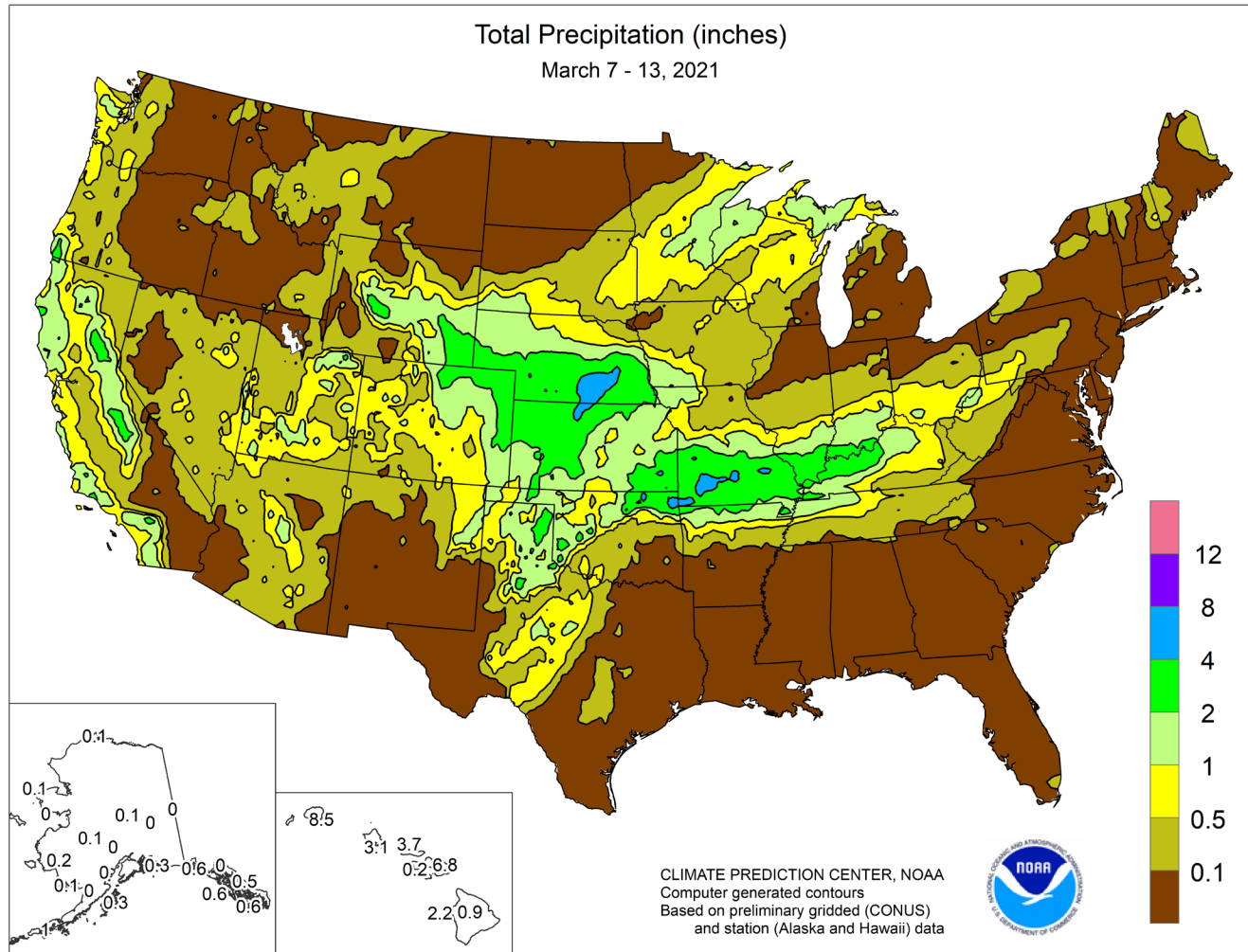


WEEKLY WEATHER AND CROP BULLETIN

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 7 – 13, 2021

Highlights provided by USDA/WAOB

A pair of storms emerged from the western U.S., delivering mid- to late-week rain and snow across a broad area. The earlier storm was responsible for a stripe of snow, mainly on March 10, from **Wyoming into parts of the upper Midwest**. The second system also produced heavy snow, primarily in the **central Rockies** and adjacent **High Plains**. The heaviest precipitation fell late in the week, continuing through Sunday, March 14, as the second storm crossed **central and southern sections of the Rockies and Plains**. Locally heavy rain also extended

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Water Supply Forecast for the Western United States

Highlights

Although the 2020-21 La Niña has begun to weaken, precipitation-related impacts continued into March across the western United States. In early March, the Climate Prediction Center of the National Weather Service indicated that “the coupled ocean-atmosphere system is consistent with a weak or decaying La Niña.”

Characteristic of La Niña, the most favorable snowpack and water-supply prospects existed across the northern tier of the western U.S. In contrast, below-average snowpack was noted in most watersheds from California to the southern Rockies, with the end of the accumulation season rapidly approaching.

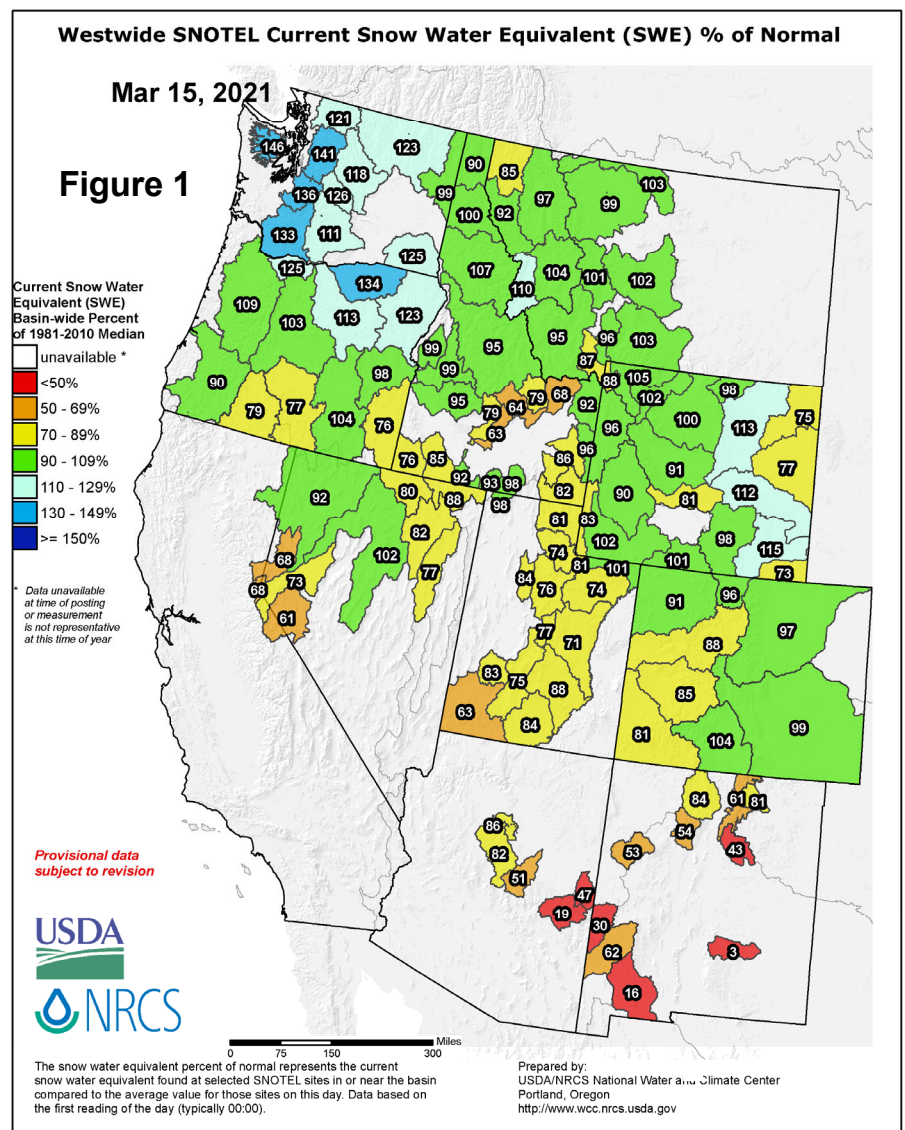
By March 15, the average water equivalency of the high-elevation Sierra Nevada snowpack stood at about 16.5 inches, according to the California Department of Water Resources, about 60 percent of normal for this time of year.

According to the *U.S. Drought Monitor*, 77 percent of the 11-state Western region was experiencing drought on March 9; that number has varied little since October 2020, ranging from 76 to 80 percent. On the same date, regional coverage of extreme to exceptional drought (D3 to D4) stood at 41 percent on March 9, down from a January peak of 47 percent. D3 to D4 covered more than one-half of Utah (90 percent), Arizona (85 percent), New Mexico (82 percent), Nevada (72 percent), and Colorado (57 percent).

A potent, mid-March storm system crossing the central Rockies could regionally improve the snowpack and water-supply situation.

Snowpack and Precipitation

Storms in February and early March provided a favorable boost in mountain snowpack from the Northwest to the northern and central Rockies. By March 15, 2021, near- or above-average snowpack values were common across the Cascades and northern Rockies, while improvements were noted compared to a month ago across the northern Great Basin and the central Rockies. Meanwhile, serious snowpack deficiencies were observed in the Sierra Nevada and large sections of the Great Basin, Intermountain West, and Southwest. The snowpack situation was especially dire in the Southwest, where limited winter precipitation and premature melting has left little moisture to feed rivers and lakes. Mid-March snowpack was less than one-half of normal for this time of year in many river basins across Arizona and New Mexico (figure 1).



Season-to-date precipitation (October 1, 2020 – March 15, 2021) was near to slightly above normal from the Pacific Northwest to the northern and central Rockies, while below-normal totals were common across the southern two-thirds of the West (figure 2). Seasonal precipitation has been disappointingly meager in much of California, the Great Basin, and the Intermountain West, with total less than two-thirds of normal in several basins. The Southwest has fared even worse, with a few watersheds in Arizona and New Mexico reporting seasonal precipitation less than one-half of normal.

Spring and Summer Streamflow Forecasts

By March 1, 2021, projections for spring and summer streamflow were indicating the likelihood of mostly favorable runoff prospects from the Pacific Northwest to the northern Rockies, courtesy of a La Niña-dominated storm track. In contrast, runoff and water-supply concerns continued to mount from California into the Southwest, despite a slight recent boost in snowpack. In some drought-stricken areas of the Southwest, dry soils beneath meager snowpack could lead to poor reservoir recharge, as some of the melting snow will be soaked up before reaching rivers and lakes.

Reservoir Storage

On March 1, statewide reservoir storage as a percent of average for the date was 43 percent in New Mexico (figure 3). California's storage stood at 77 percent of average for March 1. Below-average storage was also noted in Colorado, Nevada, and Oregon. Meanwhile, near- or above-average storage was reported in several states, including Idaho, Montana, Utah, Washington, and Wyoming.

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>

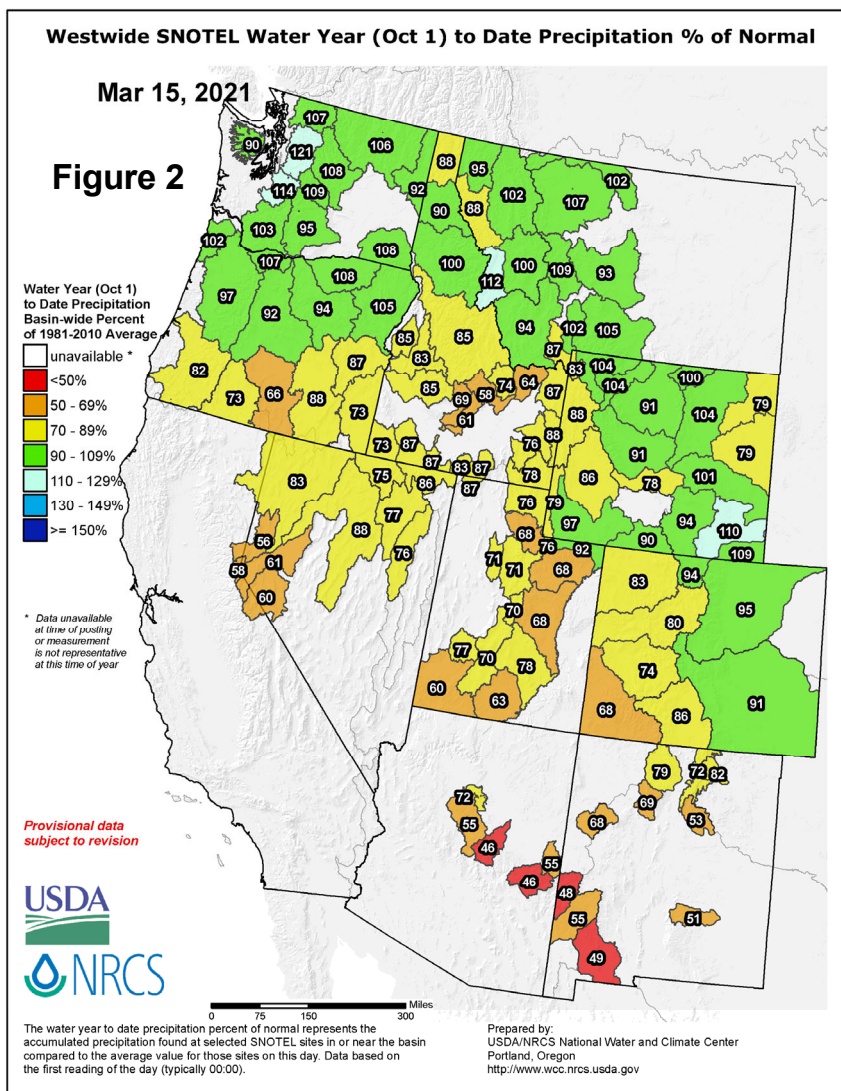
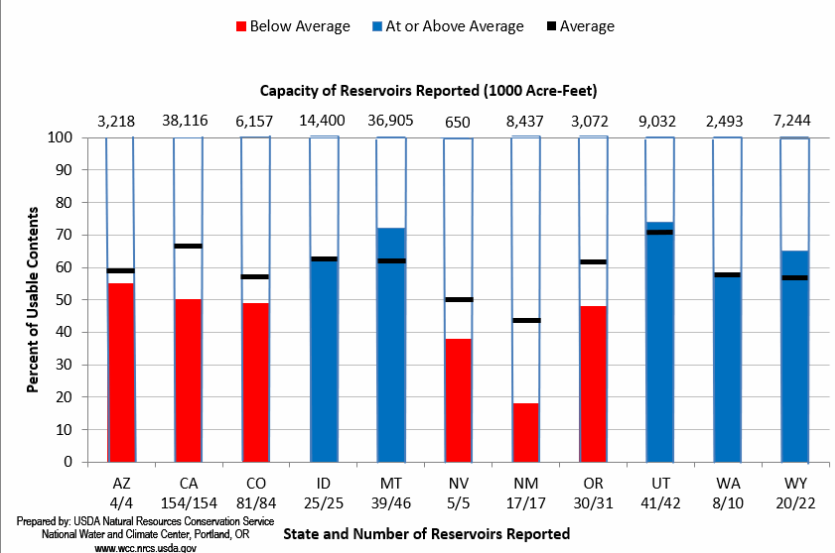
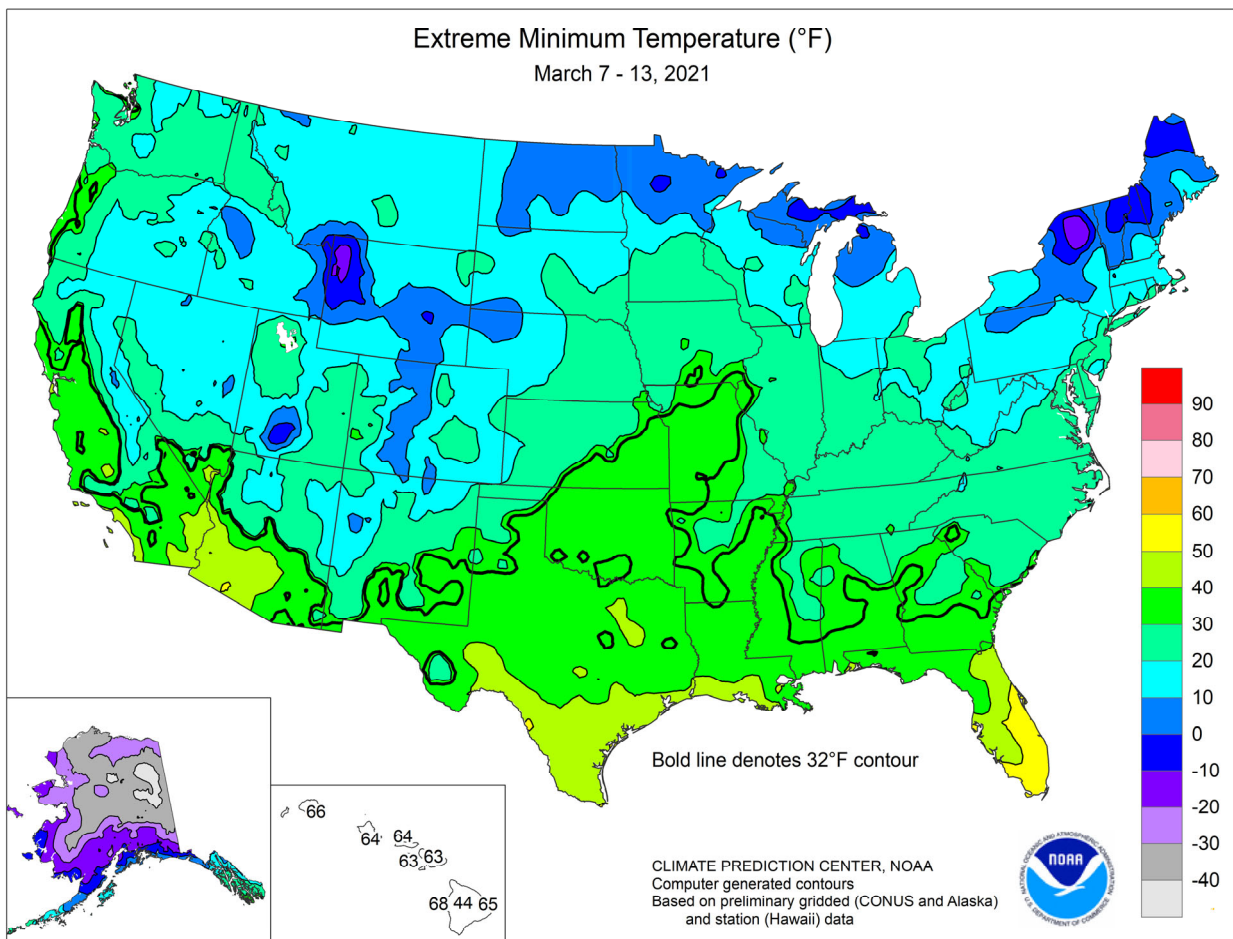
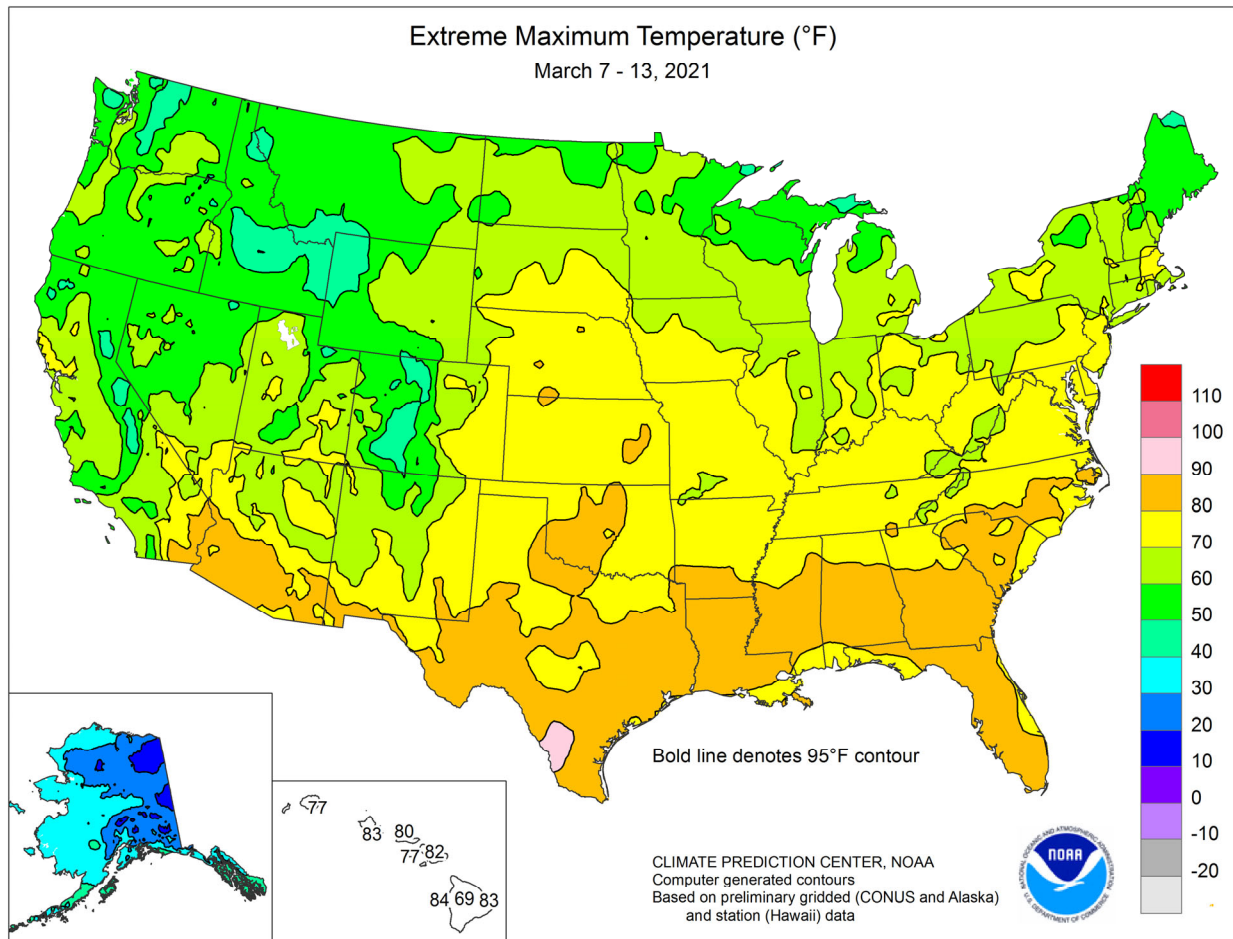


Figure 3 Reservoir Storage as of March 1, 2021



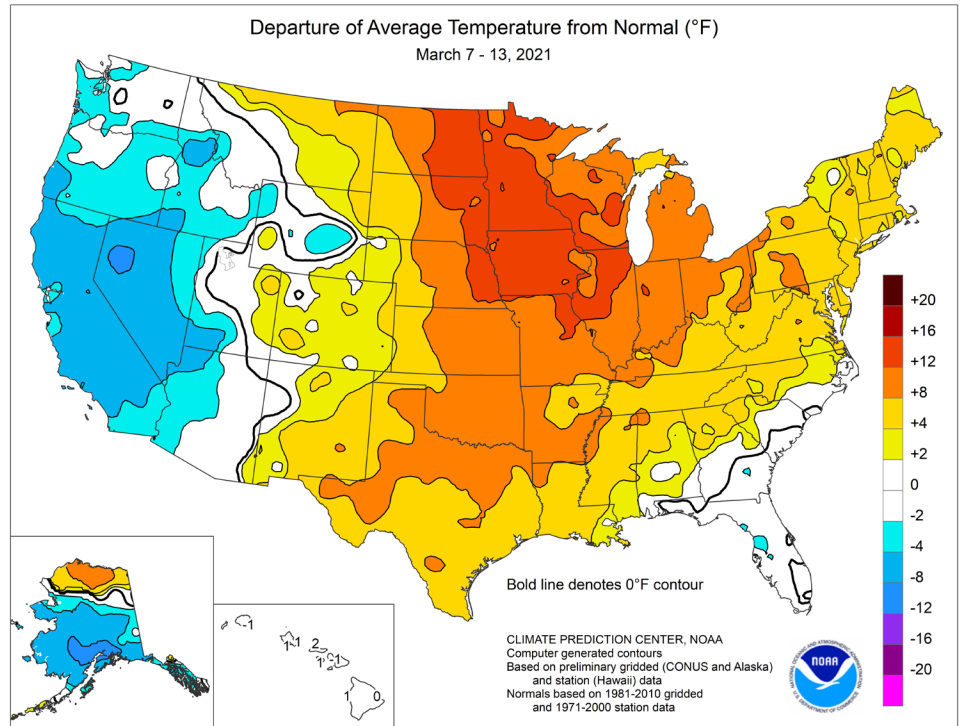


(Continued from front cover)

eastward across the **Ozark Plateau** and into the **lower Ohio Valley**, triggering (or perpetuating) lowland flooding. In contrast, mostly dry weather prevailed throughout the week across the **Gulf and Atlantic Coast States**. Elsewhere, the passage of the two storms maintained cool, showery weather from the **Pacific Coast** into the **Great Basin and Intermountain West**. However, precipitation mostly bypassed the **interior Northwest**. Weekly temperatures averaged more than 5°F below normal in parts of **California** and **Nevada**—but were more than 5°F above normal in a large area covering the **Plains, Midwest, mid-South, and Northeast**. Readings averaged at least 10 to 15°F above normal throughout the **upper Midwest**.

