



7 NEW STATIONS GO UP IN NEBRASKA

NEBRASKA STATE CLIMATE OFFICE

D So far in 2018, seven weather stations have been added to the Nebraska Mesonet, our statewide network operated out of the Nebraska State Climate Office. The total is more than have been installed in a year since 2004, and an eighth is likely to be installed by the end of summer.

Traditional tripod stations were

installed in Decatur, Plattsmouth, Mead, southeast Lincoln, Oshkosh and Broadwater, and a 10-meter tower was installed in Leigh. These additions bring our total station count to 68.

The stations were sponsored by the Nebraska Forest Service; the Papio-Missouri, Lower Elkhorn, North Platte natural resource districts; the City of Lincoln;

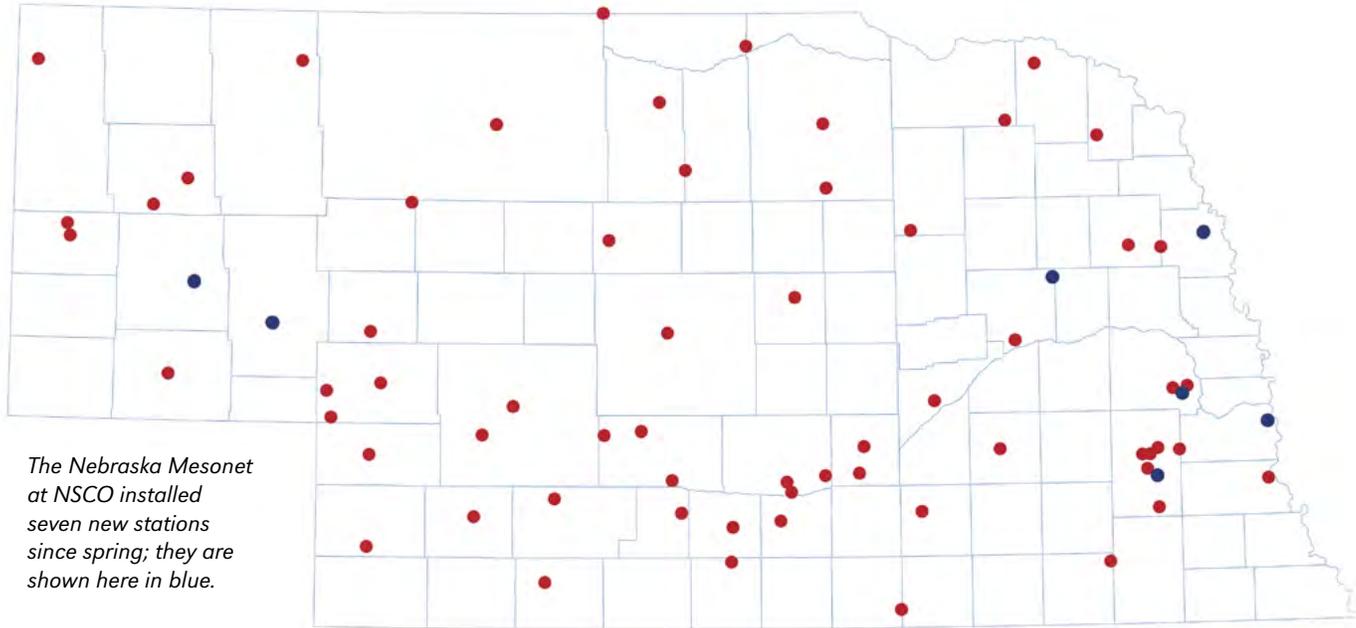
Continued on **PAGE 2**

IN THIS ISSUE

- 3 | Volatile temperatures strike Nebraska
- 5 | State climate office hosts AASC annual meeting
- 6 | Service to the state

Photo of Regan Kerman (left) and Glen Roebke installing a weather station south of Lincoln.





The Nebraska Mesonet at NSCO installed seven new stations since spring; they are shown here in blue.

Continued from PAGE 1

the Agricultural Research Division and the Institute of Agriculture and Natural Resources at the University of Nebraska-Lincoln; and Nebraska Extension.

“Each entity has a specific need, such as water resource management, stormwater management, phenotype augmentation, fire weather danger, and crop water use,” said Martha Shulski, NSCO director. “Furthermore, these seven stations increase the density of the observations in our network that ultimately lead to improved monitoring and decision support.”

