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RECLAMATION



WY Conditions & Outlooks:

Precipitation, Temperatures, Drought, Floods, & Everything In-between

May 16, 2024

The University of Wyoming is an equal opportunity/affirmative action institution.

Presentation Outline

- **Current Conditions:** Overview
 - Drought, Temperature, Precipitation, Soils, Snow Water Equivalent (SWE)
 - Streamflows
 - Reservoir Levels
 - Water Calls & Allocations
- **Outlooks:**
 - Temperature & Precipitation
 - Water Supply & Flood Risk
 - Wildland Fire Potential & Outlook
- **Highlight of the Month:**
 - Water Supply Forecast Methods
- **Questions**

USDA



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RECLAMATION

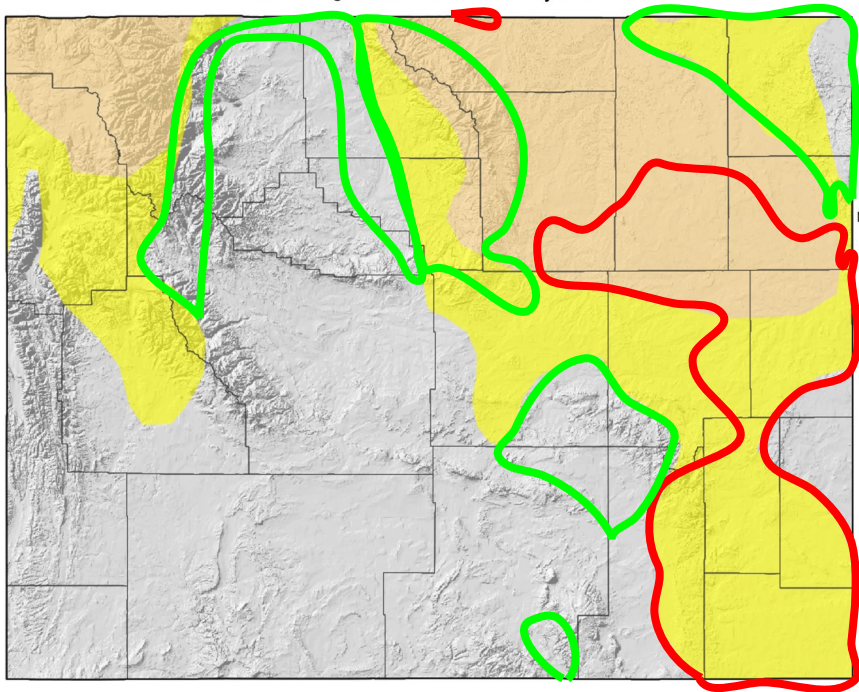


Current Conditions

US Drought Monitor for May 14, 2024

(Released Thursday, May 16th, 2024)
Valid 8 a.m. EDT

US Drought Monitor for 14 May 2024



US Drought Monitor	
26.14%	D0 Abnormally Dry
19.99%	D1 Moderate Drought
0.00%	D2 Severe Drought
0.00%	D3 Extreme Drought
0.00%	D4 Exceptional Drought

Map Created by:
National Drought Mitigation Center
<https://droughtmonitor.unl.edu>



Map Layout Prepared by:
Wyoming State Climate Office
<http://www.wrds.uwyo.edu>



Drought Level	Percentile
None	>30
D0 (Abnormally Dry)	21 to 30
D1 (Moderate Drought)	11 to 20
D2 (Severe Drought)	6 to 10
D3 (Extreme Drought)	3 to 5
D4 (Exceptional Drought)	0 to 2

How are Drought categories assigned?
<https://youtu.be/45MQ1GB-uTc>

Degradations in the east since the last webinar. Several **Improvements** in the central, north-central, and northeast

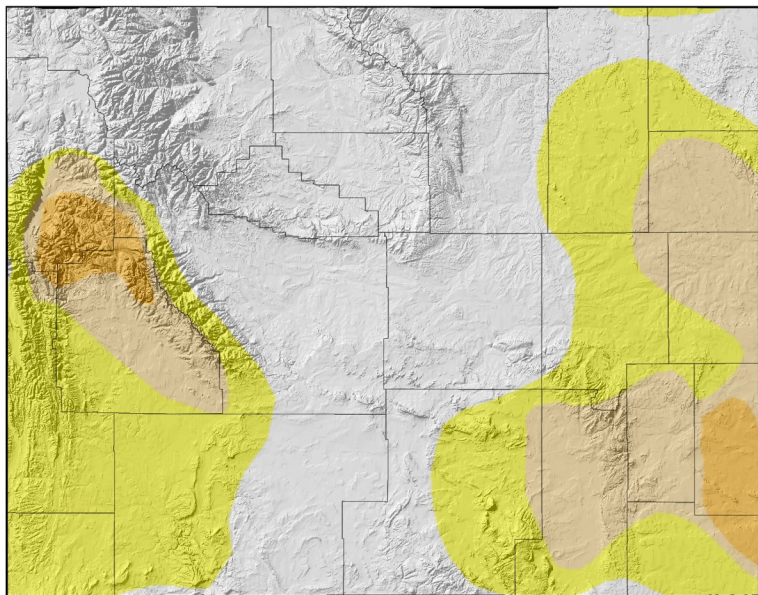
The U.S. Drought Monitor, is a weekly map of drought conditions produced jointly by the National Oceanic and Atmospheric Administration, the U.S. Department of Agriculture, and the National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln. The U.S. Drought Monitor website is hosted and maintained by the NDMC. <http://droughtmonitor.unl.edu>

Map Layout Created 16 May 2024 <http://www.wrds.uwyo.edu>



One Year Ago

US Drought Monitor for 16 May 2023



US Drought Monitor	
31.17%	D0 Abnormally Dry
14.90%	D1 Moderate Drought
3.64%	D2 Severe Drought
0.00%	D3 Extreme Drought
0.00%	D4 Exceptional Drought

Map Created by:
National Drought Mitigation Ce
<https://droughtmonitor.unl.edu>



Map Layout Prepared by:
Wyoming State Climate O
<http://www.wrds.uwyo.edu>

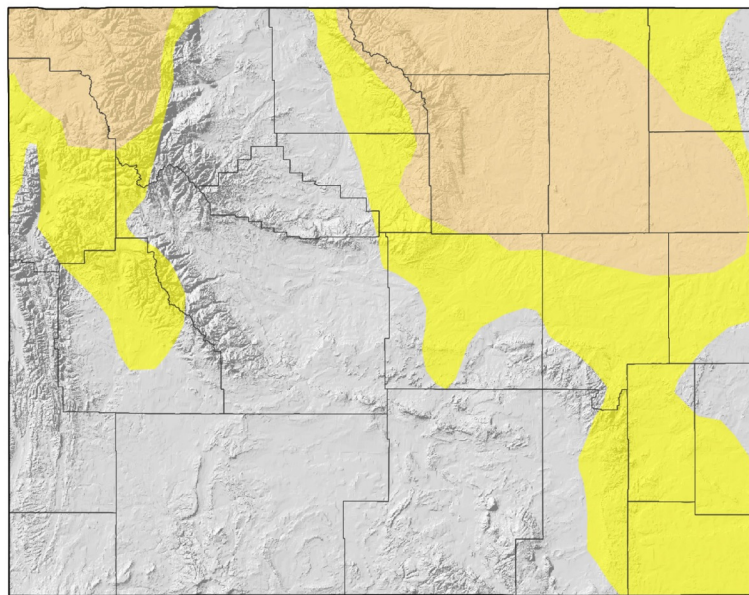


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Map Layout Created 18 May 2023 <http://www.wrds.uwyo.edu>

Today

US Drought Monitor for 14 May 2024



US Drought Monitor	
26.14%	D0 Abnormally Dry
19.99%	D1 Moderate Drought
0.00%	D2 Severe Drought
0.00%	D3 Extreme Drought
0.00%	D4 Exceptional Drought

Map Created by:
National Drought Mitigation Center
<https://droughtmonitor.unl.edu>



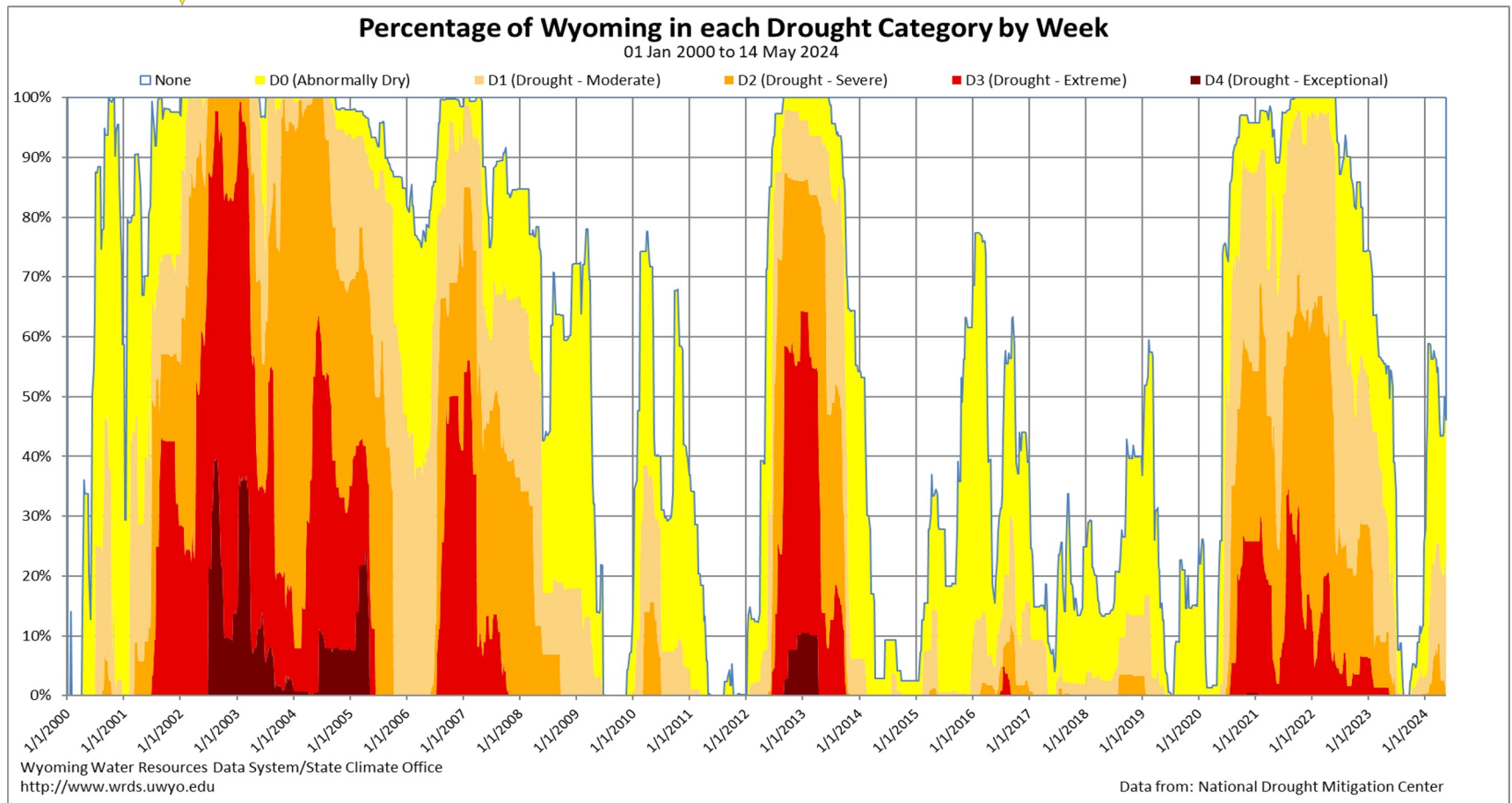
Map Layout Prepared by:
Wyoming State Climate Office
<http://www.wrds.uwyo.edu>



The U.S. Drought Monitor, is a weekly map of drought conditions produced jointly by the National Oceanic and Atmospheric Administration, the U.S. Department of Agriculture, and the National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln. The U.S. Drought Monitor website is hosted and maintained by the NDMC. <http://droughtmonitor.unl.edu>

Map Layout Created 16 May 2024 <http://www.wrds.uwyo.edu>

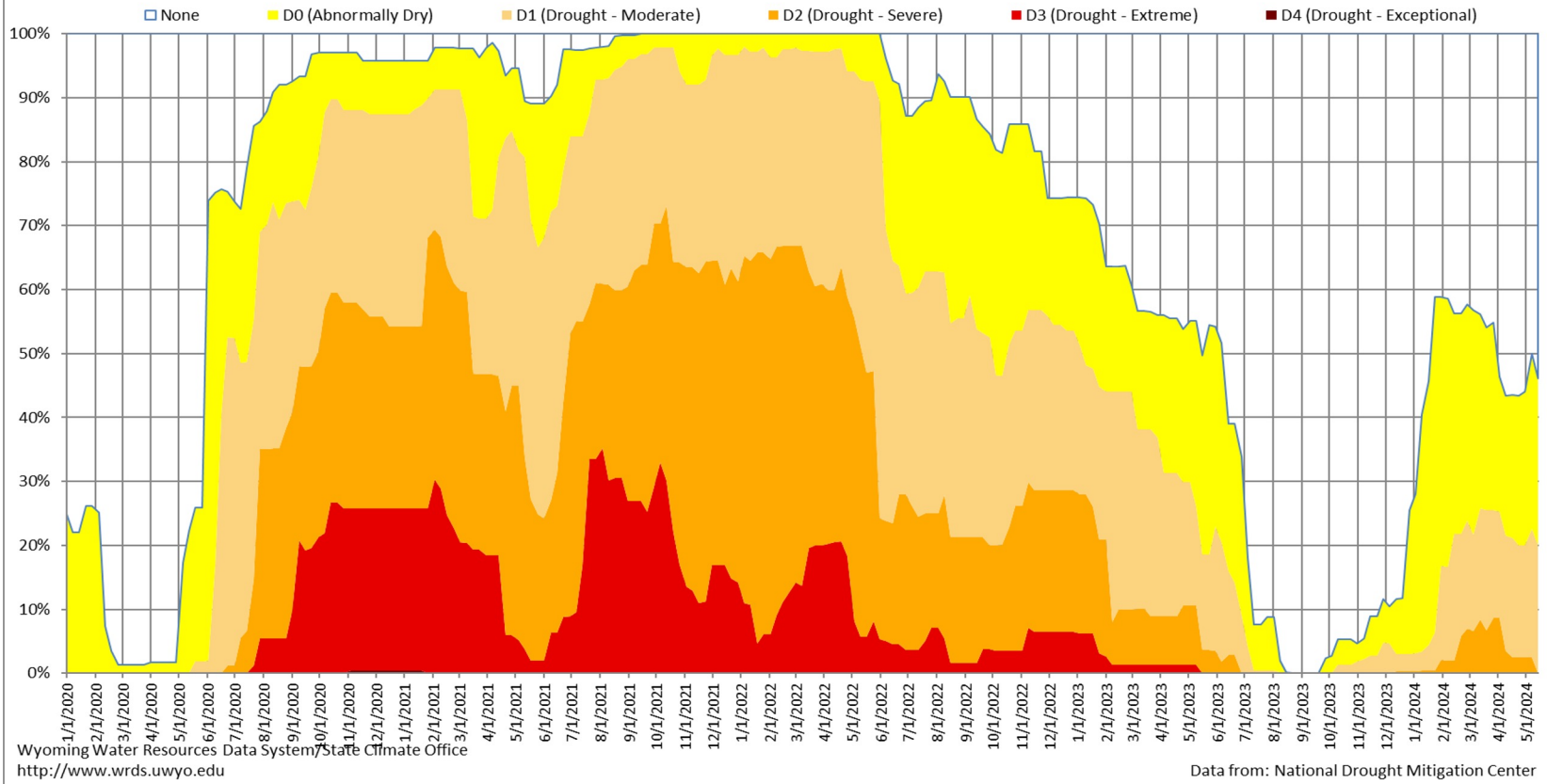
Wyoming Area Affected: 46.14% D0-D4 ; 19.99% D1-D4





Percentage of Wyoming in each Drought Category by Week

01 Jan 2020 to 14 May 2024



53.86%

19.99%

14-Day Precipitation Percentile (02 May 2024 to 15 May 2024)

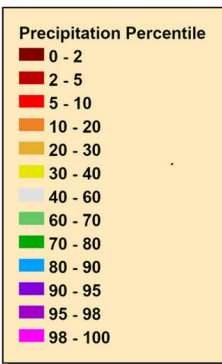
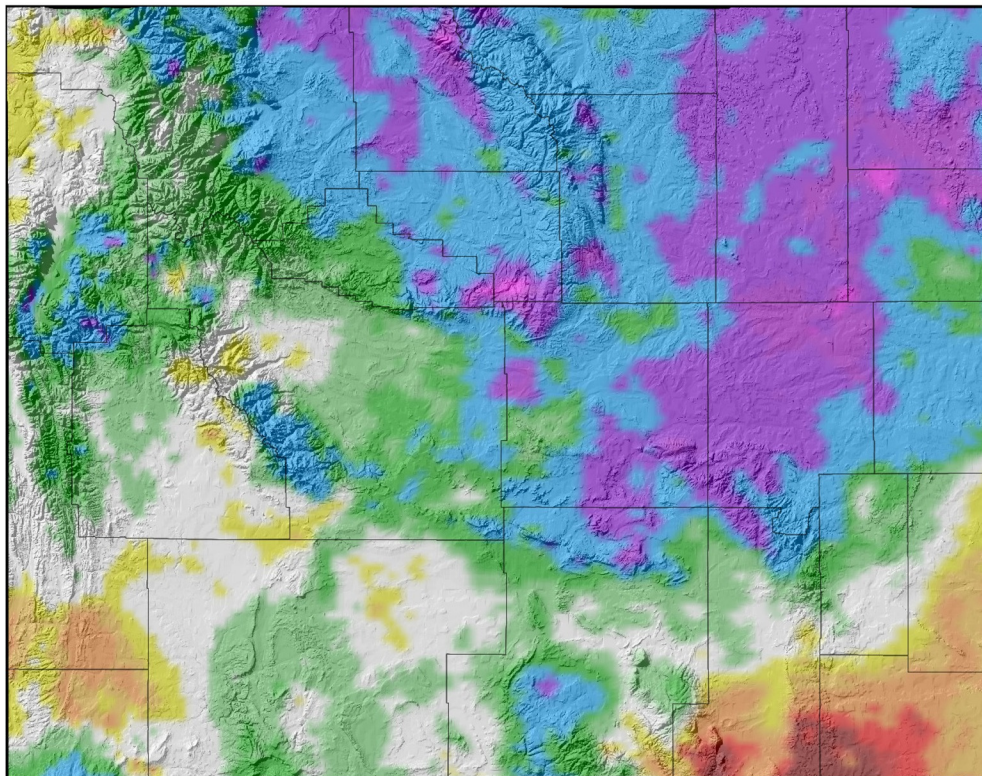
14-Day Precipitation (Percentile) for 02 May 2024 to 15 May 2024

Above Median:

- Most of Wyoming

Below Median (Areas of Concern):

- Southeast
- Lincoln/Teton Counties
- Far Northwest



Precipitation Data
PRISM Climate Group
<http://prism.oregonstate.edu>



Map Prepared by:
Wyoming State Climate Office
<http://www.wrds.uwyo.edu>



Provisional data, subject to revision

90-Day Precipitation Percentile (16 Feb 2024 to 15 May 2024)

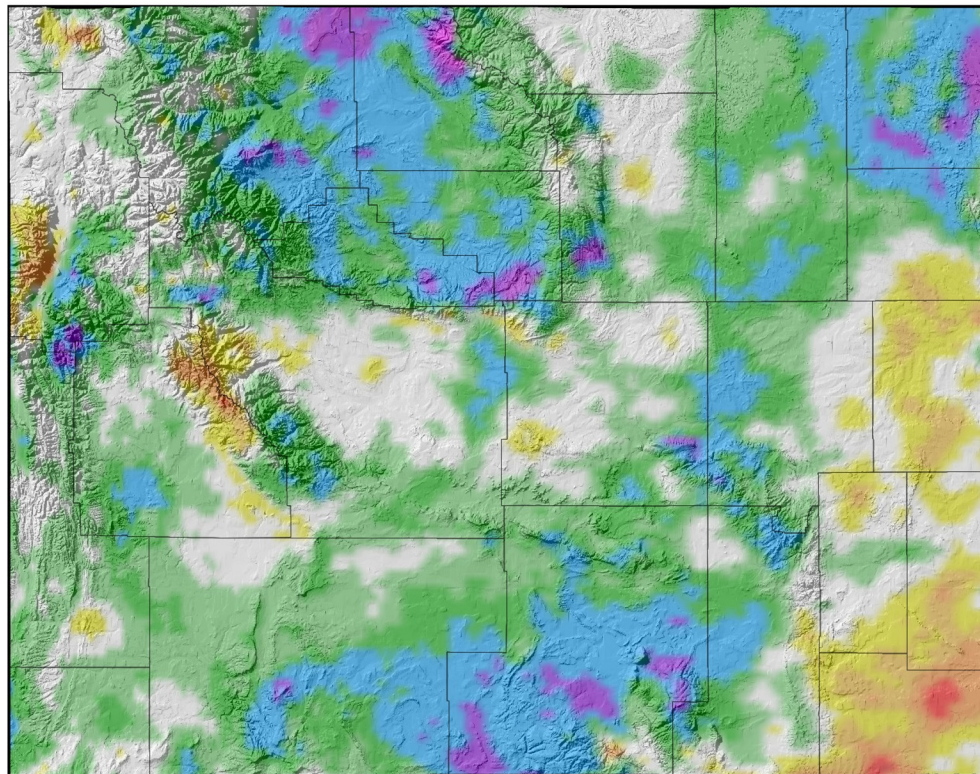
90-Day Precipitation (Percentile) for 16 Feb 2024 to 15 May 2024

Above Median:

- Much of Wyoming

Below Median (Areas of Concern):

- Central-east and Southeast
- Tetons and Northern Winds



Precipitation Data
PRISM Climate Group
<http://prism.oregonstate.edu>



Map Prepared by:
Wyoming State Climate Office
<http://www.wrds.uwyo.edu>

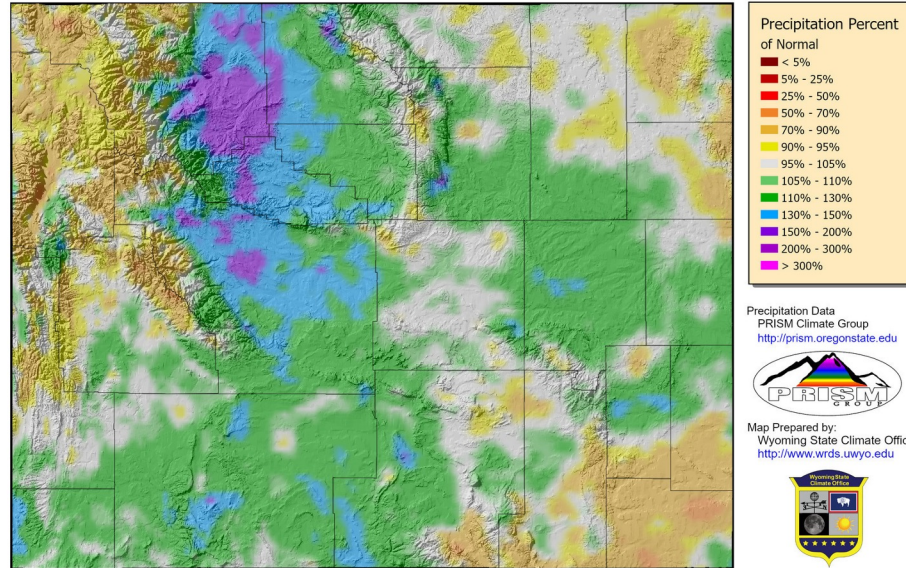


Provisional data, subject to revision

“Year”-to-Date Precipitation (Percent of Average)