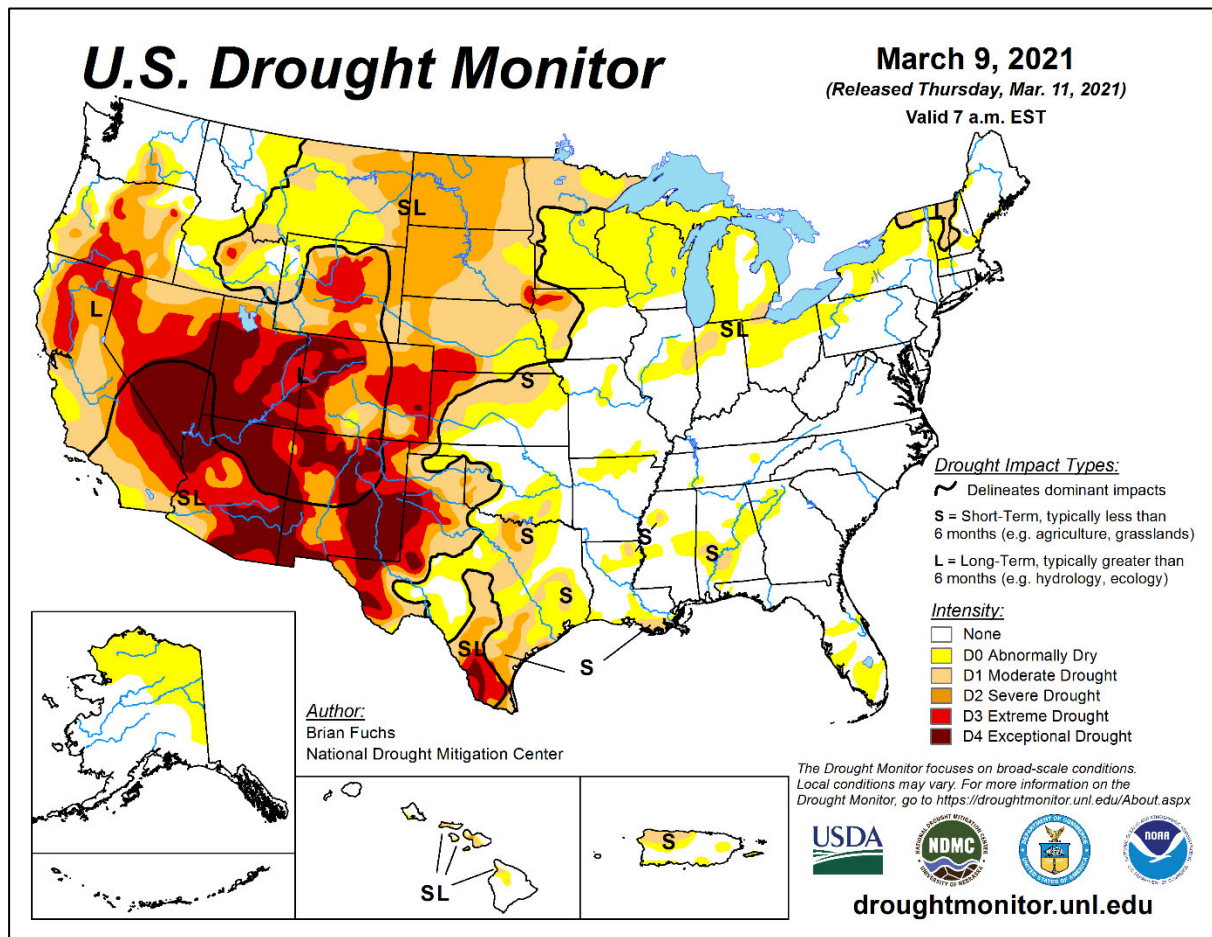
Early in the week, record-setting warmth covered the **northern Plains and upper Midwest**. On March 7-8, **Mobridge, SD**, opened the week with consecutive daily-record highs (64 and 65°F, respectively). Similarly, consecutive daily-record highs occurred on March 8-9 in locations such as **Fargo, ND** (57 and 65°F), and **Aberdeen, SD** (65 and 69°F). Highs soared to record-setting levels for March 9 in dozens of other communities, including **North Platte, NE** (81°F); **Mitchell, SD** (78°F); **Kansas City, MO** (77°F); **Sioux City, IA** (73°F), and **Peoria, IL** (71°F). **North Platte** last topped the 80-degree mark during March in 2017, when it was 90°F on March 19. In a final push of **Midwestern** warmth on March 9-10, **Des Moines, IA** (72 and 75°F), and **Toledo, OH** (68 and 72°F), logged a pair of daily-record highs. By March 11, warm weather shifted into the **East**; among the records for the date were highs of 79°F in **Washington, DC**; 77°F in **Reading, PA**; 75°F in **Newark, NJ**; and 74°F in **Boston, MA**. In contrast, a developing storm system helped to draw cold air into the **West**. By March 13, a daily-record low of -3°F was established at **Utah's Bryce Canyon Airport**.

During the first half of the week, precipitation was patchy and generally light, although **West Yellowstone, MT**, received 8.0 inches of snow in a 24-hour period on March 8-9. By March 10, however, heavy snow developed over **Wyoming** and spread northeastward. **Casper, WY**, received 11.9 inches of snow on March 9-10, aided by a daily-record total of 8.9 inches on the latter date. In **South Dakota**, daily-record snowfall amounts for March 10 included 6.4 inches in **Watertown**, 6.0 inches in **Pierre**, and 5.2 inches in **Huron**. Heavy rain, or rain changing to snow, fell on the 10th in portions of the **upper Great Lakes region**, where daily-record precipitation totals reached 1.25 inches in **Marquette, MI**, and 0.97 inch in **Duluth, MN**. Meanwhile, the second, stronger storm system arrived across the **West**. In **southern Utah**, **Capitol Reef National Park** measured 10.3 inches of snow in a 48-hour period on March 11-13. Early on the 13th, heavy snow began to fall across **central sections of the Rockies and High Plains**. From March 13-15, **Casper, WY**, received 29.5 inches of snow. With 41.4 inches of snow during the first 15 days of the month, **Casper** has already set a March record (previously, 36.2 inches in 1975). **Casper** also achieved its snowiest March day (21.2 inches on the 14th), surpassing 14.6 inches on March 18, 1954, and its second-snowiest day on record behind 24.3 inches on December 24, 1982. Elsewhere, March 13-14 totals included 30.8 inches in **Cheyenne, WY**, and 27.1 inches in **Denver, CO**. **Cheyenne's** total of 22.7 inches



on March 14 was a station record for any date (previously, 19.8 inches on November 20, 1979). **Denver's** 19.9-inch total on the 14th was a record for any March day (previously, 18.0 inches on March 5, 1983), and represented the snowiest day in that location since December 24, 1982, when 23.6 inches fell. Farther east, the 13th was the wettest March day on record in **Nebraska** locations such as **Hastings** (2.87 inches; previously, 2.29 inches on March 17, 1987) and **Grand Island** (2.56 inches; previously, 1.98 inches on March 21, 1979). March 13-14 totals reached 5.31 inches in **Grand Island** and 4.71 inches in **Hastings**; in other parts of **Nebraska**, 3 to 4 inches fell in **Lincoln, Broken Bow, North Platte, and Norfolk**. Daily-record totals for March 13 included 1.49 inches in **Garden City, KS**, and 1.41 inches in **Childress, TX**.

Mild weather prevailed early in the week in **northern Alaska**, while cold conditions covered the remainder of the state. **Fairbanks** reported lows of -35°F on March 12 and 13. Some snow accompanied the cold weather in **southeastern Alaska**, where Juneau received 3.6 inches from March 10-12. Farther south, torrential rainfall associated with a complex low-pressure system triggered flooding in parts of **Hawaii**. On March 8, **Maui** was hardest hit by an initial round of flooding, as intense rainfall above **Kaupakalua Reservoir** resulted in the overtopping of the dam. In addition, **Maui's** rainfall produced substantial flooding from **Haiku to Makawao**, damaging or destroying several bridges. Heavy rainfall and flooding shifted to **Oahu** and **Kauai** on March 9. On the morning of March 11, a landslide on **Kauai** near **Hanalei** resulted in the closure of the Kuhio Highway, blocking access into and out of communities west of the **Hanalei Bridge**. Finally, a cold front swept across the **Hawaiian Islands** on March 12-13, delivering another round of heavy rain and flooding. On March 13, **Kahului, Maui**, netted a daily-record rainfall of 4.14 inches to boost its month-to-date total to 8.83 inches (874 percent of normal). Other month-to-date totals through March 13 included 15.18 inches (280 percent of normal) in **Hilo**, on the **Big Island**, and 10.27 inches (535 percent) in **Lihue, Kauai**. Elsewhere on **Kauai**, famously wet **Mount Waialeale** received 73.26 inches of rain during the 14-day period ending on the morning of March 14.



weather.msfc.nasa.gov

15 Mar 2021
18:16 UTCGOES-West Visible
March 15, 2021
11:16 am PDT

Even while a major spring storm was still crossing the Great Plains, a new system arrived in the West. The similar disturbances, separated by fewer than 1,500 miles, benefited drought-stressed rangeland, pastures, and winter grains, but adversely affected livestock and caused travel disruptions.

National Weather Data for Selected Cities

Weather Data for the Week Ending March 13, 2021

Data Provided by Climate Prediction Center

STATES AND STATIONS		TEMPERATURE °F						PRECIPITATION							RELATIVE HUMIDITY PERCENT		NUMBER OF DAYS			
		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	TEMP. °F		PRECIP.	
																	90 AND ABOVE	32 AND BELOW	.01 INCH OR MORE	.50 INCH OR MORE
AK	ANCHORAGE	26	11	31	1	18	-7	0.10	-0.05	0.10	0.40	148	1.98	113	80	45	0	7	1	0
	BARROW	5	-17	31	-33	-6	0	0.11	0.08	0.06	0.18	383	0.79	215	75	60	0	7	3	0
	FAIRBANKS	19	-10	32	-35	4	-4	0.29	0.22	0.27	0.39	277	1.76	151	85	56	0	7	2	0
	JUNEAU	36	24	43	19	30	-2	0.40	-0.48	0.23	1.33	77	11.85	105	88	46	0	7	3	0
	KODIAK	37	25	45	18	31	-1	0.34	-0.90	0.18	0.73	31	18.11	108	74	43	0	6	3	0
AL	NOME	15	-3	34	-25	6	-4	0.00	-0.15	0.00	0.33	109	1.46	65	90	73	0	7	0	0
	BIRMINGHAM	74	44	83	31	59	5	0.00	-1.20	0.00	0.81	36	7.67	65	74	30	0	1	0	0
	HUNTSVILLE	71	43	76	28	57	5	0.00	-1.17	0.00	0.73	33	8.40	70	85	37	0	2	0	0
	MOBILE	74	47	79	36	60	1	0.00	-1.38	0.00	1.29	49	6.32	47	94	38	0	0	0	0
	MONTGOMERY	76	42	83	33	59	3	0.00	-1.39	0.00	1.41	55	6.58	52	83	28	0	0	0	0
AR	FORT SMITH	72	52	78	35	62	11	0.31	-0.54	0.30	0.32	21	3.86	54	83	49	0	0	2	0
	LITTLE ROCK	71	48	75	33	60	8	0.00	-1.03	0.00	0.00	0	7.50	82	85	50	0	0	0	0
AZ	FLAGSTAFF	43	24	59	15	33	-3	1.09	0.57	0.54	1.40	143	5.84	112	83	45	0	7	4	1
	PHOENIX	74	53	89	45	63	-1	0.37	0.11	0.24	0.37	75	0.81	34	53	20	0	0	3	0
CA	PRESCOTT	52	33	67	24	42	-3	0.15	-0.12	0.07	0.20	37	2.11	69	73	34	0	5	3	0
	TUCSON	73	48	88	37	60	1	0.29	0.10	0.25	0.29	84	1.00	45	50	13	0	0	2	0
	BAKERSFIELD	61	44	68	43	53	-4	0.29	-0.01	0.26	0.29	51	1.33	45	70	31	0	0	2	0
	EUREKA	49	37	52	32	43	-6	0.55	-0.69	0.24	1.62	67	10.61	73	97	76	0	1	4	0
	FRESNO	61	44	66	40	52	-4	0.42	-0.09	0.42	0.42	44	4.07	78	78	37	0	0	1	0
CO	LOS ANGELES	58	48	62	44	53	-5	0.88	0.38	0.66	1.01	100	2.91	41	84	54	0	0	2	1
	REDDING	60	39	70	35	49	-4	0.61	-0.55	0.52	1.05	46	7.15	53	85	38	0	0	3	1
	SACRAMENTO	61	39	69	35	50	-4	0.41	-0.29	0.27	0.54	39	3.94	46	88	39	0	0	2	0
	SAN DIEGO	62	52	64	49	57	-2	0.65	0.17	0.47	1.23	133	3.12	60	79	52	0	0	2	0
	SAN FRANCISCO	58	47	64	43	53	-2	0.75	0.00	0.39	0.96	65	5.04	51	80	49	0	0	3	0
CT	STOCKTON	60	39	66	35	50	-4	0.57	0.04	0.43	0.63	61	5.54	88	89	43	0	0	2	0
	ALAMOSA	53	17	60	11	35	3	0.02	-0.09	0.02	0.03	15	0.54	65	85	16	0	7	1	0
	CO SPRINGS	53	32	68	26	43	5	0.47	0.25	0.47	0.75	196	2.17	192	68	31	0	4	1	0
	DENVER INTL	56	31	70	20	44	5	0.61	0.43	0.58	0.92	298	1.93	166	75	31	0	4	2	1
	GRAND JUNCTION	57	35	67	29	46	3	0.30	0.11	0.20	0.32	94	0.99	67	73	24	0	3	3	0
DC	PUEBLO	59	30	76	25	45	4	0.26	0.06	0.26	0.33	97	1.37	127	73	31	0	5	1	0
	BRIDGEPORT	53	33	67	23	43	5	0.01	-0.87	0.01	0.30	18	5.77	77	76	32	0	3	1	0
DE	HARTFORD	54	27	70	17	40	5	0.00	-0.77	0.00	0.25	17	5.94	79	70	25	0	5	0	0
	WASHINGTON	65	41	79	28	53	9	0.00	-0.72	0.00	0.27	20	6.71	99	60	20	0	2	0	0
FL	WILMINGTON	60	35	74	21	48	7	0.00	-0.84	0.00	0.11	7	6.39	89	72	24	0	2	0	0
	DAYTONA BEACH	73	51	79	49	62	-1	0.00	-0.92	0.00	0.11	6	4.28	59	88	42	0	0	0	0
	JACKSONVILLE	72	43	82	35	58	-3	0.00	-0.93	0.00	1.31	73	9.17	111	97	40	0	0	0	0
	KEY WEST	79	68	81	63	73	1	0.02	-0.50	0.02	0.05	5	1.45	32	78	48	0	0	1	0
	MIAMI	78	66	81	57	72	0	0.11	-0.53	0.09	1.53	135	4.92	98	77	47	0	0	2	0
GA	ORLANDO	76	52	82	46	64	-2	0.00	-0.80	0.00	0.52	37	3.35	54	91	38	0	0	0	0
	PENSACOLA	73	51	79	46	62	3	0.02	-1.29	0.01	1.17	46	6.87	56	90	43	0	0	2	0
	TALLAHASSEE	76	40	84	32	58	-1	0.00	-1.45	0.00	0.72	26	11.03	92	93	31	0	2	0	0
	TAMPA	78	56	84	49	67	1	0.00	-0.67	0.00	0.31	24	4.85	77	76	34	0	0	0	0
	WEST PALM BEACH	78	65	81	57	71	1	0.00	-1.06	0.00	0.55	30	3.45	44	70	44	0	0	0	0
HI	ATHENS	74	40	80	30	57	5	0.00	-1.04	0.00	0.37	19	7.69	73	77	26	0	2	0	0
	ATLANTA	73	46	80	35	59	6	0.00	-1.13	0.00	0.41	19	7.65	69	65	26	0	0	0	0
	AUGUSTA	75	36	85	27	56	1	0.00	-1.00	0.00	1.37	72	12.62	130	93	22	0	3	0	0
	COLUMBUS	75	41	83	33	58	1	0.00	-1.26	0.00	0.74	31	8.95	84	79	22	0	0	0	0
	MACON	76	37	85	28	56	1	0.00	-1.07	0.00	2.00	98	9.53	89	91	26	0	3	0	0
IA	SAVANNAH	75	42	87	33	58	1	0.00	-0.84	0.00	2.46	160	8.46	106	89	25	0	0	0	0
	HILO	77	67	83	65	72	0	12.26	9.26	6.48	16.24	298	44.89	185	90	71	0	0	7	3
	HONOLULU	79	67	83	64	73	-1	3.08	2.56	1.34	3.61	390	8.33	160	93	65	0	0	5	3
	KAHULUI	78	67	82	63	72	-1	6.76	6.19	4.09	6.84	681	11.11	193	91	66	0	0	6	2
	LIHUE	75	67	77	66	71	-1	8.48	7.43	4.04	10.10	524	15.48	176	95	77	0	0	7	4
IN	BURLINGTON	62	39	71	32	50	11	0.11	-0.49	0.11	0.11	10	1.84	46	78	40	0	2	1	0
	CEDAR RAPIDS	60	33	68	27	47	13	0.07	-0.37	0.07	0.07	9	1.00	33	82	44	0	4	1	0
	DES MOINES	64	37	75	30	50	13	0.05	-0.41	0.05	0.05	6	1.43	45	73	35	0	3	1	0
	DUBUQUE	56	34	65	29	45	12	0.19	-0.28	0.19	0.19	21	2.03	58	80	50	0	3	1	0
	SIOUX CITY	62	31	73	24	46	12	0.14	-0.23	0.14	0.14	22	1.91	99	89	39	0	4	1	0
ID	WATERLOO	61	31	69	23	46	12	0.35	-0.06	0.35	0.35	47	2.41	92	84	42	0	4	1	0
	BOISE	55	28	59	25	42	-2	0.03	-0.27	0.03	0.07	12	3.08	110	79	24	0	5	1	0
	LEWISTON	53	32	59	30	43	-1	0.00	-0.26	0.00	0.02	5	2.20	92	81	39	0	4	0	0
	POCATELLO	49	20	55	13	35	-1	0.14	-0.14	0.10	0.14	26	2.09	83	84	27	0	7	2	0
	CHICAGO/O_HARE	61	39	69	26	50	15	0.16	-0.36	0.16	0.16	16	2.47	54	79	36	0	2	1	0
IL	MOLINE	64	36	71	27	50	13	0.08	-0.54	0.08	0.08	6	3.23	75	80	37	0	4	1	0
	PEORIA	64	39	73	30	52	13	0.03	-0.54	0.03	0.03	2	4.29	92	76	32	0	1	1	0
	ROCKFORD	60	36	68	22	48	14	0.09	-0.37	0.08	0.09	10	2.85	78	75	40	0	2	2	0
	SPRINGFIELD	64	42	71	28	53	13	0.39	-0.17	0.39	0.39	37	4.83	103	77	37	0	1	1	0
	EVANSVILLE	67	42	72	28	55	10	2.06	1.14	1.43	2.06	126	9.69	123	77	36	0	1	2	2
IN	FORT WAYNE	61	32	70	19	46	10	0.01	-0.53	0.01	0.01	1	3.30	62	73	33	0	4	1	0
	INDIANAPOLIS																			

