

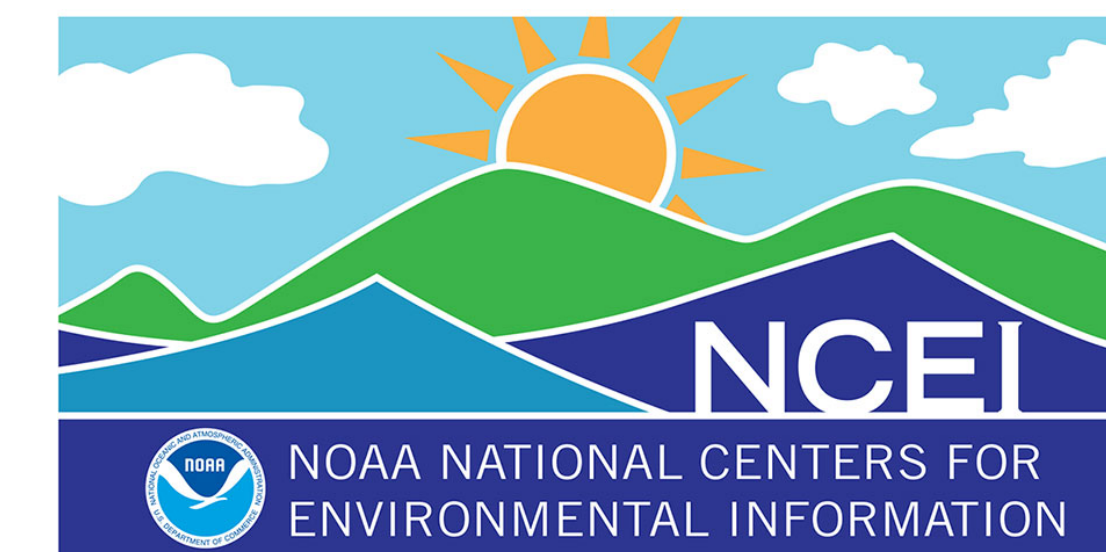
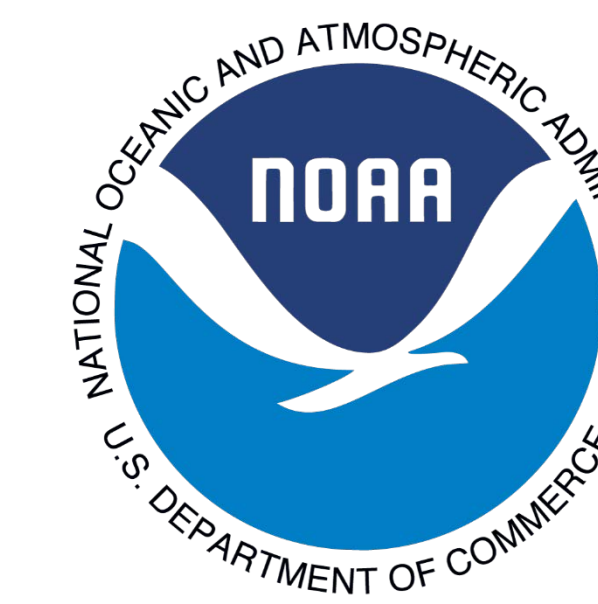


# Building Capacity with Tribal Communities in the Missouri River Basin to Use Climate Information for Decision Making

Crystal J. Stiles<sup>1</sup>, Natalie A. Umphlett<sup>1</sup>, and Doug Kluck<sup>2</sup>

