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The Prairie Post Quarterly Newsletter of the High Plains Regional Climate Center- October 2016

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The Prairie Post

Quarterly Newsletter of the High Plains Regional Climate Center

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Bull Lake, Wind River Indian Reservation, Wyoming (photo courtesy Crystal Stiles)

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Message From The Interim Director

By Ms. Natalie Umphlett

Welcome back to *The Prairie Post*! Another quarter has passed by and it's time to reflect on all the interesting things that have happened. July 1 marked the start of two NOAA Sectoral Applications Research Program (SARP) projects: "Increasing the Capacity for Municipal Climate Adaptation Planning in the Lower Missouri River Basin States" and "Drought Planning Using Community Threat and Hazard Identification and Risk Assessment." These two projects are off to running starts and we will provide updates as results come in.

A highlight for me this quarter was the Regional Climate Services Workshop, held in September at Hardin Hall in Lincoln, NE – home to HPRCC. This was the second in a series of workshops for National Weather Service personnel developed by the HPRCC and the NOAA Central Region Collaboration Team. It was an energetic three days of discussion on climate service activities, monitoring, climate data tools, and stakeholder engagement. We are excited that other groups are also interested in the series, and we hope that enhanced collaboration among those involved in regional climate services can expand across the country. Please visit page 2 for more details.

This quarter marks the start of a new series for the newsletter where we will be highlighting climate-based tools from our partners around the region. This quarter, the featured tool is the Kansas Mesonet's Freeze Monitor (http://mesonet.k-state.edu/freeze/). This tool is available in the fall and spring, when below-freezing temperatures can have an impact on vegetation. We hope you enjoy the first tool in this series and come back to learn more about the great work that is being done by our partners in the region!

Meet Our Applied Climatologist, Crystal Stiles

Crystal joined the HPRCC in 2014 as an Applied Climatologist and Postdoctoral Research Associate. She received her Ph.D. in Natural Resource Sciences from the University of Nebraska-Lincoln. Crystal facilitates the HPRCC's stakeholder engagement program, which involves working with a variety of groups such as Native American tribes to assess their climate data and information needs. She is also a drought specialist and collaborates with the National Drought Mitigation Center on several projects.

Crystal has been married for two years to her husband Josh and has a beagle named Ripley. She is an avid sports fan and cheers for the Huskers, the WKU Hilltoppers, the Kentucky Wildcats, and the Cincinnati Reds. In fact, Crystal and Josh met because he was trying to sell her tickets to a UK basketball game! She is a native Kentuckian and enjoys throwing Kentucky Derby parties for her Nebraska friends and occasionally lets her southern accent come through.

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HPRCC Holds Second Regional Climate Services Workshop for NWS

Participants of the NWS Regional Climate Services workshop. (Photo courtesy Shawna Richter-Ryerson)

The High Plains Regional Climate Center recently organized a workshop on regional climate services for National Weather Service employees whose focus is the upper Missouri River Basin. Eleven participants from nine National Weather Service Offices came to Lincoln from Missouri, Montana, North Dakota, South Dakota and Wyoming.

"There is an overwhelming amount of climate data and information available these days. With the increasing demand for climate services, it is important to be aware of climate resources that are available and who provides them," said Natalie Umphlett, HPRCC interim director and regional climatologist. "By building relationships among the climate services community in the Missouri River Basin, we can work together to provide efficient services for the region. My hope is that this workshop is merely a starting point for a long-lasting collaboration."

Workshop objectives included: introducing participants to Regional Climate Services; providing hands-on experience with climate and drought tools; identifying opportunities for collaboration in the future; and building relationships and networks between participants from the local through national scales.

Staff from the HPRCC led workshop activities from Sept. 20 to 22, with special sessions by representatives from the State Climate Offices in Montana, Nebraska, North Dakota, South Dakota and Wyoming; the National Drought Mitigation Center; and the National Oceanic and Atmospheric Administration (NOAA).

Participants cited the workshop's focus on practical uses of available climate tools and data storage as a strength of the program, which also has served as inspiration for others to host their own.