At least one station, located at the Eastern Nebraska Research and Extension Center near Mead, will be used to support research on plant responses to environmental stresses, including changes in climate.

Helping with installations is NSCO student intern, Regan Kerkman, who also is helping Glen Roebke, mesonet technician, and Stonie Cooper, mesonet manager, complete the annual maintenance run of all our stations. Maintenance season should wrap up by the end of September.

Included in the maintenance schedule is moving the stations toward higher frequency data collection. Instead of updates every five minutes, climate



SHAWNA RICHTER-RYERSON | NSCO

One of seven new stations installed in Nebraska this quarter is placed at St. Michael Catholic Church property, just south of Lincoln.

observations for air temperature, humidity, liquid precipitation, wind speed and direction, solar radiation, barometric pressure, soil temperature and soil moisture will be collected every minute.

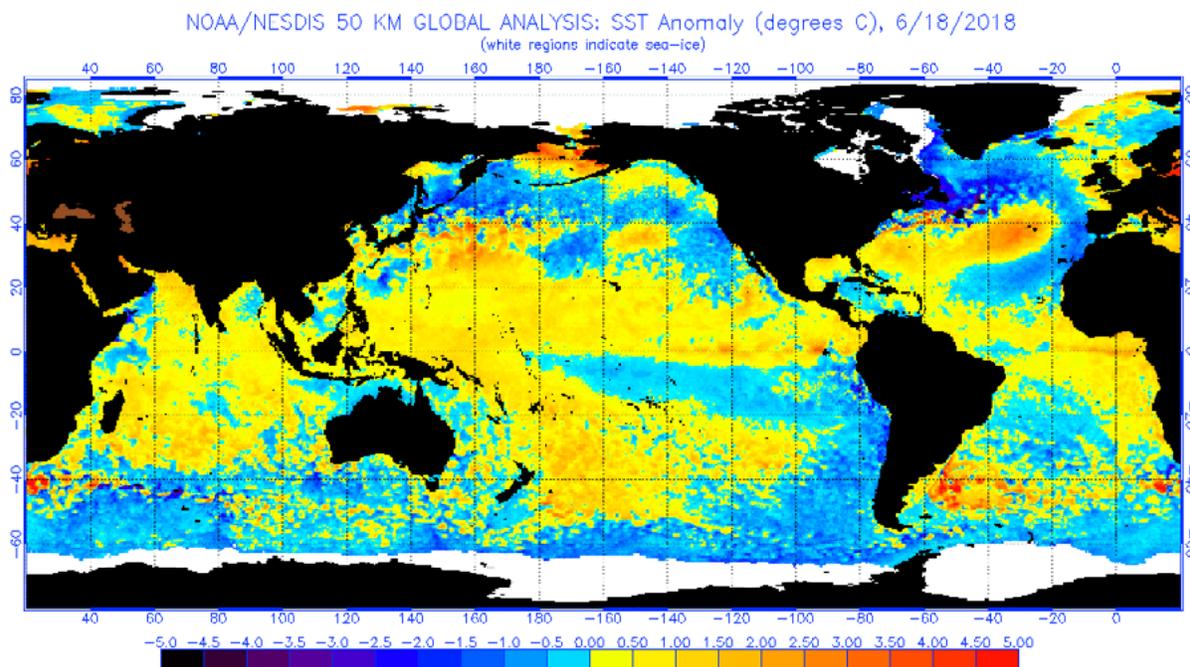
“This will allow for better observations of high-intensity rain events and wind shifts associated with storms,” Shulski said.

Nebraska Mesonet is also conducting testing on a new precipitation gauge at Rogers Farm Research and

Development site. The new gauge is billed as more responsive to heavy rainfall events. Sample data will be collected over the next year, and then will be compared to standard sets for reliability and accuracy. We’ll keep you posted on results.

On Twitter

Nebraska Mesonet is now on Twitter. [Follow our updates here.](#)



CLIMATE PREDICTION CENTER

Volatile temps strike state

Temperatures across the United States the past three months have been exceptionally volatile based upon preliminary data supplied by the National Center for Environmental Information. April brought unseasonable cool temperatures to most locations east of the Rocky Mountains, only to have May temperature trends flip to unseasonably warm temperatures. For Nebraska, April average temperatures came in as the second coldest on record dating back to 1895, while May average temperatures came in as the fourth warmest.

