40	73	27	50	15	1.44	0.94	1.41	2.74	220	7.97	126	89	46	0	1	2	1
KS	CONCORDIA	67	40	77	30	53	11	0.56	0.26	0.38	0.59	95	2.99	136	79	35	0	1	2	0
	DODGE CITY	68	36	77	28	52	8	0.00	-0.28	0.00	0.01	2	1.59	86	78	27	0	2	0	0
	GOODLAND	60	31	71	25	45	5	0.06	-0.13	0.06	0.32	87	2.15	183	79	30	0	5	1	0
	TOPEKA	71	40	76	26	55	10	0.10	-0.38	0.10	0.55	52	3.33	101	84	35	0	1	1	0

Based on 1991-2020 normals ***** Not Available**

Weather Data for the Week Ending March 16, 2024

STATES AND STATIONS		TEMPERATURE °F						PRECIPITATION							RELATIVE HUMIDITY PERCENT		NUMBER OF DAYS TEMP. °F		NUMBER OF DAYS PRECIP	
		AVERAGE MAXIMUM	AVERAGE MINIMUM	EXTREME HIGH	EXTREME LOW	AVERAGE	DEPARTURE FROM NORMAL	WEEKLY TOTAL, IN.	DEPARTURE FROM NORMAL	GREATEST IN 24-HOUR, IN.	TOTAL, IN., SINCE MAR 1	PCT. NORMAL SINCE MAR 1	TOTAL, IN., SINCE JAN 1	PCT. NORMAL SINCE JAN 1	AVERAGE MAXIMUM	AVERAGE MINIMUM	90 AND ABOVE	32 AND BELOW	.01 INCH OR MORE	.50 INCH OR MORE
	WICHITA	71	40	79	28	55	9	0.00	-0.51	0.00	0.82	75	3.15	98	83	32	0	1	0	0
KY	LEXINGTON	65	40	79	25	52	7	0.71	-0.31	0.51	2.42	102	11.23	117	79	41	0	1	2	1
	LOUISVILLE	67	42	82	31	55	7	0.46	-0.58	0.46	1.83	75	9.63	102	74	35	0	1	1	0
	PADUCAH	68	41	78	29	54	6	0.20	-0.84	0.20	1.19	48	10.94	105	86	43	0	2	1	0
LA	BATON ROUGE	80	57	87	46	68	7	0.76	-0.19	0.76	6.37	270	16.63	125	87	46	0	0	1	1
	LAKE CHARLES	76	57	83	44	67	4	1.52	0.75	1.52	2.50	135	14.10	127	95	54	0	0	1	1
	NEW ORLEANS	76	59	83	50	67	4	0.30	-0.64	0.30	5.19	227	16.57	141	89	54	0	0	1	0
	SHREVEPORT	76	57	88	45	67	8	***	***	***	***	***	***	***	85	46	0	0	***	***
MA	BOSTON	49	37	55	33	43	5	0.82	-0.08	0.79	4.20	204	12.26	139	87	65	0	0	2	1
	WORCESTER	52	33	66	28	43	9	0.49	-0.44	0.49	4.78	225	14.32	158	80	42	0	3	1	0
MD	BALTIMORE	67	42	80	35	55	11	0.02	-0.92	0.01	2.99	144	10.60	129	70	28	0	0	2	0
ME	CARIBOU	40	29	50	27	35	11	0.58	-0.04	0.51	1.33	90	4.45	64	90	62	0	7	3	1
	PORTLAND	46	32	50	27	39	6	2.29	1.39	1.97	6.16	299	14.50	157	89	60	0	4	3	1
MI	ALPENA	51	26	66	24	38	10	0.12	-0.26	0.12	1.95	217	5.22	121	92	42	0	7	1	0
	GRAND RAPIDS	57	35	71	29	46	12	0.72	0.23	0.64	2.49	212	7.58	128	84	42	0	4	4	1
	HOUGHTON LAKE	52	27	67	25	40	11	0.79	0.43	0.78	1.74	236	3.23	122	93	43	0	7	2	1
	LANSING	57	35	69	27	46	12	0.38	-0.07	0.35	1.51	144	5.59	114	82	40	0	4	2	0
	MUSKEGON	56	35	72	28	46	11	0.88	0.38	0.87	3.04	257	6.55	112	87	41	0	1	2	1
	TRAVERSE CITY	53	30	71	23	41	10	0.01	-0.31	0.01	1.07	144	2.70	77	87	40	0	6	1	0
MN	DULUTH	53	25	64	13	39	14	0.02	-0.28	0.02	0.06	8	1.11	41	74	31	0	6	1	0
	INT_L FALLS	47	22	62	8	35	13	0.08	-0.12	0.08	0.43	98	1.83	93	84	46	0	7	1	0
	MINNEAPOLIS	59	35	68	22	47	15	0.00	-0.33	0.00	0.00	0	0.78	31	60	25	0	2	0	0
	ROCHESTER	60	31	73	18	46	15	0.08	-0.32	0.06	0.09	10	0.89	30	70	24	0	3	2	0
	ST. CLOUD	58	28	68	15	43	15	0.00	-0.32	0.00	0.00	0	1.19	56	73	27	0	5	0	0
MO	COLUMBIA	69	42	78	29	56	11	0.55	-0.09	0.24	1.57	109	4.49	77	85	37	0	1	3	0
	KANSAS CITY	67	42	73	26	55	11	1.05	0.54	1.01	1.50	133	3.70	96	83	42	0	1	2	1
	SAINT LOUIS	71	45	80	30	58	12	0.63	-0.12	0.63	1.02	63	5.38	82	67	31	0	1	1	1
	SPRINGFIELD	70	41	80	26	56	9	0.18	-0.60	0.15	1.66	95	5.02	74	85	38	0	1	2	0
MS	JACKSON	73	51	83	41	62	5	0.33	-0.89	0.29	5.90	204	20.02	147	92	48	0	0	2	0
	MERIDIAN	73	47	80	38	60	3	0.52	-0.77	0.42	6.95	222	17.69	123	95	46	0	0	2	0
	TUPELO	73	45	84	33	59	5	1.00	-0.16	0.93	1.72	60	13.27	100	89	42	0	0	2	1
MT	BILLINGS	54	34	63	25	44	7	0.02	-0.15	0.02	0.17	46	1.40	93	71	32	0	2	1	0
	BUTTE	45	23	54	14	34	3	0.01	-0.11	0.01	0.15	56	1.60	140	81	38	0	7	1	0
	CUT BANK	51	28	59	23	39	9	0.00	-0.07	0.00	0.01	7	0.39	64	82	33	0	6	0	0
	GLASGOW	54	31	58	28	42	12	0.00	-0.10	0.00	0.29	130	1.32	129	80	42	0	4	0	0
	GREAT FALLS	55	29	61	23	42	9	0.00	-0.13	0.00	0.32	112	2.41	166	81	30	0	6	0	0
	HAVRE	54	31	58	28	42	12	0.01	-0.10	0.01	0.15	69	1.98	189	85	38	0	5	1	0
	MISSOULA	53	27	65	21	40	3	0.08	-0.11	0.06	0.16	34	1.82	78	93	38	0	6	2	0
NC	ASHEVILLE	67	40	78	29	54	6	0.54	-0.30	0.54	4.28	219	14.01	145	84	30	0	1	1	1
	CHARLOTTE	71	44	82	33	58	6	0.00	-0.92	0.00	2.84	133	11.03	124	76	25	0	0	0	0
	GREENSBORO	69	42	79	31	55	6	0.24	-0.61	0.24	2.69	140	11.79	143	74	26	0	1	1	0
	HATTERAS	65	51	75	45	58	5	0.00	-1.00	0.00	6.44	276	10.16	86	88	49	0	0	0	0
	RALEIGH	73	45	83	35	59	8	0.00	-0.95	0.00	2.02	94	8.11	95	78	26	0	0	0	0
	WILMINGTON	74	49	82	40	61	7	0.00	-0.93	0.00	2.33	109	5.80	60	80	28	0	0	0	0
ND	BISMARCK	55	27	61	24	41	12	0.00	-0.18	0.00	0.30	79	1.00	71	87	37	0	7	0	0
	DICKINSON	53	28	60	24	41	12	0.00	-0.10	0.00	0.08	36	0.13	16	85	36	0	6	0	0
	FARGO	56	30	70	23	43	17	0.02	-0.25	0.02	0.09	14	0.93	45	80	39	0	5	1	0
	GRAND FORKS	50	28	57	21	39	16	0.01	-0.19	0.01	0.13	30	0.64	43	85	55	0	7	1	0
	JAMESTOWN	55	28	63	19	41	16	0.02	-0.12	0.02	0.12	40	0.18	17	87	39	0	6	1	0
NE	GRAND ISLAND	65	35	76	28	50	11	0.14	-0.15	0.14	0.30	50	1.80	91	75	27	0	3	1	0
	LINCOLN	66	35	77	17	51	11	0.57	0.25	0.33	0.57	85	1.90	81	77	32	0	2	2	0
	NORFOLK	65	32	79	22	48	12	0.01	-0.28	0.01	0.01	1	1.43	69	71	24	0	4	1	0
	NORTH PLATTE	58	25	68	10	42	3	0.17	-0.04	0.17	0.87	200	2.32	163	90	38	0	5	1	0
	OMAHA	64	34	75	24	49	9	0.65	0.30	0.65	0.92	121	1.84	73	87	35	0	2	1	1
	SCOTTSBLUFF	58	29	66	21	44	4	0.00	-0.20	0.00	0.21	49	1.99	141	80	31	0	4	0	0
	VALENTINE	61	27	70	21	44	8	0.00	-0.20	0.00	0.18	40	1.61	114	83	27	0	6	0	0
NH	CONCORD	51	30	63	24	41	9	1.13	0.41	0.86	4.28	261	11.35	155	88	41	0	6	2	1
NJ	ATLANTIC_CITY	66	41	75	35	53	12	0.02	-1.04	0.02	4.72	198	12.86	141	73	29	0	0	1	0
	NEWARK	65	42	75	36	53	12	0.01	-0.93	0.01	3.79	179	10.10	117	72	30	0	0	1	0
NM	ALBUQUERQUE	57	35	69	29	46	-3	0.09	-0.01	0.09	0.13	57	0.87	84	70	31	0	2	1	0
NV	ELY	45	26	52	14	35	-2	0.17	-0.05	0.09	0.51	105	2.41	114	80	41	0	7	2	0
	LAS VEGAS	62	47	69	43	55	-5	0.63	0.54	0.35	0.63	231	1.79	108	58	25	0	0	2	0
	RENO	56	35	62	29	46	-1	0.00	-0.20	0.00	1.24	246	3.64	128	62	24	0	1	0	0
	WINNEMUCCA	55	30	63	23	42	0	0.16	-0.04	0.09	0.51	116	3.93	184	77	28	0	4	2	0
NY	ALBANY	56	33	69	29	45	10	0.22	-0.46	0.15	4.04	258	9.50	145	83	41	0	4	2	0
	BINGHAMTON	56	34	69	25	45	14	0.31	-0.37	0.16	2.98	197	9.12	137	82	40	0	2	4	0
	BUFFALO	51	35	63	28	43	10	0.65	0.01	0.31	1.04	69	6.70	90	89	52	0	2	4	0
	ROCHESTER	55	35	69	28	45	11	0.59	0.03	0.27	1.17	91	5.55	91	84	44	0	2	4	0
	SYRACUSE	55	34	72	28	45	12	0.50	-0.17	0.19	2.46	163	8.02	120	85	39	0	3	4	0
OH	AKRON-CANTON	57	35	68	25	46	8	0.78	0.07	0.61	1.63	100	5.78	81	85	50	0	3	4	1
	CINCINNATI	62	37	75	24	49	7	0.58	-0.35	0.58	2.28	108	9.65	110	86	43	0	3	1	1
	CLEVELAND	58	39	72	30	48	10	0.47	-0.21	0.20	1.65	106	6.09	85	83	48	0	2	4	0
	COLUMBUS	62	36	74	26	49	8	0.39	-0.43	0.38	1.36	76	7.26	99	84	42	0	2	2	0
	DAYTON	62	39	73	25	51	10	0.58	-0.19	0.55	2.48	144	9.45	130	81	45	0	2	3	1
	MANSFIELD	57	38	70	27	47	11	0.98	0.24	0.88	1.91	113	7.29	96	82	49	0	3	3	1

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Weather Data for the Week Ending March 16, 2024

