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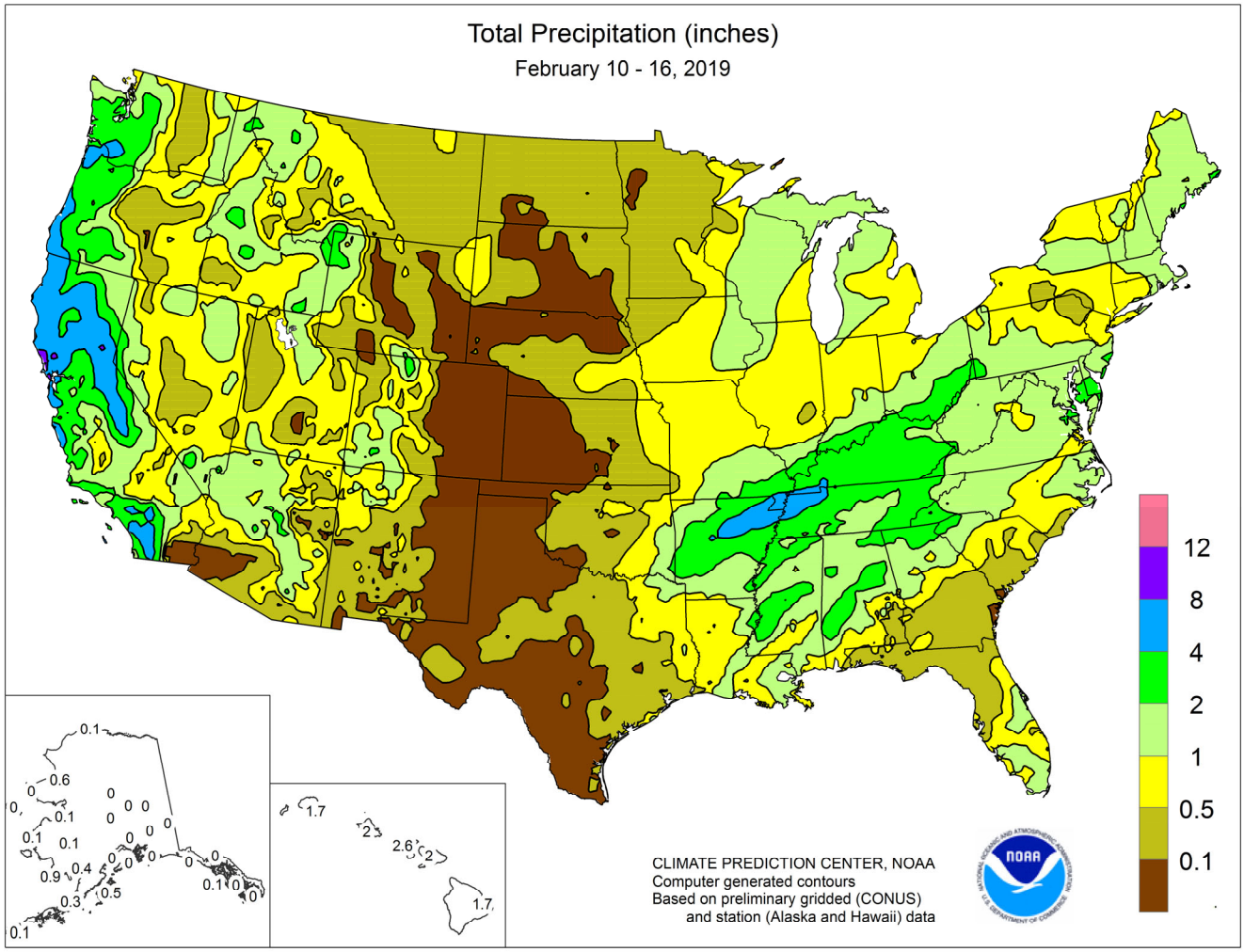
WEEKLY WEATHER AND CROP BULLETIN

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

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



HIGHLIGHTS
February 10 – 16, 2019

Highlights provided by USDA/WAOB

Powerful, late-winter storms crossed the country, delivering periods of heavy precipitation in much of the **West**, two rounds of significant snow across the **North**, and another wave of rain in the **Ohio Valley** and **mid-South**. Lowland flooding affected several river basins in the **central and eastern Corn Belt**, extending southward into the **northern Mississippi Delta**. The heaviest rain, locally 2 to 4 inches or more, fell during the first half of the week, though showers returned as the week ended. Meanwhile, much of the **North** remained under a

(Continued on page 5)

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Water Supply Forecast for the Western United States

Highlights

Widespread storminess, in part due to the contribution of a developing El Niño, led to abundant precipitation and snowfall in much of the West. Periods of stormy weather in California provided the Sierra Nevada with a full season's worth of precipitation and snowpack during the first 4½ months of the 2018-19 water year.

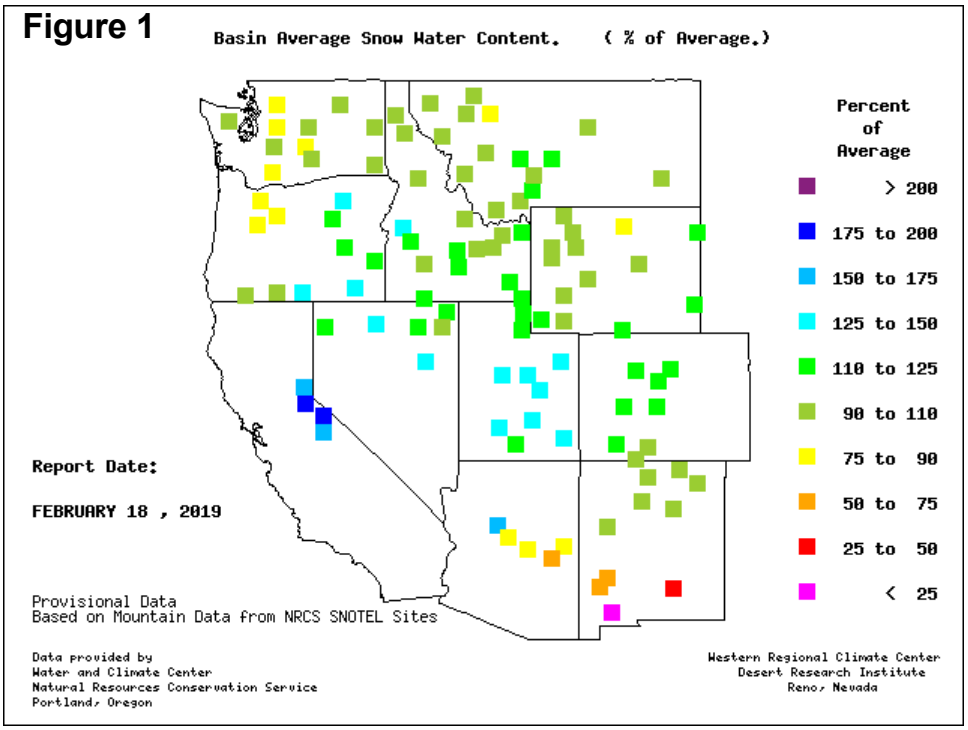
By mid-February, snowpack deficiencies were mostly limited to the Pacific Northwest and the southern reaches of the Southwest. In the former region, colder, stormier weather in early February resulted in improving snowpack. In the Southwest, however, warmth and erratic storminess left several basins with sub-par snowpack.

Snowpack and Precipitation

By February 18, 2019, near- or above-average snowpack values were common across the West. Below-average snowpack was generally limited to the Cascades and portions of Arizona and New Mexico (figure 1). In the Cascades, however, cold, stormy weather during the first half of February brought marked improvement, with snowpack in most basins increasing from 50 to 75 percent of normal to 75 to 90 percent. Elsewhere, snowpack was at least 125 to 175 percent of normal from the Sierra Nevada into portions of the Intermountain West, while snowpack was significantly below normal in a few basins across southern sections of Arizona and New Mexico.

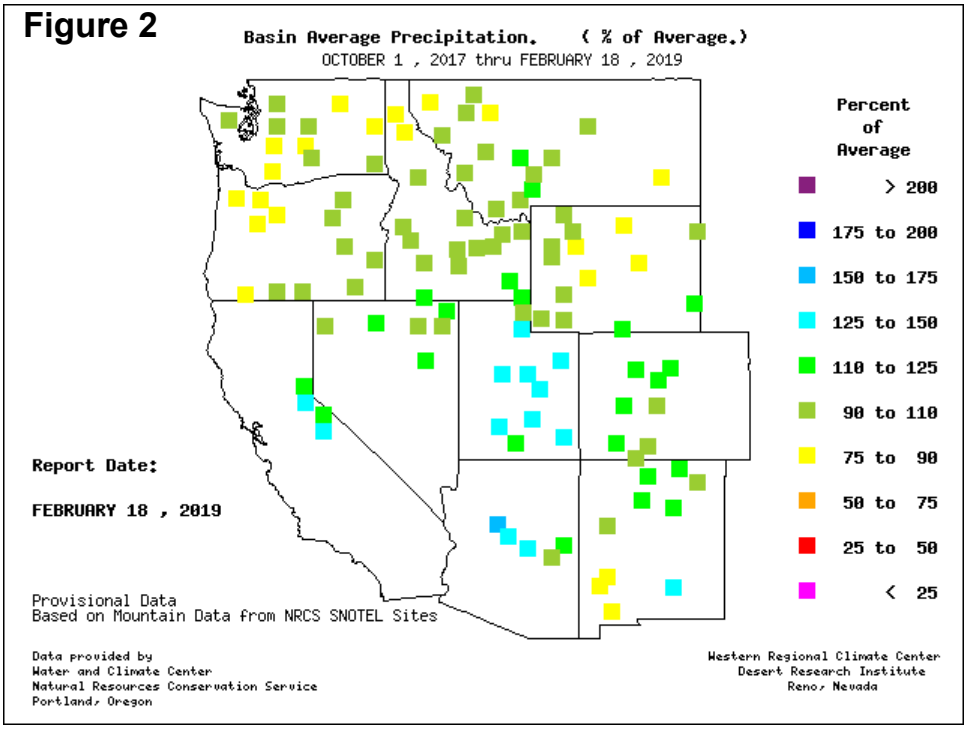
SNOTEL – River Basin Snow Water Content

Figure 1



SNOTEL – River Basin Precipitation

Figure 2



Season-to-date precipitation (October 1, 2018 – February 18, 2019) was near or above normal in many Western basins. In fact, slightly below-normal values (75 to 90 percent of average) were mostly limited to portions of the Cascades and northern Rockies. Even in those regions, recent precipitation has resulted in improving season-to-date numbers.

Spring and Summer Streamflow Forecasts

By February 1, 2019, projections for spring and summer streamflow were indicating the likelihood of a favorable melt season across much of the West. In general, some of the most optimistic runoff forecasts existed across the middle one-third of the West, stretching eastward from the Sierra Nevada. Northwestern runoff projections were somewhat less favorable due to a slow start to the snow accumulation season—partly a function of several warm early-season storms. Streamflow forecasts were also not very robust across several basins in the lower Southwest, including parts of Arizona and New Mexico.

Reservoir Storage

On February 1, 2019, reservoir storage as a percent of average for the date was substantially below average in Arizona and New Mexico, and slightly below average in Colorado, Oregon, and Washington (figure 4). Cumulative storage for this time of year was near or above average in all other Western States. Recent Western storms have produced significant precipitation that will not be fully reflected in reservoir storage until the melt season ends.

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

Spring and Summer Streamflow Forecasts

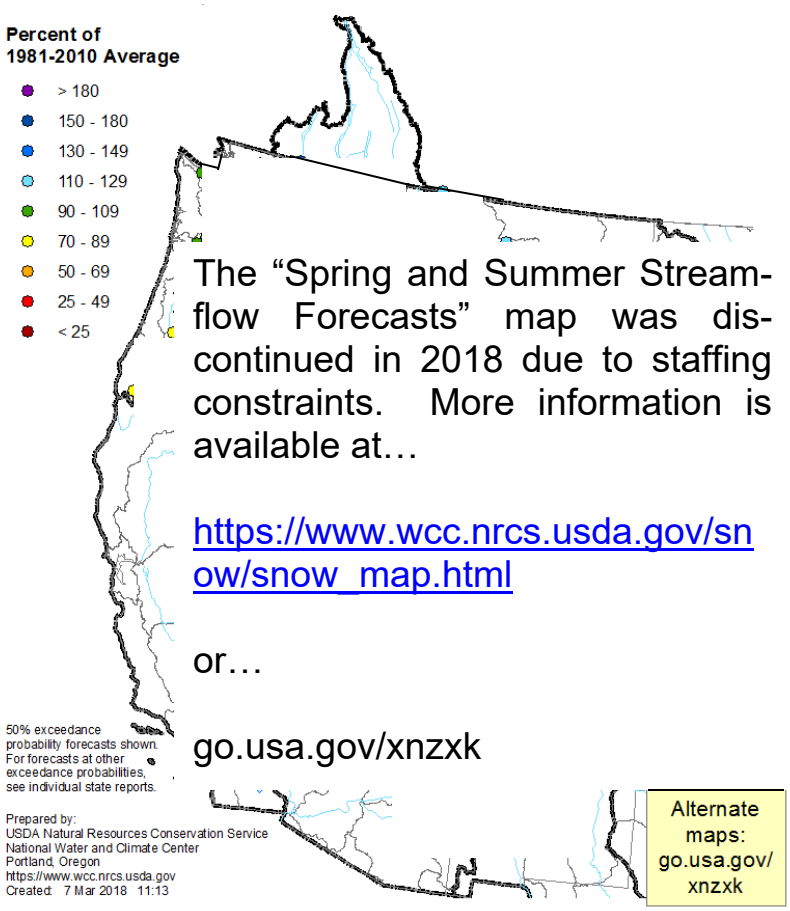
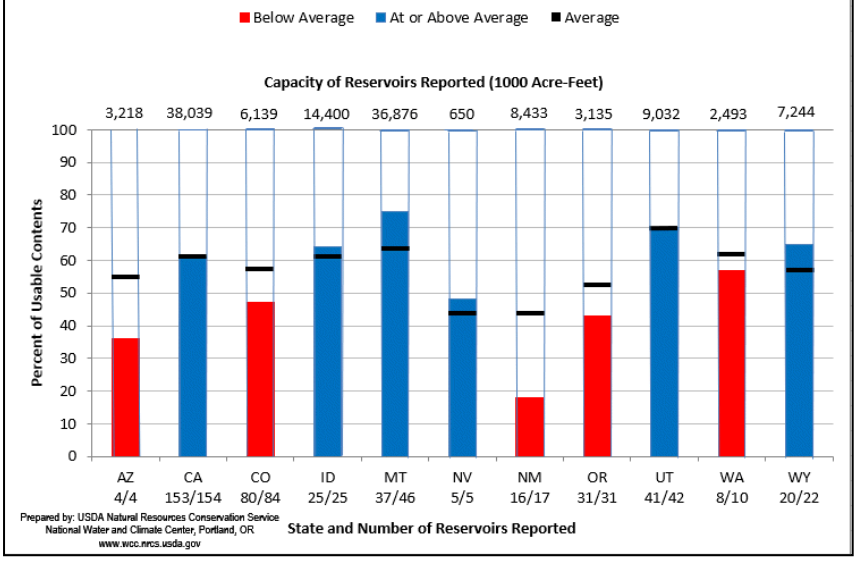
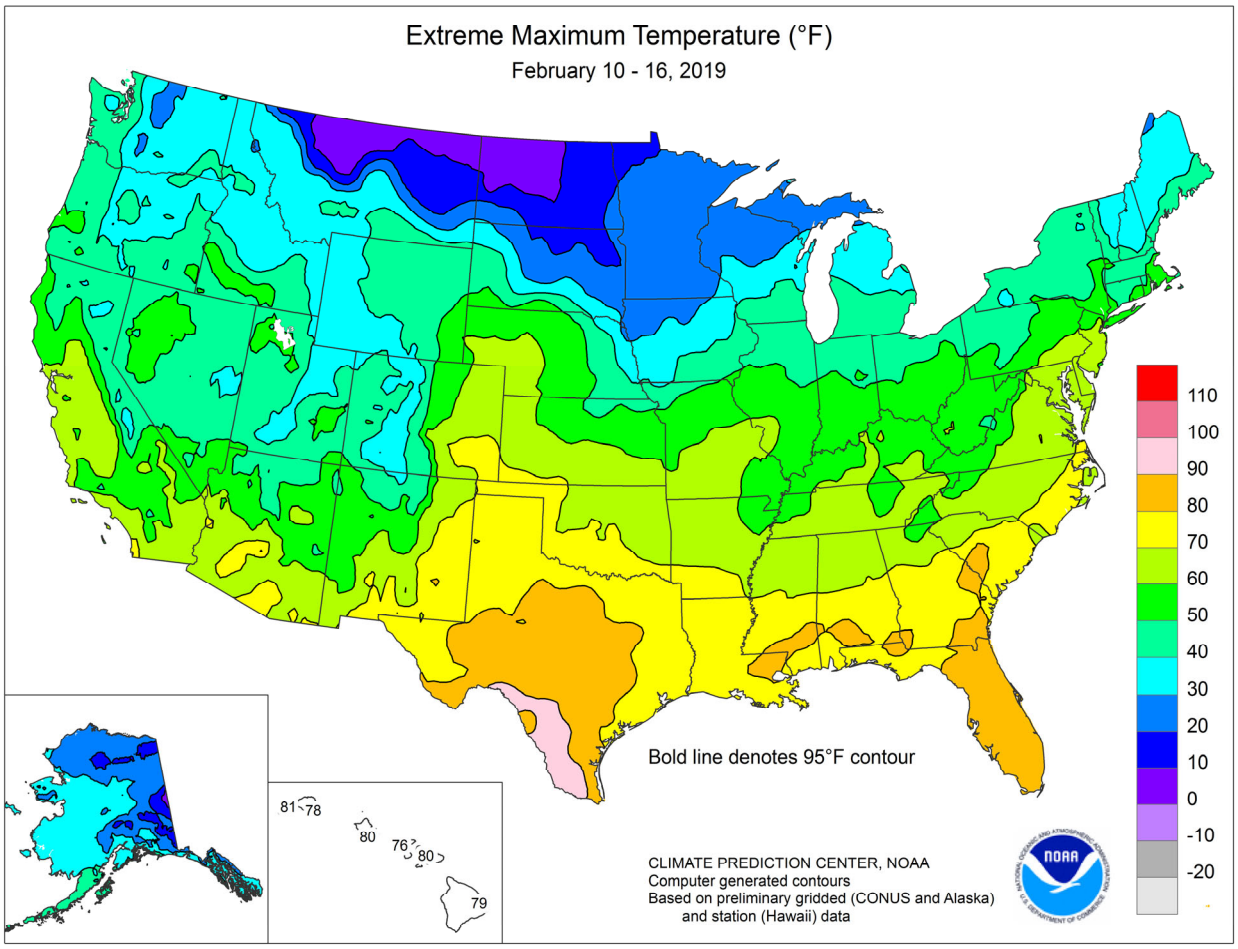
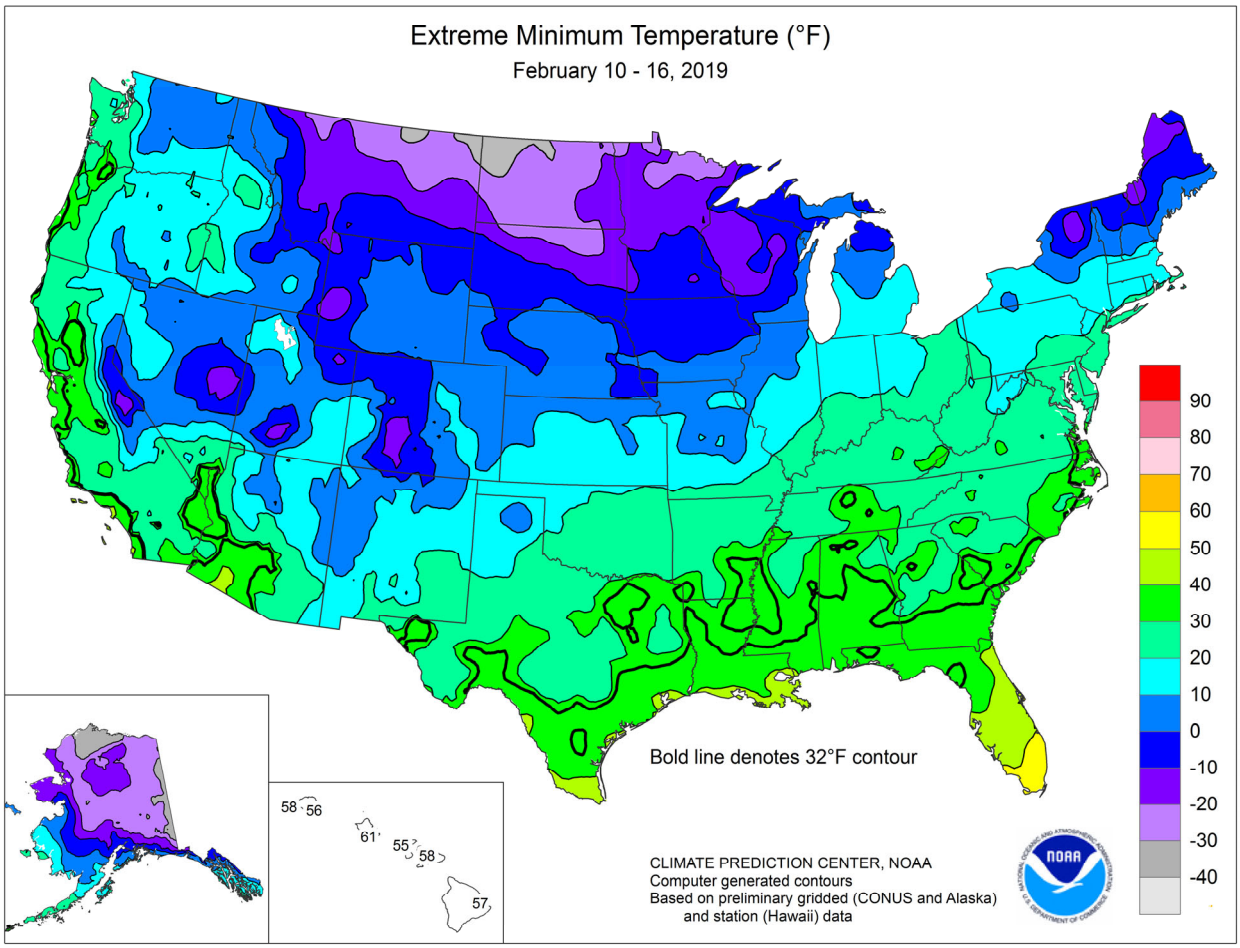


Figure 4 **Reservoir Storage as of February 1, 2019**

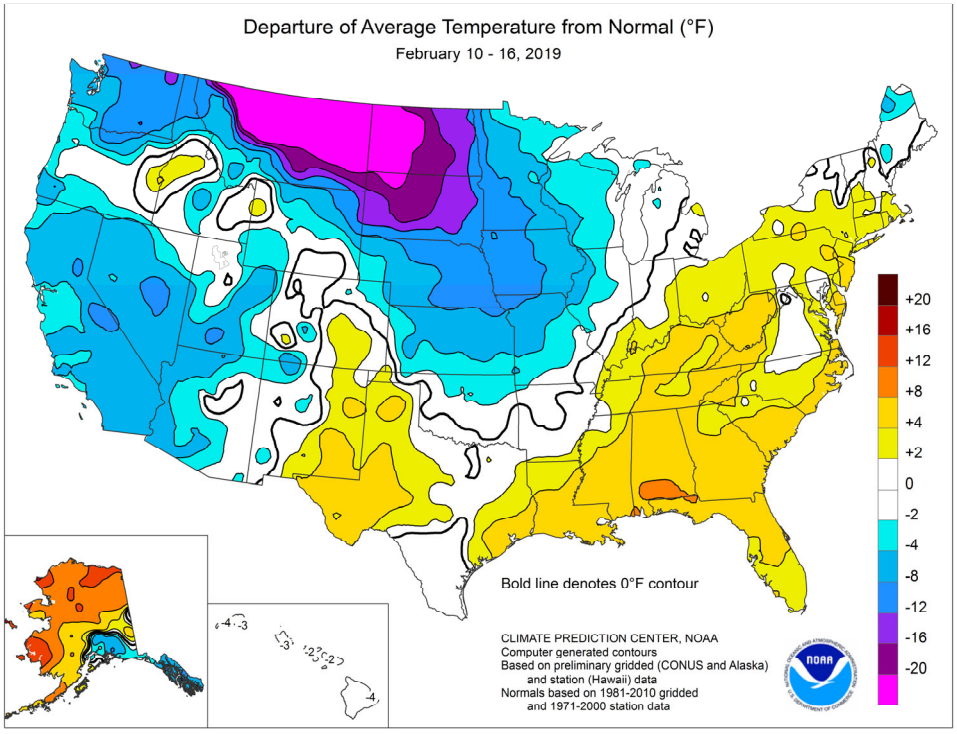



Extreme Maximum Temperature (°F)
February 10 - 16, 2019
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
Bold line denotes 95°F contour
81
78
80
76
80
79
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS and Alaska)
and station (Hawaii) data