Weather Data for the Week Ending March 13, 2021

STATES AND STATIONS		TEMPERATURE °F						PRECIPITATION							RELATIVE HUMIDITY PERCENT		NUMBER OF DAYS			
																	TEMP. °F		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
KY	WICHITA	66	44	80	37	55	10	1.31	0.75	1.04	1.46	149	4.35	144	81	43	0	0	2	1
	LEXINGTON	62	38	70	23	50	6	0.85	-0.06	0.43	1.04	63	10.40	130	69	29	0	2	2	0
	LOUISVILLE	66	45	73	32	55	9	1.60	0.68	1.17	1.60	97	11.24	140	67	28	0	2	2	1
LA	PADUCAH	66	43	75	28	55	8	1.28	0.44	0.86	1.28	83	9.86	108	83	43	0	2	3	1
	BATON ROUGE	79	51	85	36	65	5	0.00	-1.21	0.00	0.92	41	8.27	63	90	35	0	0	0	0
	LAKE CHARLES	77	54	82	41	66	6	0.00	-0.80	0.00	0.37	24	5.18	50	95	45	0	0	0	0
MA	NEW ORLEANS	76	55	80	43	65	4	0.00	-1.01	0.00	1.10	56	7.70	62	89	45	0	0	0	0
	SHREVEPORT	78	53	83	35	66	9	0.00	-0.92	0.00	2.04	113	8.06	74	81	36	0	0	0	0
	BOSTON	53	32	74	22	43	6	0.00	-0.92	0.00	0.16	9	5.17	62	61	26	0	3	0	0
MD	WORCESTER	50	27	70	14	38	6	0.00	-0.87	0.00	0.23	14	10.15	122	66	26	0	6	0	0
	BALTIMORE	64	35	79	22	50	8	0.00	-0.83	0.00	0.17	11	7.06	95	65	20	0	3	0	0
	CARIBOU	37	14	49	0	25	3	0.19	-0.37	0.16	0.68	65	4.44	74	81	46	0	6	3	0
ME	PORTLAND	47	25	59	12	36	4	0.00	-0.92	0.00	0.47	28	5.28	63	76	36	0	5	0	0
	ALPENA	51	21	61	6	36	9	0.03	-0.37	0.03	0.03	4	1.46	39	87	38	0	6	1	0
	GRAND RAPIDS	56	29	67	16	43	9	0.04	-0.46	0.04	0.04	4	2.72	56	86	37	0	5	1	0
MI	HOUGHTON LAKE	48	22	59	2	35	8	0.01	-0.37	0.01	0.01	1	1.88	54	88	42	0	5	1	0
	LANSING	58	29	70	17	43	11	0.08	-0.33	0.08	0.08	10	3.01	77	81	33	0	4	1	0
	MUSKEGON	54	30	68	16	42	9	0.00	-0.48	0.00	0.00	0	3.22	67	79	37	0	5	0	0
MN	TRAVERSE CITY	53	27	63	11	40	12	0.00	-0.39	0.00	0.00	0	0.70	13	81	37	0	6	0	0
	DULUTH	46	26	55	12	36	13	1.08	0.76	0.90	1.08	185	2.18	91	80	44	0	5	2	1
	INT_L FALLS	48	23	63	8	36	15	0.00	-0.17	0.00	0.00	0	0.69	45	84	38	0	6	0	0
MO	MINNEAPOLIS	55	32	62	26	44	14	0.67	0.29	0.67	0.71	103	2.09	87	90	42	0	5	1	1
	ROCHESTER	53	32	61	27	42	0	0.22	-0.14	0.22	0.24	36	1.91	79	89	53	0	4	1	0
	ST. CLOUD	51	30	61	21	41	14	0.77	0.46	0.72	0.82	154	2.00	111	91	48	0	4	2	1
MS	COLUMBIA	64	45	74	39	54	12	1.04	0.45	0.73	1.04	94	5.24	99	77	43	0	0	2	1
	KANSAS CITY	65	44	77	35	55	13	0.73	0.26	0.41	0.73	84	3.73	109	72	39	0	0	3	0
	SAINT LOUIS	67	48	75	34	58	14	0.52	-0.15	0.47	0.52	43	5.96	102	67	39	0	0	2	0
MT	SPRINGFIELD	63	45	70	32	54	10	5.01	4.24	1.82	5.02	360	10.19	160	84	59	0	1	3	3
	JACKSON	77	48	82	34	62	7	0.00	-1.12	0.00	0.98	46	6.74	56	86	34	0	0	0	0
	MERIDIAN	77	44	83	30	61	6	0.00	-1.24	0.00	1.09	46	8.73	66	84	31	0	2	0	0
NC	TUPELO	74	47	81	32	60	8	0.00	-1.13	0.00	1.16	53	9.74	83	86	38	0	2	0	0
	BILLINGS	51	27	57	22	39	3	0.00	-0.21	0.00	0.00	0	1.30	95	78	26	0	6	0	0
	BUTTE	40	16	46	9	28	-1	0.11	-0.04	0.11	0.12	45	0.99	81	88	39	0	7	1	0
ND	CUT BANK	50	22	57	19	36	7	0.00	-0.11	0.00	0.00	0	0.13	19	79	21	0	7	0	0
	GLASGOW	50	24	60	20	37	8	0.00	-0.10	0.00	0.00	0	0.19	21	79	32	0	7	0	0
	GREAT FALLS	47	22	56	18	35	2	0.20	0.02	0.20	0.20	61	1.09	81	86	29	0	7	1	0
NE	HAVRE	49	24	60	18	36	6	0.06	-0.04	0.03	0.06	32	0.89	99	89	37	0	7	2	0
	MISSOULA	47	24	57	20	35	-2	0.08	-0.14	0.06	0.08	20	1.80	90	94	43	0	7	2	0
	ASHEVILLE	66	35	73	26	50	5	0.07	-0.79	0.07	0.63	40	8.03	89	82	30	0	4	1	0
NC	CHARLOTTE	69	41	80	23	55	6	0.00	-0.97	0.00	0.19	10	9.11	107	71	23	0	2	0	0
	GREENSBORO	67	39	76	28	53	5	0.00	-0.84	0.00	0.28	18	9.64	128	62	21	0	2	0	0
	HATTERAS	62	44	70	31	53	3	0.00	-1.06	0.00	0.00	0	14.05	125	85	44	0	1	0	0
ND	RALEIGH	69	19	80	-94	44	-6	0.00	-0.98	0.00	0.15	8	11.21	132	73	24	0	3	0	0
	WILMINGTON	69	40	80	28	55	1	0.00	-1.02	0.00	0.20	10	10.43	113	88	30	0	2	0	0
	BISMARCK	55	23	66	11	39	12	0.00	-0.20	0.00	0.00	0	0.42	31	86	32	0	6	0	0
NE	DICKINSON	51	22	62	13	36	9	0.00	-0.13	0.00	0.00	0	0.00	0	82	36	0	7	0	0
	FARGO	51	25	65	12	38	13	0.08	-0.20	0.08	0.10	19	0.69	37	88	51	0	6	1	0
	GRAND FORKS	50	21	64	6	35	14	0.00	-0.23	0.00	0.00	0	0.44	29	82	42	0	7	0	0
NE	JAMESTOWN	53	25	64	12	39	14	0.00	-0.17	0.00	0.00	0	0.37	30	80	40	0	6	0	0
	GRAND ISLAND	62	34	78	26	48	11	2.53	2.16	2.53	2.53	416	4.11	223	82	34	0	4	1	1
	LINCOLN	66	38	77	25	52	14	0.75	0.38	0.75	0.75	119	2.41	116	74	30	0	1	1	1
NV	NORFOLK	62	33	74	24	47	12	0.41	0.07	0.35	0.41	71	1.22	62	80	35	0	5	2	0
	NORTH PLATTE	61	28	81	16	44	8	1.34	1.12	1.30	1.34	346	3.16	243	84	34	0	6	2	1
	OMAHA	65	36	76	26	51	14	0.34	-0.04	0.34	0.34	50	2.54	112	80	30	0	2	1	0
NH	SCOTTSBLUFF	55	26	69	15	41	4	1.12	0.90	0.87	1.12	300	2.11	148	82	40	0	6	3	1
	VALENTINE	60	28	78	14	44	10	0.56	0.33	0.33	0.56	146	1.71	144	82	36	0	4	2	0
	CONCORD	49	24	68	15	37	6	0.00	-0.69	0.00	0.21	16	4.69	71	72	30	0	7	0	0
NJ	ATLANTIC_CITY	59	36	71	20	48	7	0.00	-0.92	0.00	0.00	0	8.48	110	76	28	0	2	0	0
	NEWARK	58	35	75	25	47	7	0.00	-0.89	0.00	0.17	10	7.30	91	65	24	0	2	0	0
	ALBUQUERQUE	62	38	68	29	50	3	0.00	-0.13	0.00	0.00	0	0.61	53	41	11	0	1	0	0
NV	ELY	44	20	62	10	32	-3	0.33	0.12	0.20	0.33	83	1.37	73	75	33	0	6	3	0
	LAS VEGAS	61	47	74	38	54	-5	0.60	0.48	0.31	0.60	239	0.70	44	55	26	0	0	2	0
	RENO	50	29	62	24	40	-5	0.02	-0.18	0.02	0.03	7	1.43	57	78	26	0	5	1	0
NY	WINNEMUCCA	50	20	60	12	35	-5	0.15	-0.04	0.13	0.17	48	2.27	122	78	23	0	7	2	0
	ALBANY	49	23	66	10	36	3	0.00	-0.68	0.00	0.11	8	3.77	62	76	33	0	6	0	0
	BINGHAMTON	46	25	62	11	35	5	0.00	-0.64	0.00	0.17	15	4.61	78	78	36	0	6	0	0
OH	BUFFALO	50	28	70	18	39	7	0.00	-0.63	0.00	0.04	3	3.13	45	78	39	0	5	0	0
	ROCHESTER	52	26	71	14	39	7	0.08	-0.47	0.08	0.09	9	3.49	65	81	36	0	6	1	0
	SYRAC																			

Weather Data for the Week Ending March 13, 2021

STATES AND STATIONS		TEMPERATURE °F						PRECIPITATION							RELATIVE HUMIDITY PERCENT		NUMBER OF DAYS			
		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	TEMP. °F		PRECIP.	
																	90 AND ABOVE	32 AND BELOW	.01 INCH OR MORE	.50 INCH OR MORE
OK	TOLEDO	62	32	72	22	47	12	0.00	-0.52	0.00	0.00	0	3.30	65	68	27	0	4	0	0
	YOUNGSTOWN	57	30	69	13	43	9	0.09	-0.53	0.09	0.24	21	3.65	62	69	26	0	4	1	0
	OKLAHOMA CITY	71	47	80	32	59	8	0.07	-0.57	0.07	0.07	6	2.29	55	85	50	0	1	1	0
	TULSA	71	51	77	42	61	12	0.38	-0.32	0.28	0.39	30	3.48	72	80	50	0	0	3	0
OR	ASTORIA	51	33	56	29	42	-4	0.81	-0.88	0.59	1.67	51	29.89	144	95	56	0	4	3	1
	BURNS	48	24	61	21	36	0	0.05	-0.20	0.05	0.09	18	3.50	129	88	35	0	7	1	0
	EUGENE	56	35	65	32	45	-1	0.49	-0.65	0.31	0.88	39	10.41	71	95	51	0	1	3	0
	MEDFORD	56	36	68	32	46	-1	0.09	-0.28	0.06	0.89	116	4.54	87	81	35	0	1	2	0
PA	PENDLETON	53	30	60	28	42	-2	0.00	-0.31	0.00	0.04	6	3.00	96	86	37	0	7	0	0
	PORTLAND	57	37	62	32	47	0	0.26	-0.59	0.25	0.44	26	11.31	110	90	41	0	1	2	0
	SALEM	56	34	62	32	45	-1	0.31	-0.59	0.13	0.91	50	13.79	111	92	43	0	2	3	0
	ALLENTOWN	56	30	73	18	43	6	0.00	-0.71	0.00	0.08	6	6.46	92	75	26	0	5	0	0
RI	ERIE	55	31	72	15	43	9	0.00	-0.62	0.00	0.09	7	5.81	89	69	30	0	5	0	0
	MIDDLETOWN	61	34	76	21	47	8	0.00	-0.74	0.00	0.18	14	6.53	99	70	21	0	3	0	0
	PHILADELPHIA	61	37	74	26	49	8	0.00	-0.80	0.00	0.09	6	6.48	91	69	23	0	2	0	0
	PITTSBURGH	57	33	68	15	45	8	0.30	-0.35	0.26	0.50	42	4.60	73	70	24	0	3	2	0
SC	WILKES-BARRE	56	29	74	14	42	8	0.00	-0.52	0.00	0.24	24	5.06	94	71	26	0	4	0	0
	WILLIAMSPORT	57	28	66	16	42	6	0.06	-0.56	0.06	0.23	20	5.44	88	77	23	0	5	1	0
	PROVIDENCE	54	29	72	20	42	5	0.00	-1.05	0.00	0.31	16	5.78	64	70	26	0	5	0	0
	CHARLESTON	71	40	80	28	56	-1	0.00	-0.82	0.00	1.35	89	10.39	127	92	28	0	2	0	0
SD	COLUMBIA	72	37	81	26	55	1	0.00	-0.87	0.00	0.41	24	12.02	136	86	23	0	3	0	0
	FLORENCE	71	38	81	27	55	1	0.00	-0.78	0.00	0.47	32	12.85	170	81	22	0	2	0	0
	GREENVILLE	70	39	81	27	55	3	0.01	-1.05	0.01	0.34	17	8.93	92	64	22	0	2	1	0
	ABERDEEN	56	28	69	18	42	15	0.29	0.06	0.29	0.29	70	0.88	59	80	43	0	5	1	0
TN	HURON	57	28	73	20	42	12	0.20	-0.07	0.20	0.20	43	0.93	58	91	43	0	6	1	0
	RAPID CITY	52	25	62	17	38	5	0.16	-0.05	0.10	0.16	43	0.76	64	82	37	0	6	2	0
	SIOUX FALLS	59	30	73	22	45	14	0.41	0.09	0.41	0.41	77	1.78	104	81	37	0	5	1	0
	BRISTOL	65	31	73	20	48	3	0.13	-0.63	0.13	1.00	70	9.49	115	84	23	0	4	1	0
TX	CHATTANOOGA	72	40	81	31	56	6	0.06	-1.06	0.06	1.07	51	9.20	77	86	31	0	2	1	0
	KNOXVILLE	67	40	72	27	53	5	0.25	-0.70	0.25	1.47	81	8.36	80	83	33	0	3	1	0
	MEMPHIS	72	51	77	36	61	9	0.12	-1.01	0.12	0.47	22	10.69	102	77	42	0	0	1	0
	NASHVILLE	69	45	76	28	57	9	0.42	-0.48	0.23	0.69	41	7.88	84	73	36	0	2	2	0
UT	ABILENE	74	54	78	39	64	10	0.61	0.21	0.61	0.89	120	2.46	78	81	47	0	0	1	1
	AMARILLO	68	41	74	28	54	8	0.61	0.32	0.61	0.61	123	1.57	88	87	36	0	1	1	1
	AUSTIN	78	59	83	41	68	8	0.13	-0.50	0.13	0.26	22	2.83	52	82	44	0	0	1	0
	BEAUMONT	75	55	81	40	65	4	0.00	-0.78	0.00	1.30	87	6.85	66	98	55	0	0	0	0
VA	BROWNSVILLE	82	65	85	51	73	5	0.00	-0.24	0.00	0.06	12	1.16	40	88	49	0	0	0	0
	CORPUS CHRISTI	80	61	84	44	71	6	0.00	-0.42	0.00	0.07	8	1.80	41	94	51	0	0	0	0
	DEL RIO	80	59	87	48	69	7	0.00	-0.26	0.00	0.00	0	0.64	34	82	46	0	0	0	0
	EL PASO	76	48	82	38	62	7	0.00	-0.08	0.00	0.00	0	0.72	67	33	9	0	0	0	0
WY	FORT WORTH	74	58	79	43	66	10	0.00	-0.78	0.00	0.12	8	3.23	52	78	44	0	0	0	0
	GALVESTON	72	61	76	50	66	4	0.00	0.00	0.00	0.41	0	2.62	0	88	66	0	0	0	0
	HOUSTON	77	56	83	39	66	5	0.00	-0.77	0.00	0.43	29	4.54	56	89	47	0	0	0	0
	LUBBOCK	74	46	80	36	60	10	1.18	0.94	1.18	1.18	272	2.43	130	88	30	0	0	1	1
WI	MIDLAND	77	49	85	38	63	9	0.20	0.07	0.20	0.21	85	0.72	46	88	34	0	0	1	0
	SAN ANGELO	74	52	81	38	63	7	0.24	-0.11	0.24	0.24	35	1.76	59	84	50	0	0	1	0
	SAN ANTONIO	77	59	82	45	68	7	0.07	-0.44	0.07	0.07	7	2.37	52	87	48	0	0	1	0
	VICTORIA	78	58	83	42	68	6	0.00	-0.57	0.00	0.26	24	1.81	31	92	49	0	0	0	0
WV	WACO	76	54	82	31	65	9	0.00	-0.75	0.00	0.27	18	2.93	47	87	46	0	1	0	0
	WICHITA FALLS	75	51	84	34	63	11	0.06	-0.47	0.06	0.06	5	1.47	37	85	46	0	0	1	0
	SALT LAKE CITY	53	34	70	25	44	1	0.01	-0.36	0.01	0.01	1	2.54	79	76	32	0	2	1	0
	LYNCHBURG	68	34	78	22	51	7	0.00	-0.78	0.00	0.24	17	8.23	110	70	20	0	3	0	0
WY	NORFOLK	67	40	79	28	54	6	0.00	-0.83	0.00	0.07	4	10.00	124	73	28	0	2	0	0
	RICHMOND	67	37	79	25	52	5	0.00	-0.87	0.00	0.31	20	8.87	121	73	22	0	3	0	0
	ROANOKE	68	38	78	25	53	8	0.00	-0.76	0.00	0.19	14	8.61	121	54	18	0	2	0	0
	WASH/DULLES	65	36	79	18	50	8	0.00	-0.69	0.00	0.18	14	6.27	94	69	22	0	2	0	0
WY	BURLINGTON	45	23	64	6	34	6	0.01	-0.48	0.01	0.13	14	3.33	70	77	32	0	6	1	0
	OLYMPIA	54	27	62	25	41	-3	0.29	-0.93	0.27	0.67	28	19.87	128	98	41	0	7	2	0
	QUILLAYUTE	50	31	54	26	41	-3	0.78	-1.69	0.69	2.62	56	29.14	98	95	56	0	5	4	1
	SEATTLE-TACOMA	54	36	60	32	45	-1	0.14	-0.70	0.14	0.48	30	13.61	127	85	41	0	1	1	0
WY	SPOKANE	49	29	56	27	39	0	0.00	-0.37	0.00	0.00	0	3.54	92	81	35	0	7	0	0
	YAKIMA	55	25	61	22	40	-2	0.00	-0.15	0.00	0.03	10	2.39	105	80	29	0	7	0	0
	EAU CLAIRE	56	28	67	19	42	13	0.30	-0.02	0.30	0.30	52	0.94	40	83	35	0	5	1	0
	GREEN BAY	54	31	60	18	42	14	0.32	-0.07	0.32	0.32	43	1.75	58	82	46	0	5	1	0
WY	LA CROSSE	59	31	69	25	45	14	0.47	0.06	0.47	0.48	65	2.00	68	79	34	0	3	1	0
	MADISON	56	30	62	17	43	12	0.06	-0.35	0.06	0.06	7	1.99	57	89	39	0	4	1	0
	MILWAUKEE	57	35	65	24	46	13	0.00	-0.45	0.00	0.00	0	3.16	74	79	39	0	3	0	0
	BECKLEY	60	33	70	20	47	6	0.08	-0.70	0.08	0.73	50	9.35	133	63	25	0	2	1	0
WY	CHARLESTON	62	32	74																

March 11 ENSO Diagnostic Discussion

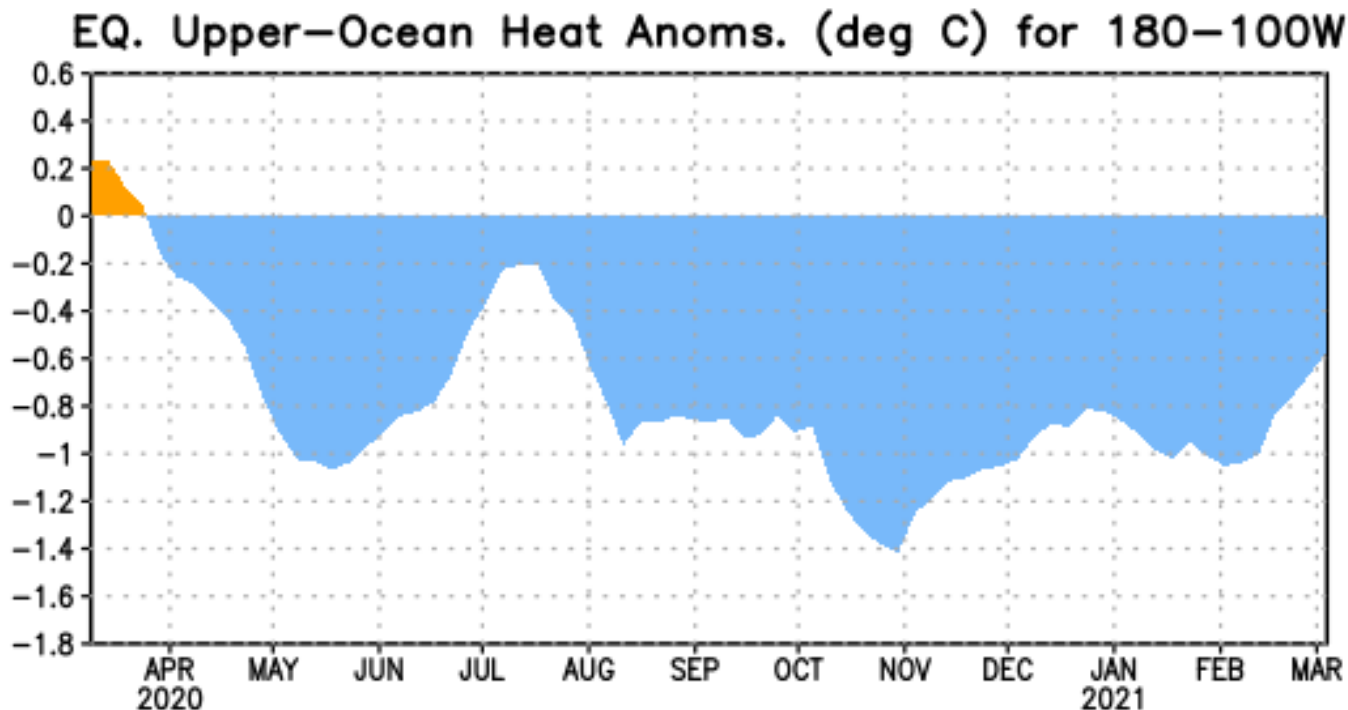


Figure 1: Area-averaged upper-ocean heat content anomaly (°C) in the equatorial Pacific (5°N-5°S, 180°-100°W). The heat content anomaly is computed as the departure from the 1981-2010 base period pentad means.

ENSO Alert System Status: **La Niña Advisory**

Synopsis: There is a ~60% chance of a transition from La Niña to ENSO-Neutral during the Northern Hemisphere spring 2021 (April-June).

La Niña continued during February, reflected by below-average sea surface temperatures (SST) anomalies, which extended from the western to east-central Pacific Ocean. SSTs returned to near average in the eastern Pacific Ocean by late January, before oscillating during February, as indicated by the week-to-week variability in most of the Niño index regions. The latest weekly Niño index values in the central (Niño-4) and east-central (Niño-3.4) Pacific Ocean were -0.8°C and -0.7°C. The below-average SSTs were linked to negative subsurface temperature anomalies (Fig. 1), which weakened noticeably during the month. Currently, negative subsurface anomalies extended from the surface to approximately ~150m below the surface between 150°E and 90°W. Low-level wind anomalies showed periods of enhanced, but localized, easterlies in the east-central Pacific. Upper-level wind anomalies were westerly across the central and eastern tropical Pacific. The suppression of tropical convection over the western and central Pacific weakened during February, as did the enhancement of rainfall around the Philippines and Indonesia compared to the previous few months. The Southern Oscillation and Equatorial Southern Oscillation remained positive, but also weakened. Overall, the coupled ocean-atmosphere system is consistent with a weak or decaying La Niña.

Most of the models in the IRI/CPC plume predict a transition to ENSO-neutral during the Northern Hemisphere spring 2021. The forecaster consensus agrees with this transition and then predicts a continuation of

ENSO-neutral at least through the Northern Hemisphere summer. In part, due to the uncertainty in predictions made at this time of year, the forecast for September-November remains lower confidence with a 45-50% for La Niña and 40-45% for ENSO-Neutral, with a low chance for El Niño. In summary, there is a ~60% chance of a transition from La Niña to ENSO-Neutral during the Northern Hemisphere spring 2021 (April-June; click [CPC/IRI consensus forecast](#) for the chances in each 3-month period).

La Niña is anticipated to affect climate across the United States during the upcoming months. The [3-month seasonal temperature and precipitation outlooks](#) will be updated on **Thursday March 18th**.

This discussion is a consolidated effort of the National Oceanic and Atmospheric Administration (NOAA), NOAA's National Weather Service, and their funded institutions. Oceanic and atmospheric conditions are updated weekly on the Climate Prediction Center web site ([El Niño/La Niña Current Conditions and Expert Discussions](#)). Additional perspectives and analysis are also available in an [ENSO blog](#). A probabilistic strength forecast is [available here](#). The next ENSO Diagnostics Discussion is scheduled for **8 April 2021**. To receive an e-mail notification when the monthly ENSO Diagnostic Discussions are released, please send an e-mail message to: ncep.list.ensu-update@noaa.gov.

International Weather and Crop Summary

February 7-13, 2021

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

HIGHLIGHTS

EUROPE: Chilly weather kept winter crops dormant in northeastern Europe and slowed or halted wheat and rapeseed development in the Balkans.

MIDDLE EAST: Widespread rain and snow improved moisture supplies in Turkey and maintained or boosted soil moisture for wheat and barley elsewhere.

NORTHWESTERN AFRICA: Additional timely showers in Morocco maintained good to excellent yield prospects for reproductive winter grains, while parts of Algeria and Tunisia continued to grapple with short-term dryness.

EASTERN ASIA: Warmer-than-normal weather promoted early greening of winter wheat and rapeseed in eastern China.

SOUTHEAST ASIA: Wet weather continued in eastern and southern sections of the region, benefiting immature winter-grown rice.

