HPRCC

April 2018

The Prairie Post

Quarterly Newsletter of the High Plains Regional Climate Center

Inside this issue:

Publisher and cover photo information:

Cover photo:
The Mississippi River at New Orleans, LA (photo courtesy Crystal Stiles)

Newsletter editor:
Crystal J. Stiles

Contributors:
Natalie Umphlett, Crystal Stiles, Shellie Hanneman

Message from the Interim Director

By Ms. Natalie Umphlett

Happy Spring?! The calendar says it is spring, but for many of us in the High Plains region, the weather tells a different story. Even with the cold and snowy weather, the Center is gearing up for the growing season with several tools available to help producers – and home gardeners – with their spring planting decisions. Be sure to check out page 3 for more information about how you can use soil temperature data and spring/fall frost data to your benefit this spring.

So far this year, HPRCC staff have been hard at work wrapping up research projects, submitting proposals, and attending conferences and outreach events. It's hard to believe, but two of our NOAA SARP-funded projects are coming to a close this summer (highlights on page 5). In the coming weeks, new products and services developed for these projects will be released, including tools designed specifically for cities within the region and a drought toolkit to help guide planners. But, as some projects come to a close, new ones begin. Just this month, we received notification that our proposal to the Unidata Community Equipment Awards was recommended for funding. This funding will cover the cost of a new server, which will enable us to provide climate data in new ways to researchers and teachers across the country. Once the new server is up and running, we will provide details about how to access the data and use the accompanying visualization tools.

Finally, I would like to congratulate all the partners who were involved in the USDA-funded Useful to Usable (U2U) project. Led by Dr. Linda Prokopy at Purdue University, the U2U project received the Indiana Governor's Award for Environmental Excellence. The HPRCC is proud to have been a partner on this project, and now houses and maintains the entire suite of U2U agro-climate tools on our website. For more information about the award, please see: https://ag.purdue.edu/stories/u2u-project-receives-governors-award-for-environmental-excellence/. Thank you for stopping at *The Prairie Post*!

Where is Spring? Look in Washington, D.C.!

With an extremely cold start to April, folks across much of the High Plains region have probably noticed a slow green-up, especially compared to recent years. For this quarter's weather photo, we are sharing a springtime favorite from Washington, D.C. – cherry blossoms!

This photo was taken by Natalie in early April this year, during the peak bloom time. Despite several cold air outbreaks, which delayed the early-season bloom forecasts, these cherries were a treat for anyone in the area the first week of April. This serves as a reminder that spring is on the way – even if it does not seem that way!

High Plains Regional Climate Center
713 Hardin Hall
3310 Holdrege Street
Lincoln, NE 68583-0997

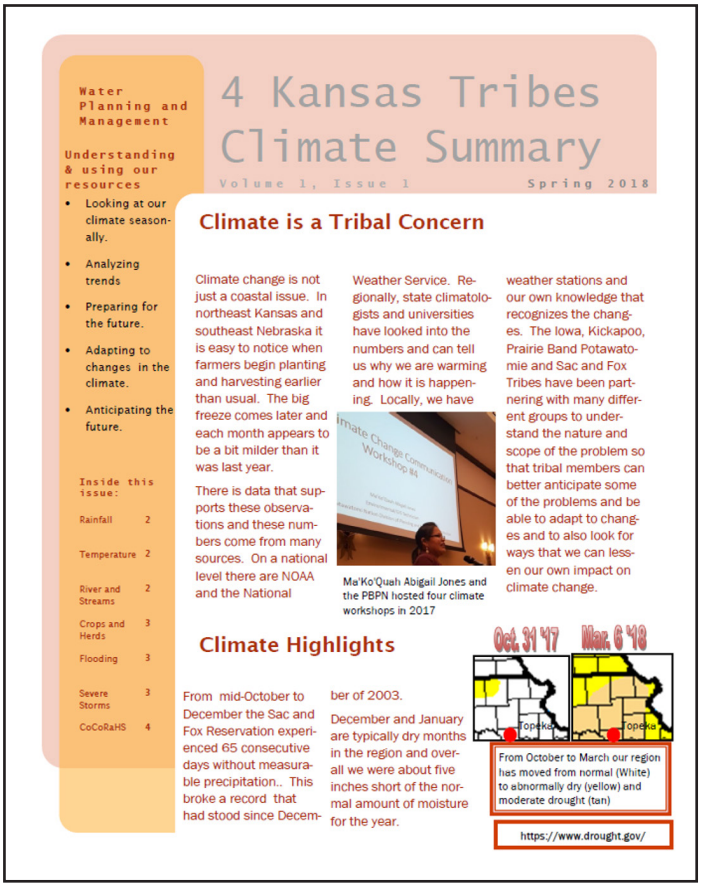
Like us on Facebook!