Current Water Year

Water-Year Precipitation (Percent of 1991-2020 Average) for 01 Oct 2023 to 15 May 2024

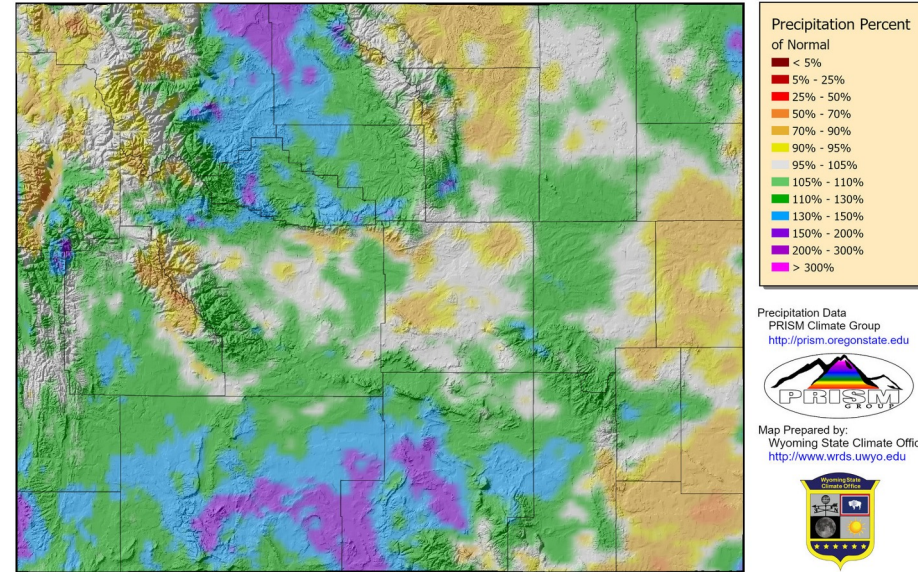


Provisional data, subject to revision

Monthly and Normal precipitation data from PRISM Climate Group, Copyright ©2024, PRISM Climate Group, Oregon State University, <http://prism.oregonstate.edu>
Map Created 16 May 2024 <http://www.wrds.uwyo.edu>
Daily averages created from PRISM daily precipitation grids

Current Calendar Year

Calendar-Year Precipitation (Percent of 1991-2020 Average) for 01 Jan 2024 to 15 May 2024



Provisional data, subject to revision

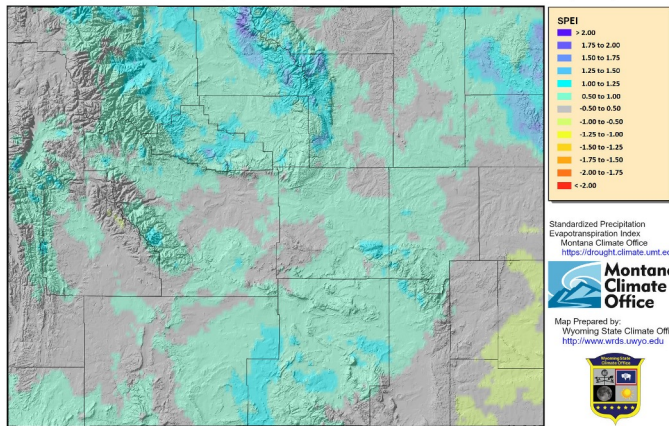
Monthly and Normal precipitation data from PRISM Climate Group, Copyright ©2024, PRISM Climate Group, Oregon State University, <http://prism.oregonstate.edu>
Map Created 16 May 2024 <http://www.wrds.uwyo.edu>
Daily averages created from PRISM daily precipitation grids

Note: a water year is October 1 through September 30 of the following year.

30-Day



Apr 15 - May 14



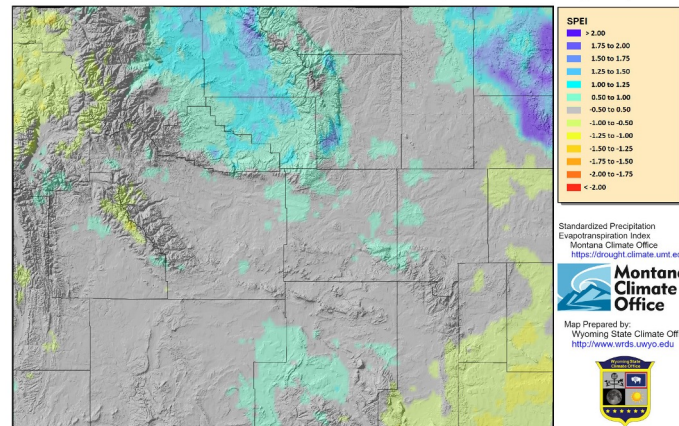
Provisional data, subject to revision

Standardized Precipitation Evapotranspiration Index Created by Montana Climate Office <https://drought.climate.umt.edu>
Map Created 16 May 2024 <http://www.wrds.uwyo.edu>

60-Day



Mar 16 - May 14



Provisional data, subject to revision

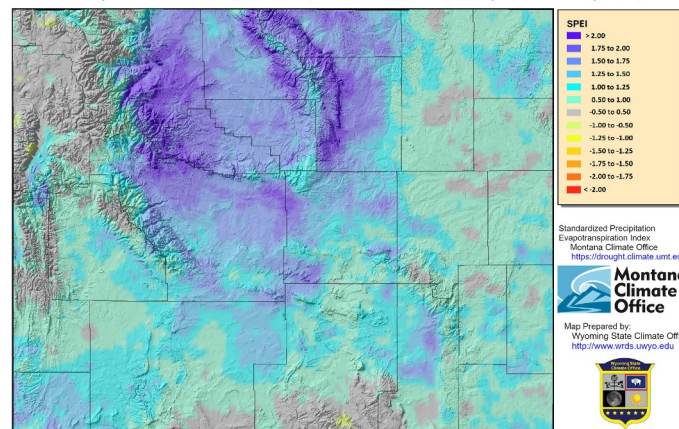
Standardized Precipitation Evapotranspiration Index Created by Montana Climate Office <https://drought.climate.umt.edu>
Map Created 16 May 2024 <http://www.wrds.uwyo.edu>

Standardized Precipitation Evapotranspiration Index (SPEI)

Short term: Southeast and Northeast
Northcentral and northwest wet at 30- and 60-day.
Emerging wet in central/southcentral at 30-day

Long term: Northcentral very wet, remainder of state on the wet side, northwest and far south central about neutral

1-Year

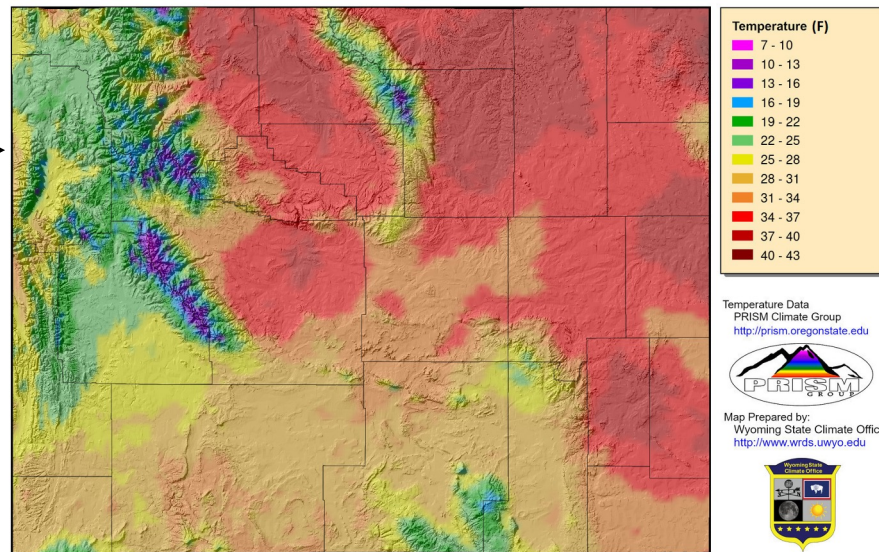


Provisional data, subject to revision

Standardized Precipitation Evapotranspiration Index Created by Montana Climate Office <https://drought.climate.umt.edu>
Map Created 16 May 2024 <http://www.wrds.uwyo.edu>

14-Day Average Minimum Temperature (02 May to 15 May)

- Most lower elevation areas seeing mins ≥ 32 F
- Warmest in north and east



Temperature Data
PRISM Climate Group
<http://prism.oregonstate.edu>



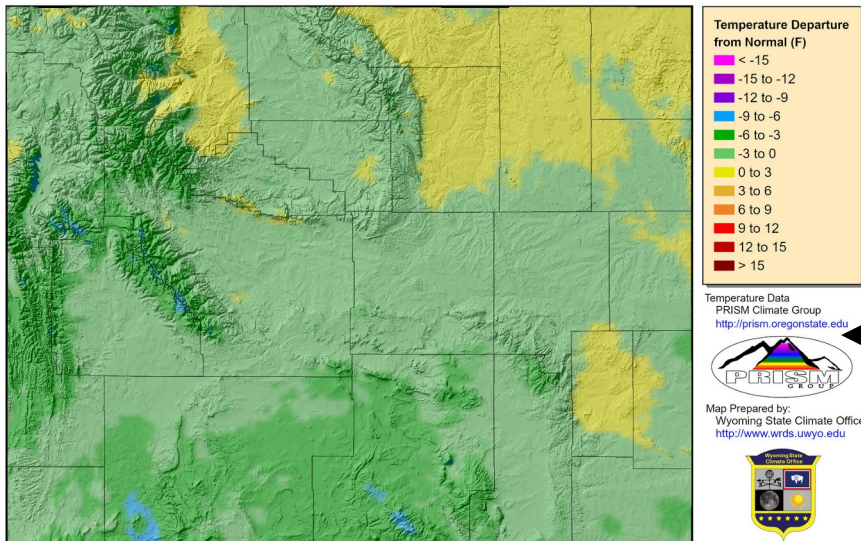
Map Prepared by:
Wyoming State Climate Office
<http://www.wrds.uwyo.edu>



Provisional data, subject to revision

Daily Temperature data from PRISM Climate Group, Copyright ©2021, PRISM Climate Group, Oregon State University, <http://prism.oregonstate.edu>
Map Created 16 May 2024 <http://www.wrds.uwyo.edu>
Temperature averages created from PRISM daily temperature grids

14-Day Average Minimum Temperature (Departure from 1991-2020 Average) for 02 May 2024 to 15 May 2024



Temperature Data
PRISM Climate Group
<http://prism.oregonstate.edu>



Map Prepared by:
Wyoming State Climate Office
<http://www.wrds.uwyo.edu>



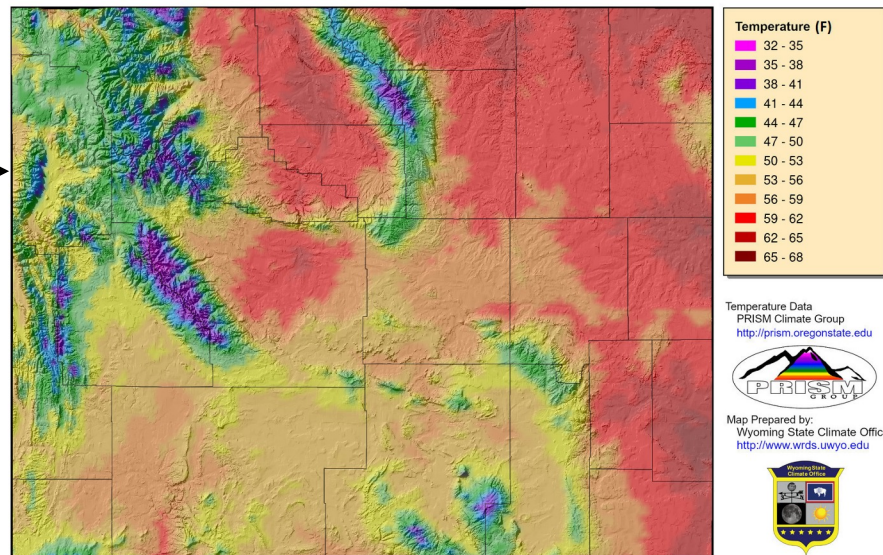
Provisional data, subject to revision

14-Day Average Minimum Temperature Departure from Normal

- Northeast, western BH Basin, Platte (and western Goshen Counties) 0-3F above average
- S Central and some NW up to 6F below average
- Remainder up to 3F below average

14-Day Average Maximum Temperature (02 May to 15 May)

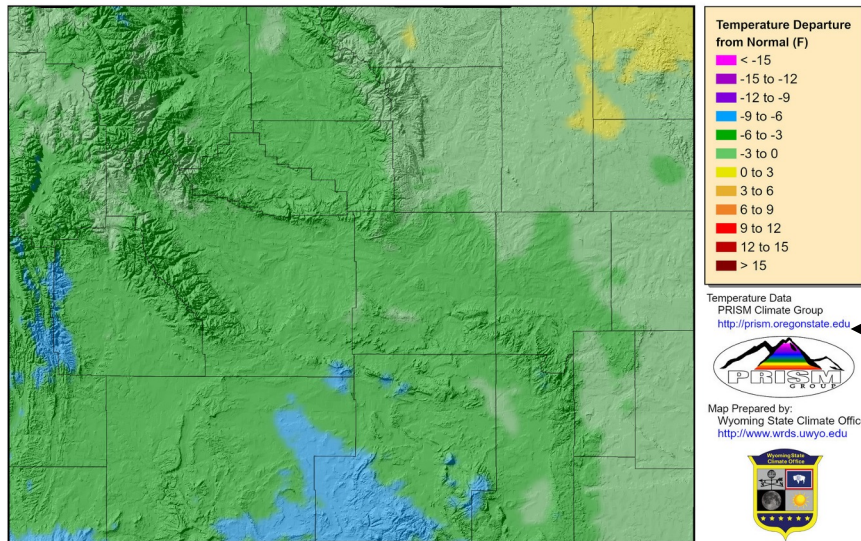
- Highs above 32F
- Eastern Plains, Wind, and BH Basins in 60s



Temperature Data
PRISM Climate Group
<http://prism.oregonstate.edu>

Map Prepared by:
Wyoming State Climate Office
<http://www.wrds.uwyo.edu>

14-Day Average Maximum Temperature (Departure from 1991-2020 Average) for 02 May 2024 to 15 May 2024



Temperature Data
PRISM Climate Group
<http://prism.oregonstate.edu>

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Daily Temperature data from PRISM Climate Group, Copyright ©2021, PRISM Climate Group, Oregon State University, <http://prism.oregonstate.edu>
Map Created 16 May 2024 <http://www.wrds.uwyo.edu>
Temperature averages created from PRISM daily temperature grids

14-Day Average Maximum Temperature Departure from Normal

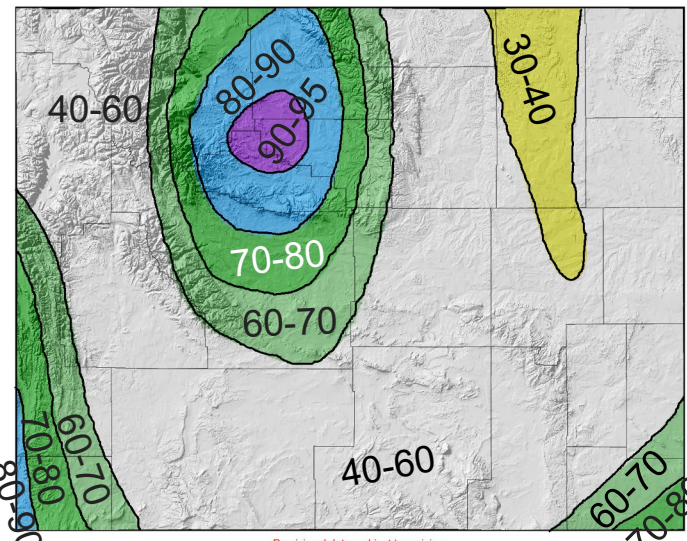
- Little Snake Basin up to 9F below average
- Far northeast up to 3F above average
- Far Northwest and rest of Northeast and far east up to 3F below average
- Remainder of WY 3F to 6F below average

Temperature

Soil Moisture Percentile

Two Weeks Ago

Soil Moisture Percentile for 02 May 2024



Soil Moisture Percentile
Climate Prediction Center



Map Prepared by:
Wyoming State Climate Office
<http://www.wrds.uwyo.edu>

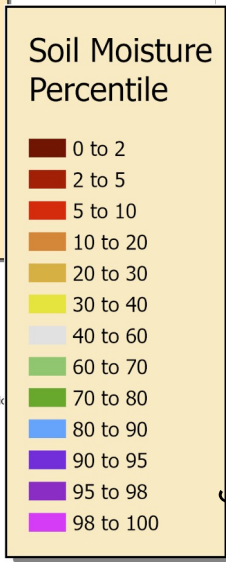
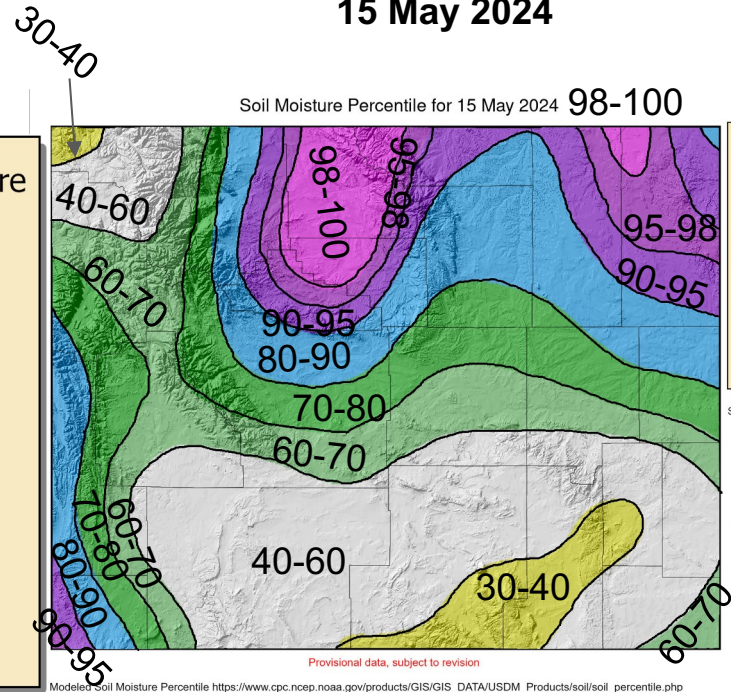


Provisional data, subject to revision

Modeled Soil Moisture Percentile https://www.cpc.ncep.noaa.gov/products/GIS/GIS_DATA/USDM_Products/soil_percentile.php
Map Created 03 May 2024 <http://www.wrds.uwyo.edu>

15 May 2024

Soil Moisture Percentile for 15 May 2024 98-100



Soil Moisture Percentile
Climate Prediction Center



Map Prepared by:
Wyoming State Climate Office
<http://www.wrds.uwyo.edu>



Provisional data, subject to revision

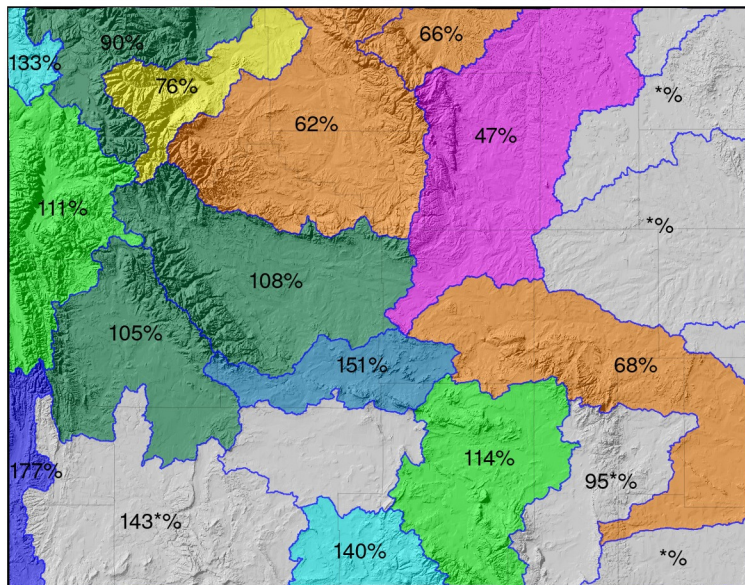
Modeled Soil Moisture Percentile https://www.cpc.ncep.noaa.gov/products/GIS/GIS_DATA/USDM_Products/soil_percentile.php
Map Created 16 May 2024 <http://www.wrds.uwyo.edu>

Some **declines** in conditions in the southeast and far northwest and **improvements** or status quo elsewhere.

Basin Snow Water Equivalent (SWE) % of Median

16 May 2023 (One Year Ago)

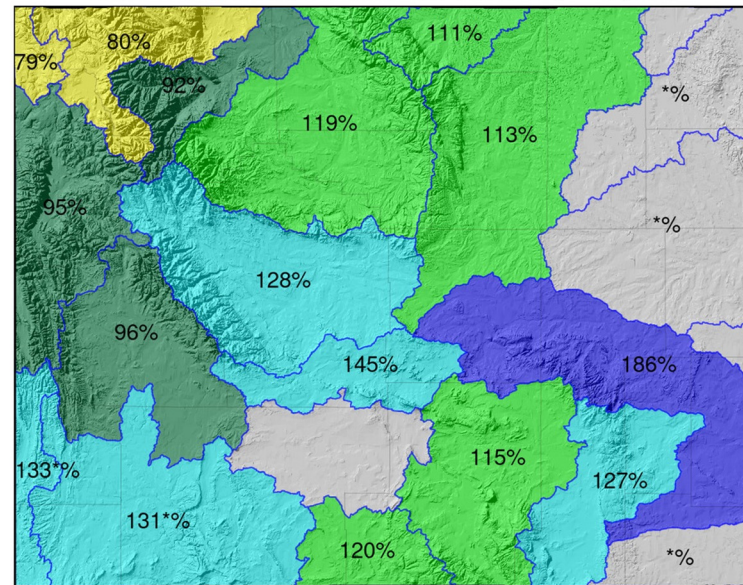
Snow Water Equivalent Percent of Median (1991-2020) 16 May 2023



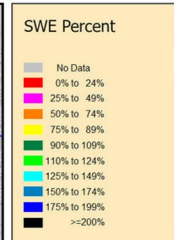
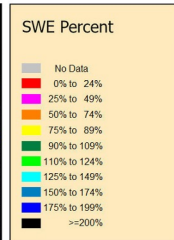
Provisional data, subject to revision

16 May 2024

Snow Water Equivalent Percent of Median (1991-2020) 16 May 2024



Provisional data, subject to revision



Snow Water Equivalent Data
NRCS
<https://www.nrcs.usda.gov>



Map Prepared by:
Wyoming State Climate Office
<http://www.wrds.uwyo.edu>



Snow Water Equivalent Data
NRCS
<https://www.nrcs.usda.gov>



Map Prepared by:
Wyoming State Climate Office
<http://www.wrds.uwyo.edu>



Basin Snow Water Equivalent Data from Natural Resources Conservation Service Water and Climate Center <https://www.nrcs.usda.gov>
Map created by Wyoming State Climate Office 16 May 2023

* Percentages denoted by an asterisk represent data that may not provide a valid measure of conditions. This is most usually seen near the end of the snow season where normal values may be very low or the melt out curve is so steep that a slight variation in days may result in abnormally high or low percentages.

