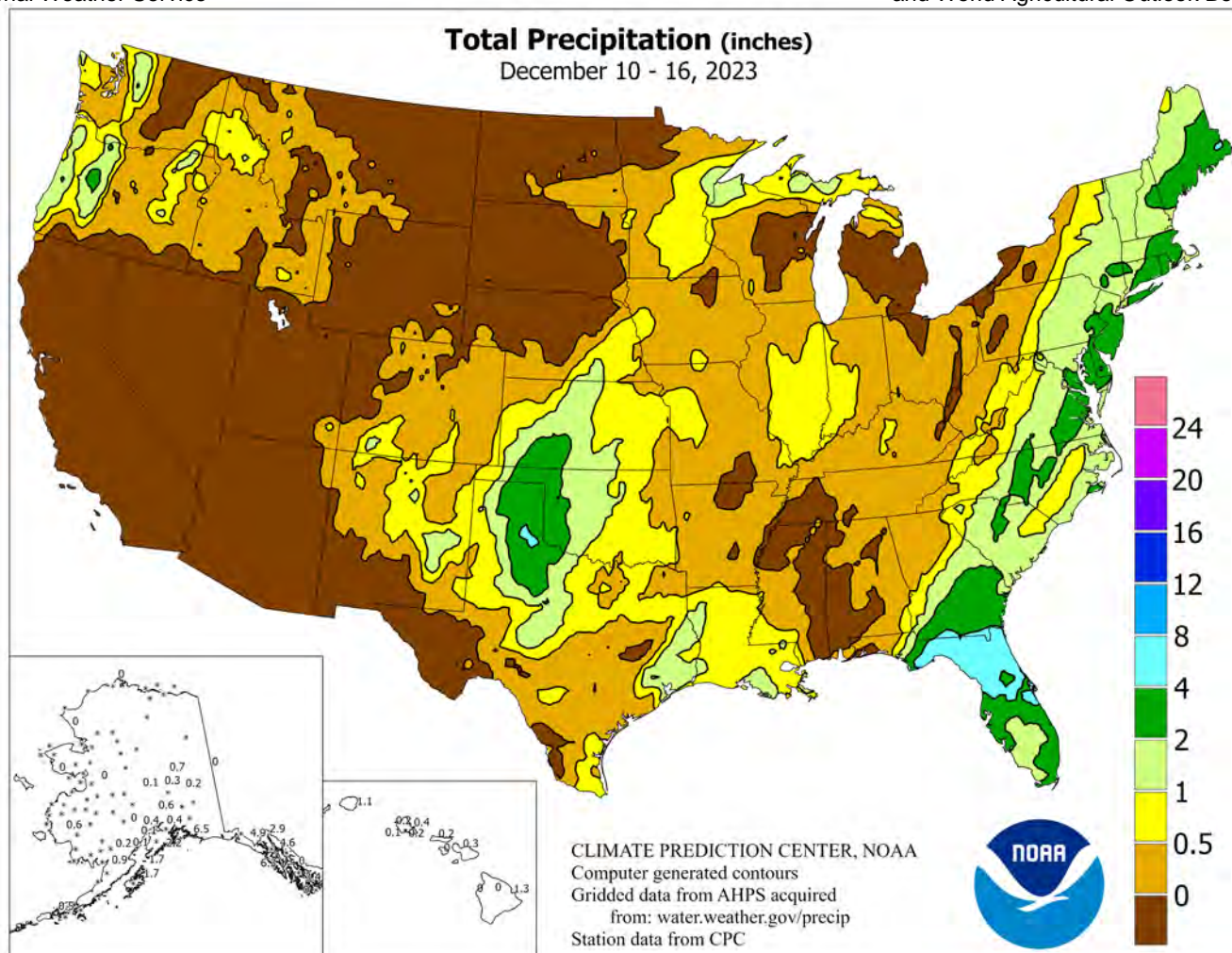


WEEKLY WEATHER AND CROP BULLETIN

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

December 10 – 16, 2023

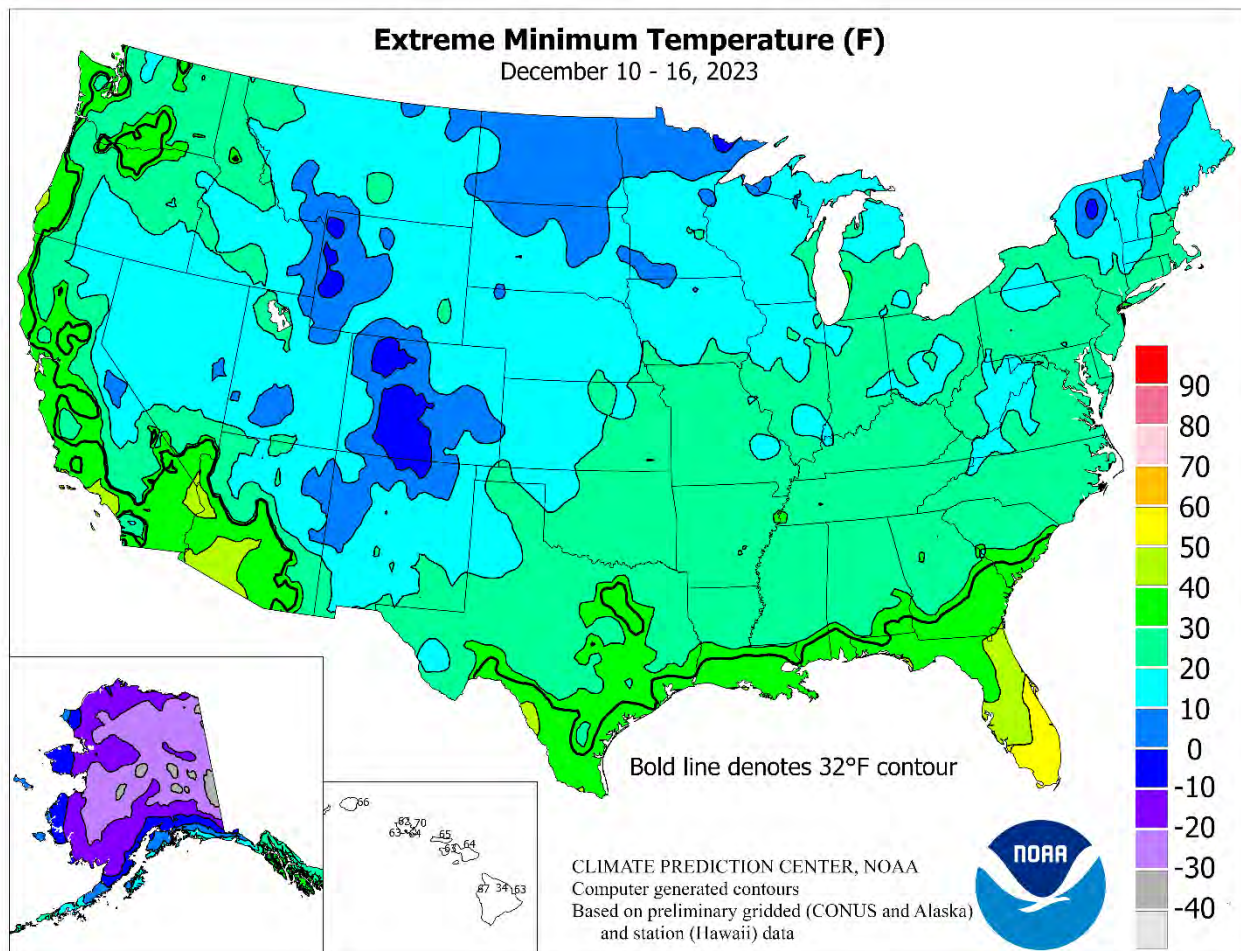
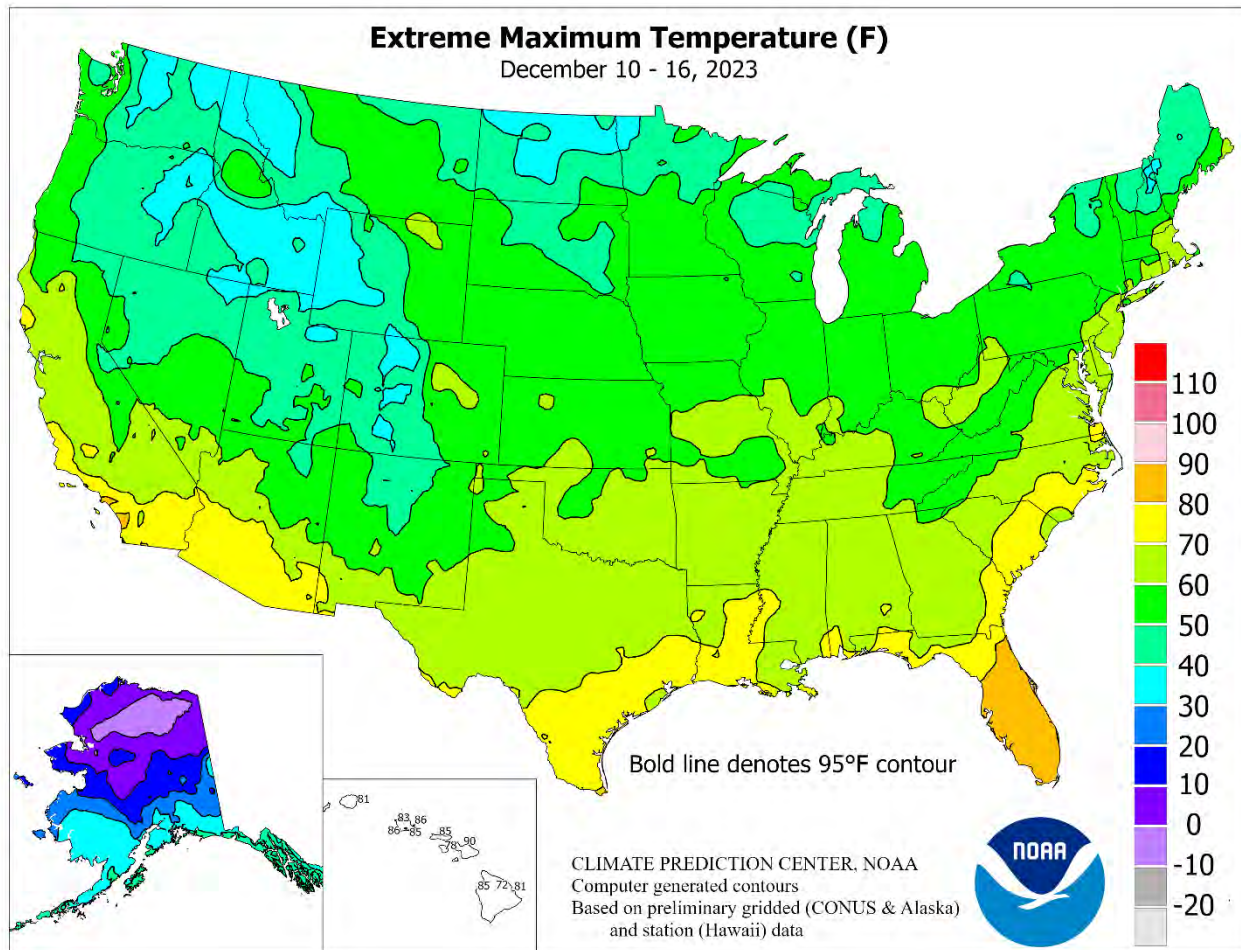
Highlights provided by USDA/WAOB

The week began and ended with heavy precipitation in the **Atlantic Coast States**. The initial storm system, which primarily struck on December 10-11, featured a rain-to-snow transition in portions of the **middle and northern Atlantic States**. The second storm, which arrived on December 16-17, delivered heavy rain from **Florida northward**. Before reaching the **East**, the late-week system also produced significant precipitation in the **south-central U.S.** On the **central and southern Plains**, rain—or a mix of rain and wet snow—halted fieldwork but

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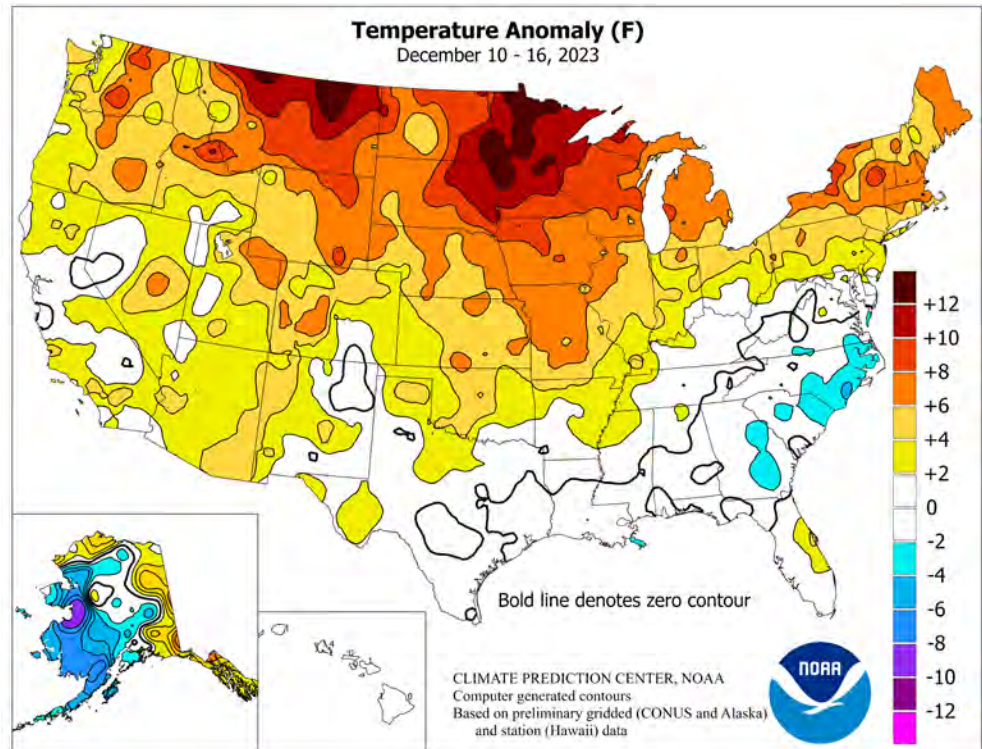
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(Continued from front cover)

provided beneficial moisture for rangeland, pastures, and winter wheat. Storm-total precipitation topped 2 inches on the **High Plains** from parts of **northern Texas** into **southwestern Kansas**. Much of the remainder of the country received little or no precipitation. Mostly light rain and snow showers were observed in the **Midwest** and **Northwest**, but dry weather prevailed from **California** and the **Great Basin** to the **northern Plains**. Additionally, overall mild conditions continued to dominate the country, with the most impressive warmth—relative to normal—focused across the **northern U.S.** Weekly temperatures averaged at least 10°F above normal across parts of the **North**, mainly from **Montana** into the **upper Great Lakes** region. Meanwhile, near- or above-normal temperatures also covered large sections of the **Plains**, **West**, **Midwest**, and **Northeast**. Significantly cooler-than-normal conditions were confined to parts of the **Southeast**, with temperatures averaging as much as 5°F below normal in parts of **Georgia** and the **Carolinas**.

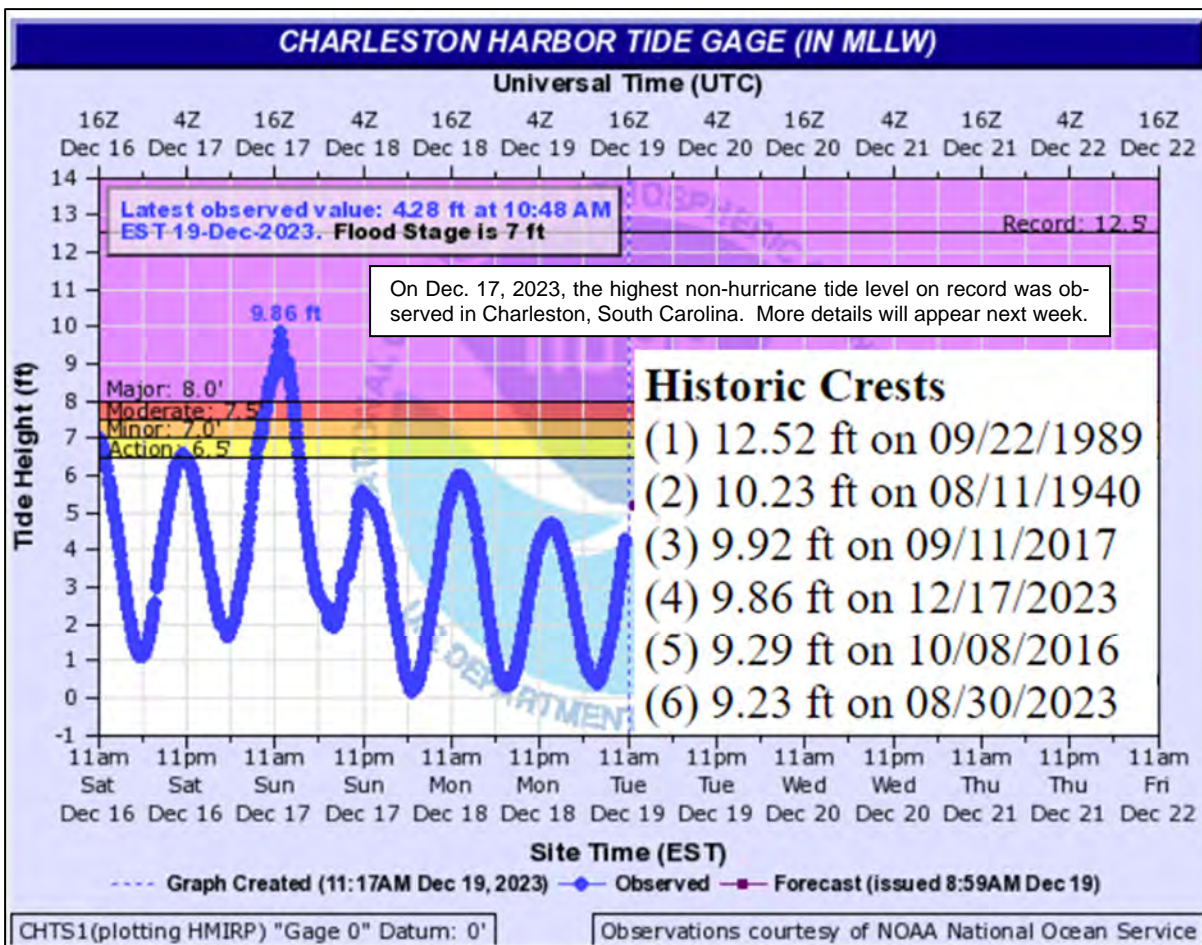
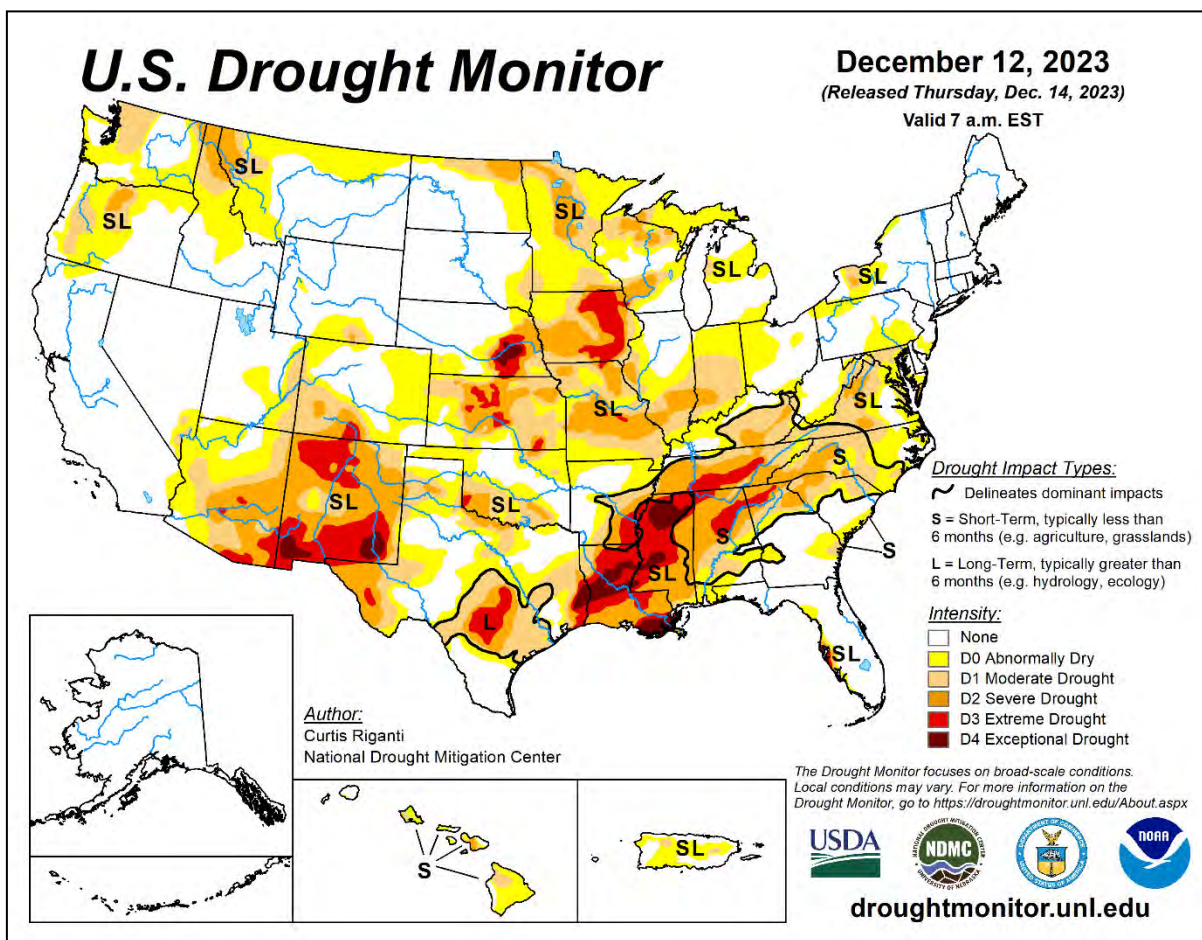


Lingering cool weather led to a handful of daily-record lows, including 24°F (on December 11) in **Austin, TX**, and 27°F (on December 12) in **Ramona, CA**. In other areas, much of the week featured warm weather, but only a few record-setting temperatures. In **Arizona**, **Nogales** posted a daily-record high of 78°F on December 11. Two days later in **Montana**, record-setting highs for the 13th reached 58°F in **Cut Bank** and 53°F in **Glasgow**. By the 14th, warmth shifted into the **upper Midwest**, where daily-record highs rose to 54°F in **Ashland, WI**, and **Sisseton, SD**. Late in the week, significant warmth appeared along the **Pacific Coast**. **Quillayute, WA**, attained 57°F each day from December 15-17, resulting in a trio of daily-record highs. In **California**, record-setting highs for December 16 soared to 86°F in **Anaheim** and 80°F in **Bakersfield**. Elsewhere in **California**, **Fresno** (77°F) tied a monthly record originally set on December 8, 2006.

The week began with heavy rain, or rain changing to snow, along the **Atlantic Coast**. The 10th was the wettest December day on record in **Richmond, VA**, where 2.73 inches fell. Previously, **Richmond's** wettest December day had occurred in 2008, when 2.62 inches fell on the 11th. Elsewhere in the **East** on December 10, daily-record totals ranged from 2 to 3 inches in locations such as **Greensboro, NC** (2.86 inches); **Bridgeport, CT** (2.75 inches); **New York's JFK Airport** (2.38 inches); and **Danville, VA** (2.09 inches). The following day, December 11, daily-record totals in **New England** included 1.81 inches in **Bangor, ME**, and 1.75 inches in **Boston, MA**. Despite some wet snow at storm's end, streaks of not experiencing a calendar-day snowfall of an inch or greater continued in several **mid-Atlantic** cities. In **Washington, DC**, and **Richmond, VA**, a 1-inch snowfall last occurred on January 16, 2022, with streaks reaching 699 days by December 16, 2023. In **Maryland**, **Baltimore's** streak—which started on January 29, 2022—reached 687 days. Through December 16, other “snowless” streaks—no calendar-day totals of an inch or greater—climbed to 686 days in **Philadelphia, PA**, and 671 days at **New York's Central Park**. Farther west, consecutive daily-record precipitation totals occurred on December 13-14 in locations such as **Borger, TX**

(1.01 and 1.72 inches, respectively), and **Guymon, OK** (1.25 inches both days). Meanwhile in **Colorado**, December 13-14 snowfall totaled 5.4 inches in **Pueblo** and 4.1 inches in **Colorado Springs**. However, mostly rain fell as far north as the **upper Great Lakes** region, where—on December 15—**Duluth, MN**, noted a daily-record precipitation sum of 0.80 inch, including snowfall totaling 0.2 inch. At week's end, an intensifying low-pressure system moving northward from the **Gulf of Mexico** delivered heavy rain and gusty winds across **Florida**. **Leesburg, FL**, experienced its wettest December day on record, with 2.97 inches falling on the 16th. Previously, **Leesburg's** wettest December day occurred in 1983, with 2.38 inches falling on the 12th. Elsewhere in **Florida**, daily-record rainfall totals for December 16 reached 3.06 inches in **Melbourne**, 2.57 inches in **Daytona Beach**, 2.46 inches in **Sarasota-Bradenton**, and 2.33 inches in **Orlando**. More details on this storm, which moved northward near the **Atlantic Seaboard** on December 17-18, will appear next week.

Frigid weather overspread **western Alaska**, while mild conditions prevailed in **northern and eastern sections of the state**. Weekly readings averaged at least 10°F below normal in scattered locations across **west-central and southwestern Alaska**, with **Bethel** reporting sub-zero minimum temperatures each day from December 9-15. **Fairbanks** dipped to -30°F on the 15th, following 7.5 inches of snow from December 11-13. Significant precipitation also fell in parts of **southern Alaska**, where **Anchorage** received 28.0 inches of snow during the 10-day period from December 7-16—with measurable snow falling each day except the 14th. In **southeastern Alaska**, daily-record precipitation totals occurred on December 12 and 14 in **Sitka** (3.03 and 2.11 inches, respectively), and **Juneau** (1.93 and 1.87 inches). Peak wind gusts on the 12th were clocked at 65 mph in **Juneau** and 63 mph in **Sitka**. Farther south, **Hawaii** experienced another week of relatively inactive weather, following the drought-easing rainfall of late November. On **Maui**, **Kahului** posted consecutive daily-record highs (90 and 89°F, respectively) on December 10-11. At the state's major airport observation sites, December 1-16 rainfall ranged from 0.41 inch (31 percent of normal) in **Kahului** to 2.79 inches (40 percent) in **Hilo**, on the **Big Island**.



