

Wind River Indian Reservation and Surrounding Area Climate and Drought Summary Spring Events & Summer Outlook 2015

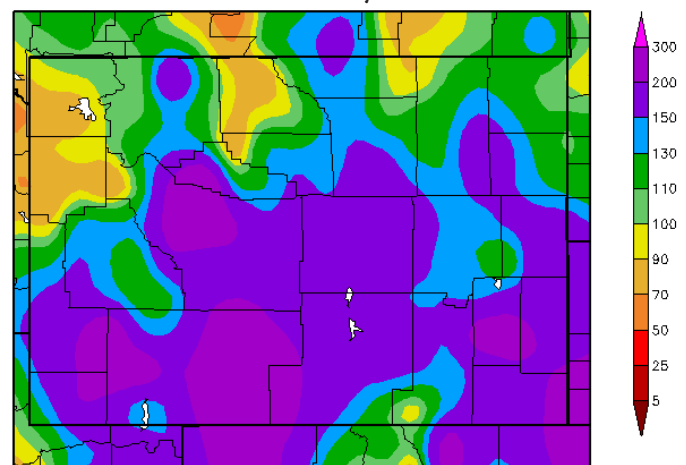
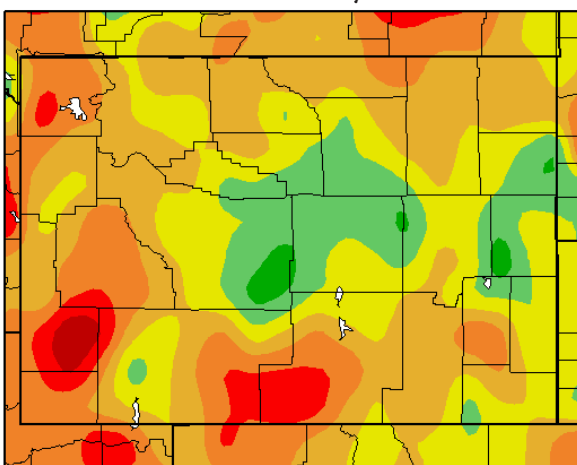


Spring Was Warm And Very Wet Across The Region

The spring season brought a variety of weather conditions to the Wind River Region*, including snow, heavy rain and record wetness, dry periods, and large temperature swings. Even with the variable conditions, overall it was a warm and wet spring. The average temperature for the spring season for the Wind River Region was near normal to about 2°F above normal (see map below left). The Basin station had its 9th warmest spring on record (for periods of record for each station, see station data table on Page 2). Spring precipitation was approximately 130-300 percent of normal across the area (see map below right). This spring ranked in the top 10 wettest on record for several stations in the area: Diversion Dam (3rd wettest), Black Mountain (4th wettest), Burris (4th wettest), Worland (8th wettest), and Riverton (10th wettest). March was the warmest month of this spring season (March-May) with temperatures as much as 6-8°F above normal, and it was also the driest month with some areas receiving only 25-50 percent of normal precipitation. Burris had its 4th warmest March on record. As for precipitation, only 0.06 inches fell in Thermopolis the entire month, tying the record in 1999 for the 3rd driest March. The warmth and dryness caused a rapid decline in snowpack in the Wyoming mountains, despite having a near normal snowpack up to that point in the snowpack season. Snowpack in the Wind River Basin declined from 99 percent of median to just 74 percent of median during March. April had slightly above normal temperatures for the month but was a little cooler and much wetter than March. Continued warmth in April caused snowpack in the Wind River Basin to further decline to 62 percent of median. (See Page 3 for information on the current snowpack situation in the region.) May was quite a different story with temperatures as cool as 4°F below normal, and precipitation was record-setting with parts of the region receiving more than 300 percent of normal precipitation. Diversion Dam had its wettest May on record, while it was the 2nd wettest May for Black Mountain and Burris. (*Note: The Wind River Region refers to the Wind River and Upper Bighorn Basins.)

