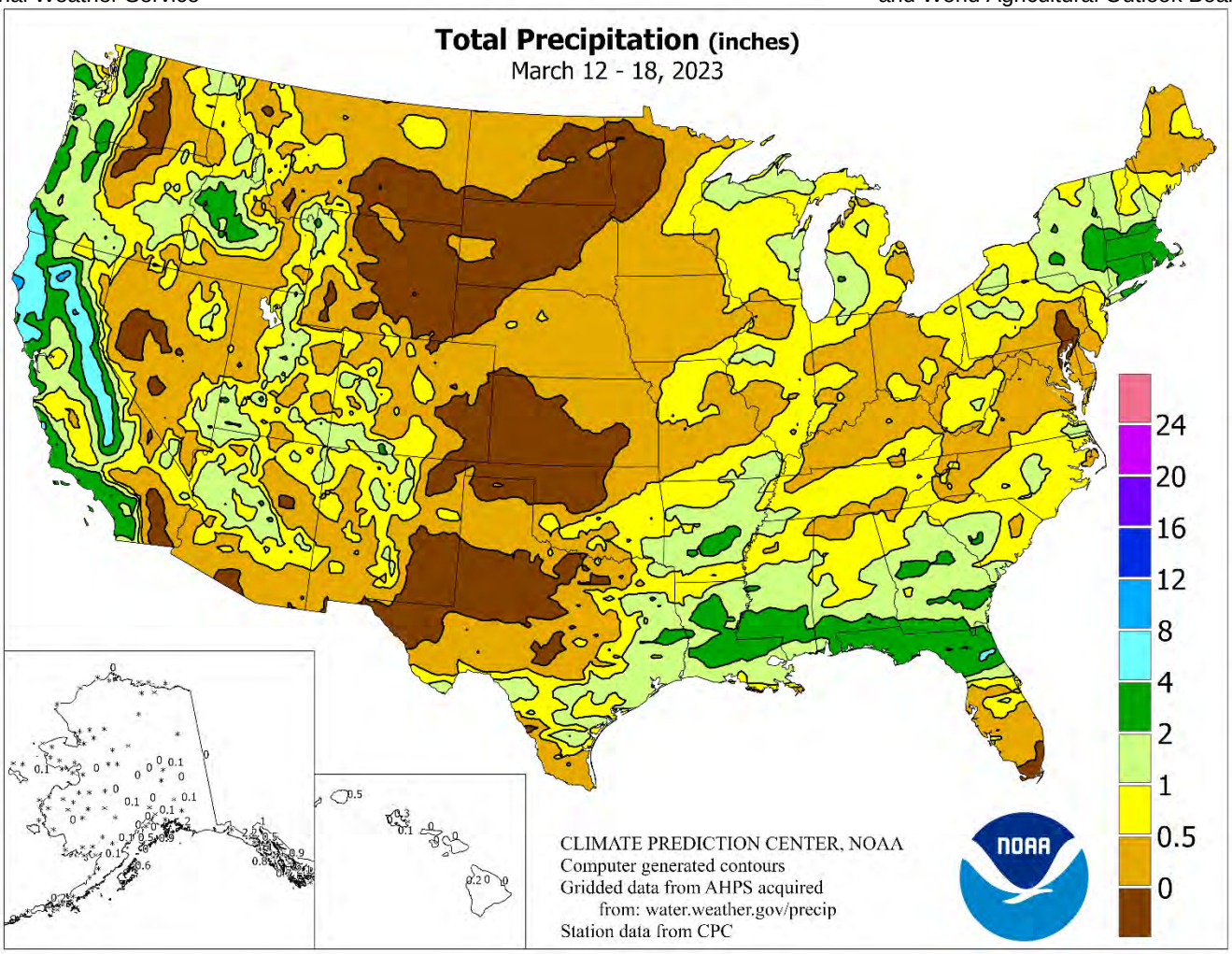
Volume 110, No. 12 www.usda.gov/oce/weather-drought-monitor March 21, 2023

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 12 – 18, 2023

Highlights provided by USDA/WAOB

Ongoing storminess in **California** padded already impressive mountain snowpack and further eased vestiges of drought. However, the wet pattern also slowed recovery efforts from recent flooding and led to high river levels, especially in areas downstream of where dam releases were increased. Unsettled weather extended to other areas of the **West**, although precipitation totals were mostly light to moderate. In contrast, mostly dry weather covered the **nation's mid-section**, including the drought-stricken **southern High Plains**. **Southern Florida** also

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Contents

Water Supply Forecast for the Western United States

Highlights

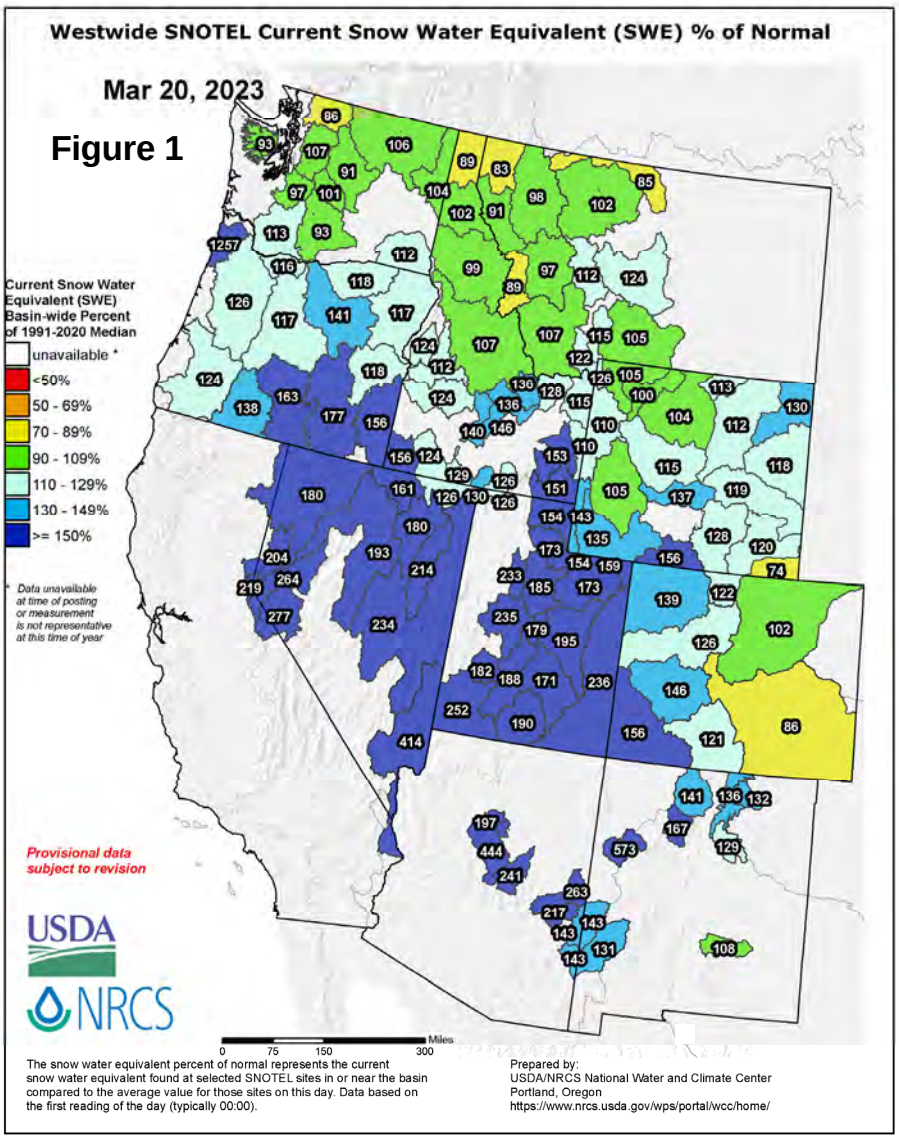
Considering the lingering (but waning) existence of La Niña, unusually heavy precipitation returned across California, the Great Basin, and parts of the Southwest in late February and March. The late-season storminess, which followed a 3-week stormy spell from late December to mid-January, effectively ended drought in the hardest-hit areas, except for ongoing water-supply deficiencies in the Colorado River Basin and incomplete recovery of groundwater reserves.

According to the California Department of Water Resources, the water equivalency of the Sierra Nevada snowpack stood near 57 inches by March 20, roughly 225 percent of average for the date. With the latest burst of precipitation, the Sierra Nevada snow-water equivalency climbed substantially above final values in the two most recent wetter-than-normal seasons (2016-17 and 2018-19). California's bounty extended inland across the Great Basin to the western slopes of the central and southern Rockies. Meanwhile, cold weather in the Northwest led to a higher-than-average portion of the precipitation falling as snow, even though some areas were drier than normal.

Winter storms have resulted in substantial drought relief, according to the *U.S. Drought Monitor*. In fact, drought coverage in the 11-state Western region decreased from 74 to 48 percent between September 27, 2022, and March 14, 2023. Additionally, Western coverage of extreme to exceptional drought (D3 to D4) during the same period decreased from 19 to 2 percent.

Snowpack and Precipitation

Another round of stormy weather, starting in late February, led to substantial, late-season increases in snow-water equivalency from California to the western slopes of the central and southern Rockies. Meanwhile, drier-than-normal weather prevailed in the Northwest during the transition from winter into spring, although cold weather led to snow-water equivalency being higher than season-to-date precipitation. By March 20, 2023, near-normal water equivalency was reported in much of the Northwest (figure 1). Some basins on the eastern side of the Continental Divide also had near- to locally below-average snowpack. In contrast, impressive snowpack (at least 150 to 250 percent of average) covered much of California, Nevada, Utah, and Arizona, as well as portions of neighboring states.



Season-to-date precipitation (October 1, 2022 – March 20, 2023) was significantly above normal from California to the western slopes of the central and southern Rockies. In fact, precipitation during that period was more than 150 percent of normal in many basins from the Sierra Nevada into Utah (figure 2). Another area, covering higher elevations of Arizona and New Mexico, has received precipitation totaling approximately 150 percent of normal since the start of the water year on October 1. In contrast, below-normal precipitation has fallen in parts of the Northwest, with several basins—mainly from the Cascades to the northern Rockies—reporting season-to-date totals ranging from 75 to 90 percent of normal.

Spring and Summer Streamflow Forecasts

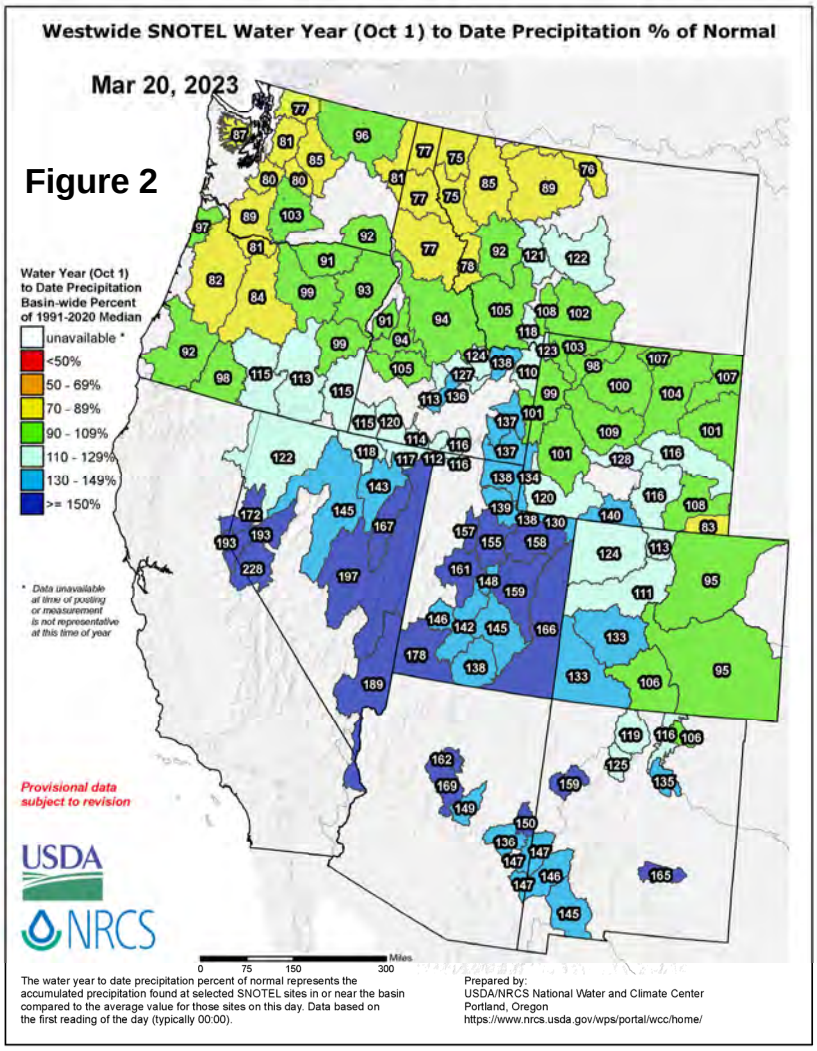
By March 1, 2023, projections for spring and summer streamflow were indicating the likelihood of mostly favorable runoff (more than 150 percent of average) from the Sierra Nevada to the Wasatch Range and parts of the Southwest. However, runoff prospects are considerably less favorable—less than 90 percent of average—in several areas, including the eastern slopes of the Rockies in southern Colorado and northern New Mexico. Much of the interior Northwest can also expect below-average streamflow (figure 3).

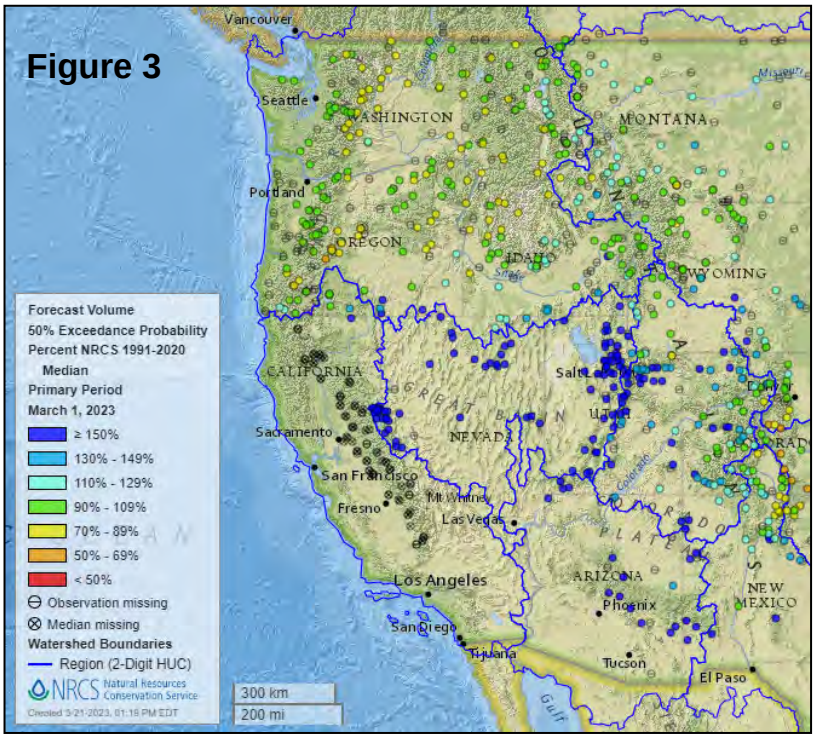
Reservoir Storage

On March 1, 2023, statewide reservoir storage as a percent of average for the date continued to reflect varying degrees of long-term drought. As March began, California's 154 primary intrastate reservoirs held 23.2 million acre-feet of water, 96 percent of average.

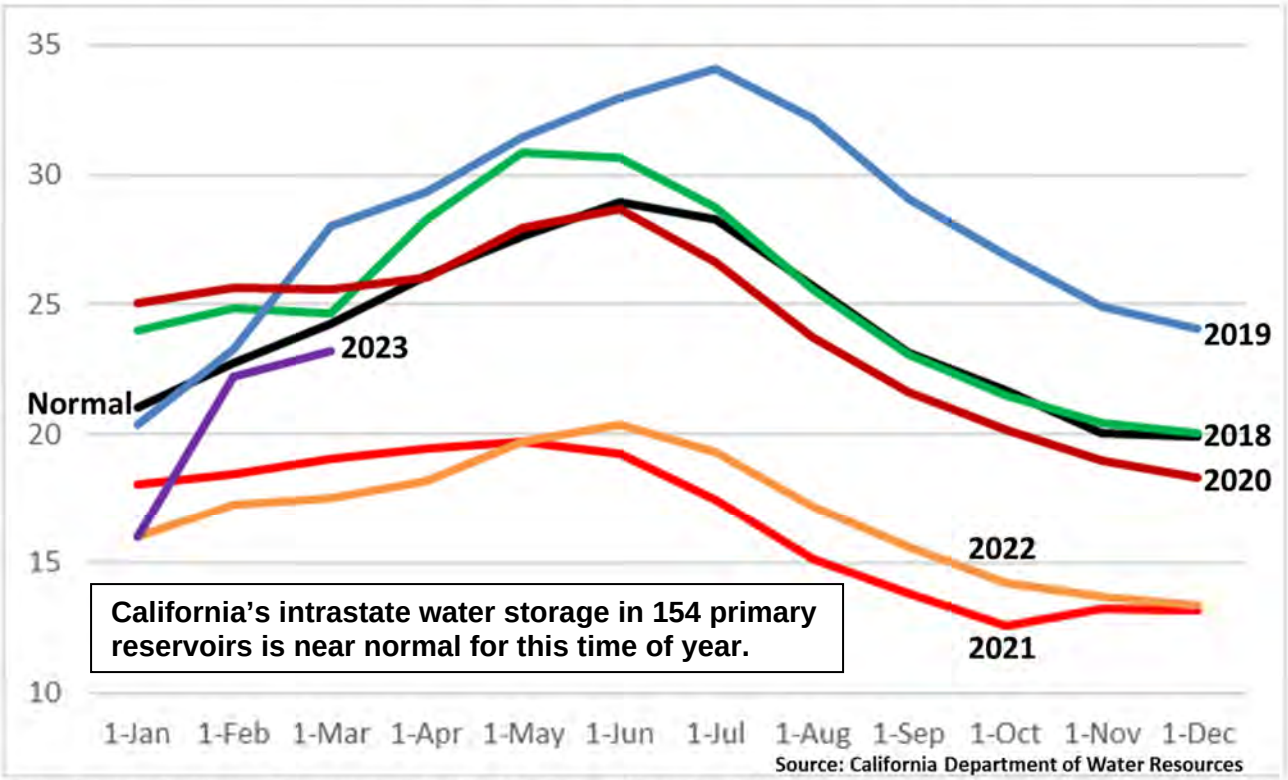
For More Information

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



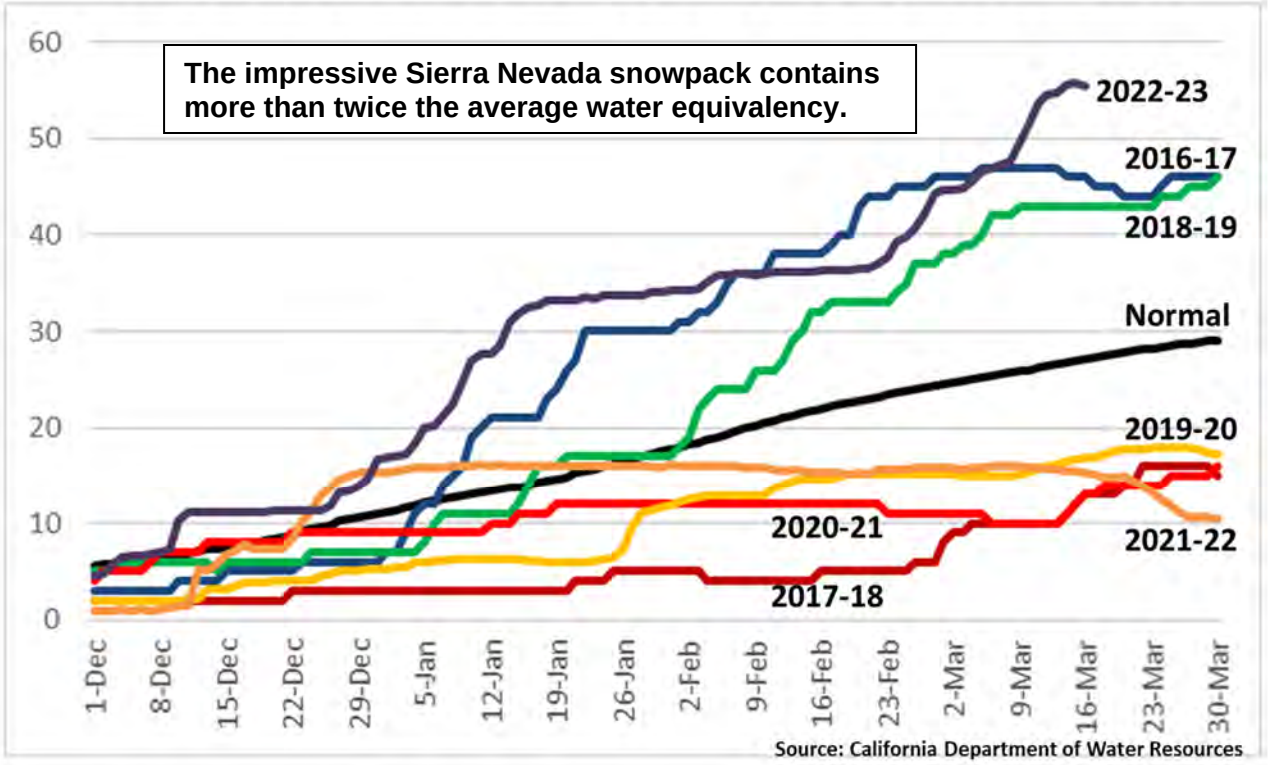


California Reservoir Storage, Million Acre-Feet, 2018-2023



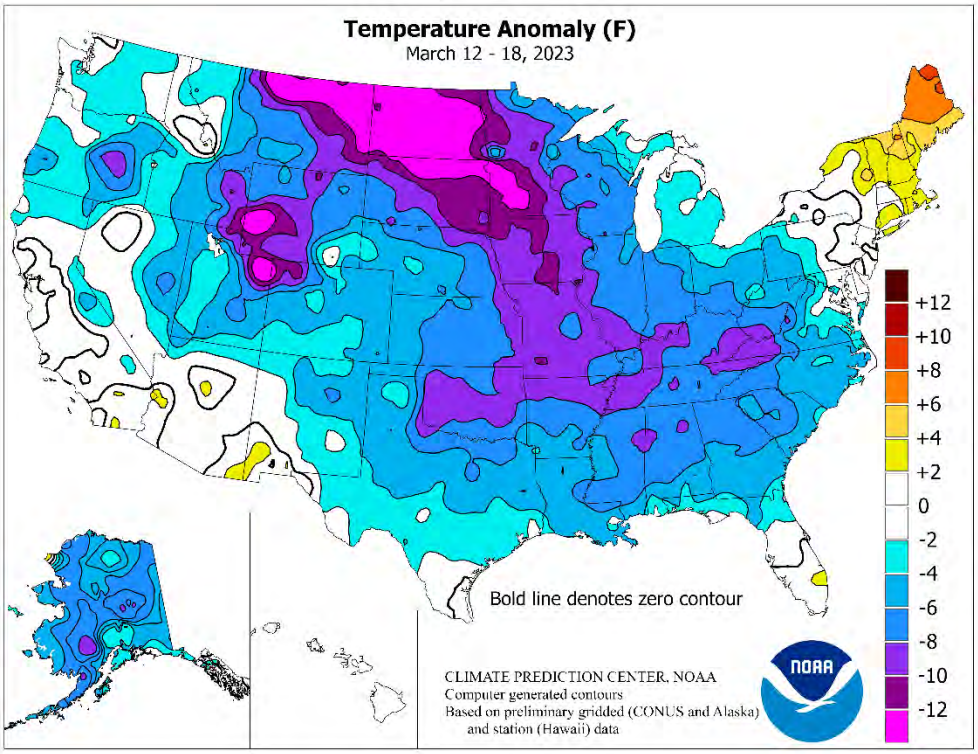
Note: One acre-foot is equal to approximately 325,851 gallons, or the amount of water it takes to cover one acre to a depth of one foot.

Daily Sierra Nevada Snowpack (Inches) vs. Normal



(Continued from front cover)

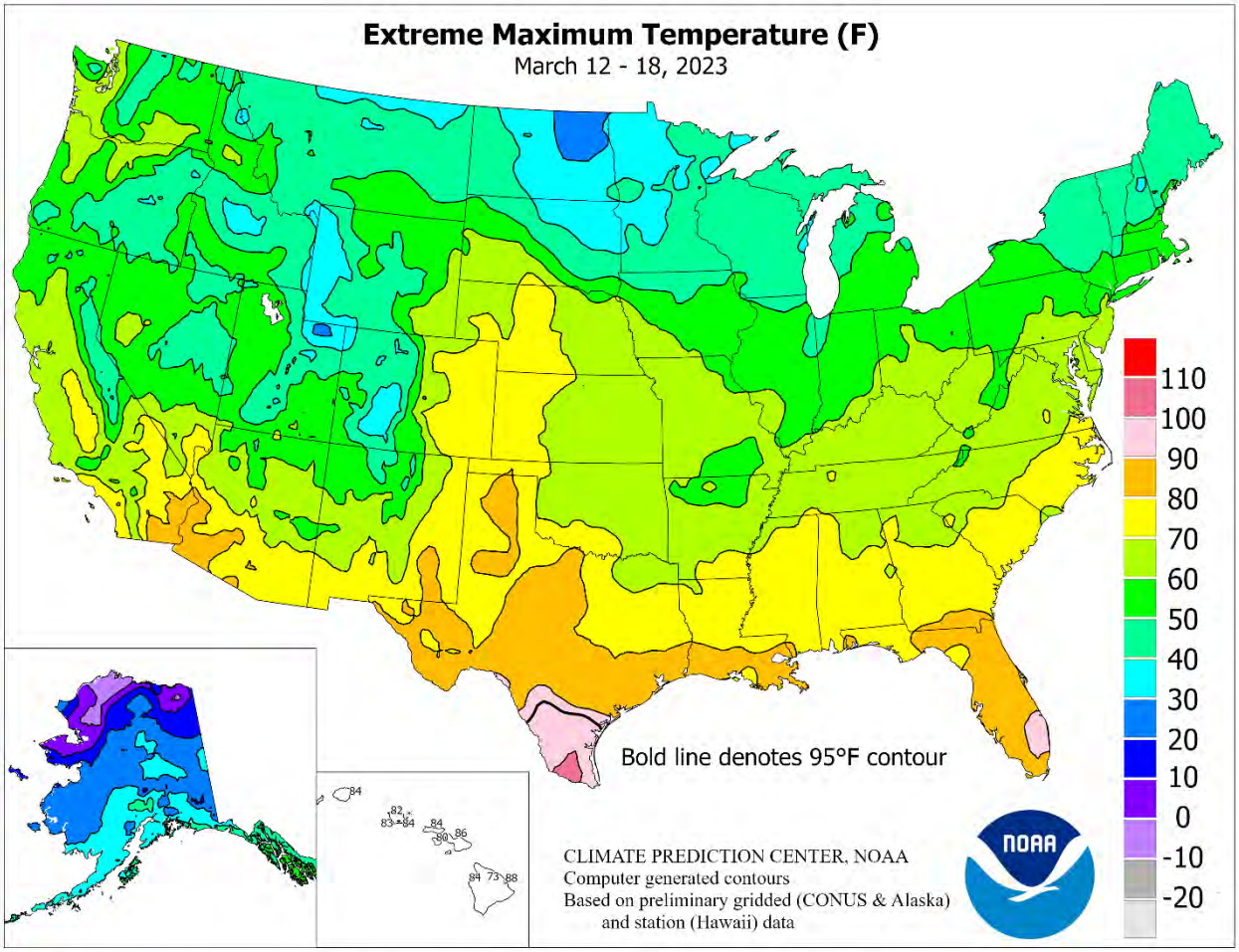
remained mostly dry. Across the remainder of the **South**, however, locally heavy showers (1 to 4 inches) slowed spring fieldwork but provided relief in areas experiencing short-term dryness. Rainfall was especially beneficial across **northern Florida** and environs. Elsewhere, an early-week coastal storm produced heavy snow and gusty winds across a relatively small geographic area of the **Northeast**, including parts of **eastern New York** and **southern New England**. With a mid-March cold wave covering much of the country, weekly temperatures averaged at least 10°F below normal across large parts of the **northern Plains** and **upper Midwest**. Meanwhile, sharply colder weather in the **South** broadly held temperatures 5 to 10°F below normal. Colder-than-normal conditions also dominated **interior sections of the West**.