STATES AND STATIONS		TEMPERATURE °F						PRECIPITATION							RELATIVE HUMIDITY PERCENT		NUMBER OF DAYS TEMP. °F		NUMBER OF DAYS PRECIP	
		AVERAGE MAXIMUM	AVERAGE MINIMUM	EXTREME HIGH	EXTREME LOW	AVERAGE	DEPARTURE FROM NORMAL	WEEKLY TOTAL, IN.	DEPARTURE FROM NORMAL	GREATEST IN 24-HOUR, IN.	TOTAL, IN., SINCE MAR 1	PCT. NORMAL SINCE MAR 1	TOTAL, IN., SINCE JAN 1	PCT. NORMAL SINCE JAN 1	AVERAGE MAXIMUM	AVERAGE MINIMUM	90 AND ABOVE	32 AND BELOW	.01 INCH OR MORE	.50 INCH OR MORE
	TOLEDO	61	38	72	28	50	12	1.25	0.69	1.17	2.15	162	7.33	121	83	42	0	2	3	1
	YOUNGSTOWN	58	35	70	28	47	11	0.56	-0.16	0.28	1.46	88	6.96	95	84	46	0	4	3	0
OK	OKLAHOMA CITY	71	44	83	31	57	7	0.01	-0.52	0.01	0.69	57	3.70	92	86	38	0	1	1	0
	TULSA	72	44	80	32	58	7	0.02	-0.66	0.02	0.73	49	4.73	98	83	38	0	1	1	0
OR	ASTORIA	59	40	75	34	50	4	1.77	-0.07	1.07	4.43	104	27.28	122	88	54	0	0	3	2
	BURNS	51	27	61	23	39	1	0.06	-0.15	0.05	0.72	148	5.00	179	87	36	0	6	2	0
	EUGENE	59	39	74	33	49	3	0.95	-0.10	0.39	2.51	100	11.79	88	92	50	0	0	4	0
	MEDFORD	61	37	74	33	49	1	0.11	-0.29	0.06	1.75	183	7.93	138	87	34	0	0	2	0
	PENDLETON	58	35	65	28	46	2	0.07	-0.23	0.05	0.13	18	3.47	100	80	38	0	2	3	0
	PORTLAND	61	42	76	36	51	4	0.54	-0.38	0.31	1.26	58	14.57	132	81	38	0	0	3	0
	SALEM	59	38	76	32	49	1	1.32	0.31	0.70	2.80	118	17.31	131	89	44	0	1	3	1
PA	ALLENTOWN	62	36	74	33	49	10	0.03	-0.79	0.02	2.86	154	10.41	129	79	35	0	0	2	0
	ERIE	55	37	67	31	46	11	0.51	-0.18	0.22	1.17	74	6.22	81	84	47	0	1	4	0
	MIDDLETOWN	64	38	76	34	51	10	0.06	-0.78	0.02	2.38	129	10.58	140	83	33	0	0	3	0
	PHILADELPHIA	66	42	77	37	54	12	0.00	-0.91	0.00	3.49	173	10.83	135	72	29	0	0	0	0
	PITTSBURGH	61	38	74	30	50	11	0.06	-0.67	0.03	1.59	97	7.53	103	75	36	0	2	3	0
	WILKES-BARRE	61	36	73	30	49	12	0.09	-0.52	0.07	3.05	220	10.13	165	79	35	0	2	2	0
	WILLIAMSPORT	62	35	73	31	49	11	0.22	-0.48	0.20	2.71	173	10.83	156	86	32	0	1	2	0
RI	PROVIDENCE	55	34	64	29	45	7	1.31	0.24	1.29	6.35	265	16.47	166	91	43	0	2	2	1
SC	CHARLESTON	77	51	86	40	64	6	0.00	-0.76	0.00	6.32	363	11.26	136	81	25	0	0	0	0
	COLUMBIA	75	45	83	37	60	5	0.20	-0.62	0.20	5.46	278	10.77	120	89	29	0	0	1	0
	FLORENCE	75	45	82	36	60	5	0.29	-0.42	0.28	3.87	231	8.46	107	88	28	0	0	2	0
	GREENVILLE	74	44	81	33	59	7	0.77	-0.27	0.77	5.50	230	18.14	173	75	23	0	0	1	1
SD	ABERDEEN	61	26	72	21	44	14	0.00	-0.18	0.00	0.00	0	0.29	18	85	27	0	5	0	0
	HURON	63	30	73	24	46	15	0.00	-0.22	0.00	0.02	4	1.06	57	79	23	0	5	0	0
	RAPID CITY	59	28	67	16	43	9	0.00	-0.18	0.00	0.00	0	0.81	67	71	26	0	5	0	0
	SIOUX FALLS	66	32	80	22	49	16	0.00	-0.30	0.00	0.00	0	1.32	62	69	21	0	4	0	0
TN	BRISTOL	65	37	77	26	51	4	0.52	-0.36	0.52	2.63	127	9.96	103	88	37	0	3	1	1
	CHATTANOOGA	71	44	82	34	58	5	1.26	0.07	1.26	3.17	112	12.52	96	82	33	0	0	1	1
	KNOXVILLE	67	41	79	28	54	5	0.71	-0.36	0.71	2.74	106	13.22	107	84	36	0	2	1	1
	MEMPHIS	69	46	80	37	58	5	2.13	0.85	1.27	3.09	103	13.30	112	81	45	0	0	3	2
	NASHVILLE	70	42	81	30	56	6	1.18	0.17	0.83	2.84	120	11.80	107	82	34	0	1	2	1
TX	ABILENE	71	50	86	33	61	3	0.10	-0.28	0.08	1.37	154	4.78	143	88	43	0	0	2	0
	AMARILLO	65	36	77	26	50	1	0.17	-0.12	0.16	0.17	30	1.81	99	76	34	0	1	2	0
	AUSTIN	77	60	84	43	68	6	0.07	-0.56	0.06	0.27	18	7.21	119	89	54	0	0	2	0
	BEAUMONT	77	58	84	42	68	5	0.54	-0.24	0.54	1.04	58	14.35	139	95	56	0	0	1	1
	BROWNSVILLE	83	67	89	60	75	5	0.03	-0.28	0.03	0.03	4	3.30	115	92	54	0	0	1	0
	CORPUS CHRISTI	81	64	88	51	72	6	0.14	-0.38	0.14	0.14	11	4.39	111	94	60	0	0	1	0
	DEL RIO	82	60	93	49	71	6	0.01	-0.24	0.01	0.01	2	0.59	32	76	33	3	0	1	0
	EL PASO	72	47	77	39	60	2	0.00	-0.06	0.00	0.00	0	0.72	75	46	17	0	0	0	0
	FORT WORTH	72	55	81	40	64	6	1.54	0.81	0.77	4.29	248	9.16	128	87	58	0	0	3	2
	GALVESTON	74	63	79	55	68	4	0.32	-0.36	0.32	0.34	22	7.95	98	94	70	0	0	1	0
	HOUSTON	77	58	83	44	68	5	0.11	-0.65	0.07	0.19	10	10.84	124	96	58	0	0	2	0
	LUBBOCK	68	41	80	30	55	2	0.49	0.24	0.25	0.49	93	1.79	96	72	33	0	1	2	0
	MIDLAND	70	44	81	31	57	0	0.52	0.39	0.47	0.52	164	1.10	69	84	30	0	1	2	0
	SAN ANGELO	73	49	88	31	61	3	0.03	-0.29	0.03	0.06	8	1.22	41	90	40	0	1	1	0
	SAN ANTONIO	77	59	88	41	68	6	0.04	-0.46	0.02	0.08	6	6.27	127	92	55	0	0	2	0
	VICTORIA	79	60	87	43	70	6	0.01	-0.62	0.01	0.02	1	10.42	168	94	55	0	0	1	0
	WACO	73	55	80	34	64	6	0.94	0.20	0.94	1.33	74	7.02	97	93	56	0	0	1	1
	WICHITA FALLS	73	47	86	35	60	6	0.45	0.02	0.45	0.76	76	5.06	138	90	42	0	0	1	0
UT	SALT LAKE CITY	54	34	62	30	44	-1	0.43	0.05	0.37	0.98	119	4.96	137	78	35	0	2	2	0
VA	LYNCHBURG	69	40	79	31	54	9	0.02	-0.85	0.02	2.31	120	10.15	121	73	25	0	1	1	0
	NORFOLK	70	46	81	41	58	8	0.04	-0.81	0.04	4.76	248	10.81	129	74	28	0	0	1	0
	RICHMOND	72	44	82	37	58	10	0.00	-0.93	0.00	4.07	197	12.08	150	71	22	0	0	0	0
	ROANOKE	70	44	82	35	57	9	0.00	-0.80	0.00	1.63	90	8.18	102	57	24	0	0	0	0
	WASH/DULLES	68	40	80	34	54	11	0.01	-0.79	0.01	2.30	130	9.49	128	72	28	0	0	1	0
VT	BURLINGTON	49	29	58	25	39	8	1.26	0.76	0.43	2.77	245	6.28	123	90	43	0	7	5	0
WA	OLYMPIA	57	35	74	28	46	2	1.18	-0.16	0.68	2.37	76	16.83	104	97	47	0	3	3	1
	QUILLAYUTE	59	39	78	34	49	5	3.38	0.64	1.71	6.81	109	32.85	103	87	56	0	0	3	2
	SEATTLE-TACOMA	56	41	74	36	48	1	0.54	-0.44	0.20	1.11	50	10.75	90	85	47	0	0	3	0
	SPOKANE	53	33	68	28	43	4	0.11	-0.31	0.06	0.45	46	4.39	99	85	44	0	2	3	0
	YAKIMA	59	30	70	25	45	2	0.00	-0.15	0.00	0.06	17	2.39	99	81	34	0	5	0	0
WI	EAU CLAIRE	59	28	69	18	43	13	0.00	-0.38	0.00	0.22	26	0.85	28	70	25	0	5	0	0
	GREEN BAY	58	31	72	25	44	13	0.00	-0.41	0.00	0.91	98	2.16	60	77	32	0	5	0	0
	LA CROSSE	62	32	70	23	47	12	0.00	-0.41	0.00	0.58	65	1.72	50	68	25	0	4	0	0
	MADISON	57	32	68	27	45	11	1.02	0.56	0.99	2.22	217	4.73	116	81	38	0	4	2	1
	MILWAUKEE	57	37	71	30	47	11	1.43	0.98	1.38	3.35	324	7.22	157	74	43	0	2	2	1
WV	BECKLEY	60	36	75	26	48	6	0.25	-0.67	0.23	1.76	84	9.64	113	73	32	0	2	2	0
	CHARLESTON	65	36	78	30	50	5	0.27	-0.70	0.27	2.05	92	10.06	111	79	33	0	2	1	0
	ELKINS	60	31	75	26	46	6	0.57	-0.35	0.40	2.09	101	9.35	106	95	39	0	5	2	0
	HUNTINGTON	66	39	80	30	53	7	0.43	-0.53	0.42	2.50	112	11.75	133	76	32	0	1	2	0
WY	CASPER	48	25	60	17	37	2	0.25	0.08	0.24	0.26	69	1.28	87	81	42	0	5	2	0
	CHEYENNE	46	29	59	23	38	1	0.44	0.24	0.32	0.69	159	1.98	148	74	46	0	6	3	0
	LANDER	45	28	54	24	36	1	0.79	0.54	0.54	0.93	188	2.84	163	78	44	0	6	2	1
	SHERIDAN	55	28	65	17	41	6	0.03	-0.18	0.03	0.15	35	1.30	75	75	33	0	6	1	0

Based on 1991-2020 normals ***** Not Available**

Winter Weather Review

Weather summary provided by USDA/WAOB

Highlights: It was easily the warmest U.S. winter on record (for the Lower 48 States), fueled by unprecedented warmth in December and near-record warmth in February. In fact, sustained frigid conditions in the central and eastern U.S., as well as the Northwest, were effectively limited to a brief period, roughly 10 days, in mid-January. The overarching warmth was driven by weather patterns associated with a strong, mature, El Niño, as well as pervasively warm oceanic temperatures spanning nearly the entire globe. Meanwhile, much of the West experienced a second consecutive favorably wet winter, with exceptions. For example, mountain snowpack was slow to build in the Sierra Nevada, although mid- to late-winter storminess left snow-water equivalencies approaching normal by the end of February—with additional snow falling in early March. Farther north, however, end-of-winter snowpack was considerably below average in much of Montana, Washington, northern Idaho, and northeastern Wyoming.

With mild conditions lasting for much of the winter, there was little reprieve from extreme weather, such as wildfires and severe thunderstorms, more typically associated with other seasons. During the final days of winter, on February 26-27, a rash of wildfires on the central and southern Plains resulted in some livestock losses and extensive damage to farm and ranch infrastructure. During the late-February wildfire siege, well over a million acres of vegetation—mostly dormant grasses—burned across the Texas Panhandle and adjacent areas, with well over 100 homes destroyed. Fire-related impacts on ranching operations included cattle deaths and injuries, as well as fencing losses. The Smokehouse Creek Fire—east and northeast of Lake Meredith—became the largest wildfire in modern Texas history, scorching more than 1.05 million acres when including some acreage in western Oklahoma. Large, late-February wildfires burned as far north as Nebraska, where the Betty's Way Fire consumed more than 71,000 acres of vegetation north of North Platte. Regarding severe thunderstorms, the last seven (of 83) U.S. tornado-related fatalities during 2023 occurred in Tennessee on December 9. The peak day for severe weather during the first month of 2024 was January 9, when one tornado-related fatality apiece occurred in Alabama and North Carolina. During the last month of meteorological winter, the first two February tornadoes ever observed in Wisconsin—with records back to 1950—touched down on the 8th. Another round of severe weather struck areas from the eastern Corn Belt to the Appalachians on February 27-28, with tornadoes spotted on the initial day of the outbreak as far north as northern Illinois and southern Michigan.

According to the *U.S. Drought Monitor*, drought coverage in the Lower 48 States started the winter at 36.05 percent and dipped as low as 19.46 percent by mid-February 2024. Winter drought improvement was particularly pronounced from the central Gulf Coast to the mid-Atlantic, with modest improvement noted in areas such as the central and southern Plains, the Pacific Northwest, and much of the Southwest. Only parts of the northern Rockies and adjacent High Plains saw a sizeable increase in drought coverage between November 28, 2023, and February 13, 2024. During the final weeks of winter, U.S. drought coverage crept back up to 21.59 percent by February 27. With improving soil moisture in many winter wheat production areas, the crop mostly overwintered well. Notably, Kansas reported the most significant improvement in winter wheat rated good to excellent between November 26 and February 25, from 32 to 57 percent. Other states observing a double-digit increase in winter wheat rated good to excellent between late November and late February included North Carolina (from 71 to 89 percent), Oklahoma (from 53 to 70 percent), Nebraska (from 49 to 60 percent), and Michigan (from 46 to 57 percent). Meanwhile, Montana experienced the greatest decline in winter wheat rated good to excellent (from 58 to 45 percent) during the 3-month period ending in late February. Based on *U.S. Drought Monitor*-derived statistics, just 12 percent of the U.S. winter wheat production area was experiencing drought on February 20, 2024, down from an autumn 2023 peak of 49 percent.

Historical Perspective: According to preliminary data provided by the National Centers for Environmental Information, the incredible warmth of December and February propelled the U.S. to its warmest winter on record, with a national average temperature of 37.60°F. That value was 5.37°F above the 1901-2000 mean and easily blasted past the 2015-16 standard of 36.78°F. Amazingly, all the thirteen warmest winters in the last 130 years have occurred since 1990. Meanwhile, it was the nation's 21st-wettest winter on record, despite a relatively dry February. December-February precipitation across the Lower 48 States averaged 7.71 inches, nearly an inch above the 1901-2000 mean of 6.79 inches.

It was the warmest winter on record in eight states, including Iowa and most Canadian Border States from North Dakota to New Hampshire (figure 1). In fact, top-ten rankings for winter warmth spanned much of the country, excluding only Arizona, New Mexico, and Washington, along with the Southeastern States from Arkansas and Louisiana eastward to the Carolinas, Georgia, and Florida. The "coolest" state, Alabama, ranked in the warmest one-third of the historical distribution, coming in with its 43rd-warmest winter. Meanwhile, state precipitation rankings ranged from the 22nd-driest winter in Montana to top-ten winter wetness in Kansas and the nine Atlantic Coast States from Virginia to Massachusetts (figure 2).

December: As December began, producers had completed most harvest activities for 2023 crops. By November 26, only 4 percent of the U.S. corn acreage had not been harvested, compared to the 5-year average of 5 percent. On the same date, the U.S. cotton harvest was 83 percent complete, ahead of the 5-year average of 79 percent. Thereafter, December featured periods of significant precipitation in several areas of the country, including large sections of the Plains, upper Midwest, and Atlantic Coast States. However, drier-than-normal weather dominated the

Figure 1

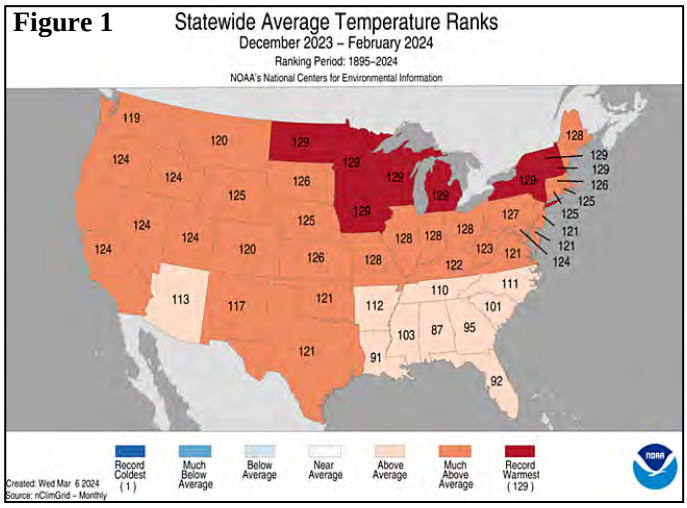
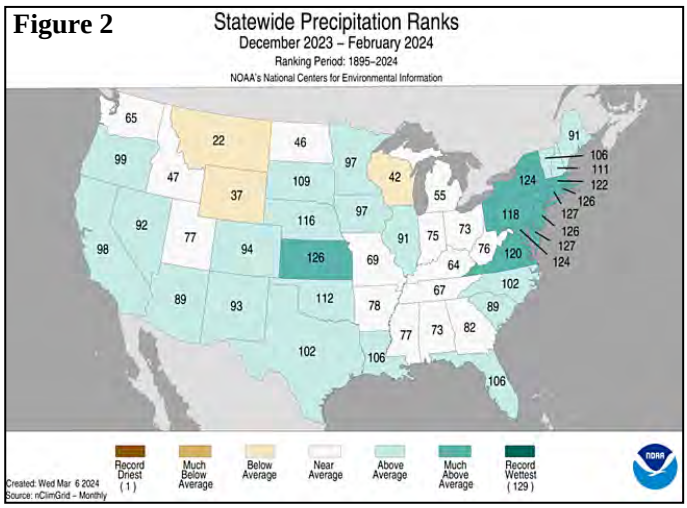


Figure 2



mid-South and interior sections of the western U.S. In the latter region, mountain snowpack was slow to build, due to a combination of mild weather and lack of storminess. According to the California Department of Water Resources, the average water equivalency of the Sierra Nevada snowpack stood at 2.5 inches by month's end, approximately one quarter of the end-of-December average.