"The NOAA Great Lakes Regional Collaboration Team will be working with our sister center, the Midwestern Regional Climate Center, on hosting a workshop focused on Great Lakes issues next year," Umphlett said.

Mark Svoboda of the NDMC provides an overview of the Drought Risk Atlas. (Photo courtesy Crystal Stiles)

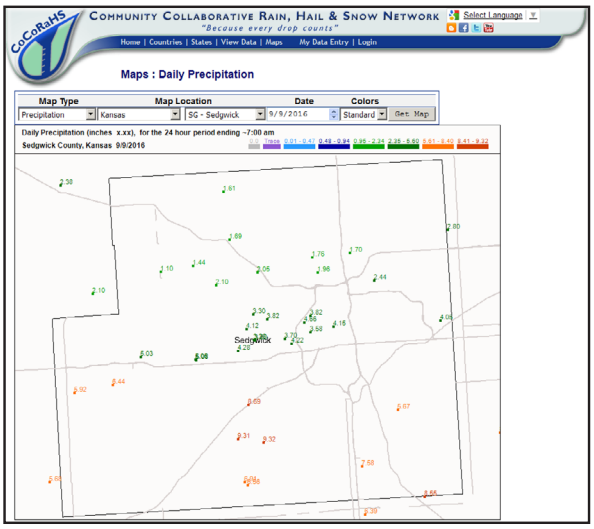
In addition to hands-on training, participants also took several field trips, including to the Dairy Store and to a U.S. Climate Reference Network climate monitoring station located at Prairie Pines, a 145-acre property owned by Nebraska Forest Service at University of Nebraska-Lincoln, that has been transformed from farmland to an area of diverse woodland and grassland habitats. Of the 114 sites in the contiguous U.S., the Lincoln area is home to two USCRN sites, one at Prairie Pines and another at Spring Creek Prairie.

Nebraska SC Martha Shulski discusses the American Association of State Climatologists. (Photo courtesy Crystal Stiles)

This workshop was the second in a series and was made possible with funding from the NOAA Central Region Collaboration Team. At least one more workshop is planned for 2017. "The goal is to create a network of people who are not only knowledgeable of Regional Climate Services, but who can also participate and collaborate in applied climate research and outreach activities in the region," Umphlett said. Each workshop completed is one step closer to achieving that goal.

Reprinted from Inside the School of Natural Resources (http://newsroom.unl.edu/announce/snr/5803/32777)

Product Highlight: Community Collaborative Rain, Hail, and Snow Network

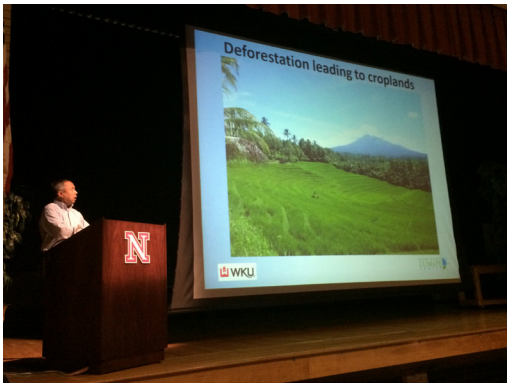


The Community Collaborative Rain, Hail, and Snow (CoCoRaHS) network was started by the Colorado Climate Center at Colorado State University in 1998. CoCoRaHS was created in response to an historic flood in Fort Collins, Colorado in 1997 that brought about the need for increased monitoring of precipitation. The CoCoRaHS network is made up of volunteers who measure and report precipitation on a daily basis. The network has grown over time and now has thousands of observers, and it has even expanded outside of the United States to Canada and the Bahamas. Daily observations are plotted on a map, and one can zoom in to a particular county. For example, the image to the left shows precipitation observations from September 9, 2016 in Sedgwick County, Kansas (which includes the city of Wichita). Thanks to a fairly dense network of CoCoRaHS stations in Sedgwick County, one can see the variability in rainfall – 1-2 inches of rain fell in the northern part of the county, while southern Sedgwick County was slammed with over 9 inches of rain! A new feature of CoCoRaHS is the condition monitoring report, which allows observers to report the condition of their landscape by selecting a condition on a sliding scale and describing it. These reports will contribute to the understanding of the impacts of drought and identify both expected and unexpected seasonal changes. CoCoRaHS data are also incorporated into the Applied Climate Information System (ACIS), which is managed by the Regional Climate Centers, and the data are integrated into the HPRCC's ACIS climate maps (http://www.hprcc.unl.edu/maps.php?map=ACISClimateMaps).