<sup>1</sup>High Plains Regional Climate Center, University of Nebraska-Lincoln

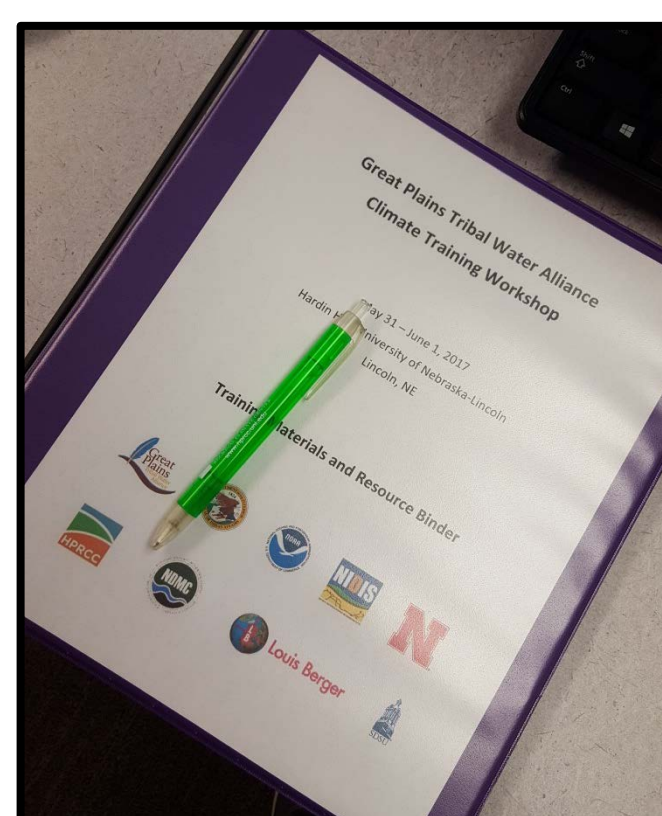