National Weather Data for Selected Cities

Weather Data for the Week Ending December 16, 2023

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 DEC 1	PCT. NORMAL SINCE DEC 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	22	13	31	4	18	-2	0.52	0.24	0.25	1.07	166	24.93	156	93	76	0	7	4	0
	BARROW	7	-4	10	-11	2	0	0.00	-0.06	0.00	0.00	0	4.59	88	86	73	0	7	0	0
	FAIRBANKS	5	-13	22	-28	-4	0	0.72	0.60	0.41	0.81	277	10.29	90	77	66	0	7	5	0
	JUNEAU	40	33	45	28	37	6	4.61	3.05	1.78	6.22	172	71.33	111	94	75	0	2	7	3
	KODIAK	34	18	44	15	26	-6	1.72	-0.29	1.54	4.38	99	62.65	84	89	67	0	7	3	1
AL	NOME	11	-1	19	-6	5	-5	0.02	-0.22	0.01	0.25	44	21.65	129	74	57	0	7	2	0
	BIRMINGHAM	61	38	64	28	49	1	1.51	0.40	1.51	2.39	97	45.92	84	75	30	0	2	1	1
	HUNTSVILLE	59	33	64	27	46	0	0.39	-1.04	0.37	3.34	106	41.95	81	92	35	0	4	2	0
	MOBILE	66	43	72	37	55	1	0.76	-0.42	0.67	4.46	174	54.28	84	77	37	0	0	2	1
	MONTGOMERY	63	37	68	29	50	-1	0.31	-0.84	0.31	0.44	18	45.20	93	85	37	0	3	1	0
AR	FORT SMITH	57	35	63	27	46	3	0.46	-0.33	0.46	0.47	25	40.05	87	84	43	0	3	1	0
	LITTLE ROCK	60	36	64	31	48	5	0.12	-1.06	0.09	0.41	14	52.69	109	80	37	0	2	2	0
AZ	FLAGSTAFF	51	19	57	13	35	5	0.00	-0.43	0.00	0.07	8	23.94	122	70	22	0	7	0	0
	PHOENIX	74	47	80	44	60	5	0.00	-0.17	0.00	0.00	0	3.24	47	40	12	0	0	0	0
	PRESCOTT	58	25	61	19	42	3	0.00	-0.22	0.00	0.00	0	9.30	75	53	14	0	7	0	0
CA	TUCSON	74	43	78	34	58	5	0.00	-0.23	0.00	0.19	37	8.83	87	33	11	0	0	0	0
	BAKERSFIELD	65	38	71	37	52	3	0.00	-0.24	0.00	0.00	0	8.59	149	76	33	0	0	0	0
	EUREKA	58	40	65	36	49	2	0.00	-1.86	0.00	2.67	64	30.87	84	96	64	0	0	0	0
	FRESNO	64	37	68	36	51	3	0.00	-0.37	0.00	0.00	0	12.82	128	80	33	0	0	0	0
	LOS ANGELES	73	52	80	50	63	5	0.00	-0.47	0.00	0.00	0	21.80	199	78	26	0	0	0	0
CO	REDDING	66	36	72	32	51	5	0.00	-1.45	0.00	1.17	36	33.50	110	84	34	0	1	0	0
	SACRAMENTO	61	34	66	32	48	0	0.00	-0.78	0.00	0.65	38	15.00	91	97	41	0	1	0	0
	SAN DIEGO	70	48	77	44	59	1	0.00	-0.37	0.00	0.07	9	13.45	151	81	35	0	0	0	0
	SAN FRANCISCO	62	47	68	44	55	3	0.00	-0.94	0.00	0.13	6	21.47	122	85	50	0	0	0	0
	STOCKTON	62	33	68	30	47	0	0.00	-0.54	0.00	0.10	8	14.04	114	94	43	0	3	0	0
CT	ALAMOSA	38	5	47	-7	22	3	0.34	0.26	0.26	0.35	187	4.19	58	92	50	0	7	2	0
	CO SPRINGS	45	24	57	10	35	3	0.30	0.24	0.28	0.57	453	25.45	161	80	45	0	7	2	0
	DENVER INTL	48	24	63	21	36	5	0.07	0.00	0.07	0.11	63	18.47	129	83	42	0	7	1	0
	GRAND JUNCTION	46	24	55	20	35	6	0.00	-0.13	0.00	0.14	43	7.00	79	84	42	0	7	0	0
	PUEBLO	44	19	57	6	31	0	0.44	0.38	0.37	0.72	446	12.15	102	93	51	0	7	2	0
DC	BRIDGEPORT	49	32	58	23	41	3	3.57	2.65	3.11	4.47	207	47.72	113	80	51	0	4	2	1
	HARTFORD	50	32	60	24	41	7	2.17	1.22	1.61	3.05	137	59.56	131	79	47	0	5	2	2
DE	WASHINGTON	55	33	63	29	44	2	1.66	0.84	1.26	2.63	141	31.77	78	85	39	0	2	2	1
FL	WILMINGTON	51	30	61	24	40	2	2.29	1.37	1.97	3.20	151	46.54	106	87	46	0	6	2	1
	DAYTONA BEACH	73	58	81	47	66	3	3.43	2.94	3.15	3.46	305	59.09	118	94	59	0	0	5	1
	JACKSONVILLE	65	47	78	40	56	-1	1.54	0.91	0.94	2.89	204	48.12	92	91	62	0	0	3	1
	KEY WEST	77	69	82	66	73	0	3.20	2.69	1.88	3.21	278	32.01	81	95	73	0	0	5	2
	MIAMI	76	67	83	59	71	0	2.15	1.55	1.22	2.15	158	75.84	114	91	66	0	0	5	2
GA	ORLANDO	74	59	82	49	67	3	3.12	2.54	2.81	3.12	248	48.01	95	90	54	0	0	2	1
	PENSACOLA	66	47	72	39	56	0	1.44	0.22	1.41	4.06	146	57.18	87	69	36	0	0	2	1
	TALLAHASSEE	66	46	70	34	56	1	3.19	2.19	2.23	8.22	380	56.96	100	83	47	0	0	2	2
	TAMPA	73	57	79	47	65	0	3.26	2.68	2.78	3.72	304	35.75	74	88	56	0	0	2	1
	WEST PALM BEACH	75	65	81	56	70	1	2.86	2.06	2.31	3.09	170	71.50	119	89	61	0	0	4	1
HI	ATHENS	57	32	61	28	45	-2	0.55	-0.46	0.55	1.06	49	45.95	98	87	38	0	3	1	1
	ATLANTA	58	36	65	33	47	-1	0.99	-0.05	0.99	1.65	74	38.71	80	78	38	0	0	1	1
	AUGUSTA	61	33	66	26	47	-3	1.17	0.28	1.06	1.17	64	58.64	139	94	35	0	5	2	1
	COLUMBUS	61	38	66	29	49	-1	1.22	0.13	1.07	1.44	60	46.15	99	83	37	0	1	2	1
	MACON	63	33	67	27	48	-2	1.36	0.32	1.28	1.44	65	43.09	96	94	37	0	4	2	1
IA	SAVANNAH	63	42	75	34	53	-1	0.74	-0.04	0.43	0.77	47	37.61	80	80	39	0	0	2	0
	HILO	79	67	81	63	73	0	1.35	-1.64	0.49	2.76	40	96.00	83	97	65	0	0	7	0
	HONOLULU	80	70	85	64	75	-1	0.17	-0.30	0.12	0.54	53	13.06	85	93	59	0	0	2	0
	KAHULUI	83	68	90	64	75	1	0.25	-0.38	0.25	0.41	30	10.87	73	89	50	1	0	1	0
	LIHUE	78	71	81	66	75	1	1.11	0.04	0.66	1.65	68	39.73	116	84	63	0	0	4	1
ID	BURLINGTON	46	29	57	21	38	7	0.17	-0.26	0.17	1.07	102	26.20	70	82	50	0	5	1	0
	CEDAR RAPIDS	44	24	53	14	34	8	0.19	-0.17	0.19	0.47	52	17.78	50	87	49	0	5	1	0
	DES MOINES	46	27	56	19	36	8	0.15	-0.22	0.13	0.15	17	23.40	65	82	48	0	5	2	0
	DUBUQUE	40	25	50	17	33	8	0.17	-0.25	0.17	0.80	78	30.18	80	86	54	0	6	1	0
	SIOUX CITY	44	22	51	15	33	8	0.46	0.24	0.36	0.46	87	23.63	82	92	56	0	5	2	0
IL	WATERLOO	44	20	56	11	32	6	0.11	-0.22	0.11	0.13	15	21.53	60	83	48	0	6	1	0
	BOISE	41	31	44	26	37	4	0.16	-0.19	0.08	1.15	146	10.82	100	92	63	0	4	2	0
	LEWISTON	44	37	47	30	41	6	0.41	0.17	0.31	0.82	143	10.25	83	81	63	0	1	3	0
	POCATELLO	32	21	36	11	26	1	0.13	-0.13	0.13	0.96	161	14.02	124	96	77	0	7	1	0
	CHICAGO/O_HARE	43	31	53	23	37	6	0.41	-0.06	0.41	1.70	147	32.00	86	79	48	0	5	1	0
IN	MOLINE	47	25	59	15	36	6	0.18	-0.28	0.18	1.29	116	27.37	73	87	46	0	6	1	0
	PEORIA	46	29	57	20	38	6	0.49	0.01	0.49	1.48	127	31.88	87	83	47	0	5	1	0
	ROCKFORD	42	25	53	15	33	6	0.12	-0.33	0.12	1.71	157	30.57	84	91	51	0	6	1	0
	SPRINGFIELD	48	29	60	21	39	5	0.57	0.09	0.57	1.77	157	32.52	87	86	47	0	5	1	1
	EVANSVILLE	54	30	65	20	42	4	0.31	-0.54	0.31	1.24	61	39.35	85	86	37	0	6	1	0
KS	FORT WAYNE	45	26	56	21	35	4	0.07	-0.45	0.07	0.69	54	32.08	83						

Weather Data for the Week Ending December 16, 2023

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 DEC 1	PCT. NORMAL SINCE DEC 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
KY	WICHITA	52	31	56	22	41	5	0.94	0.65	0.94	0.94	139	28.73	85	85	47	0	4	1	1
	LEXINGTON	51	30	59	24	40	2	0.00	-1.01	0.00	1.44	63	39.81	83	70	40	0	5	0	0
	LOUISVILLE	54	32	60	30	43	3	0.17	-0.78	0.17	1.08	49	37.74	81	75	33	0	5	1	0
LA	PADUCAH	56	31	62	24	44	4	0.34	-0.64	0.34	1.25	55	53.45	110	90	34	0	6	1	0
	BATON ROUGE	67	42	72	32	55	0	1.06	-0.07	0.96	4.81	194	47.13	79	84	36	0	1	2	1
	LAKE CHARLES	65	41	72	32	53	-2	0.41	-0.54	0.35	1.13	51	41.39	72	88	45	0	1	3	0
MA	NEW ORLEANS	64	50	69	42	57	0	2.08	1.09	1.61	7.37	330	37.36	61	86	45	0	0	2	1
	SHREVEPORT	64	39	70	30	52	2	***	***	***	***	***	***	83	32	0	1	***	***	
	BOSTON	51	35	62	28	43	7	1.95	0.96	1.30	2.87	124	44.38	106	76	48	0	3	2	2
MD	WORCESTER	46	31	60	21	39	8	2.42	1.41	1.63	3.37	144	59.09	127	77	50	0	5	2	2
	BALTIMORE	54	29	61	23	42	3	1.93	1.04	1.54	2.65	131	37.42	86	84	40	0	5	2	1
	CARIBOU	35	20	42	8	28	7	1.84	0.98	1.02	2.09	107	38.11	97	88	67	0	6	4	2
MI	PORTLAND	45	27	53	18	36	5	2.44	1.41	1.80	3.27	136	51.75	112	87	54	0	6	2	2
	ALPENA	42	28	53	17	35	7	0.16	-0.26	0.08	0.49	48	28.23	98	87	55	0	5	3	0
	GRAND RAPIDS	44	29	53	22	37	6	0.05	-0.49	0.04	0.87	66	34.21	89	86	53	0	6	2	0
MN	HOUGHTON LAKE	33	27	38	27	30	3	0.05	-0.24	0.05	0.10	14	19.62	90	84	74	0	2	1	0
	LANSING	43	29	55	23	36	6	0.06	-0.34	0.04	0.96	96	35.03	108	81	50	0	6	2	0
	MUSKEGON	46	37	55	32	42	9	0.14	-0.41	0.08	0.82	62	29.97	88	75	52	0	1	2	0
MO	TRAVERSE CITY	44	31	52	23	37	8	0.03	-0.39	0.02	0.43	42	23.38	82	81	50	0	5	2	0
	DULUTH	34	22	49	13	28	10	0.93	0.60	0.78	1.09	136	32.65	107	87	65	0	6	2	1
	INT'L FALLS	33	19	52	4	26	13	0.06	-0.16	0.04	0.07	13	22.74	91	92	64	0	7	2	0
MS	MINNEAPOLIS	38	28	52	21	33	10	0.49	0.22	0.35	0.62	96	27.50	88	75	56	0	5	3	0
	ROCHESTER	38	22	51	13	30	8	0.06	-0.24	0.04	0.08	11	28.22	82	87	60	0	6	2	0
	ST. CLOUD	37	25	53	18	31	13	0.80	0.61	0.45	0.92	198	25.23	89	83	60	0	5	2	0
MT	COLUMBIA	52	33	62	26	42	6	0.16	-0.30	0.12	1.69	156	32.30	79	82	44	0	5	2	0
	KANSAS CITY	49	32	55	23	41	7	0.73	0.36	0.59	1.22	139	33.47	86	84	48	0	5	2	1
	SAINT LOUIS	54	34	63	28	44	7	0.31	-0.22	0.31	1.04	83	30.89	76	68	36	0	4	1	0
NC	SPRINGFIELD	54	33	60	26	44	6	0.19	-0.39	0.14	0.26	19	41.94	96	82	41	0	3	2	0
	JACKSON	64	37	70	27	50	1	0.15	-0.98	0.14	1.78	70	38.48	70	84	34	0	3	2	0
	MERIDIAN	63	36	67	28	49	-1	0.33	-0.87	0.31	1.62	61	52.95	97	89	34	0	4	2	0
ND	TUPELO	61	34	68	27	47	1	0.04	-1.41	0.04	1.46	44	44.96	81	84	31	0	3	1	0
	BILLINGS	47	27	54	24	37	10	0.04	-0.08	0.04	0.12	41	16.65	118	77	38	0	7	1	0
	BUTTE	37	13	43	5	25	6	0.01	-0.09	0.01	0.16	63	17.46	139	91	57	0	7	1	0
NE	CUT BANK	48	23	58	12	36	13	0.00	-0.06	0.00	0.02	13	7.83	73	75	33	0	6	0	0
	GLASGOW	44	19	53	16	31	12	0.00	-0.09	0.00	0.08	39	12.81	97	86	40	0	7	0	0
	GREAT FALLS	46	27	52	18	37	11	0.07	-0.04	0.07	0.07	26	17.15	118	78	41	0	5	1	0
NH	HAVRE	44	19	52	15	32	10	0.00	-0.07	0.00	0.12	67	11.24	96	90	44	0	7	0	0
	MISSOULA	33	23	37	17	28	4	0.26	0.03	0.23	0.43	79	12.91	95	94	80	0	7	3	0
	ASHEVILLE	53	27	57	23	40	-2	2.08	1.09	2.05	3.52	160	35.18	73	88	37	0	6	2	1
NJ	CHARLOTTE	57	32	63	27	44	-1	2.19	1.37	2.19	2.42	137	41.23	98	87	38	0	6	1	1
	GREENSBORO	55	29	61	25	42	-1	3.13	2.40	3.02	3.44	210	41.04	96	84	39	0	6	2	1
	HATTERAS	59	44	71	37	51	-1	2.43	1.32	1.37	2.89	118	45.33	76	89	54	0	0	2	2
NM	RALEIGH	58	32	68	27	45	0	2.74	1.97	2.50	2.89	171	40.43	91	84	37	0	5	2	1
	WILMINGTON	60	34	71	29	47	-3	1.69	0.83	1.29	1.72	92	51.51	88	86	40	0	5	2	1
	BISMARCK	34	13	40	6	24	5	0.01	-0.12	0.01	0.22	73	20.17	107	95	67	0	7	1	0
NV	DICKINSON	38	17	45	6	27	7	0.00	-0.04	0.00	0.15	165	14.78	95	93	61	0	7	0	0
	FARGO	36	23	49	10	30	13	0.09	-0.10	0.07	0.15	33	18.87	80	82	67	0	6	2	0
	GRAND FORKS	30	16	38	4	23	9	0.01	-0.13	0.01	0.24	71	14.05	65	88	70	0	7	1	0
NY	JAMESTOWN	36	17	50	10	27	10	0.00	-0.07	0.00	0.09	53	15.98	81	87	59	0	7	0	0
	GRAND ISLAND	45	24	57	18	34	5	0.48	0.29	0.29	0.56	121	14.81	56	85	51	0	6	2	0
	LINCOLN	46	25	53	18	35	6	0.53	0.25	0.44	0.76	119	19.05	66	86	49	0	6	3	0
OH	NORFOLK	44	24	54	18	34	8	0.10	-0.09	0.07	0.10	21	24.95	94	88	51	0	6	2	0
	NORTH PLATTE	47	19	57	11	33	5	0.05	-0.05	0.05	0.05	23	20.93	100	89	38	0	6	1	0
	OMAHA	44	25	52	19	35	5	0.29	0.00	0.24	0.29	42	23.37	74	89	50	0	5	2	0
PA	SCOTTSBLUFF	48	21	58	17	35	7	0.03	-0.09	0.02	0.08	31	19.53	126	88	41	0	7	2	0
	VALENTINE	44	20	53	12	32	6	0.01	-0.09	0.01	0.01	4	30.89	149	91	47	0	6	1	0
	CONCORD	45	26	52	20	36	7	1.87	1.02	1.28	2.77	139	37.35	92	90	51	0	6	2	2
RI	ATLANTIC CITY	53	31	64	22	42	2	2.05	0.98	1.74	2.72	113	37.33	85	85	44	0	5	2	1
	NEWARK	53	36	64	32	44	6	1.35	0.39	1.04	2.45	111	45.59	102	76	43	0	3	2	1
	ALBUQUERQUE	48	31	51	21	40	3	0.51	0.39	0.51	0.51	178	4.81	55	72	36	0	3	1	1
SD	ELY	49	14	57	10	32	6	0.00	-0.15	0.00	0.04	11	11.43	126	81	28	0	7	0	0
	LAS VEGAS	61	42	65	38	51	3	0.00	-0.09	0.00	0.00	0	4.15	106	38	18	0	0	0	0
	RENO	48	24	51	20	36	-1	0.00	-0.23	0.00	0.00	0	10.09	149	81	40	0	7	0	0
TN	WINNEMUCCA	45	18	49	13	31	1	0.00	-0.24	0.00	0.26	52	8.32	119	87	47	0	7	0	0
	ALBANY	47	29	56	19	38	7	1.46	0.70	0.95	2.45	138	43.37	110	81	51	0	4	2	2
	BINGHAMTON	42	29	53	23	35	7	1.16	0.46	0.94	2.32	139	41.64	102	82	59	0	5	2	1
TX	BUFFALO	45	32	55	24	38	6	0.43	-0.43	0.42	1.78	91	37.41	96	83	56	0	4	2	0
	ROCHESTER	47	34	56	24	40	8	0.15	-0.											

Weather Data for the Week Ending December 16, 2023

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 DEC 1	PCT. NORMAL SINCE DEC 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	47	28	58	23	38	5	0.00	-0.52	0.00	0.84	67	29.91	88	79	44	0	5	0	0
	YOUNGSTOWN	47	29	56	24	38	5	0.03	-0.68	0.02	0.74	45	33.95	85	81	46	0	6	2	0
	OKLAHOMA CITY	56	35	60	23	46	5	0.95	0.52	0.94	0.95	99	34.00	95	77	38	0	2	2	1
OR	TULSA	57	32	63	26	45	3	0.41	-0.17	0.41	0.41	31	35.47	89	82	34	0	5	1	0
	ASTORIA	54	41	56	34	47	4	0.95	-1.41	0.64	9.48	171	54.78	84	95	67	0	0	2	1
	BURNS	36	28	40	22	32	6	0.58	0.24	0.33	1.26	161	13.31	137	93	77	0	6	2	0
PA	EUGENE	48	40	54	35	44	3	0.49	-1.14	0.47	5.27	137	27.13	72	97	83	0	0	2	0
	MEDFORD	53	34	60	28	43	4	0.02	-0.78	0.02	1.74	94	12.53	74	95	58	0	4	1	0
	PENDLETON	43	34	52	30	39	5	0.35	0.03	0.29	1.07	141	9.60	79	95	78	0	4	3	0
	PORTLAND	52	40	54	30	46	5	0.99	-0.31	0.90	6.82	221	33.52	98	87	62	0	1	3	1
	SALEM	49	37	54	29	43	2	0.82	-0.76	0.80	6.11	166	34.52	94	97	75	0	2	2	1
	ALLENTOWN	49	28	59	22	38	3	2.01	1.09	1.70	2.78	129	40.15	88	85	47	0	5	2	1
	ERIE	47	31	56	25	39	4	0.10	-0.86	0.09	1.69	78	40.42	98	76	46	0	3	2	0
	MIDDLETOWN	50	28	59	24	39	3	1.16	0.35	0.99	1.77	94	34.13	80	84	45	0	6	2	1
	PHILADELPHIA	52	34	63	29	43	4	2.07	1.12	1.78	3.18	147	37.11	87	83	43	0	4	2	1
	PITTSBURGH	50	29	61	22	40	5	0.00	-0.63	0.00	0.83	56	29.14	76	77	41	0	6	0	0
RI	WILKES-BARRE	46	30	56	26	38	4	1.54	0.89	1.26	2.02	132	41.60	111	78	50	0	4	2	1
	WILLIAMSPORT	48	28	57	22	38	5	1.12	0.35	0.98	1.97	107	38.09	90	88	46	0	5	2	1
	PROVIDENCE	51	30	62	25	41	5	2.10	1.02	1.37	2.81	109	52.65	115	90	47	0	5	2	2
	CHARLESTON	65	40	78	32	52	0	0.31	-0.48	0.15	0.31	18	47.00	92	80	35	0	1	3	0
	COLUMBIA	60	31	70	25	46	-2	0.81	-0.05	0.81	0.81	45	50.89	117	98	36	0	6	1	1
SD	FLORENCE	60	32	75	26	46	-3	0.66	-0.15	0.52	0.69	42	38.11	87	87	38	0	6	2	1
	GREENVILLE	57	30	62	25	43	-2	0.87	-0.20	0.87	1.81	77	47.36	99	84	31	0	6	1	1
	ABERDEEN	39	18	51	9	29	10	0.07	-0.06	0.04	0.10	33	21.86	101	90	64	0	7	2	0
TN	HURON	41	22	50	9	31	10	0.03	-0.11	0.03	0.03	9	17.41	75	90	59	0	6	1	0
	RAPID CITY	46	14	53	1	30	4	0.00	-0.08	0.00	0.00	0	20.59	119	94	44	0	7	0	0
	SIOUX FALLS	44	24	53	14	34	11	0.04	-0.14	0.04	0.04	8	16.85	61	81	49	0	6	1	0
	BRISTOL	54	24	61	20	39	0	1.29	0.37	1.29	3.13	151	38.43	90	92	41	0	6	1	1
	CHATTANOOGA	57	31	61	27	44	0	0.58	-0.67	0.51	3.73	130	44.48	84	91	37	0	5	2	1
TX	KNOXVILLE	55	30	59	25	42	0	1.02	-0.19	1.02	4.76	173	45.15	90	90	41	0	6	1	1
	MEMPHIS	60	37	68	29	49	4	0.04	-1.26	0.04	1.26	42	52.57	100	77	31	0	2	1	0
	NASHVILLE	58	31	63	27	45	1	0.13	-0.95	0.13	1.64	66	35.97	74	83	32	0	6	1	0
	ABILENE	61	39	68	24	50	2	1.02	0.72	0.77	1.04	159	22.25	90	80	41	0	1	3	1
	AMARILLO	53	30	60	17	42	3	1.19	1.02	0.75	1.20	347	16.85	87	86	43	0	4	2	1
	AUSTIN	63	42	68	31	53	-1	0.53	-0.08	0.45	0.53	38	23.62	67	85	41	0	1	3	0
	BEAUMONT	66	44	72	32	55	-1	0.52	-0.60	0.52	0.95	37	36.69	61	84	39	0	1	1	1
	BROWNSVILLE	73	56	82	40	65	0	0.09	-0.17	0.04	0.09	15	20.85	79	94	57	0	0	5	0
	CORPUS CHRISTI	69	51	72	35	60	0	0.39	-0.06	0.20	0.48	48	26.20	85	88	55	0	0	3	0
	DEL RIO	65	46	71	34	56	2	0.41	0.24	0.24	0.41	107	14.52	74	88	45	0	0	3	0
UT	EL PASO	63	35	68	23	49	3	0.00	-0.17	0.00	0.02	5	4.04	47	57	19	0	2	0	0
	FORT WORTH	61	41	65	35	51	3	0.60	-0.06	0.60	0.60	41	25.30	71	69	35	0	0	1	1
	GALVESTON	65	55	68	44	60	1	0.57	-0.43	0.55	1.93	81	27.42	60	81	54	0	0	2	1
	HOUSTON	65	45	73	33	55	-1	1.06	0.13	0.99	1.65	77	39.93	79	89	43	0	0	3	1
	LUBBOCK	55	31	63	19	43	1	0.58	0.40	0.53	0.58	153	16.46	91	88	47	0	4	2	1
	MIDLAND	57	35	66	26	46	0	0.17	0.04	0.09	0.17	55	7.02	52	89	54	0	2	3	0
	SAN ANGELO	61	37	68	28	49	0	1.33	1.12	1.18	1.37	300	18.37	89	87	48	0	3	3	1
	SAN ANTONIO	64	43	69	31	54	0	0.33	-0.14	0.19	0.36	33	18.88	60	87	48	0	1	2	0
	VICTORIA	68	46	73	32	57	0	0.14	-0.38	0.12	0.19	15	29.35	74	89	48	0	1	3	0
	WACO	62	36	69	26	49	-1	0.38	-0.25	0.38	0.38	27	26.17	74	84	39	0	2	1	0
VA	WICHITA FALLS	60	37	66	26	48	5	1.00	0.62	1.00	1.04	119	21.24	78	77	37	0	2	1	1
	SALT LAKE CITY	44	28	48	26	36	4	0.00	-0.32	0.00	0.74	101	17.33	116	91	53	0	7	0	0
	LYNCHBURG	54	25	60	19	40	0	2.30	1.45	2.18	2.94	151	40.91	99	89	38	0	6	2	1
WV	NORFOLK	55	35	72	29	45	-1	2.13	1.37	1.19	2.28	137	44.38	93	86	47	0	2	2	2
	RICHMOND	57	30	67	26	43	1	3.47	2.65	2.84	4.22	225	38.19	87	85	39	0	6	2	2
	ROANOKE	55	30	61	26	42	1	1.20	0.46	1.20	1.79	103	30.61	73	75	36	0	6	1	1
	WASH/DULLES	54	27	61	23	40	2	1.74	0.96	1.46	2.43	134	31.32	75	86	39	0	6	2	1
	BURLINGTON	42	27	54	17	35	6	1.52	0.94	0.97	2.51	184	40.84	112	88	54	0	6	4	2
	OLYMPIA	52	39	55	32	45	7	0.67	-1.05	0.52	8.70	213	38.97	83	92	73	0	1	2	1
	QUILLAYUTE	54	39	57	33	46	6	1.45	-1.59	0.61	10.00	140	76.52	80	86	73	0	0	4	1
	SEATTLE-TACOMA	49	39	53	34	44	2	0.30	-0.96	0.17	6.53	220	32.66	89	94	68	0	0	2	0
	SPOKANE	37	31	40	27	34	5	0.59	0.07	0.58	2.88	238	13.00	84	96	80	0	4	2	1
	YAKIMA	44	36	47	32	40	9	0.04	-0.28	0.02	0.98	140	6.50	89	92	69	0	1	2	0
WI	EAU CLAIRE	38	24	52	17	31	10	0.29	-0.02	0.20	0.39	52	25.07	77	85	59	0	6	2	0
	GREEN BAY	39	27	49	21	33	8	0.09	-0.30	0.05	0.55	57	24.81	80	83	60	0	5	2	0
	LA CROSSE	41	26	51	19	33	8	0.11	-0.23	0.11	0.30	36	22.69	65	80	53	0	6	1	0
WY	MADISON	41	25	51	14	33	7	0.13	-0.24	0.13	0.71	75	28.41	77	82	51	0	6	1	0
	MILWAUKEE	44	31	54	26	38	8	0.24	-0.19	0.24	1.34	128	32.15	95	73	45	0	4	1	0
	BECKLEY	47	26	56	21	36	0	0.88	0.08	0.88	1.77	98	39.12	93	76	44	0	6	1	1
	CHARLESTON	53																		

Autumn Weather Review

Weather summary provided by USDA/WAOB

Highlights: The tropics remained active in September and October, with U.S. impacts occurring from cyclones in both the Atlantic and Pacific Basins. Post-Tropical Cyclone Idalia moved away from the mainland U.S. in early September, with diminishing impacts along the Atlantic Coast. About 2 weeks later, former Hurricane Lee passed just east of Maine, with mostly minor wind- and rainfall-related impacts in parts of New England. Later, short-lived Tropical Storm Ophelia made landfall near Emerald Isle, NC, on September 23. Even after Ophelia's dissipation, lingering rain along the Atlantic Coast resulted in locally extensive flooding on September 29 in the New York City metropolitan area. In October, the tropical focus shifted to the Pacific Ocean, where four cyclones contributed to U.S. rainfall. On October 9 and 10, respectively, Tropical Storm Max and Hurricane Lidia made landfall on Mexico's Pacific Coast, with residual rainfall eventually reaching the southern U.S., from southern Texas to the southern Atlantic Coast. Later in October, a tropically enhanced plume of moisture racing northeastward in advance of a cold front led to significant rainfall from Texas into the Great Lakes States. The front entrained moisture associated with the terrain-shredded remnants of Hurricanes Norma and Otis, both of which made landfall in Mexico.