Twitter: @HPClimateCenter

Phone: (402) 472-6706
Fax: (402) 472-2946
Web Address: www.hprcc.unl.edu
E-mail: www.hprcc.unl.edu/contact.php

Kansas Indian Nations Release Inaugural Climate Summary

In March, the four tribes in northeastern Kansas/southeastern Nebraska (Iowa Tribe of Kansas and Nebraska, Kickapoo Tribe in Kansas, Prairie Band Potawatomi Nation, and Sac and Fox Nation of Missouri in Kansas and Nebraska) released their inaugural climate summary, highlighting winter climate conditions as well as information relevant to the spring season on the four reservations and surrounding area. Mark Junker, Tribal Response Coordinator for Sac and Fox Nation of Missouri in Kansas and Nebraska, led the effort. Below, Mark explains how the climate summary can benefit their tribal communities:


Water Planning and Management

Understanding & using our resources

- Looking at our climate seasonally.
- Analyzing trends
- Preparing for the future.
- Adapting to changes in the climate.
- Anticipating the future.

Inside this issue:

4 Kansas Tribes Climate Summary

Volume 1, Issue 1 Spring 2018

Climate is a Tribal Concern

Climate change is not just a coastal issue. In northeast Kansas and southeast Nebraska it is easy to notice when farmers begin planting and harvesting earlier than usual. The big freeze comes later and each month appears to be a bit milder than it was last year.

There is data that supports these observations and these numbers come from many sources. On a national level there are NOAA and the National Weather Service. Regionally, state climatologists and universities have looked into the numbers and can tell us why we are warming and how it is happening. Locally, we have weather stations and our own knowledge that recognizes the changes. The Iowa, Kickapoo, Prairie Band Potawatomie and Sac and Fox Tribes have been partnering with many different groups to understand the nature and scope of the problem so that tribal members can better anticipate some of the problems and be able to adapt to changes and to also look for ways that we can lessen our own impact on climate change.

Ma'Ko'Quah Abigail Jones and the PBPN hosted four climate workshops in 2017

Climate Highlights

From mid-October to December the Sac and Fox Reservation experienced 65 consecutive days without measurable precipitation.. This broke a record that had stood since December of 2003.

December and January are typically dry months in the region and overall we were about five inches short of the normal amount of moisture for the year.

From October to March our region has moved from normal (White) to abnormally dry (yellow) and moderate drought (tan)

https://www.drought.gov/

HPRCC staff have been working with these four tribes since 2014, with the intent of increasing their capacity to use climate information for decision-making. In November 2014, staff attended a National Integrated Drought Information System (NIDIS)-sponsored tribal engagement workshop in Kansas City, MO to discuss how to improve the four tribes' resiliency to drought and extreme events (a workshop summary can be found at this link: https://hprcc.unl.edu/pdf/NIDIS_KS_workshop_report.pdf). In May 2015, HPRCC staff went to Haskell Indian Nations University in Lawrence, KS for an informal one-day training on climate tools. After discussions with the tribes about the climate summaries HPRCC staff had been putting together for the tribes at Wind River, a mockup climate summary was developed by the HPRCC for the region where the Kansas Indian nations are located. Then, in October 2017, the HPRCC was invited back to Haskell Indian Nations University to provide a more in-depth training workshop on how to put a climate summary together. Mark then put together a Spring 2018 climate summary (see screen shot above), with feedback from HPRCC and NOAA staff as well as fellow tribal project team members.

Check out the full Spring 2018 climate summary here: https://hprcc.unl.edu/pdf/2018SprClimateSummaryFinal.pdf.

