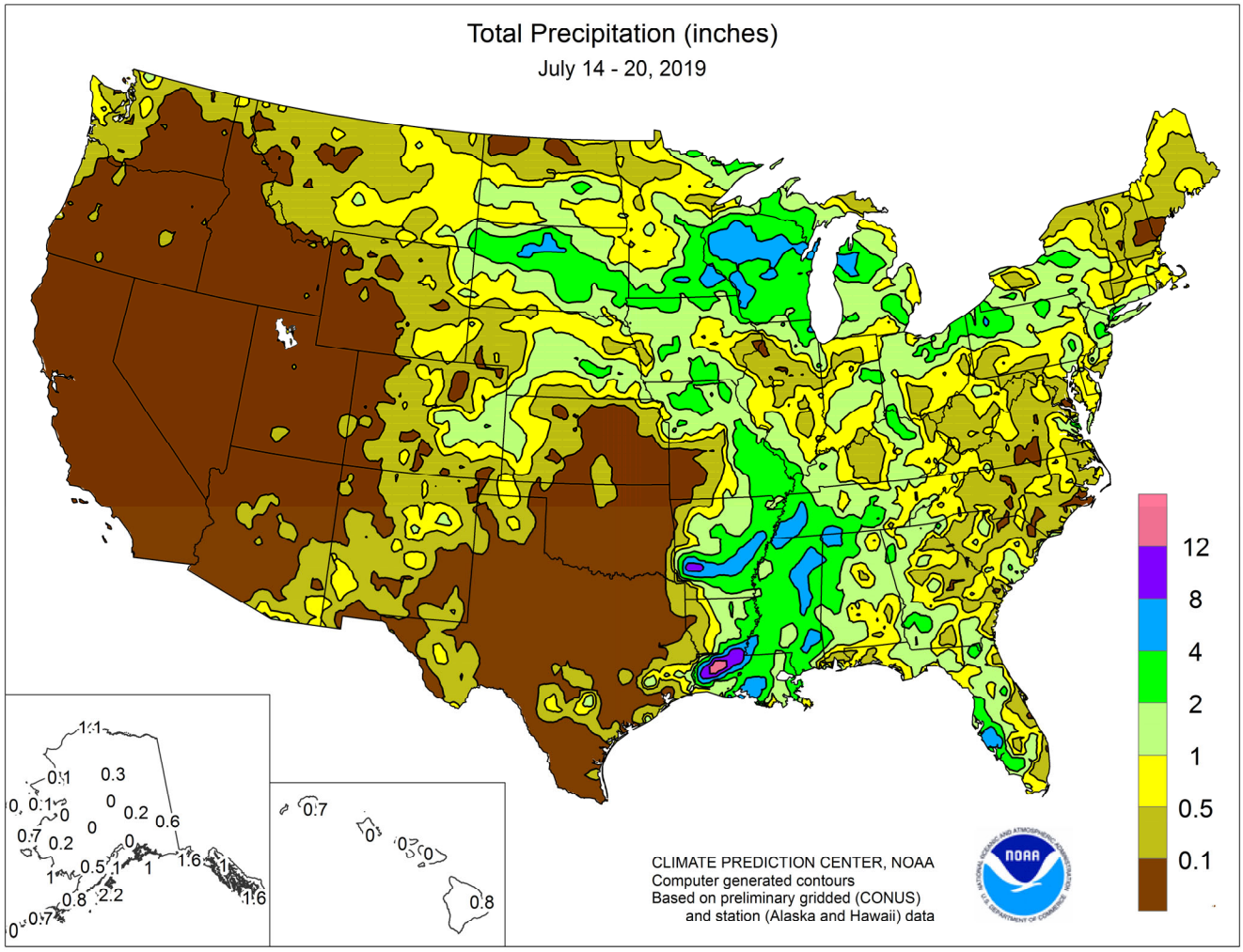
Volume 106, No. 30 http://www.usda.gov/oce/weather July 23, 2019

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
July 14 – 20, 2019

Highlights provided by USDA/WAOB

The remnants of Hurricane Barry drifted northward into the **Ohio Valley**, delivering widespread rainfall that mostly benefited summer crops but also sparked some flash flooding. Some of the heaviest rain, locally 4 to 8 inches or more, fell in portions of the **Mississippi Delta States**. Meanwhile, several cold fronts crossed the **North**, generating showers and locally severe thunderstorms from the **northern Plains into the Northeast**. Some of the highest totals, as much as 2 to 4 inches or more, fell from the **Dakotas into Michigan**, locally accompanied by high

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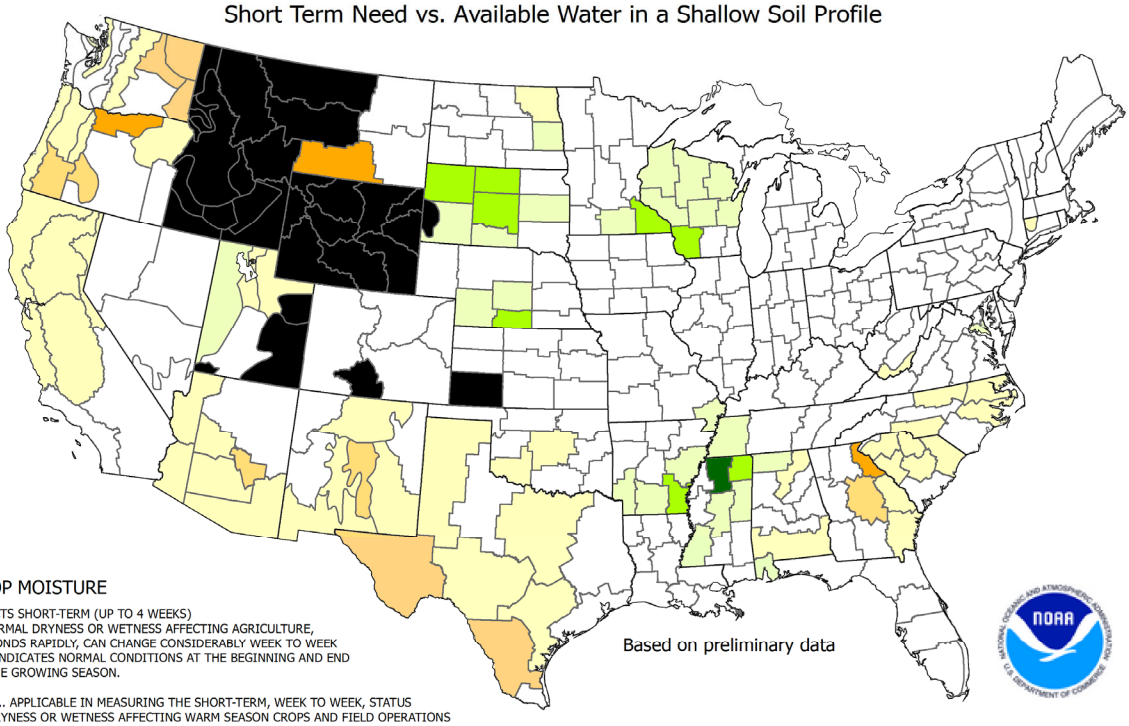
Contents

Crop Moisture Index by Division
Weekly Value for Period Ending Jul 20, 2019
Short Term Need vs. Available Water in a Shallow Soil Profile



Based on preliminary data

CROP MOISTURE

DEPICTS SHORT-TERM (UP TO 4 WEEKS) ABNORMAL DRYNESS OR WETNESS AFFECTING AGRICULTURE, RESPONDS RAPIDLY, CAN CHANGE CONSIDERABLY WEEK TO WEEK AND INDICATES NORMAL CONDITIONS AT THE BEGINNING AND END OF THE GROWING SEASON.

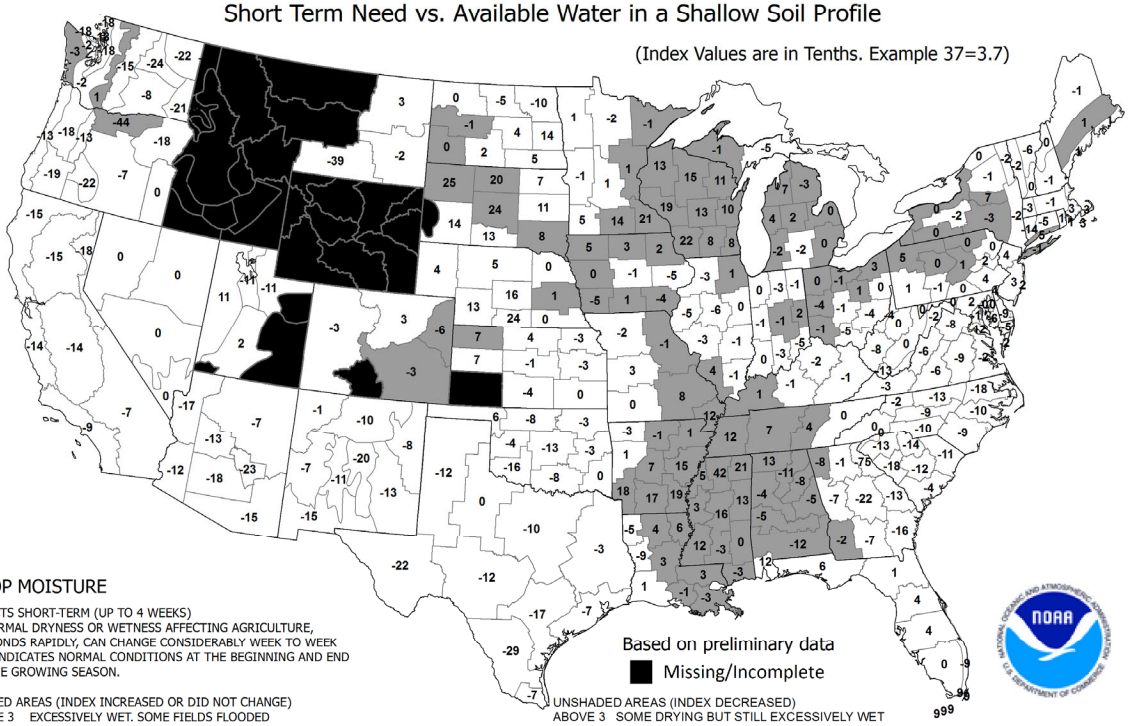
USES... APPLICABLE IN MEASURING THE SHORT-TERM, WEEK TO WEEK, STATUS OF DRYNESS OR WETNESS AFFECTING WARM SEASON CROPS AND FIELD OPERATIONS

LIMITATIONS... MAY NOT BE APPLICABLE TO GERMINATING AND SHALLOW ROOTED CROPS WHICH ARE UNABLE TO EXTRACT THE DEEP OR SUBSOIL MOISTURE FROM A SHALLOW SOIL PROFILE,OR FOR COOL SEASON CROPS GROWING WHEN TEMPERATURES ARE AVERAGING BELOW ABOUT 55F.IT IS NOT GENERALLY INDICATIVE OF THE LONG-TERM (MONTHS, YEARS) DROUGHT OR WET SPELLS WHICH ARE DEPICTED BY THE DROUGHT SEVERITY INDEX.

- -3.0 or less (Severly Dry)
- -2.0 to -2.9 (Excessively Dry)
- -1.0 to -1.9 (Abnormally Dry)
- -0.9 to +0.9 (Slightly Dry/Favorably Moist)
- +1.0 to +1.9 (Abnormally Moist)
- +2.0 to +3.0 (Wet)
- 3.0 and above (Excessively Wet)
- Missing/Incomplete

Crop Moisture Index by Division
Weekly Value for Period Ending Jul 20, 2019
Short Term Need vs. Available Water in a Shallow Soil Profile

(Index Values are in Tenths. Example 37=3.7)



Based on preliminary data

Missing/Incomplete

CROP MOISTURE

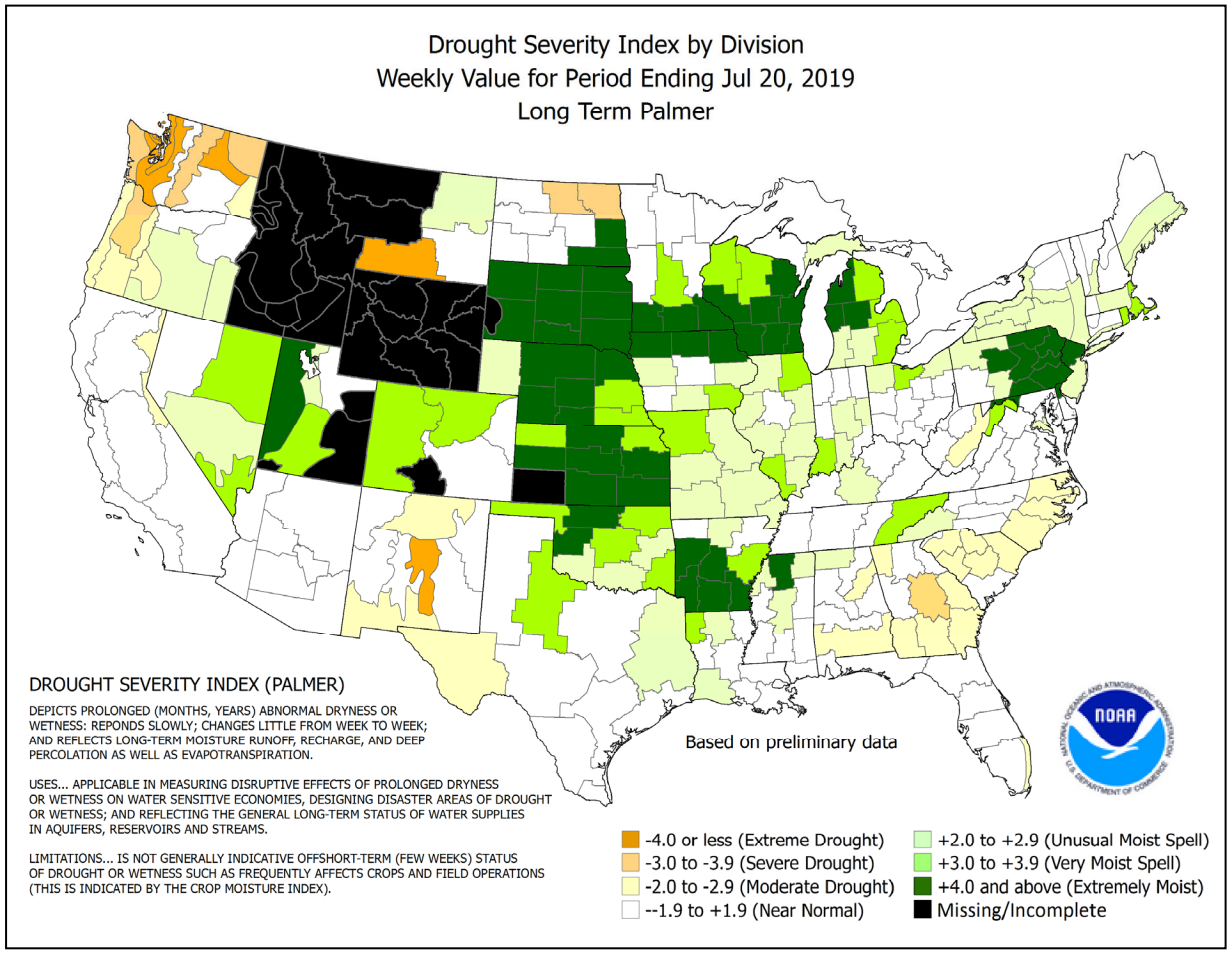
DEPICTS SHORT-TERM (UP TO 4 WEEKS) ABNORMAL DRYNESS OR WETNESS AFFECTING AGRICULTURE, RESPONDS RAPIDLY, CAN CHANGE CONSIDERABLY WEEK TO WEEK AND INDICATES NORMAL CONDITIONS AT THE BEGINNING AND END OF THE GROWING SEASON.

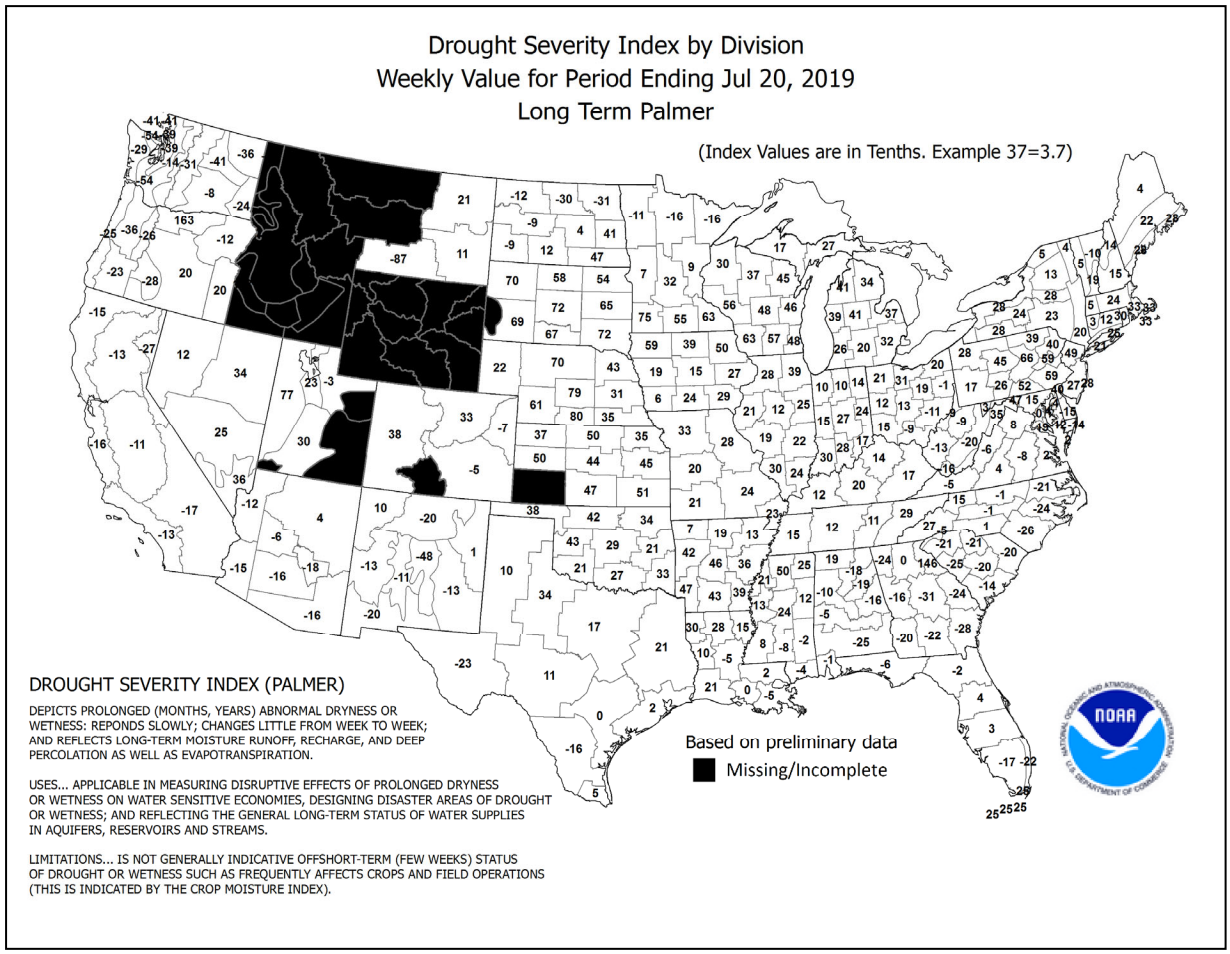
SHADED AREAS (INDEX INCREASED OR DID NOT CHANGE)

ABOVE 3	EXCESSIVELY WET. SOME FIELDS FLOODED
2 TO 3	TOO WET. SOME STANDING WATER
1 TO 2	SOME FIELDS TOO WET, PROSPECTS ABOVE NORMAL
0 TO 1	MOISTURE ADEQUATE FOR PRESENT CROP NEEDS
0 TO -1	PROSPECTS IMPROVED BUT RAIN STILL NEEDED
-1 TO -2	SOME IMPROVEMENT BUT STILL ABNORMALLY DRY
-2 TO -3	DRYNESS EASED BUT FIELDS STILL EXCESSIVELY DRY
-3 TO -4	SEVERE DRYNESS CONTINUES, MORE RAIN URGENTLY NEEDED
BELOW -4	NOT ENOUGH RAIN. EXTREMELY DRY

UNSHADED AREAS (INDEX DECREASED)

ABOVE 3	SOME DRYING BUT STILL EXCESSIVELY WET
2 TO 3	MORE DRY WEATHER NEEDED, WORK DELAYED
1 TO 2	FAVORABLE EXCEPT STILL TOO WET IN SPOTS
0 TO 1	FAVORABLE FOR NORMAL GROWTH AND FIELDWORK
0 TO -1	TOPSOIL MOISTURE SHORT, GERMINATION SLOW
-1 TO -2	ABNORMALLY DRY. PROSPECTS DETERIORATING
-2 TO -3	EXCESSIVELY DRY. YIELD PROSPECTS REDUCED
-3 TO -4	POTENTIAL YIELDS SEVERELY CUT BY DRYNESS
BELOW -4	EXTREMELY DRY. CROPS RUINED