Extreme Minimum Temperature (°F)
February 10 - 16, 2019
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
Bold line denotes 32°F contour
58
56
61
55
58
57
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS and Alaska)
and station (Hawaii) data

(Continued from front cover)

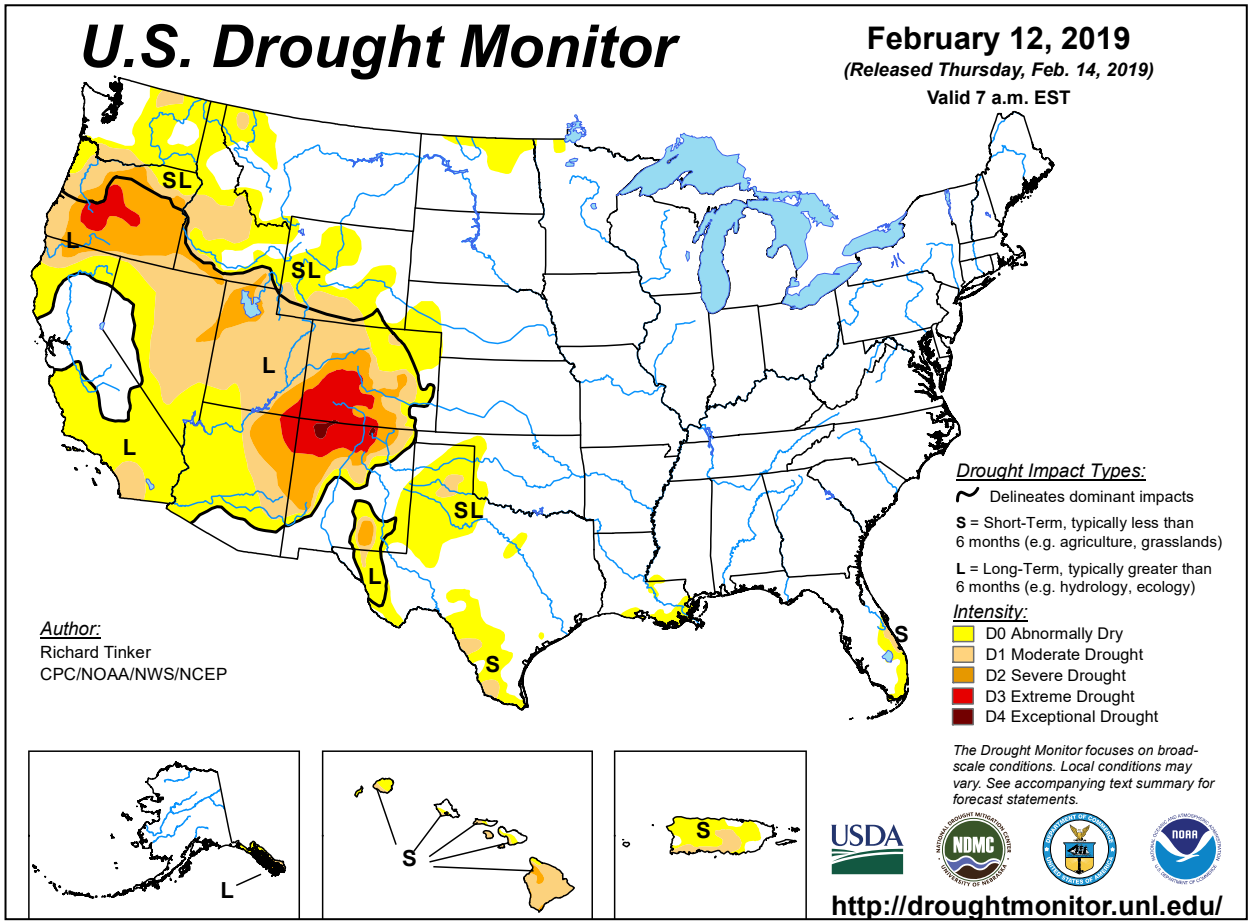
thick blanket of snow. Extremely heavy snow, totaling a foot or more, fell across portions of the **upper Great Lakes region** on February 12. The following day, snow spread into the **Northeast**. Later, snow returned across portions of the **northern Plains** and **upper Midwest** from February 14-16. Elsewhere, **California's** heaviest precipitation fell on February 13-14, resulting in flash flooding and debris flows. One of the most damaging mudslides struck in **Sausalito, CA**, near **San Francisco**. Interplay between cold and warm air masses contributed to the stormy weather pattern. Weekly temperatures averaged more than 5°F above normal in the **Southeast**, as well as parts of the **Ohio Valley** and **southern sections of the Rockies and High Plains**, but ranged from 10 to 30°F below normal on the **northern Plains**. Temperatures averaged as much as 10°F below normal in **Washington**, **east of the Cascades**, and ranged from 5 to 10°F below normal in much of **California** and the **Great Basin**.

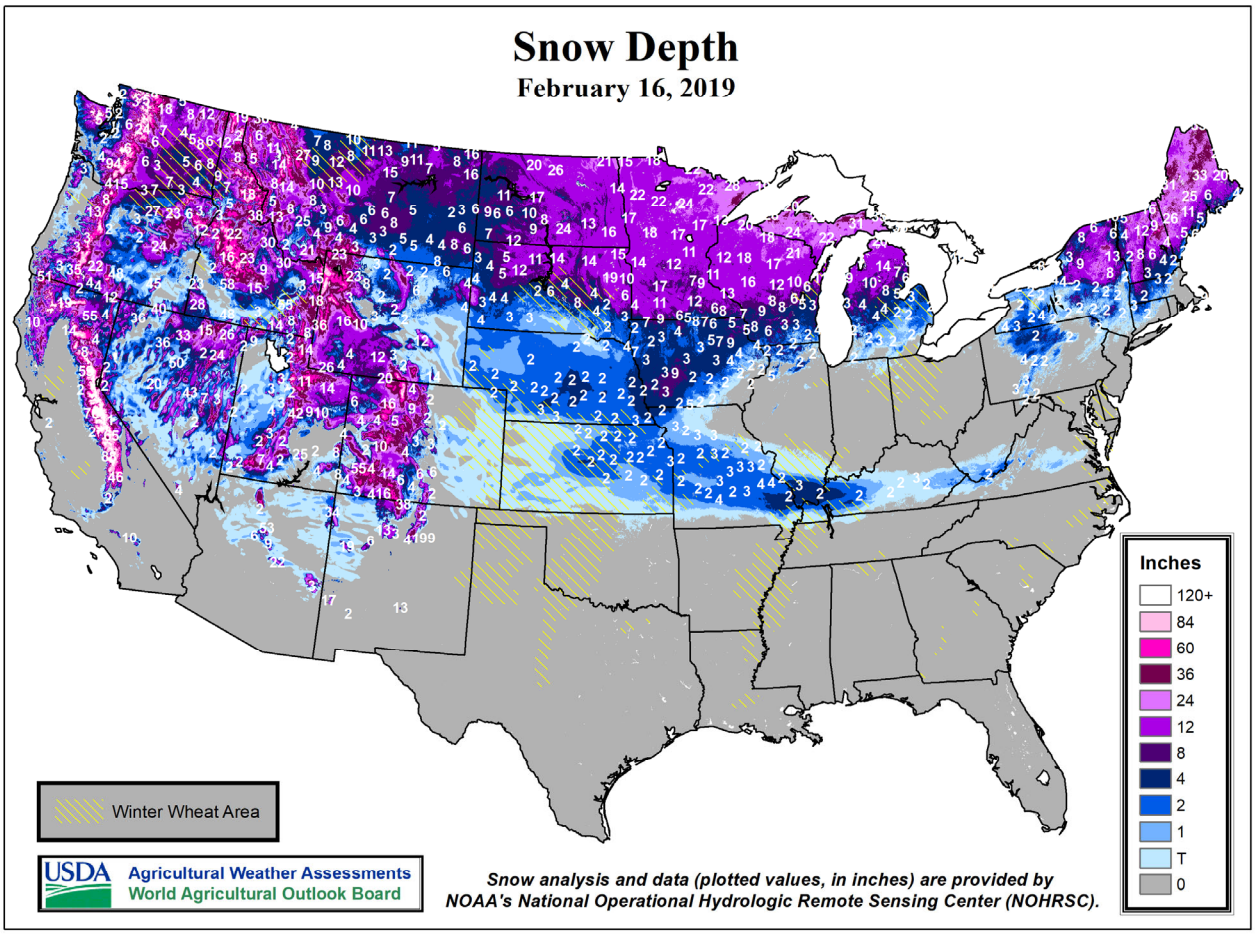


The average water content of the **Sierra Nevada** snowpack reached 30 inches by mid-February, according to the California Department of Water Resources. This was up from 17 inches at the beginning of the month—and exceeds the normal **Sierra Nevada** snow-water equivalency for an entire winter. Precipitation in **Blue Canyon, CA**, totaled 8.07 inches from February 13-16, boosting the month-to-date total to 15.75 inches. Elsewhere in **California**, daily-record totals for the 13th included 2.49 inches in downtown **San Francisco** and 2.11 inches in **Sacramento**. February 14 was the wettest day on record at the observation site on **southern California's Palomar Mountain**, where 10.10 inches fell (previously, 9.58 inches on March 1, 1991). On the same date, **Palomar Mountain** experienced a wind gust to 69 mph. **Palm Springs, CA**, received 3.69 inches of rain on February 14, accounting for 64 percent of its normal annual precipitation. Heavy precipitation also overspread desert areas, with February 14 totals topping an inch in locations such as **Las Vegas, NV** (1.11 inches); **Prescott, AZ** (1.07 inches); and **Bishop, CA** (1.06 inches). Farther north, the week had begun with a significant winter storm in progress. Record-setting snowfall totals for February 10 included 5.1 inches in **Winnemucca, NV**; 4.3 inches in **Lewiston, ID**; and 4.0 inches in **Spokane, WA**. Another daily-record snowfall, 7.2 inches, occurred in **Spokane** on February 11. Elsewhere in **Washington**, **Seattle** also collected a daily-record snowfall (6.1 inches) for February 11. **Seattle's** month-to-date snowfall climbed to 20.2 inches, representing its highest monthly total since January 1969 (45.4 inches) and highest February total since 1916 (35.4 inches). Through the 16th, February snowfall records had been already broken in locations such as **Glasgow, MT** (23.3 inches; previously, 21.4 inches in 1952), and **Pendleton, OR** (19.3 inches; previously, 16.8 inches in 1994). Meanwhile, an **upper Midwestern** storm dumped more than a foot of snow on February 12 in **Marquette, MI** (16.5 inches), and **Wausau, WI** (15.7 inches). Elsewhere in **Wisconsin**, **Eau Claire** achieved a February snowfall record (28.7 inches through the 16th; previously, 28.2 inches in 1936), aided by a daily-record total of 9.5 inches on the 12th. In **Maine**, **Caribou** reported a daily-record snowfall (12.9 inches) for February 13. Concurrently, heavy rain in the **South**, **East**, and **lower Midwest** led to record-setting totals for February 11 in **Jonesboro, AR** (3.64 inches); **Louisville, KY** (1.54 inches); and **Evansville, IN** (1.36 inches). Daily-record totals for February 12 topped an inch in **Cincinnati, OH** (1.20 inches), and **Atlantic City, NJ** (1.22 inches). Late in the week, snow returned across the **North**. On February 15, daily-record snowfall totals included 5.2 inches in **Rapid City, SD**, and 4.0 inches in **Billings, MT**. Record-setting **Midwestern** snowfall totals for the 16th included 7.6 inches in **Waterloo, IA**, and 5.4 inches in **Madison, WI**. **Des Moines, IA**, received 9.5 inches of snow on February 16-17.

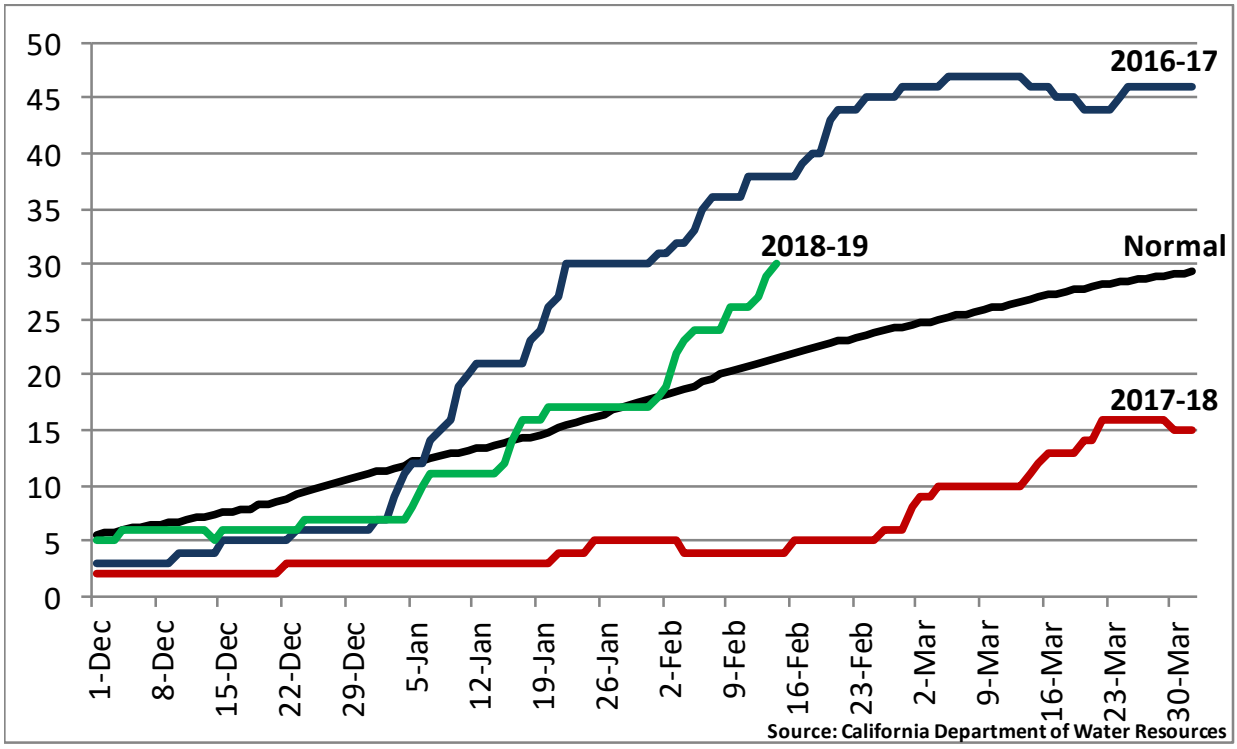
Early in the week, frigid weather accompanied the **Northwestern** snow. February 10 featured daily-record lows in **Washington** locations such as **Olympia** (5°F) and **Seattle** (21°F). Elsewhere in **Washington**, **Wenatchee** notched a trio of daily-record lows (12, 16, and 13°F) from February 11-13. Farther south, record-setting lows for February 11 included -15°F in **Ely, NV**, and 11°F in **Bishop, CA**. In contrast, early-week warmth in **Florida** expanded to cover much of the **Southeast**. On February 12, daily-record highs soared to 88°F in **Melbourne, FL**; 82°F in **Augusta, GA**; and 81°F in **Columbia, SC**. Late in the week, warmth developed across parts of **Texas**, where record-setting highs for February 15 included 93°F in **Del Rio** and 87°F in **Waco**.

Cold, mostly dry weather continued across **southeastern Alaska**, while most mainland locations reported above-normal temperatures. In fact, weekly temperatures averaged 10 to 20°F above normal in **northern and western Alaska**. **Utqiagvik (Barrow)** collected consecutive daily-record highs of 28°F on February 10-11. **Cold Bay** posted a daily-record high of 48°F on the 11th. Weekly precipitation totaled 0.59 inch in **Kotzebue**, aided by a daily-record sum of 0.16 inch on February 16. At week's end, a winter storm unfolded across portions of **interior Alaska**, where **McGrath** received 6.7 inches of snow on February 16-17. Farther south, persistently cool, unsettled weather covered **Hawaii**, which led to some additional snow on the highest peaks on **Maui** and the **Big Island**. Weekly rainfall totaled 2.03 inches in **Kahului, Maui**, and 1.72 inches in **Lihue, Kauai**. Although no records were set, low temperatures on February 10 dipped to 56°F in **Lihue** and 58°F in **Kahului**. **Lihue** also noted a northerly wind gust to 43 mph on the 10th, while **Honolulu, Oahu**, reported a westerly gust to 48 mph.


U.S. Drought Monitor
February 12, 2019
(Released Thursday, Feb. 14, 2019)
Valid 7 a.m. EST
Author:
Richard Tinker
CPC/NOAA/NWS/NCEP
Drought Impact Types:
Delineates dominant impacts
S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)
Intensity:
D0 Abnormally Dry
D1 Moderate Drought
D2 Severe Drought
D3 Extreme Drought
D4 Exceptional Drought
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.
USDA
NDMC
NOAA
http://droughtmonitor.unl.edu/


Snow Depth
February 16, 2019
Inches
120+
84
60
36
24
12
8
4
2
1
T
0
Winter Wheat Area
USDA Agricultural Weather Assessments
World Agricultural Outlook Board
Snow analysis and data (plotted values, in inches) are provided by
NOAA's National Operational Hydrologic Remote Sensing Center (NOHRSC).

Daily Sierra Nevada Snowpack (Inches) vs. Normal



California Reservoirs, Recharge and Withdrawal

Million Acre-Feet and Percent of Average

	Recharge		Withdrawal
2010-11	12.47 (158%)	**2011**	8.78 (111%)
2011-12	5.79 (73%)	**2012**	11.54 (146%)
2012-13	6.52 (83%)	**2013**	11.49 (145%)
2013-14	4.17 (53%)	**2014**	7.75 (98%)
2014-15	6.46 (82%)	**2015**	7.13 (90%)
2015-16	14.68 (185%)	**2016**	7.88 (99%)
2016-17	15.00 (189%)	**2017**	8.77 (111%)
2017-18	6.88 (87%)	**2018**	10.85 (137%)
2018-19	3.26	**2019**	N/A
Avg.	**7.92**	**Avg.**	**7.92**

Notes: Recharge and withdrawal values are based on end-of-month statistics, not daily readings. Recharge data for 2018-19 is valid through January 31.

National Weather Data for Selected Cities

Weather Data for the Week Ending February 16, 2019

Data Provided by Climate Prediction Center

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 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
AL	BIRMINGHAM	61	44	67	33	53	7	1.38	0.41	1.20	18.85	154	7.51	96	90	56	0	0	2	1
	HUNTSVILLE	58	41	67	33	50	7	2.02	0.87	1.06	19.44	142	9.44	116	86	65	0	0	5	2
	MOBILE	69	50	78	38	60	8	0.84	-0.35	0.58	16.00	121	6.55	77	90	67	0	0	3	1
	MONTGOMERY	68	46	73	34	57	8	0.68	-0.62	0.54	15.84	123	5.85	74	92	55	0	0	3	1
AK	ANCHORAGE	26	12	37	0	19	1	0.21	0.04	0.13	3.68	177	1.25	121	84	73	0	7	2	0
	BARROW	5	-15	29	-37	-5	11	0.10	0.07	0.04	1.59	530	1.22	678	89	77	0	7	4	0
	FAIRBANKS	17	-4	32	-24	6	11	0.00	-0.08	0.00	1.07	72	0.65	87	80	76	0	7	0	0
	JUNEAU	31	15	35	6	23	-5	0.14	-0.85	0.08	14.31	115	8.68	123	78	69	0	7	2	0
	KODIAK	39	29	42	22	34	4	0.46	-1.00	0.31	15.99	83	7.94	68	76	64	0	6	3	0
	NOME	22	2	32	-17	12	7	0.51	0.32	0.26	3.20	135	2.29	168	96	90	0	7	5	0
AZ	FLAGSTAFF	40	17	45	-1	29	-3	1.68	1.07	1.48	7.31	137	6.36	181	86	32	0	7	4	1
	PHOENIX	65	46	69	38	56	-2	0.07	-0.08	0.07	1.39	67	1.20	103	68	43	0	0	1	0
	PRESCOTT	51	27	57	16	39	0	1.10	0.67	1.07	3.57	94	3.40	135	85	25	0	4	3	1
	TUCSON	66	43	74	29	55	0	0.16	-0.03	0.16	3.43	139	1.93	135	58	35	0	1	1	0
AR	FORT SMITH	53	36	67	29	45	3	1.78	1.20	1.19	13.02	185	7.51	206	89	59	0	1	3	2
	LITTLE ROCK	53	36	66	31	44	0	2.62	1.82	1.77	17.28	171	6.96	129	96	61	0	2	4	2
CA	BAKERSFIELD	59	40	67	32	50	-3	0.45	0.17	0.26	2.84	111	2.22	123	77	55	0	1	5	0
	FRESNO	56	42	67	33	49	-2	1.02	0.52	0.32	5.58	121	5.02	153	83	67	0	0	5	0
	LOS ANGELES	61	48	68	42	54	-4	2.01	1.24	1.70	11.32	173	9.87	208	73	55	0	0	5	1
	REDDING	49	34	56	28	41	-8	2.92	1.55	1.97	17.87	124	13.55	139	90	74	0	2	3	2
	SACRAMENTO	55	40	63	32	48	-3	2.89	1.99	1.95	10.57	126	8.21	138	93	58	0	1	4	2
	SAN DIEGO	64	51	71	44	57	-2	1.17	0.67	0.62	8.90	188	5.88	171	70	48	0	0	5	1
	SAN FRANCISCO	56	44	65	41	50	-2	3.48	2.46	1.48	12.10	124	10.45	153	80	69	0	0	7	2
	STOCKTON	57	41	65	32	49	-2	1.61	1.00	0.94	7.92	133	5.58	135	83	70	0	1	6	1
CO	ALAMOSA	38	12	43	-4	25	4	0.26	0.23	0.15	1.74	272	1.42	458	81	57	0	7	3	0
	CO SPRINGS	54	19	64	11	37	6	0.01	-0.04	0.01	0.79	100	0.70	189	71	14	0	7	1	0
	DENVER INTL	49	20	60	11	35	5	0.10	0.09	0.10	1.02	185	0.99	413	78	34	0	7	1	0
	GRAND JUNCTION	44	25	51	19	35	2	0.61	0.52	0.47	2.13	163	1.19	151	79	59	0	7	3	0
	PUEBLO	59	19	70	9	39	5	0.00	-0.03	0.00	0.61	78	0.52	133	69	35	0	6	0	0
CT	BRIDGEPORT	42	29	49	20	35	4	0.82	0.13	0.78	12.29	139	5.96	111	72	46	0	6	2	1
	HARTFORD	39	24	49	18	32	4	0.97	0.26	0.82	12.45	136	7.49	135	74	45	0	7	3	1
DC	WASHINGTON	49	35	65	26	42	5	1.16	0.55	0.67	10.36	135	4.54	98	77	50	0	2	3	1
DE	WILMINGTON	45	30	64	17	37	4	1.42	0.78	0.94	12.84	154	5.99	122	88	48	0	6	4	1
FL	DAYTONA BEACH	76	56	84	45	66	7	0.86	0.23	0.64	9.55	130	4.67	101	99	61	0	0	4	1
	JACKSONVILLE	74	50	84	35	62	7	0.21	-0.55	0.10	10.11	124	5.15	94	95	50	0	0	3	0
	KEY WEST	80	70	83	64	75	4	1.19	0.82	0.84	4.84	92	2.94	94	86	69	0	0	3	1
	MIAMI	80	65	82	57	72	3	0.82	0.30	0.76	4.57	88	2.99	98	94	69	0	0	2	1
	ORLANDO	78	57	85	46	67	5	1.28	0.74	0.68	11.89	200	5.09	140	93	72	0	0	3	1
	PENSACOLA	71	53	78	42	62	8	0.23	-0.87	0.21	19.65	165	3.11	39	86	62	0	0	3	0
	TALLAHASSEE	72	47	80	33	60	6	0.39	-0.67	0.31	19.82	166	4.05	52	96	61	0	0	2	0
	TAMPA	78	57	84	44	68	6	0.44	-0.21	0.20	13.43	225	4.75	129	90	53	0	0	3	0
	WEST PALM BEACH	79	64	83	56	72	5	0.40	-0.23	0.40	10.56	124	9.12	170	85	63	0	0	1	0
GA	ATHENS	59	40	70	30	50	5	1.13	0.07	0.38	17.39	161	6.50	91	76	52	0	1	5	0
	ATLANTA	59	42	71	36	50	4	0.98	-0.15	0.47	19.19	167	7.36	96	81	59	0	0	5	0
	AUGUSTA	66	41	82	29	54	7	0.67	-0.32	0.22	11.01	111	5.07	75	86	55	0	1	5	0
	COLUMBUS	66	45	76	32	55	6	0.17	-0.89	0.07	13.76	119	5.83	81	93	44	0	1	4	0
	MACON	64	42	77	28	53	5	0.53	-0.58	0.30	12.95	113	6.69	88	97	53	0	1	5	0
	SAVANNAH	69	48	81	33	59	7	0.16	-0.56	0.13	11.16	131	3.02	53	89	52	0	0	3	0
HI	HILO	76	59	79	57	68	-3	1.70	-0.39	1.02	13.85	55	3.88	27	75	65	0	0	3	2
	HONOLULU	78	62	80	61	70	-3	0.85	0.27	0.48	2.32	34	1.72	42	79	66	0	0	6	0
	KAHULUI	77	63	80	58	70	-2	2.04	1.45	0.53	5.59	67	5.05	97	86	71	0	0	7	1
	LIHUE	75	62	78	56	69	-3	1.73	0.93	1.16	7.35	65	3.31	51	80	67	0	0	7	1
ID	BOISE	41	31	53	25	36	0	0.93	0.65	0.49	4.33	127	2.93	145	87	69	0	4	5	0
	LEWISTON	38	27	44	17	32	-6	1.07	0.85	0.33	3.48	128	2.68	160	87	77	0	7	6	0
	POCATELLO	36	24	46	15	30	1	0.53	0.31	0.28	3.32	121	2.54	155	77	62	0	6	5	0
IL	CHICAGO/O'HARE	34	18	50	8	26	0	0.59	0.20	0.36	7.07	140	3.75	143	86	74	0	7	4	0
	MOLINE	33	15	50	5	24	-2	0.75	0.41	0.57	7.80	172	4.85	208	81	71	0	7	3	1
	PEORIA	35	18	53	10	26	-1	0.74	0.37	0.56	8.29	176	4.10	178	85	69	0	7	3	1
	ROCKFORD	30	16	42	4	23	0	0.66	0.36	0.31	7.63	183	4.67	222	82	73	0	7	3	0
	SPRINGFIELD	37	21	56	13	29	0	0.72	0.33	0.56	9.48	191	4.57	188	90	66	0	7	3	1
IN	EVANSVILLE	50	31	57	23	40	6	2.41	1.68	1.35	14.91	185	8.76	194	85	73	0	5	4	2
	FORT WAYNE	36	22	47	17	29	3	0.79	0.33	0.52	6.80	116	3.86	125	90	74	0	7	3	1
	INDIANAPOLIS	41	25	53	20	33	3	0.94	0.38	0.46	10.31	153	6.52	175	89	66	0	6	3	0
	SOUTH BEND	32	20	42	16	26	0	0.76	0.29	0.51	7.21	112	4.46	134	86	72	0	7	4	1
IA	BURLINGTON	33	15	51	7	24	-3	0.24	-0.09	0.20	5.21	127	2.83	141	84	65	0	7	2	0
	CEDAR RAPIDS	27	7	40	-3	17	-6	0.40	0.15	0.31	3.67	119	1.58	98	93	78	0	7	3	0
	DES MOINES	27	9	40	0	18	-7	0.94	0.66	0.39	5.56	188	2.66	163	85	72	0	7	4	0
	DUBUQUE	27	9	41	-2	18	-4	1.23	0.91	0.52	6.68	182	4.61	232	84	75	0	7	4	1
	SIOUX CITY	24	7	28	0	15	-9	0.41	0.31	0.26	2.42	166	0.53	66	87	74	0	7	3	0
	WATERLOO	26	6	40	-8	16	-5	0.83	0.60	0.42	5.11	208	2.51	186	86	75	0	7	4	0
KS	CONCORDIA	35	21	48	11	28	-3	0.25	0.15	0.17	4.09	239	1.46	172	90	70	0	7	3	0
	DODGE CITY	46	22	67	16	34	-1	0.06	-0.06	0.04	2.00	124	0.80	95	82	50	0	7	2	0
	GOODLAND	45	17	65	11	31	-1	0.00	-0.06	0.00	0.89	93	0.47	84	78	56	0	7	0	0
	TOPEKA	39	22	55	13	31	-1	0.53	0.29	0.26	5.36	187	2.30	160	83	65	0	7	3	0

