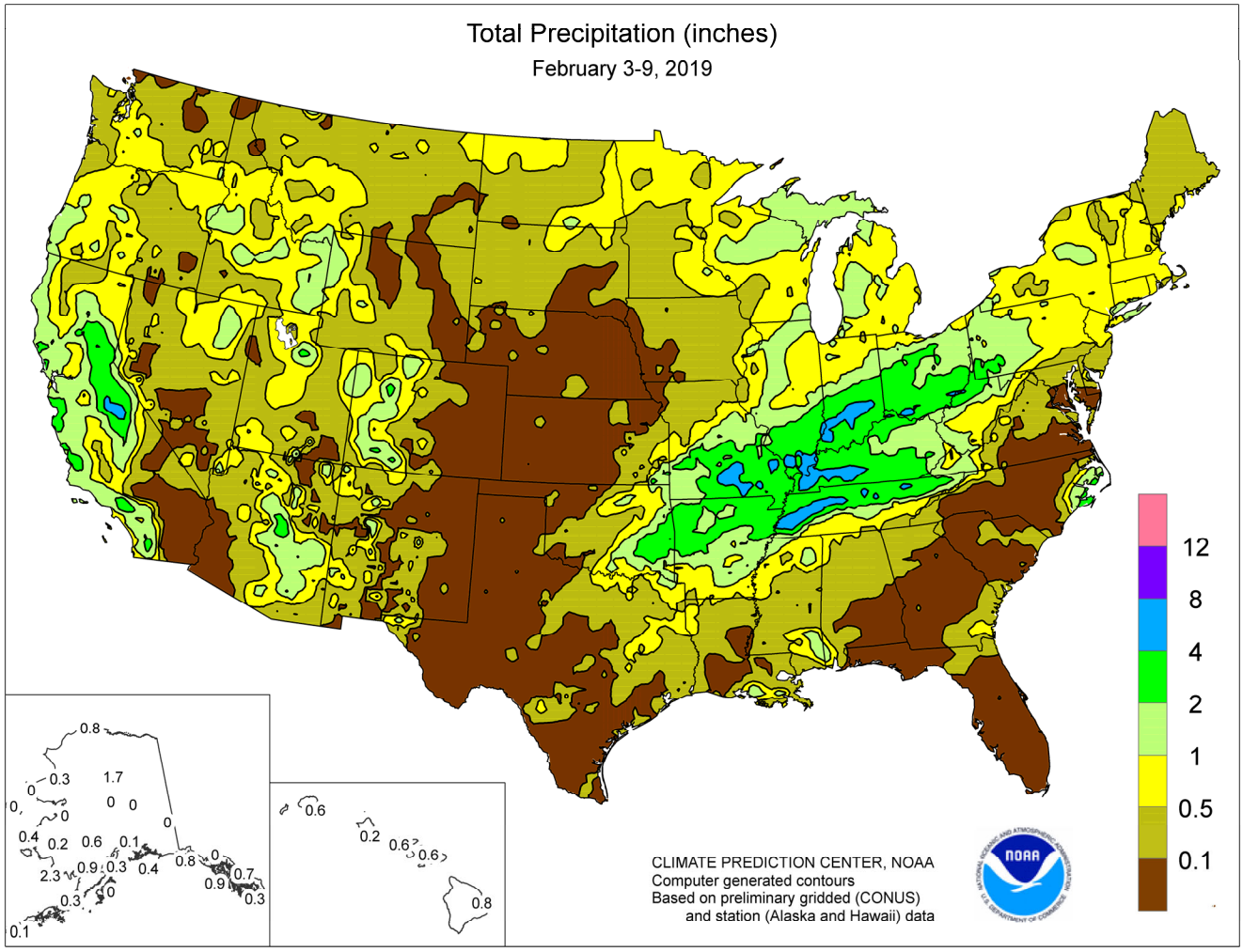
Volume 106, No. 7 http://www.usda.gov/oce/weather February 12, 2019

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 3 – 9, 2019

Highlights provided by USDA/WAOB

Pacific storms marched across the country, delivering widespread snow to the **North** and **West** and heavy rain in the **mid-South** and **lower Midwest**. In the **West**, the combination of frequent storms and deeply entrenched cold air led to significant snowfall, even at lower elevations. In addition, several freezes in **California's San Joaquin Valley** locally necessitated protective measures for citrus and other temperature-sensitive crops. Early-month storms boosted the average water content of the high-elevation **Sierra Nevada** snowpack to 26 inches

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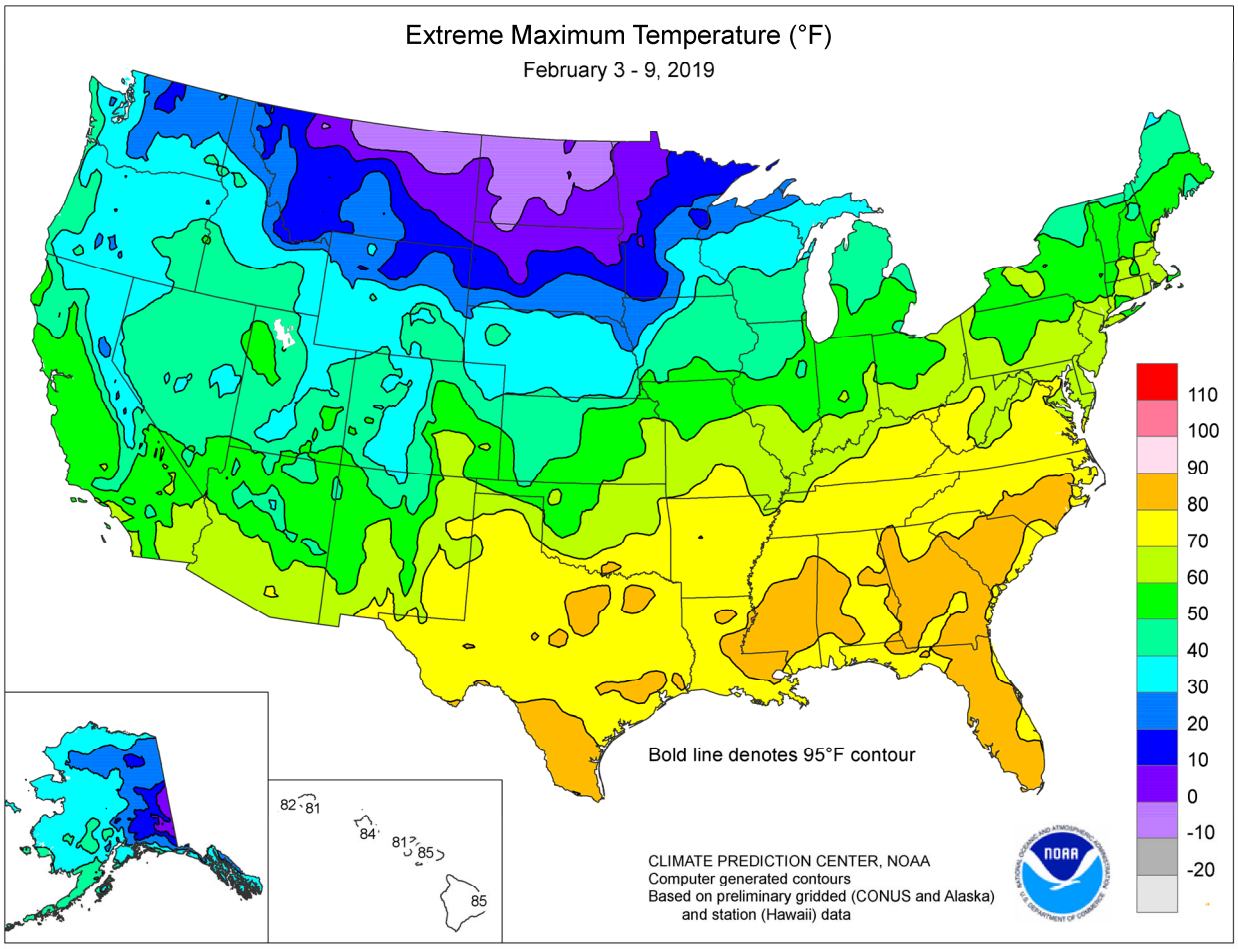
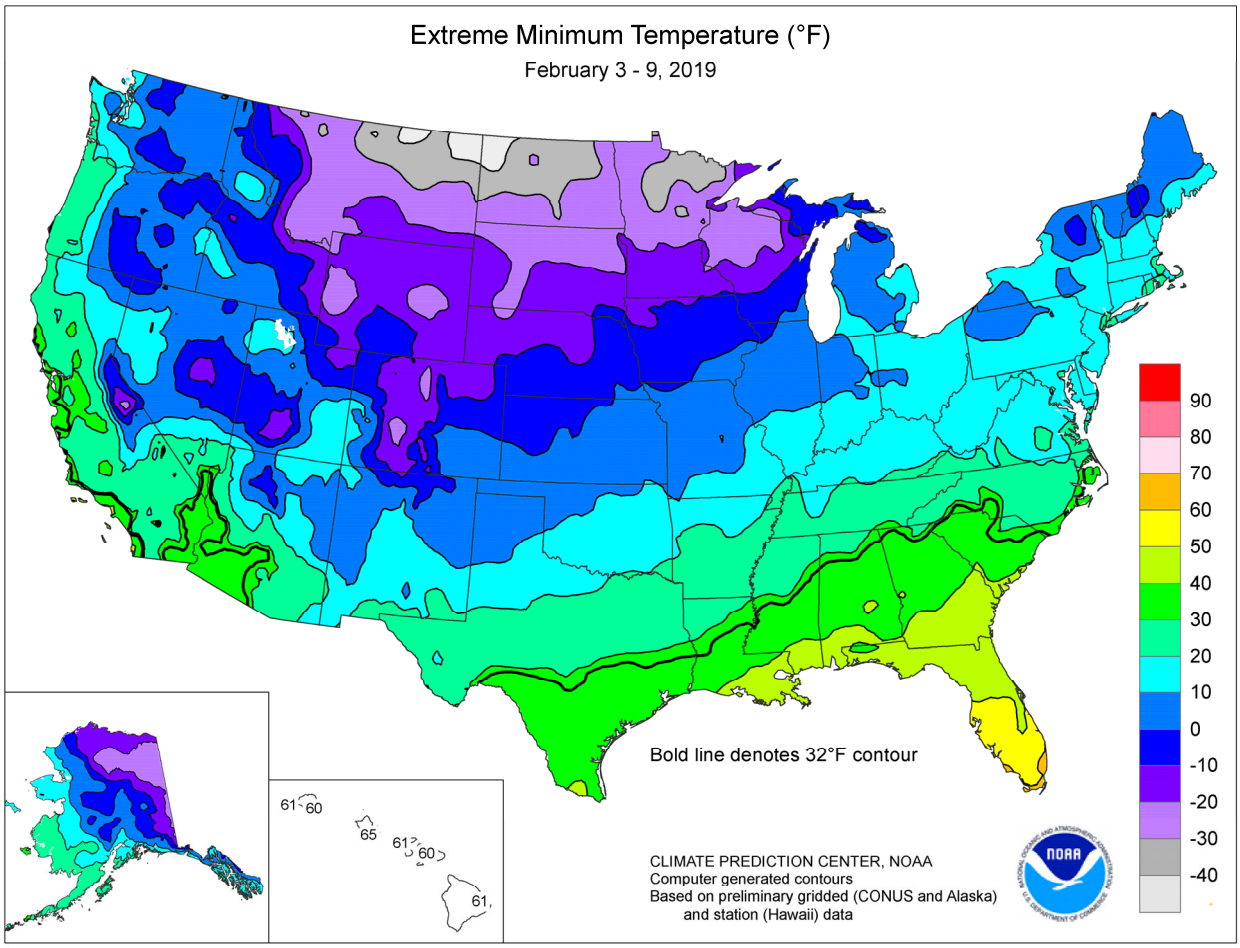
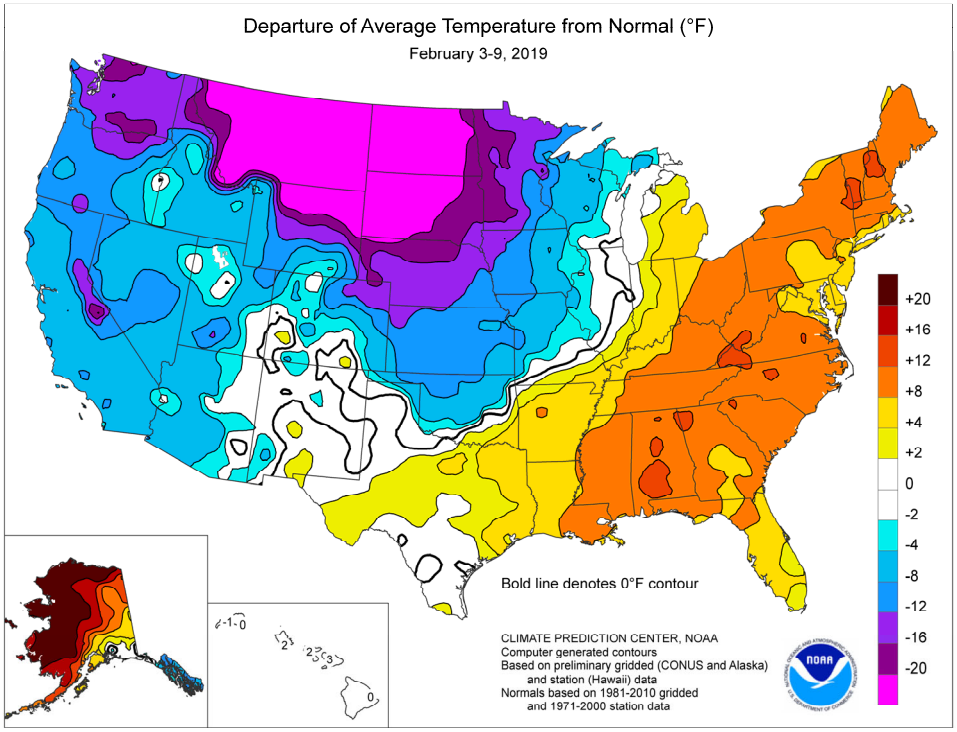
Contents


Extreme Maximum Temperature (°F)
February 3 - 9, 2019
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
82
81
84
81
85
85
Bold line denotes 95°F contour
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS and Alaska)
and station (Hawaii) data


Extreme Minimum Temperature (°F)
February 3 - 9, 2019
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
61
60
65
61
60
61
Bold line denotes 32°F contour
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS and Alaska)
and station (Hawaii) data

(Continued from front cover)

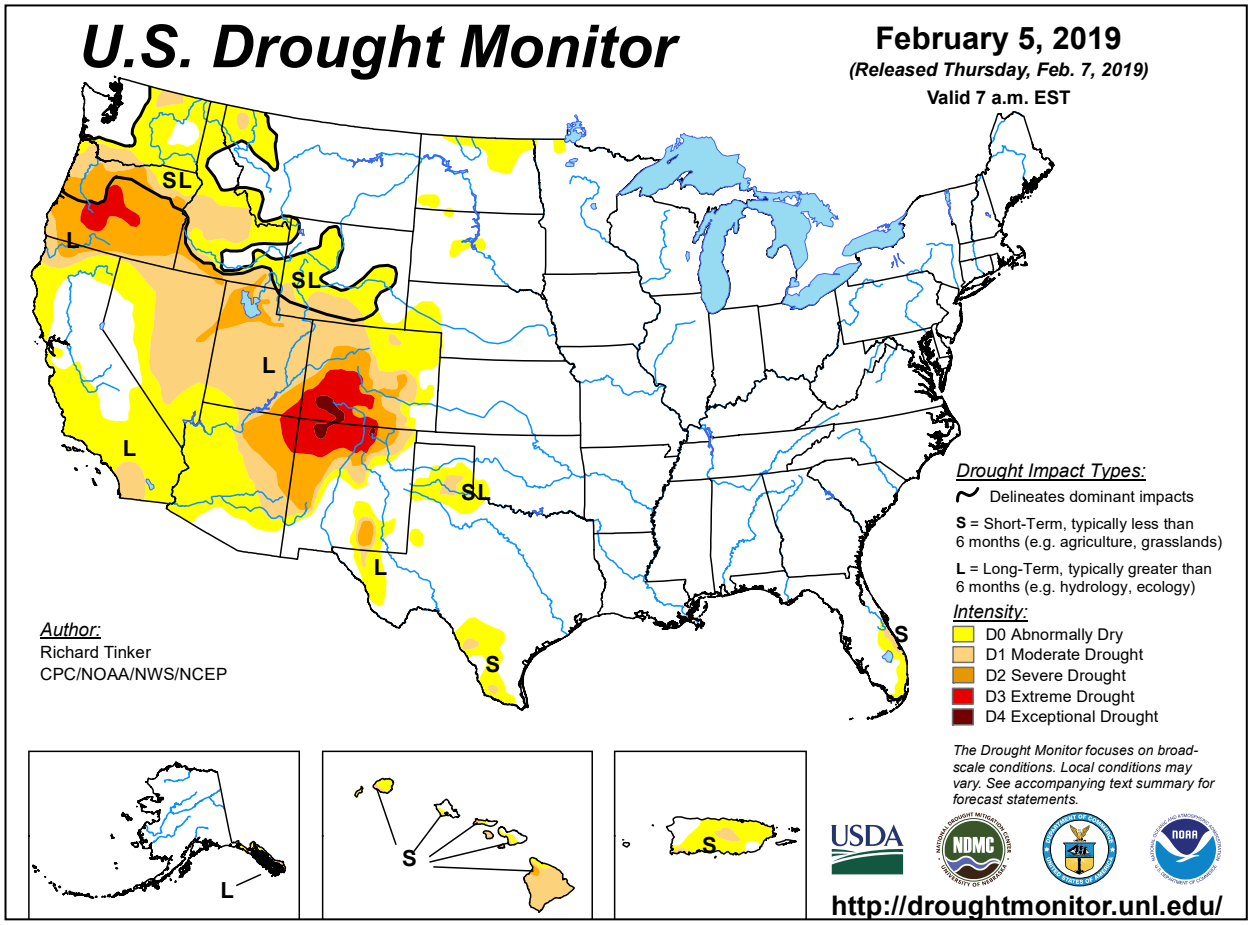
(nearly 130 percent of normal) by February 10, up from 17 inches (100 percent) at the end of January and 7 inches (70 percent) at the beginning of the year. Snow broadly fell in several other parts of the **West**, including valley locations in the **Intermountain region** and **northern Great Basin**. Meanwhile, heavy showers soaked areas along and near the **California coast**. In contrast, mostly dry weather prevailed across the **northern and central High Plains** and the **lower Southeast**, with markedly above-normal temperatures covering the latter region. In fact, spring-like warmth boosted weekly temperatures at least 10 to 15°F above normal in large sections of the **South**, **East**, and **lower Midwest**. Farther north, however, bitterly cold weather and periods of wind and snow maintained harsh conditions for livestock across the **northern Plains** and **upper Midwest**. The cold conditions held weekly readings 15 to 30°F below normal on the **northern Plains**, with late-week temperatures plunging below -30°F across the **nation's northern tier** from **Montana to Minnesota**. Elsewhere, mid-week downpours falling on already saturated soils led to widespread, lowland flooding in a broad area centered on the **Ohio Valley**. Weekly rainfall totaled 2 to 4 inches or more in **southeastern Missouri**, **southern sections of Illinois and Indiana**, and parts of **Kentucky** and **Tennessee**.

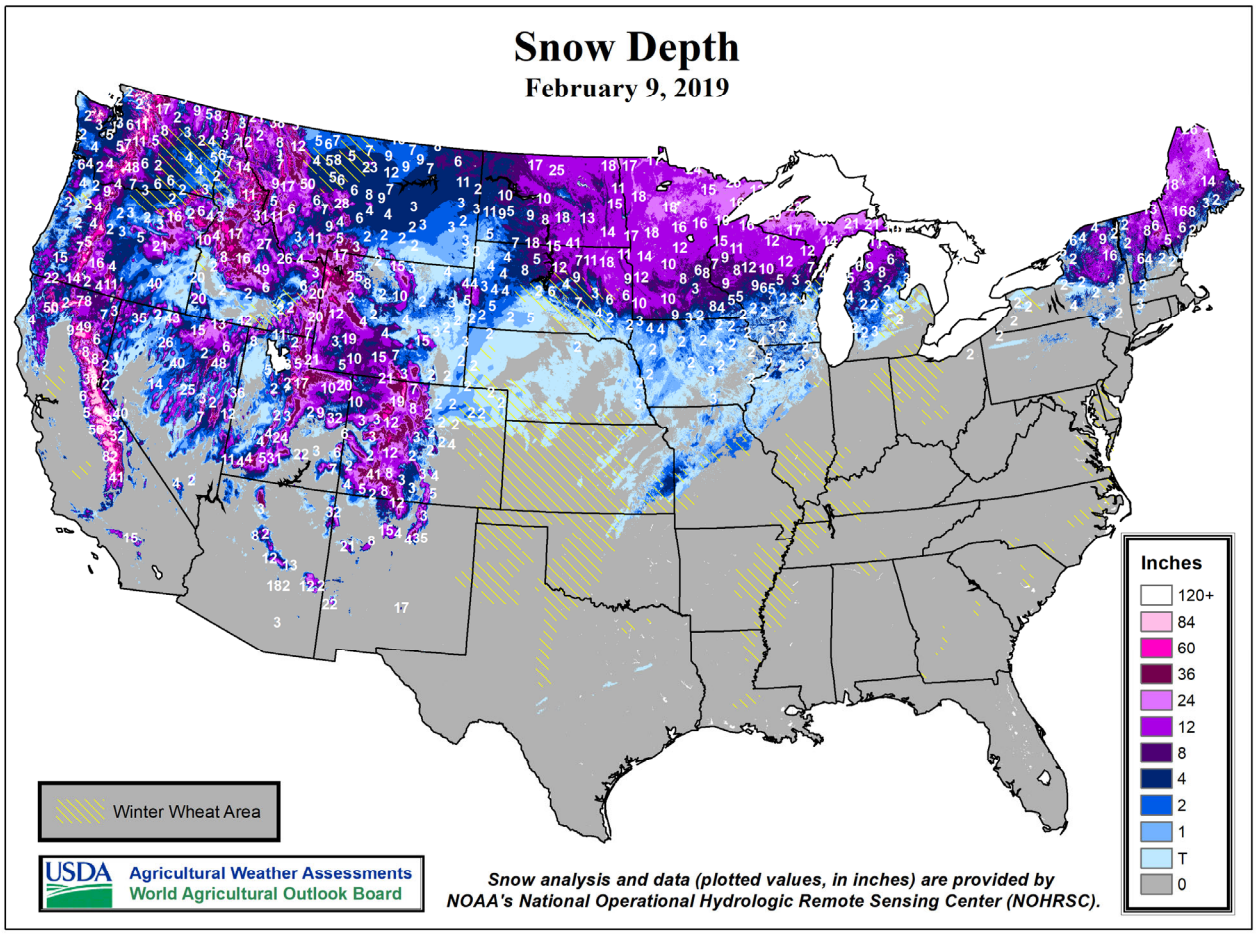


Early in the week, warmth briefly surged across the **Plains** and **Midwest** in advance of an approaching storm system. Daily-record highs for February 3 climbed to 70°F in **Valentine, NE**, and 62°F in **Indianapolis, IN**. **Toledo, OH**, posted daily-record highs of 57 and 60°F, respectively, on February 3 and 7, following consecutive daily-record lows of -10°F on January 30-31. From February 5-8, an even more impressive warm spell affected the **South**, **East**, and **lower Midwest**. On February 5, **Shreveport, LA**, notched a daily-record high of 80°F. Records for February 5 were also set in **Eastern** locations such as **Washington, DC** (74°F), and **Boston, MA** (65°F). **McAllen, TX**, logged a high of 91°F (not a record for the date) on February 7. **Charleston, SC** (78, 80, and 80°F), and **Augusta, GA** (81, 80, and 85°F), tallied a trio of daily-record highs from February 5-7. On February 6-7, consecutive daily-record highs occurred in locations such as **Chattanooga, TN** (70 and 80°F); **Tupelo, MS** (78 and 80°F); and **New Orleans, LA** (80 and 81°F). Similarly, daily records were established on February 7-8 in **New Bern, NC** (82°F both days), and **Columbia, SC** (83 and 77°F). In **Florida**, record-setting highs for February 8 surged to 86°F in **Gainesville** and 85°F in **Jacksonville**. In stark contrast, bitterly cold conditions gripped the **northern Plains** after mid-week. In **Montana**, **Havre** (-41°F on February 7) plunged below -40°F for the first time since February 1, 2011. With minima of -39°F on February 7 and 8, **Turner, MT**, noted its lowest readings since December 31, 2017 (also -39°F). **Williston, ND**, recorded -43°F on February 8, marking its coldest day since December 23, 1983, when the temperature plummeted to -50°F. It was **Williston's** coldest February day since February 16, 1936, when it was -50°F. Meanwhile in the **Northwest**, **Yakima, WA**, posted consecutive sub-zero, daily-record lows (-6 and -8°F, respectively) on February 6-7. Elsewhere in **Washington**, **Bellingham** dipped below the 20-degree mark each day from February 3-7, including a daily-record low of 15°F on the 4th. Farther south, daily-record lows were set on February 8 in **Arizona** locations such as **Douglas** (16°F) and **Sierra Vista** (19°F).

Frequent snow accompanied the **Northwestern** chill, starting on February 3-4. During that 2-day period, snowfall totaled 2.7 inches in **Seattle, WA**. Farther inland, February 4-5 snowfall reached 11.6 inches in **Yakima, WA**, and 4.7 inches in **Pendleton, OR**. Additional Northwestern snow fell on February 8-9, totaling 4.9 inches in **Portland, OR**, and 7.9 inches in **Seattle**. Meanwhile in **Montana**, record-setting snowfall totals for February 3 reached 9.5 inches in **Glasgow** and 5.0 inches in **Havre**. Weekly snowfall totaled 13.9 inches in **International Falls, MN**, and 10.9 inches in **Grand Forks, ND**. Multiple storms struck the **upper Midwest**, with at least 4 inches of snow falling on February 5, 7, and 10 in **Eau Claire, WI**; **Wausau, WI**; and **Minneapolis-St. Paul, MN**. During the 6-day period from February 5-10, **Eau Claire** received 18.7 inches of snow. At mid-week, heavy rain erupted across the **mid-South** and **lower Midwest**. Daily-record precipitation totals for February 6 reached 4.00 inches in **Nashville, TN**; 2.48 inches in **Parkersburg, WV**; and 1.78 inches in **Bowling Green, KY**. The following day, record-setting amounts for February 7 included 1.91 inches in **Dayton, OH**; 1.41 inches in **London, KY**; and 1.34 inches in **Evansville, IN**. Farther west, the **Intermountain region's** heaviest snow fell on February 5-6, when 24-hour amounts in **Utah** totaled 18.1 inches in **Alta** and 14.3 inches in **Tooele**. The **Sierra Nevada** snowpack gained an average of an inch per day of water equivalency during the week, with the bulk of the storminess occurring early in the week. During the first 5 days of February, **Blue Canyon, CA**, reported precipitation totaling 6.21 inches.

Mild, wet weather dominated **Alaska**, except for cold, mostly dry conditions in southeastern areas. Weekly temperatures averaged 20 to 30°F above normal across the **northern and western tiers of the state**. Daily-record highs were set in multiple **Alaskan** locations, including **McGrath** (36 and 42°F, respectively, on February 7 and 8) and **Kotzebue** (35°F on February 9). With a high of 33°F on February 8, **Utqiagvik (Barrow)** not only set a daily record but also topped the freezing mark for the first time since October 9, 2018. Meanwhile in **McGrath**, February 2-6 precipitation and snowfall totaled 1.14 and 13.6 inches, respectively, aided by daily-record amounts (0.44 and 5.1 inches) on the 3rd. Similarly, the first 9 days of February featured 1.83 inches of precipitation and 26.8 inches of snow in **Bettles**. The bulk of **Bettles'** precipitation (1.54 inches, including 15.7 inches of snow) fell on February 8-9. Farther south, a late-week "Kona low" delivered unusually cool weather to **Hawaii**, accompanied by strong winds and high-elevation snowfall. By the morning of February 10, **Lihue, Kauai** (56°F), reported its lowest temperature in more than a year, since December 24, 2017. Similarly, **Honolulu, Oahu** (61°F on February 10), noted its lowest reading in nearly 2 years, since April 30, 2017. On the **Big Island**, a wind gust to 191 mph was clocked on the 10th atop the **Mauna Kea** summit. On the same date, a gust to 67 mph was recorded at **Port Allen**, on the southern coastline of **Kauai**. Elsewhere, snow blanketed the **Big Island** peaks (e.g. **Mauna Loa** and **Mauna Kea**), as well as **Maui's Haleakala**.


U.S. Drought Monitor
February 5, 2019
(Released Thursday, Feb. 7, 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 9, 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).