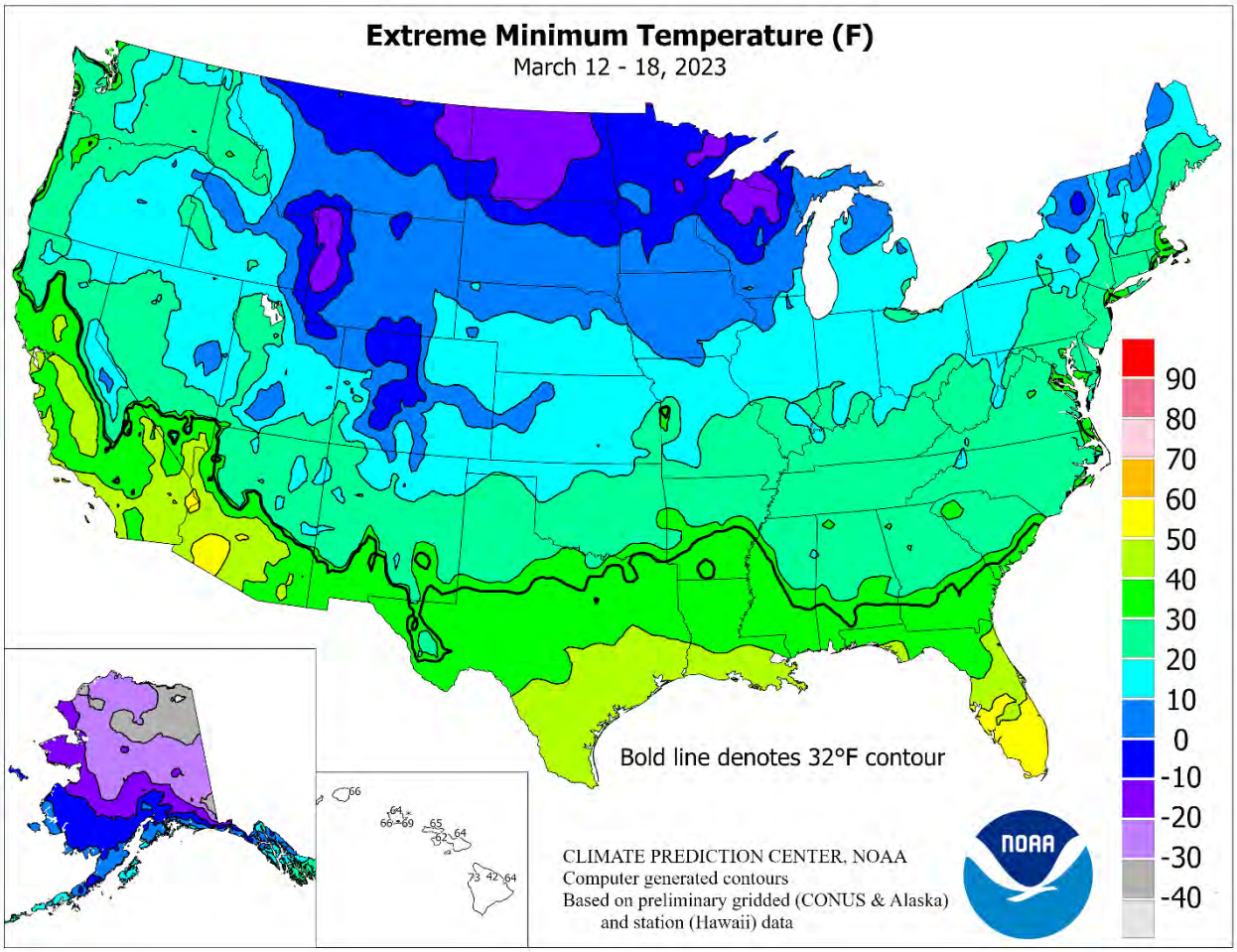


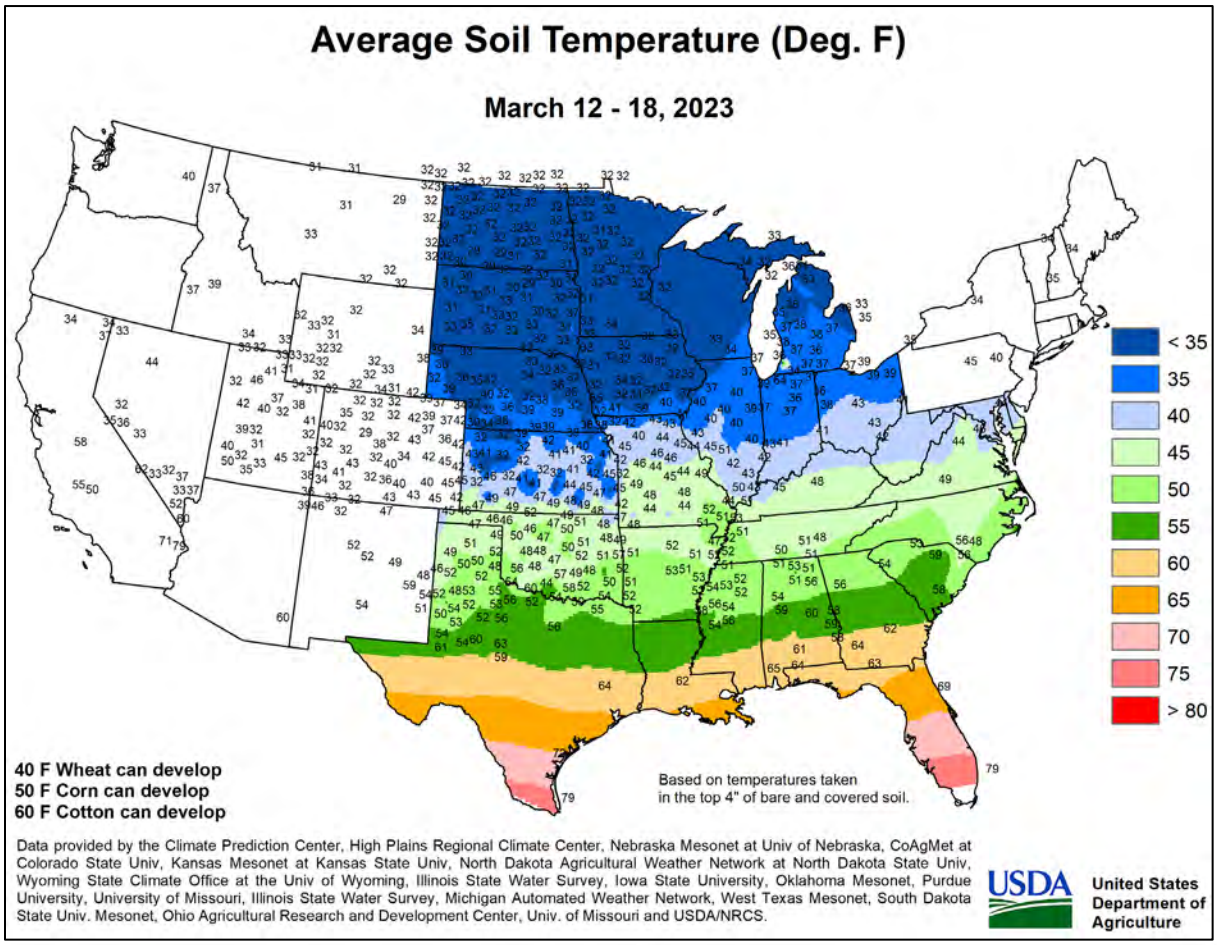
As the week began, snow shifted from the **upper Great Lakes region into the Northeast**. In **Wisconsin**, record-setting snowfall totals for March 12 included 10.5 inches in **Rhinelander**, 9.6 inches in **Wausau**, and 8.8 inches in **Green Bay**. Farther west, March 11-12 snowfall totaled 12.5 inches in **Duluth, MN**, accompanied by a peak wind gust to 45 mph. Similar conditions unfolded across the **Northeast** on March 13-14, when **Albany, NY**, received 10.1 inches of snow and had a liquid equivalency of 1.98 inches. Other March 13-14 totals included 14.4 inches of snow (2.18 inches of liquid) in **Worcester, MA**, and 10.0 inches (1.95 inches of liquid) in **Concord, NH**. **Boston, MA**, received 2.54 inches, but reported only one-half inch of snow. Peak wind gusts during the March 13-14 storm included 47 mph in **Concord**, 45 mph in **Boston**, and 44 mph in **Worcester**. Farther south, **Gainesville, FL**, netted a daily-record rainfall (2.38 inches) on the 13th, accompanied by its second-highest March wind gust on record (62 mph, behind only 63 mph on March 13, 1993). Meanwhile, another round of **Western** precipitation moved ashore, starting in the **Pacific Northwest**. In **Oregon**, record-setting rainfall totals for March 13 included 1.39 inches in **Salem** and 1.19 inches in **Portland**. The following day in **California**, daily-record amounts reached 2.54 inches in **Santa Barbara**, 2.25 inches in **Oxnard**, and 2.04 inches in **Camarillo**. Water year-to-date (October 1 – March 18) precipitation in **downtown Los Angeles** climbed to 24.08 inches (196 percent of normal), the 14th-highest seasonal sum since records began in 1877-78. With a 1.53-inch total on the 14th, **Long Beach, CA**, experienced its seventh-wettest March day on record. Elsewhere in **southern California**, 24-hour precipitation totals on March 14-15 reached 5.22 inches on **Palomar Mountain**; 4.21 inches at **Oceanside Harbor**; and 2.55 inches at **Newport Beach**. In **central California**, the **Middle Fork of the Feather River near Portola** climbed 1.92 feet above flood stage on March 15, the second-highest level on record in that location behind 3.71 feet above flood stage on February 11, 2017. **Southwestern** desert locations such as **Needles, CA** (1.65 inches), and **Kingman, AZ** (1.05 inches) collected daily-record totals for March 15. By the 16th, heavy rain shifted into the **mid-South**, where daily-record amounts in **Arkansas** totaled 2.94 inches at **Little Rock Air Force Base** and 1.84 inches in **Stuttgart**. Farther north, snow in **Montana** led to daily-record totals for March 15 in **Glasgow** (6.2 inches) and **Helena** (4.7 inches). At week's end, beneficial precipitation developed in **southern Texas**, where **Del Rio** netted a daily-record sum of 1.13 inches.

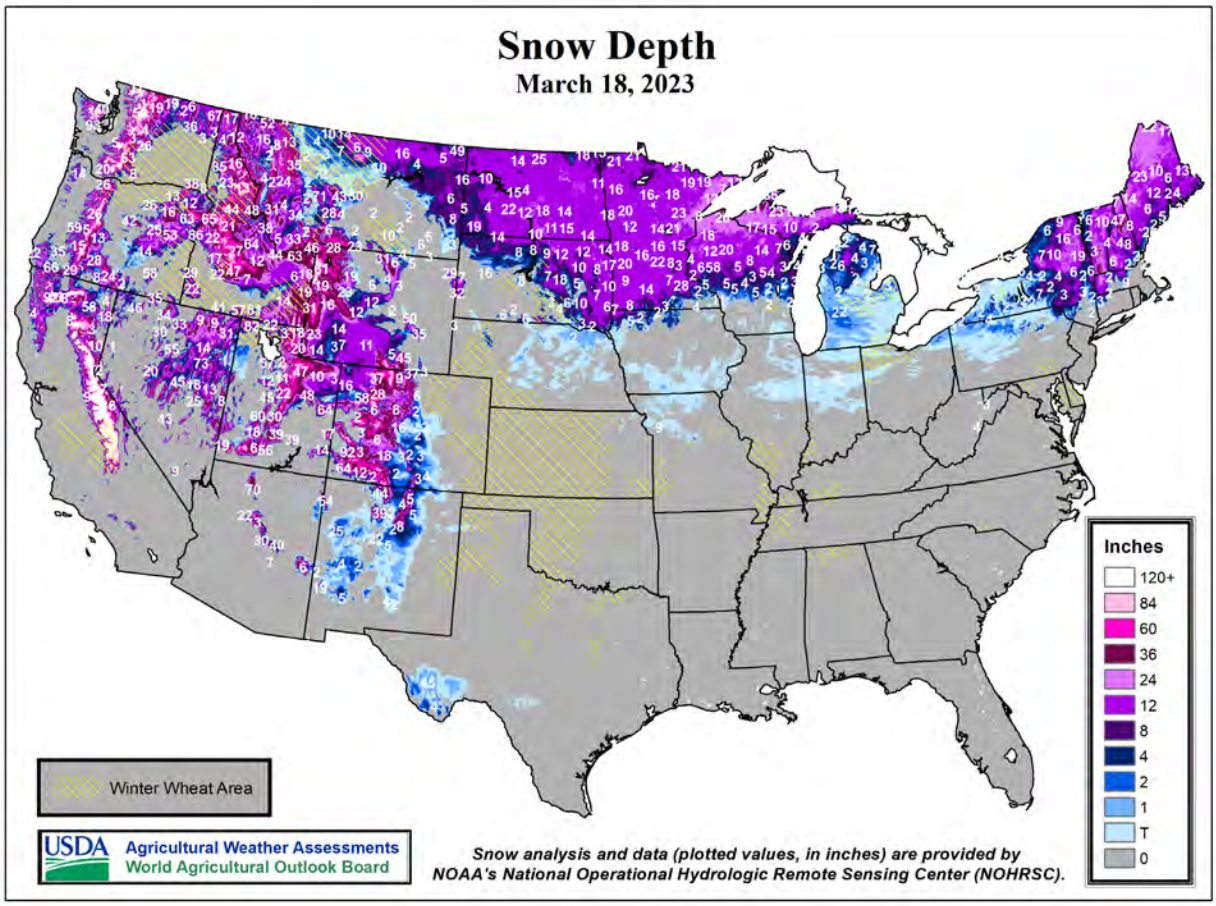
Early in the week, record-setting heat gripped **southern Texas**, where March 12 highs soared to 100°F in **Harlingen** and 99°F in **Corpus Christi**. With a high of 88°F on the 12th, **Galveston, TX**, narrowly missed a March record (89°F on March 19, 2018). Early-week warmth also prevailed in **Florida**, where record-setting highs for March 13 included 94°F in **West Palm Beach** and 90°F in **Melbourne**. In contrast, **Hibbing, MN**, tallied a daily-record low of -14°F on March 14. The following day, **Jackson, TN**, registered a record-setting low (22°F) for March 15. Cold air also prevailed across the **Plains** and **Northwest**; daily-record lows included 11°F (on March 16) in **Burns, OR**, and 15°F (on March 17) in **Garden City, KS**. **Big Piney, WY**, reported its 13th sub-zero reading of the month on March 18, notching a daily-record low of -15°F.

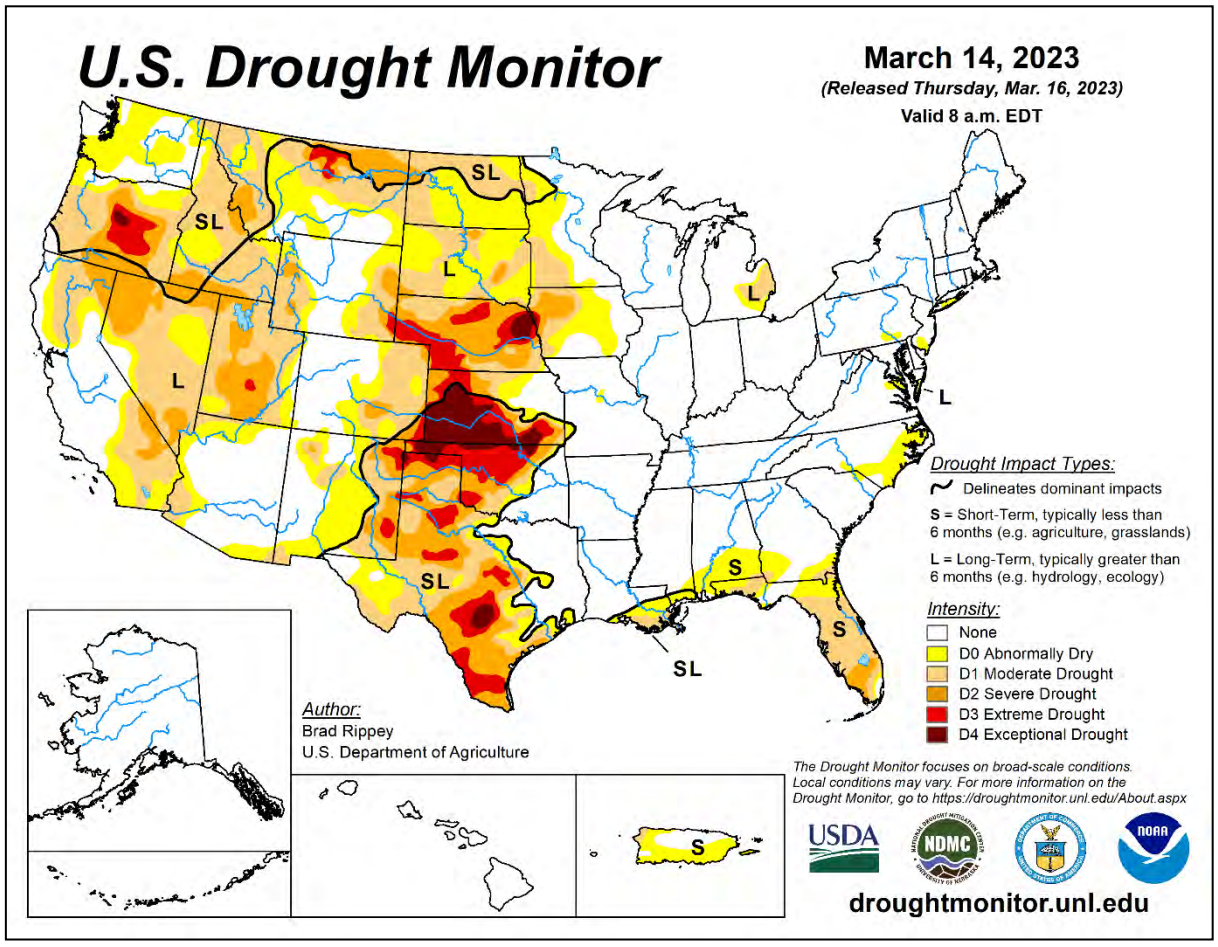
Cold, dry weather dominated **Alaska**, although some precipitation fell across the state's southern tier. Temperatures plunged below -30°F in parts of **interior Alaska**, with **Bettles** reporting lows of -36°F on March 13 and 16. Meanwhile in **Yakutat**, March 15-18 precipitation totaled 2.53 inches, featuring a transition from snow to rain. Before milder air arrived, **Juneau** tied a daily-record low on March 13 with a reading of 7°F. Farther south, warmth and dryness covered **Hawaii**, aside from some mid-week showers mainly on Kauai. On the **Big Island**, **Hilo** collected daily-record highs of 87°F on March 16 and 19. After a wet spell ended early in the month, **Hilo's** March 5-18 rainfall totaled just 0.21 inch.

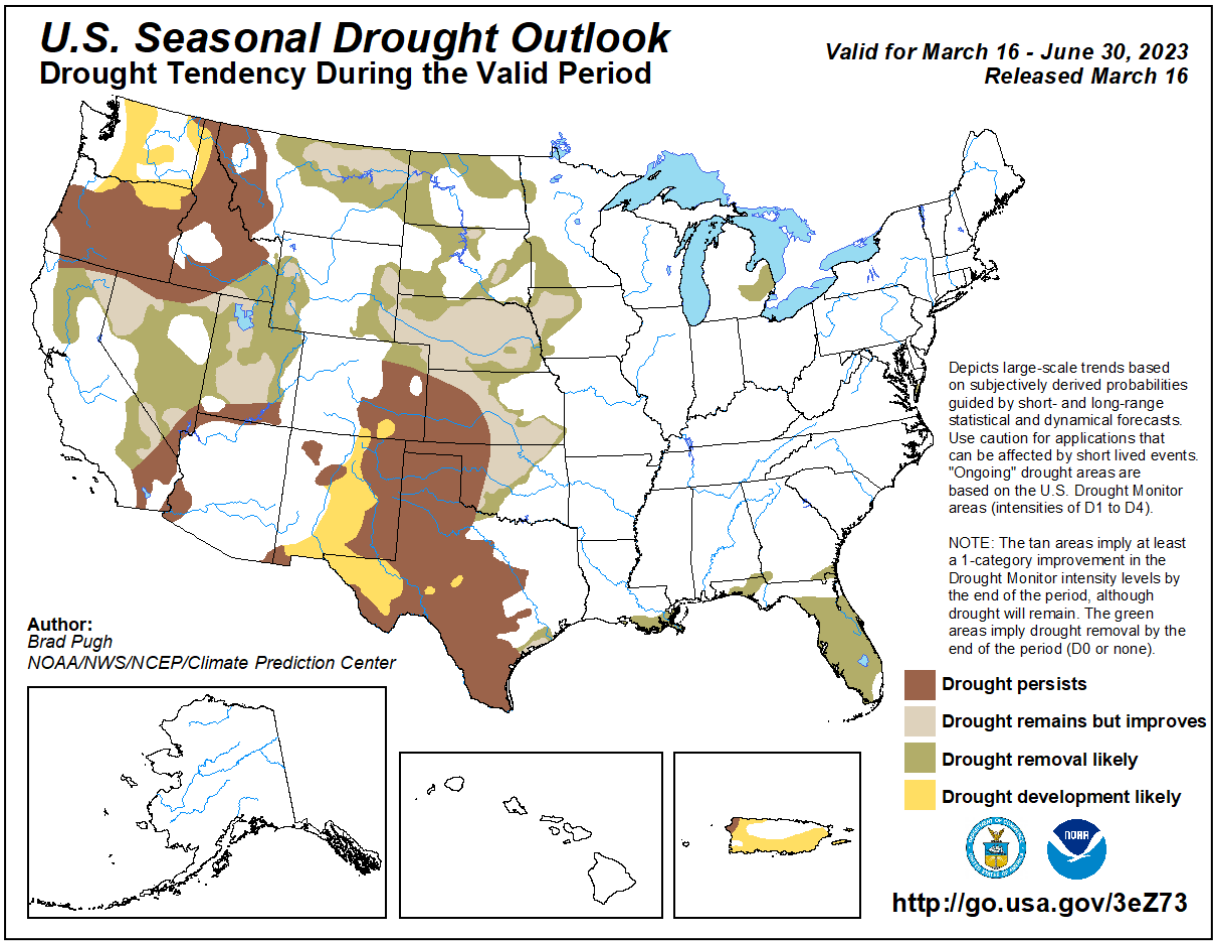

Extreme Maximum Temperature (F)
March 12 - 18, 2023
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
Bold line denotes 95°F contour
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS & Alaska)
and station (Hawaii) data
NOAA


Extreme Minimum Temperature (F)
March 12 - 18, 2023
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 & Alaska)
and station (Hawaii) data
NOAA


Average Soil Temperature (Deg. F)
March 12 - 18, 2023
< 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


Snow Depth
March 18, 2023
Inches
120+
84
60
36
24
12
8
4
2
1
T
0
Winter Wheat Area
USDA Agricultural Weather Assessments
World Agricultural Outlook Board
Snow analysis and data (plotted values, in inches) are provided by
NOAA's National Operational Hydrologic Remote Sensing Center (NOHRSC).


U.S. Drought Monitor
March 14, 2023
(Released Thursday, Mar. 16, 2023)
Valid 8 a.m. EDT
SL
L
S
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:
Brad Rippey
U.S. Department of Agriculture
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
USDA
NDMC
NOAA
droughtmonitor.unl.edu


U.S. Seasonal Drought Outlook
Drought Tendency During the Valid Period
Valid for March 16 - June 30, 2023
Released March 16
Author:
Brad Pugh
NOAA/NWS/NCEP/Climate Prediction Center
Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).
NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).
Drought persists
Drought remains but improves
Drought removal likely
Drought development likely
NOAA
http://go.usa.gov/3eZ73

National Weather Data for Selected Cities

Weather Data for the Week Ending March 18, 2023

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	29	16	38	6	22	-3	0.01	-0.15	0.01	0.02	5	2.25	109	70	44	0	7	1	0
	BARROW	-13	-24	-6	-29	-18	0	0.01	-0.02	0.01	0.13	130	1.71	370	78	68	0	7	1	0
	FAIRBANKS	15	-11	33	-21	2	-7	0.03	-0.06	0.03	0.23	93	1.89	137	74	50	0	7	1	0
	JUNEAU	37	23	47	7	30	-3	0.95	0.13	0.76	1.97	89	13.22	105	88	51	0	5	2	1
	KODIAK	34	24	44	15	29	-4	0.62	-0.38	0.27	1.11	41	11.89	68	77	51	0	7	4	0
	NOME	11	-7	14	-11	2	-6	0.05	-0.10	0.05	1.47	327	3.75	158	79	59	0	7	1	0
AL	BIRMINGHAM	60	36	69	27	48	-8	1.22	-0.05	0.77	3.68	108	15.51	116	85	41	0	2	2	1
	HUNTSVILLE	58	34	69	29	46	-8	0.67	-0.54	0.39	3.91	123	13.87	104	87	45	0	4	2	0
	MOBILE	69	44	80	38	57	-4	1.84	0.67	1.07	2.13	67	9.19	69	85	39	0	0	2	2
	MONTGOMERY	65	41	73	30	53	-6	1.00	-0.17	0.69	1.79	55	10.08	79	83	41	0	1	2	1
AR	FORT SMITH	55	37	64	32	46	-7	0.50	-0.38	0.50	3.21	147	9.07	116	77	35	0	1	1	1
	LITTLE ROCK	57	39	63	32	48	-4	2.33	1.22	2.33	6.93	237	20.56	197	79	35	0	1	1	1
AZ	FLAGSTAFF	46	26	52	21	36	-2	1.26	0.82	1.14	3.53	283	12.39	226	89	44	0	6	2	1
	PHOENIX	76	54	82	51	65	-1	0.77	0.57	0.71	1.42	251	2.80	121	73	23	0	0	2	1
	PRESCOTT	57	34	63	27	46	-2	0.49	0.28	0.49	0.96	152	4.38	140	84	34	0	2	1	0
	TUCSON	73	50	80	42	62	0	0.19	0.06	0.10	0.47	136	2.77	136	72	25	0	0	2	0
CA	BAKERSFIELD	67	49	73	45	58	0	0.35	0.08	0.31	1.43	198	5.81	188	91	48	0	0	2	0
	EUREKA	53	40	57	34	47	-3	2.28	0.98	0.98	5.49	158	15.35	97	97	79	0	0	3	3
	FRESNO	66	50	70	45	58	1	1.00	0.55	0.52	3.15	271	11.17	212	92	52	0	0	4	1
	LOS ANGELES	62	53	74	48	58	-2	3.15	2.76	2.03	4.39	371	15.73	223	96	69	0	0	2	2
	REDDING	62	43	68	37	52	-2	3.81	2.72	2.94	7.33	248	20.42	141	89	48	0	0	3	2
	SACRAMENTO	65	45	68	39	55	0	1.13	0.51	0.56	2.99	173	10.78	121	94	54	0	0	3	1
	SAN DIEGO	65	54	75	51	59	-1	1.09	0.76	1.01	2.17	219	9.07	175	88	59	0	0	2	1
	SAN FRANCISCO	62	49	66	44	55	0	1.30	0.67	0.71	3.31	187	15.82	164	90	65	0	0	3	2
	STOCKTON	66	48	70	41	57	1	1.44	1.00	1.17	3.51	296	11.12	174	90	55	0	0	2	1
CO	ALAMOSA	46	20	58	13	33	-2	0.26	0.13	0.21	0.27	95	0.93	106	92	41	0	7	2	0
	CO SPRINGS	51	25	70	13	38	-3	0.03	-0.16	0.03	0.05	12	0.95	91	66	24	0	6	1	0
	DENVER INTL	51	24	71	13	37	-5	0.24	0.04	0.12	0.25	57	1.72	141	77	26	0	6	2	0
	GRAND JUNCTION	50	31	58	23	40	-5	0.46	0.28	0.39	1.15	273	2.53	162	86	41	0	3	2	0
	PUEBLO	56	25	78	14	40	-3	0.10	-0.09	0.10	0.10	23	0.72	69	68	24	0	6	1	0
CT	BRIDGEPORT	47	34	56	30	41	1	1.36	0.44	0.67	2.69	112	8.89	102	88	52	0	2	4	2
	HARTFORD	48	31	58	26	39	2	2.05	1.19	1.33	3.52	157	11.06	128	83	46	0	5	2	2
DC	WASHINGTON	53	37	65	33	45	-2	0.09	-0.73	0.05	0.64	32	4.31	57	70	33	0	0	3	0
DE	WILMINGTON	53	35	62	28	44	1	0.06	-0.93	0.04	1.17	49	5.22	61	72	35	0	2	2	0
FL	DAYTONA BEACH	76	51	86	43	63	-2	1.50	0.66	1.50	1.57	75	3.52	49	89	46	0	0	1	1
	JACKSONVILLE	73	44	84	33	58	-4	2.06	1.35	1.34	2.85	146	6.16	76	93	42	0	0	3	1
	KEY WEST	80	72	85	67	76	2	0.08	-0.28	0.08	0.08	8	0.17	3	82	61	0	0	1	0
	MIAMI	83	67	90	59	75	2	0.03	-0.51	0.03	0.04	3	3.67	69	84	47	1	0	1	0
	ORLANDO	80	54	86	48	67	0	0.14	-0.56	0.14	0.14	8	1.68	27	86	40	0	0	1	0
	PENSACOLA	71	49	83	43	60	-3	1.84	0.72	0.76	1.92	63	8.28	64	85	42	0	0	3	2
	TALLAHASSEE	72	45	83	35	58	-3	2.29	1.10	1.10	2.37	71	12.93	107	90	37	0	0	4	2
	TAMPA	78	57	83	49	67	-1	0.10	-0.44	0.05	0.29	20	2.29	34	83	47	0	0	3	0
	WEST PALM BEACH	83	64	94	57	74	3	0.04	-0.72	0.04	0.04	2	1.36	17	83	44	1	0	1	0
GA	ATHENS	58	35	69	27	47	-8	1.70	0.70	1.20	2.34	87	14.35	125	87	37	0	3	2	2
	ATLANTA	59	37	70	31	48	-7	1.69	0.62	1.04	2.96	103	12.44	103	77	36	0	2	2	2
	AUGUSTA	63	38	75	25	50	-7	1.55	0.63	0.92	2.16	88	13.93	139	93	32	0	2	2	2
	COLUMBUS	65	41	72	31	53	-6	0.69	-0.43	0.62	1.84	61	10.46	89	82	34	0	1	2	1
	MACON	64	38	75	28	51	-6	1.49	0.54	1.01	3.44	134	14.41	130	92	36	0	2	2	1
	SAVANNAH	67	43	77	34	55	-5	1.93	1.14	0.97	2.62	127	9.81	120	86	31	0	0	3	2
HI	HILO	85	67	88	64	76	5	0.04	-2.89	0.04	4.20	55	42.75	166	93	56	0	0	1	0
	HONOLULU	83	74	84	69	79	4	0.15	-0.44	0.15	0.80	54	4.33	82	88	68	0	0	1	0
	KAHULUI	84	69	86	64	76	3	0.00	-0.67	0.00	1.44	89	7.23	119	89	56	0	0	0	0
	LIHUE	81	71	84	66	76	3	0.52	-0.87	0.26	1.37	40	14.95	152	91	65	0	0	4	0
IA	BURLINGTON	39	24	56	11	31	-9	0.83	0.29	0.83	1.72	126	5.70	126	83	56	0	7	1	1
	CEDAR RAPIDS	36	19	54	8	27	-9	0.09	-0.35	0.09	0.35	31	3.44	105	89	63	0	7	1	0
	DES MOINES	39	20	60	9	30	-9	0.15	-0.33	0.15	1.26	109	4.87	136	81	58	0	6	1	0
	DUBUQUE	35	19	50	8	27	-8	0.32	-0.16	0.30	0.94	78	6.09	148	87	59	0	7	2	0
	SIOUX CITY	37	18	63	9	28	-9	0.19	-0.19	0.19	0.66	76	3.39	140	84	63	0	6	1	0
	WATERLOO	37	18	54	9	27	-9	0.36	-0.07	0.36	0.96	93	5.17	161	81	58	0	7	1	0
ID	BOISE	53	32	56	25	42	-3	0.42	0.12	0.22	0.89	123	1.97	62	79	37	0	5	4	0
	LEWISTON	55	34	62	30	45	-1	0.26	-0.04	0.14	0.62	86	1.34	46	81	33	0	3	4	0
	POCATELLO	43	24	53	17	33	-6	0.08	-0.19	0.05	0.66	92	2.54	91	91	55	0	6	2	0
IL	CHICAGO/O_HARE	40	24	50	12	32	-6	0.32	-0.21	0.21	1.37	99	7.66	143	81	48	0	6	3	0
	MOLINE	41	25	58	13	33	-6	0.31	-0.28	0.31	0.93	61	6.56	131	78	48	0	6	1	0
	PEORIA	42	26	54	12	34	-7	0.99	0.40	0.93	2.16	142	7.01	126	84	50	0	6	3	1
	ROCKFORD	37	21	48	11	29	-8	0.34	-0.19	0.25	1.61	123	7.25	159	86	54	0	6	3	0
	SPRINGFIELD	43	27	57	16	35	-8	0.36	-0.26	0.33	2.44	159	6.01	109	83	51	0	6	3	0
IN	EVANSVILLE	47	30	60	22	39	-8	0.34	-0.69	0.24	4.33	163	12.61	136	87	45	0	5	3	0
	FORT WAYNE	42	25	55	18	33	-5	0.25	-0.37	0.08	1.56	101	8.35	136	87	53	0	7	4	0
	INDIANAPOLIS	43	26	56	19	35	-8	0.44	-0.38	0.18	2.79	138	9.13	120	87	50	0	6	5	0
	SOUTH BEND	40	25	51	16	33	-4	0.88	0.38	0.50	2.88	208	9.26	146	88	53	0	6	4	1
KS	CONCORDIA	50	25	70	18	37	-6	0.06	-0.27	0.06	0.26	34	1.99	87	80	36	0	6	1	0
	DODGE CITY	53	24	69	13	39	-7	0.01	-0.28	0.01	0.01	1	0.85	44	78	31	0	6	1	0
	GOODLAND	53	21	76	11	37	-4	0.00	-0.20	0.00	0.06	14	0.65	52	82	27	0	6	0	0
	TOPEKA	50	25	66	18	37	-8	0.25	-0.24	0.25	0.87	72	3.89	114	80	41	0	7	1	0