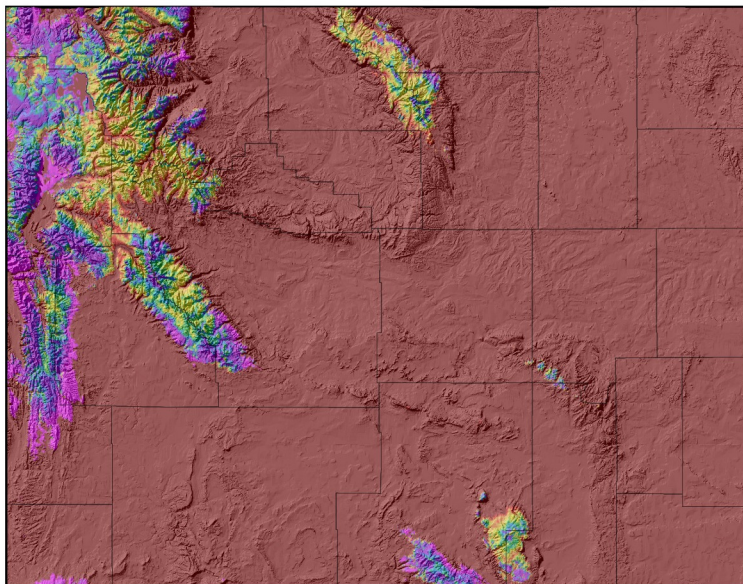
Basin Snow Water Equivalent Data from Natural Resources Conservation Service Water and Climate Center <https://www.nrcs.usda.gov>
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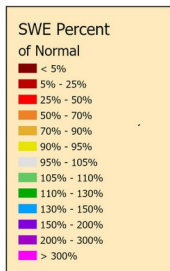
Snow Water Equivalent (SWE) % of Average

16 May 2023 (One Year Ago)

Snow Water Equivalent Percent of Average (2004-2020) for 16 May 2023



Provisional data, subject to revision



Snow Water Equivalent
NOHRSC
<https://doi.org/10.7265/N5TB14TC>

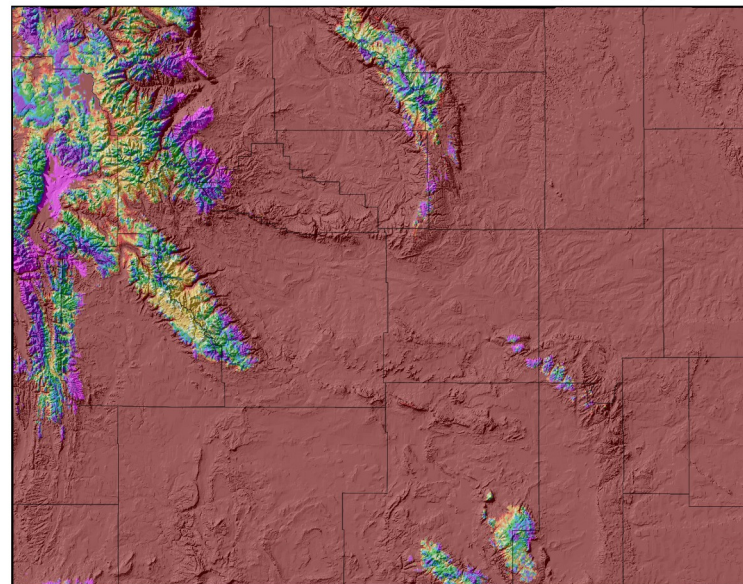


Map Prepared by:
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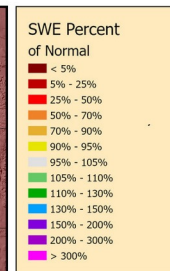


16 May 2024

Snow Water Equivalent Percent of Average (2004-2020) for 16 May 2024



Provisional data, subject to revision



Snow Water Equivalent
NOHRSC
<https://doi.org/10.7265/N5TB14TC>



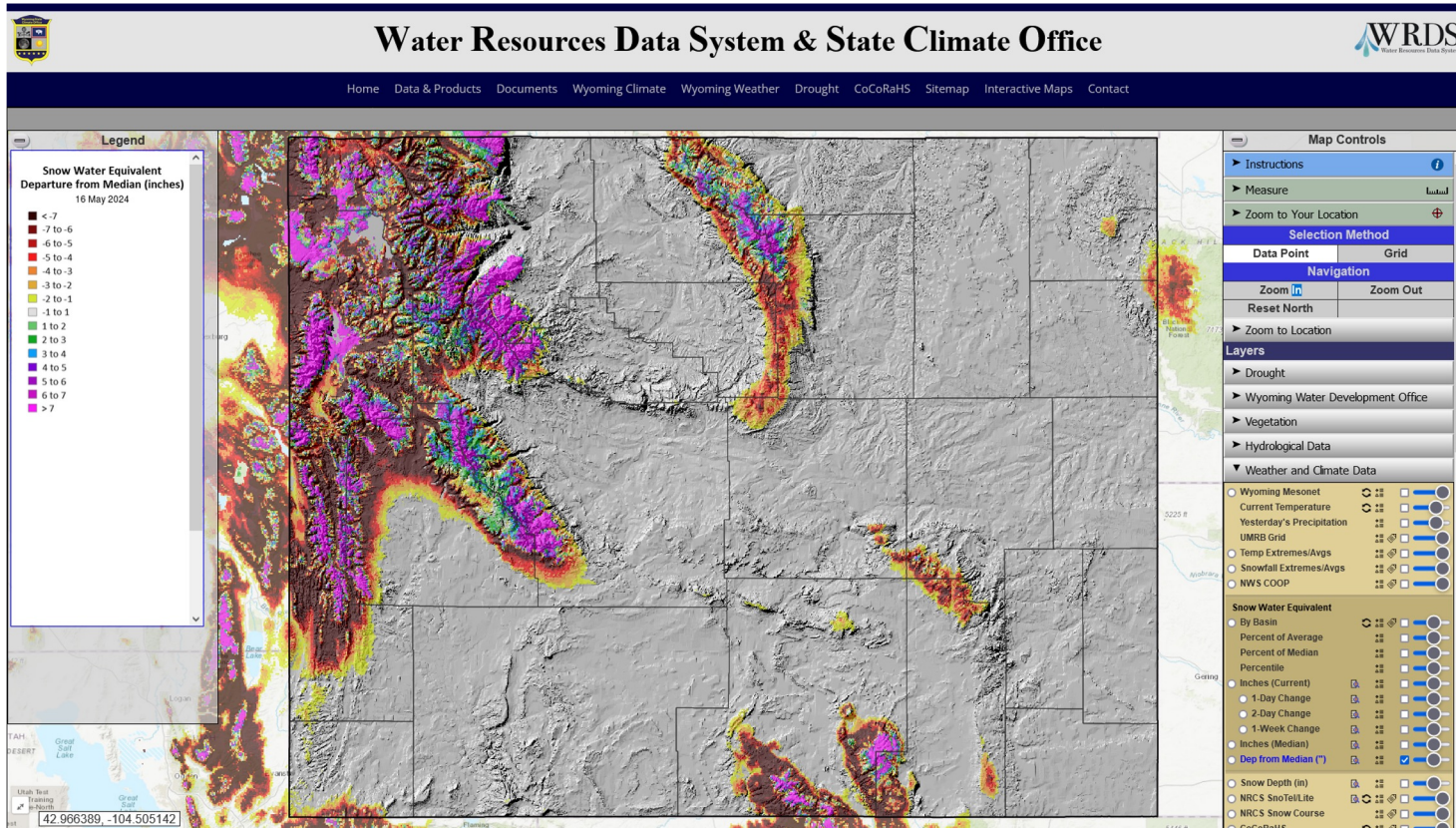
Map Prepared by:
Wyoming State Climate Office
<http://www.wrds.uwyo.edu>



Modelled Snow Water Equivalent from National Operational Hydrologic Remote Sensing Center. 2004. Snow Data Assimilation System (SNODAS) Data Products at NSIDC, Version 1. Boulder, Colorado USA. NSIDC: National Snow and Ice Data Center. doi: <https://doi.org/10.7265/N5TB14TC>. Daily Percentiles and Percentages created by Wyoming State Climate Office. Map created 16 May 2023

Modelled Snow Water Equivalent from National Operational Hydrologic Remote Sensing Center. 2004. Snow Data Assimilation System (SNODAS) Data Products at NSIDC, Version 1. Boulder, Colorado USA. NSIDC: National Snow and Ice Data Center. doi: <https://doi.org/10.7265/N5TB14TC>. Daily Percentiles and Percentages created by Wyoming State Climate Office. Map created 16 May 2024

Snow Water Equivalent (SWE) Departure from Median 16 May 2024



Peak Snow Water Equivalent Dates and Totals by Basin With Meltout Dates

This year's "to-date" peak snow water equivalent (SWE) compared to median.

Red indicates **earlier** peak date or **lower** SWE compared to median

Blue indicates **later** peak date or **higher** SWE compared to median

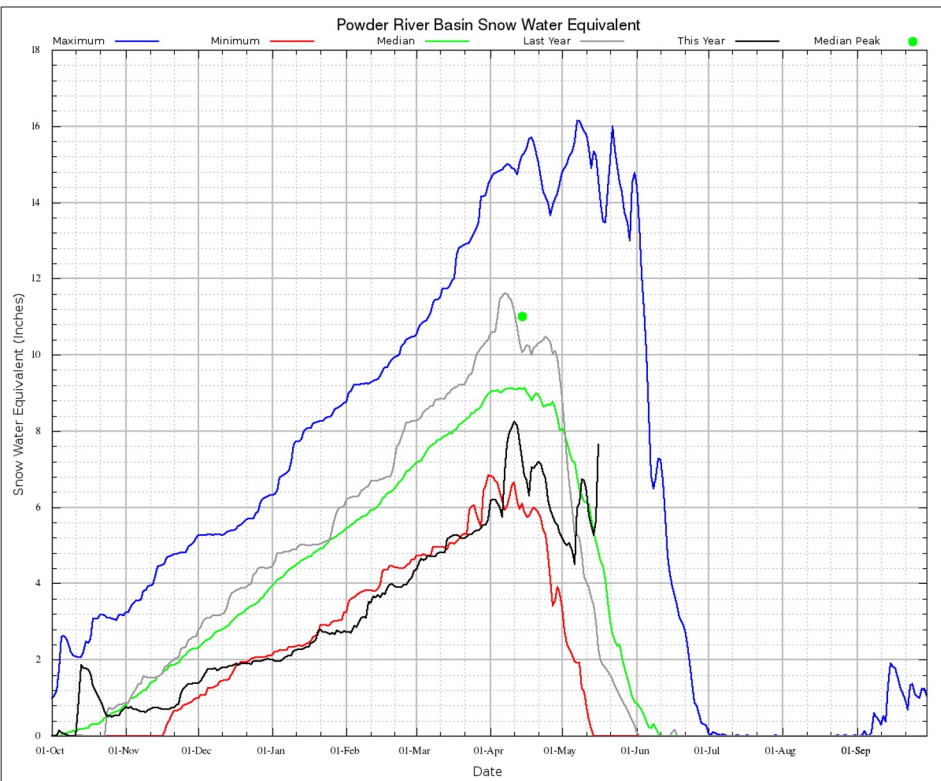
[Click Column Headers to Sort](#)

Basin Click to View Chart	This Year Peak Date	This Year Peak SWE (inches)	Days Early/Late	Peak SWE Dif (inches)	Percent of Median Peak SWE	Median Peak Date	Median Peak SWE (inches)	Current SWE	Median Meltout Date
Belle Fourche	15 Mar 2024	3.43	-14	-3.7	48%	29 Mar IMG	7.10 IMG	0.15	03 May IMG
Bighorn	15 May 2024	11.94	21	0.2	101%	24 Apr IMG	11.77 IMG	11.94	21 Jun IMG
Cheyenne	08 Mar 2024	3.90	-20	-3.6	52%	29 Mar IMG	7.55 IMG	0.20	01 May IMG
Laramie	11 Apr 2024	15.13	-7	-1.2	93%	18 Apr IMG	16.31 IMG	11.99	13 Jun IMG
Little Snake	01 Apr 2024	22.79	-5	2.3	111%	06 Apr IMG	20.50 IMG	14.84	19 Jun IMG
Lower Green	09 Apr 2024	14.42	1	0.8	106%	08 Apr IMG	13.58 IMG	9.26	13 Jun IMG
Lower North Platte	11 Apr 2024	9.97	-3	-3.1	76%	14 Apr IMG	13.05 IMG	6.17	29 May IMG
Madison	01 Apr 2024	19.23	-13	-4.5	81%	14 Apr IMG	23.75 IMG	17.27	25 Jun IMG
Powder	11 Apr 2024	8.24	-3	-2.8	75%	14 Apr IMG	11.01 IMG	8.02	10 Jun IMG
Shoshone	01 Apr 2024	15.50	-23	-2.6	86%	24 Apr IMG	18.08 IMG	12.47	29 Jun IMG
Snake	11 Apr 2024	20.89	-1	0.0	100%	12 Apr IMG	20.85 IMG	14.80	30 Jun IMG
South Platte	04 Apr 2024	5.50	6	-1.1	83%	29 Mar IMG	6.60 IMG	0.00	26 Apr IMG
Sweetwater	14 May 2024	17.15	24	1.9	112%	20 Apr IMG	15.25 IMG	17.10	06 Jun IMG
Tongue	10 May 2024	10.81	12	-2.6	81%	28 Apr IMG	13.38 IMG	9.58	09 Jun IMG
Upper Bear	03 Apr 2024	19.31	-6	1.5	108%	09 Apr IMG	17.81 IMG	12.57	16 Jun IMG
Upper Green	03 Apr 2024	14.69	-8	-1.3	92%	11 Apr IMG	15.96 IMG	12.20	19 Jun IMG
Upper North Platte	11 Apr 2024	23.06	-5	-1.6	94%	16 Apr IMG	24.63 IMG	21.39	28 Jun IMG
Wind	02 Apr 2024	13.50	-20	-0.6	96%	22 Apr IMG	14.11 IMG	11.94	26 Jun IMG
Yellowstone	11 Apr 2024	17.25	-13	-4.9	78%	24 Apr IMG	22.12 IMG	15.22	02 Jul IMG

Data from Natural Resources Conservation Service SnoTel Network

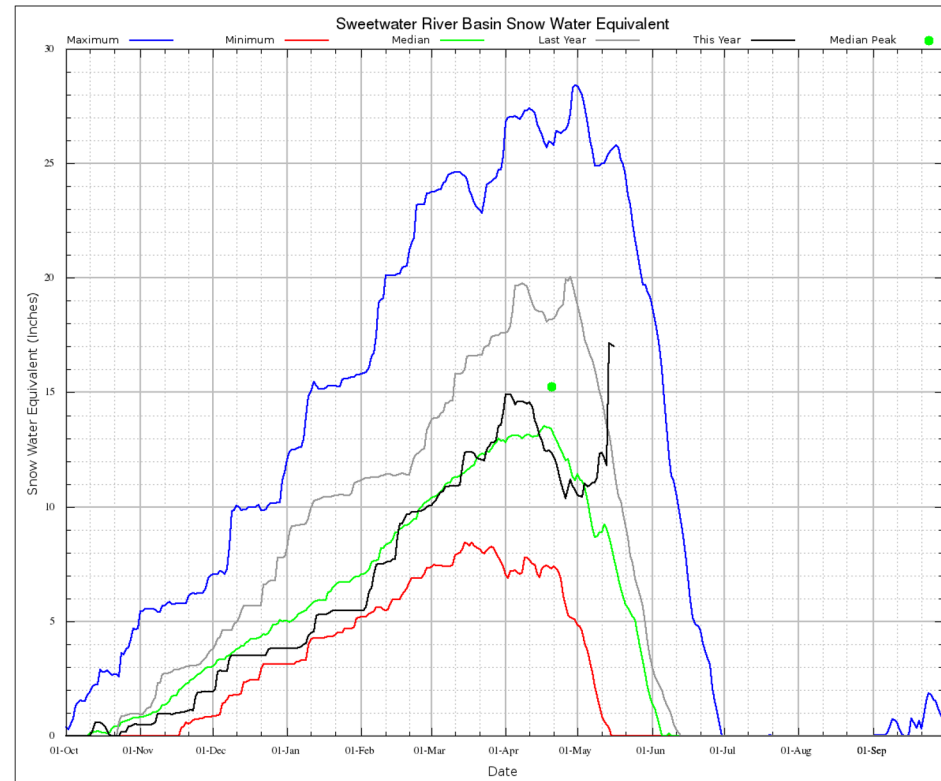
Basin Snow Water Equivalent (SWE) % of Median

Powder River Basin



Produced by the Wyoming Water Resources Data System/State Climate Office <http://www.wrds.uwyo.edu>
Data Source: Natural Resources Conservation Service Updated: 16 May 2024

Sweetwater Basin

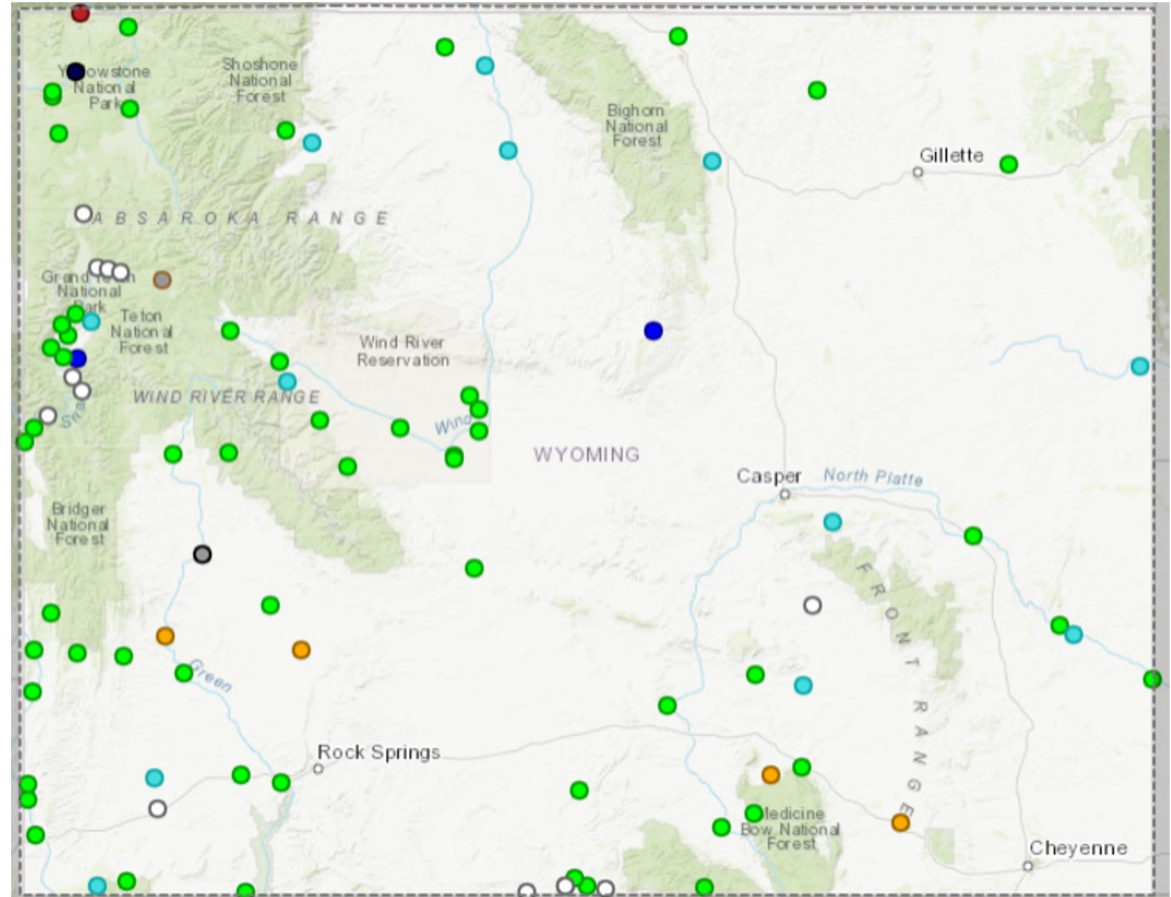


Produced by the Wyoming Water Resources Data System/State Climate Office <http://www.wrds.uwyo.edu>
Data Source: Natural Resources Conservation Service Updated: 16 May 2024

Streamflow Status

Streamflow: Status

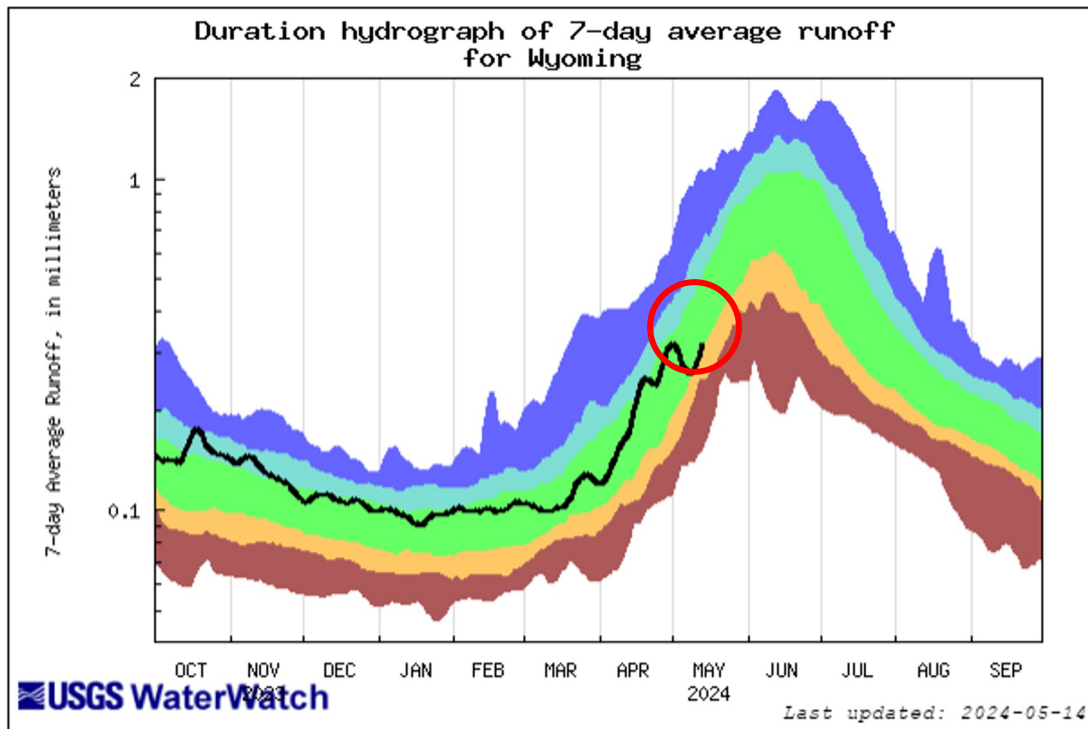
- Above flood stage
- All-time high for this day (100th percentile (maximum))
- Much above normal (>90th percentile)
- Above normal (76th – 90th percentile)
- Normal (25th – 75th percentile)
- Below normal (10th – 24th percentile)
- Much below normal (<10th percentile)
- All-time low for this day (0th percentile (minimum))
- Not flowing
- Not ranked
- Measurement flag
- Recent measurement unavailable



WY Duration Hydrograph of 7-day runoff

Mid Spring Streamflow

- Runoff continues
- Normal with a grain of salt.



