

CLIMATE UPDATE

A MONTHLY SUMMARY FROM THE NEBRASKA STATE CLIMATE OFFICE

neclimate.unl.edu

August saw reprieve from dryness, cooler temps

Overview

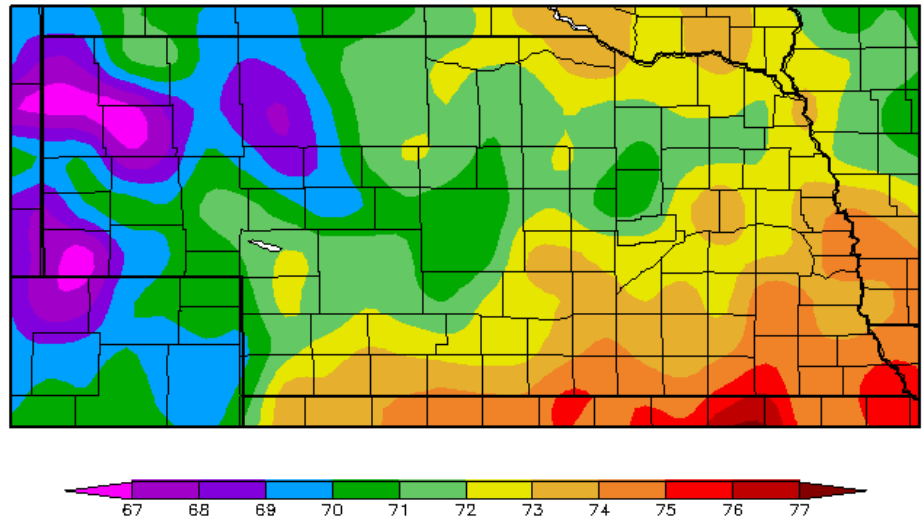
Nebraska experienced a wide range of conditions across the state during the month of August. Heavy precipitation was a common theme across eastern Nebraska, while short-term dryness issues developed in the southwest, west-central, and north-central portions of the state by the end of the month. The driest areas of the state saw improvements at the beginning of the month as precipitation events reduced drought signatures by more than 50 percent in the south-central and northern Panhandle of Nebraska.

Temperatures were cooler than normal for most of the western third of the state, while excessive nighttime heat resulted in above-normal average temperatures for the eastern half of the state. Nebraska Extension Educators had concerns that elevated temperatures would impact grain fill, particularly the corn crop.

High nighttime temperatures also led to increased cooling demand for eastern Nebraska locations with Cooling Degree Day units running up to 33 percent above normal across east-central and southeast Nebraska. Nighttime temperatures across western Nebraska were cooler than normal, as were daytime temperatures, and cooling requirements across the Panhandle were up to 25 percent below normal.

The clear distinction between above-normal temperatures for eastern Nebraska and below-normal conditions across western sections of the state was due to the mean position of the jet stream. July brought a ridging pattern to the western half of the nation and above-normal temperatures. This pattern gave way to an upper atmospheric trough in the

AVERAGE TEMPERATURE | AUG. 1 TO 31, 2016

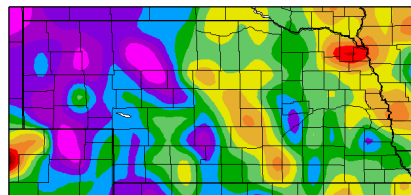


HIGH PLAINS REGIONAL CLIMATE CENTER

Map generated at HPRCC using provisional data.

DEPARTURE FROM NORMAL TEMPERATURE |

AUG. 1 TO 31, 2016



HIGH PLAINS REGIONAL CLIMATE CENTER

Map generated at HPRCC using provisional data.

Pacific Northwest that allowed below-normal temperatures to develop as far eastward as the western third of Nebraska.

Temperature

The general trend for average

temperatures during the month of August found that the Panhandle region had the coolest temperatures and greatest deviations from normal conditions. The farther one traveled east and southeast of the Panhandle, the more likely they were to experience above-normal temperatures and increased residential cooling costs.

August average temperatures ranged from 67-72 F across the Panhandle, 73-76 F south of a line from Omaha to Cambridge, and 71-73 F across north-central and northeastern Nebraska. Preliminary data from NOAA Cooperative Observers reporting in real-time indicates the warmest average temperature reported for the month of August was 77.0 F at Big Springs, while the coolest monthly average temperature was 65.4 F recorded at Harrison 20 SSE.

