



Inside this issue:

Message from the director..... 1

Staff spotlight 1

Workshop highlights..... 2

Overview of regional climate conditions 2

Tool updates..... 3

Recent and upcoming activities 4

Message from the Director

By Dr. Rezaul Mahmood

Greetings! I hope you have enjoyed some spring-like weather after a few record-breaking winter events in our region. As we continue to endure the COVID-19 pandemic, our services remain uninterrupted and engagements continue in the virtual realm. While we have persevered through this pandemic thus far, we look forward to meeting with our partners in person again.



In January, the Center’s staff organized a virtual workshop with the Nebraska Forest Service (NFS), focusing on the nexus between climate and fire. The HPRCC, the NFS, and a few selected partners shared information on fire operations, climate data, and climate-fire research that could be put into practice. This is a new and exciting area for the HPRCC, and we look forward to future collaborations. Read more about the workshop on Page 2.

During our last communication, I mentioned that we received funding from the National Centers for Environmental Information (NCEI) to develop a “Custom Climatology Tool” for obtaining temperature averages for various time periods. This tool has been developed and tested, and it is ready to be deployed with the new normals on May 4th. Read more about it on Page 3.

We wish you the best as we move into spring and summer with the hope that the pandemic will get under control. In the meantime, feel free to reach out to us if you need any assistance with climate data or climate decision tools. Thank you for reading *The Prairie Post!*

Publisher and cover photo information:

Cover photo:
Daffodils signifying the beginning of spring (photo courtesy Crystal Stiles)

Newsletter editor:
Crystal J. Stiles

Contributors:
Natalie Umphlett, Rezaul Mahmood, Bill Sorensen, Jamie Lahowetz, Carmelo Lattuca, Crystal Stiles

Meet our Intern, Carmelo Lattuca



Carmelo began interning with the HPRCC in August 2020. He started college at UNL in Fall 2018 and is majoring in Meteorology-Climatology, but he has several other interests as well, as he is minoring in Mathematics, Broadcasting, Communication Studies, and Applied Climate Science! As for extra-curricular activities, Carmelo is the treasurer for the UNL student chapter of the American Meteorological Society.

One of Carmelo’s most interesting weather memories as a kid was the time when he saw “ball lightning.” Ball lightning is a bright ball of light that moves through the atmosphere close to the ground. Carmelo saw this rare event during a thunderstorm, when suddenly in the sky he saw a blue and white “sphere-like shape.” Then it exploded across the sky and lightning went everywhere. It is one of the coolest things he has ever seen!



HPRCC Conducts Climate-Fire Workshop



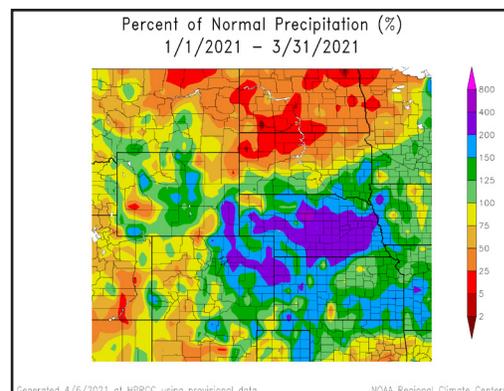
In January, the HPRCC hosted a virtual workshop on climate and fire with Nebraska Forest Service (NFS) staff. Since the fall of 2020, both wildland and grassland fires have been active across the High Plains, and these types of events are expected to occur more frequently in the future. Therefore, the HPRCC and the NFS came together during this workshop to discuss the climate data and information needs of those working in forestry and fire.

Through several discussions, a number of climate-related concerns were brought up by NFS staff. For instance, fires have been increasing in intensity and are also occurring outside the typical fire season, which prompts questions about how fire management practices might change. Another question that was brought up was, how might fuels be impacted by a longer growing season? Several needs were also identified, including climatologies, trends, and frequencies of variables such as relative humidity, extreme temperature, and wind; additional Remote Automated Weather Stations (RAWS) in Nebraska; and data on temperature inversions and vapor pressure deficit.

