



The Little Missouri River flows through Theodore Roosevelt National Park in North Dakota. US Park Service photo.

Partnering for change in the Missouri River Basin

Using recent Missouri River Basin examples, an article published in *Water Resources Impact* describes decision support and drought and resiliency planning efforts conducted with tribal communities using the National Integrated Drought Information System. The authors also describe a collaborative process and provide information on how to build productive relationships.

Citation: Stiles, C.J., N. Umphlett, J. Rattling Leaf Sr., M.D. Shulski, D. Kluck, M. Hayes, and C. McNutt, 2015: Improving Climate Resiliency in Tribal Communities: Partnering for Change in the Missouri River Basin. *Water Resources Impact*, 17(4), 15-17.

Eastern Shoshone, Northern Arapaho team up with scientist coalition

Collaboration on the Wind River

BY KELLY HELM SMITH
National Drought Mitigation Center
SHANNON MCNEELEY
Colorado State University

The Eastern Shoshone and Northern Arapaho Tribes on the Wind River Indian Reservation in Wyoming are preparing for drought and other climate fluctuations with help from a broad coalition of scientists.

“I appreciate all the collaborative effort that has gone into it so far,” said Mitchel Cottenoir, the Eastern Shoshone and Northern Arapaho Tribes’ Tribal Water Engineer. “I’m excited to see how things will progress.”

The Tribes have worked with climate and social scientists in the past year to prepare regular climate and drought summaries for use in making water and resource decisions on the reservation and in surrounding areas. A new phase of work began this summer, under a two-year grant from the Department of the Interior North Central Climate Science Center (NCCSC) and led by Cody Knutson of the National Drought Mitigation Center (NDMC), based at the University of Nebraska-Lincoln, and Shannon McNeeley, Colorado State University (CSU) and NCCSC.

This stage will help the Tribes conduct a vulnerability assessment, to see how they can reduce the likelihood of experiencing future drought-related impacts. Both the current and future generations of tribal decision-makers will be involved, finding ways to integrate scientific and traditional knowledge. The ultimate goal is for this information to be used to inform the development of a reservation-wide drought plan.

Cottenoir said the new project will put valuable tools in the hands of the Wind River Water Resources Control Board, which is charged with administering the water rights on the Wind River Reservation and balancing water resources for the 15 equally important beneficial uses of water that are identified in the Wind River Water Code.

“We’re going to have trigger points, and be able to gauge where we are, so we can be prepared

Co-investigators on the vulnerability assessment

Mitchel Cottenoir, Shoshone and Arapaho Tribes Office of the Tribal Water Engineer

Jennifer Wellman, Wyoming Experimental Program to Stimulate Competitive Research (ESPCoR, on the Wind River Reservation)

Mark Svoboda, NDMC

Gary Collins, former tribal water engineer, and Al C’Bearring (Office of the Tribal Water Engineer) as well as NDMC staff serve on the project management team.

Collaborating organizations

High Plains Regional Climate Center

NIDIS

Great Northern Landscape Conservation Cooperative

USDA’s Natural Resources Conservation Service and its Northern Plains Regional Climate Hub

University of Wyoming

U.S. Geological Survey’s University of Wyoming Cooperative Unit

Wyoming State Climate Office

Wind River Community 4-H,

Western Water Assessment (one of NOAA’s Regional Integrated Sciences and Assessment teams)

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and have water for all of the reservation,” Cottenoir said. “Agriculture is just one of 15 beneficial uses in our water code. Water is also used in cultural and religious ceremonies.”

He added that water for domestic use also becomes an issue at times. Scant surface water supplies have resulted in community members having to boil water before using it.

Top drought-related concerns that tribal members cited in interviews with McNeeley included having enough water for ranching and grazing livestock, for irrigation, for fish and fisheries, and for wildlife. Drought also affects subsistence activities, such as harvesting berries and hunting and fishing, and ceremonies and rituals. People were also concerned about decisions made by the Bureau of Indian Affairs and by various state and federal agencies.

“A primary goal of this project is to be a model for real co-production of science with the Tribes from end-to-end, starting with working with them on the proposal development phase, integrating local knowledge and observations with the science, developing decision support tools like the drought summary, and ultimately informing their development of a drought plan,” McNeeley said.