Based on 1971-2000 normals

***** Not Available**

Weather Data for the Week Ending February 16, 2019

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 DEC 1	PCT. NORMAL SINCE DEC 1	TOTAL, IN., SINCE JAN01	PCT. NORMAL SINCE JAN01	AVERAGE MAXIMUM	AVERAGE MINIMUM	90 AND ABOVE	32 AND BELOW	.01 INCH OR MORE	.50 INCH OR MORE
	WICHITA	45	27	67	17	36	1	0.08	-0.09	0.07	3.24	129	1.44	124	83	64	0	6	2	0
KY	JACKSON	50	31	60	23	41	4	2.05	1.18	0.72	15.10	155	7.63	139	89	54	0	4	5	2
	LEXINGTON	50	32	59	24	41	6	2.04	1.29	0.87	13.93	155	7.87	158	73	62	0	3	3	2
	LOUISVILLE	51	32	61	26	42	6	3.10	2.35	1.52	15.04	174	9.14	185	77	52	0	4	4	2
	PADUCAH	51	34	59	25	43	6	3.54	2.56	1.53	16.86	168	11.27	200	80	68	0	4	5	4
LA	BATON ROUGE	72	51	78	36	61	9	0.53	-0.77	0.53	13.69	94	4.05	44	96	55	0	0	1	1
	LAKE CHARLES	71	53	75	40	62	9	0.23	-0.59	0.23	13.38	109	6.34	83	94	62	0	0	1	0
	NEW ORLEANS	71	55	77	45	63	8	1.38	-0.03	1.34	11.40	80	6.07	66	94	73	0	0	3	1
	SHREVEPORT	66	43	76	32	55	5	0.58	-0.48	0.58	16.91	146	5.64	80	93	56	0	1	1	1
ME	CARIBOU	22	1	34	-4	12	0	1.18	0.68	0.87	10.97	149	7.20	173	76	56	0	7	3	1
	PORTLAND	36	18	44	10	27	3	1.66	0.90	0.73	11.27	111	7.62	129	80	46	0	7	3	2
MD	BALTIMORE	46	29	66	17	38	4	1.55	0.85	0.80	11.47	136	4.93	97	76	56	0	6	3	2
MA	BOSTON	42	27	52	19	35	4	1.29	0.48	0.96	8.88	93	5.86	101	69	39	0	6	3	1
	WORCESTER	34	21	45	12	28	3	1.33	0.60	0.98	11.77	122	7.12	122	82	49	0	7	3	1
MI	ALPENA	27	11	34	-1	19	1	1.11	0.81	0.57	6.89	160	4.22	170	89	66	0	7	6	1
	GRAND RAPIDS	32	18	42	14	25	1	0.72	0.36	0.29	7.29	130	5.30	182	85	69	0	7	6	0
	HOUGHTON LAKE	26	11	34	1	19	0	0.60	0.32	0.40	5.66	140	3.50	153	85	74	0	7	4	0
	LANSING	32	18	42	13	25	2	0.68	0.32	0.59	6.06	132	3.73	153	86	74	0	7	3	1
	MUSKEGON	33	20	44	16	27	3	0.87	0.49	0.84	8.70	151	5.81	185	75	65	0	7	2	1
	TRAVERSE CITY	30	13	41	6	22	1	0.25	-0.21	0.20	6.77	99	3.98	95	88	65	0	7	3	0
MN	DULUTH	21	6	28	-9	14	0	0.58	0.39	0.31	4.11	162	2.14	134	79	69	0	7	4	0
	INT'L FALLS	17	-10	22	-26	3	-7	0.15	0.00	0.10	2.83	147	2.00	164	90	72	0	7	2	0
	MINNEAPOLIS	21	5	25	-3	13	-6	0.62	0.45	0.32	3.60	147	1.87	129	91	77	0	7	4	0
	ROCHESTER	20	3	27	-8	11	-6	0.55	0.38	0.32	4.54	192	2.45	183	93	83	0	7	3	0
	ST. CLOUD	18	-3	24	-9	8	-7	0.54	0.41	0.40	2.85	162	1.52	142	91	69	0	7	3	0
MS	JACKSON	67	44	72	32	56	8	0.82	-0.29	0.80	15.71	115	7.68	93	89	60	0	1	2	1
	MERIDIAN	66	44	68	31	55	6	1.19	-0.08	1.10	16.83	119	6.57	74	85	66	0	1	3	1
	TUPELO	59	41	65	31	50	6	1.07	-0.02	0.80	14.97	110	7.42	98	85	67	0	1	5	1
MO	COLUMBIA	39	23	61	6	31	-1	1.33	0.82	1.13	10.39	196	6.09	215	87	60	0	6	4	1
	KANSAS CITY	36	22	53	12	29	-3	0.82	0.55	0.42	6.15	183	3.11	181	88	60	0	7	4	0
	SAINT LOUIS	41	25	64	15	33	-1	0.62	0.11	0.31	9.72	159	5.74	176	80	66	0	6	4	0
	SPRINGFIELD	46	26	62	18	36	0	0.91	0.38	0.73	9.12	141	4.89	149	85	69	0	6	3	1
MT	BILLINGS	24	0	41	-12	12	-17	0.56	0.45	0.36	2.35	134	1.66	152	87	61	0	7	5	0
	BUTTE	31	9	39	-14	20	-1	0.16	0.08	0.08	0.91	73	0.59	82	81	47	0	7	3	0
	CUT BANK	-1	-15	8	-23	-8	-31	0.00	-0.06	0.00	0.70	82	0.47	90	87	68	0	7	0	0
	GLASGOW	4	-12	10	-21	-4	-22	0.55	0.49	0.37	2.63	309	1.93	402	69	64	0	7	5	0
	GREAT FALLS	1	-10	10	-21	-4	-30	0.81	0.71	0.38	3.04	194	2.71	301	91	72	0	7	5	0
	HAVRE	0	-19	5	-28	-9	-30	0.37	0.31	0.16	1.78	160	1.60	267	81	75	0	7	4	0
	MISSOULA	30	16	40	-1	23	-5	0.33	0.16	0.13	2.73	105	1.88	129	88	72	0	7	5	0
NE	GRAND ISLAND	30	15	51	8	23	-4	0.45	0.34	0.27	4.03	284	0.59	78	88	73	0	7	3	0
	LINCOLN	30	14	43	-1	22	-5	0.55	0.45	0.20	4.96	287	1.64	189	87	71	0	7	4	0
	NORFOLK	26	9	45	3	18	-7	0.27	0.13	0.24	3.32	220	0.43	50	88	73	0	7	2	0
	NORTH PLATTE	35	13	64	5	24	-5	0.28	0.19	0.21	1.82	188	0.42	74	88	57	0	7	2	0
	OMAHA	27	11	34	1	19	-8	0.85	0.70	0.35	4.86	242	1.91	175	82	67	0	7	4	0
	SCOTTSBLUFF	40	14	61	4	27	-2	0.11	0.00	0.11	0.88	65	0.56	71	84	69	0	7	1	0
	VALENTINE	30	7	60	0	19	-7	0.24	0.15	0.14	1.36	170	0.47	100	82	68	0	7	3	0
NV	ELY	34	10	39	-15	22	-7	0.82	0.65	0.37	2.73	172	2.34	215	80	63	0	7	4	0
	LAS VEGAS	55	39	58	33	47	-4	1.17	1.01	1.11	2.64	198	2.47	266	53	36	0	0	4	1
	RENO	44	25	51	10	35	-3	2.34	2.09	1.21	7.35	293	6.26	384	79	62	0	5	5	2
	WINNEMUCCA	39	20	53	1	30	-5	0.73	0.61	0.27	***	***	***	***	80	68	0	5	4	0
NH	CONCORD	32	17	36	9	24	2	1.13	0.56	0.71	8.86	122	5.60	130	80	47	0	7	3	1
NJ	NEWARK	44	30	63	22	37	4	0.87	0.18	0.84	12.81	139	5.72	101	70	41	0	5	2	1
NM	ALBUQUERQUE	50	30	59	18	40	-1	0.12	0.04	0.11	1.60	137	0.81	119	73	26	0	4	2	0
NY	ALBANY	35	21	50	15	28	4	0.95	0.43	0.83	9.53	150	6.10	166	71	45	0	7	4	1
	BINGHAMTON	33	19	48	10	26	3	0.60	-0.01	0.54	7.99	114	5.28	133	80	59	0	7	3	1
	BUFFALO	35	21	44	13	28	3	1.15	0.56	0.68	11.28	135	7.92	174	86	60	0	7	3	1
	ROCHESTER	35	22	45	17	29	4	0.90	0.40	0.83	6.72	108	4.12	119	69	54	0	7	3	1
	SYRACUSE	33	21	49	16	27	3	1.42	0.92	1.20	8.56	124	5.29	139	83	55	0	7	4	1
NC	ASHEVILLE	56	36	68	26	46	8	1.34	0.42	0.81	17.49	183	6.62	107	78	56	0	3	5	1
	CHARLOTTE	56	38	66	27	47	3	1.29	0.46	0.57	12.94	142	5.96	101	85	54	0	1	4	2
	GREENSBORO	52	35	63	27	43	3	0.89	0.15	0.52	11.90	143	4.91	93	86	58	0	2	4	1
	HATTERAS	67	50	71	42	59	13	1.12	0.18	0.48	20.29	159	9.37	115	82	54	0	0	4	0
	RALEIGH	55	36	67	27	45	3	0.81	-0.02	0.45	10.47	116	4.24	71	78	59	0	2	3	0
	WILMINGTON	63	42	74	31	53	5	0.45	-0.43	0.24	10.41	100	3.33	50	90	50	0	2	5	0
ND	BISMARCK	6	-15	13	-28	-4	-21	0.29	0.18	0.14	2.18	191	1.51	216	81	70	0	7	4	0
	DICKINSON	6	-12	18	-24	-3	-23	0.00	-0.11	0.00	1.33	139	0.70	113	82	66	0	7	0	0
	FARGO	12	-11	21	-16	1	-12	0.35	0.24	0.15	2.69	167	1.56	150	88	75	0	7	4	0
	GRAND FORKS	8	-14	19	-20	-3	-15	0.42	0.28	0.21	2.22	144	1.39	140	87	71	0	7	4	0
	JAMESTOWN	7	-15	13	-20	-4	-19	0.07	-0.04	0.03	1.06	81	0.71	82	88	76	0	7	3	0
	WILLISTON	3	-18	11	-34	-8	-23	0.28	0.20	0.11	2.50	192	1.75	240	75	69	0	7	5	0
OH	AKRON-CANTON	39	24	52	14	32	5	1.41	0.88	1.00	9.72	146	6.34	172	77	63	0	7	5	1
	CINCINNATI	45	28	56	20	37	4	2.37	1.72	1.19	14.87	194	9.31	213	80	65	0	5	4	2
	CLEVELAND	39	25	50	16	32	5	1.01	0.46	0.83	9.07	132	6.02	161	84	65	0	7	3	1
	COLUMBUS	43	26	58	19	35	4	1.56	1.04	0.89	10.83	162	6.96	186	78	62	0	7	3	1
	DAYTON	41	26	52	20	34	5	1.18	0.63	0.63	13.49	194	8.86	230	84	64	0	6	3	1
	MANSFIELD	38	23	49	14	30	4	1.04	0.52	0.74	9.94	140	6.18	161	91	67	0	7	4	1

Based on 1971-2000 normals

***** Not Available**

Weather Data for the Week Ending February 16, 2019

STATES AND STATIONS		TEMPERATURE °F						PRECIPITATION							RELATIVE HUMIDITY PERCENT		NUMBER OF DAYS TEMP. °F		NUMBER OF DAYS PRECIP	
		AVERAGE MAXIMUM	AVERAGE MINIMUM	EXTREME HIGH	EXTREME LOW	AVERAGE	DEPARTURE FROM NORMAL	WEEKLY TOTAL, IN.	DEPARTURE FROM NORMAL	GREATEST IN 24-HOUR, IN.	TOTAL, IN., SINCE DEC 1	PCT. NORMAL SINCE DEC 1	TOTAL, IN., SINCE JAN01	PCT. NORMAL SINCE JAN01	AVERAGE MAXIMUM	AVERAGE MINIMUM	90 AND ABOVE	32 AND BELOW	.01 INCH OR MORE	.50 INCH OR MORE
	TOLEDO	35	22	47	14	29	3	0.85	0.39	0.60	6.41	114	3.59	121	77	64	0	7	5	1
	YOUNGSTOWN	38	23	49	11	31	4	1.36	0.89	1.09	10.57	165	6.84	199	84	65	0	7	5	1
OK	OKLAHOMA CITY	51	32	70	21	41	0	0.14	-0.17	0.14	6.49	172	2.33	123	86	59	0	5	1	0
	TULSA	49	31	66	23	40	-1	0.60	0.19	0.54	8.28	170	4.70	192	83	66	0	2	5	1
OR	ASTORIA	46	35	49	27	41	-3	4.33	2.33	1.38	20.80	84	10.97	77	98	86	0	1	7	3
	BURNS	35	20	41	-1	27	-2	1.12	0.87	0.85	4.60	151	3.56	203	85	72	0	7	5	1
	EUGENE	46	38	51	29	42	0	1.76	0.15	0.56	11.97	61	6.28	55	90	77	0	1	7	1
	MEDFORD	47	34	55	28	41	-2	1.60	1.08	0.71	8.84	134	5.63	153	90	58	0	3	5	1
	PENDLETON	37	22	45	14	29	-9	0.59	0.29	0.30	5.26	145	3.60	168	90	81	0	7	6	0
	PORTLAND	45	35	49	25	40	-3	2.17	1.11	0.85	10.84	82	5.76	76	95	77	0	1	7	2
	SALEM	45	37	48	28	41	-1	3.24	1.94	1.31	13.67	89	7.63	86	85	76	0	1	7	3
PA	ALLENTOWN	42	29	60	17	35	6	0.61	-0.05	0.51	12.67	150	6.43	127	71	49	0	5	4	1
	ERIE	38	24	49	12	31	4	0.85	0.30	0.80	8.89	119	5.96	159	79	68	0	7	4	1
	MIDDLETOWN	41	28	61	17	35	5	0.97	0.26	0.59	11.13	145	5.43	123	85	53	0	6	4	1
	PHILADELPHIA	45	32	62	22	38	4	1.38	0.75	1.01	12.24	147	5.86	117	68	49	0	5	4	1
	PITTSBURGH	40	25	52	15	33	3	1.18	0.63	0.70	11.52	168	5.98	150	86	61	0	6	4	1
	WILKES-BARRE	38	24	56	12	31	3	0.30	-0.21	0.28	8.14	131	4.95	135	80	46	0	6	2	0
	WILLIAMSPORT	38	26	53	13	32	4	0.92	0.28	0.89	12.14	167	5.95	137	72	55	0	7	3	1
RI	PROVIDENCE	41	26	51	19	34	4	1.42	0.58	0.97	13.77	131	8.50	133	75	47	0	7	3	1
SC	CHARLESTON	67	45	76	32	56	6	0.23	-0.50	0.12	11.69	129	1.94	33	91	47	0	1	3	0
	COLUMBIA	64	40	81	28	52	5	0.46	-0.47	0.20	10.75	105	3.50	51	88	59	0	1	4	0
	FLORENCE	64	41	78	29	52	5	0.82	0.10	0.37	10.66	115	3.75	65	91	45	0	2	5	0
	GREENVILLE	56	38	61	29	47	4	2.10	1.11	0.85	19.09	182	7.63	115	87	47	0	2	5	2
SD	ABERDEEN	13	-11	20	-22	1	-16	0.19	0.11	0.10	3.04	290	1.73	258	79	73	0	7	4	0
	HURON	17	-5	23	-14	6	-14	0.19	0.09	0.08	2.23	206	1.06	154	82	71	0	7	4	0
	RAPID CITY	20	0	48	-5	10	-17	0.41	0.32	0.35	2.45	261	1.21	224	84	66	0	7	3	0
	SIOUX FALLS	21	3	28	-7	12	-8	0.23	0.15	0.12	2.11	173	0.88	126	83	73	0	7	4	0
TN	BRISTOL	53	35	65	25	44	7	1.95	1.14	0.70	14.99	171	9.14	171	97	53	0	3	5	2
	CHATTANOOGA	55	40	63	32	48	6	2.73	1.57	1.30	18.97	147	9.97	124	91	61	0	1	5	2
	KNOXVILLE	53	36	65	28	45	4	2.94	2.00	1.32	16.22	145	8.72	130	93	59	0	1	5	1
	MEMPHIS	56	38	62	31	47	3	2.61	1.57	2.02	17.17	141	8.33	127	92	62	0	1	5	1
	NASHVILLE	55	38	62	33	46	6	2.46	1.60	0.86	15.50	149	9.69	165	80	52	0	0	5	3
TX	ABILENE	65	39	83	28	52	5	0.10	-0.16	0.05	4.74	171	1.10	73	74	57	0	1	2	0
	AMARILLO	63	30	72	21	47	7	0.09	-0.02	0.05	0.73	50	0.15	17	72	28	0	6	2	0
	AUSTIN	67	42	87	27	55	1	0.13	-0.33	0.08	9.98	188	3.61	126	84	57	0	1	2	0
	BEAUMONT	73	53	79	39	63	8	0.20	-0.63	0.20	16.17	124	7.21	92	86	61	0	0	1	0
	BROWNSVILLE	78	56	85	45	67	5	0.04	-0.28	0.04	2.36	73	1.71	80	96	66	0	0	1	0
	CORPUS CHRISTI	74	50	87	36	62	3	0.14	-0.31	0.09	2.88	66	2.07	80	91	66	0	0	3	0
	DEL RIO	71	43	93	36	57	2	0.01	-0.22	0.01	1.47	82	0.21	20	93	64	1	0	1	0
	EL PASO	65	44	74	30	55	5	0.00	-0.08	0.00	0.64	45	0.21	33	54	19	0	2	0	0
	FORT WORTH	59	39	78	33	49	1	0.45	-0.08	0.34	6.96	126	2.41	81	89	55	0	0	3	0
	GALVESTON	68	56	73	45	62	5	0.38	-0.27	0.20	10.61	114	5.90	103	94	67	0	0	2	0
	HOUSTON	72	51	79	37	62	8	0.35	-0.39	0.34	12.14	133	4.52	84	89	66	0	0	2	0
	LUBBOCK	68	33	78	21	50	8	0.02	-0.15	0.02	1.48	97	0.04	5	57	41	0	4	1	0
	MIDLAND	70	39	82	27	54	6	0.05	-0.08	0.01	1.20	82	0.18	22	69	44	0	2	2	0
	SAN ANGELO	68	41	84	32	54	5	0.05	-0.24	0.04	3.06	131	0.59	42	76	50	0	1	2	0
	SAN ANTONIO	66	44	86	32	55	1	0.11	-0.31	0.10	4.31	95	1.97	76	89	57	0	1	2	0
	VICTORIA	70	48	82	36	59	3	0.21	-0.29	0.12	8.01	132	3.07	86	93	70	0	0	3	0
	WACO	63	40	87	27	51	1	0.23	-0.35	0.17	8.98	154	4.25	138	92	64	0	1	2	0
	WICHITA FALLS	57	35	78	26	46	1	0.09	-0.26	0.08	5.74	164	1.79	98	84	59	0	3	2	0
UT	SALT LAKE CITY	42	27	52	19	35	2	0.58	0.28	0.23	4.12	125	2.84	138	87	42	0	6	4	0
VT	BURLINGTON	31	15	43	4	23	4	0.98	0.58	0.51	7.91	146	4.98	156	75	47	0	7	3	1
VA	LYNCHBURG	47	31	61	17	39	2	1.16	0.42	0.57	11.23	132	4.09	78	81	55	0	4	4	1
	NORFOLK	56	39	72	31	48	7	0.98	0.18	0.60	8.88	101	4.79	83	85	50	0	1	4	1
	RICHMOND	52	33	66	20	43	4	1.42	0.73	0.97	7.84	95	4.39	85	78	49	0	3	4	1
	ROANOKE	50	34	61	22	42	4	1.28	0.54	0.64	10.38	133	4.14	84	68	48	0	2	4	1
	WASH/DULLES	46	30	65	15	38	4	1.35	0.69	0.78	11.21	147	5.45	120	77	53	0	6	3	1
WA	OLYMPIA	39	28	43	5	34	-6	3.04	1.45	1.55	16.82	88	9.32	83	95	90	0	5	7	2
	QUILLAYUTE	41	28	47	20	35	-7	1.96	-1.17	0.85	42.16	119	19.24	92	90	72	0	5	7	1
	SEATTLE-TACOMA	41	31	47	21	36	-7	2.50	1.44	1.07	13.96	105	7.88	103	88	74	0	4	6	2
	SPOKANE	29	16	36	2	23	-9	1.35	0.99	0.47	6.24	127	3.62	136	92	77	0	7	7	0
	YAKIMA	30	21	36	9	25	-9	0.88	0.69	0.24	3.91	130	3.23	198	89	79	0	7	7	0
WV	BECKLEY	47	31	57	26	39	6	1.27	0.57	0.49	11.15	141	5.91	123	77	61	0	4	5	0
	CHARLESTON	51	31	60	20	41	5	1.27	0.52	0.47	11.42	138	5.49	111	84	47	0	4	3	0
	ELKINS	47	29	56	12	38	7	0.54	-0.22	0.43	8.52	99	4.50	87	74	53	0	4	3	0
	HUNTINGTON	49	32	59	22	40	4	1.78	1.05	0.87	12.02	147	5.92	123	77	49	0	4	4	1
WI	EAU CLAIRE	22	6	30	-12	14	-3	0.36	0.19	0.29	4.17	166	2.12	143	88	67	0	7	2	0
	GREEN BAY	30	12	42	-2	21	2	0.71	0.49	0.37	5.50	174	3.48	199	80	61	0	7	5	0
	LA CROSSE	25	8	33	-13	16	-5	0.92	0.68	0.63	5.94	198	3.03	171	87	65	0	7	3	1
	MADISON	28	14	41	-3	21	0	0.69	0.39	0.50	6.40	178	4.01	207	86	71	0	7	4	1
	MILWAUKEE	32	19	43	8	25	1	0.98	0.57	0.85	6.89	138	4.48	161	76	64	0	7	3	1
WY	CASPER	37	15	44	-5	26	0	0.14	0.00	0.09	1.20	80	0.80	91	75	55	0	7	2	0
	CHEYENNE	43	19	55	10	31	3	0.09	0.01	0.08	1.12	102	0.74	116	69	37	0	7	2	0
	LANDER	34	12	44	1	23	-1	0.00	-0.11	0.00	1.84	136	1.06	143	76	39	0	7	0	0
	SHERIDAN	33	5	48	-9	19	-7	0.17	0.04	0.05	1.65	94	0.93	87	84	68	0	7	4	0