It also indicates the western third

of the state experienced average temperature that ranged from normal to 2.5 F below normal. The central third of the state saw average temperatures range from 0.5 F below normal to 1.5 F above normal, while the eastern third of the state generally averaged 0.5 F to 2.0 F above normal.

Preliminary reports from those real-time observers also show at least 14 locations had one or more days with a maximum temperature reaching or exceeding 100 F. Chadron, McCook and Red Cloud are tied for the warmest recorded statewide high temperature during August; each recorded 103 F. The highest monthly average maximum temperature recorded was 92.6 F at Big Springs, while the lowest monthly average maximum temperature was 80.1 F at Elgin.

A cold-front during the second half of the month brought Nebraska its first taste of fall temperatures; Agate recorded the coldest August minimum temperature recorded statewide with 34 F. An additional 10 stations, located primarily in the northern Panhandle, recorded low temperatures between 35 F and 39 F. The highest monthly average minimum temperature was 48.4 F at Bushnell, while the warmest monthly average minimum temperature was

66.0 F at Falls City Brenner Field.

Residential energy use as defined by the accumulation of Cooling Degree Day units indicated 120-180 CDD units were accumulated across the Panhandle, 180-240 CDD's for the northern half of the state east of the Panhandle, and 240-330 CDD's for the southern half of the state east of the Panhandle. These values translated to departures ranging from normal to 80 CDD's below normal across the western half of the state and 60 CDD's below normal to 40 CDD's above normal across the eastern half of the state.

Precipitation

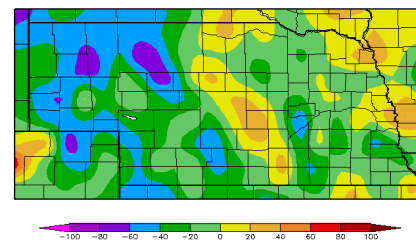
Precipitation tendencies across the state were a classic case of extremes over relatively short distances. A widespread area of central Nebraska northward through the eastern Sandhill region experienced less than an inch of moisture during August. Farther east, scattered strong thunderstorms dropped heavy rainfall of 5 to 12 inches across the eastern two tier of counties.

The general precipitation tendency for most of central and north-central Nebraska was on average 1.50 to 3.00 inches below normal. This translates into percent of normal values of less than 5 percent around the Broken Bow area to less than 25 percent of normal for the eastern Sandhill region. Precipitation values of 25 percent to 50 percent of normal were common from the southeastern Panhandle east-northeast through the western Sandhill region.

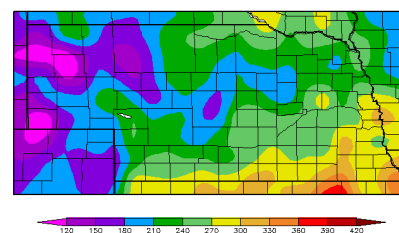
Farther east, precipitation increased to 150 to 300 across the eastern two tier of counties, as would be expected with widespread monthly totals exceeding 6 inches. Southern Nebraska totals were highly variable, with south-central Nebraska receiving several welcome events that dumped localized totals approaching 8 inches. Most of the Panhandle also experienced good moisture with normal to 150 percent of normal moisture reported across the northern three-fourths of the region.

The greatest monthly precipitation total reported by the Nebraska Rain Network was 12.58 inches at Omaha 13.5 WSW, while the Ashland site reported the highest NOAA Cooperative

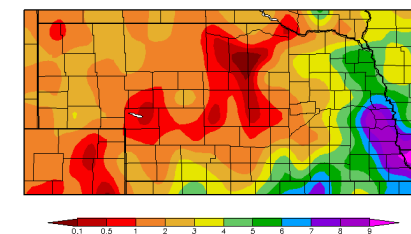
DEPARTURE FROM NORMAL COOLING DEGREE DAYS



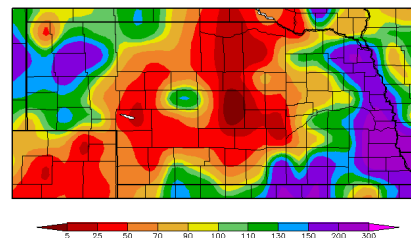
COOLING DEGREE DAYS



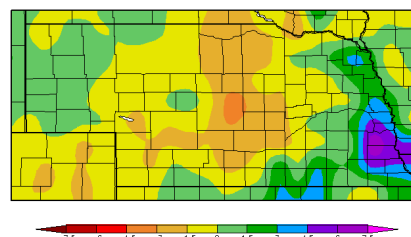
PRECIPITATION IN INCHES



PERCENT OF NORMAL PRECIPITATION



DEPARTURE FROM NORMAL PRECIPITATION



HIGH PLAINS REGIONAL CLIMATE CENTER
Map generated at HPRCC using provisional data for Aug. 1 to 31, 2016.