> *"The climate summary is a tremendous way for the Kansas Tribes to share knowledge with the community and other partners."*
>
> -Mark Junker, Tribal Response Coordinator, Sac and Fox Nation of Missouri in Kansas and Nebraska

Track Soil Temperatures with Data from the Automated Weather Data Network

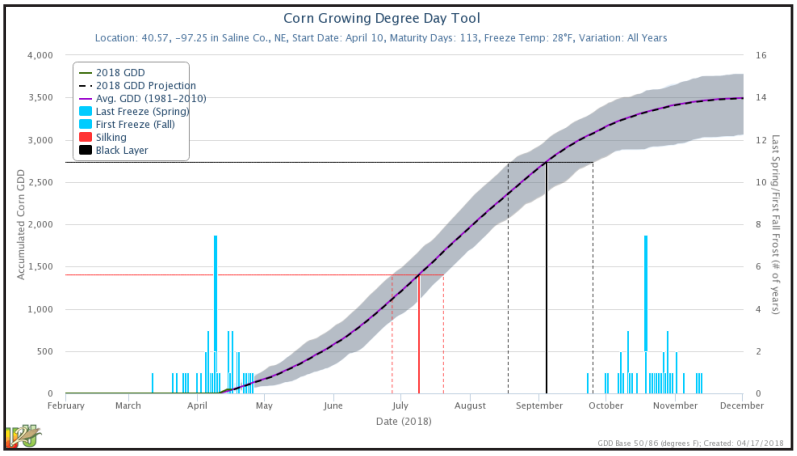
Soil temperatures have been slow to rise this spring, with several rounds of cold air outbreaks and snowfall impacting the High Plains region. Because the temperature of the soil plays a key role in germination and early plant growth, it is important to track soil temperatures before planting. Both large-scale producers and home gardeners can take advantage of the free tools available to quickly assess soil temperatures in their local area. Most stations within the state mesonets represented in the Automated Weather Data Network (AWDN) collect soil temperature data at a depth of 4 inches. Currently, there are 310 stations across the High Plains region to choose from.

For 1-day and 7-day soil temperature maps, please see: https://hprcc.unl.edu/maps.php?map=AWDNMaps. For current and archived soil temperature data at individual locations, please contact us for a free account: https://hprcc.unl.edu/contact.php.

The following table provides minimum soil temperatures for planting for selected agronomic and horticultural crops. The data came from this Nebraska Extension publication, called a NebGuide: http://extensionpublications.unl.edu/assets/pdf/g2122.pdf.

Agronomic Crops	Minimum Soil Temperature for Planting	Horticultural Crops	Minimum Soil Temperature for Planting
Spring Wheat	37°F	Spinach	38°F
Alfalfa	45°F	Lettuce	41°F
Sugarbeets	50°F	Carrots	46°F
Field Corn	55°F	Sweet Corn	55°F
Soybeans	59°F	Tomatoes	57°F
Sunflowers	60°F	Cucumber	58°F
Sorghum	65°F	Pumpkin	60°F

Assess Spring and Fall Frost Risk with the Corn Growing Degree Day Tool

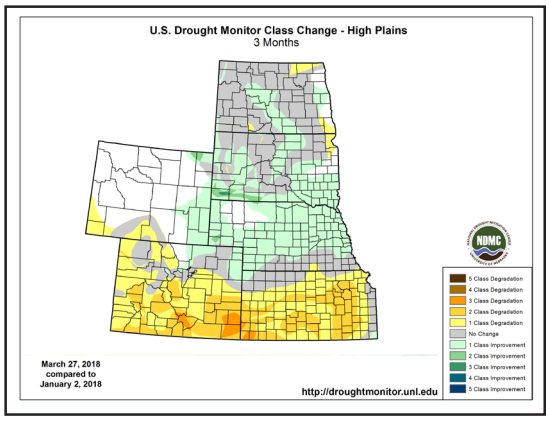


With the planting season right around the corner, producers are considering a variety of factors when making decisions as to when is the best time to plant corn. One of those factors is spring frost risk. The HPRCC hosts a tool that was developed by the Useful to Usable (U2U) project, called the Corn Growing Degree Day (GDD) tool, which helps producers make decisions regarding the planting, harvest, and seed selection of corn. The tool puts current conditions into a 30-year historical perspective and offers trend projections through the end of the calendar year. GDD projections, combined with analysis of historical analog data, can help producers make decisions about climate risks, activity planning, and marketing. The tool is available for the following states: Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Tennessee, and Wisconsin.