Drought Severity Index by Division
Weekly Value for Period Ending Jul 20, 2019
Long Term Palmer
DROUGHT SEVERITY INDEX (PALMER)
DEPICTS PROLONGED (MONTHS, YEARS) ABNORMAL DRYNESS OR WETNESS: REPONDS SLOWLY; CHANGES LITTLE FROM WEEK TO WEEK; AND REFLECTS LONG-TERM MOISTURE RUNOFF, RECHARGE, AND DEEP PERCOLATION AS WELL AS EVAPOTRANSPIRATION.
USES... APPLICABLE IN MEASURING DISRUPTIVE EFFECTS OF PROLONGED DRYNESS OR WETNESS ON WATER SENSITIVE ECONOMIES, DESIGNING DISASTER AREAS OF DROUGHT OR WETNESS; AND REFLECTING THE GENERAL LONG-TERM STATUS OF WATER SUPPLIES IN AQUIFERS, RESERVOIRS AND STREAMS.
LIMITATIONS... IS NOT GENERALLY INDICATIVE OFFSHORT-TERM (FEW WEEKS) STATUS OF DROUGHT OR WETNESS SUCH AS FREQUENTLY AFFECTS CROPS AND FIELD OPERATIONS (THIS IS INDICATED BY THE CROP MOISTURE INDEX).
Based on preliminary data
-4.0 or less (Extreme Drought)
-3.0 to -3.9 (Severe Drought)
-2.0 to -2.9 (Moderate Drought)
--1.9 to +1.9 (Near Normal)
+2.0 to +2.9 (Unusual Moist Spell)
+3.0 to +3.9 (Very Moist Spell)
+4.0 and above (Extremely Moist)
Missing/Incomplete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Long Term Palmer
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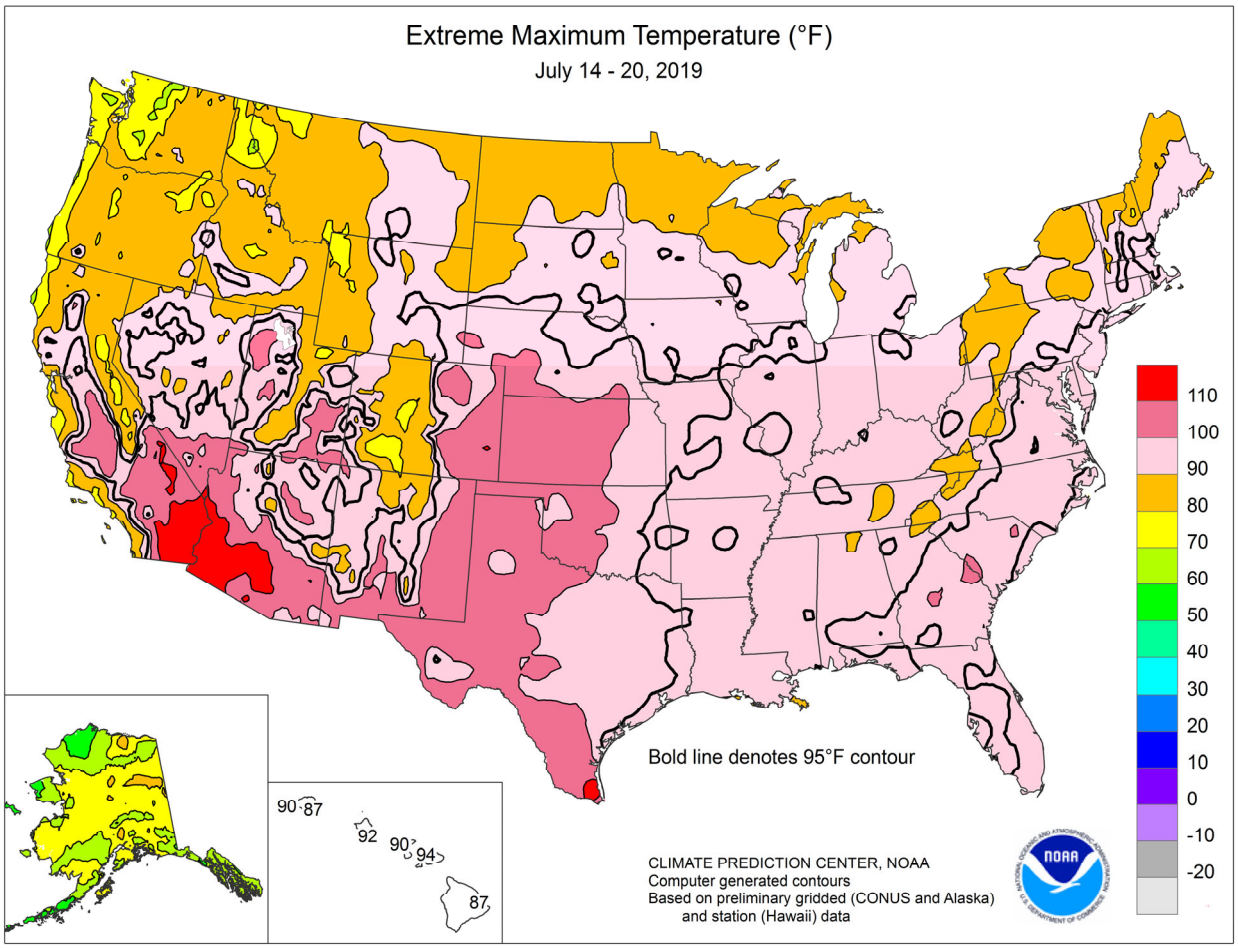
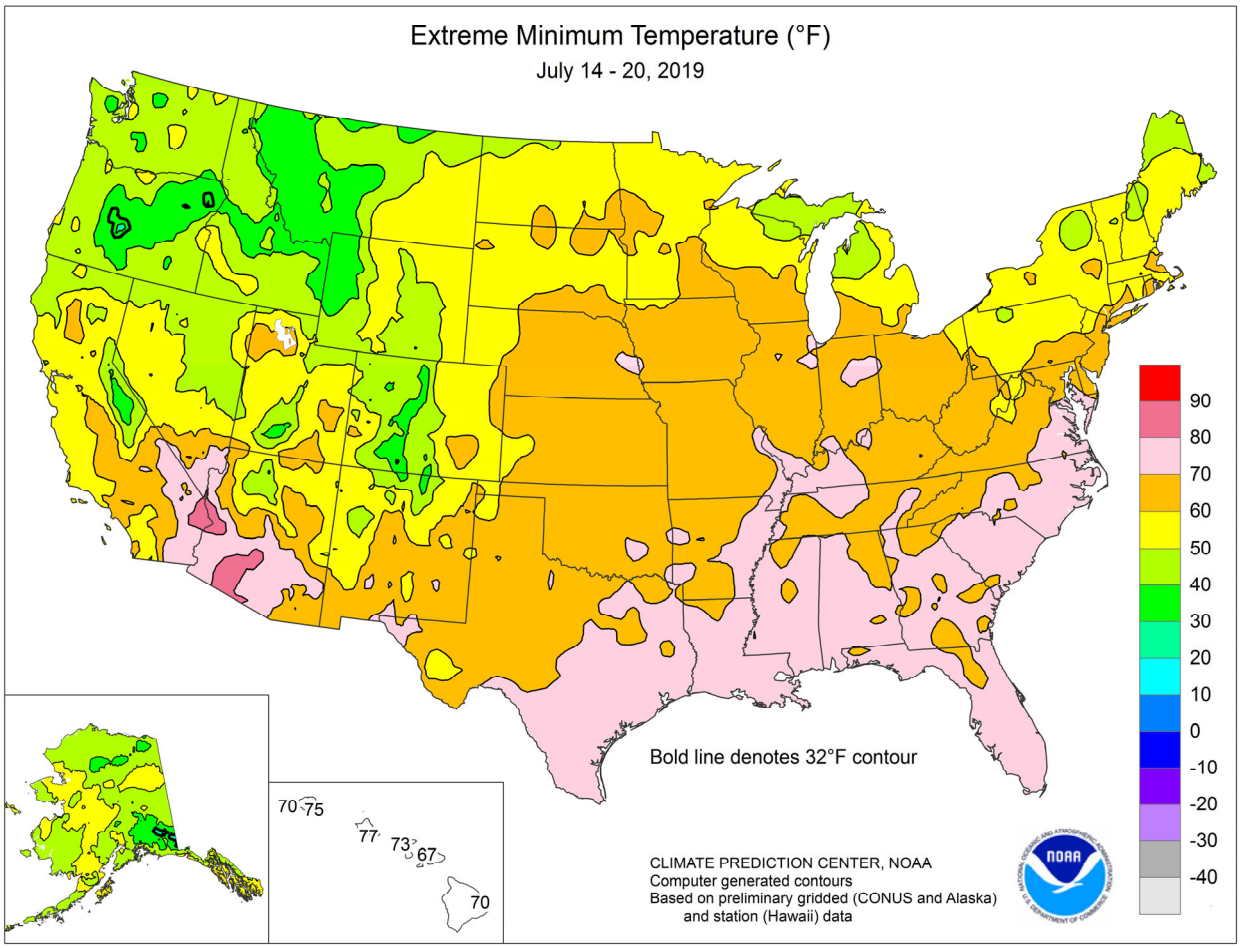
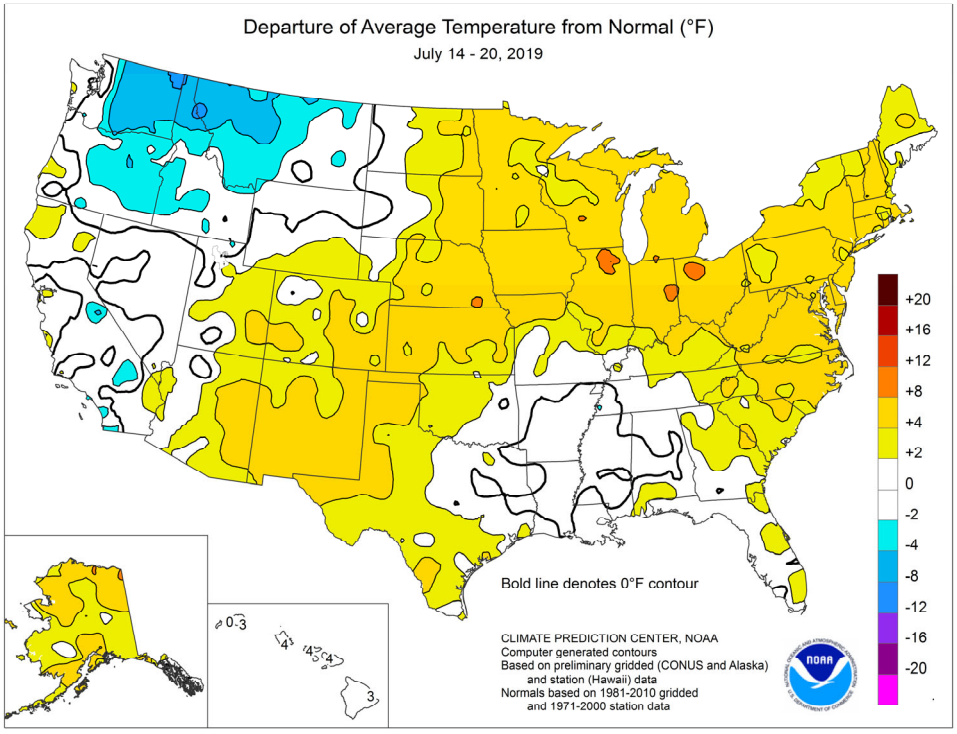

Extreme Maximum Temperature (°F)
July 14 - 20, 2019
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
Bold line denotes 95°F contour
90
87
92
90
94
87
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS and Alaska)
and station (Hawaii) data
NOAA


Extreme Minimum Temperature (°F)
July 14 - 20, 2019
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
Bold line denotes 32°F contour
70
75
77
73
67
70
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded (CONUS and Alaska)
and station (Hawaii) data
NOAA

(Continued from front cover)

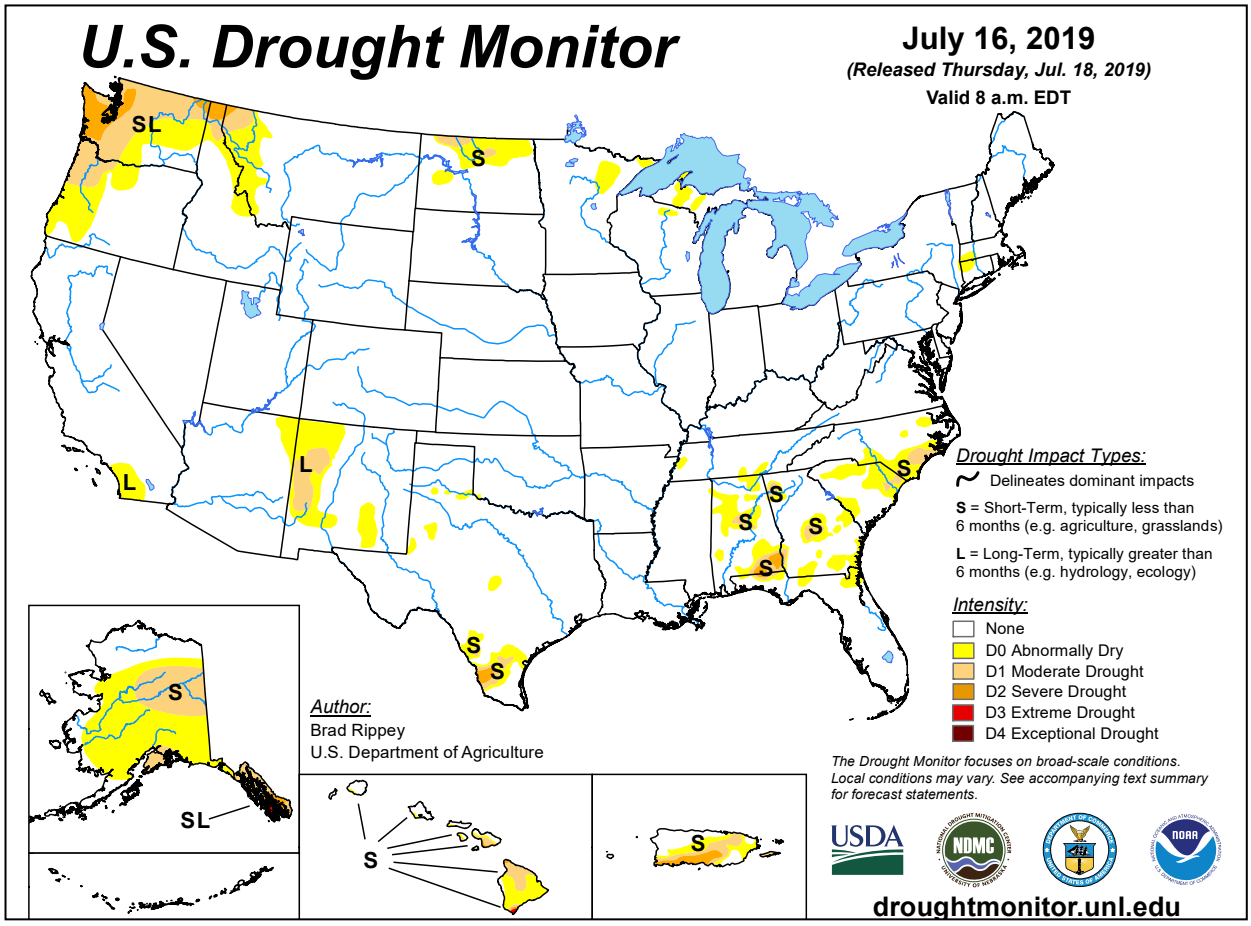
winds, large hail, and isolated tornadoes. In mid-July, much of the country experienced a brief period of heat and high humidity levels, stressing livestock and summer crops. Late-planted and poorly rooted **Midwestern** corn and soybeans were particularly susceptible to heat stress in areas that have recently dried out, following excessive spring wetness and acute planting delays. Weekly temperatures averaged at least 5°F above normal across large sections of the **Plains**, **Midwest**, **East**, and **Southwest**, while cooler-than-normal conditions were mostly limited to the **northernmost Rockies** and environs. Mid- to late-week temperatures soared to 90°F or higher **east of the Rockies**, except in parts of the **Appalachians** and across the **nation's northern tier**. Readings topped 100°F throughout the **central and southern High Plains**. Extreme heat also gripped the **Desert Southwest**, where temperatures rose to 110°F or higher. Elsewhere, dry weather covered large sections of the **West** and the **southern half of the Plains**, favoring fieldwork and crop development. However, cold fronts delivered some light rain to the **northern Rockies** and **Pacific Northwest**, while showers associated with the monsoon circulation dotted the **central and southern Rockies** and the **Desert Southwest**.

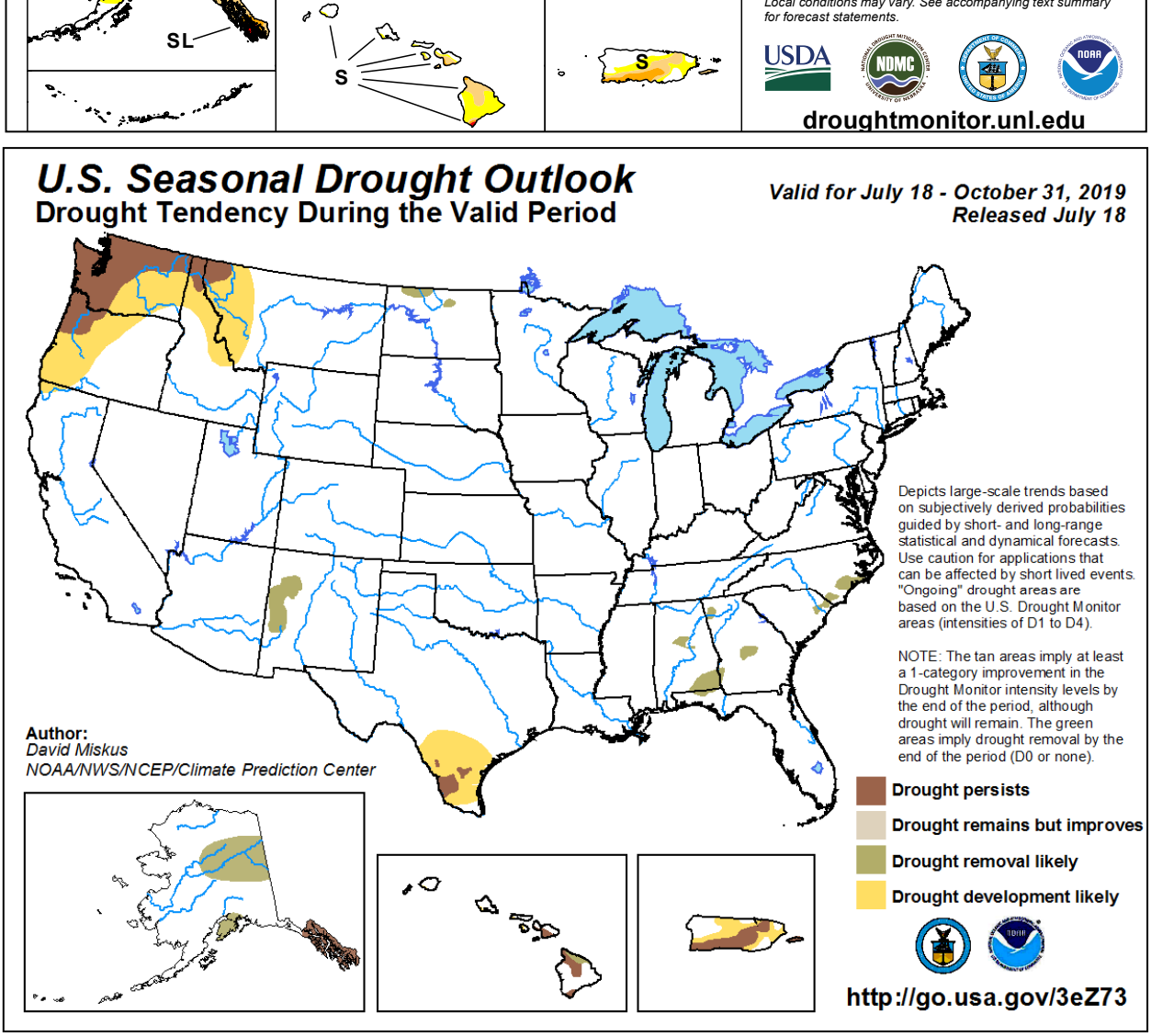


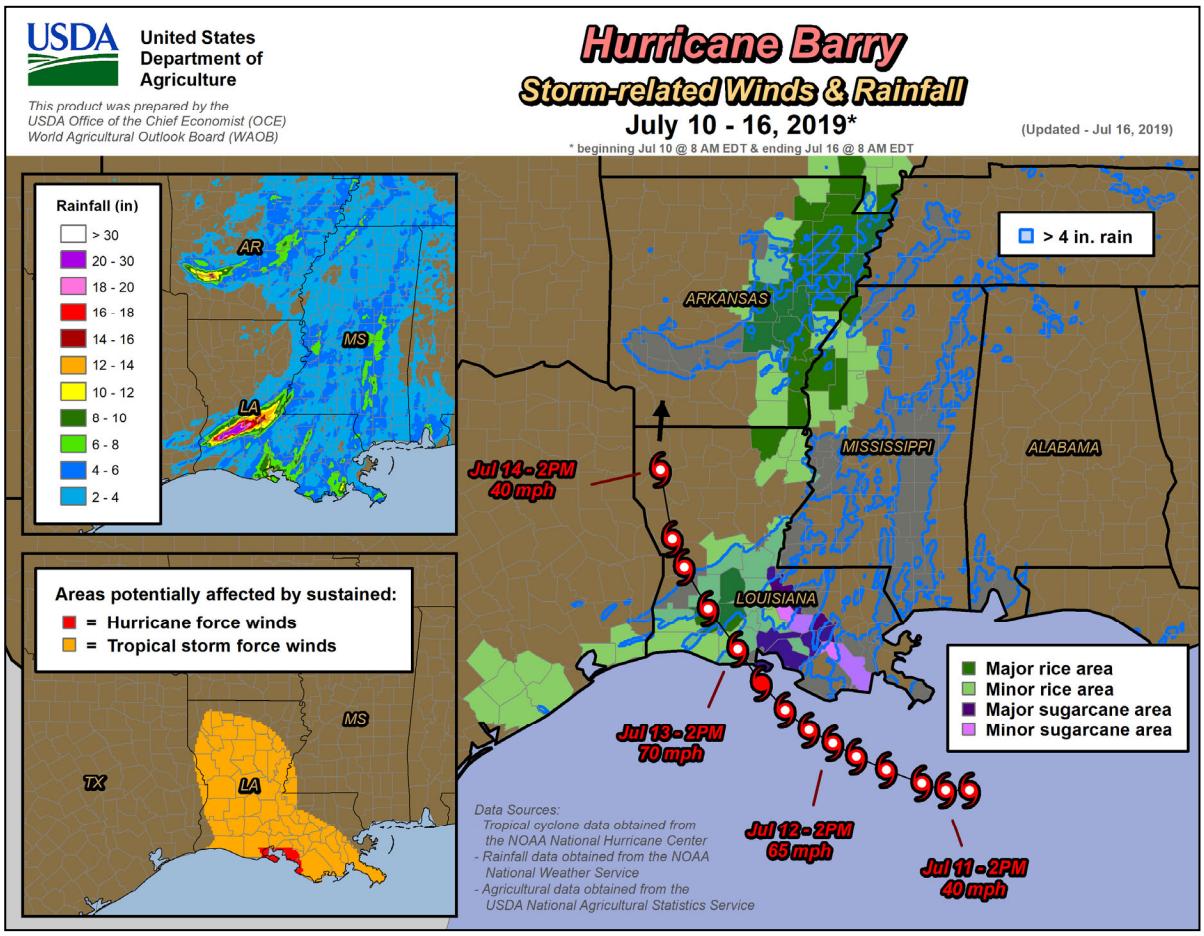
On July 13, wind gusts in **Louisiana** associated with Hurricane Barry were clocked at 62 mph at **Port Fourchon** and 61 mph in **New Iberia**. The following day, record-setting rainfall totals for July 14 included 4.21 inches in **Beaumont-Port Arthur, TX**; 4.08 inches in **Hattiesburg, MS**; and 3.67 inches in **Monticello, AR**. Local downpours across the **mid-South** persisted through July 16, when daily-record amounts reached 4.09 inches in **Pine Bluff, AR**, and 2.28 inches in **Memphis, TN**. From July 14-16, **Pine Bluff** received 7.02 inches. Other July 14-16 totals included 5.35 inches in **Greenwood, MS**, and 5.12 inches in **Memphis**. Storm totals topped 10 inches in parts of **Arkansas** and **Louisiana**. A state 24-hour rainfall record was established in Arkansas, where 16.17 inches fell at **Dierks**, in **Howard County**, on July 15-16. **Arkansas'** previous record of 14.06 inches had been established on December 3, 1982, at a weather station near **Big Fork**, in **Polk County**. An **Arkansas** state record was also broken for rainfall received during a tropical event; the 16.59-inch sum in **Dierks** eclipsed the previous standard of 13.91 inches set in **Portland, Ashley County**, during Tropical Storm Allison from June 28 – July 2, 1989. Farther north, frequent thunderstorms swept across the **northern Plains** and the **upper Great Lakes region**. On July 17, **Sioux Falls, SD**, measured a daily-record rainfall total of 2.49 inches. In **Wisconsin**, daily-records totals exceeded 2 inches in **La Crosse** (2.05 inches on July 18) and **Milwaukee** (2.01 inches on July 20). Locally heavy showers also dotted the **East**, where daily-record totals included 2.74 inches (on July 18) in **Bridgeport, CT**, and 2.67 inches (on July 19) in **Tallahassee, FL**. The **Pacific Northwest** received some precipitation, especially around mid-week, when **Quillayute, WA**, logged a daily-record total (0.96 inch on July 17).

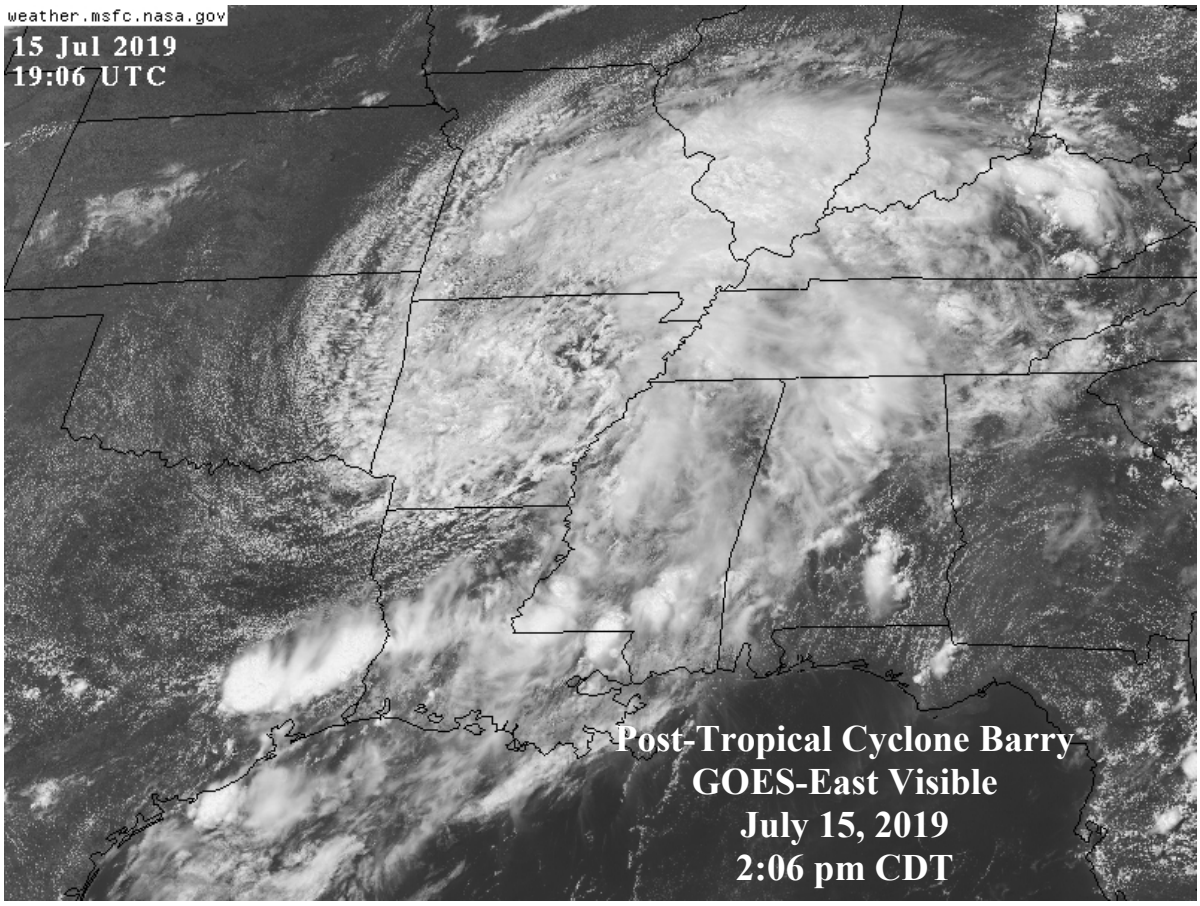
Early-week heat in the **Desert Southwest** resulted in a daily-record high of 118°F (on July 15) in **Thermal, CA**. The following day in **Arizona**, **Tucson** (110°F) posted a record-setting high for July 16. Heat also began to intensify across the **East**, where triple-digit, daily-record highs included 101°F (on July 17) in **Florence, SC**, and 100°F (on July 16) in **Georgetown, DE**. On the **southern High Plains**, **Dalhart, TX**, closed the week with a trio of daily-record highs (105, 108, and 107°F) from July 18-20. Similarly, **Roswell, NM**, noted three consecutive daily-record highs of 108°F from July 19-21. In **Colorado**, daily-record highs for July 19 were set in locations such as **Pueblo** (105°F) and **Burlington** (104°F). Late in the week, heat expanded across the remainder of the **central and eastern U.S.** In the **Midwest**, record-setting highs for July 19 rose to 97°F in **La Crosse, WI**, and 95°F in **Alpena, MI**. **Northeastern** daily-record highs for July 20 soared to 99°F in **Atlantic City, NJ**, and at **New York's JFK Airport**. In **Rockford, IL**, the minimum temperature on July 19 fell only to 80°F, tying an all-time record originally set on August 6, 1918.