Based on 1991-2020 normals

***** Not Available**

Weather Data for the Week Ending March 18, 2023

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	52	29	64	21	40	-7	0.00	-0.52	0.00	0.08	6	2.56	77	76	35	0	5	0	0
KY	LEXINGTON	49	29	67	21	39	-7	0.50	-0.52	0.39	2.08	78	12.00	123	85	43	0	4	4	0
	LOUISVILLE	49	32	66	24	40	-8	0.29	-0.74	0.16	3.09	114	10.83	114	77	42	0	5	3	0
	PADUCAH	51	31	63	24	41	-7	0.55	-0.48	0.45	5.56	202	16.52	156	85	39	0	3	3	0
LA	BATON ROUGE	69	46	83	40	58	-4	2.22	1.29	2.22	2.26	86	15.87	118	81	44	0	0	1	1
	LAKE CHARLES	69	47	84	40	58	-5	1.32	0.55	1.24	1.38	67	8.65	77	85	42	0	0	2	1
	NEW ORLEANS	68	52	84	48	60	-4	1.69	0.74	1.66	1.75	68	7.34	62	80	42	0	0	3	1
	SHREVEPORT	65	45	72	39	55	-4	0.00	-1.06	0.00	0.00	0	0.00	0	84	41	0	0	0	0
MA	BOSTON	47	35	53	32	41	3	2.52	1.60	2.07	3.20	137	9.70	108	84	55	0	1	2	1
	WORCESTER	44	32	52	28	38	4	2.20	1.26	1.54	3.54	147	11.31	123	80	52	0	6	3	2
MD	BALTIMORE	53	35	66	31	44	0	0.02	-0.93	0.01	0.75	32	4.54	54	71	30	0	3	2	0
ME	CARIBOU	41	24	44	15	32	8	0.34	-0.27	0.28	0.82	50	7.45	106	84	47	0	7	3	0
	PORTLAND	44	30	51	26	37	3	0.67	-0.23	0.67	1.83	78	11.09	118	93	56	0	7	1	1
MI	ALPENA	35	18	51	6	26	-2	0.63	0.26	0.31	1.10	109	5.45	125	92	49	0	6	5	0
	GRAND RAPIDS	38	23	51	15	31	-5	0.87	0.38	0.32	1.60	121	7.67	128	89	53	0	6	5	0
	HOUGHTON LAKE	35	18	50	5	26	-3	0.67	0.31	0.31	1.14	120	4.83	119	90	51	0	6	4	0
	LANSING	39	23	55	18	31	-3	0.59	0.14	0.22	1.61	137	6.62	133	86	50	0	6	5	0
	MUSKEGON	39	26	49	18	33	-3	1.41	0.90	0.68	1.96	147	7.74	131	85	52	0	6	5	1
	TRAVERSE CITY	38	23	51	16	30	-2	0.25	-0.07	0.17	0.52	61	2.99	84	84	49	0	6	3	0
MN	DULUTH	29	10	40	-3	19	-7	0.78	0.48	0.45	2.39	309	7.09	260	83	56	0	7	4	0
	INT_L FALLS	29	5	41	-9	17	-6	3.01	2.80	1.89	3.42	678	4.19	211	83	52	0	7	3	2
	MINNEAPOLIS	33	15	45	7	24	-9	0.26	-0.09	0.21	1.05	126	5.61	216	81	56	0	7	2	0
	ROCHESTER	31	13	43	3	22	-10	0.41	-0.01	0.40	1.04	104	5.70	190	91	70	0	7	2	0
	ST. CLOUD	30	8	41	-7	19	-10	0.63	0.29	0.57	1.58	202	4.94	224	87	58	0	7	2	1
MO	COLUMBIA	46	28	63	18	37	-9	0.30	-0.37	0.28	1.75	107	5.80	98	80	48	0	6	2	0
	KANSAS CITY	45	25	64	15	35	-9	0.53	0.01	0.52	1.67	130	6.26	160	82	48	0	6	2	1
	SAINT LOUIS	47	30	64	22	38	-8	0.33	-0.45	0.30	2.45	132	6.56	98	75	43	0	6	3	0
	SPRINGFIELD	48	26	62	18	37	-10	0.32	-0.48	0.32	3.26	165	8.72	126	84	45	0	6	1	0
MS	JACKSON	64	41	76	35	52	-5	2.20	0.97	1.55	2.57	79	14.45	105	79	44	0	0	2	2
	MERIDIAN	64	38	76	32	51	-7	1.69	0.42	1.03	1.91	55	18.02	124	89	43	0	2	2	2
	TUPELO	60	36	71	30	48	-7	2.07	0.91	1.25	7.97	251	17.22	129	81	38	0	2	2	2
MT	BILLINGS	43	20	54	10	31	-6	0.00	-0.19	0.00	0.26	61	1.37	89	82	39	0	6	0	0
	BUTTE	39	12	43	0	26	-6	0.11	-0.02	0.06	0.21	68	0.82	70	86	34	0	7	2	0
	CUT BANK	33	9	42	0	21	-10	0.14	0.07	0.14	0.19	108	0.46	73	96	65	0	7	1	0
	GLASGOW	28	7	42	-3	17	-14	0.25	0.15	0.22	0.99	393	2.84	274	86	68	0	7	2	0
	GREAT FALLS	38	15	47	0	27	-7	0.52	0.39	0.46	1.09	333	2.73	186	89	53	0	7	2	0
	HAVRE	27	2	42	-9	14	-17	0.12	0.01	0.12	0.39	153	1.23	115	92	71	0	7	1	0
	MISSOULA	48	26	53	20	37	0	0.20	0.00	0.14	0.42	82	1.89	80	90	37	0	7	3	0
NC	ASHEVILLE	50	29	65	23	40	-8	0.48	-0.37	0.45	1.38	62	9.06	92	81	37	0	5	2	0
	CHARLOTTE	57	36	68	26	47	-6	0.70	-0.21	0.35	1.24	52	9.91	110	87	35	0	3	3	0
	GREENSBORO	53	34	65	25	44	-6	0.90	0.04	0.61	2.08	96	9.40	112	82	33	0	4	2	1
	HATTERAS	57	43	65	35	50	-4	0.72	-0.29	0.37	1.17	44	6.80	57	85	56	0	0	3	0
	RALEIGH	58	37	70	28	47	-4	0.95	0.00	0.57	1.91	79	7.48	86	80	35	0	3	4	1
	WILMINGTON	63	40	76	30	51	-3	0.61	-0.31	0.42	0.76	31	6.17	63	87	43	0	1	2	0
ND	BISMARCK	24	3	36	-16	13	-16	0.04	-0.14	0.02	1.27	293	2.23	155	83	64	0	7	2	0
	DICKINSON	26	4	41	-7	15	-15	0.01	-0.09	0.01	0.17	66	0.27	33	90	68	0	7	1	0
	FARGO	25	5	36	-4	15	-12	0.04	-0.24	0.02	1.06	157	1.71	82	83	65	0	7	2	0
	GRAND FORKS	21	0	30	-11	11	-13	0.11	-0.09	0.06	0.74	149	1.19	78	87	67	0	7	3	0
	JAMESTOWN	22	3	32	-8	13	-14	0.00	-0.16	0.00	0.15	41	0.37	35	87	66	0	7	0	0
NE	GRAND ISLAND	47	22	70	13	35	-6	0.14	-0.17	0.14	0.28	40	2.17	107	80	39	0	6	1	0
	LINCOLN	46	22	70	14	34	-6	0.21	-0.14	0.21	0.55	70	2.76	114	80	44	0	6	1	0
	NORFOLK	40	22	64	11	31	-7	0.10	-0.22	0.10	0.47	66	2.81	132	89	58	0	5	1	0
	NORTH PLATTE	49	21	74	12	35	-5	0.18	-0.04	0.17	0.33	65	2.27	154	79	32	0	6	2	0
	OMAHA	42	19	66	10	31	-10	0.26	-0.12	0.24	0.69	78	3.69	143	83	53	0	6	2	0
	SCOTTSBLUFF	51	21	70	11	36	-4	0.00	-0.21	0.00	0.06	12	1.87	129	78	23	0	7	0	0
	VALENTINE	43	18	74	8	30	-7	0.14	-0.07	0.08	0.24	48	3.83	265	85	42	0	7	3	0
NH	CONCORD	43	28	49	20	36	3	1.93	1.20	1.59	3.10	167	10.18	137	94	54	0	7	2	1
NJ	ATLANTIC_CITY	52	33	63	25	43	1	0.29	-0.79	0.26	1.26	46	6.73	72	80	39	0	3	3	0
	NEWARK	51	36	62	31	44	2	0.61	-0.34	0.54	2.87	119	8.48	96	70	39	0	1	3	1
NM	ALBUQUERQUE	55	35	64	27	45	-4	0.20	0.11	0.15	0.28	107	0.89	85	79	36	0	4	4	0
NV	ELY	40	20	46	7	30	-7	0.14	-0.08	0.06	1.07	196	3.93	184	89	54	0	7	3	0
	LAS VEGAS	66	50	72	43	58	-3	0.16	0.07	0.12	0.38	129	1.33	80	61	22	0	0	2	0
	RENO	54	35	60	28	44	-2	0.21	0.02	0.20	1.52	276	5.11	179	80	33	0	3	2	0
	WINNEMUCCA	53	33	57	21	43	0	0.22	0.02	0.17	0.58	118	1.60	107	77	35	0	4	3	0
NY	ALBANY	43	29	51	21	36	1	1.99	1.29	1.48	3.32	186	8.43	126	87	50	0	5	3	1
	BINGHAMTON	38	23	50	17	30	-1	0.74	0.06	0.41	1.67	97	6.85	101	88	55	0	6	6	0
	BUFFALO	38	27	51	22	33	-1	0.60	-0.04	0.40	2.07	123	8.48	112	87	52	0	6	6	0
	ROCHESTER	40	26	53	18	33	-2	0.53	-0.02	0.39	1.76	122	7.67	125	90	51	0	6	5	0
	SYRACUSE	41	27	49	16	34	1	1.30	0.63	0.67	2.10	123	8.66	128	90	54	0	6	5	1
OH	AKRON-CANTON	41	24	59	16	33	-6	0.41	-0.31	0.21	1.78	97	8.45	117	81	51	0	7	4	0
	CINCINNATI	45	26	61	19	36	-7	0.33	-0.61	0.28	2.59	108	9.23	104	90	50	0	6	3	0
	CLEVELAND	42	26	58	18	34	-4	0.40	-0.28	0.26	1.96	112	9.99	138	78	47	0	5	3	0
	COLUMBUS	44	26	62	19	35	-6	0.33	-0.50	0.23	2.08	102	7.83	105	84	44	0	7	4	0
	DAYTON	44	27	62	19	35	-6	0.17	-0.61	0.09	2.95	152	8.37	113	79	48	0	6	2	0
	MANSFIELD	40	25	57	17	32	-5	0.35	-0.39	0.26	2.10	111	9.15	119	84	54	0	7	3	0

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

Weather Data for the Week Ending March 18, 2023

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	44	27	60	21	35	-3	0.29	-0.27	0.10	2.22	149	9.60	156	83	48	0	6	4	0
	YOUNGSTOWN	41	25	57	18	33	-4	0.39	-0.33	0.17	1.76	95	8.61	116	84	53	0	6	5	0
OK	OKLAHOMA CITY	53	34	68	29	43	-8	1.31	0.74	1.31	2.00	146	4.36	106	79	43	0	3	1	1
	TULSA	55	32	65	25	43	-8	0.33	-0.38	0.33	1.51	90	6.13	124	79	37	0	3	1	0
OR	ASTORIA	55	35	65	30	45	-1	1.52	-0.31	0.67	4.49	94	15.74	69	94	53	0	1	4	2
	BURNS	38	21	43	12	29	-10	0.95	0.74	0.75	2.17	396	4.26	151	88	65	0	5	3	1
	EUGENE	57	33	62	30	45	-2	0.96	-0.08	0.88	2.28	82	7.02	52	94	56	0	3	3	1
	MEDFORD	57	34	62	27	45	-3	0.89	0.49	0.64	1.24	115	2.77	48	91	45	0	4	3	1
	PENDLETON	56	31	65	26	44	0	0.17	-0.14	0.16	0.45	57	1.77	50	75	35	0	5	2	0
	PORTLAND	56	37	68	31	47	-2	1.45	0.54	1.25	2.76	115	8.52	76	88	48	0	1	3	1
	SALEM	57	33	66	30	45	-2	1.77	0.78	1.39	3.04	114	9.19	69	93	52	0	4	3	1
PA	ALLENTOWN	48	30	60	23	39	-1	0.16	-0.67	0.16	2.00	95	7.05	86	73	39	0	5	1	0
	ERIE	39	27	54	21	33	-2	0.37	-0.31	0.20	2.66	149	11.34	147	85	54	0	6	5	0
	MIDDLETOWN	49	32	62	25	40	-1	0.13	-0.73	0.11	1.78	85	5.24	68	76	40	0	5	3	0
	PHILADELPHIA	51	35	61	30	43	0	0.10	-0.83	0.08	1.08	47	5.72	70	73	35	0	2	2	0
	PITTSBURGH	42	25	57	18	34	-5	0.20	-0.52	0.14	0.98	53	5.95	80	81	44	0	7	3	0
	WILKES-BARRE	46	29	57	20	37	-1	0.34	-0.28	0.12	1.73	110	5.47	87	81	44	0	5	3	0
	WILLIAMSPORT	46	29	61	24	38	-1	0.38	-0.33	0.27	0.60	33	3.97	56	77	43	0	5	2	0
RI	PROVIDENCE	48	33	55	30	40	2	2.89	1.79	1.72	4.14	151	12.29	121	90	53	0	2	3	2
SC	CHARLESTON	65	41	74	33	53	-5	0.55	-0.20	0.29	1.09	56	8.54	102	89	38	0	0	2	0
	COLUMBIA	61	40	75	29	50	-5	1.29	0.49	0.63	1.66	76	10.89	120	91	36	0	2	3	2
	FLORENCE	61	39	75	28	50	-6	0.44	-0.27	0.36	0.81	43	8.86	111	88	36	0	2	3	0
	GREENVILLE	57	36	68	29	46	-6	1.36	0.32	0.85	2.31	86	12.91	121	79	35	0	3	2	2
SD	ABERDEEN	26	8	37	-4	17	-13	0.00	-0.19	0.00	1.01	217	2.11	129	93	71	0	7	0	0
	HURON	28	14	40	4	21	-12	0.06	-0.19	0.04	0.44	77	1.33	70	86	70	0	7	2	0
	RAPID CITY	41	15	66	6	28	-7	0.00	-0.19	0.00	0.65	149	1.89	152	88	49	0	7	0	0
	SIOUX FALLS	33	16	49	5	25	-10	0.27	-0.07	0.27	0.77	102	4.50	206	80	63	0	6	1	0
TN	BRISTOL	51	29	65	20	40	-7	0.67	-0.20	0.47	2.82	121	11.89	121	81	42	0	5	3	0
	CHATTANOOGA	57	35	69	30	46	-7	1.19	-0.02	0.79	3.44	109	13.07	99	81	37	0	2	2	1
	KNOXVILLE	54	32	68	26	43	-7	1.24	0.17	0.96	4.11	143	13.84	111	81	39	0	4	3	1
	MEMPHIS	55	37	68	29	46	-8	1.26	-0.03	0.96	5.66	168	18.11	150	86	41	0	3	3	1
	NASHVILLE	54	33	70	26	44	-7	0.69	-0.32	0.39	1.96	74	8.54	76	83	38	0	3	3	0
TX	ABILENE	64	40	84	34	52	-6	0.00	-0.39	0.00	0.63	62	2.64	77	75	31	0	0	0	0
	AMARILLO	57	32	80	23	45	-5	0.26	-0.05	0.23	0.26	39	0.76	39	81	29	0	3	2	0
	AUSTIN	69	48	81	41	59	-4	0.20	-0.44	0.14	0.27	16	3.26	53	80	39	0	0	2	0
	BEAUMONT	71	51	88	45	61	-2	1.07	0.28	1.04	1.08	53	7.48	71	82	45	0	0	3	1
	BROWNSVILLE	79	64	96	50	71	0	0.17	-0.15	0.09	0.17	20	0.71	24	92	56	1	0	3	0
	CORPUS CHRISTI	76	59	99	48	67	0	0.61	0.08	0.61	0.61	45	1.50	37	85	48	1	0	1	1
	DEL RIO	72	54	92	39	63	-2	1.57	1.31	1.14	1.57	242	1.79	94	74	38	2	0	3	1
	EL PASO	70	48	81	39	59	1	0.03	-0.03	0.02	0.04	26	0.63	64	53	20	0	0	2	0
	FORT WORTH	63	43	71	38	53	-5	0.95	0.23	0.95	2.30	118	7.13	98	73	35	0	0	1	1
	GALVESTON	71	56	88	48	64	-1	1.75	1.04	1.75	1.76	99	5.53	67	82	48	0	0	1	1
	HOUSTON	69	51	84	44	60	-4	0.95	0.20	0.75	1.04	51	9.05	103	80	44	0	0	2	1
	LUBBOCK	62	34	81	26	48	-5	0.00	-0.25	0.00	0.00	0	0.74	39	71	25	0	3	0	0
	MIDLAND	65	40	75	33	53	-5	0.00	-0.15	0.00	0.00	0	0.40	25	78	30	0	0	0	0
	SAN ANGELO	68	41	86	38	55	-5	0.11	-0.22	0.10	0.16	18	1.58	53	76	31	0	0	2	0
	SAN ANTONIO	70	50	85	40	60	-2	0.71	0.20	0.31	0.87	66	2.74	54	78	37	0	0	3	0
	VICTORIA	71	52	84	44	62	-3	0.62	-0.02	0.43	0.62	37	7.88	125	92	51	0	0	3	0
	WACO	64	42	75	34	53	-5	0.09	-0.65	0.06	1.06	52	5.74	78	85	43	0	0	3	0
	WICHITA FALLS	62	35	83	31	49	-6	0.03	-0.41	0.03	2.20	194	5.17	138	84	35	0	3	1	0
UT	SALT LAKE CITY	52	33	61	27	43	-3	0.30	-0.09	0.26	0.88	94	4.43	121	82	38	0	4	2	0
VA	LYNCHBURG	53	33	66	25	43	-3	0.35	-0.54	0.28	1.22	56	7.28	85	74	33	0	4	2	0
	NORFOLK	56	40	73	34	48	-2	0.64	-0.23	0.39	1.00	46	6.21	73	84	39	0	0	3	0
	RICHMOND	56	36	66	27	46	-2	0.35	-0.61	0.13	0.53	22	5.51	67	77	31	0	3	4	0
	ROANOKE	52	33	67	29	43	-5	0.19	-0.62	0.18	1.23	60	6.87	84	69	34	0	4	2	0
	WASH/DULLES	52	33	65	28	42	-1	0.10	-0.72	0.08	0.75	37	4.36	57	71	31	0	4	3	0
VT	BURLINGTON	41	26	46	16	34	2	1.33	0.84	0.91	1.99	156	6.83	132	90	53	0	6	5	1
WA	OLYMPIA	55	29	65	25	42	-2	0.60	-0.72	0.37	2.26	65	9.13	55	99	50	0	6	3	0
	QUILLAYUTE	52	32	61	27	42	-2	1.51	-1.24	0.59	5.80	83	22.52	69	97	57	0	3	4	1
	SEATTLE-TACOMA	54	37	65	33	46	-1	0.65	-0.32	0.43	1.96	78	7.31	60	87	43	0	0	2	0
	SPOKANE	48	30	54	27	39	-1	0.39	-0.04	0.37	0.98	90	3.05	67	83	41	0	6	2	0
	YAKIMA	53	26	59	22	40	-3	0.02	-0.12	0.01	0.90	220	2.20	91	82	32	0	7	2	0
WI	EAU CLAIRE	33	13	45	-4	23	-8	0.34	-0.07	0.26	1.06	109	4.17	135	83	55	0	7	2	0
	GREEN BAY	35	15	43	1	25	-7	0.96	0.54	0.47	1.57	150	4.55	125	88	58	0	6	4	0
	LA CROSSE	36	17	48	2	26	-9	0.47	0.04	0.42	1.37	133	5.45	157	84	52	0	7	2	0
	MADISON	36	18	47	9	27	-7	0.43	-0.05	0.31	1.50	128	6.25	150	83	51	0	6	3	0
	MILWAUKEE	37	23	46	13	30	-6	0.54	0.08	0.34	2.21	189	8.50	182	80	49	0	6	4	0
WV	BECKLEY	43	24	62	20	34	-8	0.49	-0.43	0.28	1.58	67	8.69	100	86	43	0	7	5	0
	CHARLESTON	47	29	64	24	38	-7	0.33	-0.63	0.22	1.04	41	9.06	99	86	39	0	5	4	0
	ELKINS	43	24	61	20	33	-7	0.61	-0.30	0.33	1.69	72	7.96	89	85	45	0	7	4	0
	HUNTINGTON	48	29	65	24	38	-8	0.19	-0.78	0.14	1.28	51	9.00	100	81	37	0	6	3	0
WY	CASPER	40	17	49	9	28	-7	0.09	-0.09	0.05	0.19	44	2.87	192	87	45	0	6	2	0
	CHEYENNE	43	19	61	14	31	-6	0.00	-0.21	0.00	0.04	8	1.57	114	75	32	0	7	0	0
	LANDER	35	14	49	6	24	-12	0.05	-0.22	0.03	0.19	32	4.09	226	81	46	0	7	2	0
	SHERIDAN	39	11	58	-1	25	-11	0.07	-0.15	0.06	0.30	60	2.70	153	78	49	0	7	2	0

Based on 1991-2020 normals

***** Not Available**

Winter Weather Review

Weather summary provided by USDA/WAOB

Highlights: Continental U.S. drought coverage decreased from an autumn 2022 peak of 62.95 percent on October 25 to 38.46 percent by February 28, according to the *U.S. Drought Monitor*. As a result, the nation's record-setting streak with at least 40 percent drought coverage ended at 126 weeks (September 29, 2020 – February 21, 2023), although serious drought impacts persisted on the central and southern Plains.

Notably, the central and southern Plains continued to suffer from soil moisture shortages and poor rangeland, pasture, and winter wheat conditions. By February 26, at least 40 percent of the winter wheat was rated in very poor to poor condition in Kansas (51 percent), Texas (49 percent), Oklahoma (41 percent), and Nebraska (40 percent). On the same date, statewide topsoil moisture in Texas was rated 72 percent very short to short, while rangeland and pastures were rated 68 percent very poor to poor. Western Texas dealt with a pair of late-winter dust storms, the second of which (on February 26) featured wind gusts of 60 to 100 mph or higher.

In contrast, a phenomenal winter wet season unfolded across the West—excluding areas from the Pacific Northwest to the northern Rockies—with periods of intense precipitation concentrated in early December, late December to mid-January, and during the final days of February. By March 1, the average water equivalency of the Sierra Nevada snowpack grew to nearly 45 inches, on par with end-of-season values in California's last two wet winters—2016-17 and 2018-19—according to the California Department of Water Resources.

The band of unusually stormy weather extended northeastward across portions of the northern Plains and upper Midwest, where some locations that received snow in November retained coverage throughout the winter. With wintry conditions lingering through the end of winter in the north-central U.S., some farmers struggled through the early stages of lambing and calving season. Additionally, livestock producers in parts of the eastern Corn Belt contended with muddy conditions.

Although much of the winter was cold in the West and mild across the South, East, and lower Midwest, there were notable exceptions. Winter's harshest cold outbreak struck for about a week during the second half of December, resulting in freezes in nearly all areas east of the Rockies, except southern Florida. Another cold wave arrived as January ended and February began, contributing to a multi-day ice storm from central Texas into the mid-South. Later in February, an extended spell of record-setting warmth across the South contributed to an increased risk of spring freezes causing damage to blooming fruit crops.

Historical Perspective: According to preliminary data provided by the National Centers for Environmental Information, the winter of 2022-23 was mild and wet, based on national statistics. The contiguous U.S. experienced its 17th-warmest, 21st-wettest December-February period in the last 128 years. The national average temperature of 34.9°F was 2.7°F above the 1901-2000 mean, while precipitation averaged 7.69 inches—113 percent of normal.

State temperature rankings ranged from the 31st-coolest winter in California to the warmest winter on record in Massachusetts (figure 1). In fact, top-ten rankings for winter warmth were noted in Arkansas, Louisiana, Missouri, and Texas, along with every state east of the Mississippi River, except Wisconsin. Meanwhile, state precipitation rankings ranged from the 23rd-driest winter in Florida to the wettest winter on record in Wisconsin (figure 2). Additionally, it was among the ten wettest winters on record in Iowa, Minnesota, Nebraska, Nevada, South Dakota, and Utah. For California, the sporadic nature of heavy precipitation—short bursts of rain and snow, followed by stretches of mostly dry weather—led to the 11th-wettest winter in the last 128 years, although it was the second-wettest December-February period of the 21st century, behind only 2016-17.

Figure 1 Statewide Average Temperature Ranks
December 2022 – February 2023
Period: 1895–2023

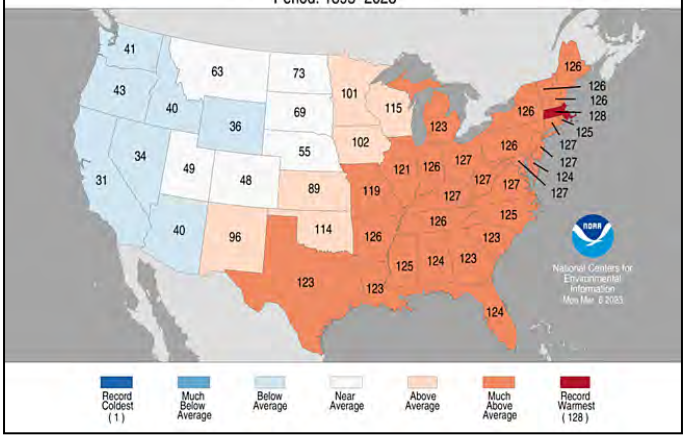
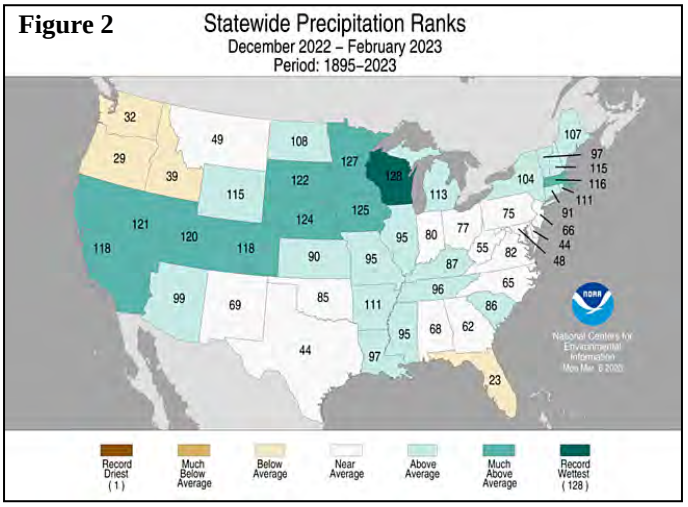


Figure 2 Statewide Precipitation Ranks
December 2022 – February 2023
Period: 1895–2023



December: Significant December precipitation in the West, as well as the South, East, northern Plains, and lower Midwest, further chipped away at expansive drought. Some of the most impressive December storminess occurred in the Far West, including northern and central California. According to the California Department of Water Resources, the average water equivalency of the Sierra Nevada snowpack grew from about 3

to 17 inches in December, with the bulk of the precipitation falling during the first half of the month and in the year's final days. The 17-inch equivalency was about 175 percent of the early-January average and roughly two-thirds of the typical end-of-season value.

In the Northwest, some winter wheat-production areas—especially in eastern Washington—retained a protective snow cover for the entire month. Snow also blanketed the northern Plains, insulating wheat from a harsh cold snap that sent temperatures into the range of -20 to -40°F, with the Arctic outbreak peaking for several days starting around December 20. The central and southern Plains were not as fortunate, with only patchy snow providing limited protection from sub-zero temperatures. Due to drought and temperature extremes, one-quarter to one-half of the winter wheat was rated in very poor to poor condition at the end of December in Oklahoma (27 percent), Nebraska (36 percent), and Kansas (49 percent).

The Arctic outbreak, which lasted through the holiday weekend (December 24-26), also potentially harmed a variety of crops in the Deep South. In the wake of multiple freezes, Southern producers monitored cover crops, winter grains, and forages, some of which were burned back by low temperatures. Southern Florida escaped the freeze, but crops such as citrus, sugarcane, and strawberries in winter agricultural regions from Deep South Texas to Louisiana and central Florida were subjected to temperatures below 32°F. Another cold-related impact was an epic Great Lake-effect snow and wind event, especially in parts of western New York.

On the strength of the cold wave, monthly temperatures averaged 5 to 15°F below normal in numerous locations from the interior Northwest to the northern Plains. Elsewhere, temperatures were closer to normal due to the offsetting effects of early-month warmth and the subsequent Arctic outbreak, although monthly readings averaged more than 5°F above normal in parts of northern New England.

With wetter December weather in parts of the South, muddy field conditions developed. By the end of December, topsoil moisture was rated 60 percent surplus in Arkansas and Louisiana. At the same time, topsoil moisture was at least one-half very short to short in a variety of states across the Plains and Rockies, including New Mexico (76 percent), Nebraska (73 percent), Kansas (69 percent), Oklahoma (58 percent), and Wyoming (56 percent).

The combination of long-term drought in the central U.S. and the late-December cold wave led to ongoing lower-than-normal river levels in much of the Mississippi River drainage basin. Due to the late-month formation of ice (and ice jams) in the middle Missouri River, record-low water levels developed in the lower Missouri River. On December 30-31 in Missouri, river stages along the Missouri River dipped to -0.98 and -2.88 feet, respectively, in Hermann and Jefferson City. Previous records had been -0.90 foot in Hermann (on December 21, 1878) and -1.10 feet in Jefferson City (on February 3, 1908.

January: Three weeks of frenetically stormy weather from the Sierra Nevada to the western slopes of the central Rockies ensured above-average seasonal snowfall, even if dry weather were to return for the final 2 months of the 2022-23 winter wet season. The extraordinary stormy spell, which had begun in late December, helped to fill some smaller reservoirs but also caused extensive damage, primarily in California due to river flooding and debris flows. Some of the worst large-scale flooding occurred in the heavily agricultural Salinas Valley, which endured breached levees and inundation of fields, roads, and farm infrastructure and equipment.

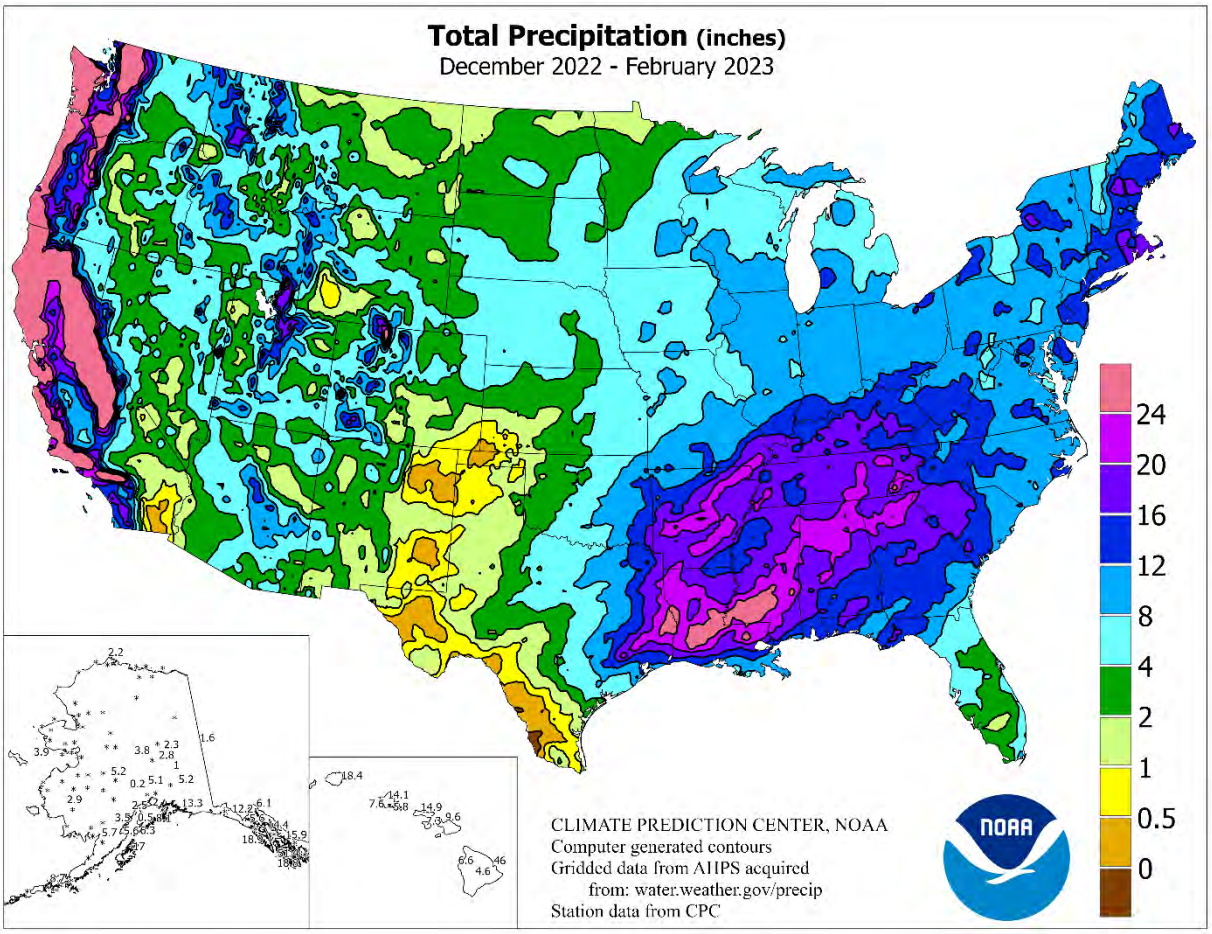
Given the cold (monthly temperatures locally averaging more than 4°F below normal), stormy weather in the West, almost all the high-elevation precipitation went into building snowpack. According to the California Department of Water Resources, the average water equivalency of the Sierra Nevada snowpack stood near 34 inches at month's end, more than twice the late-January normal and nearly 130 percent of the typical end-of-season average.

