HPRCC

January 2018

The Prairie Post

Quarterly Newsletter of the High Plains Regional Climate Center

Inside this issue:

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Ice fog envelops the landscape in Nebraska (photo courtesy Ken Dewey)

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Natalie Umphlett, Crystal Stiles

Message From The Interim Director

By Ms. Natalie Umphlett

It's hard to believe that another year has come to a close. 2017 was highly productive and each one of our staff members has reasons to be proud of their accomplishments over the past year. Crystal Stiles, our stakeholder engagement specialist, was part of a team that received an Honorable Mention Climate Adaptation Leadership Award for their work reducing climate-related threats and promoting adaptation of the nation's natural resources. Bill Sorensen, our lead programmer, took a more active role on the development of grant-funded projects, particularly in regards to enhancements of climate tools. Warren Pettee, the newest addition to our team, overhauled the code that produces our ACIS Climate Maps and is working on a new mapping framework that will be released later this year. Jamie Lahowetz, our AWDN manager, incorporated five agro-climate tools from the USDA-funded U2U project into our website. Shellie Hanneman, our data quality technician, looked at incoming AWDN data each and every day to ensure that issues could be resolved in real-time. And, finally, our undergraduate intern, Emily Brown, provided critical support for workshops we hosted here in Lincoln. As for me, I'm proud to work with such an incredible team.

So, what might 2018 have in store for the HPRCC? We'll be wrapping up our work on two NOAA SARP-funded projects, one working with water resource managers, the other with municipal planners and sustainability leaders. We'll be launching new climate tools and enhancing existing ones. And, most importantly, we'll try to have a little fun along the way. I hope you enjoy your stop at *The Prairie Post* and that you come back again to check in soon.

Weather Photo of the Quarter - Sun Pillar

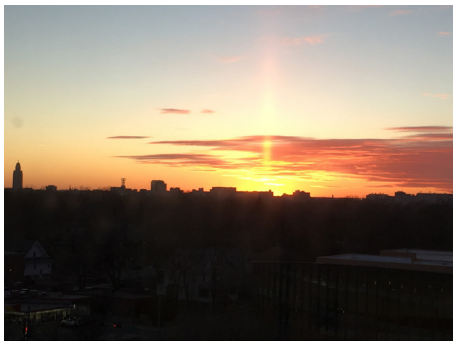

Photo courtesy Natalie Umphlett

On December 5th, HPRCC staff were delighted to see a sun pillar protruding from the Lincoln skyline just as the sun set. A sun pillar is a column of light that is typically observed during sunrise or sunset. Like other optical phenomena, sun pillars are formed from the interactions between sunlight and ice crystals. In this case, sunlight is reflected by flat, plate-like ice crystals that maintain a horizontal orientation as they fall through the sky. Interestingly, pillars can form from other sources of light, like street lights. To see other spectacular light pillar displays, see these images from NASA's Astronomy Picture of the Day: https://apod.nasa.gov/cgi-bin/apod/apod_search?tquery=%22sun%20pillar%22.