The large swing in temperatures between April and May was actually greater across Kansas and Oklahoma, with a 20- to 22-degree difference in average temperatures between the two months. This extreme temperature flip was common across the entire Corn Belt. Warm season crop planting was delayed significantly during April raising concerns about planting delay impacts.

Planting delay concerns quickly dissipated in May as warm temperatures and light precipitation allowed producers to rapidly sow their crops. Corn planting on a national basis averaged 25 percent of the intended acreage per week during the first three weeks of May. By mid-May, high temperatures across the western Corn Belt consistently broke the upper 80s, with upper 90s reported on several occasions.

The warmth and dry conditions bled into June, with highs breaching the 100-degree mark on at least five days somewhere within the state during the month of June. Although April and May brought little severe weather to the state, an active pattern that developed during the second half of June led to multiple days of tornado activity, severe thunderstorms, and high-wind events.

Accumulated precipitation deficits from south-central through east-central Nebraska were generally in the 4-

to 6-inch range for our spring period (March to April), and was followed by another 1 to 2 inches of accumulated deficits during the first half of June. A strong upper air low moving across the northern Rockies in tandem with moisture drawn northward from the eastern Pacific Hurricane "Bud" resulted in widespread heavy precipitation the third full week of the month.

The tropical moisture feeding into the northern Rockies upper air low was a very unusual event this early in the season. Typically, hurricanes that move northward along the Mexico coast and make landfall on the Baja Peninsula are more common from late August through October. Regardless of how unusual the event was, it provided significant relief from drought conditions that were intensifying over southern Nebraska.

This early hurricane activity is likely being supported by the development of El Niño-like conditions in

Continued on **PAGE 4**

Continued from PAGE 3

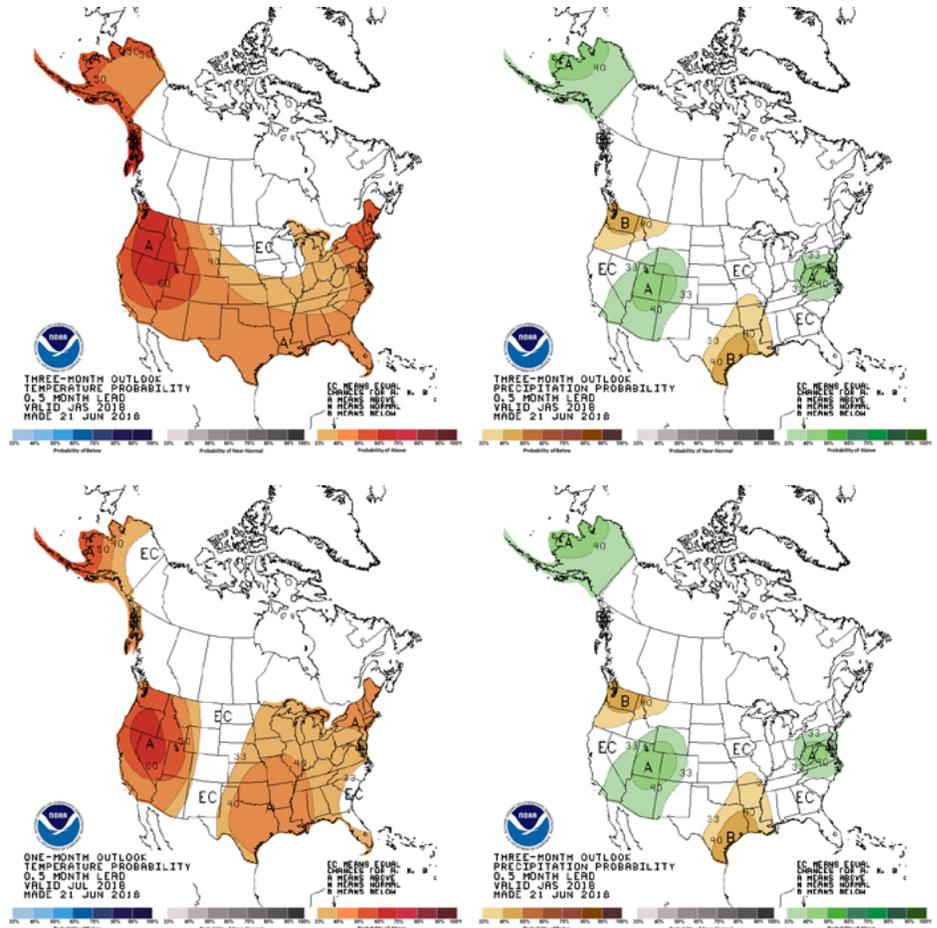
the eastern Equatorial Pacific. Surface temperatures have warmed several degrees during the last 90 days (Figure on page 3). A strong pool of warm water is underneath this region and is moving toward the eastern equatorial Pacific. This warm pulse is running 5- to 9-degrees above normal and should reach the surface within the next 30 to 45 days, which should push surface temperatures well into El Niño territory as early as August.