National Weather Data for Selected Cities

Weather Data for the Week Ending February 9, 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	68	51	79	34	59	15	0.11	-0.94	0.05	17.48	155	6.14	90	91	52	0	0	5	0
	HUNTSVILLE	66	47	78	29	57	15	0.27	-0.86	0.16	17.42	139	7.42	106	85	69	0	1	4	0
	MOBILE	71	57	79	42	64	13	1.44	0.22	1.42	15.14	126	5.69	78	89	69	0	0	3	1
	MONTGOMERY	73	52	81	41	63	15	0.02	-1.23	0.02	15.19	131	5.20	78	87	51	0	0	1	0
AK	ANCHORAGE	28	22	32	16	25	8	0.28	0.13	0.13	3.48	181	1.05	121	88	83	0	7	3	0
	BARROW	19	-3	33	-15	8	23	0.76	0.73	0.40	1.23	439	0.86	538	94	78	0	7	5	0
	FAIRBANKS	18	3	24	-9	11	19	0.00	-0.08	0.00	0.42	30	0.00	0	83	77	0	7	0	0
	JUNEAU	28	14	31	4	21	-6	0.73	-0.26	0.73	14.23	124	8.60	141	93	84	0	7	1	1
	KODIAK	43	31	47	26	37	7	0.04	-1.56	0.03	15.92	89	7.87	77	95	85	0	5	2	0
	NOME	31	23	34	18	27	22	0.47	0.28	0.12	2.68	123	1.77	151	100	92	0	7	6	0
AZ	FLAGSTAFF	36	17	43	-2	26	-5	2.19	1.62	1.25	4.92	104	3.97	137	88	53	0	6	4	2
	PHOENIX	63	46	67	36	55	-2	0.39	0.25	0.31	1.32	68	1.13	112	74	54	0	0	2	0
	PRESCOTT	46	27	54	16	37	-2	0.74	0.34	0.49	2.48	74	2.31	111	84	39	0	4	4	0
	TUCSON	62	42	70	29	52	-2	0.68	0.49	0.36	3.34	147	1.84	148	76	49	0	2	3	0
AR	FORT SMITH	62	37	79	20	50	9	1.79	1.25	0.98	11.25	174	5.74	188	83	55	0	3	2	2
	LITTLE ROCK	63	40	77	20	52	10	0.58	-0.19	0.54	14.65	157	4.33	94	91	58	0	3	2	1
CA	BAKERSFIELD	58	40	64	32	49	-2	0.29	0.01	0.14	2.39	104	1.77	116	78	58	0	2	4	0
	FRESNO	56	39	62	32	48	-1	1.28	0.78	0.41	4.56	110	4.00	143	84	67	0	1	5	0
	LOS ANGELES	59	47	61	42	53	-5	0.88	0.11	0.24	9.31	162	7.86	198	70	56	0	0	4	0
	REDDING	50	36	51	30	43	-5	1.23	-0.21	0.78	11.82	91	7.50	90	91	71	0	3	4	1
	SACRAMENTO	52	38	56	31	45	-4	0.79	-0.14	0.30	7.70	103	5.34	106	97	58	0	1	4	0
	SAN DIEGO	61	50	63	44	55	-4	1.19	0.69	1.01	7.75	183	4.73	161	70	57	0	0	2	1
	SAN FRANCISCO	54	42	56	38	48	-3	1.67	0.61	0.60	7.08	81	5.43	93	78	65	0	0	5	1
	STOCKTON	55	39	59	32	47	-2	1.54	0.91	0.73	6.32	118	3.98	113	88	74	0	2	5	1
CO	ALAMOSA	34	7	42	-11	20	1	0.00	-0.03	0.00	1.54	248	1.22	421	84	63	0	7	0	0
	CO SPRINGS	47	17	63	2	32	2	0.02	-0.01	0.02	0.39	53	0.30	94	73	26	0	6	1	0
	DENVER INTL	41	11	65	-11	26	-3	0.14	0.14	0.14	0.92	170	0.89	387	86	52	0	6	1	0
	GRAND JUNCTION	42	26	53	15	34	4	0.14	0.06	0.06	1.53	124	0.58	82	77	52	0	4	3	0
	PUEBLO	55	18	69	4	36	4	0.00	-0.03	0.00	0.61	80	0.52	141	74	51	0	6	0	0
CT	BRIDGEPORT	47	29	56	24	38	8	0.82	0.09	0.47	11.34	139	5.01	107	87	63	0	6	3	0
	HARTFORD	49	29	64	23	39	12	0.74	-0.02	0.45	16.04	190	11.07	229	88	68	0	6	4	0
DC	WASHINGTON	58	36	74	28	47	11	0.03	-0.58	0.03	9.21	131	3.39	85	82	45	0	2	1	0
DE	WILMINGTON	52	29	67	19	40	8	0.48	-0.17	0.45	11.35	148	4.50	105	92	50	0	5	2	0
FL	DAYTONA BEACH	72	54	79	48	63	4	0.00	-0.65	0.00	8.70	130	3.82	96	100	66	0	0	0	0
	JACKSONVILLE	74	52	85	46	63	9	0.51	-0.30	0.51	9.90	134	4.94	104	95	51	0	0	1	1
	KEY WEST	80	70	82	67	75	5	0.00	-0.41	0.00	3.65	75	1.75	64	88	67	0	0	0	0
	MIAMI	80	65	83	63	72	4	0.17	-0.33	0.17	3.76	80	2.18	87	94	57	0	0	1	0
	ORLANDO	78	56	83	52	67	6	0.28	-0.24	0.28	10.60	196	3.80	123	95	66	0	0	1	0
	PENSACOLA	70	57	77	43	64	11	0.03	-1.10	0.01	19.44	181	2.90	43	87	67	0	0	3	0
	TALLAHASSEE	74	50	80	47	62	9	0.01	-1.08	0.01	19.45	179	3.68	54	94	63	0	0	1	0
	TAMPA	77	61	81	58	69	7	0.08	-0.51	0.08	13.00	244	4.32	143	92	56	0	0	1	0
	WEST PALM BEACH	79	63	83	58	71	5	0.00	-0.75	0.00	10.17	129	8.73	184	89	62	0	0	0	0
GA	ATHENS	69	47	81	37	58	14	0.03	-1.03	0.02	16.26	166	5.37	89	84	57	0	0	2	0
	ATLANTA	68	50	80	38	59	15	0.15	-1.00	0.10	18.13	176	6.30	97	81	58	0	0	3	0
	AUGUSTA	74	44	85	36	59	13	0.00	-1.02	0.00	10.35	116	4.41	76	90	44	0	0	0	0
	COLUMBUS	69	50	82	43	60	12	0.01	-1.04	0.01	13.58	129	5.65	92	86	50	0	0	1	0
	MACON	70	45	81	38	57	10	0.01	-1.12	0.01	12.41	119	6.15	95	93	49	0	0	1	0
	SAVANNAH	74	49	82	43	62	12	0.31	-0.49	0.31	11.01	141	2.87	58	90	58	0	0	1	0
HI	HILO	79	64	85	61	72	1	0.82	-1.33	0.48	12.20	53	2.23	18	86	75	0	0	3	0
	HONOLULU	82	68	84	65	75	2	0.20	-0.38	0.20	1.45	23	0.85	24	79	69	0	0	1	0
	KAHULUI	82	66	85	60	74	2	0.60	-0.08	0.32	3.49	45	2.95	64	86	79	0	0	4	0
	LIHUE	79	64	81	60	71	-1	0.59	-0.26	0.55	5.66	54	1.62	28	84	72	0	0	2	1
ID	BOISE	39	26	50	14	32	-2	0.61	0.33	0.42	2.85	91	1.45	83	81	63	0	5	5	0
	LEWISTON	36	23	45	12	29	-7	1.02	0.78	0.94	2.41	96	1.61	111	78	68	0	6	2	1
	POCATELLO	32	14	46	-6	23	-4	0.96	0.74	0.59	2.83	112	2.05	144	88	75	0	6	5	1
IL	CHICAGO/O'HARE	36	20	51	4	28	4	1.08	0.69	0.71	6.36	136	3.04	135	88	79	0	6	4	1
	MOLINE	35	18	51	3	26	3	1.04	0.72	0.67	6.00	143	3.05	153	86	76	0	6	2	1
	PEORIA	35	19	50	6	27	2	0.71	0.38	0.36	7.32	169	3.13	162	90	71	0	6	4	0
	ROCKFORD	31	17	47	1	24	3	1.73	1.43	0.80	6.98	181	4.02	223	89	81	0	6	5	2
	SPRINGFIELD	39	22	58	8	30	3	0.71	0.37	0.47	8.61	188	3.70	180	95	73	0	6	3	0
IN	EVANSVILLE	52	32	67	16	42	9	2.27	1.58	1.34	12.50	170	6.36	167	93	80	0	4	4	2
	FORT WAYNE	44	27	59	11	36	11	0.92	0.48	0.59	5.87	109	2.93	112	92	76	0	3	4	1
	INDIANAPOLIS	46	27	62	10	37	9	2.68	2.14	1.45	9.44	152	5.65	178	91	73	0	4	4	2
	SOUTH BEND	38	24	53	8	31	6	0.89	0.42	0.36	5.57	93	2.82	98	91	79	0	4	4	0
IA	BURLINGTON	34	17	50	4	26	1	0.19	-0.10	0.17	3.91	103	1.53	91	87	69	0	6	2	0
	CEDAR RAPIDS	29	12	44	-3	21	0	0.30	0.05	0.22	3.27	115	1.18	87	96	79	0	6	2	0
	DES MOINES	28	11	50	-3	20	-3	0.20	-0.06	0.16	4.68	174	1.77	130	88	77	0	6	3	0
	DUBUQUE	28	12	43	-3	20	0	0.56	0.26	0.26	4.89	146	2.82	169	89	82	0	6	4	0
	SIOUX CITY	20	3	48	-8	11	-11	0.01	-0.07	0.01	1.97	145	0.08	11	80	71	0	7	1	0
	WATERLOO	29	10	46	-6	19	0	0.16	-0.06	0.14	4.29	192	1.69	151	92	78	0	6	2	0
KS	CONCORDIA	33	14	65	1	24	-5	0.09	0.02	0.09	3.38	210	0.75	100	82	64	0	6	1	0
	DODGE CITY	37	16	69	1	27	-6	0.01	-0.07	0.01	1.94	129	0.74	101	85	56	0	6	1	0
	GOODLAND	33	11	71	-2	22	-8	0.04	-0.02	0.03	0.77	86	0.35	70	82	70	0	7	2	0
	TOPEKA	37	20	68	6	29	-1	0.11	-0.09	0.08	4.74	181	1.68	140	80	63	0	6	2	0

Based on 1971-2000 normals

***** Not Available**

Weather Data for the Week Ending February 9, 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	39	23	70	8	31	-2	0.04	-0.08	0.04	3.17	135	1.37	138	89	69	0	6	1	0
KY	JACKSON	61	42	73	18	51	16	1.32	0.51	0.75	13.06	147	5.60	122	88	55	0	2	4	2
	LEXINGTON	58	40	72	15	49	16	1.43	0.73	0.85	11.89	144	5.83	138	84	67	0	2	4	1
	LOUISVILLE	57	37	70	18	47	12	2.00	1.28	1.41	11.14	141	5.24	125	83	61	0	2	4	1
	PADUCAH	57	36	70	19	46	11	2.92	1.99	1.56	13.32	148	7.73	166	84	73	0	3	3	2
LA	BATON ROUGE	73	55	82	40	64	13	0.04	-1.35	0.02	13.16	99	3.52	44	89	54	0	0	2	0
	LAKE CHARLES	67	55	78	38	61	9	0.11	-0.88	0.10	13.09	115	6.05	89	91	76	0	0	2	0
	NEW ORLEANS	72	58	81	47	65	11	0.21	-1.27	0.19	10.02	78	4.69	60	90	76	0	0	2	0
	SHREVEPORT	64	48	80	28	56	7	0.52	-0.55	0.40	16.38	156	5.11	85	91	64	0	1	4	0
ME	CARIBOU	29	11	46	-6	20	10	0.33	-0.21	0.13	9.65	141	5.88	160	84	56	0	7	5	0
	PORTLAND	43	24	62	6	34	11	0.43	-0.37	0.23	9.21	98	5.56	108	89	53	0	7	3	0
MD	BALTIMORE	54	30	71	22	42	9	0.14	-0.55	0.12	9.88	128	3.34	76	90	54	0	5	2	0
MA	BOSTON	49	32	65	25	41	11	0.65	-0.19	0.42	7.13	82	4.11	82	80	47	0	3	3	0
	WORCESTER	44	27	58	17	35	11	0.71	-0.07	0.36	10.25	115	5.60	110	88	57	0	6	4	0
MI	ALPENA	35	18	48	4	27	10	0.88	0.56	0.47	5.01	125	2.34	108	91	74	0	6	6	0
	GRAND RAPIDS	36	25	48	5	31	8	1.68	1.28	0.47	5.82	111	3.83	150	95	80	0	5	7	0
	HOUGHTON LAKE	33	19	45	3	26	8	0.78	0.48	0.55	4.60	122	2.44	121	91	81	0	5	4	1
	LANSING	39	25	51	4	32	10	1.03	0.67	0.63	5.39	127	3.06	148	93	82	0	5	5	1
	MUSKEGON	37	25	52	11	31	7	1.37	0.96	0.65	6.47	120	3.58	130	83	75	0	5	5	1
	TRAVERSE CITY	33	20	50	8	27	7	0.80	0.24	0.58	4.45	70	1.66	45	92	76	0	7	5	1
MN	DULUTH	16	0	28	-19	8	-3	0.66	0.44	0.29	3.55	150	1.58	111	81	74	0	7	4	0
	INT'L FALLS	8	-11	19	-38	-2	-9	0.96	0.79	0.34	2.47	140	1.64	153	86	62	0	7	5	0
	MINNEAPOLIS	19	3	39	-12	11	-5	0.80	0.61	0.37	3.01	132	1.28	100	95	84	0	7	5	0
	ROCHESTER	21	3	41	-15	12	-3	0.67	0.49	0.25	4.03	184	1.94	166	95	85	0	6	5	0
	ST. CLOUD	14	-4	33	-23	5	-7	0.57	0.43	0.26	2.31	141	0.98	103	91	71	0	7	4	0
MS	JACKSON	68	50	83	33	59	12	0.05	-1.12	0.04	13.84	110	5.81	81	89	60	0	0	2	0
	MERIDIAN	69	51	82	36	60	12	0.13	-1.16	0.07	15.65	121	5.39	71	83	67	0	0	3	0
	TUPELO	64	46	80	28	55	13	0.94	-0.09	0.79	14.13	112	6.58	102	86	70	0	2	5	1
MO	COLUMBIA	40	23	67	9	32	2	1.07	0.61	0.69	9.03	189	4.73	204	88	70	0	6	3	1
	KANSAS CITY	35	19	64	4	27	-3	0.21	-0.03	0.21	5.03	163	1.99	137	86	65	0	6	1	0
	SAINT LOUIS	44	25	70	12	35	3	2.19	1.71	1.18	9.16	163	5.18	188	87	69	0	5	3	2
	SPRINGFIELD	50	27	70	10	39	5	1.27	0.76	0.49	7.97	134	3.74	136	86	68	0	3	3	0
MT	BILLINGS	8	-7	28	-14	1	-26	0.15	0.02	0.05	1.80	109	1.11	113	80	61	0	7	4	0
	BUTTE	16	-7	41	-27	4	-16	0.29	0.21	0.23	0.76	65	0.44	69	80	63	0	7	3	0
	CUT BANK	-6	-19	-1	-33	-12	-33	0.00	-0.06	0.00	0.60	76	0.37	80	83	65	0	7	0	0
	GLASGOW	-3	-16	7	-32	-10	-25	0.79	0.73	0.51	1.79	227	1.09	260	68	62	0	7	6	1
	GREAT FALLS	2	-13	18	-22	-6	-30	0.90	0.81	0.39	2.12	143	1.79	221	89	68	0	7	6	0
	HAVRE	-6	-20	2	-41	-13	-31	0.71	0.65	0.40	1.43	136	1.25	231	76	69	0	7	6	0
	MISSOULA	21	7	35	1	14	-12	0.50	0.32	0.26	2.37	97	1.52	117	80	65	0	7	5	0
NE	GRAND ISLAND	26	7	57	-7	17	-8	0.00	-0.08	0.00	3.59	274	0.15	23	74	59	0	7	0	0
	LINCOLN	27	10	58	-2	18	-7	0.00	-0.08	0.00	3.90	238	0.58	74	77	65	0	7	0	0
	NORFOLK	20	3	47	-8	12	-11	0.00	-0.12	0.00	3.05	223	0.16	22	78	65	0	7	0	0
	NORTH PLATTE	28	6	53	-9	17	-9	0.01	-0.06	0.01	1.54	175	0.14	29	78	51	0	7	1	0
	OMAHA	26	10	53	-3	18	-7	0.02	-0.12	0.02	3.85	206	0.90	95	75	65	0	6	1	0
	SCOTTSBLUFF	29	3	55	-14	16	-11	0.18	0.07	0.18	0.77	62	0.46	68	88	70	0	7	1	0
	VALENTINE	20	-1	42	-17	9	-15	0.01	-0.06	0.01	1.13	159	0.24	63	75	62	0	7	1	0
NV	ELY	31	12	40	-8	22	-6	0.44	0.30	0.20	1.78	125	1.39	151	80	63	0	7	3	0
	LAS VEGAS	54	39	61	32	47	-3	0.01	-0.13	0.01	1.48	126	1.31	170	53	39	0	1	1	0
	RENO	41	25	48	17	33	-3	0.54	0.29	0.31	5.01	222	3.92	284	74	56	0	6	4	0
	WINNEMUCCA	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
NH	CONCORD	43	23	60	12	33	12	0.66	0.07	0.42	7.90	118	4.64	124	88	55	0	7	3	0
NJ	NEWARK	52	32	68	24	42	10	1.06	0.31	0.57	11.70	137	4.61	93	83	57	0	4	3	1
NM	ALBUQUERQUE	54	29	63	17	41	2	0.02	-0.06	0.02	1.33	122	0.54	90	67	31	0	4	1	0
NY	ALBANY	46	29	57	20	38	15	0.86	0.34	0.56	8.52	146	5.09	162	77	51	0	5	4	1
	BINGHAMTON	44	26	56	11	35	13	0.86	0.25	0.39	7.42	116	4.71	140	85	69	0	5	5	0
	BUFFALO	48	26	60	13	37	13	1.06	0.44	0.81	10.11	130	6.75	170	91	67	0	5	5	1
	ROCHESTER	50	28	63	16	39	15	0.65	0.15	0.51	4.24	74	1.64	55	84	68	0	5	5	1
	SYRACUSE	47	25	61	15	36	13	0.62	0.08	0.39	7.16	112	3.88	118	91	64	0	6	5	0
NC	ASHEVILLE	65	38	74	30	52	15	0.00	-0.93	0.00	16.16	187	5.29	101	80	46	0	3	0	0
	CHARLOTTE	70	44	79	33	57	14	0.00	-0.85	0.00	11.66	141	4.68	92	78	37	0	0	0	0
	GREENSBORO	67	42	79	32	55	16	0.01	-0.74	0.01	11.01	145	4.03	89	82	38	0	1	1	0
	HATTERAS	66	50	73	40	58	12	4.91	3.85	3.19	19.18	163	8.26	114	83	53	0	0	2	2
	RALEIGH	69	42	79	32	55	14	0.00	-0.85	0.00	9.73	119	3.50	68	84	45	0	1	0	0
	WILMINGTON	71	46	83	31	59	12	0.16	-0.77	0.16	9.97	105	2.89	51	88	42	0	1	1	0
ND	BISMARCK	-1	-12	15	-28	-6	-20	0.41	0.30	0.21	1.93	187	1.26	214	74	65	0	7	4	0
	DICKINSON	0	-16	25	-28	-8	-26	0.00	-0.11	0.00	0.68	80	0.05	10	79	63	0	7	0	0
	FARGO	2	-12	14	-27	-5	-15	0.63	0.50	0.21	2.38	159	1.25	134	84	73	0	7	5	0
	GRAND FORKS	-2	-16	13	-29	-9	-18	0.19	0.05	0.06	1.72	122	0.89	103	82	71	0	7	4	0
	JAMESTOWN	-2	-13	11	-25	-8	-20	0.01	-0.10	0.01	0.57	48	0.22	29	83	72	0	7	1	0
	WILLISTON	-4	-22	7	-43	-13	-25	0.93	0.85	0.65	2.23	183	1.48	228	71	67	0	7	5	1
OH	AKRON-CANTON	51	31	60	15	41	15	1.26	0.74	0.86	7.37	120	3.99	126	81	67	0	2	3	1
	CINCINNATI	53	33	66	14	43	12	2.81	2.18	1.29	12.26	175	6.70	180	84	72	0	2	4	2
	CLEVELAND	51	31	61	17	41	15	0.79	0.24	0.43	6.97	110	3.92	123	87	67	0	2	4	0
	COLUMBUS	52	29	62	14	40	11	2.05	1.52	1.01	9.14	149	5.27	164	86	72	0	4	3	2
	DAYTON	50	31	61	12	41	13	3.29	2.74	1.90	11.24	176	6.61	200	88	70	0	3	4	2
	MANSFIELD	49	30	58	13	39	14	1.20	0.67	1.01	7.98	121	4.22	127	96	74	0	2	3	1

Based on 1971-2000 normals

***** Not Available**

Weather Data for the Week Ending February 9, 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	46	29	60	15	37	12	0.99	0.55	0.59	5.48	107	2.66	106	86	70	0	3	4	1
	YOUNGSTOWN	52	30	61	12	41	15	1.71	1.23	1.19	8.33	141	4.60	155	87	71	0	2	3	2
OK	OKLAHOMA CITY	45	31	70	15	38	-1	0.38	0.14	0.29	6.35	183	2.19	139	89	65	0	4	2	0
	TULSA	45	29	69	12	37	-2	0.26	-0.09	0.17	7.72	173	4.14	203	87	73	0	3	3	0
OR	ASTORIA	41	29	43	24	35	-8	0.88	-1.20	0.39	16.52	73	6.69	54	93	78	0	6	4	0
	BURNS	33	17	46	5	25	-2	0.40	0.15	0.15	3.48	124	2.45	163	85	72	0	7	5	0
	EUGENE	42	30	47	26	36	-5	1.08	-0.60	0.44	10.22	56	4.53	46	89	83	0	6	5	0
	MEDFORD	42	30	46	24	36	-6	0.53	-0.01	0.43	7.17	118	3.96	125	91	63	0	6	3	0
	PENDLETON	30	15	42	3	22	-14	0.91	0.61	0.39	4.67	141	3.01	164	91	80	0	6	5	0
	PORTLAND	39	28	47	23	34	-8	0.71	-0.38	0.32	8.67	71	3.60	56	83	71	0	6	5	0
	SALEM	41	31	46	24	36	-6	1.29	-0.04	0.68	10.43	74	4.39	58	87	79	0	5	5	1
PA	ALLENTOWN	51	27	66	17	39	11	0.84	0.15	0.35	12.67	163	6.43	146	81	54	0	6	3	0
	ERIE	50	31	64	11	40	13	0.76	0.23	0.39	7.21	104	4.28	133	82	68	0	2	5	0
	MIDDLETOWN	49	27	64	17	38	9	0.80	0.12	0.30	10.12	146	4.42	119	91	54	0	6	4	0
	PHILADELPHIA	53	31	67	22	42	9	0.40	-0.27	0.34	10.70	139	4.32	98	86	59	0	5	3	0
	PITTSBURGH	53	31	62	14	42	14	1.49	0.92	0.91	9.69	154	4.15	121	90	66	0	4	5	2
	WILKES-BARRE	48	27	59	14	38	11	0.55	0.01	0.21	7.85	138	4.66	148	91	56	0	5	4	0
	WILLIAMSPORT	46	26	61	16	36	10	0.96	0.30	0.43	11.20	169	5.02	136	90	63	0	4	3	0
RI	PROVIDENCE	48	29	64	23	39	10	0.60	-0.29	0.34	12.22	126	6.95	126	91	69	0	6	3	0
SC	CHARLESTON	73	49	80	41	61	12	0.01	-0.79	0.01	11.47	137	1.71	33	89	47	0	0	1	0
	COLUMBIA	71	44	83	33	58	12	0.03	-0.95	0.03	10.31	111	3.06	52	91	52	0	0	1	0
	FLORENCE	72	46	83	34	59	13	0.05	-0.69	0.05	9.85	115	2.94	58	90	41	0	0	1	0
	GREENVILLE	69	45	77	34	57	15	0.00	-0.96	0.00	17.00	179	5.54	98	84	42	0	0	0	0
SD	ABERDEEN	2	-10	13	-23	-4	-19	0.34	0.26	0.17	2.66	274	1.35	229	77	71	0	7	4	0
	HURON	6	-6	19	-19	0	-17	0.08	0.00	0.07	2.04	208	0.88	149	77	68	0	7	2	0
	RAPID CITY	9	-8	40	-19	1	-24	0.31	0.24	0.19	1.84	216	0.60	133	80	68	0	7	3	0
	SIOUX FALLS	14	-1	39	-12	7	-10	0.09	0.01	0.06	1.85	162	0.63	102	78	70	0	7	3	0
TN	BRISTOL	64	36	76	24	50	15	2.88	2.08	2.34	12.25	154	6.40	141	97	51	0	4	3	1
	CHATTANOOGA	66	45	80	32	56	15	0.24	-0.93	0.12	16.39	140	7.39	107	84	60	0	1	3	0
	KNOXVILLE	64	41	77	28	53	14	0.80	-0.14	0.30	13.28	129	5.78	100	91	56	0	2	4	0
	MEMPHIS	62	43	73	23	52	10	0.97	-0.02	0.81	14.55	130	5.71	104	89	66	0	3	4	1
	NASHVILLE	64	42	78	22	53	14	2.69	1.86	2.32	13.05	136	7.24	144	81	53	0	2	2	1
TX	ABILENE	64	45	78	22	54	8	0.14	-0.08	0.09	4.64	184	1.00	80	86	59	0	2	2	0
	AMARILLO	57	26	75	7	41	3	0.00	-0.09	0.00	0.65	48	0.07	9	78	30	0	4	0	0
	AUSTIN	66	53	79	34	60	8	0.22	-0.19	0.18	9.90	204	3.53	146	87	71	0	0	4	0
	BEAUMONT	68	55	81	38	61	8	0.14	-0.85	0.09	15.97	130	7.01	100	84	72	0	0	3	0
	BROWNSVILLE	75	61	84	40	68	7	0.07	-0.28	0.07	2.33	80	1.68	92	94	80	0	0	1	0
	CORPUS CHRISTI	70	57	81	37	63	6	0.19	-0.22	0.17	2.75	71	1.94	91	88	75	0	0	3	0
	DEL RIO	67	51	80	37	59	6	0.03	-0.17	0.03	1.47	94	0.21	26	94	87	0	0	1	0
	EL PASO	63	41	73	31	52	4	0.11	0.03	0.07	0.64	48	0.21	38	65	28	0	1	2	0
	FORT WORTH	65	47	80	23	56	10	0.35	-0.08	0.24	6.52	130	1.97	81	89	56	0	2	2	0
	GALVESTON	65	54	73	40	60	4	0.40	-0.37	0.36	10.26	119	5.55	109	90	75	0	0	3	0
	HOUSTON	67	55	82	37	61	8	0.07	-0.70	0.05	11.85	142	4.24	91	90	79	0	0	2	0
	LUBBOCK	60	32	76	13	46	5	0.00	-0.15	0.00	1.44	106	0.00	0	67	36	0	3	0	0
	MIDLAND	63	40	79	23	52	6	0.00	-0.11	0.00	1.15	87	0.13	19	77	37	0	3	0	0
	SAN ANGELO	65	43	80	24	54	7	0.22	-0.02	0.12	3.01	146	0.54	48	82	57	0	3	3	0
	SAN ANTONIO	65	53	76	34	59	7	0.23	-0.16	0.21	4.21	102	1.88	87	91	61	0	0	3	0
	VICTORIA	66	55	78	38	61	7	0.06	-0.45	0.03	7.82	140	2.88	93	88	81	0	0	2	0
	WACO	63	48	79	27	56	8	0.20	-0.29	0.13	8.76	166	4.03	161	87	69	0	1	3	0
	WICHITA FALLS	62	36	76	16	49	6	0.01	-0.27	0.01	5.46	173	1.51	103	89	62	0	3	1	0
UT	SALT LAKE CITY	38	25	51	12	32	0	0.50	0.20	0.31	3.58	120	2.30	131	83	54	0	5	4	0
VT	BURLINGTON	42	22	53	16	32	14	0.62	0.18	0.37	6.94	138	4.01	143	80	59	0	6	5	0
VA	LYNCHBURG	64	35	74	25	50	14	0.10	-0.65	0.08	10.08	130	2.93	65	84	43	0	3	2	0
	NORFOLK	66	41	79	33	54	14	0.00	-0.83	0.00	7.91	99	3.81	76	89	48	0	0	0	0
	RICHMOND	66	37	75	24	52	15	0.01	-0.68	0.01	6.12	81	2.68	60	83	48	0	2	1	0
	ROANOKE	64	37	72	25	50	13	0.13	-0.61	0.13	8.70	123	2.46	59	78	45	0	3	1	0
	WASH/DULLES	56	30	72	19	43	10	0.09	-0.57	0.09	9.67	139	3.91	100	93	52	0	5	1	0
WA	OLYMPIA	36	20	42	13	28	-11	1.04	-0.63	0.41	13.79	78	6.29	65	93	83	0	6	4	0
	QUILLAYUTE	37	24	43	18	31	-11	0.28	-2.88	0.13	40.08	124	17.16	97	81	67	0	7	4	0
	SEATTLE-TACOMA	36	25	42	20	31	-11	0.84	-0.28	0.37	11.47	94	5.39	82	82	68	0	7	4	0
	SPOKANE	26	15	35	6	21	-9	0.37	0.00	0.17	4.90	108	2.28	99	84	62	0	7	4	0
	YAKIMA	28	12	39	-8	20	-12	0.93	0.72	0.49	3.15	112	2.47	172	89	79	0	7	4	0
WV	BECKLEY	59	36	70	16	48	16	1.09	0.40	0.44	9.63	134	4.39	107	82	62	0	2	3	0
	CHARLESTON	61	36	75	18	49	15	0.69	-0.05	0.35	10.17	135	4.24	101	91	53	0	4	5	0
	ELKINS	57	30	70	15	43	13	0.49	-0.25	0.22	7.97	102	3.95	90	89	61	0	4	4	0
	HUNTINGTON	60	38	73	18	49	15	0.99	0.30	0.79	10.29	138	4.19	102	85	57	0	2	2	1
WI	EAU CLAIRE	22	5	41	-21	14	-1	0.83	0.63	0.63	3.02	130	0.97	75	93	71	0	6	4	1
	GREEN BAY	28	15	41	-6	21	4	0.83	0.59	0.34	4.57	156	2.55	168	84	70	0	7	5	0
	LA CROSSE	27	10	45	-13	18	-1	0.63	0.37	0.23	4.86	176	1.95	127	90	69	0	6	5	0
	MADISON	29	14	45	-2	22	3	0.76	0.46	0.27	5.71	173	3.32	202	89	82	0	6	5	0
	MILWAUKEE	33	20	48	3	27	5	1.07	0.66	0.48	5.72	124	3.31	139	83	73	0	6	5	0
WY	CASPER	27	0	51	-23	14	-10	0.18	0.05	0.12	0.87	64	0.46	62	79	66	0	7	3	0
	CHEYENNE	38	9	61	-14	24	-3	0.13	0.05	0.12	0.64	63	0.26	46	84	49	0	7	2	0
	LANDER	26	4	46	-11	15	-7	0.14	0.05	0.14	1.72	139	0.94	149	87	55	0	7	1	0
	SHERIDAN	14	-5	36	-14	4	-20	0.02	-0.12	0.01	1.45	89	0.72	76	81	69	0	7	2	0

Based on 1971-2000 normals

***** Not Available**

January Weather and Crop Summary

Weather

Weather summary provided by USDA/WAOB

Highlights: Most of the country continued to receive ample precipitation, with occasional heavy snow occurring from the northern and central Plains into the Northeast and periods of heavy rain soaking the South. However, mild weather on the northern High Plains eroded winter wheat's protective snow cover, while a substantial snow cover developed across the upper Midwest and interior Northeast.

Late in the month, brutally cold weather engulfed the Midwest, setting all-time low temperature records in some locations and severely stressing livestock. High winds and periods of snow accompanied the Arctic blast, further disrupting the normal cycle of agricultural and municipal life. Although snow covered much of the Midwest late in the month, some soft red winter wheat fields from central Missouri into northwestern Ohio were exposed to potential winterkill and soil heaving.