You can access the tool on our website at the following link: https://hprcc.unl.edu/gdd.php. Using the map interface, simply click on the desired county, then click "Create GDD Graph" on the dialog box that pops up. The graph is customizable, as you can specify GDD start date, freeze temperature threshold, and corn maturity rating. You can also turn layers of the graph on and off. If you are assessing spring freeze potential, you will want to be sure "Last Freeze (Spring)" is checked. You also have the option of downloading the data associated with the graph, and you can even view time-lapse animations of annual GDD accumulations from previous years.

Cold and Snowy to the North, Warm and Dry to the South

The first quarter of the year yielded contrasting climate conditions across the High Plains. In the northern part of the region, it was cold and snowy, while the southern portion was left warm and dry. For temperature, portions of Colorado and Wyoming were consistently warm throughout the winter, with January being a standout month for well above-normal temperatures. Meanwhile, other portions of the region were largely on the cold side. February was particularly cold across northern portions of the region. In March, cold and snowy conditions were confined to the north, while warm and dry conditions were present to the south. This pattern produced contrasting snowfall records. For instance, this March was among the top 10 snowiest for locations in North Dakota, while areas of Colorado and Kansas had a top 10 least snowiest March on record.



While wet conditions led to drought improvements across northern and central portions of the region, the continued lack of precipitation during late winter/early spring contributed to the expansion of drought conditions across Colorado and Kansas. By the end of March, the U.S. Drought Monitor indicated that 74% of Colorado and 81% of Kansas was experiencing drought. In fact, exceptional drought conditions, the most severe category on the U.S. Drought Monitor intensity scale, were introduced to southwestern Kansas in March, as this region has received less than 25% of normal precipitation since October. In Colorado, snowpack has remained well below normal the entire season, and with the normal peak for the snowpack season approaching, it will be difficult to make up the deficit. Soil moisture was severely depleted in large portions of these states, which has already damaged winter wheat and is cause for concern regarding the upcoming growing season.

DID YOU KNOW?

Ever wonder why precipitation data from the Automated Weather Data Network (AWDN) is missing during the cold season? With the exception of Wyoming, the majority of AWDN stations do not have heated rain gauges, so readings for any frozen precipitation event would likely be inaccurate. Also, because AWDN stations are automated, no one is physically at each station measuring the snow. So, from the late fall to mid-spring, we do not display precipitation values in our Classic Online system or maps. With that in mind, are you now wondering how to get winter precipitation data for your area? Try our CLIMOD site, which contains wintertime precipitation data from networks like COOP and CoCoRaHS: http://climod.unl.edu/.

What is the State Climate Extremes Committee?

Records

Download: XML

State: Colorado Element: All Elements

STATE	ELEMENT	VALUE	DATE	LOCATION	STATION ID	STATUS
Colorado	Maximum Temperature	114°F	July 1, 1933	LAS ANIMAS	054834	N1A
			July 11, 1954	SEDGWICK	057513	N1A
Colorado	Minimum Temperature	-61°F	February 1, 1985	MAYBELL	055446	E
Colorado	24-Hour Precipitation	11.85 in.	September 12, 2013	USGS Rod & Gun (Ft. Carson)	USGS 384053104492001	NA
Colorado	24-Hour Snowfall	75.8 in.	April 14 - 15, 1921	SILVER LAKE	057648	E
Colorado	Snow Depth	251 in.	March 31, 1979	WOLF CREEK PASS 1 E	059181	N

The State Climate Extremes Committee was formed in 2006, with the purpose of reviewing and establishing statewide record events. When a potential record-setting event occurs, an initial review is conducted by the local National Weather Service Weather Forecast Office and/or the State Climatologist for the particular state. If deemed legitimate, the State Climate Extremes Committee will convene, review the data, and vote to accept or reject the new record. Staff at the High Plains Regional Climate Center serve on the State Climate Extremes Committee when record-setting events occur within the region.