Would you like to become part of the CoCoRaHS network as an observer? It is quite easy! Sign up at http://www.cocorahs.org. Instructions will be provided for purchasing a high capacity 4" rain gauge, which is only about $30. Online training tutorials are also available from the CoCoRaHS website. Join the CoCoRaHS effort to contribute important information about the environment and become an observer today!

Partnership Spotlight: American Association of State Climatologists

The HPRCC has enjoyed a long-time partnership with the American Association of State Climatologists (AASC – http://www.stateclimate.org/). The mission of the AASC is to advance the development and delivery of science-based climate services on a local and state level. The organization helps to build and sustain effective State Climate Offices, and it also facilitates interaction and collaboration among providers of climate services at the state, regional, and national levels. Three members of HPRCC's staff are AASC members who regularly attend the annual meeting. Our Center is very fortunate to have a good relationship with the State Climatologists in our region.



Dr. Mahmood gives his seminar to faculty, staff, and students of the School of Natural Resources. (Photo courtesy Crystal Stiles)

The HPRCC also engages with State Climatologists and State Climate Office staff outside our region. In fact, the Center hosted Dr. Rezaul Mahmood as a part of the School of Natural Resources fall seminar series in September. Dr. Mahmood is currently a Professor of Geography/Meteorology at Western Kentucky University and is also the Associate Director of both the Kentucky Mesonet and the Kentucky Climate Center. He has published more than 65 peer-reviewed articles on research topics such as mesoscale meteorology, climatology, and observations; modeling atmospheric impacts of land use/land cover change; modeling impacts of soil moisture on weather and climate; air quality meteorology; and flash flooding climatology and hydrometeorology of the Appalachia. Much of Dr. Mahmood's work on land use/land cover changes centers on the Great Plains, making his work quite relevant to not only the HPRCC, but others here at the University of Nebraska-Lincoln (UNL). His visit to UNL was packed with meetings with students, staff, and faculty, and there was good attendance at his talk entitled, "Land Cover Change, Irrigation, and their Impacts on Climate."

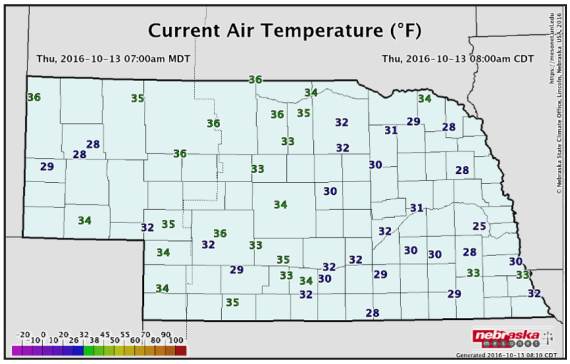
Learn More About The Automated Weather Data Network