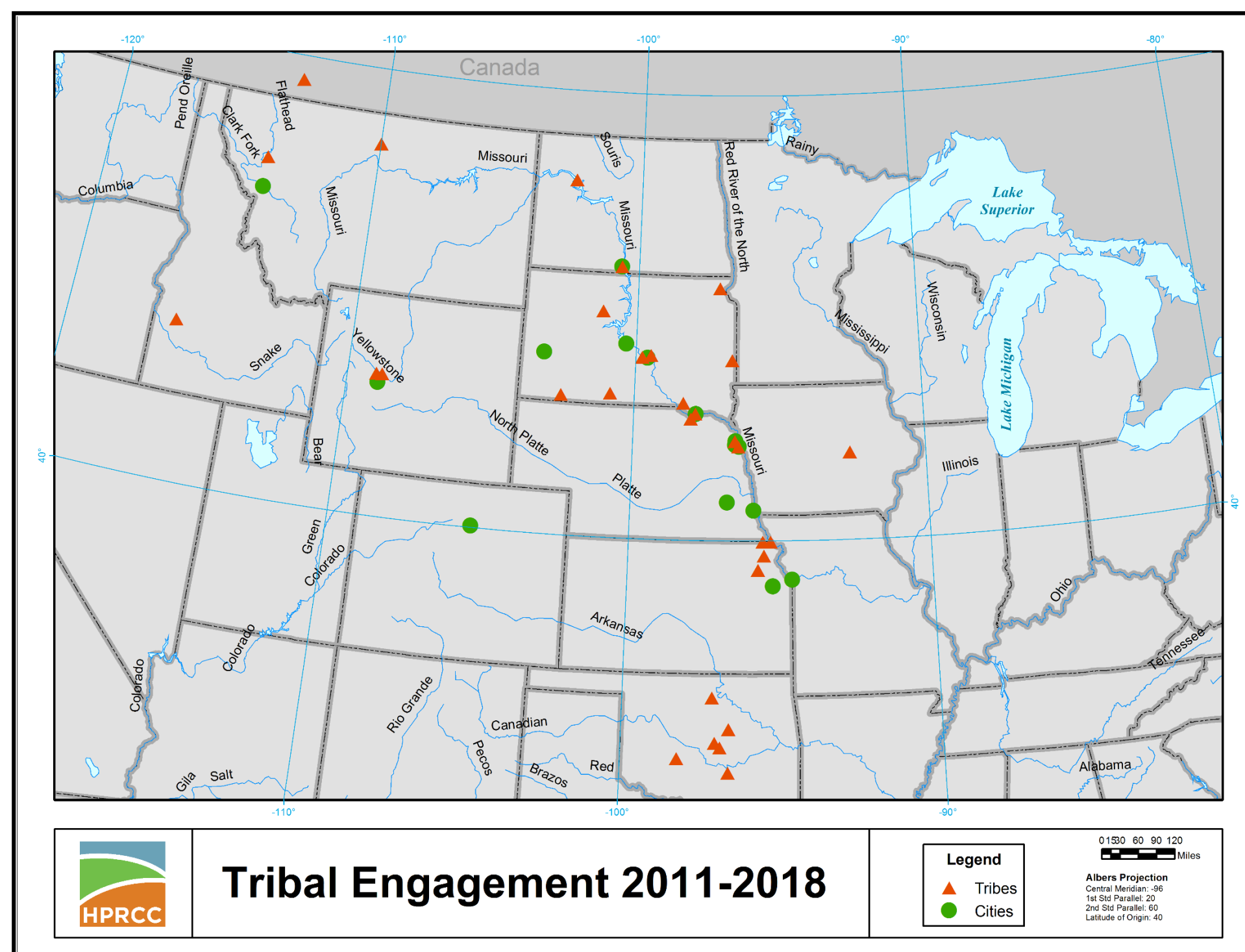
<sup>2</sup>National Oceanic and Atmospheric Administration / National Centers for Environmental Information