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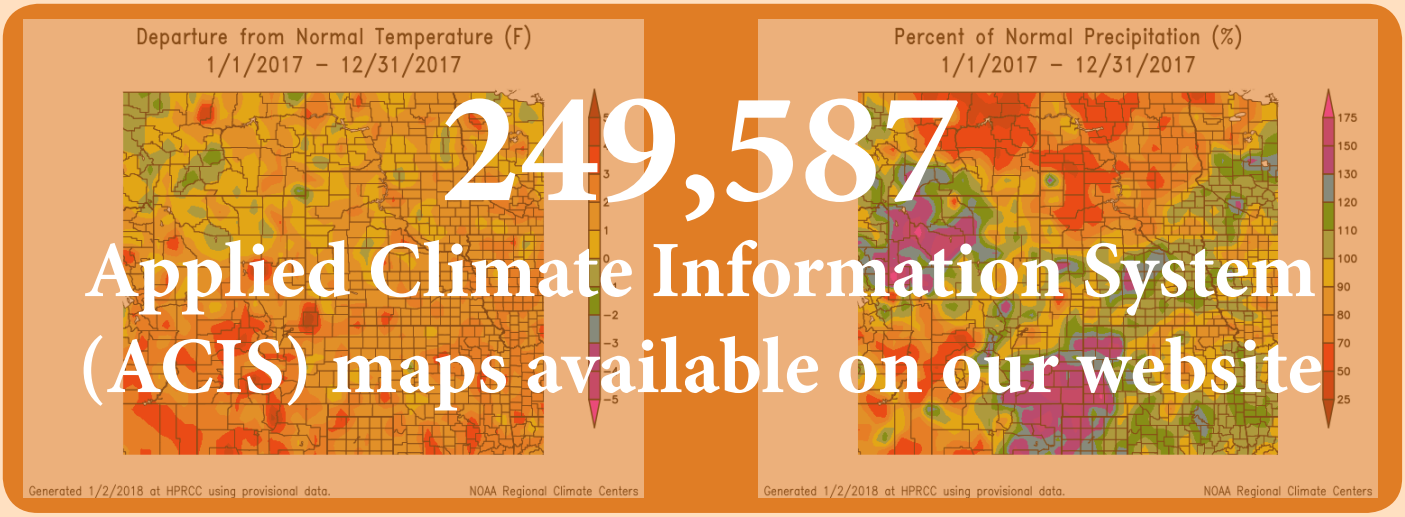
HPRCC Services In 2017 - By The Numbers