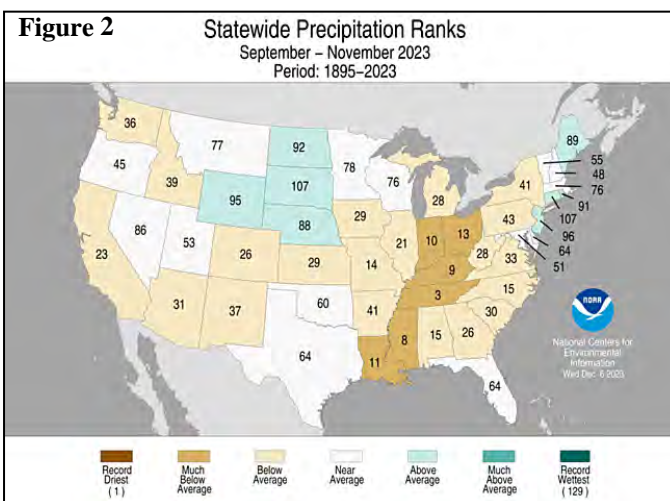
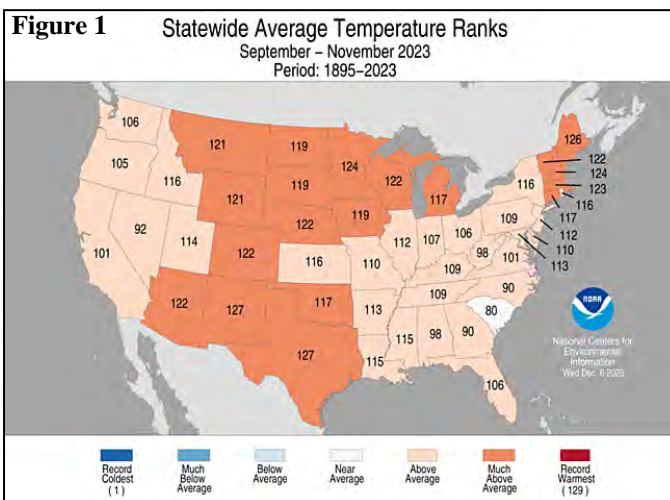
Despite autumn warmth dominating the country, cold weather made periodic appearances, especially in late October. Still, the lack of sustained cold conditions allowed most summer crops to dry down without freeze-related concerns. By the time sub-freezing temperatures engulfed the country—excluding warmer areas of the Far West, Desert Southwest, and Deep South—crops were largely mature or had already been harvested. Meanwhile, winter wheat planting and emergence proceeded roughly on schedule, although pockets of drought resulted in uneven stands across parts of the Plains and Northwest. Nationally, wheat headed into dormancy in its best overall shape in 4 years, since autumn 2019.

According to the *U.S. Drought Monitor*, drought coverage across the Lower 48 States increased from a 3-year low of 19 percent at the end of May to 40 percent for several weeks in October. By November 29, national drought coverage had dipped to 36 percent. On that date, extreme to exceptional drought (D3 to D3) covered parts of 20 contiguous states, including 89 percent of Mississippi, 87 percent of Louisiana, 43 percent of New Mexico, 35 percent of Tennessee, 33 percent of Alabama, and 27 percent of Iowa. During much of the autumn of 2023, worsening drought gripped the Southeast, although some relief arrived in late November. Elsewhere, drought developed or intensified in parts of the Southwest and lower Midwest, while improving conditions were noted across portions of the nation's norther tier and much of an area broadly extending from Texas into the upper Great Lakes region.

Historical Perspective: According to preliminary data provided by the National Centers for Environmental Information, the autumn of 2023 featured warmer- and drier-than-normal conditions across much of the country. The contiguous U.S. experienced its sixth-warmest autumn, with warmer September–November periods occurring in 1963, 1998, 2015, 2016, and 2021. The nation's autumn average temperature of

56.08°F was 2.53°F above the 20th century mean. Meanwhile, autumn precipitation averaged 5.35 inches, just 82 percent of the 1901–2000 mean of 6.88 inches. It was the nation's driest autumn since 1999, and before that, 1956.

All states ranked in the upper half of the autumn temperature distribution (figure 1). South Carolina, with its 50th-warmest autumn, was the “coolest” state. Top-ten rankings for September–November warmth covered thirteen states, led by New Mexico and Texas—both third warmest. Joining New Mexico and Texas on the top-ten list for autumn warmth were eleven states: four in New England (MA, ME, NH, and VT) and seven across the Rockies, Plains, Midwest, and Southwest (AZ, CO, MN, MT, NE, WI, and WY). Meanwhile, state precipitation rankings ranged from top-ten autumn dryness in Indiana, Kentucky, Mississippi, and Tennessee, to the 23rd-wettest autumn in Massachusetts and South Dakota (figure 2).



September: Late-season warmth in New England and between the Rockies and the Appalachians was generally sandwiched between cool conditions in the Far West and parts of the southern Atlantic States. September temperatures averaged 4 to 6°F above normal in many locations across

Texas and environs, while readings averaged at least 2 to 4°F above normal across parts of the northern Plains, upper Midwest, and northern New England. It was the warmest September on record in Texas locations such as Austin, Corpus Christi, Del Rio, Laredo, San Antonio, and Victoria. In addition, the warmth prevented freezes from reaching any of the nation's key agricultural regions through the end of September. Meanwhile, cooler-than-normal conditions were prominent in much of California and the Great Basin, where monthly temperatures locally averaged more than 4°F below normal.

Warmth across the Plains, Midwest, and South promoted a rapid pace of summer crop maturation, as well as early-season harvest efforts. By October 1, most (86 percent) of the U.S. soybeans were dropping leaves, according to USDA/NASS, while 82 percent of the corn was fully mature. On the same date, harvest was 23 percent complete for both crops. In the South, 75 percent of the U.S. rice was harvested by October 1, ahead of the 5-year average of 69 percent. In drier areas, however, crop conditions were less than optimal, with 17 percent of the nation's corn, 18 percent of the soybeans, 27 percent of the sorghum, and 43 percent of the cotton rated in very poor to poor condition as October began. Texas led the nation on October 1 with 65 percent of its cotton rated very poor to poor.

Meanwhile, winter wheat planting—40 percent complete, nationally, by October 1—began during September under mixed conditions, with some areas having adequate moisture for germination and establishment, and others contending with significant drought. By September 26, nearly one-half (47 percent) of the nation's winter wheat production area was experiencing drought, according to the U.S. Drought Monitor. On October 1, at least one-half of the rangeland and pastures were rated in very poor to poor condition in seven states, led by Washington (76 percent) and Texas (73 percent). Other states on that list were Louisiana and Minnesota, both at 65 percent, along with Oregon (54 percent), Kansas (51 percent), and Mississippi (50 percent). Similarly, topsoil moisture was rated at least one-half very short to short in 20 states, mainly across the Plains, Northwest, and Mississippi and Ohio Valleys, helping to push the national value to 55 percent very short to short by October 1. By late September into October, lack of runoff into the Mississippi River basin lowered water levels to record values from where the Ohio River enters the Mississippi River, downstream to the Mississippi Delta.

As September began, Idalia recovery efforts continued in Florida's Big Bend, where the cyclone had moved ashore on the morning of August 30 as a Category 3 hurricane, with sustained winds near 125 mph. About 2 weeks later, former Category 5 Hurricane Lee reached the Canadian Maritimes, first reaching land on Long Island in Nova Scotia on the afternoon of September 16, approximately 50 miles east-southeast of Eastport, ME, with sustained winds near 70 mph. Wind gusts associated with Lee topped 50 mph in parts of coastal New England, while rainfall exceeded 2 inches in portions of eastern Maine. Finally, Tropical Storm Ophelia made landfall near Emerald Isle, NC, just before daybreak on September 23, with sustained winds near 70 mph. Less than 18 hours after moving ashore, Ophelia had lost most of its tropical characteristics and was re-classified as a post-tropical cyclone. Still, the short-lived storm produced as much as 4 to 8 inches of rain in the middle Atlantic coastal plain, as well as wind gusts from 50 to 70 mph. Even after Ophelia's

dissipation, cool, cloudy weather lingered for days along portions of the Atlantic Coast.

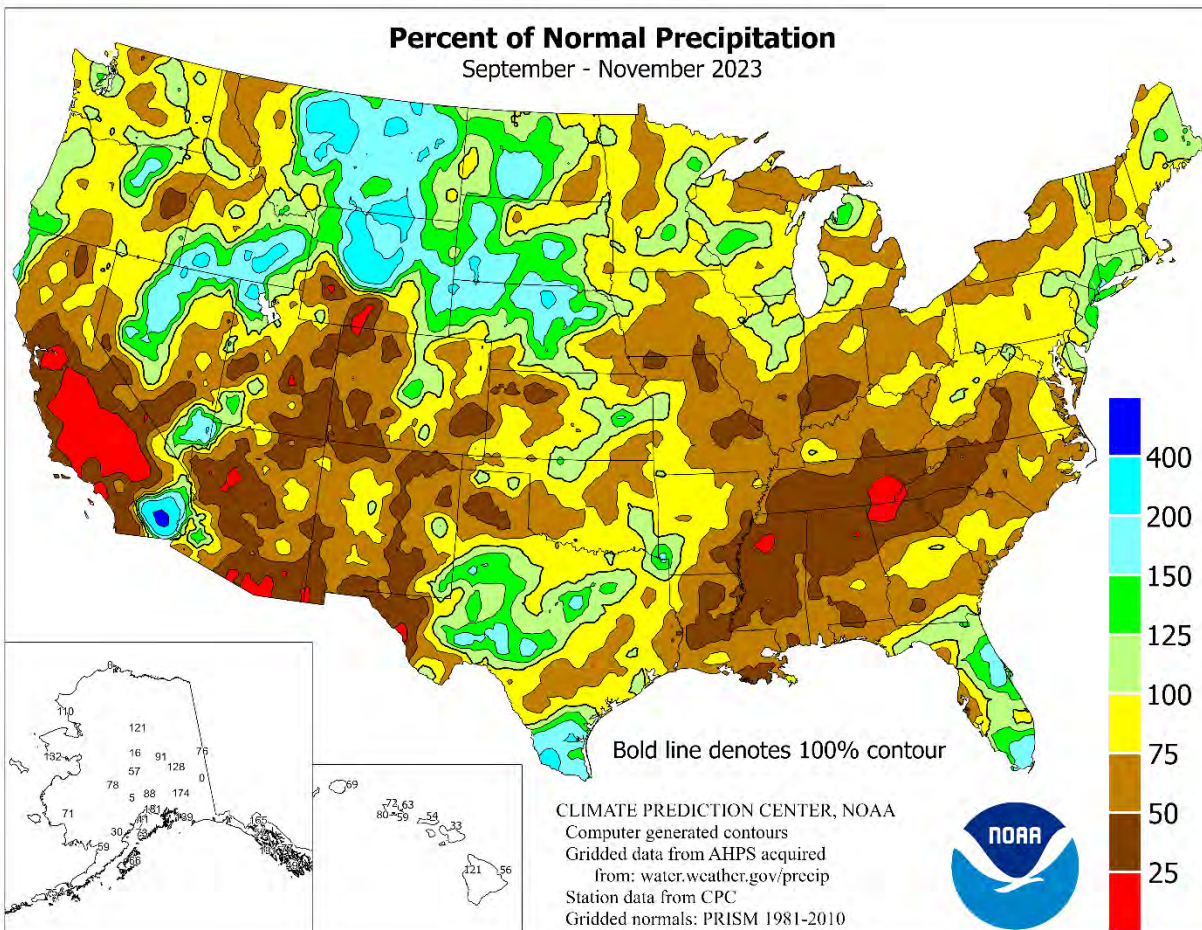
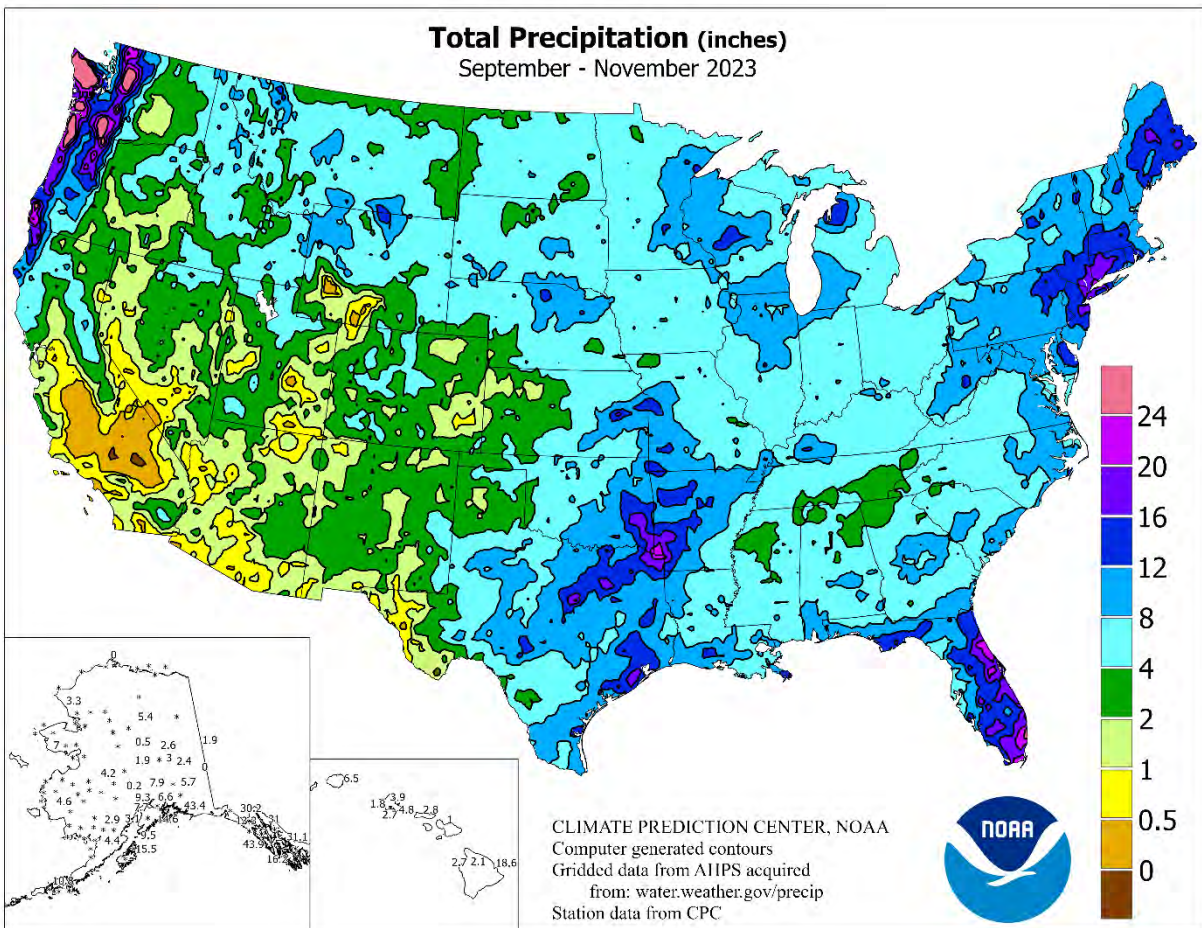
October: Much of October was quite warm, with temperatures averaging more than 5°F above normal in parts of northern New England, although dramatic, late-month changes led to cold air overspreading much of the country. Despite the sudden transition to colder conditions (and freezes into the Deep South), there were relatively few agricultural impacts, as most summer crops were either fully mature or had already been harvested. For example, 85 percent of the U.S. soybeans had been harvested by October 29, along with 71 percent of the corn. Both harvest numbers were ahead of the respective 5-year averages of 78 and 66 percent. Parts of the central and northwestern U.S. received late-month snow, with mixed impacts. In areas where the heaviest snow fell and the coldest weather occurred, mainly from Montana into North Dakota, there was a temporary increase in livestock stress. However, the snow—which also blanketed portions of the central High Plains and upper Midwest—provided moisture and insulation for emerging winter wheat. By October 29, nearly one-half (47 percent) of the nation's winter wheat was rated in good to excellent condition, a significant improvement from last year's value of 28 percent—and wheat's best start to the autumn growing season since 2019.

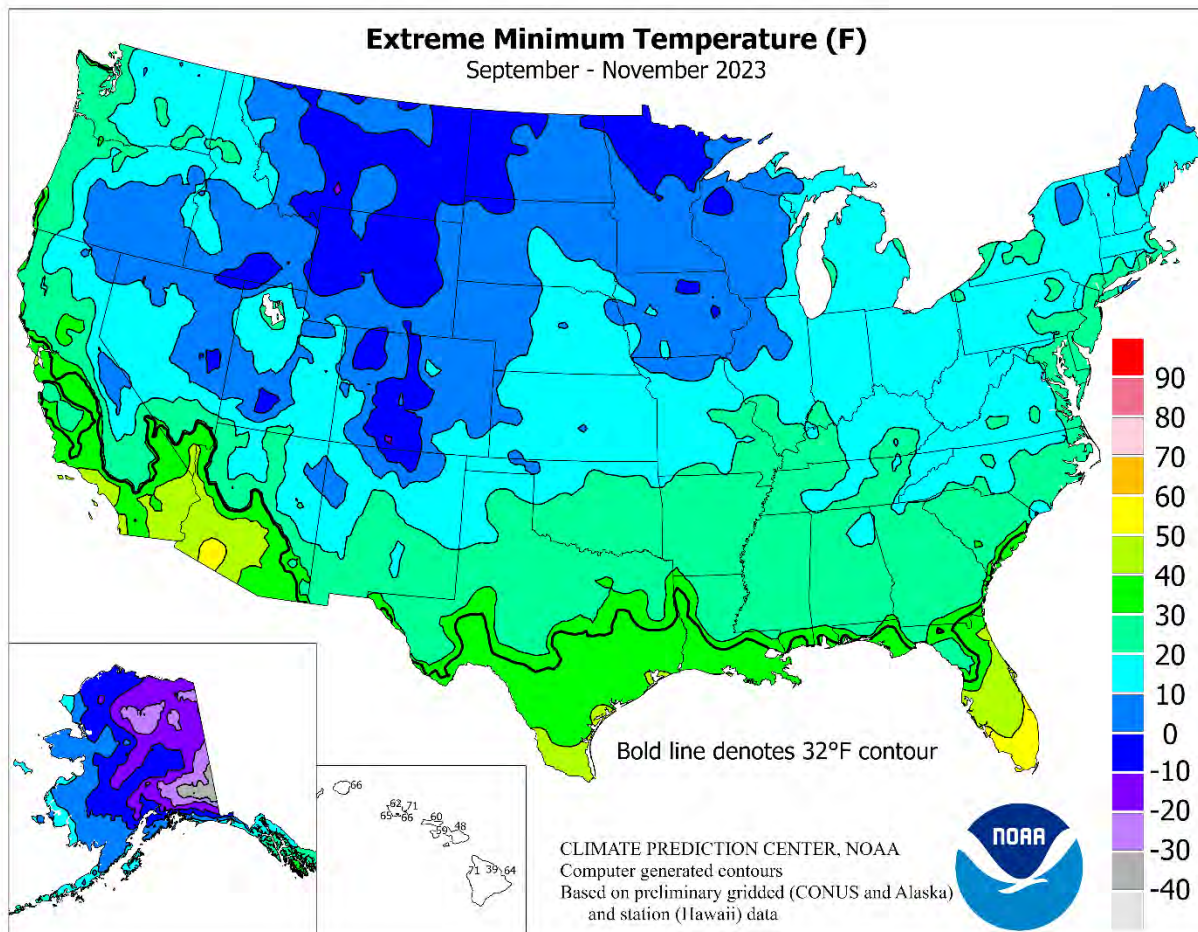
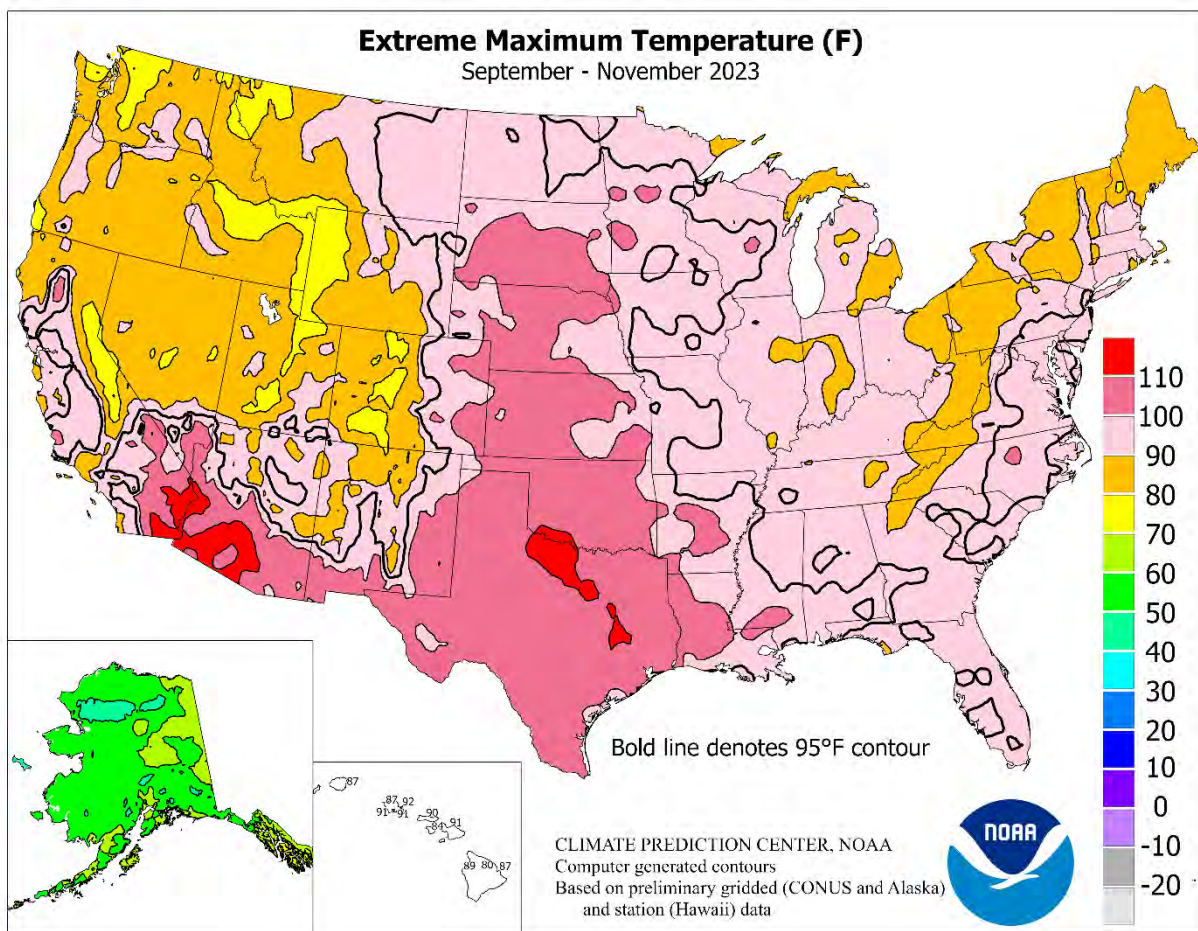
For most of the month, drier-than-normal weather dominated the southern half of the U.S. In fact, negligible precipitation fell in numerous Southeastern communities that typically receive 3 to 4 inches of October rainfall. The list of places receiving October rainfall totaling less than 0.50 inch included many observation sites in Alabama (Birmingham, Huntsville, Muscle Shoals, and Tuscaloosa), Mississippi (Greenwood, Jackson, Tupelo, and Vicksburg), and Tennessee (Chattanooga and Crossville). By October 29, more than 60 percent of the rangeland and pastures were rated in very poor to poor condition in Texas, Louisiana, Mississippi, and Alabama, with freezes in early November burning back grass growth that had already been curtailed by drought.