Mild December weather covered not only the West, but also the remainder of the country. Characteristic of El Niño, which developed in the spring and summer of 2023 but only much later began to strongly influence North American weather patterns, the warmest weather—with temperatures averaging at least 6 to 12°F above normal—stretched from the northern and central Plains into the Northeast. Even relatively cooler areas, such as the lower Southeast, noted near- or slightly above-normal December temperatures. For parts of the northern Plains and upper Midwest, it was the warmest December on record. In South Dakota alone, it was the warmest December in dozens of communities, including Huron, Mitchell, Mobridge, Sioux Falls, Sisseton, and Watertown. In each of those locations, previous records for December warmth had been set in 1939 or earlier.

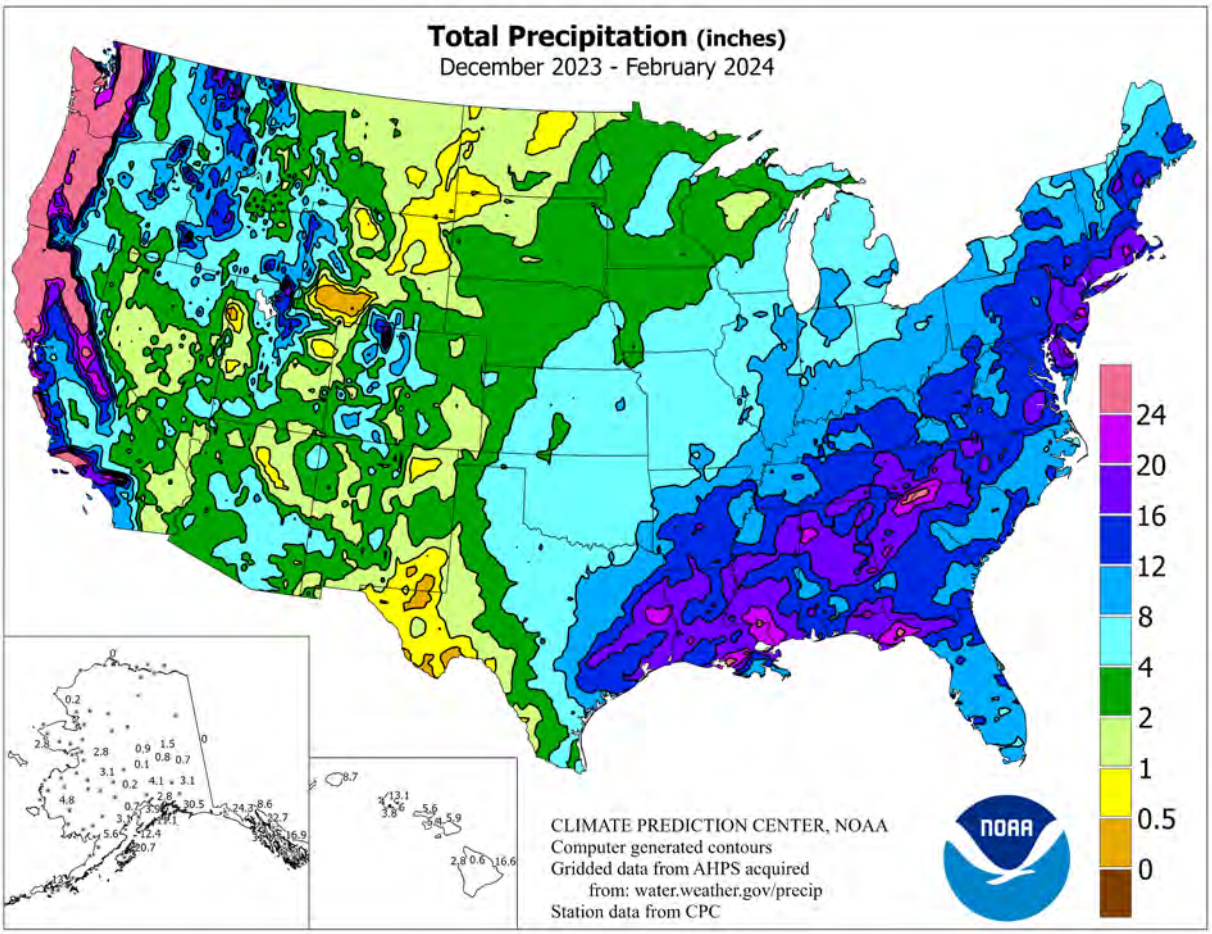
January: Following the nation's warmest December on record, January began with a continuation of mild weather. However, for approximately 10 days, peaking around mid-January, frigid, windy, and occasionally snowy weather caused widespread travel disruptions and significantly increased livestock stress, just as lambing and calving were getting underway. Some of the greatest impacts stretched from the central Plains into the Midwest, where back-to-back winter storms resulted in blizzard conditions. Ironically, the snow was highly beneficial for winter wheat, especially in drought-affected areas of the central Plains.

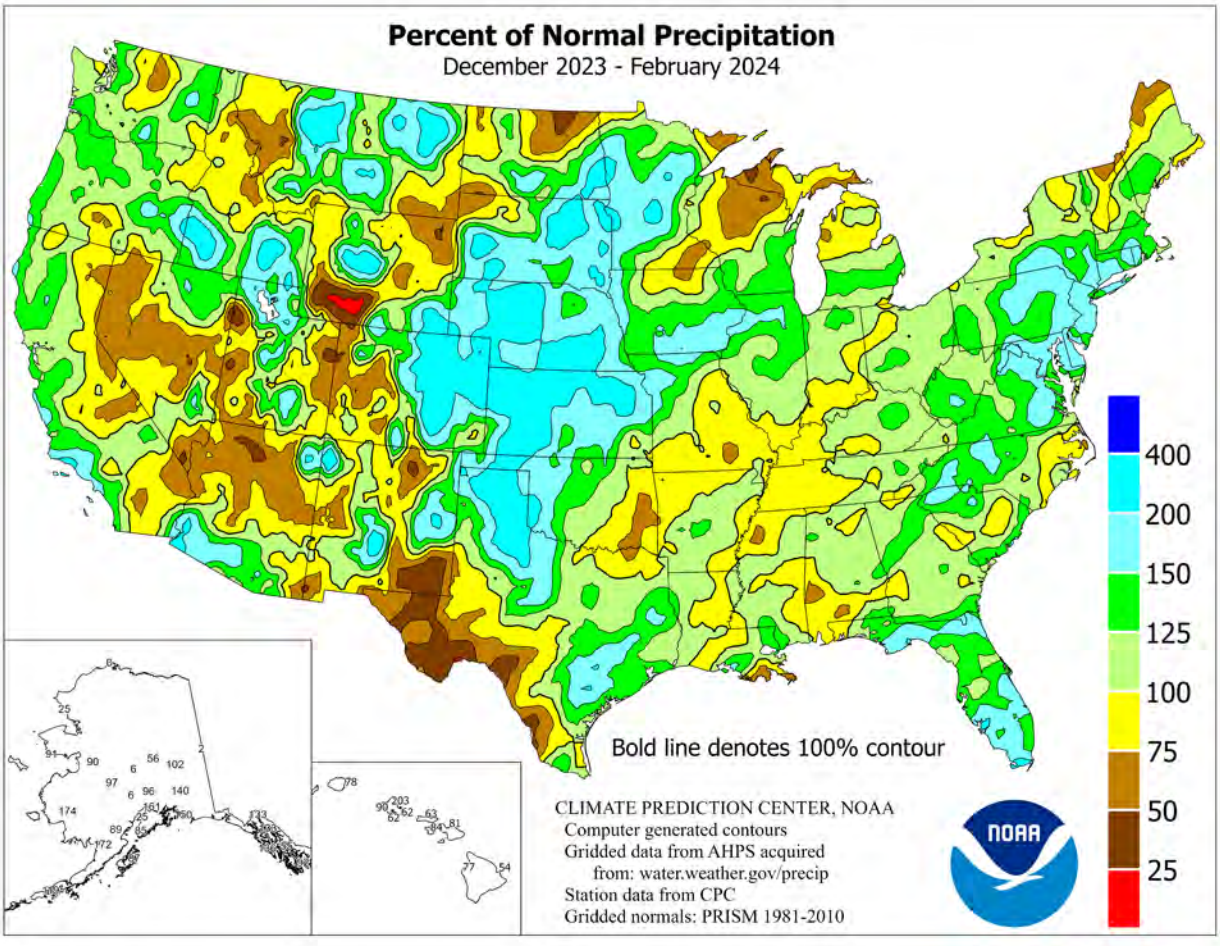
In fact, there were marked improvements in topsoil moisture during January across the Plains, South, and lower Midwest. Between December 31, 2023, and late January, states reporting 20- to 50-point decreases in topsoil moisture rated very short to short included Louisiana (from 64 to 15 percent), Mississippi (from 52 to 8 percent), Tennessee (from 44 to 2 percent), Indiana (from 40 to 8 percent), Kansas (from 47 to 20 percent), Nebraska (from 52 to 26 percent), Illinois (from 28 to 4 percent), and Colorado (from 45 to 23 percent). Despite lingering, long-term drought in parts of the South and Midwest, surplus topsoil moisture developed in some areas, due to rain and melting snow. By late January, topsoil moisture was rated one-third to two-thirds surplus in a few states, including Ohio (62 percent), Tennessee (60 percent), North Carolina (43 percent), Illinois (39 percent), Louisiana (39 percent), and Mississippi (34 percent).

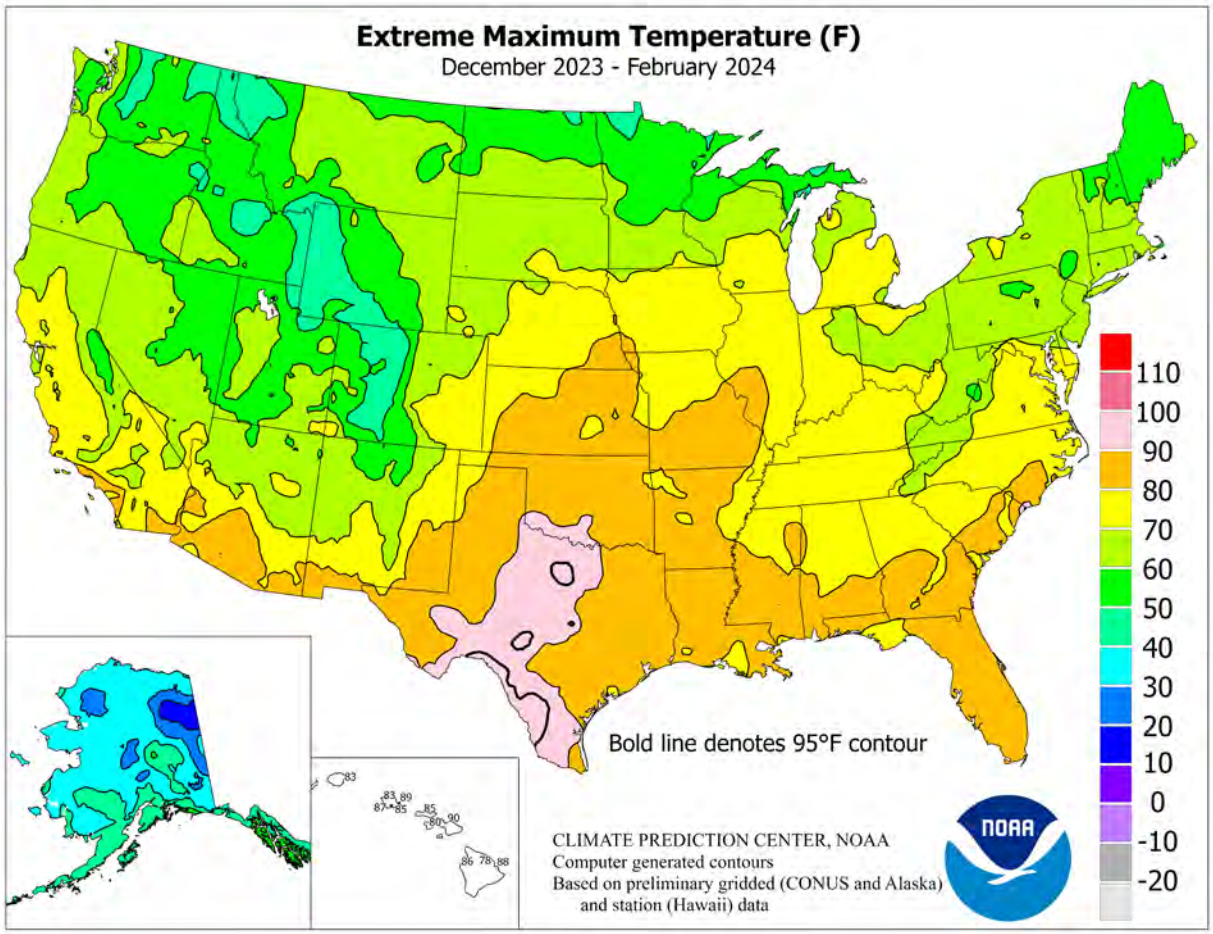
There was some January improvement in the Western snowpack situation, although there were still large gaps in adequate coverage. Notably, the average water equivalency of the Sierra Nevada snowpack increased about 6 inches during January. However, that left the Sierra Nevada with an average water equivalency of just 8.5 inches by month's end, approximately one-half of the end-of-January average. Another notable area with sub-par snowpack at the end of January stretched from the northern Cascades to the northern Rockies.

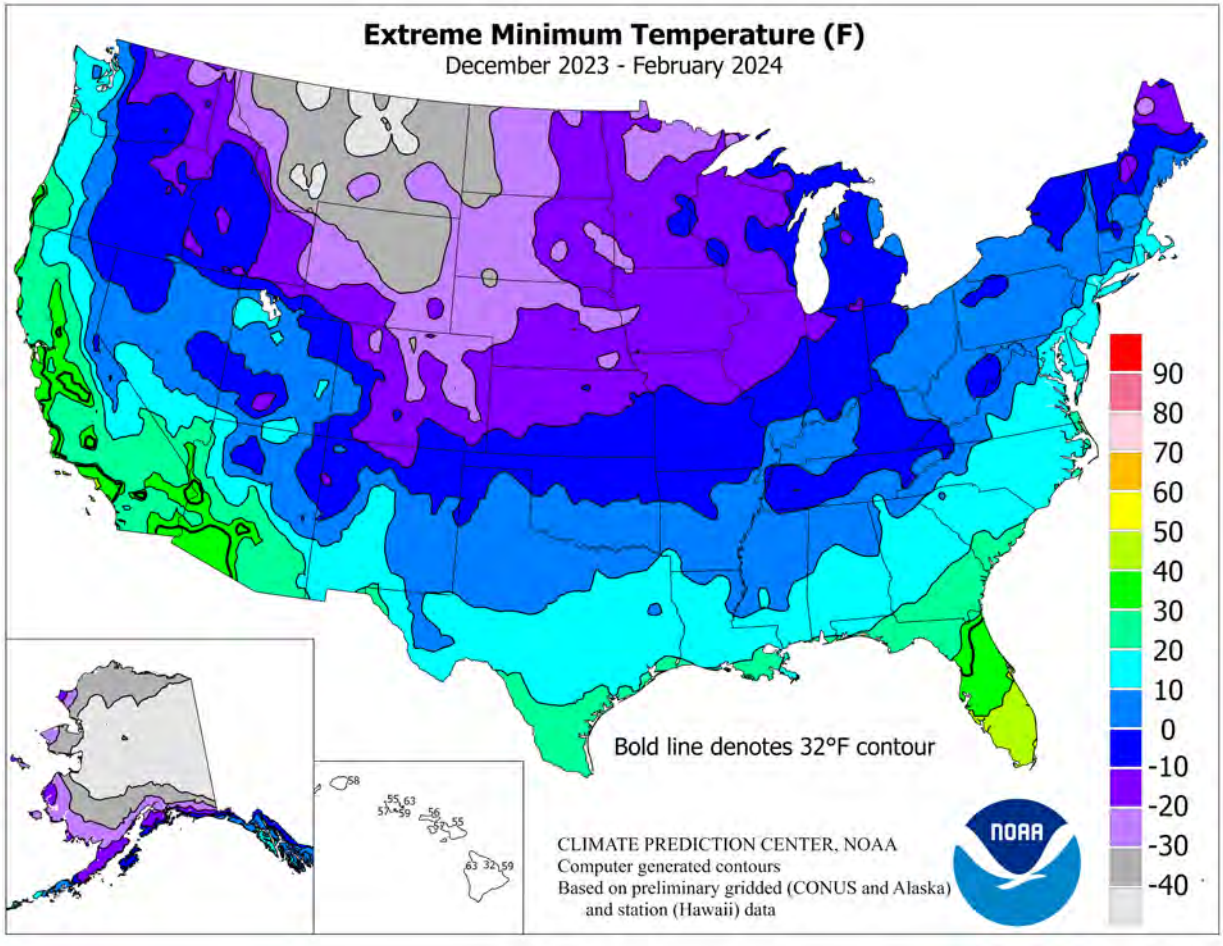
The mid-month Arctic blast produced sub-zero temperatures as far south as Texas' northern panhandle and the Tennessee Valley and resulted in readings below -30°F on the northern High Plains. The greatest concern for winter wheat health was focused across Montana, where only a patchy or shallow snow cover existed when the coldest air arrived on January 13-14. Farther south, freezes struck Deep South Texas on January 16-17, with potential impacts on citrus and other temperature-sensitive crops. Southern Louisiana experienced hard freezes (28°F or below) from January 15-17, although impacts were limited by the fact that the sugarcane harvest was complete. Meanwhile, Florida's key winter agricultural areas escaped the cold wave. On the strength of the mid-January cold snap, monthly temperatures averaged at least 2 to 6°F below normal across the nation's mid-section, including much the Plains, mid-South, and western and central Gulf Coast States, as well as the northern tier of the western U.S. In contrast, readings averaged 2 to 6°F above normal from the Great Lakes region into the Northeast.