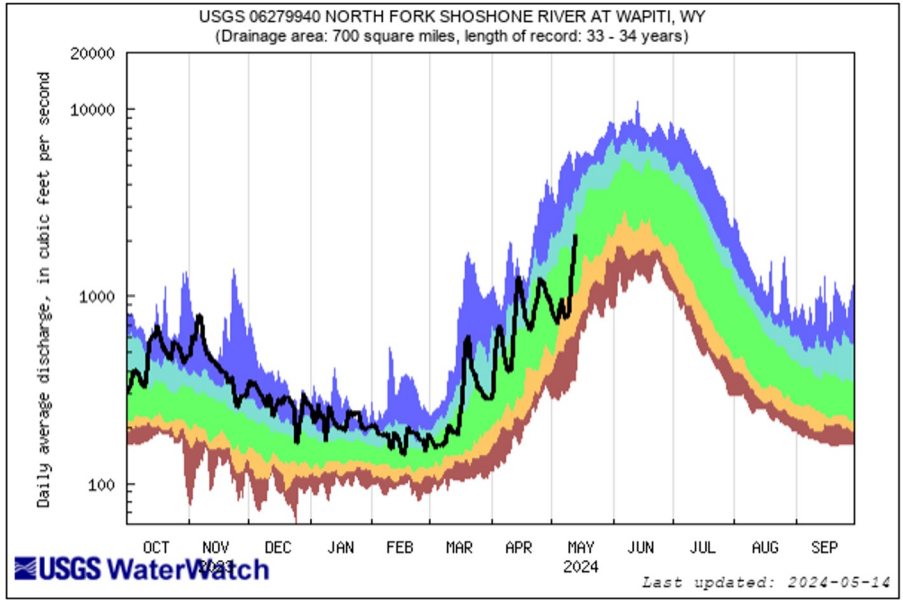
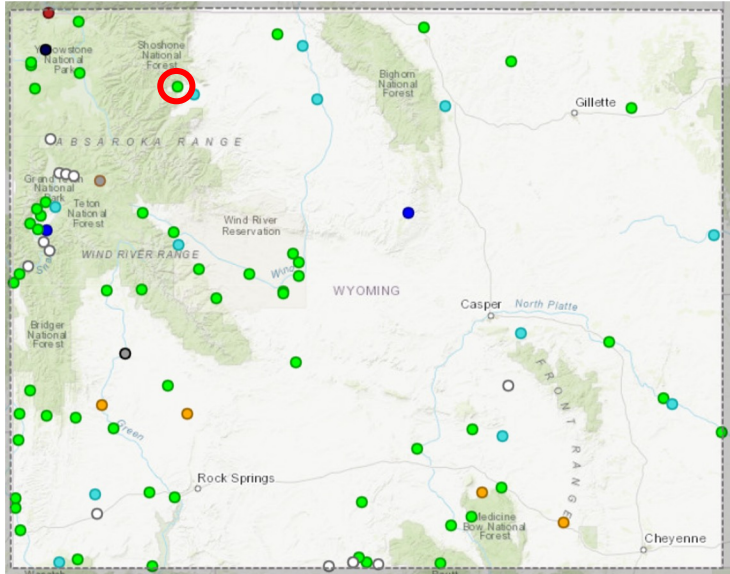
Explanation - Percentile classes							
lowest-5th percentile	6-9	10-24	25-75	76-90	91-94	95th percentile - highest	Runoff
Severe hydrologic drought	Moderate hydrologic drought	Below normal	Normal	Above normal	Much above normal		

<https://dashboard.waterdata.usgs.gov/>

<https://waterdata.usgs.gov/>

North Fork Shoshone, at Wapiti, WY

Select WY Streamflows



Explanation - Percentile classes

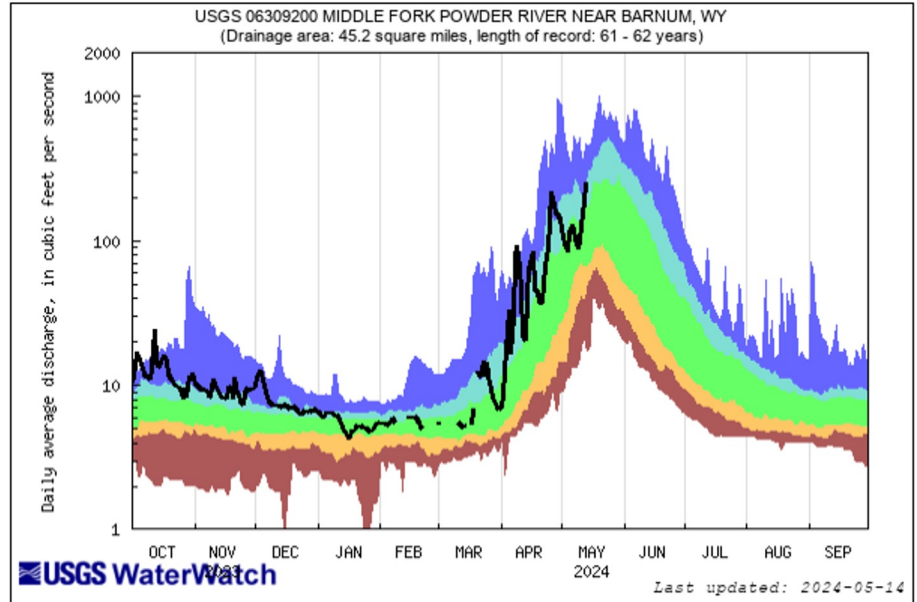
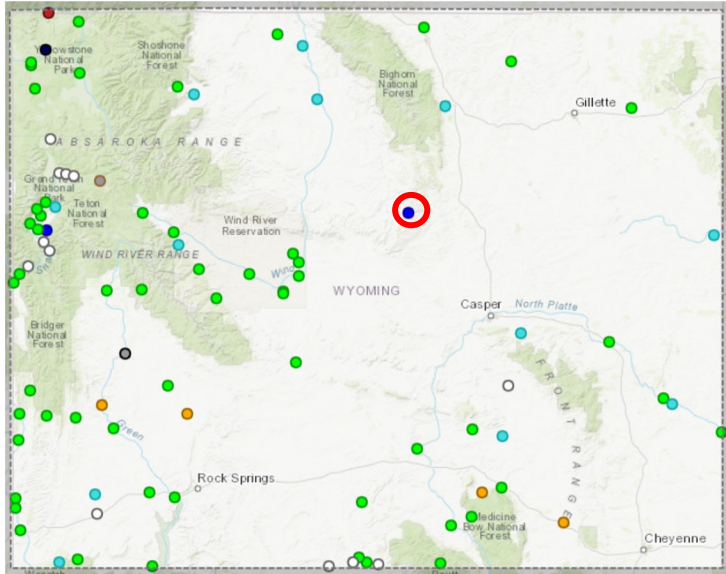
lowest-10th percentile	5	10-24	25-75	76-90	95	90th percentile - highest
Much below Normal	Below normal	Normal	Above normal	Much above normal		Flow

<https://dashboard.waterdata.usgs.gov/>

<https://waterdata.usgs.gov/>

Middle Fork Powder River, Near Barum, WY

Select WY Streamflows

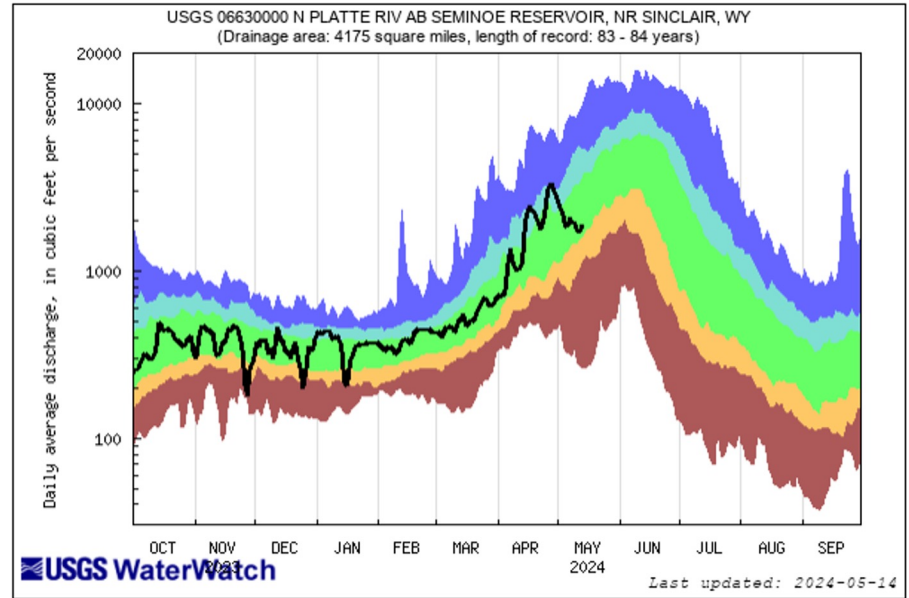
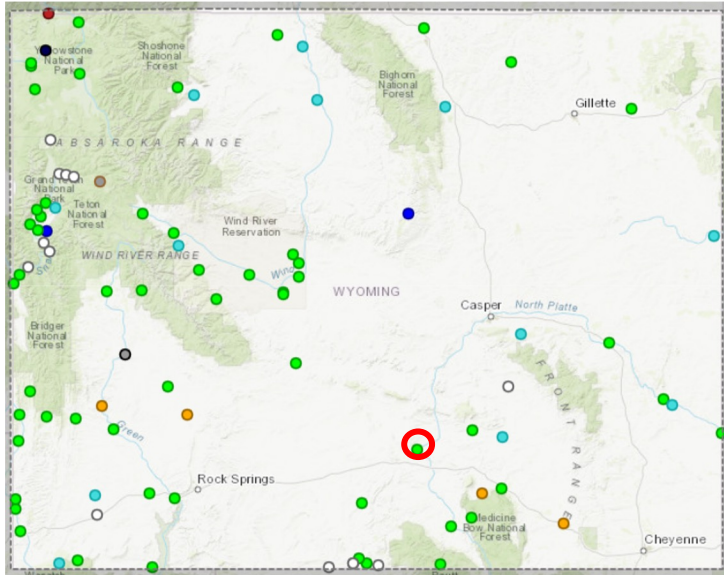


<https://dashboard.waterdata.usgs.gov/>

<https://waterdata.usgs.gov/>

Explanation - Percentile classes						
lowest-10th percentile	5	10-24	25-75	76-90	95	90th percentile-highest
Much below Normal	Below normal	Normal	Above normal	Much above normal		Flow

Select WY Streamflows



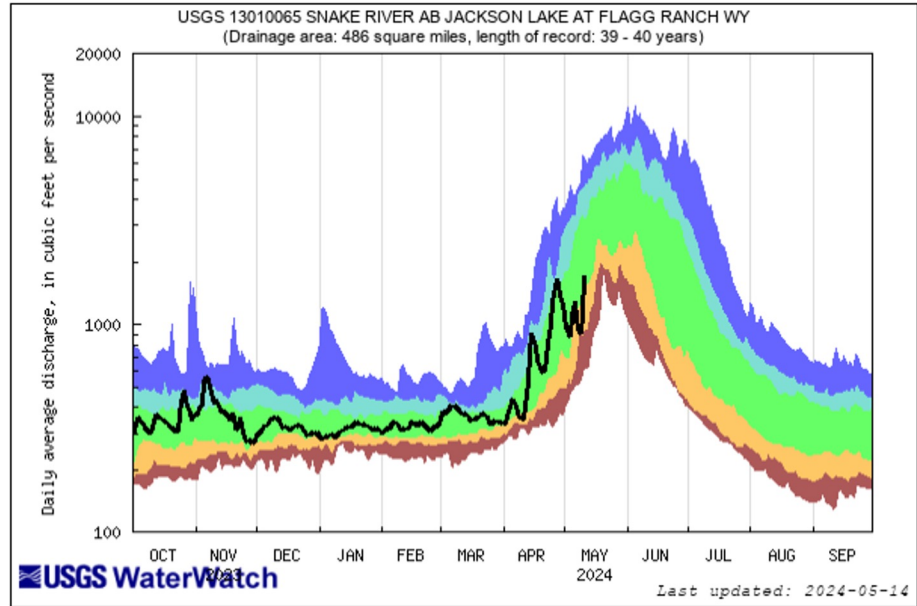
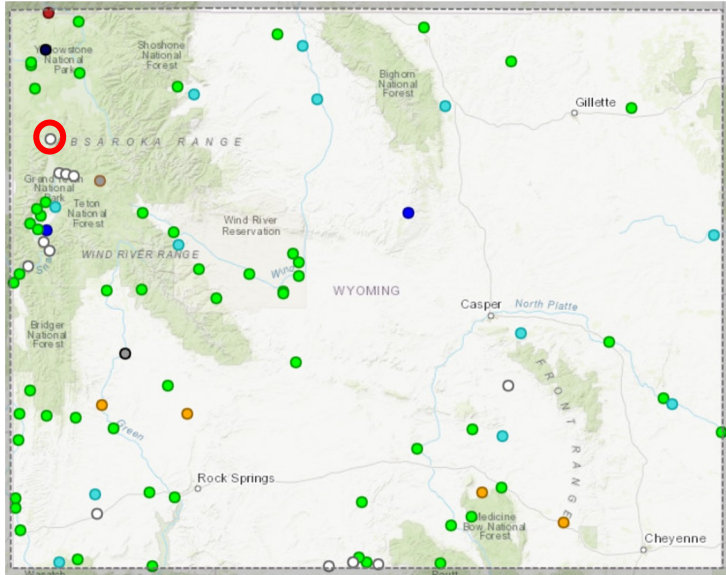
<https://dashboard.waterdata.usgs.gov/>

<https://waterdata.usgs.gov/>

Explanation - Percentile classes						
lowest-10th percentile	5	10-24	25-75	76-90	95	90th percentile-highest
Much below Normal	Below normal	Normal	Above normal	Much above normal		Flow

Snake River ab Jackson Lake, Flagg Ranch, WY

Select WY Streamflows



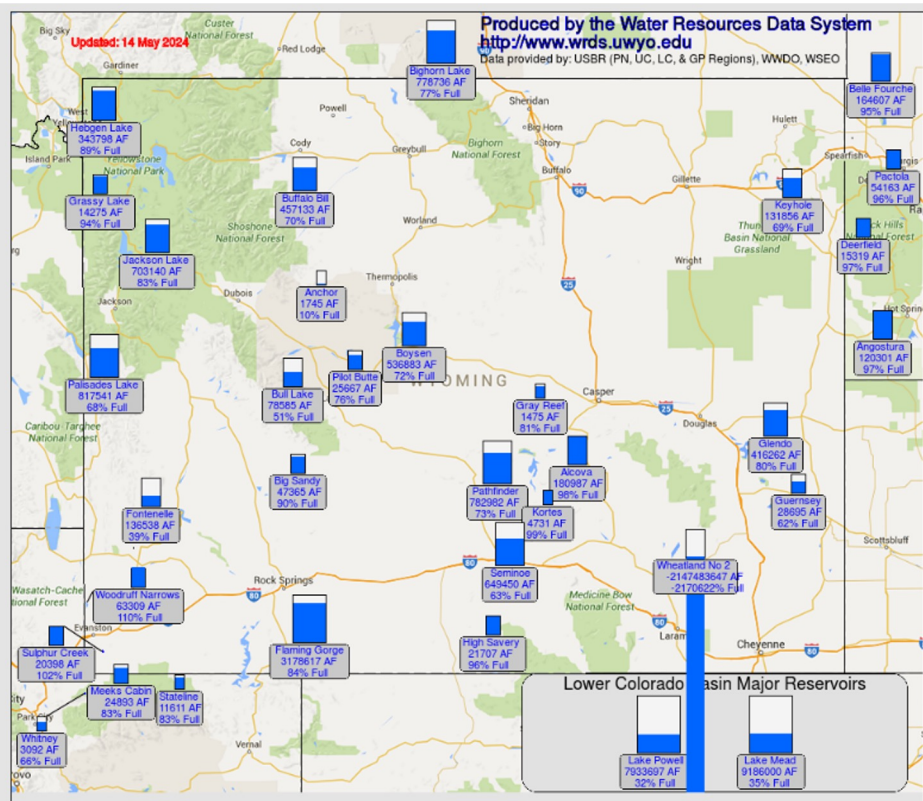
<https://dashboard.waterdata.usgs.gov/>

<https://waterdata.usgs.gov/>

Explanation - Percentile classes						
lowest-10th percentile	5	10-24	25-75	76-90	95	90th percentile-highest
Much below Normal	Below normal	Normal	Above normal	Much above normal		Flow

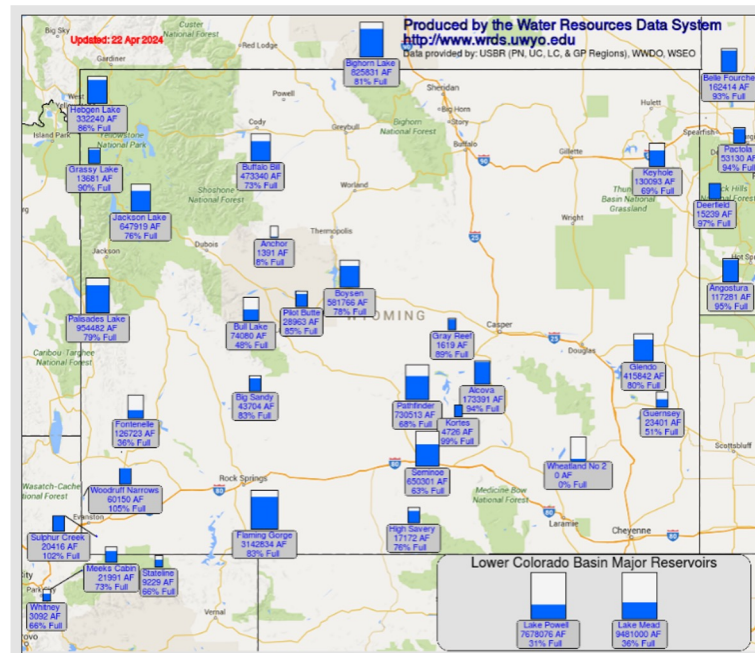
WY Reservoirs

May 15, 2024

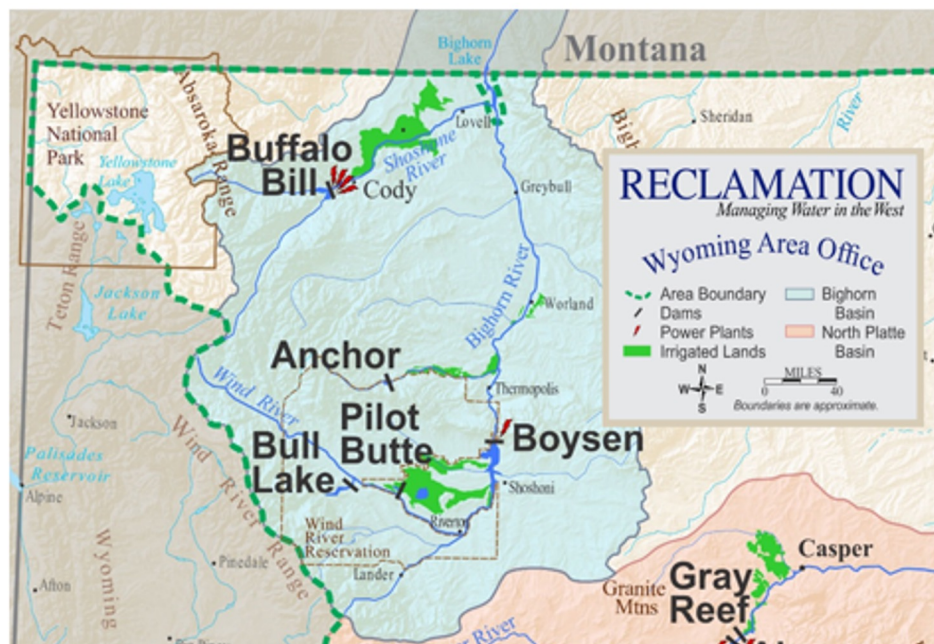


- Mostly minor changes (+/-) from last month
- Most major reservoirs are 60-80% full
- Palisades is being lowered -11% since Apr 15

April 15, 2024



Current Reservoir Conditions: Bighorn System



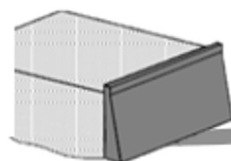
Bighorn System (May 13):

<u>Reservoir</u>	<u>Content</u>	<u>Capacity</u>	<u>% of Full</u>	<u>% of Avg</u>	<u>Releases</u>
Bull Lake	78,100	152,500	51%	96%	31 cfs
Buffalo Bill	454,000	646,600	70%	114%	1,300 cfs
Boysen	538,800	741,600	73%	102%	2,200 cfs





BUFFALO BILL RESERVOIR (BBR)
Top 644126 af, 5393.5 ft
Current 457133 af, 5368.5 ft
To fill 186993 af, 25.0 ft
Computed Inflow 3321 cfs
Total Outflow 1759 cfs



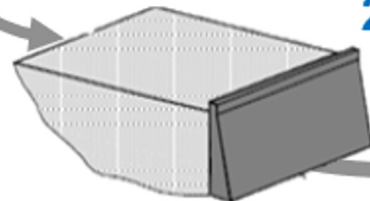
1,300 cfs

BOYSEN RESERVOIR (BOYR)
Top 741594 af, 4725.0 ft
Current 536883 af, 4713.1 ft
To fill 204711 af, 11.9 ft
Computed Inflow 1232 cfs
Total Outflow 2206 cfs

BULL LAKE (BLR)
Top 152459 af, 5805.0 ft
Current 78585 af, 5778.9 ft
To fill 73874 af, 26.1 ft
Computed Inflow 288 cfs
Total Outflow 38 cfs