At the end of the workshop, the NFS determined that collaboration on future projects with the HPRCC would help enhance their understanding of the relationship between climate and fire. We look forward to exploring this topic further and working with our NFS partners!

Overview of Regional Climate Conditions

It was a tale of two extremes in regards to precipitation during the first quarter of 2020. A combination of heavy snow and rain in February and March resulted in precipitation exceeding 200% of normal for the January-March period across much of Nebraska, eastern portions of Colorado and Wyoming, and western Kansas. Casper, WY, Goodland, KS, and Grand Island, NE had their wettest Marches on record, with much of it falling as rain in Goodland and Grand Island, while falling as snow in Casper. The ongoing wetness helped alleviate and/or remove drought across these areas. However, just to the north in the Dakotas, precipitation was scarce from January-March. The majority of North Dakota and northern South Dakota received less than 50% of normal precipitation for this time period. Drought intensified throughout the winter, which is quite uncommon for the Northern Plains. Snow was almost nonexistent across the landscape, and because this region entered the cold season with depleted soil moisture, there are major concerns regarding agriculture and livestock operations this spring. Furthermore, the wildfire season got off to an early start in the Dakotas due to extremely dry fuels.

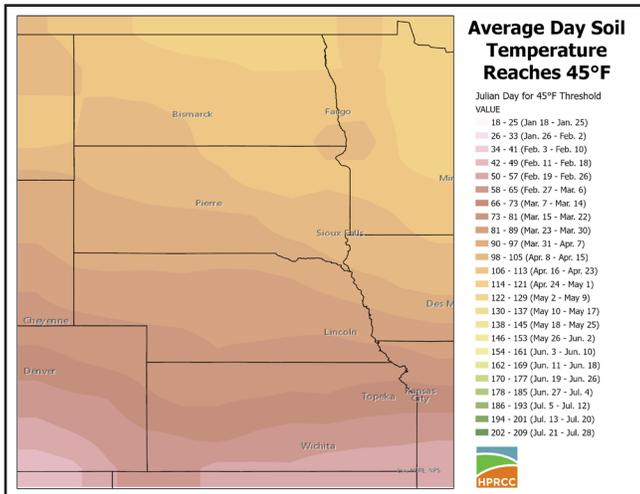


While average temperatures for the January-March period were not too far from normal across the High Plains region, it truly masked the extremes that occurred during these three months. For instance, January was quite warm, with many locations in the Dakotas breaking into the top 5 of warmest Januarys on record. Then, in February, the pattern significantly changed as cold air invaded the High Plains east of the Rockies. Several locations, particularly throughout Nebraska and Kansas, broke into the top 10 of coldest Februarys. The magnitude and duration of the cold put a strain on the power grid, prompting rolling blackouts across parts of the region. Temperatures rebounded in March, as departures were above normal for most of the Dakotas, Nebraska, and Kansas. To learn more about the current state of the climate in the High Plains, check out our monthly summaries here: <https://hprcc.unl.edu/climatesummaries.php>.

2020 High Plains Annual Climate Summary

2020 was another eventful year in the High Plains, including the development and expansion of drought, the occurrence of historic wildfires in Colorado, and flooding in the Dakotas. For a recap of climate conditions and major climate events in 2020 for the High Plains region, check out our annual summary here: <https://hprcc.unl.edu/pdf/climatesummary/Annual-2020.pdf>.