The last extreme to be evaluated for the High Plains region took place during the heavy rainfall and flooding event of September 2013 along the Front Range in Colorado. Rainfall totals exceeding 10 inches were widespread throughout the area and numerous daily and monthly records were set at individual locations. Shortly after the event, the committee was formed to examine the data and determine if any statewide records had occurred. It was decided that a new record had indeed been set at the USGS Rod & Gun site at Ft. Carson, which is located just south of Colorado Springs. This station had a 24-hour rainfall total of 11.85 inches on September 12, beating the old record of 11.08 inches in Holly, which had stood since June 17, 1965. To learn more about the State Climate Extremes Committee and to search for records in your state, please see: https://www.ncdc.noaa.gov/extremes/scec/overview.

HPRCC Staff Develop Tools through NOAA Research Projects

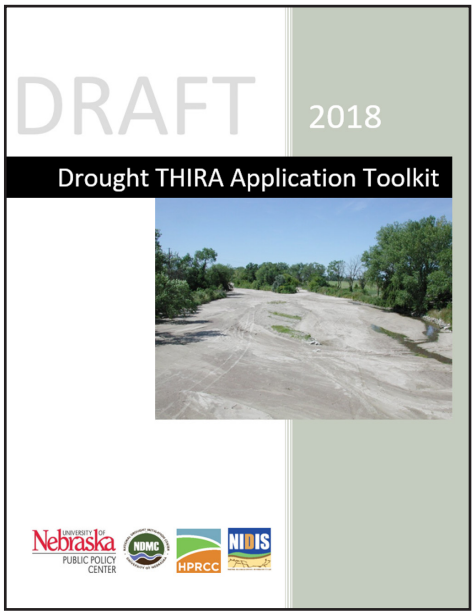
Climate4Cities

Since the summer of 2016, the HPRCC has been involved in a NOAA Sectoral Applications Research Program (SARP) project, which aims to help municipalities in the Plains and Midwest plan for a variable and changing climate. The project brings together climatologists, planners, social scientists, and city representatives from the states in the lower Missouri River Basin to understand the current use of climate data at the municipal level and ways to better incorporate that data into planning processes in the future. Through surveys and focus groups, the project team learned that there were several ways that municipalities might be able to increase their use of climate data, including reports, webinars, and interactive online resources with localized information that is specific to cities. In response to these needs, the project team is creating and testing a new line of products that will help municipalities access historical and projected data for their location, make comparisons to other locations, and read planning documents from several locations across the region.

Please stay tuned for the release of these new tools later this spring or early summer. In the meantime, you can learn more about the project with this informative video: https://go.unl.edu/climate4cities.

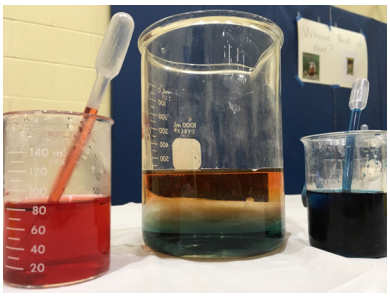
Drought THIRA Toolkit

The other NOAA SARP project in which the HPRCC is involved is "Drought Planning Using Community Threat and Hazard Identification and Risk Assessment (THIRA)," which is wrapping up this summer as well. One of the deliverables of this project is a toolkit for planners to guide them through the development of a drought scenario using the THIRA process. Last April, project team members from the HPRCC and the National Drought Mitigation Center developed a drought scenario for the Platte River Basin in Nebraska. This scenario was tested with stakeholders during a THIRA workshop, which was hosted by the entire team (see the July 2017 edition of *The Prairie Post* for a summary of the workshop). After the workshop, the project team began putting together a draft of the toolkit. It has been presented to the project's stakeholder advisory team, who is providing feedback on its content and design, and it will be completed and distributed this summer. A webinar will be held in June to introduce the toolkit to interested stakeholders, so keep an eye on our Twitter feed for an advertisement of the webinar.



Check out the project website here: http://droughtthira.unl.edu/.