31 cfs



2,200 cfs

Current Reservoir Conditions: North Platte System



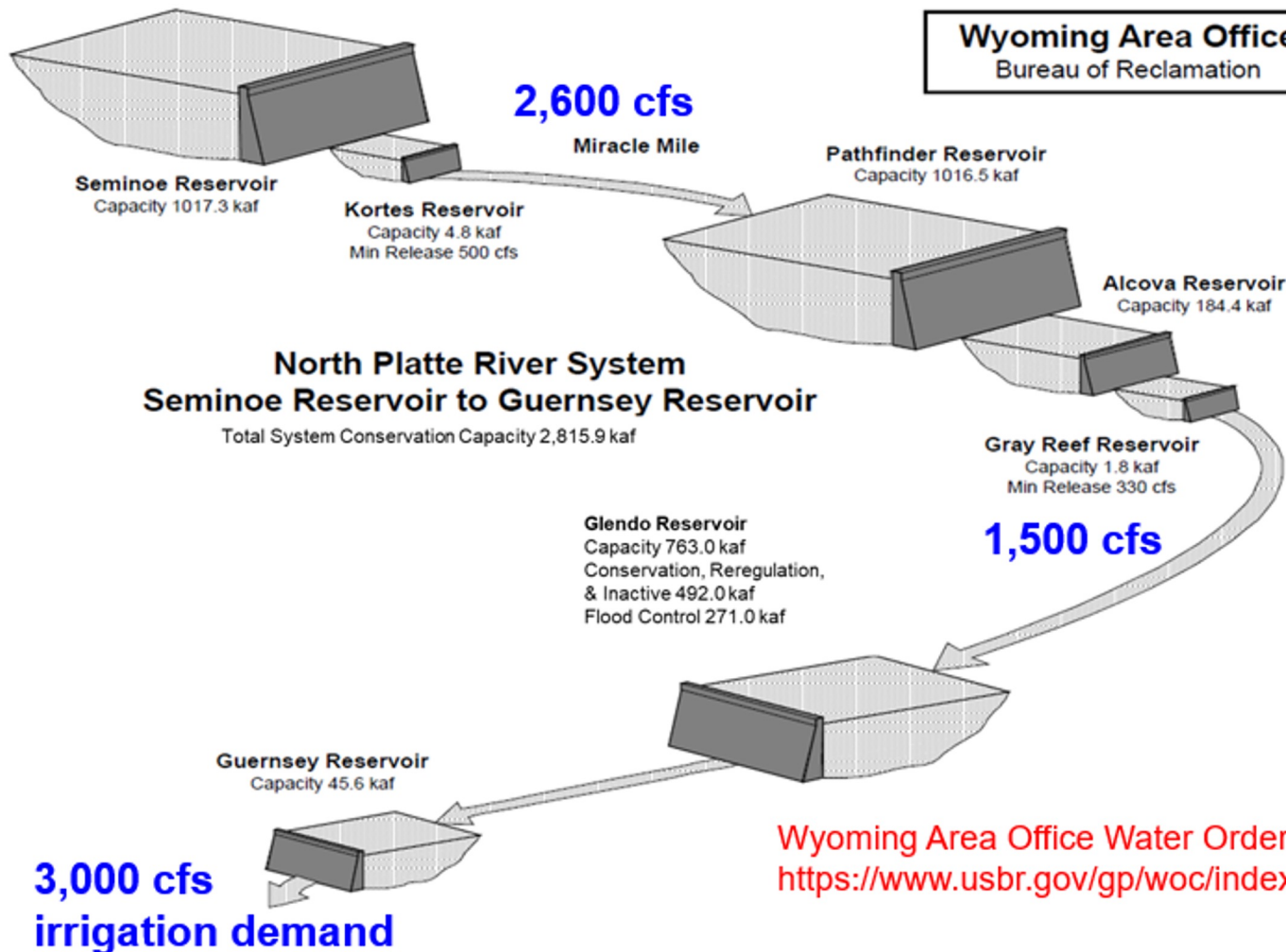
North Platte System (May 13):

<u>Reservoir</u>	<u>Content</u>	<u>Capacity</u>	<u>% of Full</u>	<u>% of Avg</u>
Seminoe	650,017	1,017,300	64%	118%
Pathfinder	780,600	1,070,000	73%	125%
Glendo	416,891	492,000	85%	91%





Wyoming Area Office
Bureau of Reclamation



Wyoming Area Office Water Order Changes –
<https://www.usbr.gov/gp/woc/indexwy.html>



WY SEO Divisions and Superintendents

Contact information for calls and administration

Division 3

Joshua
Fredrickson,
856-0747



Division 2

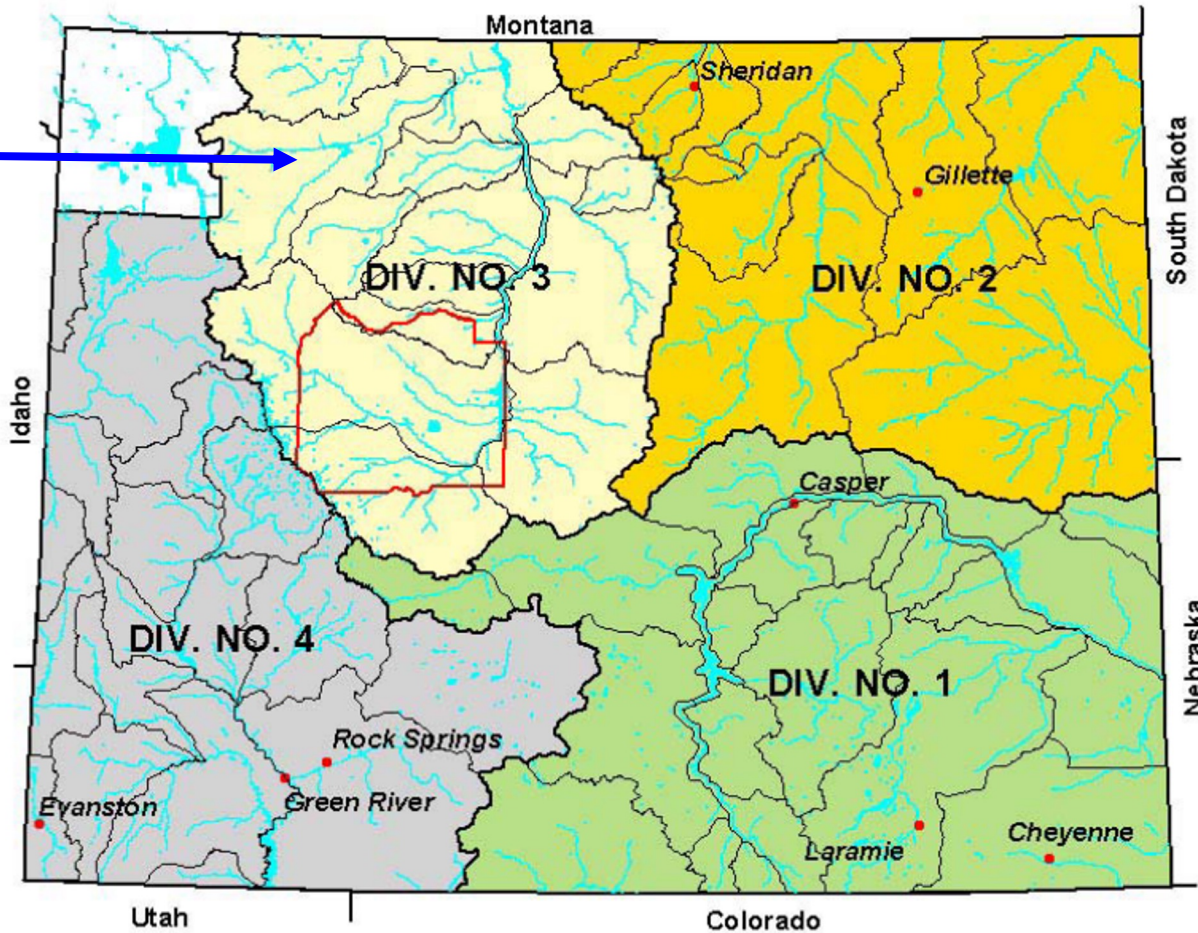
David
Schroeder,
674-7012

Division 4

Kevin Payne,
279-3441

Division 1

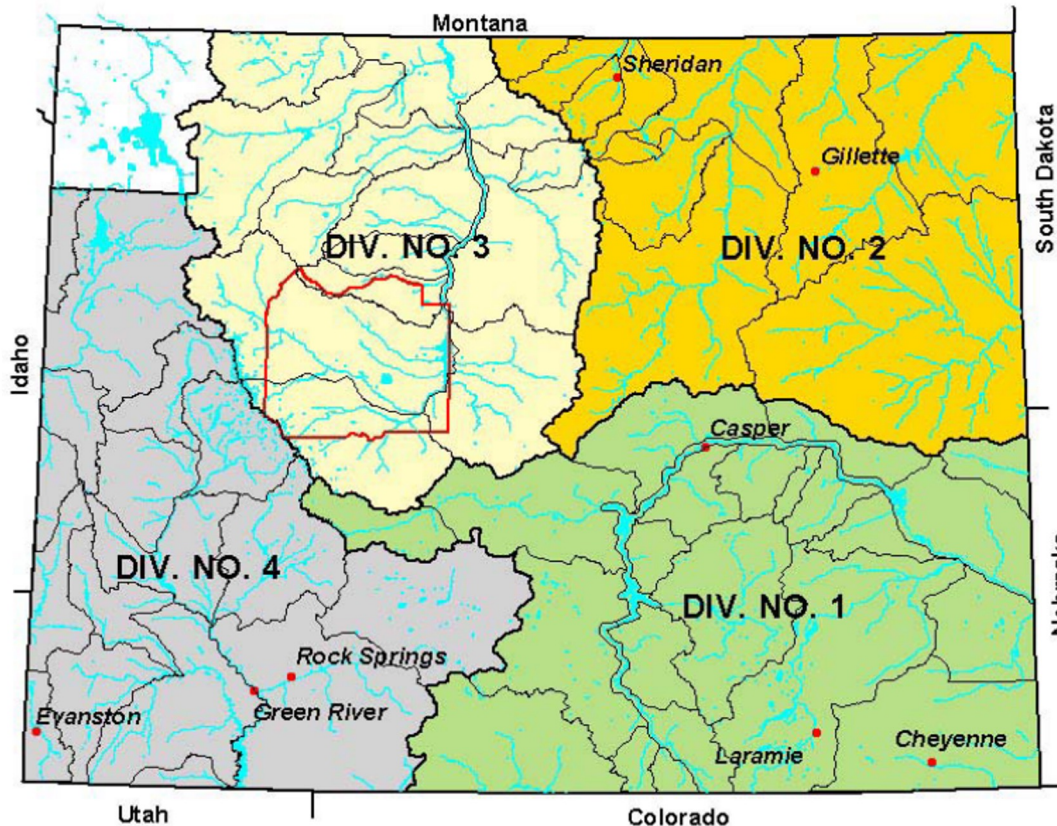
Cory Rinehart,
532-2248





WY SEO Divisions and Superintendents

Contact information for calls and administration



Note from Jeff Cowley, SEO Administrator, Interstate Streams:

As of May 14th,

3 streams in state of Wyoming are under regulation, **all in Division 1:**

- **Laramie River:** regulated to 1898
- **Soldier Creek:** reg to 1884
- **Horse Creek:** reg to 1884

USDA



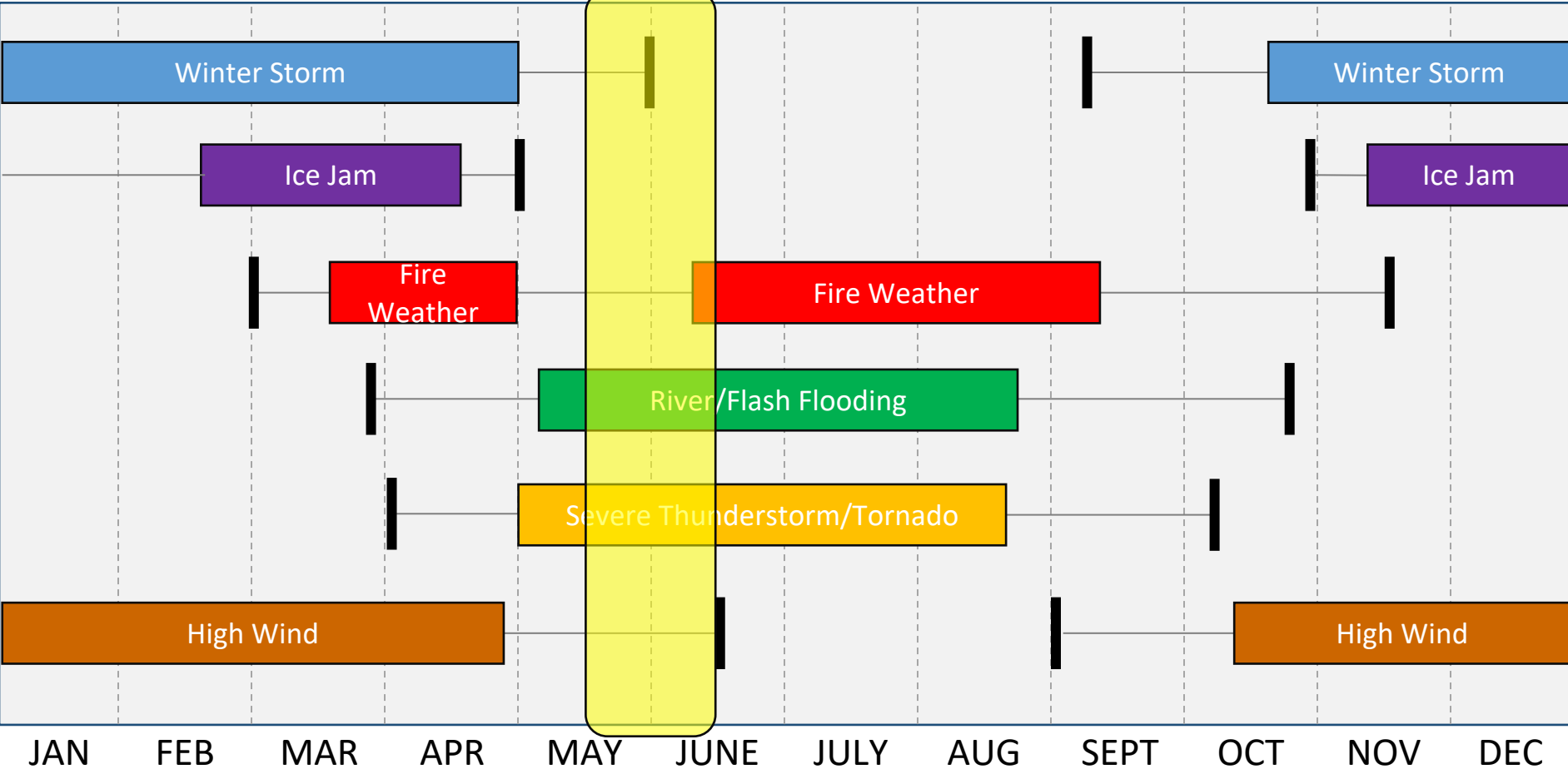
— BUREAU OF —
RECLAMATION



Weather Info & Forecasts



NWS Wyoming Typical Hazard Calendar

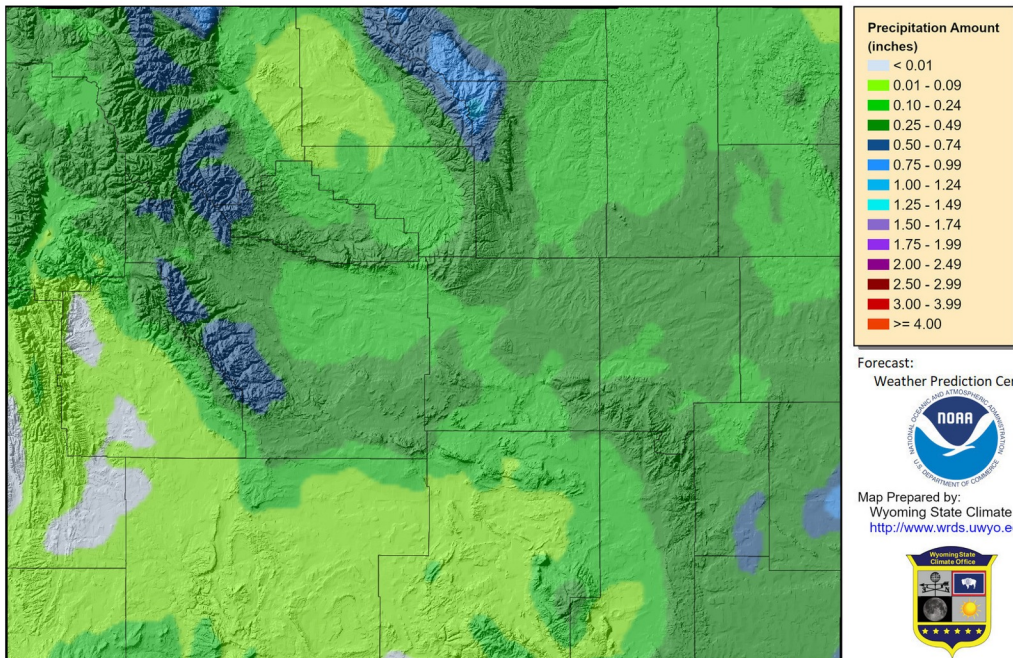




7-Day Total Precipitation Forecast

(May 16 - May 23)

7-Day Quantitative Precipitation Forecast 16 May 2024



Provisional data, subject to revision



Forecast:
Weather Prediction Center



Map Prepared by:
Wyoming State Climate Office
<http://www.wrds.uwyo.edu>



- Drier, warm, and windier weather across the state
- More “Maylike” weather patterns
- Chances of precipitation increase Sunday and Monday
- Very few places likely to get more than 1” of precipitation.

The Quantitative Precipitation Forecast shows the liquid amount of forecasted precipitation over the next 7 days
The Forecast is created by the National Weather Service Weather Prediction Center
Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, National Centers for Environmental Prediction,
and Weather Prediction Center - <https://www.wpc.ncep.noaa.gov>
Map Layout Created 16 May 2024 <http://www.wrds.uwyo.edu>

https://bit.ly/7_dayQPForecast



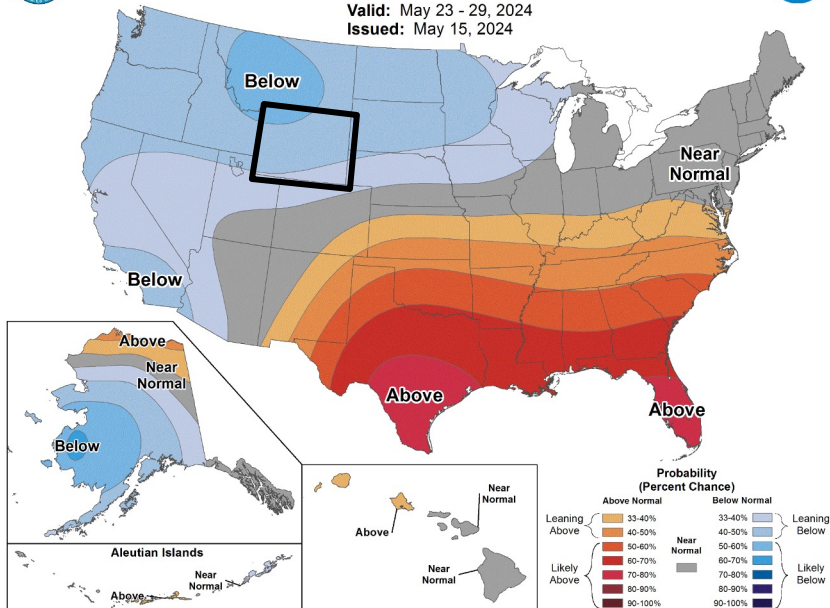
8-14 Day Outlooks (May 23 - May 29)

https://bit.ly/CPC8_14Day



8-14 Day Temperature Outlook

Valid: May 23 - 29, 2024
Issued: May 15, 2024

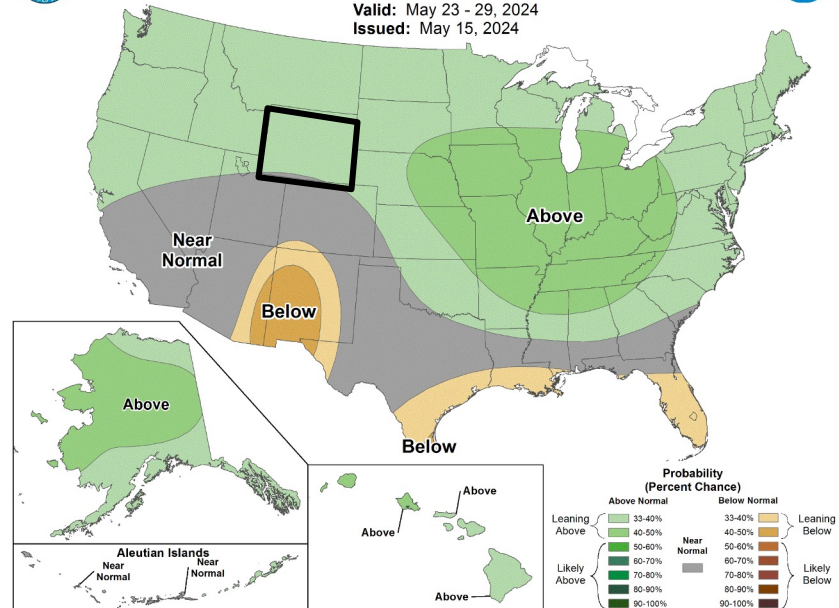


- Moderate below-normal signal across most of the state. Strengthening from weak in SE to strong in NW.



8-14 Day Precipitation Outlook

Valid: May 23 - 29, 2024
Issued: May 15, 2024



- Weak above-normal precipitation signal across the state.