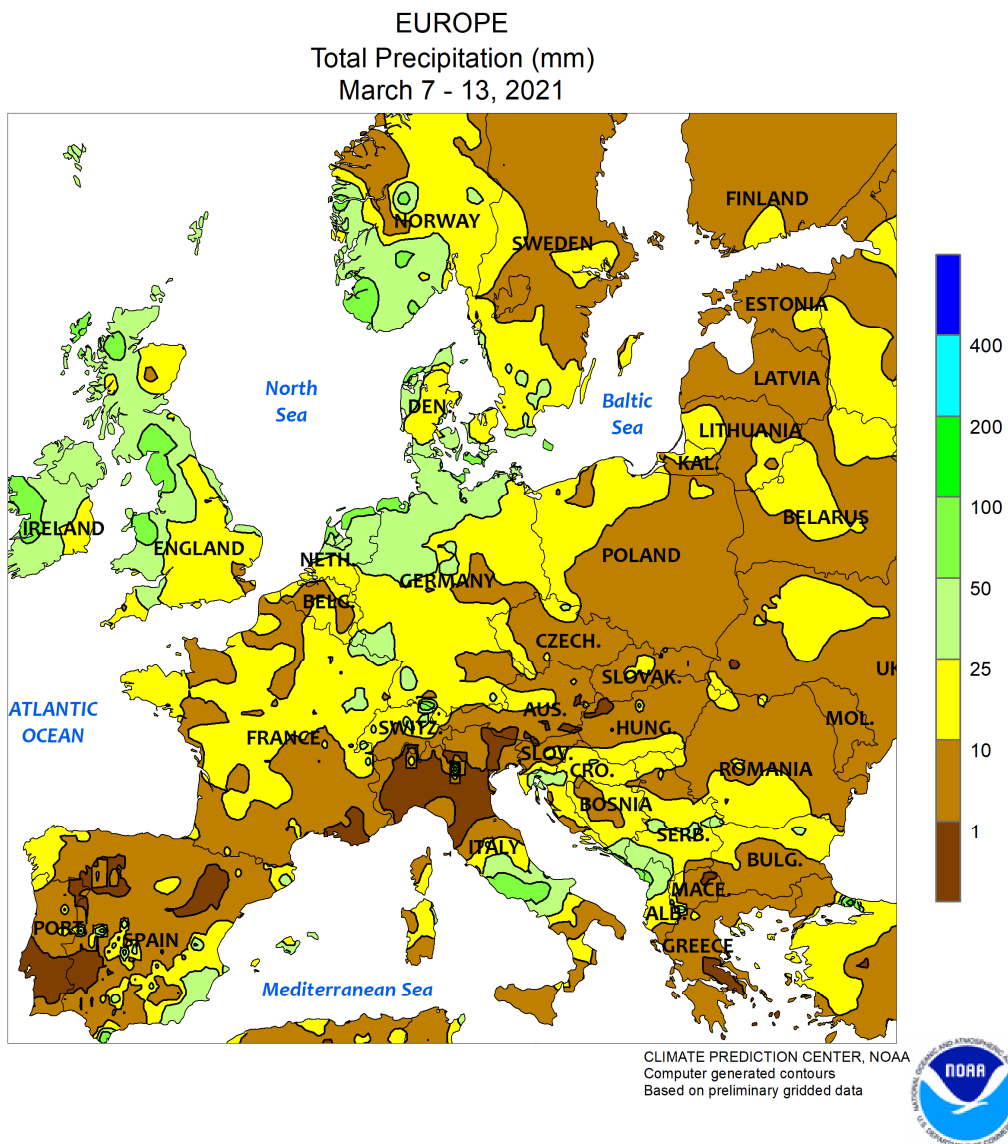
AUSTRALIA: Soaking rain hampered drydown and harvesting of maturing summer crops.

SOUTH AFRICA: Warm, sunny weather continued across the corn belt.

ARGENTINA: Unseasonable warmth and dryness persisted in high-yielding farming areas of central Argentina, stressing immature grains and oilseeds.

BRAZIL: Beneficial rain continued in northern corn and cotton areas, but drier conditions dominated much of the south.



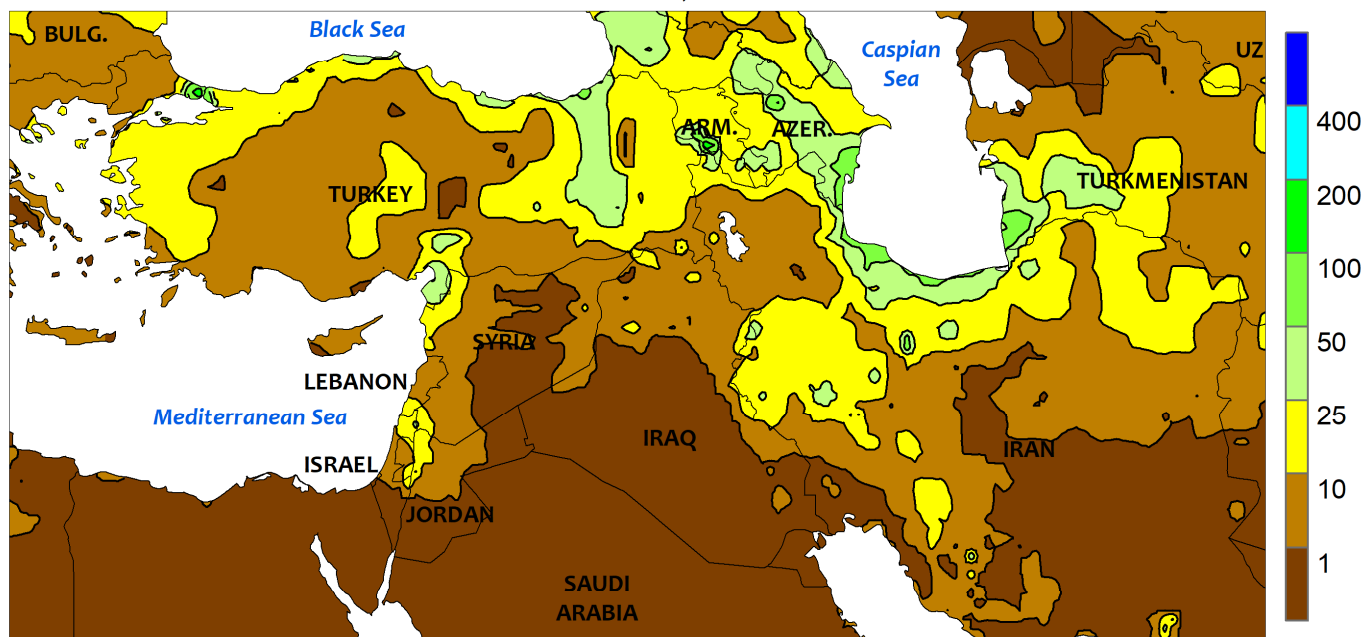


EUROPE

Cooler, increasingly unsettled weather maintained overall favorable early season prospects for winter crops. After a dry start to the week, expanding light to moderate showers (5-45 mm) over much of central and northern Europe as well as the lower Danube River Valley maintained or improved soil moisture following a recent dry spell. After a very warm end of February hastened some winter crops out of dormancy, temperatures averaged near normal over much of central and northern Europe and up to 3°C below normal from southern

Poland into the Balkans. Weekly average temperatures less than 5°C indicated winter crops remained dormant over the continent's northeastern quadrant while growth slowed considerably in the Danube River Valley. Conversely, 7-day average temperatures greater than 5°C across western croplands indicated winter grains and oilseeds continued to add vegetative growth in England, France, and Spain. Overall, winter crop prospects remained favorable across most of Europe following a wet fall and winter.

MIDDLE EAST
Total Precipitation (mm)
March 7 - 13, 2021



CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded data



MIDDLE EAST

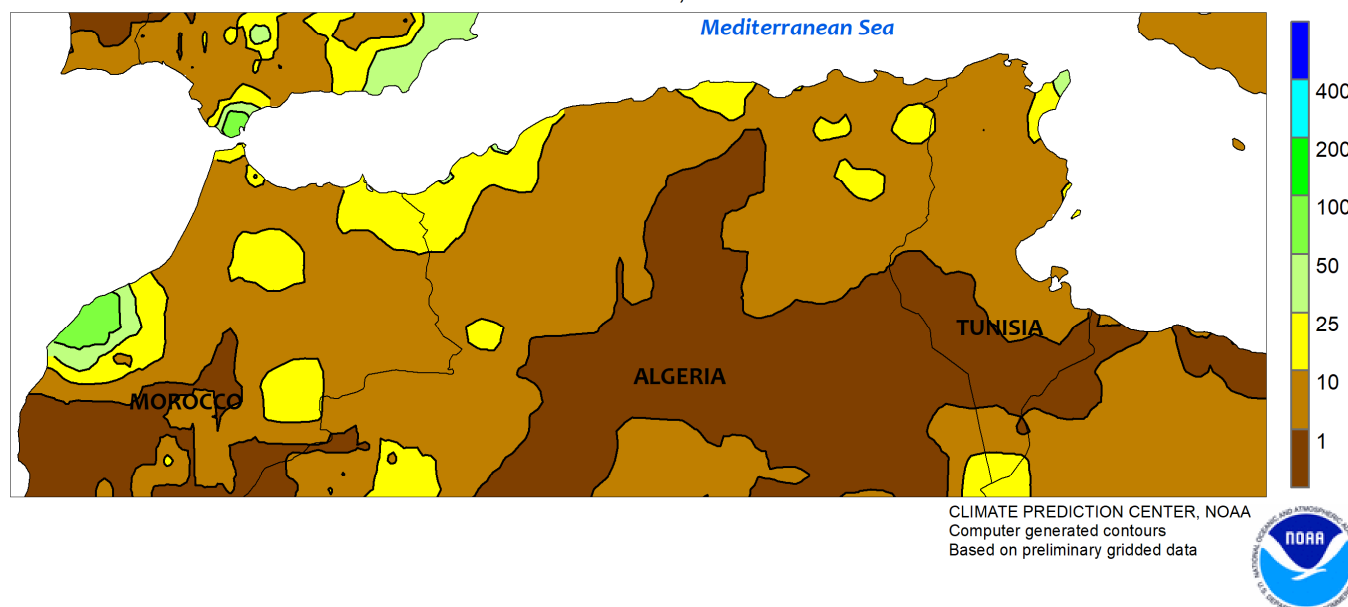
Rain and snow overspread the region, maintaining or improving moisture supplies for winter grains. After a recent return to dryness in Turkey, light to moderate rain and snow (2-25 mm) across central and western portions of the country improved soil moisture for dormant (Anatolian Plateau) to vegetative (south and southeast) winter wheat and barley. In eastern Turkey, moderate to heavy rain and snow (10-45 mm liquid equivalent) boosted mountain snowpacks in the Armenian Highlands and improved spring runoff prospects for irrigated warm-season crops. Meanwhile, additional light to moderate showers (2-25 mm) along the eastern Mediterranean Coast maintained favorable conditions for vegetative winter grains and upcoming summer crop planting, though the

satellite-derived Vegetation Health Index (VHI) continued to depict very poor conditions in eastern Syria; the poor VHI in Syria could be a function of localized drought, logistical difficulties, or a combination of both. Farther east, widespread rain and snow (5-30 mm liquid equivalent) from northern Iraq into much of Iran increased summer crop irrigation reserves and maintained favorable soil moisture for dormant (north) to vegetative (south) winter grains. The moisture was especially welcome in northeastern Iran (Khorasan) where year-to-date precipitation improved to 50 percent of normal, up from 30 percent last week. Cooler-than-normal conditions in Turkey (up to 3°C below normal) contrasted with readings up to 4°C above normal elsewhere.

NORTHWESTERN AFRICA

Total Precipitation (mm)

March 7 - 13, 2021

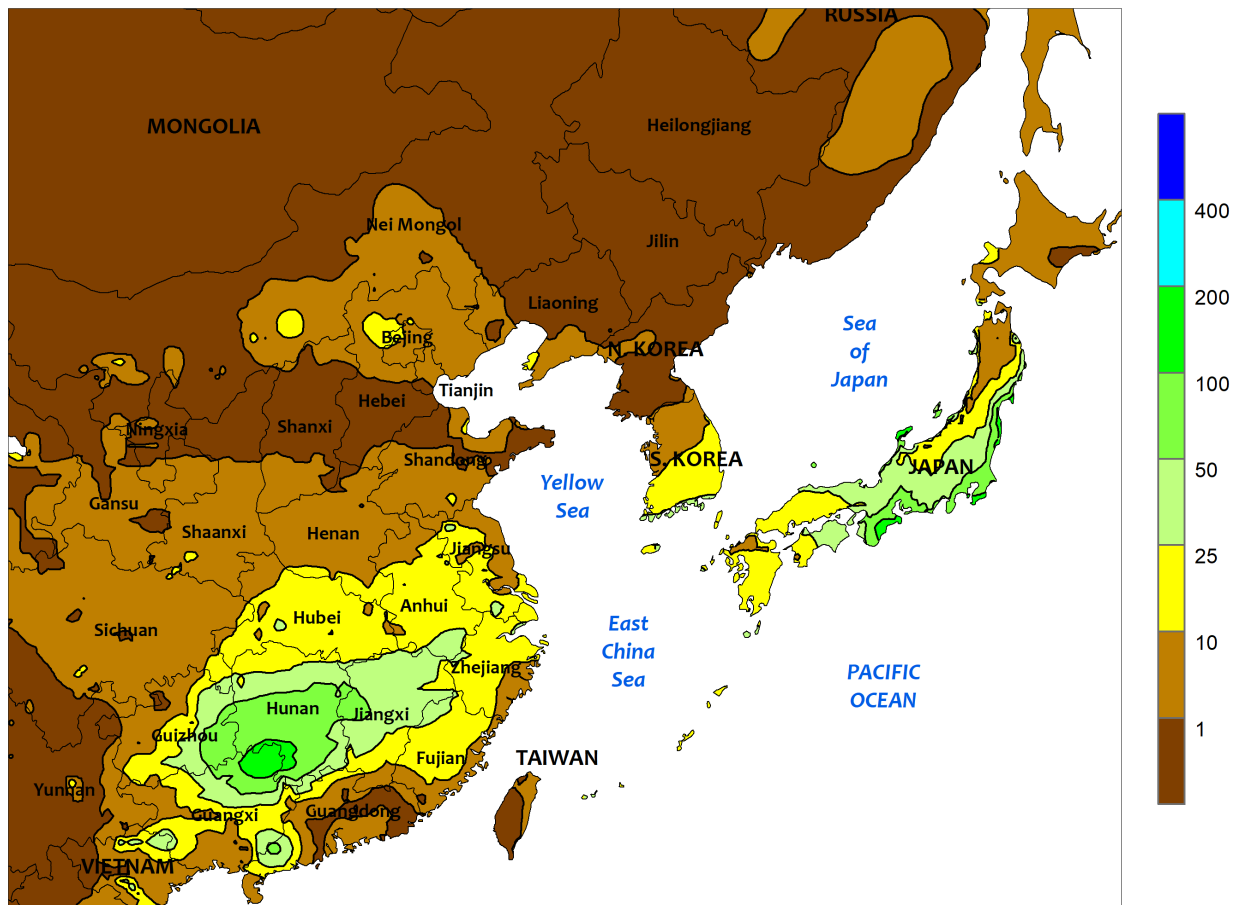


NORTHWESTERN AFRICA

Widespread showers maintained good to excellent winter grain yield prospects in the west and eased short-term dryness locally in central and eastern crop areas. Additional well-timed showers in Morocco (4-12 mm) maintained favorable soil moisture for reproductive winter grains. The latest satellite-derived Vegetation Health Index (VHI) continued to indicate Moroccan winter grain prospects are better than average and vastly improved over last year's drought-afflicted crops. Farther east, widespread albeit highly variable showers

(1-20 mm) across Algeria and Tunisia boosted moisture supplies locally, although short-term dryness and drought intensified where rain was light or nonexistent. The most notable year-to-date precipitation deficits were noted across western Algeria's Tell Region (less than 40 percent of normal) and the inland Steppe Region of Tunisia (25 percent of normal). Nevertheless, the most recent VHI indicated conditions remained better than last year in Tunisia and generally on par with last year in Algeria.

EASTERN ASIA
Total Precipitation (mm)
March 7 - 13, 2021



CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded data

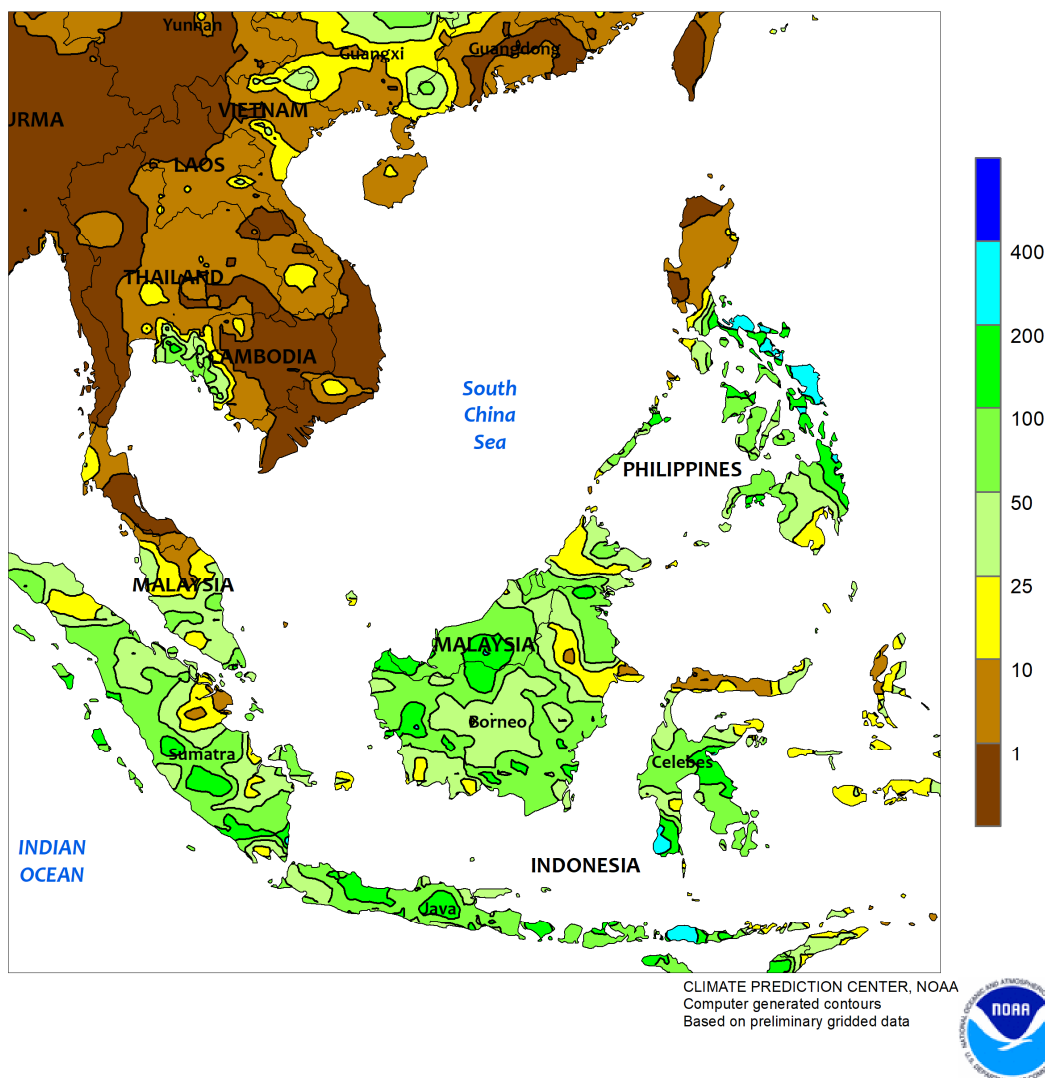


EASTERN ASIA

A bout of unseasonable warmth across eastern China continued to promote earlier-than-normal greening of winter wheat. Temperatures have consistently been 1 to 5°C above normal during the last several weeks and averaged between 5 and 10°C on a daily basis. Additionally, the warm weather promoted early

greening of rapeseed in the Yangtze Valley as well as encouraged early-crop rice sowing in the southern provinces. Furthermore, periods of rain, including recent rainfall (1-10 mm in wheat areas, 10-50 mm or more in rapeseed and rice areas), boosted soil moisture and ensured good vegetative conditions.

SOUTHEAST ASIA
Total Precipitation (mm)
March 7 - 13, 2021

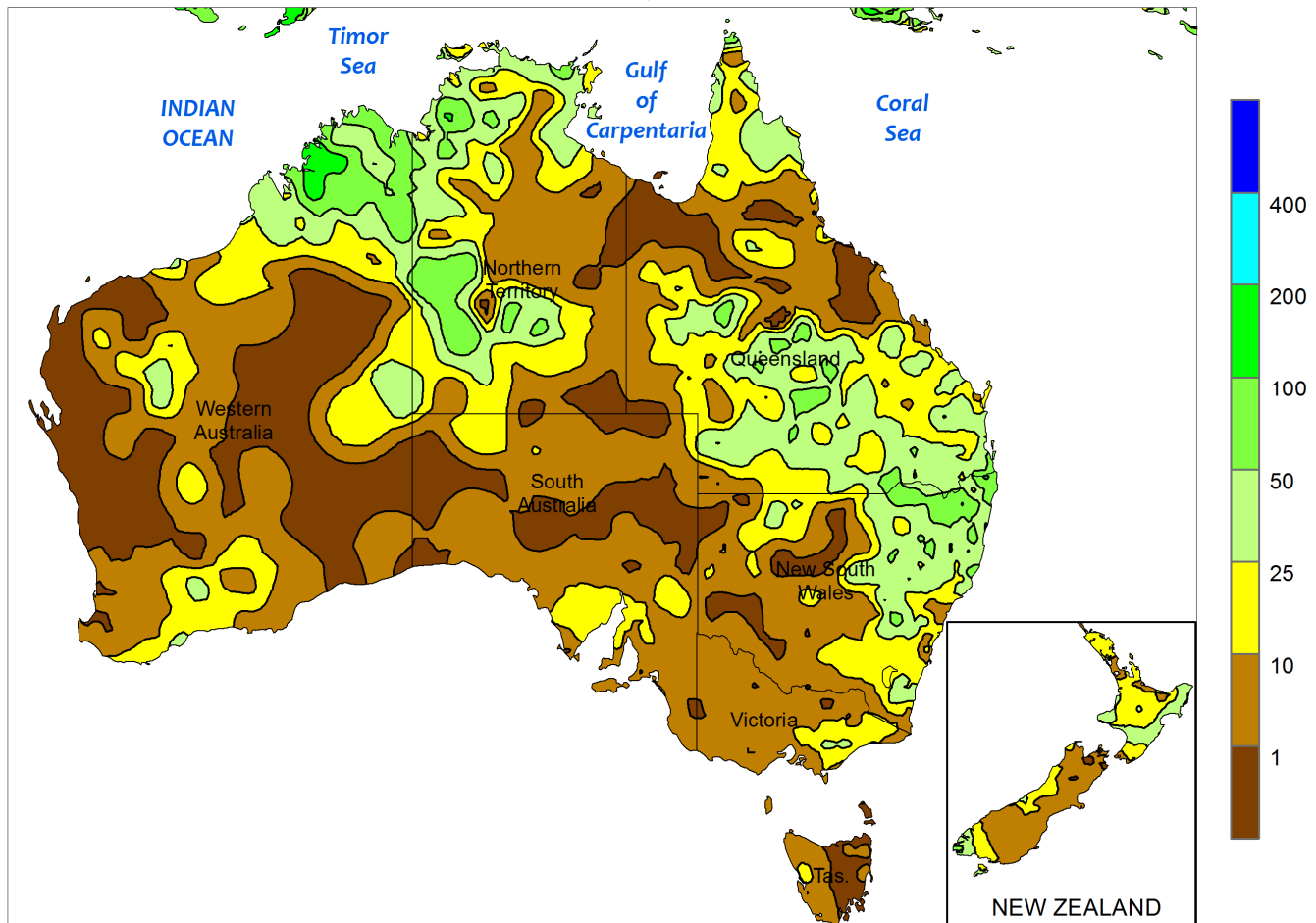


SOUTHEAST ASIA

Showers remained confined to the seasonally wetter eastern (Philippines) and southern (Malaysia and Indonesia) portions of the region. Rainfall in the Philippines prevailed in all but the northern-most regions, with totals between 25 and 100 mm to locally over 200 mm in parts of the east. The moisture benefited immature winter rice as well as bolstered irrigation supplies for spring-sown varieties. Farther south, widespread showers (25-100 mm) in Indonesia and parts of Malaysia also supported both

immature winter-grown rice and irrigation supplies for dry-season rice sown in the spring and summer. Additionally, oil palm benefited from the increased moisture, especially following poor rainfall in the latter half of February. However, the rainfall failed to dent the short-term moisture deficits in western Malaysia. Meanwhile, seasonal heat (temperatures over 35°C) began to build somewhat earlier than usual in Thailand and environs, advancing development of dry-season rice.