Recent and Upcoming Travel and Activities



Nature Learning Night activity. (Photo courtesy Natalie Umphlett)

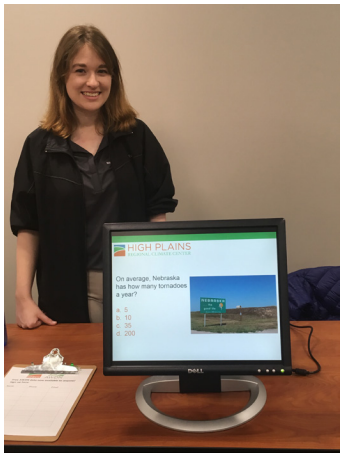
Nature Learning Night, Lincoln, NE (January 25)
The HPRCC returned to Pershing Elementary School for their annual Nature Learning Night. This year, Natalie created a new activity, which demonstrated density with water of different temperatures. The students enjoyed seeing the "rainbow" that was created from the cold (blue), room temperature (yellow), and hot (red) water.

Lower Platte South NRD Drought Plan Meeting, Lincoln, NE (February 5)
Natalie had the opportunity to meet with representatives from the Lower Platte South Natural Resources District to discuss their plans for increased drought monitoring and planning for the district. The HPRCC looks forward to providing applicable climate data and information as the project moves along. Other partners in attendance included the Nebraska State Climate Office, Nebraska Extension, and UNL's School of Natural Resources. The Lower Platte South NRD is located in southeast Nebraska and serves the city of Lincoln. For more information, see: http://www.lpsnrd.org/.

U.S. Air Force Science and Technology 2030 Forum, Lincoln, NE (March 22-23)
Warren attended the U.S. Air Force Science and Technology 2030 Forum in Lincoln, NE. This forum provided opportunities to learn more about funding through the Department of Defense and share research ideas with potential partners.

Central Plains Severe Weather Symposium (CPSWS) and Weatherfest, Lincoln, NE (April 7)
Every spring since 1999, CPSWS has been attracting crowds who are eager to learn more about severe weather and disaster preparedness in the Plains. The HPRCC is proud to have participated each and every year! This year, Natalie and Emily brought a trivia game to test people's knowledge of fun weather and climate facts. People were surprised to learn that the lowest temperature ever recorded in Nebraska was -47°F, while the highest was 118°F!

American Association of Geographers Annual Meeting, New Orleans, LA (April 10-14)
Crystal attended the AAG meeting in order to share the Center's tribal engagement work with a broader audience. Crystal presented a poster on various methods used to build the capacity of tribal communities to make decisions based on climate information.



HPRCC intern Emily Brown plays trivia with Weatherfest participants. (Photo courtesy Natalie Umphlett)

Upcoming: Congressional Roundtable, Sioux Falls, SD (May)
The NOAA Central Region Collaboration Team will be hosting a congressional roundtable meeting in May, with the goal of increasing the awareness of NOAA's activities specifically in the state of South Dakota. Several pertinent topics will be covered, such as fire weather and drought. As part of the team, Natalie will travel to the event and highlight Regional Climate Services activities.

Upcoming: Climate and Wildlife Workshop, Wood River, NE (May)
Crystal and Natalie are delivering a climate and wildlife workshop at the Crane Trust Nature & Visitor Center. Co-hosted by the Crane Trust, this workshop will provide wildlife researchers and land managers hands-on experience using climate data and tools that can be used to better understand the influence of weather and climate on habitat, ecosystems, and wildlife populations and communities.

Upcoming: Climate Prediction Applications Science Workshop, Fargo, ND (May)
Hosted by North Dakota State University this year, Natalie and Crystal will be presenting at the 16th Annual CPASW. The workshop brings together a diverse group of climate researchers, information producers, and users to share developments in the research and applications of climate predictions for societal decision-making. Register for the workshop or view the program here: https://www.ag.ndsu.edu/cpasw.

Upcoming: American Association of State Climatologists (AASC) Annual Meeting, Nebraska City, NE (June)
Several HPRCC staff will be attending the AASC Annual Meeting because it is being held in our backyard in Nebraska City! The Nebraska State Climate Office is hosting AASC this year, which will be held at the beautiful Lied Lodge next to the Arbor Day Farm. The AASC provides an opportunity for state climatologists, regional climate center staff, and their partners to interact and share research and ideas.