Departure from Normal Temperature (°F)
March 1, 2015 - May 31, 2015

Percent of Normal Precipitation (%)
March 1, 2015 - May 31, 2015



Maps produced by the High Plains Regional Climate Center and are available at: <http://www.hprcc.unl.edu/maps/current>

Summary of Station Data (March 2015-May 2015)

Station	Average Temp. (°F)	Dep. from Normal Temp. (°F)	Temp. Rank	Total Precip. (in.)	Dep. from Normal Precip. (in.)	Percent of Normal Precip.	Precip. Rank	Period of Record
Basin	48.2	1.2	9th warmest	2.58	0.19	108	near normal	1898-present
Black Mtn	44.7	-0.6	-	8.38	3.07	158	4th wettest	1963-present
Boysen Dam	46.4*	-	-	5.03	1.79	155	13th wettest	1948-present
Burris	42.8*	-	-	6.55	3.49	214	4th wettest	1963-present
Diversion Dam	43.3	0.0	near normal	7.81	4.25	219	3rd wettest	1920-present
Dubois	-	-	-	3.53*	0.39	112	near normal	1905-present
Lander 1N	42.6	-	-	7.87	-	-	-	1999-present
Riverton	45.1	-0.3	-	5.60	2.61	187	10th wettest	1907-present
Thermopolis	48.9*	-	-	-	-	-	-	1899-present
Worland	47.7*	-	-	4.46*	1.72	163	8th wettest	1907-present

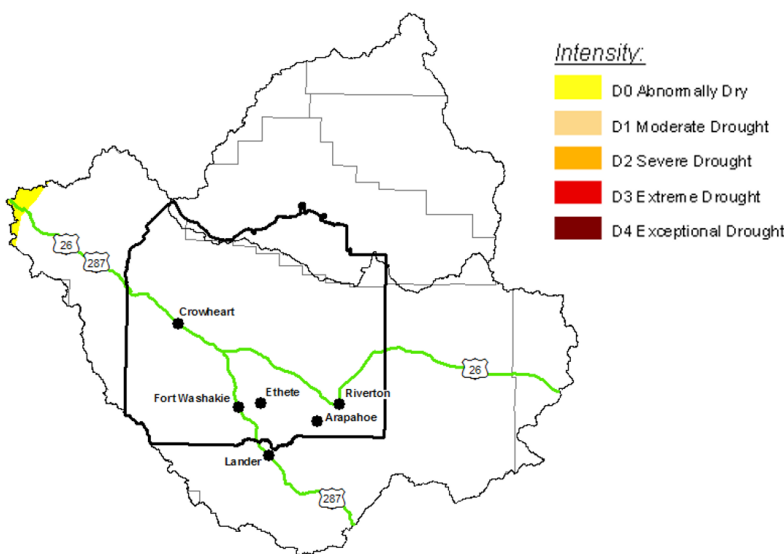
A dash (-) indicates insufficient data for calculation. An asterisk (*) indicates some missing data for this period.
 All data are preliminary and subject to change.
 Data were retrieved from the Applied Climate Information System (ACIS): rcc-acis.org

Despite Early Spring Dryness, Wind River Region Ends Season Drought Free

Spring started warm and dry across the Wind River Region, but as the season progressed, conditions turned cooler and wetter. Due to the abnormal warmth and dryness at the beginning of spring, the western and southwestern edges of the Wind River Basin were placed in the abnormally dry (D0) category of the U.S. Drought Monitor in mid-May. However, cool temperatures and record wetness throughout the month of May alleviated the dryness so that most of this region was removed from abnormally dry conditions, with the exception of the extreme western edge of the Wind River Basin (see the U.S. Drought Monitor map and corresponding statistics table below). Less than one percent of the Wind River Region was experiencing abnormally dry conditions as of the end of May.

U.S. Drought Monitor of the Wind River Indian Reservation and Surrounding Area - May 26, 2015

Released May 28, 2015 Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	99.55	0.45	0.00	0.00	0.00	0.00
Last Week <i>05-19-2015</i>	95.24	4.76	0.00	0.00	0.00	0.00
3 Months Ago <i>02-24-2015</i>	100.00	0.00	0.00	0.00	0.00	0.00
Start of Calendar Year <i>12-30-2014</i>	100.00	0.00	0.00	0.00	0.00	0.00
Start of Water Year <i>09-30-2014</i>	100.00	0.00	0.00	0.00	0.00	0.00
One Year Ago <i>05-27-2014</i>	100.00	0.00	0.00	0.00	0.00	0.00