AUSTRALIA
Total Precipitation (mm)
March 7 - 13, 2021



Gridded data from the Australian Bureau of Meteorology: www.bom.gov.au/
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CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded data

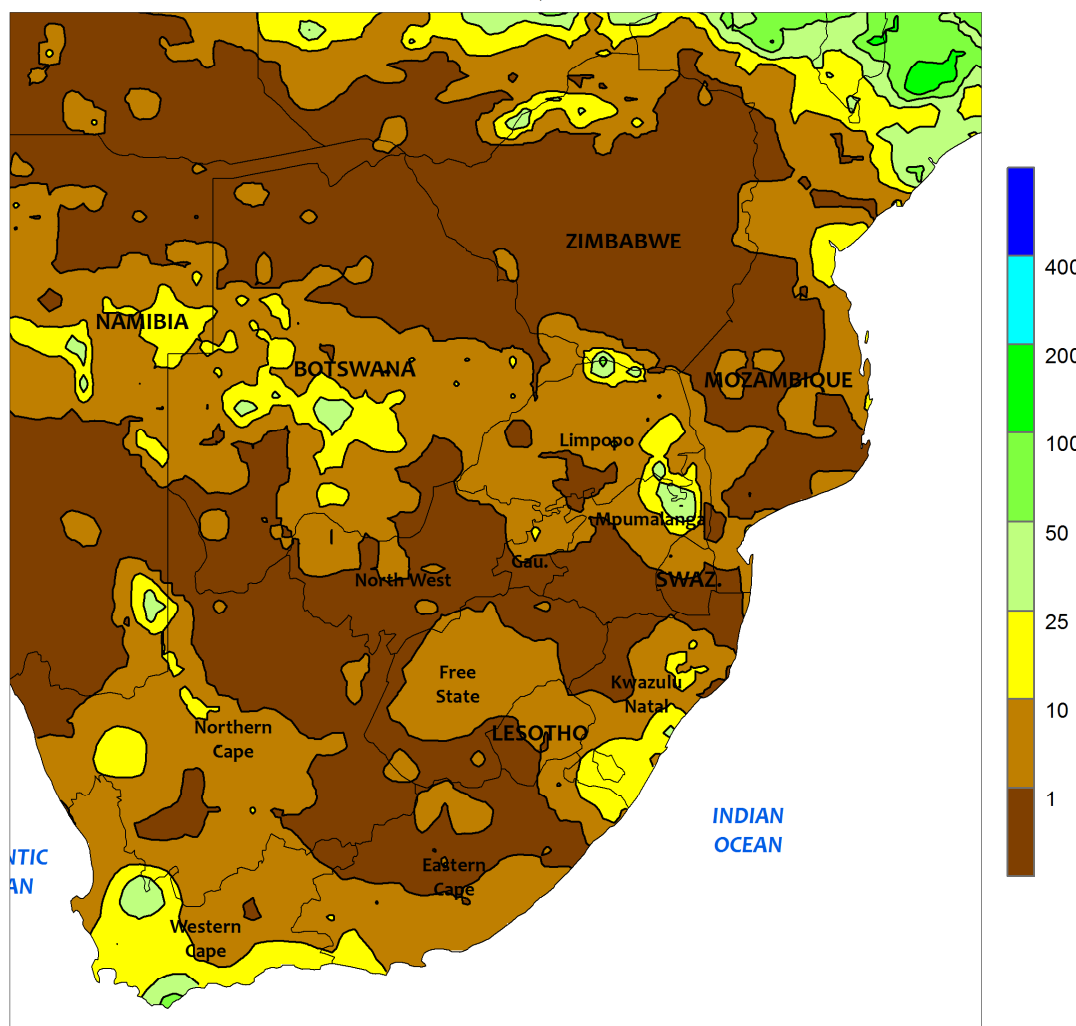


AUSTRALIA

Soaking rain (25-50 mm, locally more) fell across a large portion of eastern Australia, maintaining adequate to abundant moisture supplies for immature cotton and sorghum and further increasing soil moisture well in advance of winter crop planting. However, the rain hampered drydown and harvesting of the earliest-

maturing cotton and sorghum and likely raised some concern about the quality of these crops as they await harvest. Temperatures continued to average near normal (within 1°C of normal) in major summer crop producing areas, with maximum temperatures generally in the lower to middle 30s degrees C.

SOUTH AFRICA
Total Precipitation (mm)
March 7 - 13, 2021



CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded data

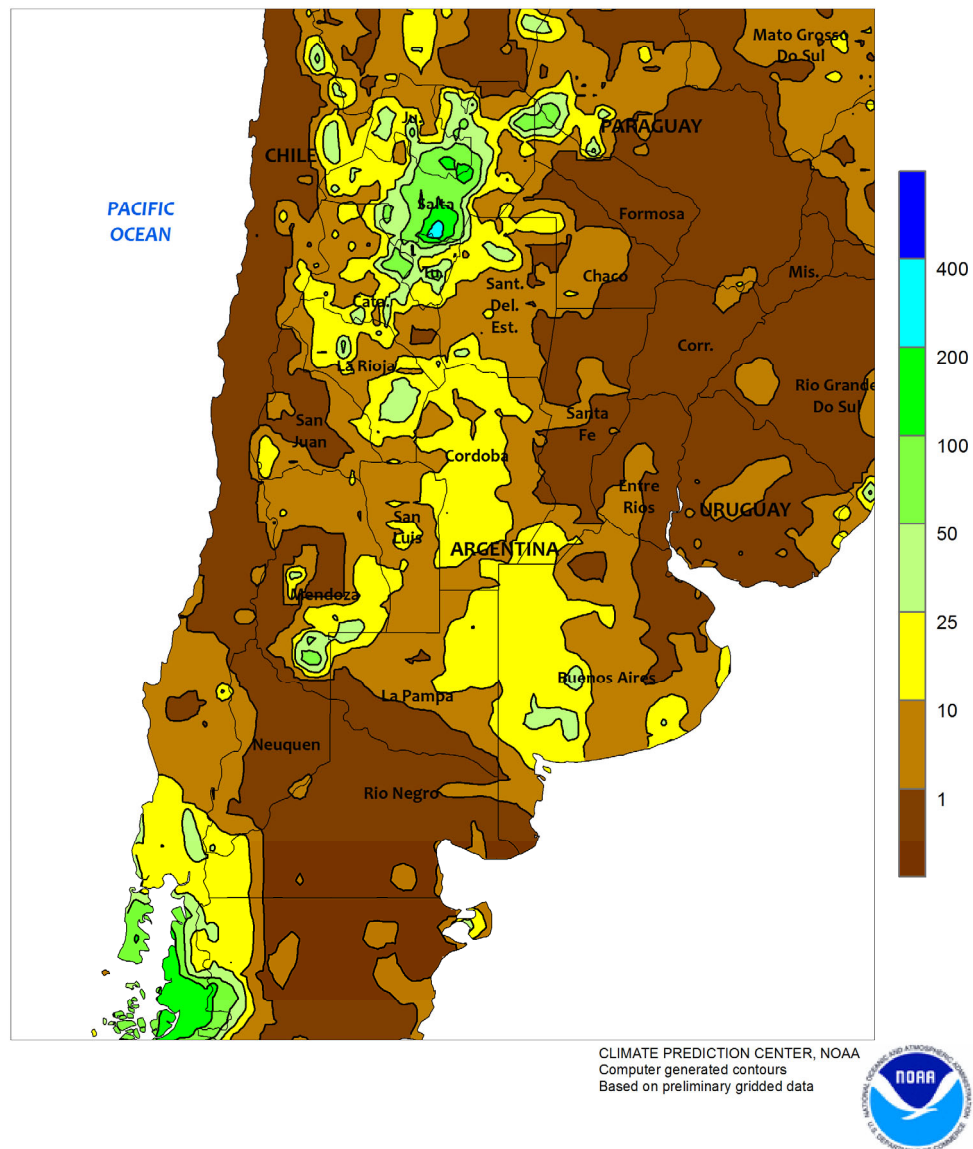


SOUTH AFRICA

For a second week, dry, sunny weather dominated eastern commercial farming regions, promoting rapid development of corn and other summer crops. Weekly temperatures averaged up to 2°C above normal across the corn belt, with daytime highs reaching the upper 20s and lower 30s (degrees C) on most days, fostering growth of well-watered crops in the absence of heat stress. Hotter weather (highs reaching the upper 30s and lower 40s) occurred in outlying northern and

eastern production areas, including irrigated sugarcane plantations in eastern Mpumalanga and northern KwaZulu-Natal. The dryness came as most corn had advanced through reproduction and was growing with adequate soil moisture reserves. However, moisture has become limited for sugarcane development in rain-fed production areas in southern KwaZulu-Natal. Elsewhere, unseasonable rain (10-50 mm) in Western Cape was untimely for maturing tree and vine crops.

ARGENTINA
Total Precipitation (mm)
March 7 - 13, 2021

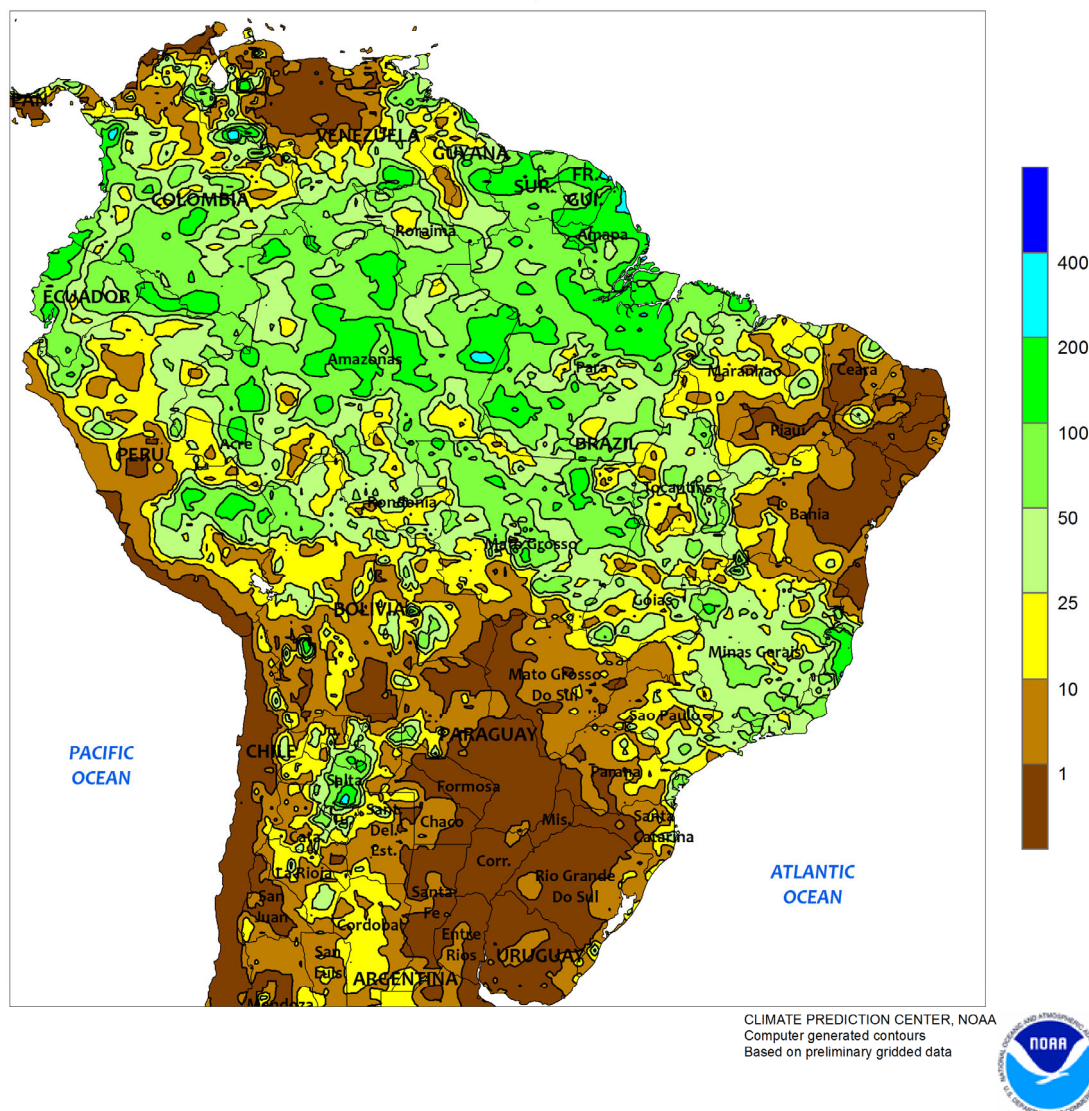


ARGENTINA

Warm, dry weather persisted in eastern farming areas, further reducing moisture available for normal development of summer grains, oilseeds, and cotton. Little to no rain fell from eastern Buenos Aires northward to Formosa, while light to moderate rain (5-25 mm, locally higher in more northerly crop areas) fell from La Pampa and western Buenos Aires to Salta. Weekly temperatures averaged up to 2°C above normal in central and northwestern farming areas; daytime highs reaching the lower to middle 30s (degrees C) intensified the impacts of the dryness on immature corn and soybeans in key

production areas of central Brazil (La Pampa, Buenos Aires, and neighboring locations in Cordoba, Santa Fe, and Entre Rios). Similar temperatures prevailed across the north, with hotter conditions (highs approaching 40°C) in the northwest. Additional rain is needed immediately to prevent further declines in yield potential. According to the government of Argentina, sunflower harvesting was 35 percent complete (versus 47 percent last year) as of March 11, as fieldwork advanced in southern production areas; harvesting was 9 percent complete in Buenos Aires, 5 points behind last year's pace.

BRAZIL
Total Precipitation (mm)
March 7 - 13, 2021

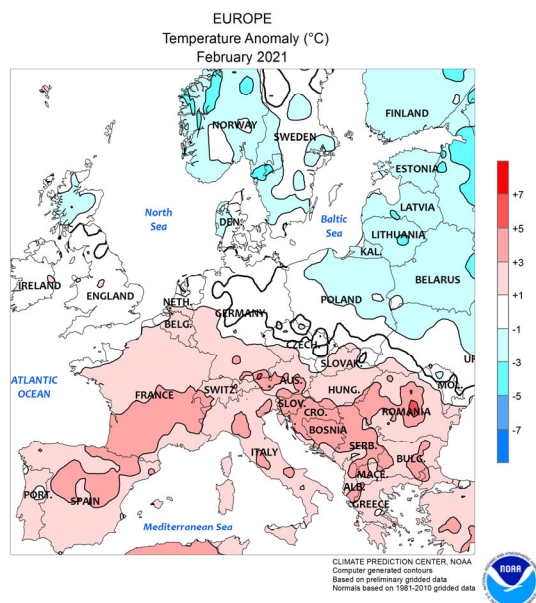
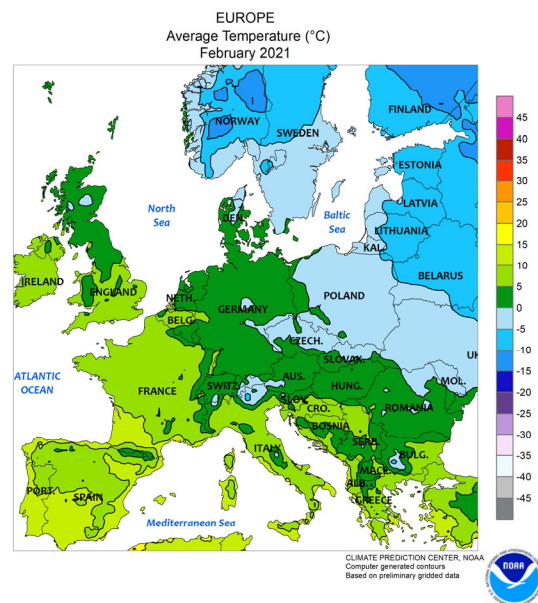
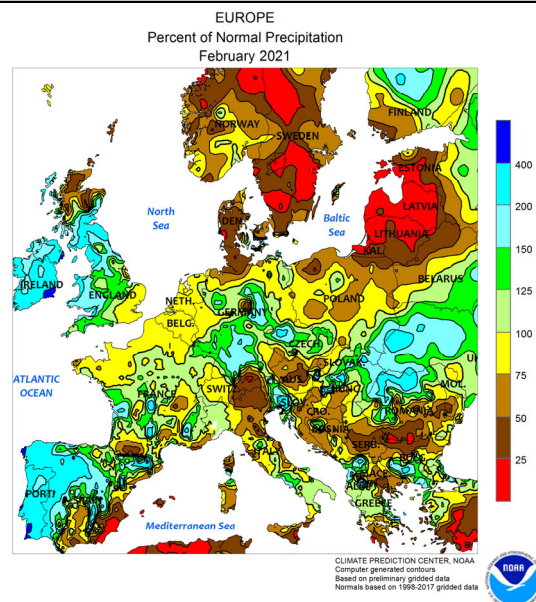
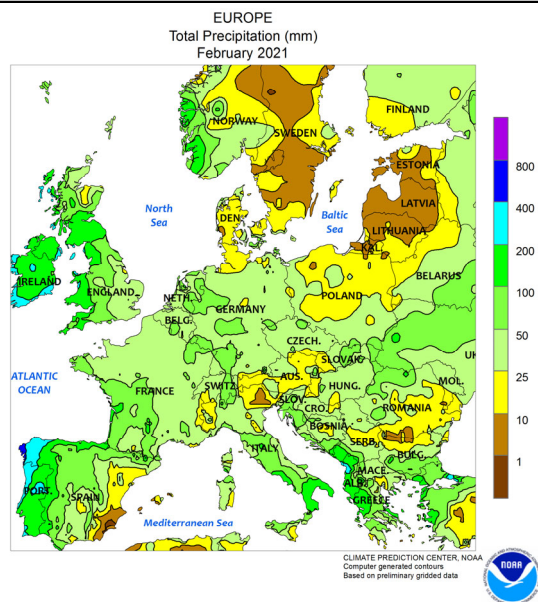


BRAZIL

Scattered showers maintained overall favorable conditions for emerging corn and cotton in key northern producing states. Rainfall totaled 10 to 50 mm from Mato Grosso eastward, reaching as far south as Minas Gerais and the coastal coffee region of Espírito Santo and Rio de Janeiro, though a few pockets of dryness developed in parts of the northeast. Daytime highs in the lower to middle 30s (degrees C) sustained rapid early crop development but kept evaporative losses high. According to the government of Mato Grosso, soybeans were 80 percent harvested as of March 12, lagging the 5-year average pace by 8 points; additionally, corn was 88 percent planted, compared with 97 percent on average. Drier

conditions prevailed farther south, with much of the region from Mato Grosso do Sul and western São Paulo southward recording less than 10 mm. According to reports emanating from Brazil, the dryness was needed for harvesting of corn and other seasonal fieldwork, even though later-planted soybeans in Rio Grande do Sul were in need of moisture. According to the government of Rio Grande do Sul, soybeans were 85 percent filling to mature on March 11, with 1 percent harvested; meanwhile the earlier-planted corn crop was 60 percent harvested. In Paraná, first plantings of soybeans and corn were 36 and 53 percent harvested, respectively, as of March 8; second-crop corn was 43 percent planted.

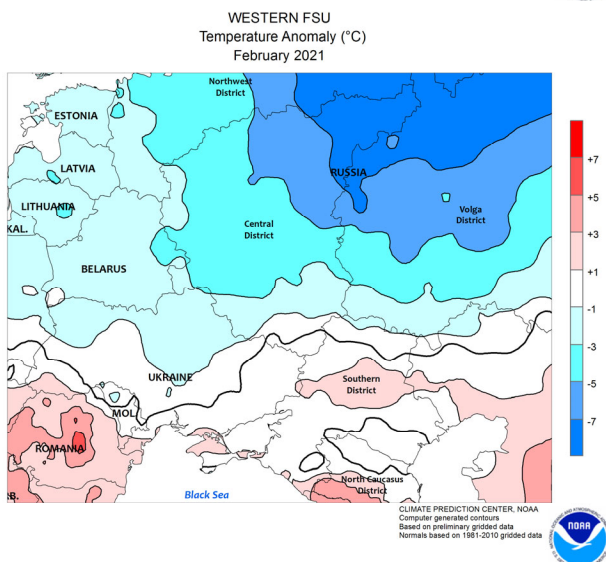
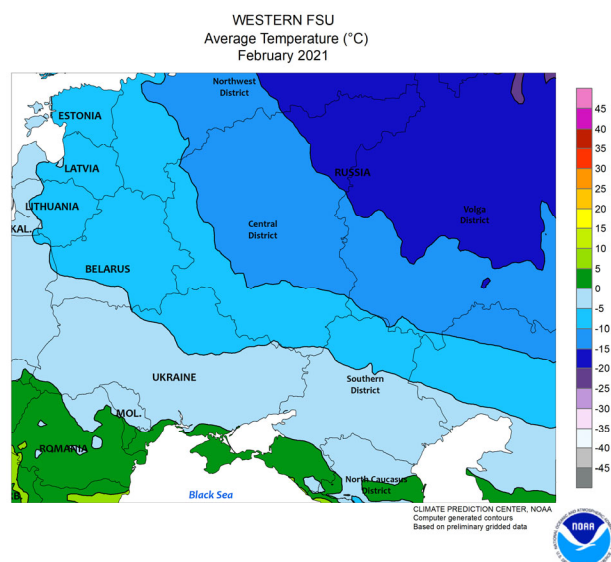
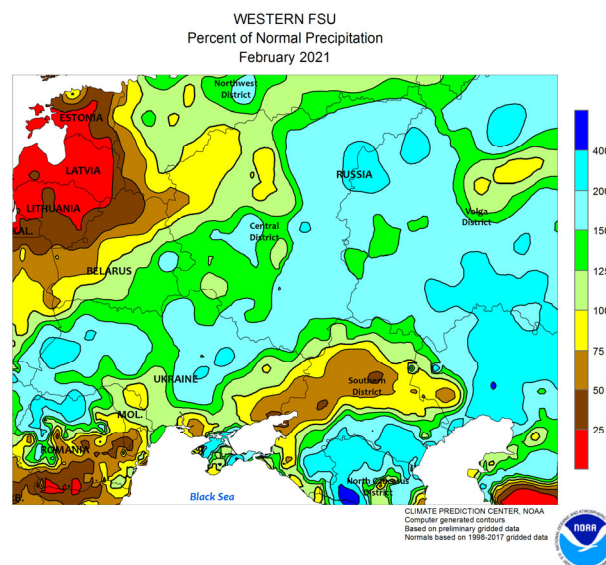
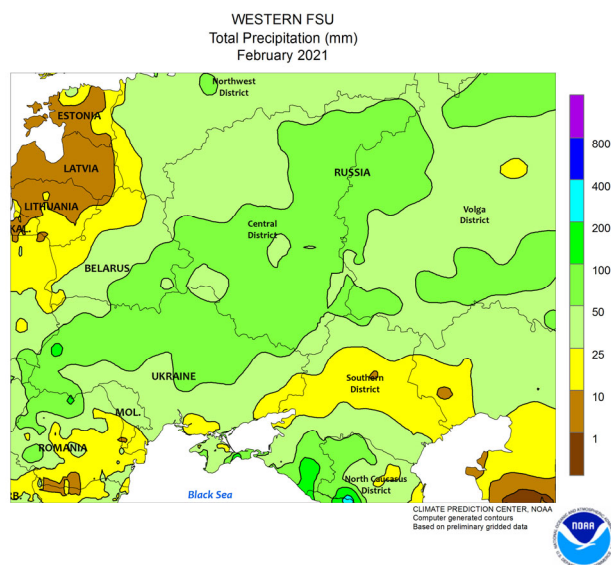
February International Temperature and Precipitation Maps



EUROPE

Near- to above-normal precipitation continued across much of the continent during February, with chilly conditions in northeastern Europe contrasting with unseasonable warmth in southern and western growing areas. Temperatures averaged up to 5°C above normal from Spain and France southeastward into the Balkans, ushering winter crops out of dormancy well ahead of normal in central and northern growing areas and promoting a rapid pace of development in the climatologically warmer Mediterranean Basin. Conversely, cold conditions (up to 3°C below normal)

lingered in northeastern Europe, keeping winter crops dormant and covered in snow. Precipitation was highly variable but overall favorable for winter crops, though locally dry conditions (less than 25 percent of normal) were noted in the lower Danube River Valley. Even with the dry February in the southern Balkans, this region still averaged wetter than normal for the winter. Conversely, wet weather in Spain and Portugal (50-200 mm, locally more than 200 percent of normal) boosted moisture supplies for semi-dormant to vegetative winter grains and boosted irrigation reserves for summer crops.