Station	24 Hour Observations		This Fall		Fall Freeze Climatology		
	Time <32°F (Hours)	Lowest Temp (°F)	First 32°F	Most Recent 32°F	Average Date	Record Earliest	Record Latest
Ashland Bottoms	0.0	54.4			10-14	09-20 (1918)	11-10 (1998)
Butler	0.0	54.8			10-19	09-22 (1995)	11-09 (1986)
Cherokee	0.0	48.9			10-23	09-27 (1942)	11-25 (2004)
Cheyenne	0.0	47.4	10-05 07:55	10-07 08:50	10-07	09-03 (1974)	10-28 (1963)
Clay	0.0	52.2			10-14	09-15 (1916)	11-10 (1944)
Colby	0.0	51.3	10-07 01:50	10-07 08:40	10-05	09-03 (1974)	10-28 (2014)
Garden City	0.0	52.8	10-07 04:25	10-07 08:50	10-13	09-21 (1995)	10-31 (2014)
Grant	0.0	53.6	10-07 06:25	10-07 08:20	10-13	09-21 (1983)	11-07 (1953)
Gray	0.0	52.4			10-13	09-03 (1974)	11-14 (1965)
Gypsum	0.0	52.0			10-23	09-24 (1989)	11-11 (1998)
Hamilton	0.0	53.4	10-05 05:55	10-07 09:00	10-07	09-03 (1974)	10-29 (2014)
Harper	0.0	54.5			10-26	09-26 (1912)	11-20 (2001)
Haskell	0.0	53.3	10-07 07:10	10-07 07:55	10-16	09-21 (1983)	11-09 (1987)
Hays	0.0	54.7	10-07 07:35	10-07 08:00	10-09	09-13 (2014)	11-10 (1998)
Haysville	0.0	55.5			10-18	09-21 (2000)	11-04 (2004)
Hiawatha	0.0	53.9			10-13	09-19 (1991)	11-11 (1998)
Hill City	0.0	55.9	10-07 05:50	10-07 08:25	10-10	09-13 (1974)	11-05 (1947)
Hodgeman	0.0	54.8	10-07 07:40	10-07 08:15	10-12	09-19 (1991)	10-28 (2010)
Hutchinson 10SW	0.0	52.5			10-17	09-15 (1993)	11-05 (1998)

AWDN Product Highlight: Kansas Mesonet Freeze Monitor

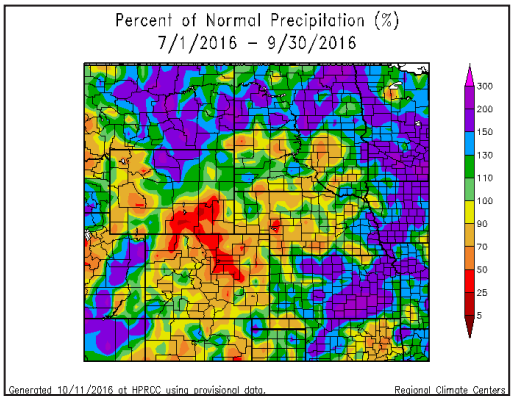
Staff from the Kansas Weather Data Library developed a useful tool for producers and gardeners alike. The Freeze Monitor tool helps put current conditions into an historical perspective. The Freeze Monitor map displays data updated every 5 minutes and includes the 24-hour low temperature as well as the number of hours below 32°F and 24°F for each station, which is especially important when assessing freeze damage to crops and gardens. The map is accompanied by tables that provide fall freeze climatology data (see example table to the left). The fall freeze climatology provides dates for the average first freeze, the record earliest freeze, and the record latest freeze for the temperature thresholds mentioned above. Click on the following link to start using the Freeze Monitor: http://mesonet.k-state.edu/freeze/.

State Network Highlight: Nebraska Mesonet



The newly formed Nebraska State Climate Office (NSCO) is focused on providing climate services on a local and state level. The NSCO operates the Nebraska Mesonet, which is comprised of nearly 70 stations, and is striving for the goal of putting a station in every Nebraska county. The NSCO also collects data for a handful of stations in Wyoming. Each station, at minimum, collects data on air temperature, relative humidity, rainfall, wind direction and speed, incoming solar radiation, and soil temperature, and there are plans to add barometers so that atmospheric pressure can be collected as well. The Nebraska Mesonet website offers maps of daily values and current conditions as well as valued-added products like evapotranspiration, degree days, and heat index/wind chill index values. Check out the site here: mesonet.unl.edu.