1-Month Outlooks (May - June)

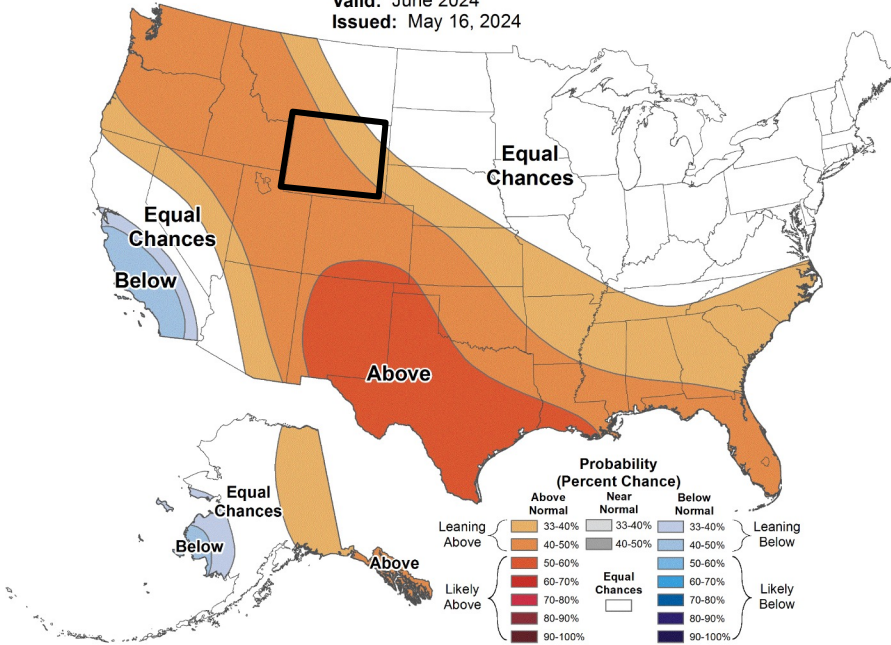
cpc.ncep.noaa.gov/products/predictions/30day/



Monthly Temperature Outlook



Valid: June 2024
Issued: May 16, 2024



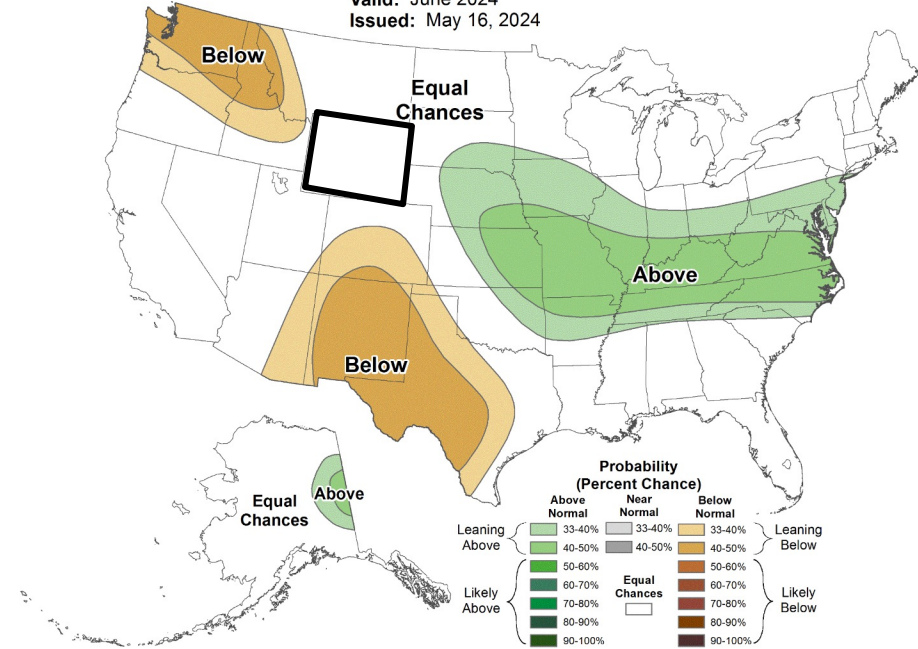
- No signal in NE strengthening to a moderate above-normal signal in the SW $\frac{2}{3}$ of the state.



Monthly Precipitation Outlook



Valid: June 2024
Issued: May 16, 2024



- No signal either way. Climatology is probably the best forecast.



Wyoming Water Supply Outlook

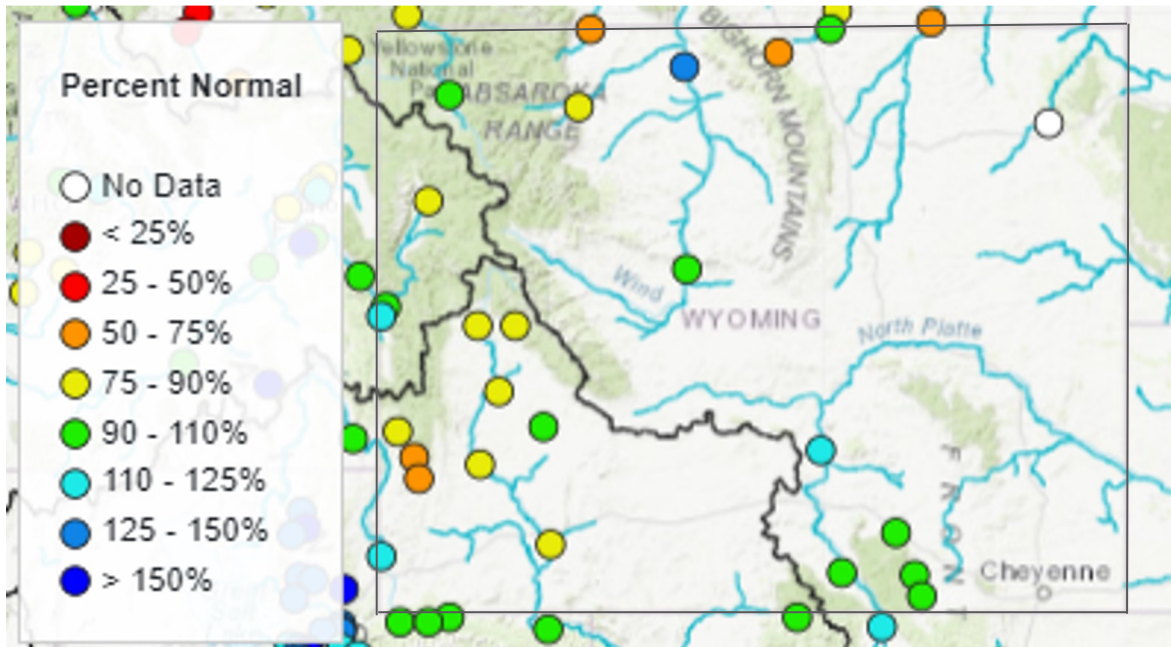
Valid April-September

April thru September runoff volumes appears to be near-to-below normal.

This graphic depicts the NWS water supply outlook locations, colored by the percent of April-thru-September volumetric normal. Many southern Wyoming stations are projected to see near-normal volumes this season (greens and blues). The northern tier and upper Green River stations are forecast to be lower than normal (yellow and orange).

**Please note that the Colorado River basin colors reflect April-thru-July percent-of-normals.*

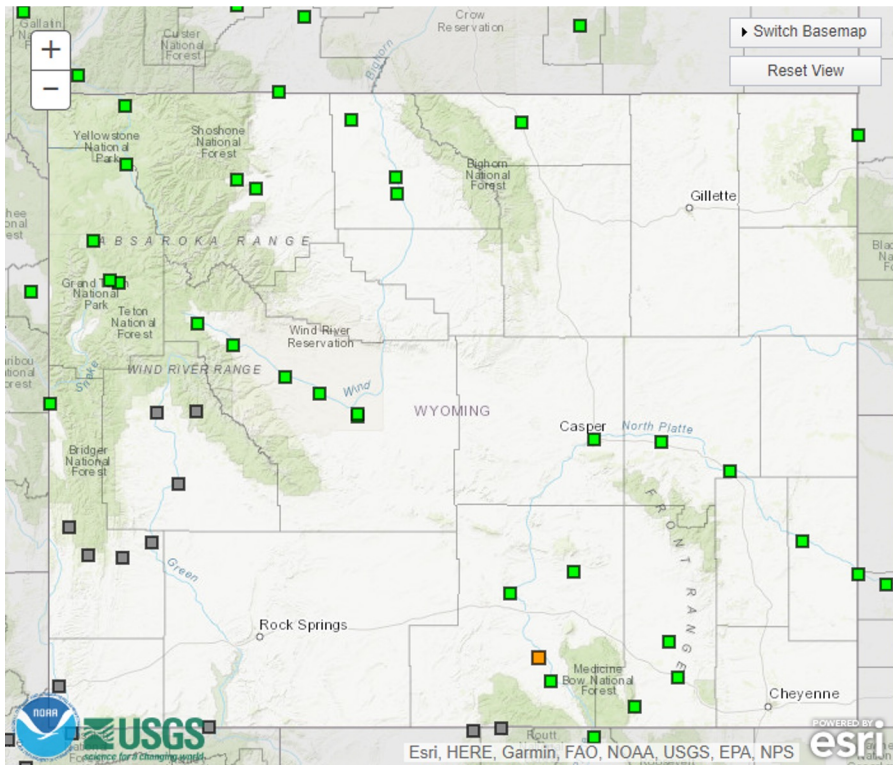
https://www.cbrfc.noaa.gov/wsup/graph/west/map/esp_map.html





Wyoming Flood Potential Update

Valid May-June-July



[Return to national map.](#)

Click on the map or select one of the data views below:

- Wyoming
- NWS Weather Forecast Offices
- NWS River Forecast Centers
- Water Resources Regions

54 total gauges
 Show locations with 50% or greater chance of flooding during May-Jun-Jul (1)

- 0 Gauges: > 50% Major Long-Range Flood Risk
- 0 Gauges: > 50% Moderate Long-Range Flood Risk
- 1 Gauges: > 50% Minor Long-Range Flood Risk
- 39 Gauges: < 50% Long-Range Flood Risk
- 14 Gauges: No forecast within selected timeframe

[Show all locations](#)

Last map update:
 05/15/2024 at 06:27:49 pm EDT
 05/15/2024 at 22:27:49 UTC

[What is UTC time?](#)

[Map Help](#)

[Product Description](#)

[Feedback](#)

[Disclaimer](#)

POWERED BY
 Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS

No riverine flooding is expected through late June

This graphic depicts the NWS river forecast locations, colored by the highest flood category expected during the next 90-days.

Only the station at Saratoga has a 50% chance of flooding.

The National Hydrologic Assessment was issued May 7, 2024.

<https://www.weather.gov/owp/2024NHA#:~:text=The%20National%20Hydrologic%20Assessment%20is,fl ood%20potential%2C%20and%20water%20supply.>

water.weather.gov



Wildland Fire Potential and Outlook

Fuel Moisture Content Basics

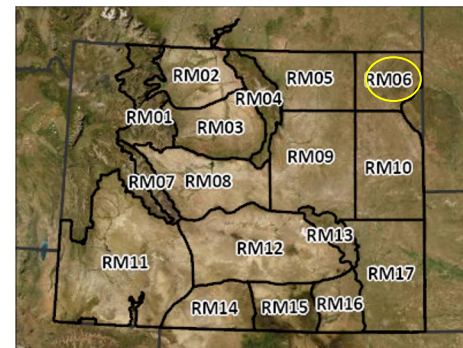
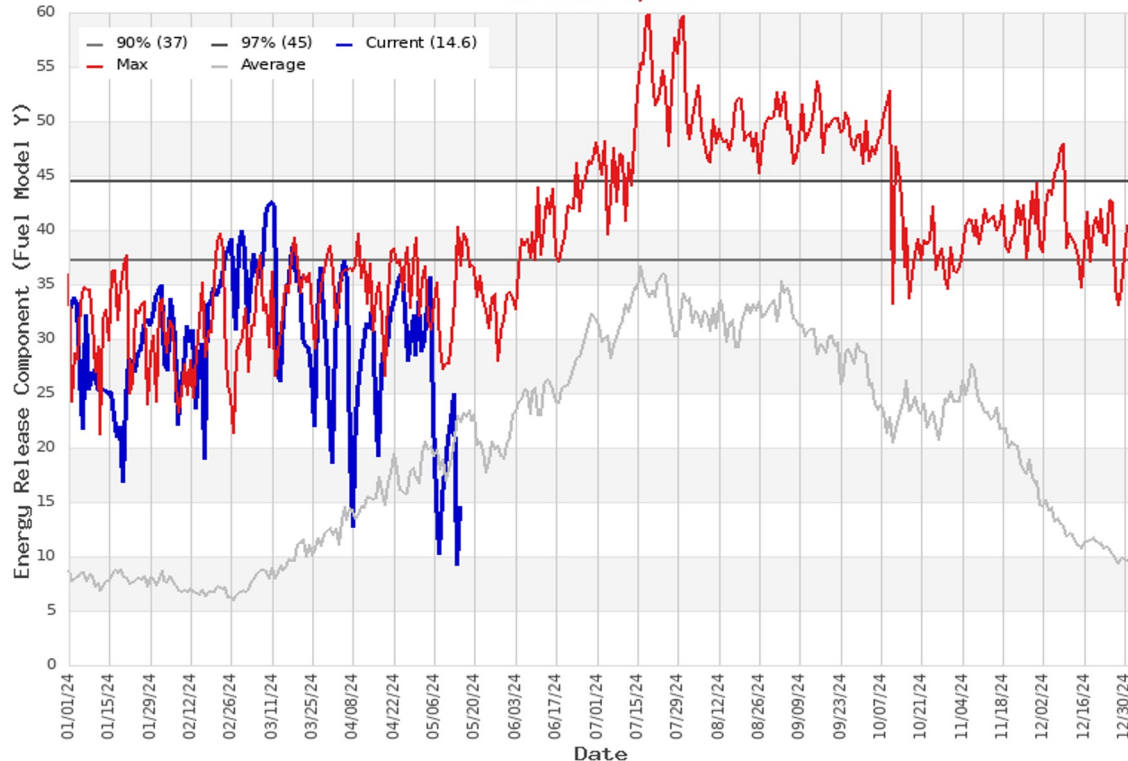
- **Fuel Moisture Content** - A key contributor to fire behavior along with weather and topography. Measures the amount of water in a fuel, expressed as a percentage of the dry weight.
- **Two Main Types of Wildland Fuel**
 - **Live Fuels-** Moisture content changes based on a number of factors, including plant phenology, time of year, and soil moisture. During dormancy, live fuels may resemble dead.
 - **Dead Fuels-** Absorb moisture from humidity in the air around them at variable rates depending on size. Classified by “time lag”, amount of time it takes for the fuel to gain or lose substantial moisture.
 - **1 Hour** - < 1/4” - grasses, forbs etc...
 - **10 Hour** - 1/4” to 1” - small twigs and branches
 - **100 Hour-** 1” to 3” - larger branches and small trees
 - **1000 Hour-** > 3” - downed logs, large branches
- **Fuel Loading-** Measured in tons per acre, highly variable depending on predominant vegetation.



Wildland Fire Potential and Outlook

Energy Release Component

RM06 - Devils Tower
Valid Date: 15-May-2024

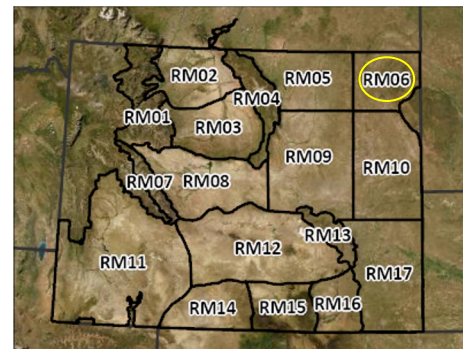
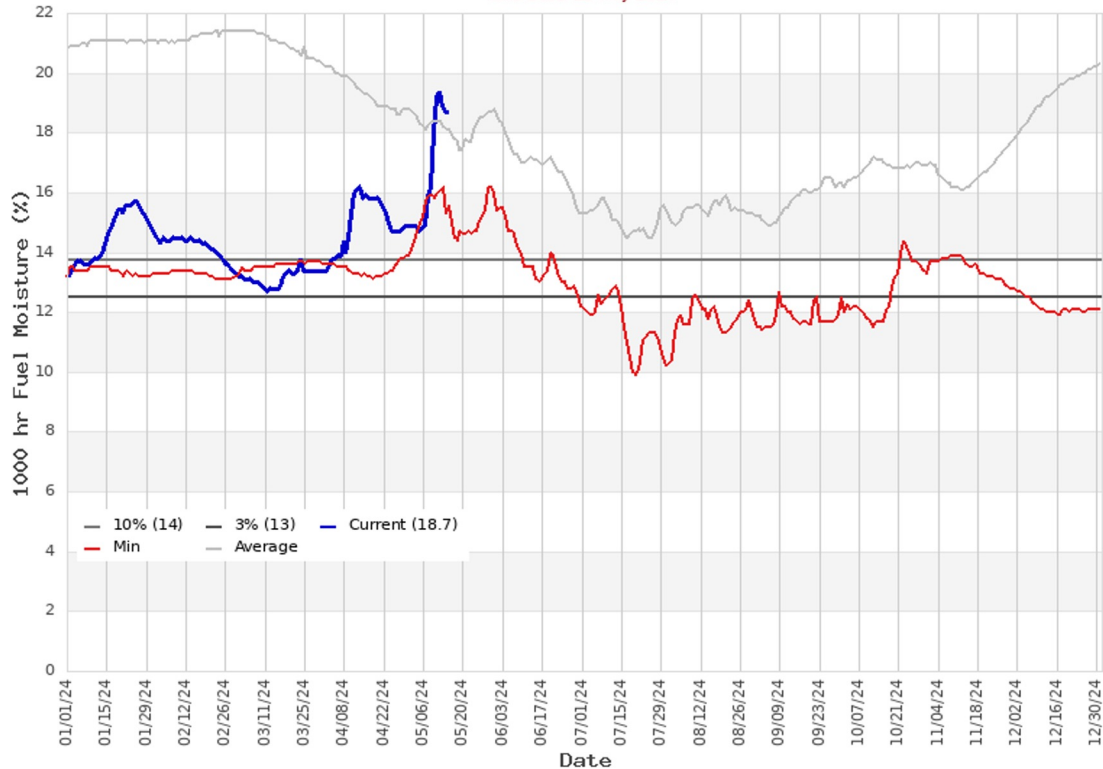




Wildland Fire Potential and Outlook

1000 Hour Fuel Moistures

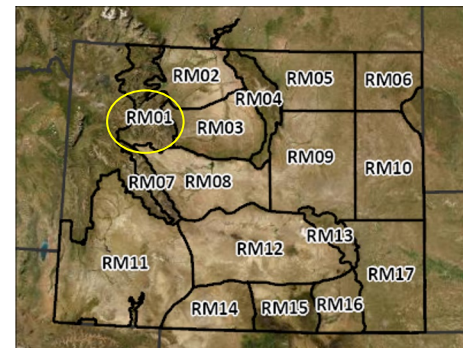
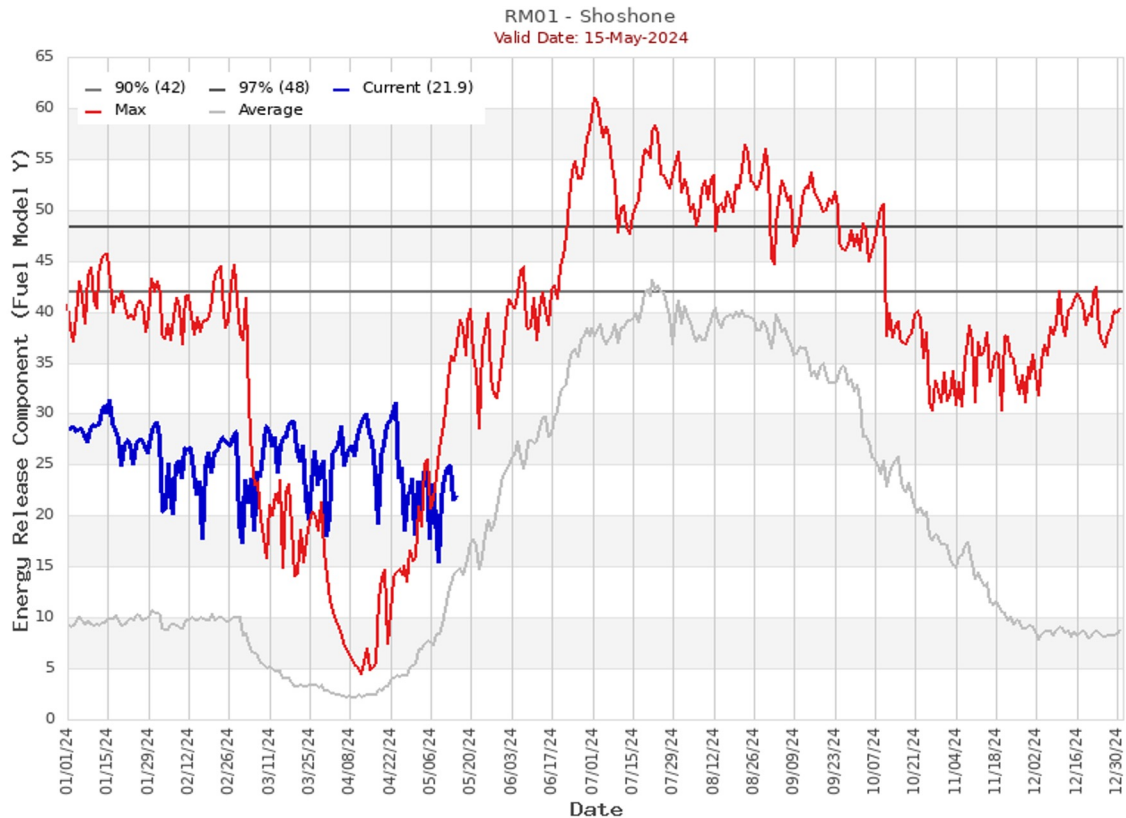
RM06 - Devils Tower
Valid Date: 15-May-2024





Wildland Fire Potential and Outlook

Energy Release Component

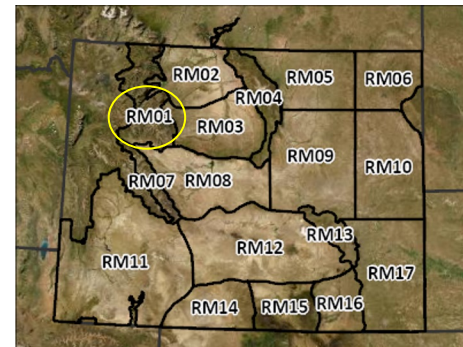
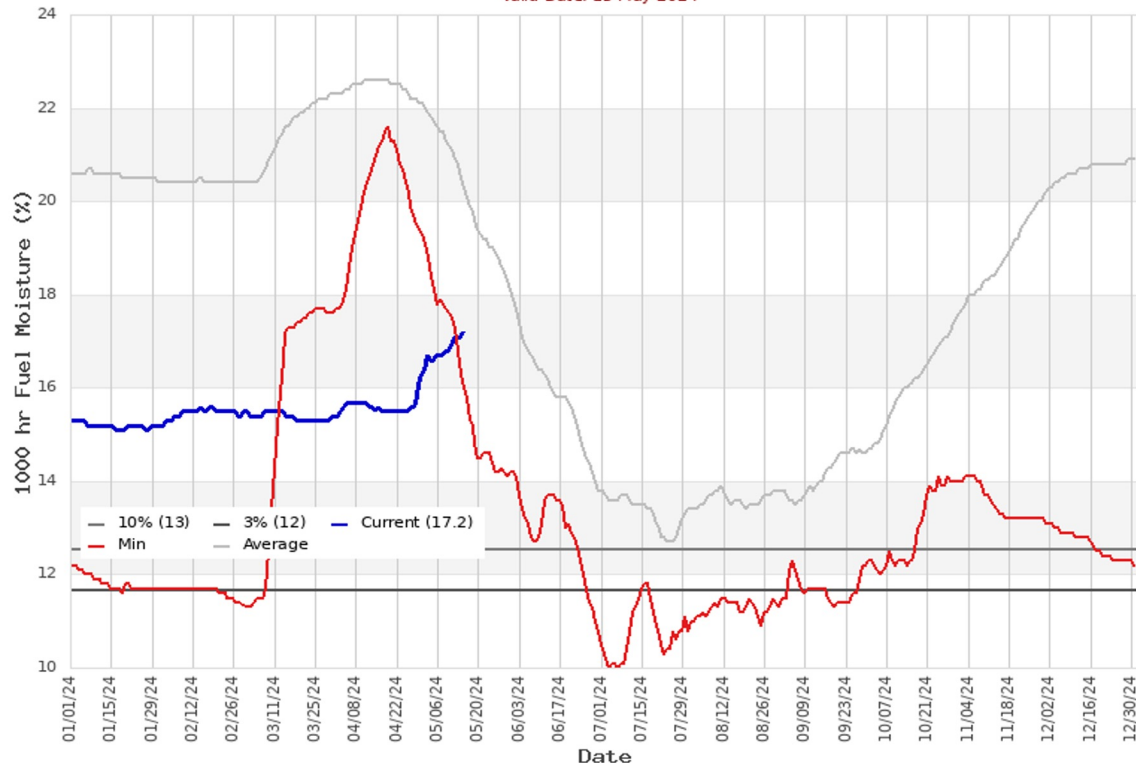