Based on 1971-2000 normals ***** Not Available**

February 14 ENSO Diagnostic Discussion

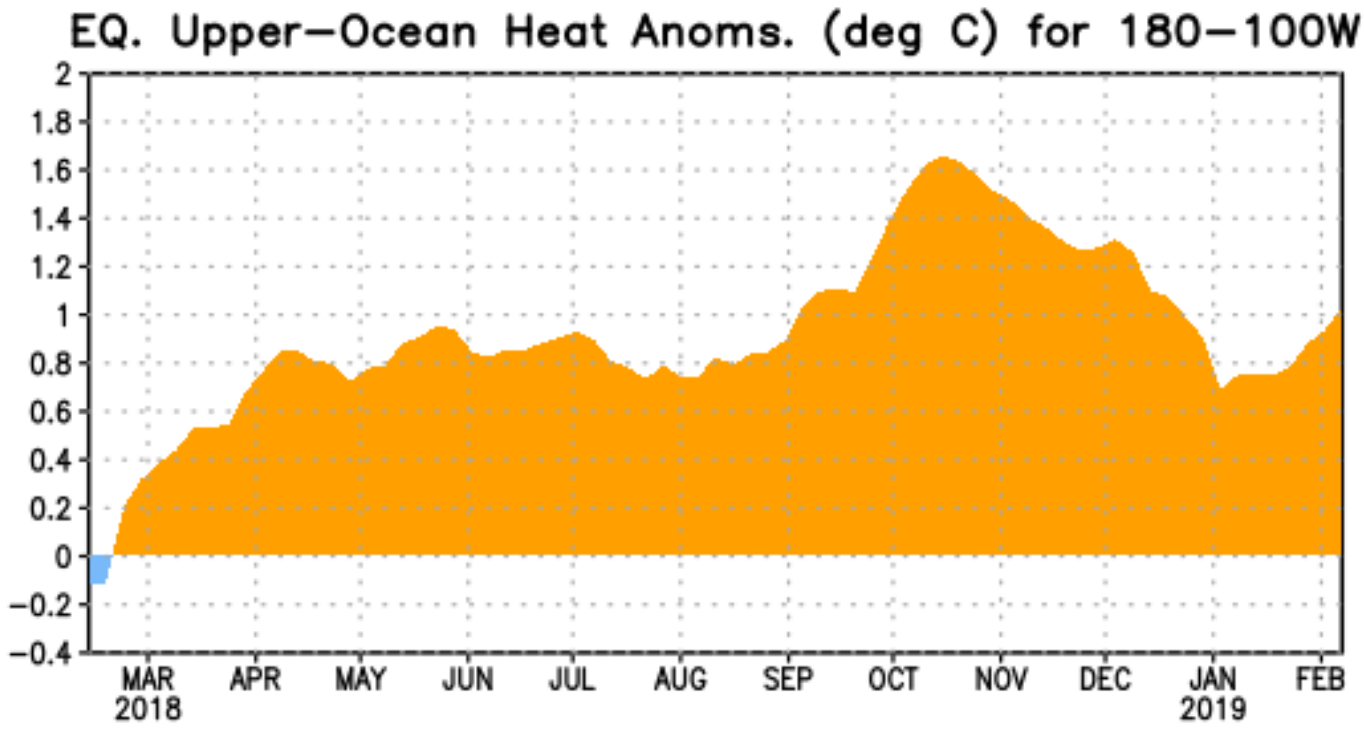


Figure 1: Area-averaged upper-ocean heat content anomaly (°C) in the equatorial Pacific (5°N-5°S, 180º-100ºW). The heat content anomaly is computed as the departure from the 1981-2010 base period pentad means.

ENSO Alert System Status: El Niño Advisory

Synopsis: Weak El Niño conditions are present and are expected to continue through the Northern Hemisphere spring 2019 (~55% chance).

El Niño conditions formed during January 2019, based on the presence of above-average sea surface temperatures (SSTs) across most of the equatorial Pacific Ocean and corresponding changes in the overlying atmospheric circulation. The weekly Niño indices remained above average during the month, although decreasing in the Niño-3 and Niño-3.4 regions. However, the Niño-4 region remained elevated, with a value of +0.8°C in early February. Positive subsurface temperature anomalies (averaged across 180°-100°W) increased in the last couple weeks (Fig. 1), in association with a downwelling Kelvin wave that contributed to above-average temperatures in the central Pacific. Compared to last month, the region of enhanced equatorial convection expanded near the Date Line, while anomalies remained weak over Indonesia. Low-level wind anomalies became westerly across the western Pacific Ocean, while upper-level wind anomalies were mostly westerly over the eastern Pacific. The equatorial Southern Oscillation index was negative (-0.6 standard deviations). Overall, these features are consistent with borderline, weak El Niño conditions.

The majority of models in the IRI/CPC plume predict a Niño 3.4 index of +0.5°C or greater through at least the Northern Hemisphere spring 2019. Given the recent downwelling Kelvin wave and the forecast of westerly wind anomalies, most forecasters expect SST anomalies in the east- central Pacific to increase slightly in the upcoming month or so. Because forecasts through the spring tend to be more uncertain and/or less accurate, the predicted chance that El Niño will persist beyond the spring is 50% or less. In summary, weak El Niño conditions are present and are expected to continue through the Northern Hemisphere spring 2019 (~55% chance**;** click CPC/IRI consensus forecast for the chance of each outcome for each 3-month period).

Due to the expected weak strength, widespread or significant global impacts are not anticipated. However, the impacts often associated with El Niño may occur in some locations during the next few months (the 3-month seasonal outlook will be updated on Thursday February 21st).

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). Forecasts are also updated monthly in the Forecast Forum of CPC's Climate Diagnostics Bulletin. Additional perspectives and analysis are also available in an ENSO blog. The next ENSO Diagnostics Discussion is scheduled for **14 March 2019**. To receive an e-mail notification when the monthly ENSO Diagnostic Discussions are released, please send an e-mail message to: ncep.list.enso-update@noaa.gov.

International Weather and Crop Summary

February 10-16, 2019

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

HIGHLIGHTS

EUROPE: Milder weather prevailed across the continent, with widespread showers in northern and eastern Europe contrasting with dry weather on the Iberian Peninsula.

MIDDLE EAST: Another round of moderate to heavy rain and mountain snow maintained abundant to locally excessive moisture supplies for winter grains.

NORTHWESTERN AFRICA: Showers in the east contrasted with increasingly dry weather over western growing areas.

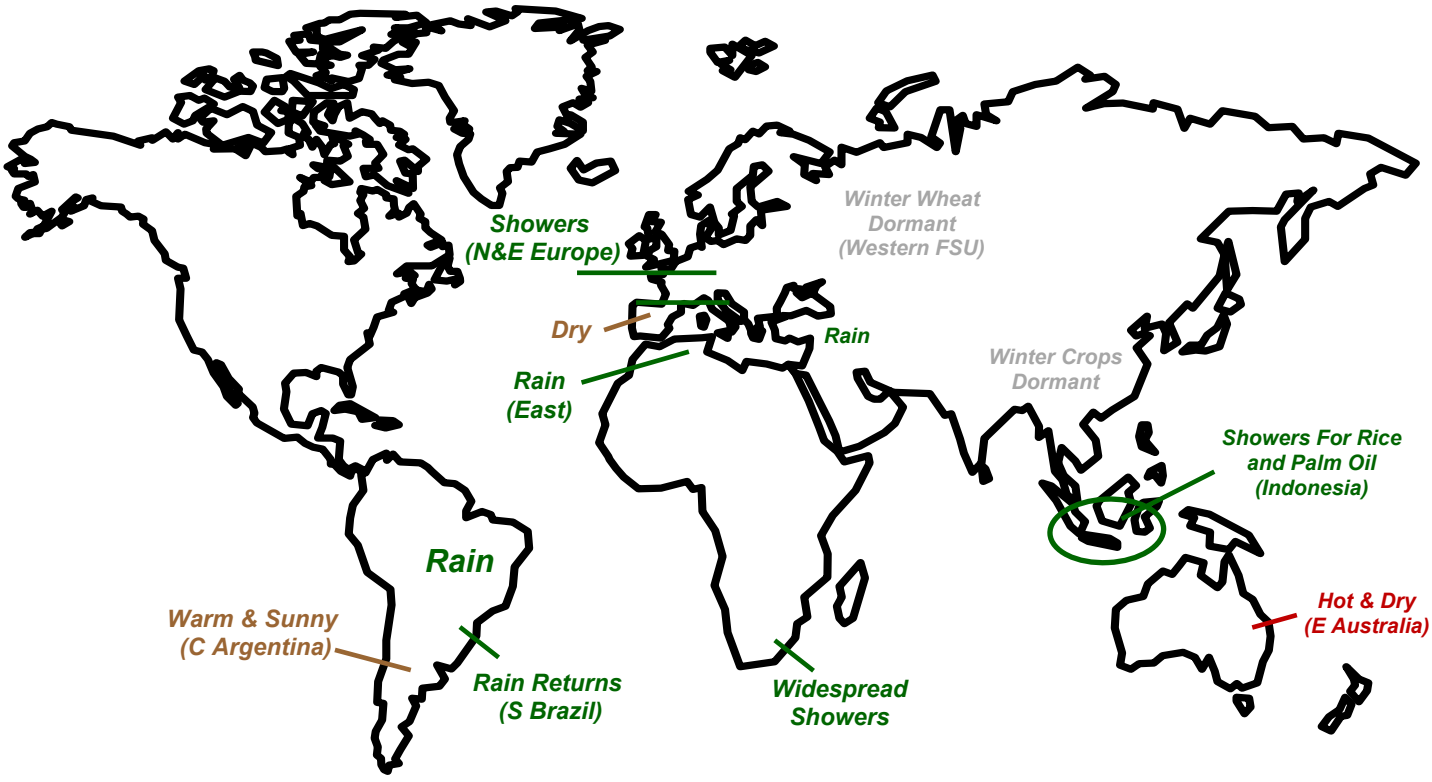
SOUTHEAST ASIA: Continued showers in Indonesia supported oil palm and provided good late-season moisture to rice.

AUSTRALIA: Hot, dry weather continued to plague major summer crop producing areas in the east.

SOUTH AFRICA: Locally heavy showers overspread the region, helping to further stabilize corn in previously dry western production areas.

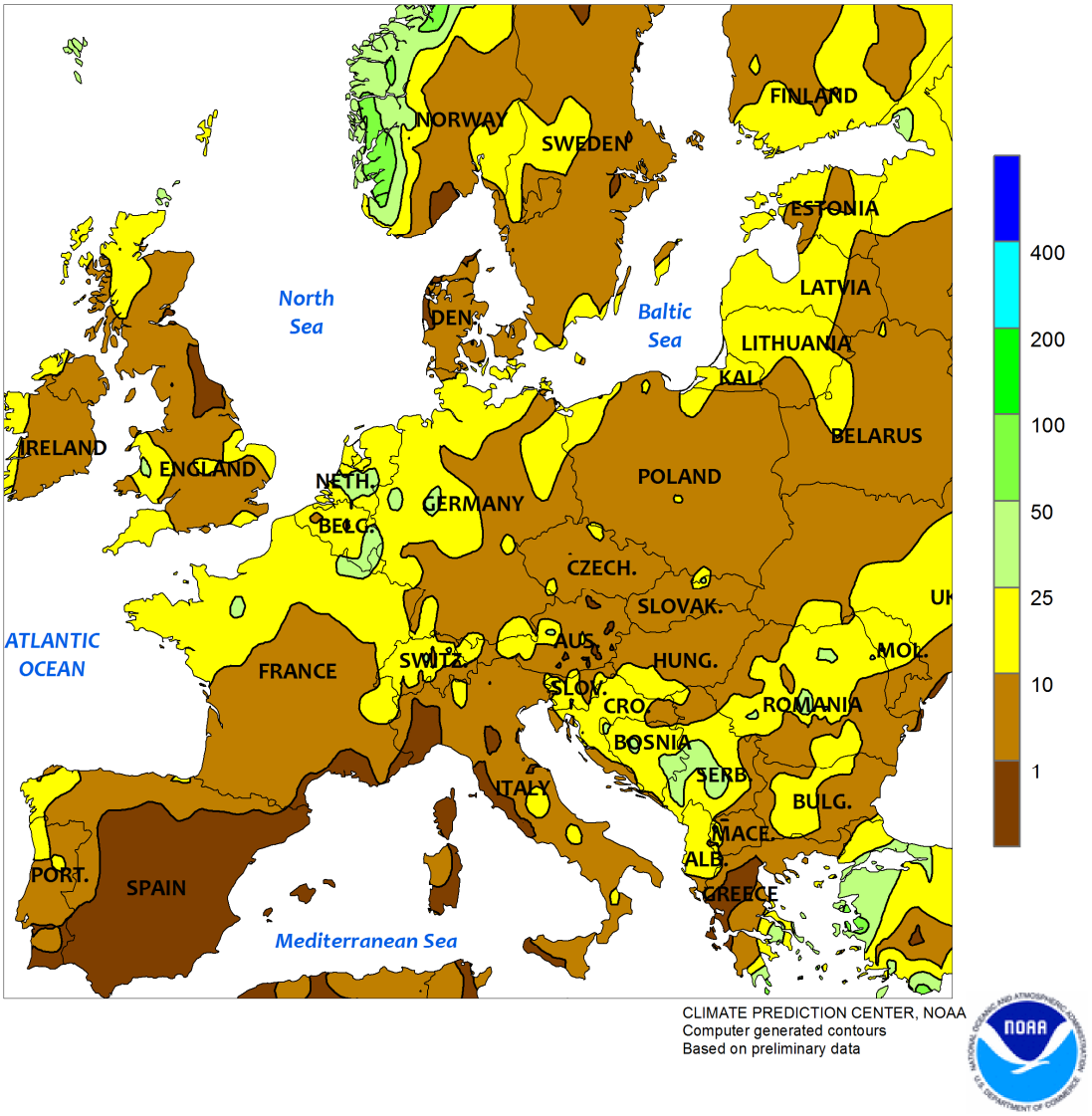
ARGENTINA: Sunshine and occasional warmth benefited corn and soybeans growing with ample moisture.

BRAZIL: Beneficial rain returned to southern farming areas, improving prospects of emerging second-crop corn.



For additional information contact: mbrusberg@oce.usda.gov

EUROPE
Total Precipitation (mm)
FEB 10 - 16, 2019

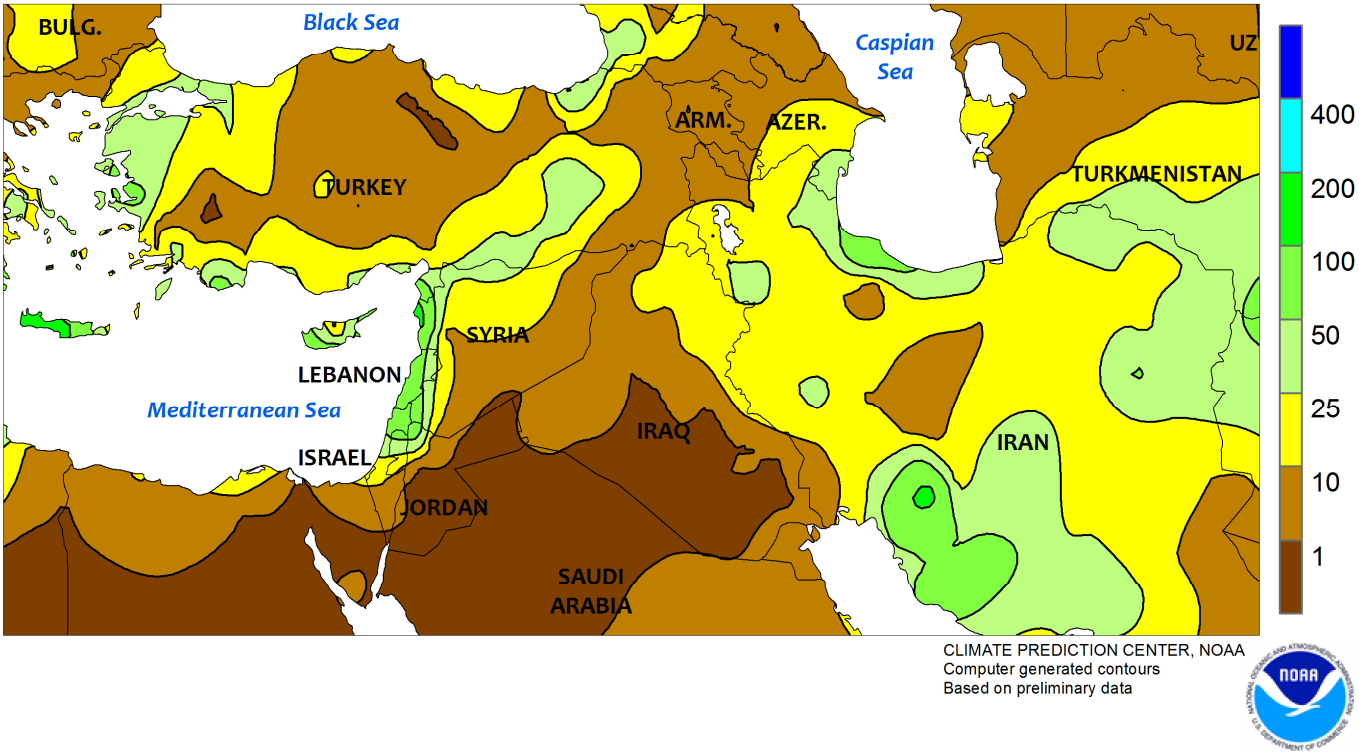


EUROPE

Milder weather continued over most of the continent, with widespread showers in northern and eastern Europe contrasting with increasingly dry conditions on the Iberian Peninsula. Temperatures averaged 2 to 5°C above normal over most of the continent, with readings up to 7°C above normal near the Baltic Sea. Winter crops remained dormant, though weekly average temperatures in excess of 5°C (an indicator of dormancy) across most of France and northern Germany suggested wheat and rapeseed were losing cold hardiness. Showers were widespread, with areas of heavier rainfall (10-30 mm, locally more) from northern France and southeastern England into the Baltic States and from southern Italy eastward through the Balkans. Elsewhere in central and northern Europe, rainfall totaled 1 to 5 mm. Despite the unsettled weather pattern, the Iberian Peninsula remained dry; 60-day rainfall in Spain's wheat and barley areas has totaled less than 50 percent of normal, although crops are still vegetative and have plenty of time to benefit from an increase in rainfall.

For additional information contact: mbrusberg@oce.usda.gov

MIDDLE EAST
Total Precipitation (mm)
FEB 10 - 16, 2019

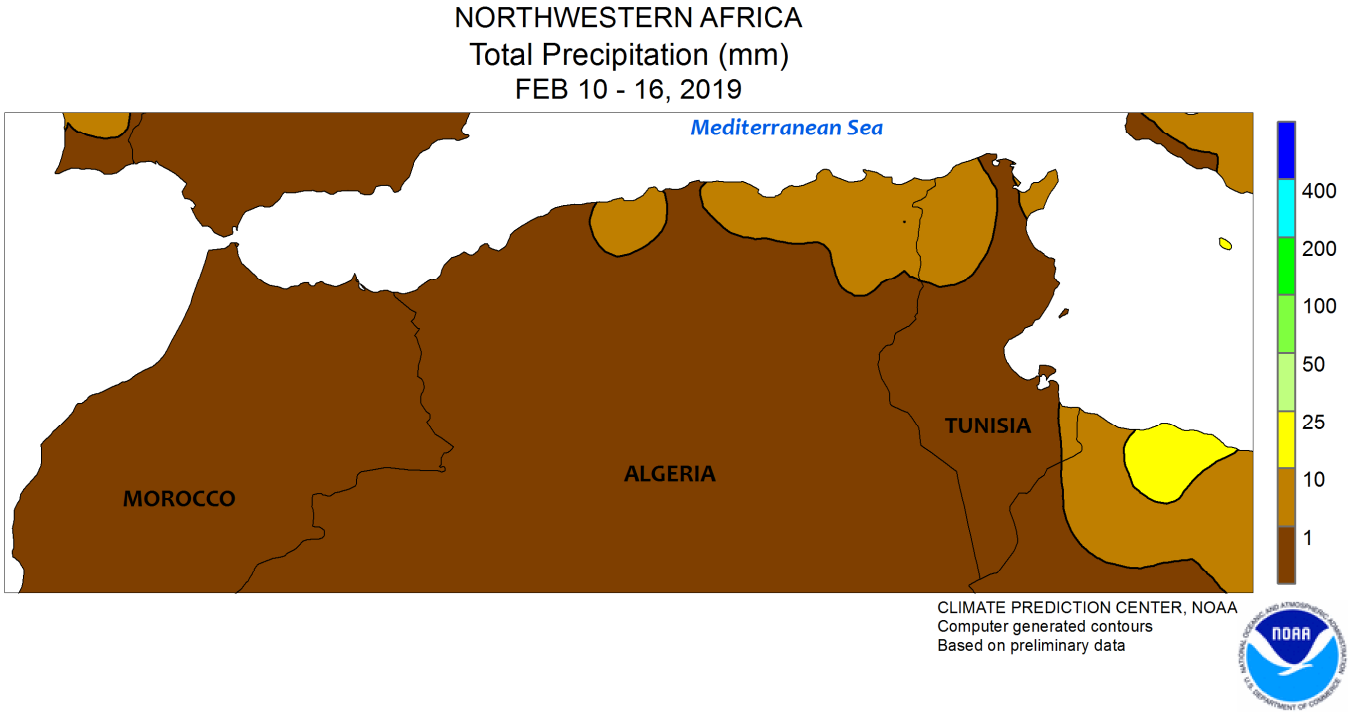


CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary data

MIDDLE EAST

The season-long wet weather pattern continued across the Middle East. Over the past week, another in a series of slow-moving storms triggered widespread moderate to heavy rain and mountain snow (10-100 mm liquid equivalent, locally more) from Turkey and the eastern Mediterranean Coast into Iran. Over the past 60 days, precipitation has totaled 150 to 500 percent of normal over most of the region, with the heaviest precipitation noted in west-central Iran. Unusually heavy rain (50-125 mm) was reported in southern Iran near the Caspian Sea Coast, likely causing lowland flooding. Despite the stormy weather, temperatures during the past week averaged 2 to 6°C above normal, reducing winter grain cold hardiness in the typically colder growing areas and accelerating wheat and barley development elsewhere.