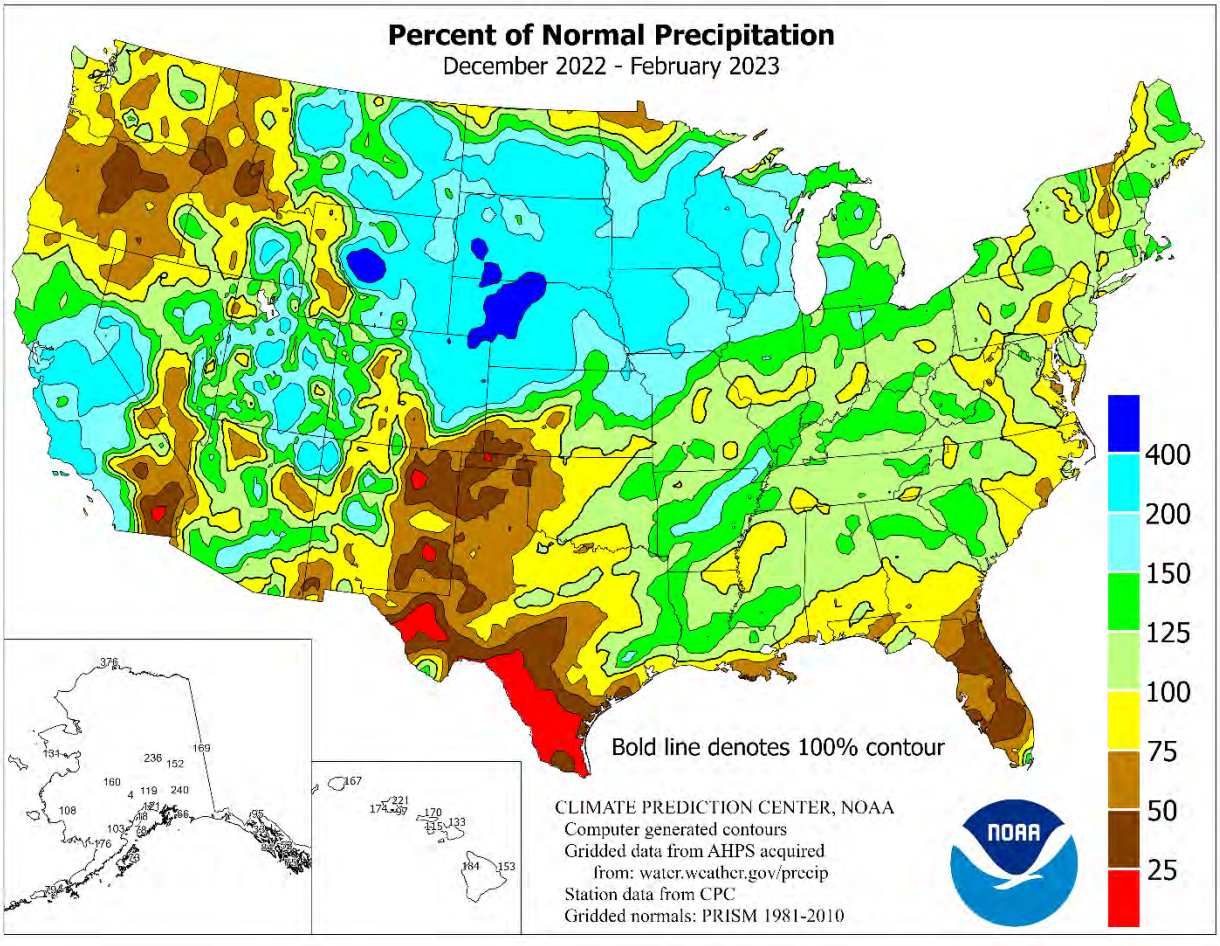
Periodically significant precipitation affected other areas of the West, although January totals were below average in parts of the southern Rockies and the Northwest. Farther east, a stripe of heavy precipitation extended across the Plains and upper Midwest, with some of the heaviest snow blanketing Nebraska and portions of neighboring states. In fact, it was the snowiest January on record in Nebraska locations such as Valentine (28.3 inches) and North Platte (22.6 inches). A continuous snow cover has remained on the ground in parts of the upper Midwest since November.

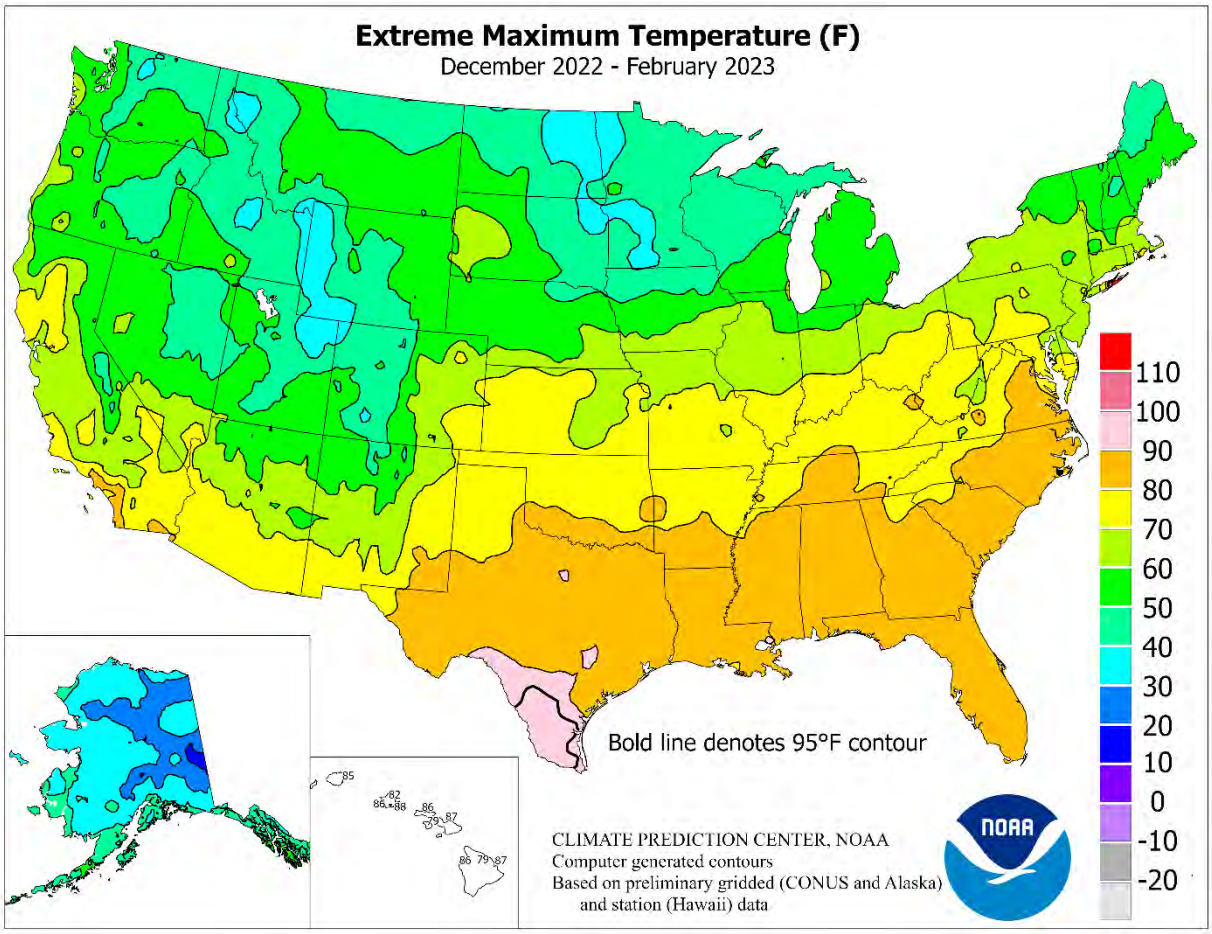
Most other areas of the Plains also received periods of beneficial January precipitation, although winter wheat continued to exhibit stress due to poor crop establishment and effects from episodic cold waves. An Arctic outbreak in late January delivered sub-0°F temperatures as far south as the central High Plains—but was neither as long-lasting nor severe as a December cold blast. By late January, more than one-third of the winter wheat was rated in very poor to poor condition in Texas (52 percent), Kansas (47 percent), Nebraska (40 percent), and Oklahoma (34 percent). Nearly one-quarter of the wheat—24 percent—was rated very poor to poor in Colorado and South Dakota. Among those six states, only Colorado exhibited a significant improvement in condition, as compared with late-November 2022.

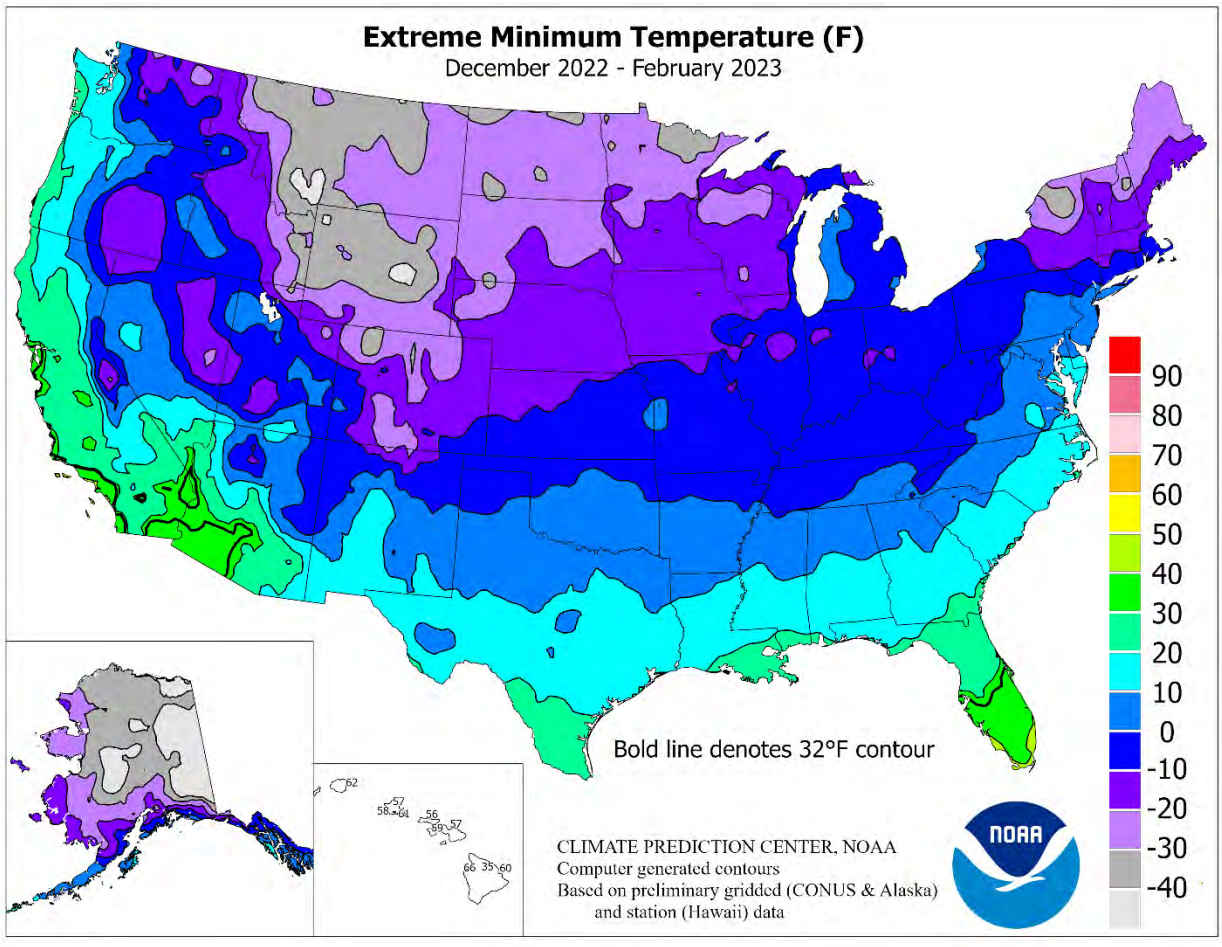
Farther east, mild, wet weather dominated areas east of the Mississippi River, with monthly temperatures averaging at least 4 to 8°F above normal in many locations. In fact, it was the warmest January on record in numerous Northeastern communities. Exceptions to the Eastern wetness included southeastern Louisiana and peninsular Florida. Mid-winter snow was notably scarce in the mid-Atlantic, with New York City setting a record for its latest first accumulation of the season—0.4 inch on February 1. Farther south, however, spring-like thunderstorms spawned dozens of tornadoes, especially from January 2-4, 11-12, and 24-25. Tornadoes were reported as far north as central Illinois (on January 3) and eastern Iowa (on January 16). The first tornado-related deaths of the year occurred on January 12, with seven fatalities in Autauga County, AL, and one in Spalding County, GA. The nation's preliminary monthly count of 168 tornadoes was second only to 214 in January 1999.

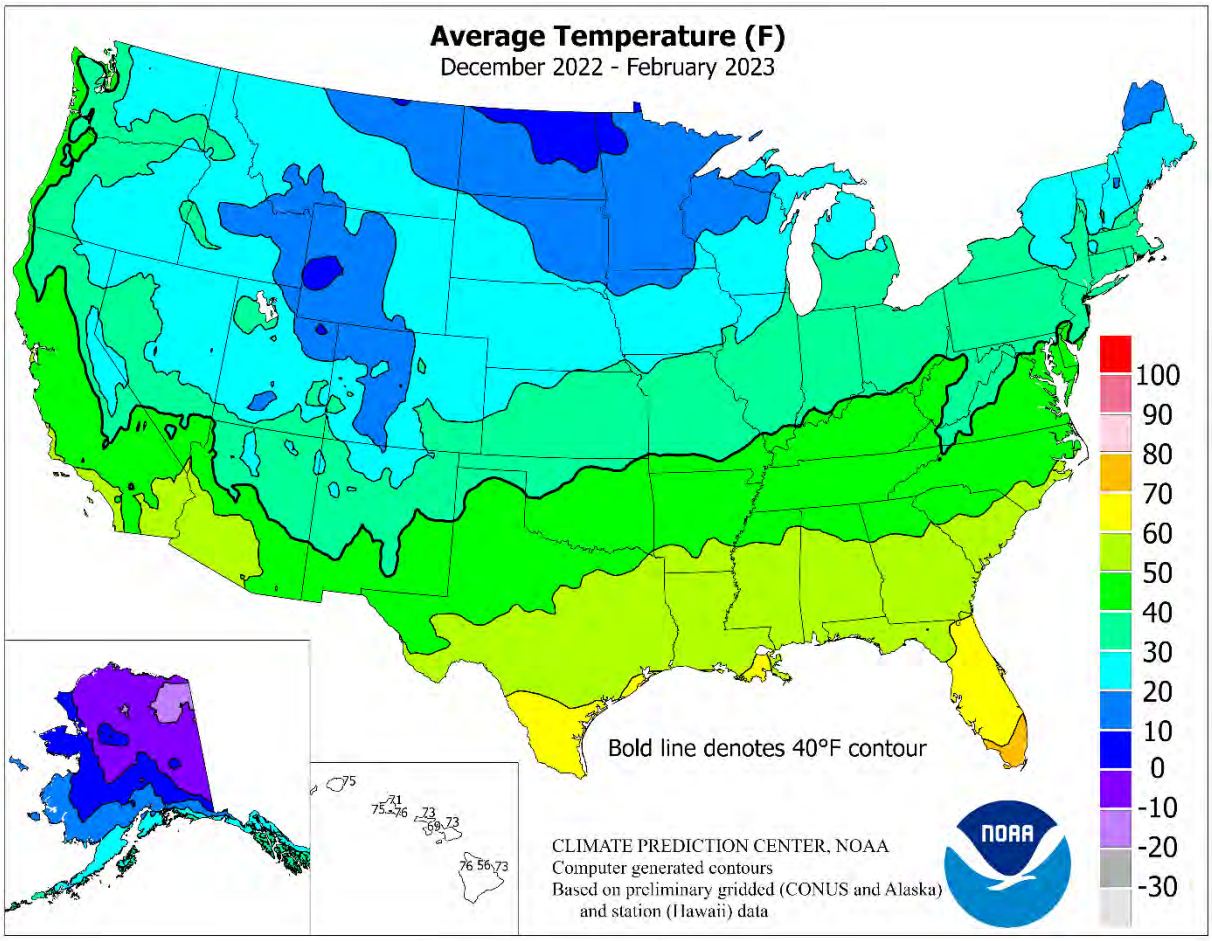
February: A complete summary appeared in the *Weekly Weather and Crop Bulletin* dated March 14, 2023.

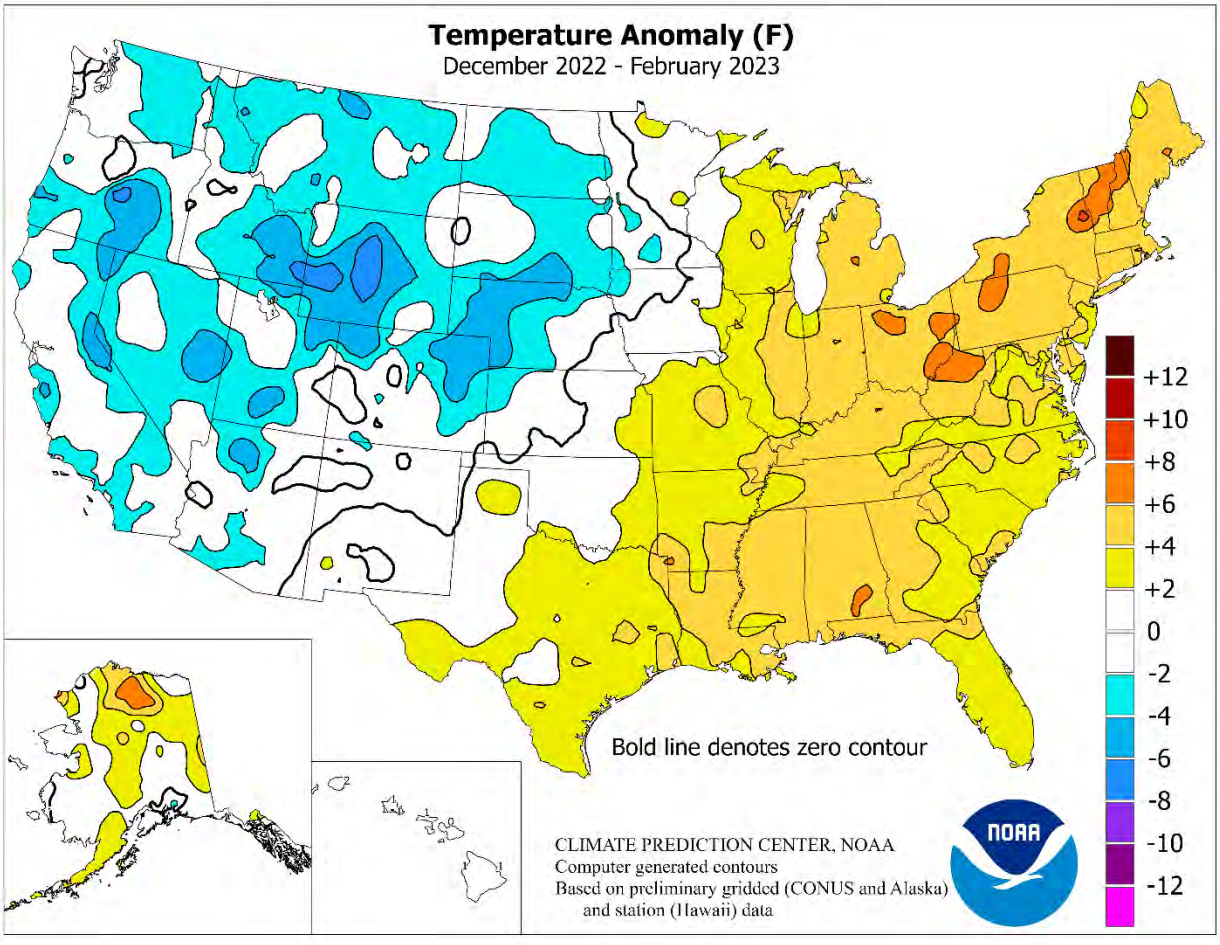

Total Precipitation (inches)
December 2022 - February 2023
24
20
16
12
8
4
2
1
0.5
0
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Gridded data from AHPS acquired
from: water.weather.gov/precip
Station data from CPC
NOAA


Percent of Normal Precipitation
December 2022 - February 2023
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 2022 - February 2023
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 2022 - February 2023
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 & Alaska)
and station (Hawaii) data
NOAA


Average Temperature (F)
December 2022 - February 2023
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 2022 - February 2023
+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

Winter 2022-23

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	20	1	6.13	3.35	WICHITA	36	1	3.26	-0.02	TOLEDO	35	5	8.28	1.19
BARROW	-4	0	2.19	1.61	KY LEXINGTON	42	6	13.30	2.04	YOUNGSTOWN	35	5	8.42	-0.30
FAIRBANKS	-1	3	2.83	1.13	LOUISVILLE	43	5	10.99	0.06	OK OKLAHOMA CITY	42	2	4.38	-0.14
JUNEAU	30	0	14.40	-2.46	PADUCAH	43	4	15.42	3.32	TULSA	42	2	7.17	1.49
KODIAK	33	1	17.05	-6.42	LA BATON ROUGE	59	5	20.87	4.78	OR ASTORIA	42	-1	22.79	-5.67
NOME	9	1	3.91	0.94	LAKE CHARLES	57	2	16.49	2.79	BURNS	22	-6	4.46	0.67
AL BIRMINGHAM	52	5	16.08	1.24	NEW ORLEANS	61	5	13.61	-0.51	EUGENE	41	-1	9.74	-8.19
HUNTSVILLE	49	4	16.07	0.10	SHREVEPORT	54	5	0.00	-13.65	MEDFORD	41	0	5.53	-2.68
MOBILE	59	6	11.81	-3.77	MA BOSTON	37	4	10.18	-0.72	PENDLETON	36	0	2.80	-1.42
MONTGOMERY	56	5	11.85	-2.67	WORCESTER	34	6	13.87	2.80	PORTLAND	41	-1	14.12	-0.36
AR FORT SMITH	46	3	9.79	0.71	MD BALTIMORE	42	5	8.57	-1.12	SALEM	41	-1	11.75	-5.83
LITTLE ROCK	49	6	19.79	7.24	ME CARIBOU	19	4	11.13	2.16	PA ALLENTOWN	36	3	9.38	-0.55
AZ FLAGSTAFF	29	-2	11.17	5.05	PORTLAND	30	3	13.21	1.67	ERIE	34	4	9.73	-0.37
PHOENIX	55	-2	3.39	0.91	MI ALPENA	27	5	5.81	0.61	MIDDLETOWN	38	5	7.81	-1.22
PRESCOTT	38	-2	4.31	0.83	GRAND RAPIDS	31	4	7.52	0.40	PHILADELPHIA	41	5	9.45	-0.40
TUCSON	53	-1	3.54	0.90	HOUGHTON LAKE	27	5	5.00	0.13	PITTSBURGH	36	5	6.63	-1.80
CA BAKERSFIELD	49	-1	5.99	2.52	LANSING	32	5	5.99	0.32	WILKES-BARRE	35	5	7.38	-0.08
EUREKA	46	-2	18.90	-1.50	MUSKEGON	33	4	6.96	0.02	WILLIAMSPORT	36	5	8.45	-0.10
FRESNO	49	0	12.53	6.65	TRAVERSE CITY	30	5	3.13	-1.36	RI PROVIDENCE	36	3	14.15	2.10
LOS ANGELES	56	-2	13.80	5.71	MN DULUTH	16	1	7.92	4.49	SC CHARLESTON	56	5	9.11	-0.66
REDDING	47	-1	21.28	3.46	INT_L FALLS	11	3	1.07	-1.40	COLUMBIA	51	4	12.22	1.64
SACRAMENTO	48	-1	15.57	4.99	MINNEAPOLIS	20	0	6.33	3.40	FLORENCE	51	3	10.76	1.22
SAN DIEGO	56	-3	8.45	2.59	ROCHESTER	19	1	6.28	3.00	GREENVILLE	47	3	15.04	2.50
SAN FRANCISCO	52	0	22.11	10.12	ST. CLOUD	16	1	5.25	2.95	SD ABERDEEN	13	-3	2.54	0.76
STOCKTON	48	-1	16.13	8.55	MO COLUMBIA	38	4	5.26	-1.07	HURON	17	-2	2.63	0.65
CO ALAMOSA	23	3	0.69	-0.26	KANSAS CITY	35	4	5.78	1.57	RAPID CITY	25	-1	1.93	0.78
CO SPRINGS	32	0	1.40	0.56	SAINT LOUIS	39	4	6.06	-1.26	SIOUX FALLS	18	-3	5.34	3.08
DENVER INTL	29	-3	2.63	1.48	SPRINGFIELD	39	3	7.68	0.12	TN BRISTOL	43	5	12.93	1.70
GRAND JUNCTION	32	1	2.63	0.90	MS JACKSON	55	6	17.50	1.85	CHATTANOOGA	48	5	15.69	0.40
PUEBLO	31	-2	0.75	-0.16	MERIDIAN	54	4	20.11	3.88	KNOXVILLE	45	4	15.21	0.65
CT BRIDGEPORT	37	4	10.28	0.00	TUPELO	51	5	16.41	0.35	MEMPHIS	48	4	18.37	4.19
HARTFORD	35	5	11.98	1.50	MT BILLINGS	26	-2	1.72	0.04	NASHVILLE	47	5	10.98	-1.93
DC WASHINGTON	44	4	7.43	-1.46	BUTTE	16	-4	1.09	-0.24	TX ABILENE	50	2	2.47	-1.17
DE WILMINGTON	40	4	9.24	-0.68	CUT BANK	22	-1	0.26	-0.50	AMARILLO	41	2	0.65	-1.29
FL DAYTONA BEACH	64	3	3.06	-4.35	GLASGOW	14	-3	2.73	1.54	AUSTIN	56	2	4.87	-2.37
JACKSONVILLE	60	3	3.52	-5.40	GREAT FALLS	25	-1	2.55	0.88	BEAUMONT	59	4	12.03	-1.36
KEY WEST	74	2	4.13	-1.39	HAVRE	15	-5	2.31	1.10	BROWNSVILLE	66	1	0.80	-2.52
MIAMI	73	3	5.35	-1.07	MISSOULA	24	-1	2.73	-0.19	CORPUS CHRISTI	62	3	1.20	-3.41
ORLANDO	66	3	2.47	-4.54	NC ASHEVILLE	44	3	11.24	-0.54	DEL RIO	59	4	0.21	-1.74
PENSACOLA	61	6	11.83	-3.38	CHARLOTTE	48	4	13.21	3.03	EL PASO	49	1	0.91	-0.53
TALLAHASSEE	59	5	12.61	-0.32	GREENSBORO	45	3	11.07	1.71	FORT WORTH	52	3	7.20	-0.93
TAMPA	66	2	4.38	-3.44	HATTERAS	51	1	8.92	-5.07	GALVESTON	61	3	6.94	-3.74
WEST PALM BEACH	71	3	4.78	-4.80	RALEIGH	48	5	9.22	-0.38	HOUSTON	58	3	11.84	1.07
GA ATHENS	49	3	16.72	3.57	WILMINGTON	53	4	7.58	-3.39	LUBBOCK	44	2	1.16	-0.90
ATLANTA	52	5	12.89	-0.82	ND BISMARCK	13	-3	3.05	1.44	MIDLAND	48	1	0.48	-1.34
AUGUSTA	51	2	15.51	4.12	DICKINSON	16	-2	0.24	-0.50	SAN ANGELO	51	2	2.44	-0.57
COLUMBUS	54	4	10.19	-3.30	FARGO	10	-3	2.61	0.32	SAN ANTONIO	57	3	2.34	-3.36
MACON	54	4	12.97	-0.09	GRAND FORKS	9	-1	1.76	0.09	VICTORIA	59	3	8.69	1.72
SAVANNAH	57	4	8.91	-0.38	JAMESTOWN	11	-2	0.65	-0.37	WACO	50	1	5.24	-2.90
HI HILO	73	1	46.02	15.87	NE GRAND ISLAND	28	0	2.33	0.14	WICHITA FALLS	47	3	4.98	0.83
HONOLULU	75	1	5.76	-0.20	LINCOLN	28	0	2.84	0.04	UT SALT LAKE CITY	33	0	5.84	1.71
KAHULUI	73	0	9.59	2.37	NORFOLK	24	0	3.02	0.77	VA LYNCHBURG	43	5	11.64	1.78
LIHUE	75	2	18.43	7.39	NORTH PLATTE	25	-3	3.28	1.86	NORFOLK	47	3	8.06	-1.53
IA BURLINGTON	30	3	4.79	-0.23	OMAHA	27	0	4.03	1.12	RICHMOND	45	5	9.48	0.13
CEDAR RAPIDS	25	2	3.40	-0.36	SCOTTSBLUFF	25	-4	2.45	0.98	ROANOKE	44	5	9.58	0.44
DES MOINES	27	1	5.53	1.54	VALENTINE	21	-5	5.81	4.44	WASH/DULLES	41	5	8.52	-0.32
DUBUQUE	25	3	7.35	2.66	NH CONCORD	29	4	11.09	1.83	VT BURLINGTON	29	5	7.42	1.02
SIOUX CITY	22	0	4.39	1.85	NJ ATLANTIC_CITY	40	4	10.98	-0.09	WA OLYMPIA	39	-1	14.50	-6.24
WATERLOO	24	1	5.85	2.24	NEWARK	41	6	10.09	-0.45	QUILLAYUTE	41	-1	31.34	-7.82
ID BOISE	33	-1	2.91	-1.03	NM ALBUQUERQUE	39	0	1.24	-0.08	SEATTLE-TACOMA	41	-2	12.85	-2.41
LEWISTON	36	-1	1.90	-1.39	NV ELY	21	-6	4.35	2.10	SPOKANE	29	-2	5.61	-0.14
POCATELLO	23	-4	3.46	0.26	LAS VEGAS	48	-2	1.02	-0.80	YAKIMA	30	-3	3.44	0.01
IL CHICAGO/O_HARE	32	3	8.43	2.37	RENO	34	-3	8.65	5.26	WI EAU CLAIRE	20	2	4.13	0.65
MOLINE	31	4	7.30	1.77	WINNEMUCCA	33	0	3.43	1.69	GREEN BAY	25	4	4.66	0.31
PEORIA	33	4	7.50	1.24	NY ALBANY	32	5	8.88	0.75	LA CROSSE	24	1	6.10	2.17
ROCKFORD	28	3	8.18	3.02	BINGHAMTON	30	5	8.92	0.81	MADISON	26	4	7.09	2.46
SPRINGFIELD	34	3	5.65	-0.45	BUFFALO	32	4	16.19	6.60	MILWAUKEE	31	4	8.56	3.20
IN EVANSVILLE	41	4	11.83	1.47	ROCHESTER	32	4	20.18	12.83	WV BECKLEY	39	5	9.88	0.33
FORT WAYNE	33	5	8.98	1.90	SYRACUSE	32	5	9.72	1.40	CHARLESTON	41	4	9.20	-1.00
INDIANAPOLIS	37	5	8.93	0.46	OH AKRON-CANTON	36	6	8.54	0.28	ELKINS	38	5	9.42	-0.78
SOUTH BEND	33	6	9.53	2.16	CINCINNATI	38	5	9.28	-0.92	HUNTINGTON	42	5	9.36	-0.69
KS CONCORDIA	33	2	2.39	-0.19	CLEVELAND	36	5	9.24	0.78	WY CASPER	22	-4	3.43	1.76
DODGE CITY	34	0	0.92	-1.26	COLUMBUS	37	5	7.75	-0.80	CHEYENNE	27	-2	1.57	0.22
GOODLAND	28	-3	0.58	-0.67	DAYTON	37	5	6.89	-1.59	LANDER	14	-8	5.22	3.38
TOPEKA	35	2	3.98	0.30	MANSFIELD	35	5	8.38	-0.39	SHERIDAN	23	-2	3.43	1.63

Based on 1991-2020 normals

***** Not Available**

International Weather and Crop Summary

March 12-18, 2023

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

HIGHLIGHTS

EUROPE: Additional rain eased drought concerns in western portions of the continent and maintained favorable winter crop prospects in central and eastern Europe.