Precipitation Extremes Cause Flooding and Impacts to Agriculture



Temperatures during the July-September period were near normal across much of the region, with temperatures that were slightly above normal in parts of the eastern High Plains and eastern Colorado. Precipitation varied throughout the region, as it was excessively wet across North Dakota and Kansas but especially dry throughout Colorado. The disparity in precipitation caused low streamflows in the Upper Missouri River Basin and high streamflows in the lower portion. As a result, the U.S. Army Corps of Engineers did not have to increase releases to meet downstream targets over the summer. North Dakota and Kansas were hammered with numerous rounds of precipitation during the late summer, which had negative impacts to agriculture in North Dakota and caused flooding in Kansas. Drought caused reductions in alfalfa yields, poor pasture conditions, water quantity and quality issues, and an increase in wildfires in the Black Hills region of South Dakota and in Wyoming. However, drought was not an issue across a large part of the High Plains or the Midwest regions this past summer, which is a contributing factor to the forecast for record-high corn and soybean production in the U.S. this year.

Recent outlooks for El Niño-Southern Oscillation (ENSO) by the Climate Prediction Center (CPC) indicate that while ENSO-neutral conditions are currently present, La Niña is favored to develop this fall and is slightly favored to persist during the upcoming winter. Therefore, a La Niña Watch is in effect. According to the CPC, there is an increased chance for above-normal temperatures across the High Plains region through December. Above-normal precipitation is favored in northern Wyoming and western North Dakota, while the rest of the region has equal chances for above-, below-, or near-normal precipitation.

Regional News

Participants of the ITEP Climate Change Adaptation Planning Course. (Photo courtesy Adam Howard, Arbor Day Foundation)

HPRCC Participates in Climate Change Adaptation Planning Course for Tribes

The HPRCC was given the opportunity to participate in a climate change adaptation planning course held by the Institute for Tribal Environmental Professionals (ITEP), which took place September 13-15 at the Lied Lodge and Arbor Day Farm in Nebraska City, Nebraska. ITEP, which is housed at Northern Arizona University in Flagstaff, has established several programs to support tribal governments in protecting their natural resources and promoting a healthy environment for tribal communities. One such program focuses on climate change, which includes the delivery of three-day courses on climate change adaptation planning. Courses are offered periodically in different locations across the country with regional foci and are intended for tribal environmental and natural resource professionals. Participants are provided an overview of climate change and its impacts in the region, an introduction to developing climate change adaptation plans, and tools and resources on adaptation planning.

ITEP

Crystal participated as an instructor for the course held in Nebraska City in September. She discussed the basics of climate change and trends, talked about the climate and drought summaries HPRCC helps produce for the tribes of Wind River in Wyoming, and demonstrated several climate tools that would be useful to participants. She also helped different groups brainstorm ideas for their climate change adaptation plans. She especially enjoyed interacting with and learning from the course participants, who represented 17 federally recognized tribes/tribal organizations in 10 states. She also liked the field trip, which included touring the Arbor Day Farm and the Fuelwood Energy Plant at the Lied Lodge.

High Plains Region COOP Observers Win Thomas Jefferson and John Campanius Holm Awards

All across the country, thousands of observers in the Cooperative Observer Program (COOP) report their local weather conditions on a daily basis. Their data are integrated into a variety of products and used for decision making in sectors such as agriculture and utilities. Each year, the National Weather Service honors those COOP observers who have gone above and beyond in their service to the program.

The two most prestigious awards are the Thomas Jefferson Award and the John Campanius Holm Award. The Thomas Jefferson Award is presented to a small number of observers (usually around five) each year who have demonstrated outstanding and unusual achievements in observing the weather. The award is named after President Thomas Jefferson who was an avid weather observer himself. Meanwhile, about 25 John Campanius Holm Awards are presented each year for outstanding accomplishments in weather observations. The award is named after a minister who was the first known to take weather observations in the U.S. colonies. This year, several awards were given to observers here in the High Plains region. Congratulations to everyone!