## Overview

Understanding climate information for use in decision making helps communities reduce their vulnerability to climate change and extreme events. In particular, tribal communities are especially at risk with respect to changes in climate and are increasingly seeking innovative ways to address this issue. Entities such as the National Integrated Drought Information System (NIDIS) and the U.S. Department of the Interior Bureau of Indian Affairs (BIA) have recognized the need to bridge this gap. NIDIS and the BIA have funded meetings and projects that bring tribal environmental professionals, climate scientists, and other federal, regional, and state-level partners together to address climate monitoring and drought management on tribal lands in the Missouri River Basin. Along with its partners, the High Plains Regional Climate Center (HPRCC), whose mission is to increase the use and availability of climate data and information, has undertaken the task of **providing training and expertise to tribal environmental professionals to help them build capacity to use climate information for decision making.** Such methods used to accomplish this task include:

- Delivering hands-on, interactive **climate data and information training workshops**
- Co-producing **region-specific climate summaries** with tribal environmental professionals
- Developing **online decision dashboards** that contain web links to useful climate information



Examples of NIDIS- and BIA-sponsored tribally-focused meetings and workshops:



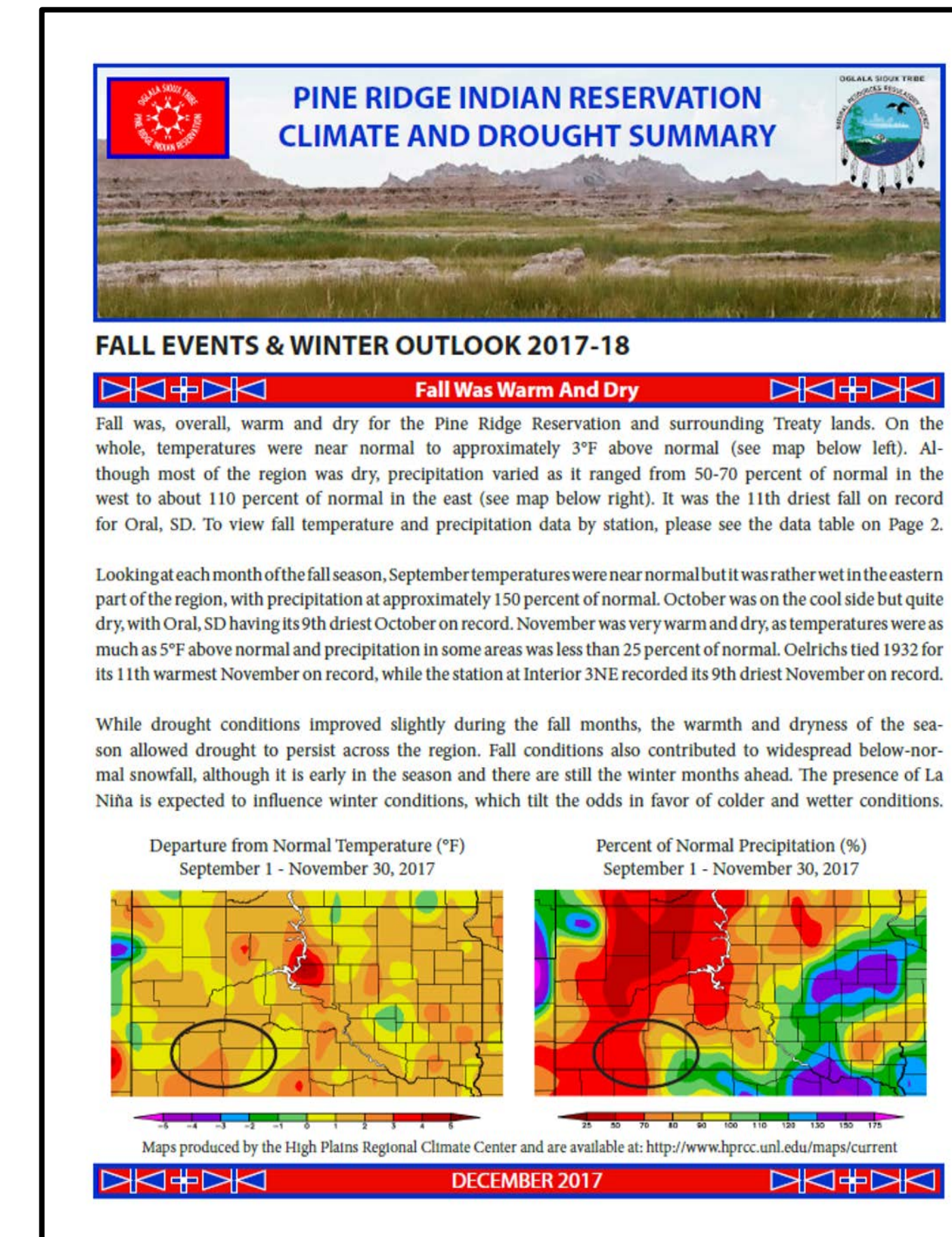
## Climate Summaries

Climate summaries have become a popular and useful decision-support tool for tribes in the Missouri River Basin region. HPRCC staff have worked with tribal environmental professionals in Wyoming, the Dakotas, Kansas, and Nebraska to develop climate summary prototypes. Through an iterative process, these prototypes have been refined based on feedback from the local tribal communities. Climate summaries provide the following benefits to tribes:

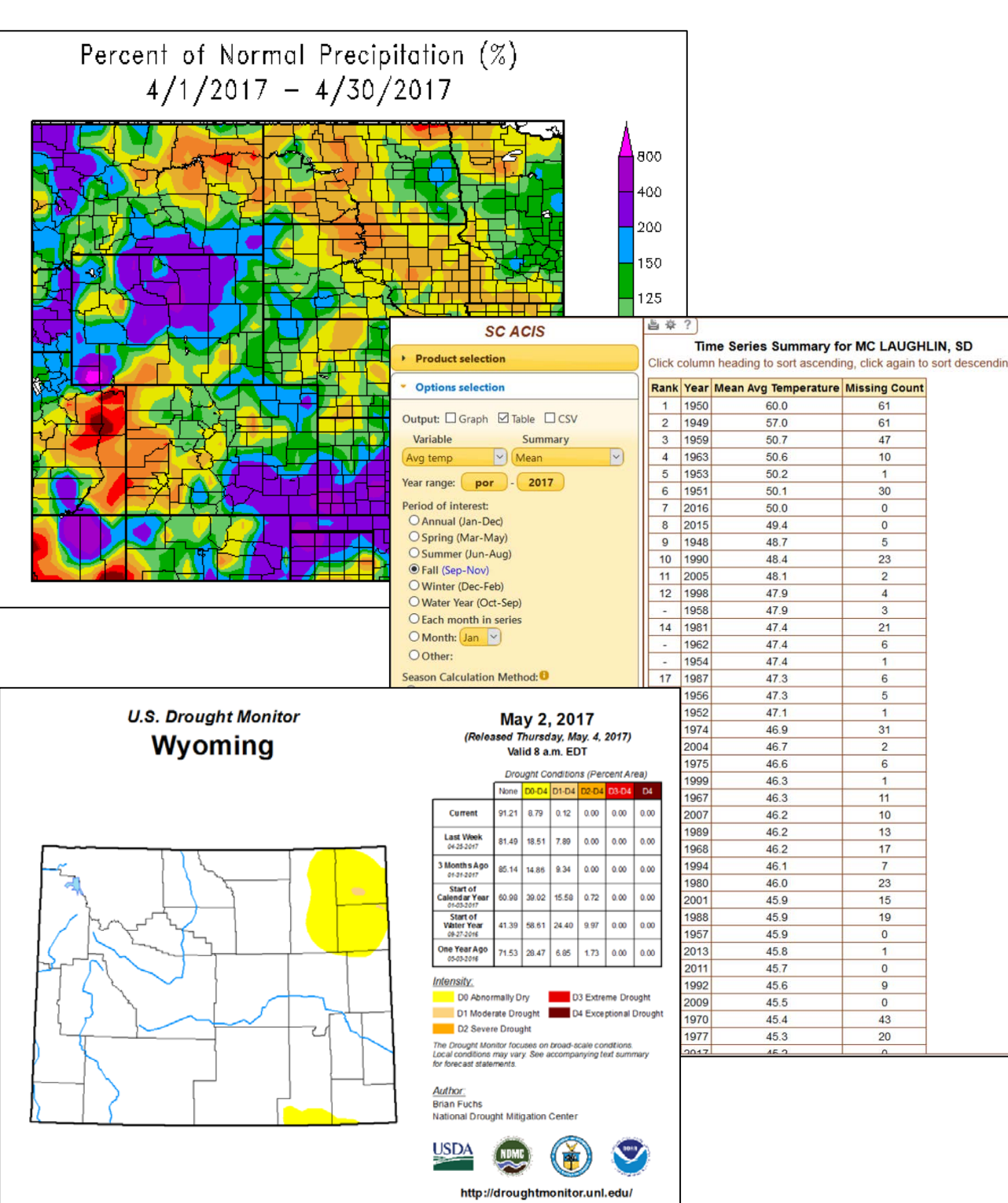
- They provide an overview of recent climate conditions **at the level of a reservation and the surrounding region.**
- They are written in a **concise, non-technical format** that can be easily understood by the general public and used by natural resource managers as a **decision-support tool.**
- They serve as **documentation of climate conditions** on the reservation that can be used to complement existing climate histories and demonstrate a need for funding for environmental monitoring or climate-related projects.