WESTERN FSU: Warm, showery weather eased winter crops out of dormancy over central growing areas and promoted crop development near the Black Sea Coast.

MIDDLE EAST: Moderate to heavy rain alleviated dryness and drought in Turkey, Syria, and western Iran.

NORTHWESTERN AFRICA: Increasingly dry and warm weather trimmed yield prospects for reproductive to filling winter grains over much of the region.

EAST ASIA: More showers in southern China benefited reproductive rapeseed, while cooler weather eased stress on wheat to the north.

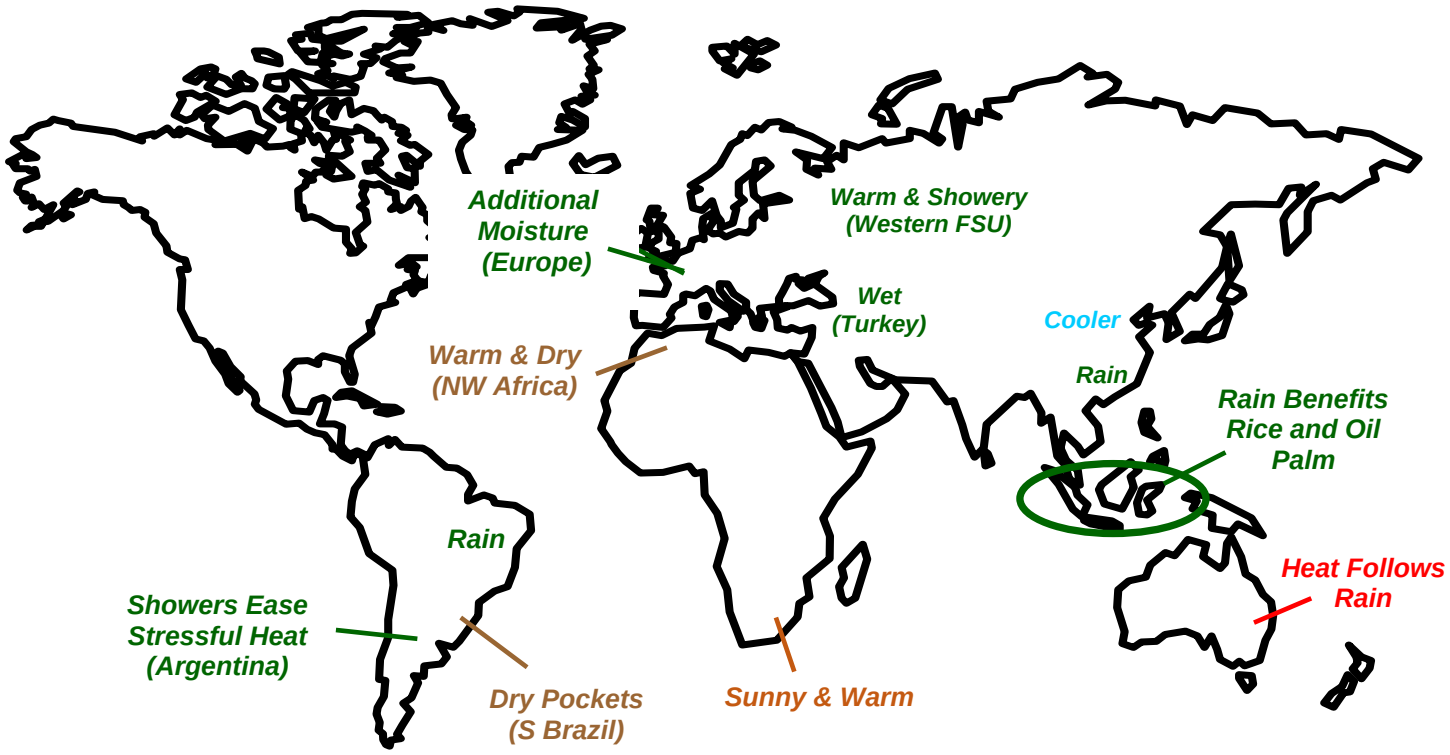
SOUTHEAST ASIA: Wet weather remained entrenched in portions of Malaysia and Indonesia, benefiting oil palm and irrigation supplies for rice.

AUSTRALIA: Soaking rain in the east temporarily interrupted fieldwork before heat and dryness overspread the region.

SOUTH AFRICA: Sunny skies fostered rapid development of corn and other rain-fed summer crops.

ARGENTINA: Rain ushered cooler weather into the region, although pockets of dryness lingered in some high-yield farming areas.

BRAZIL: Much-needed rain benefited cotton in previously dry northeastern production areas.



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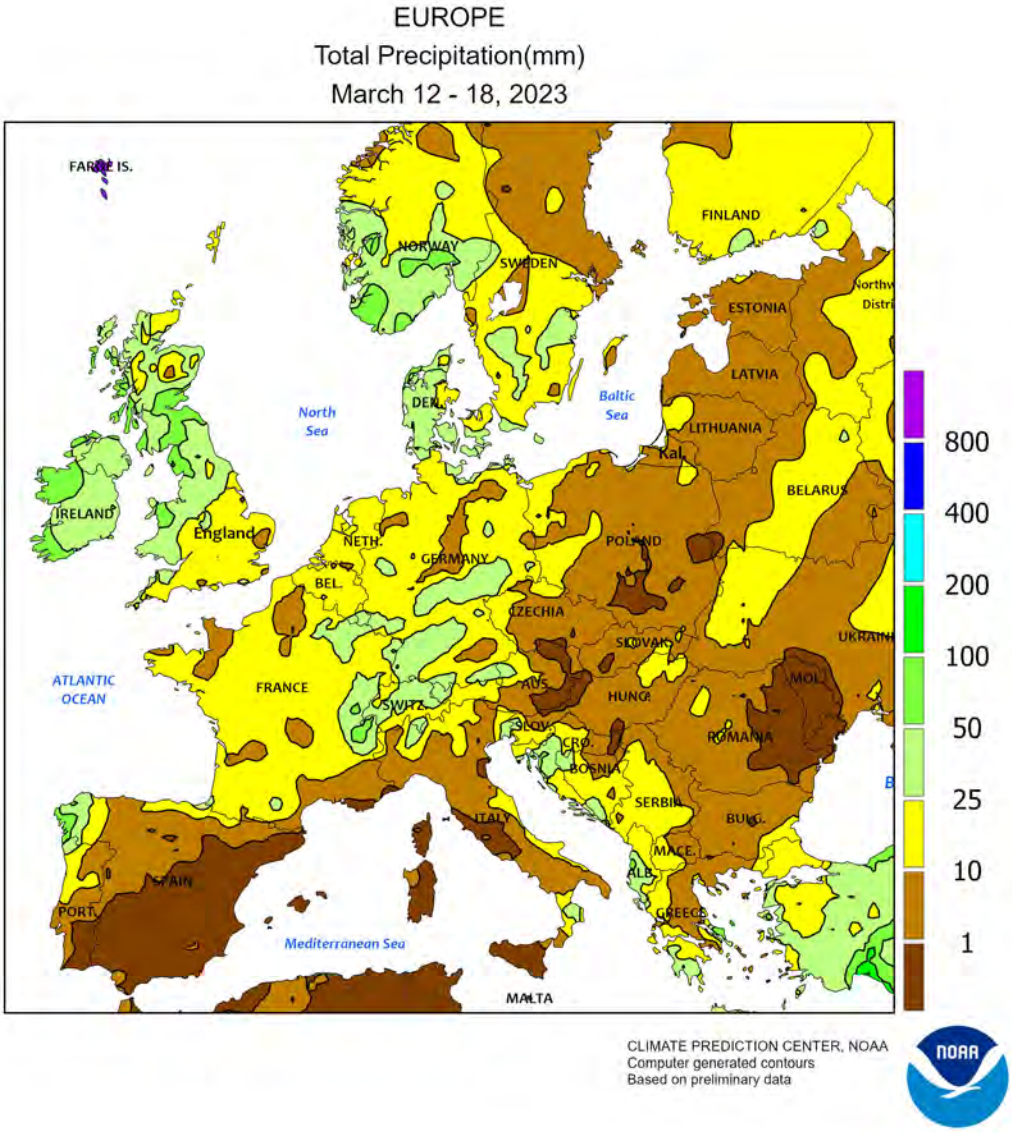

EUROPE

The recent spell of warm and unsettled weather continued, though dry conditions returned to Spain. For the second consecutive week, widespread showers and thunderstorms (10-50 mm, locally more) in England, France, and Germany further eased dryness concerns and boosted soil moisture for vegetative winter crops. Lighter showers (2-20 mm) were likewise beneficial for greening to vegetative winter grains and oilseeds over eastern Europe, though crops remained dormant in Poland and the Baltic States. Conversely, dry weather returned to central and southern Spain, where long-term drought persisted despite recent rain. Likewise in Italy, this week's welcome showers (2-20 mm) did little to ease long-term drought, especially in the Piemonte Region of northwestern Italy. Temperatures during the week averaged 3 to 8°C above normal in France and Spain, 2 to 4°C above normal across the remainder of central and northern Europe, but locally up to 4°C below normal in Greece and the southern Balkans.

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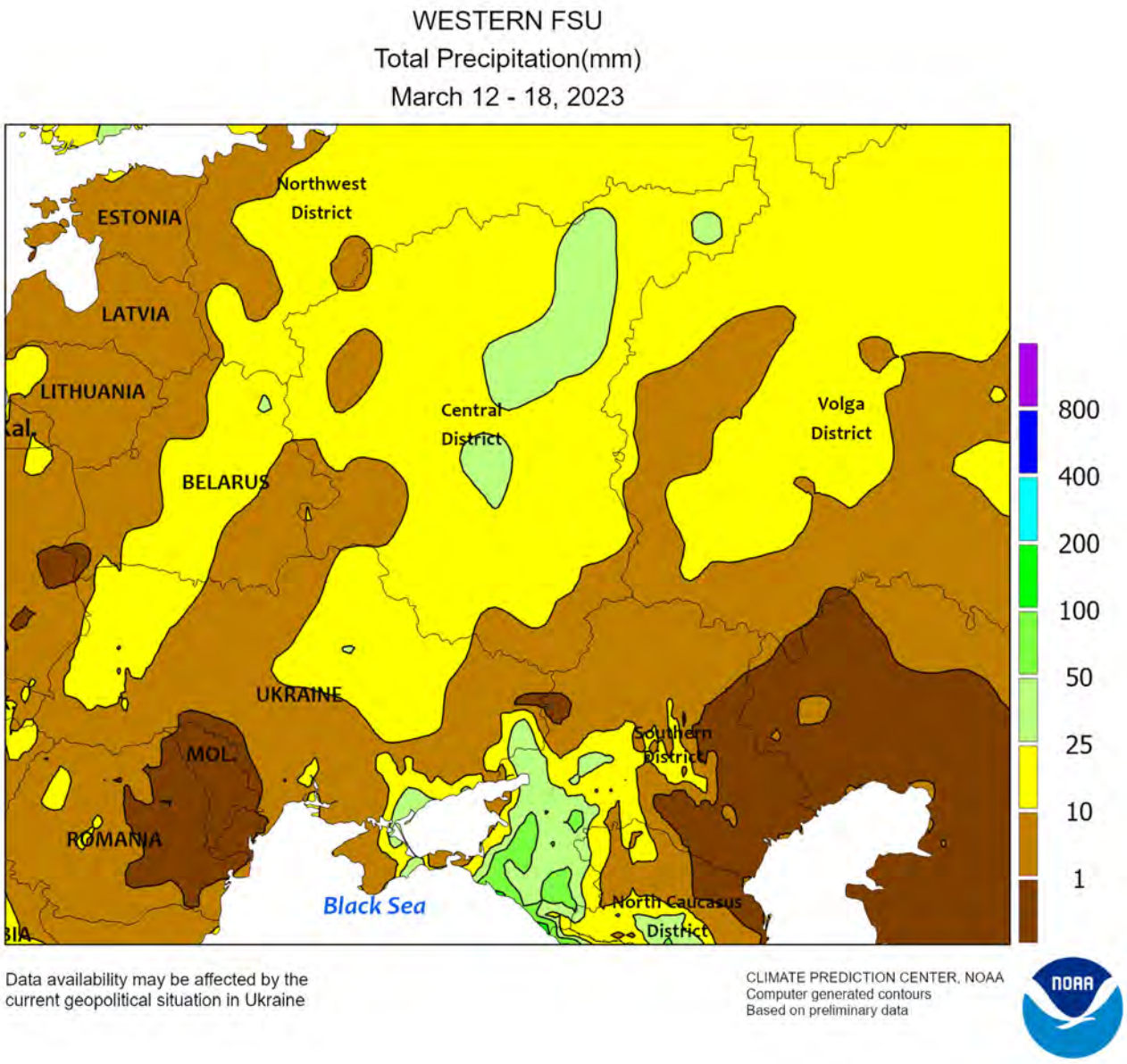

WESTERN FSU

Warm and showery weather favored winter crop green up and development. A warm end to the winter ushered winter grains and oilseeds out of dormancy in early March up to three weeks ahead of normal from Moldova into southern Ukraine and southwestern Russia. Continued anomalous warmth over the past week (2-6°C above normal) eased winter wheat, barley, and rapeseed out of dormancy across the Steppe Region of central Ukraine and west-central Russia. Winter crops from Belarus into northwestern Russia remained dormant despite losing cold hardiness; however, most of these growing areas were now devoid of snow cover and will begin greening up over the upcoming weeks. Widespread light to moderate showers (2-25 mm) maintained good to excellent moisture supplies for spring growth over most of the region, though pockets of dryness persisted from southern Moldova into southeastern Ukraine.

The WWCB focuses entirely on weather and resultant crop conditions; conflict and unrest are beyond the scope of this publication.

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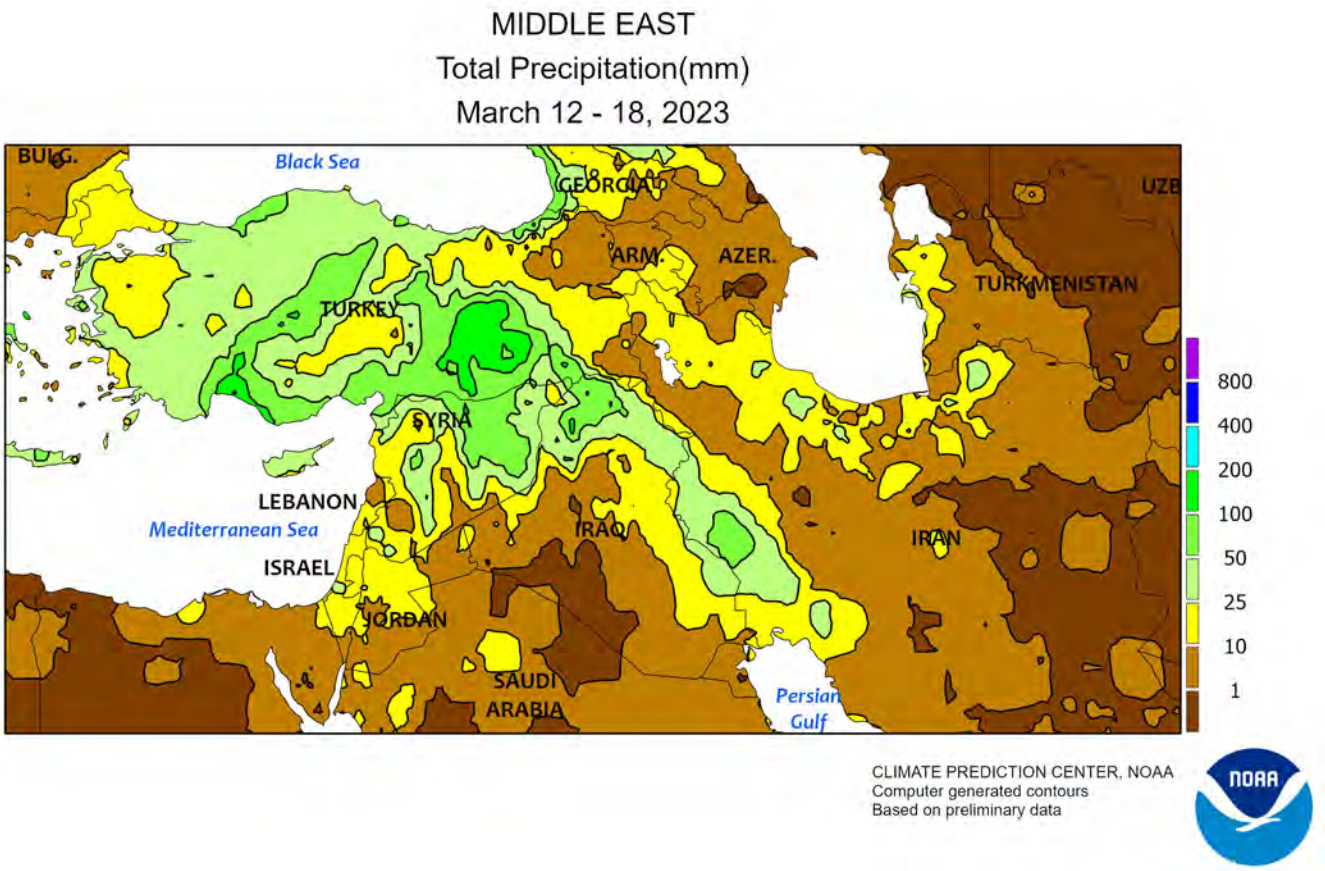

MIDDLE EAST

Stormy weather further improved moisture supplies for winter grains over much of the region. A stationary storm system anchored over the eastern Mediterranean Coast produced very heavy rainfall (50-140 mm) in southeastern Turkey, eradicating drought but causing widespread flooding and damage to infrastructure. Moderate to heavy showers (10-100 mm) overspread central and western Turkey, improving moisture supplies for vegetative winter grains from the Anatolian Plateau westward to the Aegean Sea. Similarly, moderate to heavy rainfall (10-75 mm) benefitted winter wheat and barley from the eastern Mediterranean Coast into Syria, Iraq, and much of western Iran. Dry weather (5 mm or less) was limited to northeastern Iran's Khorasan Province, where season-to-date (since September 1) precipitation has averaged 66 percent of normal, the 6th driest of the past 30 years. Temperatures during the monitoring period averaged 2 to 8°C above normal across central and eastern portions of the region, while chilly weather (up to 3°C below normal) slowed crop development over central and western Turkey.

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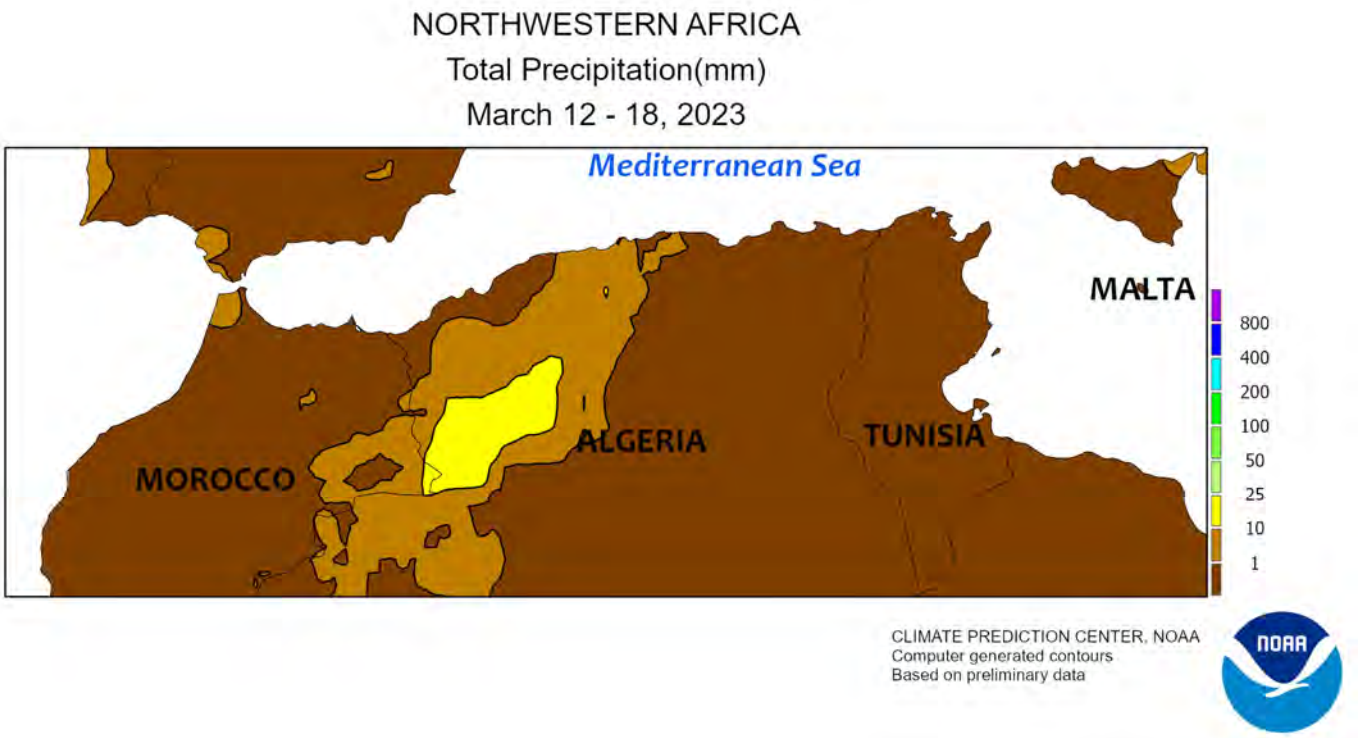

NORTHWESTERN AFRICA

Increasingly dry and warm weather prevailed over the region following late-winter rain. In Morocco, dry and very warm weather (2-5°C above normal) trimmed yield prospects for reproductive to filling winter grains. The current wet season (September-May) has been wildly inconsistent in Morocco: a record-dry autumn was followed by heavy early-December rains, with little to no rain afterwards until late-February showers. March has seen a return of complete dryness. Heightening crop concerns for a second consecutive week were daytime temperatures in the middle 30s (degrees C) in central and southern Morocco. Likewise, dry weather prevailed across Algeria and Tunisia, with only a few light showers (5 mm or less) dotting these croplands; the rain which fell over western Algeria (10-25 mm) was too far south to benefit wheat and barley. The latest satellite-derived Vegetation Health Index (VHI) continued to depict sharply divergent conditions across the region. As of March 20, the VHI indicated good to excellent conditions in northern Morocco, northeastern Algeria, and northern Tunisia contrasting with a fair to very poor VHI across southern and central Morocco, western Algeria, and inland portions of eastern Algeria and northern Tunisia.

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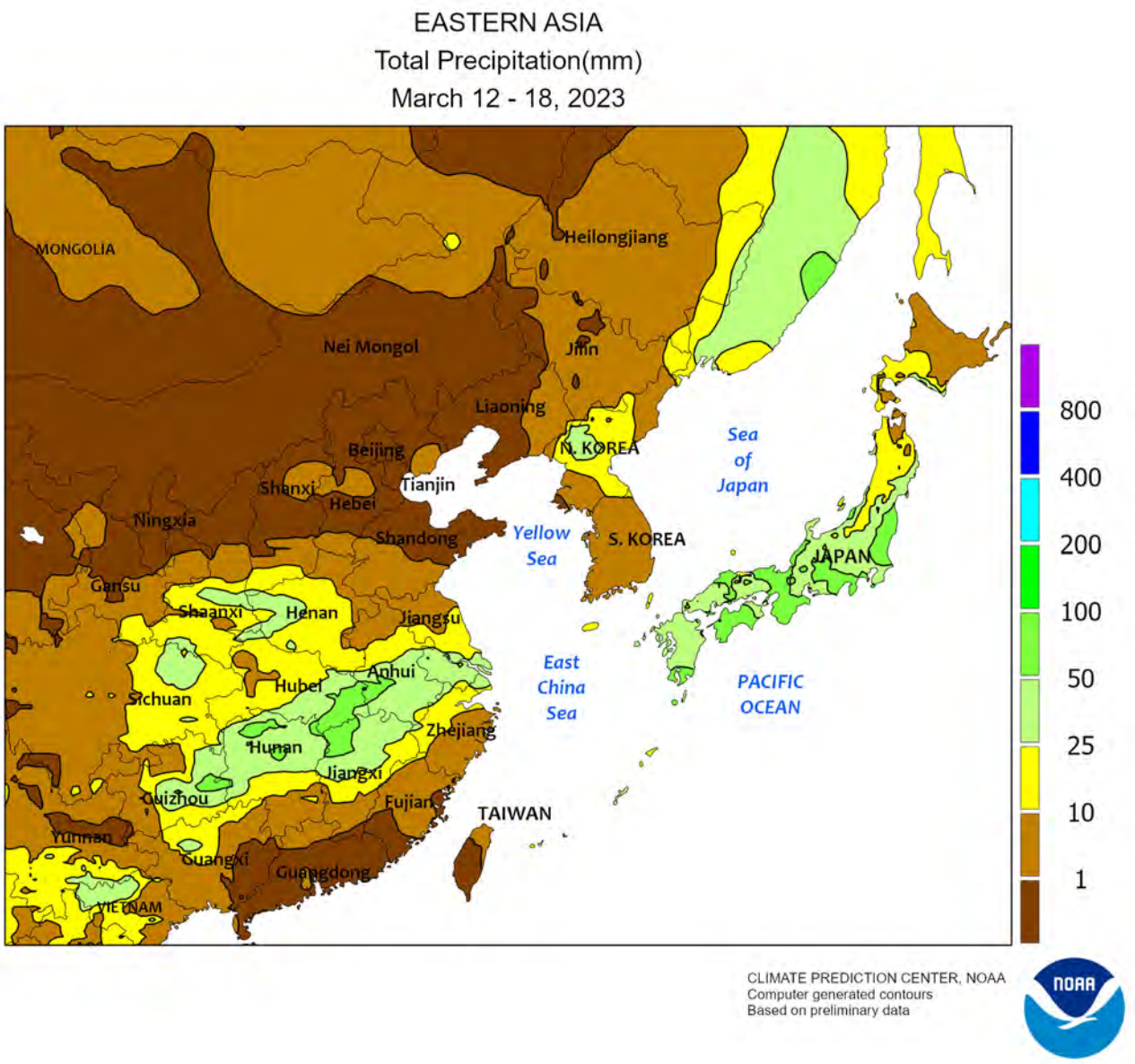

EASTERN ASIA

Showers moved through southern China around mid-week, bringing 25 to 50 mm or more to locales in the southern Yangtze Valley and 10 to 25 mm to the surrounding areas. The moisture benefited rapeseed in early reproductive phases of development and further eased drought established back in the autumn. Vegetative wheat in southern sections of the North China Plain also benefited from rain that extended northward. Moreover, the frontal system that produced the rainfall also brought cooler weather following unseasonable heat last week (daytime temperatures dropped nearly 15°C), easing stress on wheat.

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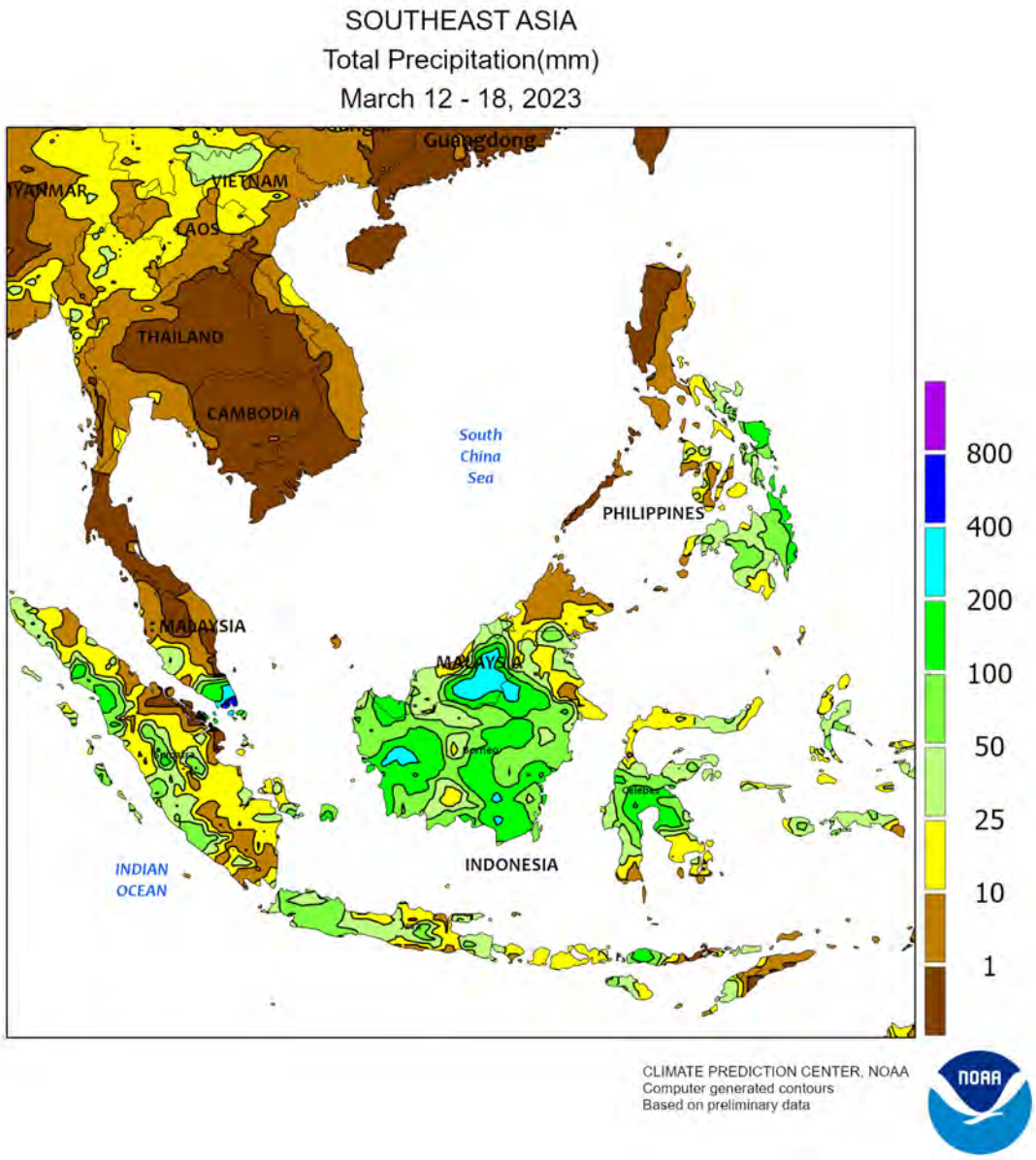

SOUTHEAST ASIA

The bulk of tropical moisture remained centered across southern sections of the region with the highest rainfall totals (over 100 mm) occurring mainly in eastern Malaysia and Indonesia. First-crop rice in Indonesia was in the last stages of harvesting, but the wet weather added to irrigation supplies for the next cropping cycle. Meanwhile, showers in the Philippines were heavy (25-100 mm or more) in eastern- and southern-most regions, becoming light (less than 25 mm) toward the northwest. The bulk of winter-grown crops were in the last stages of development. Elsewhere, rainfall (1-25 mm) in Indochina was limited to the northern tier locales as seasonably hot weather (daytime temperatures over 35°C) continued; irrigated dry-season rice is generally in latter stages of development with harvesting beginning late next month.