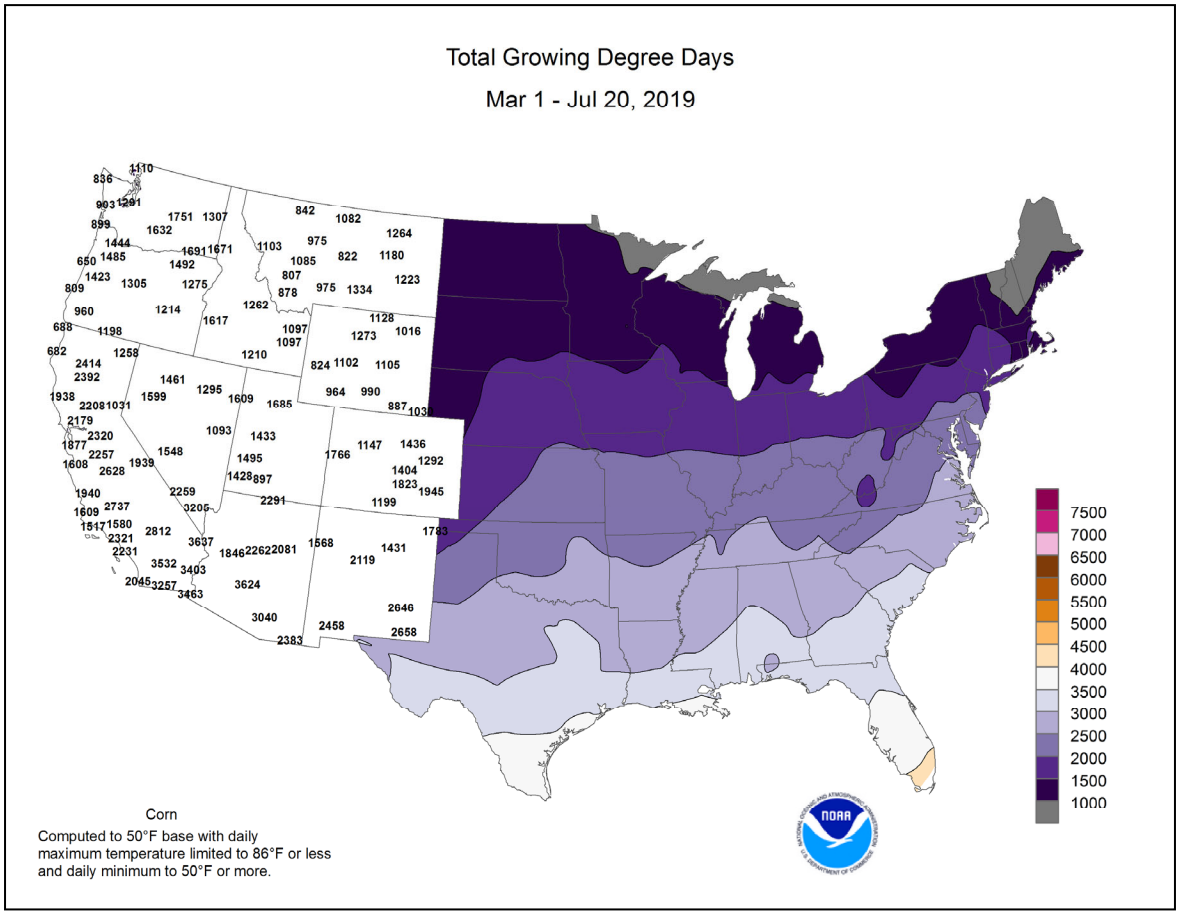
Warmth continued across **Alaska**, accompanied by scattered to widespread showers. However, the showers also resulted in frequent lightning. In a 24-hour period on July 18-19, more than 24,000 lightning strikes were counted across **Alaska** and the neighboring **Yukon Territory**. During the same thunderstorm outbreak, hail up to one-half inch in diameter was reported on the 18th in the community of **North Pole**. By July 21, more than six dozen active **Alaskan** wildfires had cumulatively burned well over 1.8 million acres of vegetation. Meanwhile, **Kotzebue** reported highs of 70°F or greater each day from July 6-16, receiving no rain during that 11-day span. Elsewhere in **Alaska**, **Kodiak** posted a daily-record high of 77°F on July 18, while **Utqiagvik (Barrow)** netted daily-record rainfall totals (0.40 and 0.41 inch, respectively) on July 15 and 20. Farther south, **Hawaiian** weather was very warm and mostly dry. **Kahului, Maui**, notched six consecutive daily-record highs (94, 91, 93, 92, 91, and 94°F) from July 11-16. However, **Kahului's** streak of 26 days in a row with a high of 90°F or greater ended on July 17 with a high of 89°F. Daily-record highs were also set or tied in other **Hawaiian** locations, including **Honolulu, Oahu** (92°F on July 16); **Lihue, Kauai** (87°F on July 18); and **Hilo**, on the **Big Island** (87°F on July 19). Through July 20, month-to-date rainfall at the state's major airport observation sites ranged from 0.04 inch (14 percent of normal) in **Kahului** to 3.46 inches (51 percent) in **Hilo**.

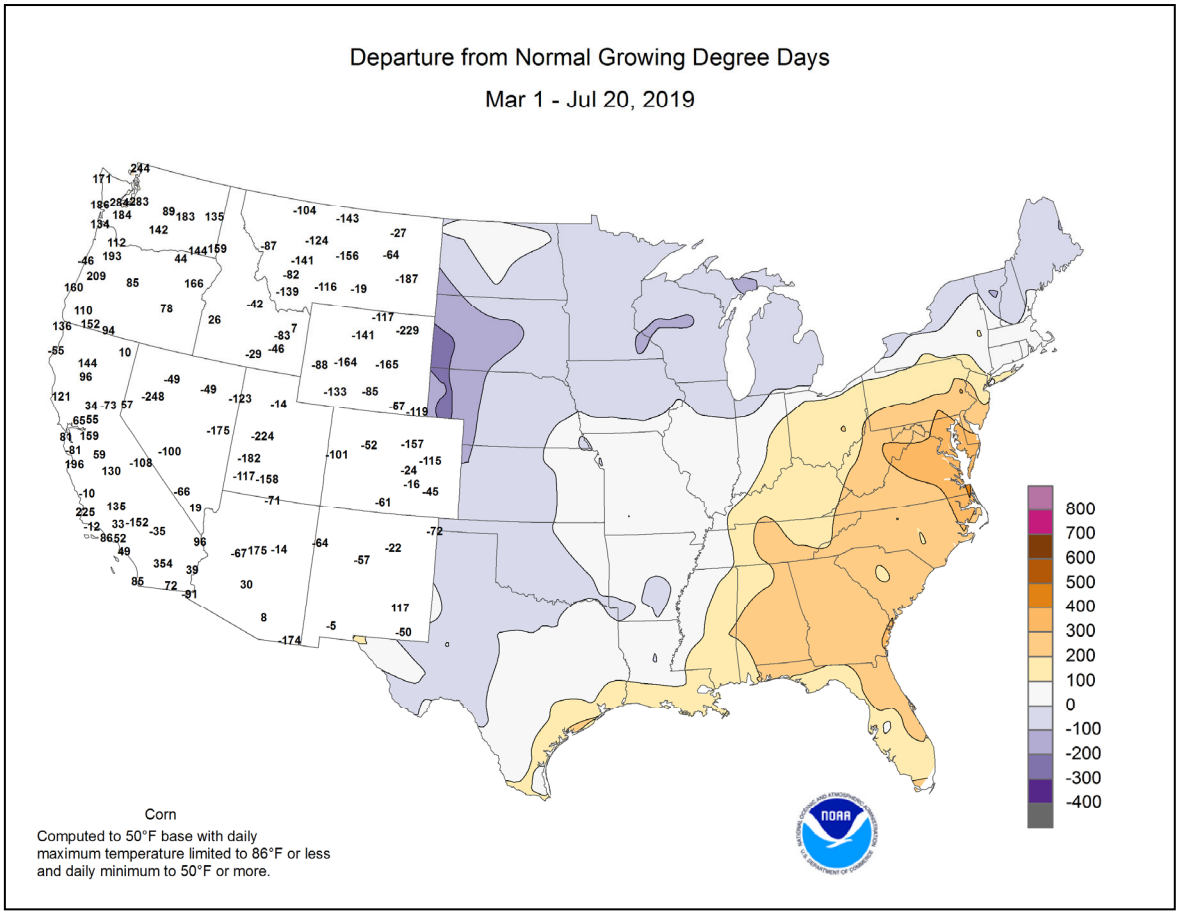

U.S. Drought Monitor
July 16, 2019
(Released Thursday, Jul. 18, 2019)
Valid 8 a.m. EDT
Drought Impact Types:
Delineates dominant impacts
S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)
Intensity:
None
D0 Abnormally Dry
D1 Moderate Drought
D2 Severe Drought
D3 Extreme Drought
D4 Exceptional Drought
Author:
Brad Rippey
U.S. Department of Agriculture
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.
droughtmonitor.unl.edu

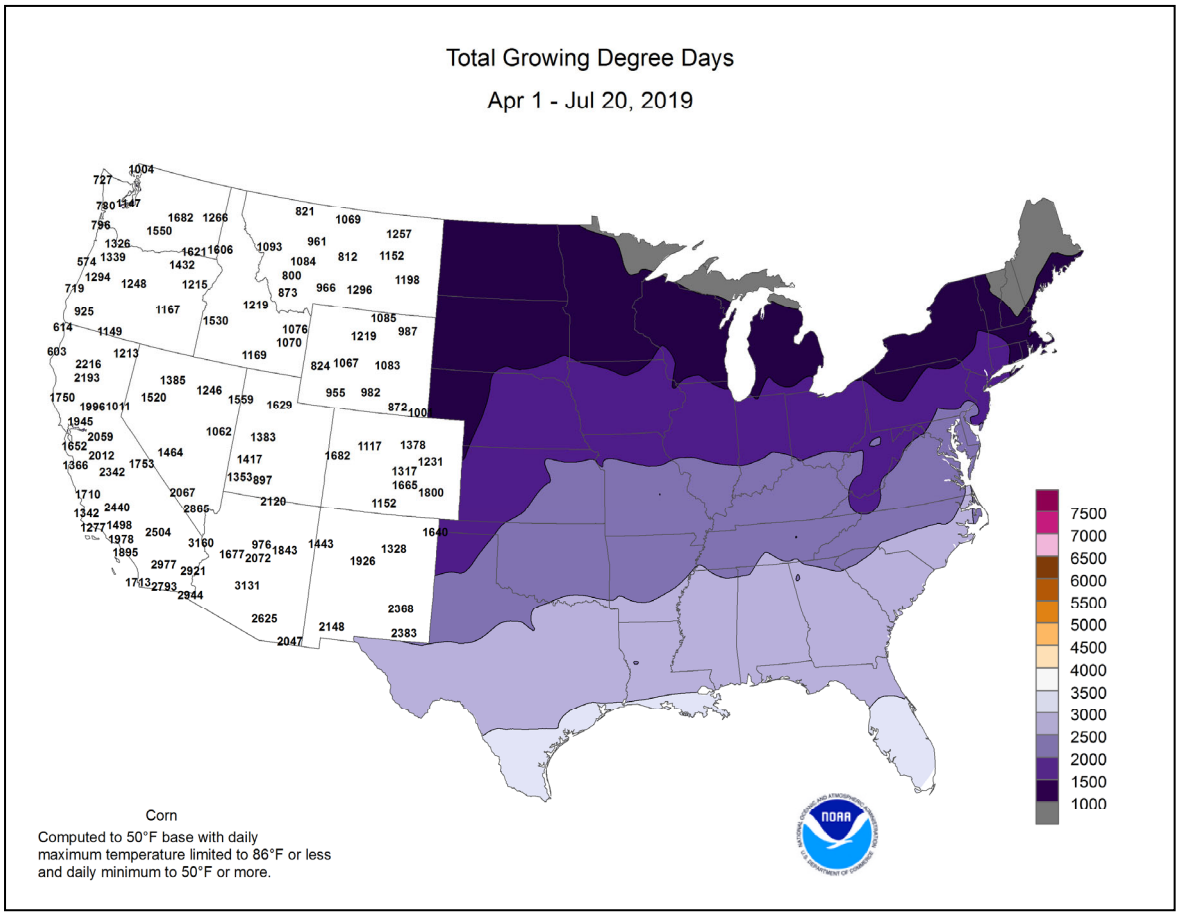

U.S. Seasonal Drought Outlook
Drought Tendency During the Valid Period
Valid for July 18 - October 31, 2019
Released July 18
Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).
NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).
Drought persists
Drought remains but improves
Drought removal likely
Drought development likely
Author:
David Miskus
NOAA/NWS/NCEP/Climate Prediction Center
http://go.usa.gov/3eZ73

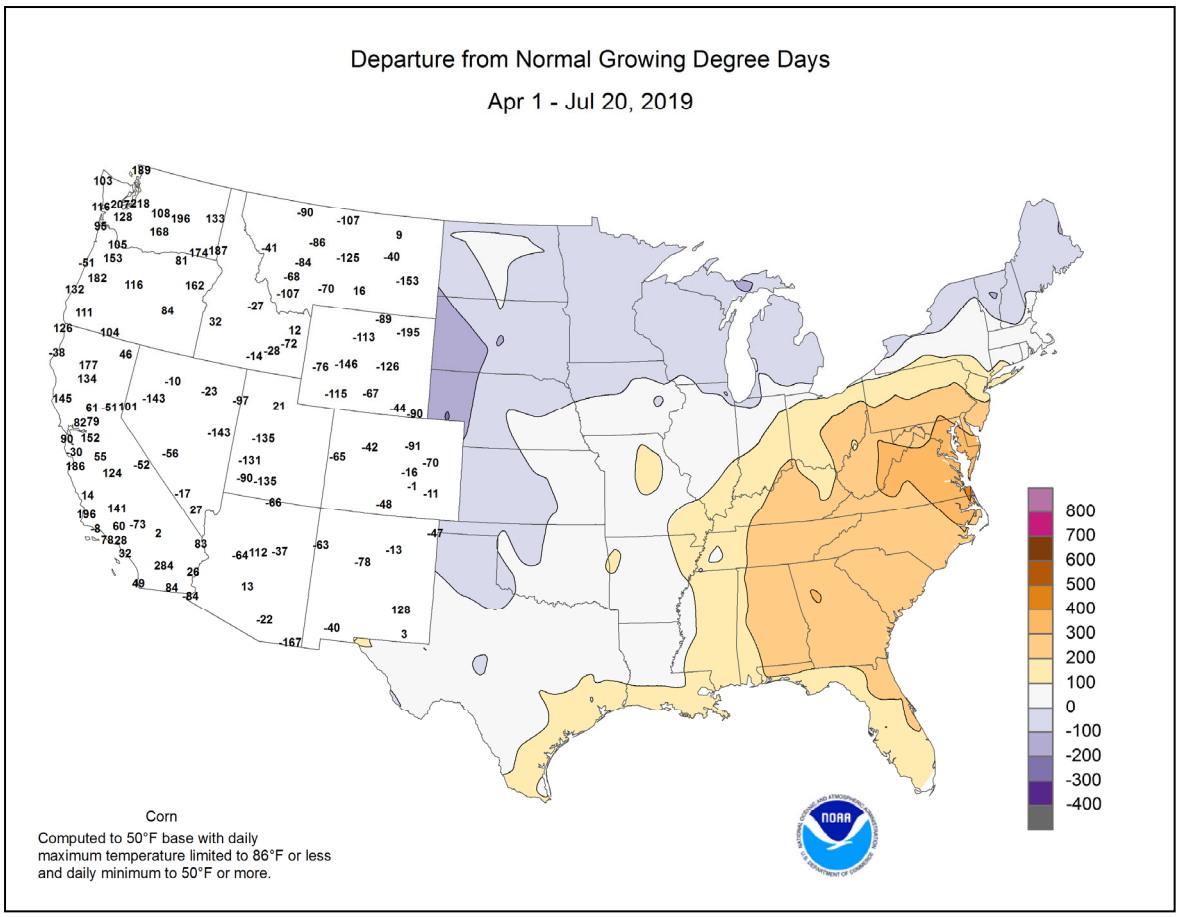

USDA
United States Department of Agriculture
This product was prepared by the USDA Office of the Chief Economist (OCE) World Agricultural Outlook Board (WAOB)
Hurricane Barry
Storm-related Winds & Rainfall
July 10 - 16, 2019*
* beginning Jul 10 @ 8 AM EDT & ending Jul 16 @ 8 AM EDT
(Updated - Jul 16, 2019)
Rainfall (in)
> 30
20 - 30
18 - 20
16 - 18
14 - 16
12 - 14
10 - 12
8 - 10
6 - 8
4 - 6
2 - 4
> 4 in. rain
AR
MS
LA
ARKANSAS
MISSISSIPPI
ALABAMA
LOUISIANA
Jul 14 - 2PM
40 mph
Jul 13 - 2PM
70 mph
Jul 12 - 2PM
65 mph
Jul 11 - 2PM
40 mph
Areas potentially affected by sustained:
= Hurricane force winds
= Tropical storm force winds
TX
Major rice area
Minor rice area
Major sugarcane area
Minor sugarcane area
Data Sources:
Tropical cyclone data obtained from the NOAA National Hurricane Center
- Rainfall data obtained from the NOAA National Weather Service
- Agricultural data obtained from the USDA National Agricultural Statistics Service


weather.msfc.nasa.gov
15 Jul 2019
19:06 UTC
Post-Tropical Cyclone Barry
GOES-East Visible
July 15, 2019
2:06 pm CDT


Total Growing Degree Days
Mar 1 - Jul 20, 2019
7500
7000
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
Corn
Computed to 50°F base with daily maximum temperature limited to 86°F or less and daily minimum to 50°F or more.


Departure from Normal Growing Degree Days
Mar 1 - Jul 20, 2019
800
700
600
500
400
300
200
100
0
-100
-200
-300
-400
Corn
Computed to 50°F base with daily maximum temperature limited to 86°F or less and daily minimum to 50°F or more.


Total Growing Degree Days
Apr 1 - Jul 20, 2019
7500
7000
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
Corn
Computed to 50°F base with daily maximum temperature limited to 86°F or less and daily minimum to 50°F or more.


Departure from Normal Growing Degree Days
Apr 1 - Jul 20, 2019
800
700
600
500
400
300
200
100
0
-100
-200
-300
-400
Corn
Computed to 50°F base with daily maximum temperature limited to 86°F or less and daily minimum to 50°F or more.

National Weather Data for Selected Cities

Weather Data for the Week Ending July 20, 2019

Data Provided by Climate Prediction Center

STATES AND STATIONS		TEMPERATURE ˚F						PRECIPITATION							RELATIVE HUMIDITY PERCENT		NUMBER OF DAYS TEMP. ˚F		NUMBER OF DAYS PRECIP	
		AVERAGE MAXIMUM	AVERAGE MINIMUM	EXTREME HIGH	EXTREME LOW	AVERAGE	DEPARTURE FROM NORMAL	WEEKLY TOTAL, IN.	DEPARTURE FROM NORMAL	GREATEST IN 24-HOUR, IN.	TOTAL, IN., SINCE JUN 1	PCT. NORMAL SINCE JUN 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	90	74	93	73	82	2	0.84	-0.37	0.72	7.47	106	31.66	98	88	52	4	0	3	1
	HUNTSVILLE	87	72	90	70	80	0	2.41	1.38	0.70	6.95	97	41.88	123	95	72	1	0	5	2
	MOBILE	91	76	94	74	84	2	0.43	-1.09	0.23	12.00	132	33.28	87	96	67	5	0	4	0
	MONTGOMERY	93	73	96	71	83	1	0.75	-0.51	0.68	6.43	84	27.00	82	94	60	6	0	3	1
AK	ANCHORAGE	72	58	77	54	65	6	0.06	-0.29	0.05	0.13	7	5.16	99	82	60	0	0	2	0
	BARROW	51	42	55	41	47	6	1.11	0.92	0.41	2.46	324	5.42	411	93	76	0	0	4	0
	FAIRBANKS	75	55	79	51	65	2	0.07	-0.30	0.03	1.76	72	5.24	118	85	60	0	0	3	0
	JUNEAU	62	54	69	51	58	1	0.97	0.06	0.49	4.60	79	22.30	91	99	88	0	0	5	0
	KODIAK	67	56	77	53	61	7	2.22	1.30	1.10	5.73	70	34.15	87	84	73	0	0	4	2
	NOME	57	49	63	46	53	0	0.05	-0.41	0.05	2.75	120	9.89	166	98	88	0	0	1	0
AZ	FLAGSTAFF	85	54	88	53	70	4	0.00	-0.54	0.00	0.14	9	15.31	138	60	19	0	0	0	0
	PHOENIX	110	88	115	84	99	6	0.00	-0.22	0.00	0.00	0	3.02	83	30	18	7	0	0	0
	PRESCOTT	93	64	96	59	79	5	0.00	-0.65	0.00	0.17	9	8.97	104	49	15	7	0	0	0
	TUCSON	105	79	110	76	92	5	0.01	-0.45	0.01	0.31	25	5.34	120	49	28	7	0	1	0
AR	FORT SMITH	92	74	97	71	83	1	0.19	-0.53	0.17	11.52	177	38.09	155	96	58	5	0	2	0
	LITTLE ROCK	86	74	93	70	80	-3	2.30	1.56	1.73	7.27	117	41.92	147	98	68	4	0	3	1
CA	BAKERSFIELD	99	71	104	69	85	2	0.00	0.00	0.00	0.23	192	6.50	141	43	28	7	0	0	0
	FRESNO	98	69	104	67	84	2	0.00	0.00	0.00	0.00	0	9.52	121	55	33	7	0	0	0
	LOS ANGELES	73	63	74	62	68	-1	0.00	0.00	0.00	0.00	0	12.81	136	87	71	0	0	0	0
	REDDING	98	68	101	64	83	1	0.00	0.00	0.00	0.00	0	31.08	142	63	31	7	0	0	0
	SACRAMENTO	90	61	95	58	76	0	0.00	0.00	0.00	0.00	0	19.36	162	81	31	4	0	0	0
	SAN DIEGO	73	64	77	62	69	-2	0.00	0.00	0.00	0.01	11	8.42	110	89	72	0	0	0	0
	SAN FRANCISCO	75	58	78	55	67	4	0.00	0.00	0.00	0.00	0	18.42	138	81	58	0	0	0	0
	STOCKTON	95	63	99	61	79	1	0.00	0.00	0.00	0.00	0	12.48	139	65	40	6	0	0	0
CO	ALAMOSA	87	48	88	44	67	3	0.01	-0.19	0.01	0.45	42	5.13	159	78	25	0	0	1	0
	CO SPRINGS	94	59	97	55	76	6	0.30	-0.30	0.27	2.86	73	8.55	89	69	15	6	0	3	0
	DENVER INTL	95	64	101	60	79	6	0.01	-0.50	0.01	3.26	111	10.60	131	60	16	6	0	1	0
	GRAND JUNCTION	98	65	100	55	82	5	0.05	-0.08	0.05	0.83	117	6.67	143	38	20	7	0	1	0
	PUEBLO	101	63	105	60	82	6	0.77	0.33	0.48	3.81	157	8.24	122	63	22	7	0	2	0
CT	BRIDGEPORT	88	71	94	67	80	6	3.60	2.75	2.74	7.60	128	29.49	119	83	57	4	0	2	2
	HARTFORD	92	69	98	59	80	6	0.32	-0.48	0.25	3.03	49	27.83	111	79	48	5	0	2	0
DC	WASHINGTON	94	76	97	72	85	6	0.29	-0.54	0.29	10.26	190	28.28	132	81	47	7	0	1	0
DE	WILMINGTON	92	72	96	66	82	5	0.35	-0.64	0.24	12.22	193	32.28	134	92	51	6	0	2	0
FL	DAYTONA BEACH	92	75	93	73	83	1	0.01	-1.12	0.01	15.43	169	26.77	109	100	60	7	0	1	0
	JACKSONVILLE	96	73	98	70	84	2	1.16	-0.18	1.07	8.63	93	21.19	79	93	49	7	0	2	1
	KEY WEST	90	82	91	80	86	1	0.07	-0.59	0.04	1.33	20	12.11	68	78	64	7	0	3	0
	MIAMI	92	80	93	78	86	2	0.37	-0.82	0.27	18.34	147	31.55	113	77	54	6	0	3	0
	ORLANDO	94	75	95	74	85	3	0.12	-1.50	0.12	12.48	102	24.10	90	90	51	7	0	1	0
	PENSACOLA	91	78	93	73	84	1	1.03	-0.82	0.97	11.86	103	26.77	74	97	67	6	0	4	1
	TALLAHASSEE	94	74	97	72	84	2	2.75	0.92	2.67	13.23	110	25.54	69	97	57	7	0	4	1
	TAMPA	92	76	94	72	84	1	1.44	0.01	0.56	16.80	175	33.25	151	87	57	7	0	6	1
	WEST PALM BEACH	91	81	92	80	86	3	0.01	-1.32	0.01	8.08	68	29.09	95	76	60	6	0	1	0
GA	ATHENS	96	72	99	70	84	4	0.77	-0.22	0.56	8.04	119	24.07	86	88	48	7	0	2	1
	ATLANTA	92	74	94	72	83	3	1.28	0.07	0.97	8.24	119	29.40	99	84	50	7	0	3	1
	AUGUSTA	99	73	101	71	86	5	0.03	-0.85	0.01	6.98	103	21.46	83	87	54	7	0	3	0
	COLUMBUS	94	74	96	72	84	2	2.28	1.10	2.00	10.09	151	27.65	95	90	46	7	0	3	1
	MACON	98	72	100	71	85	4	1.33	0.34	1.21	7.39	117	20.80	77	89	40	7	0	2	1
	SAVANNAH	97	75	99	72	86	4	0.15	-1.16	0.15	14.62	159	25.29	95	88	51	7	0	1	0
HI	HILO	86	72	87	70	79	3	0.83	-1.65	0.27	7.35	52	41.88	62	83	70	0	0	5	0
	HONOLULU	90	79	92	77	85	4	0.00	-0.10	0.00	5.80	853	8.88	93	71	63	6	0	0	0
	KAHULUI	91	74	94	67	83	4	0.00	-0.10	0.00	0.06	13	9.34	83	74	61	6	0	0	0
	LIHUE	86	78	87	75	82	3	0.73	0.25	0.29	7.03	227	15.49	76	82	72	0	0	5	0
ID	BOISE	88	60	94	53	74	-1	0.00	-0.08	0.00	0.04	4	12.11	161	58	32	3	0	0	0
	LEWISTON	85	60	89	51	72	-2	0.01	-0.13	0.01	1.20	74	9.14	119	59	33	0	0	1	0
	POCATELLO	87	55	92	47	71	2	0.07	-0.07	0.06	0.55	42	9.09	121	60	32	2	0	2	0
IL	CHICAGO/O'HARE	90	73	95	70	82	9	1.96	1.22	1.36	5.91	102	27.13	144	82	57	5	0	4	1
	MOLINE	93	74	97	69	83	7	0.13	-0.74	0.13	5.68	79	30.86	145	83	57	6	0	1	0
	PEORIA	90	74	95	70	82	7	0.18	-0.74	0.14	7.01	108	31.31	155	88	59	4	0	3	0
	ROCKFORD	93	72	97	68	82	9	1.67	0.78	1.66	5.95	79	28.32	139	90	67	5	0	2	1
	SPRINGFIELD	91	72	94	66	82	6	0.15	-0.62	0.13	7.37	122	30.48	152	95	56	5	0	2	0
IN	EVANSVILLE	88	74	93	71	81	2	0.81	-0.04	0.66	8.61	131	38.36	145	89	66	4	0	2	1
	FORT WAYNE	89	73	92	70	81	7	1.13	0.35	0.39	4.67	73	23.53	115	94	60	3	0	4	0
	INDIANAPOLIS	91	74	93	69	82	6	1.49	0.50	1.08	9.84	142	32.97	142	92	53	6	0	2	1
	SOUTH BEND	89	72	93	70	80	7	0.79	-0.02	0.33	6.79	102	27.32	130	92	65	3	0	3	0
IA	BURLINGTON	91	73	94	69	82	6	1.31	0.30	0.99	5.56	77	28.25	134	87	57	5	0	3	1
	CEDAR RAPIDS	89	70	92	64	80	5	0.97	0.08	0.76	5.80	81	24.19	130	95	62	4	0	3	1
	DES MOINES	92	72	96	68	82	6	2.91	2.00	1.65	8.57	118	26.62	137	83	60	6	0	2	2
	DUBUQUE	88	70	91	66	79	7	1.74	0.94	1.63	8.22	128	25.97	135	91	68	2	0	3	1
	SIOUX CITY	89	70	93	66	80	5	2.09	1.35	1.12	8.63	150	23.01	149	94	70	4	0	3	2
	WATERLOO	91	72	95	68	81	7	0.72	-0.20	0.40	8.21	108	24.26	128	87	67	4	0	3	0
KS	CONCORDIA	97	76	102	70	87	8	0.00	-0.96	0.00	7.62	115	22.71	133	79	51	7	0	0	0
	DODGE CITY	99	72	105	65	86	6	0.00	-0.72	0.00	4.30	83	16.10	119	76	32	7	0	0	0
	GOODLAND	99	65	105	61	82	7	0.51	-0.29	0.51	3.61	67	11.42	92	83	34	7	0	1	1
	TOPEKA	95	74	98	67	85	6	0.00	-0.84	0.00	7.48	101	26.64	132	85	59	6	0	0	0