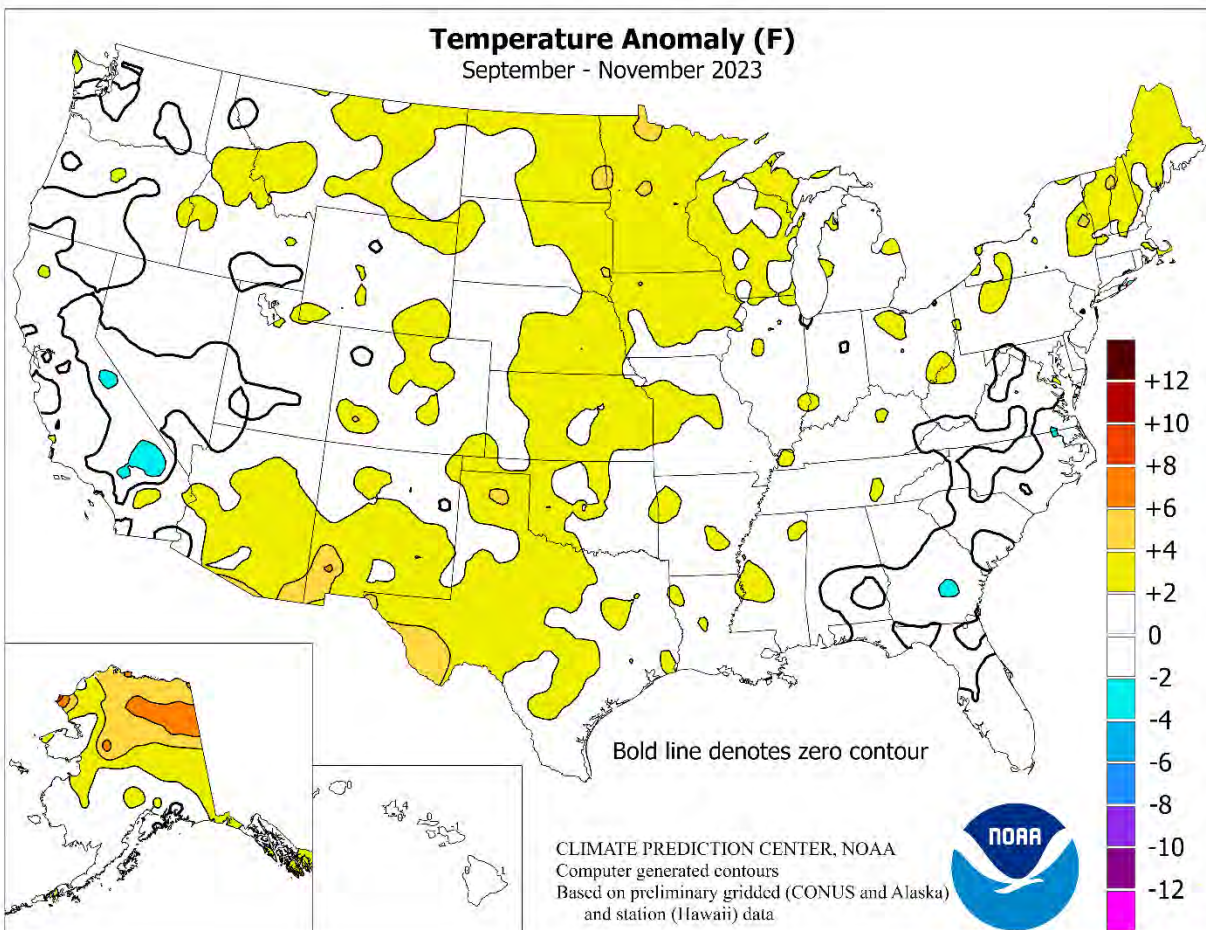
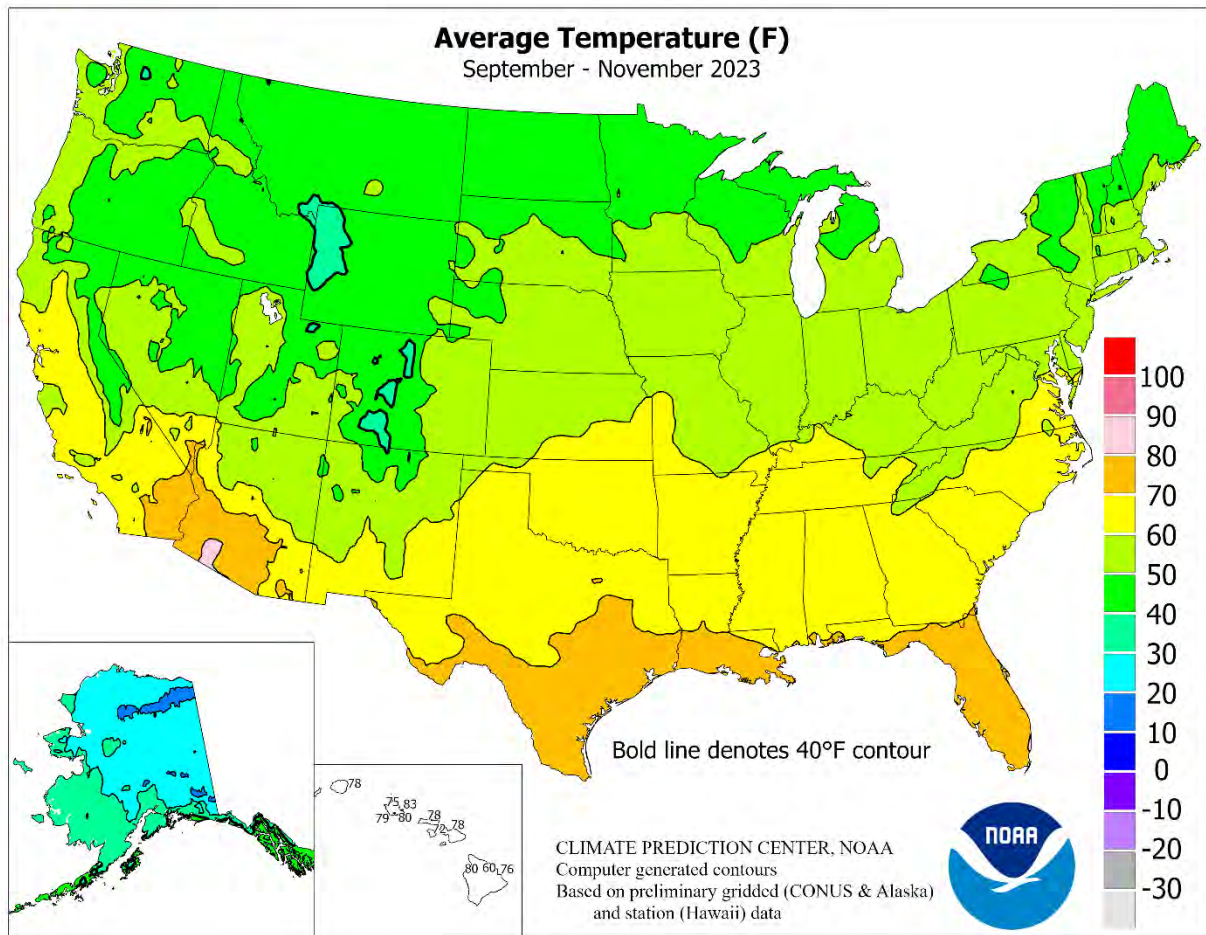
Late in the month, however, a tropically enhanced plume of moisture spreading northward in advance of a cold front led to a band of significant rainfall from Texas into portions of the Great Lakes States. The front entrained moisture associated with the remnants of eastern Pacific Hurricanes Norma and Otis—both of which made landfall in Mexico. Earlier in the month, two other tropical cyclones—Tropical Storm Max and Hurricane Lidia—had also made landfall (on October 9 and 10, respectively) on the Pacific Coast of Mexico, with residual tropical moisture eventually reaching parts of the southern U.S., from southern Texas to the southern Atlantic Coast.

Despite October precipitation, lingering drought impacts were apparent in rangeland and pasture conditions across parts of the central Plains, Midwest, and Northwest, with at least one-half rated in very poor to poor condition on October 29 in Washington (69 percent), Kansas (55 percent), Missouri (52 percent), Minnesota (52 percent), and Oregon (50 percent). Conversely, rangeland and pastures were rated at least one-half good to excellent on that date in several areas, including Florida (50 percent); seven states from Nevada to the northern Plains, led by Wyoming (72 percent); and nine states from the Ohio Valley into New England.

November: A complete summary appeared in the *Weekly Weather and Crop Bulletin* dated December 12, 2023.







National Weather Data for Selected Cities

September - November 2023

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	38	2	9.65	3.54												
	BARROW	26	0	0.00	-1.69	KY	WICHITA	61	2	9.94	2.68		TOLEDO	55	0	5.39	-2.78
	FAIRBANKS	29	4	2.59	-0.26		LEXINGTON	60	2	4.89	-5.56		YOUNGSTOWN	54	1	6.12	-4.02
	JUNEAU	44	2	31.01	6.89		LOUISVILLE	62	2	4.98	-5.83	OK	OKLAHOMA CITY	64	3	7.65	-1.07
	KODIAK	43	0	15.51	-7.95		PADUCAH	61	2	5.93	-5.71		TULSA	63	1	9.47	-0.81
	NOME	31	1	7.01	1.70	LA	BATON ROUGE	72	3	8.13	-5.03	OR	ASTORIA	54	1	14.84	-5.63
AL	BIRMINGHAM	66	1	3.16	-8.41		LAKE CHARLES	72	1	9.71	-4.39		BURNS	47	1	1.78	-0.38
	HUNTSVILLE	64	1	3.61	-7.69		NEW ORLEANS	73	1	8.03	-4.65		EUGENE	55	1	7.33	-3.20
	MOBILE	70	1	9.01	-4.85	MA	SHREVEPORT	70	3	***	***		MEDFORD	57	1	5.10	0.78
	MONTGOMERY	67	0	9.16	-1.24		BOSTON	56	1	6.59	-4.65		PENDELTON	53	2	3.76	0.75
AR	FORT SMITH	66	2	9.89	-2.43		WORCESTER	53	2	13.68	0.59		PORTLAND	57	1	8.98	-1.40
	LITTLE ROCK	67	4	9.28	-2.93	MD	BALTIMORE	60	2	10.06	-1.45		SALEM	55	0	10.35	-0.53
AZ	FLAGSTAFF	50	2	2.14	-2.78	ME	CARIBOU	47	3	9.82	-0.96	PA	ALLENTOWN	54	-1	8.48	-3.74
	PHOENIX	81	4	0.36	-1.35		PORTLAND	52	1	10.85	-2.41		ERIE	55	1	8.44	-4.01
	PRESCOTT	59	1	0.89	-1.89	MI	ALPENA	49	2	5.11	-2.81		MIDDLETOWN	57	1	9.40	-2.20
	TUCSON	75	3	0.80	-1.66		GRAND RAPIDS	52	0	8.29	-2.26		PHILADELPHIA	60	1	9.34	-1.44
CA	BAKERSFIELD	69	1	0.33	-0.50		HOUGHTON LAKE	49	2	4.24	-2.88		PITTSBURGH	56	2	6.11	-2.89
	EUREKA	55	1	7.29	-0.60		LANSING	52	1	8.64	0.21		WILKES-BARRE	54	0	12.84	2.13
	FRESNO	68	1	0.20	-1.27		MUSKOGON	54	2	8.41	-1.57		WILLIAMSPORT	55	1	6.58	-5.12
	LOS ANGELES	67	0	0.17	-1.24		TRAVERSE CITY	52	2	7.09	-2.12	RI	PROVIDENCE	55	0	12.18	-0.44
	REDDING	65	1	3.83	-2.07	MN	DULUTH	46	3	13.00	4.65	SC	CHARLESTON	68	0	12.08	-0.93
	SACRAMENTO	64	0	1.06	-1.54		INT_L FALLS	45	4	5.83	-0.78		COLUMBIA	65	0	8.98	-0.82
	SAN DIEGO	66	-1	0.49	-0.92		MINNEAPOLIS	53	4	9.96	2.76		FLORENCE	64	-1	5.49	-5.10
	SAN FRANCISCO	64	3	1.41	-1.50		ROCHESTER	51	3	8.31	0.48		GREENVILLE	62	0	2.56	-8.60
	STOCKTON	65	0	0.67	-1.50	MO	ST. CLOUD	50	5	6.56	-0.43	SD	ABERDEEN	49	3	4.75	-0.12
CO	ALAMOSA	45	1	1.31	-0.69		COLUMBIA	59	1	4.31	-5.68		HURON	51	3	6.18	0.98
	CO SPRINGS	54	3	2.45	-0.04		KANSAS CITY	58	2	5.86	-3.43		RAPID CITY	50	2	3.86	0.76
	DENVER INTL	55	3	1.28	-1.70		SAINT LOUIS	62	3	5.76	-3.78		SIOUX FALLS	54	4	3.02	-3.29
	GRAND JUNCTION	55	2	1.31	-1.49		SPRINGFIELD	60	1	9.13	-2.34	TN	BRISTOL	59	2	2.94	-5.54
	PUEBLO	55	2	1.71	-0.17	MS	JACKSON	69	3	2.86	-8.80		CHATTANOOGA	64	2	3.26	-9.36
CT	BRIDGEPORT	56	0	13.73	2.81		MERIDIAN	67	0	3.80	-7.43		KNOXVILLE	62	2	2.90	-7.61
	HARTFORD	55	1	16.89	4.48	MT	TUPELO	66	2	2.86	-9.15		MEMPHIS	67	2	5.82	-5.89
DC	WASHINGTON	62	1	6.85	-3.64		BILLINGS	51	2	2.61	-0.73		NASHVILLE	64	2	4.47	-6.54
DE	WILMINGTON	57	0	9.02	-2.09		BUTTE	42	2	4.11	1.60	TX	ABILENE	70	3	5.48	-1.42
FL	DAYTONA BEACH	74	0	21.57	6.81		CUT BANK	45	3	1.54	-0.54		AMARILLO	62	3	1.34	-2.85
	JACKSONVILLE	70	-1	14.97	1.37		GLASGOW	48	3	2.20	-0.26		AUSTIN	72	1	9.83	-0.45
	KEY WEST	82	1	14.53	-0.42		GREAT FALLS	48	3	4.55	1.47		BEAUMONT	73	2	8.83	-7.23
	MIAMI	81	2	27.49	6.09		HAVRE	47	3	3.17	0.87		BROWNSVILLE	78	1	7.18	-4.13
	ORLANDO	76	1	14.54	2.92	NC	MISSOULA	47	3	3.14	-0.18		CORPUS CHRISTI	76	1	8.42	-2.16
	PENSACOLA	71	0	9.11	-6.62		ASHEVILLE	59	1	3.23	-7.99		DEL RIO	76	4	2.53	-3.08
	TALLAHASSEE	70	0	11.44	0.19		CHARLOTTE	63	1	4.14	-6.04		EL PASO	71	5	1.59	-0.96
	TAMPA	77	0	8.23	-1.60		GREENSBORO	60	0	7.45	-3.50		FORT WORTH	70	3	10.81	1.19
	WEST PALM BEACH	79	1	22.04	4.56		HATTERAS	67	-1	12.19	-5.78		GALVESTON	75	0	9.89	-6.19
GA	ATHENS	64	0	2.97	-8.02		RALEIGH	63	1	9.10	-2.74		HOUSTON	73	1	9.14	-4.90
	ATLANTA	66	1	5.07	-6.01	ND	WILMINGTON	65	-1	8.02	-8.89		LUBBOCK	64	3	6.89	2.01
	AUGUSTA	64	-2	11.44	2.63		BISMARCK	47	3	4.83	1.00		MIDLAND	67	2	5.09	1.49
	COLUMBUS	67	-1	7.20	-2.87		DICKINSON	46	2	3.73	0.46		SAN ANGELO	69	2	7.88	1.79
	MACON	65	-1	5.40	-4.26		FARGO	50	5	3.59	-2.22		SAN ANTONIO	74	3	4.91	-4.80
	SAVANNAH	68	0	3.89	-6.57		GRAND FORKS	47	4	4.89	-0.18		VICTORIA	74	2	11.16	-0.27
HI	HILO	76	1	18.56	-14.77	NE	JAMESTOWN	48	3	3.74	-0.41		WACO	70	2	10.12	0.13
	HONOLULU	80	0	2.75	-1.89		GRAND ISLAND	56	3	3.07	-2.02		WICHITA FALLS	68	3	5.69	-1.80
	KAHULUI	78	-1	1.01	-2.08		LINCOLN	56	3	2.45	-3.89	UT	SALT LAKE CITY	57	2	4.22	0.58
	LIHUE	78	0	6.53	-2.96		NORFOLK	55	4	9.33	3.59	VA	LYNCHBURG	58	1	6.69	-3.78
IA	BURLINGTON	55	1	3.67	-5.24		NORTH PLATTE	52	2	2.79	-0.95		NORFOLK	63	0	6.17	-6.20
	CEDAR RAPIDS	54	3	4.32	-3.98		OMAHA	56	2	3.59	-3.13		RICHMOND	62	1	8.31	-2.75
	DES MOINES	56	3	4.57	-3.31		SCOTTSBLUFF	52	2	3.13	0.08		ROANOKE	60	1	5.65	-4.40
	DUBUQUE	52	3	8.30	-0.66	NH	VALENTINE	51	2	7.50	3.79		WASH/DULLES	59	2	9.80	-0.92
	SIOUX CITY	53	3	6.55	0.31		CONCORD	51	2	8.59	-2.92	VT	BURLINGTON	53	2	11.79	1.59
	WATERLOO	54	3	5.47	-2.29	NJ	ATLANTIC_CITY	58	0	11.61	0.55	WA	OLYMPIA	52	1	11.71	-3.62
ID	BOISE	56	3	2.61	0.18		NEWARK	60	2	12.30	1.37		QUILLAYUTE	54	3	25.78	-4.71
	LEWISTON	55	1	4.12	1.22	NM	ALBUQUERQUE	61	2	2.20	-0.39		SEATTLE-TACOMA	54	0	11.99	0.15
	POCATELLO	48	0	5.47	2.65	NV	ELY	46	0	1.91	-0.16		SPOKANE	50	1	2.70	-1.31
IL	CHICAGO/O_HARE	56	3	6.41	-2.63		LAS VEGAS	71	0	1.36	0.43		YAKIMA	51	1	1.28	-0.45
	MOLINE	55	2	8.60	0.17		RENO	56	0	0.94	-0.39	WI	EAU CLAIRE	50	3	5.93	-2.00
	PEORIA	57	2	5.94	-3.40		WINNEMUCCA	51	0	2.57	0.91		GREEN BAY	51	2	4.26	-3.59
	ROCKFORD	53	1	7.73	-0.79	NY	ALBANY	54	2	7.90	-2.68		LA CROSSE	53	2	5.36	-2.61
	SPRINGFIELD	57	1	6.58	-2.28		BINGHAMTON	51	2	8.38	-2.50		MADISON	52	2	6.54	-1.88
IN	EVANSVILLE	60	2	4.72	-6.10		BUFFALO	53	1	8.94	-2.69		MILWAUKEE	55	2	8.77	0.59
	FORT WAYNE	54	1	5.60	-3.35		ROCHESTER	53	1	5.60	-3.56	WV	BECKLEY	54	0	8.35	-0.37
	INDIANAPOLIS	57	2	4.94	-4.87		SYRACUSE	54	2	7.11	-3.58		CHARLESTON	57	0	7.26	-2.31
	SOUTH BEND	54	2	8.33	-1.65	OH	AKRON-CANTON	53	-1	4.60	-5.32		ELKINS	50	-3	7.81	-1.65
KS	CONCORDIA	60	4	5.24	-0.70		CINCINNATI	57	1	5.97	-3.72		HUNTINGTON	59	1	4.19	-5.05
	DODGE CITY	59	3	3.36	-0.78		CLEVELAND	56	1	7.38	-3.52	WY	CASPER	47	1	2.87	0.09
	GOODLAND	54	2	0.65	-2.70		COLUMBUS	57	1	5.65	-3.18		CHEYENNE	50	3	1.93	-1.15
	TOPEKA	60	3	3.92	-4.22		DAYTON	57	1	4.36	-4.96		LANDER	48	2	3.80	0.65
							MANSFIELD	53	0	5.37	-4.31		SHERIDAN	49	3	6.29	2.48

December 14 ENSO Diagnostic Discussion

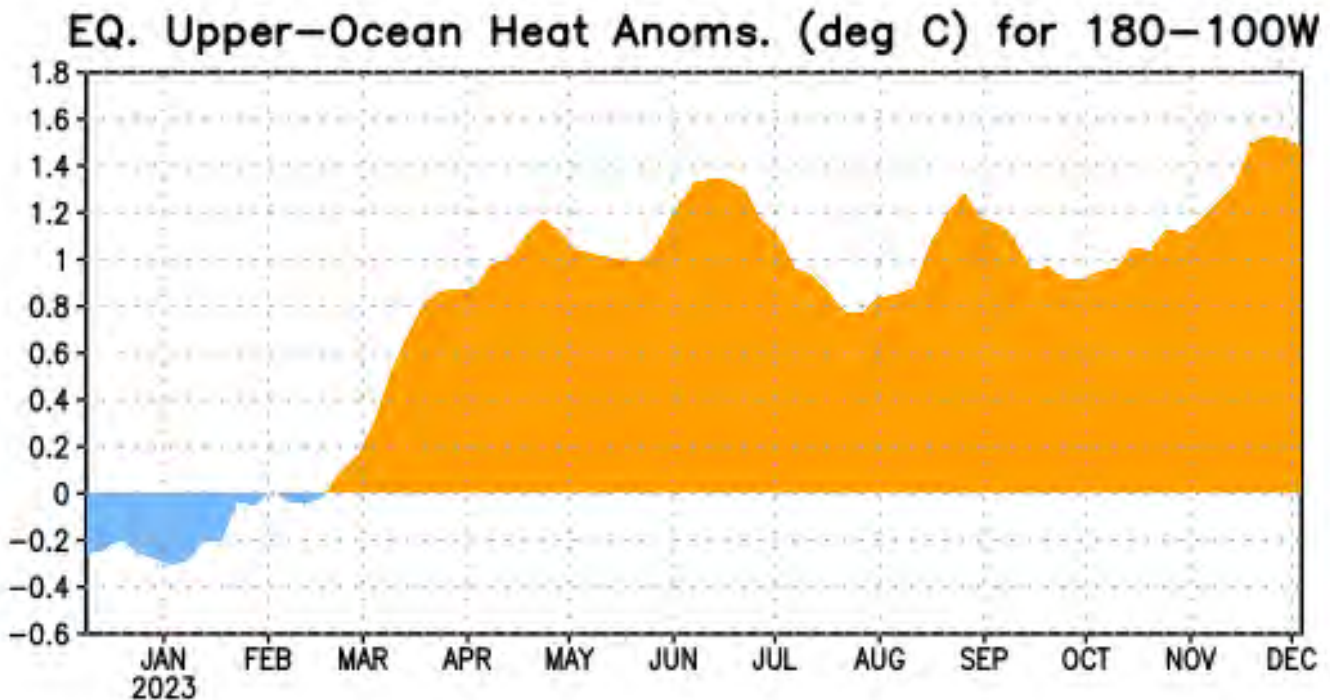


Figure 1: Area-averaged upper-ocean heat content anomaly (°C) in the equatorial Pacific (5°N-5°S, 180°-100°W). The heat content anomaly is computed as the departure from the 1991-2020 base period pentad means.

ENSO Alert System Status: **El Niño Advisory**

Synopsis: El Niño is expected to continue through the Northern Hemisphere winter, with a transition to ENSO-neutral favored during April-June 2024 (60% chance).

Sea surface temperatures (SST) were above average across the equatorial Pacific Ocean, increasing in the central and east-central Pacific during November. The growth in SST anomalies, however, abated in early December, with the latest weekly Niño index values at +1.4°C in Niño-4, +1.9°C in Niño-3.4, +2.0°C in Niño-3, and +1.3°C in Niño-1+2. Area-averaged positive subsurface temperature anomalies increased significantly during November (Fig. 1), reflecting the strengthening of above-average subsurface temperatures in the central and eastern Pacific associated with a downwelling oceanic Kelvin wave. Low-level wind anomalies were westerly in the central and eastern Pacific, while upper-level wind anomalies were easterly across the Pacific. Convection/rainfall remained enhanced at the Date Line and was suppressed around Indonesia. The equatorial Southern Oscillation Index (SOI) and the station-based SOI were negative. Collectively, the coupled ocean-atmosphere system reflected a strong El Niño.

The most recent IRI plume favors El Niño to continue through the Northern Hemisphere winter 2023-24. Based on the latest forecasts, there is now a [54% chance](#) of a “historically strong” El Niño during the November-January

season ($\geq 2.0^{\circ}\text{C}$ in Niño-3.4). An event of this strength would potentially be in the top 5 of El Niño events since 1950. While stronger El Niño events increase the *likelihood* of El Niño-related climate anomalies, it does not imply expected impacts will emerge in all locations or be of strong intensity (see [CPC seasonal outlooks](#) for probabilities of temperature and precipitation). In summary, El Niño is expected to continue through the Northern Hemisphere winter, with a transition to ENSO-neutral favored during April-June 2024 (60% chance).

This discussion is a consolidated effort of the National Oceanic and Atmospheric Administration (NOAA), NOAA’s National Weather Service, and their funded institutions. Oceanic and atmospheric conditions are updated weekly on the Climate Prediction Center website ([El Niño/La Niña Current Conditions and Expert Discussions](#)). Additional perspectives and analyses are also available in an [ENSO blog](#). A probabilistic strength forecast is [available here](#). The next ENSO Diagnostics Discussion is scheduled for **11 January 2024**. 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.

NOTICE: Publication of Monthly International Maps to Cease Beginning in 2024

After the publication of the December 2023 monthly maps on January 17, 2024, global International Monthly maps will no longer be printed in the *Weekly Weather and Crop Bulletin*.

In the future, we ask that readers go to the following website for updates :

https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/.



By clicking on the interactive map on the website, users may navigate to the desired regional products.

Any questions or comments regarding this change may be directed to:

Mark Brusberg

Chief Meteorologist

USDA/Office of the Chief Economist/ World Agricultural Outlook Board

mark.brusberg@usda.gov

International Weather and Crop Summary

December 10-16, 2023

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

HIGHLIGHTS

EUROPE: Much warmer weather overspread the continent, accompanied by additional moderate to heavy showers in most growing areas.

MIDDLE EAST: Unseasonable warmth continued, with additional widespread showers maintaining or improving moisture supplies for winter grains.

NORTHWESTERN AFRICA: Additional drought-easing rain in the east contrasted with intensifying drought in the west.

SOUTHEAST ASIA: A lull in seasonal rains across much of Java, Indonesia, further exacerbated poor moisture conditions for rice.

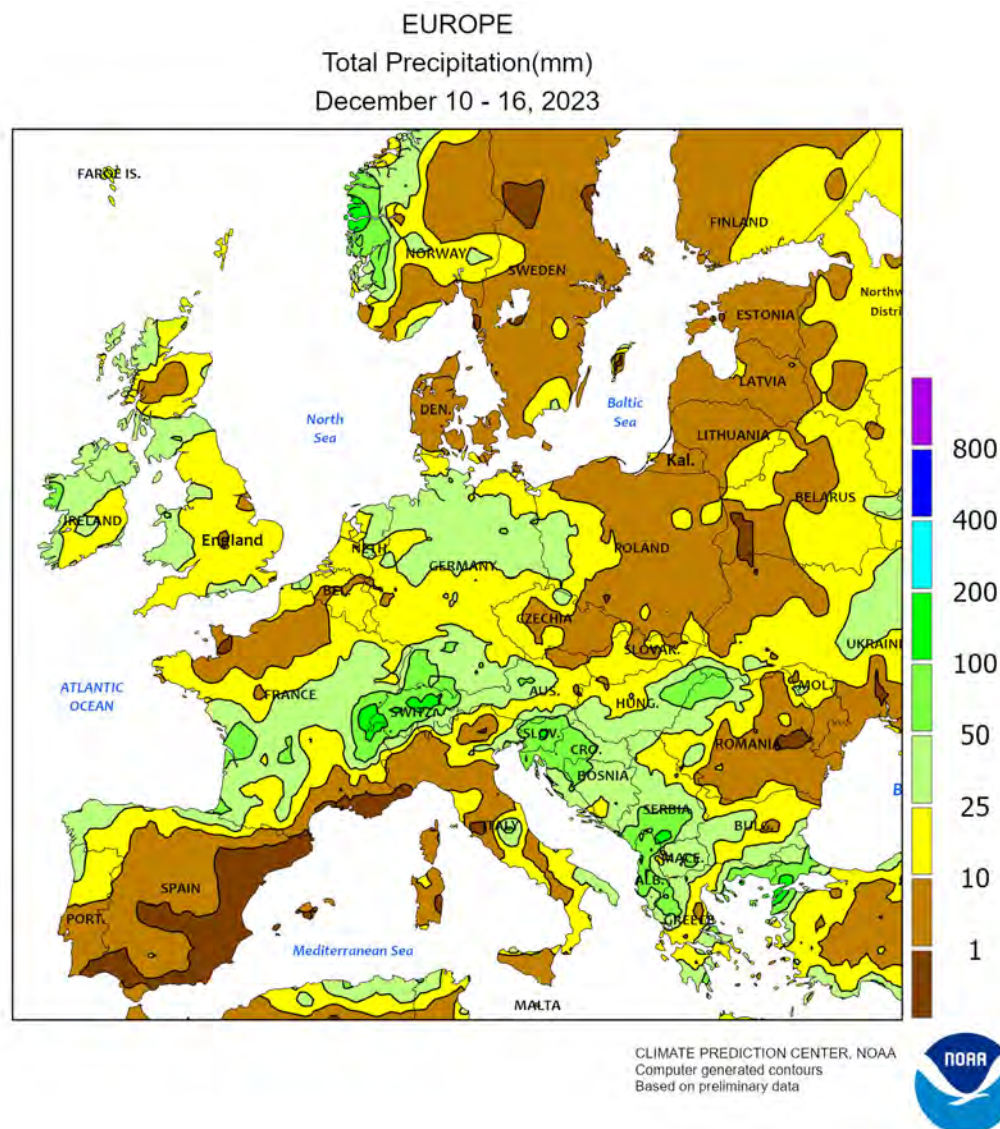
AUSTRALIA: Soaking rain in the south hampered winter crop harvesting.