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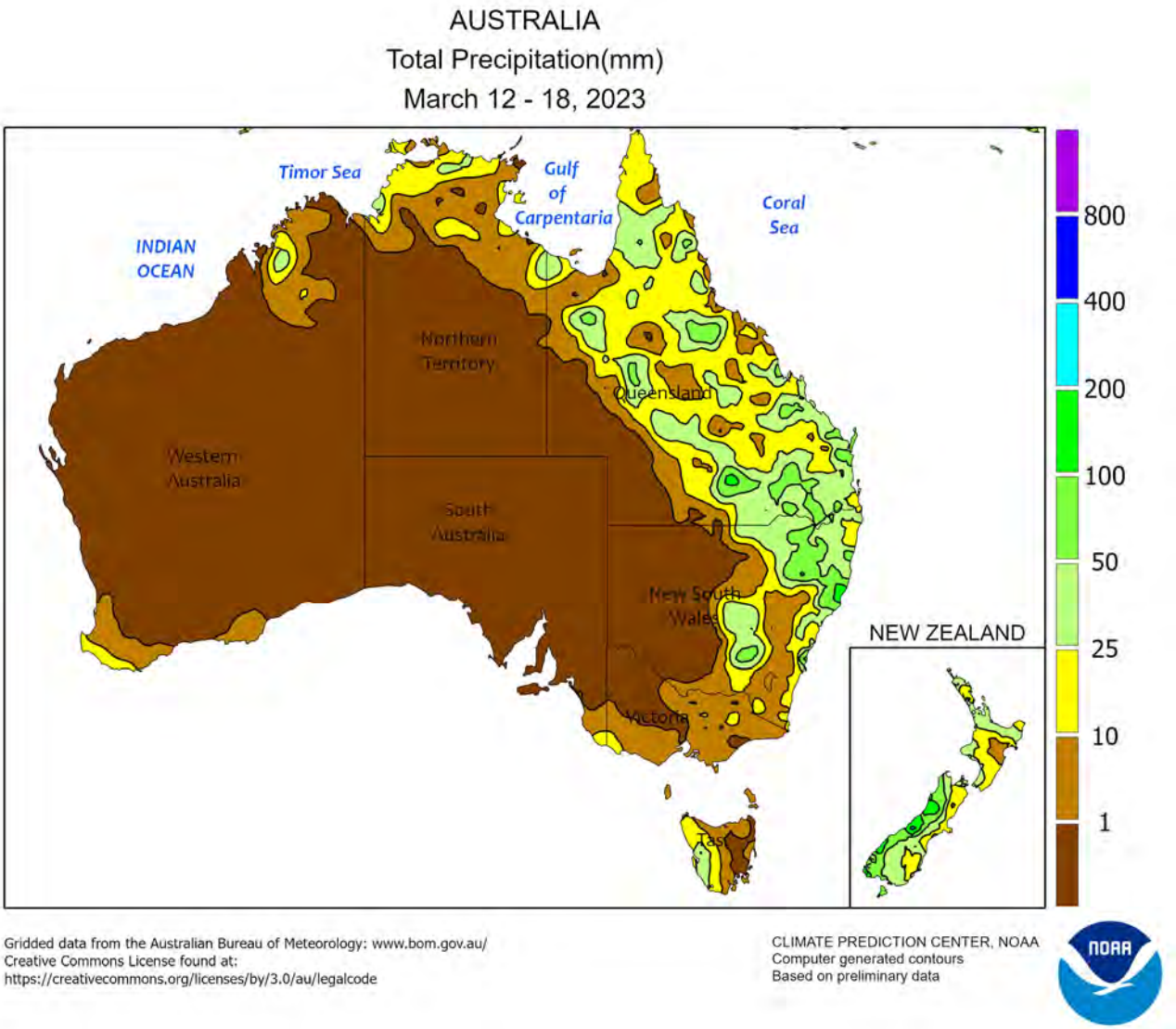

AUSTRALIA

During the first half of the week, soaking rain (25-50 mm, locally more) in northern New South Wales and southern Queensland temporarily interrupted cotton and sorghum harvesting. Although the wet weather was unfavorable for mature summer crops awaiting harvest, the rain benefited later-maturing varieties and helped condition the soil in advance of winter crop planting. During the latter half of the week, hot, dry weather overspread these areas, aiding summer crop drydown and enabling fieldwork to resume. Temperatures averaged 1 to 2°C above normal for the week, with maximum temperatures rising into the middle and upper 30s (degrees C) by week's end.

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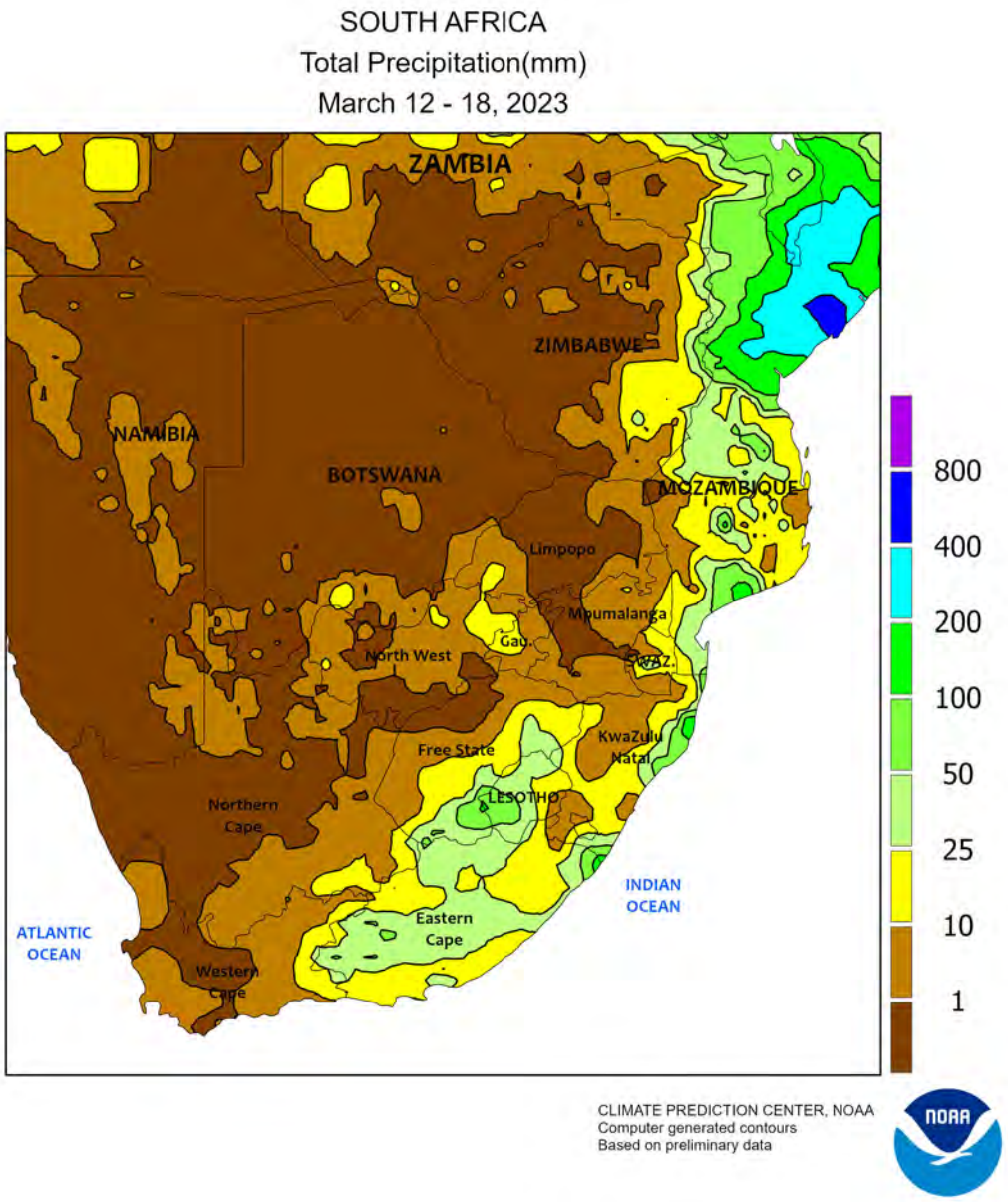

SOUTH AFRICA

Warm, sunny weather promoted rapid development of rain-fed summer crops. Most of the corn belt (North West and northern Free State eastward) recorded little to no rainfall (5 mm or less) and highest daytime temperatures ranged from the middle 20s to lower 30s (degrees C). Light to moderate rain (10-25 mm, locally exceeding 50 mm) lingered farther south, maintaining favorable irrigation levels for crops locally and in the Orange River Valley. Meanwhile, above-normal temperatures (highest daytime temperatures reaching the middle and upper 30s) fostered rapid development of irrigated summer crops in traditionally dry farming areas in the Cape Provinces.

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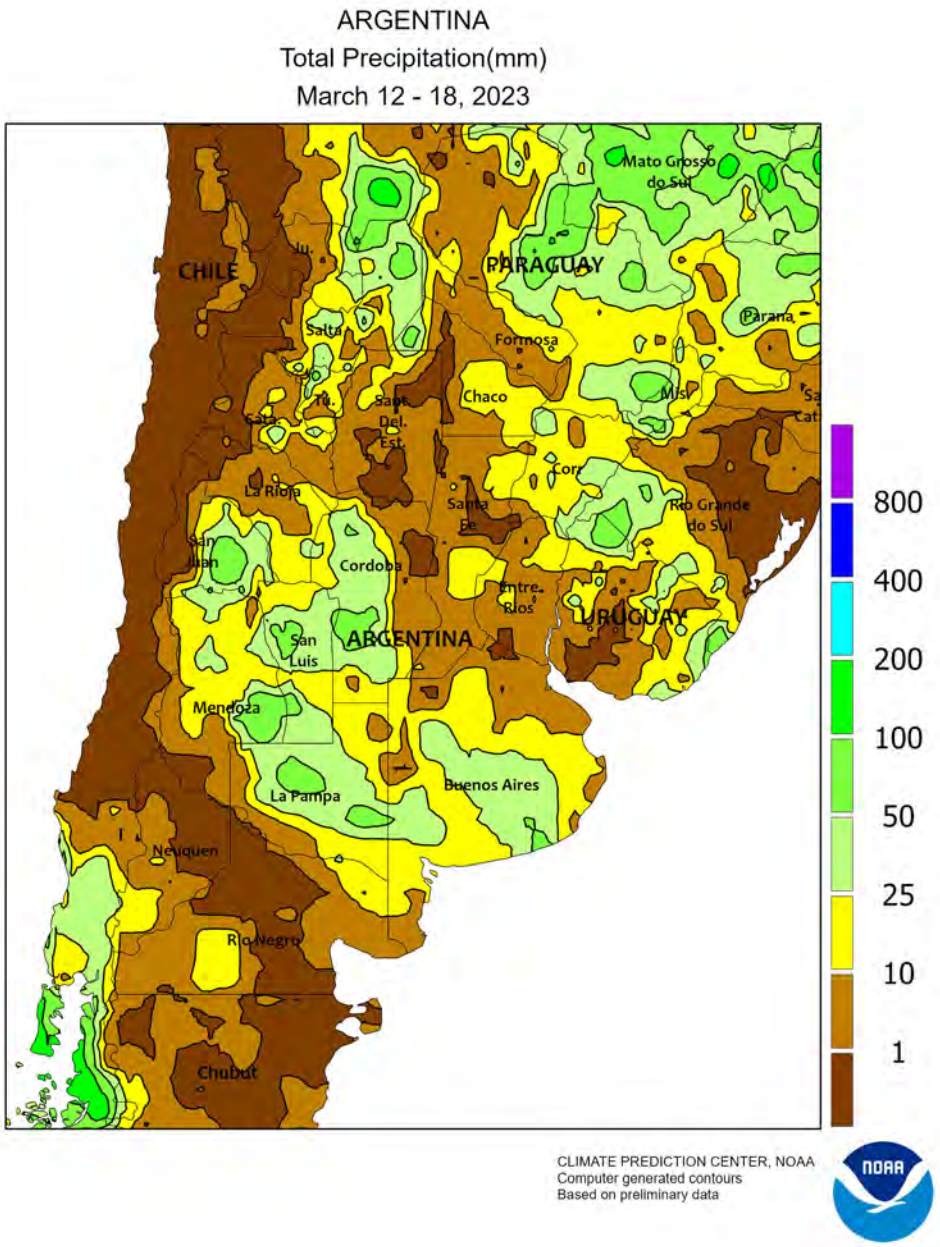

ARGENTINA

Early-week showers ushered somewhat milder weather into the region, though many locations were still in need of moisture. The heaviest rainfall (greater than 25 mm) was concentrated over southwestern farming areas, including southern Córdoba and large portions of La Pampa and Buenos Aires. Drier conditions (rainfall totaling below 10 mm) lingered, however, from eastern Córdoba eastward through Entre Rios as the heavier rain failed to develop. Regardless, temperatures gradually dropped from stressful levels (highs reaching 40°C locally) in the aforementioned region to more autumn-like levels (highs generally in the 20s and lower 30s degrees C). Farther north, warm, showery weather prevailed, though most locations recorded less than 25 mm. According to the government of Argentina, sunflowers were 41 percent harvested as of March 16, on par with last year's pace (39 percent); fieldwork was advancing more rapidly in Buenos Aires (18 percent harvested versus 17 percent last year).

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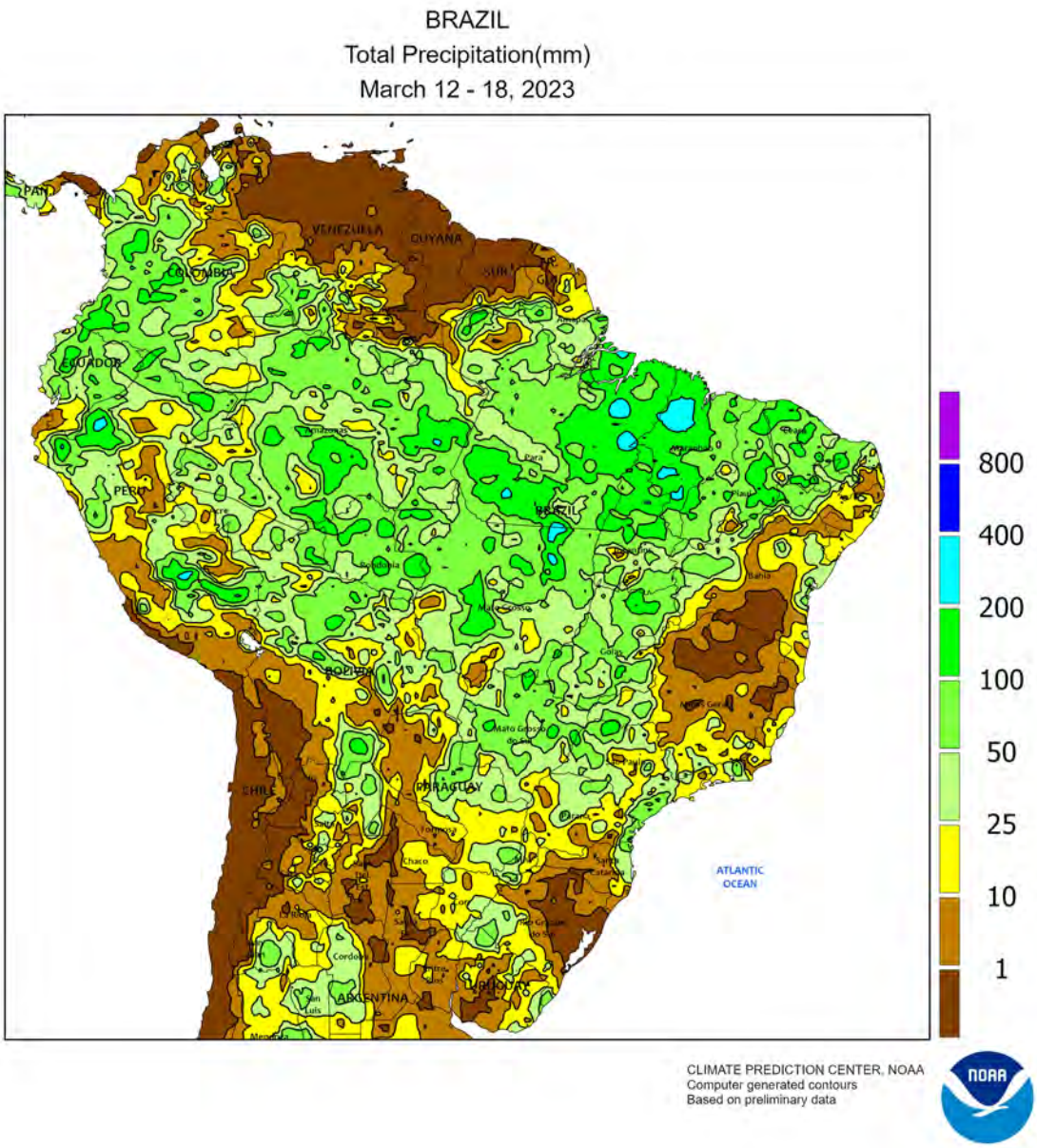

BRAZIL

Showers intensified over previously dry locations in northeastern Brazil, providing timely moisture for cotton and other second-season crops. The rainfall (25-100 mm) was particularly timely in western Bahia, which struggled with dryness during February. Meanwhile, the moisture maintained overall favorable conditions elsewhere in the northeast and the Center-West Region (Mato Grosso and neighboring farming areas in Mato Grosso do Sul and Goiás). According to the government of Mato Grosso, soybeans were 99 percent harvested as of March 17, compared with the 5-year average of 90 percent, and corn was 99 percent planted. Rainfall was patchier farther south, with pockets of dryness (accumulations below 10 mm) prevalent from Rio Grande do Sul to southern Minas Gerais. Hot weather (daytime highs reaching 35°C) compounded the impact of the dryness on crops in western production areas of Rio Grande do Sul. According to the government of Rio Grande do Sul, soybeans were 74 percent reproductive to filling as of March 16, with 1 percent harvested; meanwhile, corn was 68 percent harvested. In Paraná, soybeans and first-crop corn were 48 and 43 percent harvested, respectively, as of March 13, with second-crop corn 61 percent planted.

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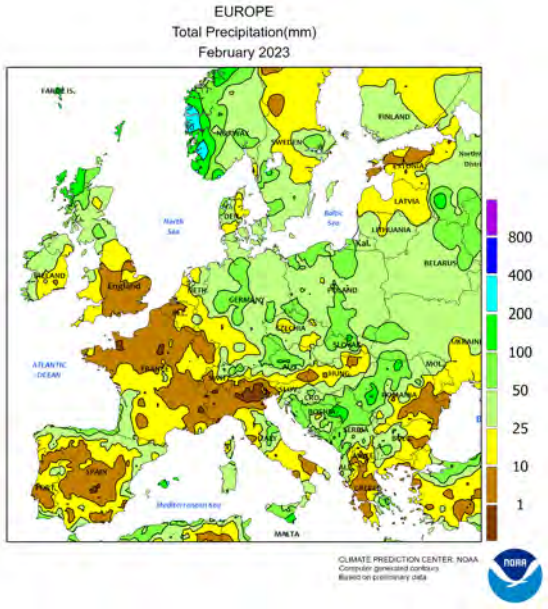
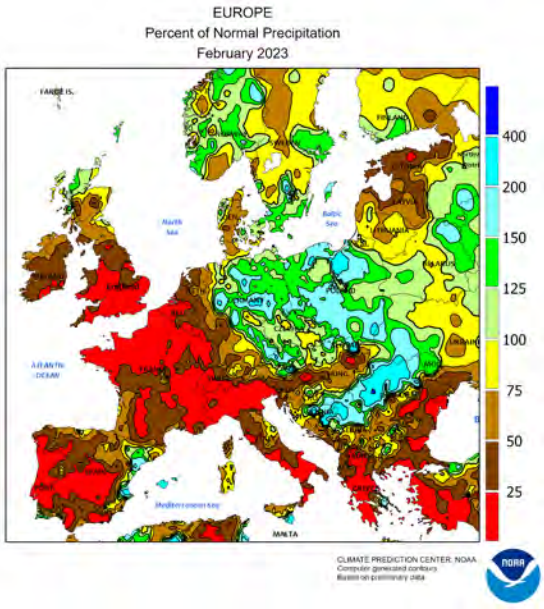
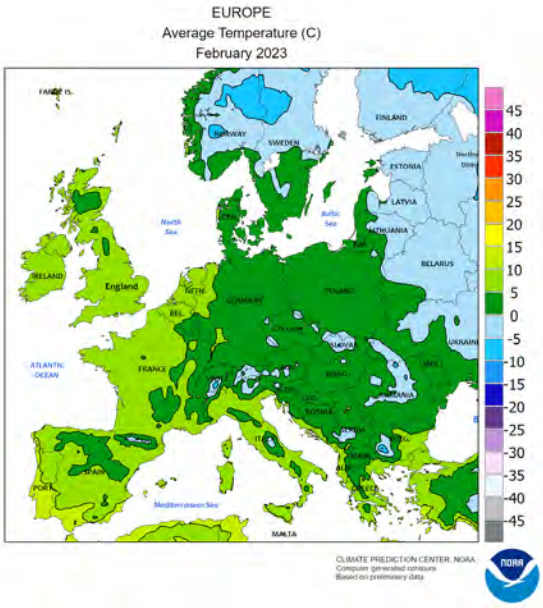
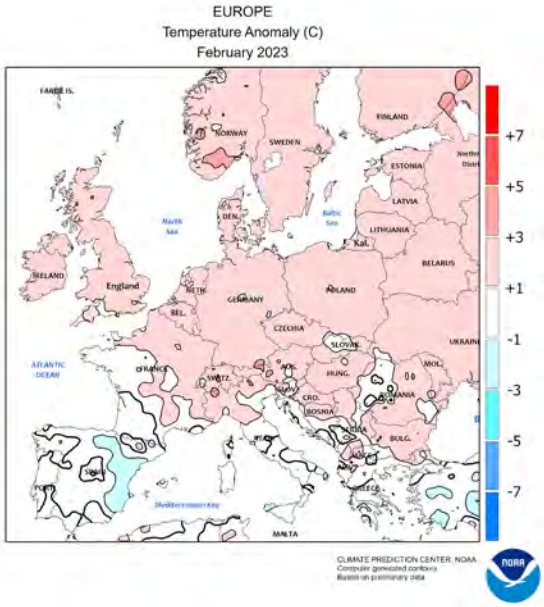
February International Temperature and Precipitation Maps









EUROPE

Anomalous warmth persisted during February, with very dry weather in western and southern Europe contrasting with favorable precipitation over northern and eastern croplands. Temperatures across the continent averaged 1.3°C above normal for the month; anomalies were most pronounced (2-4°C above normal) from England into the Baltic States, though warmer-than-normal conditions (1-3°C above normal) prevailed from much of Spain and France eastward into Poland and the Balkans. Near- to below-normal temperatures were mostly confined to Greece and locales immediately adjacent to the Mediterranean Coast. Precipitation totaled less than 25 percent of normal across the Mediterranean Basin and from Ireland and the United Kingdom southeastward into France and western Germany. While the dryness reduced topsoil moisture for spring growth, the impacts of late-winter dryness on dormant (north) to vegetative (south) barley, rapeseed, and wheat were minimal but heightened the need for spring rain. Conversely, near- to above-normal precipitation extended from northern and eastern Germany into Poland, the Baltic States, as well as northern portions of Serbia and Romania. However, a ribbon of dryness extended eastward from Italy into Hungary.

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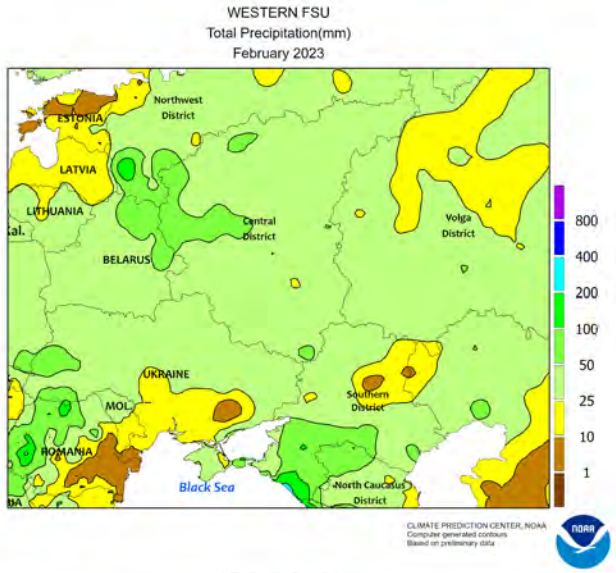

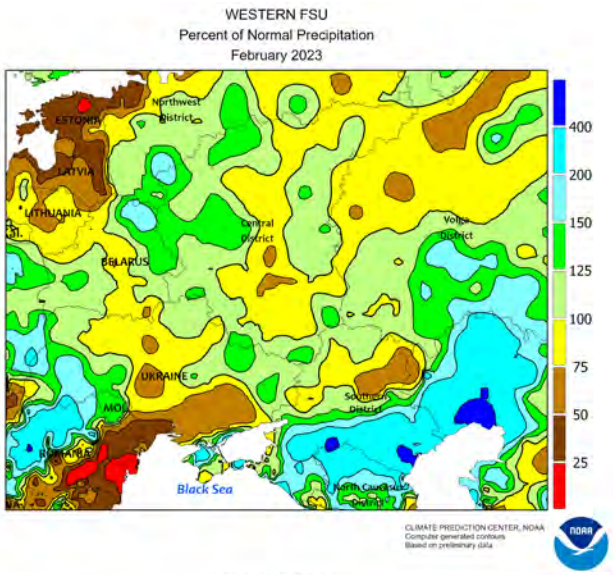

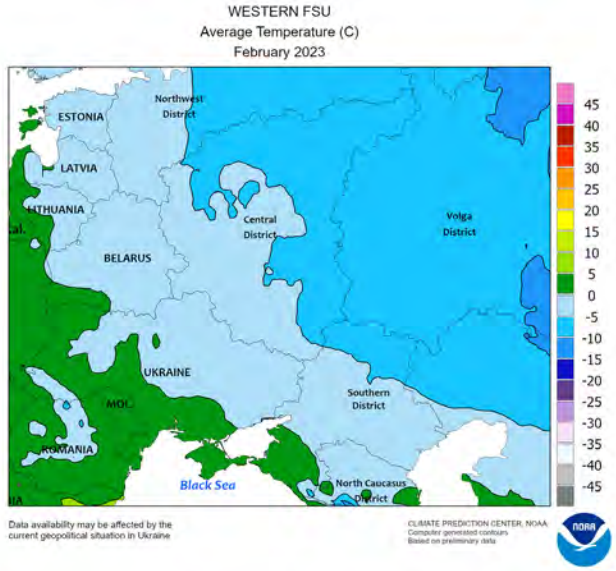

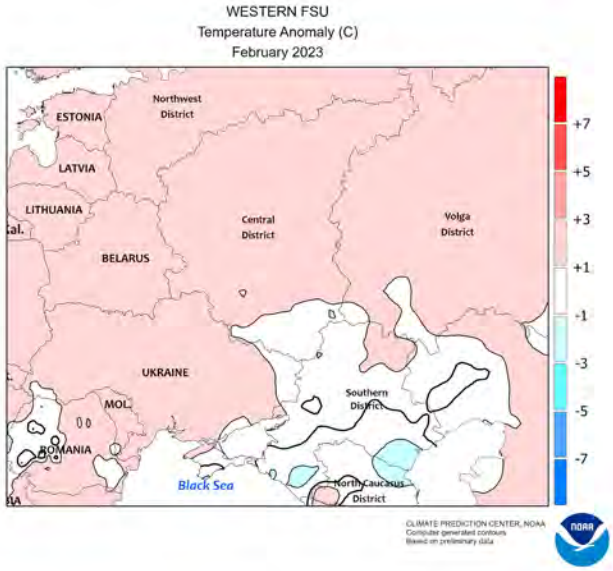

WESTERN FSU

Near- to above-normal precipitation expanded across most of the region during February, though dry conditions persisted adjacent to the western Black Sea Coast. Near- to above-normal precipitation was reported from Belarus, western Ukraine, and northern Moldova eastward into western and central Russia, with a ribbon of enhanced rain and snow (200-400 percent of normal) noted from southeastern Ukraine into the southern half of the Southern District. The locally heavy precipitation eased winter dryness in Ukraine and boosted moisture reserves for spring growth in Russia. However, winter crops remained dormant, with green up typically occurring during the latter half of March. Temperatures averaged near normal in Russia, though colder-than-normal conditions (up to 2°C below normal) were noted in western- and southern-most crop areas. Conversely, increasingly warm conditions were observed across the western half of the region, with temperatures up to 3°C above normal noted from northern Moldova into western Ukraine and southern Belarus.

The WWCB focuses entirely on weather and resultant crop conditions; conflict and unrest are beyond the scope of this publication.

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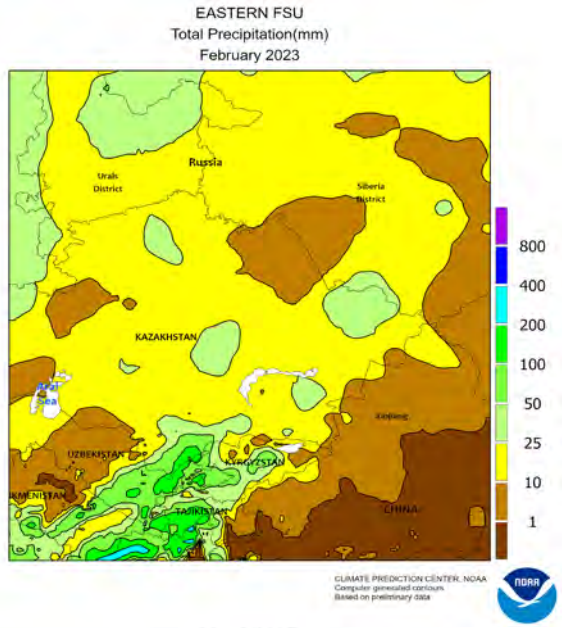

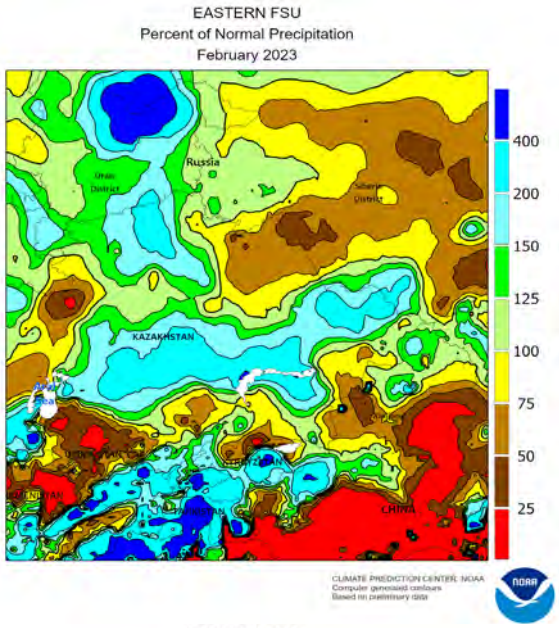

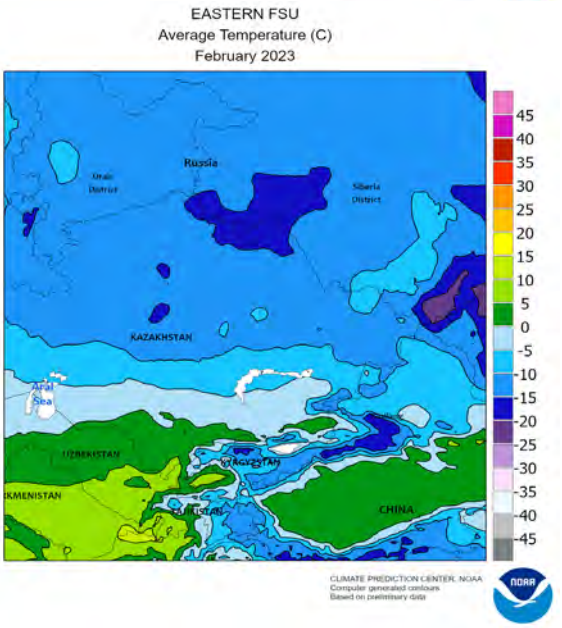

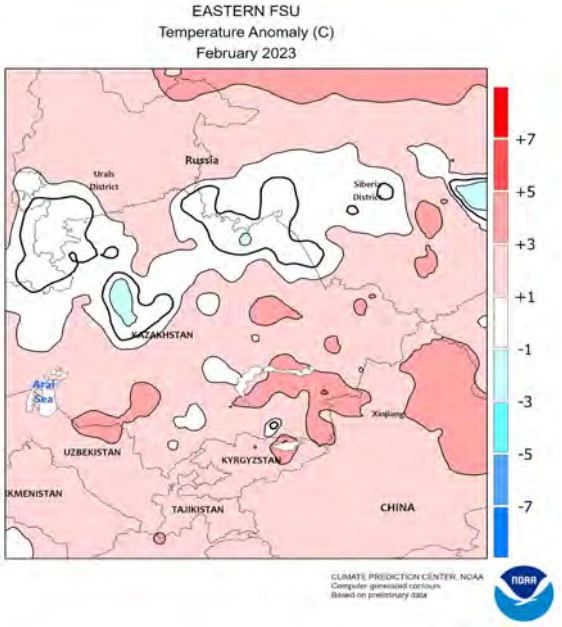

EASTERN FSU

Seasonally cold, snowy weather prevailed across much of the region during February. Despite temperatures averaging up to 5°C above normal across northern Kazakhstan and central Russia, cold conditions (-35 to -24°C) persisted with the region encased in a deep snowpack. Winter weather has no bearing on spring grain prospects. Farther south across Uzbekistan, Turkmenistan, Tajikistan, and Kyrgyzstan, warmer temperatures (up to 4°C above normal) replaced January's bitter cold, with continued drier-than-normal conditions (locally less than 50 percent of normal) in the west contrasting with near- to above-normal precipitation in the east. Irrigation prospects courtesy of the 2022-23 Water Year remained favorable; as of March 18, season-to-date (since September 1) precipitation in the catchment basins of the Amu (south) and Syr (north) Darya Rivers — primary sources of summer crop irrigation — stood at 185 and 125 percent of normal, respectively. The Amu Darya's current water year (275 mm, 130 mm surplus) remained the wettest of the past 30 years despite a dry February, while the Syr Darya's 270 mm was enough to rank as the 5th wettest water year to date of the past 30 years. In fact, the Amu Darya has already eclipsed the total water year normal of 250 mm with two months remaining in the climatological wet season.