Based on 1971-2000 normals

***** Not Available**

Weather Data for the Week Ending July 20, 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 JUN 1	PCT. NORMAL SINCE JUN 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	98	74	102	69	86	5	0.11	-0.62	0.11	7.36	114	27.06	152	77	47	7	0	1	0
KY	JACKSON	87	71	91	70	79	4	1.32	0.28	0.76	13.30	174	36.53	129	100	68	2	0	3	1
	LEXINGTON	91	73	94	69	82	6	0.58	-0.52	0.46	9.11	118	32.48	120	85	61	4	0	3	0
	LOUISVILLE	93	76	96	74	85	6	0.17	-0.82	0.09	8.63	133	36.00	137	82	51	6	0	3	0
	PADUCAH	88	74	93	72	81	3	2.16	1.13	0.89	11.01	145	49.55	171	91	70	3	0	5	2
LA	BATON ROUGE	91	75	95	73	83	1	3.70	2.35	2.90	12.61	138	40.27	111	97	58	5	0	2	2
	LAKE CHARLES	90	78	92	76	84	1	1.10	-0.06	0.84	12.73	133	41.20	130	93	65	5	0	2	1
	NEW ORLEANS	90	79	94	76	85	2	1.26	-0.13	0.49	8.74	78	35.77	96	89	69	5	0	4	0
	SHREVEPORT	92	76	95	71	84	0	0.21	-0.69	0.20	8.54	109	31.26	102	94	59	6	0	2	0
ME	CARIBOU	82	57	89	52	70	4	0.68	-0.18	0.24	4.63	82	23.24	121	90	49	0	0	4	0
	PORTLAND	83	64	91	60	73	4	0.02	-0.72	0.01	7.58	140	29.04	117	82	51	1	0	2	0
MD	BALTIMORE	95	72	100	66	84	7	0.43	-0.44	0.41	6.11	105	24.81	107	84	48	7	0	2	0
MA	BOSTON	90	72	97	66	81	7	0.47	-0.19	0.43	7.82	151	28.01	121	74	45	5	0	2	0
	WORCESTER	83	66	90	60	74	4	0.67	-0.27	0.67	6.20	93	29.45	112	88	57	1	0	1	1
MI	ALPENA	85	61	95	50	73	6	0.42	-0.28	0.24	4.36	99	20.57	141	90	50	3	0	2	0
	GRAND RAPIDS	88	70	92	62	79	7	1.53	0.73	0.81	7.86	129	27.69	145	87	57	3	0	3	1
	HOUGHTON LAKE	83	62	90	47	72	5	0.85	0.27	0.53	6.02	131	21.52	150	90	62	1	0	2	1
	LANSING	88	69	93	59	79	9	1.44	0.87	1.23	9.55	175	25.15	151	86	58	3	0	3	1
	MUSKEGON	87	68	89	61	77	7	0.49	0.01	0.41	5.71	145	27.89	175	82	60	0	0	2	0
	TRAVERSE CITY	86	66	91	51	76	6	1.88	1.19	1.38	6.17	114	23.50	137	90	51	1	0	3	1
MN	DULUTH	84	63	89	61	74	8	0.43	-0.51	0.16	4.83	69	17.46	111	85	59	0	0	4	0
	INT'L FALLS	81	58	85	53	70	4	2.62	1.88	2.21	7.34	116	16.26	128	98	61	0	0	4	1
	MINNEAPOLIS	88	70	95	62	79	6	2.79	1.91	1.75	9.75	140	27.16	168	86	67	3	0	4	2
	ROCHESTER	86	67	90	62	76	6	4.28	3.24	1.50	16.39	237	37.61	221	92	77	1	0	5	3
	ST. CLOUD	87	66	92	59	77	7	0.24	-0.46	0.24	7.00	104	22.07	150	96	54	3	0	1	0
MS	JACKSON	90	74	94	72	82	1	3.09	2.02	1.43	7.64	112	36.88	110	90	60	5	0	4	2
	MERIDIAN	90	75	96	73	82	0	1.26	-0.03	0.81	6.47	86	39.32	108	90	68	4	0	3	1
	TUPELO	90	74	95	72	82	1	5.70	4.87	2.31	12.99	176	50.97	149	90	70	4	0	6	3
MO	COLUMBIA	90	72	95	68	81	4	0.07	-0.78	0.05	6.76	105	29.45	130	87	58	4	0	2	0
	KANSAS CITY	93	72	97	65	83	4	0.00	-1.02	0.00	10.10	137	34.65	165	86	57	6	0	0	0
	SAINT LOUIS	92	75	97	71	83	3	0.91	0.01	0.52	6.35	100	32.72	148	81	58	5	0	3	1
	SPRINGFIELD	90	72	95	68	81	2	0.05	-0.75	0.03	6.90	90	34.18	138	89	66	4	0	2	0
MT	BILLINGS	86	61	95	57	74	2	1.09	0.81	0.56	4.70	169	13.51	142	71	31	1	0	5	1
	BUTTE	77	47	85	36	62	-1	0.40	0.09	0.31	2.15	71	8.38	106	83	25	0	0	4	0
	CUT BANK	75	46	85	41	61	-2	0.17	-0.16	0.12	2.98	84	7.87	100	80	27	0	0	2	0
	GLASGOW	84	57	92	51	71	1	0.56	0.17	0.56	5.08	149	9.64	138	76	40	1	0	1	1
	GREAT FALLS	79	49	88	41	64	-2	0.05	-0.25	0.04	3.12	99	12.65	136	78	24	0	0	2	0
	HAVRE	83	50	91	42	67	-1	0.18	-0.15	0.11	3.47	119	8.18	114	82	34	1	0	2	0
	MISSOULA	80	50	89	39	65	-2	0.11	-0.11	0.10	1.60	65	9.41	114	77	40	0	0	2	0
NE	GRAND ISLAND	92	73	97	67	82	6	1.19	0.50	1.19	8.44	147	24.27	155	81	61	5	0	1	1
	LINCOLN	96	75	99	68	85	7	0.32	-0.48	0.32	5.14	90	20.41	124	79	52	7	0	1	0
	NORFOLK	90	71	94	68	80	5	0.17	-0.67	0.17	6.02	89	21.48	129	89	62	3	0	1	0
	NORTH PLATTE	93	67	102	63	80	6	0.01	-0.71	0.01	7.54	144	20.40	161	90	48	5	0	1	0
	OMAHA	94	76	97	71	85	8	0.57	-0.31	0.55	5.67	88	20.90	119	82	56	6	0	2	1
	SCOTTSBLUFF	93	62	102	57	77	4	0.00	-0.48	0.00	4.85	117	20.16	185	47	29	5	0	0	0
	VALENTINE	92	68	100	64	80	6	0.74	-0.03	0.45	8.65	167	24.39	199	82	54	5	0	3	0
NV	ELY	91	47	91	42	69	1	0.00	-0.11	0.00	0.23	24	11.57	204	38	11	7	0	0	0
	LAS VEGAS	107	84	110	81	95	4	0.00	-0.09	0.00	0.03	12	4.63	184	17	11	7	0	0	0
	RENO	94	62	95	60	78	7	0.00	-0.04	0.00	0.00	0	8.51	187	45	23	7	0	0	0
	WINNEMUCCA	94	54	96	49	74	2	0.00	-0.05	0.00	0.11	13	7.13	140	48	21	6	0	0	0
NH	CONCORD	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
NJ	NEWARK	93	73	98	70	83	6	1.29	0.20	0.96	8.83	140	32.78	127	74	52	5	0	2	1
NM	ALBUQUERQUE	98	71	100	69	84	5	0.03	-0.23	0.03	0.95	74	4.40	112	49	16	7	0	1	0
NY	ALBANY	88	68	95	60	78	7	0.98	0.22	0.89	6.64	111	22.96	111	84	52	3	0	4	1
	BINGHAMTON	84	65	89	57	74	5	1.19	0.41	0.58	7.35	120	25.47	120	90	62	0	0	3	1
	BUFFALO	83	69	86	60	76	5	0.46	-0.21	0.33	5.68	96	24.00	115	87	57	0	0	3	0
	ROCHESTER	86	68	92	59	77	6	0.53	-0.10	0.48	6.45	122	19.44	109	86	59	2	0	3	0
	SYRACUSE	87	66	95	59	77	6	1.23	0.31	1.14	6.22	97	24.67	118	88	55	3	0	3	1
NC	ASHEVILLE	89	68	93	65	78	5	0.26	-0.59	0.14	8.78	128	35.92	132	90	57	2	0	2	0
	CHARLOTTE	96	73	98	71	84	4	2.27	1.42	2.15	8.58	149	30.05	124	88	43	7	0	2	1
	GREENSBORO	94	74	96	73	84	6	0.00	-1.02	0.00	9.44	148	29.71	123	89	48	7	0	0	0
	HATTERAS	90	79	92	75	84	5	0.00	-1.08	0.00	4.57	69	33.12	116	96	69	4	0	0	0
	RALEIGH	96	73	98	70	85	6	0.40	-0.59	0.35	6.19	101	26.61	110	91	49	7	0	2	0
	WILMINGTON	95	77	97	74	86	5	0.08	-1.68	0.08	6.92	68	18.31	61	90	52	7	0	1	0
ND	BISMARCK	86	65	92	60	75	5	1.01	0.43	0.84	6.35	149	13.83	142	88	54	2	0	3	1
	DICKINSON	81	59	88	55	70	1	1.11	0.65	0.48	5.28	107	14.09	135	89	42	0	0	4	0
	FARGO	86	67	91	62	77	6	1.13	0.50	0.77	8.00	147	18.02	151	90	52	1	0	4	1
	GRAND FORKS	86	62	90	57	74	5	0.27	-0.41	0.14	5.78	116	13.79	130	89	45	1	0	4	0
	JAMESTOWN	83	63	89	60	73	2	0.49	-0.24	0.26	8.15	157	16.35	152	96	54	0	0	4	0
	WILLISTON	83	58	89	51	71	2	0.00	-0.52	0.00	6.89	177	11.06	130	86	48	0	0	0	0
OH	AKRON-CANTON	89	70	94	63	79	7	1.54	0.63	0.89	14.13	231	32.99	154	86	64	3	0	3	2
	CINCINNATI	91	71	93	63	81	5	1.56	0.73	0.84	9.78	143	37.69	151	87	64	6	0	3	2
	CLEVELAND	89	71	95	61	80	8	1.40	0.62	0.73	9.61	154	28.01	134	83	49	4	0	4	1
	COLUMBUS	91	72	94	70	82	7	0.76	-0.29	0.52	9.38	133	31.67	145	85	58	6	0	2	1
	DAYTON	90	73	93	71	82	7	1.89	1.06	1.42	7.55	113	32.01	139	88	59	5	0	4	1
	MANSFIELD	89	70	93	65	80	9	1.31	0.39	0.71	13.46	186	33.95	142	96	57	3	0	4	2

Based on 1971-2000 normals

***** Not Available**

Weather Data for the Week Ending July 20, 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 JUN 1	PCT. NORMAL SINCE JUN 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	92	71	97	64	82	9	1.47	0.88	0.47	8.16	142	25.95	140	84	53	6	0	5	0
	YOUNGSTOWN	87	66	91	55	77	7	1.85	0.91	0.87	11.76	176	33.90	162	87	57	2	0	3	2
OK	OKLAHOMA CITY	95	73	99	69	84	2	0.00	-0.65	0.00	7.00	104	30.89	148	90	43	7	0	0	0
	TULSA	94	76	98	68	85	1	0.00	-0.66	0.00	9.90	145	37.07	154	85	58	5	0	0	0
OR	ASTORIA	69	56	73	48	62	2	0.35	0.11	0.21	2.39	68	24.39	67	93	75	0	0	3	0
	BURNS	83	48	86	41	66	0	0.38	0.30	0.38	1.05	117	11.09	175	76	33	0	0	1	0
	EUGENE	83	55	89	49	69	3	0.01	-0.12	0.01	0.58	29	22.65	81	82	52	0	0	1	0
	MEDFORD	90	60	100	53	75	2	0.00	-0.06	0.00	0.01	1	13.86	141	66	27	2	0	0	0
	PENDLETON	84	57	88	43	70	-3	0.00	-0.08	0.00	0.31	30	9.59	131	57	35	0	0	0	0
	PORTLAND	80	61	88	55	71	3	0.02	-0.13	0.01	1.25	59	14.17	70	74	55	0	0	2	0
	SALEM	80	56	86	48	68	1	0.08	-0.03	0.08	0.85	45	19.40	89	82	55	0	0	1	0
PA	ALLENTOWN	91	70	95	61	80	7	1.02	0.06	0.85	11.47	171	37.84	155	81	54	4	0	2	1
	ERIE	86	70	91	60	78	6	0.68	-0.02	0.36	6.20	95	22.82	108	84	64	2	0	3	0
	MIDDLETOWN	93	73	97	68	83	7	0.77	-0.04	0.55	7.64	123	29.97	132	87	46	6	0	3	1
	PHILADELPHIA	93	74	97	70	83	5	0.55	-0.47	0.48	13.08	217	34.26	146	82	55	5	0	3	0
	PITTSBURGH	85	69	90	60	77	4	1.01	0.11	0.88	12.07	178	33.03	151	92	59	1	0	3	1
	WILKES-BARRE	90	67	94	59	78	6	0.66	-0.19	0.40	10.51	160	29.90	144	90	51	4	0	3	0
	WILLIAMSPORT	89	67	93	58	78	6	2.22	1.29	1.44	11.77	161	32.28	139	90	55	3	0	3	2
RI	PROVIDENCE	88	68	94	63	78	5	0.55	-0.14	0.39	6.35	118	30.15	119	87	61	3	0	2	0
SC	CHARLESTON	94	74	95	72	84	2	2.63	1.28	1.46	15.99	162	23.70	86	93	53	7	0	3	2
	COLUMBIA	95	74	98	73	85	3	0.12	-1.12	0.12	10.67	125	22.58	81	86	50	6	0	1	0
	FLORENCE	98	76	101	74	87	6	0.19	-0.99	0.19	7.89	105	21.23	86	90	43	7	0	1	0
	GREENVILLE	92	71	94	70	82	3	0.71	-0.35	0.41	8.05	119	29.09	101	90	51	5	0	4	0
SD	ABERDEEN	89	66	96	63	77	5	1.98	1.33	1.14	7.95	145	18.79	153	86	60	3	0	5	1
	HURON	88	69	93	57	79	5	1.11	0.46	0.51	8.33	160	23.01	174	91	62	3	0	4	1
	RAPID CITY	84	62	88	56	73	1	1.30	0.86	0.86	8.43	201	25.68	236	90	57	0	0	5	1
	SIOUX FALLS	90	70	96	60	80	7	3.37	2.73	2.52	9.45	175	27.51	193	90	69	4	0	4	2
TN	BRISTOL	89	69	92	67	79	5	0.38	-0.60	0.35	9.28	139	35.69	142	94	53	4	0	2	0
	CHATTANOOGA	89	74	93	72	82	2	0.15	-0.96	0.13	6.78	95	41.35	129	93	64	2	0	3	0
	KNOXVILLE	88	72	93	70	80	2	0.47	-0.64	0.30	8.67	121	40.87	138	90	56	3	0	2	0
	MEMPHIS	87	75	93	70	81	-2	5.12	4.15	2.28	16.00	222	46.71	145	96	70	4	0	3	3
	NASHVILLE	91	74	97	72	83	4	0.36	-0.50	0.27	9.67	147	39.69	141	87	55	5	0	5	0
TX	ABILENE	98	75	100	69	87	3	0.00	-0.33	0.00	4.46	107	18.80	154	86	50	7	0	0	0
	AMARILLO	98	70	102	61	84	6	0.75	0.17	0.75	5.55	111	13.32	120	66	27	7	0	1	1
	AUSTIN	98	75	98	73	87	3	0.00	-0.40	0.00	5.60	110	24.78	133	81	46	7	0	0	0
	BEAUMONT	93	78	94	76	85	2	4.57	3.39	4.21	17.16	167	40.92	125	90	65	7	0	3	1
	BROWNSVILLE	97	81	98	79	89	5	0.00	-0.37	0.00	4.38	103	10.06	83	94	53	7	0	0	0
	CORPUS CHRISTI	95	78	97	76	87	3	0.00	-0.39	0.00	2.61	54	12.26	79	93	57	7	0	0	0
	DEL RIO	102	77	103	74	90	5	0.00	-0.45	0.00	7.85	211	13.26	130	76	47	7	0	0	0
	EL PASO	102	77	104	74	90	7	0.05	-0.28	0.05	1.06	61	1.77	51	43	17	7	0	1	0
	FORT WORTH	95	77	97	73	86	1	0.00	-0.45	0.00	4.90	109	24.68	122	80	44	6	0	0	0
	GALVESTON	91	83	92	81	87	3	0.44	-0.32	0.23	8.02	126	25.14	114	84	66	7	0	4	0
	HOUSTON	94	78	96	76	86	2	0.22	-0.45	0.21	9.21	121	26.34	100	88	52	7	0	2	0
	LUBBOCK	97	73	101	64	85	5	0.00	-0.45	0.00	2.22	50	9.12	91	68	37	7	0	0	0
	MIDLAND	100	75	103	65	87	5	0.00	-0.41	0.00	1.84	64	9.89	143	66	36	7	0	0	0
	SAN ANGELO	100	74	102	66	87	5	0.00	-0.20	0.00	4.48	138	14.11	129	79	44	7	0	0	0
	SAN ANTONIO	97	77	99	75	87	3	0.08	-0.33	0.08	5.66	99	14.99	82	87	42	7	0	1	0
	VICTORIA	97	76	99	74	87	3	0.09	-0.54	0.09	4.54	64	14.58	67	93	52	7	0	1	0
	WACO	96	76	98	72	86	1	0.00	-0.50	0.00	8.41	184	27.72	147	90	57	7	0	0	0
	WICHITA FALLS	98	74	101	69	86	1	0.00	-0.30	0.00	4.68	97	19.70	121	87	47	7	0	0	0
UT	SALT LAKE CITY	98	70	99	67	84	7	0.07	-0.09	0.07	0.62	53	14.83	150	50	20	7	0	1	0
VT	BURLINGTON	85	65	94	59	75	4	0.35	-0.53	0.35	6.46	109	23.07	126	86	52	2	0	1	0
VA	LYNCHBURG	95	69	98	63	82	7	0.07	-0.95	0.05	5.75	86	23.05	93	94	48	7	0	2	0
	NORFOLK	95	78	100	76	87	8	0.00	-1.17	0.00	5.88	85	24.62	97	82	53	6	0	0	0
	RICHMOND	96	75	99	73	85	7	0.29	-0.78	0.27	10.47	164	30.85	128	85	51	7	0	2	0
	ROANOKE	95	72	99	69	84	8	0.10	-0.81	0.10	5.89	95	23.63	98	81	44	7	0	1	0
	WASH/DULLES	95	70	98	64	82	6	0.41	-0.37	0.41	4.39	69	24.27	105	81	46	7	0	1	0
WA	OLYMPIA	74	54	81	44	64	1	0.42	0.25	0.33	1.37	56	16.39	60	89	64	0	0	3	0
	QUILLAYUTE	69	52	73	48	61	2	1.02	0.52	1.01	3.77	75	35.42	64	97	74	0	0	2	1
	SEATTLE-TACOMA	75	59	80	55	67	2	0.38	0.23	0.20	2.05	99	16.02	82	79	61	0	0	4	0
	SPOKANE	76	55	82	46	65	-4	0.29	0.13	0.29	0.73	43	8.41	89	64	32	0	0	1	0
	YAKIMA	83	53	89	47	68	-1	0.04	0.01	0.04	0.06	8	5.95	133	71	37	0	0	1	0
WV	BECKLEY	86	67	90	62	76	5	0.98	-0.12	0.45	6.52	93	29.76	121	89	57	1	0	3	0
	CHARLESTON	93	70	97	65	82	8	0.15	-0.95	0.15	5.02	70	27.61	110	92	46	6	0	1	0
	ELKINS	88	66	92	60	77	7	0.40	-0.70	0.19	9.83	127	30.50	115	89	55	2	0	3	0
	HUNTINGTON	90	70	94	65	80	4	0.64	-0.37	0.58	7.76	117	28.82	118	96	58	5	0	2	1
WI	EAU CLAIRE	85	64	92	57	75	3	2.72	1.87	1.02	7.67	113	26.04	152	95	61	2	0	4	2
	GREEN BAY	86	67	92	59	76	6	2.42	1.67	1.42	7.95	141	23.88	157	92	65	2	0	5	2
	LA CROSSE	91	70	97	67	80	6	4.51	3.57	2.05	11.75	174	28.66	162	89	57	3	0	5	3
	MADISON	89	69	93	63	79	7	3.42	2.57	1.91	10.72	163	28.43	158	85	64	3	0	5	2
	MILWAUKEE	88	71	93	65	79	7	2.81	2.03	2.01	7.56	129	25.37	135	81	67	3	0	3	2
WY	CASPER	93	54	97	49	74	4	0.17	-0.13	0.17	3.30	146	13.52	163	76	30	6	0	1	0
	CHEYENNE	87	58	95	54	73	5	0.45	-0.06	0.43	5.37	157	17.93	191	66	42	3	0	2	0
	LANDER	88	58	92	55	73	2	0.01	-0.18	0.01	0.86	51	14.24	169	63	22	3	0	1	0
	SHERIDAN	86	56	93	53	71	2	0.10	-0.14	0.09	3.67	129	14.52	155	82	42	1	0	2	0

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

National Agricultural Summary

July 15 – 21, 2019

Weekly National Agricultural Summary provided by USDA/NASS

HIGHLIGHTS

Rain fell most heavily in parts of the Delta and the Corn Belt, with some areas receiving more than 4 inches. The Great Lakes, Great Plains, New England, and Southwest were warmer than normal for the week, with temperatures averaging 4°F or more above normal in many places. In contrast, temperatures were 2°F or more below normal in parts of California, the Delta, Pacific Northwest, and northern Rocky Mountains.

Corn: Thirty-five percent of the nation's corn acreage was at or beyond the silking stage by July 21, forty-three percentage points behind last year and 31 points behind the 5-year average. In Iowa, 41 percent of the corn had reached the silking stage by week's end, 44 percentage points behind last year and 30 points behind average. By July 21, five percent of the nation's corn was at or beyond the dough stage, 11 percentage points behind last year and 5 points behind average. All of the estimating states were at or behind the average pace. Overall, fifty-seven percent of the corn was rated in good to excellent condition, 1 percentage point below the previous week and 15 points below the same time last year.

Soybean: By July 21, forty percent of the nation's soybean acreage had reached the blooming stage, 36 percentage points behind last year and 26 points behind the 5-year average. Blooming advanced at a rapid pace, with gains of at least 12 percentage points during the week in 14 of the 18 major estimating states. Nationally, seven percent of the soybeans were setting pods, 34 percentage points behind the previous year and 21 points behind the same time last year. On July 21, fifty-four percent of the soybeans were rated in good to excellent condition, identical to the previous week but 16 percentage points below the same time last year.

Winter Wheat: Sixty-nine percent of the 2019 winter wheat acreage was harvested by July 21, ten percentage points behind both last year and the 5-year average. Winter wheat harvest progress advanced at least 15 percentage points during the week in Colorado, Kansas, Nebraska, and Ohio.

Cotton: Seventy-eight percent of the nation's cotton acreage had reached the squaring stage by July 21, one percentage point ahead of last year but 2 points behind the 5-year average. In Texas, 74 percent of the cotton had reached the squaring stage by week's end, 4 percentage points ahead of last year but identical to the average. By July 21, thirty-three percent of the nation's cotton had begun setting bolls, 7 percentage points behind last year and 4 points behind average. On July 21, sixty percent of the cotton was rated in good to excellent condition, 4 percentage points above the previous week and 21 points above the same time last year.

Sorghum: By July 21, twenty-seven percent of the nation's sorghum acreage had reached the heading stage, 13 percentage points behind both last year and the 5-year average. Seventy-three percent of Texas' sorghum had reached the heading stage by July 21, one percentage point behind last year and 5 points behind average. Sixteen percent of nation's sorghum was at or beyond the coloring stage by July 21, six percentage points behind both last year and the average. On July 21, seventy-three percent of the sorghum was rated in good to excellent condition, 1 percentage point below the previous week but 24 points above the same time last year.

Rice: By July 21, thirty-one percent of the nation's rice acreage had reached the heading stage, 13 percentage points behind last year and 12 points behind the 5-year average. Heading in Louisiana and Texas was the most advanced, with 78 percent of the acreage headed in both states. On July 21, sixty-five percent of the nation's rice was rated in good to excellent condition, 2 percentage points below the previous week and 6 points below the same time last year.