SOUTH AFRICA: Mild, showery weather provided timely moisture for germination and establishment of corn and other rain-fed crops.

ARGENTINA: Conditions remained overall favorable for summer crop planting.

BRAZIL: Lingering heat maintained concern for soybeans in northern production areas.



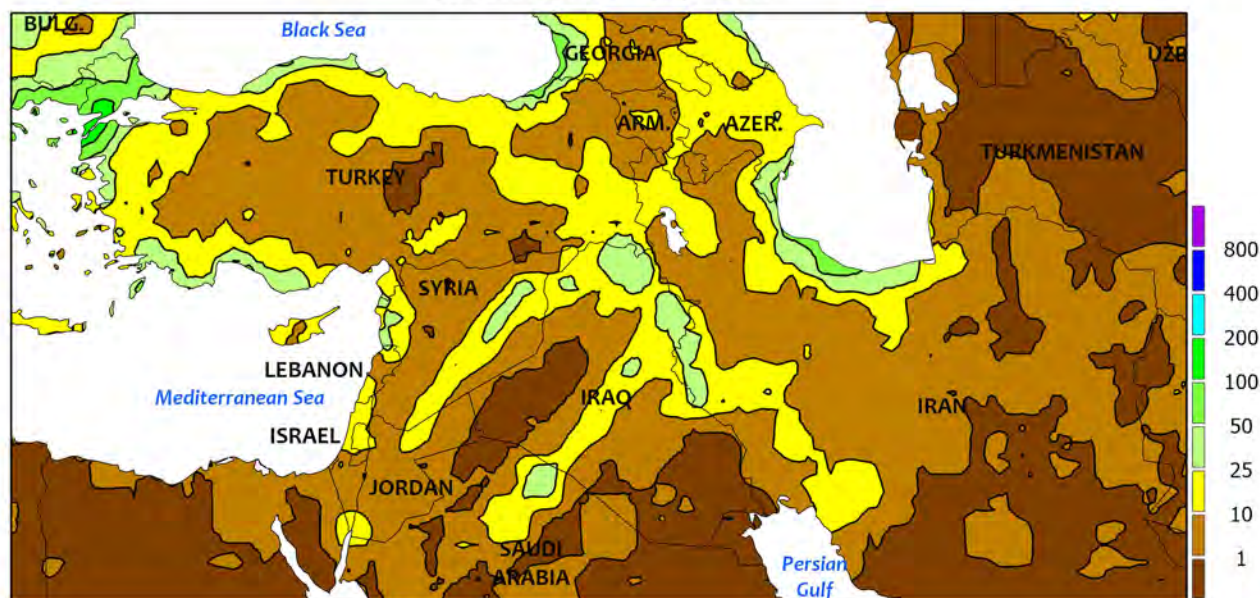


EUROPE

Much warmer but continued wet weather replaced the recent cold snap over most of Europe. Temperatures for the week averaged 2 to 5°C above normal nearly everywhere save for northeastern Europe (1-3°C below normal, up to 7°C below normal in northern-most locales). The warmth melted most of the recent snow cover in northeastern Europe and reduced

winter crop cold hardiness elsewhere. Meanwhile, a series of Atlantic storms maintained moderate to heavy showers (10-100 mm, locally more) from England, France, and northern Spain eastward. The rain continued to hamper late-season fieldwork but maintained abundant moisture reserves for dormant winter grains and oilseeds.

MIDDLE EAST
Total Precipitation(mm)
December 10 - 16, 2023



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



MIDDLE EAST

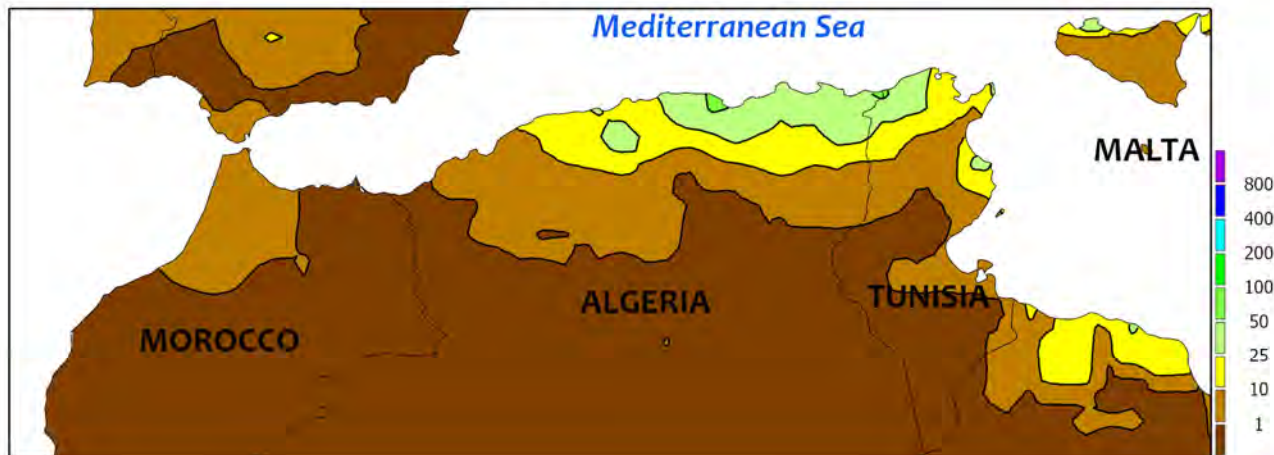
Very warm weather prevailed over much of the region, with additional rain in the west expanding into Iraq and western Iran. In Turkey, another week with widespread albeit highly variable showers (1-10 mm on the Anatolian Plateau, but more than 25 mm along the country's perimeter) further boosted prospects for winter wheat and barley establishment. Rain was heaviest (more than 50 mm) in northwestern Turkey's Thrace Region, which went from autumn drought to nearly 150 percent-of-normal rainfall since September 1 on the heels of the recent downpours. Light to moderate showers (2-30 mm) also were reported along the eastern

Mediterranean Coast, keeping soils favorably moist for winter grain germination and establishment. Unlike previous weeks, rainfall (5-30 mm) spread eastward into Iraq and western Iran, improving soil moisture for winter grain establishment. Conversely, drier-than-normal conditions lingered in northeastern Iran's Khorasan Province, though isolated showers (up to 10 mm) moistened soils locally. Temperatures up to 6°C above normal kept winter crops from going dormant in the climatologically colder northern growing areas and accelerated wheat and barley development in central and southern portions of the Middle East.

NORTHWESTERN AFRICA

Total Precipitation(mm)

December 10 - 16, 2023



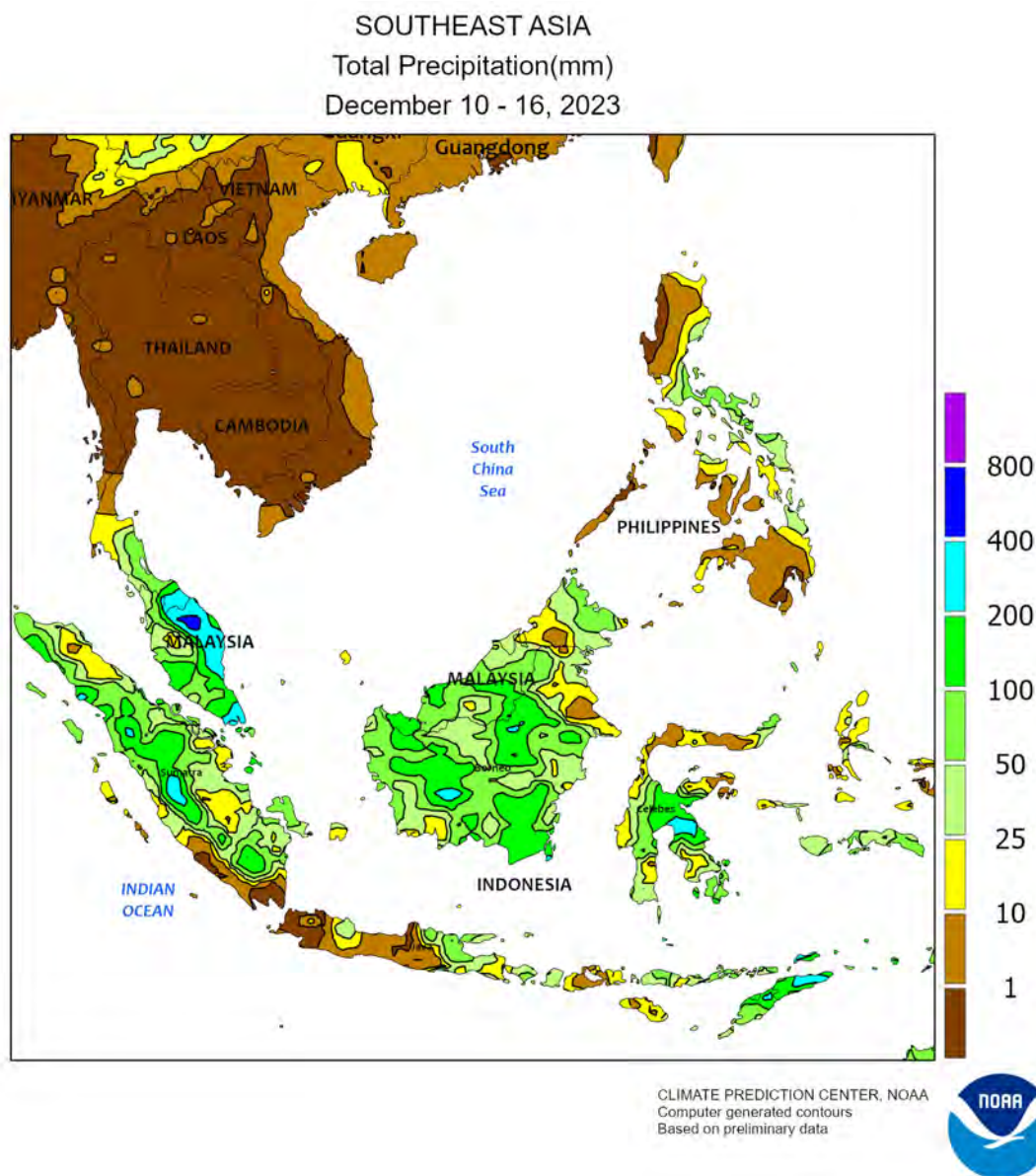
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary data



NORTHWESTERN AFRICA

For the second consecutive week, drought-easing rain in the east contrasted with increasing drought in Morocco and western Algeria. Additional moderate to heavy rain (10-75 mm) from north-central Algeria into northern Tunisia further eased drought and improved prospects for winter grain establishment and early development. However, while season-to-date (since September 1) rainfall has improved to 75 percent of normal or more in Algeria, northern Tunisia's Tell Region was still the lowest of the past 30 years at 60

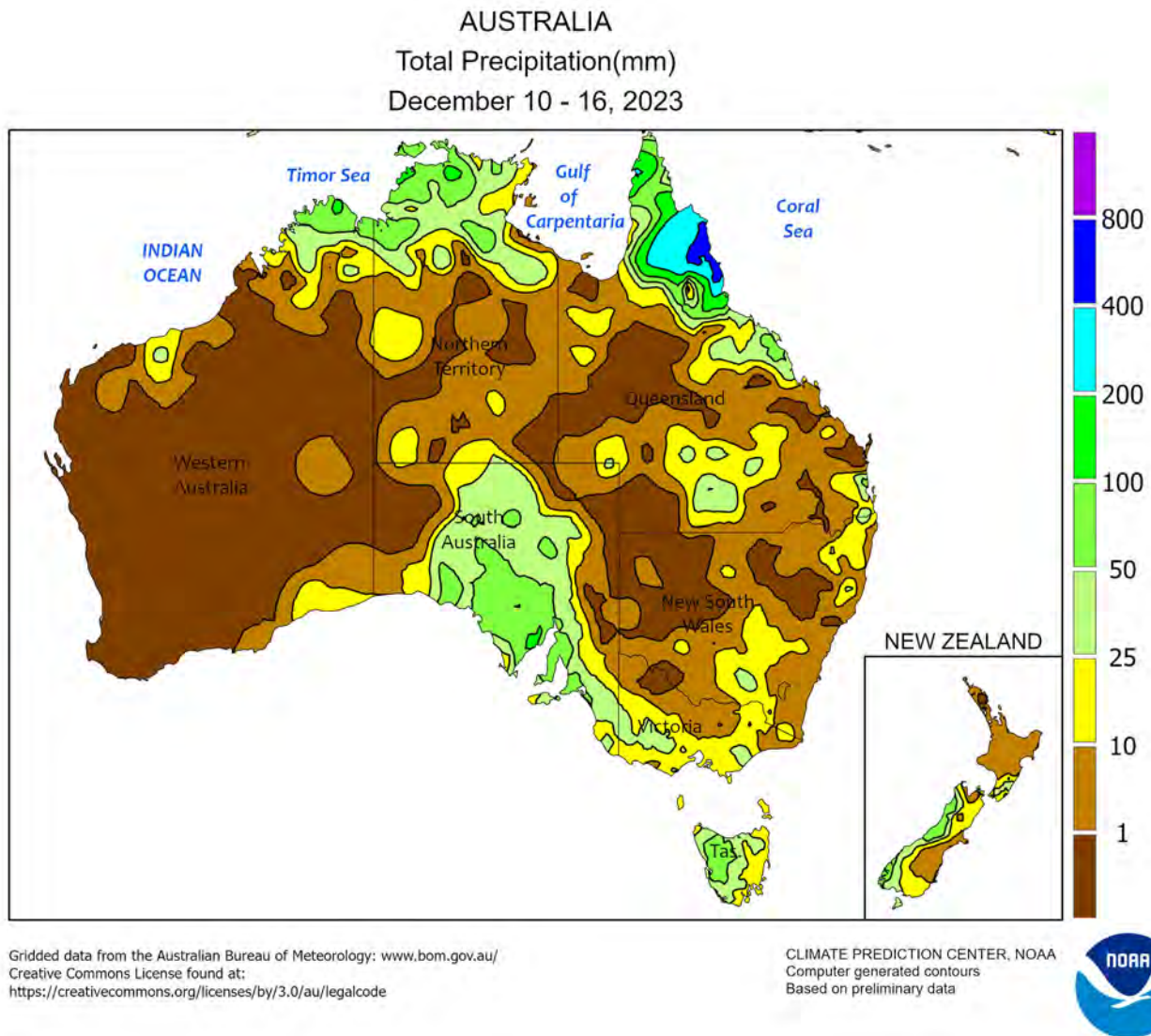
percent (deficit of nearly 100 mm). Conversely, dry weather in Morocco ushered the country deeper into drought. As of December 18, rainfall since September 1 in Morocco's primary growing areas slipped below 50 percent of normal and was now the fourth driest of the past 30 years. Likewise, season-to-date rainfall in western Algeria dropped to 45 percent of normal, the driest of the past 30 years. Time is running out for drought-afflicted western growing areas to receive rain for this season's wheat and barley.



SOUTHEAST ASIA

A lull in rainfall across much of Java, Indonesia, further plagued rice growers following a prolonged delay in the onset of seasonal showers. Little if any rain was recorded in all but eastern-most sections of Java (averaging 50 mm in the east). More consistent moisture is needed for proper rice development, with Java as a whole experiencing half the normal seasonal

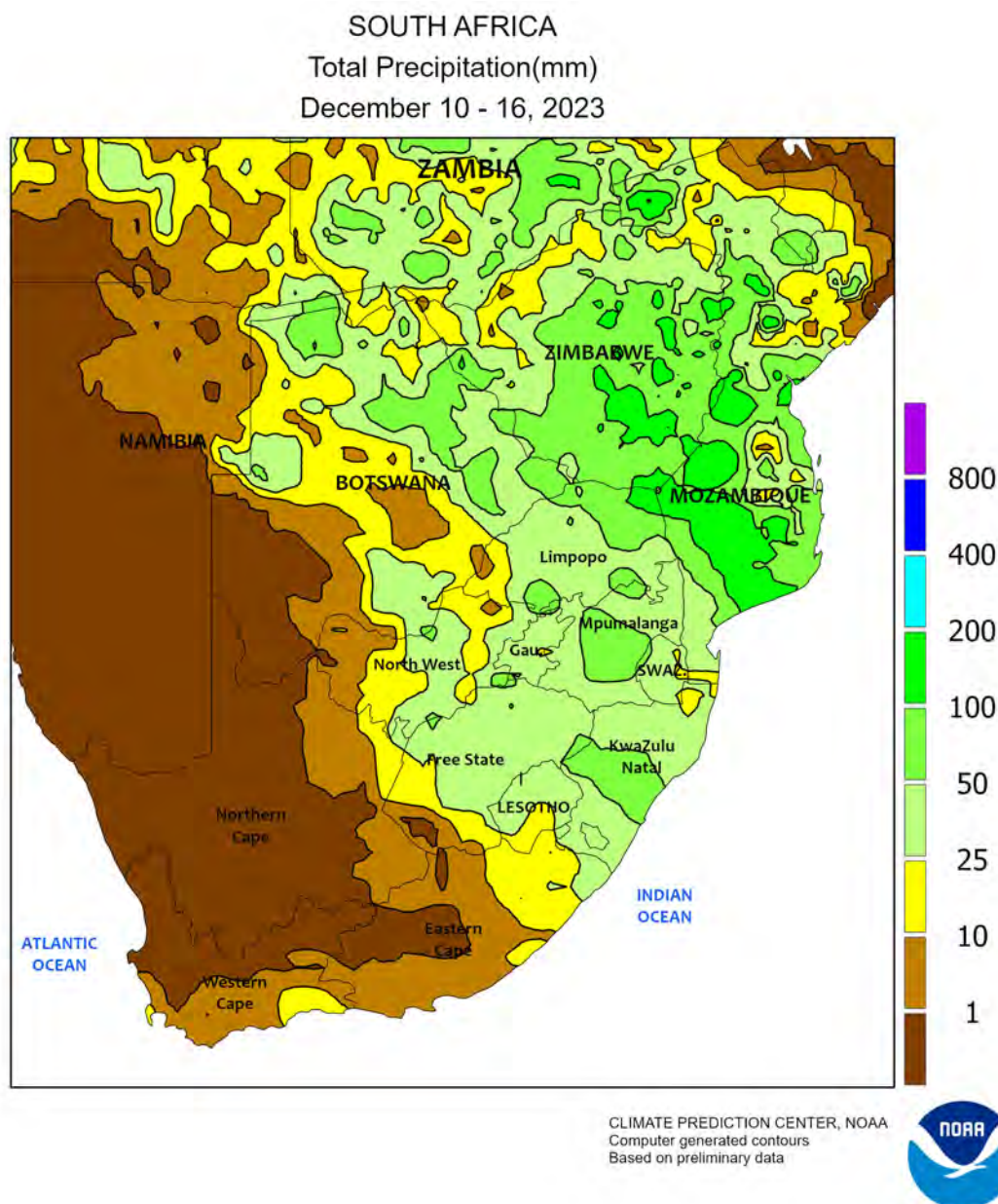
rainfall thus far. Meanwhile, oil palm areas in the remainder of Indonesia and neighboring Malaysia continued to receive favorable to locally excessive precipitation (25-100 mm, locally over 200 mm). Elsewhere, showers (25-100 mm) in the Philippines were mainly confined to traditionally wetter eastern locales, benefiting seasonal rice and corn.



AUSTRALIA

In eastern Australia, scattered showers (5-25 mm) aided summer crop emergence and establishment, while pockets of drier weather favored additional sorghum planting. Wheat and other winter crop harvesting has reportedly concluded in Queensland and northern New South Wales and continued to make good progress in southern New South Wales. Farther south, soaking rain (25-50 mm or more) in southern and western Victoria and South Australia slowed or outright halted

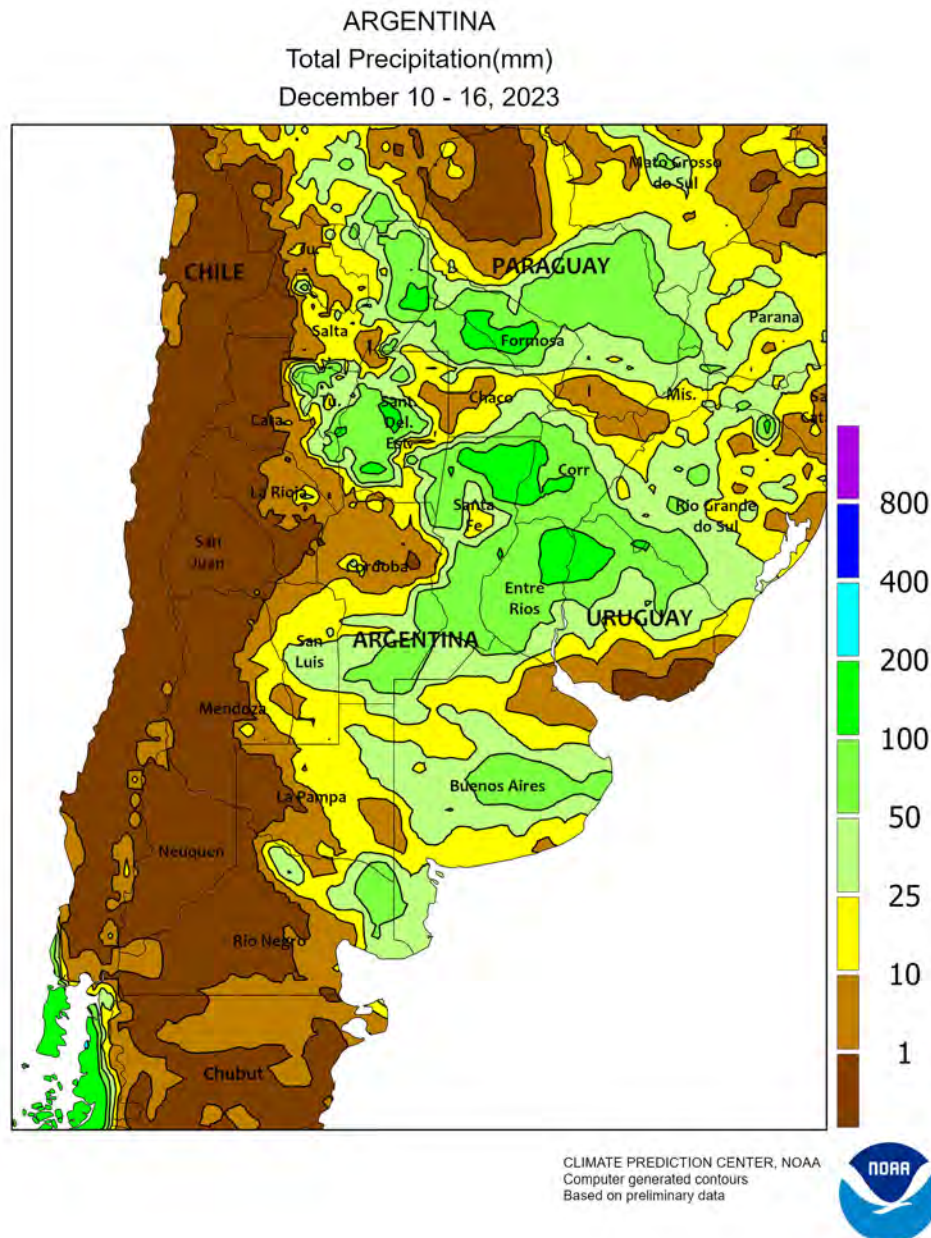
wheat, barley, and canola harvesting in many areas. The wet weather likely reduced local crop quality as well. Elsewhere in the wheat belt, dry, seasonably hot weather in Western Australia promoted winter crop harvesting, which is expected to wrap up by the end of the year. Temperatures averaged near normal in Western Australia and Victoria, 2 to 4°C below normal in South Australia, and 2 to 4°C above normal in southern Queensland and New South Wales.