The climate summaries have been produced on a quarterly basis, coinciding with the climatological seasons. The content of the summaries is dependent upon the season, the geography and climate of the reservation and surrounding lands, and the specific data and information needs of the tribes. The following describes the type of information that has been included in these climate summaries:

- **Seasonal temperature and precipitation data and maps**
- **Drought conditions and impacts**
- **Snowpack information**
- **Ground and surface water supply information**
- **Winter weather safety**
- **Modeled soil moisture conditions**



- **Seasonal outlooks for temperature, precipitation, and drought**
- **Vegetation condition**
- **Traditional plant remedies**

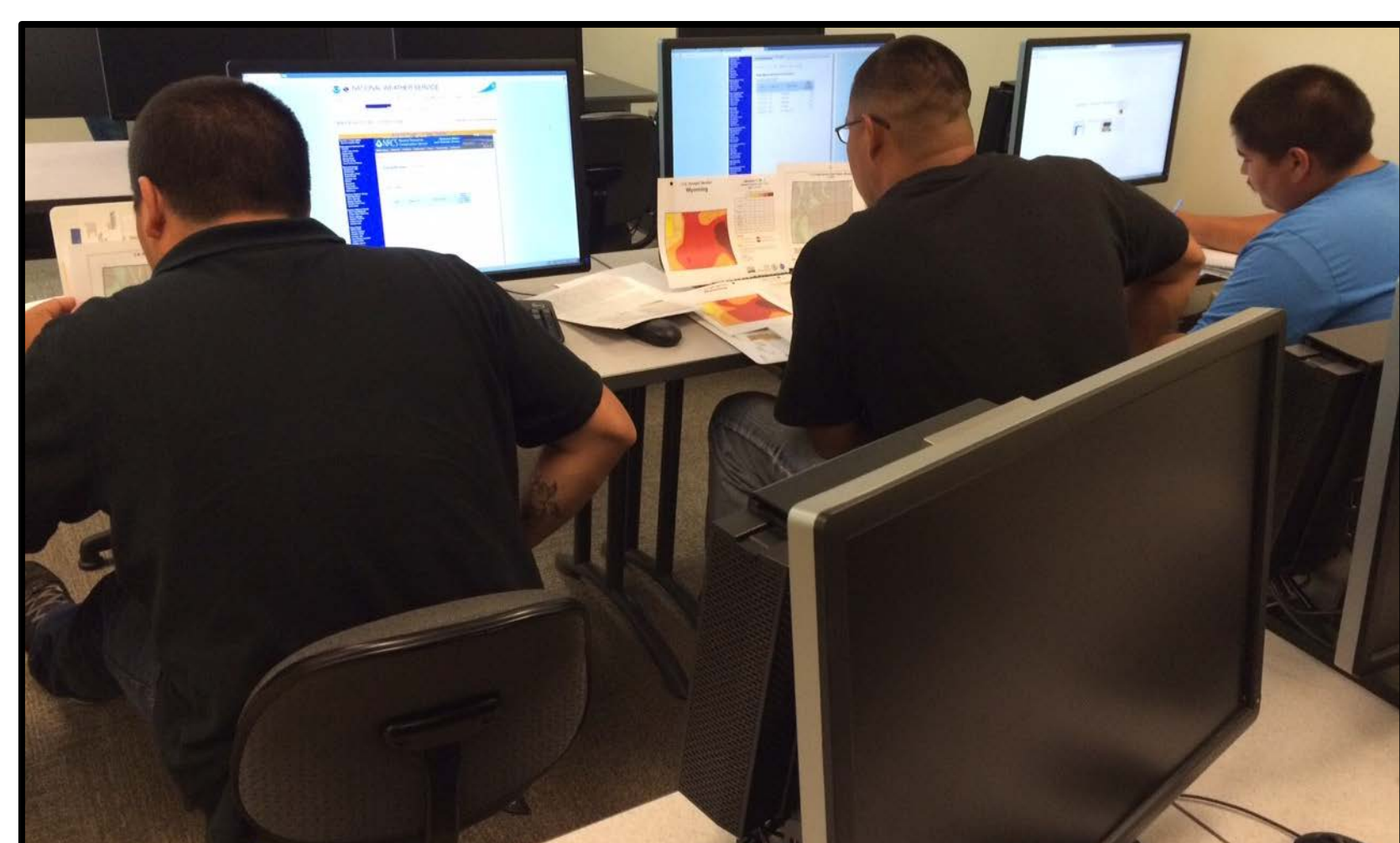


## Training Workshops

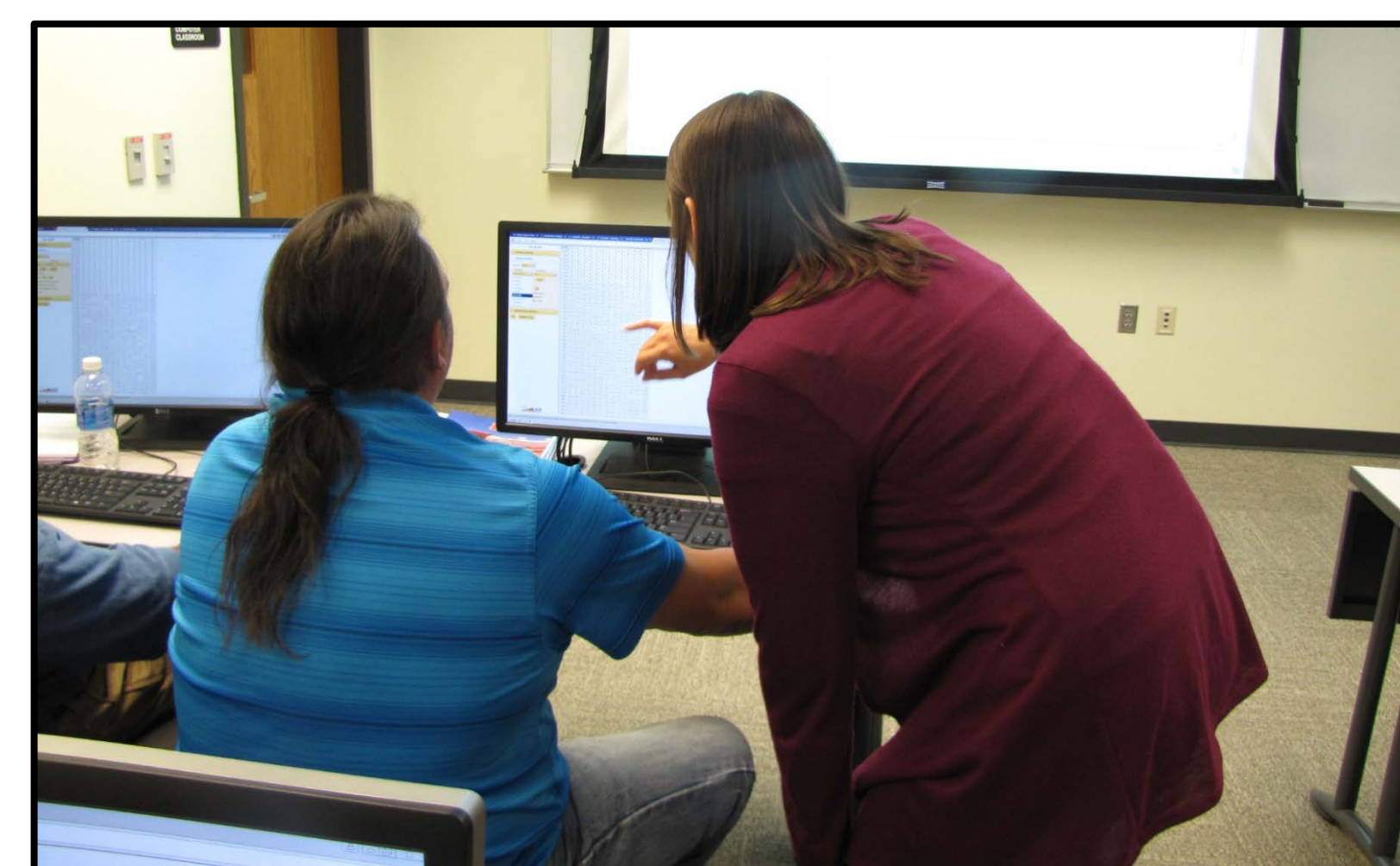
In order to provide tribal environmental professionals with the capacity to use climate information for decision making, the HPRCC has led hands-on, interactive training workshops for several tribes in the Missouri River Basin region. Topics and activities included the following:

- Introduction to **climate and drought science**
- Overview of **local climate history, trends, and projections**
- Demonstration of **climate and drought tools and resources**
- **Hands-on practice** using climate and drought tools and resources in a computer lab
- **Open discussions** on climate and drought data and information needs

Participants were given binders containing lecture slides, resource sheets, and tutorials presented at the workshop to reference when needed. Not only have these training workshops enhanced the participants' understanding of climate information that can be used for decision making, but they have helped tribes identify data gaps that may hinder climate and drought monitoring and planning efforts.