Small Grains: By July 21, ninety-four percent of the nation's oat acreage had headed, 5 percentage points behind last year and 4 points behind the 5-year average. Twelve percent of the oats had been harvested by July 21, eleven percentage points behind last year and 10 points behind average. Harvest was nearly complete in Texas with 99 percent harvested, 1 percentage point behind the previous year but 1 point ahead of average. On July 21, sixty-four percent of the nation's oats were rated in good to excellent condition, 4 percentage points below the previous week and 8 points below the same time last year.

Ninety percent of the nation's barley acreage had reached the heading stage by July 21, three percentage points behind last year and 5 points behind the 5-year average. On July 21, seventy-six percent of the barley was rated in good to excellent condition, identical to the previous week but 5 percentage points below the same time last year.

By July 21, ninety-two percent of the nation's spring wheat had reached the heading stage, 4 percentage points behind last year and 2 points behind the 5-year average. On July 21, seventy-six percent of the spring wheat was rated in good to excellent condition, identical to the previous week but 3 percentage points below the same time last year.

Other Crops: By July 21, seventy-eight percent of the nation's peanut acreage had reached the pegging stage, identical to last year but 1 percentage point ahead of the 5-year average. On July 21, seventy-one percent of the peanuts were rated in good to excellent condition, 2 percentage points above the previous week but 1 point below the same time last year.

Crop Progress and Condition

Week Ending July 21, 2019

Weekly U.S. Progress and Condition Data provided by USDA/NASS

Corn Percent Silking

	Prev Year	Prev Week	Jul 21 2019	5-Yr Avg
CO	50	4	21	30
IL	96	19	36	84
IN	84	10	23	67
IA	85	8	41	71
KS	80	36	54	74
KY	85	60	69	81
MI	43	0	5	38
MN	72	2	21	56
MO	94	45	62	89
NE	80	11	40	70
NC	93	80	89	94
ND	59	1	10	32
OH	77	6	18	56
PA	49	30	55	47
SD	72	0	9	50
TN	94	80	88	92
TX	84	75	81	82
WI	50	1	10	37
18 Sts	78	17	35	66

These 18 States planted 92% of last year's corn acreage.

Corn Percent Dough

	Prev Year	Prev Week	Jul 21 2019	5-Yr Avg
CO	1	NA	0	0
IL	29	NA	1	18
IN	5	NA	0	4
IA	6	NA	1	5
KS	32	6	13	17
KY	30	8	19	23
MI	1	NA	0	0
MN	3	NA	0	1
MO	45	NA	5	28
NE	19	NA	2	10
NC	61	38	53	64
ND	0	NA	0	0
OH	4	NA	0	2
PA	2	NA	0	2
SD	9	NA	0	3
TN	61	33	45	46
TX	64	50	58	59
WI	0	NA	0	0
18 Sts	16	NA	5	10

These 18 States planted 92% of last year's corn acreage.

Corn Condition by Percent

	VP	P	F	G	EX
CO	0	2	20	65	13
IL	4	14	39	39	4
IN	6	18	41	31	4
IA	2	7	28	52	11
KS	3	9	31	46	11
KY	2	7	18	54	19
MI	4	17	37	34	8
MN	3	8	32	47	10
MO	8	20	39	29	4
NE	1	4	18	62	15
NC	9	21	30	34	6
ND	0	4	19	65	12
OH	6	17	42	31	4
PA	0	4	15	64	17
SD	3	7	32	43	15
TN	0	2	13	57	28
TX	0	3	29	50	18
WI	4	10	26	41	19
18 Sts	3	10	30	47	10
Prev Wk	3	9	30	48	10
Prev Yr	3	6	19	50	22

Soybeans Percent Blooming

	Prev Year	Prev Week	Jul 21 2019	5-Yr Avg
AR	92	66	75	83
IL	87	12	30	72
IN	79	7	21	67
IA	79	26	47	72
KS	72	15	28	52
KY	50	23	34	44
LA	98	84	90	93
MI	59	9	23	60
MN	71	16	47	70
MS	91	76	82	82
MO	67	13	25	49
NE	76	28	46	71
NC	47	22	36	43
ND	83	18	49	70
OH	76	12	27	60
SD	66	32	45	65
TN	70	40	56	60
WI	64	7	29	60
18 Sts	76	22	40	66

These 18 States planted 95% of last year's soybean acreage.

Soybeans Percent Setting Pods

	Prev Year	Prev Week	Jul 21 2019	5-Yr Avg
AR	76	33	43	60
IL	63	NA	2	33
IN	51	NA	1	32
IA	37	NA	4	28
KS	28	2	6	15
KY	28	NA	11	20
LA	87	59	72	79
MI	19	NA	0	18
MN	32	NA	2	23
MS	75	37	48	60
MO	30	NA	2	16
NE	37	NA	8	25
NC	20	8	18	20
ND	40	NA	1	25
OH	38	NA	1	19
SD	26	NA	0	21
TN	36	13	27	29
WI	24	NA	1	21
18 Sts	41	NA	7	28

These 18 States planted 95% of last year's soybean acreage.

Soybean Condition by Percent

	VP	P	F	G	EX
AR	4	10	30	38	18
IL	5	13	37	40	5
IN	7	17	40	32	4
IA	2	5	29	55	9
KS	3	7	40	45	5
KY	2	6	20	58	14
LA	1	7	39	44	9
MI	2	13	39	40	6
MN	2	7	31	52	8
MS	1	8	35	46	10
MO	4	13	42	38	3
NE	1	4	22	63	10
NC	3	11	32	44	10
ND	1	5	29	59	6
OH	8	20	42	27	3
SD	3	8	42	33	14
TN	0	1	17	61	21
WI	1	8	29	44	18
18 Sts	3	9	34	46	8
Prev Wk	3	9	34	46	8
Prev Yr	2	6	22	52	18

Crop Progress and Condition

Week Ending July 21, 2019

Weekly U.S. Progress and Condition Data provided by USDA/NASS

Cotton Percent Squaring

	Prev Year	Prev Week	Jul 21 2019	5-Yr Avg
AL	82	82	88	85
AZ	95	95	97	92
AR	100	91	95	100
CA	74	79	80	84
GA	87	79	90	90
KS	83	40	60	51
LA	99	86	93	97
MS	93	65	74	88
MO	99	36	64	88
NC	85	82	90	88
OK	68	50	77	65
SC	73	68	89	81
TN	96	63	79	87
TX	70	52	74	74
VA	85	77	88	86
15 Sts	77	60	78	80

These 15 States planted 99% of last year's cotton acreage.

Cotton Percent Setting Bolls

	Prev Year	Prev Week	Jul 21 2019	5-Yr Avg
AL	57	32	50	53
AZ	49	33	59	55
AR	94	72	79	88
CA	32	30	35	56
GA	50	45	60	53
KS	10	2	10	6
LA	88	40	59	77
MS	71	21	33	60
MO	86	1	6	36
NC	40	35	53	48
OK	28	0	18	25
SC	38	34	53	45
TN	48	13	24	40
TX	28	12	24	26
VA	30	9	32	30
15 Sts	40	20	33	37

These 15 States planted 99% of last year's cotton acreage.

Cotton Condition by Percent

	VP	P	F	G	EX
AL	1	6	35	51	7
AZ	0	10	25	58	7
AR	0	1	13	49	37
CA	0	0	100	0	0
GA	3	7	30	52	8
KS	5	19	43	29	4
LA	0	3	29	57	11
MS	1	7	39	40	13
MO	7	10	55	28	0
NC	4	17	28	45	6
OK	0	1	26	70	3
SC	0	3	28	64	5
TN	0	6	20	59	15
TX	3	9	30	48	10
VA	0	0	8	87	5
15 Sts	2	8	30	50	10
Prev Wk	3	12	29	47	9
Prev Yr	14	19	28	32	7

Sorghum Percent Headed

	Prev Year	Prev Week	Jul 21 2019	5-Yr Avg
CO	24	0	0	12
KS	19	6	7	13
NE	34	13	17	22
OK	39	16	20	35
SD	29	0	9	31
TX	74	67	73	78
6 Sts	40	24	27	40

These 6 States planted 97% of last year's sorghum acreage.

Sorghum Percent Coloring

	Prev Year	Prev Week	Jul 21 2019	5-Yr Avg
CO	0	0	0	0
KS	0	0	1	0
NE	2	0	0	1
OK	11	0	1	8
SD	0	0	0	1
TX	65	49	53	59
6 Sts	22	14	16	22

These 6 States planted 97% of last year's sorghum acreage.

Sorghum Condition by Percent

	VP	P	F	G	EX
CO	1	1	21	71	6
KS	1	3	24	66	6
NE	0	0	20	67	13
OK	0	1	7	84	8
SD	0	1	44	43	12
TX	0	1	25	48	26
6 Sts	1	2	24	60	13
Prev Wk	1	2	23	61	13
Prev Yr	5	11	35	44	5

Peanuts Percent Pegging

	Prev Year	Prev Week	Jul 21 2019	5-Yr Avg
AL	79	80	87	72
FL	74	71	84	83
GA	89	82	92	85
NC	75	57	72	78
OK	56	40	45	54
SC	68	75	87	83
TX	54	10	26	46
VA	58	62	74	53
8 Sts	78	67	78	77

These 8 States planted 96% of last year's peanut acreage.

Peanut Condition by Percent

	VP	P	F	G	EX
AL	0	6	45	39	10
FL	0	0	40	51	9
GA	1	4	25	60	10
NC	3	7	30	53	7
OK	0	0	14	80	6
SC	0	0	21	72	7
TX	0	0	1	90	9
VA	0	0	9	81	10
8 Sts	1	3	25	62	9
Prev Wk	1	5	25	61	8
Prev Yr	1	3	24	60	12

Crop Progress and Condition

Week Ending July 21, 2019

Weekly U.S. Progress and Condition Data provided by USDA/NASS

Oats Percent Headed

	Prev Year	Prev Week	Jul 21 2019	5-Yr Avg
IA	100	96	98	100
MN	97	95	99	98
NE	100	95	97	100
ND	95	69	87	92
OH	100	88	91	99
PA	89	86	92	93
SD	99	79	90	99
TX	100	100	100	100
WI	95	74	88	97
9 Sts	99	87	94	98

These 9 States planted 66% of last year's oat acreage.

Oats Percent Harvested

	Prev Year	Prev Week	Jul 21 2019	5-Yr Avg
IA	33	NA	12	35
MN	3	NA	0	5
NE	71	NA	14	54
ND	1	NA	0	4
OH	64	NA	8	41
PA	17	0	1	9
SD	21	NA	0	26
TX	100	96	99	98
WI	4	0	1	7
9 Sts	23	NA	12	22

These 9 States harvested 65% of last year's oat acreage.

Oat Condition by Percent

	VP	P	F	G	EX
IA	1	4	34	51	10
MN	2	3	28	55	12
NE	2	4	24	59	11
ND	0	2	19	61	18
OH	2	12	48	34	4
PA	0	7	19	61	13
SD	1	2	31	55	11
TX	7	10	32	46	5
WI	1	5	24	50	20
9 Sts	3	5	28	52	12
Prev Wk	2	5	25	57	11
Prev Yr	4	3	21	59	13

Rice Percent Headed

	Prev Year	Prev Week	Jul 21 2019	5-Yr Avg
AR	37	9	18	35
CA	13	15	15	18
LA	86	73	78	84
MS	48	28	48	57
MO	33	2	7	29
TX	86	64	78	79
6 Sts	44	24	31	43

These 6 States planted 100% of last year's rice acreage.

Spring Wheat Percent Headed

	Prev Year	Prev Week	Jul 21 2019	5-Yr Avg
ID	91	85	93	94
MN	100	96	100	96
MT	88	60	87	91
ND	97	79	93	93
SD	99	75	86	98
WA	100	95	100	99
6 Sts	96	78	92	94

These 6 States planted 99% of last year's spring wheat acreage.

Barley Percent Headed

	Prev Year	Prev Week	Jul 21 2019	5-Yr Avg
ID	92	80	87	94
MN	97	97	99	96
MT	90	60	88	95
ND	98	85	93	94
WA	99	90	98	99
5 Sts	93	75	90	95

These 5 States planted 78% of last year's barley acreage.

Rice Condition by Percent

	VP	P	F	G	EX
AR	2	10	30	40	18
CA	0	0	0	60	40
LA	1	6	32	53	8
MS	1	3	30	55	11
MO	3	5	42	33	17
TX	0	2	56	39	3
6 Sts	1	6	28	46	19
Prev Wk	1	6	26	50	17
Prev Yr	1	5	23	56	15

Spring Wheat Condition by Percent

	VP	P	F	G	EX
ID	3	4	25	58	10
MN	0	1	14	75	10
MT	1	13	22	53	11
ND	0	2	18	66	14
SD	1	2	27	56	14
WA	1	3	41	45	10
6 Sts	0	4	20	63	13
Prev Wk	0	4	20	66	10
Prev Yr	1	3	17	65	14

Barley Condition by Percent

	VP	P	F	G	EX
ID	0	3	12	67	18
MN	1	1	18	71	9
MT	1	9	24	42	24
ND	0	2	15	70	13
WA	1	2	39	52	6
5 Sts	0	5	19	58	18
Prev Wk	0	5	19	62	14
Prev Yr	0	2	17	67	14

Crop Progress and Condition

Week Ending July 21, 2019

Weekly U.S. Progress and Condition Data provided by USDA/NASS

Winter Wheat Percent Harvested

	Prev Year	Prev Week	Jul 21 2019	5-Yr Avg
AR	100	100	100	100
CA	92	90	95	92
CO	89	22	65	80
ID	11	1	2	11
IL	100	90	94	97
IN	97	79	92	92
KS	100	81	96	98
MI	65	2	14	47
MO	100	96	100	98
MT	6	0	0	15
NE	79	14	33	76
NC	100	93	100	100
OH	95	64	83	88
OK	100	98	100	99
OR	30	4	17	33
SD	43	0	0	42
TX	99	97	100	99
WA	15	1	10	22
18 Sts	79	57	69	79

These 18 States harvested 91% of last year's winter wheat acreage.

Pasture and Range Condition by Percent
Week Ending Jul 21, 2019

	VP	P	F	G	EX			VP	P	F	G	EX
AL	2	9	34	53	2		NH	13	13	31	43	0
AZ	7	23	42	28	0		NJ	0	0	25	67	8
AR	0	3	26	47	24		NM	6	31	40	22	1
CA	35	5	15	45	0		NY	5	5	28	51	11
CO	1	3	17	68	11		NC	1	9	33	55	2
CT	0	0	100	0	0		ND	1	5	22	58	14
DE	3	11	31	51	4		OH	1	20	41	34	4
FL	2	4	17	57	20		OK	0	3	21	66	10
GA	4	13	38	41	4		OR	4	17	25	49	5
ID	1	5	22	55	17		PA	0	4	34	54	8
IL	2	6	42	36	14		RI	0	15	40	40	5
IN	3	10	39	39	9		SC	0	9	30	56	5
IA	1	7	31	52	9		SD	2	3	15	50	30
KS	1	3	21	61	14		TN	1	5	25	57	12
KY	1	7	26	57	9		TX	2	12	28	44	14
LA	0	5	36	50	9		UT	0	1	15	61	23
ME	0	3	5	52	40		VT	0	0	0	64	36
MD	2	3	36	49	10		VA	3	12	35	40	10
MA	0	5	15	70	10		WA	4	15	54	27	0
MI	4	14	28	41	13		WV	0	9	19	62	10
MN	1	4	22	58	15		WI	3	8	27	43	19
MS	1	6	33	47	13		WY	0	9	21	66	4
MO	1	8	27	53	11		48 Sts	2	7	25	53	13
MT	0	3	15	56	26							
NE	1	2	14	67	16		Prev Wk	2	6	24	54	14
NV	10	10	35	45	0		Prev Yr	10	16	29	38	7

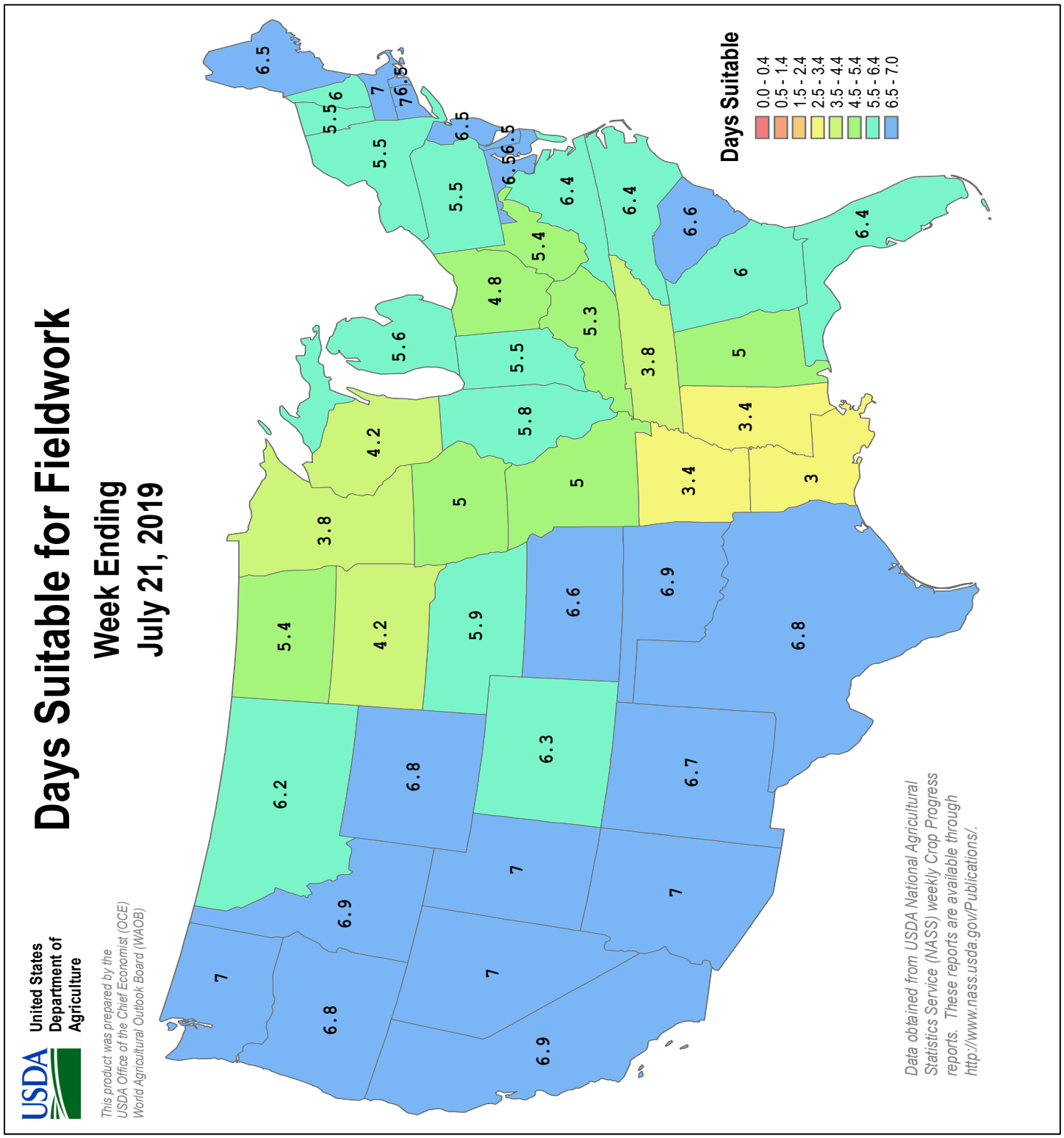
VP - Very Poor; P - Poor; F - Fair; G - Good; EX - Excellent

NA - Not Available; *Revised

Crop Progress and Condition

Week Ending July 21, 2019

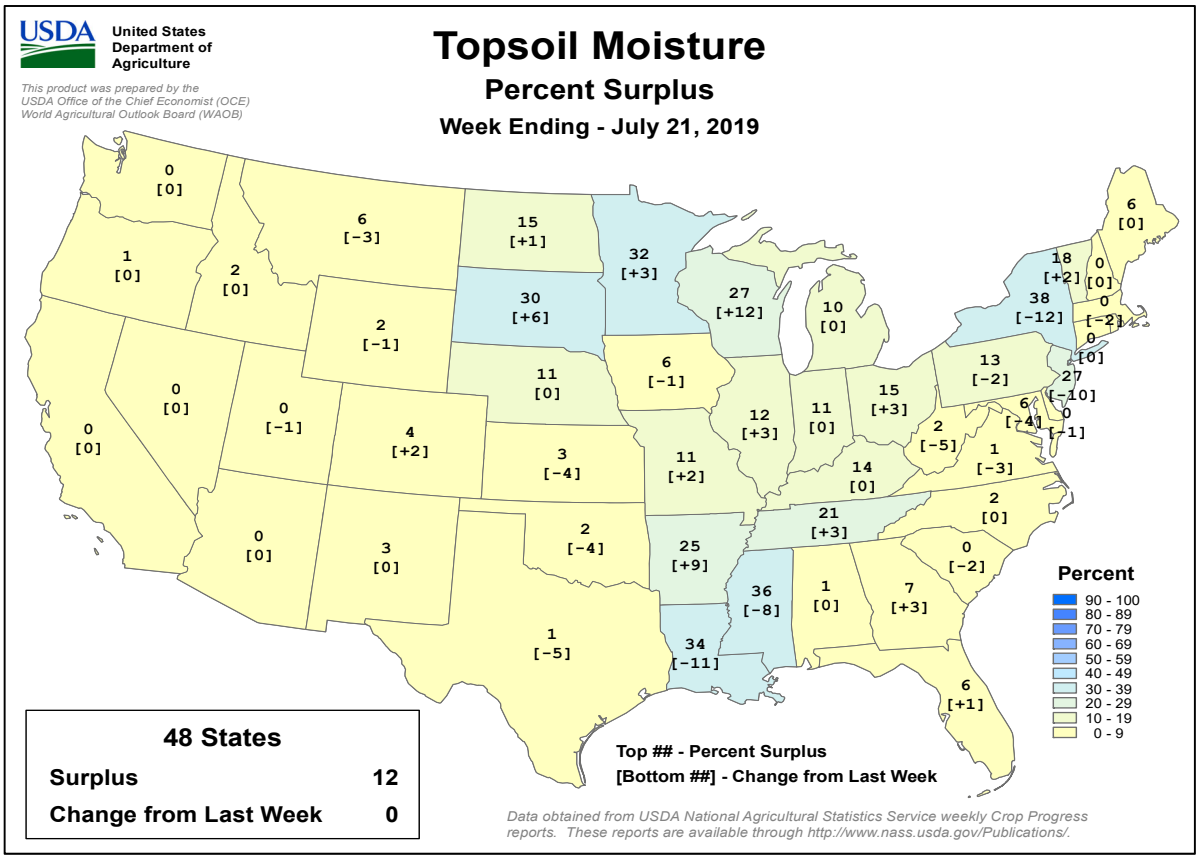
Weekly U.S. Progress and Condition Data provided by USDA/NASS