Despite the late-month cold wave, significantly below-normal January temperatures were mostly limited to the upper Great Lakes States. Meanwhile, monthly temperatures averaged at least 5°F above normal across parts of the West and the northern High Plains.

Western precipitation was highly variable, but generally above normal from California to the central Rockies, and below normal in the southern Rockies and the Northwest. Heavy January precipitation in the Sierra Nevada added 10 inches (from 7 to 17 inches) to the average water equivalency of the high-elevation snowpack—a boost from approximately 70 to 100 percent of normal. In contrast, end-of-January snowpack ranged from 50 to 75 percent of average in many basins in the Cascades and southern Idaho.

Historical Perspective: According to preliminary data provided by the National Centers for Environmental Information, the contiguous U.S. experienced its 29th-warmest, 37th-wettest January during the 125-year period of record. The nation's monthly average temperature of 32.7°F was 2.6°F above the 1901-2000 mean, while precipitation averaged 2.49 inches—108 percent of normal. Notable wetness in the Northeast contrasted with drier-than-normal conditions in the Northwest.

State temperature rankings ranged from the 50th-coolest January in Michigan to the 11th-warmest January in California. In portions of the Great Lakes region, the late-month Arctic outbreak barely pushed monthly temperatures into the "cool" half of the historical distribution. Meanwhile, state precipitation rankings ranged from the 23rd-driest January in Nebraska to the eighth-wettest January in Rhode Island and Vermont.

Figure 1 Statewide Average Temperature Ranks
January 2019
Period: 1895–2019

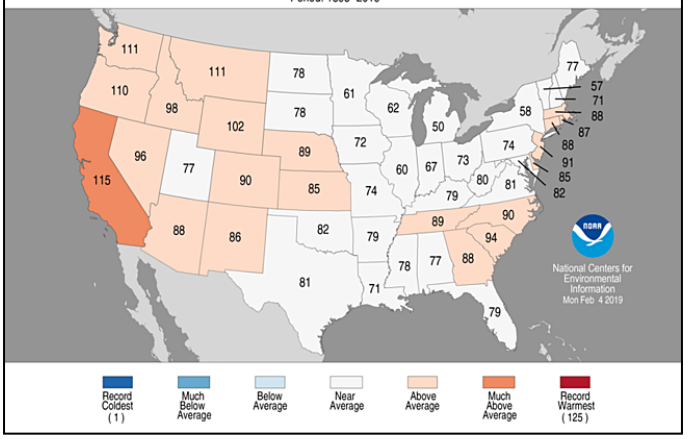
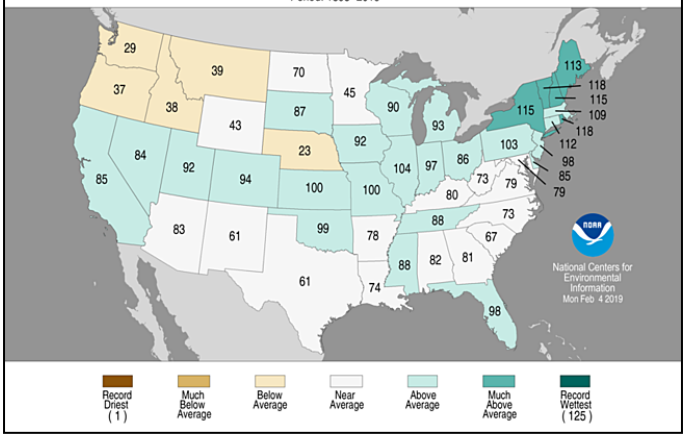


Figure 2 Statewide Precipitation Ranks
January 2019
Period: 1895–2019



Summary: On New Year's Eve and New Year's Day, a large area of rain swept across the Corn Belt and the Southeast, while snow blanketed portions of the northern Plains and upper Midwest, as well as the southern Rockies. It was the wettest January 1 on record in a host of communities, including Springfield, IL (2.08 inches); Columbia, MO (2.06 inches); Jackson, MS (1.67 inches); London, KY (1.63 inches); and Dayton, OH (1.47 inches). Meanwhile, Albuquerque, NM, received 2.0 inches of snow on New Year's Day, following a 3.0-inch snowfall from December 26-28. Farther east, heavy rain fell again across the South from January 2-4. Record-setting rainfall totals for January 2 included 2.52 inches in Waco, TX, and 2.16 inches in Alexandria, LA. A day later, stormy weather across portions of the southern Plains set precipitation and snowfall records for January 3 in Oklahoma City, OK (1.29 inches and 4.5 inches of snow), and Wichita Falls, TX (0.75 inch and 2.5 inches of snow). Later, daily-record rainfall totals included 2.14 inches (on January 3) in New Iberia, LA, and 2.33 inches (on January 4) in Columbus, GA.

Spring-like warmth preceded the Southeastern rain. It was the warmest New Year's Day on record in locations such as Jacksonville, FL (83ºF); Elizabeth City, NC (75ºF); and Georgetown, DE (68ºF). In Georgia, Savannah logged consecutive daily-record highs (83 and 79ºF, respectively) on January 1-2. In Florida, daily-record highs included 87ºF (on January 2) in Naples and 86ºF (on January 4) in Melbourne. In contrast, the year began on a frigid note across the northern Rockies and Intermountain West. In Wyoming, Big Piney posted a daily-record low of -23ºF on January 2. Meanwhile in California, daily-record lows dipped to 19ºF (on January 2) in Barstow-Daggett and 25ºF (on January 4) in Ramona. In contrast, chinook winds contributed to rapid warming across the nation's northern tier. Great Falls, MT, clocked a wind gust to 64 mph on January 3. The following day, Cut Bank, MT, reported a peak gust to 69 mph. Elsewhere in Montana, daily-record highs for January 3 included 56ºF in Havre and 50ºF in Glasgow. On January 4-5, locations such as Minneapolis-St. Paul (47ºF both days) and Rhinelander, WI (45 and 43ºF, respectively) collected consecutive daily-record highs. Other daily-record highs in Wisconsin on January 5 included 56ºF in Milwaukee and 47ºF in Green Bay.

During the first full week of January, a pair of coast-to-coast storm systems delivered widespread wintry precipitation to a broad area, as well as rain in the Deep South and Far West. On January 6, downtown Sacramento, CA, netted a daily-record rainfall of 1.26 inches. Farther inland, Utah's Kodachrome Basin State Park received a 24-hour snowfall total of 7.8 inches on January 5-6. Later, heavy precipitation spread across parts of the Midwest. Record-setting precipitation totals for January 7 included 1.34 inches in Sault Sainte Marie, MI; 0.95 inch in Dubuque, IA; and 0.91 inch in Green Bay, WI. Sault Sainte Marie also reported a daily-record snowfall of 12.3 inches. Then, following a few days of mostly tranquil weather, heavy snow developed across the nation's mid-section. On January 11, Alamosa, CO, collected daily-record totals for precipitation and snowfall (0.60 and 7.6 inches, respectively). On the same date in Missouri, snowfall totaled 10.4 inches in Columbia and 7.8 inches in St. Louis. Storm-total (January 11-12) snowfall in those locations reached 16.9 and 11.4 inches, respectively. Heavy snow fell as far north as central Iowa, where Des Moines received 5.5 inches on January 11-12. With 3 inches on the ground on the morning of the 12th, Des Moines also noted its latest-ever occurrence of the season's first snow depth of an inch or greater (previously, January 5, 1980). Meanwhile in Illinois, January 11-13 snowfall totaled 11.7 inches in Lincoln, 11.5 inches in Springfield, and 11.2 inches in Peoria. Farther east, record-setting snowfall totals for January 12 included 6.9 inches in Indianapolis, IN, and 6.1 inches in Dayton, OH. Snow also began on that date in the Mid-Atlantic region, where January 12-13 snowfall topped the 10-inch mark at Virginia's Dulles Airport (10.6 inches) and Washington, DC (10.2 inches). Days earlier, January 9 had been the last of 28 consecutive days with an above-normal daily average temperature in Washington, DC—a streak that had begun on December 13.

At mid-month, the focus for heavy precipitation temporarily shifted to the West. In southern California, record-setting rainfall totals for January 14 reached 1.52 inches in Burbank and 1.30 inches in Sandberg. January 14-17 rainfall at those two locations totaled 3.13 and 3.80 inches, respectively. In the Sierra Nevada foothills, Blue Canyon, CA, received 10.05 inches of precipitation from January 14-21. Farther inland, Las Vegas, NV, netted consecutive daily-record rainfall amounts (0.28 and 0.39 inch, respectively) on January 14-15. Other record-setting totals for January 15 included 0.86 inch in Sacramento, CA, and 0.82 inch in Kingman, AZ. Sacramento also measured a daily-record sum (1.41 inches) on January 16. Elsewhere in California, Bishop received a January 17 total of 1.49 inches—the highest daily sum in that location since December 19, 2010, when 3.32 inches fell. On January 17, daily-record totals included 0.76 inch in Salt Lake City, UT, and 0.30 inch in Idaho Falls, ID. Alta, UT, received 2.55 inches of precipitation and 19.0 inches of snow in a 24-hour period on January 17-18. While much of the western U.S. was bracing for stormy weather, mild conditions covered the Pacific Northwest. For example, Salem, OR, posted a daily-record high of 60ºF on January 10. In Washington, Seattle collected consecutive daily-record highs (61 and 59ºF, respectively) on January 11-12. Elsewhere on the 12th, Medford, OR, logged a daily-record high of 65ºF. It was Medford's highest temperature since November 18, 2018. Other Northwestern daily-record highs included 57°F (on January 13) in Hoquiam, WA, and 63°F (on January 14) in North Bend, OR. Warmth extended across the Rockies to the northern High Plains, where Cut Bank, MT, posted a daily-record high of 58°F on January 13.

By January 18, heavy snow developed across the north-central U.S. In South Dakota, daily-record precipitation and snowfall totals for January 18 were broken in locations such as Mitchell (0.49 and 4.7 inches) and Huron (0.47 and 6.5 inches). Daily records for both precipitation and snowfall were also set on the 18th in Rochester, MN (0.55 and 8.1 inches). The following day, when heavy precipitation spread across the Great Lakes and Northeastern States, record-setting snowfall totals for January 19 reached 7.8 inches in Rochester, NY, and 5.8 inches in Detroit, MI. Rochester's 2-day (January 19-20) snowfall totaled 16.0 inches. The major Northeastern

winter storm continued through January 20, with daily-record snowfall totals for that date being set in locations such as Caribou, ME (16.9 inches); Burlington, VT (15.6 inches); and Albany, NY (10.4 inches). Caribou and Albany netted a daily-record precipitation totals (1.45 and 1.25 inches, respectively) for January 20, while—closer to the Atlantic Coast—Providence, RI, also collected a daily-record sum (2.04 inches), but received snowfall totaling just 0.7 inch. (Caribou's monthly snowfall eventually reached 59.8 inches, surpassing its January 1994 standard of 44.5 inches and becoming its second-snowiest month behind 59.9 inches in December 1972.) Burlington achieved the feat of reporting three consecutive days with a low temperature of -6°F from January 19-21, a period during which snowfall totaled 18.6 inches. Farther west, International Falls, MN, logged a low of -38ºF (not a record for the date) on January 19. Elsewhere in northern Minnesota, a low of -46ºF was reported early on January 20 in the community of Cotton. (During the late-January cold outbreak, Cotton's temperature on the 31st slid to -56°F, very close to Minnesota's state record low of -60°F, set in Tower on February 2, 1996.)

Meanwhile, another round of Western storminess led to record-setting rainfall totals for January 19 in Crescent City, CA (3.63 inches), and Medford, OR (1.58 inches). By January 20, Eureka, CA, measured a daily-record rainfall of 2.26 inches. The following day, record-setting snowfall totals for January 21 included 8.6 inches in Tooele, UT, and 6.3 inches in Billings, MT. Billings received a second round of snow, totaling 6.5 inches, on January 23. Meanwhile, snow also spread across the central Plains, where Concordia, KS, logged a daily-record snowfall (6.4 inches) for January 22. The following day, heavy rain erupted across the South. Record-setting rainfall totals for January 23 included 2.46 inches in Birmingham, AL, and 2.32 inches in New Orleans, LA. Rain extended northward into the lower Midwest, where Indianapolis, IN, reported rainfall totaling 1.15 inches—a daily record for January 23. Heavy showers swept into the East on January 24, setting a multitude of daily rainfall records—among them were totals of 1.95 inches in New Bern, NC; 1.90 inches in Allentown, PA; 1.65 inches in Atlantic City, NJ; 1.46 inches in Glens Falls, NY. Burlington, VT, received a daily-record total of 1.02 inches of precipitation—mostly rain—on the 24th, days after reporting 18.6 inches of snow from January 19-21 and a low of -16°F on January 22. Later, light snow—except locally heavy downwind of the Great Lakes—fell in the Midwest, while heavy rain developed across Florida's peninsula. Record setting snowfall totals for January 25 included 17.2 inches in Buffalo, NY, and 2.2 inches in Lincoln, IL. The following day in Florida, Fort Lauderdale collected a record-setting rainfall total (2.13 inches) for January 26. Fort Lauderdale's two-day (January 26-27) sum reached 3.55 inches. Elsewhere in Florida, record-setting rainfall totals for January 27 reached 3.74 inches in in Melbourne, 3.67 inches in Fort Myers, and 3.29 inches in Fort Pierce. It was Melbourne's third-wettest January day behind 4.70 inches on January 12, 1979, and 4.13 inches on January 20, 1983.

Late in the month, a brutal but short-lived Arctic outbreak swept across the Midwest and Northeast, severely stressing livestock and disrupting agricultural and municipal activities. Snow and gusty winds preceded and accompanied the cold wave. Several days before the core of the Arctic blast arrived, frigid air trailed a storm system into the Great Lakes and Northeastern States. On January 21 in Michigan, daily-record lows plunged to -23°F in Gaylord and -12°F in Muskegon. Elsewhere on the 21st, Worcester, MA, reported minimum and maximum temperatures of -6 and 1°F, respectively—both records for the date. However, Midwestern and Northeastern temperatures quickly (but temporarily) rebounded to above-normal levels in conjunction with the January 23-24 storm system. Days later, another sharp cold snap arrived across the Midwest. By January 26, temperatures plummeted to daily-record levels in locations such as Alpena, MI (-25°F); Oshkosh, WI (-24°F); Moline, IL (-22°F); and Dubuque, IA (-20°F). With a low of -23°F on the 26th, Madison, WI, reported its lowest reading since February 3, 1996, when the temperature dropped to -29°F. (Madison's lows later plunged to -26°F on January 30 and 31.) In northern Minnesota, lows dipped to daily-record levels on January 27 in International Falls (-46°F) and Hibbing (-40°F). It was the lowest reading in International Falls since January 21, 2011, when the temperature also fell to -46°F. In Michigan, Marquette collected consecutive daily-record lows of -26°F on January 27-28. Meanwhile, mild weather in the Pacific Coast States resulted in daily-record highs for January 27 in locations such as San Francisco, CA (68°F), and Redmond, OR (67°F).

Heavy Midwestern snow preceded the heart of the Arctic outbreak. Rochester, MN, received 8.4 inches of snow from January 26-28, aided by a daily-record sum of 5.1 inches on the 27th. Record-setting snowfall totals for January 28 included 11.8 inches in Alpena, MI; 9.7 inches in Green Bay, WI; and 6.7 inches in South Bend, IN. Farther south, precipitation briefly changed to snow across parts of the South. In Mississippi, record-setting snowfall totals for January 29 included 0.3 inch in Jackson and 0.1 inch in Meridian. In areas downwind of the Great Lakes, snow squalls developed during the cold blast. Buffalo, NY, measured consecutive daily-record snowfall totals (6.4 and 13.6 inches, respectively) on January 29-30.

Historically cold air engulfed the Midwest from January 29-31, when wind chill temperatures bottomed out between -60 and -65°F in numerous upper Midwestern locations, including Grand Forks, ND; Rochester, MN; and Charles City, IA. In South Dakota, actual air temperatures (and daily-record lows) for January 30 plunged to -37°F in Aberdeen and -34°F in Watertown. Moline, IL, set all-time record lows on consecutive days, with -29 and -33°F, respectively, on January 30-31. Previously, Moline's lowest reading had been -28°F on February 3, 1996. Other all-time records on the 31st included -31°F in Rockford, IL (previously, -27°F on January 10, 1982), and -30°F in Cedar Rapids, IA (previously, -29°F on January 15, 2009). With lows of -20°F on January 30-31, South Bend, IN, experienced its coldest weather since January 19, 1994, when it was -21°F. Elsewhere on the 31st, daily-record lows plummeted to -45°F in International Falls, MN; -33°F in La Crosse, WI; -31°F in Sisseton, SD, and Dubuque and Waterloo, IA; and -30°F in Marshfield, WI. For Dubuque, it was the lowest temperature since January 7, 1887, when an all-time record low of -32°F occurred. For La Crosse and Marshfield, it was the coldest weather since February 3, 1996. The temperature in La Crosse remained below 0°F for 72 consecutive hours from January 29 – February 1, the longest such streak in that location since a 143-hour stretch of sub-zero readings from January 29 – February 4, 1996. In Chicago, IL, where consecutive daily-record lows (-23 and -21°F, respectively) occurred on January 30-31, at least a trace of snow—totaling 15.5 inches—fell on 16 consecutive days from January 17 – February 1, with the snow depth peaking at 10 inches on the 29th.

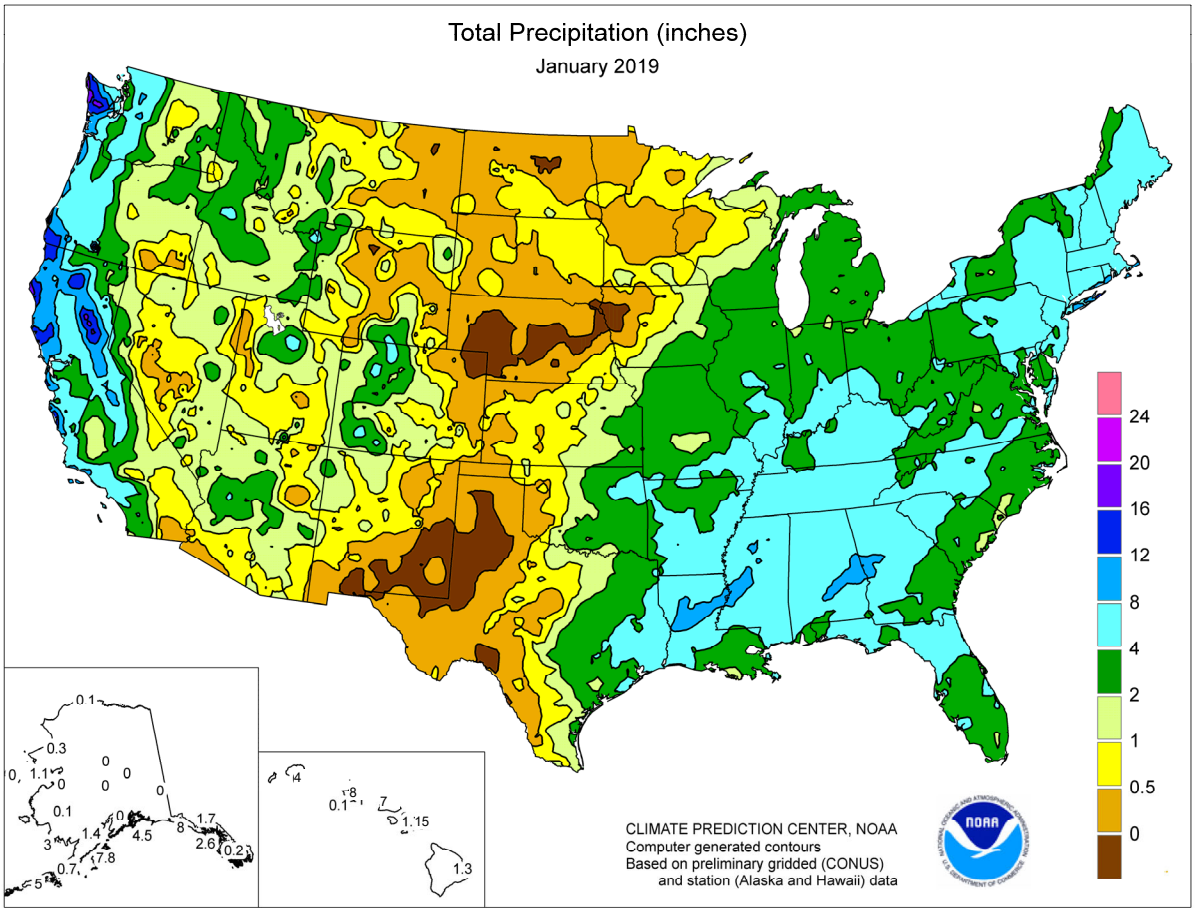
Some of the coldest weather of the decade engulfed the Alaskan interior during the first half of January, followed by a marked warming trend. In Fairbanks, where the temperature plunged to -44ºF on January 12, it was the lowest reading in nearly 2 years. Fairbanks had last been colder on January 19, 2017, when the low was -48ºF. Meanwhile, Nome notched a daily-record low of -32ºF on January 11. More impressively, it was Nome's lowest reading since February 3, 2012. Similarly, McGrath endured a low of -53ºF on January 11—the lowest temperature in that spot since January 28, 2012, when it was -54ºF. Later, mild weather returned across most of the state. With a high of 40°F on January 14, Bethel experienced its warmest day since November 6, 2018. Similarly, McGrath on January 27 logged a daily-record high of 42°F—the highest reading in that location since October 25, 2018. Juneau notched consecutive daily-record highs (44 and 47°F, respectively) on January 25-26. Meanwhile, periods of precipitation were heaviest across the state's southern tier, although some long-term drought lingered across climatologically wetter areas of southeastern Alaska. In fact, New Year's Day featured 1.73 inches, a record for the date, in Juneau, and 3.14 inches in Ketchikan. Later, Ketchikan received precipitation totaling 10.39 inches from January 8-13. During the first full week of January, Juneau measured 17.1 inches of snow, aided by a daily-record sum of 9.7 on the 10th. Ketchikan received another 6.58 inches of rain during the week ending January 26, helping to boost its monthly total to 23.01 inches (149 percent of normal). Elsewhere in southeastern Alaska, Juneau's monthly precipitation totaled 7.81 inches (146 percent of normal).

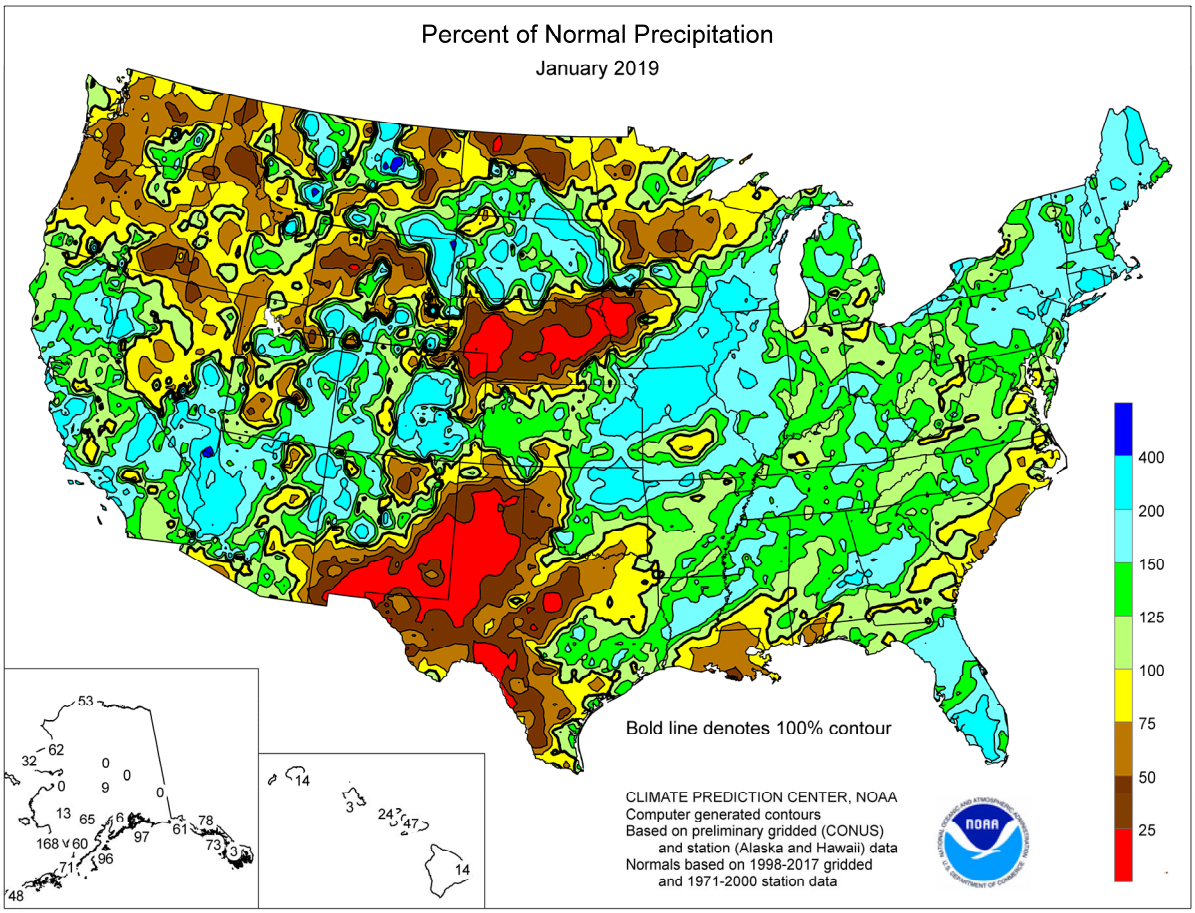
Drier-than-normal January weather dominated Hawaii, leading to further expansion of dryness and drought. According to the U.S. Drought Monitor, drought covered 67 percent of Hawaii on February 5, up from less than 5 percent at the beginning of the year. Monthly rainfall totaled 0.33 inch in Honolulu, Oahu, and 1.26 inches in Hilo, on the Big Island—just 14 percent of normal in both locations. At times, record-setting warmth accompanied the dryness. Honolulu posted daily-record highs of 85°F on January 2, 17, and 25. Daily-record highs were also set in Kahului, Maui (88°F on January 20), and Lihue, Kauai (83°F on January 21). Toward month's end, some areas experienced an increase in rainfall. Kahului, with a 0.58-inch total on January 30, reported its wettest day since November 10, 2018. In a 48-hour period from January 31 – February 2, rainfall reached 9.37 inches at the Lyon Arboretum on Oahu.