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AUGUST STORM REPORTS

- www.spc.noaa.gov/climo/reports/160801_rpts.html
- www.spc.noaa.gov/climo/reports/160803_rpts.html
- www.spc.noaa.gov/climo/reports/160804_rpts.html
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- www.spc.noaa.gov/climo/reports/160823_rpts.html
- www.spc.noaa.gov/climo/reports/160828_rpts.html

Weather Observation with 12.38 inches. At least nine NeRAIN stations reported 10 or more inches of precipitation for the month. In addition, 73 NeRAIN locations reported at least 6 inches and less than 10 inches of rain for the month of August.

Some very impressive 24-hour precipitation totals were reported during August, and both the NeRAIN and NOAA cooperative weather observation reports picked up the heavy precipitation event in the Blue Hill area. The Blue Hill 2.2 NE NeRain observer reported a maximum 24-hour value of 7.72 inches, while the Blue Hill 4 SW NOAA cooperative observer reported 6.62 inches with the same storm complex. Significant flooding was reported in the area, but specific monetary damage assessments were not available at the time this report was published.

Whenever heavy rainfall totals are reported, there is a strong likelihood that a severe weather outbreak developed in conjunction with heavy rainfall events.

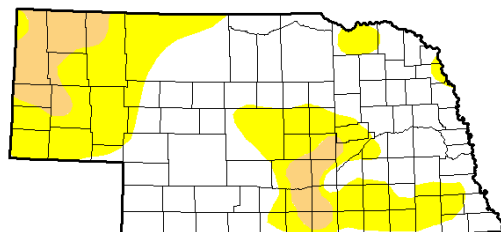
The most widespread severe weather day during the month occurred Aug. 11 when two tornadoes were reported, as were four hail and 24 wind reports. Two additional tornado reports were received, one on Aug. 4 and one Aug. 23.

It is no surprise that the National Drought Monitor depicted improving conditions for the most hard hit areas of the state in regards to drought depiction (particularly the northern Panhandle of eastern Nebraska) as the month progressed.

Peak drought intensity depicted for the month occurred on Aug. 2 when 31.65 percent of Nebraska was depicted as experiencing "Abnormally

U.S. DROUGHT MONITOR FOR NEBRASKA

JULY 26, 2016



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	57.84	42.16	10.07	0.00	0.00	0.00
Last Week <small>7/18/2016</small>	59.55	40.45	2.85	0.00	0.00	0.00
3 Months Ago <small>4/26/2016</small>	96.28	3.72	0.00	0.00	0.00	0.00
Start of Calendar Year <small>1/22/2015</small>	99.99	0.01	0.00	0.00	0.00	0.00
Start of Water Year <small>8/28/2015</small>	71.41	28.59	0.00	0.00	0.00	0.00
One Year Ago <small>7/28/2015</small>	81.28	18.72	0.00	0.00	0.00	0.00

Intensity

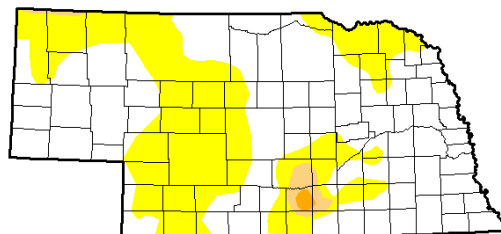
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Brad Rippey
U.S. Department of Agriculture



AUG. 30, 2016



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	61.96	38.04	2.09	0.33	0.00	0.00
Last Week <small>8/23/2016</small>	60.98	39.02	7.65	0.86	0.00	0.00
3 Months Ago <small>5/31/2016</small>	100.00	0.00	0.00	0.00	0.00	0.00
Start of Calendar Year <small>1/22/2015</small>	99.99	0.01	0.00	0.00	0.00	0.00
Start of Water Year <small>8/28/2015</small>	71.41	28.59	0.00	0.00	0.00	0.00
One Year Ago <small>8/1/2015</small>	93.99	6.01	0.00	0.00	0.00	0.00

Intensity

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

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Author:
Chris Fenimore
NCE/NESDIS/NOAA



SOURCE: DROUGHTMONITOR.UNL.EDU

Dry DO" conditions, 9.74 percent was in Moderate Drought, while 0.61 percent was in Severe Drought. The Severe Drought area was confined to south-central Nebraska, just south and west of the Hastings area. Moderate Drought areas covered the northern Panhandle and south-central Nebraska.