HPRCC Releases Soil Temperature Climatology



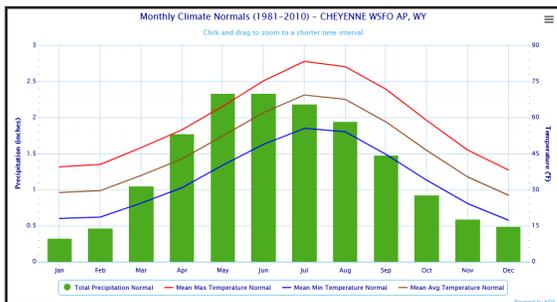
The HPRCC is pleased to present a new tool for agricultural producers and horticulturalists – a soil temperature climatology for the High Plains region. The tool was created as a result of requests from our clients over the years for this type of data. The soil temperature climatology gives the average Julian and calendar day at which the five-day running average soil temperature at four inches reaches specific temperature thresholds conducive for crop and agronomic seed germination. The project was an enhancement of a soil temperature climatology conducted for Nebraska (check out this NebGuide on the Nebraska project from Pathak et al. 2012: <https://extensionpublications.unl.edu/assets/pdf/g2122.pdf>).

In our analysis, stations included have at least 15 years of data ending in 2020, except for stations in South Dakota, which have about 10 years of data ending in 2020. Stations included in the analysis came

from the Climate Reference Network (CRN), the Colorado Agricultural Meteorological Network (CoAgMET), the Kansas Mesonet, the Nebraska Mesonet, the North Dakota Agricultural Weather Network (NDAWN), and the Soil Climate Analysis Network (SCAN). Both shaded and dot maps are available for the average day that soil temperature reaches 40°F, 45°F, 50°F, 55°F, 60°F, 65°F, and 70°F.

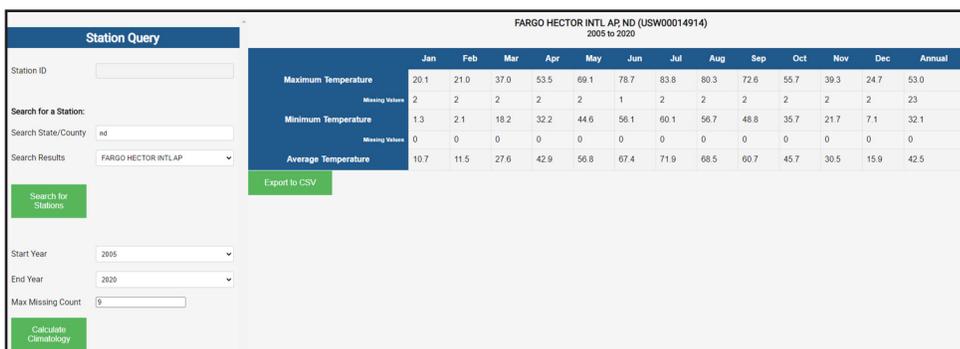
This tool can be useful for determining the best time to plant certain agronomic and horticultural crops. For instance, according to Pathak et al. 2012, potatoes require a minimum soil temperature of 45°F at the time of planting. If one wanted to plant potatoes in Lincoln, Nebraska, our analysis indicates that the average day that soil temperatures reach 45°F in Lincoln falls in the range of Julian Days 81-89, or March 23-30. Check out the tool here: <https://hprcc.unl.edu/maps.php?map=SoilTemp#>.

Staff Develop Tool to Accompany 1991-2020 Climate Normals

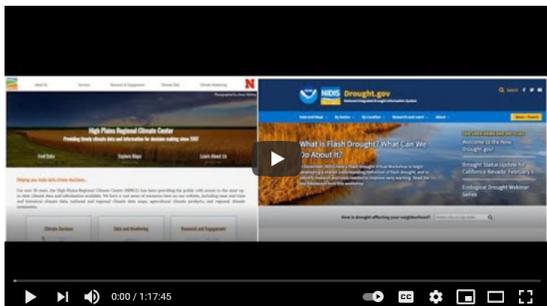


For anyone working with climate data, this is a big year – the year the new Climate Normals are released. If you are new to climate data, Climate Normals are 30-year averages of climatological variables such as temperature, precipitation, and snowfall. These averages are calculated from observations at thousands of stations across the country by the National Centers for Environmental Information (NCEI). You can see an example of a climograph to the left, which shows the temperature and precipitation Normals for Cheyenne, WY. While this graph is showing the Normals from 1981-2010, the new Normals period will cover the timeframe between 1991-2020 and will be released on May 4.