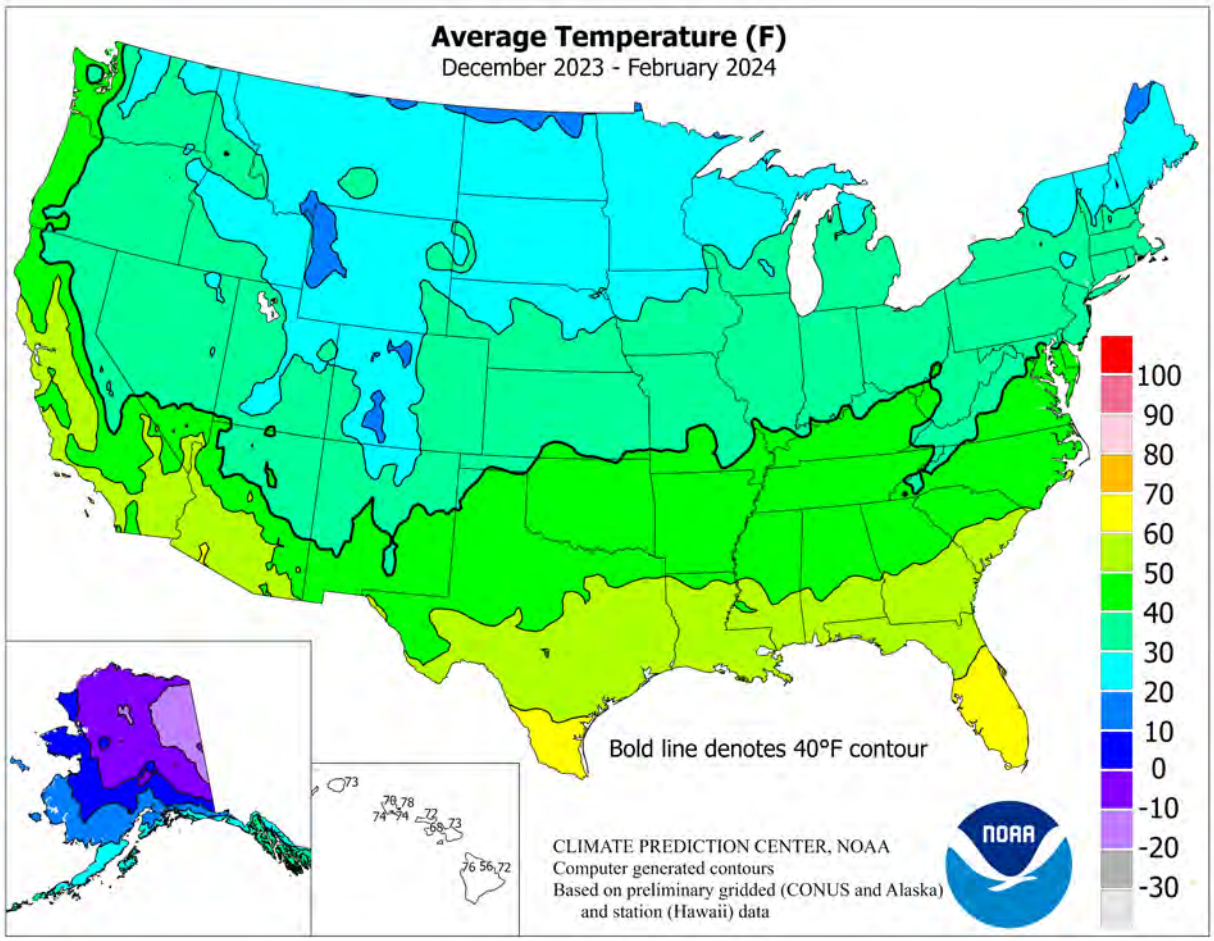
February: A complete summary appeared in the *Weekly Weather and Crop Bulletin* dated March 12, 2024.

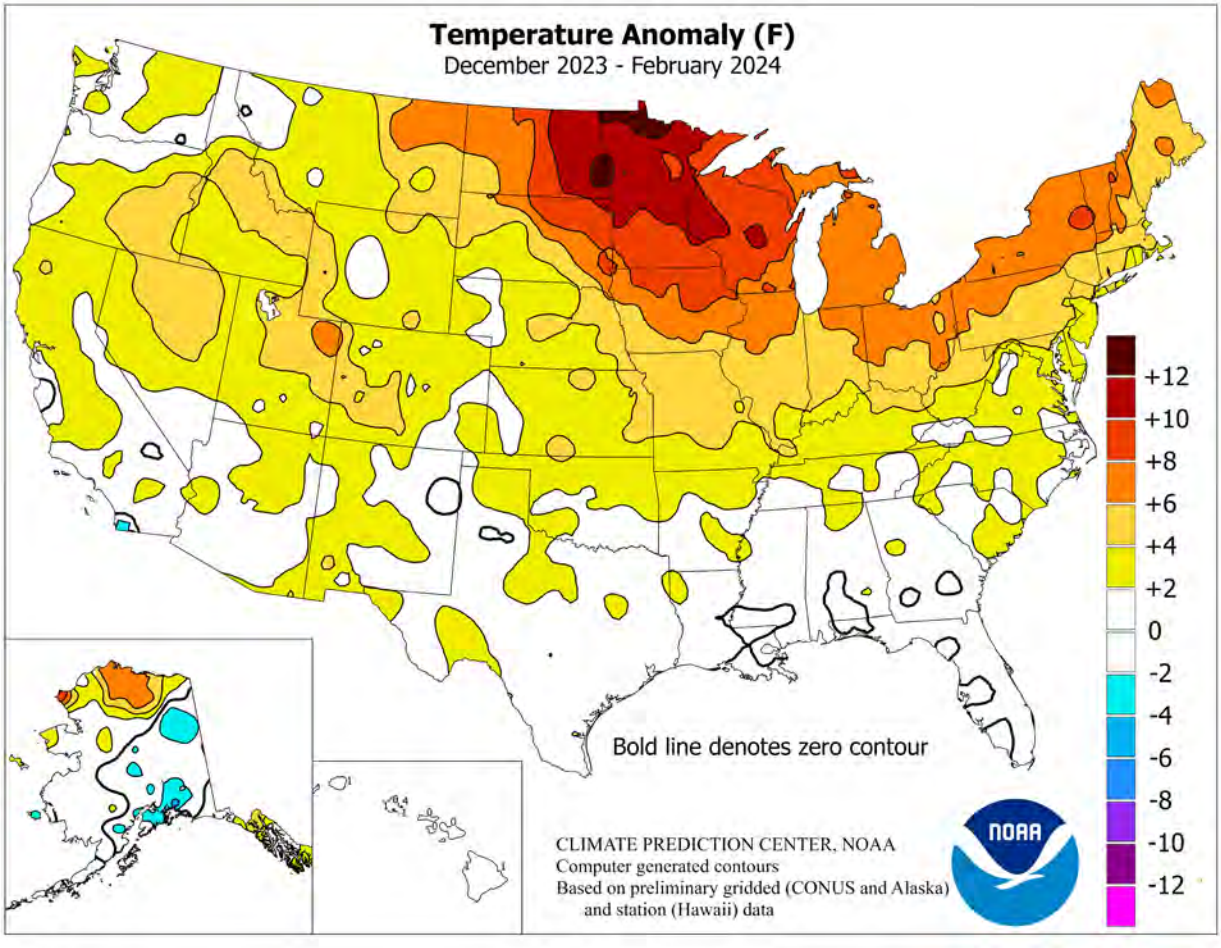

Total Precipitation (inches)
December 2023 - February 2024
24
20
16
12
8
4
2
1
0.5
0
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Gridded data from AHPS acquired
from: water.weather.gov/precip
Station data from CPC
NOAA


Percent of Normal Precipitation
December 2023 - February 2024
400
200
150
125
100
75
50
25
Bold line denotes 100% contour
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Gridded data from AHPS acquired
from: water.weather.gov/precip
Station data from CPC
Gridded normals: PRISM 1981-2010
NOAA


Extreme Maximum Temperature (F)
December 2023 - February 2024
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
Bold line denotes 95°F contour
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS and Alaska)
and station (Hawaii) data
NOAA


Extreme Minimum Temperature (F)
December 2023 - February 2024
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
Bold line denotes 32°F contour
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS and Alaska)
and station (Hawaii) data
NOAA


Average Temperature (F)
December 2023 - February 2024
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
Bold line denotes 40°F contour
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS and Alaska)
and station (Hawaii) data
NOAA


Temperature Anomaly (F)
December 2023 - February 2024
+12
+10
+8
+6
+4
+2
0
-2
-4
-6
-8
-10
-12
Bold line denotes zero contour
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS and Alaska)
and station (Hawaii) data
NOAA