An integral part of the new project is involving youth and young

professionals, who will be working with water supply issues in the future. “They’ll be dealing with water supply issues when the rest of us have moved on,” Cottenoir said. “We’re bringing young people along, and getting them involved.”

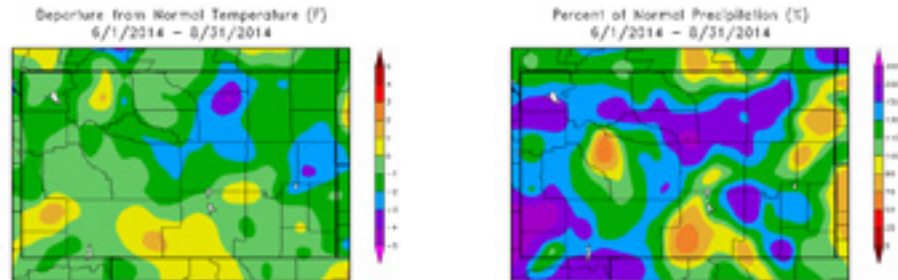
This project builds on a preceding year of effort that included many meetings, workshops, and

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A Cool, Wet Summer Staves Off Drought Conditions

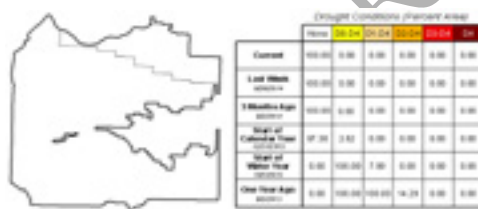
Summer 2014 was mostly characterized by below normal temperatures and above normal precipitation across the reservation. The seasonal average temperature was about 1 to 2 deg F below normal, while seasonal precipitation totals ranged from about 130-150 percent of normal. June and August were cooler with average temperatures running about 2 deg F below normal, while July temperatures were near normal. Despite below normal precipitation in June and slightly below normal precipitation in July, August precipitation made up for those months with precipitation totals as much as 200-300 percent of normal across the reservation. Cool and wet conditions helped stave off drought conditions in the reservation, which is discussed below.



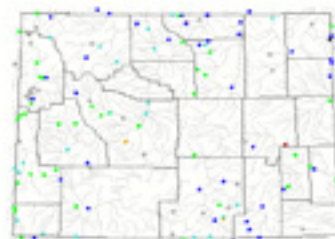
Reservation Avoids Drought during Summer

Cool and wet conditions kept drought out of the reservation this summer. Abnormal dryness that was present in southern Wyoming at the beginning of the summer eventually crept northward toward the reservation in June, and in late July, a pocket of moderate drought conditions (D1) appeared. By August, however, copious rainfall alleviated drought conditions, and the pocket of drought and dryness began to shrink as it retreated southward. The latest U.S. Drought Monitor map for the reservation shows drought-free conditions, which is the opposite of conditions one year ago when 100% of the reservation was experiencing at least moderate drought. Streamflow conditions on water bodies in and around the reservation were mostly normal at the start of the fall season.

U.S. Drought Monitor of Wind River - September 2, 2014
Released September 4, 2014 Valid 8 a.m. EDT



Streamflow Information
June 1-September 2, 2014



Legend:
 D0 Abnormally Dry
 D1 Moderate Drought
 D2 Severe Drought
 D3 Extreme Drought
 D4 Exceptional Drought

Explanation - Percentile classes
 Low: <=10 (Most frequent)
 10-24 (Below normal)
 25-75 (Normal)
 75-90 (Above normal)
 High: >90 (Most frequent)
 Non-ranked

For more information about collaborators and the project's Advisory Committee, please refer to the project summary: <http://revampclimate.colostate.edu/revamp/project/wind-river-drought-preparedness>

webinars at Wind River Reservation, which resulted in the quarterly Wind River Climate and Drought Summary, with regular production shifting into the hands of the Eastern Shoshone and Northern Arapaho tribes that share the reservation.