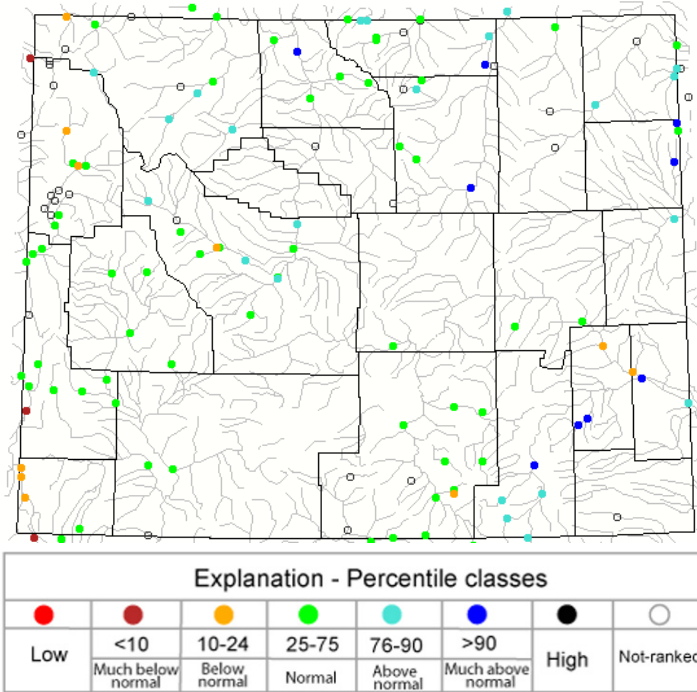
(Note: Statistics are for reservation and surrounding area.)

The U.S. Drought Monitor is jointly produced by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration. Map courtesy of NDMC-UNL. For more information on the U.S. Drought Monitor, go to: <http://droughtmonitor.unl.edu>

Wet Conditions And Early Snowmelt Producing Above Normal Streamflow

Above normal temperatures during the middle part of snowpack season caused early snowmelt and above normal streamflow for this time of year. As of June 1, only the Hobbs Park (elevation 10,100 feet) and Deer Park (elevation 9,700 feet) SNOTEL sites in the Wind River Region had snow. Both sites were reporting above median Snow Water Equivalent (SWE*) for June 1. The Cold Springs, Owl Creek, and St. Lawrence Alt SNOTEL sites were snow free. Extremely wet conditions in May also contributed to above normal streamflow (see streamflow map and corresponding stream gauge table below). All stream gauges in the Wind River Region with the exception of the one at Bull Lake Creek near Lenore show that streamflow was normal or above normal compared to historical streamflow for June 1. As a result, reservoirs are filling up around the region (see reservoir data table at bottom). As of June 1, reservoirs in the Wind River and Bighorn Basins were above average at 138 percent and 121 percent, respectively. (*Note: SWE is the amount of water contained within the snowpack. It can be thought of as the depth of water that would theoretically result if you melted the entire snowpack instantaneously. Median is a common descriptor used to express a “middle” value in a set of data. Median better represents SWE than does the “average.” Source: Natural Resources Conservation Service)

28-Day Average Streamflow Compared To Historical Streamflow For June 1 (Wyoming)



Stream Gauge	Percentile
Wind River near Dubois	85th
Wind River above Red Creek, near Dubois	82nd
Dinwoody Creek above lakes, near Burris	61st
Bull Lake Creek above Bull Lake	33rd
Bull Lake Creek near Lenore	10th
Wind River near Crowheart	71st
Wind River near Kinnear	84th
Wind River at Riverton	50th
Little Wind River near Riverton	76th
Little Popo Agie River near Lander	65th
Fivemile Creek near Shoshoni	74th
Wind River below Boysen Reservoir	82nd
Bighorn River at Worland	80th
Bighorn River at Basin	72nd

A percentile is a value on a scale of one hundred that indicates the percent of a distribution that is equal to or below it. The streamflow data and map shown represent 28-day average streamflow compared to historical streamflow for the day of the year (June 1). Streamflow data and map provided by the U.S. Geological Survey: <http://waterwatch.usgs.gov>

Reservoir Data as of June 1, 2015

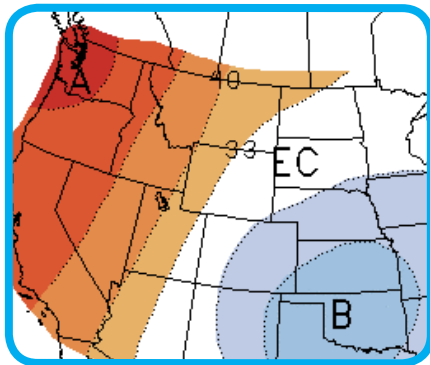
Reservoir Name	Reservoir Elevation (feet)	Reservoir Storage (acre-feet)	Reservoir % Full	Reservoir Name	Reservoir Elevation (feet)	Reservoir Storage (acre-feet)	Reservoir % Full
Anchor	6,387.3	2,524.8	14.7	Pilot Butte	5,456.1	30,307.0	89.9
Boysen	4,724.2	725,266	97.8	Ray Lake	5,525.66	no data	no data
Bull Lake	5,800.0	137,121	89.9	Washakie	6,354.99	no data	no data
Dinwoody	no data	no data	no data				