430
Climate requests, which served 35 states, Washington, D.C., and 7 countries

310
Automated Weather Data Network (ADWN) stations available

150+
Stakeholders served by 8 workshops



249,587
Applied Climate Information System (ACIS) maps available on our website

46
News articles mentioning HPRCC

41
Technical reports produced

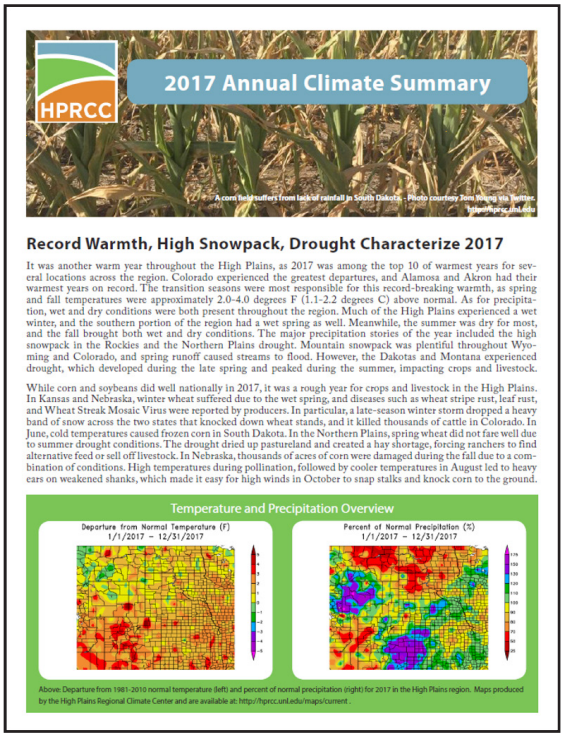
8
New climate products developed

42
Peer-reviewed articles utilizing HPRCC data

43
Presentations given to our peers and stakeholders

7
Outreach events to interact with the community

Record Warmth, High Snowpack, Drought Characterize 2017



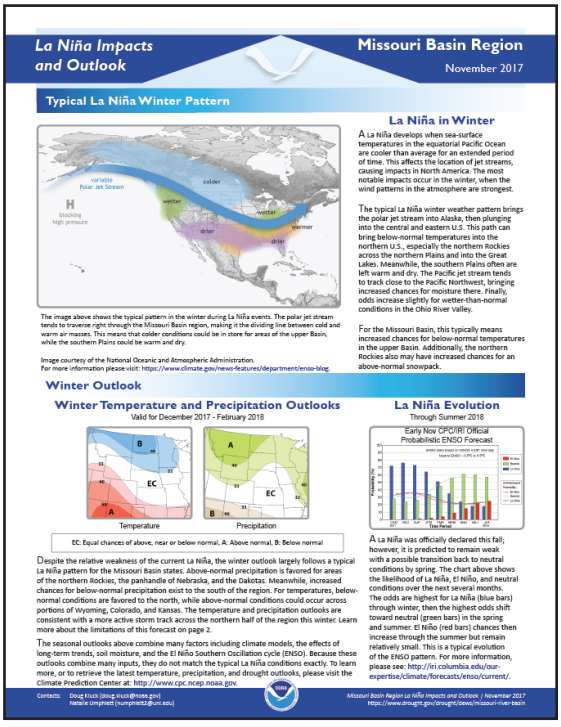
The year 2017 was a warm one throughout much of the High Plains, with departures of 1-3°F above normal in most areas. Numerous locations had a top 10 warmest year on record, mostly because of the abnormally warm spring and fall. Precipitation varied across the region, with wet conditions throughout northwestern Wyoming and parts of Kansas and Nebraska, and dryness in the Dakotas and western Colorado. It was a good year for snowpack in the Rockies of Wyoming and Colorado, although Colorado snowpack got off to an abysmal start in the current season. Plains snowpack was largely below normal last season with the exception of North Dakota, where above-normal snowfall caused spring flooding. Dryness developed across the Dakotas and Montana during late spring, and eventually drought spread across this region, causing impacts mostly to agriculture. The fact that the year ended on a dry note for much of the High Plains has many concerned about spring agricultural activities. Several noteworthy climate events occurred in the High Plains in 2017:

- Ice storm in Kansas and Nebraska, January 14-16
- Early-spring wildfires
- Late-season winter storm, April 28-May 1
- Denver area hail storm, May 8
- Northern Plains Drought
- Legion Lake Fire in South Dakota

To read more about the climate of 2017, including these noteworthy events in the High Plains region, check out the full version of our annual climate summary here: https://hprcc.unl.edu/climatesummaries.php.

La Niña Is Here! How Might It Impact The Missouri River Basin?

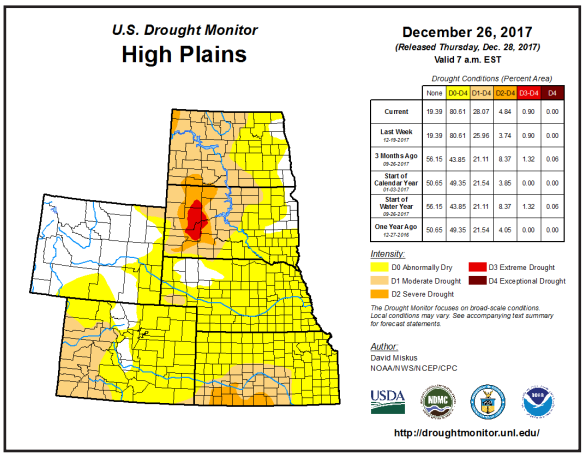
In response to developing La Niña conditions, the HPRCC worked with partners to create a short briefing describing what a typical La Niña pattern could mean for the Missouri River Basin, as well as outlooks and potential impacts for the winter season. For a typical La Niña pattern, the polar jet has a tendency to bisect the region, which means that areas on the north side could have colder conditions, while areas to the south could be warm and dry. The winter outlook for December, January, and February largely followed this pattern. For more information, or to download a copy of the report, please see: https://hprcc.unl.edu/pdf/LaNina-MOBasin-2017-Final.pdf. Similar reports for the Midwest and Great Lakes regions are available at the following links:
Midwest: https://hprcc.unl.edu/pdf/LaNina-Midwest-2017.pdf
Great Lakes: https://hprcc.unl.edu/pdf/GreatLakesLaNina-report-final.pdf



DID YOU KNOW?