National Weather Data for Selected Cities

December 2023 - February 2024

Data Provided by Climate Prediction Center

STATES AND STATIONS	TEMP, ˚F		PRECIP.		STATES AND STATIONS	TEMP, ˚F		PRECIP.		STATES AND STATIONS	TEMP, ˚F		PRECIP.	
	AVERAGE	DEPARTURE	TOTAL	DEPARTURE		AVERAGE	DEPARTURE	TOTAL	DEPARTURE		AVERAGE	DEPARTURE	TOTAL	DEPARTURE
AK ANCHORAGE	18	-2	3.90	1.09	WICHITA	38	3	4.93	1.60	TOLEDO	36	6	6.89	-0.30
BARROW	-2	0	0.00	-0.59	KY LEXINGTON	41	4	10.81	-0.46	YOUNGSTOWN	36	7	8.15	-0.68
FAIRBANKS	-5	-1	1.52	-0.19	LOUISVILLE	42	4	9.59	-1.48	OK OKLAHOMA CITY	43	2	4.74	0.16
JUNEAU	32	2	22.67	5.67	PADUCAH	42	4	11.64	-0.61	TULSA	43	2	5.80	0.05
KODIAK	30	-2	20.67	-2.98	LA BATON ROUGE	56	2	16.74	0.48	OR ASTORIA	46	2	35.34	6.63
NOME	10	2	2.75	-0.26	LAKE CHARLES	55	0	13.97	0.15	BURNS	33	5	5.91	2.08
AL BIRMINGHAM	48	1	15.56	0.53	NEW ORLEANS	57	1	20.76	6.48	EUGENE	45	3	15.49	-2.61
HUNTSVILLE	46	1	15.67	-0.50	SHREVEPORT	52	3	***	***	MEDFORD	46	4	8.37	0.09
MOBILE	54	1	15.78	0.02	MA BOSTON	36	4	13.77	2.75	PENDLETON	37	2	4.80	0.54
MONTGOMERY	50	0	17.06	2.36	WORCESTER	33	6	16.94	5.75	PORTLAND	44	2	21.91	7.30
AR FORT SMITH	45	3	6.65	-2.53	MD BALTIMORE	41	4	14.60	4.80	SALEM	44	1	22.04	4.31
LITTLE ROCK	47	5	13.63	0.91	ME CARIBOU	21	6	6.44	-2.63	PA ALLENTOWN	35	3	16.02	5.99
AZ FLAGSTAFF	33	2	6.01	-0.19	PORTLAND	31	4	14.90	3.22	ERIE	36	5	8.26	-1.94
PHOENIX	59	2	2.78	0.27	MI ALPENA	30	8	4.90	-0.37	MIDDLETOWN	38	5	13.36	4.22
PRESCOTT	41	1	2.92	-0.61	GRAND RAPIDS	33	6	6.87	-0.33	PHILADELPHIA	40	4	15.11	5.15
TUCSON	55	1	4.32	1.65	HOUGHTON LAKE	31	9	1.63	-1.22	PITTSBURGH	38	7	8.44	-0.09
CA BAKERSFIELD	53	3	4.31	0.79	LANSING	33	7	6.23	0.49	WILKES-BARRE	35	5	12.85	5.31
EUREKA	50	2	23.28	2.67	MUSKEGON	36	7	5.15	-1.88	WILLIAMSPORT	36	6	13.26	4.62
FRESNO	53	4	5.86	-0.09	TRAVERSE CITY	33	8	2.89	-1.64	RI PROVIDENCE	35	3	16.92	4.74
LOS ANGELES	58	0	15.06	6.88	MN DULUTH	25	10	4.13	0.67	SC CHARLESTON	54	2	11.80	1.93
REDDING	51	3	20.35	2.34	INT_L FALLS	21	12	2.59	0.09	COLUMBIA	49	1	9.89	-0.82
SACRAMENTO	51	3	12.88	2.17	MINNEAPOLIS	30	10	3.06	0.09	FLORENCE	49	1	7.84	-1.81
SAN DIEGO	58	-1	8.93	2.99	ROCHESTER	28	10	1.93	-1.41	GREENVILLE	45	1	17.51	4.83
SAN FRANCISCO	55	3	13.05	0.93	ST. CLOUD	27	12	4.55	2.22	SD ABERDEEN	25	9	2.11	0.30
STOCKTON	52	3	9.13	1.47	MO COLUMBIA	38	4	5.65	-0.76	HURON	26	7	2.27	0.24
CO ALAMOSA	24	4	1.09	0.14	KANSAS CITY	36	4	5.22	0.95	RAPID CITY	30	5	1.11	-0.07
CO SPRINGS	35	3	2.58	1.72	SAINT LOUIS	41	6	6.52	-0.89	SIOUX FALLS	29	8	3.13	0.83
DENVER INTL	34	3	1.85	0.69	SPRINGFIELD	40	3	4.47	-3.19	TN BRISTOL	41	2	10.93	-0.43
GRAND JUNCTION	37	6	1.21	-0.54	MS JACKSON	51	1	17.38	1.55	CHATTANOOGA	45	1	15.49	0.01
PUEBLO	35	2	3.08	2.16	MERIDIAN	50	0	13.45	-2.98	KNOXVILLE	43	1	16.45	1.71
CT BRIDGEPORT	37	3	15.98	5.57	TUPELO	47	1	14.02	-2.24	MEMPHIS	46	2	12.78	-1.58
HARTFORD	35	5	17.57	6.96	MT BILLINGS	32	4	1.57	-0.13	NASHVILLE	44	2	11.71	-1.36
DC WASHINGTON	43	3	13.40	4.41	BUTTE	23	2	1.76	0.42	TX ABILENE	50	2	4.80	1.10
DE WILMINGTON	38	3	16.00	5.98	CUT BANK	26	3	0.40	-0.37	AMARILLO	41	1	3.36	1.41
FL DAYTONA BEACH	61	1	10.13	2.64	GLASGOW	24	7	1.11	-0.11	AUSTIN	54	1	9.03	1.71
JACKSONVILLE	56	0	12.84	3.81	GREAT FALLS	29	4	2.17	0.48	BEAUMONT	56	1	17.32	3.83
KEY WEST	71	-1	11.95	6.38	HAVRE	23	3	2.03	0.80	BROWNSVILLE	65	1	3.37	0.02
MIAMI	70	0	7.74	1.25	MISSOULA	28	2	2.15	-0.81	CORPUS CHRISTI	61	1	4.76	0.07
ORLANDO	63	1	7.62	0.54	NC ASHEVILLE	42	2	16.06	4.16	DEL RIO	58	3	1.19	-0.80
PENSACOLA	55	0	12.20	-3.18	CHARLOTTE	47	3	14.45	4.15	EL PASO	51	3	0.91	-0.54
TALLAHASSEE	55	1	17.77	4.66	GREENSBORO	44	2	16.15	6.69	FORT WORTH	51	3	8.41	0.16
TAMPA	63	-1	10.72	2.81	HATTERAS	50	0	10.80	-3.32	GALVESTON	59	1	10.56	-0.20
WEST PALM BEACH	68	0	9.55	-0.13	RALEIGH	47	4	12.87	3.17	HOUSTON	56	1	13.19	2.30
GA ATHENS	47	1	19.35	6.04	WILMINGTON	50	2	11.58	0.49	LUBBOCK	44	2	1.88	-0.20
ATLANTA	49	2	13.25	-0.63	ND BISMARCK	24	8	1.13	-0.50	MIDLAND	48	1	1.13	-0.71
AUGUSTA	48	-1	10.14	-1.39	DICKINSON	25	6	0.20	-0.56	SAN ANGELO	50	1	3.29	0.23
COLUMBUS	50	-1	14.13	1.44	FARGO	26	14	3.46	1.14	SAN ANTONIO	55	1	7.28	1.51
MACON	50	0	12.81	-0.39	GRAND FORKS	22	12	1.44	-0.25	VICTORIA	57	1	11.08	4.02
SAVANNAH	54	1	9.80	0.41	JAMESTOWN	24	11	0.63	-0.41	WACO	50	1	8.80	0.54
HI HILO	72	1	16.59	-13.99	NE GRAND ISLAND	32	3	2.75	0.52	WICHITA FALLS	46	2	5.67	1.46
HONOLULU	74	-1	3.77	-2.27	LINCOLN	32	4	2.81	-0.03	UT SALT LAKE CITY	37	4	4.94	0.76
KAHULUI	73	0	5.90	-1.39	NORFOLK	30	5	2.94	0.65	VA LYNCHBURG	41	3	12.88	2.92
LIHUE	73	1	8.69	-2.51	NORTH PLATTE	32	4	1.83	0.39	NORFOLK	46	2	12.45	2.75
IA BURLINGTON	34	6	4.00	-1.10	OMAHA	32	4	2.58	-0.37	RICHMOND	44	3	16.83	7.37
CEDAR RAPIDS	31	8	1.53	-2.29	SCOTTSBLUFF	31	2	1.89	0.39	ROANOKE	43	3	10.70	1.46
DES MOINES	33	7	5.83	1.78	VALENTINE	29	3	2.01	0.62	WASH/DULLES	41	4	12.87	3.93
DUBUQUE	30	8	3.92	-0.84	NH CONCORD	31	5	13.96	4.60	VT BURLINGTON	30	6	9.18	2.71
SIOUX CITY	29	6	3.20	0.62	NJ ATLANTIC_CITY	39	3	14.73	3.53	WA OLYMPIA	43	3	24.82	3.91
WATERLOO	31	8	2.29	-1.45	NEWARK	40	5	13.80	3.13	QUILLAYUTE	46	5	40.79	1.28
ID BOISE	37	3	5.59	1.61	NM ALBUQUERQUE	41	2	1.74	0.40	SEATTLE-TACOMA	44	1	17.92	2.54
LEWISTON	39	2	3.89	0.57	NV ELY	31	3	1.93	-0.36	SPOKANE	33	2	7.24	1.44
POCATELLO	30	3	4.58	1.34	LAS VEGAS	52	1	1.22	-0.62	YAKIMA	36	3	3.74	0.28
IL CHICAGO/O_HARE	35	7	6.94	0.80	RENO	41	3	2.78	-0.65	WI EAU CLAIRE	29	11	2.05	-1.48
MOLINE	34	7	5.64	0.03	WINNEMUCCA	37	4	3.70	0.98	GREEN BAY	31	9	2.56	-1.85
PEORIA	35	6	6.51	0.16	NY ALBANY	34	6	11.10	2.87	LA CROSSE	31	9	2.09	-1.89
ROCKFORD	32	7	5.65	0.42	BINGHAMTON	32	7	12.06	3.85	MADISON	30	8	4.14	-0.54
SPRINGFIELD	36	5	7.63	1.59	BUFFALO	34	7	9.44	-0.25	MILWAUKEE	35	8	6.07	0.64
IN EVANSVILLE	40	4	8.80	-1.70	ROCHESTER	35	6	7.17	-0.26	WV BECKLEY	38	3	10.62	0.96
FORT WAYNE	35	6	6.54	-0.62	SYRACUSE	34	7	10.66	2.24	CHARLESTON	40	3	10.06	-0.28
INDIANAPOLIS	37	5	7.22	-1.35	OH AKRON-CANTON	35	4	6.70	-1.67	ELKINS	37	3	9.93	-0.39
SOUTH BEND	34	7	7.95	0.50	CINCINNATI	38	4	9.24	-1.08	HUNTINGTON	41	4	10.93	0.75
KS CONCORDIA	36	5	3.85	1.24	CLEVELAND	37	5	7.74	-0.83	WY CASPER	29	3	1.08	-0.61
DODGE CITY	37	3	3.93	1.73	COLUMBUS	38	6	9.13	0.48	CHEYENNE	31	2	1.40	0.02
GOODLAND	33	2	2.79	1.52	DAYTON	38	5	8.89	0.31	LANDER	23	1	2.62	0.75
TOPEKA	37	4	5.59	1.85	MANSFIELD	35	6	7.77	-1.10	SHERIDAN	30	5	1.25	-0.57

Based on 1991-2020 normals

***** Not Available**

March 14 ENSO Diagnostic Discussion

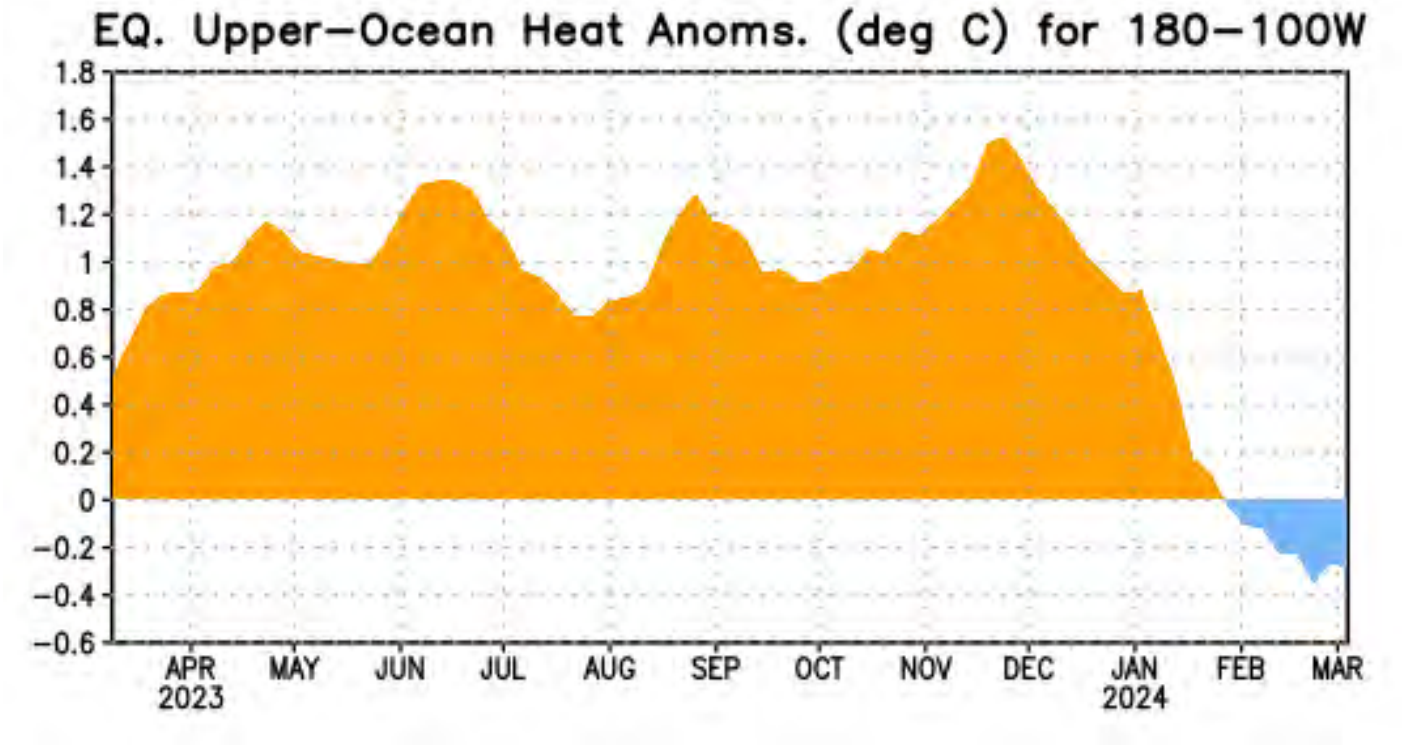


Figure 1: Area-averaged upper-ocean heat content anomaly (°C) in the equatorial Pacific (5°N-5°S, 180º-100ºW). The heat content anomaly is computed as the departure from the 1991-2020 base period pentad means.

ENSO Alert System Status: El Niño Advisory / La Niña Watch

Synopsis: A transition from El Niño to ENSO-neutral is likely by April-June 2024 (83% chance), with the odds of La Niña developing by June-August 2024 (62% chance).

During February 2024, sea surface temperature (SST) anomalies continued to weaken across most of the equatorial Pacific Ocean. In the last week, below-average SSTs emerged in a small region of the eastern equatorial Pacific Ocean (~100°W). The weekly Niño indices weakened but remained positive, with the latest value in Niño-3.4 standing at 1.4°C. Area-averaged subsurface temperature anomalies were slightly negative (Fig. 1), reflecting the consequences of an upwelling Kelvin wave and associated below-average temperatures across the equatorial Pacific Ocean. Low-level winds were near average over most of the equatorial Pacific, while upper-level wind anomalies were easterly over the east-central Pacific. Convection was enhanced near the Date Line and was suppressed near Indonesia. Collectively, the coupled ocean-atmosphere system reflected a weakening El Niño.

The most recent IRI plume indicates a transition to ENSO-neutral during spring 2024, with La Niña potentially developing during summer 2024. While different types of models suggest La Niña will develop, the forecast team favors the dynamical model guidance, which is slightly more accurate for forecasts made during this time of year. Even though forecasts made through the spring season tend to be less reliable, there is a historical tendency for La Niña to follow strong El Niño events. In summary, a transition from El Niño to ENSO-neutral is likely by April-June 2024 (83% chance), with the odds of La Niña developing by June-August 2024 (62% chance).

This discussion is a consolidated effort of the National Oceanic and Atmospheric Administration (NOAA), NOAA's National Weather Service, and their funded institutions. Oceanic and atmospheric conditions are updated weekly on the Climate Prediction Center website (El Niño/La Niña Current Conditions and Expert Discussions). Additional perspectives and analyses are also available in an ENSO blog. A probabilistic strength forecast is available here. The next ENSO Diagnostics Discussion is scheduled for **11 April 2024**. To receive an e-mail notification when the monthly ENSO Diagnostic Discussions are released, please send an e-mail message to: ncep.list.enso-update@noaa.gov.

International Weather and Crop Summary

March 10-16, 2024

International Weather and Crop Highlights and Summaries provided by USDA/WAOB

HIGHLIGHTS

EUROPE: Warm and showery weather prevailed, with locally heavy rain reported from England southeastward into the southern Balkans.

WESTERN FSU: Rain eased dryness in the west, while dry but chilly weather lingered farther east.

MIDDLE EAST: Widespread showers in Turkey and Iran bookended dry conditions in central portions of the region.

NORTHWESTERN AFRICA: Sunny skies replaced recent beneficial rain, though summer-like heat developed late in the period over western-most growing areas.

EAST ASIA: Unseasonable warmth promoted winter crop development, while southern showers aided early-crop rice establishment.

SOUTHEAST ASIA: Southern showers continued to benefit seasonal rice, while earlier-than-normal heat continued in Thailand.

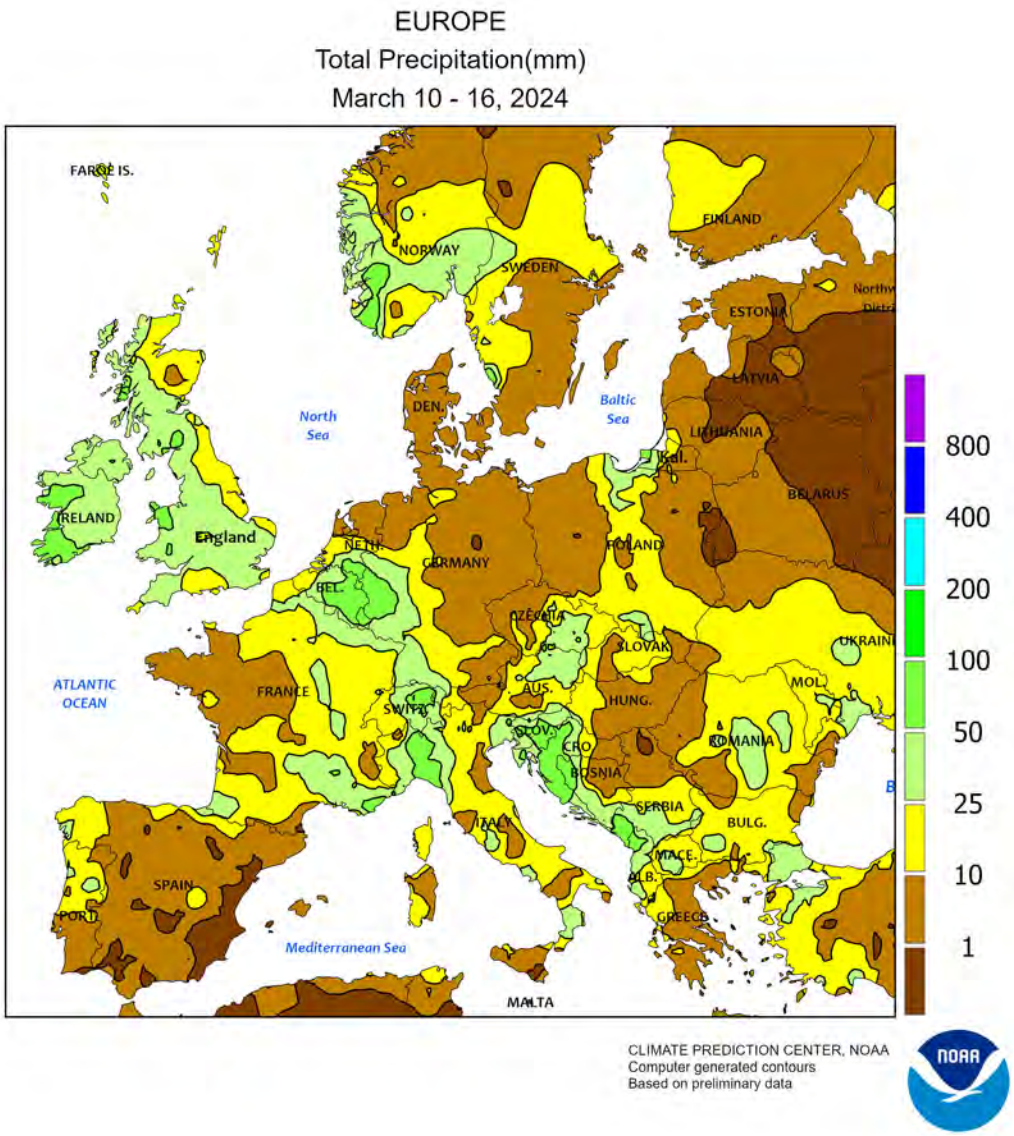
AUSTRALIA: Relatively dry weather in the east favored summer crop maturation and harvesting.