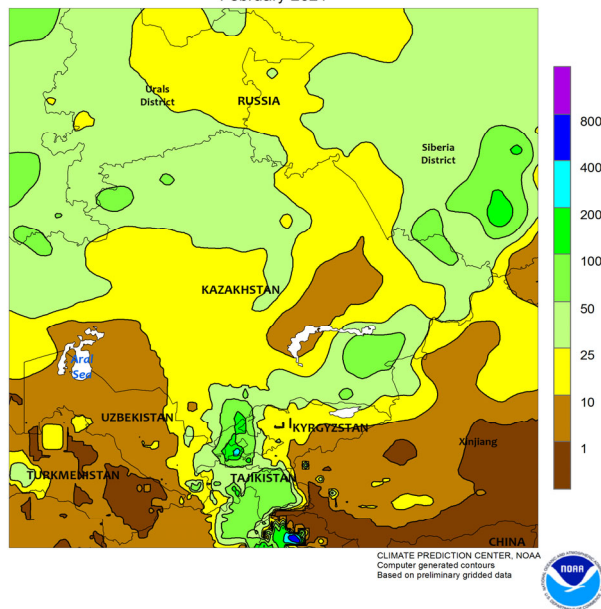


WESTERN FSU

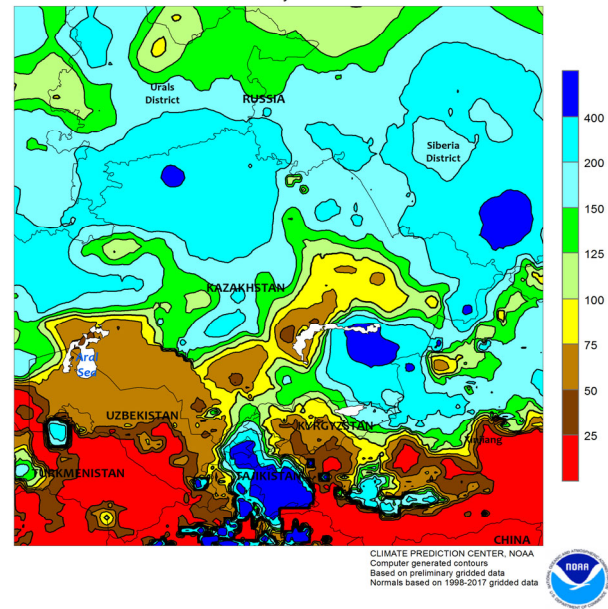
Temperatures were highly variable, with unseasonable warmth during the first half of the month giving way to sharply colder weather in the latter half of February. Temperatures across the region's primary winter wheat belt (southern Ukraine into southwestern Russia) averaged near normal, belying large fluctuations; the first half of February featured temperatures 5 to 10°C above normal, only to be offset by similar below-normal readings during the latter half of the month. Consequently, winter grains and oilseeds remained dormant at month's end despite losing some cold hardiness due to the early February warm

spell. Ukraine remained wet, with precipitation during the month totaling 100 to 250 percent of normal. This continued the country's recovery from autumn drought, which began with the onset of widespread soaking rains in December. However, locally drier conditions (75 percent of normal or less) were noted along Ukraine's southeastern coast. Farther east, after autumn drought bled into a dry December across western Russia, a second consecutive month of near- to above-normal rain and snow (100-300 percent of normal) boosted moisture supplies for spring growth of winter wheat.

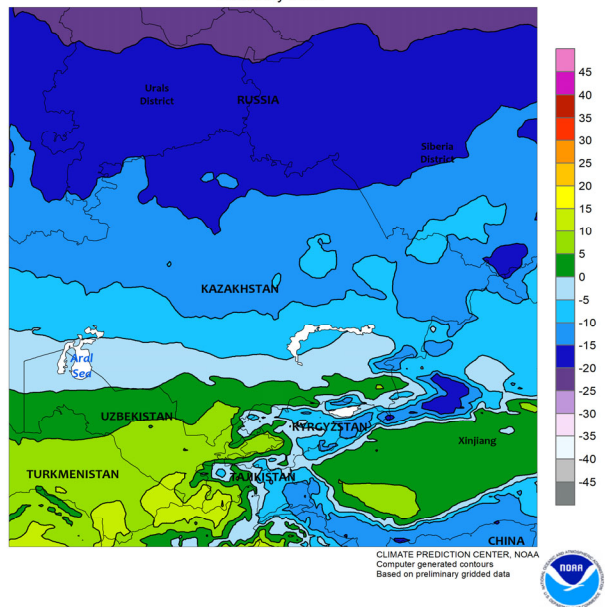
EASTERN FSU
Total Precipitation (mm)
February 2021



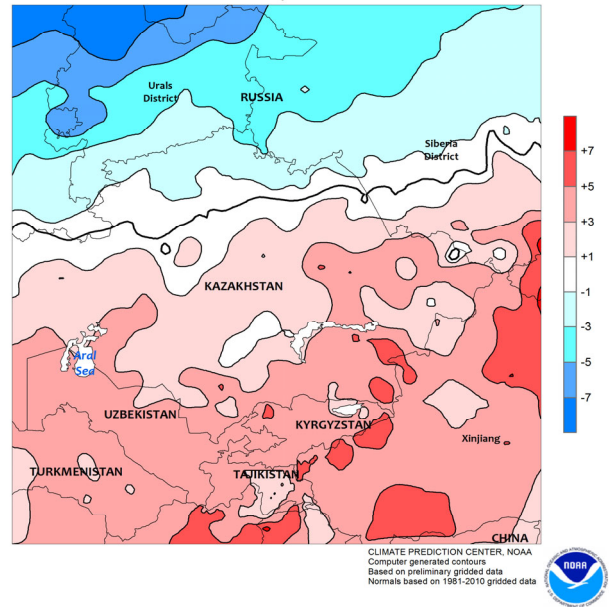
EASTERN FSU
Percent of Normal Precipitation
February 2021



EASTERN FSU
Average Temperature (°C)
February 2021



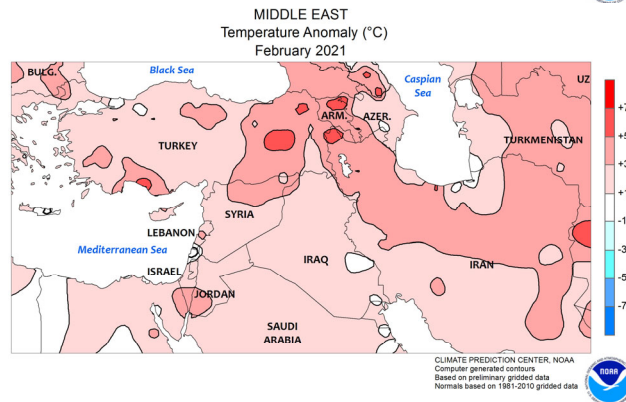
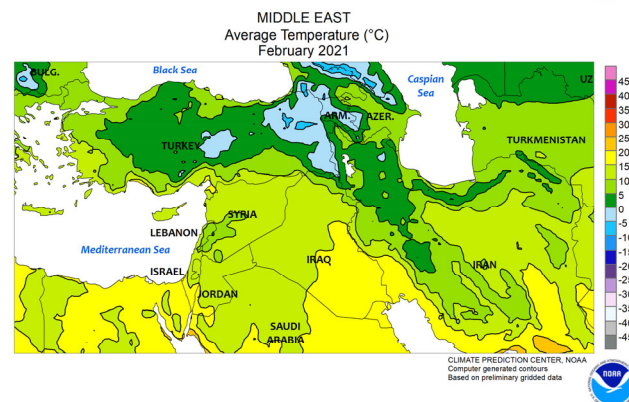
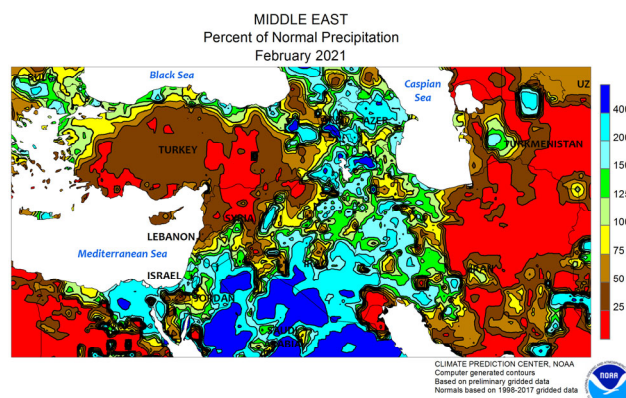
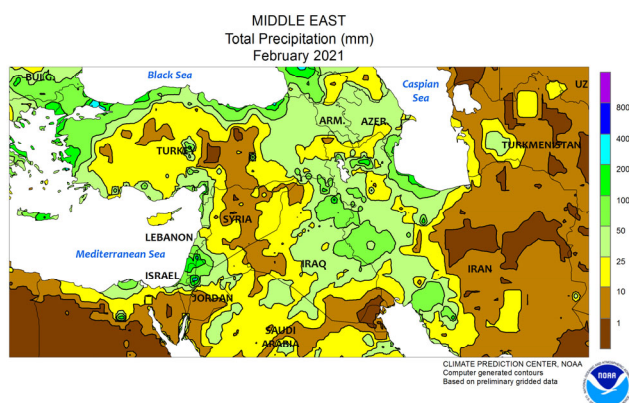
EASTERN FSU
Temperature Anomaly (°C)
February 2021



EASTERN FSU

During February, seasonable bitter cold persisted over central Russia and northern Kazakhstan, while much-needed rain and snow arrived in the south. Temperatures averaged 1 to 3°C below normal in northern Kazakhstan and central Russia, with nighttime readings in the -30s (degrees C) to as low as -40°C. The region remained encased in a deep snowpack, and agricultural activity is nonexistent during the winter months due to the extreme cold. Farther south, the dry start to the 2020-21 water year lingered into the first half of February before late-month rain and snow eased drought concerns somewhat. However, even with the

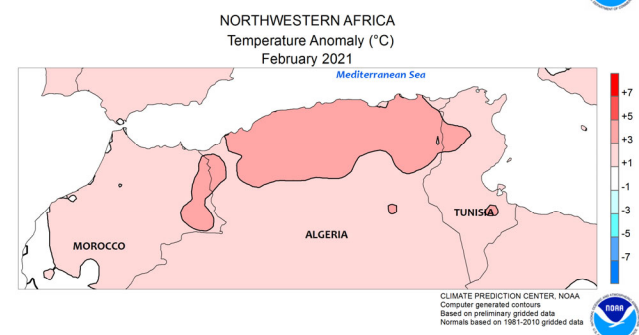
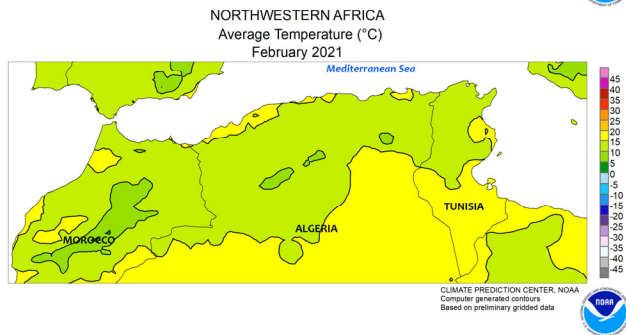
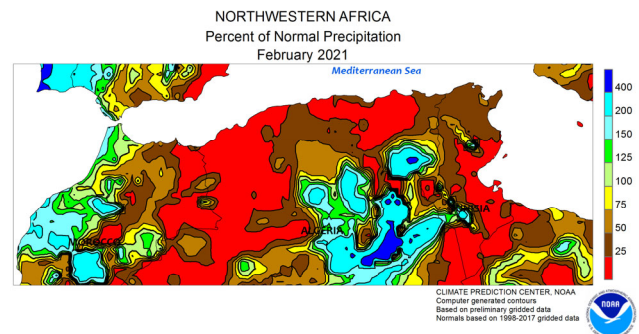
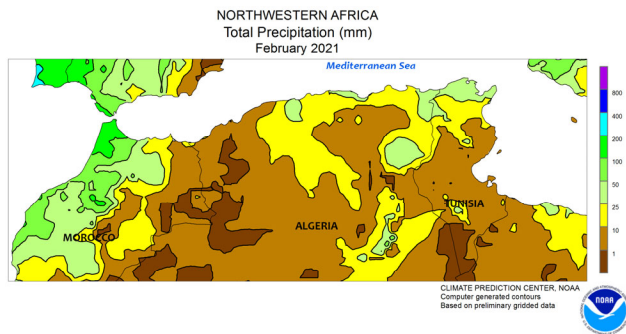
late-month precipitation, long-term deficits continued. Since September 1, regional-average precipitation through March 15 has totaled 50 percent of normal in both Turkmenistan (4th driest over the past 30 years) and central Uzbekistan (driest of the past 30 years). Season-to-date precipitation has been marginally better (at or slightly above 60 percent of normal) in western and eastern Uzbekistan. With the current climatological wet season (November – May) roughly halfway complete, time is running out to fully recharge mountain snowpacks and reservoirs; these are vital sources for cotton irrigation in the summer.



MIDDLE EAST

During February, dry and cool weather in central Turkey contrasted with good rains across much of the rest of the region. In central Turkey, where autumn drought severely limited winter grain establishment, monthly precipitation averaged less than half of normal following two months of favorable rain and snow. Due to the autumn drought, winter wheat and barley entered dormancy in very poor shape and will be reliant on winter and spring moisture to rebound. Meanwhile, rain and mountain snow (25-125 mm liquid

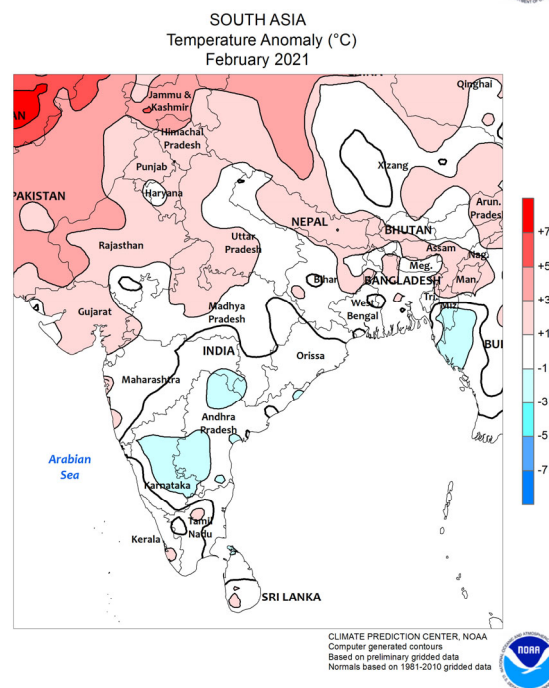
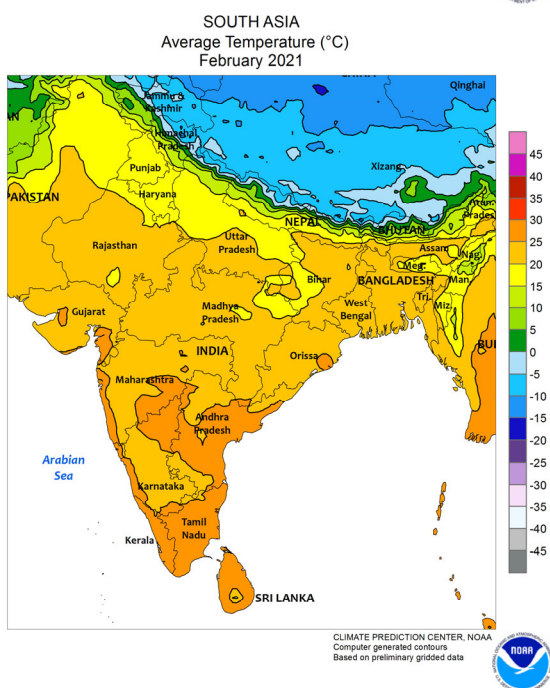
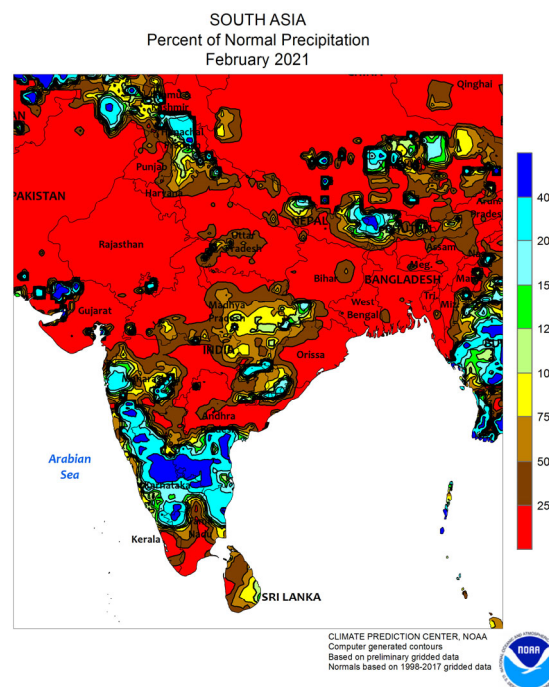
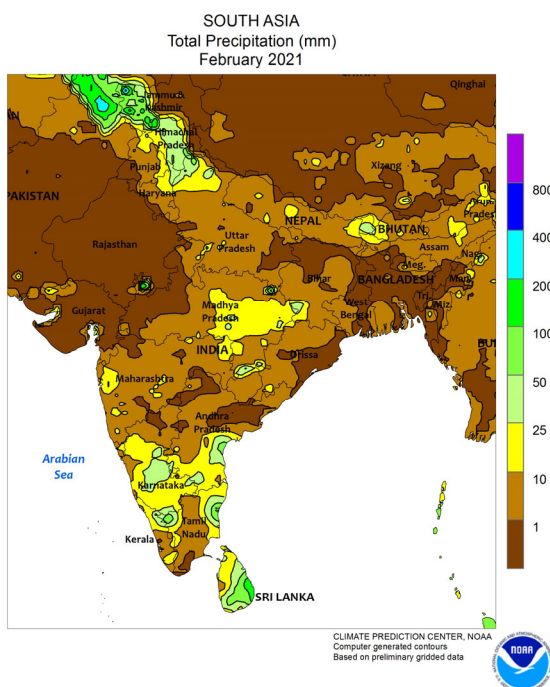
equivalent) was reported from the eastern Mediterranean Coast into western and northern Iran, though precipitation largely bypassed much of Syria (as indicated by satellite-derived rainfall estimates) as well as Khorasan in northeastern Iran. As a result, winter grains were developing favorably as the calendar turned to March outside of the aforementioned drier locales, though rain returned to Khorasan recently. Temperatures averaged near normal on central Turkey's Anatolian Plateau and 2 to 5°C above normal elsewhere.



NORTHWESTERN AFRICA

During February, wet weather in western growing areas contrasted with increasing short-term dryness in central and eastern portions of the region. The pronounced recovery from autumn drought continued in Morocco, with additional moderate to heavy rainfall (widespread 25-75 mm, more than 100 mm in the far north) boosting moisture supplies for winter grains approaching reproduction by month's end. For the second consecutive month, showers diminished sharply to the east and away from the coast over Algeria and Tunisia,

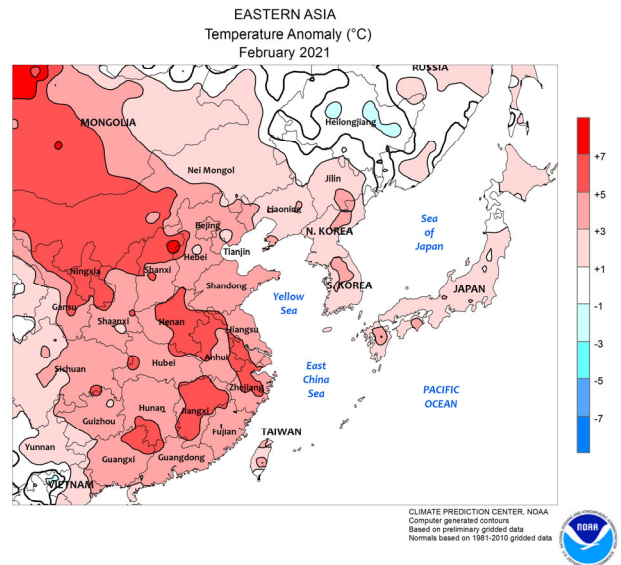
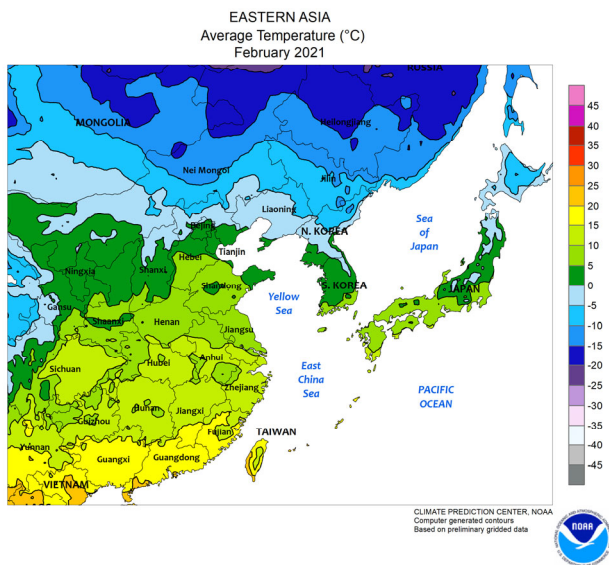
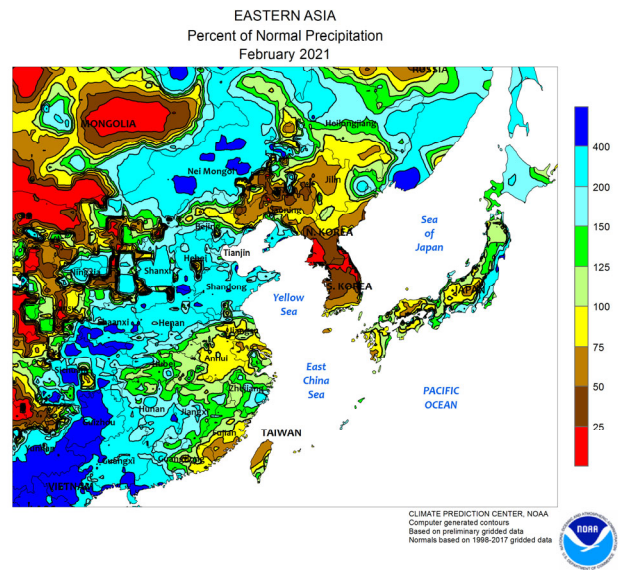
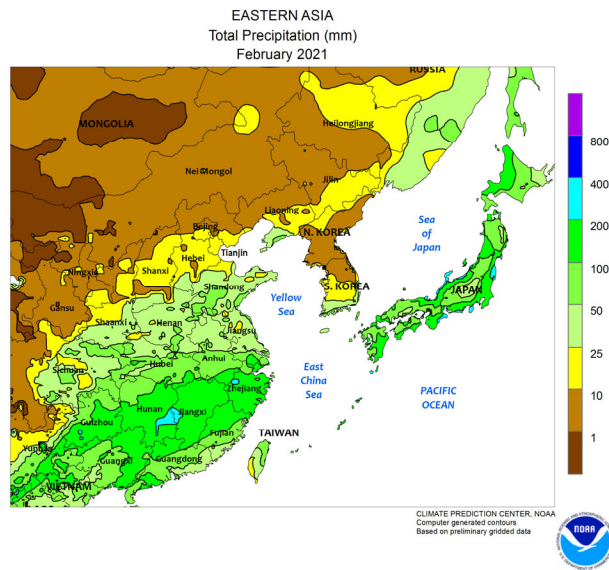
with acute dryness (less than 10 mm) noted over western Algeria as well as the Steppe Region of northern Tunisia. Elsewhere in Algeria and Tunisia, the observed rainfall (10-25 mm) was well short of normal (less than 50 percent of normal) in most growing areas. The central and eastern dryness was accompanied by temperatures up to 5°C above normal which accelerated winter grains toward reproduction up to three weeks ahead of average, while clouds and showers kept readings closer to normal in Morocco.