SOUTH AFRICA

Widespread, locally heavy showers brought needed relief from heat and dryness. Rainfall totaling 25 to 100 mm spread from North West and Limpopo southward, including the corn belt and sugarcane areas in KwaZulu-Natal and eastern Mpumalanga. The timely rain also extended northward into Mozambique, Zimbabwe, and other drought-stricken locations in southern Africa. The rainy weather ushered cooler weather into the region, with weekly temperatures averaging 1 to 3°C below normal throughout

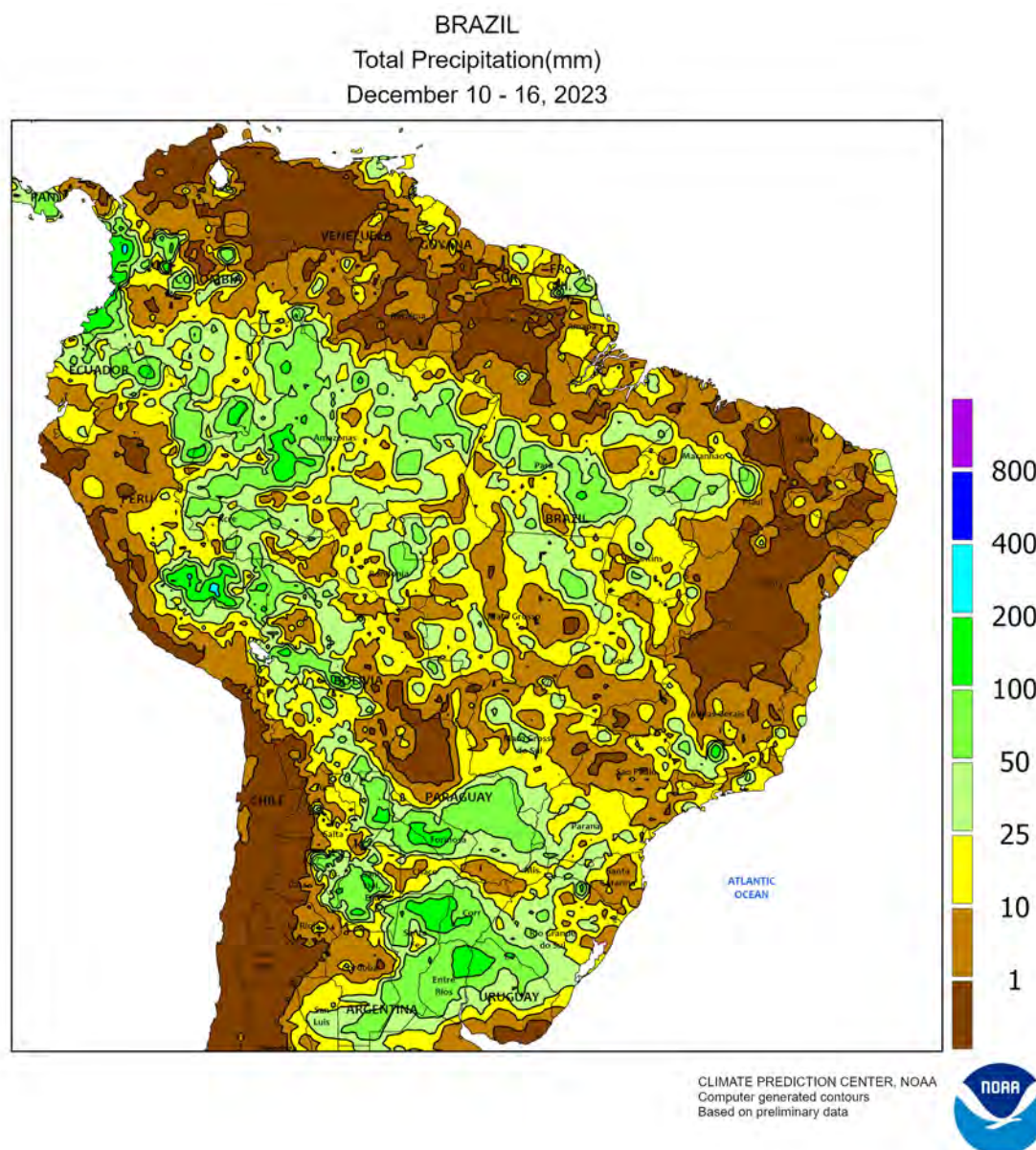
South Africa; highest daytime temperatures ranged from the upper 20s to lower 30s (degrees C) in the aforementioned corn and sugarcane areas, advancing crop growth in the absence of stress. Planting in western sections of the corn belt (North West and neighboring locations in Free State) should be underway in response to the timely increase in soil moisture. Elsewhere, warm, sunny weather in Northern and Western Cape advanced development of irrigated crops, including summer row crops in the Orange River Valley.



ARGENTINA

Moderate to heavy showers maintained overall favorable conditions for germination and establishment of summer crops, while also encouraging additional planting. Rainfall totaling 25 to 100 mm covered most major agricultural delegations, with many others receiving at least 10 mm. However, unseasonably warm conditions accompanied the moisture (weekly average temperatures ranging from 2 to 4°C above normal). Daytime temperatures reached as high as

the upper 30s (degrees C) as far south as Buenos Aires, owing to a brief surge in heat prior to the onset of the rain; in the far north, highs reached 40°C throughout the week. According to the government of Argentina, corn and soybeans were 64 and 65 percent planted, respectively, as of December 14; cotton was 58 percent planted, compared with 43 percent last year, while wheat was 56 percent harvested, 12 points behind last year's pace.

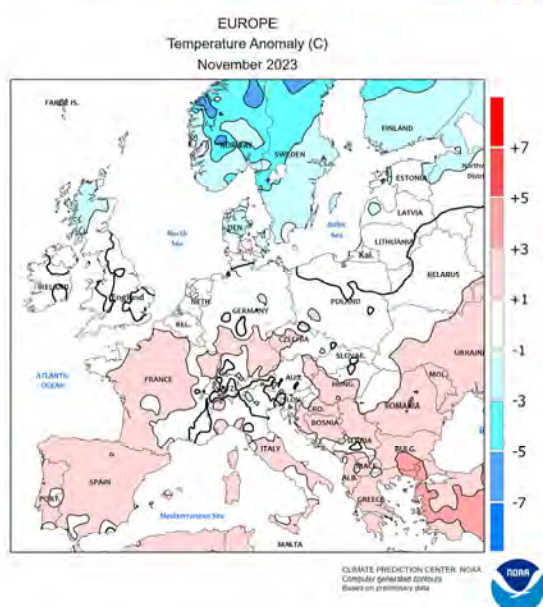
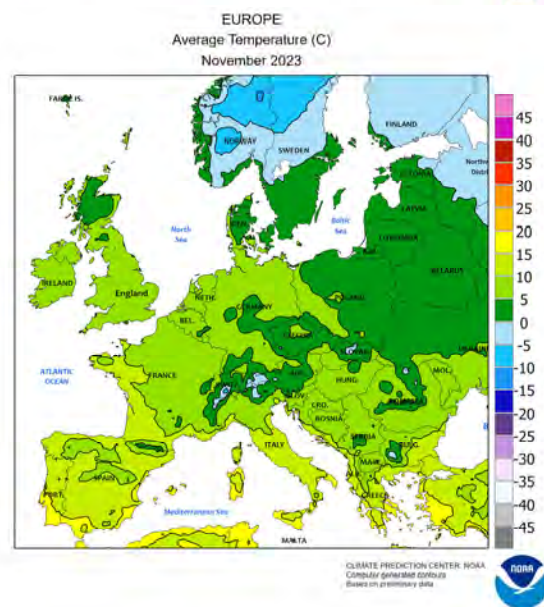
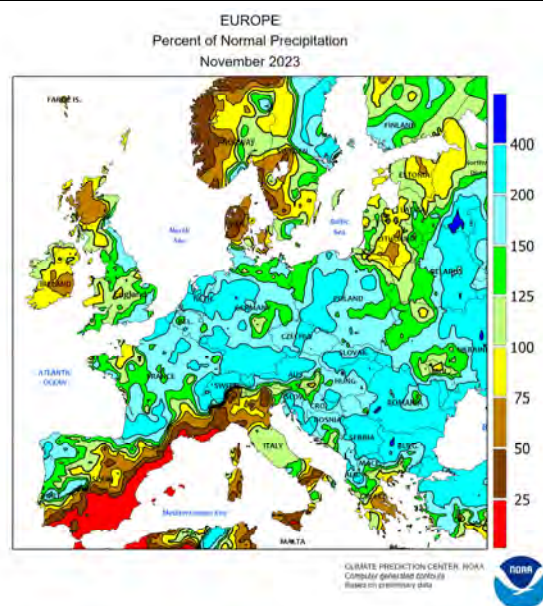
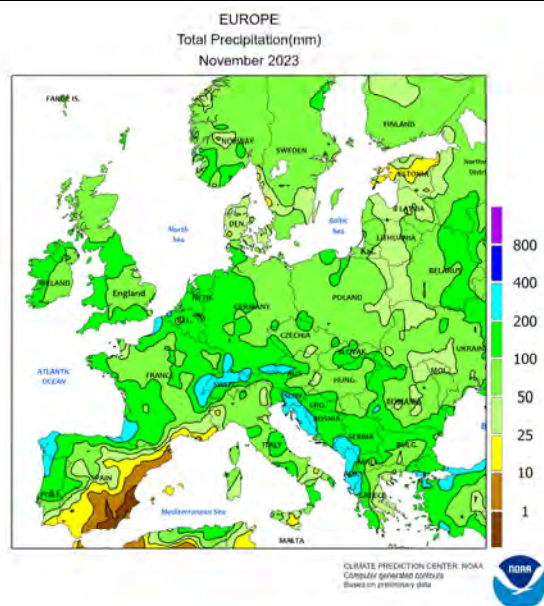


BRAZIL

Unseasonable warmth persisted in large parts of Brazil, maintaining high evaporative losses and resulting in some stress of vulnerable crops. Highest daytime temperatures again reached the upper 30s and lower 40s (degrees C) from Mato Grosso and Mato Grosso do Sul north and eastward, including a broad area stretching from Minas Gerais to Maranhão and southward into Paraná and São Paulo. Showers were widely scattered throughout the region, although amounts were variable and many locations recorded less than 10 mm. Soybeans are in urgent need of moisture as crops near or enter

reproduction. Farther south, light to moderate rain (5-50 mm, locally higher) fell in Rio Grande do Sul, while conditions in Santa Catarina and Paraná were similar to those in central Brazil. According to the government of Rio Grande do Sul, corn was 88 percent planted as of December 14, with 70 percent of the crop currently in the ground ranging from flowering to mature; 84 percent of soybeans were planted, with none having reached flowering. In Paraná, nearly 80 percent of the first-crop corn had reached reproduction as of December 11, as had nearly 60 percent of soybeans.

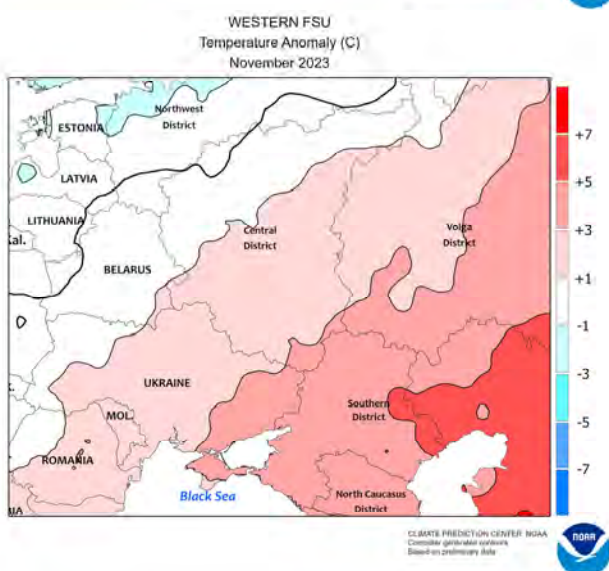
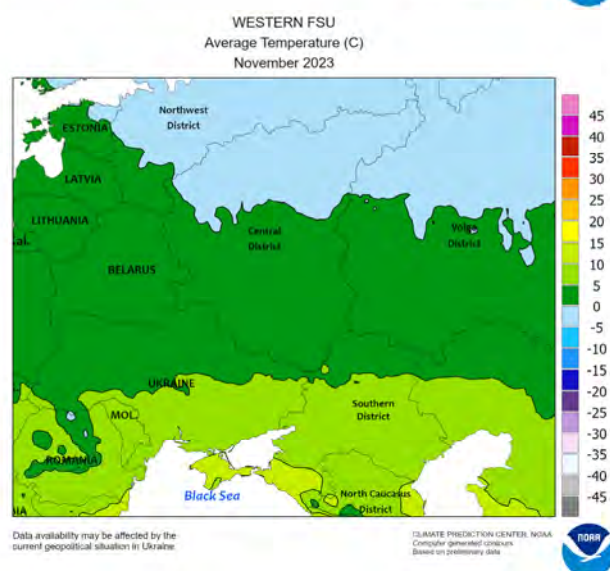
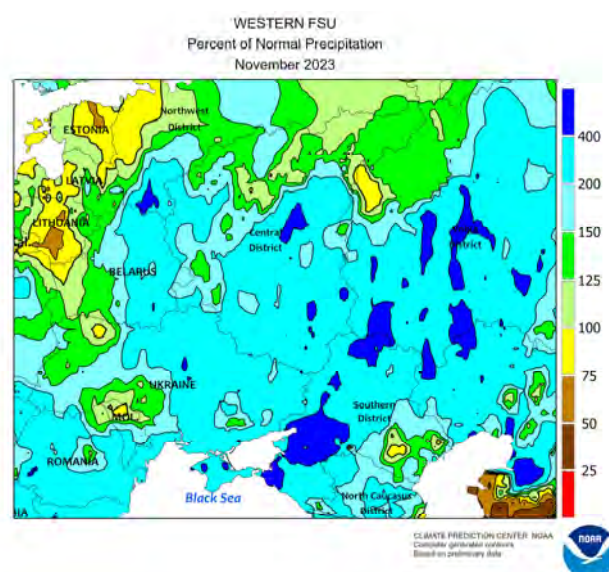
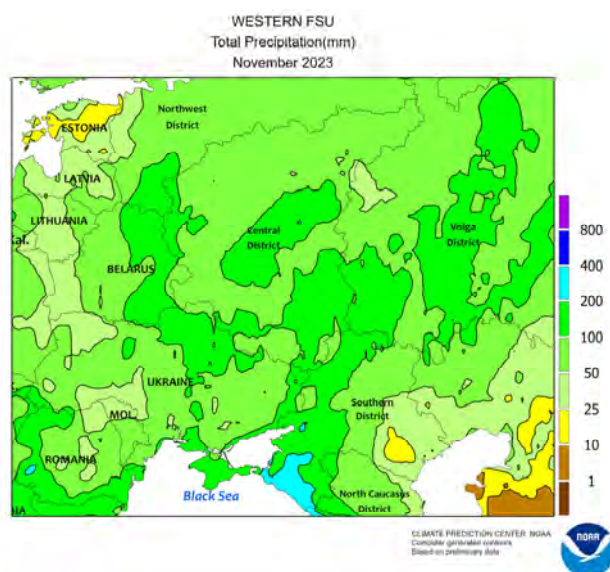
November International Temperature and Precipitation Maps



EUROPE

Wet weather prevailed across much of the continent during November, though dry conditions returned to southern Spain and Italy. Rainfall totaled 150 to 250 percent of normal from England and France eastward into Poland and the Balkans, boosting moisture reserves for winter crops which approached or entered dormancy by month's end. More notably, the wet weather in the lower Danube River Valley alleviated autumn drought and improved soil moisture for winter wheat and rapeseed. Farther west, occasional showers

avored winter grain establishment in northern Spain. Conversely, dry conditions returned to southern Spain as well as central and northern Italy, facilitating fieldwork after a wet October. Following a warm start to the month over much of the continent, much cooler weather during the latter half of November netted central and northeastern Europe near-normal temperatures. Above-normal temperatures (up to 3°C above normal) lingered, however, in Spain, France, and the southern Balkans.

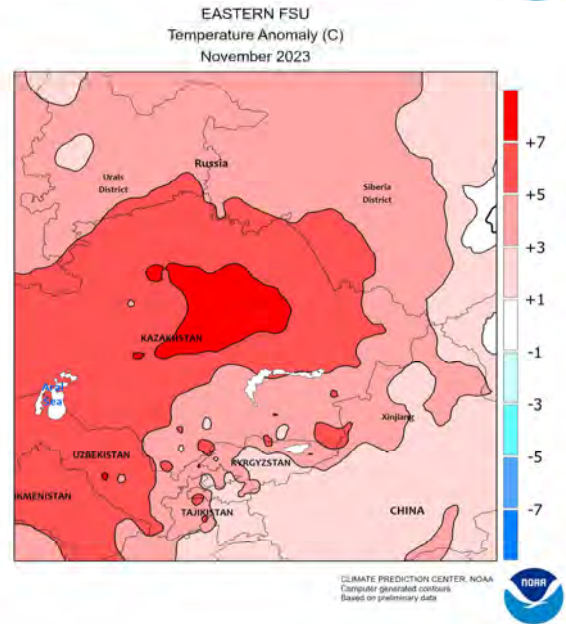
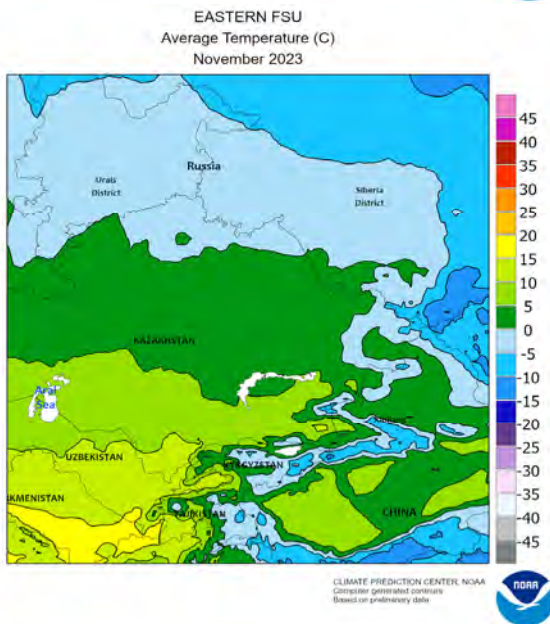
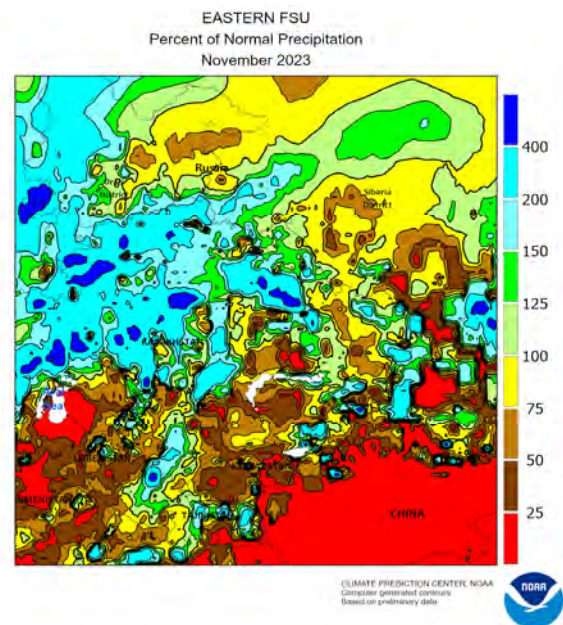
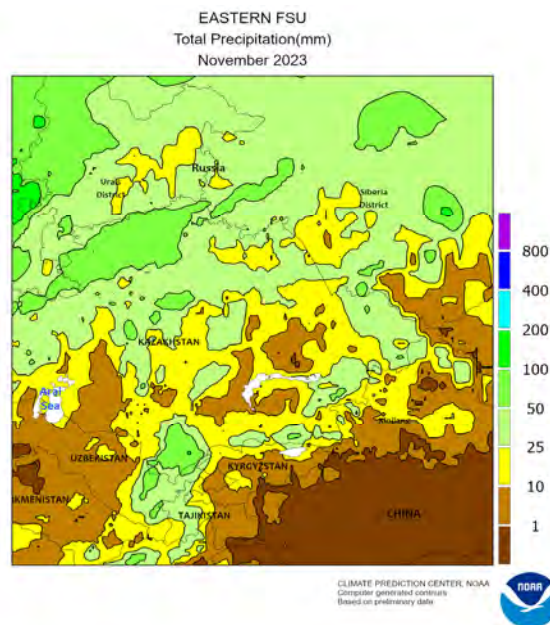


WESTERN FSU

Very wet but warm weather replaced recent acute dryness across the entire region during November. Monthly rainfall (75-225 mm) averaged 150 to 400 percent of normal over nearly all of Moldova, Belarus, Ukraine, and western Russia, boosting moisture reserves for winter grains and oilseeds but hampering summer crop harvesting and other seasonal fieldwork. Temperatures averaged 2 to 4°C above normal over primary winter

crop areas adjacent to the Black Sea Coast, allowing wheat, barley, and rapeseed to benefit from the late-arriving moisture over previously dry croplands from Moldova into southern Ukraine and southwestern Russia.

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

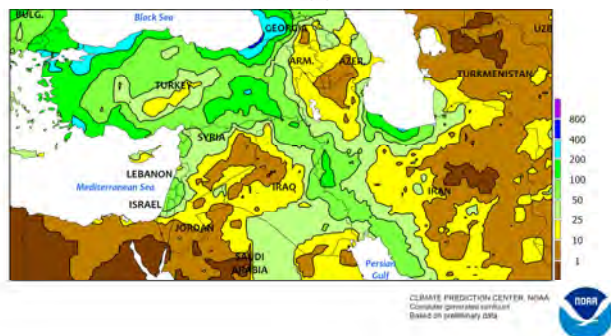


EASTERN FSU

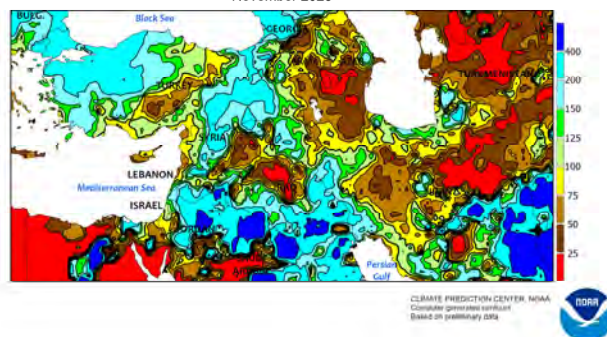
Moderate to heavy rain continued into November over the spring grain belt, while dry weather returned farther south across the region's cotton and winter wheat areas. Moderate to heavy rain and late-month snow (50-75 mm, 90-350 percent of normal) persisted for a third consecutive month from the southern Urals District in Russia eastward across northern Kazakhstan. The precipitation sustained a slow pace of spring grain harvesting and further lowered crop yield prospects. However, somewhat drier conditions over much of central Russia allowed late spring grain harvesting to resume. Temperatures across the spring grain belt averaged 4 to 8°C above normal, keeping the region

snow free for much of the month and allowing producers to take advantage of breaks in the wet weather for harvesting. Farther south across the Commonwealth of Independent States (CIS), mostly dry and very warm conditions followed October's favorable start to the 2023-24 Water Year. The sunny skies promoted winter wheat establishment but reduced soil moisture reserves for spring growth. More importantly, temperatures up to 7°C above normal across the CIS limited recharge of mountain snowpacks, which are vital for summer crop irrigation. Furthermore, precipitation in the watersheds of the Syr and Amu Darya Rivers trended below normal, raising concerns over developing drought.

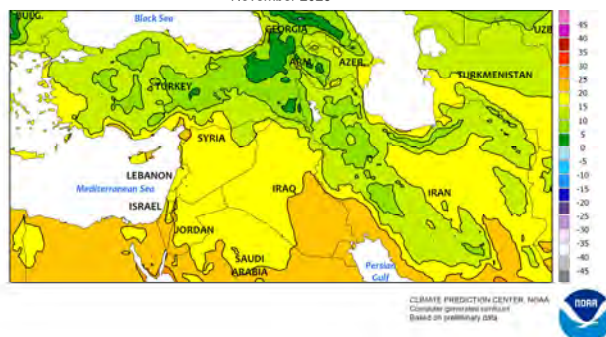
MIDDLE EAST
Total Precipitation(mm)
November 2023



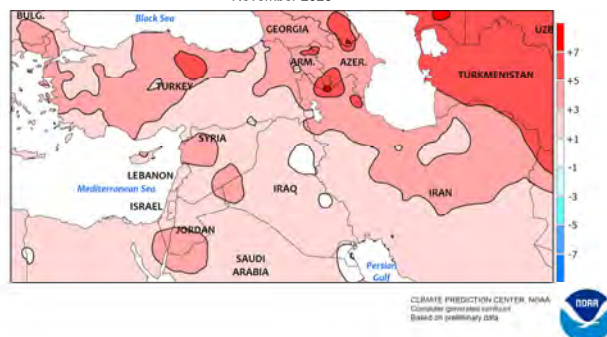
MIDDLE EAST
Percent of Normal Precipitation
November 2023



MIDDLE EAST
Average Temperature (C)
November 2023



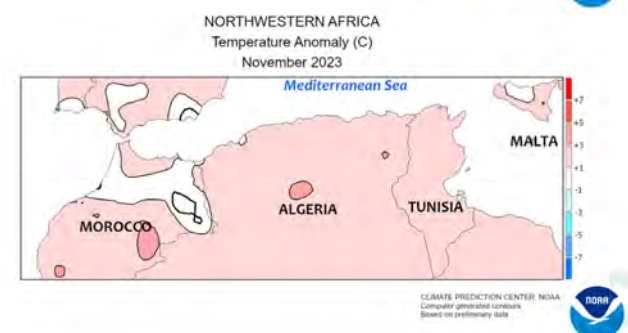
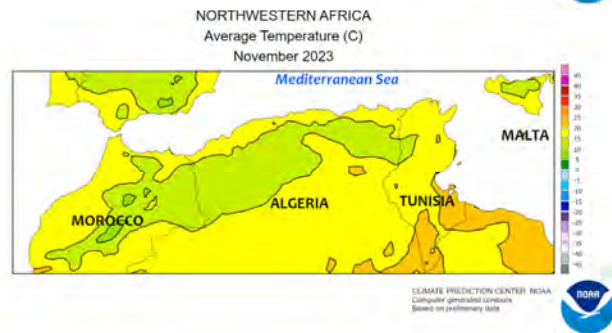
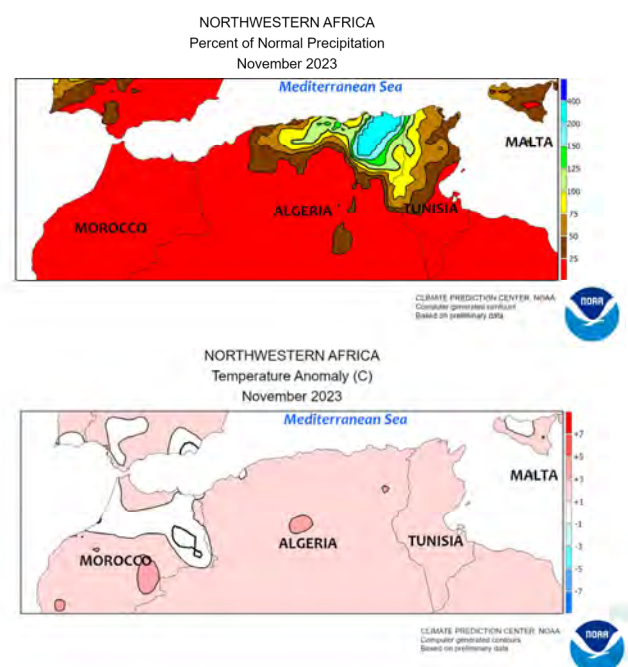
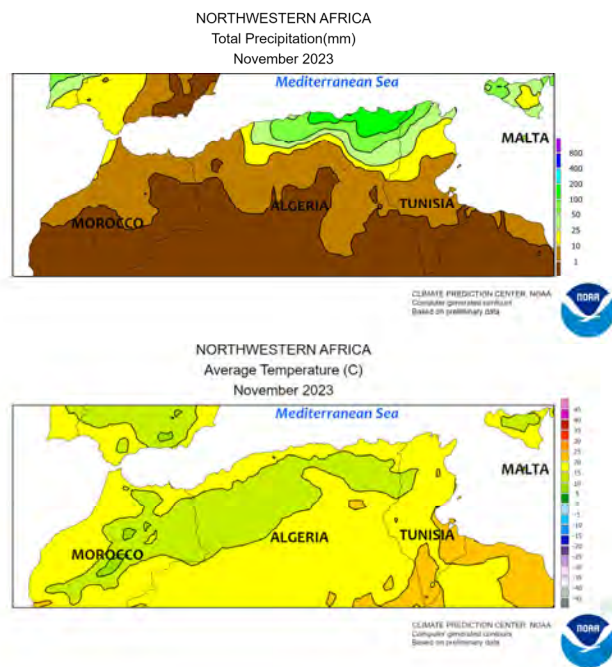
MIDDLE EAST
Temperature Anomaly (C)
November 2023