Data sources: Bureau of Indian Affairs (not available online), Bureau of Reclamation (http://www.usbr.gov/gp/lakes_reservoirs/wyoming_lakes.htm)

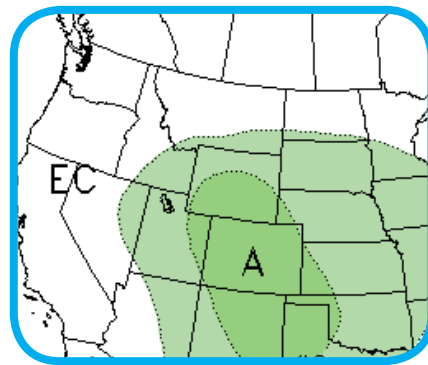
Warm And Wet Conditions Expected To Continue This Summer

El Niño is present in the Pacific, and there is an 85 percent chance that it will last through the 2015-16 winter (its impacts are reflected in the outlooks). The Climate Prediction Center is calling for an increased chance of above normal temperatures for the western half of Wyoming this summer, including the Wind River Region (see map below left). Above normal precipitation is also expected for the next three months (see map below center). Drought is not expected to develop through the end of September in the region (see map below right). The National Interagency Fire Center predicted that the potential for significant wildland fire in the Wind River Region is normal through the end of September. Despite predicted above normal precipitation and early June flooding, the extended forecast calls for less than a 50 percent chance of flooding through the end of August for the upper reaches of the Wind River.

3-Month Temperature Outlook
Valid July-September 2015

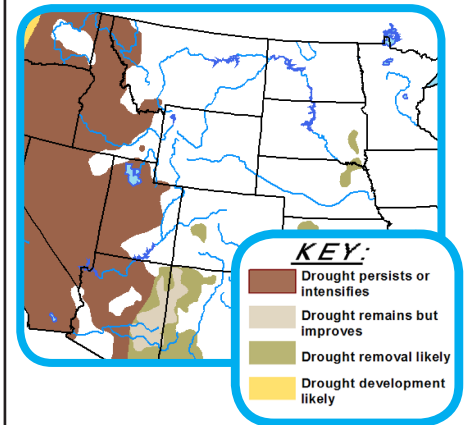


3-Month Precipitation Outlook
Valid July-September 2015



EC: Equal chances of above, near, or below normal
A: Above normal B: Below normal

U.S. Seasonal Drought Outlook
Valid June 18-September 30, 2015



U.S. Seasonal Drought Outlook explanation:

The Climate Prediction Center issues a seasonal drought outlook for the U.S. that is based on probabilities for drought development, persistence and intensification, improvement, and removal at a large scale. Local-scale changes in drought conditions may not be captured by this outlook. “On-going” drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4). The tan areas on the map imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

Three-Month Temperature and Precipitation Outlook explanation:

Each month, the Climate Prediction Center issues a new three-month outlook for temperatures and precipitation for the lower 48 states and Alaska. These outlooks indicate the probability of temperatures and precipitation being above, near, or below normal. (“Normal” is what is expected based on average temperatures and precipitation during the period of 1981-2010.) In general, the colors on the map will indicate warmer/cooler or wetter/drier conditions. In the temperature outlook, the oranges signify above normal temperatures, while the blues signify below normal temperatures. In the precipitation outlook, the greens indicate above normal precipitation, while the browns indicate below normal precipitation. You will also see probabilities on the map (e.g. 33, 40, 50, 60, 70, and 80). For a location and season, forecasters divide the 30 observations from 1981-2010 into thirds: 1/3 is the coldest or driest, 1/3 is the warmest or wettest, and 1/3 is in between. When forecasters indicate that an area will have above normal precipitation, for example, they are saying that the probability is greater than 33 percent. The outlooks are for the 3-month period as a whole and do not indicate when certain conditions would occur or the duration and intensity of any particular event. Areas of white are marked by “EC,” which means equal chances of above, near, or below normal temperatures/precipitation. EC does not mean near normal.