SOUTH AFRICA: Heat and dryness increased stress on corn and other rain-fed summer crops in key eastern production areas.

ARGENTINA: Heavy rain provided abundant moisture for summer crops in high-yielding central and northeastern farming areas.

BRAZIL: Warm, sunny weather returned to much of the south, hastening maturation of first-crop corn and soybeans but limiting moisture for later-planted summer crops.

For additional information contact: mark.brusberg@usda.gov



EUROPE

Warm and showery weather continued over Europe during the monitoring period, with a stripe of locally heavy rain bisecting the continent from northwest to southeast. Temperatures averaged 2 to 5°C above normal across much of Europe, with readings up to 7°C above normal noted in parts of Germany and Poland. As a result, winter crops continued to develop two to four weeks ahead of average (locally more). In fact, the Balkans' winter wheat and rapeseed were approaching or entering the more freeze-sensitive jointing and budding stages of development, respectively, as of the third week of March. Showers were widespread, with a stripe of moderate to heavy rain (10-120 mm) from England and France into the southern Balkans; in particular, 15 to 50 mm of rainfall in the lower Danube River Valley eased short-term dryness and improved winter crop prospects. Lesser totals (1-10 mm) were noted over southwestern and northeastern portions of the continent. Moisture supplies remained overall favorable across Europe, though soils remained saturated in parts of England, France, western Germany, and northern Italy.

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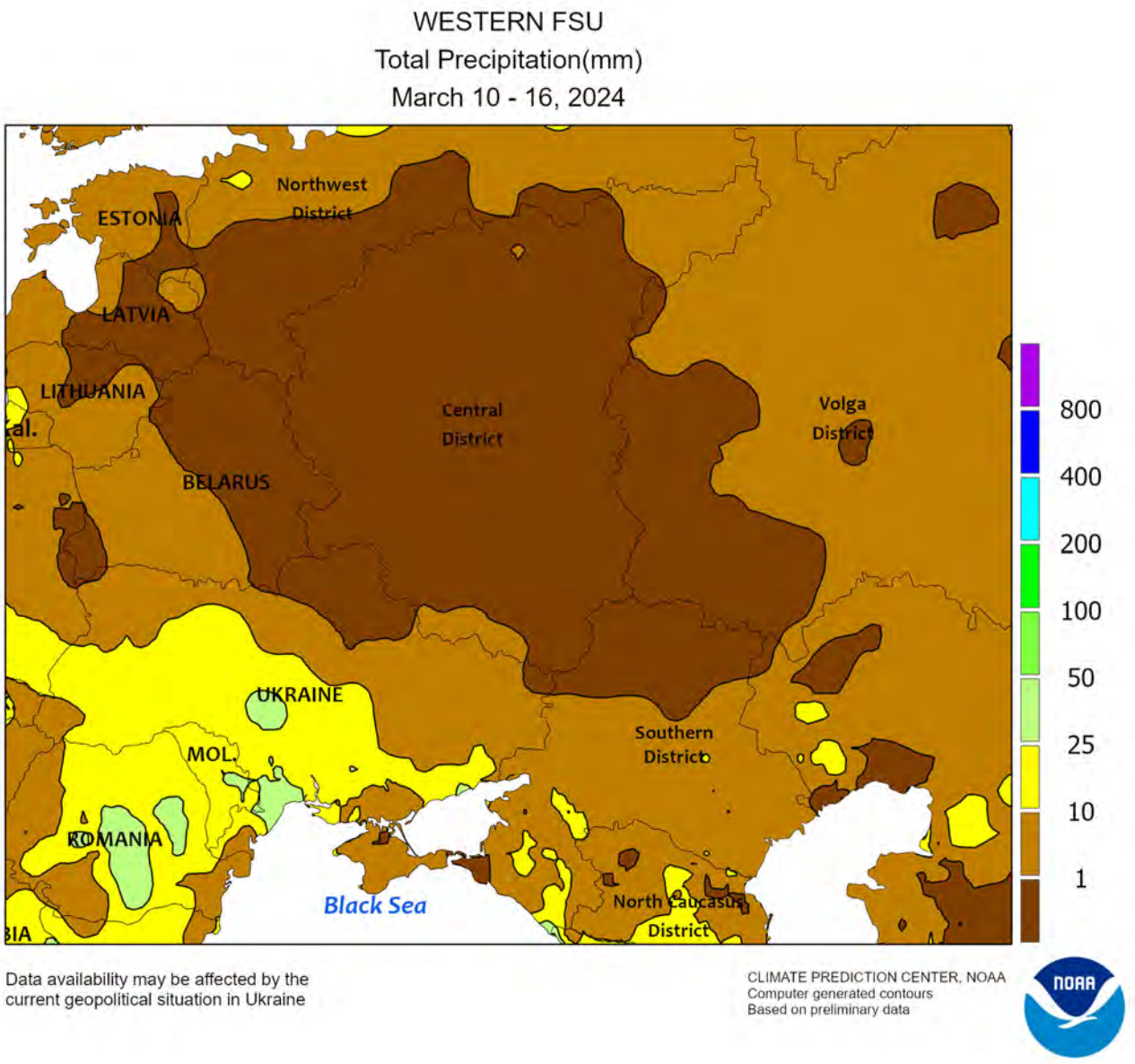

WESTERN FSU

Beneficial showers in western croplands contrasted with continued dry but cooler weather farther east. The record-setting February and early-March warmth subsided somewhat, with temperatures averaging 1 to 4°C above normal in western and northern portions of the region but 1 to 3°C below normal over much of western Russia. Nevertheless, southern-grown winter wheat, barley, and rapeseed were still advancing through the vegetative stages of development one to three weeks ahead of average. Rain arrived in Moldova and western Ukraine (10-50 mm), easing moisture deficits and improving prospects for spring growth. Conversely, dry weather continued over much of western Russia and eastern Ukraine, though spotty light rain and snow showers (1-11 mm) moistened soils locally. While the past 30 days have been very dry in the aforementioned eastern growing areas (less than 25 percent-of-normal rainfall), moisture demands for vegetative (south) to dormant (north) winter crops remained low.

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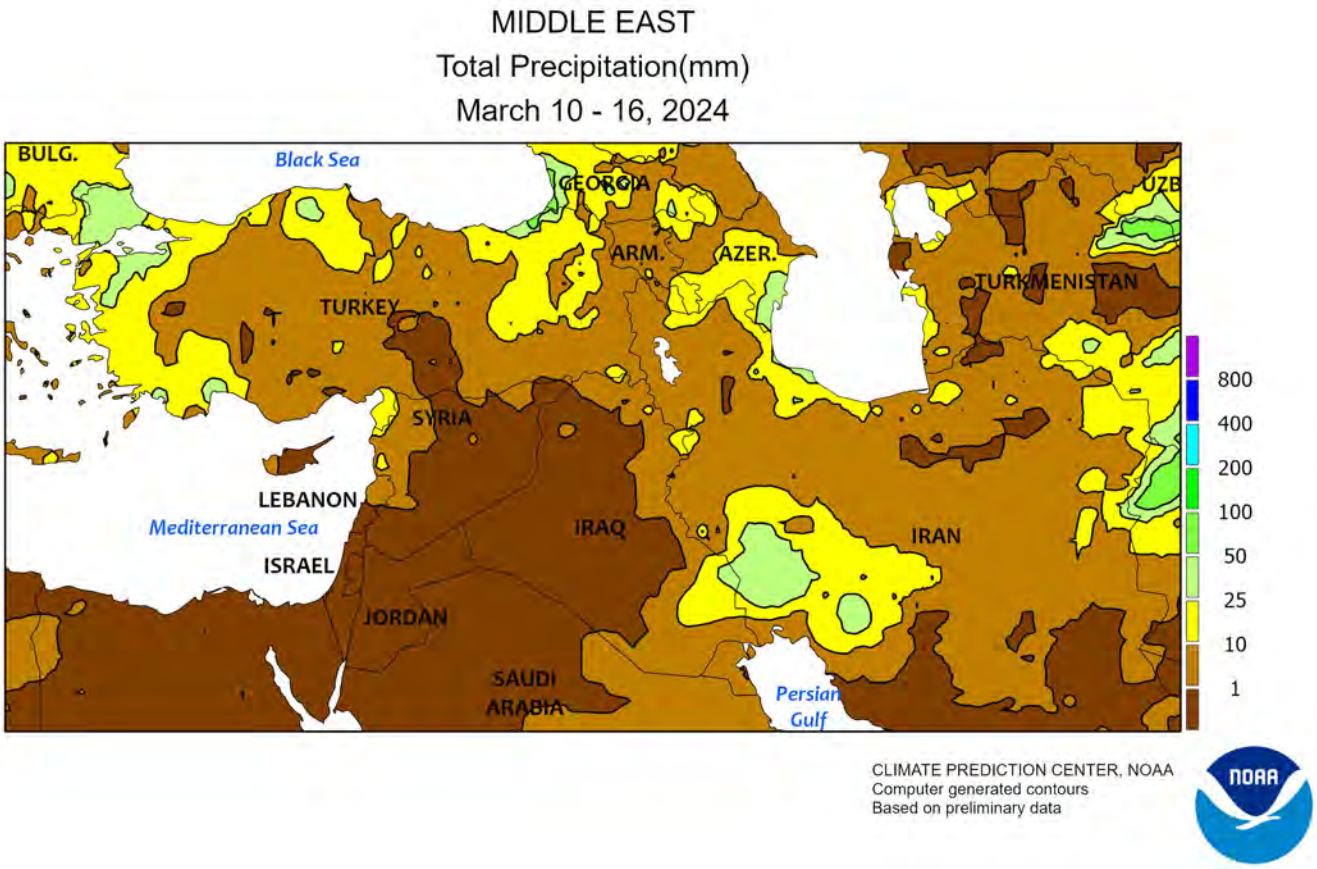

MIDDLE EAST

Persistent showers in Turkey and Iran bookended drier conditions over central portions of the region. A slow-moving Mediterranean storm system triggered widespread light to moderate showers (2-25 mm) over much of central and eastern Turkey, while heavier rain (25-60 mm) was reported in western portions of the country. Similarly, light to moderate showers (2-20 mm) in northwestern and northeastern Iran transitioned to heavier rain (25-45 mm) closer to the Persian Gulf Coast. Consequently, moisture supplies remained good to excellent for vegetative (north) to reproductive (south) winter wheat and barley in both countries. Meanwhile, sunny skies promoted fieldwork and winter grain development from the eastern Mediterranean Coast into central and northern Iraq. Anomalous warmth was not as widespread or pronounced as previous weeks, although temperatures still averaged up to 4°C above normal in northwestern Turkey, central Iraq, and northwestern Iran.

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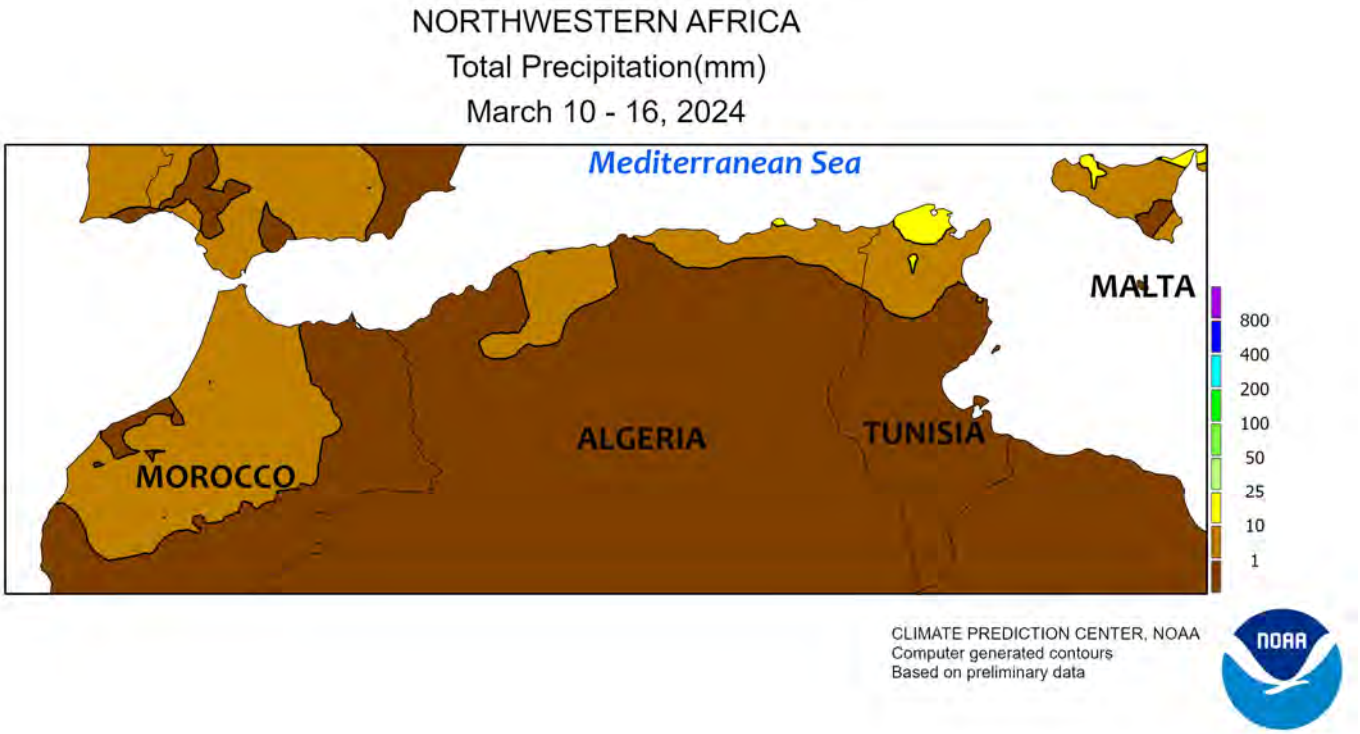

NORTHWESTERN AFRICA

Dry weather replaced recent beneficial rain, though summer-like heat developed over western-most growing areas at week's end. In Morocco, sunny skies promoted winter grain development in northern portions of the country which received much-needed rainfall over the preceding weeks. However, west-central and southwestern croplands remained mired in drought. In Morocco's primary winter crop areas adjacent to the central Atlantic Coast, season-to-date rainfall (since September 1) remained below 60 percent of normal, good for the fifth driest of the past 30 years. Exacerbating the drought's impacts were daytime temperatures reaching the middle and upper 30s (degrees C) at the end of the monitoring period, with heat persisting into the ensuing week. Winter wheat and barley were largely late-flowering to filling, and crops have suffered irreversible yield losses due to this season's extreme drought. The drought extended into western Algeria, where the preceding week's rain did little to dent this region's significant season-to-date rainfall deficits (55 percent of normal since September 1, driest of the past 30 years). Farther east, mostly sunny skies favored the development of reproductive to filling winter crops after recent rain, though light to moderate showers (5-20 mm) lingered in northern Tunisia. Winter wheat was mostly heading to flowering over the eastern half of the region but still vegetative on the higher terrain of the Hautes Plateau of eastern Algeria. Winter barley was flowering to filling, but likewise still vegetative on the Hautes Plateau.