Drought Monitor

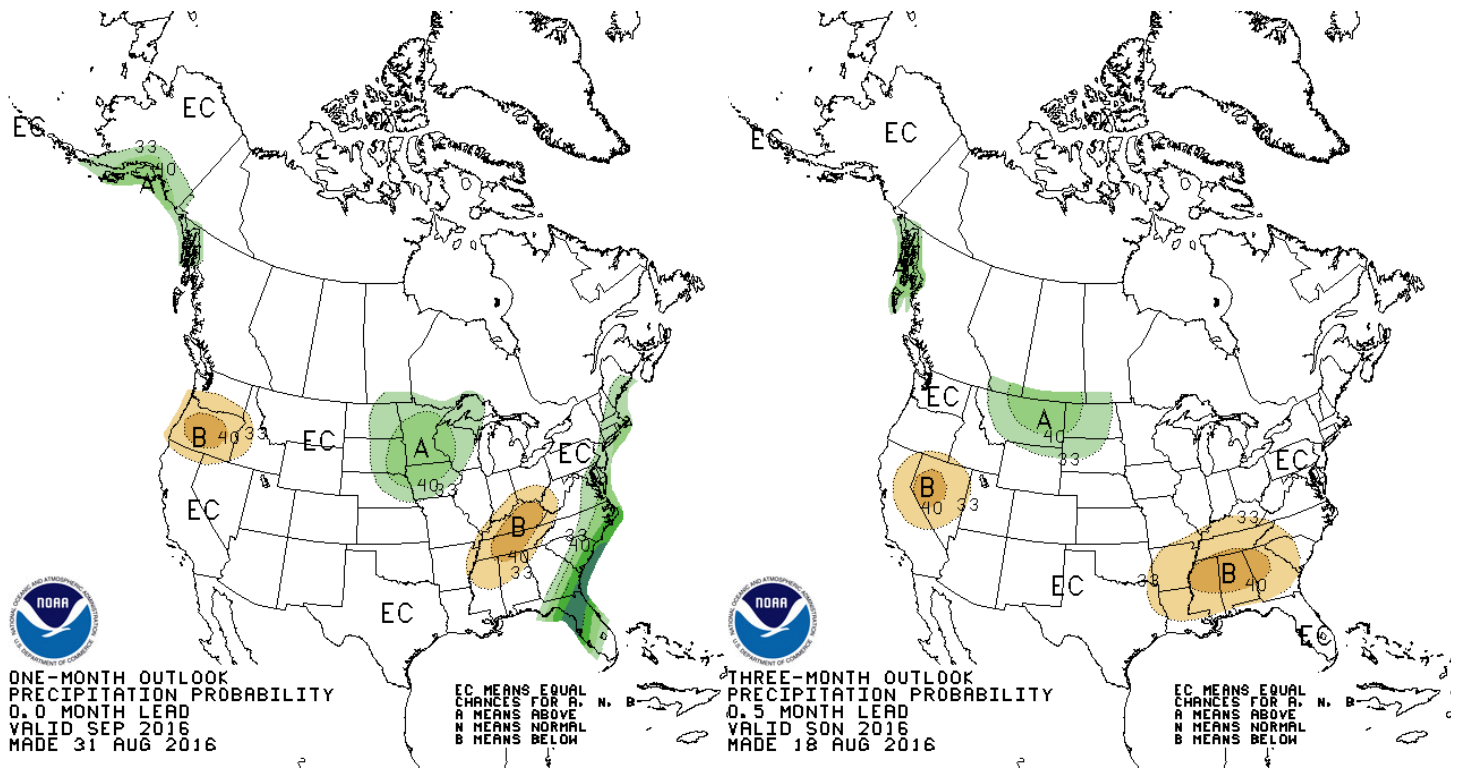
The Drought Monitor depiction for the first day of August was based upon the July 26 release and indicated that 37.09 percent of the state was in

Abnormal Dry (D0) conditions, while 10.07 percent was in Moderate Drought conditions. The two primary areas of concern at the beginning of August were the northern half of the Panhandle and a broad area of south-central and southeast Nebraska south of I-80.