For additional information contact: mbrusberg@oce.usda.gov

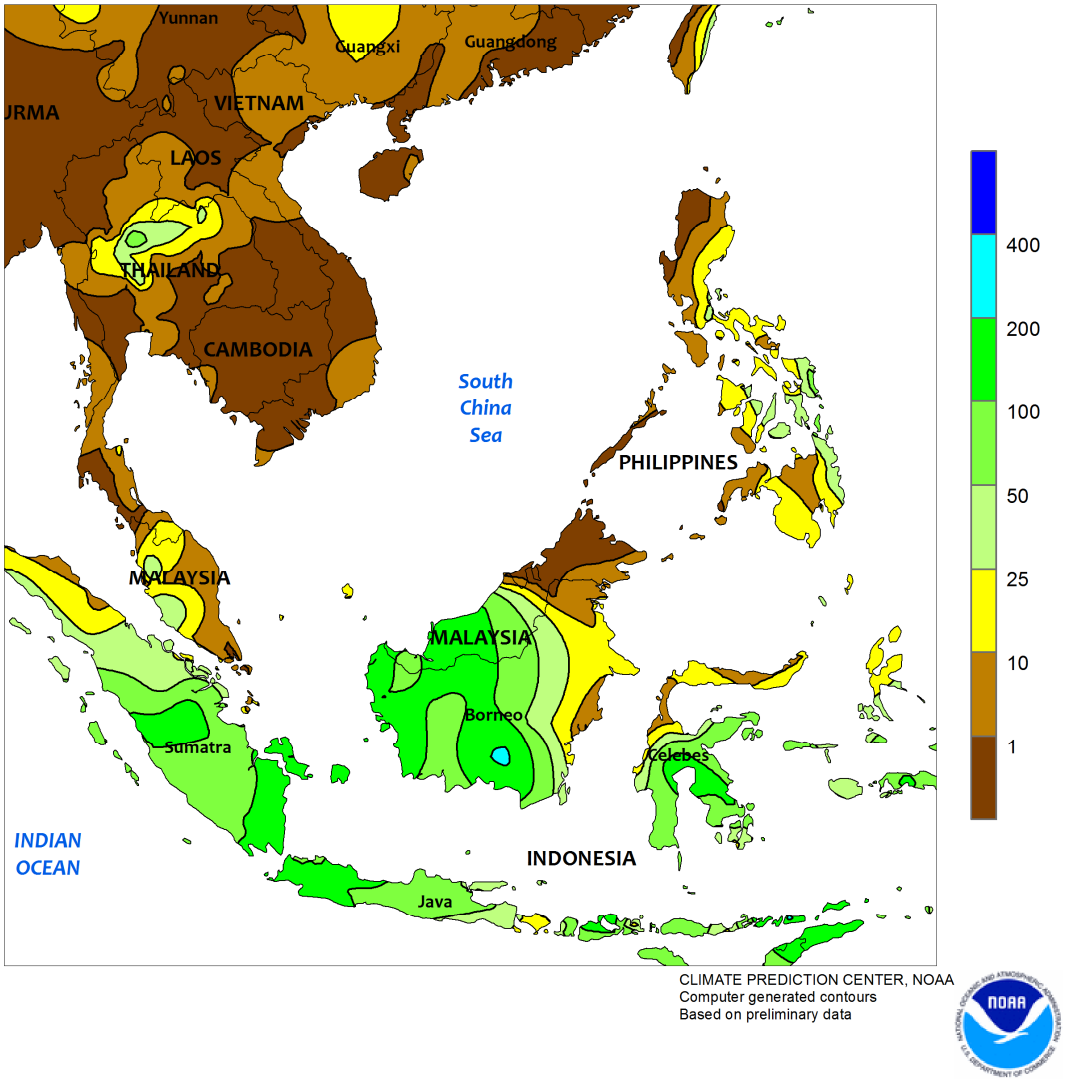


NORTHWESTERN AFRICA

Light showers in eastern-most growing areas contrasted with increasingly dry weather in the west. Light showers (6 mm or less) maintained favorable prospects for vegetative wheat and barley from north-central Algeria into northern Tunisia. Conversely, dry, warm weather accelerated winter grains toward the reproductive stages of development in Morocco and western Algeria, with daytime highs reaching 30°C in southwestern Morocco. Rainfall over the past 30 days has been highly variable in Morocco—the region's leading wheat and barley producer—with very dry conditions in the southwest (less than 10 percent of normal) contrasting with good moisture supplies (100-150 percent of normal) farther north.

For additional information contact: mbrusberg@oce.usda.gov

SOUTHEAST ASIA
Total Precipitation (mm)
FEB 10 - 16, 2019

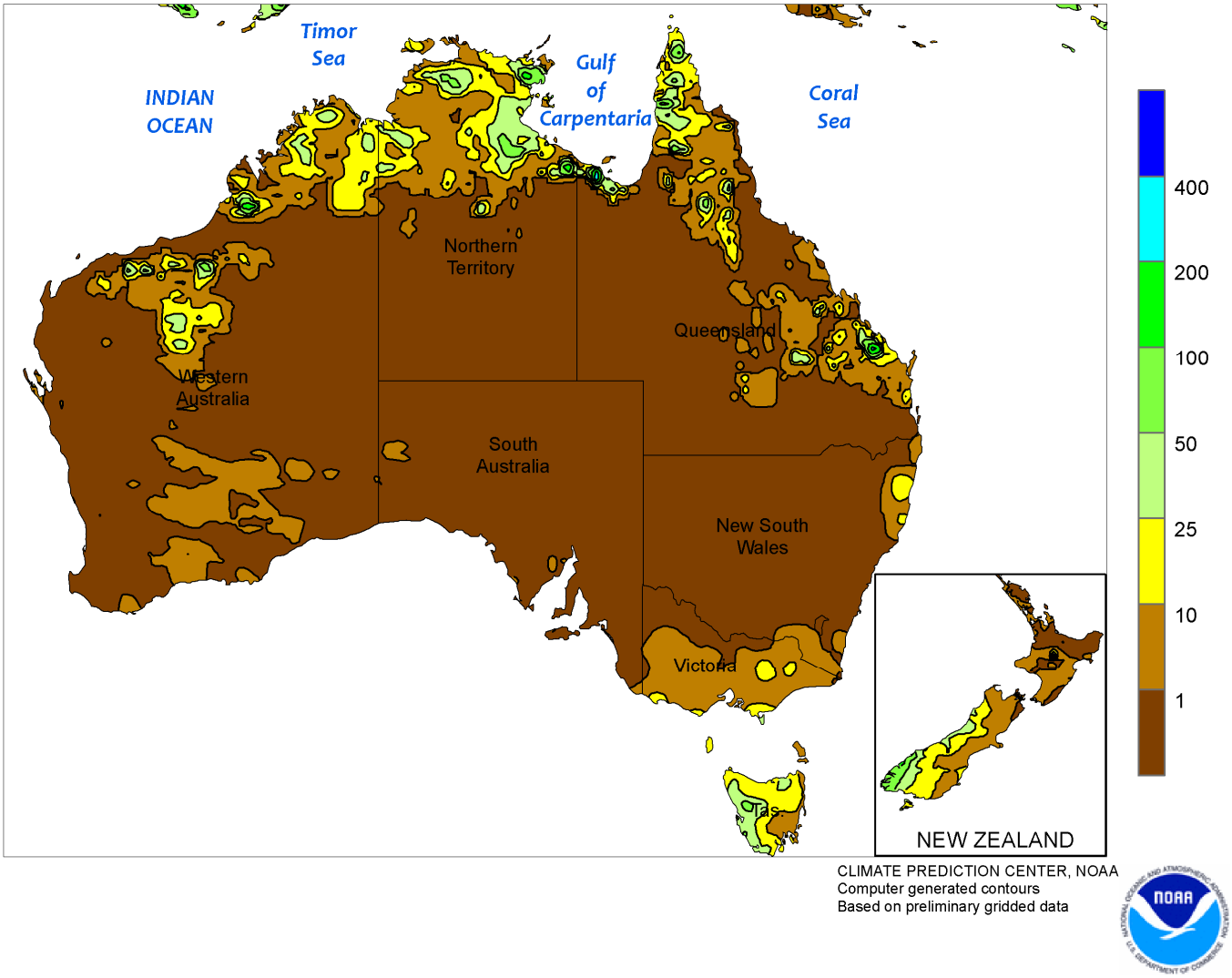


SOUTHEAST ASIA

Seasonably heavy rainfall continued across Indonesia, supporting oil palm and rice development. In Java, Indonesia, over 100 mm in western growing areas eased lingering long-term drought, while 25 to 100 mm elsewhere maintained above-average moisture supplies for vegetative to reproductive rice. In oil palm areas, 25 to over 100 mm kept trees adequately watered, but in nearby sections of Malaysia, unseasonably dry weather further reduced soil moisture for oil palm. Meanwhile, unseasonably light showers (less than 25 mm) in the Philippines did little to alleviate seasonal drought in the northeast.

For additional information contact: mbrusberg@oce.usda.gov

AUSTRALIA
Total Precipitation (mm)
February 10 - 16, 2019



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

AUSTRALIA

Scattered showers (5-25 mm, locally more) in central Queensland maintained local moisture supplies for immature summer crops. In contrast, dry weather persisted in major cotton and sorghum producing areas of southern Queensland and northern New South Wales. Hot weather continued to amplify the effects of the dryness, stressing immature dryland crops, such as sorghum, while maintaining the need to water immature irrigated crops, such as cotton. Although the hot, dry weather remained unfavorable for immature summer crops, some earlier-sown and drought-stressed crops have reached maturation, and are thus now benefiting from the heat and dryness. Temperatures averaged 1 to 3°C above normal in major summer crop producing areas of southern Queensland and northern New South Wales, with maximum temperatures generally in the upper 30s degrees C.

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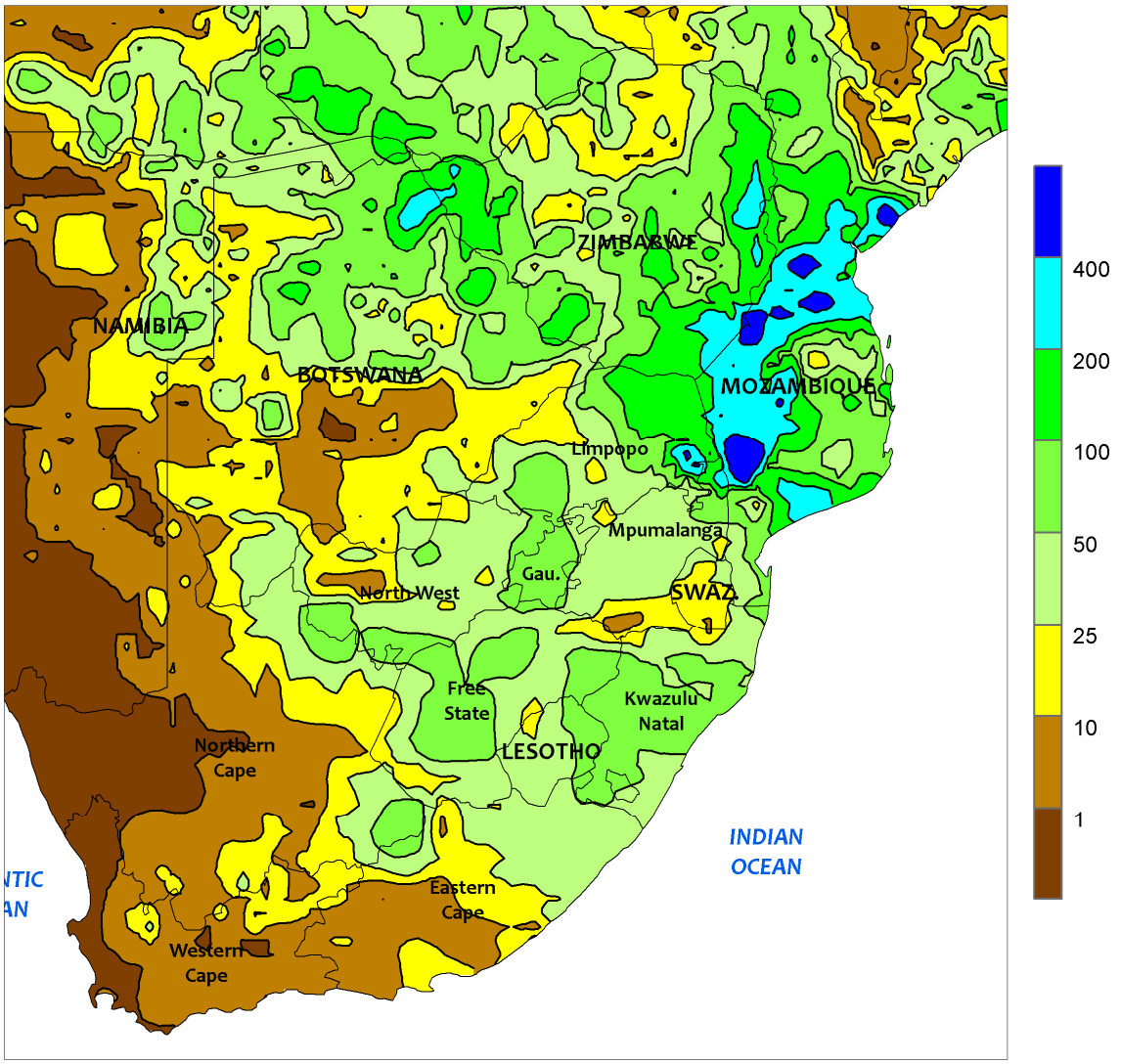
SOUTH AFRICA
Total Precipitation (mm)
February 10 - 16, 2019



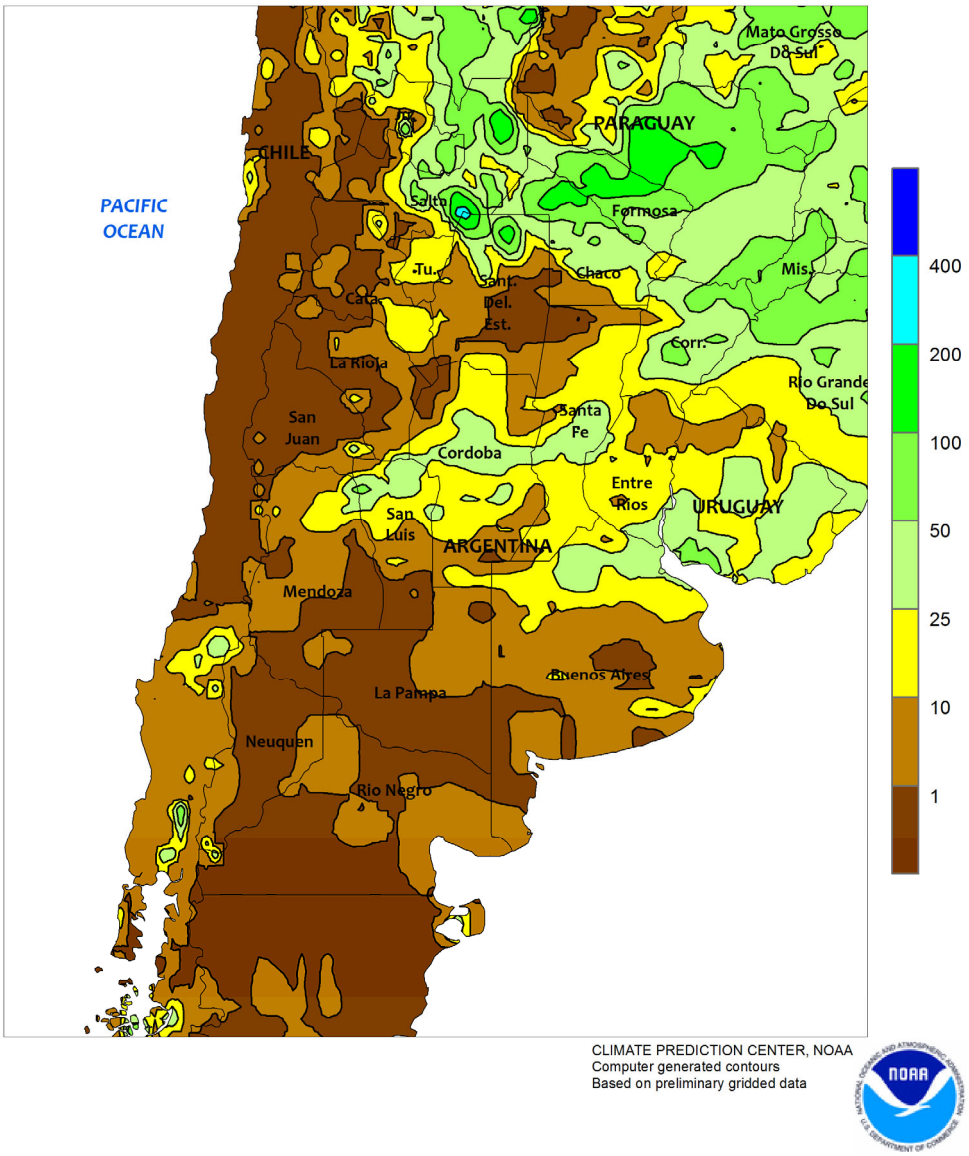
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded data

SOUTH AFRICA

Heavy showers overspread the region, providing a significant boost in moisture to eastern commercial farming areas. Rainfall totaled 25 to 100 mm across a large area spanning the corn belt (North West and Free State to Mpumalanga and Limpopo), KwaZulu-Natal, and farming areas in eastern sections of Northern and Eastern Cape. The rainfall was particularly welcome in commercial white corn areas of North West and Free State, which are still recovering from earlier periods of drought. Similarly, rain-fed sugarcane areas of southern KwaZulu-Natal benefited from the boost in moisture amidst a generally drier-than-normal growing season. Daytime highs were generally capped in the upper 20s and lower 30s degrees C in the aforementioned area, although temperatures were somewhat higher in irrigated sugarcane areas in northern KwaZulu-Natal and eastern Mpumalanga. Elsewhere, scattered showers in Western Cape (isolated amounts in excess of 10 mm) likely had limited impact on harvests of local tree and vine crops, as seasonable warmth (highs reaching 40°C in spots) fostered high rates of evaporation.

For additional information contact: mbrusberg@oce.usda.gov

ARGENTINA
Total Precipitation (mm)
February 10 - 16, 2019



ARGENTINA

For a second week, periods of warm, sunny weather benefited corn and soybeans in central Argentina growing with abundant moisture. Although weekly temperatures averaged near to slightly below normal throughout the nation's main farming areas, daytime highs reached the lower and middle 30s (degrees C) on several days, fostering growth of summer crops with an absence of stressful heat. Weekly rainfall totaled 10 to 25 mm or more from northern sections of Buenos Aires and Cordoba northward, with the highest rainfall (50-100 mm or more) in the far north (notably Salta, Chaco, and Formosa). Drier conditions prevailed in the far southwest (La Pampa, southern Cordoba, and western and southern sections of Buenos Aires), where showers were generally patchy and light (amounts totaling less than 10 mm in most areas).

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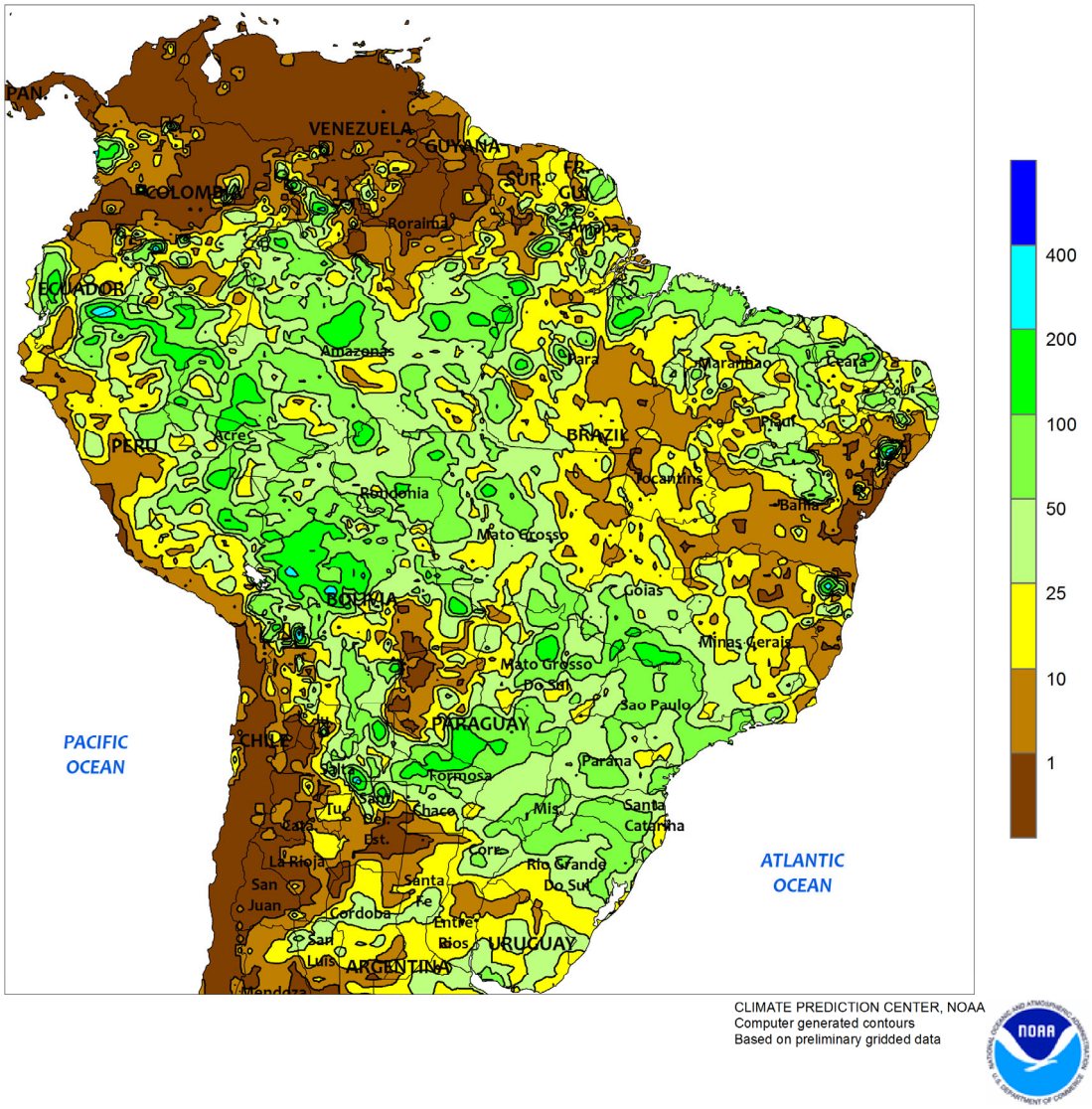
BRAZIL
Total Precipitation (mm)
February 10 - 16, 2019



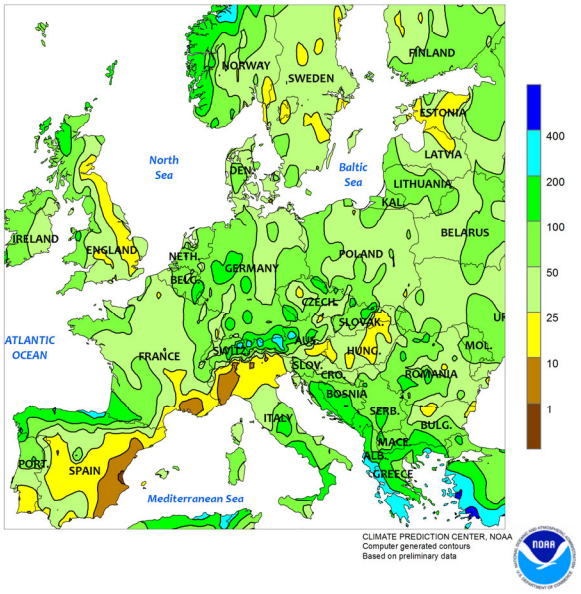
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded data

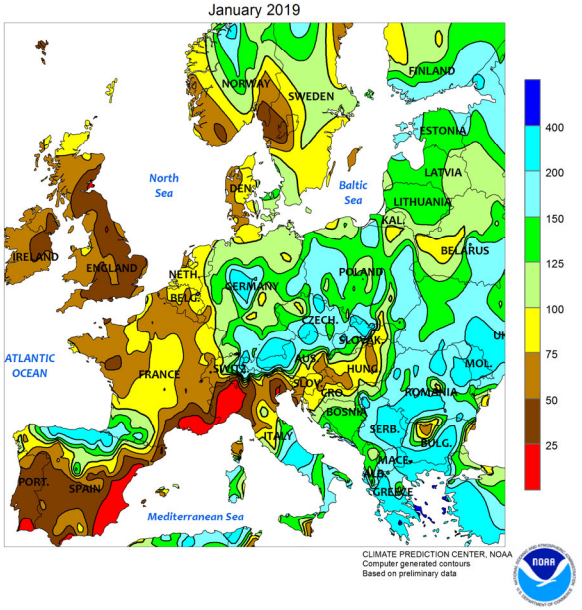
BRAZIL

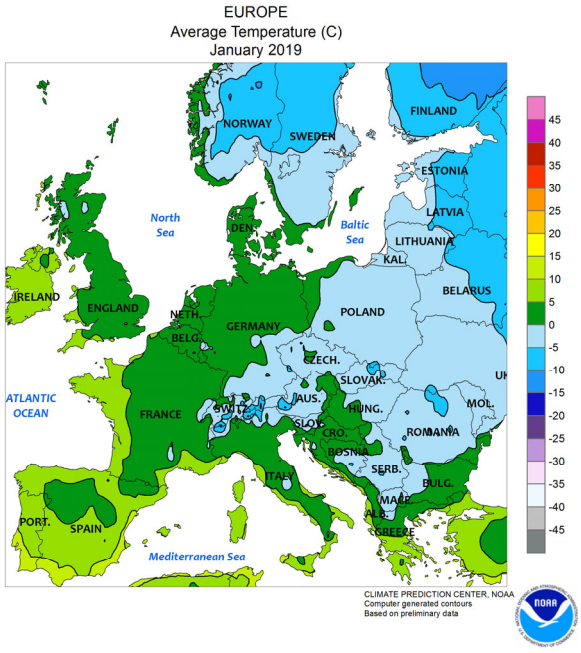
Moderate to heavy showers benefited corn, cotton, and other secondary summer row crops in key farming areas throughout Brazil. Rainfall totaled more than 50 mm from Mato Grosso to Rio Grande do Sul, reaching eastward into sugarcane and coffee areas of Sao Paulo and Minas Gerais. Following recent periods of dryness, the moisture was particularly welcome in previously dry sections of the southeast (notably Parana and Sao Paulo) for emerging second-crop corn and other important crops. The moisture also helped to limit the number of hot days (highs reaching 35°C) during the week. According to the government of Mato Grosso, soybeans were 69 percent harvested as of February 15, about 25 points ahead of the 5-year average; as a result of the rapid soybean harvest, corn was 74 percent planted compared with 47 percent on average. Elsewhere, amounts were generally lighter (10-50 mm) in Brazil's more easterly farming areas, including western Bahia and other locations in the northeastern interior experiencing recent periods of dryness; while not a large producer of second-crop corn, these locations would welcome additional moisture for development of later-planted soybeans and cotton.