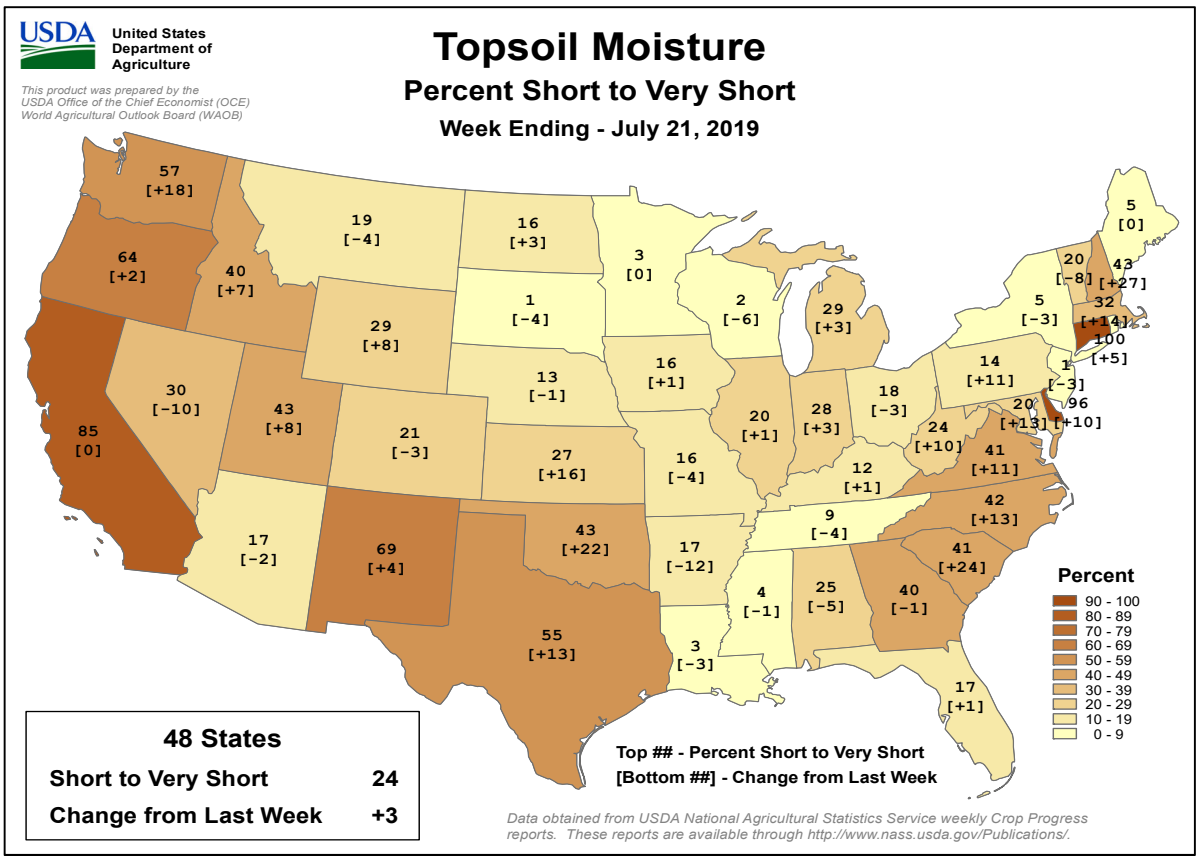


Crop Progress and Condition

Week Ending July 21, 2019

Weekly U.S. Progress and Condition Data provided by USDA/NASS

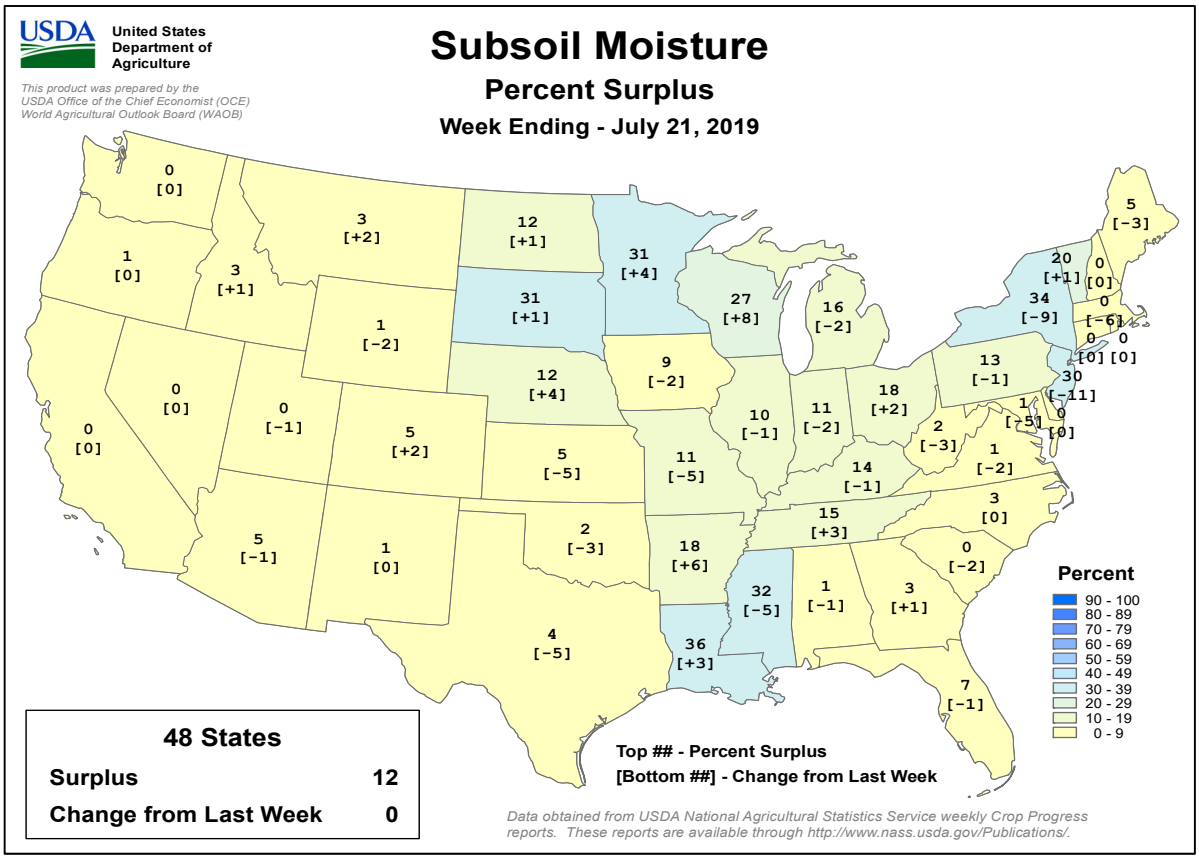


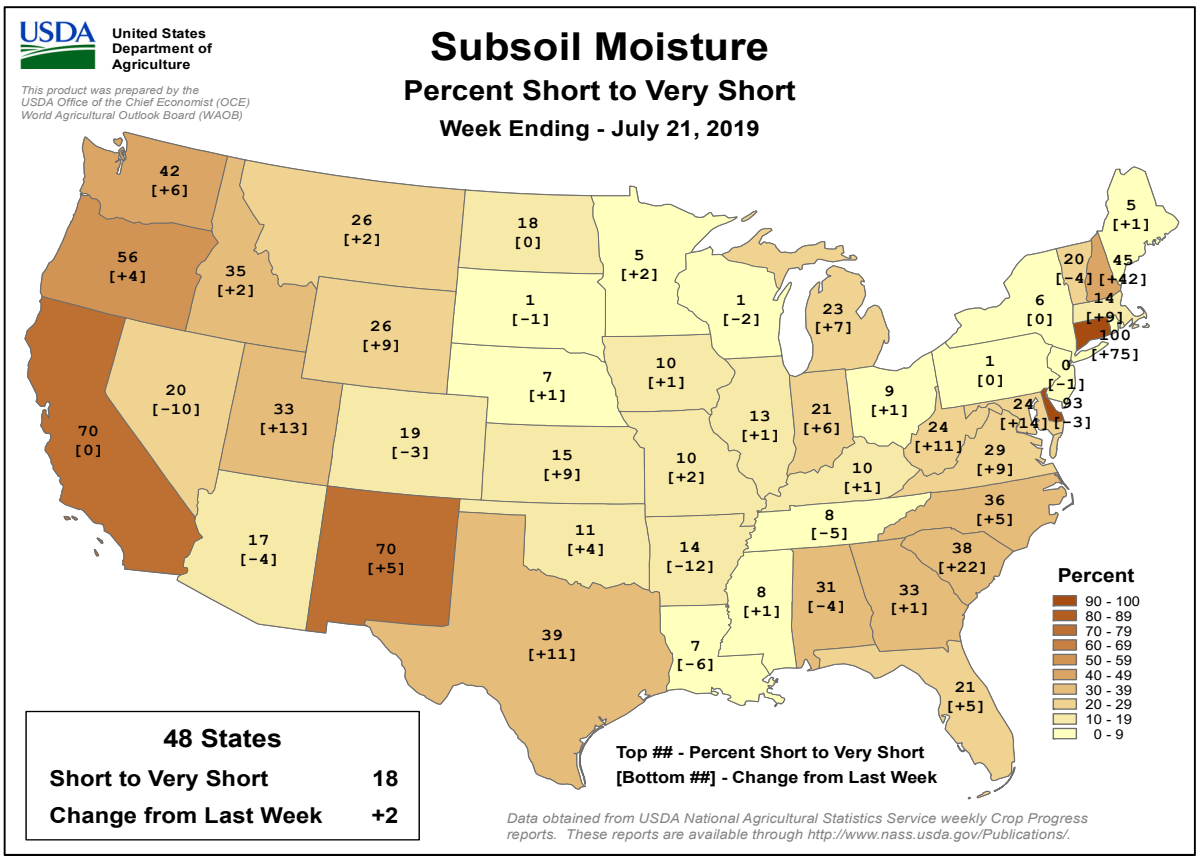


Crop Progress and Condition

Week Ending July 21, 2019

Weekly U.S. Progress and Condition Data provided by USDA/NASS





July 11 ENSO Diagnostic Discussion

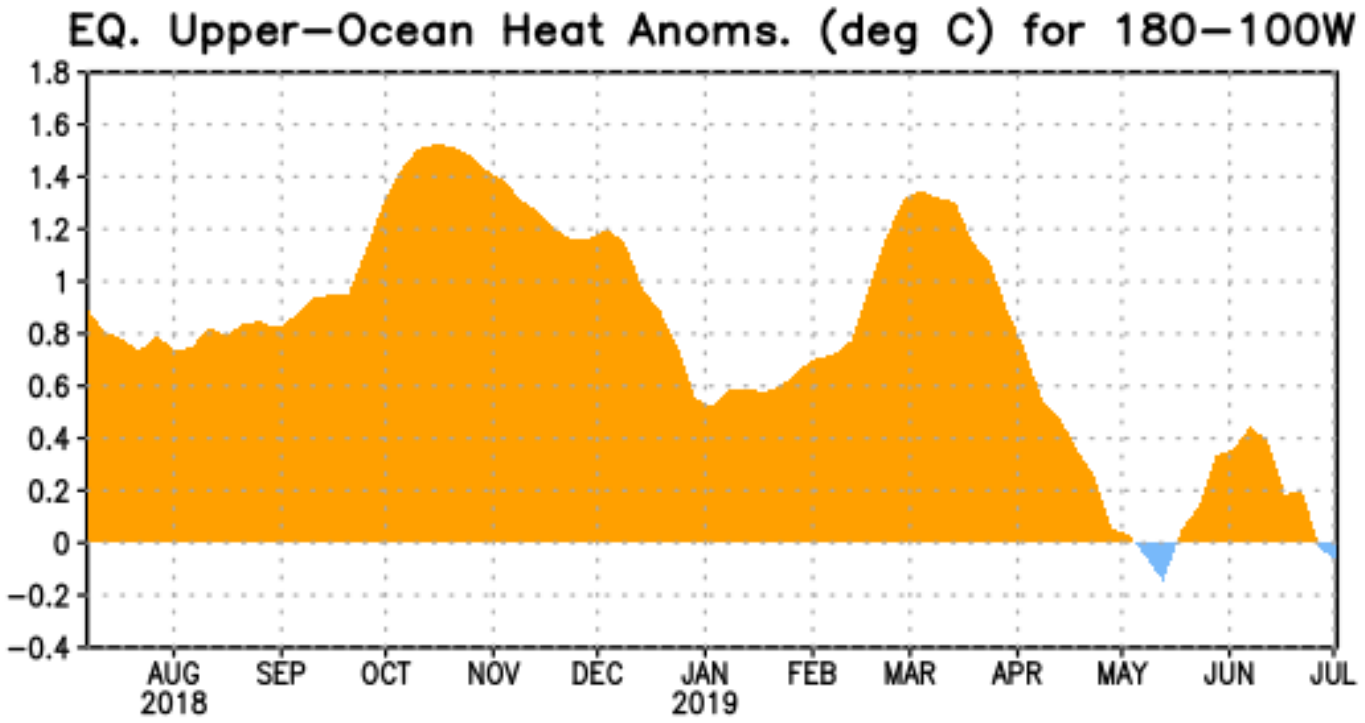


Figure 1: Area-averaged upper-ocean heat content anomaly (°C) in the equatorial Pacific (5°N-5°S, 180º-100ºW). The heat content anomaly is computed as the departure from the 1981-2010 base period pentad means.

ENSO Alert System Status: El Niño Advisory

Synopsis: A transition from El Niño to ENSO-neutral is expected in the next month or two, with ENSO-neutral most likely to continue through Northern Hemisphere fall and winter.

During June, El Niño was reflected in the continued presence of above average sea surface temperatures (SSTs) across the central equatorial Pacific Ocean. However, SST anomalies across most of the eastern Pacific decreased during the month. The latest weekly ENSO indices were +0.9°C in Niño-4 and +0.6°C in Niño-3.4, with smaller departures in the Niño-3 and Niño-1+2 regions. Upper-ocean subsurface temperatures (averaged across 180°-100°W) were above average at the beginning of June, but returned to near average by end of the month (Fig. 1), as anomalously cool waters expanded at depth. Weakly suppressed tropical convection continued over Indonesia, while weakly enhanced convection persisted near the Date Line. Low-level wind anomalies were near average over the tropical Pacific Ocean, and upper-level wind anomalies were westerly over the far eastern Pacific. The traditional and equatorial Southern Oscillation Indices were slightly negative. Overall, oceanic and atmospheric conditions were consistent with a weakening El Niño.

The latest plume of North American Multi-model Ensemble forecasts of the Niño-3.4 index shows a rapid transition toward ENSO-neutral by the late Northern Hemisphere summer, remaining neutral through fall and winter. Due to this model guidance and recent observations, the forecast consensus also favors a transition to ENSO-neutral during the next few months. In summary, a transition from El Niño to ENSO-neutral is expected in the next month or two, with ENSO-neutral most likely to continue through Northern Hemisphere fall and winter (click CPC/IRI consensus forecast for the chance of each outcome for each 3-month period).

This discussion is a consolidated effort of the National Oceanic and Atmospheric Administration (NOAA), NOAA's National Weather Service, and their funded institutions. Oceanic and atmospheric conditions are updated weekly on the Climate Prediction Center web site (El Niño/La Niña Current Conditions and Expert Discussions). Forecasts are also updated monthly in the Forecast Forum of CPC's Climate Diagnostics Bulletin. Additional perspectives and analysis are also available in an ENSO blog. The next ENSO Diagnostics Discussion is scheduled for **8 August 2019**. To receive an e-mail notification when the monthly ENSO Diagnostic Discussions are released, please send an e-mail message to: ncep.list.enso-update@noaa.gov.

International Weather and Crop Summary

July 14-20, 2019

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

HIGHLIGHTS

EUROPE: Deteriorating conditions in the north and west contrasted with good to excellent summer crop prospects in the southeast.

WESTERN FSU: Widespread showers and cool temperatures were nearly ideal for reproductive summer crops, though pockets of dryness lingered in Ukraine.

EASTERN FSU: Excessive heat stressed reproductive spring grains in the west and flowering cotton in the south, while showers maintained excellent wheat prospects in eastern growing areas.

MIDDLE EAST: Additional rain benefited reproductive to filling summer crops in Turkey.

SOUTH ASIA: Monsoon showers eased in India, reducing moisture supplies for kharif crops.

EASTERN ASIA: Rainfall throughout much of China maintained adequate to locally abundant soil moisture for summer crops, but dry weather continued on the North China Plain and environs.

SOUTHEAST ASIA: Unseasonably light showers continued in Thailand, while Tropical Cyclone Danas brought heavy showers to the northwestern Philippines.

AUSTRALIA: Showers benefited crops in the west and southeast, while drought remained entrenched in the northeast.

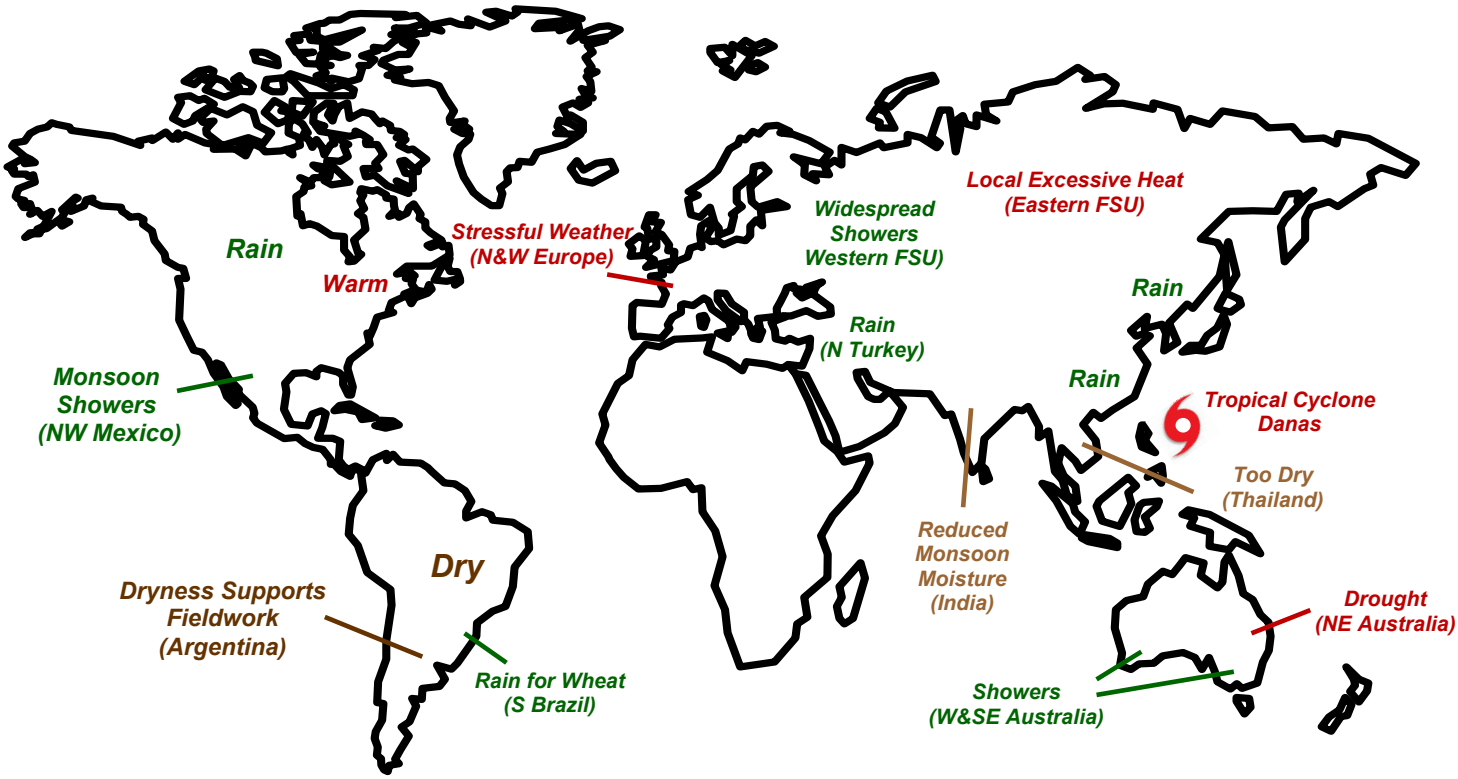
ARGENTINA: Warm, dry weather promoted growth of emerging winter grains and aided the final stages of summer crop harvesting.

BRAZIL: Light rain benefited wheat in southern production areas, while warm, dry weather aided corn and cotton harvesting farther north.

MEXICO: Monsoon showers intensified over northwestern watersheds.

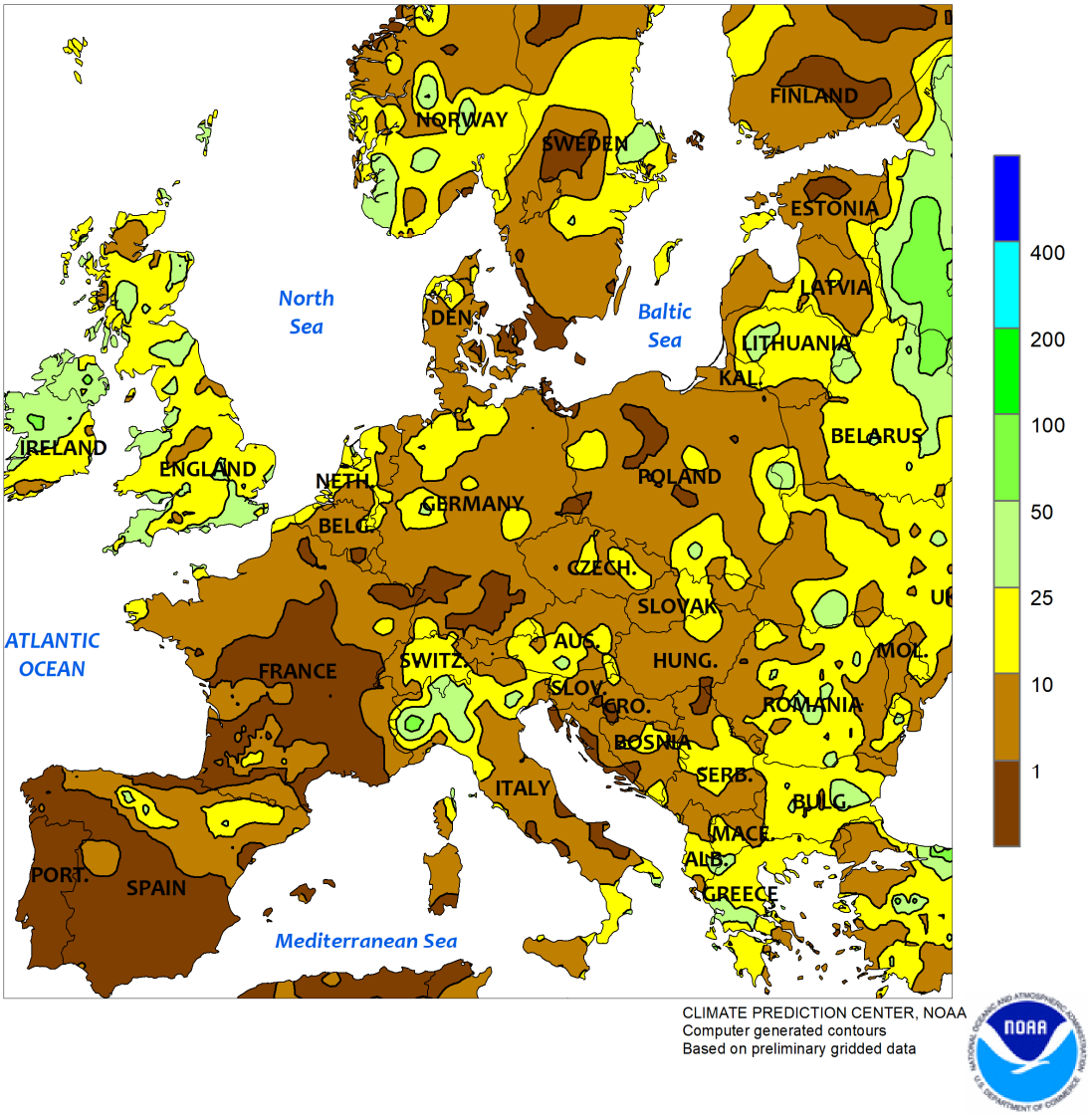
CANADIAN PRAIRIES: Locally heavy showers brought some relief from long-term dryness.

SOUTHEASTERN CANADA: Warm, showery weather benefited vegetative corn and soybeans in major production areas of Ontario.



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

EUROPE
Total Precipitation (mm)
July 14 - 20, 2019

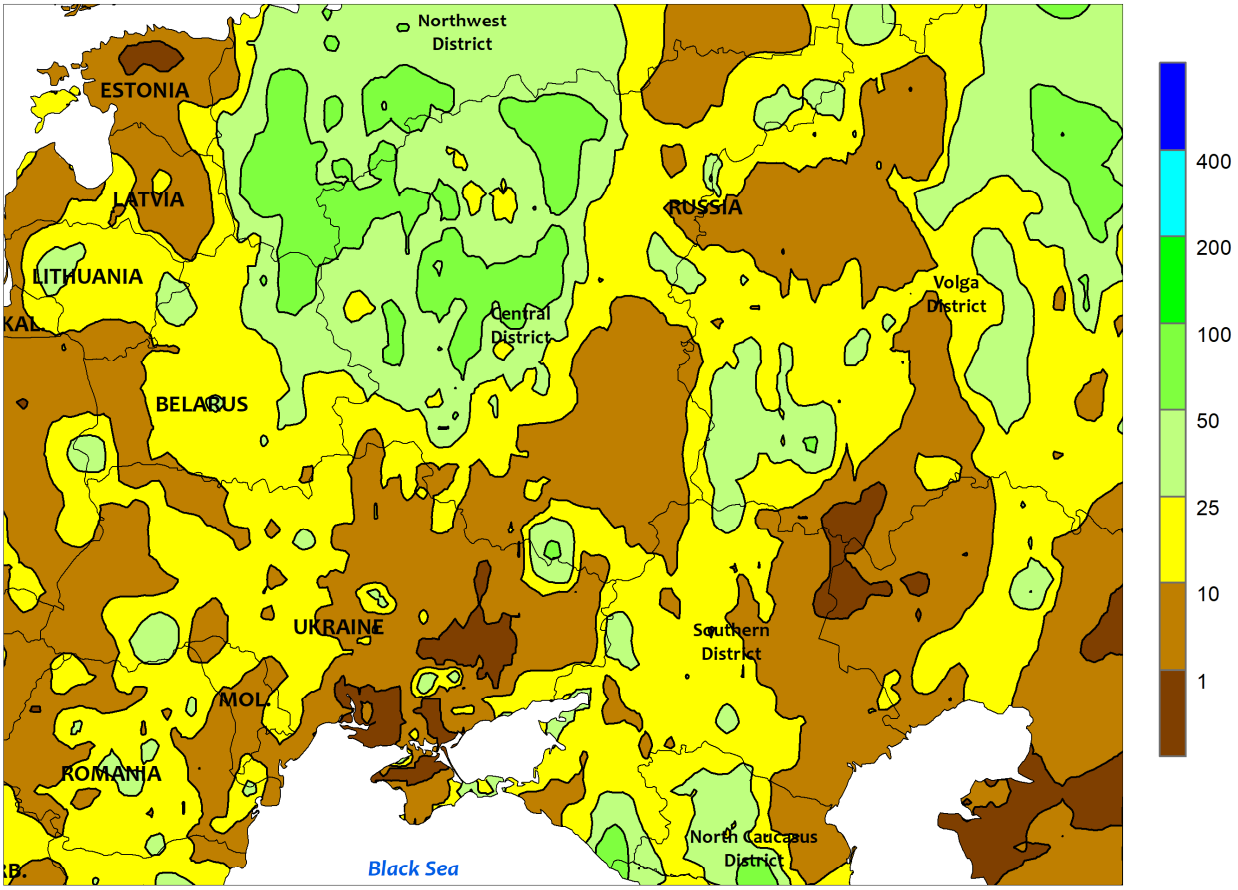


EUROPE

Good to excellent conditions in southeastern crop areas contrasted with varying degrees of dryness and drought in northern and western Europe. Temperatures during the period averaged near normal from southeastern England and northern France into Poland and the Baltic States. However, heat (up to 3°C above normal) continued in Spain, with highs in the upper 30s (degrees C) over central and southern portions of the country further stressing reproductive to filling summer crops. On the other hand, reproductive corn and sunflowers in northern Spain (Castilla y León) benefited from somewhat cooler weather (1-2°C above normal) as well as recent rain, and yield prospects are much more favorable in the country's northern growing areas. Meanwhile, acute short-term dryness in France (30-day rainfall 20 to 35 percent of normal, locally less) limited soil moisture for reproductive summer crops, though conditions are somewhat better in key corn and sunflower areas in the southwest. Similarly, below-normal rainfall over the past 30 days (locally less than 50 percent of normal) in Germany, Poland, and the Low Countries is affecting reproductive spring grains and summer crops. Conversely, widespread albeit highly variable showers (2-90 mm) from northern Italy into the Balkans boosted moisture supplies for reproductive corn, soybeans, and sunflowers, with yield prospects especially favorable across southeastern Europe. Summer crops in the Danube River Valley have benefited from timely rain over the past 30 days (100-200 percent of normal), and satellite-derived vegetation health data depicted excellent crop vigor.