The Climate Prediction Center has initiated an El Niño watch for this fall and it now appears that the event will unfold. How intense the event becomes is the remaining question, with a weak to weak-moderate event being the most likely solution. This should increase the Monsoonal flow into the southwestern desert region during the second half of this summer and increase the likelihood that some drought relief will occur across the southern Rockies and Plains late this summer and throughout the fall period (Figures for 30- and 90-day outlooks at right).

Closer to home, considerable uncertainty exists regarding the forecast for the remainder of the summer and early fall. As the El Niño event unfolds, it should slowly begin to strengthen the southern jet and weaken the northern jet. This type of pattern can lead to a split flow regime across the continental U.S., where the primary forecast track remains across the southern third of the U.S., while the northern jet remains across the northern Plains.

Under split flow patterns, the position of the northern jet will determine who benefits from systems diving south-eastward out of southern Canada. The mean position of this jet usually lies over the Great Lakes and northeastern U.S., but can on occasion be situated further westward over the northern Plains. This pattern typically reaches peak intensity during the first half of the winter, and the area where the southern and northern jet intersect is typically where most of the U.S. winter storm activity will develop east of the Rocky Mountains.

I see two possible scenarios for Nebraska's weather over the next three



NOAA

months. First would be a continuation of the pattern that dominated our spring season. Distinct periods of well-above-normal temperatures, interspersed with periods of active weather. Heat will continue to build northward from the southern Plains, occasionally broke down by systems moving across the northern Plains that bring temporary cool-downs and active weather.

It should be noted that under this type of pattern, we will not be able to miss precipitation opportunities, especially if temperatures average 6 degrees or more above normal like we experienced in May and June. This would put average July and August highs consistently in the upper 90's and above, with daytime lows in the middle to upper 70's. High evapotranspiration values and poor nighttime respiration are common under these conditions.

The second possible solution is that the atmosphere is signaling a phase change with the development of El Niño-like condi-

tions during June. If this indeed happening, additional tropical moisture events in the eastern Pacific likely will move into the southwestern desert region and interact with any upper air lows crossing the northern Rockies similar to the pattern experience during the third week of June.

This type of pattern would allow for some drought relief to develop across the southern Plains region, but also would increase the odds that wetness concerns over the northern Corn Belt would continue for the remainder of the growing season. We would see drought relief across southern Nebraska and Iowa, as well as northern Kansas and Missouri. Unfortunately, the eastern Dakota's, extreme northern Nebraska, southern Minnesota and Wisconsin, as well as northern Iowa and Illinois would likely deal with excessive precipitation for the remainder of the summer.

— Writer: Al Dutcher, Extension climatologist



SHAWNA RICHTER-RYERSON | NSCO

American Association of State Climatologists 2018 annual meeting.

NSCO hosts state climatologists

For the first time in about 20 years, Nebraska hosted the American Association of State Climatologists annual meeting, but this time it was by the 2-year-old Nebraska State Climate Office.

The meeting, which drew a near-record number of attendees, brought together climatologists and weather station managers from nearly every state and regional climate center in the United States. For three days, they converged on the Lied Lodge in Nebraska City.

"The meeting had an exceptional turnout of more than 100 applied climatologists from universities, state and federal agencies, and the private sector," said Martha Shulski, NSCO director and Nebraska state climatologist. "The annual meeting provides an excellent peer-to-peer learning environment to advance climate services in the U.S."

"A range of topics were covered," she added, "such as engaging with end-users of climate information, state weather networks, the U.S. National Climate Assessment, and tribal-focused projects."