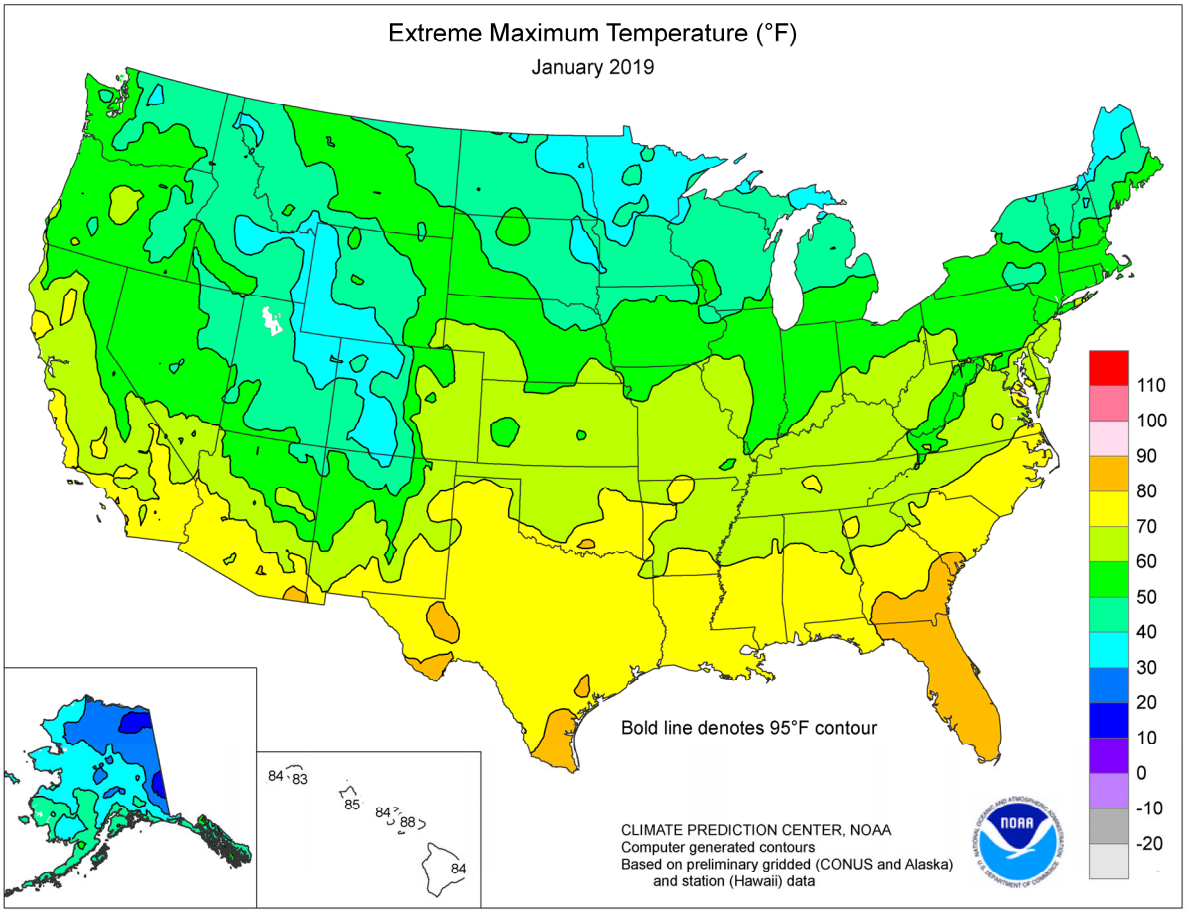
Fieldwork

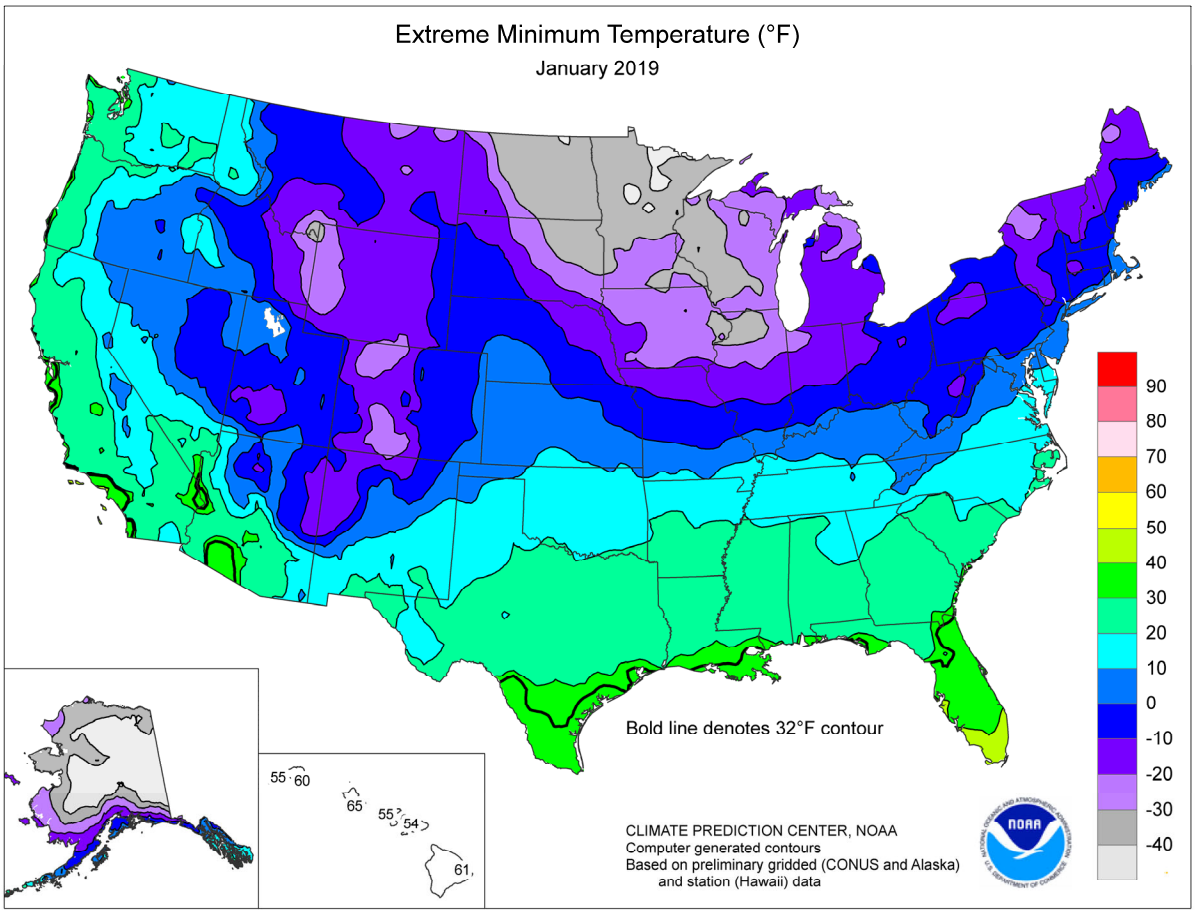
Fieldwork summary provided by USDA/NASS

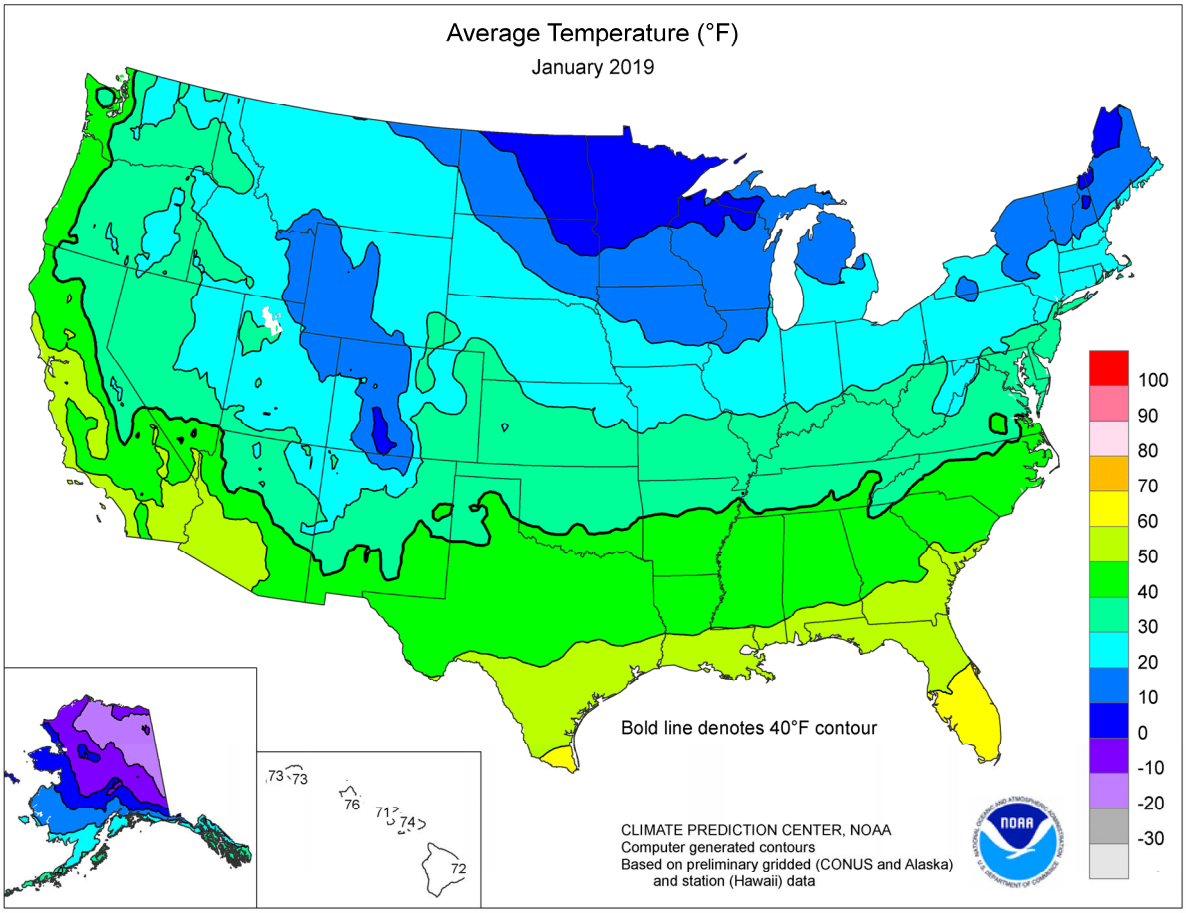
Monthly average temperatures were more than 4°F below normal in parts of the Great Lakes region. Below-normal temperatures also affected portions of the Midwest, New England, Rocky Mountains, and Southwest. Conversely, warmer-than-normal conditions prevailed across large sections of the Great Plains, Pacific Northwest, Southeast, and California, with temperatures averaging more than 2°F above normal in many locations. Precipitation was above normal across much of the eastern United States with much of the South and East receiving at least 4 inches of rain. In contrast, parts of the West remained in drought, despite receiving some January precipitation. Monthly precipitation was generally below normal in the Northwest and considerably below normal across parts of the central and southern Plains.

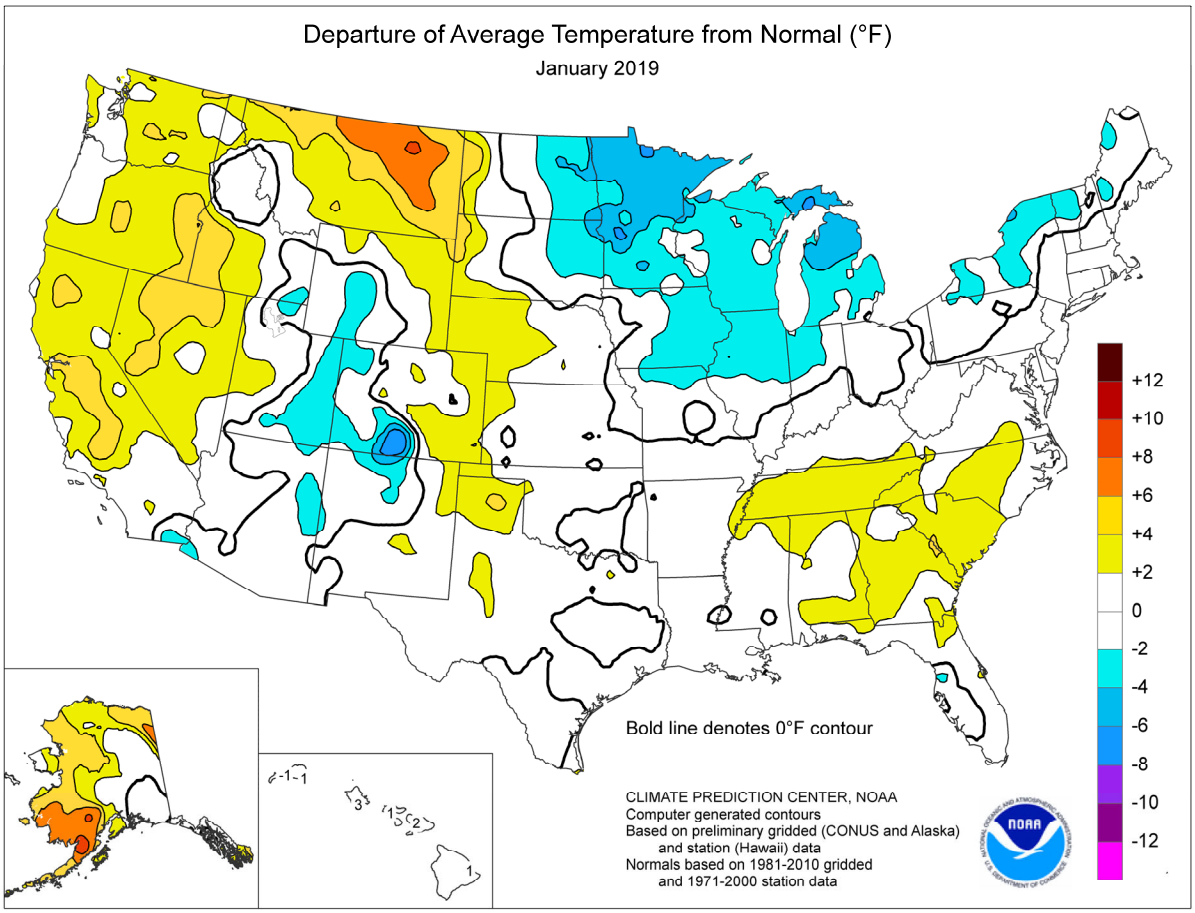

Total Precipitation (inches)
January 2019
24
20
16
12
8
4
2
1
0.5
0
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS)
and station (Alaska and Hawaii) data
NOAA


Percent of Normal Precipitation
January 2019
400
200
150
125
100
75
50
25
Bold line denotes 100% contour
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS)
and station (Alaska and Hawaii) data
Normals based on 1998-2017 gridded
and 1971-2000 station data
NOAA


Extreme Maximum Temperature (°F)
January 2019
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
Bold line denotes 95°F contour
84
83
85
84
88
84
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS and Alaska)
and station (Hawaii) data


Extreme Minimum Temperature (°F)
January 2019
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
Bold line denotes 32°F contour
55
60
65
55
54
61
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS and Alaska)
and station (Hawaii) data


Average Temperature (°F)
January 2019
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
Bold line denotes 40°F contour
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS and Alaska)
and station (Hawaii) data
NOAA
73
73
76
71
74
72


Departure of Average Temperature from Normal (°F)
January 2019
+12
+10
+8
+6
+4
+2
0
-2
-4
-6
-8
-10
-12
Bold line denotes 0°F contour
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS and Alaska)
and station (Hawaii) data
Normals based on 1981-2010 gridded
and 1971-2000 station data
NOAA
-1
-1
3
1
2
1

National Weather Data for Selected Cities

January 2019

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
AL BIRMINGHAM	45	2	6.02	0.57	LEXINGTON	34	2	4.35	1.01	COLUMBUS	29	1	3.09	0.56
HUNTSVILLE	43	3	7.15	1.63	LONDON-CORBIN	37	3	4.80	0.79	DAYTON	29	3	4.25	1.65
MOBILE	51	1	4.27	-1.48	LOUISVILLE	35	2	4.02	0.74	MANSFIELD	25	1	3.80	1.17
MONTGOMERY	48	1	5.15	0.11	PADUCAH	37	4	4.78	1.31	TOLEDO	25	1	1.72	-0.21
AK ANCHORAGE	20	4	0.76	0.08	LA BATON ROUGE	51	1	3.48	-2.71	YOUNGSTOWN	26	1	3.75	1.41
BARROW	-9	5	0.32	0.20	LAKE CHARLES	53	2	6.00	0.48	OK OKLAHOMA CITY	37	0	1.81	0.53
COLD BAY	33	5	4.91	1.83	NEW ORLEANS	54	1	4.40	-1.47	TULSA	38	2	3.84	2.24
FAIRBANKS	-7	3	0.65	0.09	SHREVEPORT	48	2	4.54	-0.06	OR ASTORIA	45	3	4.92	-4.70
JUNEAU	30	4	7.81	3.00	ME BANGOR	19	1	5.15	1.81	BURNS	29	5	1.42	0.24
KING SALMON	27	12	0.80	-0.23	CARIBOU	11	1	5.64	2.67	EUGENE	42	2	3.23	-4.42
KODIAK	33	3	7.42	-0.75	PORTLAND	24	2	5.53	1.44	MEDFORD	42	3	3.36	0.89
NOME	8	2	1.09	0.17	MD BALTIMORE	33	1	3.15	-0.32	PENDLETON	37	3	2.07	0.62
AZ FLAGSTAFF	31	1	2.39	0.21	MA BOSTON	31	2	3.92	0.00	PORTLAND	43	3	2.79	-2.28
PHOENIX	56	2	0.74	-0.09	WORCESTER	23	-1	5.08	1.01	SALEM	43	3	2.93	-2.91
TUCSON	53	1	1.09	0.10	MI ALPENA	15	-3	2.23	0.47	PA ALLENTOWN	30	3	4.69	1.19
AR FORT SMITH	40	2	3.94	1.57	DETROIT	24	0	1.86	-0.05	ERIE	27	0	4.35	1.82
LITTLE ROCK	42	2	3.75	0.14	FLINT	21	0	1.93	0.36	MIDDLETOWN	31	2	3.56	0.72
CA BAKERSFIELD	53	5	1.38	0.20	GRAND RAPIDS	22	0	2.90	0.87	PHILADELPHIA	33	1	4.02	0.50
EUREKA	49	1	6.67	0.70	HOUGHTON LAKE	14	-4	2.12	0.51	PITTSBURGH	28	0	3.16	0.46
FRESNO	52	6	2.23	0.07	LANSING	21	-1	2.02	0.41	WILKES-BARRE	26	0	4.10	1.64
LOS ANGELES	57	0	5.52	2.54	MUSKEGON	23	-1	3.57	1.35	WILLIAMSPORT	27	1	4.07	1.22
REDDING	50	4	7.00	0.50	TRAVERSE CITY	19	-2	2.93	-0.05	PR SAN JUAN	78	1	2.11	-0.91
SACRAMENTO	50	4	4.21	0.37	MN DULUTH	8	0	0.90	-0.22	RI PROVIDENCE	29	0	6.48	2.11
SAN DIEGO	59	1	2.80	0.52	INT'L FALLS	0	-3	0.88	0.04	SC CHARLESTON	51	3	1.70	-2.38
SAN FRANCISCO	55	6	4.57	0.12	MINNEAPOLIS	14	1	0.45	-0.59	COLUMBIA	47	2	3.01	-1.65
STOCKTON	51	5	2.04	-0.67	ROCHESTER	12	0	1.23	0.29	FLORENCE	47	2	2.88	-1.21
CO ALAMOSA	9	-6	1.16	0.91	ST. CLOUD	8	-1	0.41	-0.35	GREENVILLE	44	3	5.53	1.12
CO SPRINGS	33	5	0.67	0.39	MS JACKSON	47	2	6.81	1.14	MYRTLE BEACH	48	2	1.39	-2.27
DENVER	32	4	0.75	0.52	MERIDIAN	48	2	5.25	-0.67	SD ABERDEEN	10	-1	1.20	0.72
GRAND JUNCTION	27	1	0.44	-0.16	TUPELO	43	3	5.41	0.27	HURON	14	0	0.79	0.31
PUEBLO	33	4	0.52	0.19	MO COLUMBIA	30	2	3.69	1.96	RAPID CITY	26	4	0.49	0.12
CT BRIDGEPORT	31	1	4.32	0.59	JOPLIN	35	2	3.02	1.18	SIOUX FALLS	17	3	0.56	0.05
HARTFORD	26	0	5.78	1.94	KANSAS CITY	28	1	2.08	0.93	TN BRISTOL	38	4	4.29	0.77
DC WASHINGTON	37	2	3.30	0.09	SPRINGFIELD	34	2	2.71	0.60	CHATTANOOGA	42	3	7.00	1.60
DE WILMINGTON	33	2	4.00	0.57	ST JOSEPH	27	1	1.37	0.49	JACKSON	39	1	4.54	0.21
FL DAYTONA BEACH	59	1	3.81	0.68	ST LOUIS	31	1	2.93	0.79	KNOXVILLE	40	2	4.98	0.41
FT LAUDERDALE	68	1	4.21	1.27	MT BILLINGS	29	5	0.95	0.14	MEMPHIS	42	2	4.75	0.51
FT MYERS	64	-1	5.10	2.87	BUTTE	20	2	0.14	-0.39	NASHVILLE	40	3	4.54	0.57
JACKSONVILLE	55	2	4.37	0.68	GLASGOW	22	11	0.59	0.24	TX ABILENE	46	2	0.86	-0.11
KEY WEST	71	1	1.75	-0.47	GREAT FALLS	30	8	0.98	0.30	AMARILLO	40	4	0.06	-0.57
MELBOURNE	62	1	4.46	1.98	HELENA	25	5	0.47	-0.05	AUSTIN	50	0	3.26	1.37
MIAMI	68	0	2.00	0.12	KALISPELL	26	5	1.22	-0.25	BEAUMONT	53	1	6.85	1.16
ORLANDO	60	-1	3.50	1.07	MILES CITY	26	9	0.35	-0.15	BROWNSVILLE	63	3	1.60	0.24
PENSACOLA	53	1	2.84	-2.50	MISSOULA	25	1	1.03	-0.03	COLLEGE STATION	51	1	4.83	1.51
ST PETERSBURG	60	-2	3.84	1.08	NE GRAND ISLAND	27	5	0.14	-0.40	CORPUS CHRISTI	58	2	1.73	0.11
TALLAHASSEE	52	0	3.47	-1.89	HASTINGS	28	4	0.27	-0.28	DALLAS/FT WORTH	46	2	1.58	-0.32
TAMPA	61	0	4.21	1.94	LINCOLN	25	3	1.09	0.42	DEL RIO	53	2	0.14	-0.43
WEST PALM BEACH	65	-1	6.67	2.92	MCCOOK	30	4	0.45	-0.05	EL PASO	47	2	0.10	-0.35
GA ATHENS	45	3	5.34	0.65	NORFOLK	23	3	0.16	-0.41	GALVESTON	55	-1	5.12	1.04
ATLANTA	46	3	6.23	1.21	NORTH PLATTE	29	6	0.13	-0.26	HOUSTON	53	1	4.08	0.40
AUGUSTA	49	4	4.40	-0.10	OMAHA/EPPLEY	25	3	1.04	0.27	LUBBOCK	42	4	0.02	-0.48
COLUMBUS	50	3	5.65	0.87	SCOTTSBLUFF	30	6	0.27	-0.27	MIDLAND	46	3	0.10	-0.43
MACON	49	3	6.15	1.15	VALENTINE	27	6	0.22	-0.08	SAN ANGELO	47	2	0.32	-0.49
SAVANNAH	52	3	2.55	-1.40	NV ELKO	29	3	1.15	0.01	SAN ANTONIO	52	2	1.63	-0.03
HI HILO	72	1	1.26	-8.48	ELY	28	3	0.89	0.15	VICTORIA	54	1	2.36	-0.08
HONOLULU	75	2	0.33	-2.40	LAS VEGAS	50	3	1.04	0.45	WACO	47	1	3.82	1.92
KAHULUI	74	2	1.80	-1.94	RENO	39	5	2.92	1.86	WICHITA FALLS	42	2	1.69	0.57
LIHUE	73	1	0.58	-4.01	WINNEMUCCA	35	5	1.00	0.17	UT SALT LAKE CITY	31	2	1.76	0.39
ID BOISE	35	5	1.08	-0.31	NH CONCORD	22	2	3.81	0.84	VT BURLINGTON	17	-1	3.29	1.07
LEWISTON	37	3	0.57	-0.57	NJ ATLANTIC CITY	33	1	3.73	0.13	VA LYNCHBURG	35	0	2.83	-0.71
POCATELLO	25	1	1.02	-0.12	NEWARK	32	1	3.79	-0.19	NORFOLK	42	2	3.81	-0.12
IL CHICAGO/O'HARE	21	-1	2.06	0.31	NM ALBUQUERQUE	36	0	0.67	0.18	RICHMOND	39	3	2.92	-0.63
MOLINE	20	-1	3.06	1.48	NY ALBANY	23	1	4.29	1.81	ROANOKE	36	0	2.73	-0.50
PEORIA	23	1	2.65	1.15	BINGHAMTON	20	-2	3.82	1.24	WASH/DULLES	32	0	3.96	0.91
ROCKFORD	18	-1	2.27	0.86	BUFFALO	23	-1	5.71	2.55	WA OLYMPIA	40	2	4.88	-2.66
SPRINGFIELD	25	0	3.14	1.52	ROCHESTER	24	0	2.56	0.22	QUILLAYUTE	44	3	15.03	1.38
IN EVANSVILLE	33	2	4.05	1.14	SYRACUSE	21	-2	3.25	0.65	SEATTLE-TACOMA	45	4	3.83	-1.30
FORT WAYNE	25	1	2.11	0.06	NC ASHEVILLE	39	3	5.28	1.22	SPOKANE	31	4	1.75	-0.07
INDIANAPOLIS	28	2	2.82	0.34	CHARLOTTE	44	2	4.67	0.67	YAKIMA	34	5	1.42	0.25
SOUTH BEND	21	-2	2.78	0.51	GREENSBORO	40	2	4.01	0.47	WV BECKLEY	31	1	3.49	0.26
IA BURLINGTON	22	-1	2.40	1.09	HATTERAS	48	2	3.34	-2.50	CHARLESTON	35	2	3.45	0.20
CEDAR RAPIDS	17	-1	0.88	-0.17	RALEIGH	42	2	3.43	-0.59	ELKINS	29	0	3.19	-0.24
DES MOINES	21	1	1.52	0.49	WILMINGTON	47	1	2.72	-1.80	HUNTINGTON	35	2	3.09	-0.12
DUBUQUE	16	-1	2.82	1.54	ND BISMARCK	13	3	0.81	0.36	WI EAU CLAIRE	13	1	0.93	-0.11
SIOUX CITY	22	3	0.11	-0.48	DICKINSON	18	4	0.70	0.33	GREEN BAY	16	0	1.92	0.71
WATERLOO	16	0	1.52	0.68	FARGO	6	-1	0.58	-0.18	LA CROSSE	16	0	1.48	0.29
KS CONCORDIA	29	2	1.12	0.46	GRAND FORKS	2	-3	0.78	0.10	MADISON	16	-1	2.56	1.31
DODGE CITY	33	3	0.73	0.11	JAMESTOWN	8	-1	0.63	0.01	MILWAUKEE	21	0	2.43	0.58
GOODLAND	32	4	0.43	0.00	MINOT	12	2	0.33	-0.32	WAUSAU	12	-1	1.37	0.28
HILL CITY	30	4	0.86	0.39	WILLISTON	17	9	0.54	0.00	WY CASPER	27	5	0.48	-0.10
TOPEKA	30	3	1.66	0.71	OH AKRON-CANTON	27	2	3.63	1.14	CHEYENNE	31	5	0.52	0.07
WICHITA	33	3	1.32	0.48	CINCINNATI	31	1	4.11	1.19	LANDER	18	-2	0.92	0.40
KY JACKSON	35	1	4.26	0.70	CLEVELAND	28	2	4.18	1.70	SHERIDAN	27	6	0.74	-0.03

Based on 1971-2000 normals

*** Not Available

2018 U.S. Weather Review

Annual "Weather Review" provided by USDA/WAOB; rankings provided by National Centers for Environmental Information.

For the second year in a row, deadly and destructive hurricanes struck parts of the country. On September 14, Category 1 Hurricane Florence arrived on the North Carolina coastline near Wrightsville Beach, but left a more significant inland imprint over the next several days as the slow-moving storm sparked torrential rainfall and major flooding in the eastern Carolinas. Less than a month later, on October 10, high-end Category 4 Hurricane Michael charged ashore near Panama City, Florida, bearing ferocious, 155 mph winds and a devastating storm surge. Both storms were destructive with respect to agriculture; Florence submerged low-lying fields of cotton, peanuts, and soybeans and resulted in notable losses in the poultry and swine sectors, while Michael caused substantial wind-related losses across western Florida, southwestern Georgia, and southeastern Alabama with respect to timber, pecans, and row crops such as cotton.

Meanwhile, wildfires again made headlines in several regions, including the Plains and the West. The Plains' most significant wildfire outbreaks occurred in mid-April, with activity peaking on April 12-13 and 17-18. Although the fires were followed by rain, Oklahoma's two largest April wildfires—the Rhea Fire and the 34 Complex—collectively charred approximately 350,000 acres of grass and brush. Farther west, wildfires were a factor for much of the year, starting in the spring across the Four Corners States and later shifting into the Northwest. California endured several major wildfire outbreaks, including one in July that produced the state's largest wildfire in modern history—the 459,000 acre Mendocino Complex—and a November disaster that included the nation's deadliest wildfire in a century, since the Cloquet Fire scorched northern Minnesota in October 1918. During California's latter outbreak, which began on November 8, the Camp Fire incinerated much of the community of Paradise, in Butte County, California, destroying nearly 14,000 homes and resulting in at least 85 deaths. For the year, U.S. wildfires charred more than 8.5 million acres of vegetation, below the 2015 modern record of 10.1 million acres but well above the 10-year average of 6.6 million acres.

Although Western drought generally persisted or intensified in 2018, much of the central and eastern U.S. was free of drought by year's end. However, embedded within the overall wet pattern from the Plains to the East Coast were pockets of drought, most notably during the growing season from the southern Plains to the southwestern Corn Belt. Untimely drought in those areas adversely affected a variety of summer crops, including cotton and corn. The last cotton condition report of the season, on November 4, indicated that 35 percent of the crop was rated in very poor to poor condition—reflecting both summer drought on the southern Plains and hurricane-related damage in the Southeast.

However, a bigger weather story across the central and eastern U.S. was consistent warmth from early May through the end of the growing season, which accelerated crop development and hastened maturation. In many areas, ample rainfall accompanied the above-normal temperatures, leading to record-high yield expectations for U.S. corn and soybeans. As the growing season ended, rainfall intensified in many areas, contributing to substantial harvest delays. Fieldwork further slowed in some areas in November, when cold, stormy weather hampered final harvest efforts and slowed winter wheat planting, emergence, and establishment across portions of the Plains, Midwest, South, and East. By November 25, only 70 percent of the U.S. cotton and 94 percent of the soybeans had been harvested—leaving a record amount of both crops in the field for that date, based on data since 1995.

Late in the year, El Niño was poised to return for the first time since early 2016. Even before the development of El Niño, U.S. drought was on the wane, despite widespread coverage west of the Rockies. During 2018, U.S. drought coverage ranged from a maximum of 39.64 percent on February 6 to a minimum of 20.94 percent on November 13. At the time of the November minimum, 50.46 percent of the land in the eleven Western States was in drought.

Figure 1 Contiguous U.S., Average Temperature, January-December

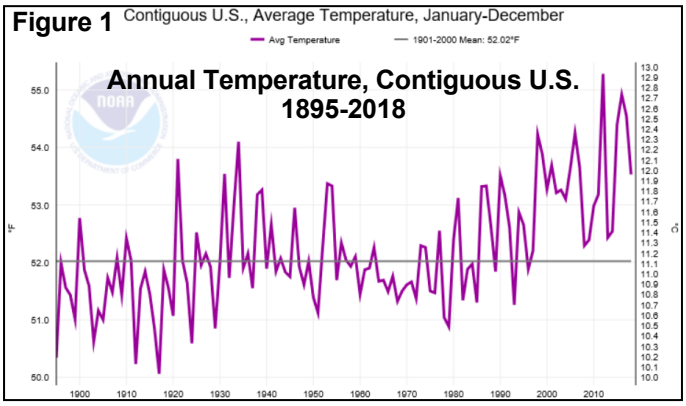
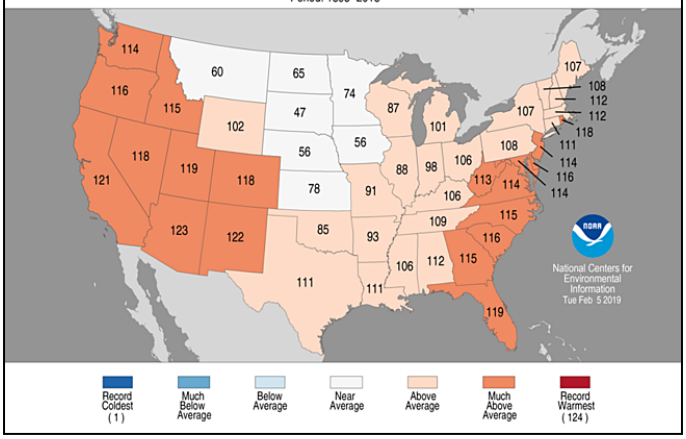


Figure 2 Statewide Average Temperature Ranks
January–December 2018
Period: 1895–2018



According to the National Centers for Environmental Information (NCEI), 2018 was the 13th-warmest, third-wettest year during the 1895-2018 period of record. The nation's annual average temperature of 53.5°F was 1.5°F above the 20th century mean. This marked a decline in the U.S. annual average temperature from 2015-2017, which were the fourth-, second-, and third-warmest years on record, respectively (figure 1)

Top-ten values for annual warmth occurred in eight Western States and six Atlantic Coast States (figure 2). Arizona experienced its second-warmest year, behind only 2017. South Dakota had the nation's lowest ranking, noting its 47th-coolest year (figure 2).

Annual U.S. precipitation in 2018 averaged 34.63 inches—116 percent of normal (figure 3). It was the nation's third-wettest year on record, behind 1973 (34.96 inches) and 1983 (34.76 inches). State precipitation rankings ranged from the 13th-driest year in Oregon and the 14th-driest year in Colorado to the wettest year on record in Tennessee, West Virginia, and seven Atlantic Coast States (figure 4). It was among the ten wettest years in an additional dozen states across the central and eastern U.S.