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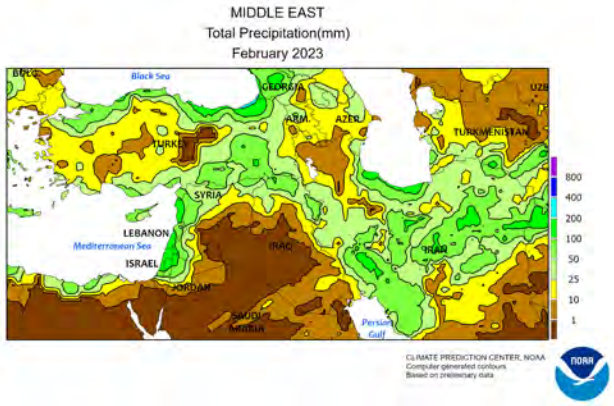
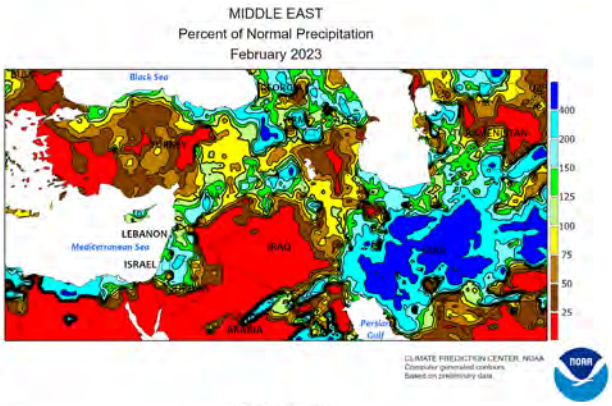
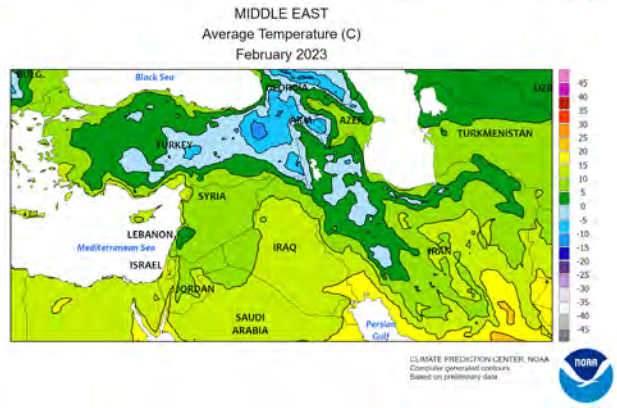
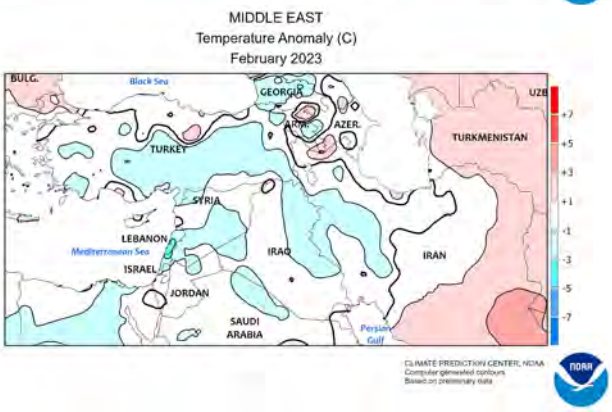


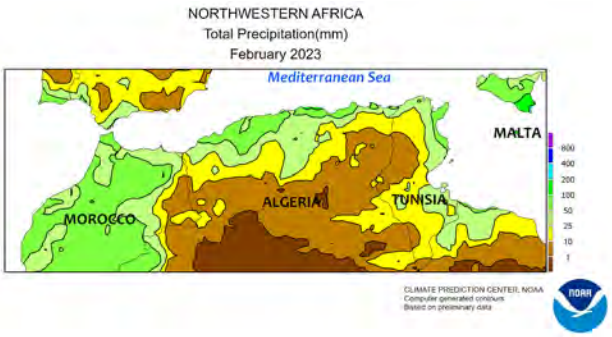


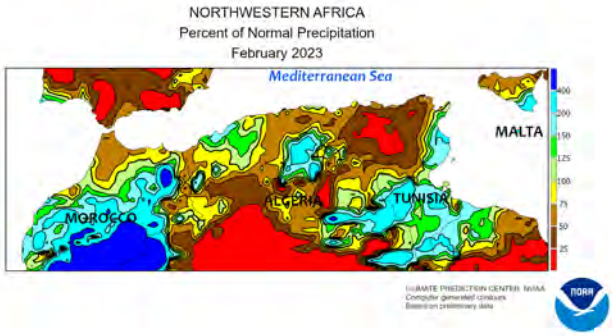


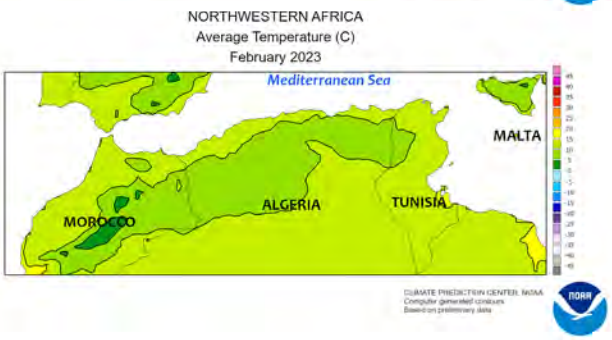


MIDDLE EAST

Precipitation across the region was highly variable during February, though cold weather settled over much of the Middle East save for southeastern Iran. Central and western Turkey slipped further into drought, with most of these locales reporting less than 50 percent-of-normal precipitation (locally less than 25 percent) for the month. Meanwhile, moderate to heavy rain and snow in southeastern Turkey (50-75 mm) eased drought but was untimely for earthquake recovery efforts. Similar precipitation also improved moisture supplies for vegetative winter grains from the eastern Mediterranean Coast into central Syria. Near- to above-normal precipitation (rain and mountain snow) was also noted in Iran from the Persian Coast into the Khorasan Province. Conversely, acute dryness (25-50 percent of normal) overspread winter grain areas from eastern Syria into Iraq and northwestern Iran. Temperatures for the month averaged 2 to 5°C below normal from Turkey into western Iran, but up to 4°C above normal in southeastern Iran.

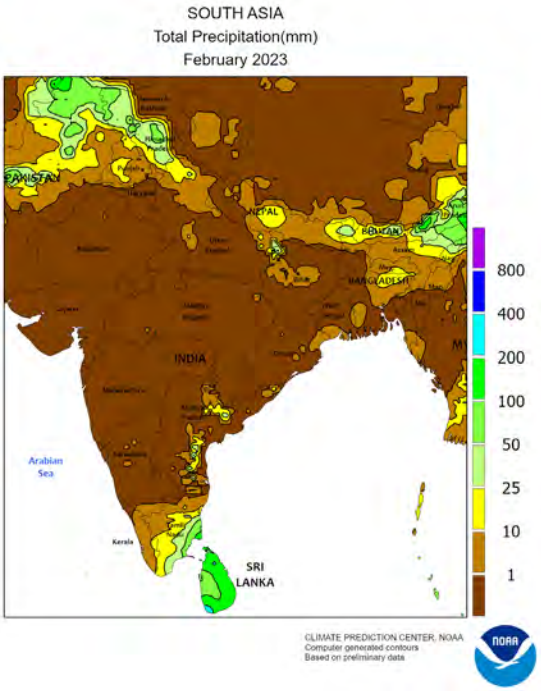


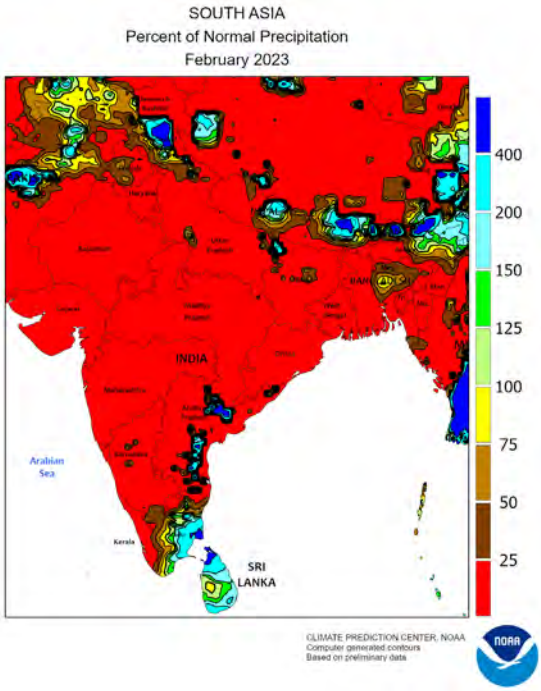


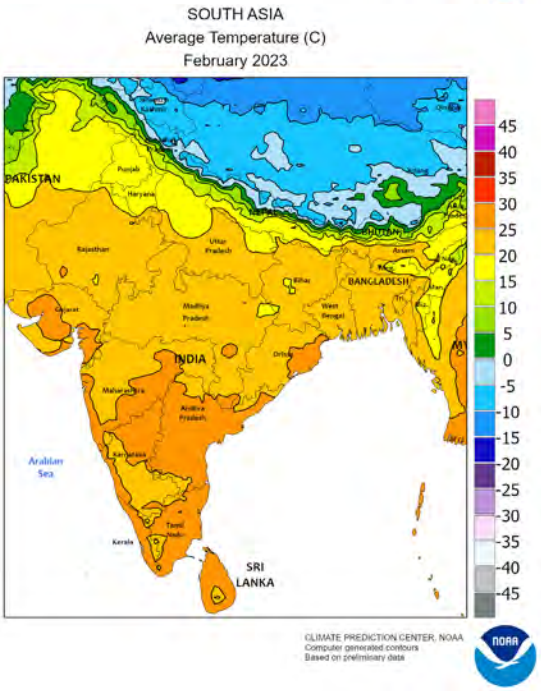


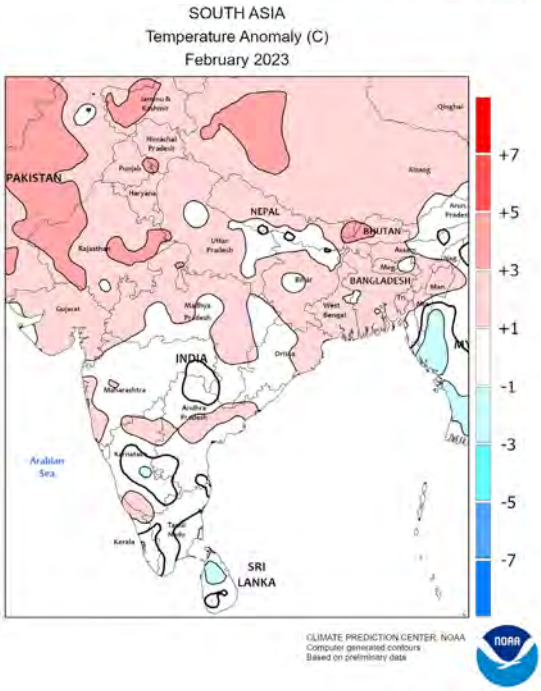
NORTHWESTERN AFRICA

During February, rainfall was highly variable across the region. Much-needed rain during the latter half of the month in Morocco provided timely moisture for winter grains approaching or entering reproduction, though totals varied considerably. Likewise, near-normal rainfall in western Algeria eased drought for wheat and barley development. In contrast, very dry conditions (10-50 percent of normal) were noted from central Algeria eastward into Tunisia, reducing soil moisture for vegetative winter wheat and barley. Temperatures for the month averaged near normal across the region's primary crop areas, though pockets of cool weather (up to 2°C below normal) in central Morocco contrasted with similar positive anomalies in parts of Tunisia.









SOUTH ASIA

Seasonably dry weather prevailed throughout much of the region in February, with rainfall limited to the extreme northern and southern locales of India as well as the surrounding areas of Pakistan and Sri Lanka. Most crops in the region were in the latter stages of development and beginning to mature by month's end. Temperatures were warmer than normal (1-3°C above normal) in northern reaches, helping to advance wheat and rapeseed development without causing significant stress.

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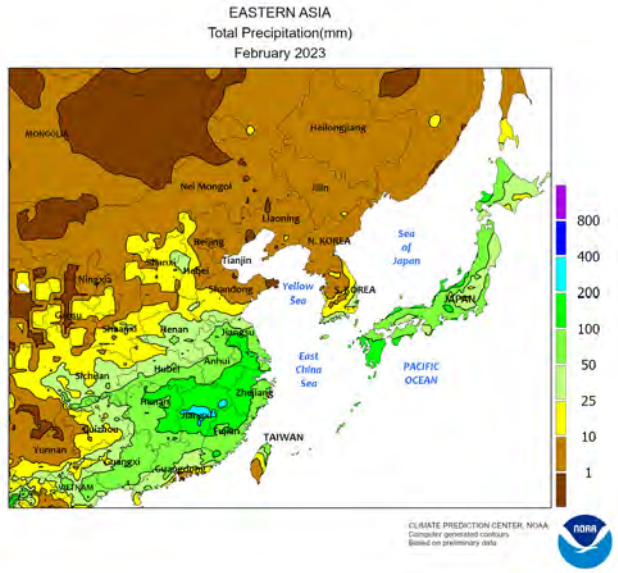

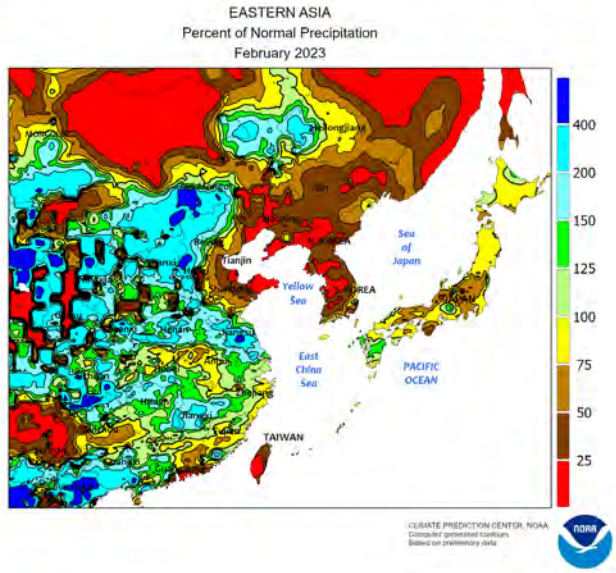

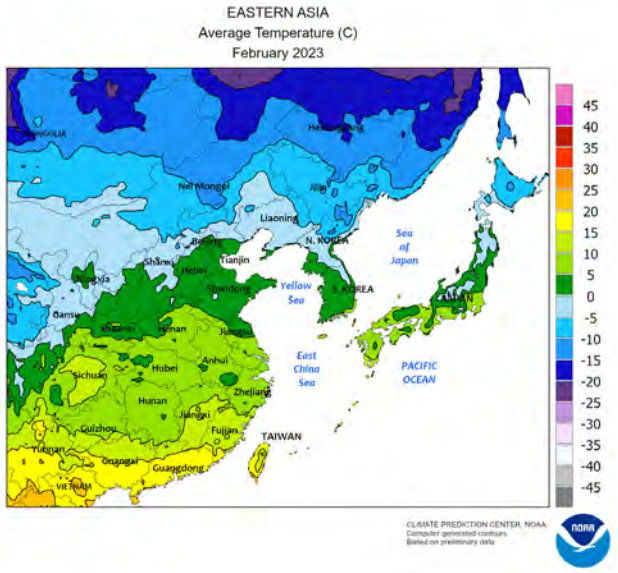

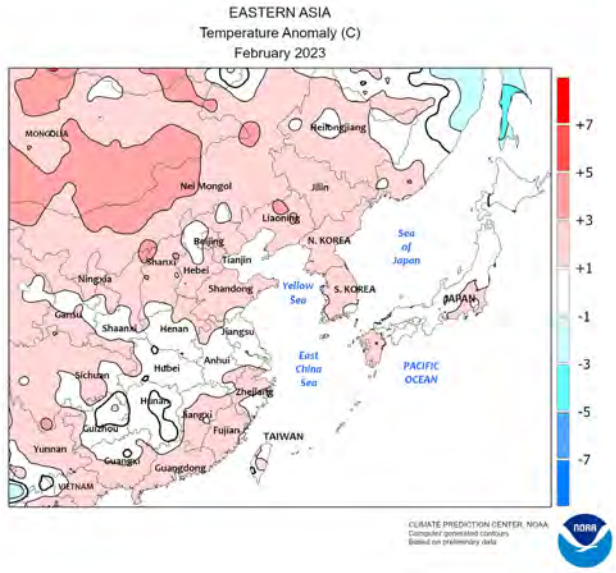

EASTERN ASIA

Most winter crop areas of China recorded above-average rainfall (over 200 percent of normal locally) in February with most of the rain occurring around mid-month. Although brief, the showers provided timely moisture to wheat that began breaking dormancy toward the end of the month as well as greening rapeseed. Additionally, the rain eased longer-term moisture shortfalls as a result of winter drought. Temperatures were generally near normal in the heart of the crop areas and around 2°C above normal along the periphery.

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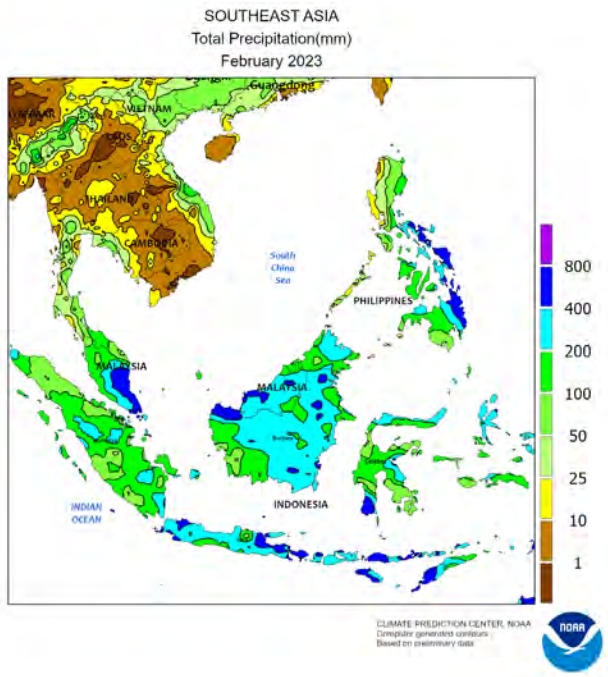

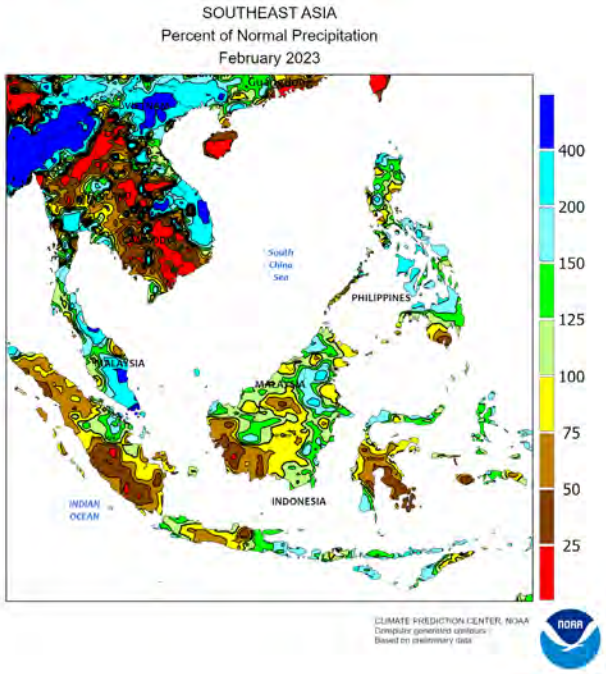

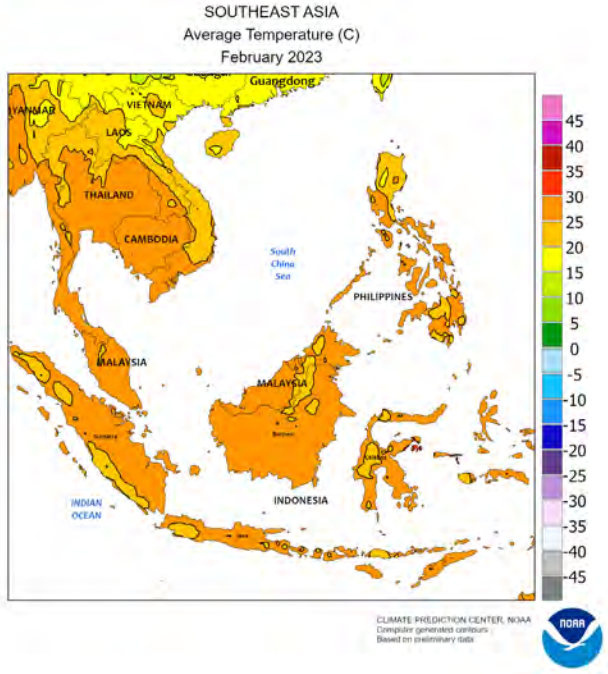

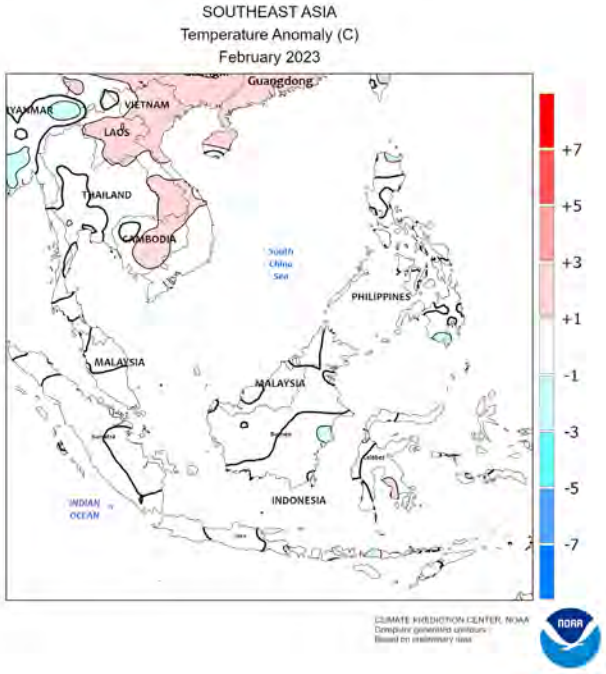

SOUTHEAST ASIA

Heavy showers continued to be prevalent in the seasonably wetter eastern and southern areas of the region during February. Above- to well-above-normal rainfall amounts (exceeding 200 percent of normal locally) were recorded throughout much of the Philippines and Malaysia as well as portions of Indonesia. While pockets of below-average rainfall (less than 75 percent of normal) were present in Indonesia, moisture conditions remained favorable for immature rice and oil palm. Meanwhile, rainfall was lighter than normal from Thailand and the surrounding areas into southern Vietnam, but irrigation supplies remained adequate for dry-season rice.

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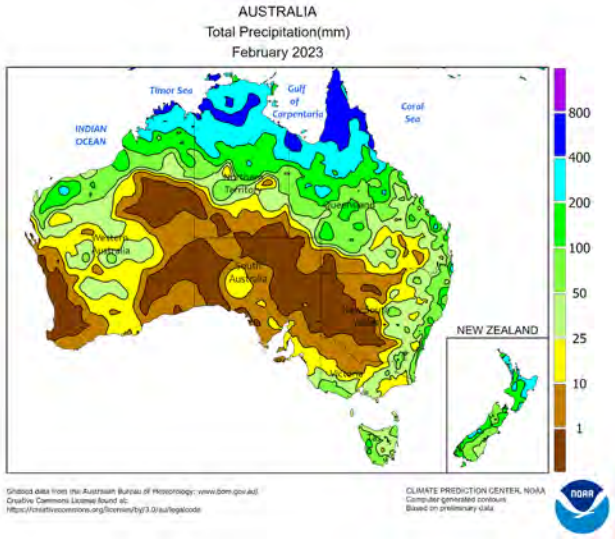

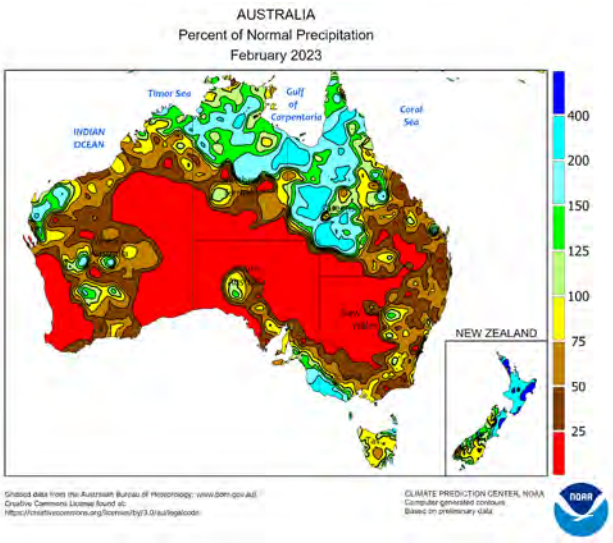

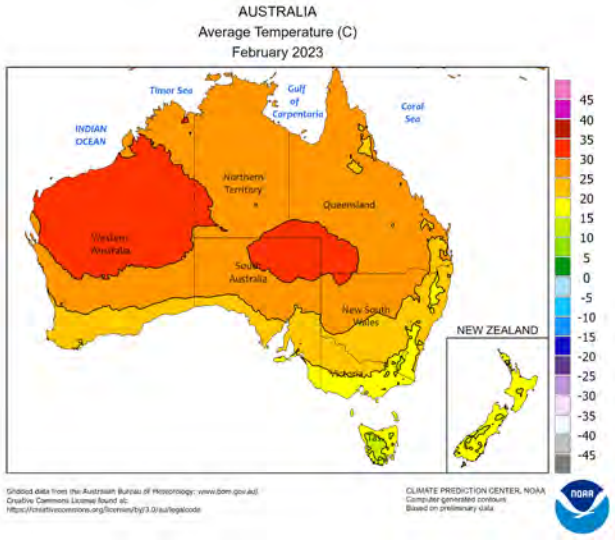

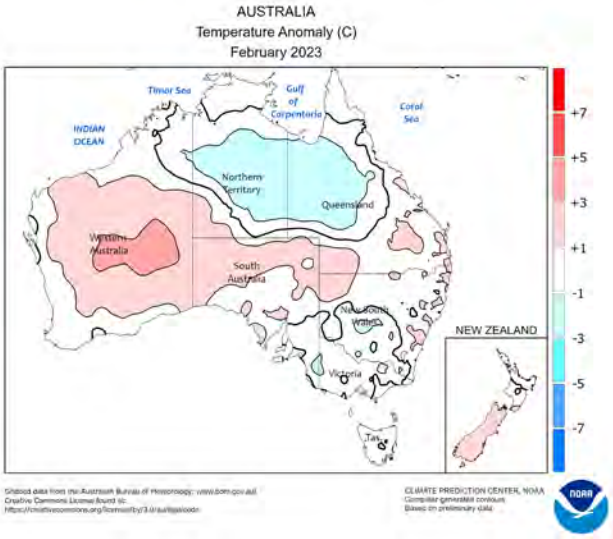

AUSTRALIA

During February, rainfall was below normal in eastern Australia, benefiting the earliest maturing summer crops. For example, the relatively dry weather promoted maturation and harvesting of sorghum that had been sown early in the planting window. Although the dryness benefited the earliest maturing varieties, most summer crops could still benefit from additional rainfall during February. Specifically, the mostly dry weather increased the irrigation demands of immature cotton, but this dryness also enabled farmers to optimize the timing of the supplemental water. However, the relatively dry weather was unfavorable for immature dryland crops, including sorghum that had been sown later in the planting window. Consequently, crop prospects remained good to excellent for irrigated crops and for the earliest maturing dryland crops, but the recent dryness likely trimmed the yield prospects of later maturing dryland crops. Temperatures averaged near normal in major summer crop producing areas, with daily maximum temperatures typically in the 30s (degrees C).