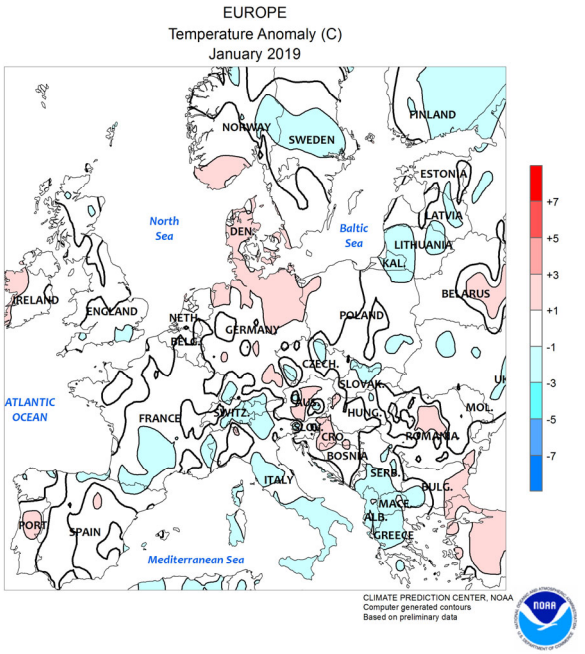
For additional information contact: mbrusberg@oce.usda.gov

January International Temperature and Precipitation Maps





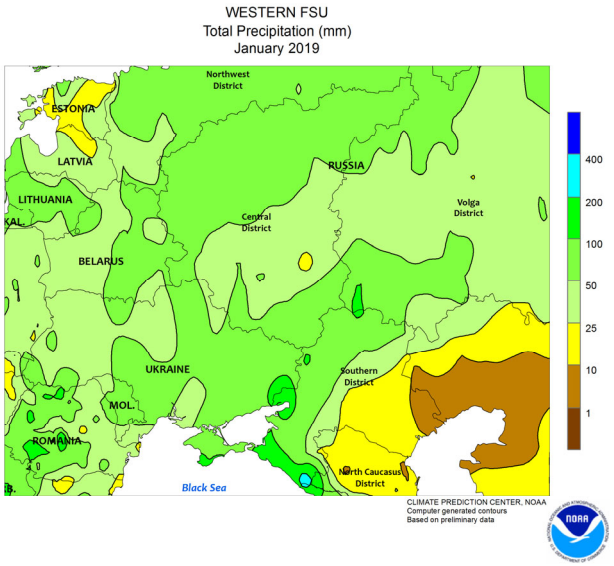


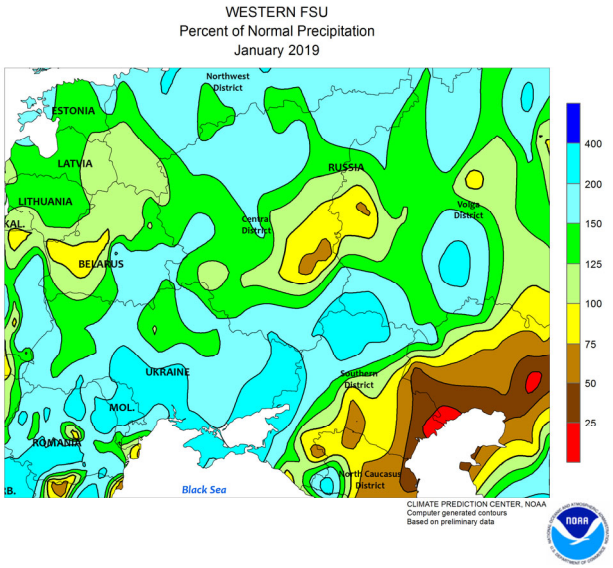


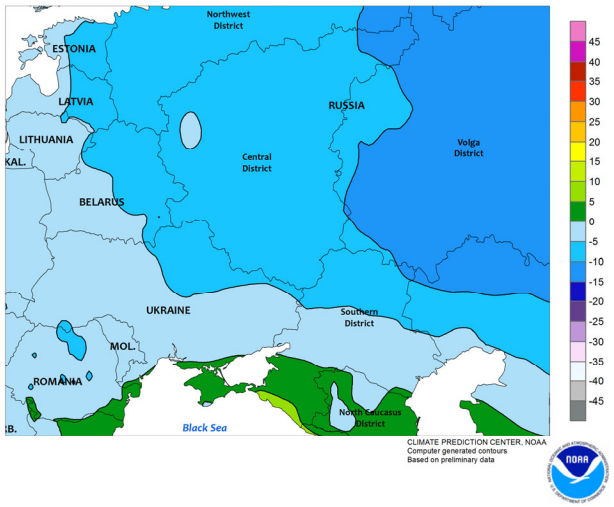
EUROPE

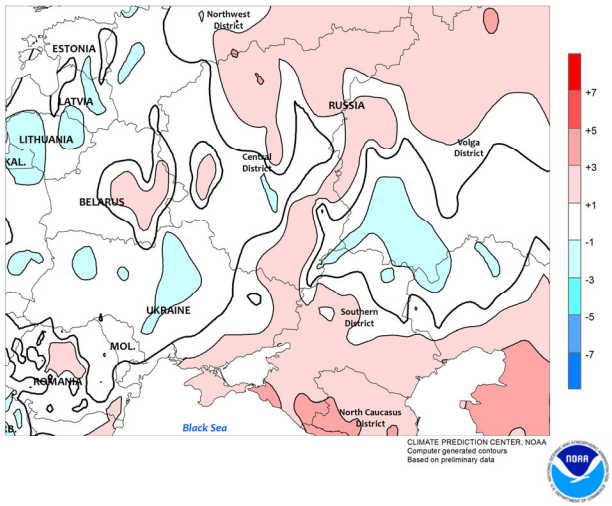
During January, drier-than-normal conditions over much of western Europe contrasted with above-normal precipitation in central and eastern growing areas. In particular, drought-afflicted portions of Germany and the Balkans received much-needed rain and snow, with locally more than 100 mm of precipitation recharging soil moisture for spring growth but arriving too late to aid winter crop establishment. Conversely, dry weather in western Europe renewed drought concerns in central and northern France (40-75 percent of normal) and rapidly reduced moisture for winter grains (20-50 percent of normal) in Spain. However, widespread rain overspread some western locales in early February, easing or eliminating drought worries for winter crops (particularly in France and England).

For additional information contact: mbrusberg@oce.usda.gov





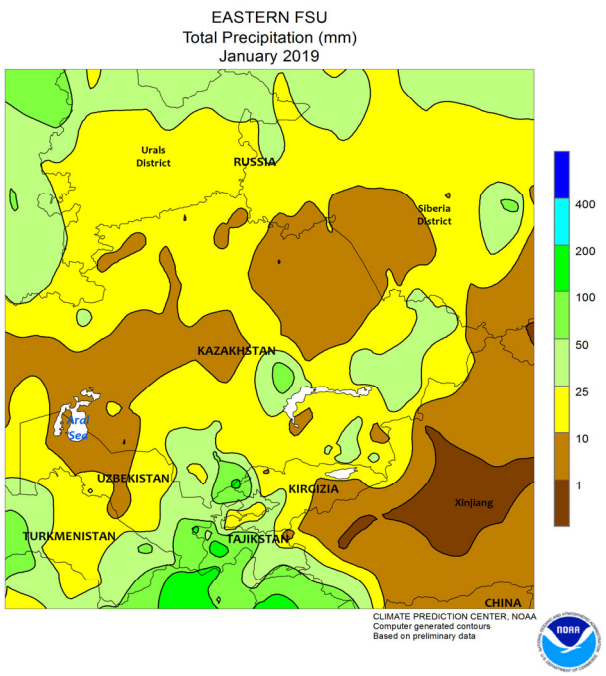


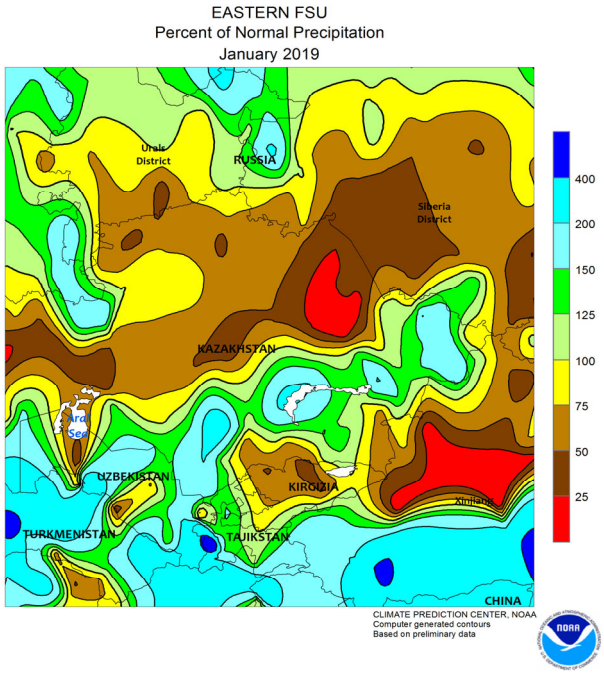


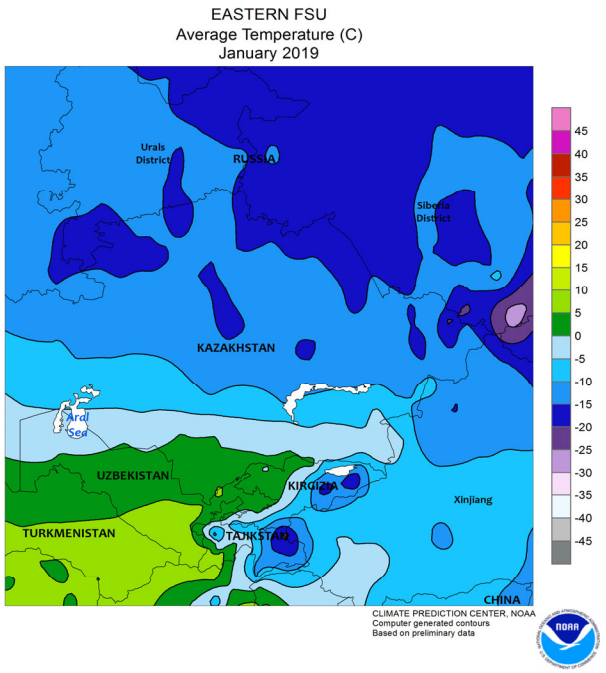
WESTERN FSU

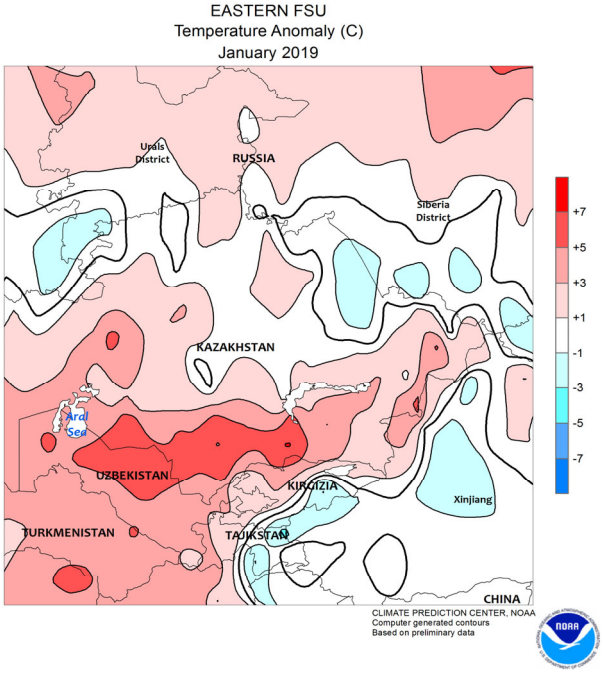
An unsettled weather pattern maintained abundant moisture reserves for dormant winter wheat. January precipitation totaled 100 to 300 percent of normal over primary winter wheat areas of southern Ukraine and southwestern Russia. Crops remained insulated by a deep snowpack save for milder locales adjacent to the Black Sea, though minimum temperatures in these latter crop areas remained above the threshold for winterkill.

For additional information contact: mbrusberg@oce.usda.gov





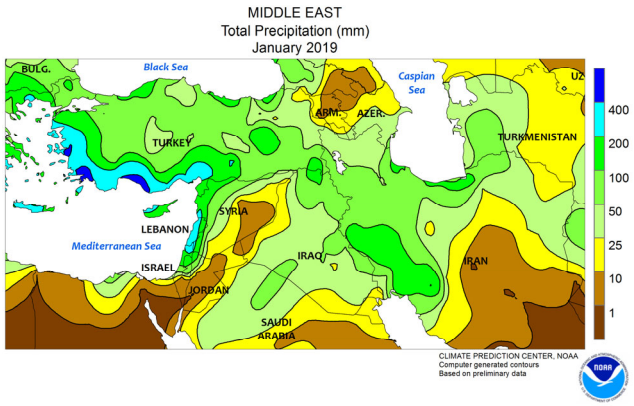


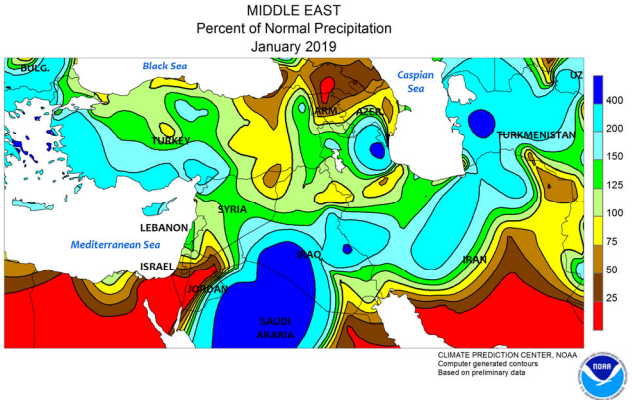


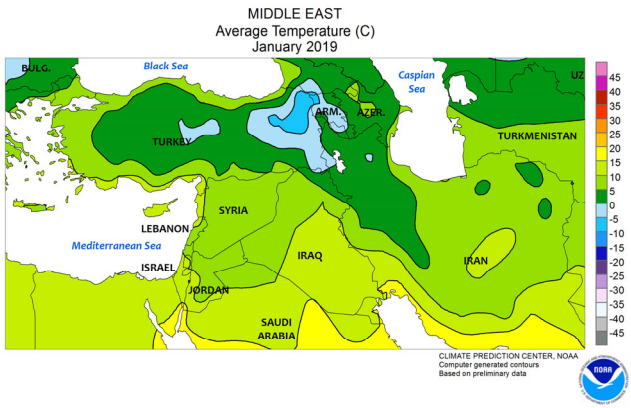
EASTERN FSU

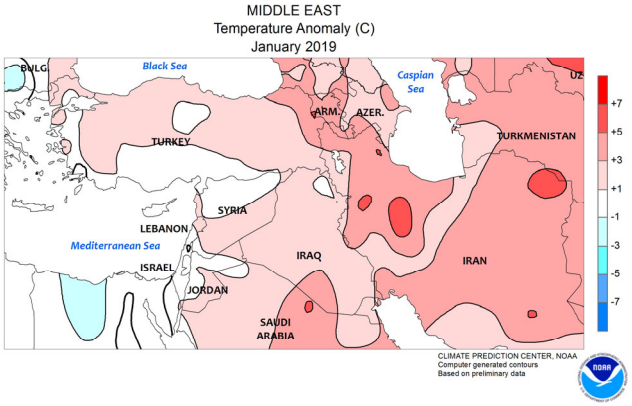
Seasonally cold weather prevailed over the region during January, though wet, mild conditions were reported in southern growing areas. In the north, crop districts of northern Kazakhstan and central Russia remained encased in a deep snowpack. Farther south, winter wheat areas of central and eastern Uzbekistan benefitted from a wet January (locally more than 200 percent of normal). In addition, mountain snowpacks—vital for irrigated summer crops—were likewise recharged by the active weather pattern.

For additional information contact: mbrusberg@oce.usda.gov



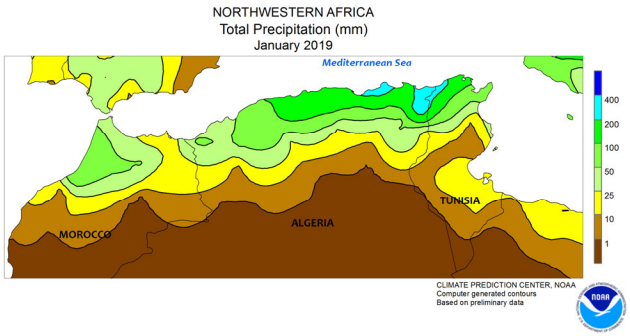


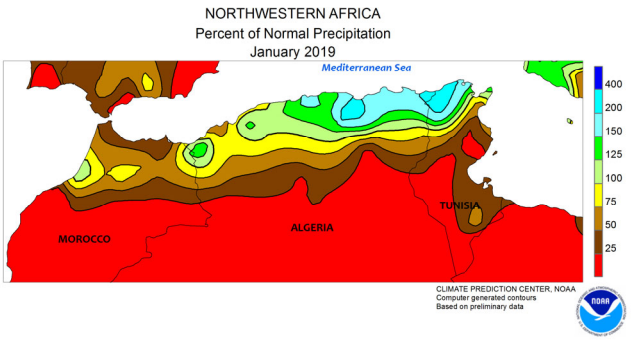


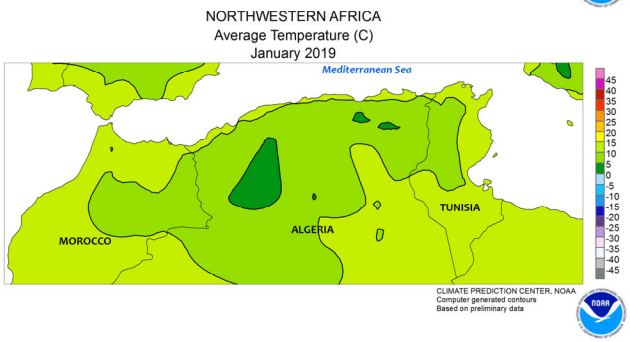


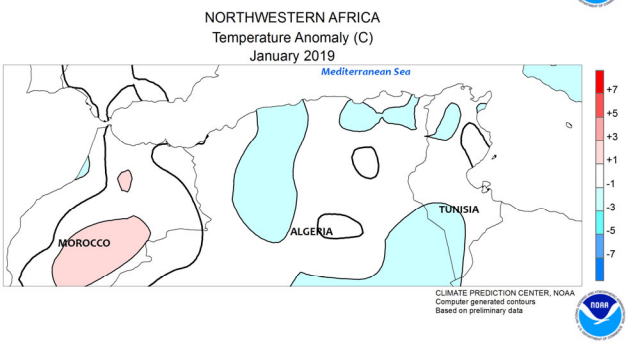
MIDDLE EAST

Wet weather prevailed during January across much of the Middle East. In Turkey and along the eastern Mediterranean Coast, moderate to heavy rain (50-100 mm, locally more than 400 mm in coastal locales) improved prospects for dormant (north) to vegetative (south) wheat and barley. Heavy rainfall (50-220 mm) was also reported in Iraq and Iran, boosting moisture reserves for winter grains but likely causing localized flooding. Even typically arid locations in Saudi Arabia reported more than 50 mm of rain, providing supplemental moisture for the country's small pockets of irrigated barley. Temperatures during January averaged 2 to 4°C above normal over the western half of the region, and up to 7°C above normal in the east; consequently, there were few—if any—winterkill threats in primary wheat and barley areas of Turkey and Iran.



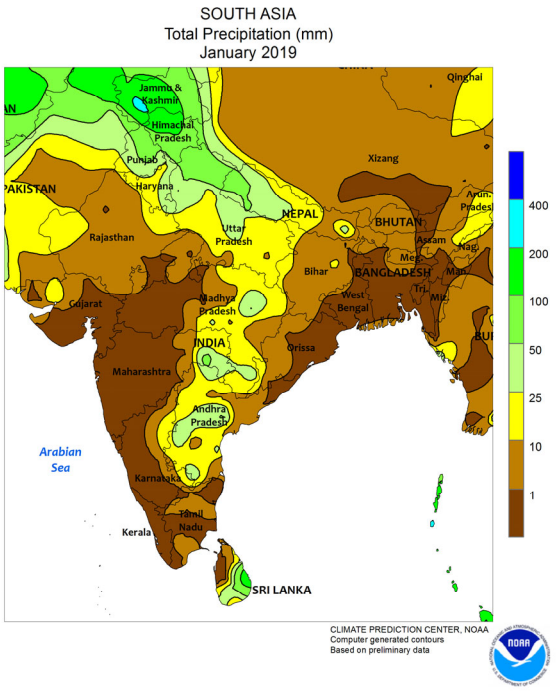


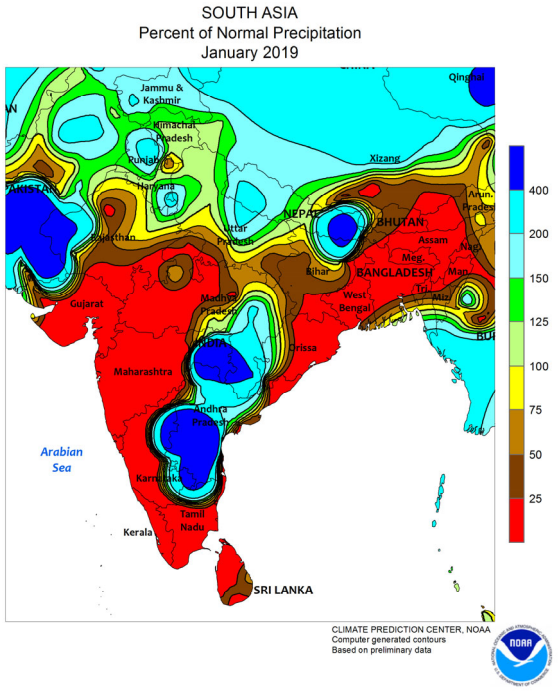


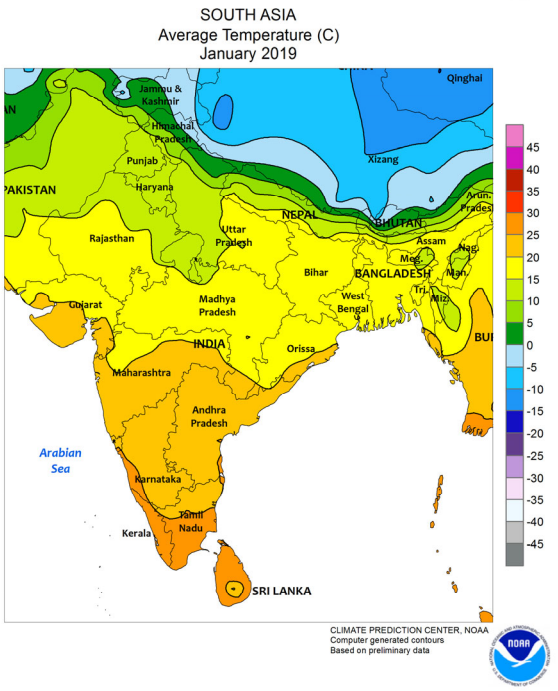


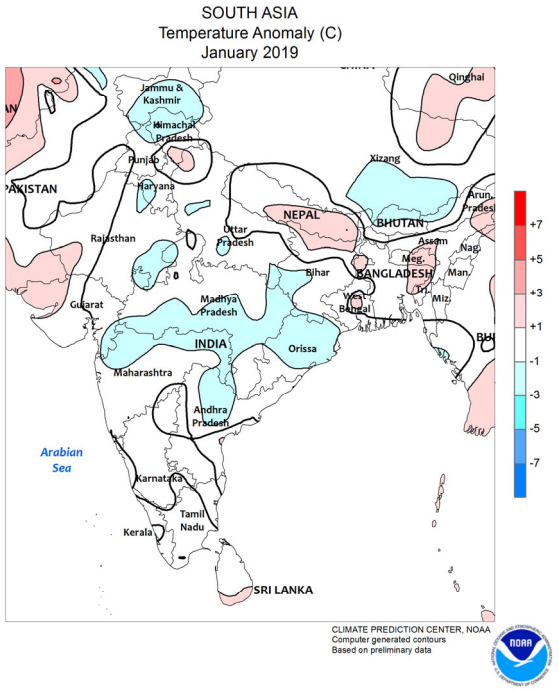
NORTHWESTERN AFRICA

During January, rain eased short-term dryness in northern Morocco while maintaining adequate to abundant moisture supplies for vegetative winter grains from central Algeria into Tunisia. Monthly rainfall topped 50 mm in northern Morocco and 100 mm (locally more than 200 mm) from north-central Algeria into Tunisia. Consequently, early-season prospects for wheat and barley remained good to excellent in these aforementioned areas. However, dryness lingered in southwestern Morocco (10 percent of normal or less), increasing concerns over developing drought and lowering prospects for winter grains which were approaching reproduction by month's end.