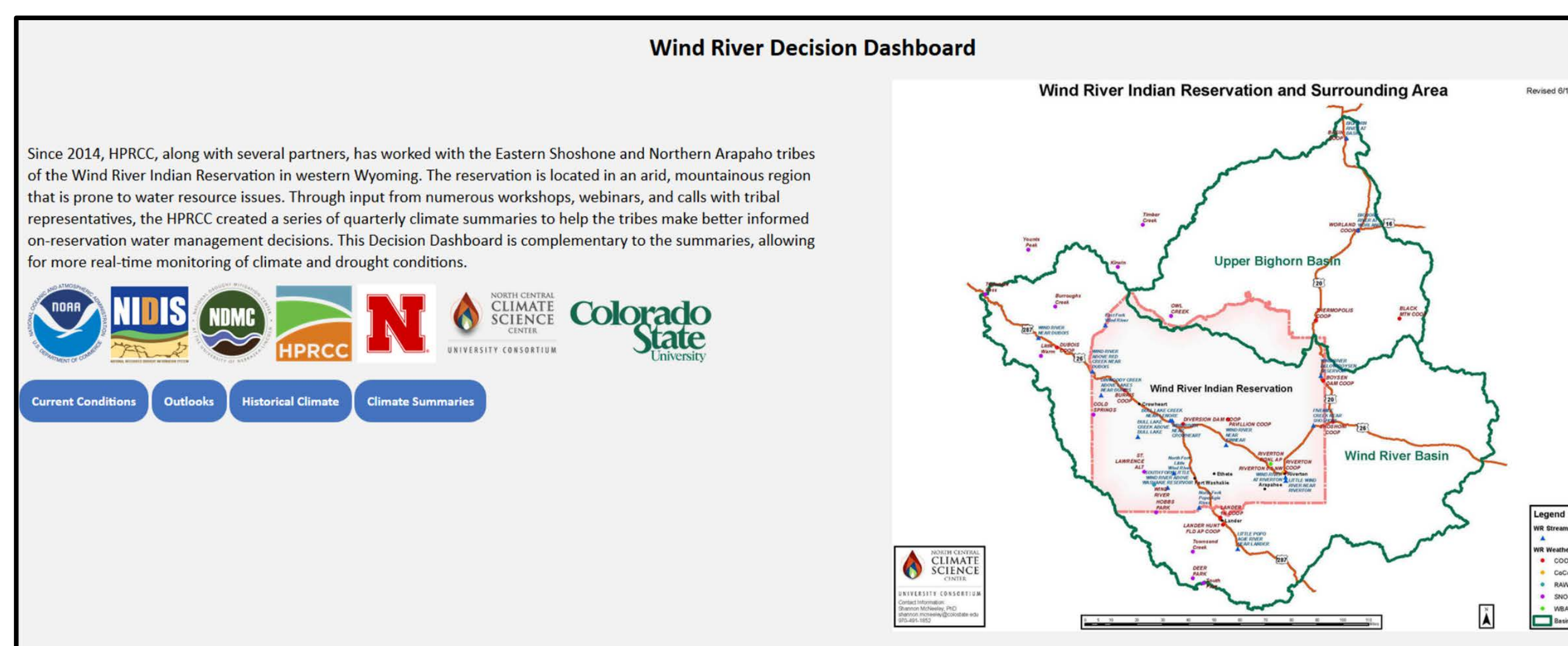


Technicians from the Shoshone and Arapaho (Wind River) Office of the Tribal Water Engineer practice writing a summary of drought conditions at a training workshop in Lincoln, Nebraska in July 2015. (Photo by Crystal Stiles)



Natalie Umphlett of the HPRCC explains how to use a climate data tool to a participant of the Great Plains Tribal Water Alliance Climate Training Workshop in Lincoln, Nebraska in May 2017. (Photo by Crystal Stiles)

Taking this work a step further, HPRCC staff have provided training and support to tribal environmental professionals to take over production of their climate summaries. Training has been provided through interactive workshops accompanied by a binder containing the training materials. Upon completion of the training, HPRCC staff began the process of transitioning production of the summaries to the tribes. This process involves co-producing the summaries with tribal environmental professionals, with the concept that the tribe will take on more responsibility for climate summary production each time they are produced and HPRCC staff will do less. The transition of climate summary production to the tribes allows them to make better informed decisions for natural resource management.



## Decision Dashboards

The amount of data and tools presented at the training workshops and used for producing climate summaries can be overwhelming, and locating them on the Internet can be quite time-consuming. In order to save time and make it easier for tribal environmental professionals to monitor climate conditions and find the information they need, the HPRCC has offered to develop **reservation-specific online decision dashboards** containing links to climate tools, products, and information.

The decision dashboard above was developed by HPRCC staff for the Wind River Indian Reservation in Wyoming for use by technicians from the Shoshone and Arapaho Office of the Tribal Water Engineer. It contains current products to monitor **temperature and precipitation, drought, streamflow and snowpack conditions, and soil moisture.** It also includes links to **outlooks and historical climate data**, as well as an archive of Wind River Indian Reservation and Wyoming **climate and drought summaries.** Check out the Wind River Decision Dashboard on HPRCC's website at this link: <https://hprcc.unl.edu/windriver.php>.

If you would like to learn more about our capacity-building work with tribal communities, we would love to hear from you! Please email us: Dr. Crystal Stiles: [cstiles3@unl.edu](mailto:cstiles3@unl.edu) Natalie Umphlett: [numphlett2@unl.edu](mailto:numphlett2@unl.edu) Doug Kluck: [doug.kluck@noaa.gov](mailto:doug.kluck@noaa.gov)