One full week later, the Drought Monitor depiction for Nebraska reached its peak intensity for the growing season with 0.61 percent of the state experiencing Severe Drought (D3). Over half of this area was eliminated in the subsequent two Drought Monitor releases as localized heavy rainfall

30-DAY OUTLOOK PRECIPITATION

90-DAY OUTLOOK PRECIPITATION



hit the southeastern area of the D3 depiction, including over 6 inches in the Blue Hill area.

Precipitation events were numerous enough during the remainder of the month that most of the Moderate (D1) and Severe (D2) conditions were eliminated by month's end. The Aug. 30 Drought Monitor depiction for Nebraska had reduced the D1 area to 1.73 percent and D2 conditions to 0.33 percent. This translates into a five-fold decrease in Moderate Drought conditions and a 50 percent reduction in Severe Drought conditions.

Dry conditions across west-central, southwest and north-central Nebraska forced an expansion of Abnormally Dry (D0) conditions across the western half of these three climate districts. Most of the abnormal conditions depicted for eastern Nebraska in early August had disappeared by month's end. Only a small pocket of extreme northeastern Nebraska remained dry primarily because several of the early August

precipitation events slide across east-central and southeast Nebraska and completely missed the area.

Crops

Crop ratings during the month of August suggest that the dryness issues depicted by the Drought Monitor did not appear to visually influence contribution inputs from survey responders.

The first soil moisture estimate released by Nebraska Agricultural Statistics Service (NASS) indicated soil moisture was 7 percent very short, 29 percent short, 32 percent adequate, and 1 percent surplus. By month's end, soil moisture was 8 percent very short, 32 percent short, 57 percent adequate and 3 percent surplus. There was a 6 percent decline in adequate ratings, while surplus increased 2 percentage points, while short-very short increased 4 percentage points.

Corn ratings changed little from

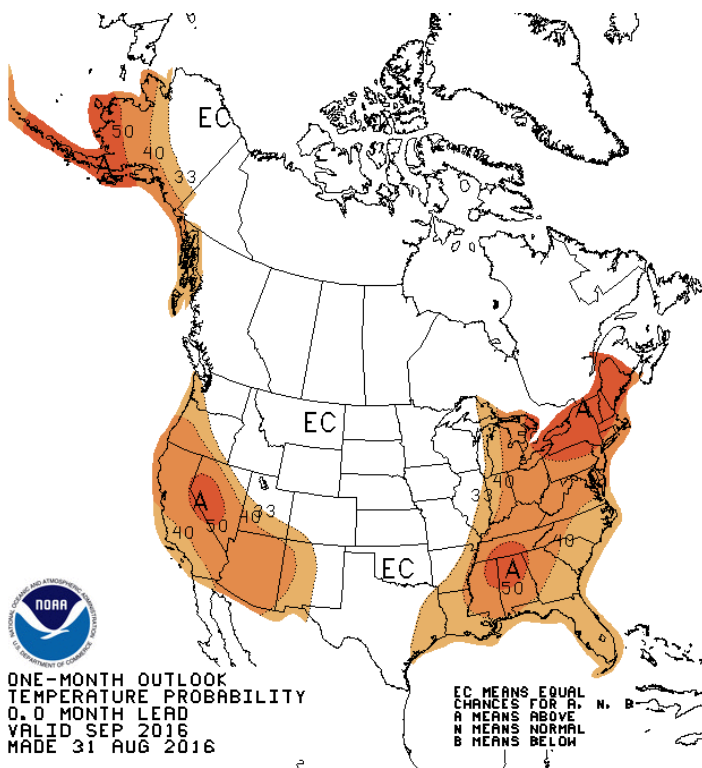
the beginning of the month to the end. The first NASS release of August indicated 5 percent of the corn crop was in very poor to poor conditions, while 78 percent of the crop was in good to excellent conditions. By month's end, the very poor to poor conditions increased to 6 percent and good to excellent conditions increased to 78 percent. Early August NASS ratings indicated 47 of the crop was in the dough stage and 9 percent was in the dent stage. By month's end, 100 percent was in the dough stage, 61 percent in the dent stage, and 5 percent had reached physiological maturity.