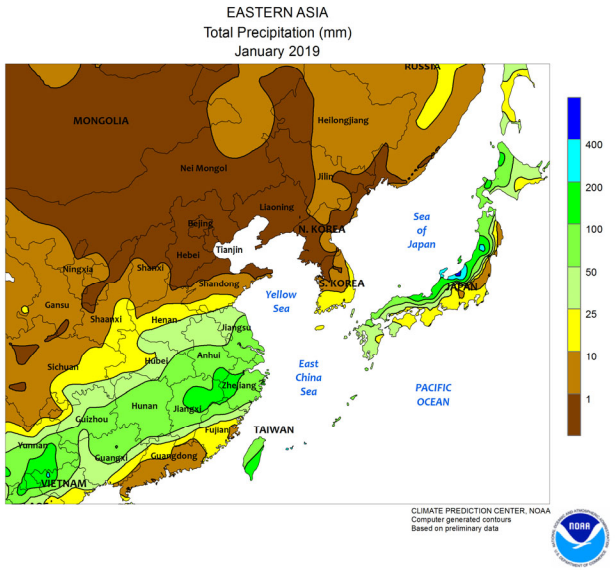


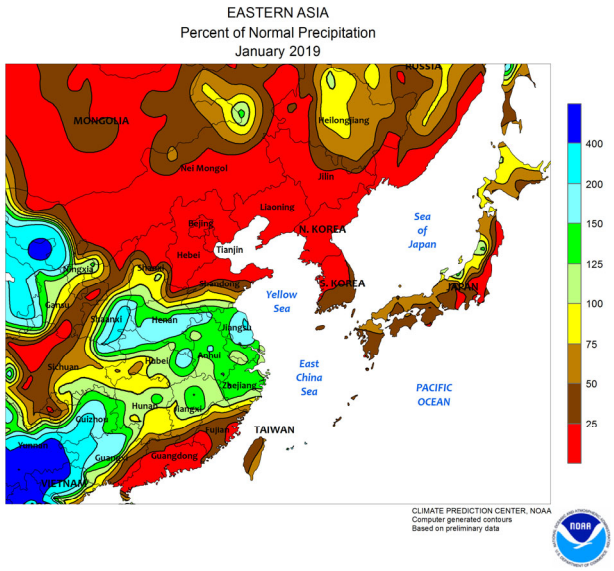


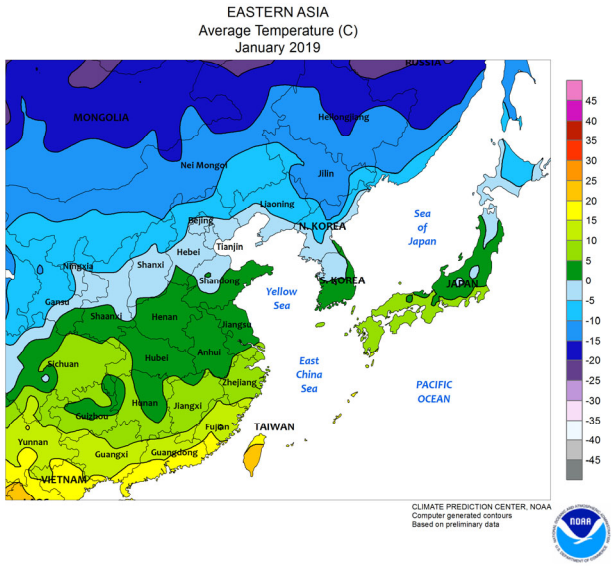


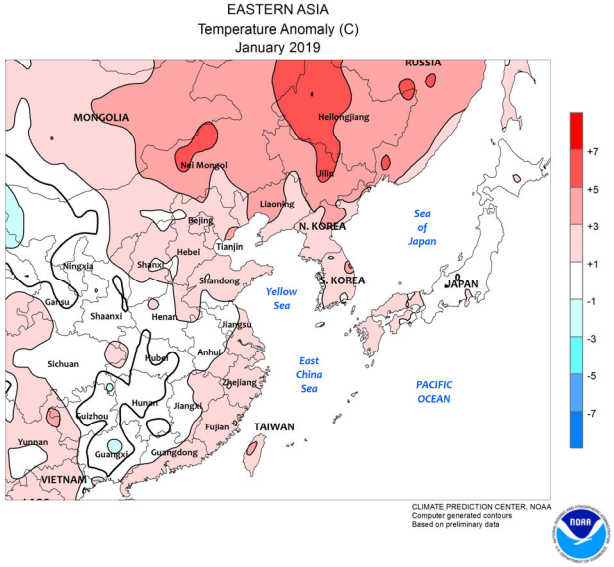
SOUTH ASIA

January was seasonably dry and slightly cooler than normal throughout the majority of India. Occasional showers (10-25 mm, locally more) in far northern and central sections provided some additional moisture to irrigated winter (rabi) crops. The cool weather and periodic moisture were particularly favorable to reproductive rapeseed and vegetative wheat in northern growing areas. Additionally, similar conditions were observed in Pakistan, supporting vegetative wheat there as well. Elsewhere, after favorable rainfall encouraged winter (maha) rice sowing in Sri Lanka, drier-than-normal weather overspread the country beginning in mid-December and extending into January, lowering moisture supplies.



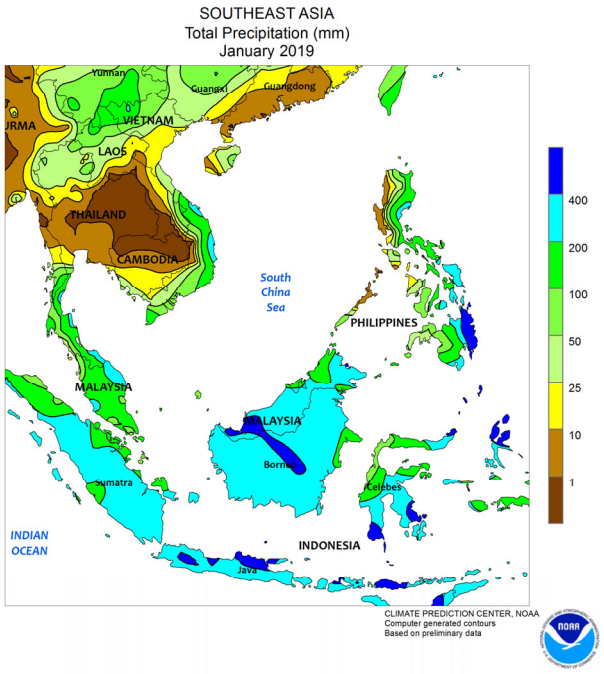


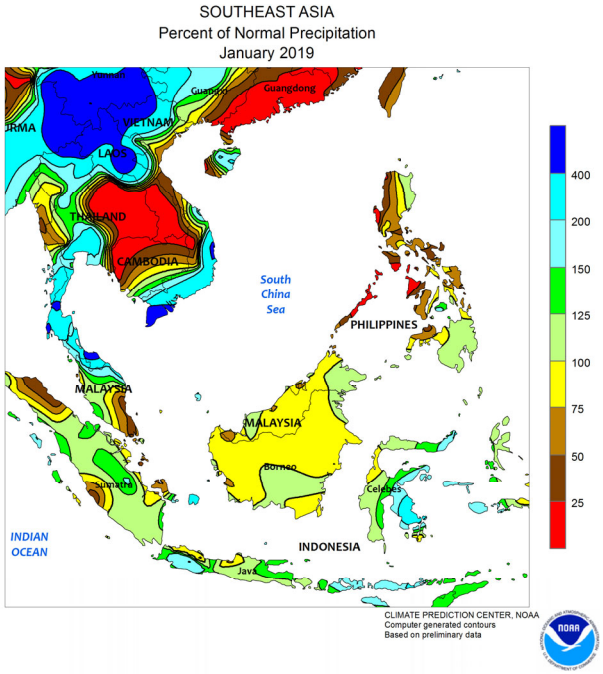


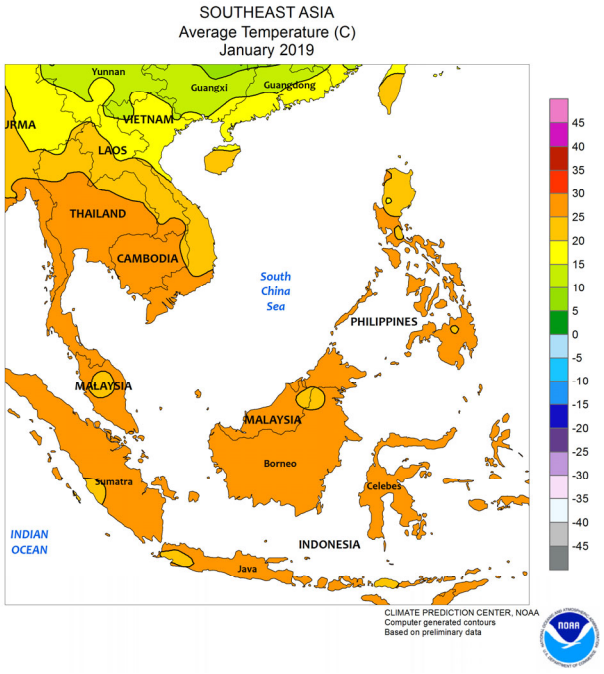


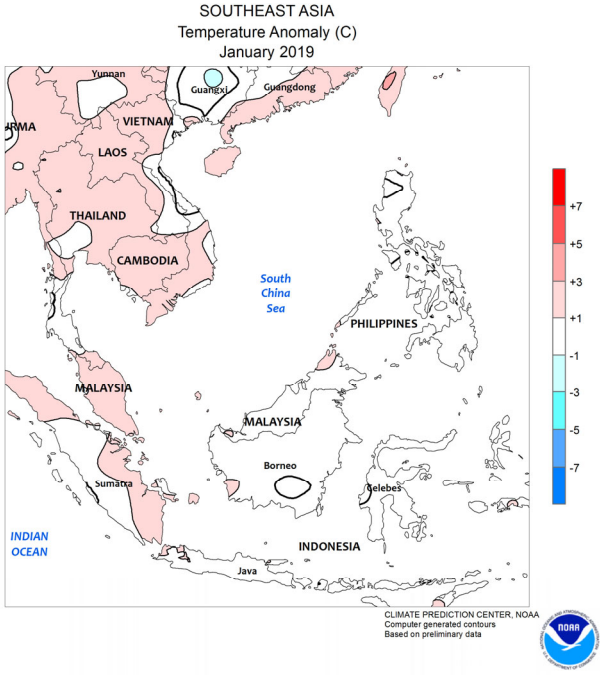
EASTERN ASIA

Consistent January showers across eastern and southern portions of China boosted moisture reserves for overwintering wheat and rapeseed. Rainfall totals on the North China Plain varied between less than 5 mm (north) to over 25 mm (south), and along with occasional snow, boosted moisture reserves for dormant wheat. Meanwhile, higher totals (25-100 mm or more) were reported in the Yangtze Valley, causing excessively wet conditions for rapeseed in some locales but increasing moisture supplies for spring rice sown in late February and early March. Additionally, temperatures throughout eastern crop areas were generally mild during the month, limiting occurrences of winterkill.





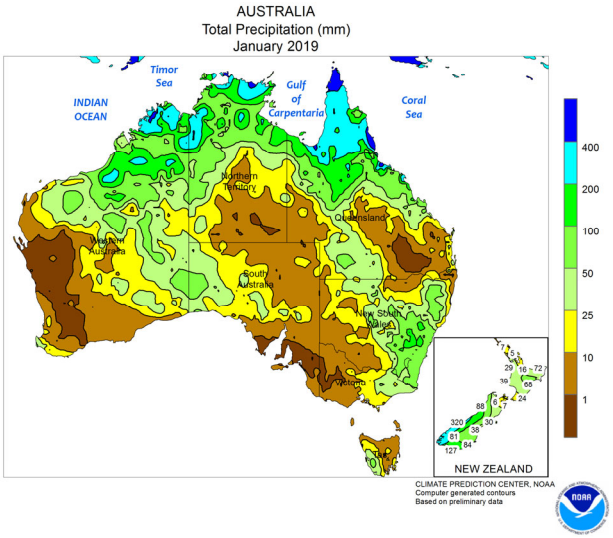


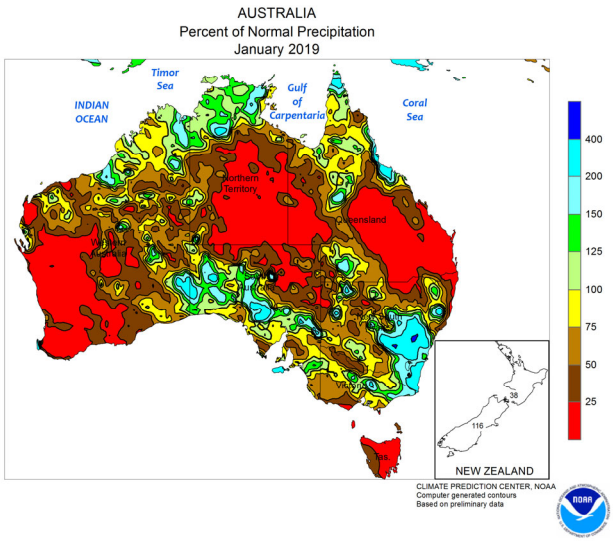


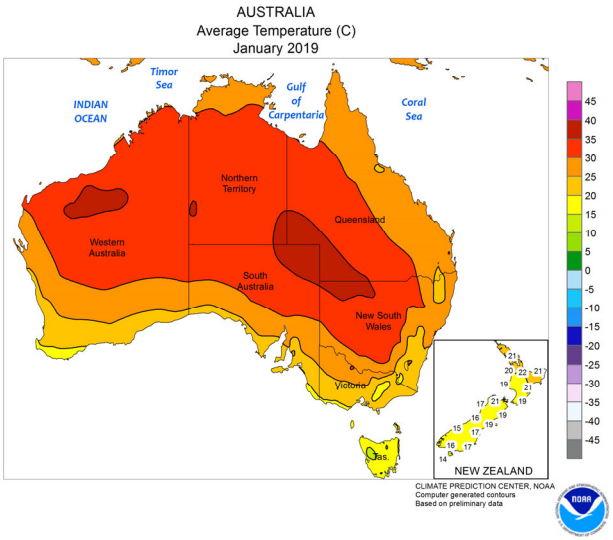
SOUTHEAST ASIA

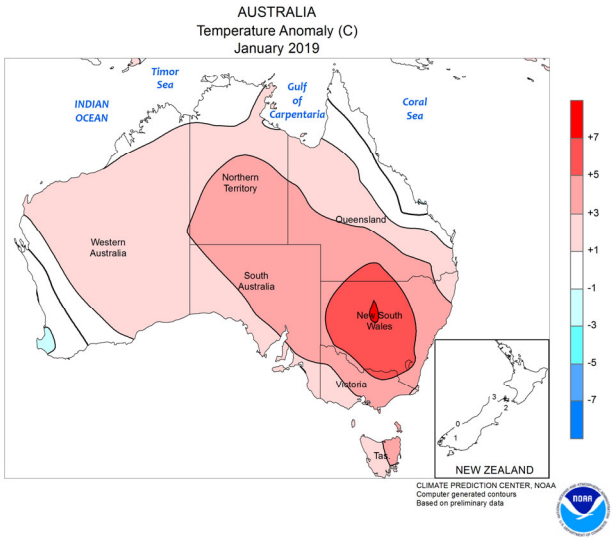
January rainfall was above average across Indonesia (over 250 mm) and portions of Malaysia (over 100 mm). The wetness maintained generally good moisture conditions for oil palm and vegetative to reproductive rice. However, the majority of oil palm areas in Malaysia saw a moisture deficit for the month, exacerbating longer-term drought. More rainfall will be needed in the next few months to prevent yield declines. Meanwhile in the Philippines, rainfall (25-100 mm or more) in the northeast eased seasonal drought for rice and corn, but drier conditions in the south limited soil moisture for crops.

For additional information contact: mbrusberg@oce.usda.gov



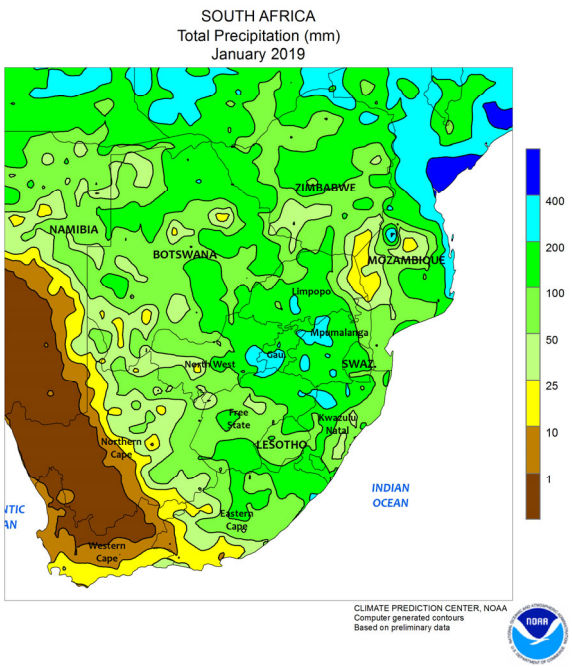


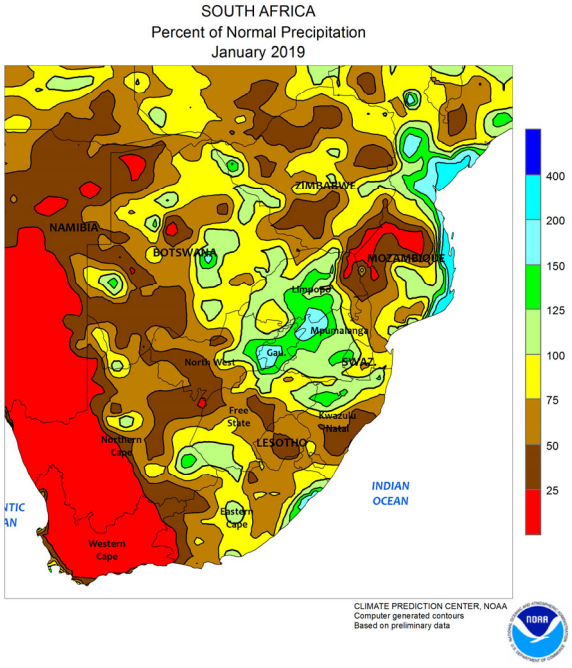


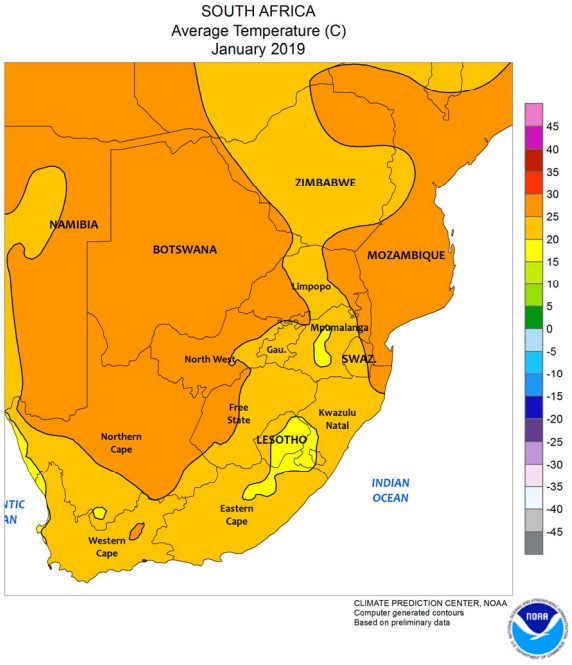


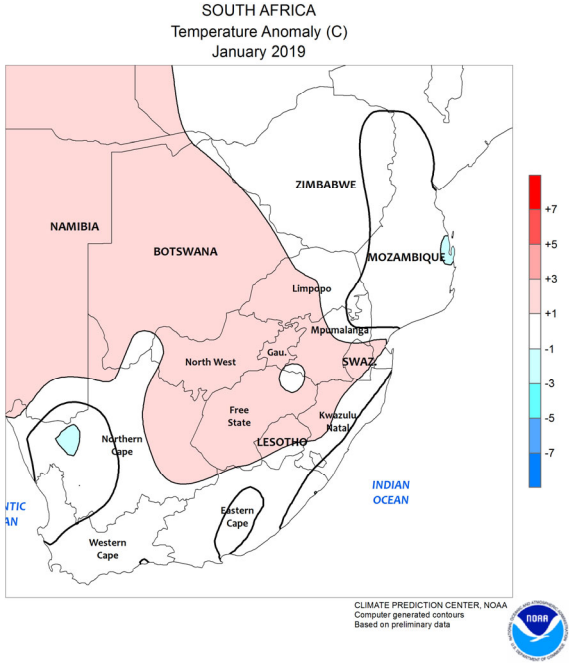
AUSTRALIA

In January, unfavorably hot, locally dry weather plagued major cotton and sorghum producing areas in eastern Australia. In southern Queensland and northern New South Wales, the repeated heat and persistent dryness reduced yield prospects for dryland crops, while the extremely hot conditions may have negatively impacted some irrigated crops as well. The effects of the heat may have been even greater farther south. Rainfall was higher across southern New South Wales, but multiple periods of very hot weather increased stress on irrigated crops.





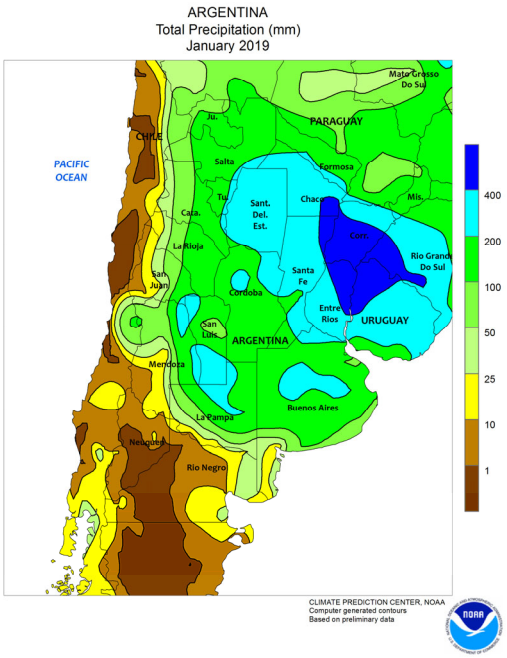


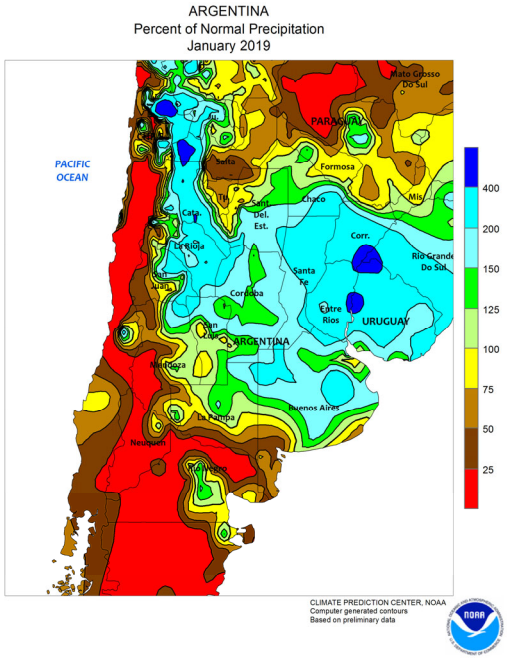


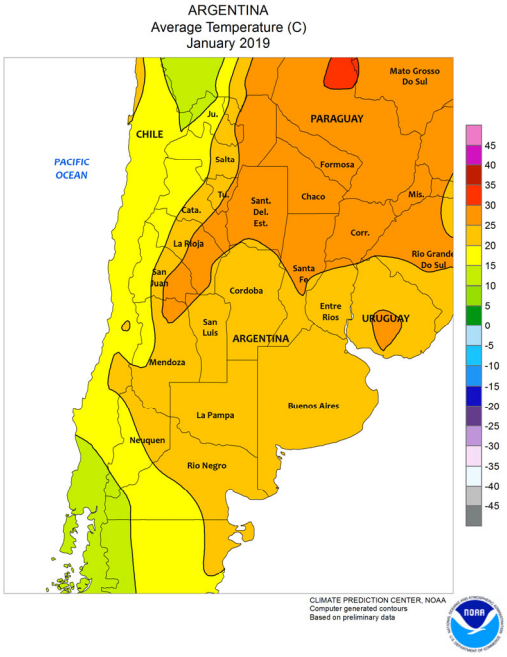
SOUTH AFRICA

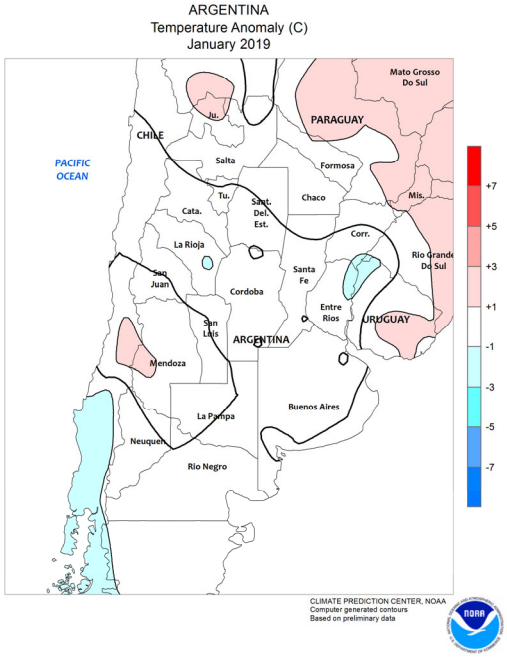
In January, beneficial rain helped to stabilize the condition of rain-fed summer crops in central and eastern sections of the corn belt (Gauteng, Mpumalanga, and environs), as early-planted crops entered or neared reproductive stages of development. However, pockets of warmth and dryness persisted in key western farming areas (North West and Free State), likely limiting planting, although late-month showers brought temporary relief from the dryness. Monthly average temperatures were near to above normal across the corn belt, with daytime highs approaching 40°C at the western edge of the region. Elsewhere, drier-than-normal weather, accompanied by summer warmth (highs reaching the lower and middle 30s degrees C), dominated sugarcane areas of KwaZulu Natal and eastern Mpumalanga, increasing irrigation requirements of northern crops and limiting moisture for sugar development in the southern rain-fed areas. A general pattern of warmth and dryness also dominated the Cape Provinces for much of January, although late-month showers gave a boost to irrigation for corn, cotton, and other crops in the Orange River Valley. In Western Cape, ample sunshine favored development of irrigated tree and vine crops.