Figure 3 Contiguous U.S., Precipitation, January-December

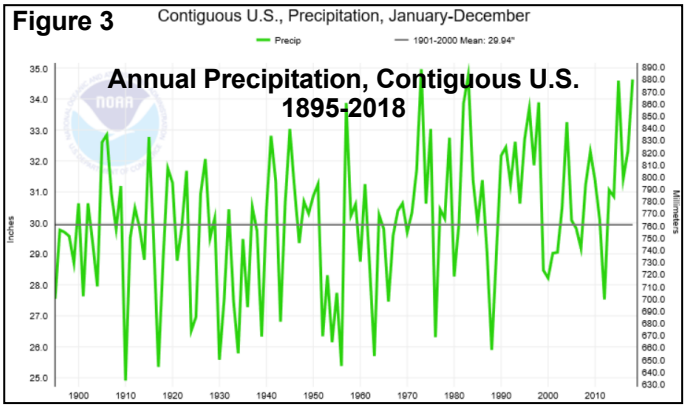
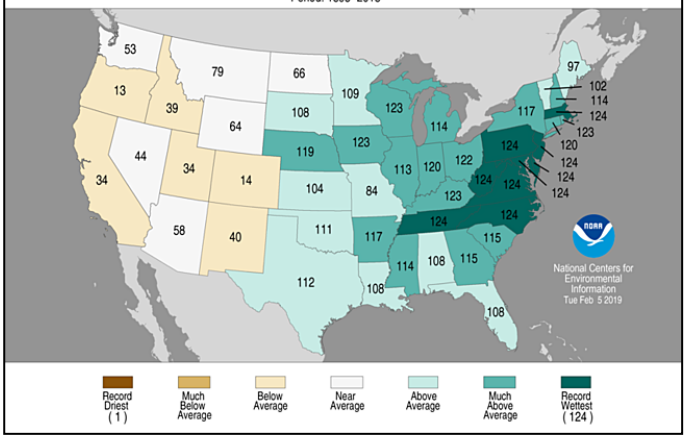


Figure 4 Statewide Precipitation Ranks
January–December 2018
Period: 1895–2018



Winter (December 2017 – February 2018)

La Niña's influence on North American weather patterns contributed to warmth and dryness in the Southwest and lower Southeast; periods of cold, snowy weather on the northern Plains; and late-winter wetness and flooding in the mid-South and lower Midwest. In addition, intensifying drought gripped the southern half of the High Plains, leading to adverse impacts on rangeland, pastures, and winter wheat.

As winter began, wildfires scorched several southern California hillsides. In particular, the Thomas Fire charred more than 280,000 acres of vegetation in Ventura and Santa Barbara Counties, becoming the largest single wildfire in modern California history and setting the stage for devastating early-January mudslides and debris flows. The January storm notwithstanding, southern California—and most of the remainder of the nation's southwestern quadrant—experienced a warm, dry winter.

Farther north, however, a cold, snowy winter eased the effects of a punishing summer drought and insulated winter wheat on the northern High Plains. However, the cold, snowy weather also stressed livestock. At times, short-lived but severe cold snaps affected many other parts of the country. When frigid weather reached the Deep South in mid-January, temperatures locally fell to their lowest levels since 1989 or 1996. The South also contended with multiple rounds of wintry precipitation, including heavy snow.

Elsewhere, a pattern change in mid-February brought colder, wetter weather to much of the West, maintaining favorable water-supply forecasts from the Pacific Northwest to the northern Rockies, and improving runoff prospects from the Sierra Nevada to the central Rockies. The West's cool, wet regime extended through much of March, quadrupling the average water content of the Sierra Nevada snowpack (from 4 to 16 inches, or from 20 to nearly 60 percent of average). At the same time, late-winter downpours across the mid-South and lower Midwest led to river navigation disruptions and extensive lowland flooding, and pushed the Ohio River between Cincinnati, Ohio, and Evansville, Indiana, to its highest level since 1997.

Drought coverage in the contiguous U.S. reached a winter peak of 39.64 percent on February 6, according to the U.S. Drought Monitor. Subsequently, heavy precipitation in several regions, including the mid-South and lower Midwest, reduced drought coverage to 31.30 percent by February 27. However, drought further intensified across the southern High Plains. By March 6, exceptional drought (D4) made its first appearance in Oklahoma since May 5, 2015. As winter ended, extreme drought (D3) was noted in parts of Kansas, Oklahoma, and Texas, as well as portions of the Four Corners States.

According to NCEI, the contiguous U.S. experienced its 24th-warmest winter during the 123-year period of record. December-February temperatures averaged 34.0°F, 1.7°F above the 1901-2000 mean. State temperature rankings ranged from the 39th-coldest winter in Montana to one of the ten warmest winters in California, Nevada, and the Four Corners States (figure 5). Meanwhile, December-February precipitation averaged 6.26 inches, 92 percent of normal, representing the nation's 34th-driest winter. State precipitation rankings ranged from the second-driest winter in California to the fourth-wettest winter in Arkansas (figure 6).

Figure 5 Statewide Average Temperature Ranks
December 2017–February 2018
Period: 1895–2018

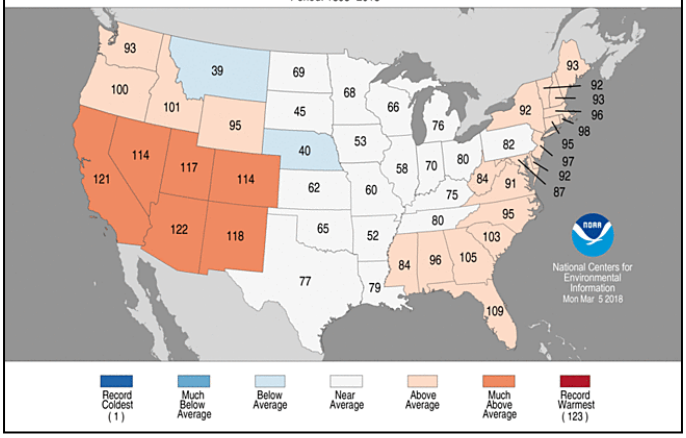
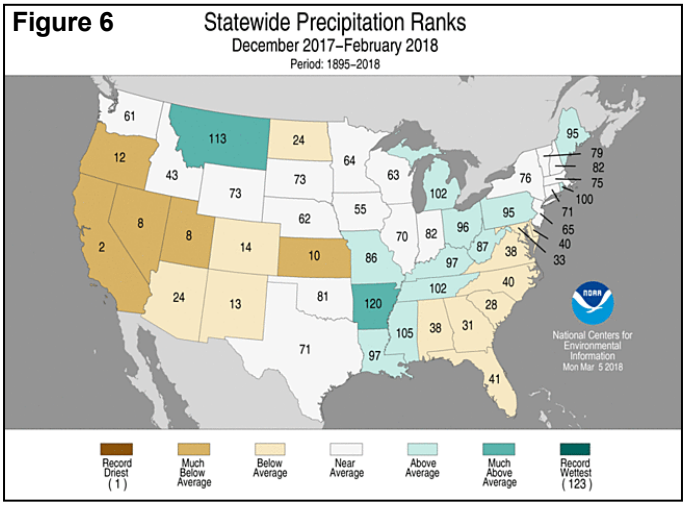


Figure 6 Statewide Precipitation Ranks
December 2017–February 2018
Period: 1895–2018



Spring (March-May)

Spring 2018 featured a remarkable transition in the central and eastern U.S. from a cold April to a warm May. Nationally, the change in average temperature between April and May was 16.36°F, considerably above the 1901-2000 mean value of 9.15°F, according to the National Centers for Environmental Information. In fact, a record was set (during the 124-year period of record) for the greatest U.S. increase in average temperature between April and May; the previous record of 13.50°F had been set in 1975.

Given the sudden transition from winter-like to summer-like conditions, the U.S. planting season was generally compressed, with fieldwork starting late in many areas but mostly ending on schedule. Subsequently, summer crops such as corn and soybeans exhibited rapid germination and growth due to the late-spring warmth. Nearly two-thirds (64 percent) of the intended U.S. corn acreage was planted during the 3-week period ending May 20, while 62 percent of the soybeans were planted in the 3 weeks ending May 27. Soybean emergence reached 68 percent by June 3, significantly ahead of the 5-year average of 52 percent.

There was also several other spring weather developments. First, a barrage of March storms in California (and environs) significantly improved water-supply prospects. Also, drought persistence or intensification in the southwestern and south-central U.S. contributed to an active spring wildfire season—and reduced yield prospects and increased abandonment rates for hard red winter wheat. Finally, late-spring downpours in the middle and southern Atlantic States curtailed fieldwork and caused local flooding.

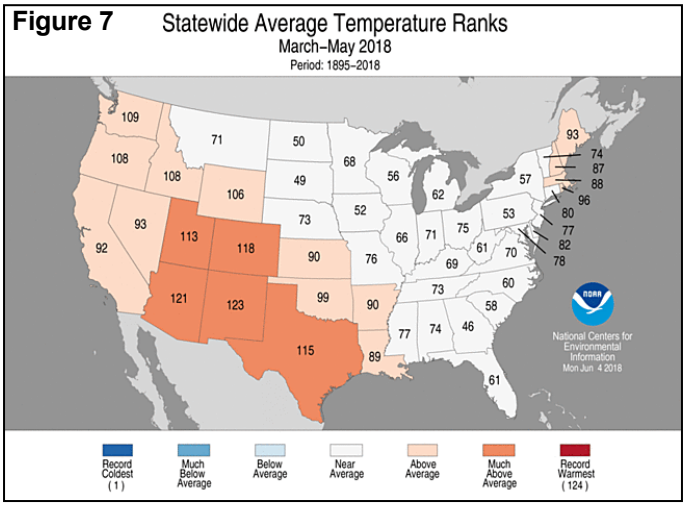
Subtropical Storm Alberto, which formed several days before the official start of the Atlantic hurricane season, made landfall on Memorial Day, May 28, near Panama City, Florida, with maximum sustained winds near 45 mph. In general, however, Alberto—which later moved almost due northward through the Great Lakes region—was far less impressive than a parade of March nor'easters that delivered wind, rain, and snow to the northern Atlantic States.

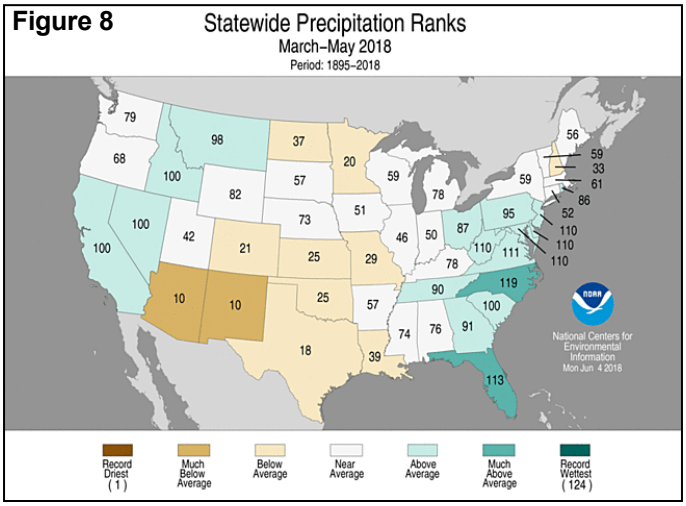
Drought coverage fell to 26.42 percent of the contiguous U.S. by May 29, down from a February 2018 peak of 39.64 percent. The reduction in drought coverage was largely due to abundant spring precipitation in several regions, including the Southeast, Far West, and portions of the Plains. However, a core drought area persisted across the southern High Plains and the Southwest. At the end of spring, some exceptional drought (D4) was noted in parts of the Four Corners States, along with Kansas, Oklahoma, and Texas.

According to NCEI, the contiguous U.S. experienced its 22nd-warmest spring during the 124-year period of record. March-May temperatures averaged 52.4°F, 1.5°F above the 1901-2000 mean. State temperature rankings ranged from the 46th-coldest spring in Georgia to the second-warmest spring in New Mexico (figure 7). Arizona, Colorado, and Texas joined New Mexico in experiencing one of their ten warmest springs. Meanwhile, March-May precipitation averaged 7.91 inches, almost exactly equal to the 20th century mean of 7.94 inches. It was the 61st driest spring during the 124-year period of record. State precipitation rankings ranged from the tenth-driest spring in Arizona and New Mexico to the sixth-wettest spring in North Carolina (figure 8).

Summer (June-August)

Despite overarching summer warmth that accelerated crop development, primary production areas across the central and eastern U.S. received enough rain to support favorable outcomes for most major row crops. A notable exception was cotton, which suffered due to drought in the southern Plains' production area—and was rated 33 percent very poor to poor by September 2.





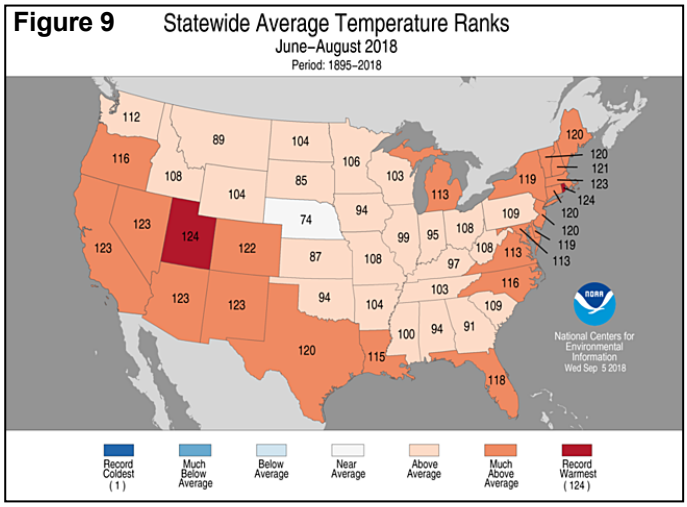
Summer weather highlights also included persistent Western heat and drought, as well as rampant wildfires; significant variation in Midwestern conditions, ranging from pockets of excessive wetness in the upper Mississippi Valley to drought in the southwestern Corn Belt; and periods of excessive rainfall and flooding in the mid-Atlantic States and environs.

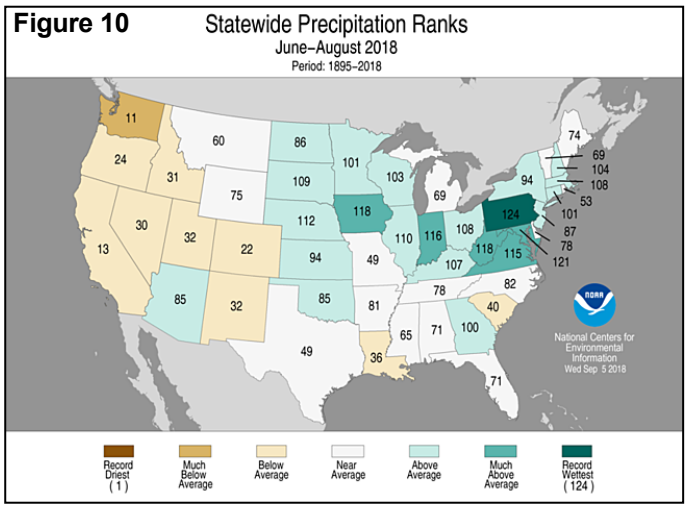
From January to August, U.S. wildfires burned more than 6.8 million acres of vegetation, nearly 130 percent of the 10-year average. Some of the worst summer wildfires, including the Mendocino Complex and the Carr Fire, affected northern California. The Mendocino Complex became the largest wildfire in modern California history, with nearly 460,000 acres of timber, brush, and grass torched near Potter Valley, while the Carr Fire—near Redding, California—destroyed nearly 1,100 homes and charred some 230,000 acres of vegetation. For the second summer in a row, a shroud of Northwestern smoke reduced visibility and air quality across a broad area.

During the summer of 2018, there was a general increase in overall drought (D1 to D4) coverage—from 27.09 to 36.21 percent of the contiguous U.S. between June 5 and August 14. According to the U.S. Drought Monitor, however, there was a net decrease in extreme to exceptional drought (D3 to D4), with summer coverage peaking at 9.25 percent on June 12 and falling to 7.50 percent by August 28. Nevertheless, core drought areas of the Four Corners

States retained substantial extreme to exceptional drought by summer's end; on August 28, D3 to D4 coverage stood at 48 percent in Arizona, 44 percent in Colorado, 37 percent in Utah, and 36 percent in New Mexico.

Consistent warmth and wetness in many parts of the country resulted in the fourth-hottest, 25th-wettest summer during the 1895-2018 period of record. According to NCEI, the nation's summer average temperature of 73.5°F was 2.1°F above the 1901-2000 mean. State temperature rankings ranged from the 51st-warmest summer in Nebraska to the hottest summer on record in Utah (figure 9). Nineteen other states reported one of their ten hottest summers. Meanwhile, state precipitation rankings ranged from the 11th-driest summer in Washington to the wettest summer on record in Pennsylvania (figure 10). Additionally, it was among the ten wettest summers in Indiana, Iowa, Maryland, Virginia, and West Virginia.





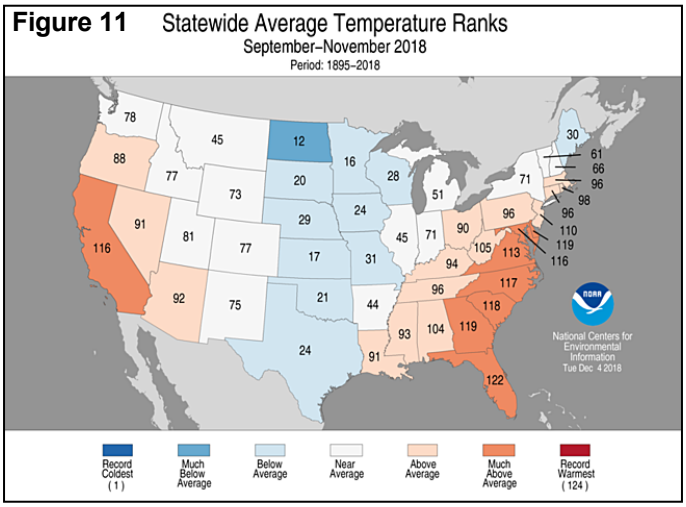
Autumn

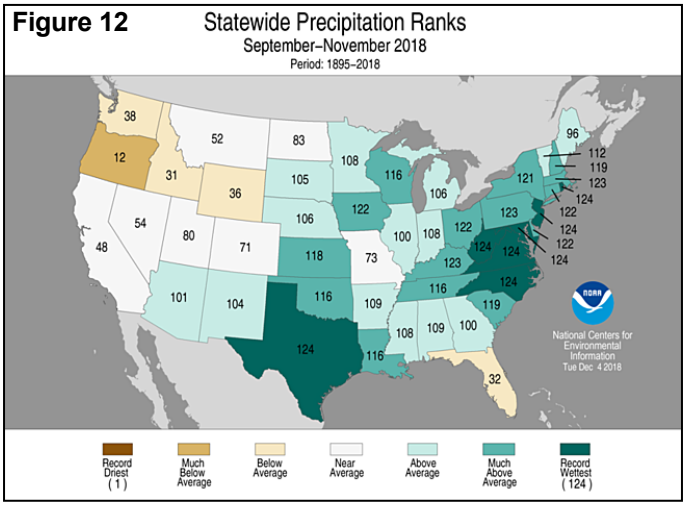
Despite some weather challenges, U.S. corn and soybeans achieved near record-high yields of 176.4 and 51.6 bushels per acre, respectively, based on data released by USDA's National Agricultural Statistics Service. Some other crops, including cotton, did not fare quite as well, in part due to drought (on the southern High Plains) and hurricanes (in the Southeast).

In fact, Hurricanes Florence and Michael grabbed headlines for their adverse impacts on Southeastern agriculture. Florence resulted in catastrophic mid-September flooding in eastern North Carolina and portions of neighboring states, followed by Michael's devastating storm-surge strike on western Florida and subsequent wind-related inland impacts on cotton, pecans, timber, and other commodities in western Florida, southwestern Georgia, and southeastern Alabama.

As autumn progressed, colder, wetter conditions developed across the central and eastern U.S. In particular, cold, wet weather resulted in extensive fieldwork delays—including summer crop harvesting and winter wheat planting—across the Plains and Midwest. Those conditions also hampered winter wheat emergence and establishment.

From January to November, U.S. wildfires burned more than 8.5 million acres of vegetation, nearly 140 percent of the 10-year average. In California, devastating November wildfires struck both northern and sections of the state. In particular, northern California's Camp Fire became the nation's deadliest wildfire in a century, with at least 85 fatalities reported in Butte County. The Camp Fire also scorched more than 153,000 acres of land and destroyed nearly 14,000 homes.





(Continued to back cover)

National Weather Data for Selected Cities

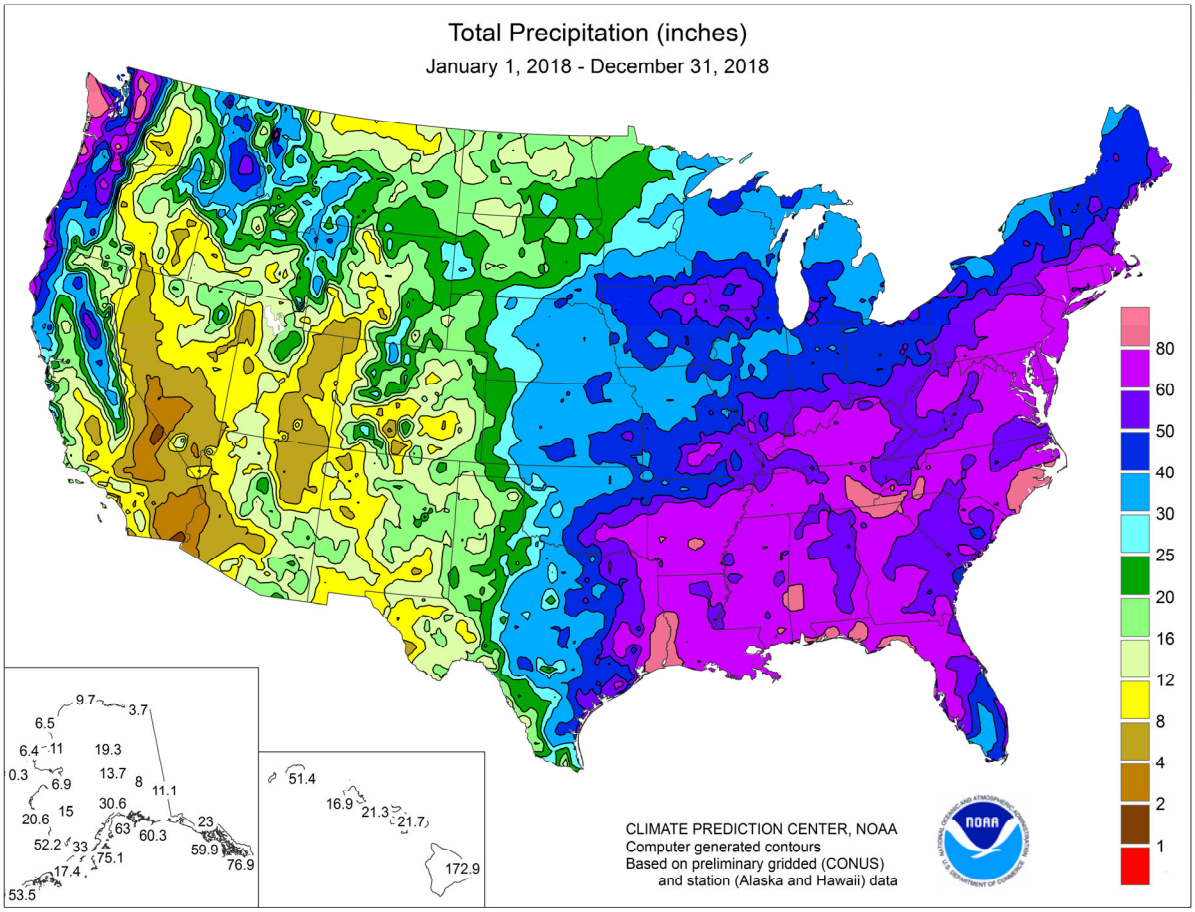
2018

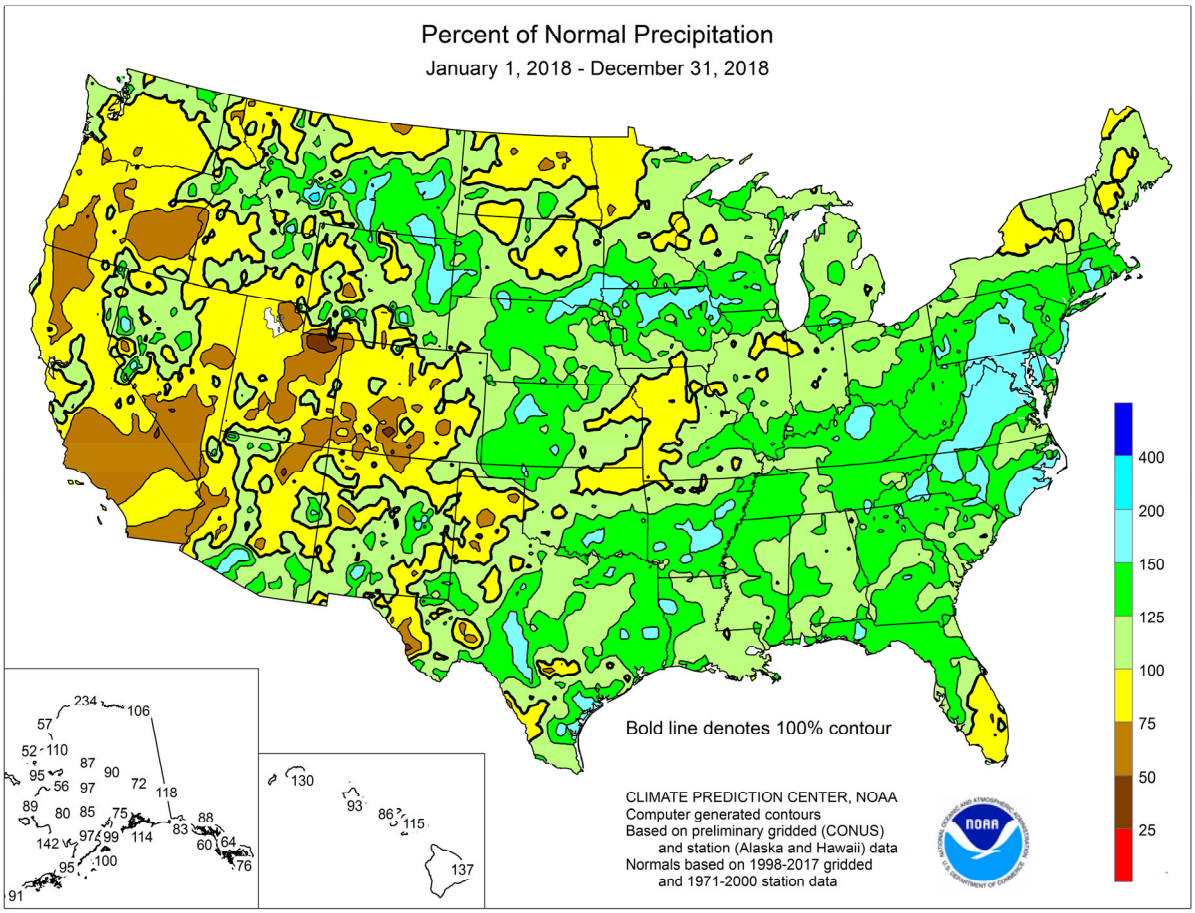
Data Provided by Climate Prediction Center