NOAA has an El Niño-Southern Oscillation (ENSO) blog that is updated regularly to reflect current ENSO conditions. If you would like to keep up to date with the latest information on the current La Niña, check out the ENSO blog here: https://www.climate.gov/enso

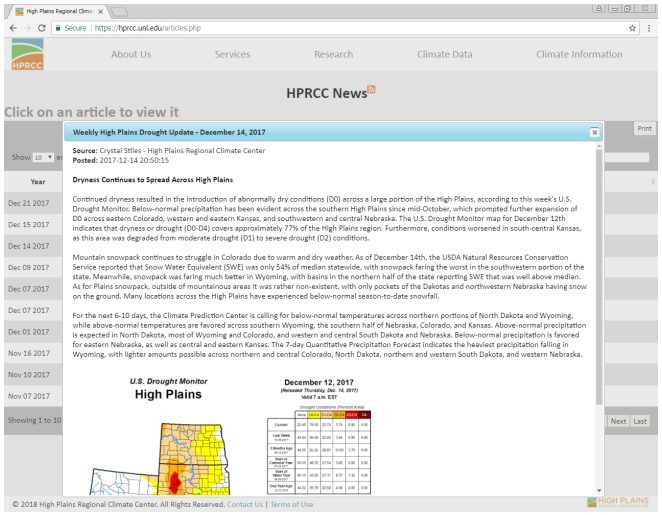
Late Fall/Early Winter Dryness Caused Wildfires, Drought To Spread



The last three months of 2017 brought dryness to much of the region, which caused drought to spread across portions of the High Plains. By the end of December, about 80% of the region was experiencing abnormally dry conditions or drought (D0-D4), according to the U.S. Drought Monitor. The dryness, along with above-normal temperatures, caused season-to-date snowfall to be below normal for much of the region through December. Mountain snowpack in Colorado got off to a very slow start, and by the end of December, statewide Snow Water Equivalent (SWE) was only about 50% of median. On the other hand, snowpack started off well in the Rockies of Wyoming and remained well above median by the end of December, despite warm temperatures in the late fall/early winter. Temperatures were above normal in the High Plains during the October-December period. However, late December brought bitter cold to much of the region, and some locations experienced their coldest temperatures of the year on New Year's Eve with readings well below 0°F.

One particularly impactful event that occurred in December was the Legion Lake Fire, which burned approximately 54,000 acres in the Black Hills of South Dakota and became the 3rd largest fire in South Dakota's history. The fire burned parts of Custer State Park, killing wildlife and damaging roads, trails, and fences. The park closed temporarily so that park officials could make repairs and locate the bison herd. The occurrence and size of the fire were unusual because December is outside the typical fire season in South Dakota.

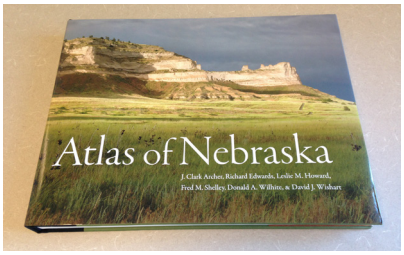
Product Highlight: Weekly Drought Update



Since June of 2012, the HPRCC has been providing weekly drought updates for the High Plains region. These updates provide an overview of recent changes to the U.S. Drought Monitor, along with precipitation and temperature highlights over the previous week. Also included is the current Climate Prediction Center 6-10 day outlook as well as the 7-day Quantitative Precipitation Forecast. These updates provide an efficient way to track drought conditions and outlooks for the region. The updates were in especially high demand during the past summer when drought was impacting the Northern Plains.