For additional information contact: mbrusberg@oce.usda.gov









ARGENTINA

This season's trend of wetter-than-normal weather continued through the month of January, sustaining adequate to abundant levels of moisture for development of summer grains, oilseeds, and cotton. Near-normal temperatures accompanied the rainfall, fostering development of crops growing with overall favorable levels of moisture. As in December, potentially stressful heat (daytime highs greater than or equal to 35°C) occurred at a lower than expected frequency in most major farming areas compared with recent years.

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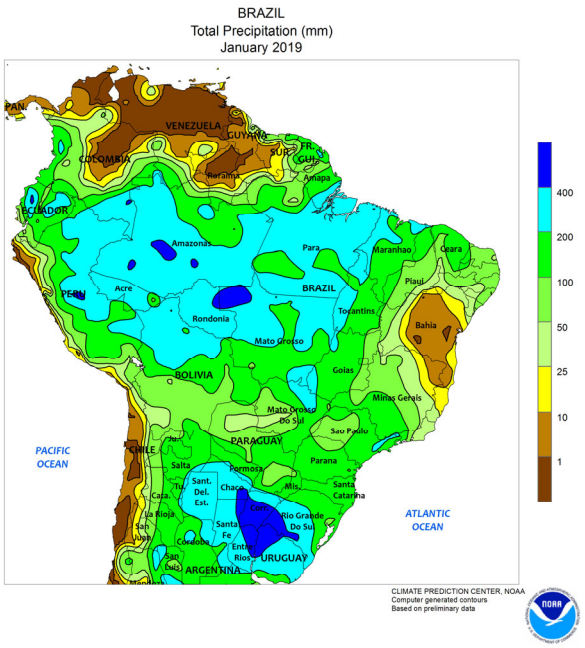

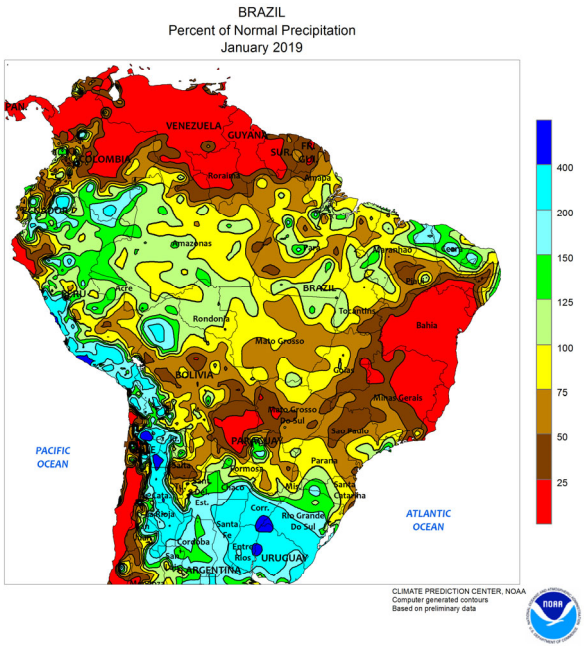

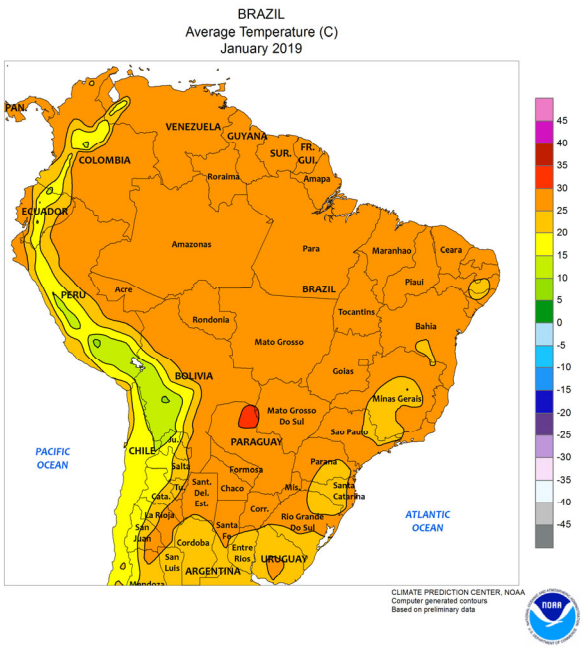

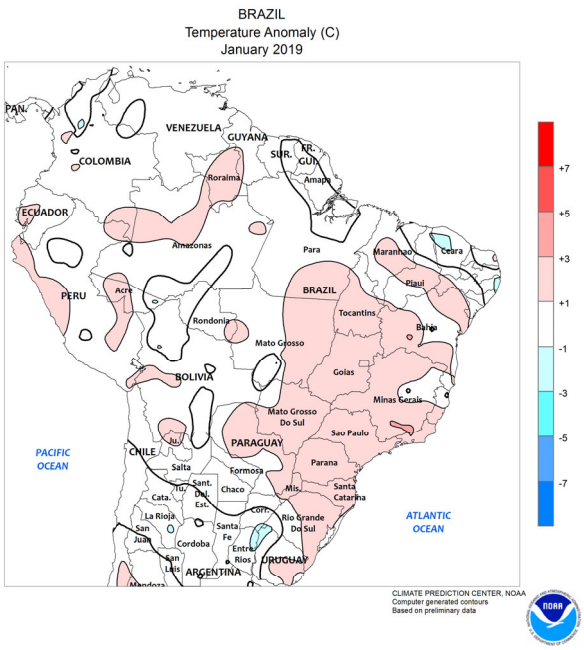

BRAZIL

January rainfall was below normal in nearly all major agricultural areas, limiting moisture for normal development of soybeans and other main-season summer crops. Many locations from the Center-West Region to the far south (Mato Grosso to Rio Grande do Sul) recorded monthly accumulations of 100 to 200 mm or more, as periods of beneficial rain were interspersed with brief to extended spells of dryness. In Parana and other southern locations experiencing dryness, the rain helped to stabilize conditions of soybeans and other reproductive to filling summer crops but above-normal temperatures (daytime highs often exceeding 35°C) sustained high crop moisture requirements and losses through evapotranspiration. In Mato Grosso, the dryness and warmth were timely for maturing soybeans and enabled harvesting to progress quickly, allowing corn planting to advance rapidly as well. Some more easterly production areas, including Sao Paulo, Minas Gerais, parts of Goias, and much of the northeastern interior (western Bahia and environs), experienced more prolonged periods of warmth and dryness, posing some stress on summer crops. In contrast, outlying production areas in Rio Grande do Sul and Mato Grosso recorded near- to above-normal rainfall, maintaining locally favorable summer crop yield prospects.

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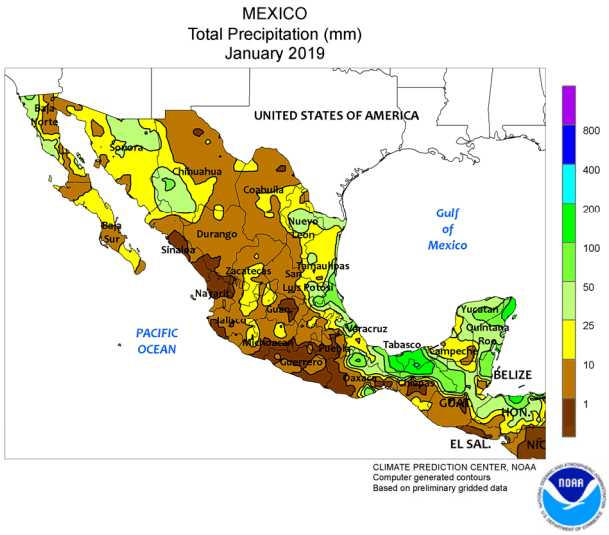

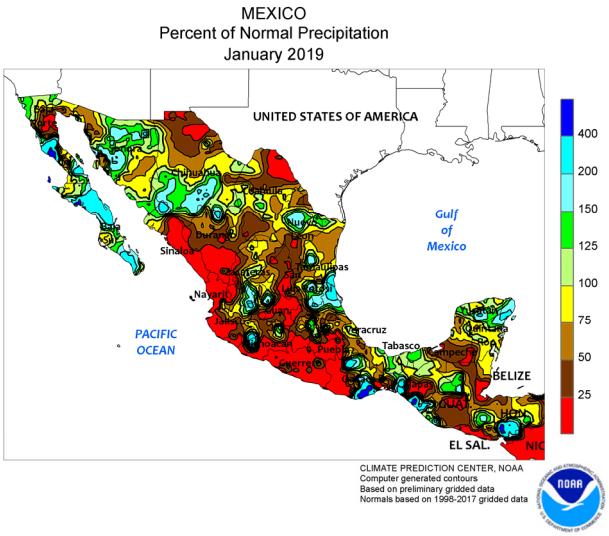

MEXICO

In early January, a brief period of locally heavy showers boosted reservoirs in northwestern Mexico. Cool weather preceded the rainfall but no freeze was reported in Sinaloa, a key producer of winter-grown corn. Seasonably drier conditions prevailed in the northwest for the remainder of the month. Similarly, mostly dry weather favored harvesting of corn and other summer crops across the southern plateau (Jalisco to Puebla). In contrast, scattered showers were common along the Gulf Coast, boosting irrigation reserves for winter-grown crops and helping to moisten topsoils in the northeast (notably Tamaulipas) for germination and establishment of rain-fed winter sorghum. According to the government of Mexico, reservoir levels were at 73 percent capacity nationally, on par with last year and 2017; in the northwest, reservoirs were at 61 percent capacity, ahead of last year (55 percent) but lagging that of 2017 (75 percent).

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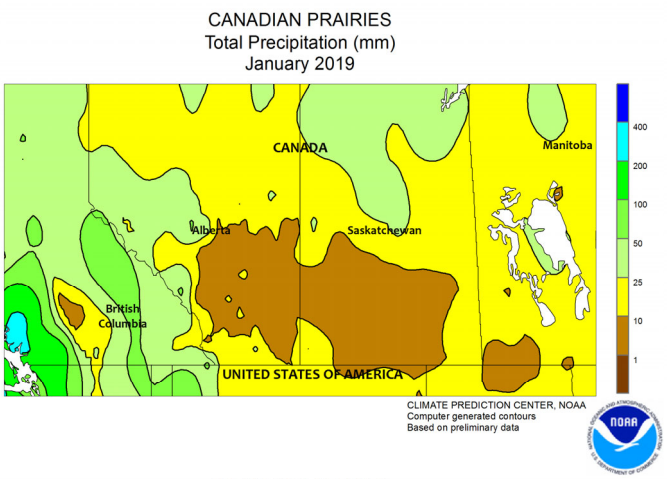
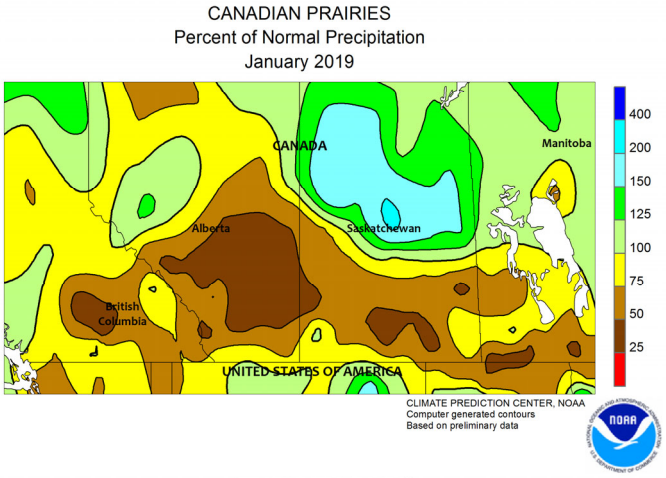
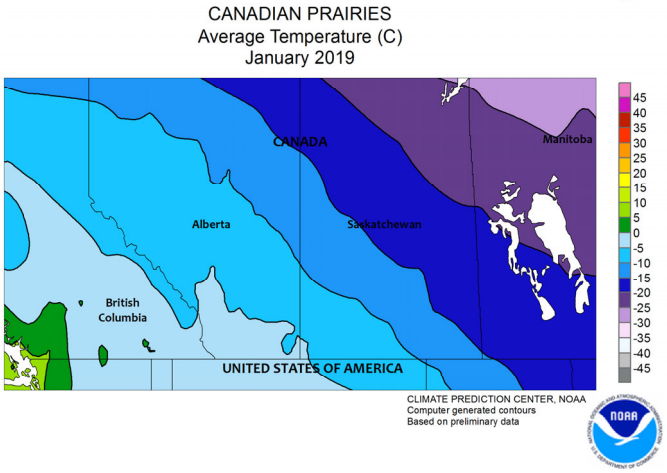
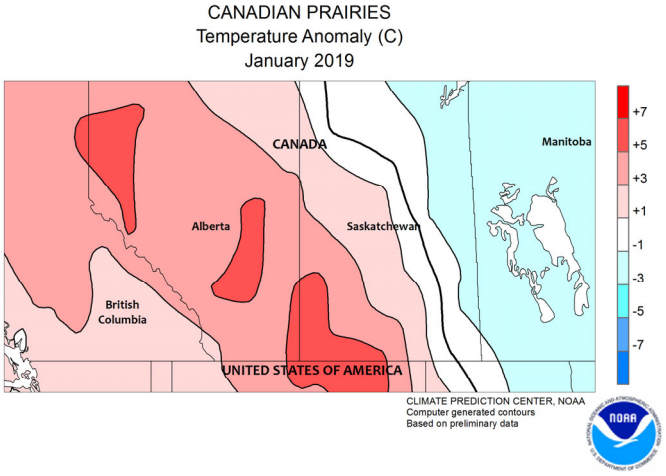


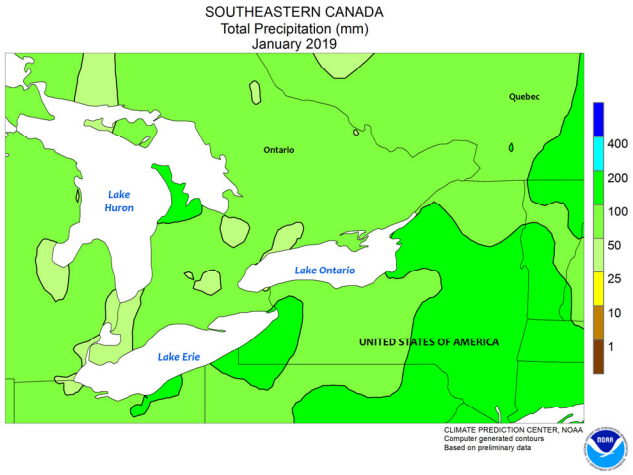


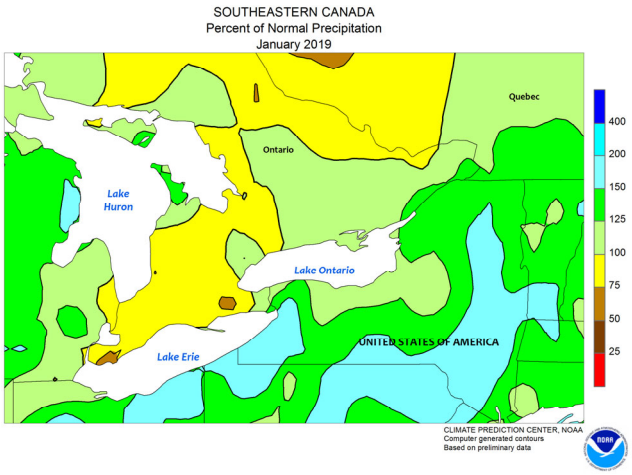


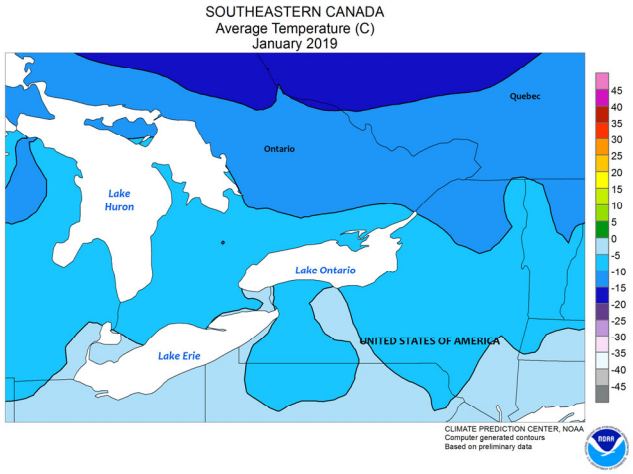


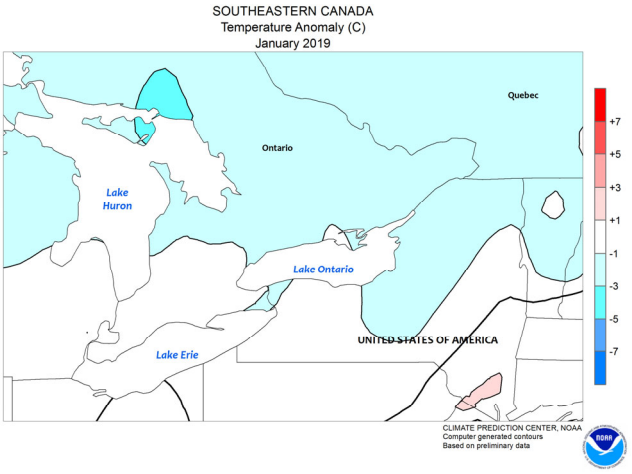
CANADIAN PRAIRIES

Drier-than-normal conditions prevailed throughout much of January, keeping some western farming areas void of snow for much of the month. While monthly average temperatures were 1 to 3°C above normal in Alberta and western Saskatchewan, nighttime lows occasionally fell well below -20°C. Snow cover in the southwestern Prairies was patchy and light during several cold outbreaks raising the possibility of winterkill on wheat. In contrast, snow cover was moderate to deep (10 cm or greater) across the north and east, including most of Manitoba, offering some protection from the bitter cold.





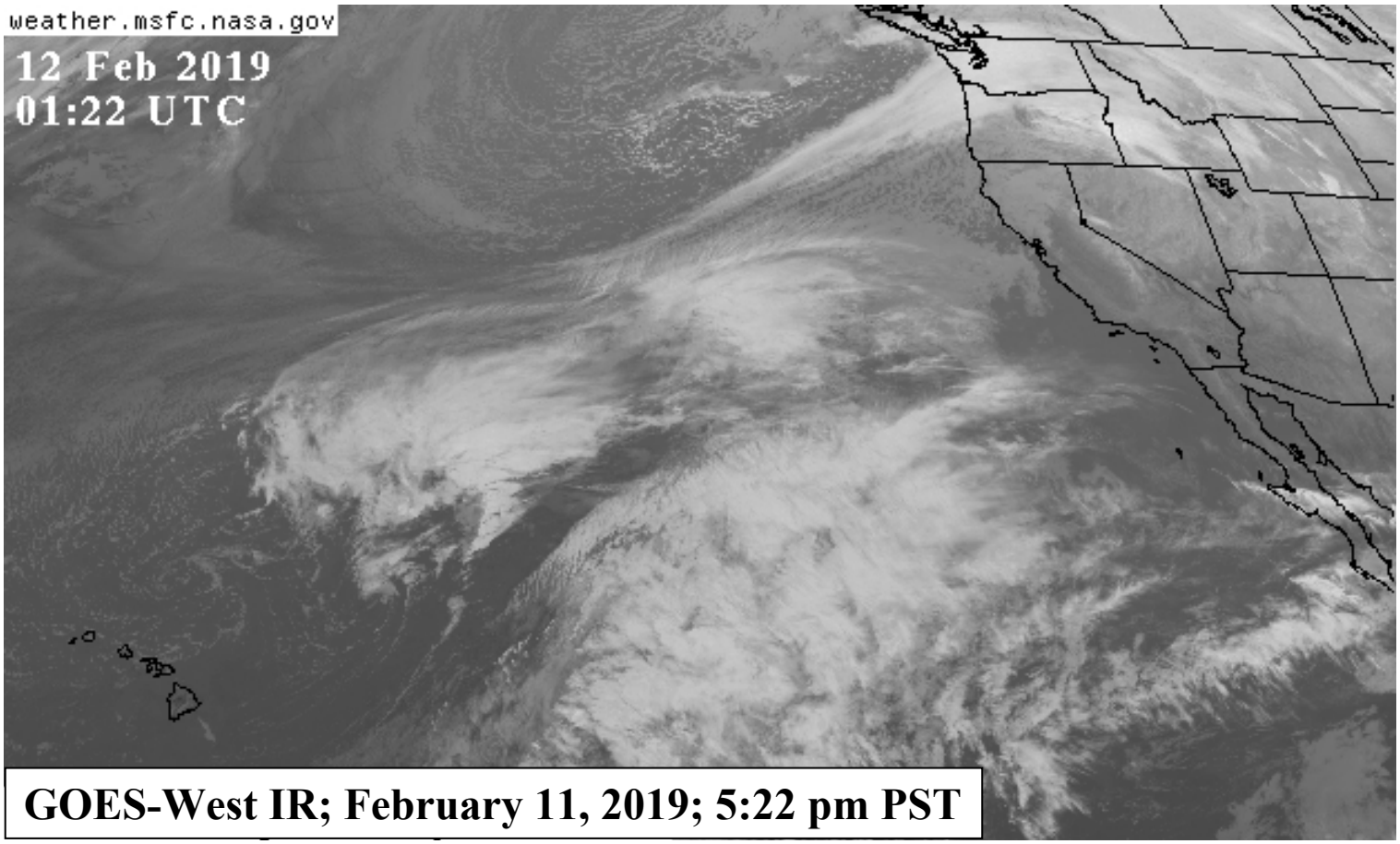




SOUTHEASTERN CANADA

A warm start to January gradually gave way to much cooler conditions as the month progressed, raising concern for potential winterkill to winter wheat. During the middle part of the month, nighttime lows dropped below the threshold for potential damage (-17°C) in Ontario's southwestern farming areas, where snow cover was patchy and locally light (estimated less than 5 cm). Snow fell later in January, offering protection from much colder weather (nighttime lows falling below -20°C). Snow cover was generally deeper in Quebec's farming areas, offering protection from bitter cold throughout the month.

For additional information contact: mbrusberg@oce.usda.gov



GOES-West IR; February 11, 2019; 5:22 pm PST

During the weekend of February 9-10, stormy weather stretched from Hawaii to the Pacific Northwest. In Hawaii, snow blanketed the highest peaks of Maui and the Big Island, while a wind gust to 191 mph was recorded on February 10 on the Mauna Kea summit. Meanwhile, measurable snow fell on multiple days in the Northwest, with February 8-12 totals reaching 17.9 inches in Spokane, WA, and 16.6 inches in Pendleton, OR. Through the 12th, Pendleton's month-to-date snowfall of 21.3 inches had already surpassed its February 1994 record of 16.8 inches.

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