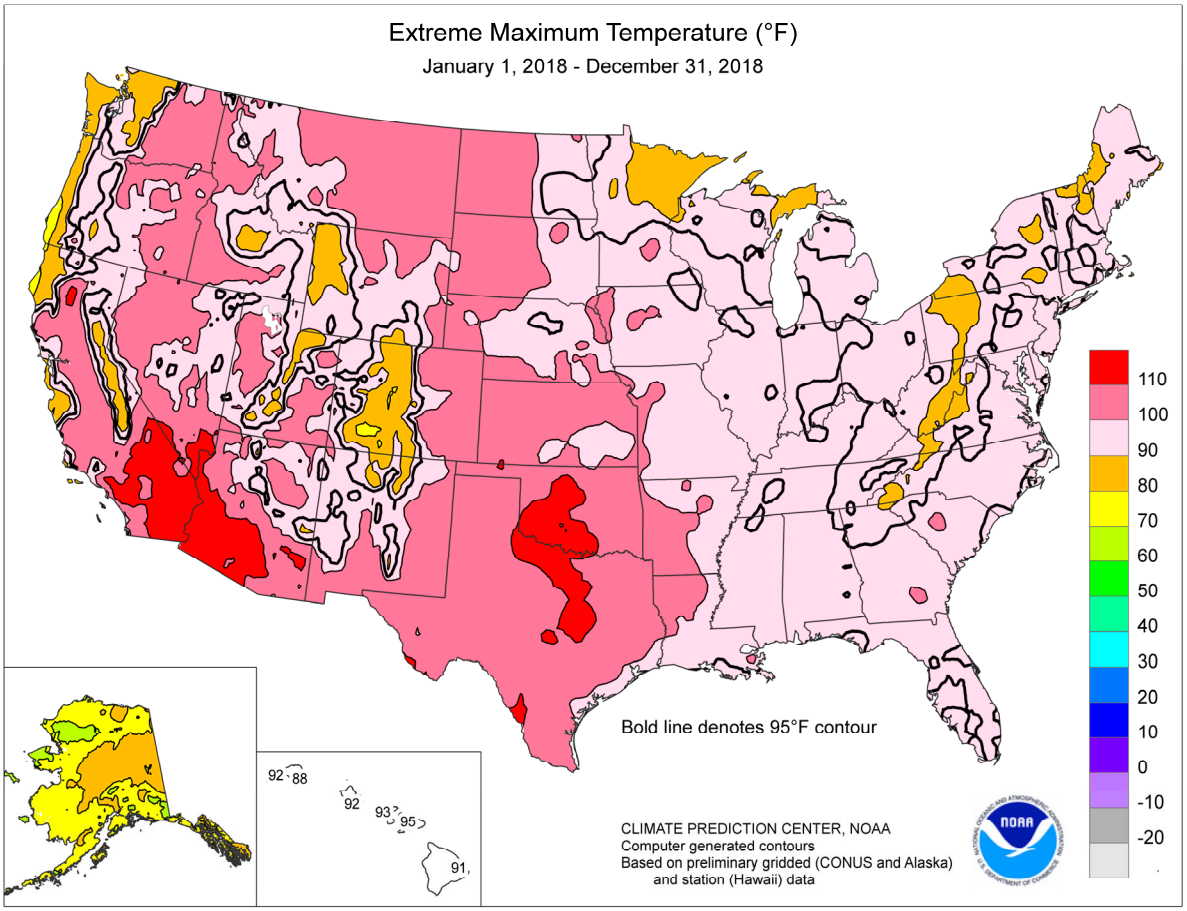
STATES AND STATIONS	TEMP, °F AVERAGE	TEMP, °F DEPARTURE	PRECIP. TOTAL	PRECIP. DEPARTURE
AL BIRMINGHAM	65	3	63.09	9.11
HUNTSVILLE	63	2	59.91	2.40
MOBILE	69	2	64.33	-1.96
MONTGOMERY	67	2	55.49	0.72
AK ANCHORAGE	41	5	18.50	2.44
BARROW	17	6	9.72	5.57
COLD BAY	42	4	46.28	6.00
FAIRBANKS	31	4	13.75	3.42
JUNEAU	43	1	55.78	-2.55
KING SALMON	39	4	32.98	13.57
KODIAK	44	3	75.11	-0.24
NOME	31	4	15.71	-0.85
AZ FLAGSTAFF	48	2	21.56	-1.35
PHOENIX	76	3	9.29	1.00
TUCSON	72	3	13.44	1.27
AR FORT SMITH	63	2	54.17	10.30
LITTLE ROCK	62	0	71.41	20.48
CA BAKERSFIELD	68	3	5.18	-1.30
EUREKA	52	-1	36.74	-1.36
FRESNO	67	4	8.65	-2.58
LOS ANGELES	65	2	7.79	-5.36
REDDING	64	2	25.39	-8.13
SACRAMENTO	62	1	18.41	0.48
SAN DIEGO	66	2	7.65	-3.12
SAN FRANCISCO	59	2	15.69	-4.41
STOCKTON	63	1	14.13	0.29
CO ALAMOSA	44	3	5.76	-1.49
CO SPRINGS	51	3	15.41	-1.98
DENVER	52	3	8.83	-4.79
GRAND JUNCTION	55	3	8.20	-0.78
PUEBLO	54	2	7.71	-4.68
CT BRIDGEPORT	54	2	61.74	17.59
HARTFORD	51	1	63.15	16.99
DC WASHINGTON	60	2	66.25	26.90
DE WILMINGTON	56	2	62.02	19.21
FL DAYTONA BEACH	72	1	63.53	14.24
FT LAUDERDALE	77	1	50.13	-14.07
FT MYERS	76	1	52.12	-2.07
JACKSONVILLE	70	2	59.83	7.49
KEY WEST	79	1	37.48	-1.46
MELBOURNE	75	3	36.41	-11.88
MIAMI	78	1	61.45	2.92
ORLANDO	74	1	51.84	3.49
PENSACOLA	70	2	91.00	26.72
ST PETERSBURG	75	1	61.20	11.62
TALLAHASSEE	69	1	79.85	16.65
TAMPA	75	2	62.87	18.11
WEST PALM BEACH	76	1	53.96	-7.43
GA ATHENS	64	2	69.26	21.44
ATLANTA	64	2	70.02	19.83
AUGUSTA	66	3	56.82	12.23
COLUMBUS	67	2	66.73	18.16
MACON	66	2	50.54	5.55
SAVANNAH	68	2	47.61	-1.97
HI HILO	76	2	172.94	46.67
HONOLULU	79	2	16.92	-1.36
KAHULUI	76	0	21.69	2.89
LIHUE	76	0	51.39	11.83
ID BOISE	54	2	10.67	-1.53
LEWISTON	55	2	12.90	0.18
POCATELLO	48	1	9.06	-3.53
IL CHICAGO/O'HARE	51	2	49.79	13.51
MOLINE	51	1	46.74	8.70
PEORIA	52	1	46.86	10.84
ROCKFORD	49	1	55.90	19.29
SPRINGFIELD	54	1	47.49	11.93
IN EVANSVILLE	57	1	60.44	16.17
FORT WAYNE	52	2	44.27	7.72
INDIANAPOLIS	54	1	47.76	6.82
SOUTH BEND	49	-1	52.78	13.08
IA BURLINGTON	52	0	43.43	5.49
CEDAR RAPIDS	49	0	45.45	12.04
DES MOINES	51	1	42.81	8.09
DUBUQUE	47	0	52.01	16.50
SIOUX CITY	47	-1	41.31	15.32
WATERLOO	47	0	56.43	23.29
KS CONCORDIA	53	-1	36.94	8.51
DODGE CITY	56	1	27.96	5.61
GOODLAND	52	1	21.63	1.87
HILL CITY	53	0	36.86	13.97
TOPEKA	56	2	31.81	-3.83
WICHITA	58	2	32.30	1.92
KY JACKSON	58	2	69.06	19.67
LEXINGTON	57	2	78.04	32.14
LONDON-CORBIN	57	1	68.93	21.52
LOUISVILLE	59	2	72.58	28.05
PADUCAH	59	2	62.85	13.61
LA BATON ROUGE	69	2	66.98	3.91
LAKE CHARLES	70	2	61.53	4.35
NEW ORLEANS	72	3	63.89	-0.27
SHREVEPORT	67	1	67.06	15.76
ME BANGOR	45	0	49.28	9.71
CARIBOU	41	2	42.00	4.57
PORTLAND	47	1	52.80	6.97
MD BALTIMORE	56	1	73.58	31.64
MA BOSTON	53	1	55.00	12.47
WORCESTER	48	1	62.72	13.67
MI ALPENA	44	1	34.07	5.67
DETROIT	51	1	43.80	10.90
FLINT	48	1	39.79	8.18
GRAND RAPIDS	50	2	47.93	10.81
HOUGHTON LAKE	45	2	33.09	4.65
LANSING	49	2	41.67	10.14
MUSKEGON	49	2	46.94	14.07
TRAVERSE CITY	47	1	39.60	6.13
MN DULUTH	40	1	32.30	1.30
INT'L FALLS	37	-1	25.58	1.64
MINNEAPOLIS	46	1	35.43	6.02
ROCHESTER	44	0	43.68	12.27
ST. CLOUD	42	0	31.11	3.98
MS JACKSON	66	2	78.00	22.06
MERIDIAN	67	2	71.48	12.83
TUPELO	63	2	74.30	18.44
MO COLUMBIA	56	2	40.39	0.11
JOPLIN	58	0	37.81	-8.26
KANSAS CITY	55	1	43.16	5.17
SPRINGFIELD	58	2	45.25	0.28
ST JOSEPH	54	0	34.51	-0.73
ST LOUIS	57	1	45.30	6.55
MT BILLINGS	46	-1	23.77	9.01
BUTTE	40	0	14.58	1.80
GLASGOW	42	-1	13.78	2.55
GREAT FALLS	44	0	17.23	2.34
HELENA	45	1	15.80	4.48
KALISPELL	44	1	13.36	-3.85
MILES CITY	43	-3	23.80	10.31
MISSOULA	46	1	16.46	2.64
NE GRAND ISLAND	50	0	34.94	9.05
HASTINGS	51	0	35.81	7.87
LINCOLN	51	0	41.51	13.14
MCCOOK	51	0	29.50	7.88
NORFOLK	48	-1	37.09	10.43
NORTH PLATTE	49	0	28.30	8.64
OMAHA/EPPLEY	52	1	39.42	9.20
SCOTTSBLUFF	49	1	24.08	7.75
VALENTINE	48	1	34.83	15.31
NV ELKO	49	3	9.23	-0.36
ELY	47	2	7.83	-2.14
LAS VEGAS	72	4	3.39	-1.10
RENO	56	5	9.25	1.77
WINNEMUCCA	51	2	9.79	1.46
NH CONCORD	48	2	53.59	15.99
NJ ATLANTIC CITY	56	2	68.57	27.98
NEWARK	56	1	63.37	17.11
NM ALBUQUERQUE	59	2	9.92	0.46
NY ALBANY	50	2	45.94	7.88
BINGHAMTON	47	1	58.05	19.40
BUFFALO	49	1	41.63	1.09
ROCHESTER	50	2	35.35	1.39
SYRACUSE	48	0	43.80	3.76
NC ASHEVILLE	58	3	79.48	32.44
CHARLOTTE	62	1	59.12	15.60
GREENSBORO	60	2	64.10	20.97
HATTERAS	65	2	93.06	35.31
RALEIGH	61	1	60.28	17.23
WILMINGTON	65	1	102.99	45.92
ND BISMARCK	42	0	21.66	4.82
DICKINSON	42	-1	20.99	4.64
FARGO	41	-1	27.96	6.77
GRAND FORKS	39	-1	24.93	5.33
JAMESTOWN	40	-2	26.28	7.79
MINOT	42	0	17.38	-1.06
WILLISTON	41	0	22.51	8.35
OH AKRON-CANTON	52	2	51.81	13.34
CINCINNATI	55	1	61.30	18.69
CLEVELAND	53	3	57.28	18.58
COLUMBUS	55	2	60.38	21.88
DAYTON	53	1	54.08	14.50
MANSFIELD	51	2	53.09	9.86
TOLEDO	51	1	38.59	5.38
YOUNGSTOWN	51	2	56.87	18.85
OK OKLAHOMA CITY	60	0	45.85	10.00
TULSA	61	0	34.37	-8.05
OR ASTORIA	52	1	64.33	-2.80
BURNS	45	1	7.10	-3.47
EUGENE	53	1	27.86	-23.05
MEDFORD	56	2	12.06	-6.31
PENDLETON	53	1	10.54	-2.22
PORTLAND	56	2	27.29	-9.78
SALEM	55	2	31.01	-8.99
PA ALLENTOWN	54	3	69.70	24.53
ERIE	51	1	49.23	6.46
MIDDLETOWN	55	2	67.33	26.83
PHILADELPHIA	56	1	64.91	22.87
PITTSBURGH	52	1	63.62	25.77
WILKES-BARRE	51	1	62.07	24.52
WILLIAMSPORT	52	2	71.53	29.94
PR SAN JUAN	81	1	50.60	-0.16
RI PROVIDENCE	53	2	65.99	19.53
SC CHARLESTON	68	3	60.59	9.06
COLUMBIA	66	2	50.02	1.75
FLORENCE	65	1	61.69	16.93
GREENVILLE	62	2	67.95	17.73
MYRTLE BEACH	65	1	64.87	19.16
SD ABERDEEN	43	-1	19.97	-0.25
HURON	45	0	23.73	2.84
RAPID CITY	45	-2	27.04	10.41
SIOUX FALLS	46	1	44.29	19.60
TN BRISTOL	58	3	54.84	13.52
CHATTANOOGA	62	2	65.91	11.39
JACKSON	61	1	76.75	21.97
KNOXVILLE	60	2	61.87	13.65
MEMPHIS	63	1	66.15	11.50
NASHVILLE	62	3	61.60	13.49
TX ABILENE	65	1	33.92	10.15
AMARILLO	59	2	13.60	-6.12
AUSTIN	69	0	35.91	2.26
BEAUMONT	71	2	91.95	32.06
BROWNSVILLE	76	3	23.04	-4.51
COLLEGE STATION	69	0	50.69	11.02
CORPUS CHRISTI	72	0	40.54	8.29
DALLAS/FT WORTH	67	1	56.17	21.44
DEL RIO	71	1	26.19	7.96
EL PASO	68	3	8.37	-1.06
GALVESTON	72	1	61.18	17.34
HOUSTON	71	2	59.02	11.18
LUBBOCK	62	2	15.28	-3.40
MIDLAND	66	2	17.69	2.89
SAN ANGELO	67	2	34.06	13.16
SAN ANTONIO	70	1	41.18	8.26
VICTORIA	71	1	38.13	-1.97
WACO	68	1	34.98	1.64
WICHITA FALLS	64	1	38.60	9.79
UT SALT LAKE CITY	56	4	13.19	-3.31
VT BURLINGTON	48	3	39.58	3.53
VA LYNCHBURG	57	2	68.26	24.95
NORFOLK	62	2	56.89	11.15
RICHMOND	60	2	65.13	21.23
ROANOKE	58	2	63.64	21.16
WASH/DULLES	56	2	67.15	25.34
WA OLYMPIA	51	1	44.48	-6.31
QUILLAYUTE	50	1	105.44	3.72
SEATTLE-TACOMA	55	3	35.73	-1.33
SPOKANE	49	2	15.95	-0.72
YAKIMA	53	4	5.06	-3.20
WV BECKLEY	53	1	61.57	19.95
CHARLESTON	57	2	68.02	23.98
ELKINS	52	2	69.74	23.65
HUNTINGTON	57	2	65.54	23.23
WI EAU CLAIRE	44	0	40.61	8.49
GREEN BAY	46	1	40.57	11.38
LA CROSSE	48	1	44.80	12.44
MADISON	47	1	56.71	23.76
MILWAUKEE	49	1	47.68	12.87
WAUSAU	43	-1	40.77	7.41
WY CASPER	46	1	20.18	7.15
CHEYENNE	47	2	20.61	5.16
LANDER	45	0	17.93	4.51
SHERIDAN	44	-1	22.80	8.08

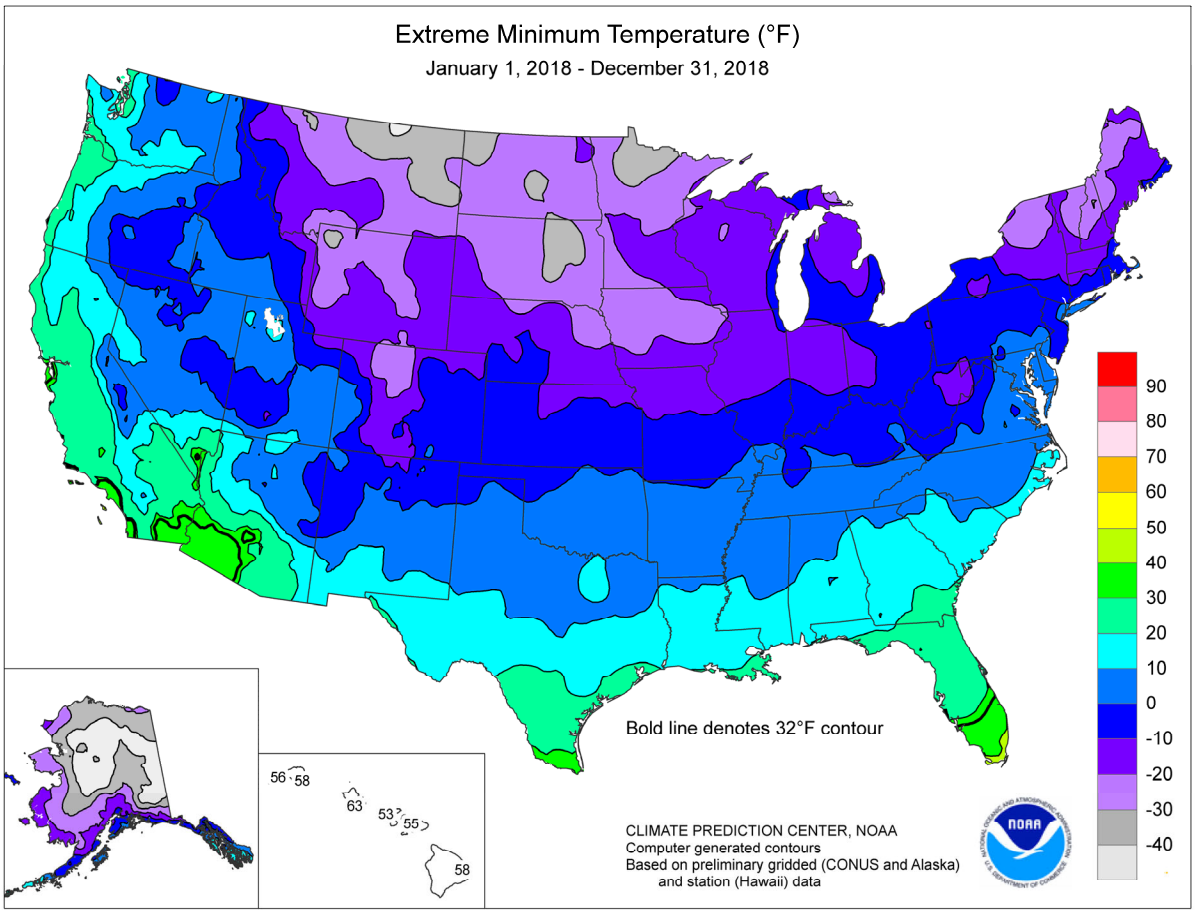
Based on 1971-2000 normals

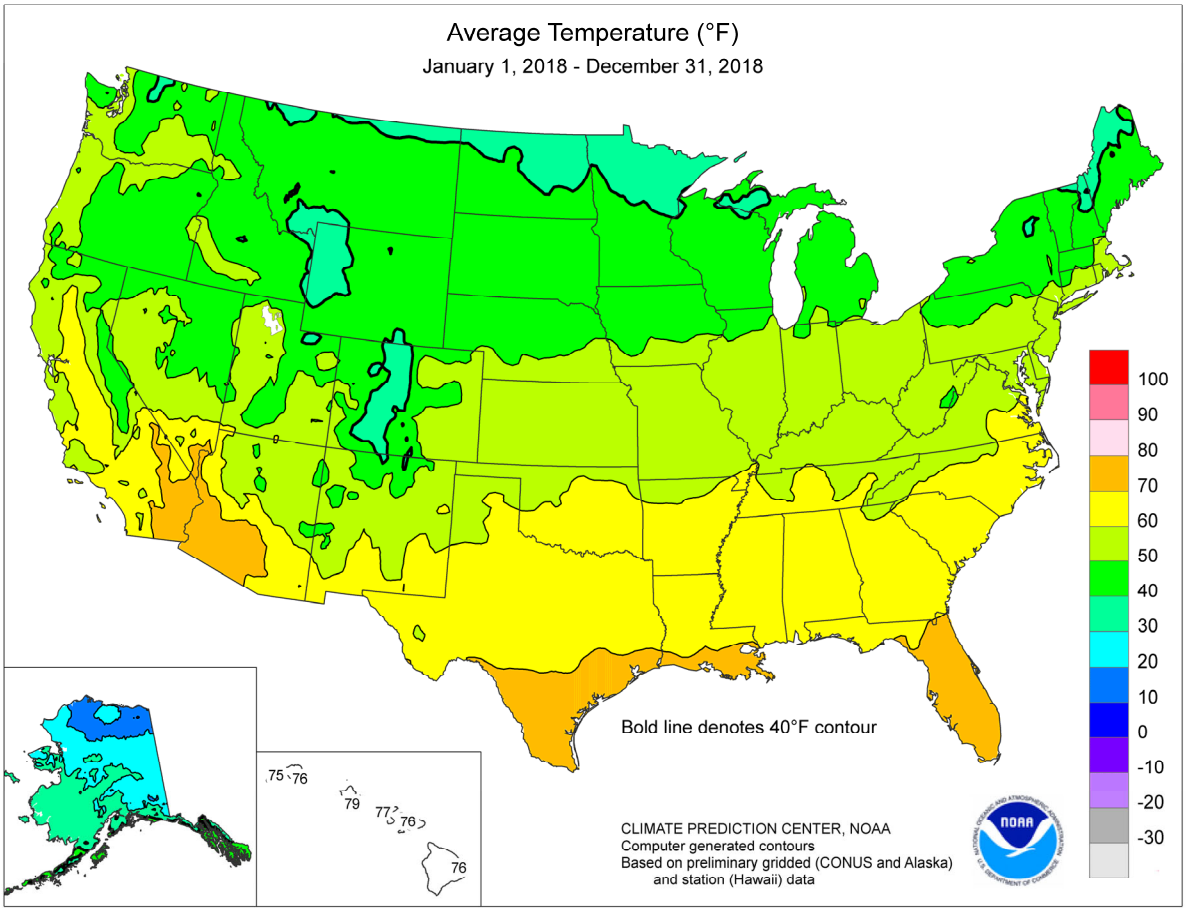
***** Not Available**

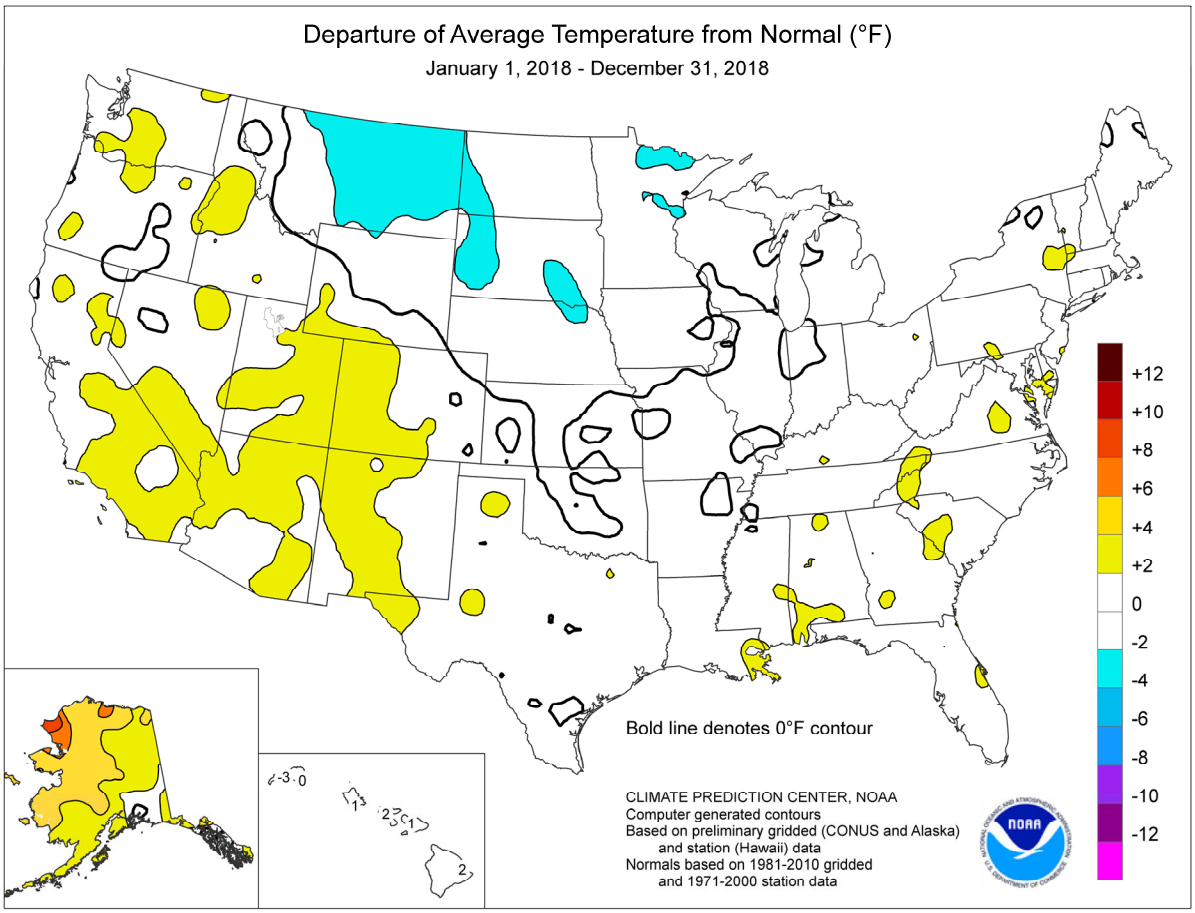

Total Precipitation (inches)
January 1, 2018 - December 31, 2018
80
60
50
40
30
25
20
16
12
8
4
2
1
9.7
3.7
6.5
6.4
11
19.3
0.3
6.9
13.7
8
11.1
30.6
20.6
15
63
60.3
23
52.2
33
75.1
59.9
76.9
17.4
53.5
51.4
16.9
21.3
21.7
172.9
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS)
and station (Alaska and Hawaii) data
NOAA


Percent of Normal Precipitation
January 1, 2018 - December 31, 2018
400
200
150
125
100
75
50
25
234
106
57
52
110
87
90
95
56
97
72
118
89
80
85
75
88
83
142
97
99
114
60
64
95
100
76
91
130
93
86
115
137
Bold line denotes 100% contour
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS)
and station (Alaska and Hawaii) data
Normals based on 1998-2017 gridded
and 1971-2000 station data
NOAA


Extreme Maximum Temperature (°F)
January 1, 2018 - December 31, 2018
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
92
88
92
93
95
91
Bold line denotes 95°F contour
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS and Alaska)
and station (Hawaii) data
NOAA


Extreme Minimum Temperature (°F)
January 1, 2018 - December 31, 2018
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
56
58
63
53
55
58
Bold line denotes 32°F contour
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS and Alaska)
and station (Hawaii) data
NOAA


Average Temperature (°F)
January 1, 2018 - December 31, 2018
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
Bold line denotes 40°F contour
75 76
79
77 76
76
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS and Alaska)
and station (Hawaii) data


Departure of Average Temperature from Normal (°F)
January 1, 2018 - December 31, 2018
+12
+10
+8
+6
+4
+2
0
-2
-4
-6
-8
-10
-12
Bold line denotes 0°F contour
-3.0
1
2
1
2
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS and Alaska)
and station (Hawaii) data
Normals based on 1981-2010 gridded
and 1971-2000 station data

2018 U.S. Fieldwork Highlights

Highlights, released on February 8, 2019, were provided by USDA/NASS.

April: Below-average April temperatures were recorded for most areas east of the Rockies. In the upper Midwest, cold weather led to planting delays. However, from the Rockies westward, many areas were warmer than normal. Scattered showers occurred in drought-stricken sections of Oklahoma and northern Texas. In contrast, heavy rain fell in the central Gulf Coast States. Similar wetness occurred along the northern Pacific Coast.

By April 8, producers had planted 2 percent of the nation's corn crop, 1 percentage point behind the previous year but equal to the 5-year average. Producers had planted 17 percent of the 2018 corn crop by April 29, fifteen percentage points behind the previous year and 10 points behind average. All states were behind their average planting pace, except Missouri and Texas, which had 52 and 70 percent planted, respectively. Cotton producers had planted 12 percent of the cotton crop by April 29, two percentage points behind both the previous year and the 5-year average. In Texas, 15 percent of the 2018 cotton crop was planted by April 29, two percentage points ahead of both the previous year and the 5-year average.

May: Warmer-than-normal weather prevailed across most of the nation. May precipitation was above normal in much of the Southeast, but the Colorado Basin remained dry. Drought in the Colorado Valley and southern Plains continued through May, though conditions improved in parts of Texas and Oklahoma.

By May 13, sixty-two percent of the 2018 corn crop was planted, 6 percentage points behind the previous year and 1 point behind the 5-year average. Twenty-eight percent of the nation's corn had emerged by May 13, one percentage point behind the previous year but 1 point ahead of average. Nationally, 36 percent of the cotton crop was planted by May 13, five percentage points ahead of both the previous year and the average. Producers had planted 32 percent of the 2018 sorghum crop by May 13, equal to the previous year but 1 percentage point behind average. By May 13, sixty-two percent of the barley crop was seeded, 12 percentage points behind both the previous year and the average. By May 27, seventy-seven percent of the nation's soybean crop was planted, 12 percentage points ahead of the previous year and 15 points ahead of average. Ninety-one percent of the nation's spring wheat crop was seeded by May 27, four percentage points behind the previous year but 2 points ahead of average.

June: Temperatures were above normal for much of the nation, especially in the Great Plains and Rocky Mountains. Warmer-than-normal weather also prevailed in the Southeast. In contrast, New England was cooler than average in early June before temperatures began to moderate. Precipitation fell most heavily in the eastern half of the country, where soils were damp from Subtropical Storm Alberto, which had moved through in late May. Rain in northern Texas and the panhandle of Oklahoma eased drought, while parts of the the lower Rockies contended with exceptional drought.

Nationally, planting of the 2018 corn crop was 97 percent complete by June 3, two percentage points ahead of both the previous year and the 5-year average. By June 17, more than 96 percent of the corn crop had emerged in all estimating states except Michigan and Pennsylvania. Eighty-seven percent of the nation's soybean crop was planted by June 3, six percentage points ahead of the previous year and 12 points ahead of average. Nationally, 95 percent of the soybean crop had emerged by June 24, two percentage points ahead of last year and 6 points ahead of average. By June 3, ninety-seven percent of the barley crop was seeded, one percentage point behind the previous year but 2 points ahead of average. Nationwide, 96 percent of the barley crop had emerged by June 17, equal to last year but one percentage point ahead of average. Peanut planting advanced to 83 percent complete by June 3, six percentage points behind the previous year and 4 points behind average. The nation's spring wheat was 81 percent emerged by June 3, seven percentage points behind the previous year but 1 point ahead of average. Ninety-five percent of the rice crop had emerged by June 3, five percentage points ahead of the previous year and 4 points ahead of average. Nationally, 96 percent of the cotton crop was planted by June 17, two percentage points ahead of both the previous year and the 5-year average. By June 24, ninety-five percent of the nation's sorghum was planted, 1 percentage point ahead of the previous year and 4 points ahead of average.

July: Temperatures were below normal in many parts of the country, including the Great Plains. Cooler-than-normal conditions also covered the Midwest and Southeast for much of the month. However, parts of the Southwest and New England were warmer than normal. Precipitation fell most heavily in the eastern half of the U.S. Heavy rainfall along the Atlantic Coast resulted in flash flooding, while Southwestern rain eased drought.

Nationally, 27 percent of the nation's soybean acreage was at or beyond the blooming stage by July 1, ten percentage points ahead of the previous year and 14 points ahead of the 5-year average. By July 29, sixty percent of the 2018 soybean crop was at or beyond the pod-setting stage, 15 percentage points ahead of the previous year and 19 points ahead of average. By July 1, fifty-eight percent of the spring wheat crop was at or beyond the heading stage, 2 percentage points ahead of the previous year and 10 points ahead of average. Heading of this year's oat crop advanced to 82 percent complete by July 1, one percentage point behind the previous year but 2 points ahead of average. Heading of the nation's barley crop advanced to 50 percent complete by July 1, two percentage points ahead of the previous year but 1 point behind average. Thirty-two percent of the 2018 rice crop was at or beyond the heading stage by July 15, one percentage point ahead of the previous year and 3 points ahead of average. Nationally, 88 percent of the cotton was at or beyond the squaring stage by July 29, two percentage points ahead of the previous year but 1 point behind the average. By July 29, bolls were setting on 49 percent of the nation's cotton, 4 percentage points ahead of the previous year and 1 point ahead of average. Ninety-one percent of the corn acreage was at or beyond the silking stage by July 29, nine percentage points ahead of both the previous year and the 5-year average. By July 29, fifty-four percent of the nation's sorghum was at or beyond the heading stage, 7 percentage points ahead of the previous year and 4 points ahead of average. Eighty-six percent of the nation's peanut acreage was pegging by July 29, equal to the previous year but 1 percentage point ahead of average.

August: Temperatures were below average for parts of the country, especially the Great Plains. However, the Southwest and New England were warmer than normal. Widespread precipitation fell in the eastern half of the nation. In contrast, much of the Pacific Coast and Southwest remained mostly dry.