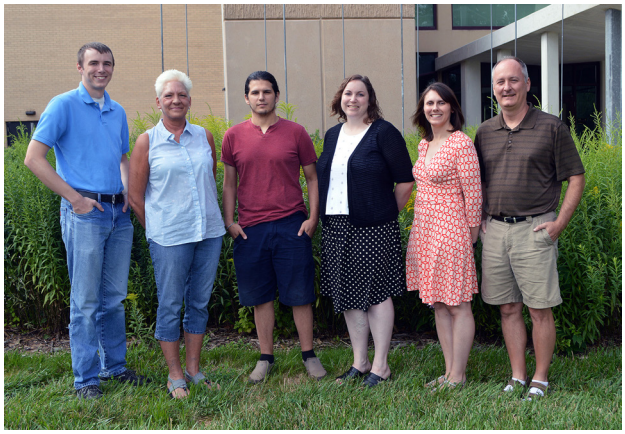
You can obtain these updates from our News page (https://hprcc.unl.edu/articles.php) or by subscribing to our RSS feed (https://hprcc.unl.edu/rss.xml). The updates are also posted on our Twitter page (our handle is @HPClimateCenter).

HPRCC Contributes To *Atlas Of Nebraska*



Last fall, the *Atlas of Nebraska* was published by a group of researchers at the University of Nebraska-Lincoln and University of Oklahoma. It was perfect timing for the release of the book, given that the state celebrated its sesquicentennial last year. With over 300 full-color maps and explanations, *Atlas of Nebraska* takes readers through a visual journey of the history of the state. HPRCC staff contributed to the book by creating climate-related maps and graphs for the physical and biological environment chapter. For more information, please see: http://www.nebraskapress.unl.edu/bison-books/9780803249394/.

Regional Climate Center Turns 30



HPRCC staff from left: Warren Pettee, Shellie Hanneman, Jamie Lahowetz, Crystal Stiles, Natalie Umphlett, Bill Sorensen. (Photo courtesy Shawna Richter-Ryerson)

The High Plains Regional Climate Center quietly turned 30 in 2017, while it continued to collect and make available a host of climate data, organized and taught numerous climate training workshops, and answered hundreds of consumer calls. The Center didn't pause to celebrate. Instead, it continued to crank out the products it has become best known for — climate maps, with a rainbow-colored scale, that stand as a record of climate conditions of the recent past — all while continuing to have an eye on its future.

"The nature of climate services has really changed since we were established in 1987," said Natalie Umphlett, HPRCC interim director. "We had a larger research mission when we started. Now we focus more on engagement and product development with our partners and for our stakeholders."

"Our stakeholders are making decisions using climate data, so a major focus for us is to figure out how to best help them do that," added Crystal Stiles, applied climatologist with the Center.

The High Plains Regional Climate Center was one of three pilot centers created in response to the National Climate Program Act, passed by Congress in 1978. The Act recognized a need for accurate, localized climate information to support government decision makers, but also stakeholders, such as Natural Resource Districts, watershed managers, and even producers. The decision was partially driven by this one fact: Climate recognizes no political boundary.

And so, the High Plains Regional Climate Center was born. It covers a six-state region: Colorado, Kansas, Nebraska, North Dakota, South Dakota, and Wyoming, and works in conjunction with the five other regional climate centers that serve the nation. All are supported by the National Oceanic and Atmospheric Administration.

In addition to its climate services, which make available climate data and information to the public, the Center also develops and delivers products that turn raw climate data into usable information on local, regional, and national scales. Familiar products include their precipitation and temperature maps, but also growing degree day maps that highlight when certain pests may be an issue for producers.

The Center also hosts five agro-climate decision-support tools that were produced as part of the U2U project, a collaborative research effort funded by the U.S. Department of Agriculture, and it conducts research of its own as part of its role with the School of Natural Resources at the University of Nebraska-Lincoln. Research topics include resilient cropping systems, drought planning, municipal climate adaptation, and tribal climate resilience.

"Our customer base is large," Umphlett said. It includes researchers, educators, nonprofit organizations, utility companies, insurance companies, media, engineers, and state, federal, and tribal governments. In the past five years, the Center has served applied climate data needs in every state in the nation and more than 20 countries and U.S. territories. All with six employees, two of which have been with the Center since the 1990s.

Despite its reach, the Center is often overlooked as its primary function is to store and make climate data available to users. Yet its data helps inform the U.S. Drought Monitor map and Nebraska Extension weather, climate, and crop decisions.