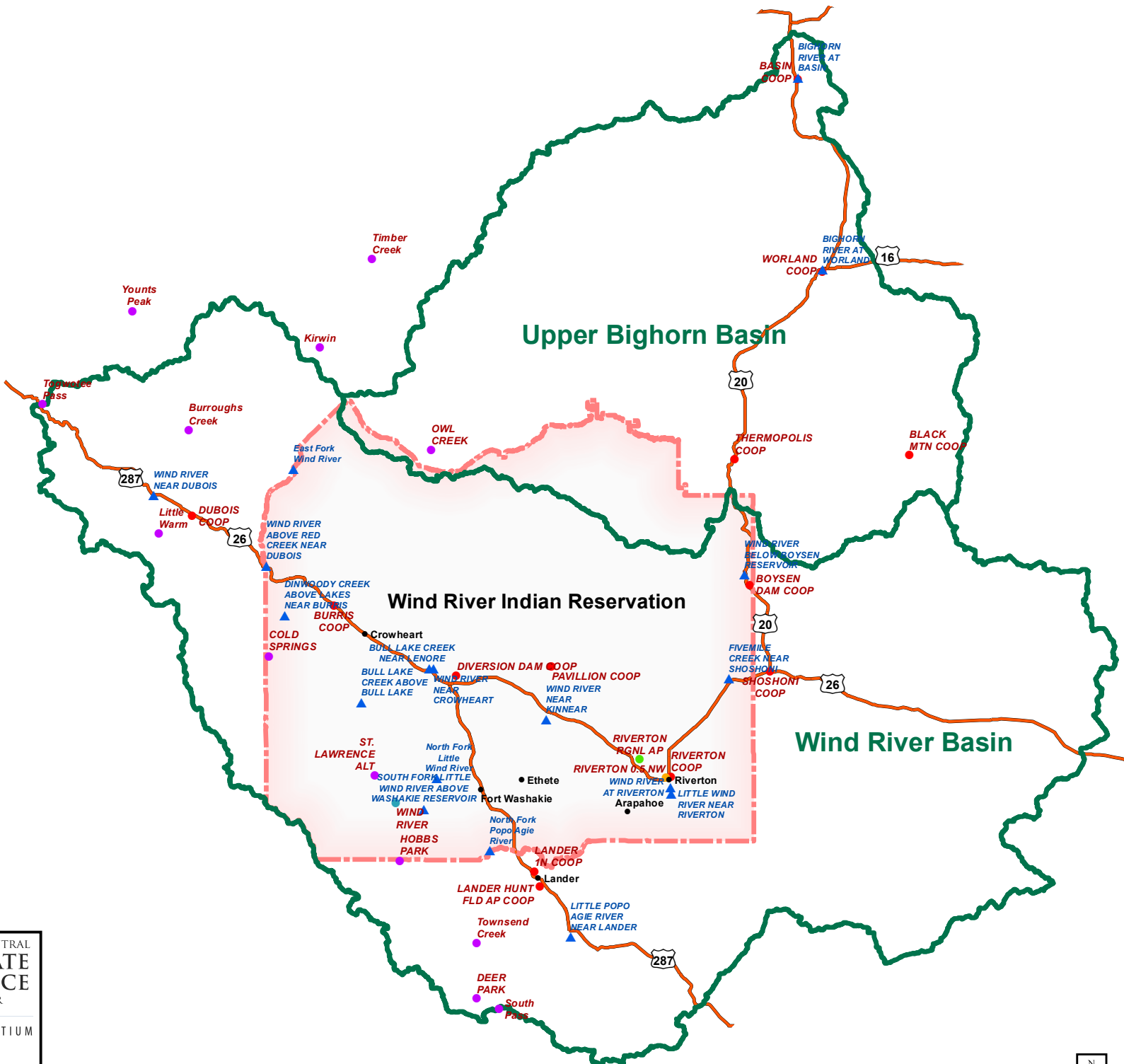
Collaborators and Partners:



Contact Information: Please direct questions and feedback on this climate summary to Al C’Bearing, Office of the Tribal Water Engineer, 307-332-6464.

Wind River Indian Reservation and Surrounding Area

Revised 6/18/2015



Legend

- WR Stream Gauges
 - ▲
- WR Weather Stations
 - COOP
 - CoCoRaHS
 - RAWS
 - SNOTEL
 - WBAN
- Basin Boundary
 - ▭



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