By August 5, ninety-six percent of the corn was at or beyond the silking stage, 4 percentage points ahead of both the previous year and the 5-year average. Nationally, 57 percent of the corn was at or beyond the dough stage by August 5, eighteen percentage points ahead of 2017 and 20 points ahead of average. By August 12, barley producers had harvested 41 percent of the 2018 crop, 7 percentage points behind the previous year but 3 points ahead of average. Overall, 81 percent of the barley was reported in good to excellent condition on August 12, compared with 79 percent on August 5 and 49 percent at the same time in 2017. By August 19, spring wheat producers had harvested 60 percent of the crop, 5 percentage points ahead of the previous year and 16 points ahead of average. Overall, 74 percent of the spring wheat was reported in good to excellent condition on August 19, down 4 percentage points from July 29 but 40 points higher than at the same time in 2017. Sorghum heading was 87 percent complete by August 19, four percentage points ahead of both the previous year and the average. Rice was 95 percent headed by August 19, equal to the previous year but 4 percentage points ahead of average. Eighty percent of the oats were harvested by August 19, four percentage points ahead of the previous year and 3 points ahead of average. By August 12, ninety-six percent of the soybeans were at or beyond the blooming stage, 3 percentage points ahead of the previous year and 4 points ahead of average. Ninety-five percent of the soybeans were at or beyond the pod-setting stage by August 26, three percentage points ahead of the previous year and 5 points ahead of average. Ninety-one percent of the nation's cotton was at or beyond the boll-setting stage by August 26, one percentage point behind the previous year but equal to the average.

September: Monthly temperatures were generally above normal across the eastern U.S. and below normal in much of the West. Precipitation was above normal in the central and eastern U.S., especially where Hurricane Florence hit. Florence dumped 10 to 30 inches of rain or more in parts of the Carolinas.

Nationally, 75 percent of the corn was at or beyond the dent stage by September 2, seventeen percentage points ahead of the previous year and 15 points ahead of average. Seventy-two percent of the corn was mature by September 23, twenty-three percentage points ahead of the previous year and 19 points ahead of average. By September 9, ninety-two percent of the barley was harvested, 3 percentage points behind the previous year but equal to the average. Spring wheat producers had harvested 93 percent of the crop by September 9, one percentage point below the previous year but 8 points ahead of average. Oat producers had harvested 96 percent of the crop by September 9, one percentage point ahead of the previous year but equal to average. Producers had harvested 49 percent of the rice by September 16, four percentage points behind the previous year but 2 points ahead of average. Overall, 74 percent of the rice was rated good to excellent on September 16, compared with 75 percent on September 2 and 69 percent at the same time in 2017. Fifty-three percent of the soybeans were at or beyond the leaf-dropping stage by September 16, fifteen percentage points ahead of the previous year and 17 points ahead of average. By September 16, eighty-eight percent of the sorghum was at or beyond the coloring stage, 5 percentage points ahead of both the previous year and the average. By September 23, producers had sown 28 percent of the 2019 winter wheat, 6 percentage points ahead of last year and 2 points ahead of average. By September 23, fifty-eight percent of the cotton was at or beyond the boll-opening stage, 3 percentage points ahead of the previous year and 1 point ahead of average.

October: Hurricane Michael brought significant rain and wind to the Southeast. At the end of the month, remnants of Hurricane Willa transitioned to a nor'easter near Texas. The storm later brought precipitation and cool weather to the eastern U.S. In fact, October wetness prevailed in many areas of the country. Temperatures were generally below normal across the western half of the U.S., but above normal in the Southeast.

Soybean producers had harvested 38 percent of the nation's crop by October 14, nine percentage points behind the previous year and 15 points behind the 5-year average. Overall, 66 percent of the soybean crop was reported in good to excellent condition on October 14, five percentage points higher than at the same time in 2017. By October 14, forty-five percent of the nation's peanut crop was harvested, four percentage points behind the previous year but 1 point ahead of average. Overall, 58 percent of the peanut crop was reported in good to excellent condition on October 14, twelve percentage points lower than at the same time in 2017. By October 21, ninety percent of the rice crop was harvested, 7 percentage points behind the previous year and 4 points behind the average. Sixty-three percent of the 2018 corn crop was harvested by October 28, eleven percentage points ahead of the previous year but equal to the average. Sorghum producers had harvested 53 percent of the crop by October 28, four percentage points behind the previous year and 13 points behind the average. Producers had sown 78 percent of the 2019 winter wheat crop by October 28, five percentage points behind the previous year and 7 points behind average. Nationally, producers had harvested 44 percent of the cotton by October 28, one percentage point behind the previous year but 1 point ahead of average. Overall, 35 percent of the cotton was reported in good to excellent condition on October 28, twenty percentage points below the same time in 2017. Producers had harvested 82 percent of the sugarbeet crop by October 28, three percentage points behind both the previous year and the 5-year average.

November: Monthly temperatures were below normal across much of the country. Warmer-than-normal weather was mostly limited to the Pacific Coast States. Precipitation was largely above normal in the northern and eastern U.S. but below normal in the Pacific Northwest and much of the Southwest.

Eighty-nine percent of the winter wheat was sown by November 11, five percentage points behind both the previous year and the average. Winter wheat emergence advanced to 77 percent by November 11, six percentage points behind both the previous year and the average. Fifty-five percent of the winter wheat was reported good to excellent on November 25, compared with 50 percent at the same time in 2017. By November 11, ninety-six percent of the sugarbeets were harvested, equal to both the previous year and the average. Producers had harvested 91 percent of the soybeans by November 18, five percentage points behind both the previous year and the average. Producers had harvested 86 percent of the peanuts by November 18, nine percentage points behind the previous year and 7 points behind average. Ninety-four percent of the corn was harvested by November 25, equal to 2017 but 2 percentage points behind average. By November 25, eighty-nine percent of the sorghum was harvested, 5 percentage points behind both the previous year and the average. Producers had harvested 70 percent of the cotton by November 25, eight percentage points behind the previous year and 7 points behind average. By November 25, seventy-seven percent of the sunflowers were harvested, 15 percentage points behind 2017 and 14 points behind the average.

2018 U.S. Crop Production Highlights

Highlights, released on February 8, 2019, were provided by USDA/NASS.

Corn: Corn for grain production in the U.S. is estimated at 14.4 billion bushels, down 1 percent from the 2017 estimate. The average U.S. yield is estimated at 176.4 bushels per acre, 0.2 bushel below the 2017 record-high yield of 176.6 bushels per acre.

Estimated yields in 2018 are up from the previous year across most of the northern Plains and eastern Corn Belt. Record-high yields are estimated in Arizona, Idaho, Illinois, Indiana, Nebraska, Ohio, Utah, West Virginia, and Wyoming.

Corn planted area, at 89.1 million acres, was down 1 percent from 2017. Area harvested for grain was estimated at 81.7 million acres, down 1 percent from the 2017 estimate.

The 2018 corn objective-yield data indicated the highest number of ears per acre on record for the combined ten objective yield states (Iowa, Illinois, Indiana, Kansas, Minnesota, Missouri, Nebraska, Ohio, South Dakota, and Wisconsin). Record-high ear counts were recorded in Illinois, Nebraska, Ohio, South Dakota, and Wisconsin.

Corn silage production was estimated at 121 million tons for 2018, down 5 percent from 2017. The U.S. silage yield was estimated at 19.9 tons per acre, down 0.1 ton from 2017. Area harvested for silage was estimated at 6.11 million acres, down 4 percent from a year ago.

Sorghum: Grain production in 2018 was estimated at 365 million bushels, up 1 percent from the 2017 total. Planted area for 2018 was estimated at 5.69 million acres, up 1 percent from the previous year. Area harvested for grain, at 5.06 million acres, was up less than 1 percent from 2017. Grain yield was estimated at 72.1 bushels per acre, up 0.4 bushel from 2017. A record-high yield was estimated in Illinois.

Silage production was estimated at 3.33 million tons, down 12 percent from 2017. Area harvested for silage was estimated at 264,000 acres, down 6 percent from the previous year. Silage yield averaged 12.6 tons per acre, down 0.8 ton per acre from 2017.

Oats: Production in 2018 was estimated at 56.1 million bushels, up 13 percent from 2017. Yield was estimated at 64.9 bushels per acre, up 3.2 bushels from the previous year. Harvested area, at 865,000 acres, was 8 percent above the previous year. Record-low acres were harvested in Arkansas, California, Georgia, Idaho, Iowa, Maine, Oregon, Pennsylvania, and South Carolina.

The largest increases in production from 2017 occurred in the Dakotas, where yields were up from the previous year in the wake of last year's drought. A record-high yield was estimated in North Dakota.

Barley: Production was estimated at 153 million bushels, up 8 percent from the 2017 total of 142 million bushels. Average yield, at 77.4 bushels per acre, was up 4.4 bushels from the previous year. Producers seeded 2.54 million acres in 2018, up 2 percent from 2017. Harvested area, at 1.98 million acres, was up 1 percent from 2017.

All wheat: Production totaled 1.88 billion bushels in 2018, up 8 percent from the 2017 total of 1.74 billion bushels. Area harvested for grain totaled 39.6 million acres, up 5 percent from the previous year. The U.S. yield was estimated at 47.6 bushels per acre, up 1.3 bushels from the previous year. Levels of production and changes from 2017 by type were: winter wheat, 1.18 billion bushels, down 7 percent; other spring wheat, 623 million bushels, up 50 percent; and Durum wheat, 77.3 million bushels, up 41 percent.

Winter wheat: Winter wheat production for 2018 totaled 1.18 billion bushels, down 7 percent from the 2017 total of 1.27 billion bushels. The U.S. yield, at 47.9 bushels per acre, was down 2.3 bushels from 2017. Area harvested for grain was estimated at a record-low 24.7 million acres, down 2 percent from the previous year. Record-high yields were estimated for 2018 in Louisiana, Montana, and Nevada.

Harvested acreage was down from 2017 in most of the major Hard Red Winter (HRW) growing states, the primary winter wheat-producing area. As a result of the decreased harvested acreage and lower yields in 2018, HRW production totaled 662 million bushels, down 12 percent from 2017.

In the Soft Red Winter (SRW) growing area, planted and harvested acreage decreased from 2017. SRW production totaled 286 million bushels, down 3 percent from 2017.

White winter production totaled 236 million bushels, up 4 percent from the previous year. Harvested acreage in the Pacific Northwest (Idaho, Oregon, and Washington) was up less than 1 percent from 2017. Yields were up from last year throughout the region.

Other spring wheat: Production for 2018 was estimated at 623 million bushels, up 50 percent from the 2017 total of 416 million bushels. Harvested area totaled 12.9 million acres, up 27 percent from 2017. The U.S. yield was estimated at a record-high 48.3 bushels per acre, 7.3 bushels above 2017. Record-high yields were estimated in 2018 for Idaho and North Dakota. Of the total production, 587 million bushels were Hard Red Spring wheat, up 53 percent from the revised 2017 total.

Durum wheat: Production for 2018 was estimated at 77.3 million bushels, up 41 percent from the 2017 total of 54.8 million bushels. Area harvested for grain totaled 1.97 million acres, down 7 percent from the previous year. The U.S. yield was estimated at 39.3 bushels per acre, up 13.3 bushels from the 2017 yield. Production in North Dakota, the largest durum-producing state, was up 48 percent from 2017.

Rice: Production in 2018 totaled 224 million cwt, up 26 percent from the 2017 total. Planted area for 2018 was estimated at 2.95 million acres, up 20 percent from 2017. Area harvested, at 2.92 million acres, was up 23 percent from the previous crop year. The average yield for all U.S. rice was estimated at 7,692 pounds per acre, up 185 pounds from the 2017 average yield of 7,507 pounds per acre.

In all states, higher prices contributed to the increase in rice acres compared with the previous crop year.

Yields increased from the previous year in all states except Mississippi. Record-high yield and production values were estimated in Missouri.

All hay: Production of all dry hay for 2018 was estimated at 124 million tons, down 4 percent from the revised 2017 total. Area harvested was estimated at 52.8 million acres, up less than one percent from 2017. The average yield, at 2.34 tons per acre, was down 0.09 ton from the previous year.

Alfalfa and alfalfa mixtures: Production in 2018 was estimated at 52.6 million tons, down 6 percent from the revised 2017 total. Harvested area, at 16.6 million acres, was 2 percent below the previous year. Average yield was estimated at 3.17 tons per acre, down 0.11 ton from 2017.

The top three states for alfalfa acreage (Montana, North Dakota, and South Dakota) produced more alfalfa hay than last year due to improved moisture over the drought conditions of 2017. However, many other regions of the country had lower production. The Four Corners States dealt with dry conditions throughout much of 2018, while the Ohio River Valley struggled to find periods of dry weather to make hay.

Record-high yields were estimated in Nebraska and North Carolina.

All other hay: Production in 2018 totaled 71.0 million tons, down 2 percent from the revised 2017 total. Harvested area, at 36.2 million acres, was up 1 percent from the previous year. Average yield was estimated at 1.96 tons per acre, down 0.06 ton from 2017.

The top three states for other hay acreage (Texas, Oklahoma, and Missouri) reported lower yields than last year due to patches of dry conditions that persisted throughout much of the growing season.

Record-high yields were estimated in Alabama, California, Connecticut, Florida, Kentucky, Nebraska, New York, and North Carolina.

Forage: In 2018, seventeen states were included in the forage estimation program, which measures annual production of forage crops. Haylage and greenchop production was converted to 13 percent moisture and combined with dry hay production to derive the total forage production. The total 2018 all haylage and greenchop production for the 17 states in the forage program was 29.6 million tons, of which 19.1 million tons were from alfalfa and alfalfa mixtures. The 17-state total for all forage production was 79.8 million tons. Of this total, 41.9 million tons were produced from alfalfa and alfalfa mixtures.

Peanuts: Production was estimated at 5.46 billion pounds, down 23 percent from 2017. Planted area was estimated at 1.43 million acres, down 24 percent from 2017. Harvested area was estimated at 1.37 million acres, down 23 percent from 2017. The average yield was estimated at 3,991 pounds per acre, down 16 pounds from 2017.

Planted area for peanuts was estimated at its lowest level since 2014. Harvested area decreased in all states from last year. Production in 2018 was down from the previous year in all estimating states. In Georgia, growers realized the lowest production since 2016.

Canola: Production in 2018 was estimated at a record-high 3.62 billion pounds, up 18 percent from 2017. The average yield, at a record-high 1,861 pounds per acre, up 335 pounds from the 2017 average yield. Planted area was estimated at 1.99 million acres, 4 percent below the previous year's acreage. Harvested area, at 1.94 million acres, was down 3 percent from 2017.

Production in North Dakota, the leading canola-producing state, was estimated at 3.10 billion pounds. This was up 24 percent from the previous year and a record-high production for North Dakota. Planted and harvested area in North Dakota were both record highs.

North Dakota's average yield of 1,960 pounds per acre was the highest on record.

Sunflower: The 2018 sunflower production totaled 2.12 billion pounds, down 1 percent from 2017. The U.S. average yield per acre of 1,731 pounds increased 128 pounds from 2017. The average U.S. yield was a record high. Planted area, at 1.30 million acres, was 7 percent below the previous year. Area harvested decreased 8 percent from 2017 to 1.22 million acres.

South Dakota, the leading sunflower-producing state during 2018, produced 975 million pounds, a decrease of 4 percent from 2017. Compared with 2017, planted area in South Dakota decreased 8 percent but yield increased 105 pounds to 1,840 pounds per acre. Meanwhile, production in North Dakota increased 5 percent primarily due to average yield, which increased 6 percent from the previous year. The average yield in North Dakota increased 95 pounds from 2017 to 1,760 pounds per acre.

U.S. production of oil-type sunflower varieties, at 1.90 billion pounds, increased 3 percent from 2017. Compared with the previous year, harvested acres were down 6 percent, but the average yield increased by 144 pounds to 1,726 pounds per acre.

Production of non-oil sunflower varieties was estimated at 220 million pounds, a decrease of 24 percent from 2017. Area harvested, at 123,500 acres, was down 25 percent from 2017, and was the lowest on record back to 1975. The average yield increased by 31 pounds from 2017 to 1,781 pounds per acre and represented the second-highest yield on record for non-oil varieties.

Soybeans: Production in 2018 totaled a record-high 4.54 billion bushels, up 3 percent from 2017. The average yield was estimated at 51.6 bushels per acre, 2.3 bushels above 2017, but 0.3 bushel below the record-high yield in 2016. The nation's planted area, 89.2 million acres, was down 1 percent from the 2017 planted acreage. Soybean growers harvested 88.1 million acres, down 2 percent from last year.

Record-high yields occurred in Arkansas, Illinois, Indiana, Mississippi, New York, and Ohio.

The 2018 soybean objective-yield survey data indicated that final average pod counts were higher than last year in the combined eleven objective-yield states. Compared with final counts for 2017, pod counts were up in eight of the eleven published states. An increase of more than 200 pods per 18 square feet from 2017's final pod count occurred in Illinois, Indiana, Iowa, Nebraska, Ohio, and South Dakota.

Cotton: Upland cotton production was estimated at 17.6 million 480-pound bales, down 13 percent from the previous year. The U.S. yield for Upland cotton is estimated at 821 pounds per acre, down 74 pounds from 2017. Upland planted area, estimated at 13.9 million acres, was up 11 percent from last year. Harvested area, at 10.3 million acres, was down 5 percent from the previous year.

In the Southeast States (Alabama, Florida, Georgia, North Carolina, South Carolina, and Virginia), planting was completed by the end of June with some re-planting necessary due to rainy weather at the end of May. High temperatures helped the crop progress and the yields were looking very promising until Hurricane Florence hit the Carolinas in September. In October, Hurricane Michael hit Florida and Georgia, which were forecasting promising yields before the storm. The crop was in mostly good to excellent condition throughout the growing season where the hurricanes did not hit.

In the Delta region, planting was complete by mid-June. Some areas within the region struggled with excessive moisture throughout the season. Continued wet soils slowed harvest near the end of November into early December.

In Texas, a significant portion of the region's dryland crop did not make it to harvest. A string of days well above the 100-degree mark, coupled with the lack of measurable rainfall, caused conditions to worsen in already suffering dryland fields. Kansas planted a record amount of acres and Oklahoma planted the most since 1956.

American Pima producers planted 249,000 acres in 2018, down 1 percent from 2017. Harvested area, at 247,500 acres, was down 1 percent from the previous year. Production was estimated at 794,000 480-pound bales, up 14 percent from 2017. The U.S. yield is estimated at 1,540 pounds per acre, up 199 pounds from the previous year.

Ginnings totaled 16,662,700 running bales prior to February 1, compared with 18,653,900 running bales ginned prior to the same date last year.

Sugarbeets: Production for 2018 was estimated at 33.1 million tons, down 6 percent from the previous year's revised production. Growers in the eleven major sugarbeet-producing states planted 1.11 million acres, down 2 percent from the 2017 revised area. Harvested area, at 1.10 million acres, was down 2 percent from the previous year. Estimated yield, at 30.3 tons per acre, was down 1.4 tons from last year.

Sugarcane: Production of sugarcane for sugar and seed in 2018 was estimated at 34.8 million tons, of which 32.8 million tons were utilized for sugar and 1.93 million tons for seed. Total production for sugar and seed was up 5 percent from 2017. Sugarcane producers harvested 908,200 acres for sugar and seed in 2018, up slightly from the previous year. Yield for sugar and seed was estimated at 38.3 tons per acre, up 1.5 tons from 2017.

International Weather and Crop Summary

February 3-9, 2019

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

HIGHLIGHTS

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

MIDDLE EAST: Moderate to heavy rain and mountain snow continued across much of the region, maintaining abundant to locally excessive moisture supplies for winter grains.

NORTHWESTERN AFRICA: Early-week rain in the east contrasted with dry weather over central and western growing areas.

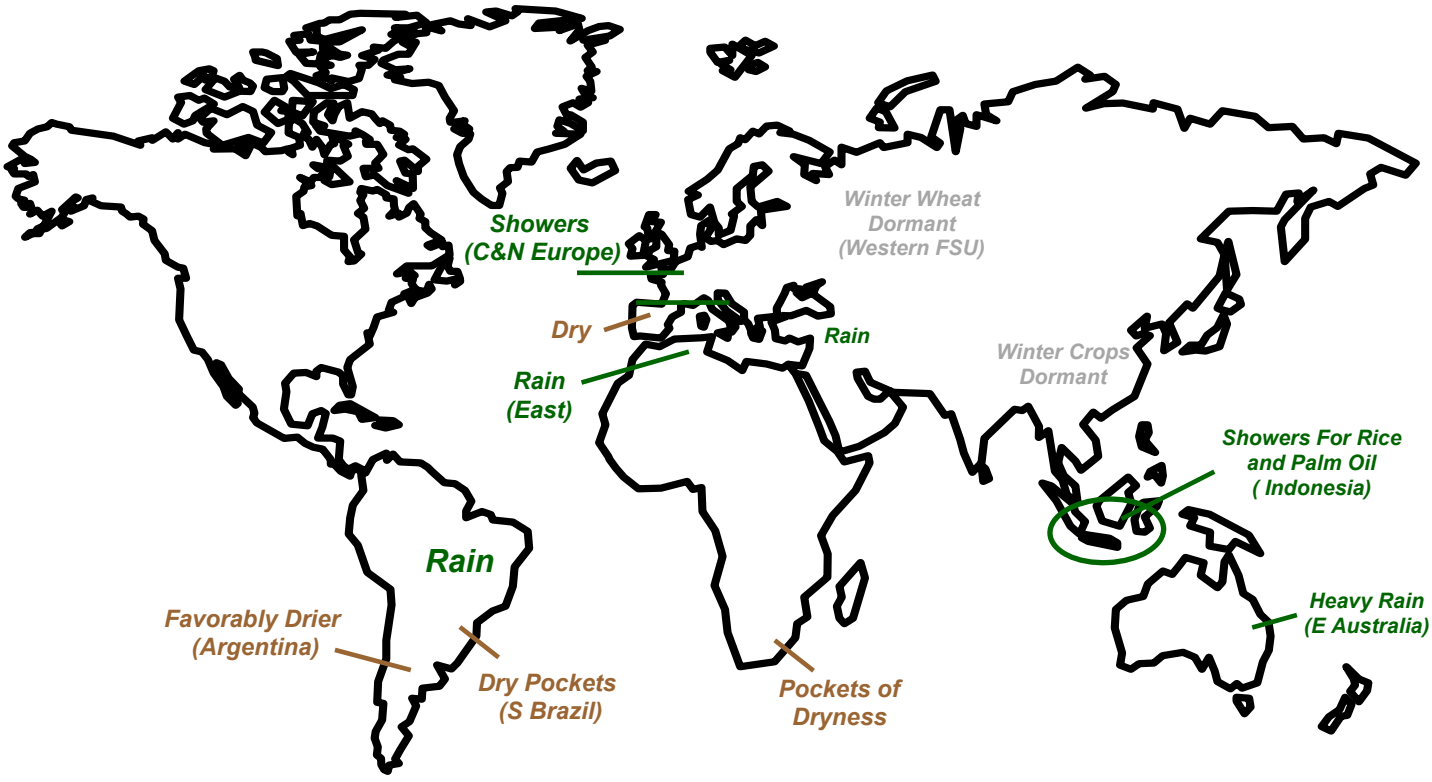
SOUTHEAST ASIA: Showers in Indonesia continued to benefit oil palm and reproductive rice.

AUSTRALIA: The heavy rain in the east remained well north of major cotton and sorghum producing areas.

SOUTH AFRICA: Showers and summer warmth spurred summer crop growth, though pockets of dryness returned to western growing areas.

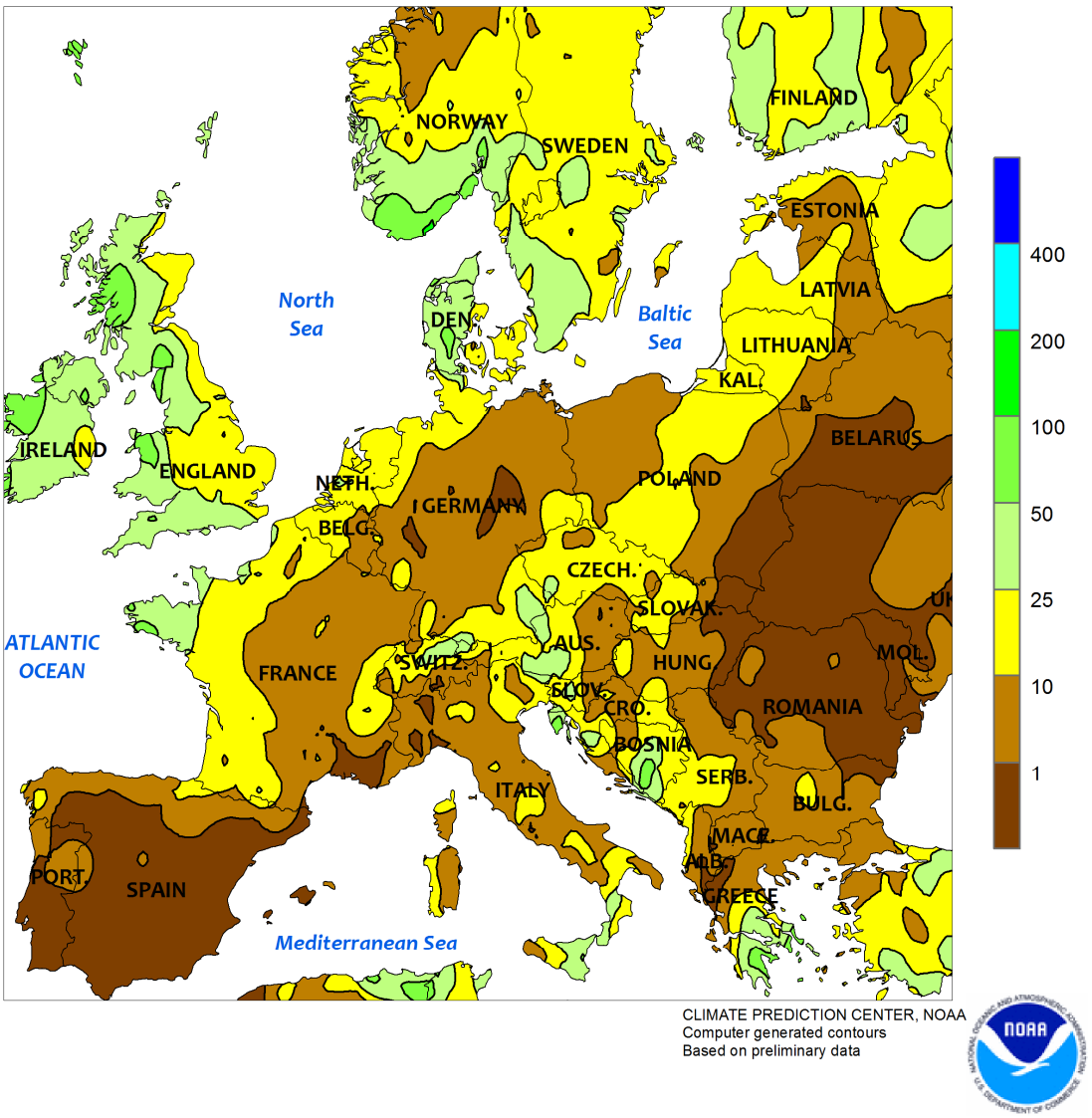
ARGENTINA: Sunny skies benefited corn and soybeans growing with adequate to abundant levels of moisture.

BRAZIL: Showers intensified in northern farming areas but pockets of dryness persisted in southern soybean areas.



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

EUROPE
Total Precipitation (mm)
FEB 3 - 9, 2019



EUROPE

Milder weather returned to the continent, with widespread rain in central and northern Europe contrasting with dry conditions on the Iberian Peninsula. Temperatures averaged 2 to 5°C above normal over most of the continent, with readings up to 8°C above normal in the Balkans. Despite the warmth, winter crops remained dormant with weekly average temperatures at or below 5°C from northeastern France into most of eastern Europe. Rain was widespread, with the highest amounts (10-50 mm, locally more) from western France into England and from southern Germany northeastward through central Poland into the Baltic States. Even outside these two ribbons of heavier rainfall, amounts routinely totaled 5 to 10 mm. Despite the widespread rain, dry weather returned to the Iberian Peninsula; rain during the cool growing season has been sporadic, averaging 50 to 75 percent of normal over the past 90 days in this region's winter grain areas. However, Spain's wheat and barley are still vegetative and have plenty of time to benefit from an increase in rainfall.