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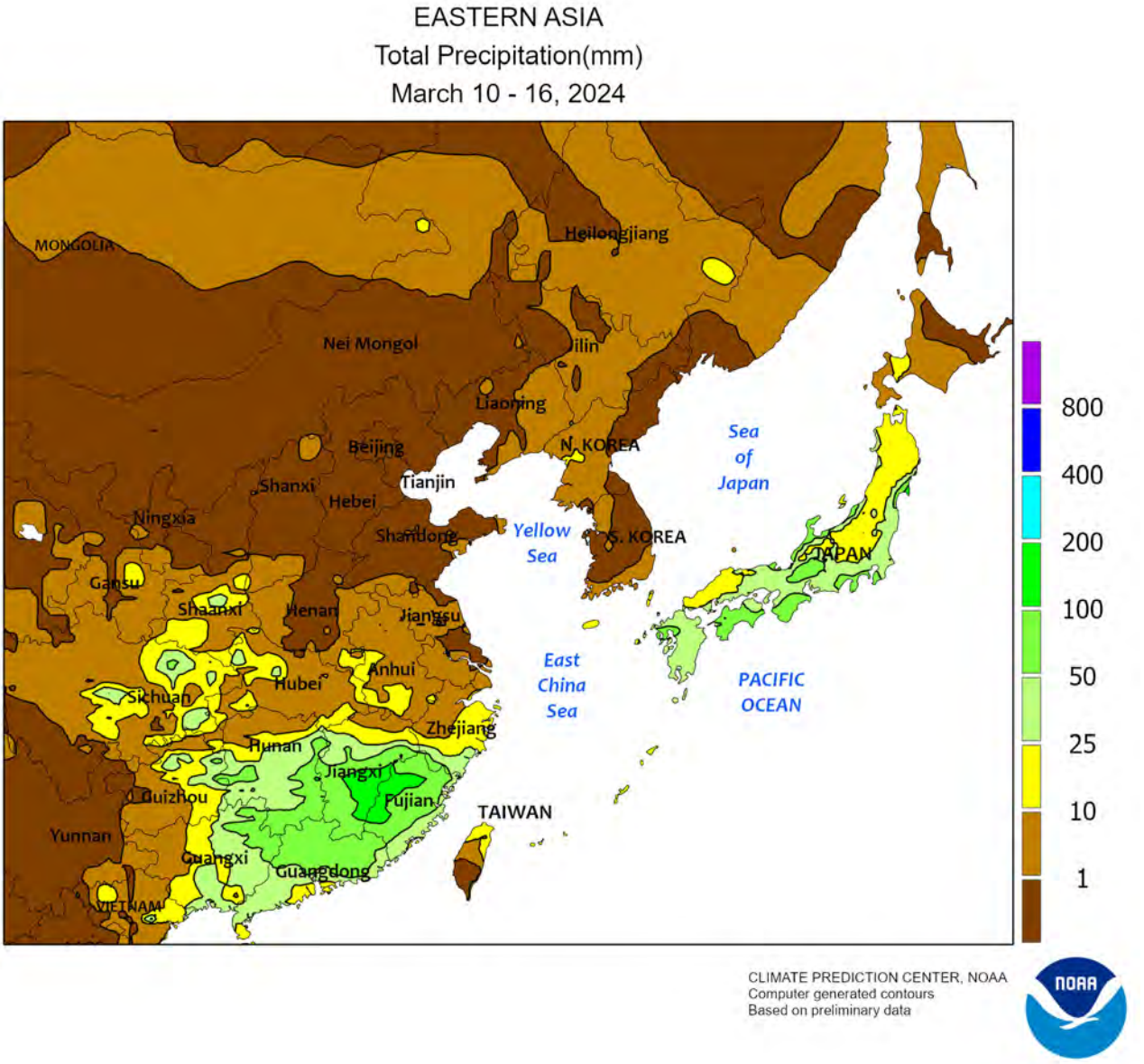

EASTERN ASIA

Above-average temperatures (as much as 5°C above average) prevailed across eastern and southern China, promoting winter crop development. Wheat on the North China Plain was solidly vegetative (on par with average but 10 days behind last year's pace), while rapeseed in the Yangtze Valley was beginning to bud (on par with average but 8 days behind last year's pace). Meanwhile, showers progressed through southern growing areas, with the highest totals (25-100 mm or more) located in the southeast, supporting establishment of early-crop rice.

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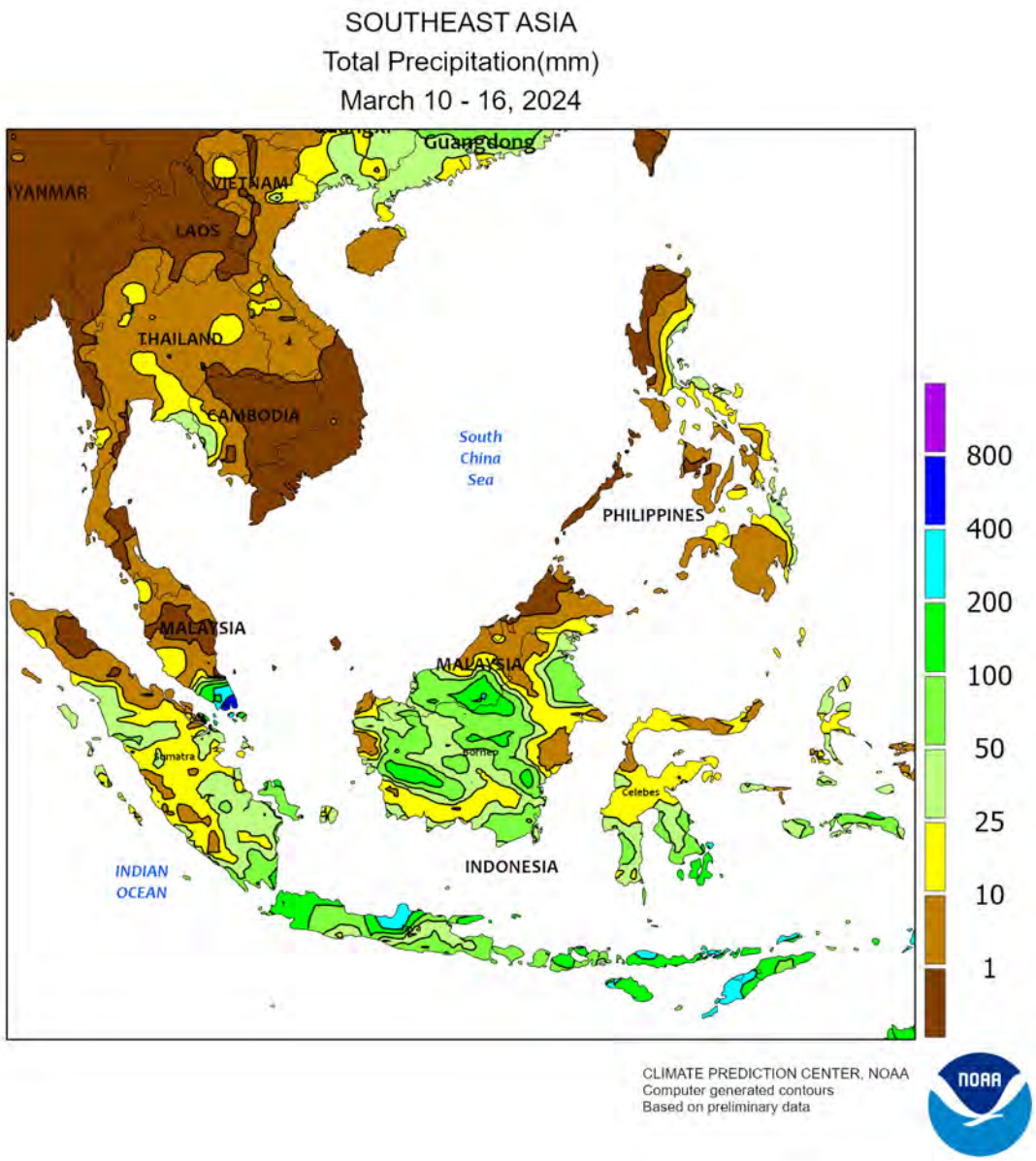

SOUTHEAST ASIA

The heaviest rainfall (25-100 mm or more) was limited to southern reaches of the region, particularly southern Indonesia (Java). The wet weather continued to support immature rice and bolster irrigation supplies for spring and summer crops. However, the rainfall was lighter in many oil palm areas of Malaysia and Indonesia, where short-term moisture deficits have surfaced. Showers were similarly light across the Philippines, where drought has been ongoing in key northern growing areas, lowering yield prospects for both seasonal rice and corn. Meanwhile, March remained on pace to be the hottest on record in Thailand and some of the surrounding areas, as temperatures touched 42°C. While pre-monsoon heat is typical, it usually occurs in April right before the onset of seasonal rains.

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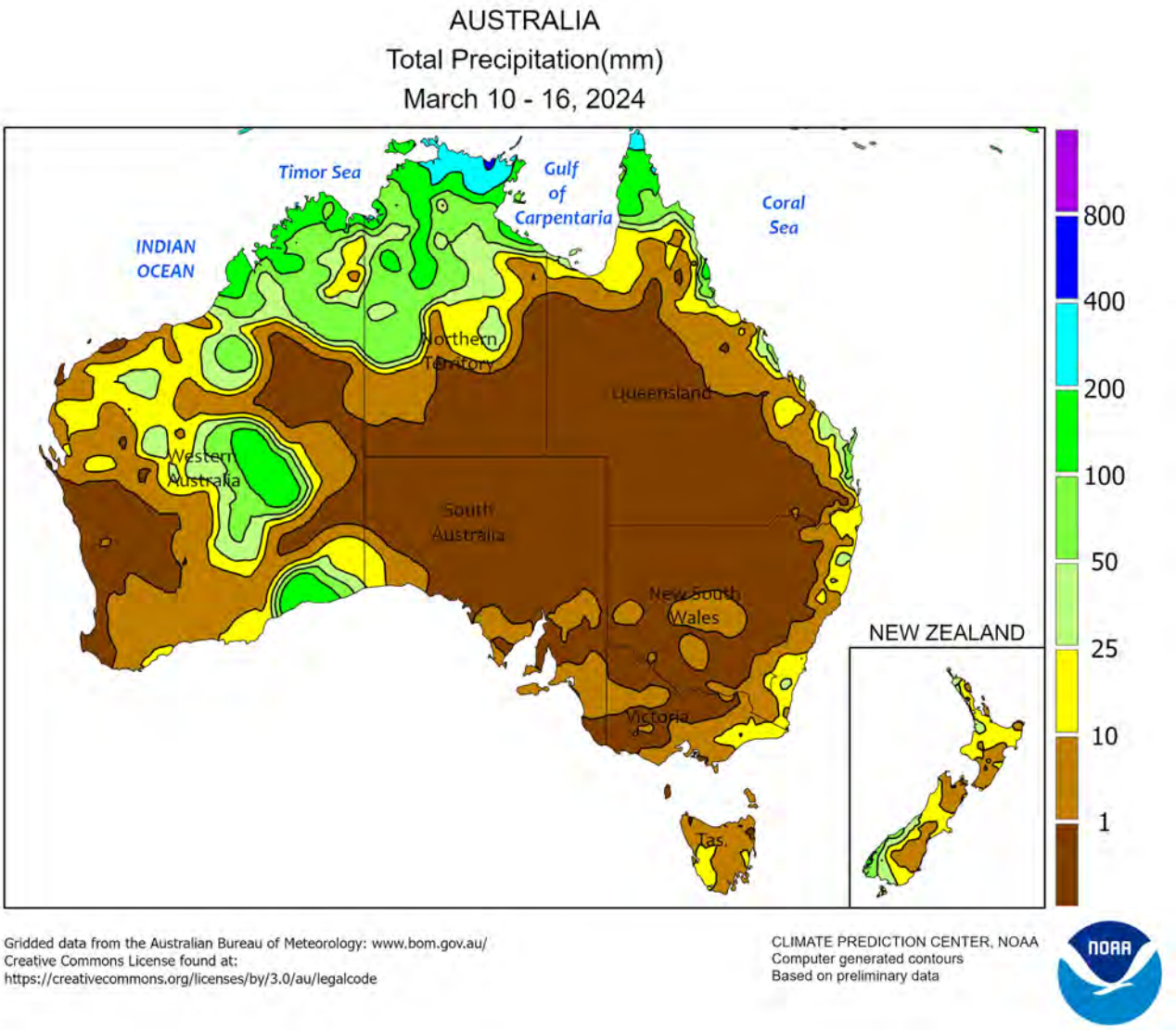

AUSTRALIA

Showers were generally light and widely scattered throughout the wheat belt, with rainfall totals mostly under 5 mm. The relatively dry weather favored summer crop maturation and harvesting in the east, although some later maturing crops would likely benefit from additional rain or supplemental irrigation. More rain would be welcome in the south and west as well to help boost topsoil moisture in advance of winter crop planting. Typically, winter grains and oilseeds are planted in April, May, and June each year. Temperatures averaged 3 to 6°C above normal in South Australia, Victoria, and southern New South Wales, while more seasonable temperatures prevailed elsewhere. For the second week in a row, maximum temperatures rose into the upper 30s and lower 40s (degrees C) in the southeast, maintaining large evaporation rates.

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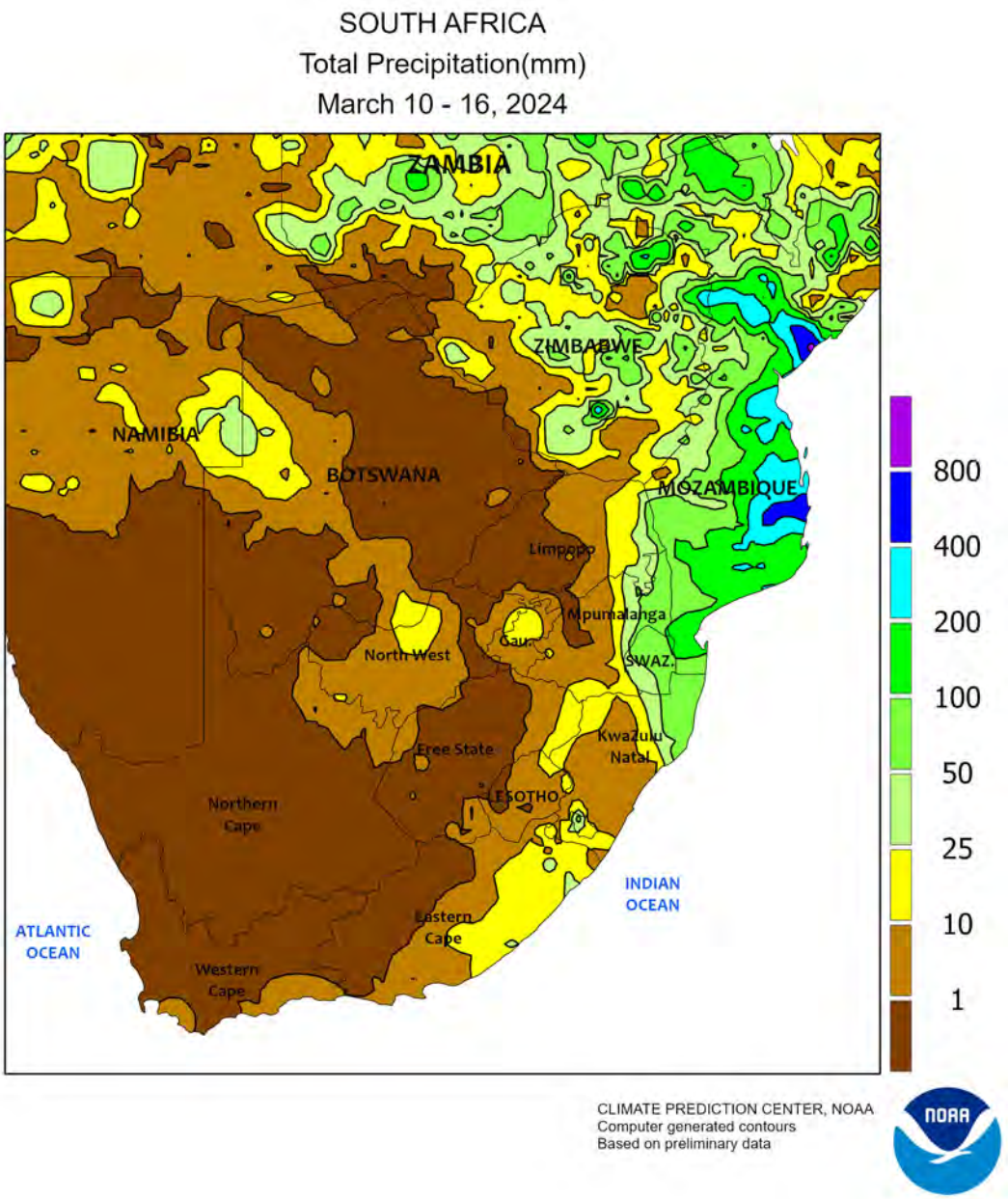

SOUTH AFRICA

Warm, mostly dry weather covered nearly all major commercial farming areas, increasing stress on corn and other rain-fed summer crops still in critical stages of development. Near-complete dryness prevailed throughout the corn belt (North West and Free State eastward to western Mpumalanga), with few locations recording more than 5 mm. Unseasonable warmth (temperatures averaging 2-5°C above normal) compounded the impact of the dryness on immature crops, particularly in western farming areas (notably Free State and Northwest), where daytime highs reached the upper 30s and lower 40s (degrees C). Similar conditions prevailed in southern rain-fed sugarcane areas, as well as in irrigated farming areas in northern KwaZulu-Natal; in contrast, heavy rain (25-100 mm) generated by a tropical storm hitting Mozambique fell in irrigated sugarcane areas in eastern Mpumalanga. Elsewhere, warm (highs reaching the upper 30s), sunny weather prevailed, fostering rapid development of irrigated crops in the Cape Provinces.