Michael Overturf, Thomas Jefferson Award winner, poses with his family and Steve Eddy from NWS Hastings. (Photo courtesy Marla Doxey)

Thomas Jefferson Award

- Arlene Bernhardt, Taylor, North Dakota (Bismarck, ND WFO)
- Ella Mae Julian, Big Bow, Kansas (Dodge City, KS WFO)
- Michael Overturf, Clay Center, Nebraska (Hastings, NE WFO)
- Alan Winkler, McFarland, Kansas (Topeka, KS WFO)

John Campanius Holm Award

- Rhonda Berns, Blue Hill, Nebraska (Hastings, NE WFO)
- Roland Bromley, Drake, North Dakota (Bismarck, ND WFO)
- Leonard Lindly, Anselmo, Nebraska (North Platte, NE WFO)
- Karen and Gordon Preis, Emblem, Wyoming (Riverton, WY WFO)

Recent And Upcoming Travel And Activities

Dinwoody Lake, a glacially-fed lake on the Wind River Indian Reservation. (Photo courtesy Crystal Stiles)

Wind River Drought Preparedness Workshop, Fort Washakie, WY (July 26-27)

Another drought preparedness workshop was held on the Wind River Indian Reservation in July as part of the Wind River drought vulnerability project that is funded by the North Central Climate Science Center (http://nccsc.colostate.edu/revamp/project/wind-river-drought-preparedness). Crystal attended to discuss updates on the climate and drought summary that she produces for the tribes at Wind River, as well as provide information on transitioning this effort to technicians from the Office of the Tribal Water Engineer. (An example of the Wind River and surrounding area climate and drought summary can be found here: http://www.hprcc.unl.edu/pdf/Wind-River-Climate-Drought-Summary_Sep16.pdf.) Crystal got a special treat during this trip as she got to visit several of the water resources around the reservation, as well as the beautiful Wind River Canyon, which provided helpful context for her involvement in the project.

S.T.E.M.-ing into the Future, Grand Island, NE (August 29)

Natalie and Crystal participated in the S.T.E.M.-ing into the Future event at the Nebraska State Fair, which provided activities for children that focus on the STEM fields (Science, Technology, Engineering, and Mathematics). Natalie and Crystal brought manual and automated rain gauges to demonstrate how precipitation is measured, and they provided weather and climate trivia questions for children to answer.

Crystal and Natalie at the S.T.E.M.-ing into the Future event at the Nebraska State Fair. (Photo courtesy Maranda Kegley)

Science Night Live!, Lincoln, NE (September 23)

Natalie participated in Science Night Live!, an event focused on breaking down the stereotypes about scientists. The event featured a science-based comedy show, interactive displays, and "scientist speed-dating" where the general public could interact with scientists directly. Science Night Live! was part of a 2-day workshop called SciComm2016, which brought together experts from around the nation who are involved in improving science literacy and engagement.

Upcoming: Great Plains Tribal Water Alliance Fall Conference, Rapid City, SD (November)

Crystal will be attending another meeting of the Great Plains Tribal Water Alliance, which will be held in Rapid City, SD. Crystal and Natalie will be working with the GPTWA on projects that facilitate climate change adaptation planning. More details on these projects are to come.

Science enthusiasts gather for Science Night Live! in downtown Lincoln, NE. (Photo courtesy Ken Dewey)

Upcoming: NIDIS Midwest DEWS Regional Workshops, Champaign, IL and Cincinnati, OH (December)

Regional meetings are being held in November and December to discuss next steps toward creating a NIDIS Drought Early Warning System for the Midwest. Crystal will attend regional meetings in December with stakeholders from Illinois and Indiana in Champaign, IL, and stakeholders from Kentucky and Ohio in Cincinnati, OH. Other regional meetings are planned for November for Iowa and Missouri in Iowa City, IA, and for Minnesota and Wisconsin in Rochester, MN.

Upcoming: Weather and Climate Decision Tools for Farmers, Ranchers, and Land Managers, Gainesville, FL (December)

A 2.5-day conference focused on the development of weather and climate decision support tools for agriculture will take place at the University of Florida in early December. Natalie will be presenting on how the U2U project engaged stakeholders in the tool development process and will also showcase select tools during a "Tools Café" session. More information about the U2U project may be found here: http://agclimate4u.org.