Wildland Fire Potential and Outlook

1000 Hour Fuel Moisture

RM01 - Shoshone
Valid Date: 15-May-2024

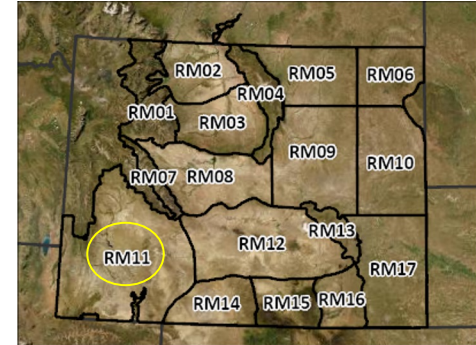
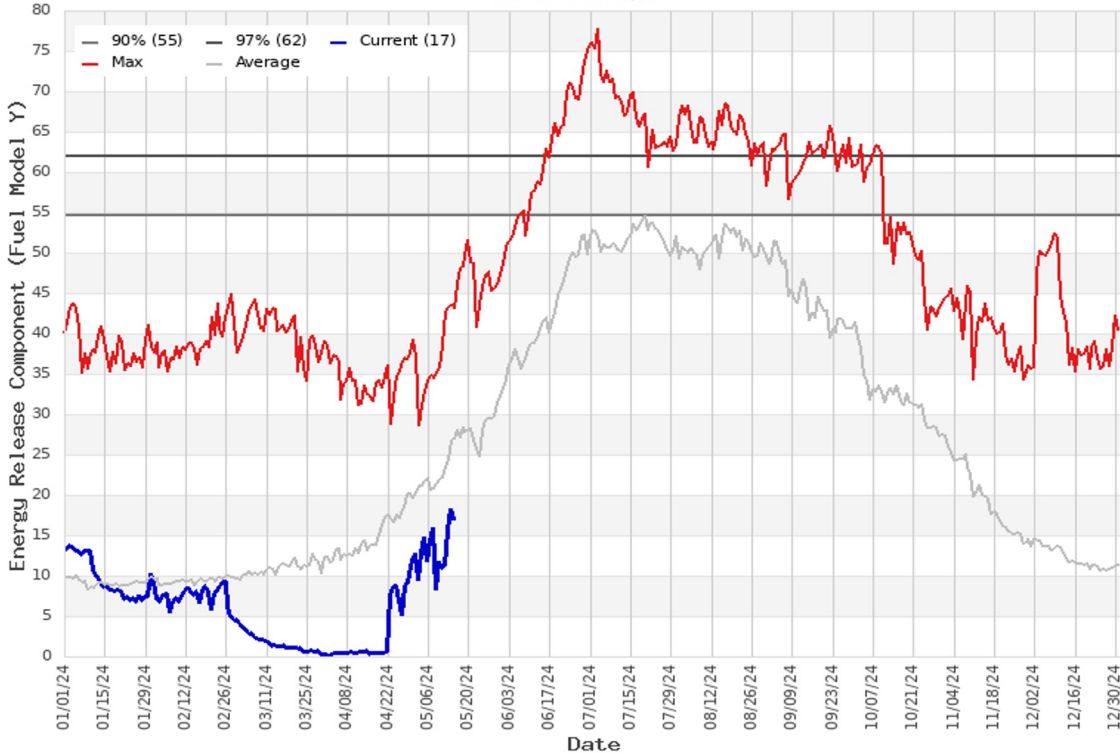




Wildland Fire Potential and Outlook

Energy Release Component

RM11 - Great Divide Basin
Valid Date: 15-May-2024

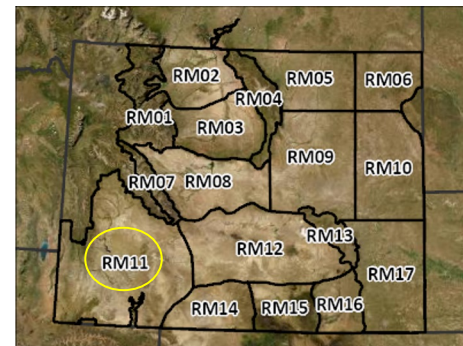
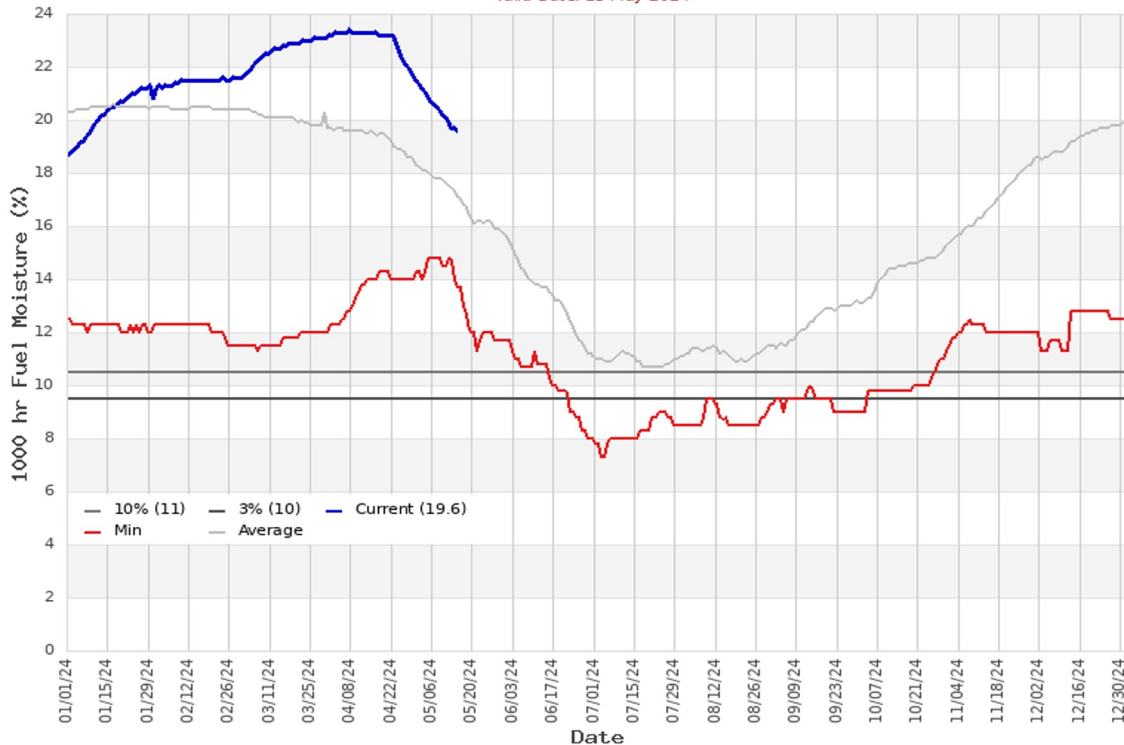




Wildland Fire Potential and Outlook

1000 Hour Fuel Moisture

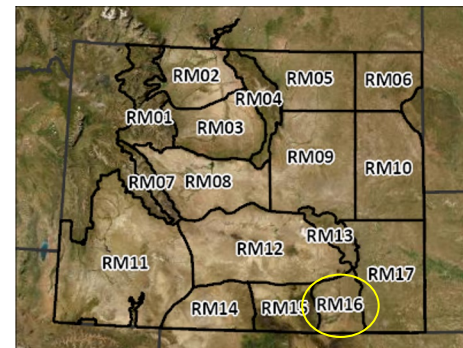
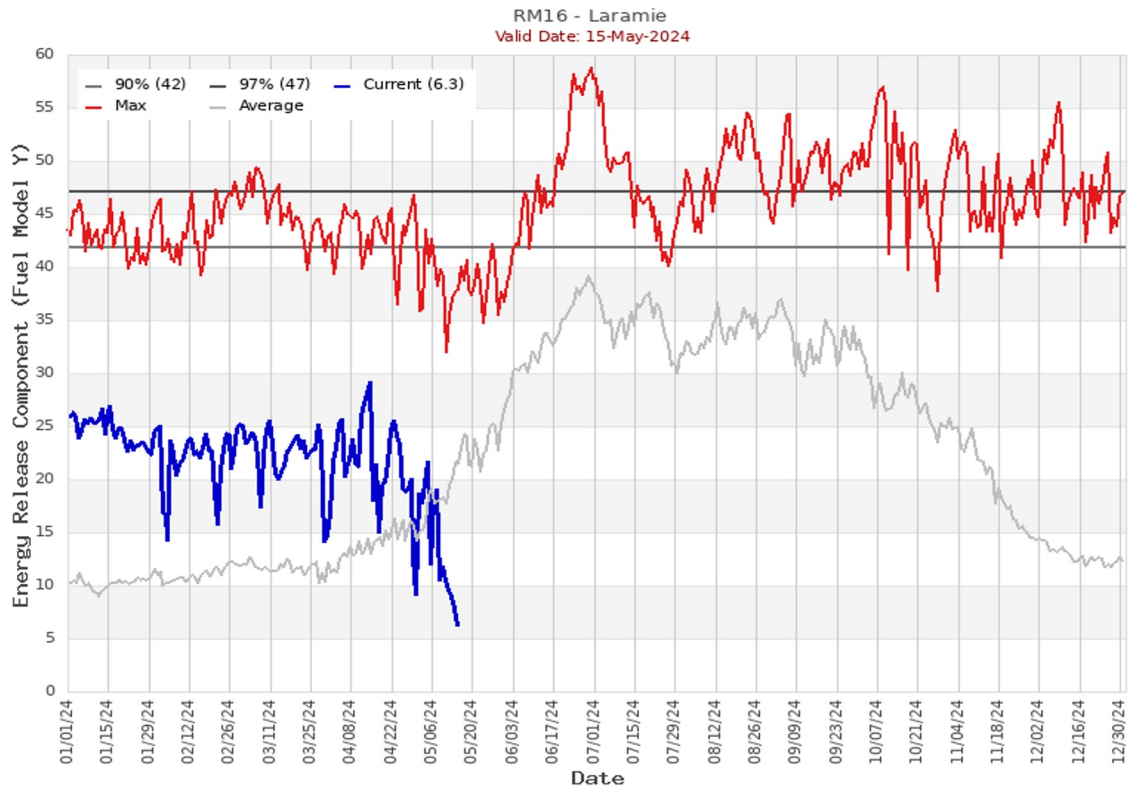
RM11 - Great Divide Basin
Valid Date: 15-May-2024





Wildland Fire Potential and Outlook

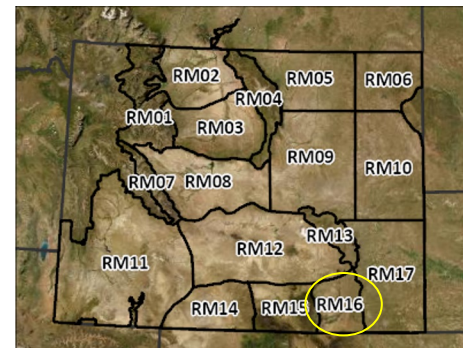
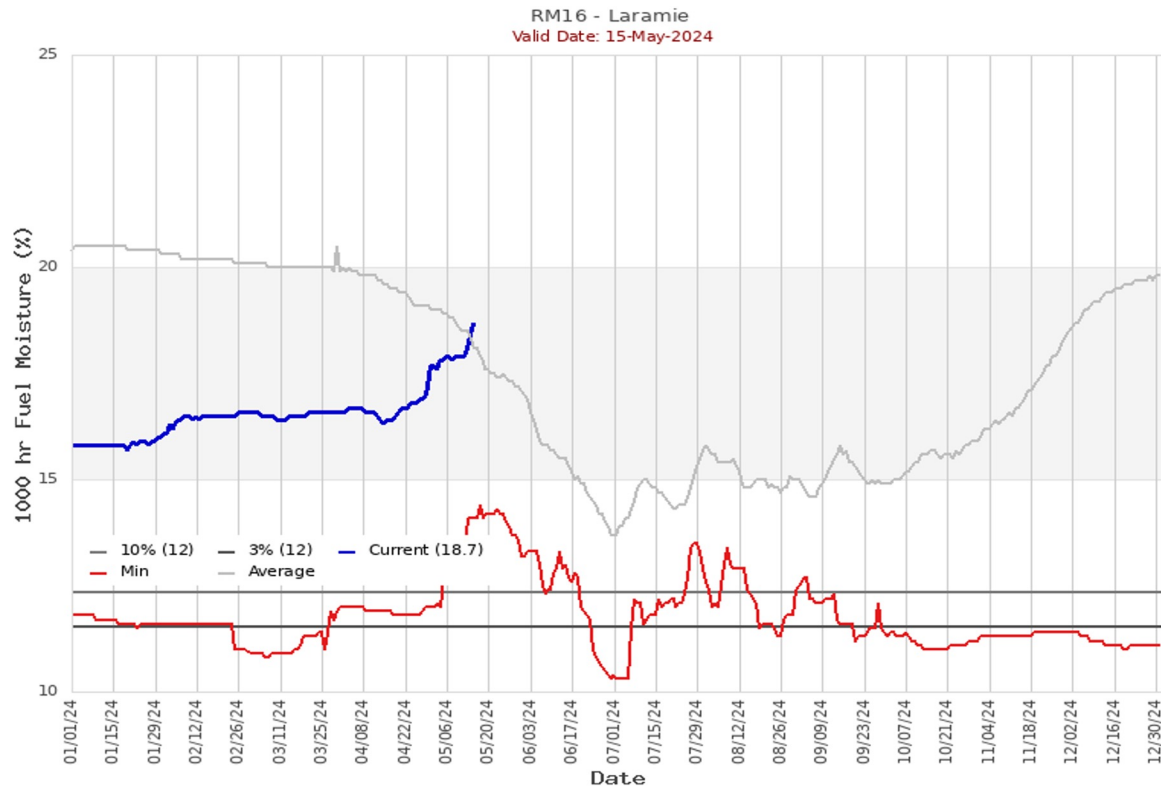
Energy Release Component





Wildland Fire Potential and Outlook

1000 Hour Fuel Moisture





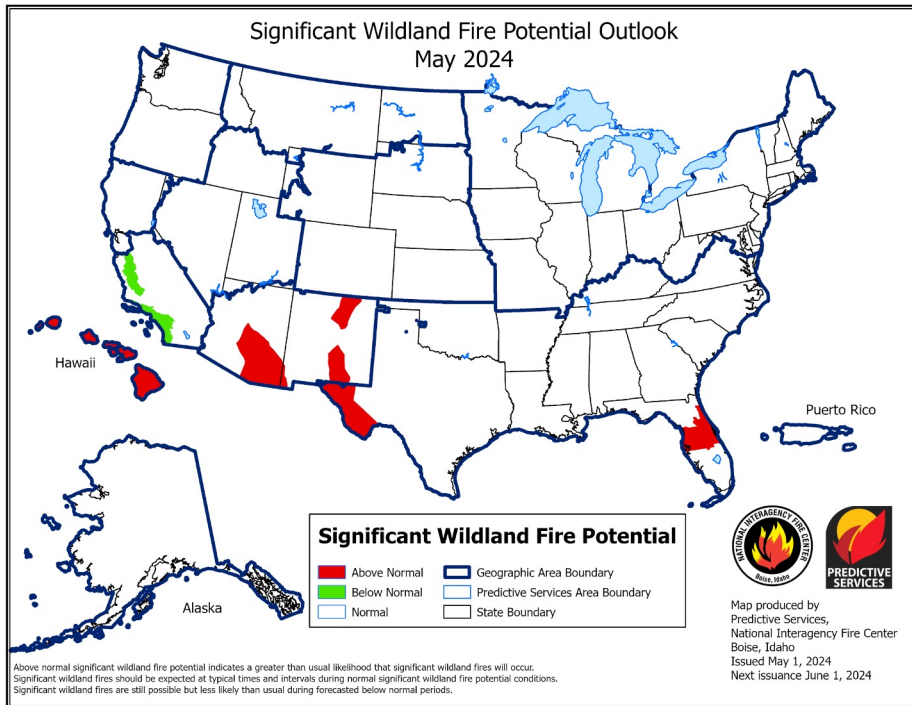
Wildland Fire Potential and Outlook

National Outlook- Released Monthly on 1st of the month

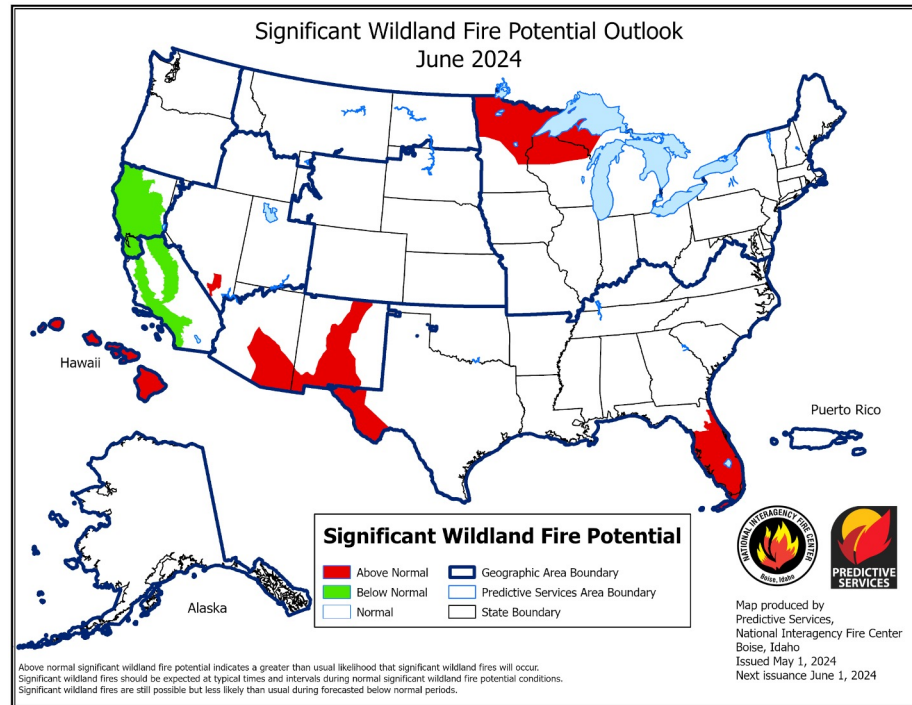
May 2024

June 2024

Significant Wildland Fire Potential Outlook
May 2024



Significant Wildland Fire Potential Outlook
June 2024





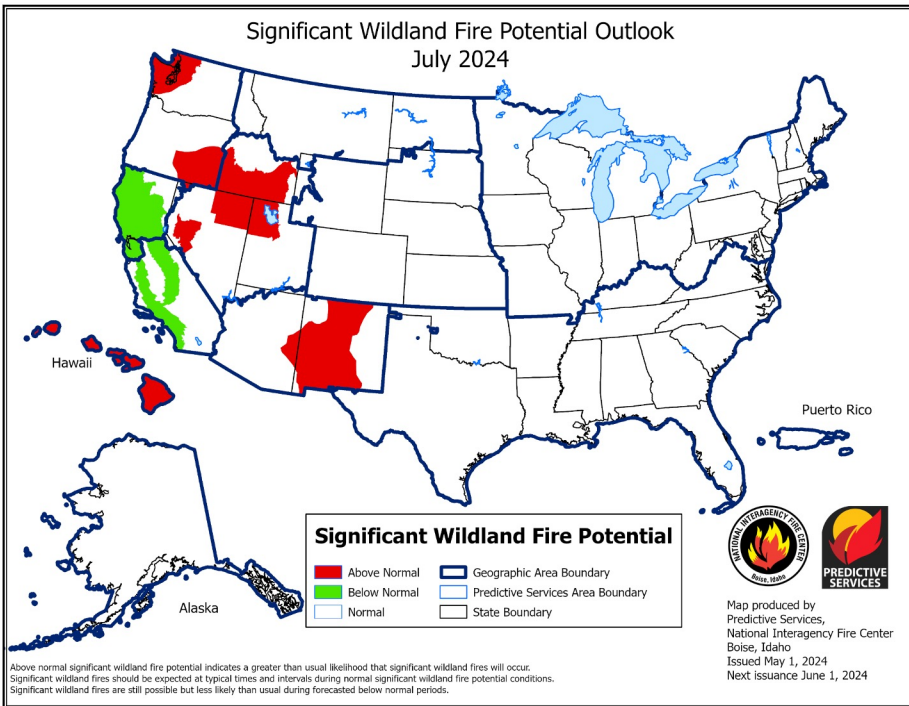
Wildland Fire Potential and Outlook

National Outlook- Released Monthly on 1st of the month

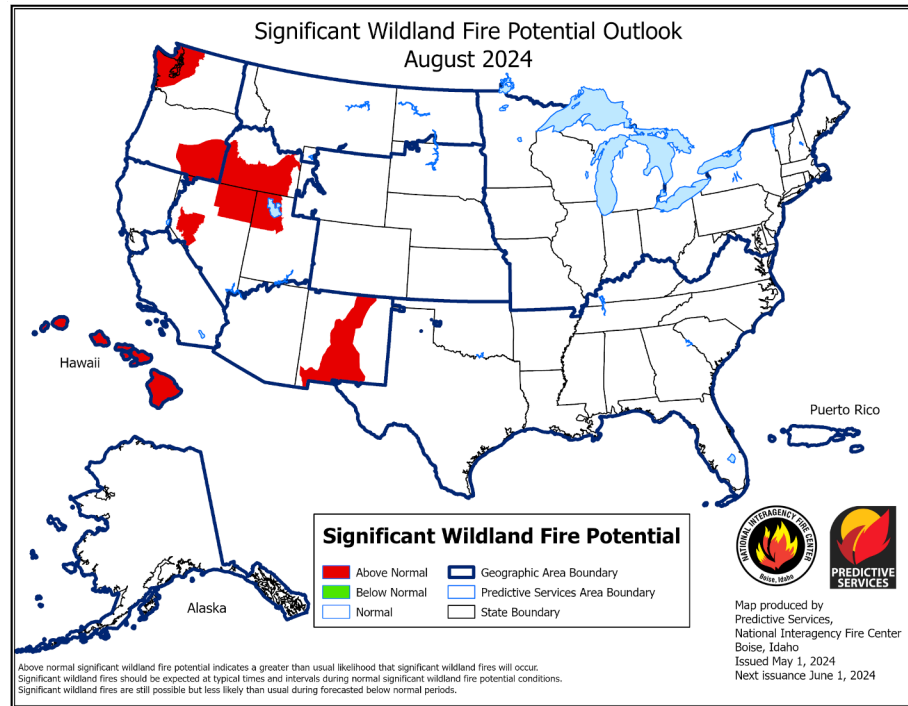
July 2024

August 2024

Significant Wildland Fire Potential Outlook
July 2024



Significant Wildland Fire Potential Outlook
August 2024



USDA



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RECLAMATION



Highlight of the Month: Water Supply Forecast Methods



NRCS-NWCC Water Supply Program

Statistical Water Supply Forecasting at NRCS

Persephone 0.3.39 NF Shoshone R at Wapiti (10080012)