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

WESTERN FSU
Total Precipitation (mm)
July 14 - 20, 2019



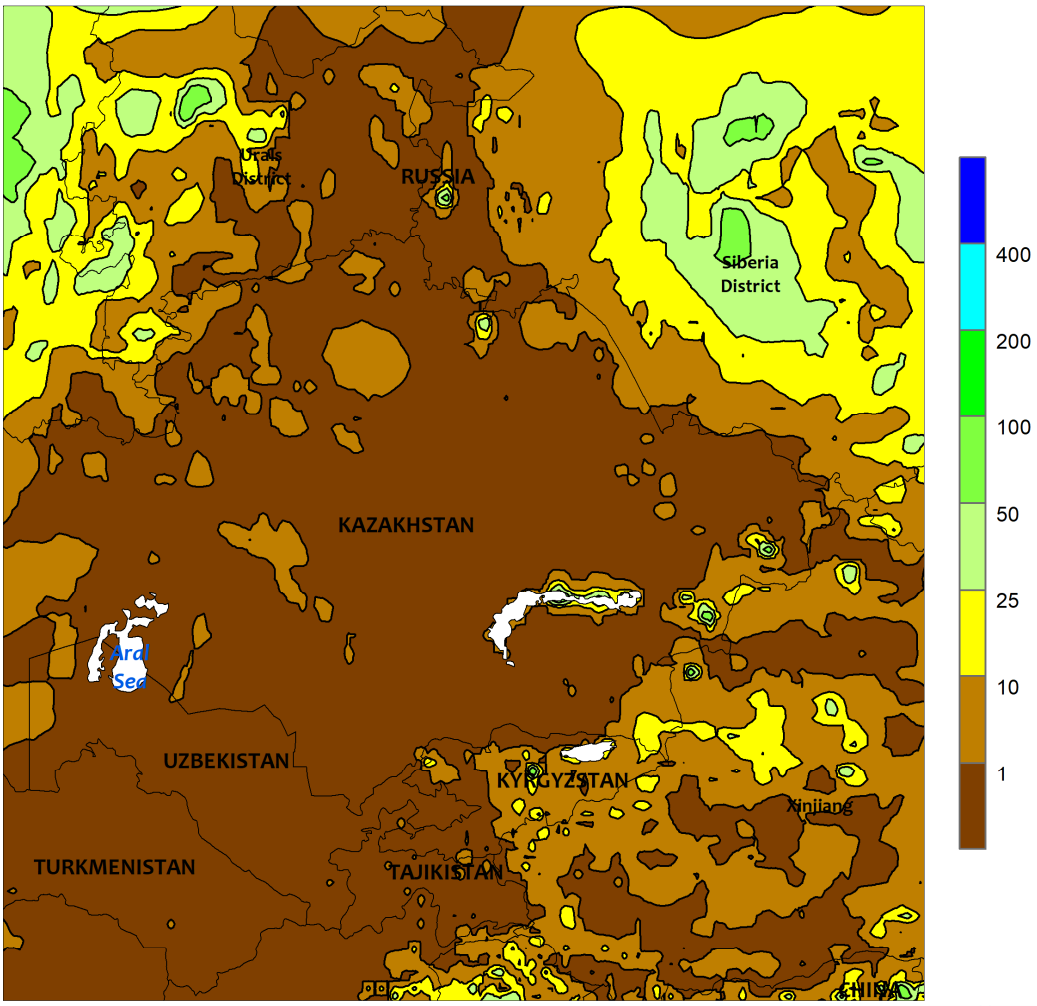
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded data

WESTERN FSU

Well-timed rain and cool temperatures continued over the region. For a second consecutive week, below-normal temperatures (up to 2°C below normal) were ideal for corn, soybeans, and sunflowers progressing through the temperature-sensitive reproductive stages of development. Furthermore, another round of moderate to heavy showers (5-70 mm) accompanied the cooler weather, though parts of east-central Ukraine reported less than 5 mm. The cool, wet weather over the past two weeks has been perfect for summer crops: soybeans in Ukraine were in full bloom; corn was tasseling in Ukraine and ranged from reproductive to filling in southwestern Russia; and sunflowers were approaching mid-stage bloom by week's end in Moldova, Ukraine, and southwestern Russia. With another storm approaching the region at the end of the period, yield prospects for summer crops continued to improve from early-summer heat and dryness.

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

EASTERN FSU
Total Precipitation (mm)
July 14 - 20, 2019



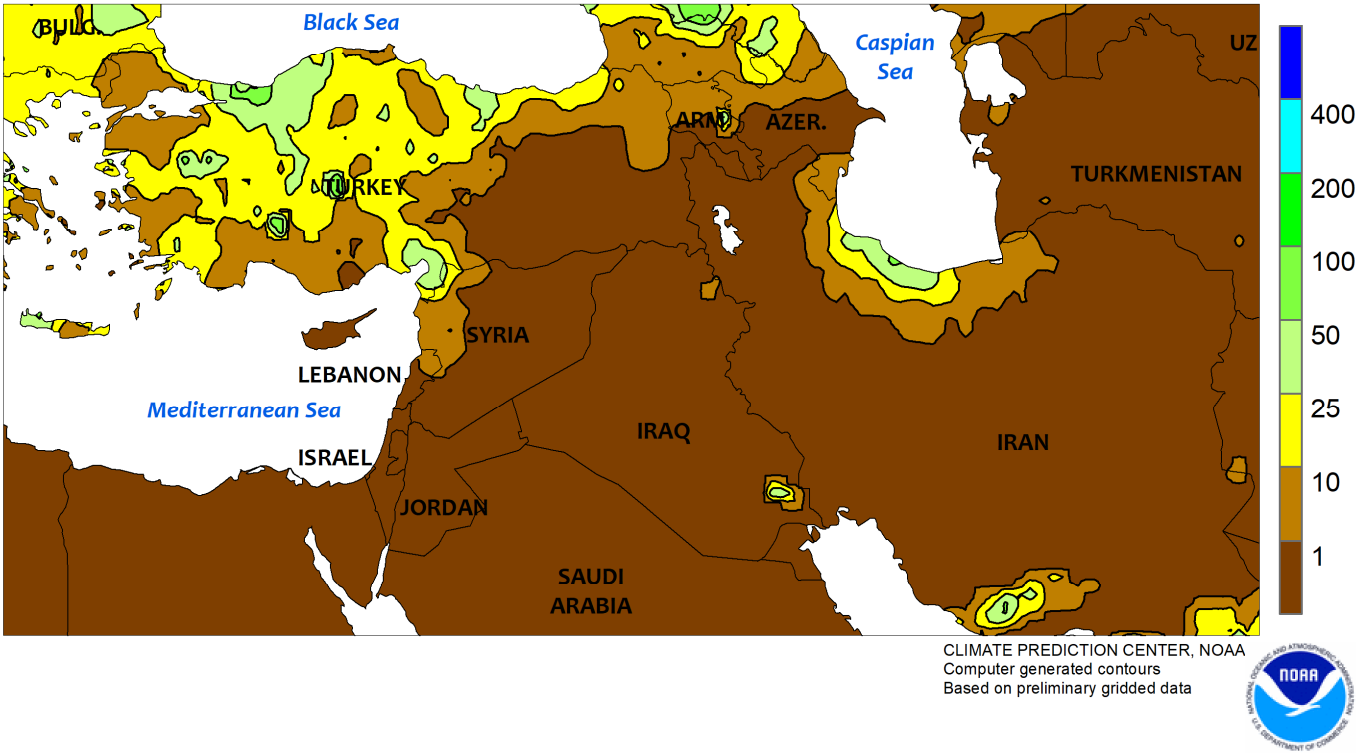
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded data

EASTERN FSU

Hot, dry weather in western and southern portions of the region contrasted with beneficial showers in eastern spring grain areas. For a second consecutive week, extreme heat (38-42°C) afflicted spring grain areas of northwestern Kazakhstan (Kostanay Oblast) and neighboring portions of central Russia. Wheat in these locales was approaching or in the reproductive stages of development, and crop yield losses are likely due to the untimely heat wave. Furthermore, localized albeit acute drought (90-day rainfall locally less than 50 percent of normal) in these same croplands has left soils devoid of moisture. Satellite-derived vegetation health data continued to depict localized but pronounced crop stress from the heat and dryness. Conversely, conditions remained good to excellent in eastern growing areas. In particular, moderate to heavy rain in the Siberia District (10-75 mm) boosted moisture supplies for heading to flowering wheat and barley, and satellite-derived vegetation health data depicted good to excellent crop vigor in these eastern growing areas. Farther south, sunny skies and above-normal temperatures maintained very high irrigation demands for flowering cotton in Uzbekistan and environs. The hotter-than-normal weather likely caused some crop stress; daytime highs in Uzbekistan reached as high as 48°C, with 7-day average high temperatures above 30°C (an indicator of stress to flowering cotton) — locally greater than 35°C — for a second consecutive week across Turkmenistan, Uzbekistan, and southwestern Kazakhstan.

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

MIDDLE EAST
Total Precipitation (mm)
July 14 - 20, 2019

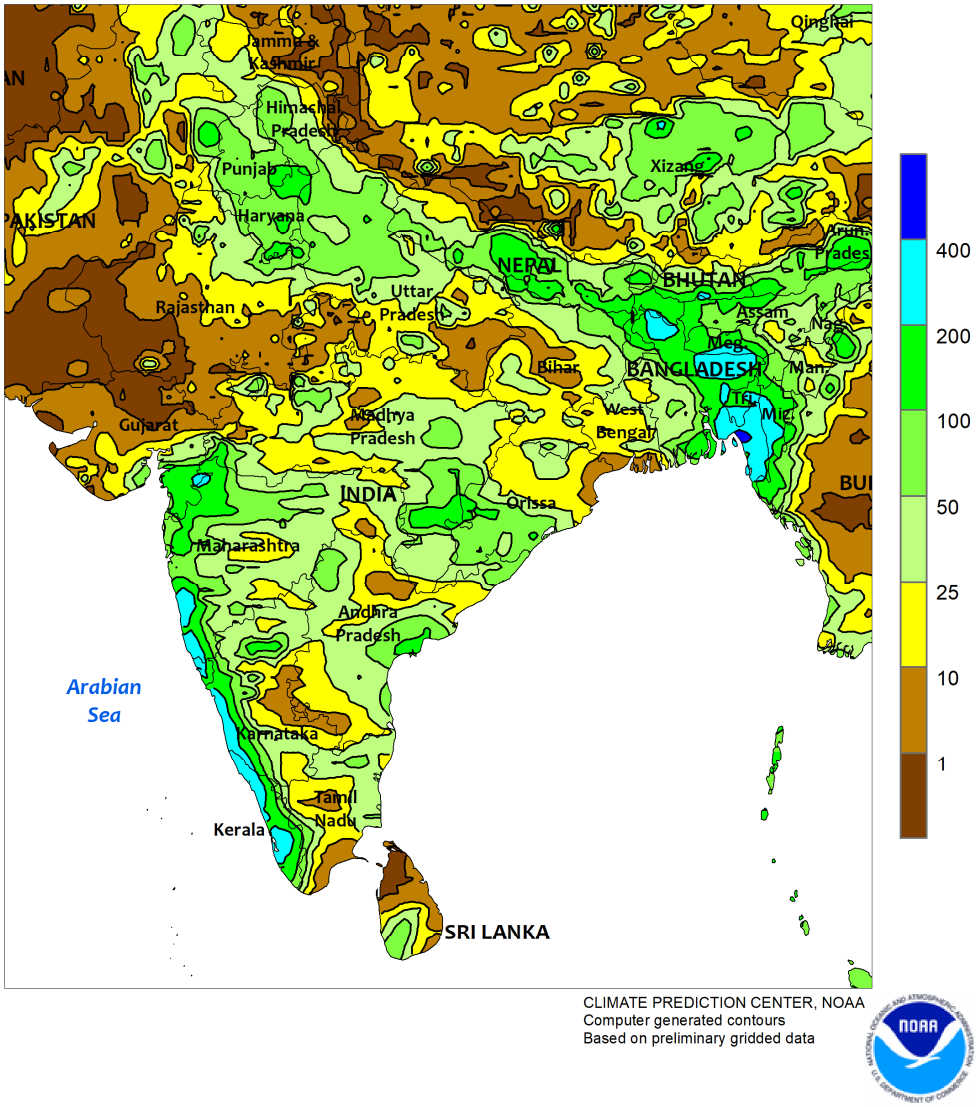


MIDDLE EAST

Rain in Turkey contrasted with seasonably dry weather elsewhere. An upper-air disturbance triggered showers and thunderstorms (5-65 mm) over much of Turkey, providing supplemental moisture for reproductive (north) to filling (south) corn as well as flowering cotton (west and southeast) and filling sunflowers (northwest). From the eastern Mediterranean Coast into Iran, sunny skies and below-normal temperatures favored the development of irrigated summer crops and seasonal fieldwork.

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

SOUTH ASIA
Total Precipitation (mm)
July 14 - 20, 2019

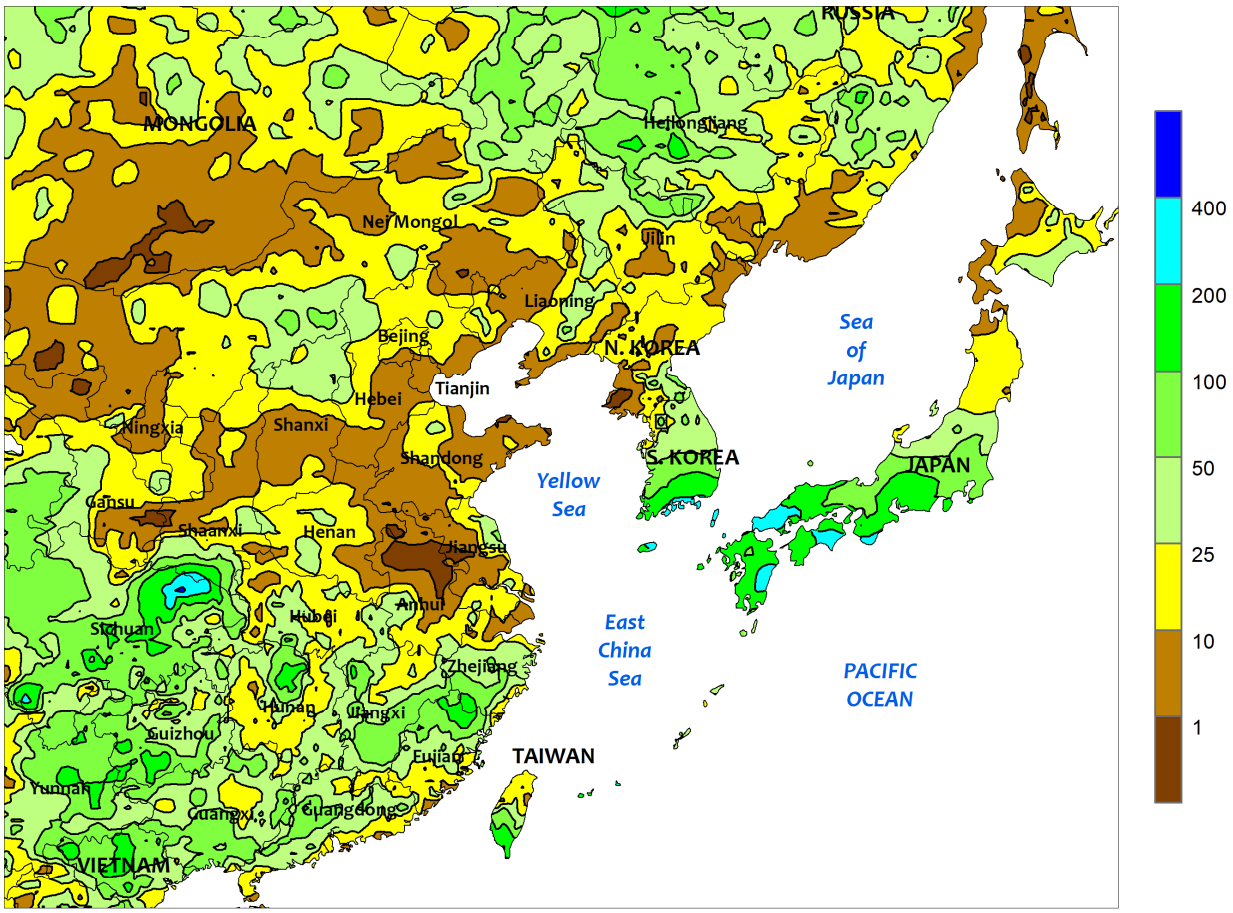


SOUTH ASIA

A lull in the monsoon brought lower rainfall totals to large portions of India. Showers were nearly non-existent in far western growing areas, lowering soil moisture for cotton and groundnuts, with most other areas receiving 10 to 50 mm. In contrast, heavy showers (25-100 mm) in northern India boosted moisture supplies for irrigated rice and cotton. Since the start of the monsoon, moisture conditions have been near to slightly below normal in much of India, but well below normal in key western growing areas. Time still remains for crop conditions to improve with more seasonable rainfall. In other parts of the region, rainfall was more seasonable (25-100 mm, locally over 200 mm) for rice in Bangladesh following last week's torrential downpours, while occasional rainfall (10-50 mm or more) in Pakistan maintained good moisture for irrigated cotton and rice.

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

EASTERN ASIA
Total Precipitation (mm)
July 14 - 20, 2019



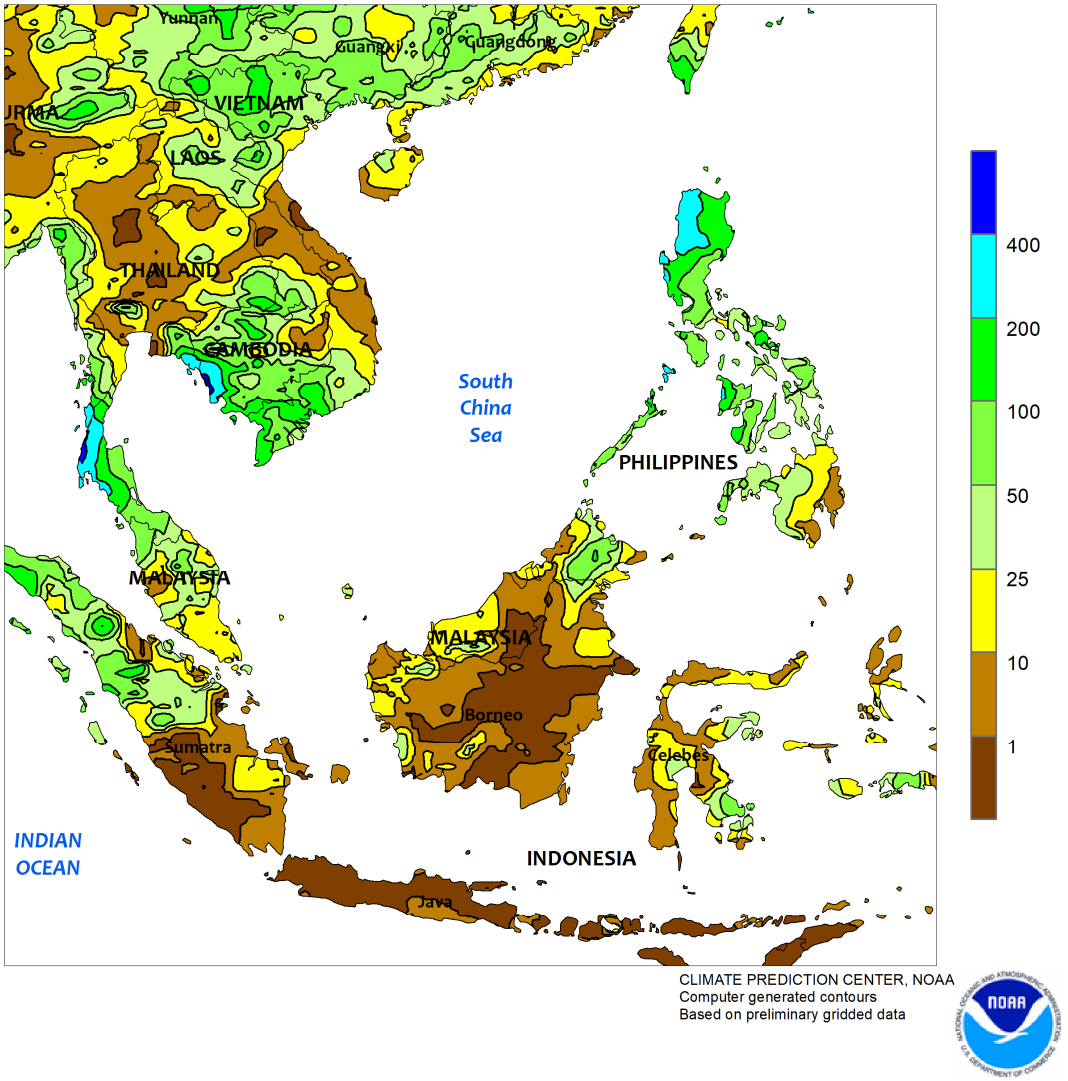
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded data

EASTERN ASIA

Widespread showers in China maintained good soil moisture for reproductive summer crops. In the northeast, 25 mm or more of rain in Heilongjiang and neighboring portions of Inner Mongolia benefited corn, soybeans, and rice. Lesser amounts (10-25 mm, locally more) occurred in Jilin and Liaoning. Overall seasonal moisture has been good to excellent throughout most of the northeast. The most notable exception was Liaoning, where 30-day rainfall totals were less than 65 percent of normal. In southern China, moisture conditions remained favorable for late-crop rice, with consistent showers (25-75 mm) in most areas. However, inconsistent rainfall continued in key single-crop rice areas of the Yangtze Valley (Hubei, Anhui, and Jiangsu), where 30-day totals were less than half of normal. Meanwhile on the North China Plain, unseasonably hot, dry weather continued to increase irrigation demands for summer crops and stress rain-fed crops. Elsewhere in the region, showers were prevalent across the Koreas and Japan, with the highest amounts (25-100 mm, locally over 200 mm) occurring in southern Japan, South Korea, and eastern North Korea.

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

SOUTHEAST ASIA
Total Precipitation (mm)
July 14 - 20, 2019



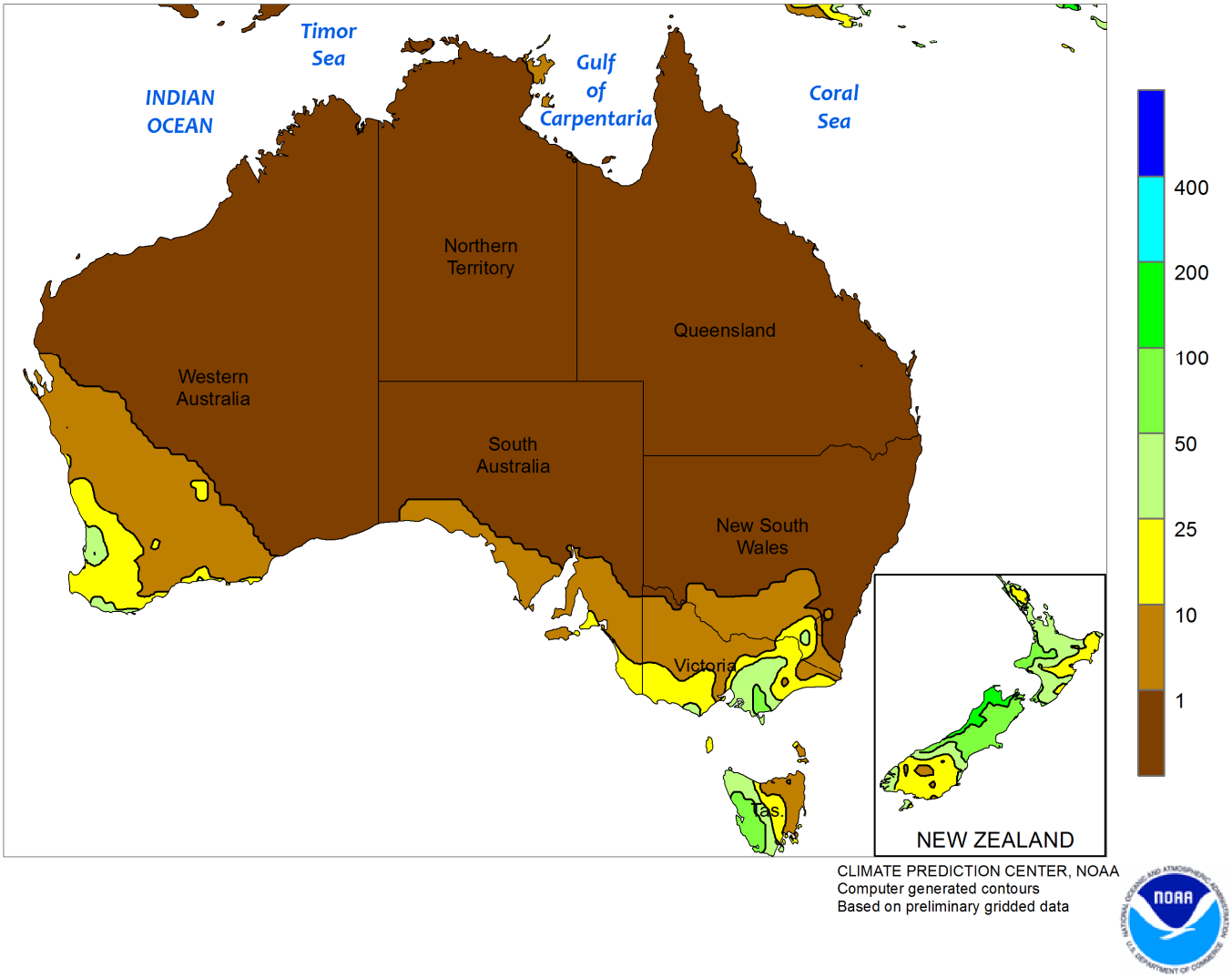
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded data

SOUTHEAST ASIA

Rainfall continued to be largely absent in Thailand, increasing irrigation demands for rice and stressing rain-fed varieties. In particular, seasonal totals (beginning May 1) in rain-fed areas of the northeast are the lowest in 30 years. The pattern of deficit rainfall also extended into southern Laos and central Vietnam. Meanwhile, Tropical Cyclone Danas skirted the northeastern Philippines with winds over 40 knots and produced heavy downpours (over 200 mm) in key rice areas of western Luzon. Rice in the rest of the country benefited from less intense rainfall (25-100 mm). In southern sections of the region, unseasonably light showers (less than 25 mm) in Malaysia and adjacent areas in eastern Indonesia lowered soil moisture for oil palm, while over 25 mm in western oil palm areas of Indonesia maintained adequate soil moisture.