But they aren't in it for the glory. They're in it to help fill a gap in stakeholder need, which is why they'll continue interacting and engaging with stakeholders and continue developing new climate data products. Hopefully for at least another 30 years.

-Writer: Shawna Richter-Ryerson; the High Plains Regional Climate Center contributed to and adapted this report.

Recent And Upcoming Travel And Activities

Natalie gives a guest lecture to a Hazard Mitigation Planning class at Nebraska. (Photo courtesy Zhenghong Tang)

Guest Lectures (October 30, November 17)

From time to time, HPRCC staff are invited to give guest lectures relating to current projects or our products and services. This quarter, Natalie gave two guest lectures for courses at Nebraska in Hazard Mitigation Planning (October 30th) and Applied Climate Sciences (November 17th). If you are teaching a course and think your students would like to learn more about the work that we do, and how it could help them in their studies, please contact us for more information. https://hprcc.unl.edu/contact.php

Governor's Conference on the Future of Water in Kansas (November 9)

The sixth annual Governor's Conference on the Future of Water in Kansas was held in early November in Manhattan, Kansas. The conference brought together a wide variety of professionals who all have an interest in Kansas water resources. Natalie served on a panel with colleagues from the National Centers for Environmental Information, the Mid-America Regional Council, the USDA Southern Plains Climate Hub, and the USDA-funded Ogallala Water Coordinated Agriculture Project. The panel members discussed their experiences with assessment and adaptation to extreme events in the Plains, in the context of urban and rural landscapes.

National Weather Service Integrated Warning Team Workshop, Lincoln, NE (November 14)

Natalie participated in an Integrated Warning Team Workshop for the State of Nebraska, which had the goal of improving warning services through collaboration between the National Weather Service (NWS), media, public officials, emergency management, and others. This workshop provided an opportunity to establish new partnerships within the community.

Wind River Drought Preparedness Workshop, Ft. Washakie, WY (November 14-15)

Crystal remotely participated in the final Wind River Drought Preparedness Workshop of the project that HPRCC has been a part of since 2014. Crystal presented on the Wind River Decision Dashboard that was developed in-house for the Wind River tribes to monitor climate conditions and obtain information for climate summaries in one place. Check out the dashboard here: https://hprcc.unl.edu/windriver.php.

Upcoming: CPASW Call for Abstracts (Deadline January 26, 2018)

The next Climate Prediction Applications Science Workshop (CPASW) will take place May 22-24 in Fargo, North Dakota. The theme of the workshop is "Impact-based Decision Support Tools and Applications for Climate Services." As a member of the CPASW planning committee, we encourage you to consider submitting an abstract for this event! The deadline is Friday, January 26th. For more information, please see: https://www.ag.ndsu.edu/CPASW/call-for-abstracts.

Natalie poses with colleagues at the Governor's Conference on the Future of Water in Kansas. (Photo courtesy Natalie Umphlett)

Upcoming: Nature Learning Night, Lincoln, NE (January)

For the fourth year in a row, HPRCC will be participating in Nature Learning Night at Pershing Elementary School. Nature Learning Night gives students and their parents an opportunity to learn more about nature and science in a fun, hands-on environment.

Upcoming: GPTWA Spring Conference, Location TBA (March)

Natalie and Crystal plan to attend the Great Plains Tribal Water Alliance (GPTWA) spring conference, which is expected to be held in March. As part of this project with the GPTWA, Crystal and Natalie are co-producing quarterly climate summaries with 4 tribes in the Dakotas, with the intent to transition production of the summaries to the tribes by the end of the project period next fall.

Upcoming: AAG Annual Meeting, New Orleans, LA (April)

Natalie and Crystal are attending and giving presentations at the American Association of Geographers (AAG) Annual Meeting, which will be held in New Orleans this year. This national conference offers an opportunity for scholars to share their research from a wide variety of disciplines, and as such, it attracts professionals from many areas of research. Natalie and Crystal hope to network and share research and ideas with a diverse audience at this meeting.