MIDDLE EAST

Near- to above-normal precipitation and temperatures prevailed across much of the region during November. Heavy rain (200 mm or more) in northwestern Turkey's Thrace Region alleviated short-term drought and improved prospects for winter wheat establishment. Near-normal precipitation on central Turkey's Anatolian Plateau kept soils sufficiently moist for winter grain development prior to the onset of the region's seasonally cold winter weather. Rain and mountain snow were also

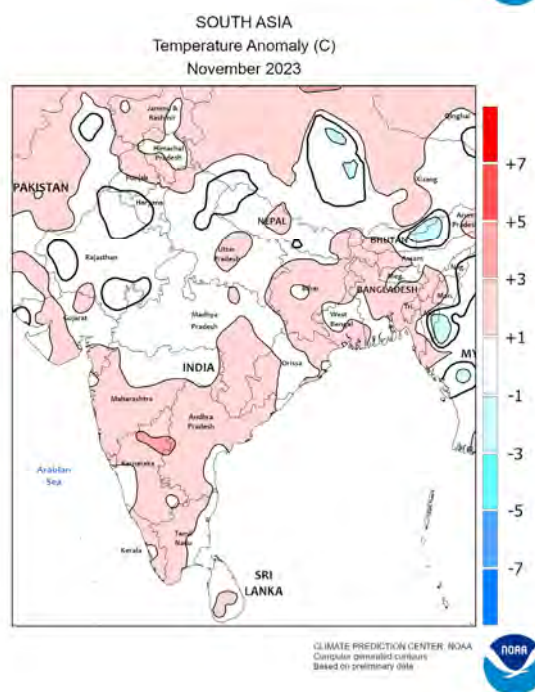
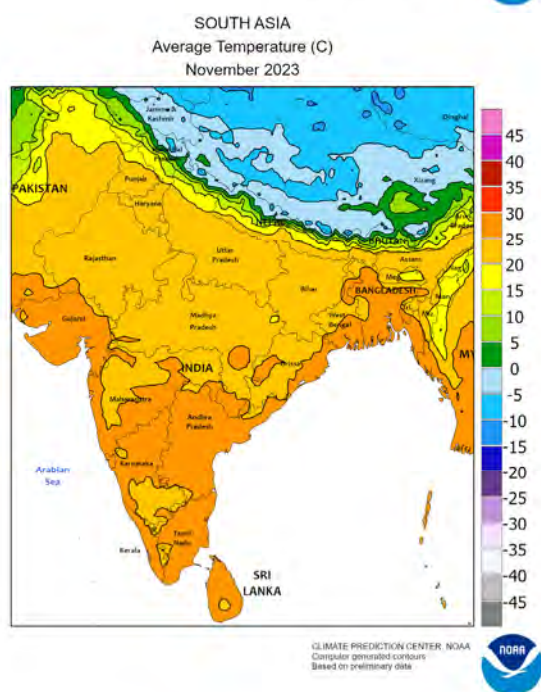
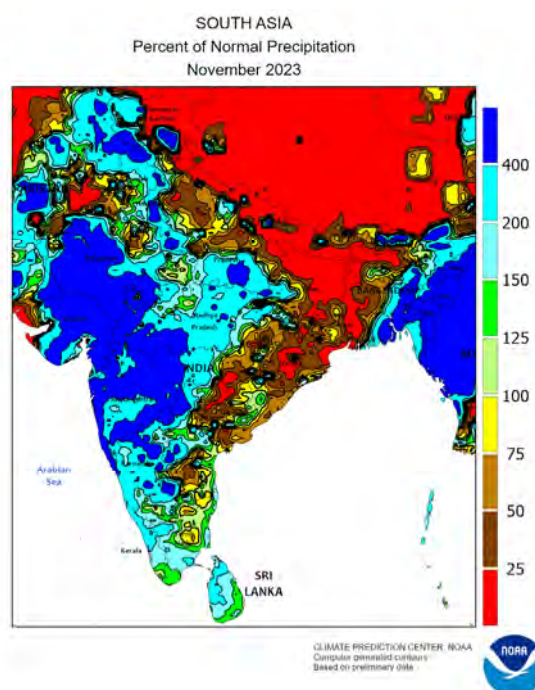
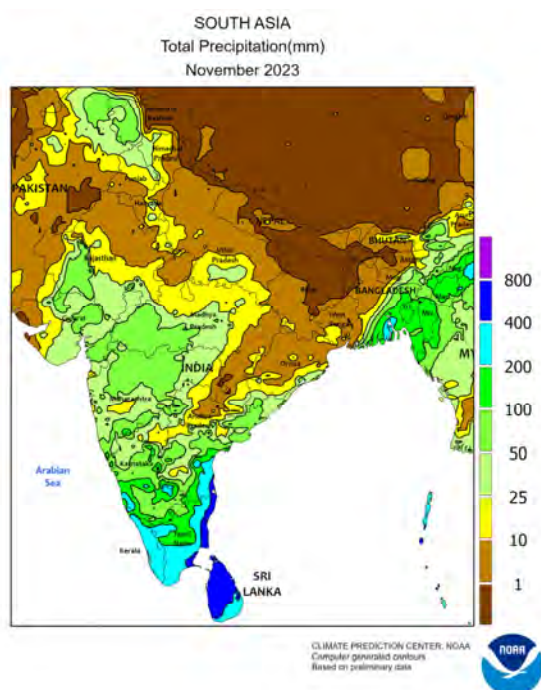
reported from eastern Turkey southeastward into northern Iraq and western Iran. Despite the generally favorable weather pattern, short-term dryness (locally less than 50 percent of normal) developed in northwestern Iran and persisted in northeastern Iran. Temperatures averaged 2 to 5°C above normal over most of the region's primary growing areas, keeping climatologically colder areas devoid of snow but extending the window for winter crop establishment.



NORTHWESTERN AFRICA

The return of dryness in the west contrasted with much-needed rain in the east during November. In Morocco, acute dryness (no rain whatsoever in many growing areas) followed October's showers, raising drought concerns and reducing soil moisture for winter grain establishment. The dry weather extended eastward across western Algeria, keeping soils devoid of moisture for winter wheat and barley. Meanwhile, heavy rain (25-

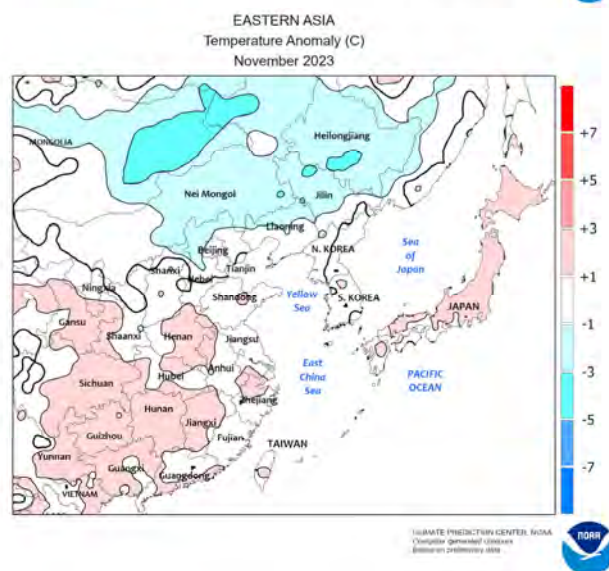
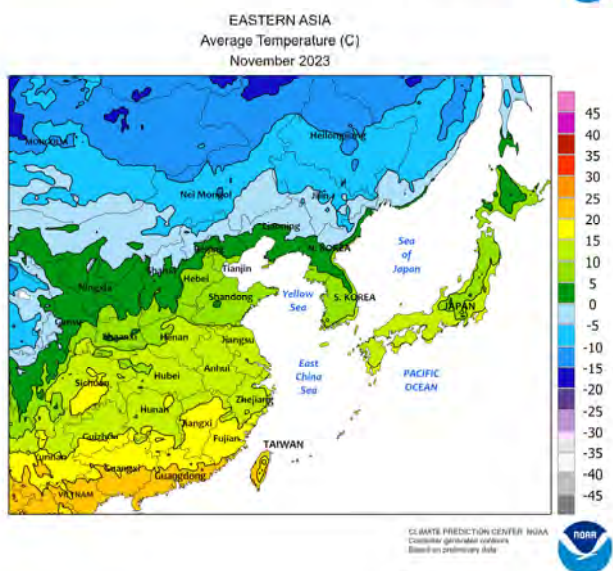
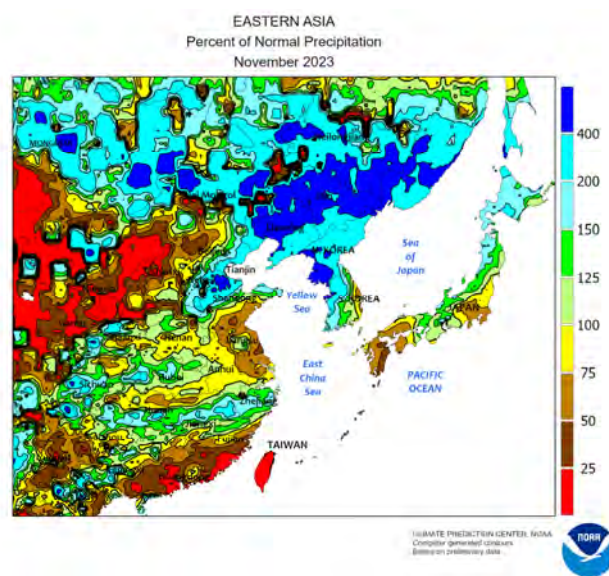
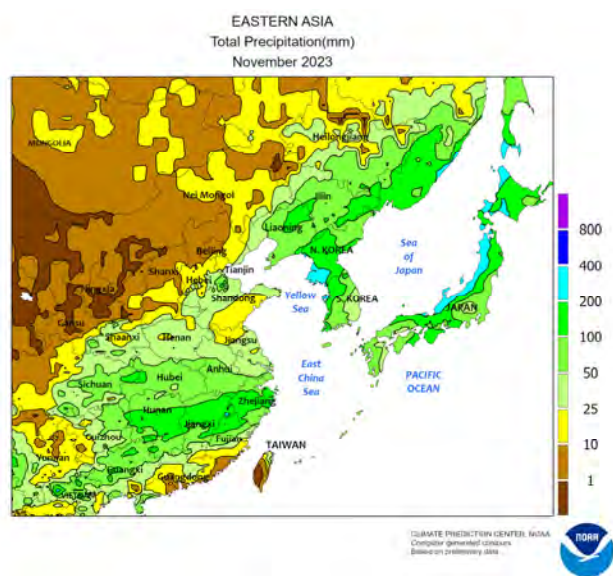
125 mm) during the third week of November from north-central Algeria into northwestern Tunisia eased drought and provided the season's first moisture for winter wheat and barley, though the rain's intensity likely resulted in much of the moisture running off parched topsoils. While warmer-than-normal weather prevailed during November (1-3°C above normal), anomalies were not as pronounced as the summer-like heat observed in October.



SOUTH ASIA

Following the withdrawal of the southwest monsoon in October, seasonably drier weather prevailed throughout most of India during November. The drier conditions supported maturation and harvesting of kharif crops as well as sowing of rabi crops. Rainfall (over 150 mm, 100-200 percent of normal) was most prevalent in traditionally wetter southern sections of India during the month. However, an unusually strong mid-latitude storm system pushed through western India (Gujarat and environs) late in

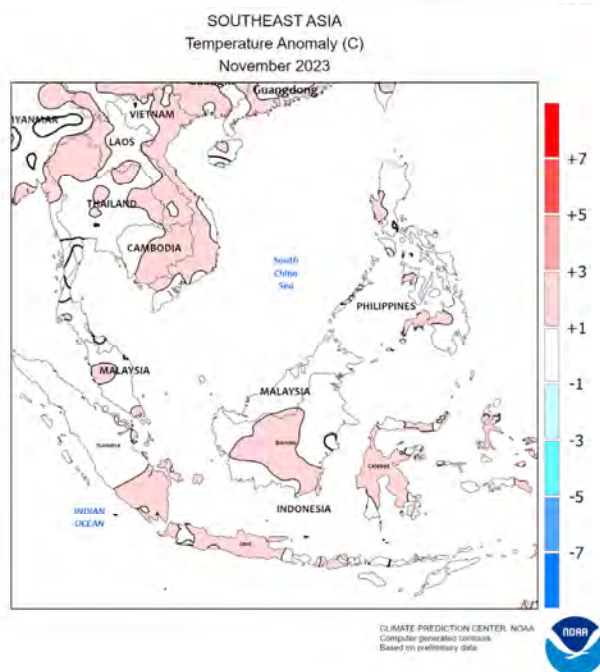
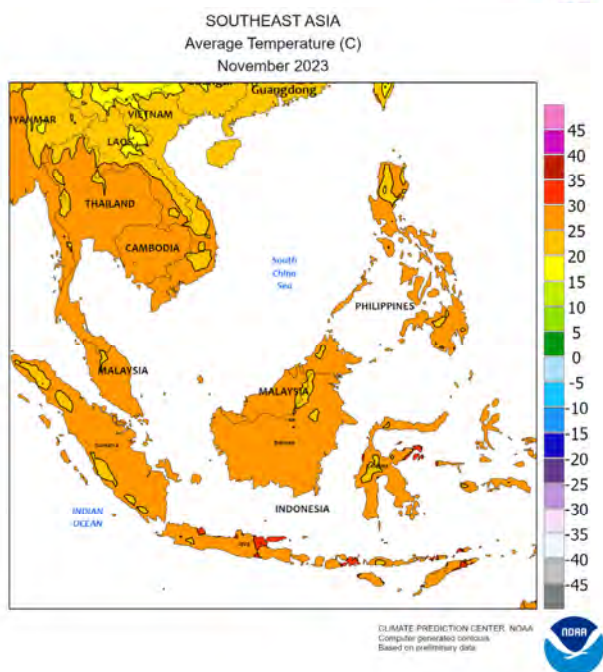
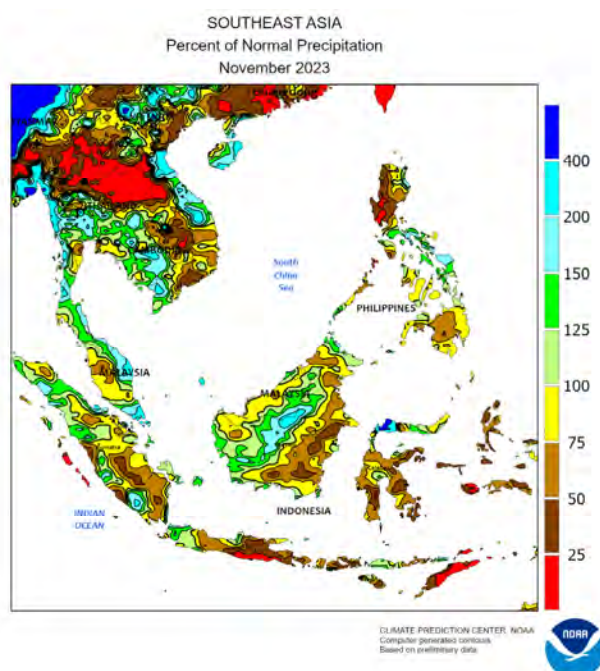
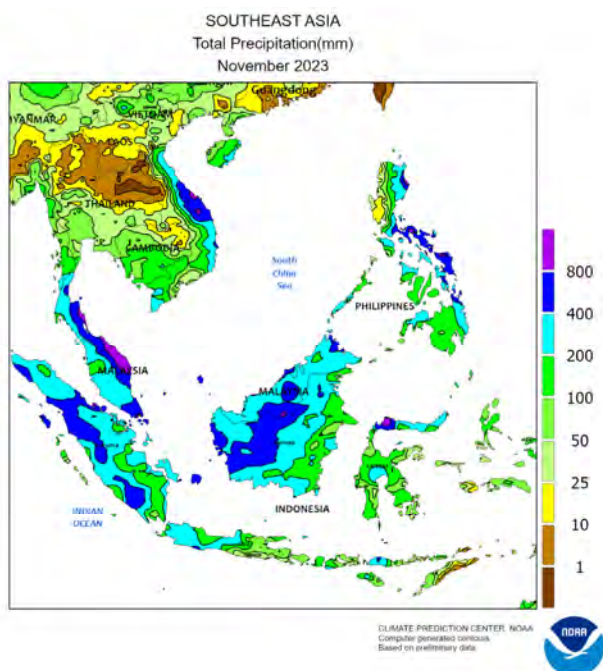
the month, producing over 50 mm of rain (over 5 times the normal monthly amount). The wetness slowed fieldwork but benefited immature cotton that was planted later in the season. Additionally, a tropical cyclone (Midhili) swept through northeastern-most India and eastern Bangladesh around mid-month, bringing heavy showers (topping 100 mm in most areas, over 400 percent of normal) to rice areas. While not completely unfavorable, the moisture was ill-timed for maturation of aman rice in Bangladesh.



EASTERN ASIA

Near- to above-normal rainfall was prevalent across most major winter crop areas of eastern China during November. Despite a few pockets of below-average precipitation, moisture conditions were favorable for rapeseed establishment in the Yangtze Valley. On the North China Plain, early month showers (averaging 40 mm) gave way to dry

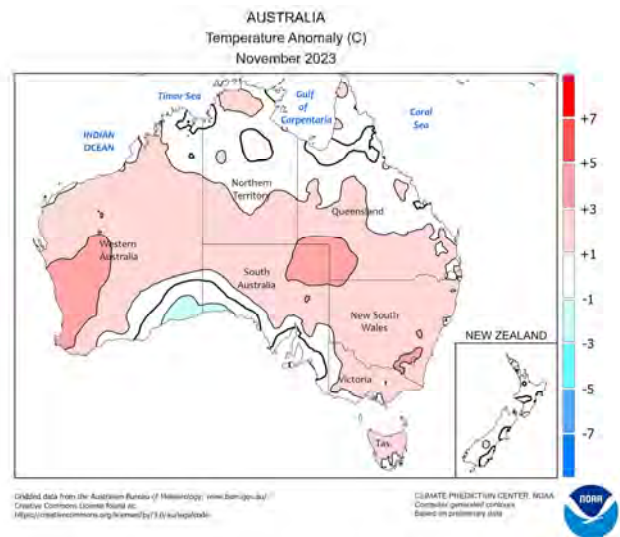
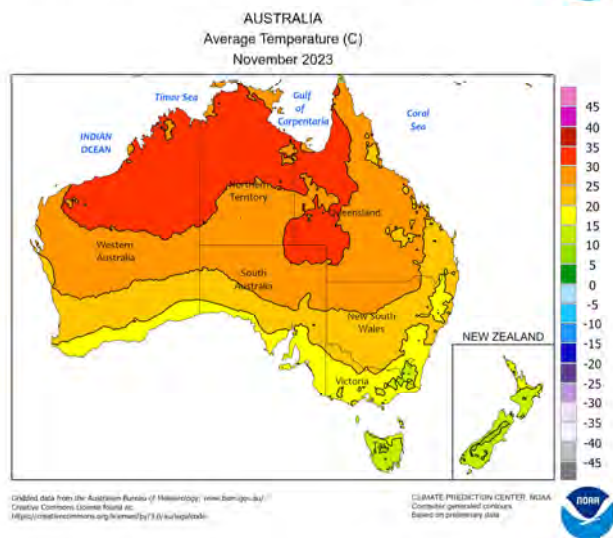
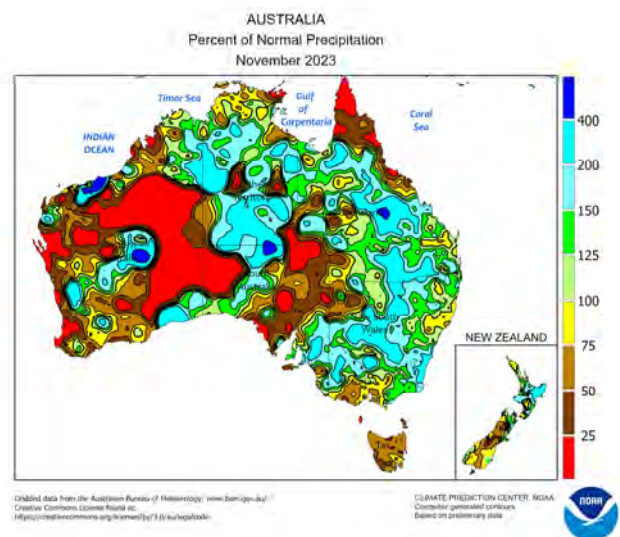
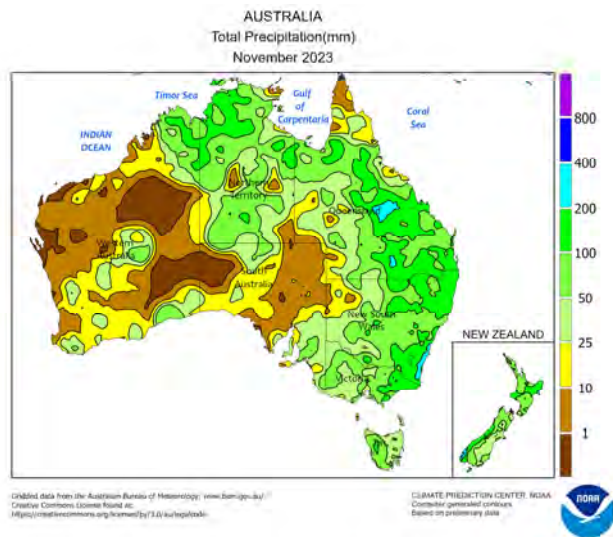
weather for the remainder of the month, but with declining temperatures, moisture conditions were adequate for wheat establishment. By month's end seasonably colder weather moved into winter crop areas ushering wheat into dormancy (average temperatures below 5°C) and slowing rapeseed development (average temperatures below 10°C).



SOUTHEAST ASIA

After a lengthy delay, seasonal rainfall became established in western Java, Indonesia, in late November. The delayed onset of rain (over a month) led to developing drought and forced some rice growers to switch to other less moisture intensive crops. However, the late-month improvement in moisture conditions benefited rice that was sown. Meanwhile, central and eastern Java continued to experience lagging seasonal showers with as much as 50

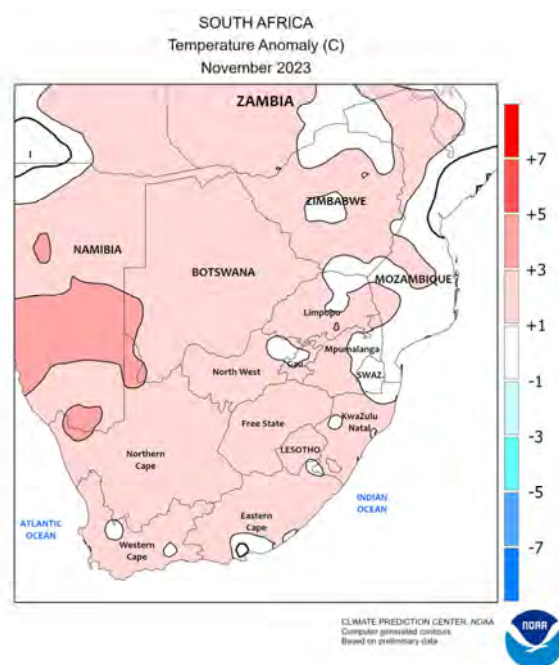
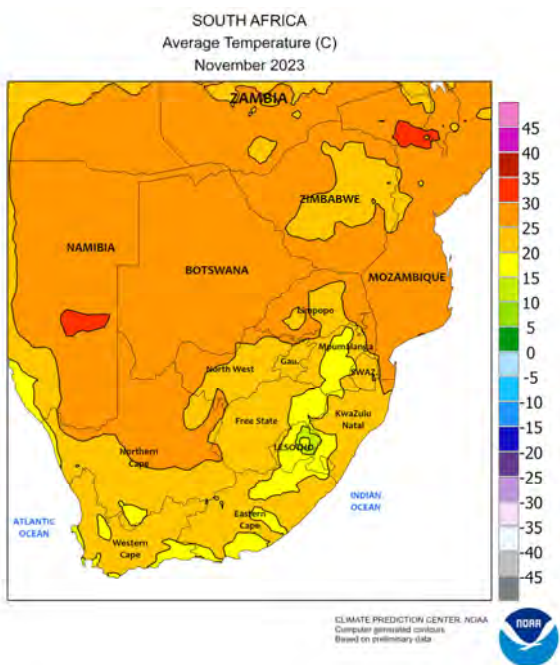
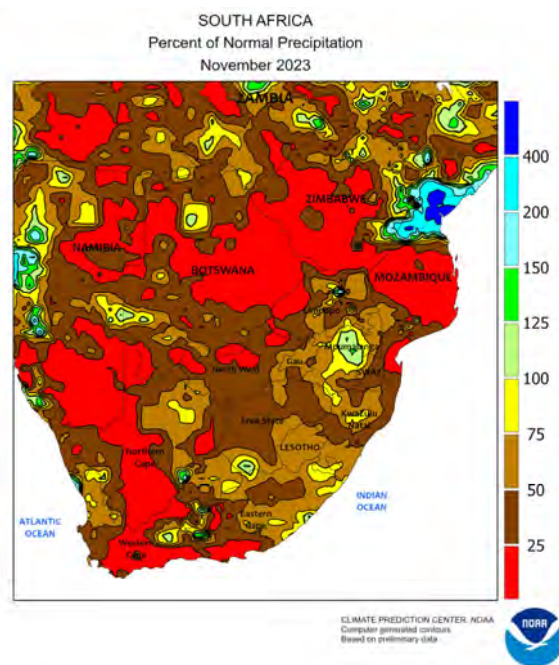
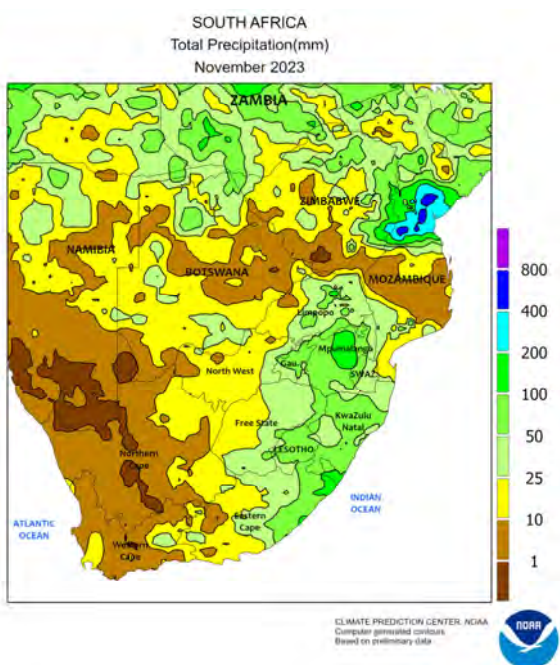
percent below normal rainfall for the month. Showers were generally more seasonable in most oil palm areas of Indonesia and Malaysia, although parts of peninsula Malaysia recorded torrential downpours that pushed monthly totals over 800 mm (165 percent of normal). Elsewhere, the main rice-producing areas in the eastern Philippines reported near-normal rainfall (150-300 mm or more) and adequate seasonal moisture.