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

AUSTRALIA
Total Precipitation (mm)
July 14 - 20, 2019

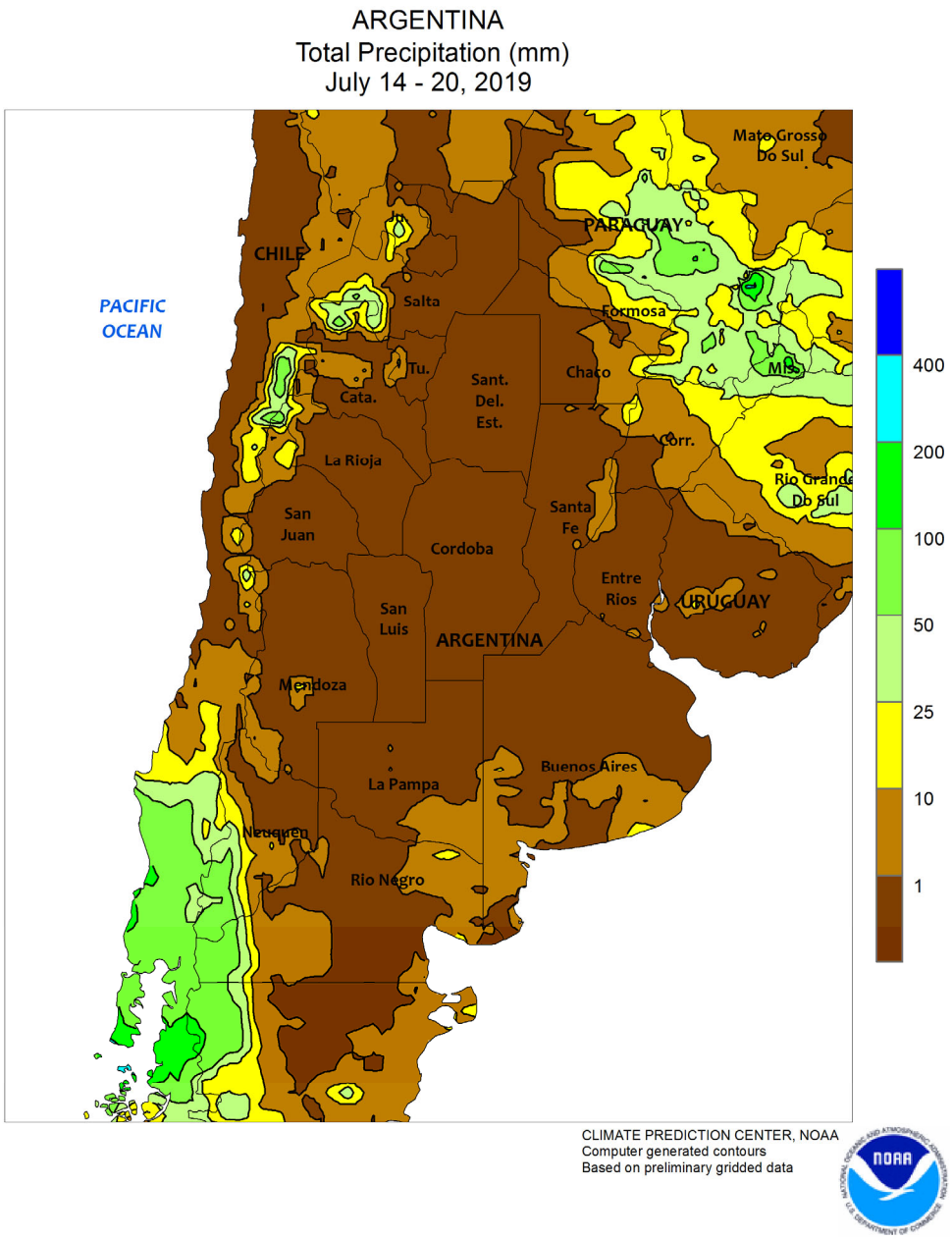


CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded data

AUSTRALIA

Dry weather kept drought firmly entrenched in southern Queensland and northern New South Wales, further reducing the yield potential of wheat and other winter crops. In contrast, scattered, generally light showers (1-10 mm, locally more) in southern New South Wales, Victoria, and South Australia sustained local moisture supplies for vegetative wheat, barley, and canola. Elsewhere in the wheat belt, sunny skies in Western Australia gave way to scattered showers (5-25 mm) late in the week, maintaining good early season yield prospects for winter grains and oilseeds. Temperatures averaged near normal in the west and slightly above normal in the southeast (up to 1°C above normal). In the drought-plagued northeast, temperatures averaged 1 to 2°C below normal.

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



ARGENTINA

Dry, unseasonably warm weather dominated nearly all agricultural areas, favoring the final stages of seasonal fieldwork. Most locations received no rain, with moderate amounts (greater than 10 mm) confined to outlying farming areas of Formosa and Corrientes. Weekly temperatures averaged 2 to 4°C above normal throughout the region; highest daytime temperatures ranged from the upper 10s (degrees C) in La Pampa and Buenos Aires to the upper 20s and lower 30s in far northern areas; nighttime lows dropped below freezing on several evenings in southern parts of the country. According to the government of Argentina, cotton was 91 percent harvested as of July 18; corn harvesting advanced 4 points to reach 76 percent complete. Meanwhile, wheat was 89 percent planted nationally, lagging last year's pace by 3 points.

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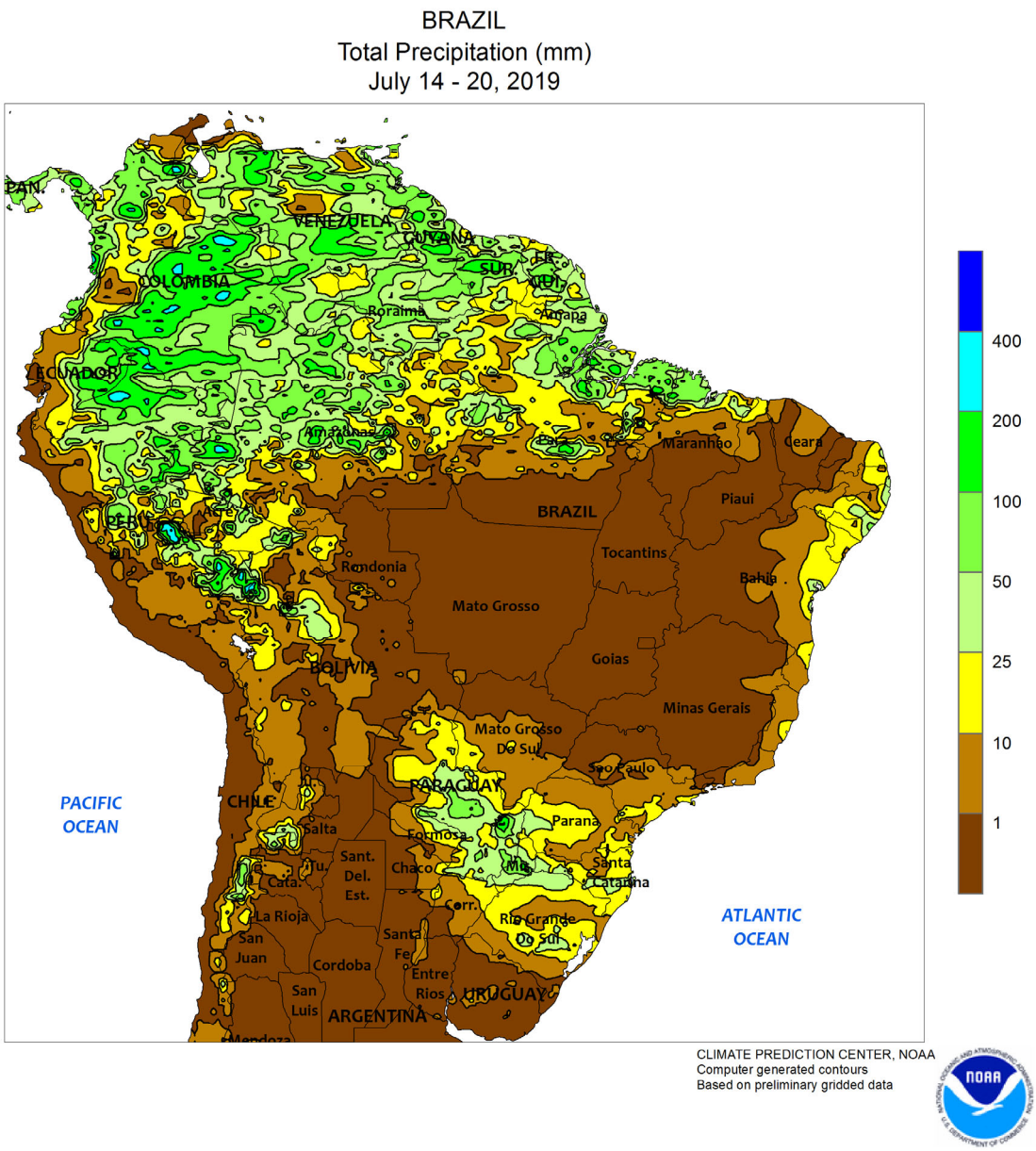
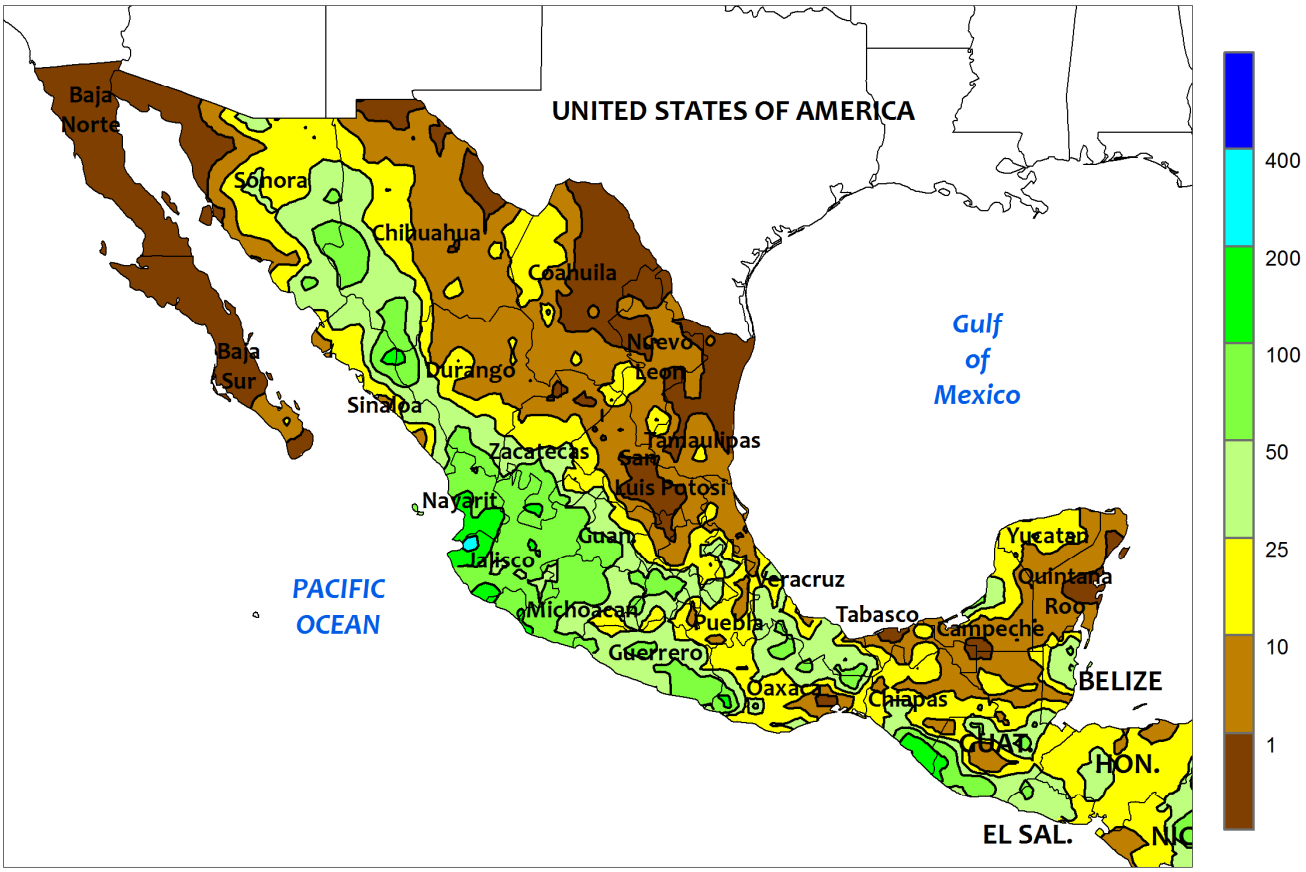


BRAZIL

Showers and somewhat warmer weather returned to southern wheat areas, maintaining overall favorable conditions for emerging to reproductive wheat. Rainfall totaled more than 10 mm from southern Mato Grosso do Sul and western Parana southward through Rio Grande do Sul. Temperatures rebounded from last week's unseasonably low levels, though nighttime lows briefly fell into the lower single digits (degrees C) in Rio Grande do Sul and traditionally cooler locations in southern Parana. According to the government of Parana, second-crop corn was 58 percent harvested as of July 15; meanwhile, 51 percent of the wheat crop had reached flowering. Wheat was 98 percent planted in Rio Grande do Sul as of July 18, with 3 percent flowering. Elsewhere, warm, sunny weather favored maturation and drydown of corn and cotton in major production areas of central and northeastern Brazil, as seasonal showers (locally greater than 25 mm) lingered over coffee, cocoa, and sugarcane areas along the northeastern coast. According to the government of Mato Grosso, corn was 86 percent harvested as of July 19, nearly 20 points ahead of the 5-year average; cotton was 14 harvested, 3 points behind average.

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

MEXICO
Total Precipitation (mm)
July 14 - 20, 2019



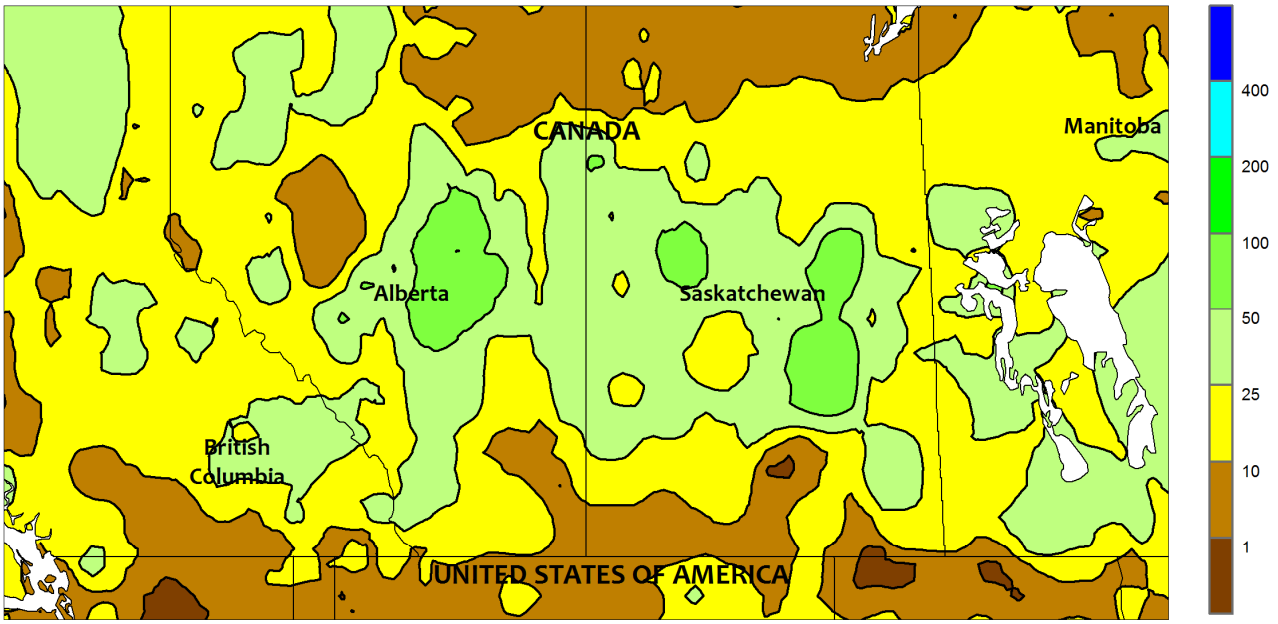
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded data

MEXICO

Monsoon showers intensified over northwestern watersheds, helping to replenish reservoirs depleted by winter farming. Rainfall totaled more than 25 mm (locally greater than 50 mm) in mountain locations from Zacatecas to the border with New Mexico. Farther south, moderate to heavy rain (25-50 mm or more) fell in western and central sections of the southern plateau corn belt (Jalisco to Guanajuato and Mexico), with lighter showers (5-25 mm) in and around Puebla. Scattered showers (5-50 mm) extended from Veracruz to Oaxaca eastward through the Yucatan Peninsula, with the driest conditions impacting Tabasco and Chiapas. Unseasonable dryness also prevailed over much of northeastern Mexico, including sugarcane areas in the vicinity of northern Veracruz. Summer heat (daytime highs reaching the lower 40s degrees C) sustained high water requirements of livestock and irrigated crops in the lower Rio Grande Valley (Coahuila to Tamaulipas).

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

CANADIAN PRAIRIES
Total Precipitation (mm)
July 14 - 20, 2019



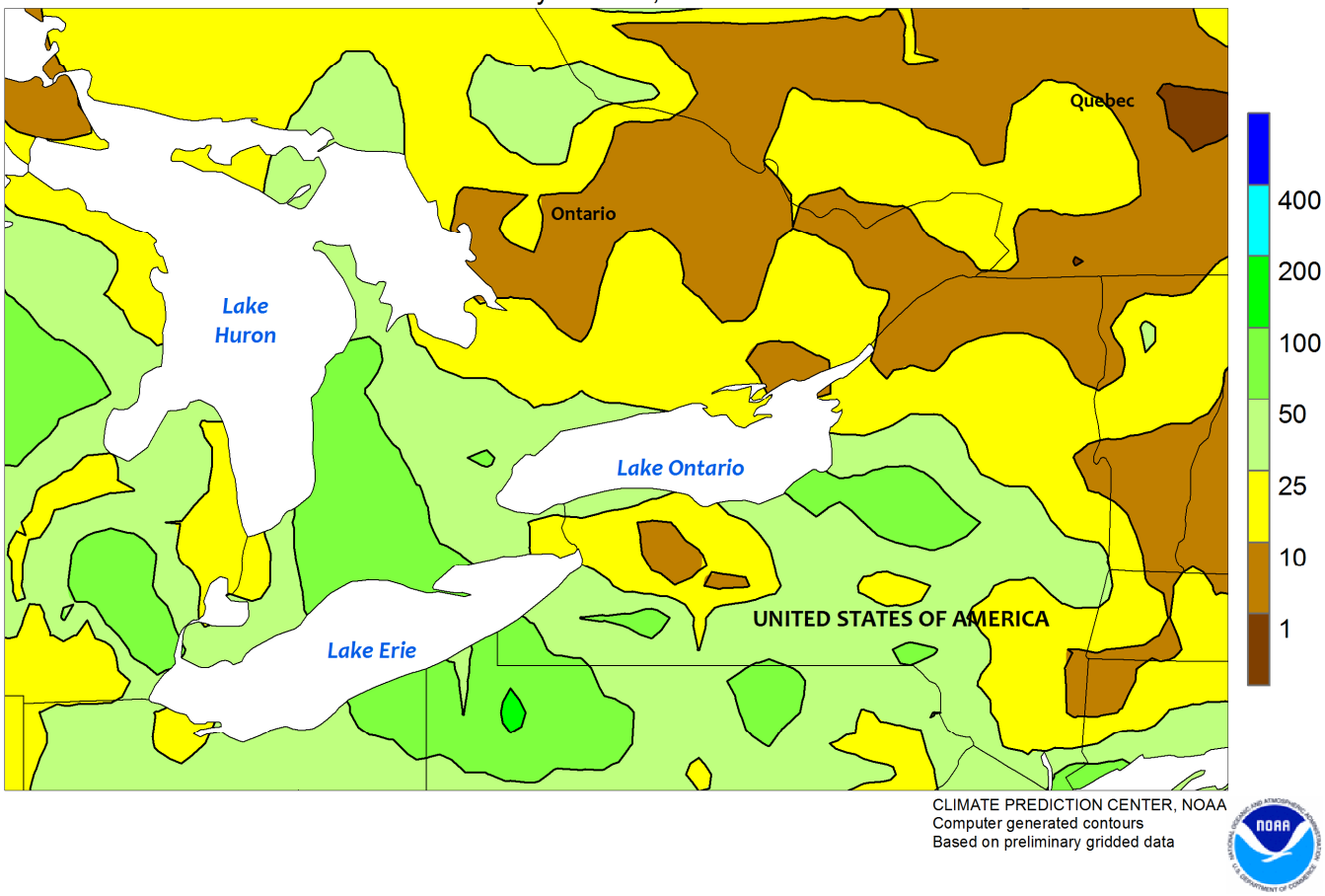
CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary gridded data

CANADIAN PRAIRIES

Widespread, locally heavy showers brought some relief from long-term dryness to spring crops in many key agricultural districts. Most locations recorded rainfall totaling 10 to 50 mm (locally higher), although drier conditions prevailed along the U.S. border from southern Alberta to southwestern Manitoba. Weekly temperatures averaged near to above normal as early week warmth (daytime highs reaching the lower 30s degrees C in southern districts) gave way to unseasonably cooler conditions (highs ranging from the 10s to the lower and middle 20s) for the remainder of the week. Nighttime lows dropped into the low single digits in southwestern production areas but no freeze was reported. According to the government of Saskatchewan, spring cereals and oilseeds were 35 and 46 percent behind in development, respectively, as of July 15, with the majority of crops in poor-to-good condition.

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

SOUTHEASTERN CANADA
Total Precipitation (mm)
July 14 - 20, 2019



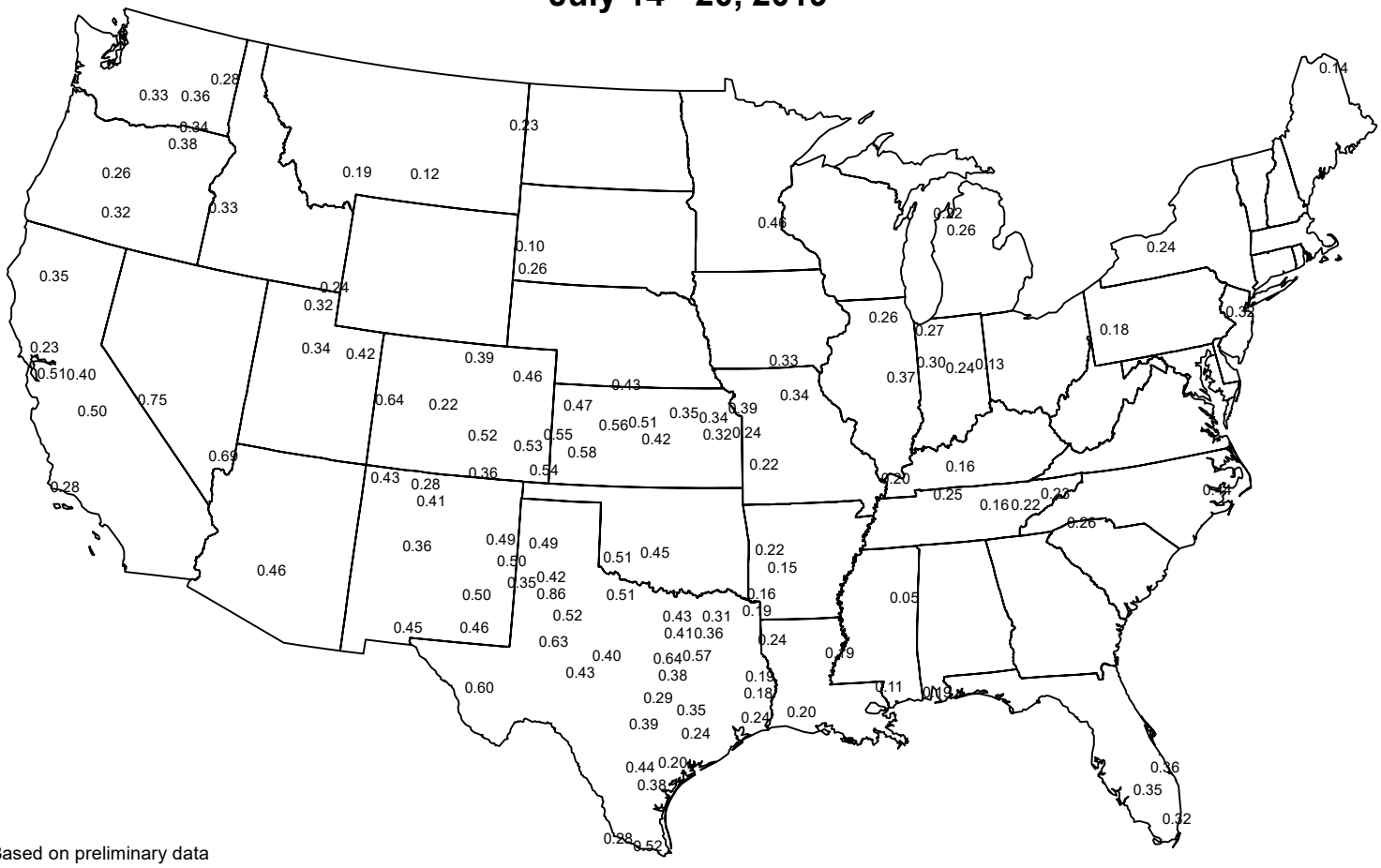
SOUTHEASTERN CANADA

Unseasonable warmth fostered a rapid pace of development of summer crops, winter wheat, and pastures. Weekly temperatures averaged 2 to 3°C above normal, with daytime highs reaching the 30s (degrees C) on several days throughout the region. Delayed planting of summer crops — particularly soybeans — has resulted in delayed progress of most crops, and many had not yet reached temperature-sensitive stages of development by the onset of the warm spell. Rainfall totaled 10 to 75 mm in Ontario's southwestern farming areas as lighter rain (less than 25 mm, with large areas recording less than 10 mm) fell elsewhere in Ontario and in Quebec.

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

Average Pan Evaporation (inches/day)

July 14 - 20, 2019



Based on preliminary data

USDA Agricultural Weather Assessments

Data obtained from the NWS Cooperative Observer Network.

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