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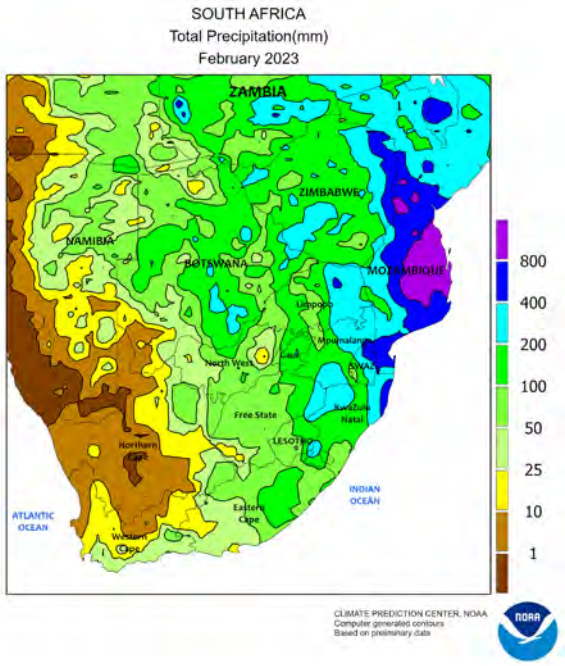

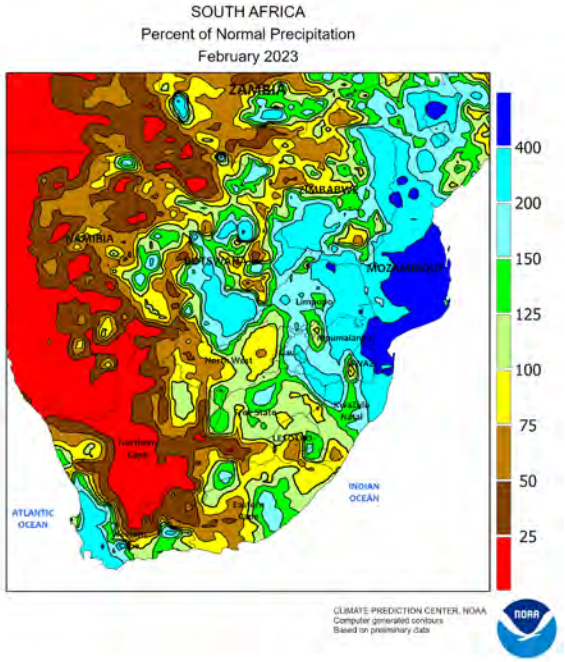

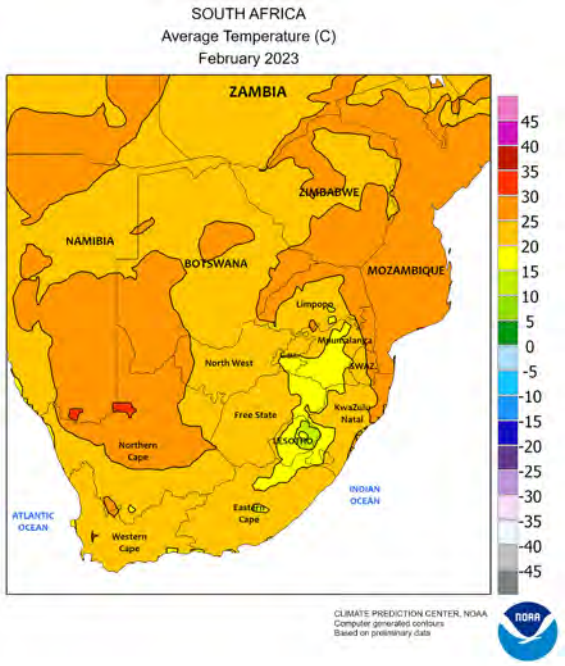

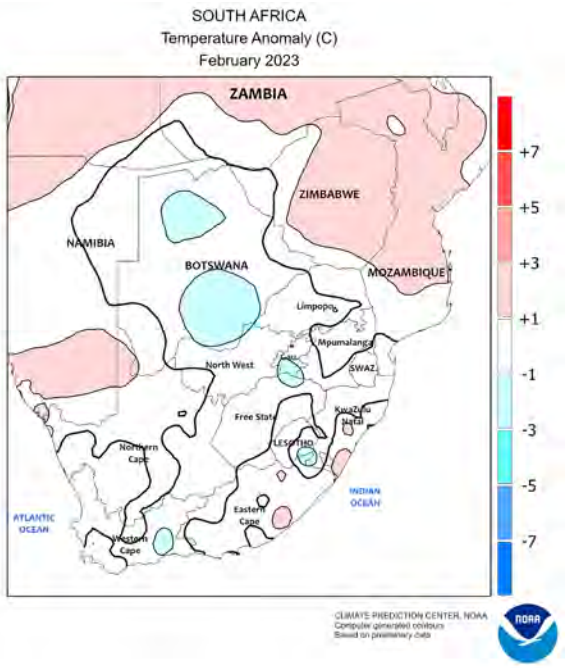

SOUTH AFRICA

During February, abundant rain – combined with periods of warm, sunny weather – maintained favorable prospects for corn and other rain-fed summer crops. Moreover, the rainfall occurred on several occasions throughout the month, with no extended periods of dryness. Sugarcane areas in Mpumalanga and northern KwaZulu-Natal experienced periods of excessive rain (accumulations over 200 mm over just a few days) from the remnants of tropical cyclones, and localized flooding was reported. Elsewhere, unseasonably heavy February rainfall maintained adequate to abundant levels of moisture for irrigated crops – including corn and cotton in the Orange River Valley – but moisture was untimely for tree and vine crops in Western Cape. Meanwhile, February temperatures averaged near to slightly below normal throughout the region. Hot weather (daytime highs 35°C or higher) was generally confined to traditionally warmer farming areas, including those at the edge of the corn belt (Limpopo and western production areas in North West and Free State), sugarcane areas across KwaZulu-Natal, and in the Cape Provinces.

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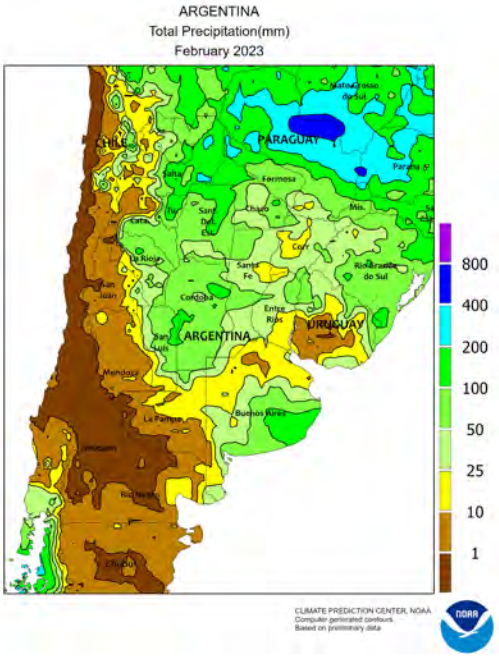
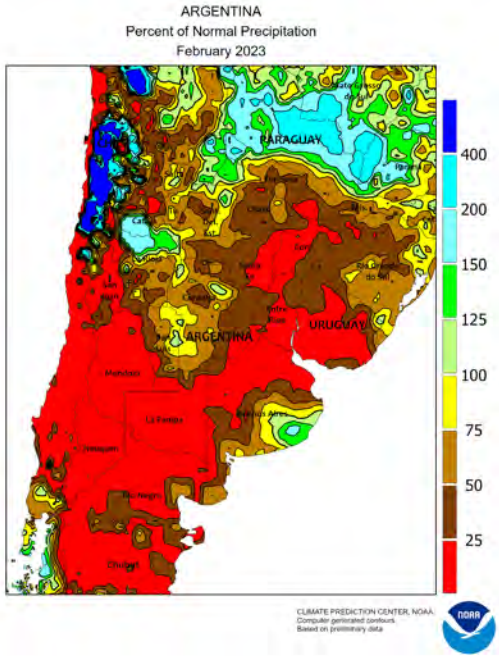
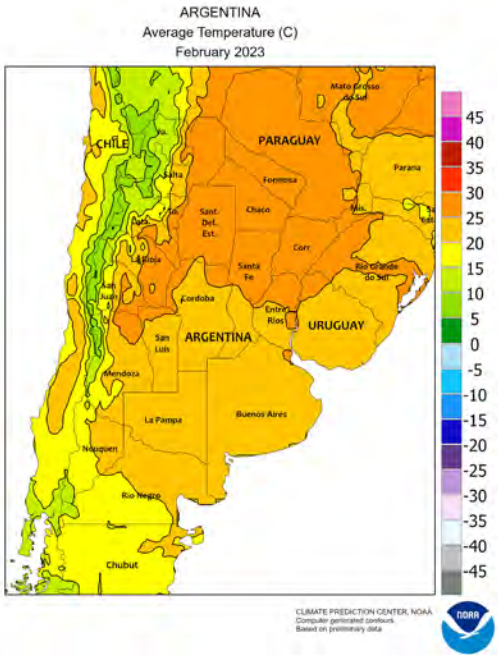
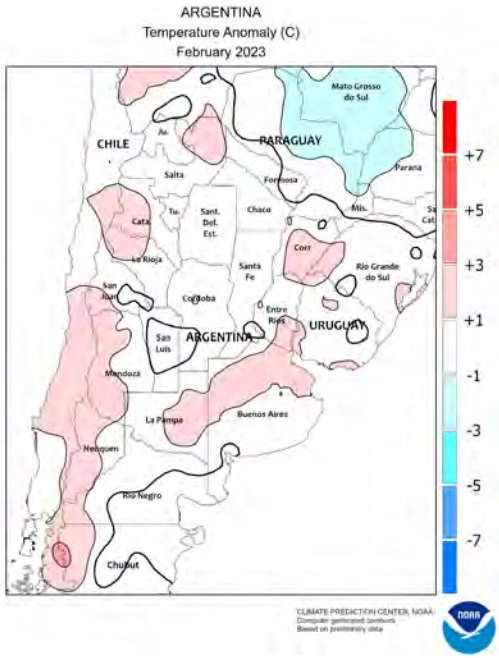


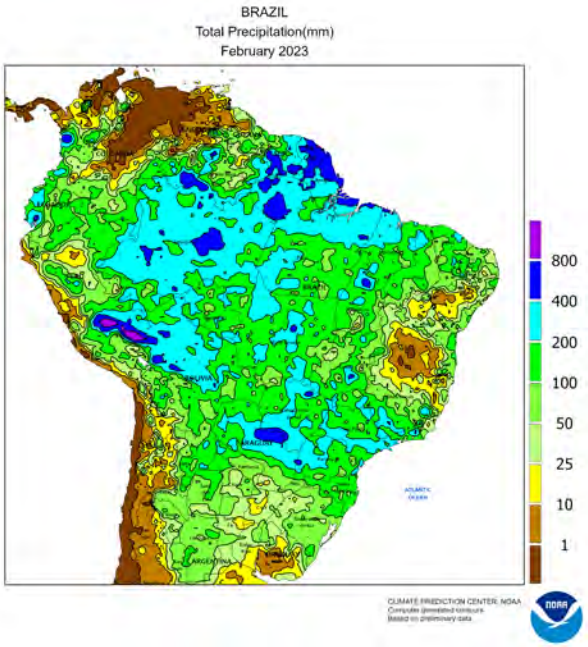


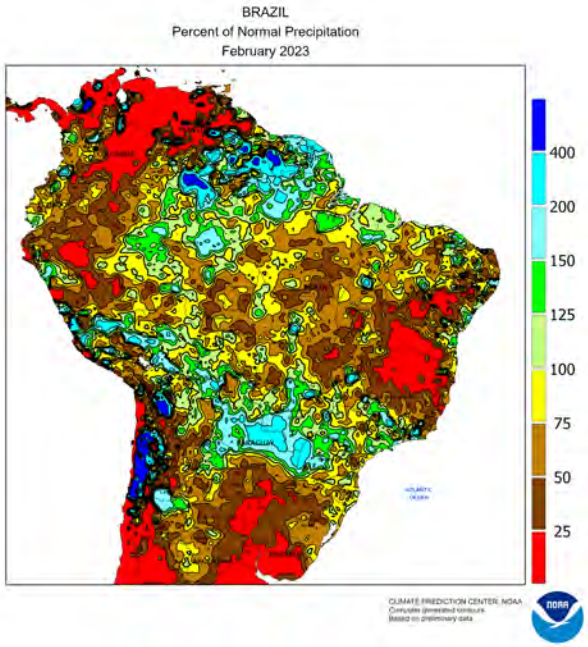


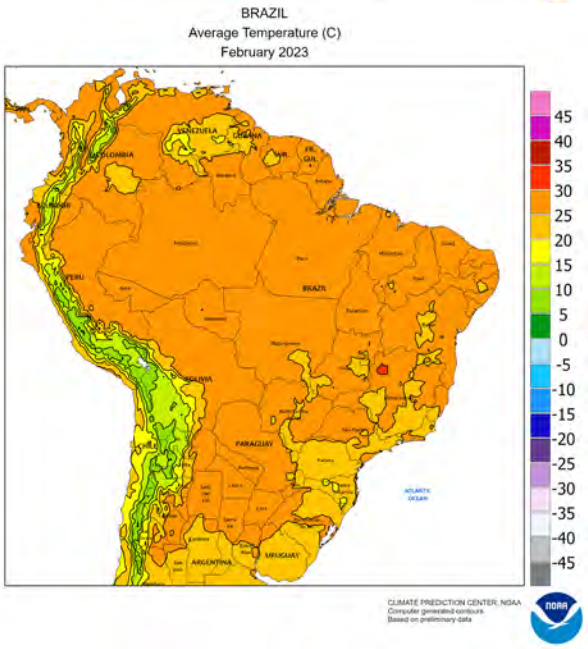


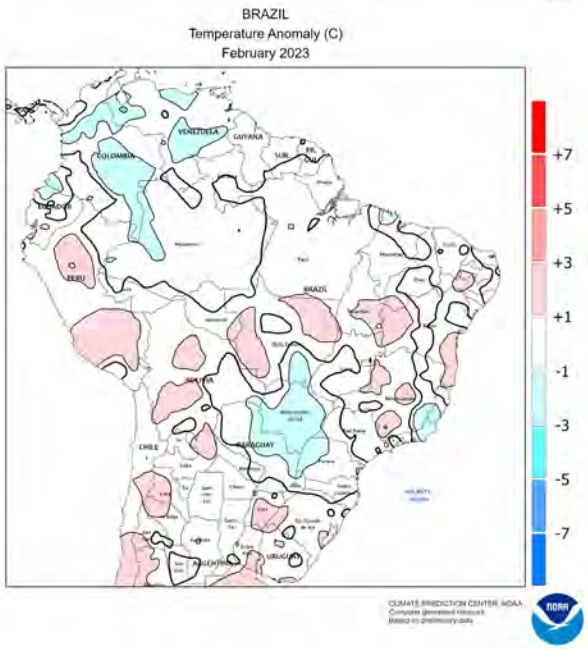
ARGENTINA

Erratic rainfall and the recurrence of stressful heat lingered across the region throughout February, resulting in further declines in summer crop condition and yield potential. The impacts of the intensifying drought were most profound in sections of central Argentina, with some locations reporting monthly accumulations of 10 to 50 mm and numerous consecutive days with high temperatures at or above 35°C. Elsewhere, locally heavy rain brought temporary relief from dryness to farmlands of southeastern Buenos Aires and rainy conditions brought similar relief to the northwest. February temperatures averaged 1 to 3°C above normal throughout the country, with daytime highs reaching 40°C as far south as La Pampa and Buenos Aires. However, a strong cold front ushered cooler weather (nighttime lows of 5°C or lower) into the region during the latter half of the month, but frost impacts – if any – were likely minor.









BRAZIL

Conditions remained overall favorable for second-crop corn and cotton during February, although periodic dryness reduced monthly rainfall accumulations to below-normal levels in many regions. One of the drier locations relative to normal was Bahia, where conditions favored the final stages of soybean harvesting but reduced moisture for emerging to vegetative cotton. Similarly, rainfall was infrequent in Rio Grande do Sul, aiding drydown and harvesting of corn but raising concerns for immature soybeans in western locations where hot weather (daytime highs greater than 35°C) sustained high crop moisture demands and evaporative losses. In contrast, near- to above-normal February rainfall maintained overall favorable conditions for emerging second-crop corn in Paraná while also benefiting sugarcane and coffee in key production areas of São Paulo and Minas Gerais. Periodic dryness in Mato Grosso aided fieldwork but rainfall was sufficient to maintain favorable prospects for second-crop corn and cotton.

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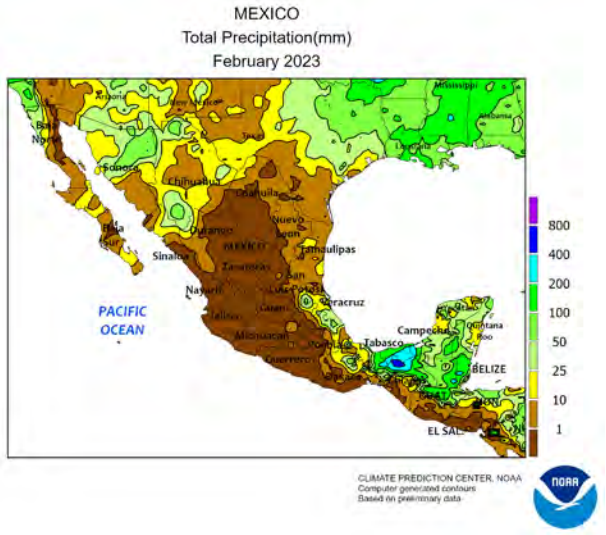
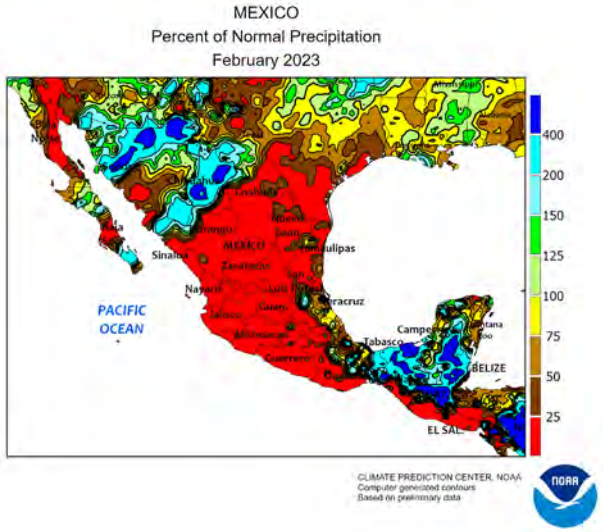
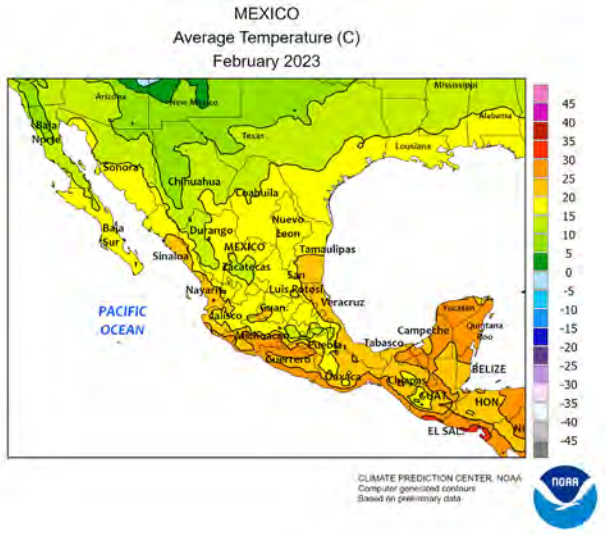
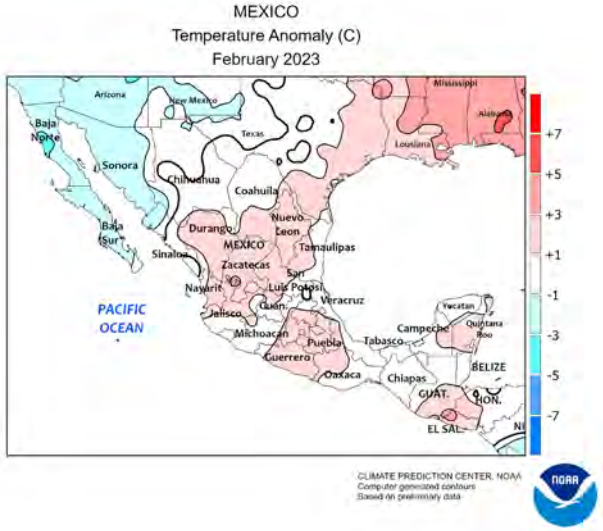


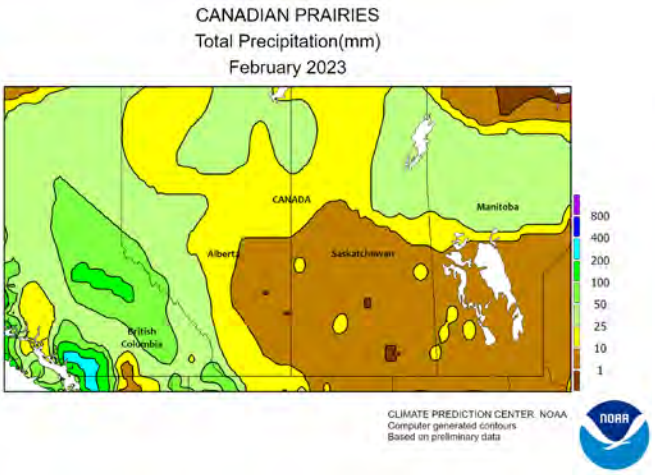


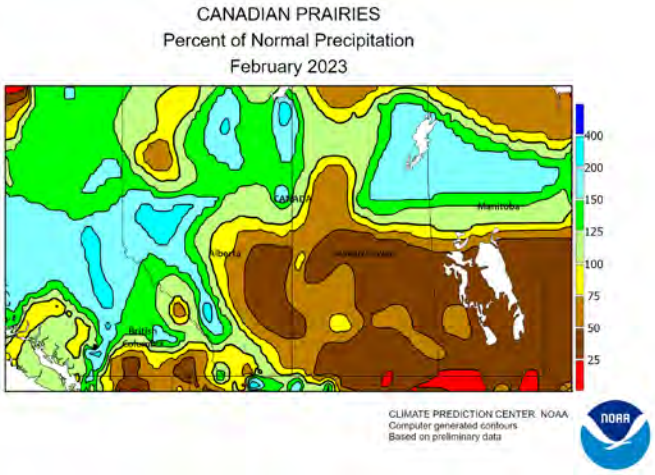


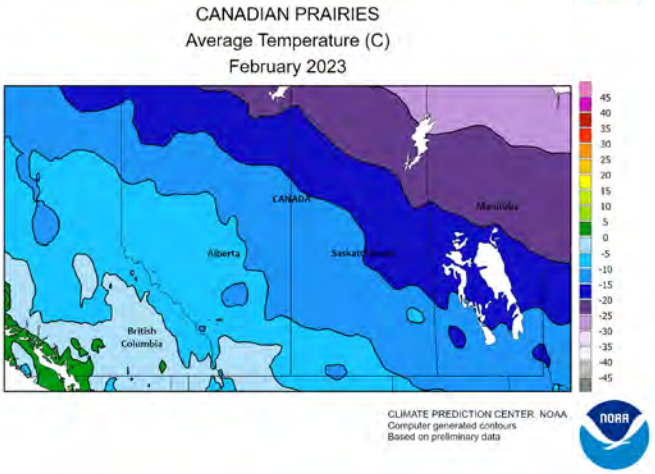


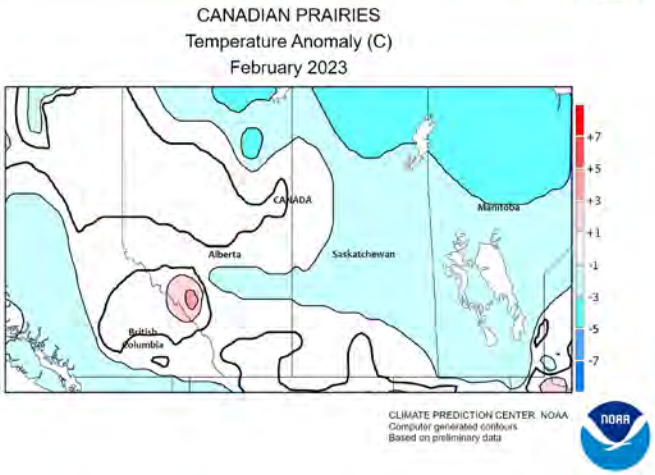
MEXICO

February showers increased moisture reserves for winter grains in key northwestern production areas. Monthly accumulations totaled more than 50 mm locally in Sonora and northwestern Durango, with other locations recording at least 10 mm. In contrast, rainfall was unseasonably light in the northeast (northern Coahuila to Tamaulipas), limiting moisture for winter sorghum as seasonal warming placed higher moisture demands on crops. Temperatures occasionally dropped below freezing in some northern farming areas, but any impacts were likely confined to local areas. Elsewhere, heavy rain in the southeast (Tabasco and environs) contrasted with seasonal dryness on the southern plateau (Jalisco to Puebla), which aided seasonal fieldwork including corn harvesting. Spotty showers improved local reservoir levels in and around Yucatan in advance of the onset of seasonal rainfall that typically arrives in April. According to the government of Mexico, reservoirs were at 59 percent of capacity nationally as of February 28. In the northwest, reservoir levels ranged from 47 percent (Sinaloa) to 82 percent (Chihuahua).



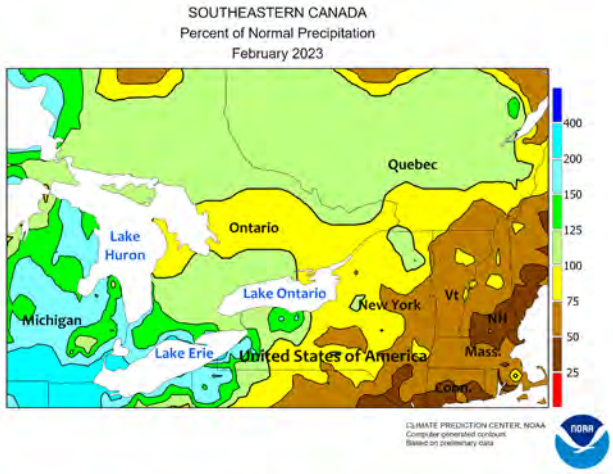


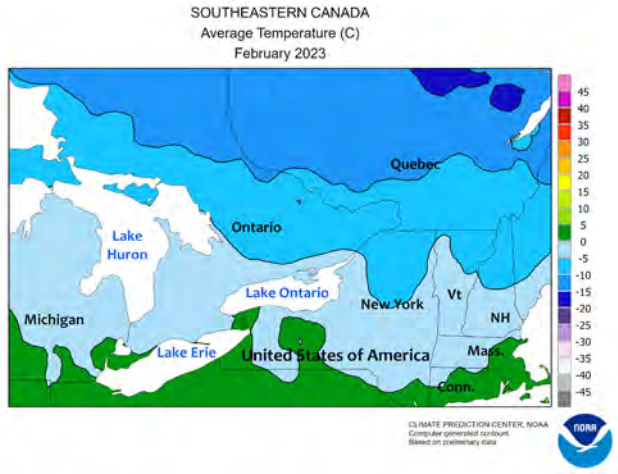


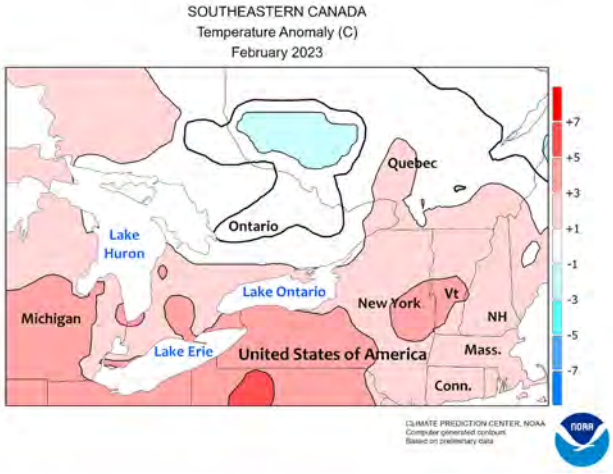


CANADIAN PRAIRIES

Drier-than-normal weather, accompanied by highly variable temperatures, dominated the Prairies in February. Most agricultural districts recorded precipitation totaling below 10 mm (liquid equivalent), with the notable exception of Alberta's Peace River Valley where amounts locally exceeded 25 mm. Monthly average temperatures varied between near normal and as much as 4°C above, owing to a mid-month warmup that pushed daytime highs above freezing for several days. However, the brief period of warmth was insufficient to initiate growth of pasture or winter grains in areas with no snow cover, and all locations recorded temperatures below -30°C on several occasions. According to the Canadian Drought Monitor, many agricultural districts remained in Moderate to Severe Drought (D1 or D2) as of February 28.



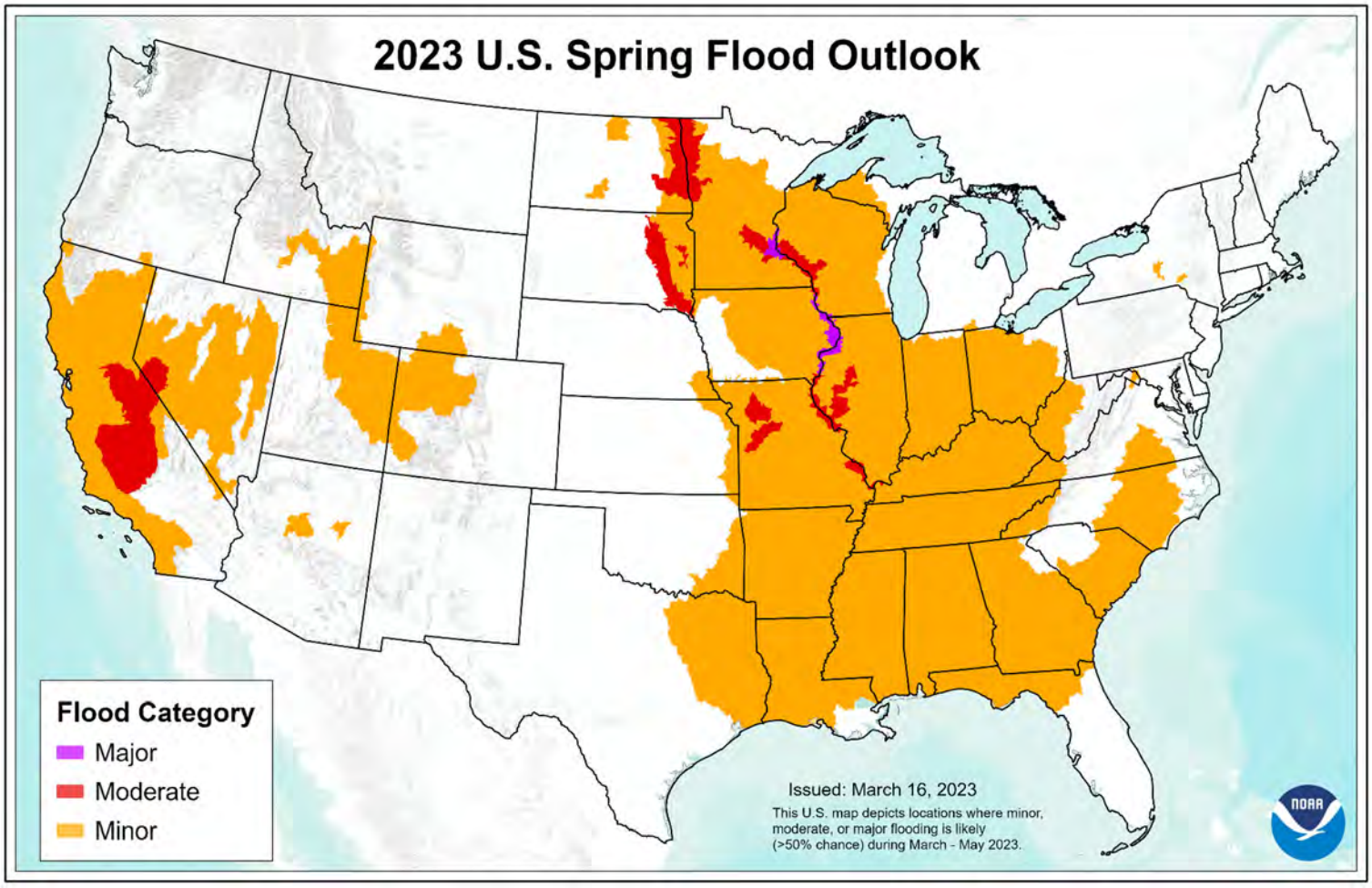




SOUTHEASTERN CANADA

In February, mild, generally wet conditions favored overwintering wheat and pastures. In Ontario, an extended period of warm, occasionally rainy weather eliminated the snow cover in key southern production areas, but protection was adequate during cold outbreaks at the beginning of February and again toward the end of the month. According to the Canadian Drought Monitor, pockets of drought lingered in farming areas southwest of Toronto as of February 28, but the intensity abated somewhat due to February's unseasonable wetness.

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



The 2023 U.S. Spring Flood Outlook was issued by the National Oceanic and Atmospheric Administration on March 16. Moderate to major spring flooding should be limited to a handful of waterways, including the upper Mississippi River, the James River, and the Red River Valley of the North. Central California and the western Great Basin also have a risk of moderate flooding. For a complete suite of products, visit: https://www.noaa.gov/news-release/spring-outlook-california-drought-cut-by-half-with-more-relief-to-come.

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