AUSTRALIA

During November, near- to above-normal rainfall in southern and eastern Australia helped alleviate local drought, triggering additional sorghum planting. The rain benefited recently sown summer crops, aiding germination and emergence, but the rain likely came too late in the spring to encourage a significant

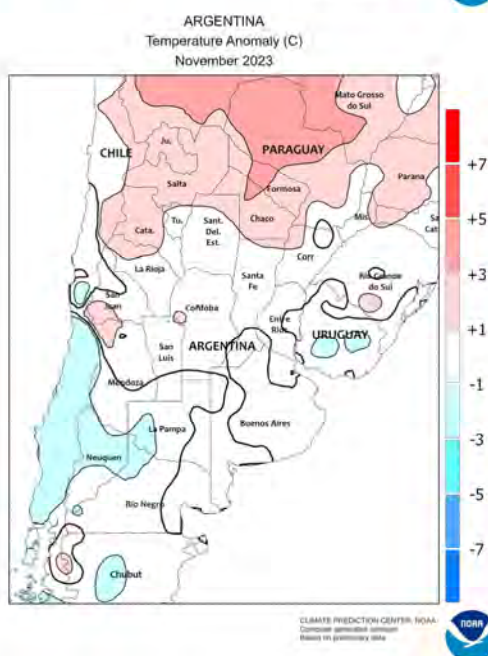
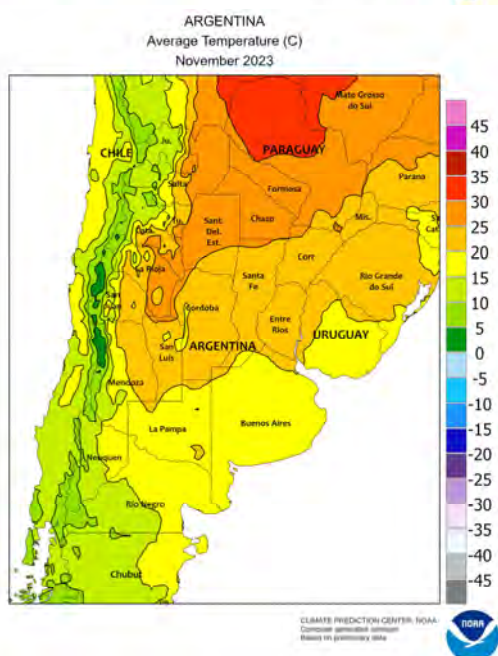
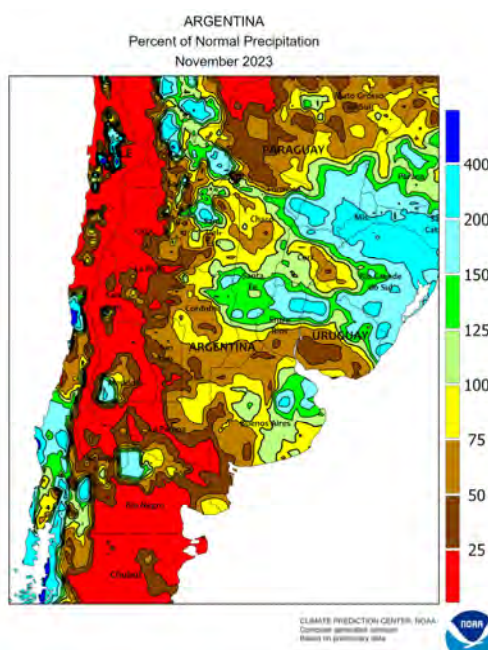
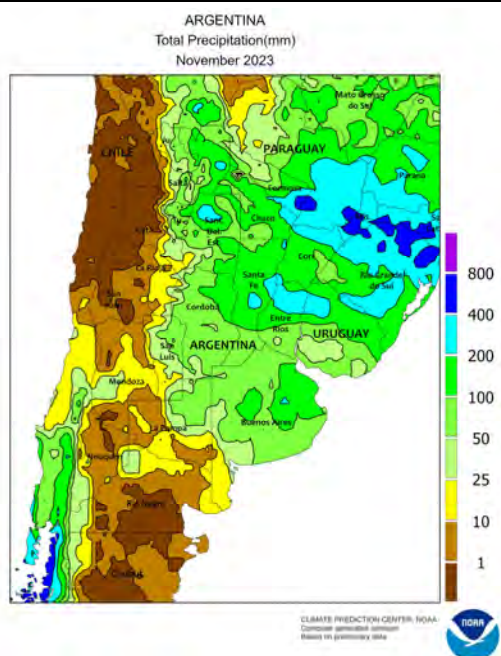
amount of additional cotton planting. The wet weather caused some fieldwork delays too, but winter crop harvesting advanced nonetheless. Elsewhere in the wheat belt, mostly dry, frequently hot weather in Western Australia allowed wheat, barley, and canola harvesting to proceed at a rapid pace.



SOUTH AFRICA

A November heatwave depleted topsoil moisture needed for germination of later-planted summer crops while increasing moisture demands of those already actively growing. Monthly temperatures average 1 to 2°C above normal regionwide, with several outbreaks of unusually high temperatures (at or above 40°C) on several occasions. In eastern commercial farming areas, the heat maintained high moisture requirements for sugarcane in KwaZulu-Natal and eastern Mpumalanga, while in western sections

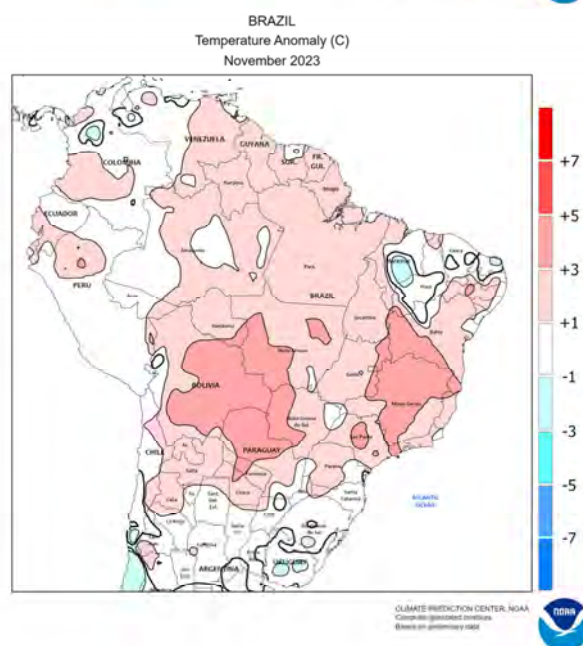
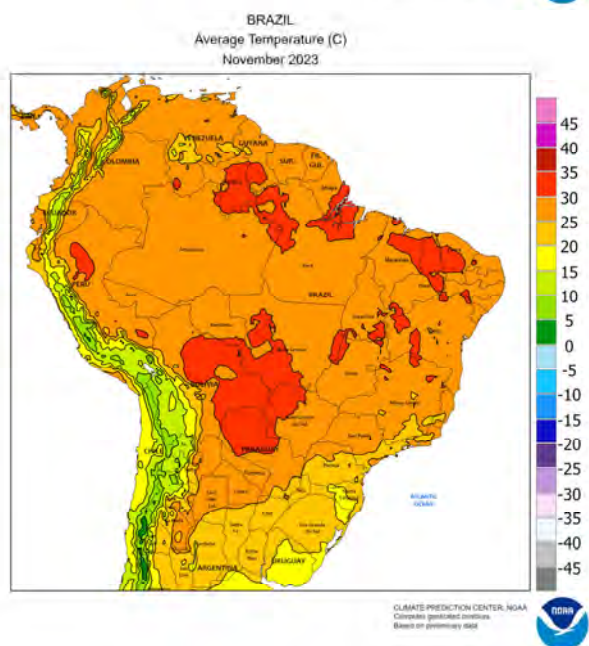
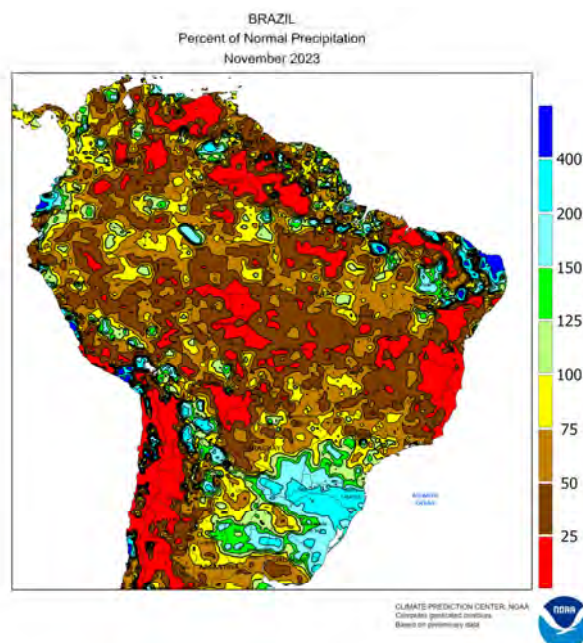
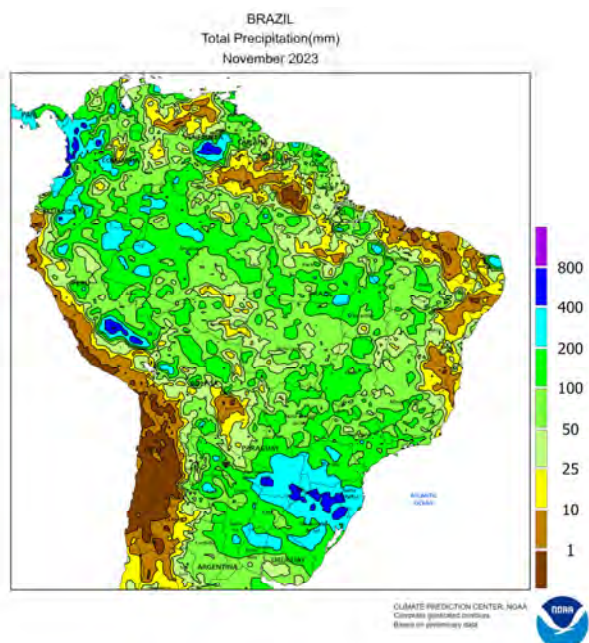
of the corn belt (North West and adjacent locations in Free State) the combined heat and dryness discouraged any pre-planting fieldwork. November rainfall was below normal in most areas, an exception being eastern sections of the corn belt (western Mpumalanga and environs), where frequent, occasionally heavy rainfall maintained favorable prospects for that region's earlier-planted summer crops. Western farming areas required timely December rainfall to avoid planting delays due to dry soils.



ARGENTINA

Timely November showers improved planting prospects of summer grains, oilseeds, and cotton in nearly all agricultural districts. Following an exceptionally dry winter, rainfall continued the more normal pattern that began in October, with total accumulations exceeding 100 mm in eastern farming areas (Buenos Aires northward). Although not as wet as in the east, western farming areas (La Pampa

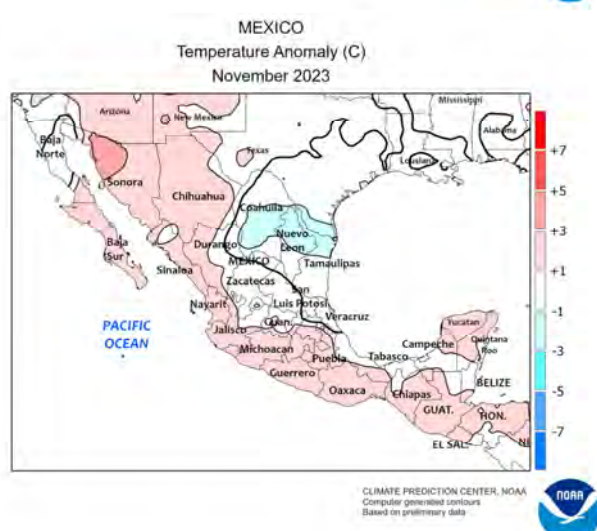
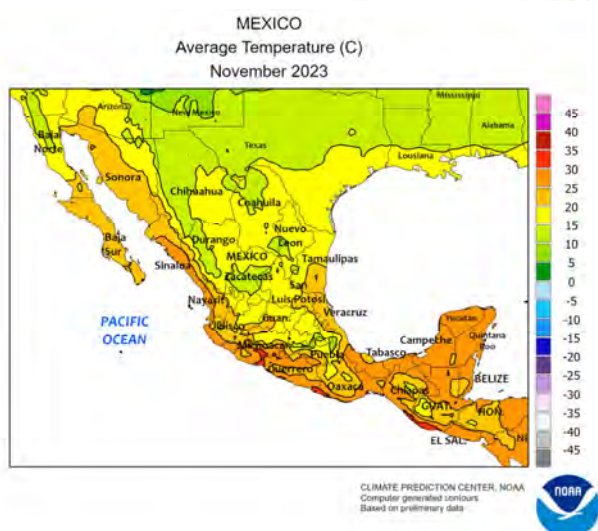
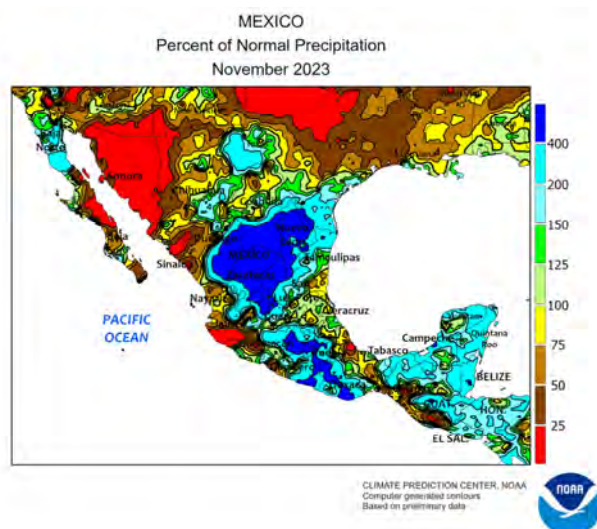
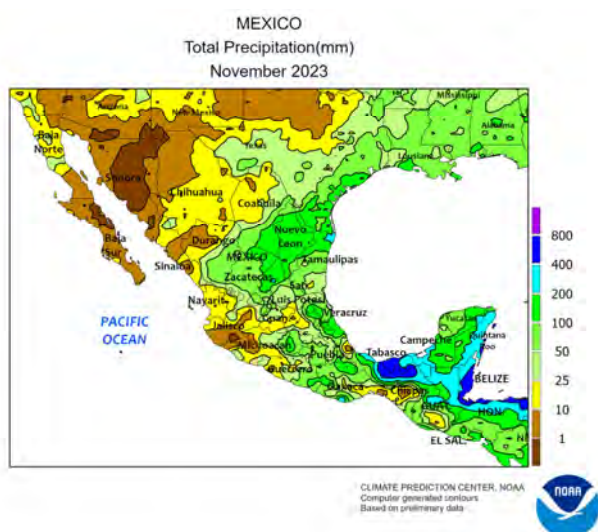
northward, including Córdoba) also received a timely boost in topsoil moisture. Monthly temperatures averaged near to slightly above normal, with the warmest weather recurring in the traditionally warmer north and west; highest temperatures exceeded 40°C several times during the month as far south as northern Córdoba, with highs reaching the upper 30s (degrees C) southward through La Pampa and western Buenos Aires.



BRAZIL

During November, extended periods of warmer- and drier-than-normal weather in Brazil's central and northeastern farming areas contrasted with frequent, locally excessive rainfall farther south. The northern dryness was a continuation of the pattern that began in October and eventually led to a reported slowdown in soybean planting in Mato Grosso. Summer heat (daytime highs reaching 40°C) accompanied the dryness, compounding the impacts of the dryness and possibly necessitating replanting of stressed seedlings. Similar conditions were also recorded in

the northeastern interior (western Bahia and environs), likely with similar results. Farther south, however, heavy rain – particularly in Rio Grande do Sul, where monthly accumulations exceeded 200 percent of normal – maintained adequate to locally excessive levels of moisture for corn and soybeans, while also hampering the late stages of the wheat harvest. Temperatures in the south were generally more seasonable, although highs reached the middle and upper 30s (degrees C) in the traditionally warmer western and northern parts of the region.

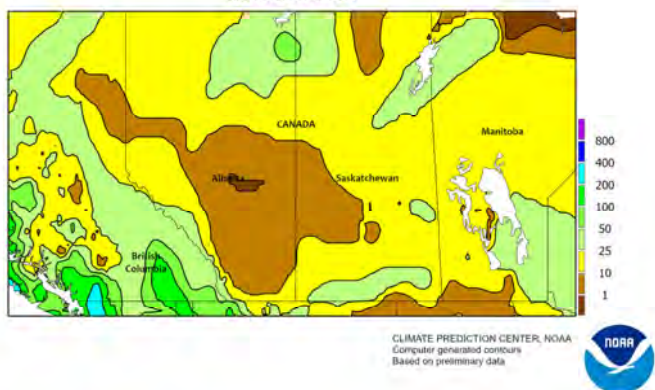


MEXICO

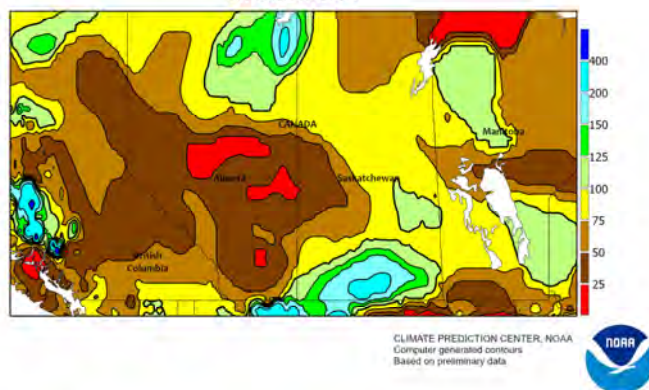
Above-normal November rainfall helped to replenish depleted reservoirs in central and northeastern Mexico while also giving a late-season boost to irrigation reserves in parts of the south. Monthly accumulations totaling 50 to 100 mm extended from southern Durango northeastward through Tamaulipas, with lighter amounts recorded in southern sections of both Chihuahua and Sinaloa. Similar amounts were reported in Veracruz, while seasonably heavier rain (totaling more than 200 mm locally) prevailed during the month in the southeast, including farming areas in

and around Tabasco. However, mostly dry weather prevailed in drought-stricken western sections of the southern plateau (central Jalisco and neighboring locations in Guanajuato and Michoacán) and much of the northwest, where moisture was limited for winter cropping going into the dry season. According to the government of Mexico, reservoirs were at 50 percent capacity nationally as of November 30. However, levels were lower relative to capacity in the northwest, including Sinaloa (33 percent), Sonora (31 percent), and Chihuahua (41 percent).

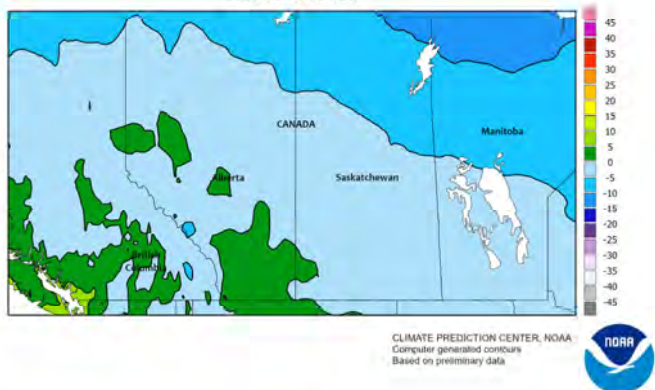
CANADIAN PRAIRIES
Total Precipitation(mm)
November 2023



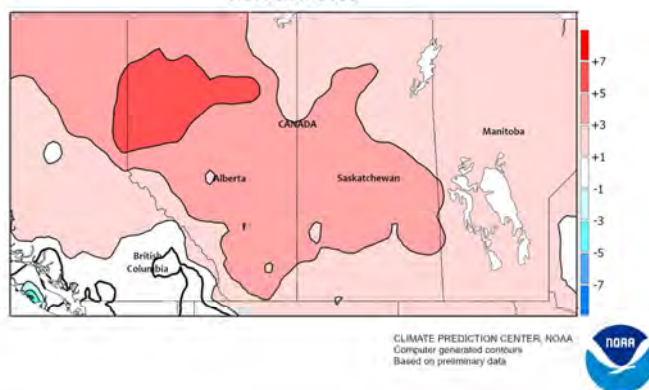
CANADIAN PRAIRIES
Percent of Normal Precipitation
November 2023



CANADIAN PRAIRIES
Average Temperature (C)
November 2023



CANADIAN PRAIRIES
Temperature Anomaly (C)
November 2023

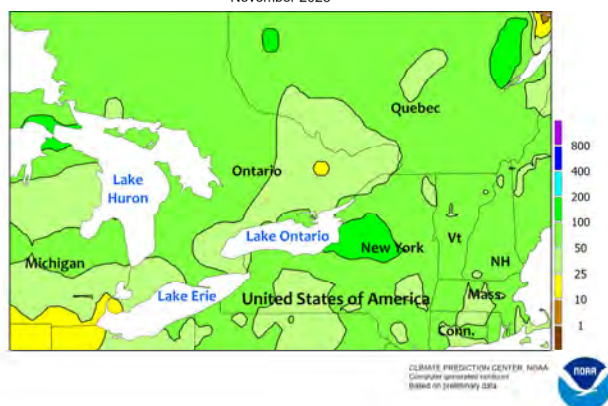


CANADIAN PRAIRIES

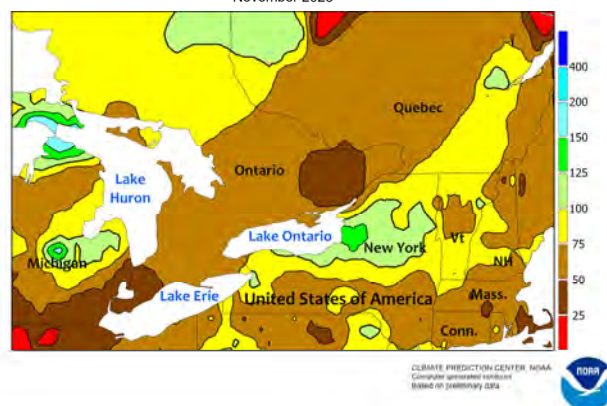
Despite the trend toward seasonably cooler conditions, including an outbreak of Arctic air during the latter half of the month, warmer-than-normal weather prevailed during most of November. Monthly average temperatures ranged from 2°C above normal in Manitoba and southern Saskatchewan to as much as 6°C above normal farther west, including Alberta's Peace River Valley. Lowest minimum temperatures

ranged from -10 to -20°C regionwide, although the location and duration of the coldest conditions likely had no impact on overwintering vegetation. November precipitation was generally light, though monthly accumulations approached 25 mm in parts of Manitoba and Saskatchewan. According to the Canadian Drought Monitor, nearly all farming districts entered the winter in varying degrees of dryness and drought.

SOUTHEASTERN CANADA
Total Precipitation(mm)
November 2023



SOUTHEASTERN CANADA
Percent of Normal Precipitation
November 2023



SOUTHEASTERN CANADA
Average Temperature (C)
November 2023



SOUTHEASTERN CANADA
Temperature Anomaly (C)
November 2023



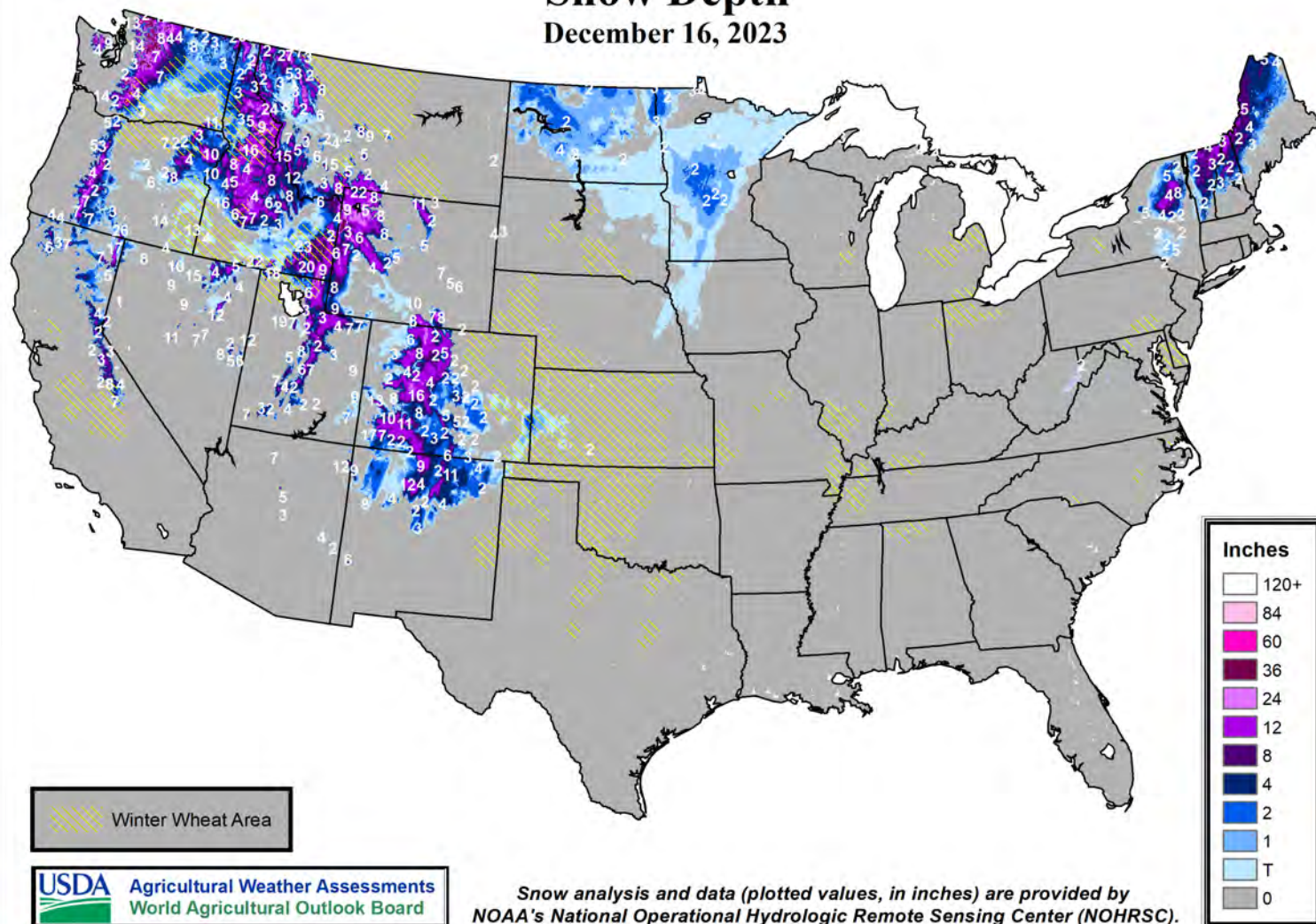
SOUTHEASTERN CANADA

Drier-than-normal weather prevailed during November, favoring summer crop harvesting but reducing moisture somewhat for wheat and pastures entering dormancy. Total accumulated precipitation generally ranged from 25 to 75 mm (liquid equivalent), representing mostly below-normal levels, with a few exceptions in southern Quebec.

Monthly temperatures averaged within 1°C of normal in all major agricultural districts; seasonal cooling prompted dormancy of winter grains during the early part of November. According to the Canadian Drought Monitor, Moderate to Severe Drought (D1 and D2) had developed in sections of Ontario by November 30.

Snow Depth

December 16, 2023



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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

Production Editor..... **Brian Morris** (202) 720-3062

International Editor..... **Mark Brusberg** (202) 720-2012

Agricultural Weather Analysts..... **Harlan Shannon**
and **Eric Luebehusen**

National Agricultural Statistics Service

Agricultural Statistician and State Summaries Editor.....

Irwin Anolik (202) 720-7621

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