Here at the High Plains Regional Climate Center, we have been assisting NCEI on a tool that will accompany this new Normals dataset. This tool is called the “Custom Climatology Tool” and it allows users to create temperature averages for various time periods of interest. The Custom Climatology Tool will be released along with the new Normals on May 4. Please see image at right for a sneak peek of the tool!



Recent and Upcoming Activities



Screenshot of the CRCT website demo.

American Meteorological Society Annual Meeting, Virtual (January 10-15)

Paul Flanagan presented three different projects at the annual AMS meeting: “Extreme Precipitation Climatology of the Missouri River Basin from 1950 to 2019,” “Summertime Atmospheric Impacts of Near-Future Land-Use Land Cover Change in the North-Central United States,” and “Impact of Anthropogenic Climate Change on Future U.S. Great Plains Wet and Dry Years.” As a side note, Paul accepted a research agronometeorologist position with the USDA in El Reno, OK. We wish Paul the best!

AASC Mesonet Community Meeting, Virtual (January 29 and February 5)

Jamie attended the American Association of State Climatologists Mesonet Community Meeting. Several topics of interest to the mesonet community were discussed during this two-day remote meeting, including data monetization and metadata.

USDA Inversions Meeting, Virtual (February 9-11)

Jamie and Rezaul attended the Agricultural Drift and Inversion Monitoring Workshop. The workshop had a goal of connecting partners to “better understand the occurrence of inversions, impacts on applications, and to set new research areas for future work.”

CRCT Website Demo, Virtual (February 10)

As you may know, the HPRCC website got a refresh last summer, with a new look and feel and several new tools. Earlier this year, our partners at the National Integrated Drought Information System (NIDIS) also released a new website. So, in an effort to get the word out, the NOAA Central Region Collaboration Team hosted a “Website Walkabout” featuring the new bells and whistles of each site. Team members Natalie Umphlett (HPRCC) and Molly Woloszyn (NIDIS) provided the virtual tours and a recording can be watched here: <https://www.youtube.com/watch?v=HtHvMgnJOI>.

Climate Change and Culture in the Great Plains, Virtual (April 1-2)

Each year, the Center for Great Plains Studies hosts a symposium on issues of importance to the Plains. This year’s symposium, which Crystal attended, focused on Climate Change and Culture in the Great Plains. More information about the conference, along with recordings, may be found here: <https://www.unl.edu/plains/2021-great-plains-conference-page>.

Upcoming: CPASW Annual Meeting, Virtual (April)

In April, Natalie will be attending the 18th Annual Climate Prediction Applications Science Workshop. This year’s workshop will bring together virtual attendees around the theme of “Providing services for the cascading effects of intensifying heat in a rapidly growing region.” To learn more about this year’s workshop, please see: <https://sgsup.asu.edu/CPASW>.

Upcoming: Shifting Seasons Summit, Virtual (April)

Crystal is planning to attend the 3rd Shifting Seasons Summit, which is hosted by the College of Menominee Nation – Sustainable Development Institute. This year, the Summit will address Tribal climate adaptation and implementation projects occurring across the Northeast and the Midwest.

Upcoming: WERA 1012 Meeting, Virtual (May)

Bill will be attending the annual WERA 1012 meeting, sponsored by the staff of CoCoRaHS. The conference will once again be virtual and many topics relating to managing and utilizing precipitation data from volunteer networks will be discussed.

Upcoming: AASC Annual Meeting, Virtual (June)

The American Association of State Climatologists (AASC) Annual Meeting will be virtual once again this year. This meeting provides State Climatologists/State Climate Office staff, Regional Climate Center staff, and their partners an opportunity to share updates on services, research, and outreach. Several HPRCC staff are expected to participate this year.



A cherry blossom tree in full bloom. (Photo courtesy Crystal Stiles)