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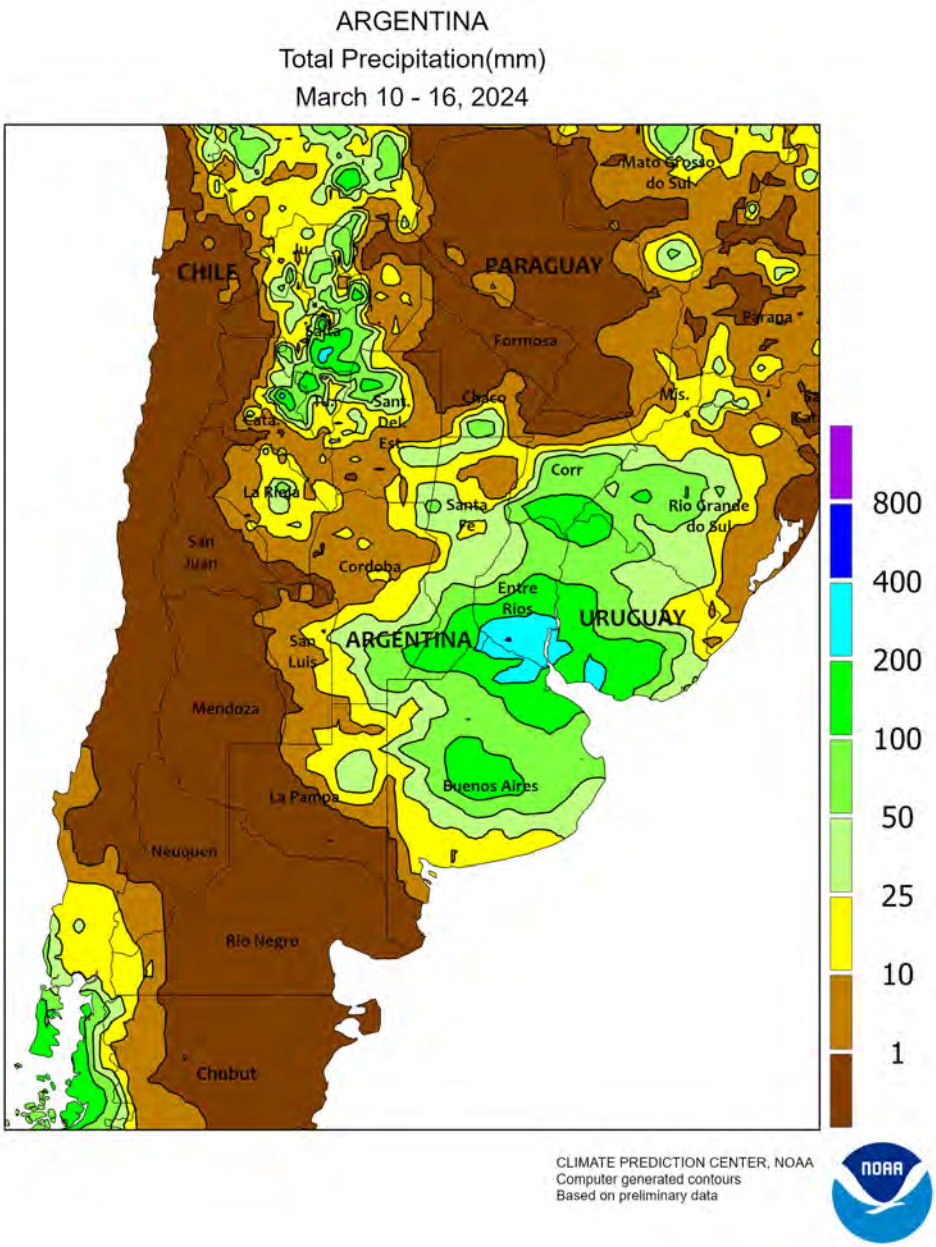

ARGENTINA

Locally heavy rainfall provided abundant to excessive levels of moisture for immature summer crops in key farming areas in central and northeastern Argentina. Amounts totaling 25 to more than 100 mm stretched from La Pampa and Buenos Aires northeastward into Corrientes, extending westward into Córdoba. Generally drier conditions prevailed elsewhere, however, with a large part of the far north – including Chaco and Formosa – registering complete dryness. Weekly average temperatures ranged from 1 to 2°C above normal in southern farming areas (La Pampa, Buenos Airies, and environs), where highest daytime temperatures mostly ranged from the upper 20s to lower 30s (degrees C). In contrast, temperatures averaged 8°C or more above normal in the driest northern locations, with daytime highs reaching 40°C as far south as northern growing areas in Córdoba and Santa Fe. According to the government of Argentina, sunflowers were 43 percent harvested (30 percent last year) as of March 14; fieldwork was nearing completion over earlier-maturing northern production areas, and was 24 and 50 percent completed, respectively, in Buenos Aires and La Pampa.

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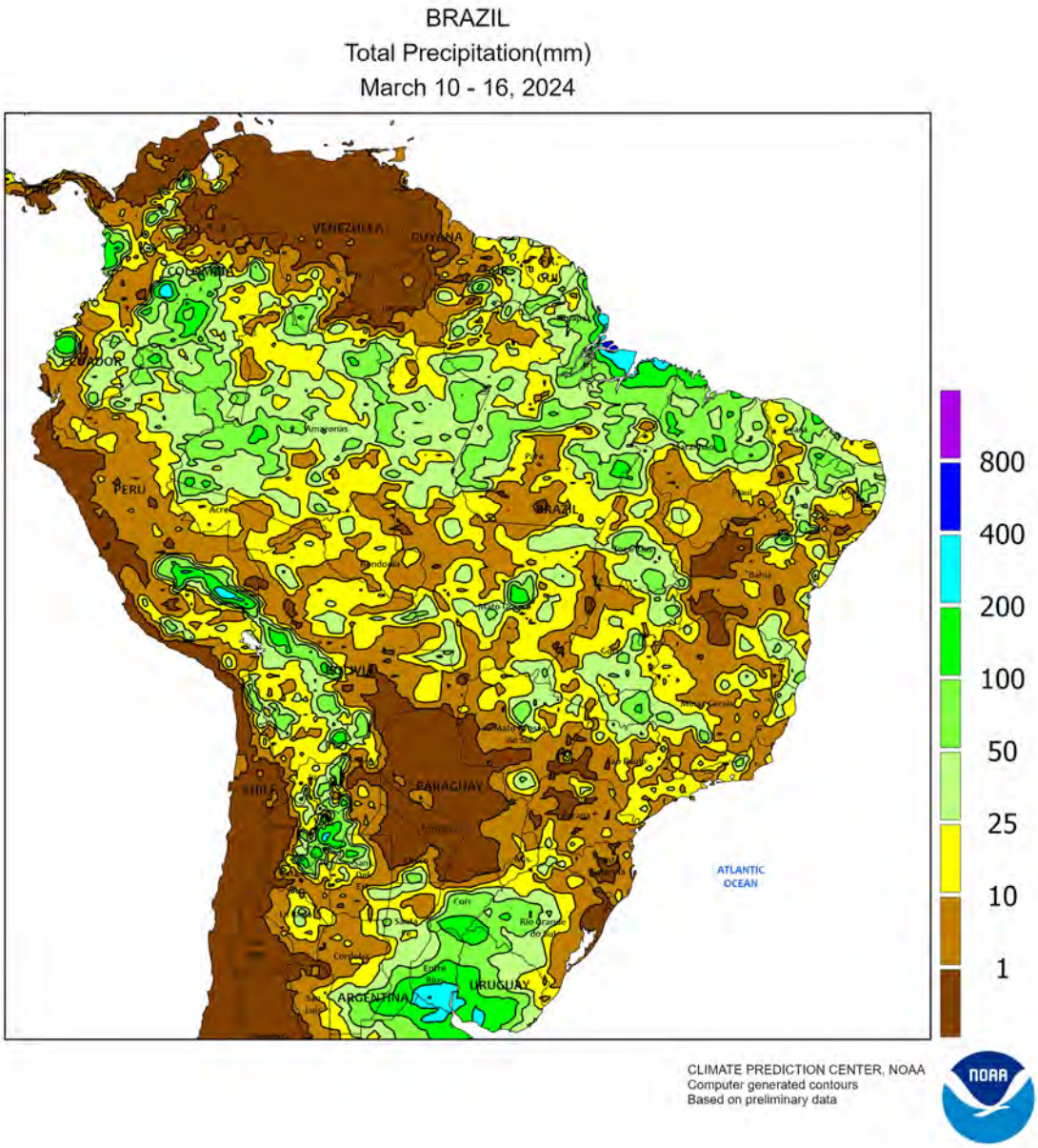

BRAZIL

Unseasonable dryness and warmth returned to much of the south, hastening development of later-developing corn and soybeans but limiting moisture for later-planted crops. Mostly dry weather prevailed from Mato Grosso do Sul and São Paulo southward through eastern sections of Santa Catarina and Rio Grande do Sul, with daytime highs reaching the upper 30s (degrees C) in and around northern Paraná. In contrast, showers (5-50 mm) spread eastward into Rio Grande do Sul, providing a late-season boost in moisture for immature soybeans. According to government reports, 1 percent of soybeans were harvested as of March 14 in Rio Grande do Sul, with the majority of the crop (65 percent) in the pod filling stage; meanwhile, corn was 72 percent harvested, with the remainder mostly filling to mature. In Paraná, first-crop corn and soybeans were 82 and 73 percent harvested, respectively, as of March 11; second-crop corn was 91 percent planted. Farther north, scattered showers (5-50 mm) increased moisture for corn and cotton from Mato Grosso and northern Mato Grosso do Sul eastward, with a few lingering pockets of dryness. Weekly temperatures averaged 1 to 2°C above normal in these more northerly farming areas, with daytime highs reaching the lower and middle 30s. According to the government of Mato Grosso, soybeans were 96 percent harvested as of March 15, while corn planting was nearing 100 percent completion.

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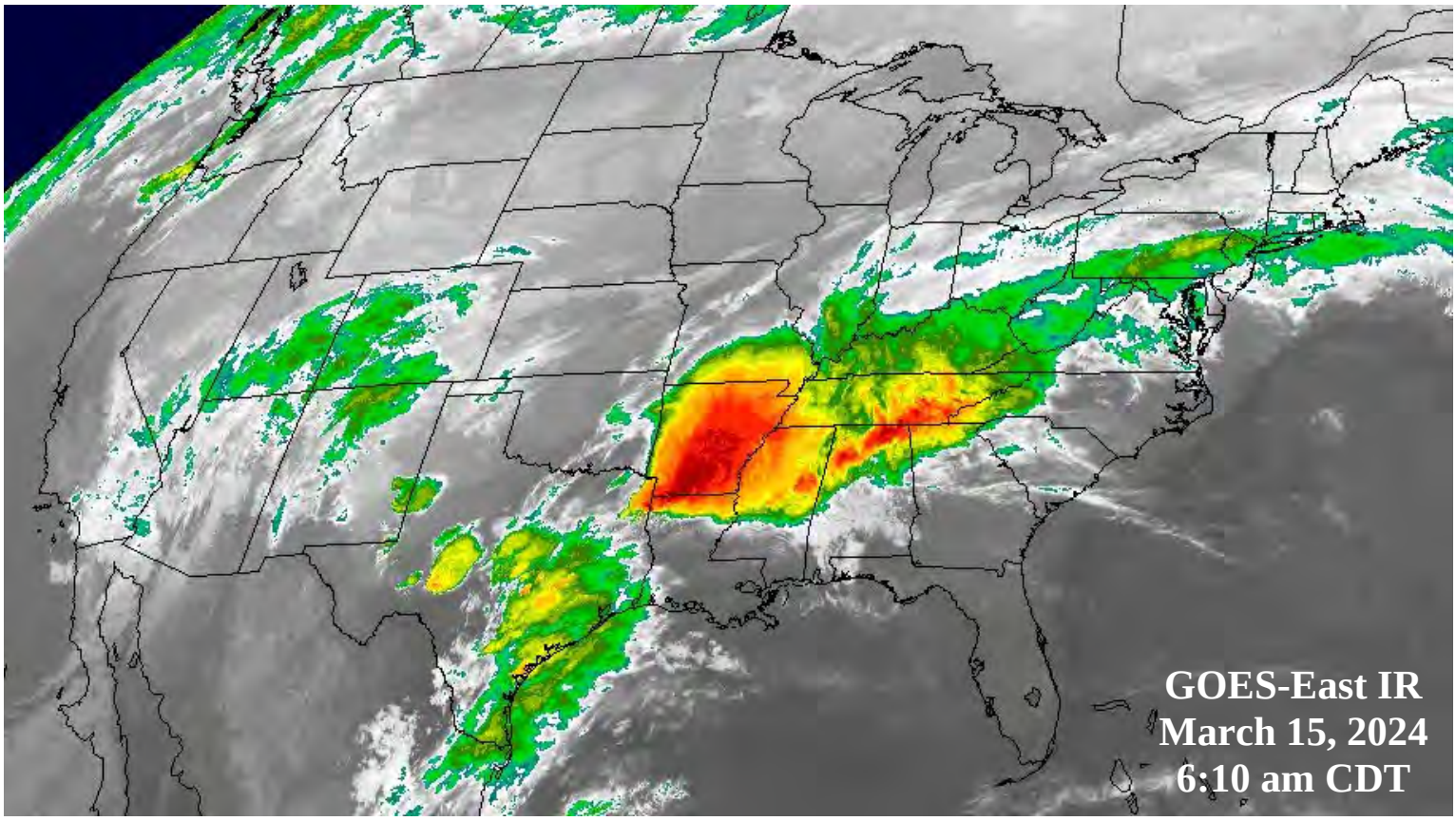

On March 14-15, an early-season severe weather outbreak stretched more than 1,000 miles from Oklahoma and Texas into the Ohio and Tennessee Valleys. On the evening of the 14th, the outbreak spawned more than two dozen tornadoes. Of note, an EF-3 tornado crossing Auglaize and Logan Counties in western Ohio resulted in three fatalities, according to preliminary reports. In addition, hail measuring 4 inches in diameter was observed in numerous places, including parts of Morgan County, IL; Benton County, AR; and Mayes and Pontotoc Counties in Oklahoma.

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