There was a similar pattern for NASS ratings on soybeans and sorghum when compared to corn, only slightly better.

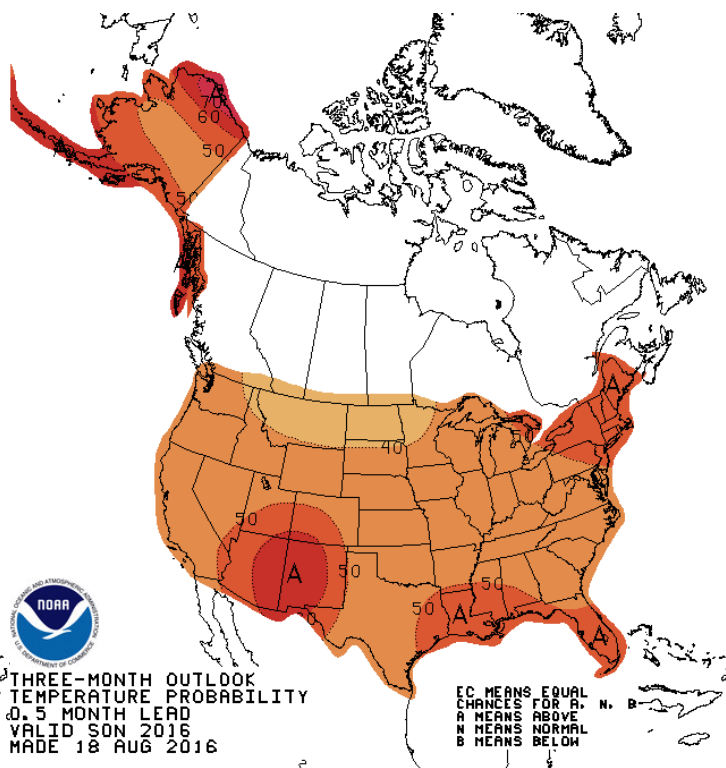
Soybeans and sorghum showed no net change in the percentage of the crop at the beginning and the end of the month.

Soybeans were rated 4 percent very poor to poor, while sorghum was reported as having 0 percent rated

30-DAY OUTLOOK TEMPERATURE



90-DAY OUTLOOK TEMPERATURE



in the very poor to poor category. On the flip side, soybeans rated as good to excellent decreased from 81 percent at the beginning of August to 78 percent by month's end. Sorghum ratings decreased from 86 percent to 81 percent from the beginning of the month to the end of the month.

Nebraska Extension Educator survey reports from conditions within fields paint a much less optimistic picture than NASS survey data, which is based upon visual look of fields. Some of the extreme June heat during early corn growth was reported to be having an impact on ear size and length, while high nighttime temperatures in July was having an impact on grain fill.

No preliminary yield results were available from early harvest activity, so it is unclear how much corn yields will be impacted. On a more positive note, very few issues were mentioned by Extension Educators about the soybean and sorghum crop. Of the limited problems mentioned, excessive

canopy height and potential for lodging issues was noted for soybeans, while increasing sugar cane aphid numbers were the major sorghum concern at month's end.

ENSO Conditions & Outlook

Equatorial Sea Surface Temperatures (SSTs) in the Pacific continued to remain static through the month of August. After showing a rapid decline in above normal SSTs in May, there has been very little change during the past 90 days in regards to additional SST cooling from the eastern through central Equatorial Pacific. Although La Nina conditions are forecasted, it is becoming readily apparent that the intensity of this projected event likely will be weaker than forecasted in May, due to the failure of the SSTs to show additional cooling this summer.

Although the Climate Prediction Center continues to indicate that La Nina conditions will materialize (as

of the end of August), each forecast issued this summer has called for a weaker event than the previous forecast. Therefore, trends that are usually experienced during La Nina conditions may be weaker than normal or nonexistent.

Fall and spring periods also need to be watched during La Nina conditions. It is not uncommon to see drier and warmer-than-normal conditions during the fall harvest period (October to November) and cooler and drier-than-normal during the spring period (March to April). If this event becomes stronger than currently forecasted, than the tendency for drier conditions would increase along with concerns in regards to adequate subsoil moisture recharge prior to the onset of the 2017 agricultural season.

— Report compiled by Al Dutcher, associate state climatologist, and Tyler Williams, climatologist and educator, with the Nebraska State Climate Office.