SOUTH ASIA

February rainfall was seasonably light (generally less than 10 mm) throughout much of the region, with isolated totals over 25 mm. Harvesting of the earliest-sown wheat and rapeseed crops was underway in northern India and Pakistan, with above-average temperatures (2-5°C above

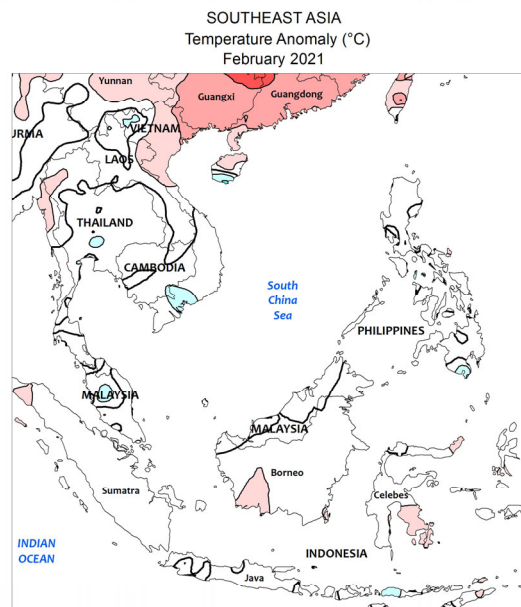
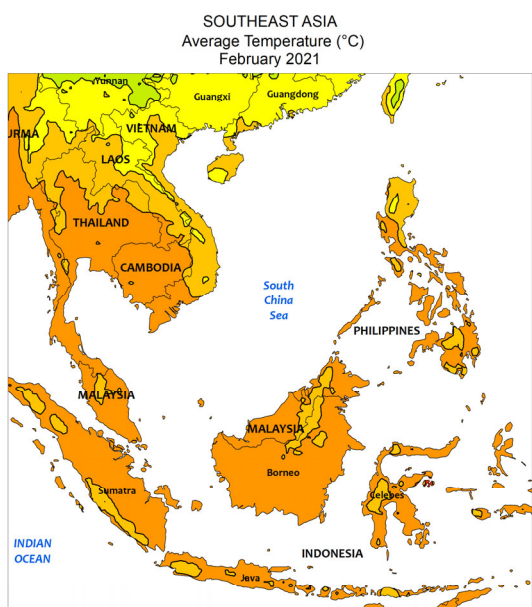
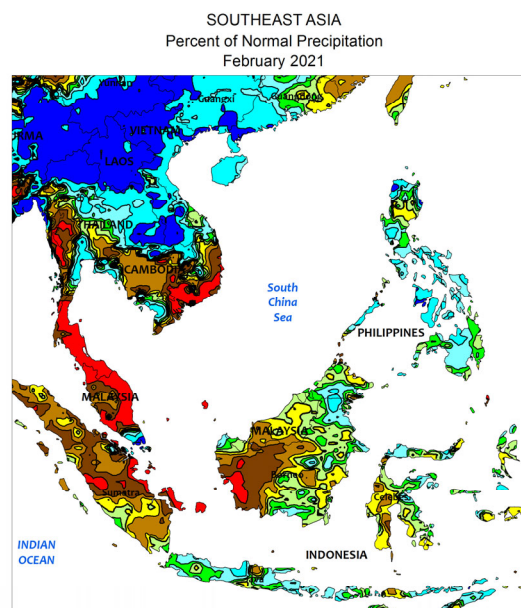
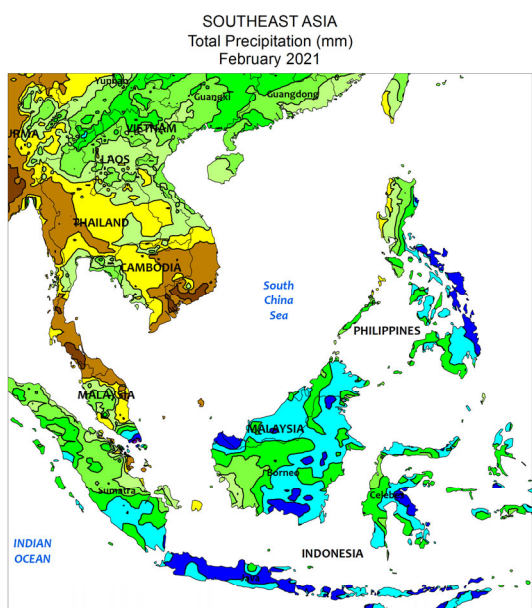
normal) supporting maturation and harvesting. Meanwhile, maturation continued for other rabi crops across India, as field preparations began for the smaller spring-sown varieties. Elsewhere, maha rice harvesting began in Sri Lanka under relatively dry conditions.



EASTERN ASIA

During February, unseasonable warmth (temperatures up to 6°C above average) across eastern China allowed wheat to break dormancy nearly a month earlier than usual while also promoting earlier-than-normal spring growth for rapeseed. In addition, daily average temperatures were consistently above 10°C in southern provinces, allowing for early-crop rice sowing 2 to 3 weeks ahead of the

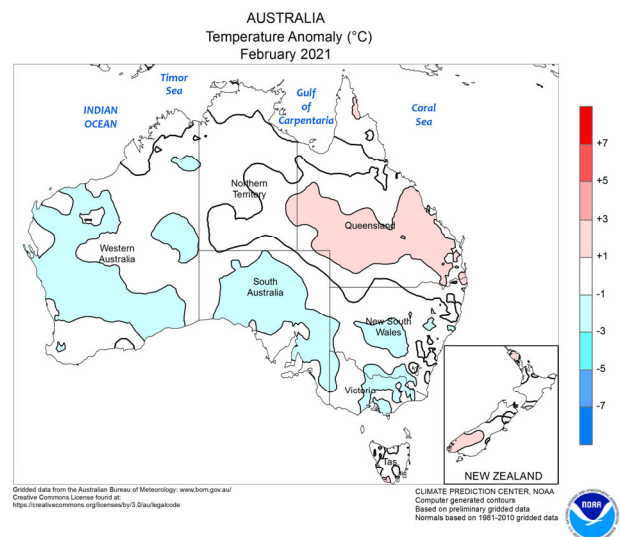
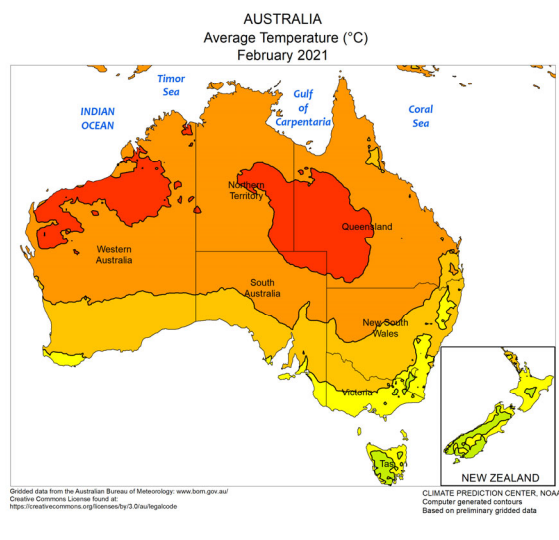
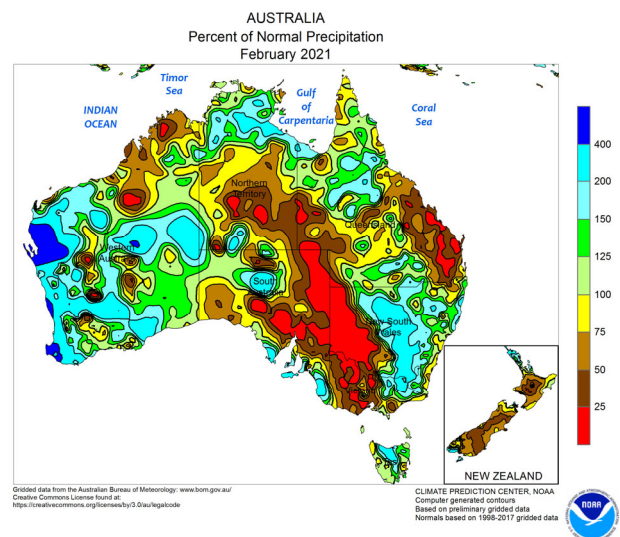
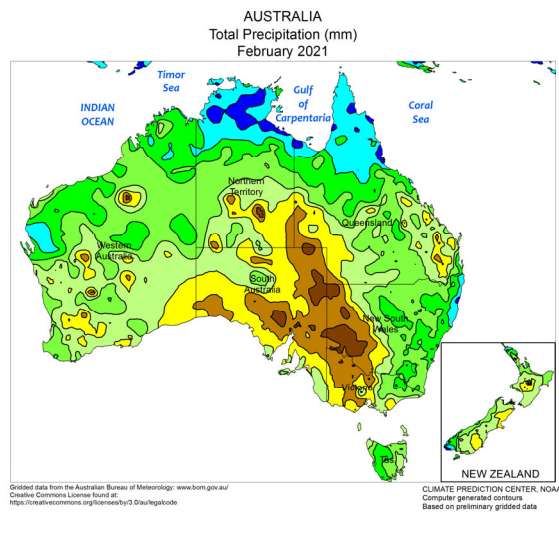
typical start date (March 1). Beside the unusually warm weather, above-average rainfall was also recorded. Wheat areas benefited from 25 to 75 mm (four times the normal amount), while rapeseed and much of the south received more normal totals (50-150 mm). All considered, the early season warmth and ample moisture should ensure good crop conditions heading into spring.



SOUTHEAST ASIA

February rainfall was above normal across large portions of the region including the seasonally wetter areas in the east (Philippines) and south (Indonesia). Rainfall totals in these areas were generally between 150 to locally over 600 mm (100-200 percent of normal), supporting immature winter-grown rice and bolstering irrigation supplies. In addition, an early year tropical cyclone in the southern Philippines contributed to these monthly

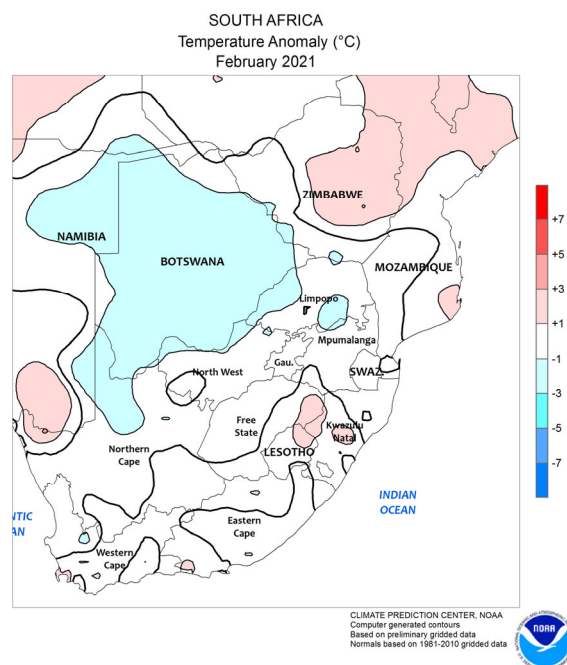
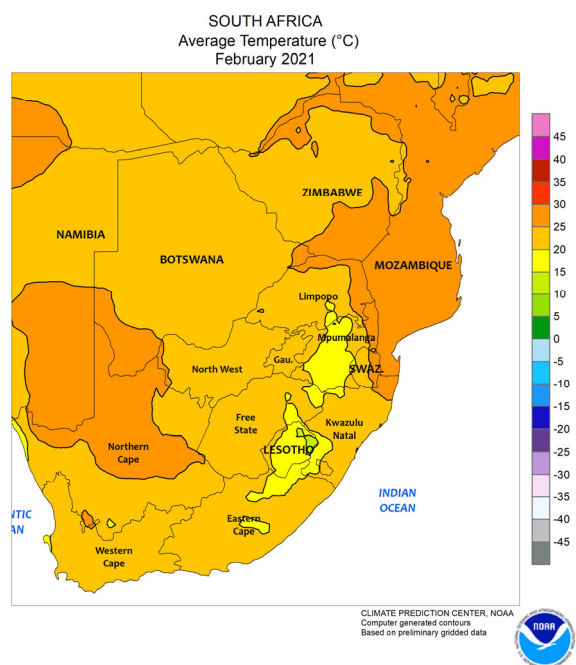
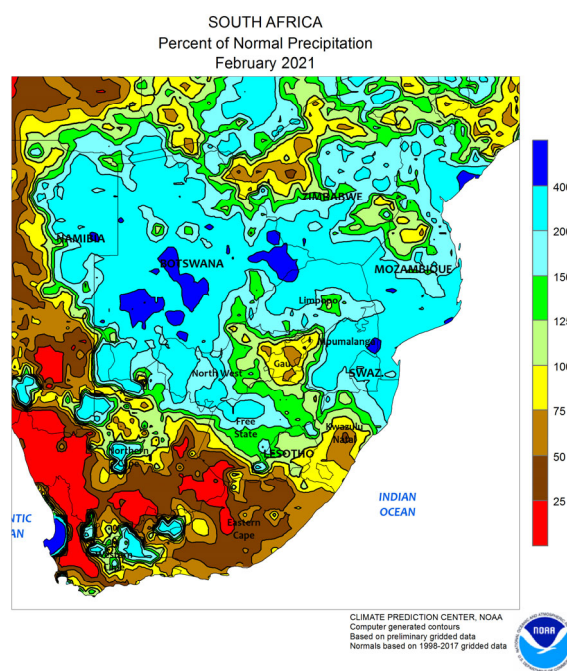
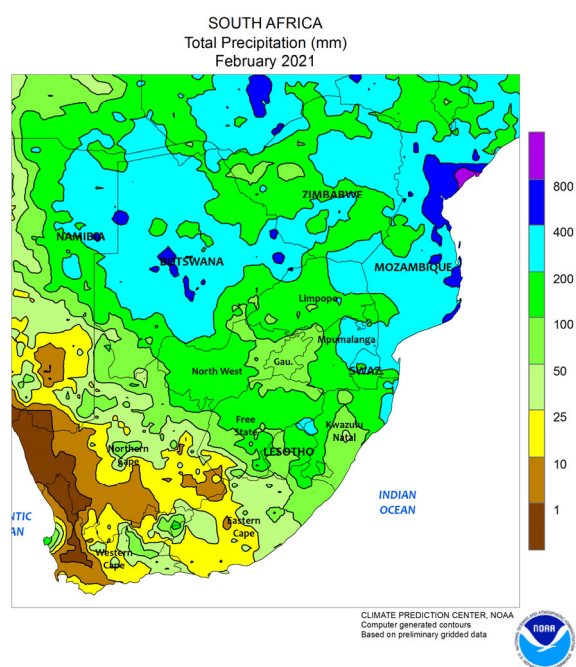
totals. Furthermore, typically dry Thailand and environs reported wetter-than-normal weather (20-50 mm, 100-200 percent of normal) to aid immature dry-season rice. In contrast, most oil palm locales in western Malaysia and Indonesia received below-average rainfall (10-50 mm, less than 50 percent of normal) while still maintaining adequate long-term (60-90 day) soil moisture due to unusually heavy downpours in January.



AUSTRALIA

During February, near- to above-normal rainfall in New South Wales favored development of immature summer crops and helped maintain good to excellent yield prospects. In contrast, below-normal rainfall in southern Queensland reduced soil moisture for dryland crops, such

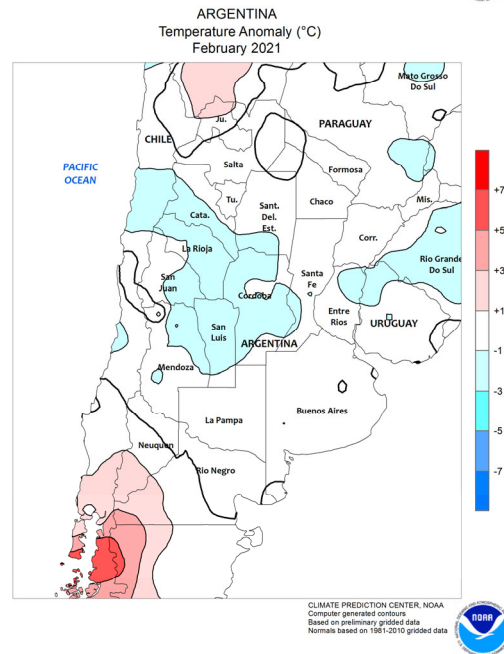
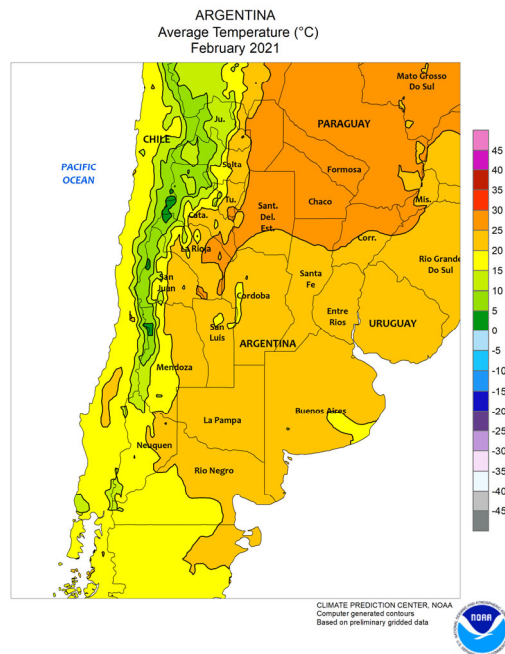
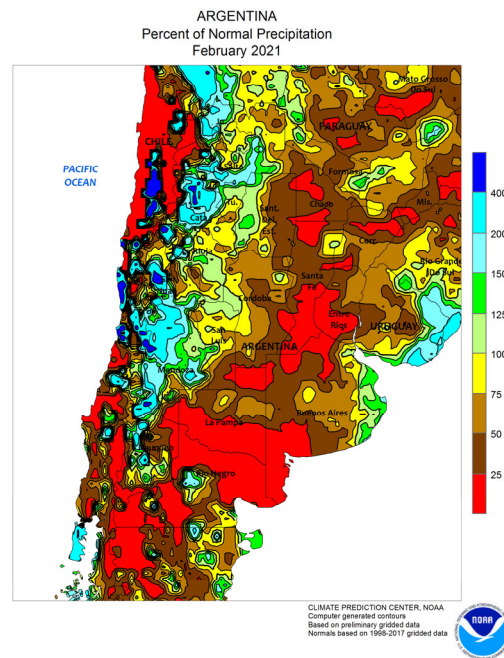
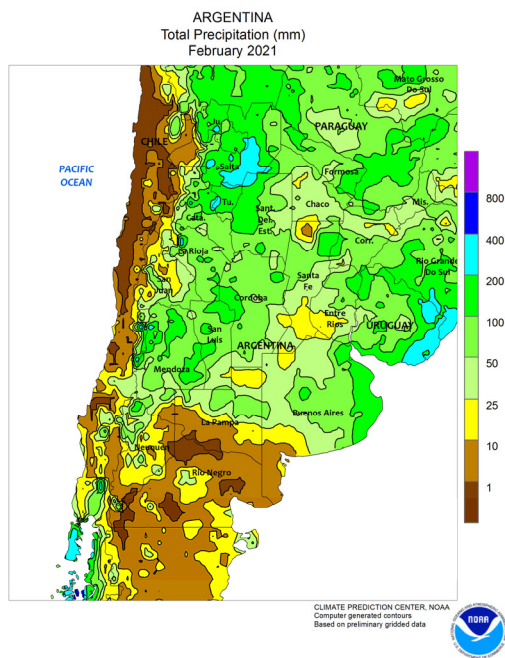
as sorghum, while increasing the supplemental water demands of irrigated crops, such as cotton. Temperatures averaged somewhat above normal in southern Queensland (up to 1°C above normal) and slightly below normal in New South Wales (up to 1°C below normal).