“We want the climate summary to be a valuable tool to the agricultural community,” Cottenoir said. In drought years, “crops burn up in the field, especially if there’s no water, as in some cases, past the Fourth of July. We’re just trying to provide them the best possible information so they can prepare and decide which crops they’re going to plant, and know if they’re going to have to get into a conservation mode, and what time frame that’s going to be, rather than waiting until there’s no water in the ditch.”

The climate and drought summary can be of use across and beyond the reservation. Cottenoir said his office is developing a website, sharing it via email with surrounding irrigation districts, and is exploring distribution options such as inserting it into local newspapers.

NIDIS supported development of the climate and drought summary. The High Plains Regional Climate Center and the NDMC, together with NCCSC, worked with tribal water decision-makers and technicians as the summary was being created.

“The climate summary is an invaluable tool for decision-makers because it condenses a vast amount of climate information into a simple format with non-technical language that is intended for a general audience,” said Crystal Stiles, an applied climatologist at the HPRCC who helped create the summary.

“It provides a snapshot of climate, water, and drought conditions from the previous season, as well as what can be expected during the next season. The greatest challenge in creating the climate summary is being mindful of the language and jargon used that a general audience may not have been exposed to, so feedback from decision-makers has been extremely valuable.”

WEBINARS: Keep up with current conditions in your area

Several of NIDIS’ partner organizations offer regular live reports through webinars on drought conditions in their regions. Upcoming and past webinar listings are at <http://www.drought.gov/drought/content/regional-programs/regional-drought-webinars>. How to sign up for future events, or view past sessions:

Managing Drought in the Southern Plains

The Southern Climate Impacts Planning Program (SCIPP) holds bi-weekly discussions of drought and its impacts on the second and fourth Thursdays of each month at 11:00 a.m. Central Time. States covered include Oklahoma, Texas, and New Mexico. To join in, please register at <http://www.southernclimate.org/>. You can view past webinars on YouTube at <https://www.youtube.com/user/SCIPP01>.

Upper Colorado River Basin Webinar

The Colorado Climate Center conducts Climate, Water and Drought Assessment briefings detail events in the basin states of Colorado, Utah and Wyoming. To register, please visit: http://ccc.atmos.colostate.edu/drought_webinar_registration.php

Midwest and Great Plains Drought Update

The National Oceanic and Atmospheric Administration (NOAA), the American Association for State Climatologists (AASC) and the High Plains Regional Climate Center (HPRCC) have responded to drought across the Midwest and Great Plains by organizing, creating and presenting webinars since July 2012. These presentations are held monthly but can be more frequent when conditions warrant.

The webinars consist of a regional climate summary, impacts due to drought and climate outlooks.

The webinars are held on the third Thursday of every month at 1pm Central Time. A link to the webinar registration page, along with recordings and powerpoints from previous webinars, can be found here: <http://www.drought.gov/>

[drought/news/midwest-and-great-plains-drought-webinar-jan-15-2015](http://www.drought.gov/drought/news/midwest-and-great-plains-drought-webinar-jan-15-2015).

Apalachicola-Chattahoochee-Flint (ACF) River Basin Drought Assessment Webinar

The Southeast Climate Consortium (SECC) organizes a drought assessment webinar that includes current conditions and outlooks for the ACF basin.

Currently the webinars occur monthly, and will increase in frequency if drought conditions warrant. Webinar partners include the U.S. Army Corps of Engineers, National Weather Service and USGS. To receive webinar announcements, send a request to reuteem@auburn.edu to get on the email list. To view previous webinar summaries, visit <http://www.drought.gov/drought/regional-programs/acfrb/acfrb-home> and choose from the list on the right side of the page.



The National Integrated Drought Information System (NIDIS) is a nexus of drought information, policy and research. We promote collaboration among government agencies, communities and individuals at all levels to share information about drought, and provide resources for planning, forecasting, management and recovery. Together with our federal, state and local partners we pursue these goals:

- Leadership and networking among all sectors to plan for and cope with the impacts of drought
- Supporting research on the science of drought, including indicators, risk assessment and resilience
- Creating regional early warning systems for drought management
- Developing resources, systems and tools to promote drought awareness and response