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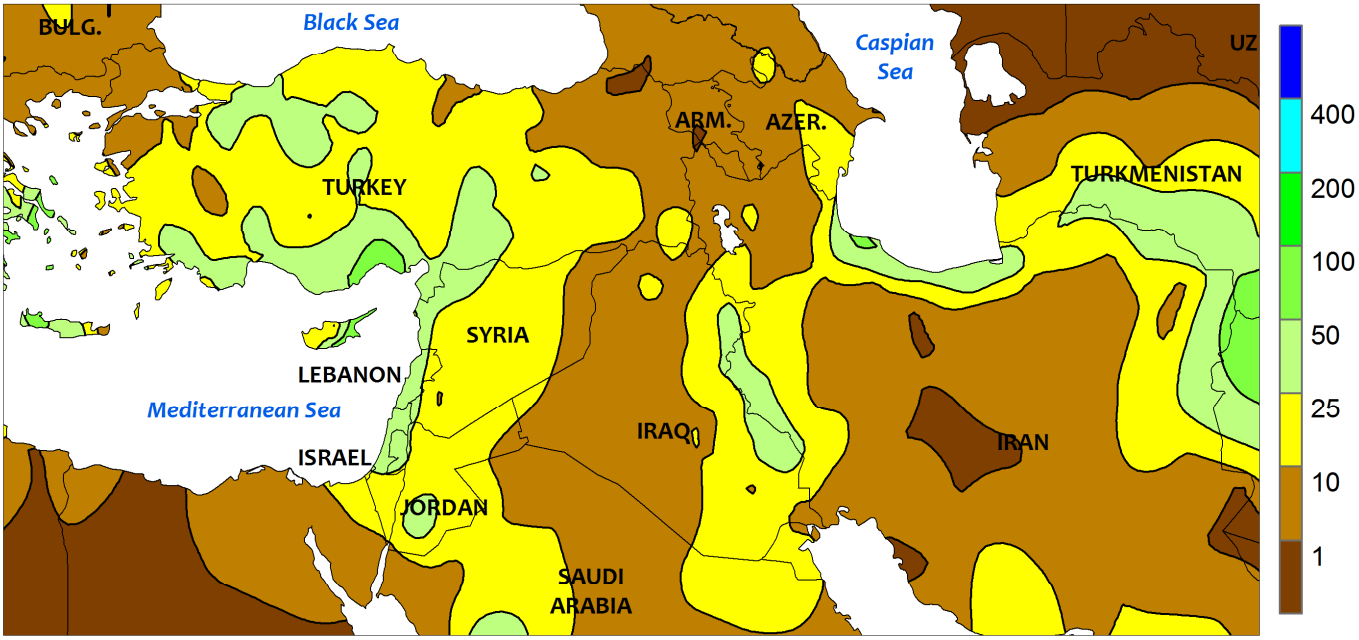
MIDDLE EAST
Total Precipitation (mm)
FEB 3 - 9, 2019



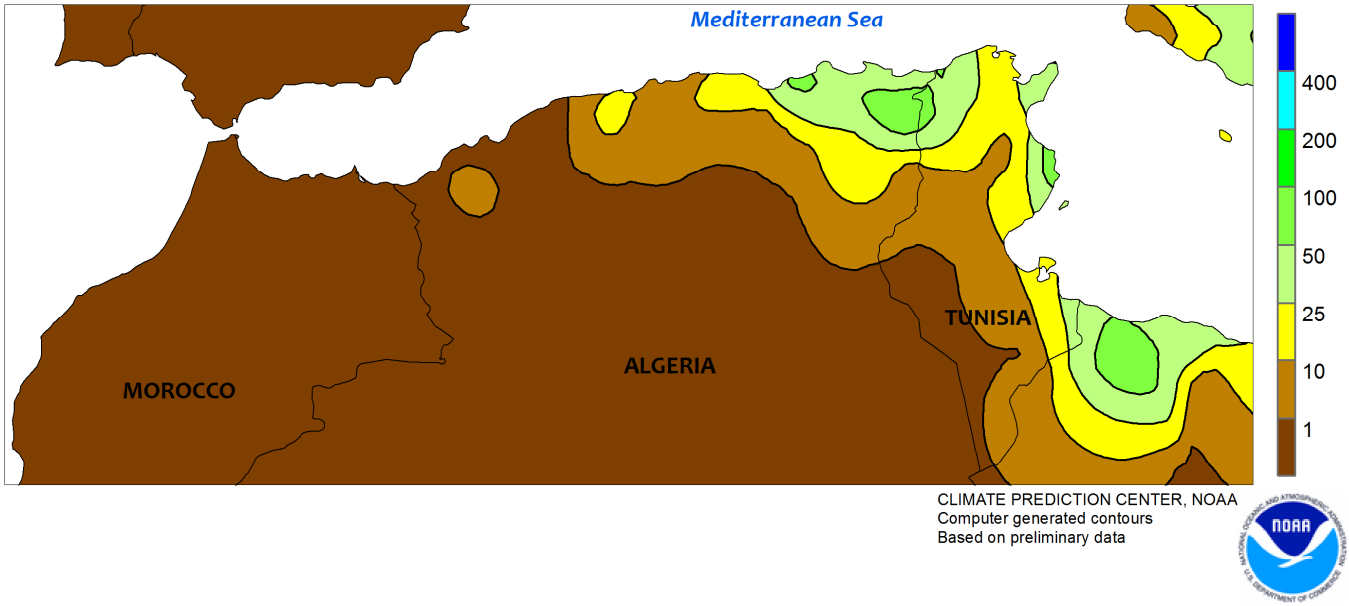
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary data

MIDDLE EAST

The season-long wet weather pattern continued across the Middle East. Over the past week, a slow-moving storm system brought widespread moderate to heavy rain and mountain snow (10-50 mm liquid equivalent) from Turkey and the eastern Mediterranean Coast into western and northern Iran. This week's precipitation pushed 90-day totals to more than 200 percent of normal (locally more than 400 percent) over vast stretches of primary winter grain areas. Unusually heavy rain (locally more than 25 mm) was reported in Jordan and Saudi Arabia, providing additional supplemental moisture for pockets of irrigated winter barley. Despite the stormy weather, temperatures during the past week averaged 2 to 9°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
Total Precipitation (mm)
FEB 3 - 9, 2019

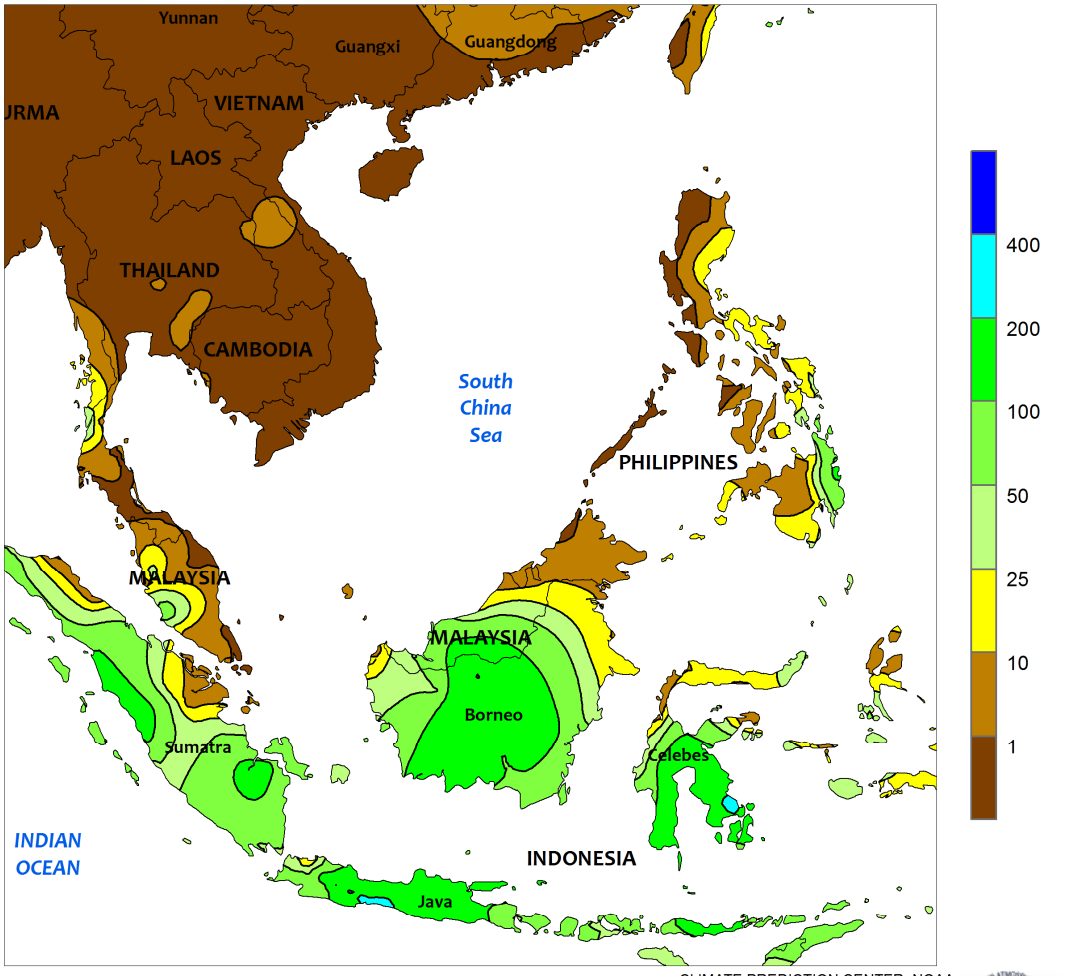


NORTHWESTERN AFRICA

Early-week rainfall in eastern-most growing areas contrasted with a developing dry trend in the west. Early in the period, a departing Mediterranean storm system produced another 10 to 80 mm of rain from northeastern Algeria into northern Tunisia, pushing 30-day totals above 100 mm (locally more than 200 mm) for vegetative wheat and barley in these growing areas. In contrast, an expansive area of high pressure anchored over the northeastern Atlantic Ocean maintained dry, sunny weather from Morocco into central Algeria. In Morocco (the region's leading wheat and barley producer), 30-day dryness (less than 50 percent of normal) has been most pronounced in southwestern growing areas, while 90-day deficits (75 percent of normal or less) are more widespread across the country. Winter grains are approaching the heading stage in southern Morocco, but still several weeks away from reproduction in the country's primary northern production areas. Winter crop prospects in the west range from fair in southwestern Morocco to good in northern Morocco and western Algeria. Farther east, winter grain prospects remained good to excellent owing to abundant season-to-date rainfall.

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

SOUTHEAST ASIA
Total Precipitation (mm)
FEB 3 - 9, 2019



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

SOUTHEAST ASIA

Seasonably heavy showers continued throughout Indonesia, maintaining good soil moisture for oil palm and rice. In Java, Indonesia, both the western and eastern third of the island received in excess of 25 mm of rain, while the central zone topped 100 mm. Seasonally (since November 1), rainfall totals have been above last year across Java and above the long-term average in all but the western third of Java. For oil palm, 90-day rainfall totals have been near to above normal, sustaining good yield prospects. In contrast, soil moisture for oil palm in Malaysia has been below average over the last 90 days, and more rain will be needed in the next few months to prevent yield declines. Meanwhile, drier-than-normal weather returned to the Philippines, lowering moisture supplies for rice and corn. Indeed, rainfall totals over the last three months in key northern-growing areas are the lowest since 2010.

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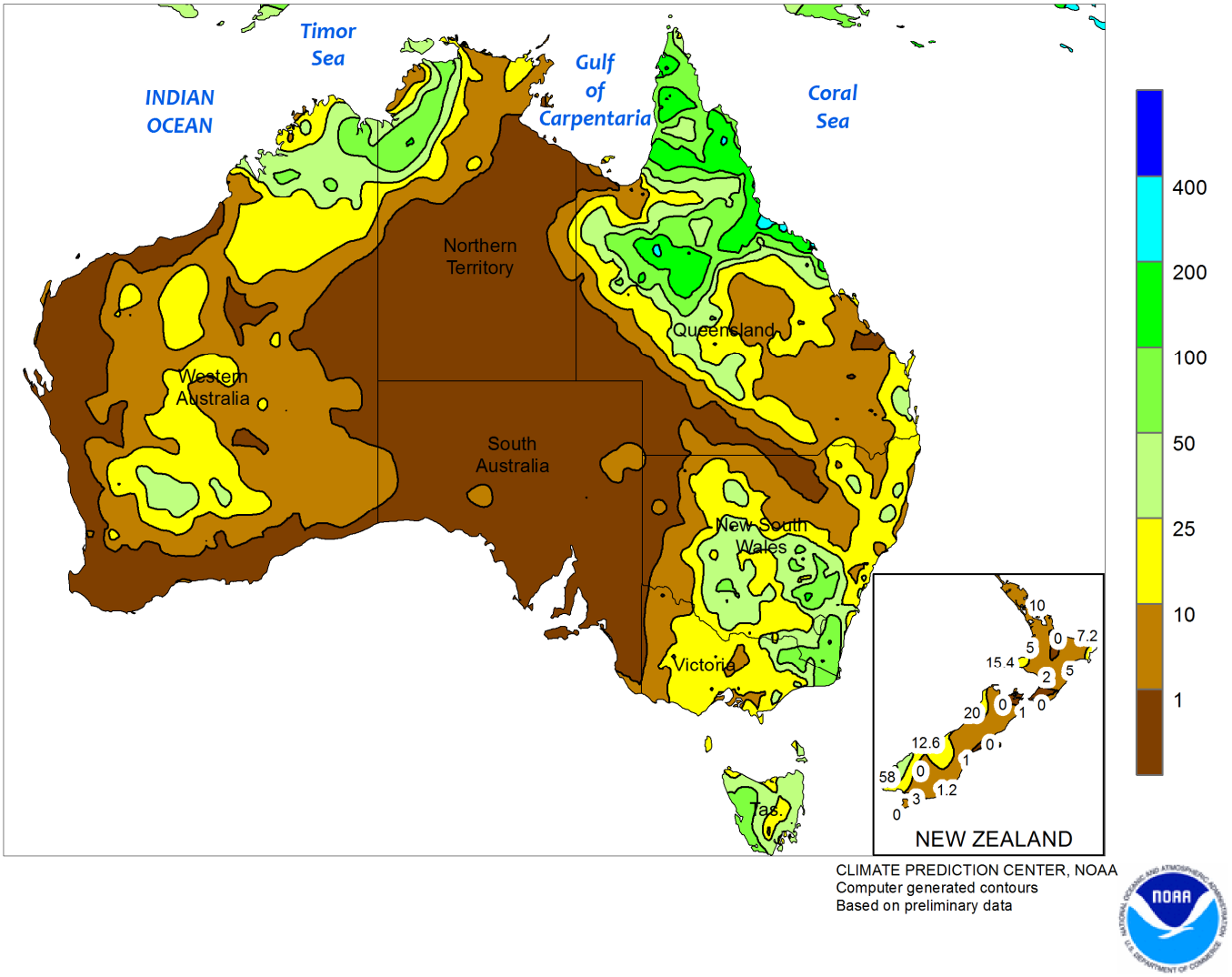
AUSTRALIA
Total Precipitation (mm)
FEB 3 - 9, 2019



AUSTRALIA

Torrential rain (50-400 mm or more) continued to soak northern and central Queensland, exacerbating local flooding and potentially causing some damage to sugarcane. The heavy rain remained well north of major cotton and sorghum producing areas, however, offering no relief to immature summer crops which could benefit from more moisture. Indeed, hot, mostly dry weather (primarily less than 5 mm) continued to stress dryland summer crops in southern Queensland and northern New South Wales, while also maintaining the need to water irrigated crops. Although the weather was unfavorable for immature dryland crops, the heat and dryness promoted maturation and harvesting of sorghum sown early in the growing season. Elsewhere in eastern Australia, widespread showers (5-25 mm, locally near 50 mm) in central and southern New South Wales sustained moisture supplies for immature summer crops but hot weather maintained greater-than-normal evaporation rates. Temperatures averaged 2 to 4°C above normal in New South Wales and 1 to 2°C above normal in southern Queensland.

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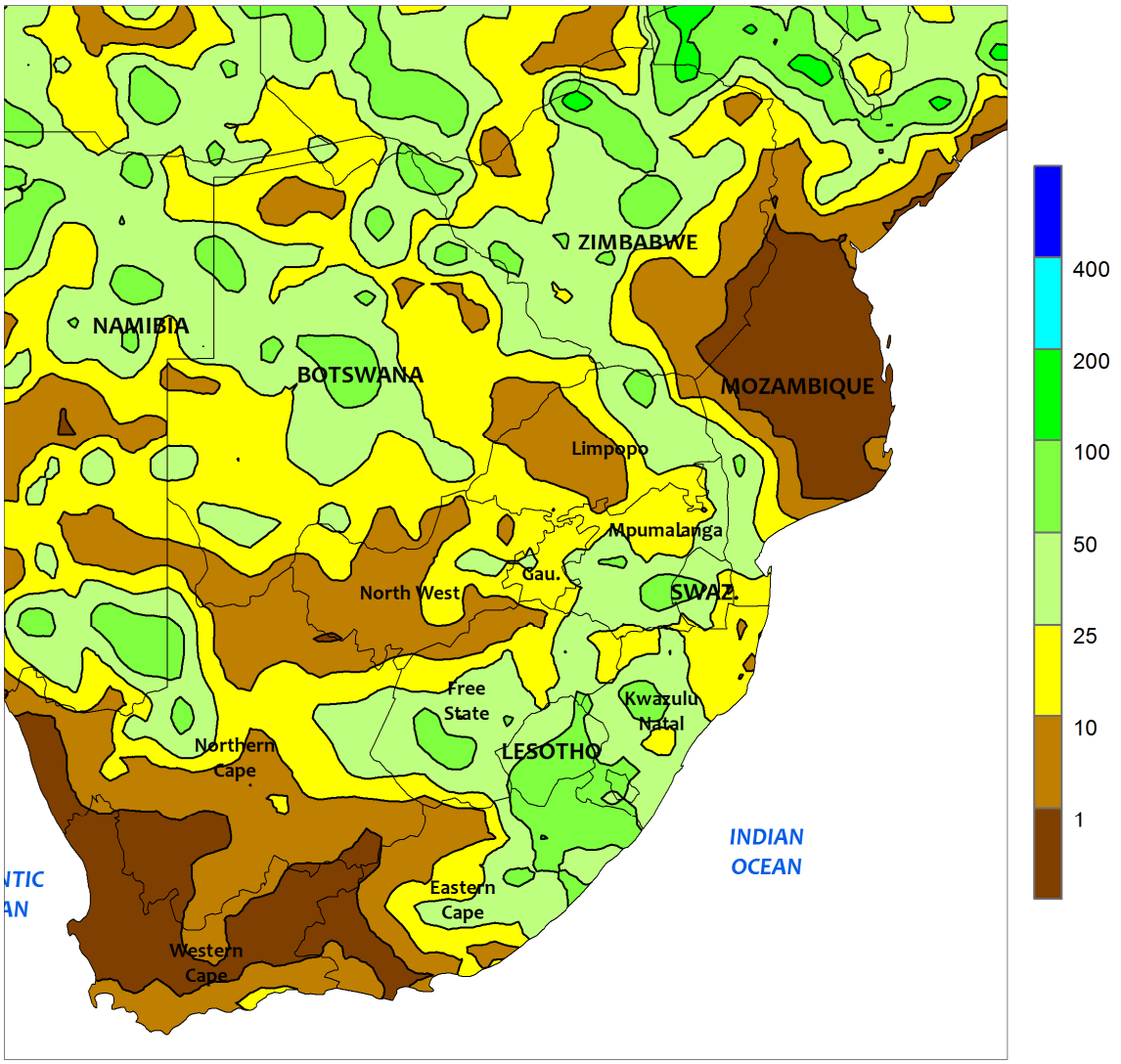
SOUTH AFRICA
Total Precipitation (mm)
FEB 3 - 9, 2019



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

SOUTH AFRICA

Warm, showery weather overspread the corn belt, though pockets of dryness returned to key western farming areas. Rainfall totaled 3 to 35 mm from North West and Free State northeastward through Mpumalanga and Limpopo, where near- to above-normal temperatures (daytime highs reaching the upper 20s and lower 30s degrees C) fostered rapid rates of crop development. Following last week's abundant rainfall, pockets of dryness returned to commercial white corn areas bordering North West and Free State; additional rainfall would be welcomed to further stabilize conditions of late-planted corn advancing toward reproduction. Elsewhere, moderate to heavy rain (10-25 mm, locally exceeding 50 mm) stretched from Eastern Cape northeastward through KwaZulu-Natal, benefiting corn, sugarcane, and other rain-fed crops. Warmth (daytime highs approaching 40°C) and dryness spurred development of irrigated sugarcane in eastern Mpumalanga. Meanwhile, scattered showers (5-25 mm, locally higher) boosted irrigation reserves for corn and cotton in the Orange River Valley. In contrast, hot, sunny weather (highs in excess of 40°C) fostered rapid maturation of tree and vine crops in Western Cape.

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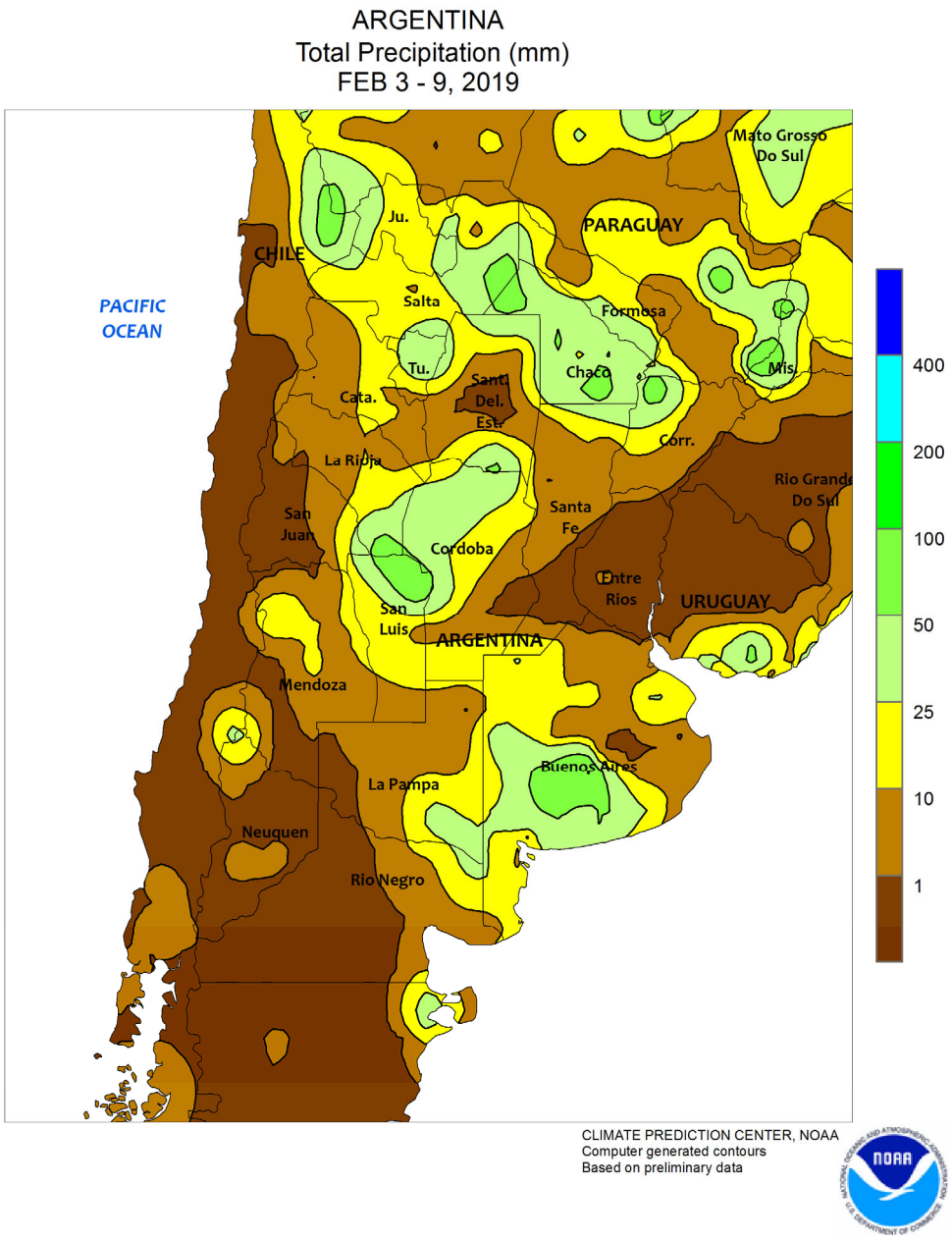

ARGENTINA

Warm, sunny weather fostered rapid development of summer crops, following a general trend of above-normal rainfall which has dominated much of the season. Dry weather prevailed for much of the week between La Pampa and Buenos Aires northward through Santa Fe and Corrientes; by week's end, however, moderate to heavy rain (10-25 mm, locally higher) had returned to southern and western farming areas, with highest amounts in south-central Buenos Aires. Farther north, moderate rain (greater than 10 mm) fell from western and northern Cordoba to Salta, stretching eastward into Chaco. Weekly temperatures averaged near to slightly above normal, with daytime highs reaching 40°C in and around Formosa. Otherwise, daytime highs were capped in the lower and middle 30s degrees C, with the warmest weather occurring during the latter half of the week. Reports emanating from Argentina depicted corn and soybean conditions as being rated much higher than last year's drought-reduced crops.

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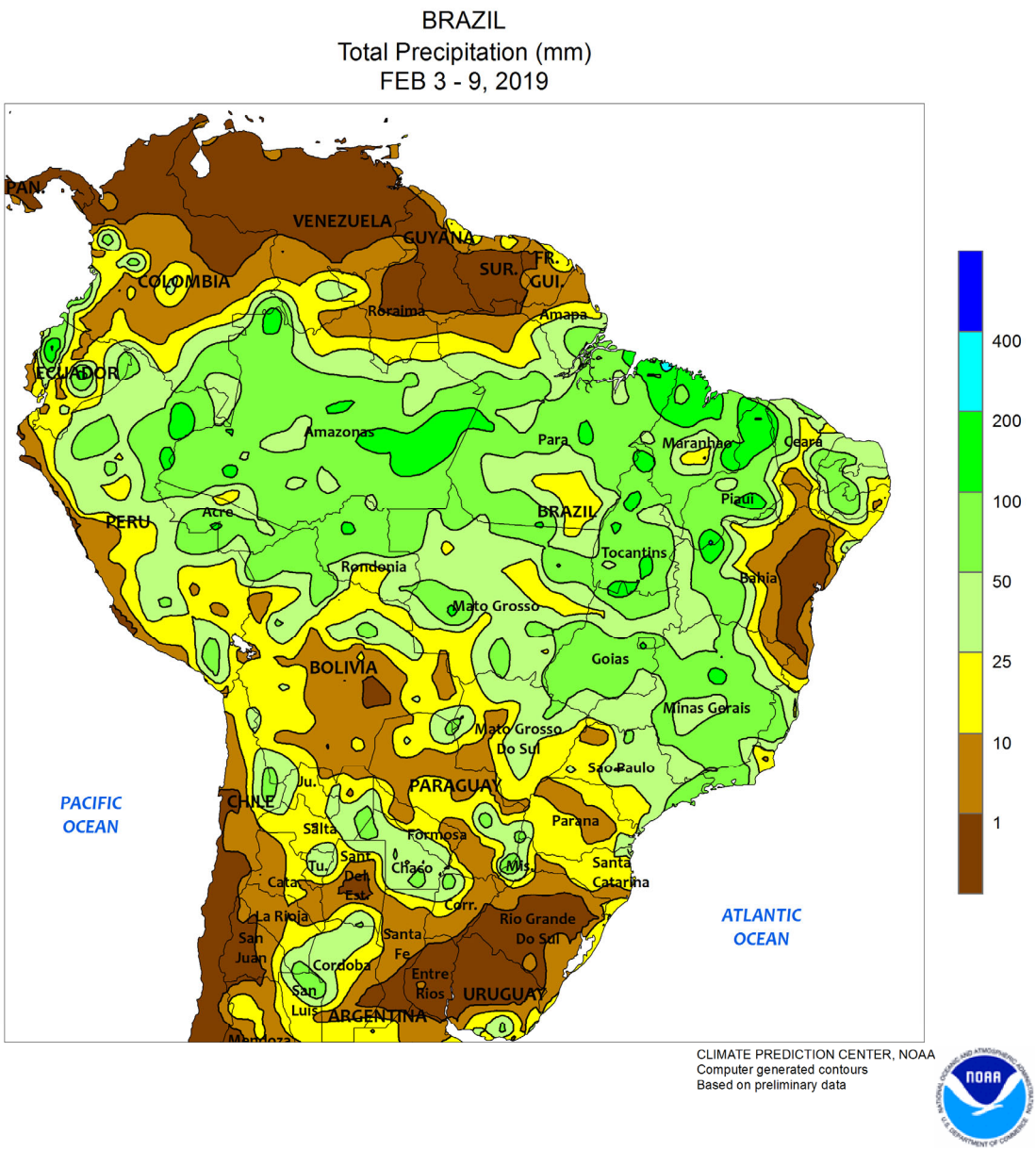

BRAZIL

Showers intensified across much of central and northeastern Brazil, boosting moisture for second-crop corn and cotton. Rainfall totaled 25 to more than 50 mm from northern and eastern Mato Grosso eastward, including previously dry locations in Goias, Minas Gerais, and western Bahia. While above-normal temperatures (daytime highs exceeding 35°C in spots) maintained high evaporative losses, the moisture sustained favorable conditions for immature summer crops, including coffee and emerging second-season row crops. According to the government of Mato Grosso, soybeans were 53 percent harvested as of February 8, more than 20 points ahead of the 5-year average; as a result of the early soybean harvest, corn was 52 percent planted, 25 points ahead of average. Farther south, mostly dry, occasionally warm weather dominated, with rainfall totaling less than 25 mm at most locations from Sao Paulo southward through Rio Grande do Sul. Daytime highs reached 35°C on several days, continuing this season's trend of occasional unseasonable warmth. According to the government of Parana, soybeans and first-crop corn were 25 and 8 percent harvested, respectively, as of February 4; meanwhile, second-crop corn was 38 percent planted.

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U.S. Crop Production Highlights

The following information was released by USDA's Agricultural Statistics Board on February 8, 2019. This report also contains information normally published in the January report, which was not issued due to the lapse in federal funding. The additional estimates include January 1, 2019, forecasted production of the 2018-2019 citrus crops.

The **U.S. all orange** forecast for the 2018-2019 season is 5.54 million tons, unchanged from last month but up 41 percent from the 2017-2018 final utilization.

The Florida all orange forecast, at 77.0 million boxes (3.47 million tons), is unchanged from last month but up 71 percent from last season's final utilization. Early, midseason, and Navel varieties in Florida are forecast at 32.0 million boxes (1.44 million tons), unchanged from last month but up 69 percent from last season's final utilization. The Florida Valencia orange forecast, at 45.0 million boxes (2.03 million tons), is unchanged from last month but up 73 percent from last season's final utilization.

California and Texas orange production forecasts were carried forward from the January 1 forecast.

(Continued from page 19)

In the contiguous U.S., warm-season drought (D1 to D4) coverage peaked at 36.21 percent on August 14, according to the U.S. Drought Monitor. However, there was a marked autumn decrease in drought coverage, especially in the central and eastern U.S. By November 13, drought covered just 20.94 percent of the Lower 48 States. By December 4, drought was nearly non-existent across the central and eastern U.S., but covered 54 percent of the eleven Western States. A core area of extreme to exceptional drought (D3 to D4) persisted into early December across the Four Corners region, covering 27 percent of Colorado, 21 percent of New Mexico, 13 percent of Arizona, and 8 percent of Utah.

Autumn generally started warm and ended cold. Overall, it was the 55th-warmest autumn during the 1895-2018 period of record, but the coolest since 2006. The nation's autumn average temperature of 53.8°F was one-quarter degree above the 20th century mean. State temperature rankings ranged from the 12th-coldest autumn in North Dakota to the third-warmest autumn in Florida (figure 11). Six states joined Florida in having a top-ten ranking for autumn warmth. Meanwhile, the U.S. weathered its second-wettest autumn, behind only 1985. Autumn precipitation averaged 9.61 inches, 140 percent of normal. Oregon noted its 26th-driest autumn, but top-ten wetness covered 22 states from the central and southern Plains into the Midwest and East. It was the wettest autumn on record in Maryland, New Jersey, North Carolina, Rhode Island, Texas, Virginia, and West Virginia (figure 12).

December

A complete summary appeared in the *Bulletin* dated January 30, 2019 (Vol. 106, No. 2), starting on page 7.

The *Weekly Weather and Crop Bulletin* (ISSN 0043-1974) is jointly prepared by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA) and the U.S. Department of Agriculture (USDA). Publication began in 1872 as the *Weekly Weather Chronicle*. It is issued under general authority of the Act of January 12, 1895 (44-USC 213), 53rd Congress, 3rd Session. The contents may be redistributed freely with proper credit.

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