Included was a presentation by Campbell Scientific, a leading business in the design and manufacture of research-grade climate observation equipment. The



Martha Shulski (left) and Hope Mizzell kick off the American Association for State Climatologists annual meeting, hosted by the Nebraska State Climate Office at the Lied Lodge in Nebraska City in late June.

company recently launched a new website, [Mesonet Essentials](#), a resource for the national mesonet community. The site, which highlights key features about weather stations, their maintenance and

importance to the body of climate science, includes information and images from the Nebraska Mesonet.

The annual meeting also included a

Continued on PAGE 6

Continued from PAGE 5

banquet that featured a presentation by Mary Harner from the Platte Basin Timelapse project. The project has more than 60 time-lapse camera systems placed within the 90,000 square-mile river basin, documenting the watershed in motion. The cameras take one photograph every hour during the day, capturing a variety of landscapes and climate conditions.

“The project was of great interest to our community,” Shulski said. “Visualizing the beautiful landscape across the basin was poignant and effective in communicating the stories of the Great Plains.”

Annual meetings for the American Association of State Climatologists have been hosted since 1976; Nebraska last hosted in 2001. Sponsors for this year’s event included the School of Natural Resources at the University of Nebraska-Lincoln, where NSCO is based; Campbell Scientific; the Nebraska Public Power District; and the Nebraska Sorghum Board.

National Climate Assessment

The National Climate Assessment also drew attention at the AASC annual meeting. The report, mandated by the



Stonie Cooper, Mesonet manager, presents during the AASC annual meeting.

Global Change Research Act of 1990, acts as a summary of climate change impacts on the United States. Shulski, one of the authors for the Great Plains section of the 2018 report, served on a discussion panel for the upcoming report, set for release later this year.

“This report has a chapter that focuses on the Northern Great Plains — Nebraska, the Dakotas, Wyoming and Montana. In the previous version (2014), the report had the entire Great Plains from Montana to Texas in a single chapter,” Shulski said. “Information will now be more relevant locally.”

More than 300 experts help produced the report, which is extensively reviewed by the public and experts, including federal agencies and a panel of the National Academy of Sciences.

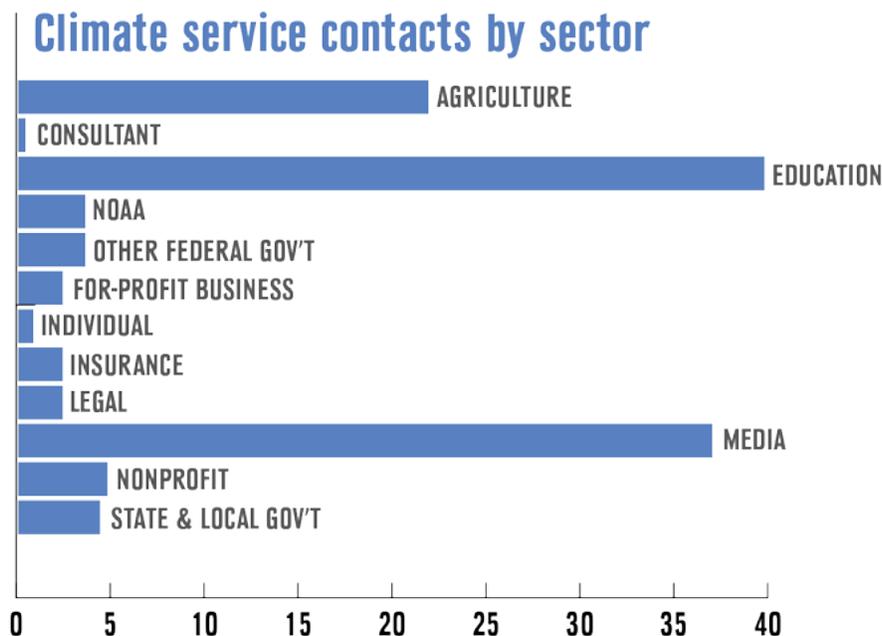
Lincoln was host to an engagement workshop last year that brought local perspectives on issues important to Nebraska to the report.

“Our job at the NSCO is to help people understand information in the report and make it useful to a variety of applications and sectors,” Shulski said.

Look for the report to be released to the public in December of this year.

NSCO
Jan. 1 to June 30

2018



28
TALKS

1,474
PEOPLE IN
ATTENDANCE