SOUTH AFRICA

Near- to above-normal February rainfall maintained favorable levels of moisture for summer crops in most major summer cropping areas. Frequent, locally heavy showers (monthly accumulations of 50-150 mm) continued this season's favorable trend of sufficient rain during critical stages of growth; crops in western production areas, including white corn areas of North West and Free State, are planted later and likely advanced through reproduction during February. Monthly temperatures averaged slightly below normal, with highest daytime temperatures reaching the lower and middle 30s (degrees C), advancing crop development with limited stressful heat. Elsewhere,

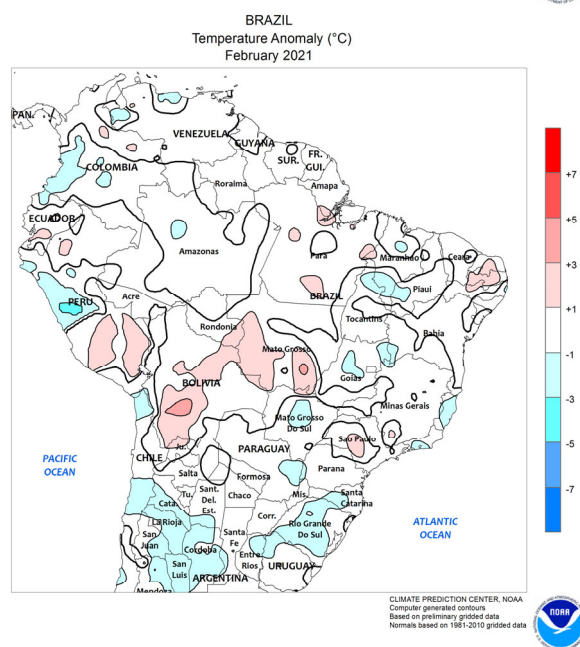
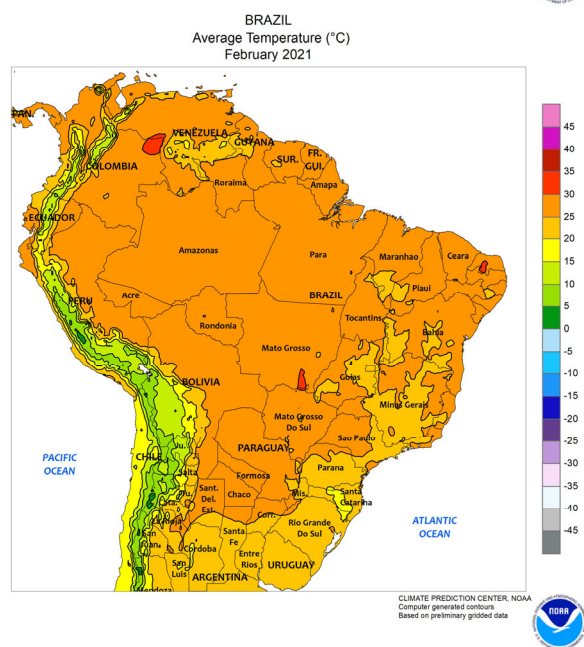
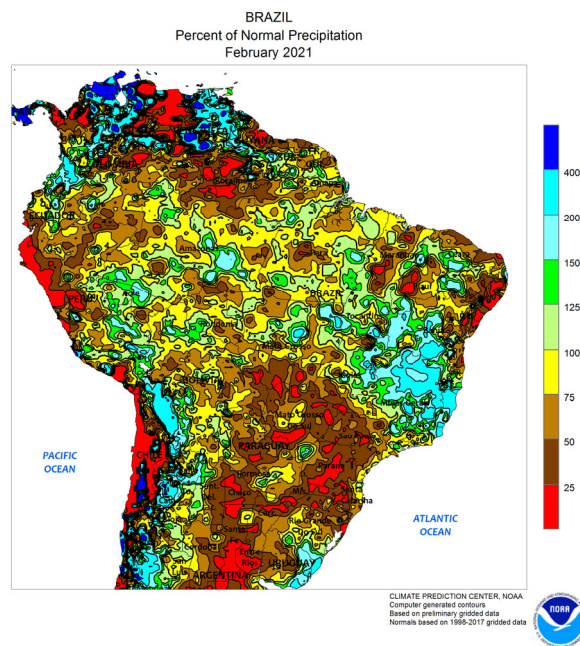
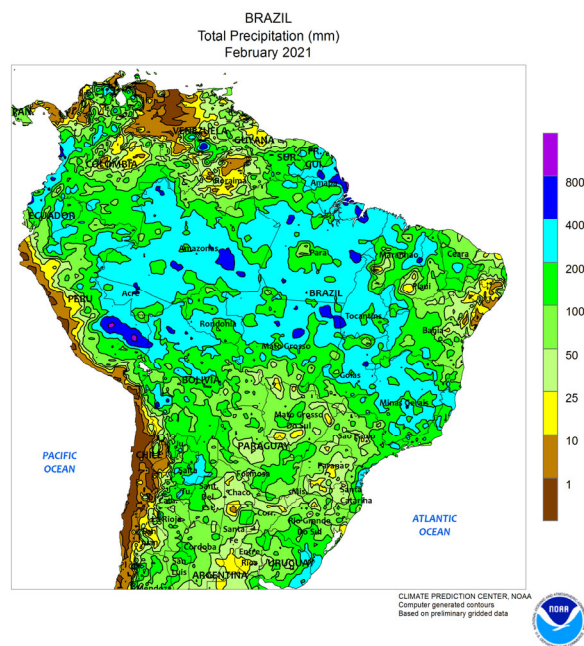
unseasonably wet weather continued for a second month in far northern and eastern production areas, including irrigated sugarcane areas in eastern Mpumalanga and northern KwaZulu-Natal, partly due to another tropical cyclone (Guambe) in the vicinity of southern Mozambique. In contrast, unseasonable dryness (monthly accumulations totaling below 50 mm locally) reduced moisture for rain-fed sugarcane in southern KwaZulu-Natal. Meanwhile, conditions favored irrigated crops in the Cape Provinces; heavy rain in watersheds of the Orange River Valley benefited corn and cotton, while warm, sunny weather aided development and early harvesting of tree and vine crops.



ARGENTINA

In early February, a drying trend developed over central Argentina and by month's end, immature corn and soybeans were in need of moisture. In western delegations, including those in and around Cordoba, the dryness was initially beneficial as it followed a period of excessive rainfall (locally more than 100 mm) that began in late January. Despite the dryness, February temperatures averaged near to slightly below normal in the aforementioned areas, although several warm days

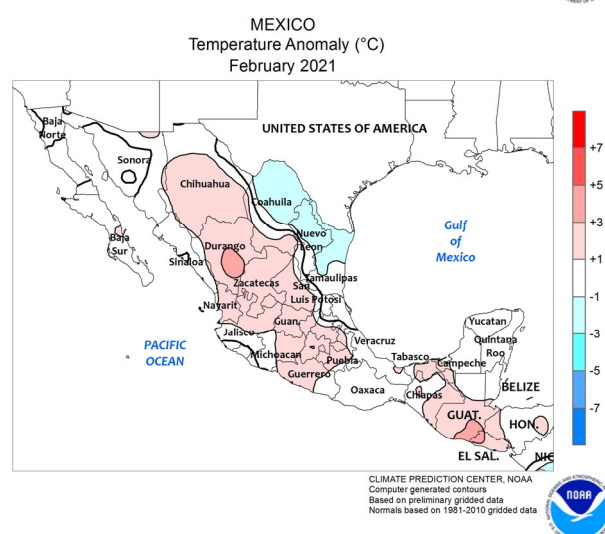
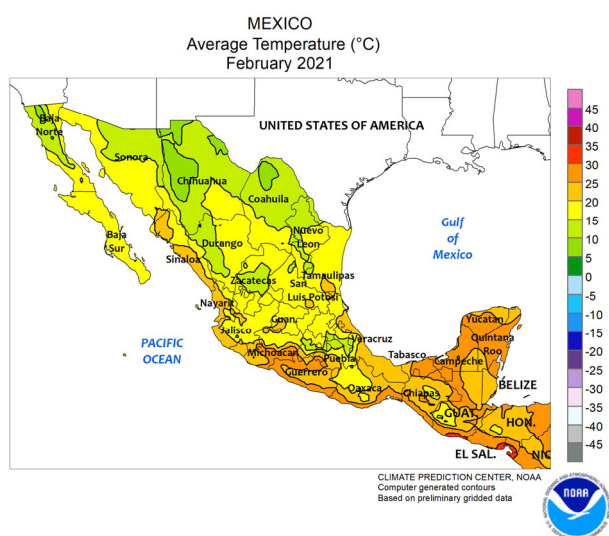
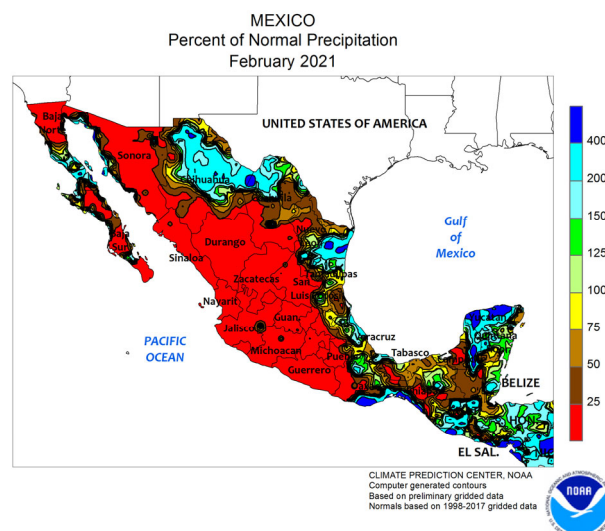
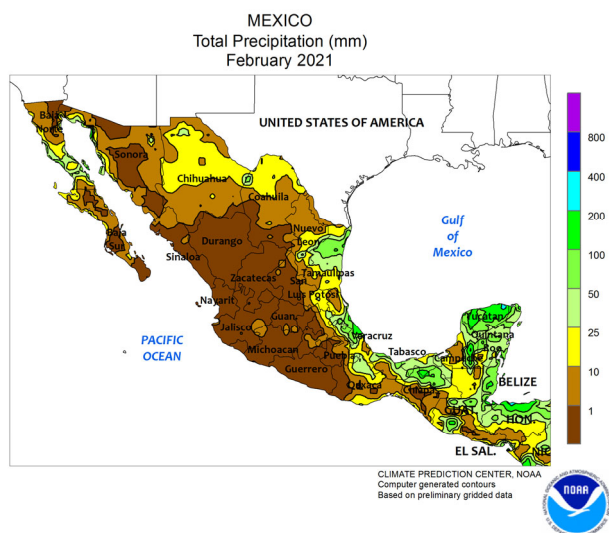
(highs reaching the middle 30s degrees C) were reported during the latter half of the month. Rainfall was closer to normal farther north, with portions of the cotton belt recording monthly accumulations of more than 100 mm. As in central Argentina, monthly average temperatures were generally within 1°C of normal, though daytime highs reached the upper 30s and lower 40s, fostering rapid crop development while maintaining high crop moisture demands.



BRAZIL

During February, frequent, occasionally heavy showers benefited corn and cotton in key northern production areas, although the wetness reportedly hampered fieldwork. Monthly rainfall accumulations totaled well above 100 mm from Mato Grosso and northern Mato Grosso do Sul eastward through Minas Gerais, western Bahia, and points north. The moisture favored emerging corn and cotton but slowed planting, as well as harvesting of late-planted soybeans. As a result, corn and cotton will require late-season rain to achieve current

yield expectations. Other crops benefiting from the moisture included coffee in and around southern Minas Gerais. In contrast, drier weather prevailed over most of southern Brazil (Sao Paulo to northern Rio Grande do Sul), reducing moisture for sugarcane, emerging second-crop corn, and late-developing soybeans (Rio Grande do Sul). However, near-normal temperatures helped to mitigate the impact of the dryness on actively growing southern crops, and locally heavy showers increased moisture for rice in southern Rio Grande do Sul.

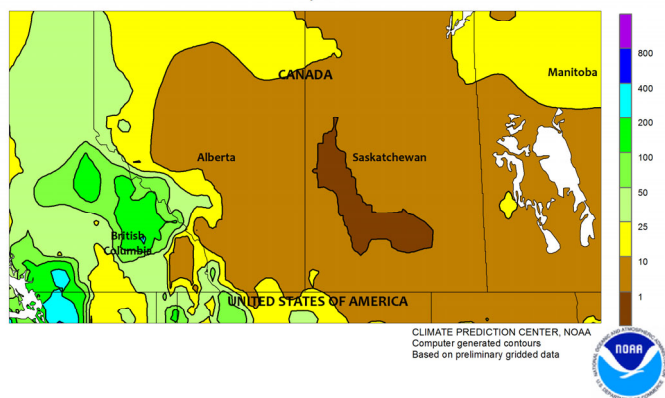


MEXICO

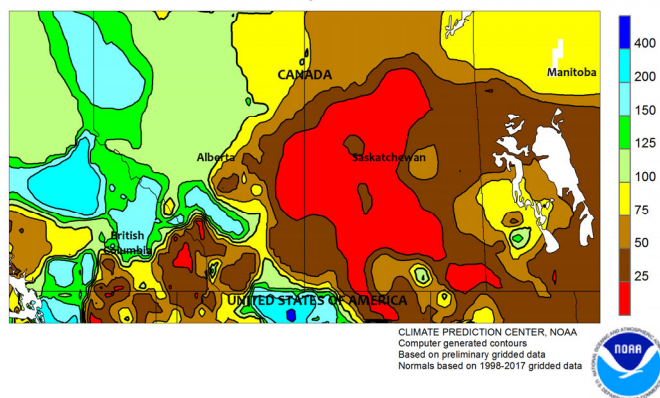
A February cold wave impacted northeastern crops, including vegetables and winter sorghum. On February 15, temperatures dropped well below freezing (-7 to -2°C) in northern Tamaulipas, with lower readings in portions of Coahuila and Chihuahua. Damage assessments were ongoing, though initial reports of damage were similar to those emanating from southern Texas during the same outbreak. Elsewhere, locally heavy showers increased winter irrigation reserves along the Gulf Coast, with heavy rainfall (monthly accumulations between 50 and 150 mm

concentrated over central Veracruz and northern Chiapas. Meanwhile, seasonably dry weather dominated central and western Mexico and generally warm conditions promoted development of winter-grown vegetables and grains; although nighttime lows occasionally dropped below 10°C , no freeze was reported in corn-producing regions of Sinaloa. According to the government of Mexico, reservoirs were at 54 percent capacity nationally as of February 28. Reservoirs were reportedly at 24 and 39 percent capacity, respectively, in Sinaloa and Sonora.

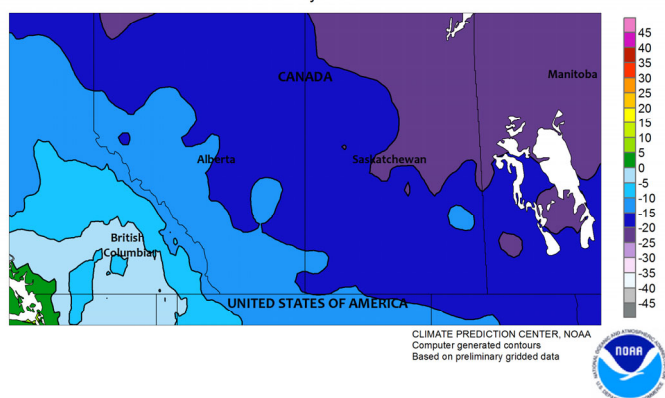
CANADIAN PRAIRIES
Total Precipitation (mm)
February 2021



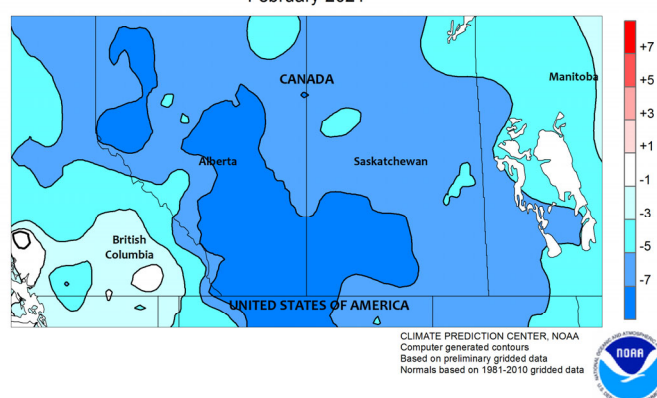
CANADIAN PRAIRIES
Percent of Normal Precipitation
February 2021



CANADIAN PRAIRIES
Average Temperature (°C)
February 2021



CANADIAN PRAIRIES
Temperature Anomaly (°C)
February 2021

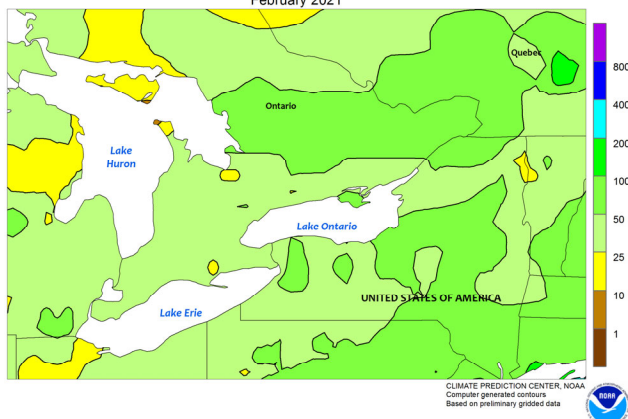


CANADIAN PRAIRIES

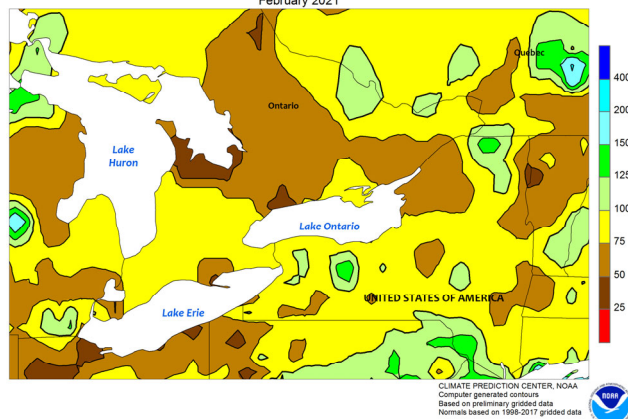
Cold, dry weather prevailed across the Prairies throughout much of February, intensifying concern for potential winterkill of overwintering grains and pastures. Monthly temperatures averaged 4 to 8°C below normal across the region, with all locations recording nighttime lows well below -30°C on several days during the early and middle part of the month. Snow cover during the incursion of bitter cold was patchy from southern Alberta to Manitoba, and some crop losses may have occurred. Warmer

conditions during the latter half of the month led to an erosion of snow cover in southern farming districts, and at month's end another cold snap dropped temperatures below -20°C on several nights in Manitoba; this latest cold outbreak was preceded by snow, but coverage was not uniform and bare patches likely remained. Except for the Peace River Valley and a few locations in southern Alberta, February precipitation was generally light, totaling less than 10 mm over the entire month nearly Prairie-wide.

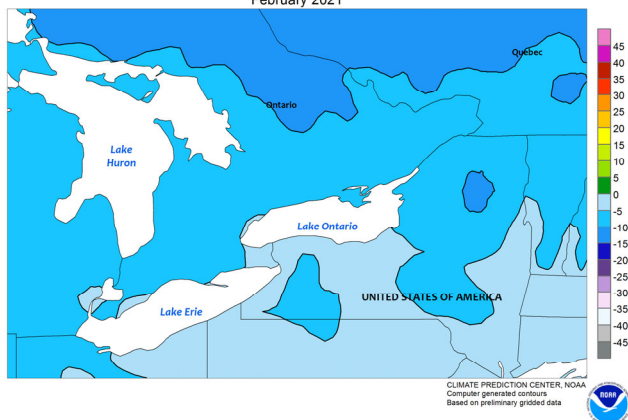
SOUTHEASTERN CANADA
Total Precipitation (mm)
February 2021



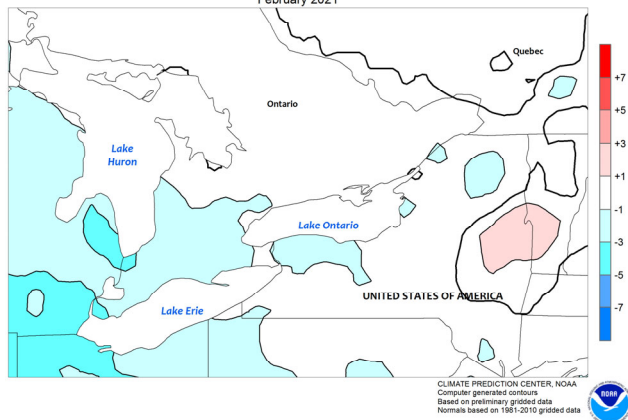
SOUTHEASTERN CANADA
Percent of Normal Precipitation
February 2021



SOUTHEASTERN CANADA
Average Temperature (°C)
February 2021



SOUTHEASTERN CANADA
Temperature Anomaly (°C)
February 2021



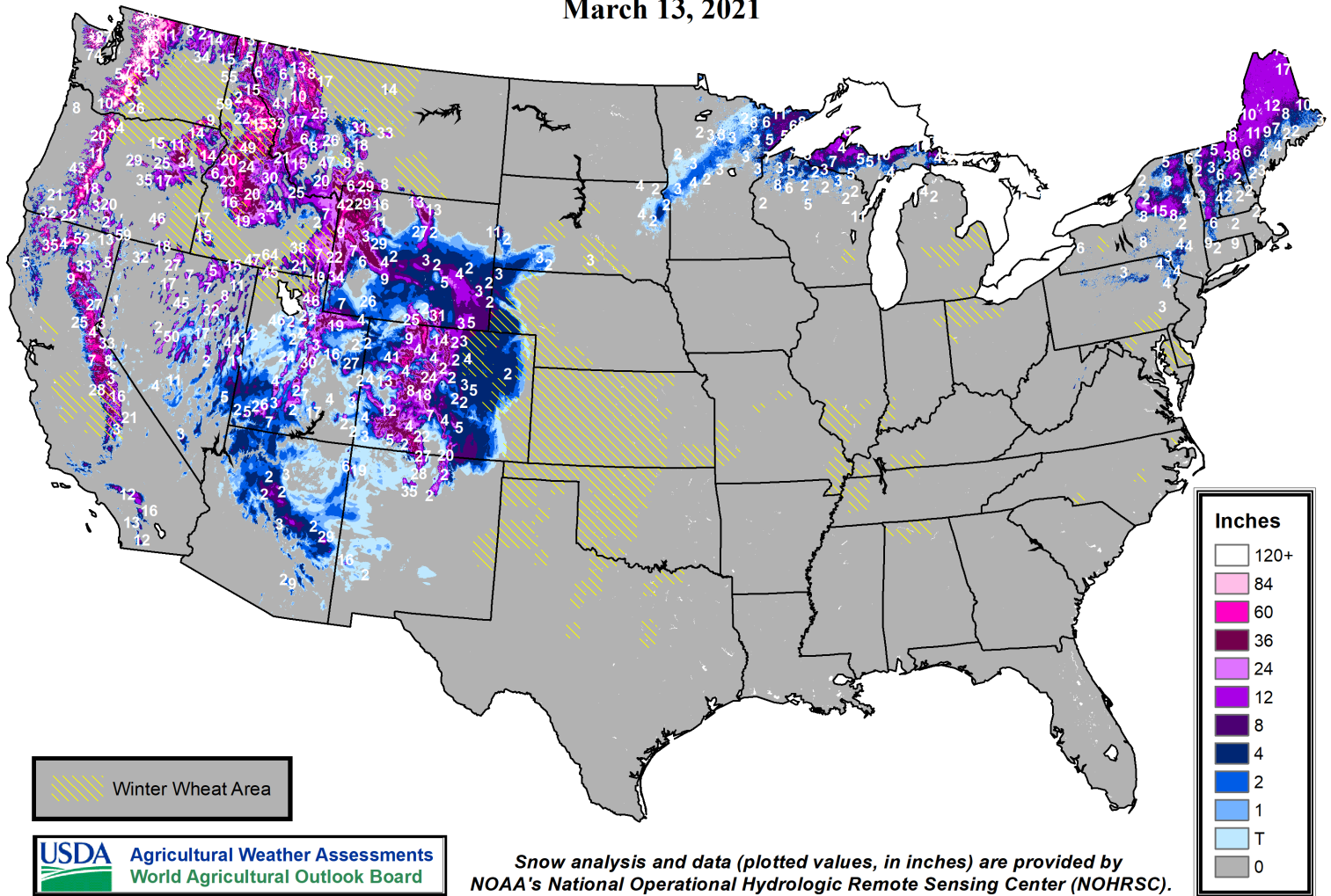
SOUTHEASTERN CANADA

Colder-than-normal weather dominated Ontario and southern Quebec for much of February, maintaining a protective layer of snow for overwintering wheat and pastures. Temperatures averaged 2 to 4°C below normal, with nighttime lows occasionally dropping below -17°C, a level considered the threshold for potential damage to unprotected dormant wheat. However, most major

farming areas enjoyed a protective layer of snow cover, minimizing the risk for winterkill attributed to those particular events. February precipitation was generally lighter than normal, with just a few locations recording more than 50 mm (liquid equivalent); much of the moisture arrived as snow, although a late-month warmup resulted in some light rain showers.

Snow Depth

March 13, 2021



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Correspondence to the meteorologists should be directed to:
***Weekly Weather and Crop Bulletin*, NOAA/USDA, Joint Agricultural Weather Facility, USDA South Building, Room 4443B, Washington, DC 20250.**

Internet URL: www.usda.gov/oce/weather-drought-monitor

E-mail address: brad.rippey@usda.gov

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World Agricultural Outlook Board

Managing Editor..... **Brad Rippey** (202) 720-2397

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