Models BUILD FORECAST

Base standarddaily | Apr F - Jul L 1991-2020 | 30

Apr-Jul Apr F thru Jul L

Apr-Sep Apr F thru Sep L

June | Jun 1-Jul 1 Jun F thru Jul L

June | Jun 1-Sep 1 Jun F thru Sep L

May | May 1-Jul 1 May F thru Jul L

05-01 standarddaily | May F - Jul L 1991-2020 | 30

Forecast Complete

Forecast for water year: 2024

Round Training Statistics

Publishing Status: Ready for Final Publication

WCIS OUTPUT	FORECAST OUTPUT	WCIS DATA	FORECAST STATS	NOTES					
Model	y90	y70	frwrd_prd	y30	y10	Pruned by M4	Custom	External	Plot
ensemble	315000	350000	380000	415000	460000				
PCANN	283628.3535	333279.3919	367602.8010	401926.2101	451577.2485				
PCANN-BC	303027.7120	339693.5943	367602.8010	397804.9248	445938.1339				
PCMCQRNN	294876.0513	333234.5685	371593.1591	409951.8095	448310.5061				
PCQR	300960.8937	334268.3739	371981.1372	421027.1061	476345.3946				



NRCS-NWCC Water Supply Program

Statistical Water Supply Forecasting at NRCS

Traditionally:

Linear Regression

$$Q_{Vol} \approx AX_{SNOW} + BX_{PRECIP} + C$$

Traditionally:
Linear Regression

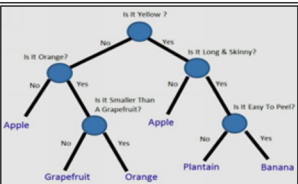
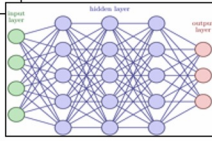
$$Q_{Vol} \approx AX_{SNOW} + BX_{PRECIP} + C$$

Now:

Ensemble of ML + Linear Regression Techniques

6 independent model building techniques

PCR, QR, SVM, ANN, QRNN, RF

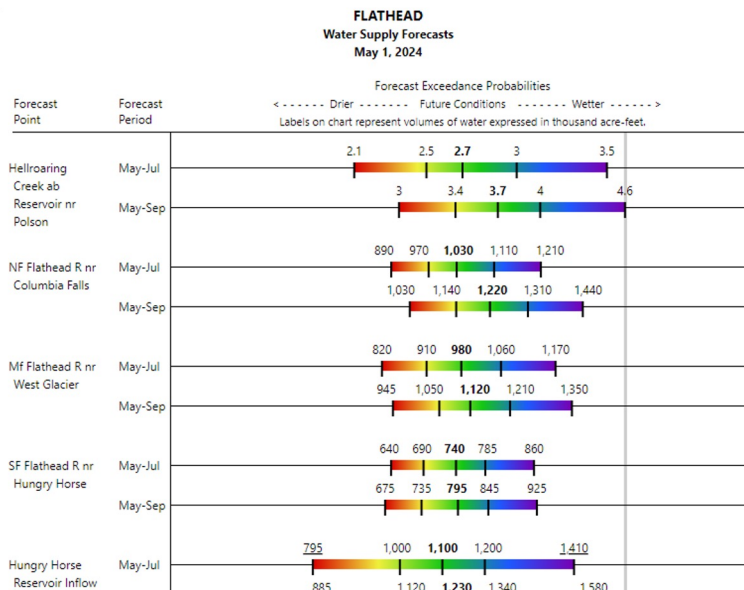
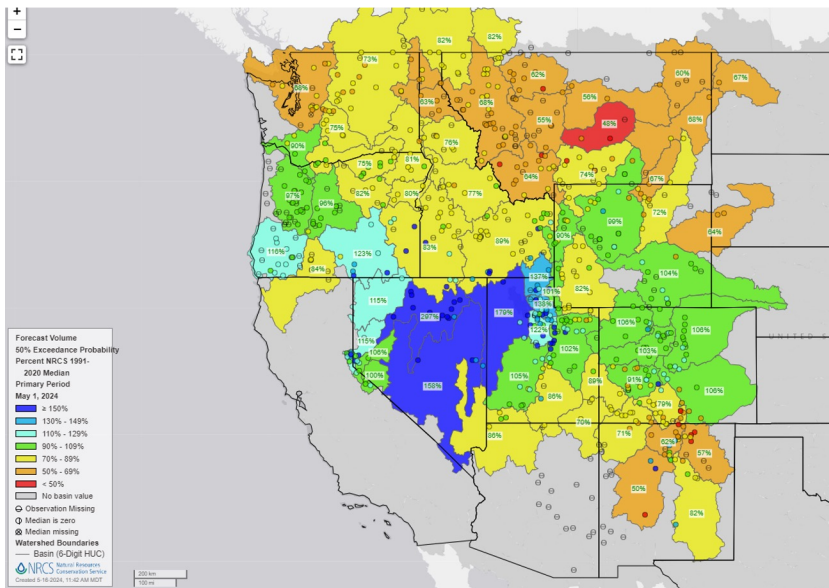
$$Q_{Vol} \approx \left\{ \begin{array}{l} \min_{\theta} C \sum_{i=1}^m \left[y^{(i)} \text{cost}_1(\theta^T x^{(i)}) + (1 - y^{(i)}) \text{cost}_0(\theta^T x^{(i)}) \right] + \frac{1}{2} \sum_{j=1}^n \theta_j^2 \\ \begin{array}{l} \text{Decision Tree Diagram} \\ \text{Neural Network Diagram} \end{array} \end{array} \right\}$$





NRCS-NWCC Water Supply Program

Statistical Water Supply Forecasting at NRCS

All Forecasts available on the iMap and in our Forecast Charts



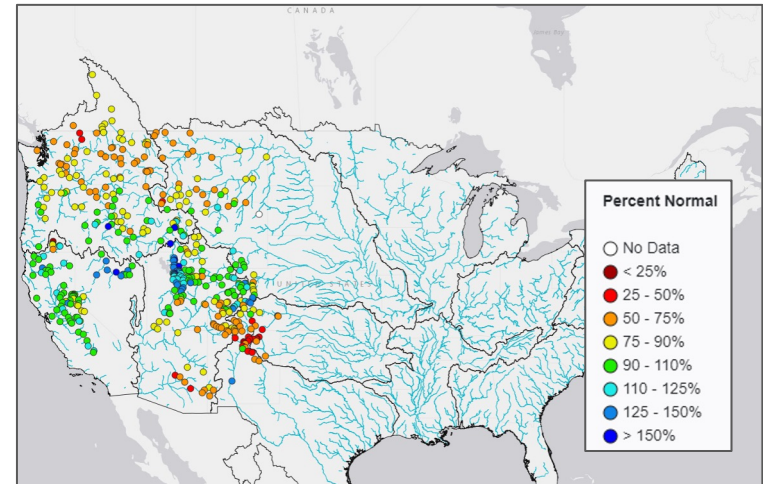
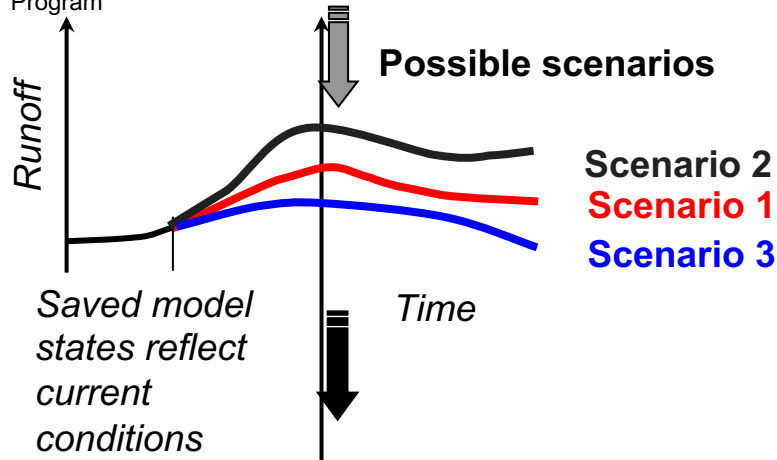


National Weather Service Water Supply Program

Probabilistic Forecasts for accumulated runoff

- Similar to Ensemble Streamflow Prediction (ESPs), use historical data as forcings for our hydrologic model using today's conditions
- Run daily; official forecasts issued based on conditions on the 1st of the month

©The COMET Program





National Weather Service Water Supply Program

Probabilistic Forecasts

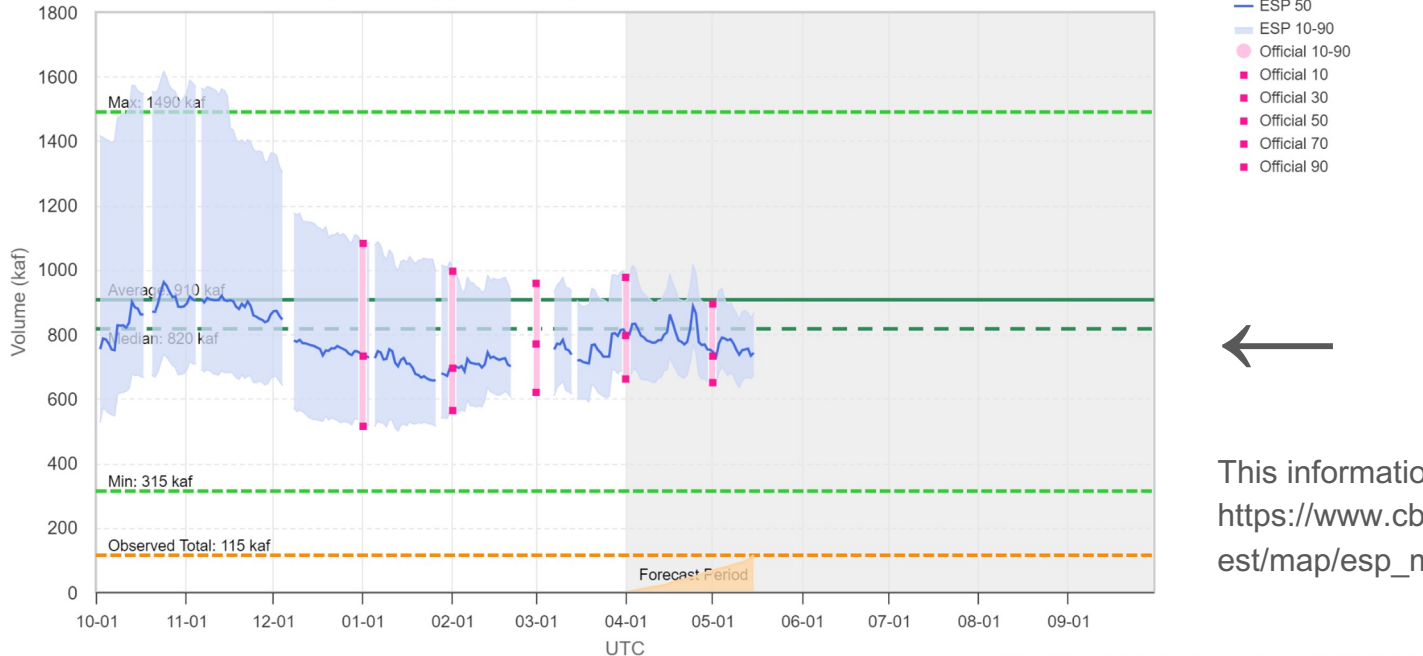
2024 Water Supply Forecast - Buffalo Bill Reservoir Inflow (CDYW4)

ESP is Unregulated and Includes 120 Hour Precipitation Forecast

Official 50% Fcst (2024-05-01): 733 kaf (81% Avg, 89% Med)

ESP 50% Fcst (2024-05-16): 704 kaf (77% Avg, 86% Med)

Observed Volume: 115 kaf (13% Average, 14% Median)



This information can be found at
https://www.cbrfc.noaa.gov/wsup/graph/west/map/esp_map.html

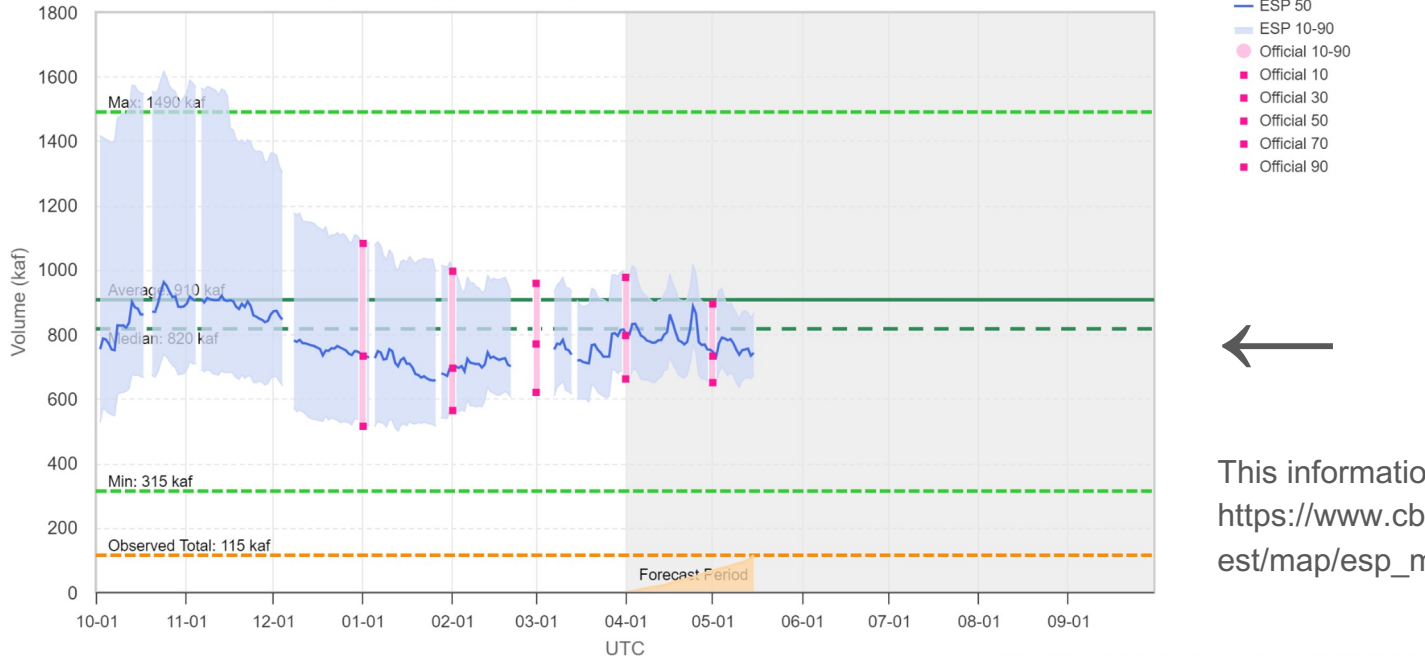


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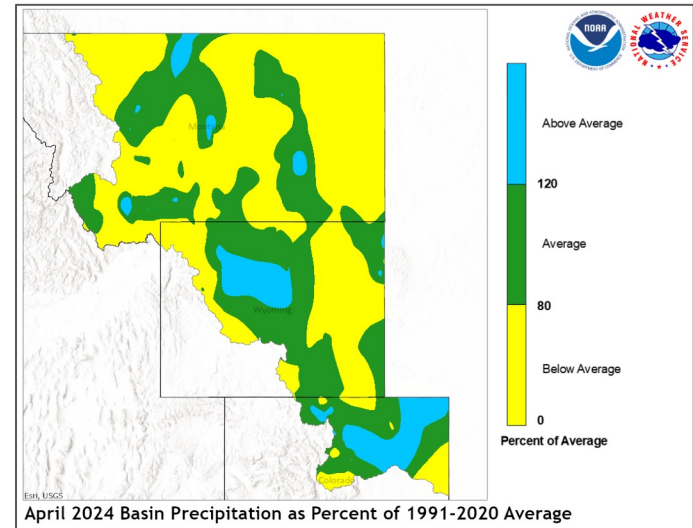
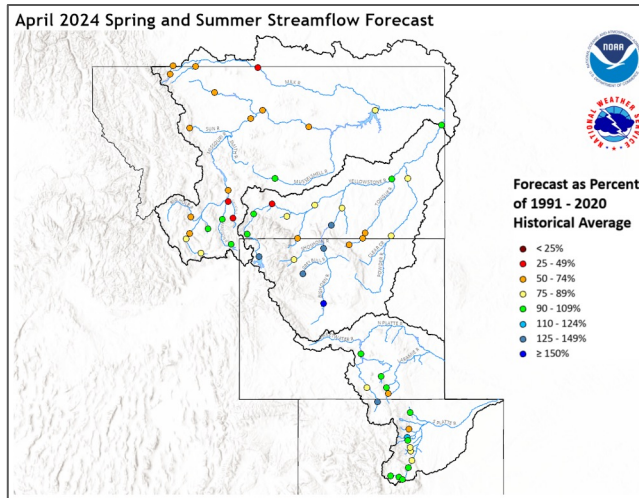
National Weather Service Water Supply Program

Probabilistic Forecasts

Precipitation Normals + Graphical Forecast

– Summary of water supply forecasts and information about precipitation normals can be found at the MBRFC website

https://www.weather.gov/mbrfc/water_supply





USBR Water Supply Program

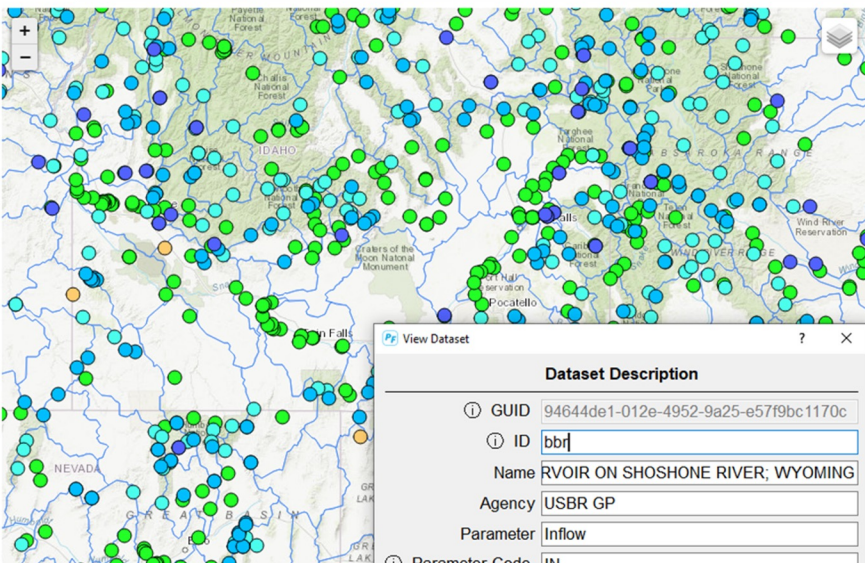
Statistical Water Supply Forecasting at USBR

PyForecast Software

PyForecast V5.0.12

File

Datasets Data Model Configurations Saved Forecasts



Datasets

Buffalo Bill Reservoir On Shoshone River; Wyoming

ID: bbr
Agency: USBR GP
Parameter: Inflow
Unit: cubic feet per second

North Fork Shoshone

ID: 10080012
Agency: Regional Climate Center
Parameter: Precipitation
Unit: inches

North Fork Shoshone

ID: 10080012
Agency: Regional Climate Center
Parameter: Temperature
Unit: degrees fahrenheit

View Dataset

Dataset Description

① GUID 94644de1-012e-4952-9a25-e57f9bc1170c

① ID

Name

Agency

Parameter

① Parameter Code

① Raw Units (flow) cfs - cubic feet per second

Work/PyForecast/2024_Forecasts_BOR/Buffalo Bill.fcst



USBR Water Supply Program

Statistical Water Supply Forecasting at USBR

PyForecast Software

Ensemble of Linear Regression Models

$Q_{Vol} \approx AX_{SNOW} + BX_{PRECIP} + C$

$Q_{Vol} \approx AX_{Drought} + BX_{Flow} + CX_{Snow}$

$Q_{Vol} \approx AX_{Climate} + BX_{Precip} + CX_{Snow}$

Parameter: Inflow
① Parameter Code: IN
① Raw Units: (flow) cfs - cubic feet per second
Unit: degrees fahrenheit
Work/PyForecast/2024_Forecasts_BOR/Buffalo Bill.fcst



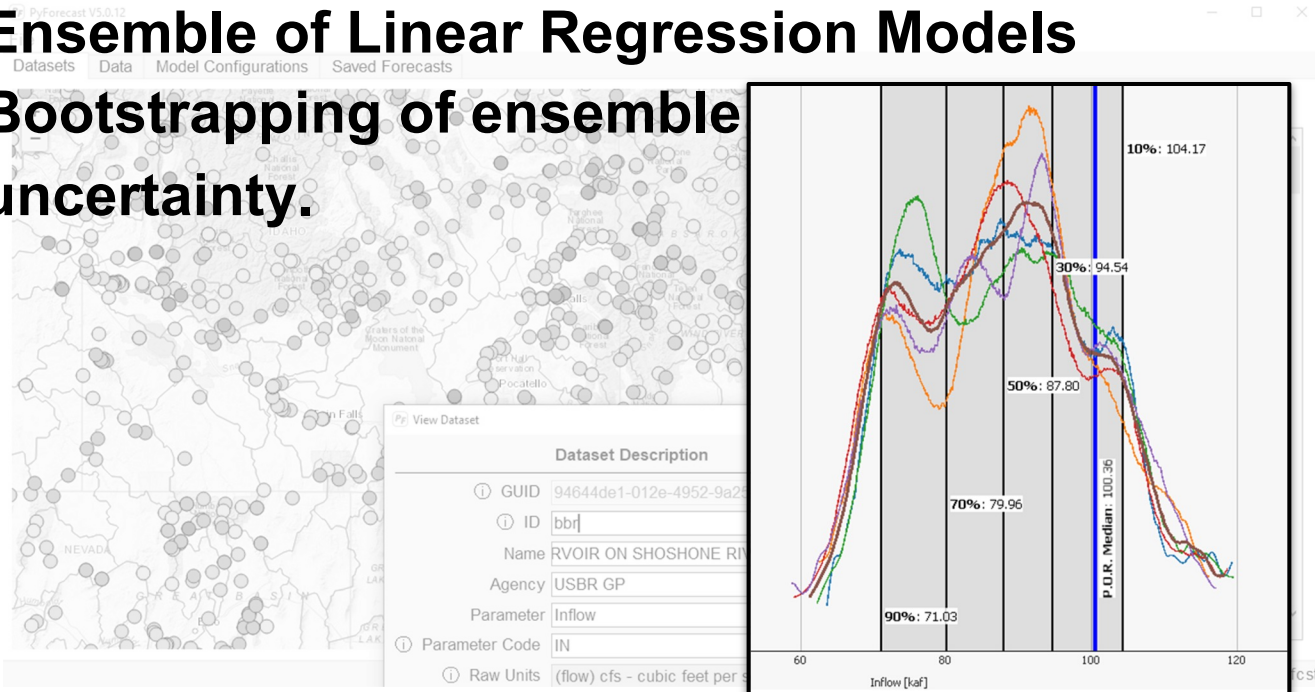
USBR Water Supply Program

Statistical Water Supply Forecasting at USBR

PyForecast Software

Ensemble of Linear Regression Models

Bootstrapping of ensemble uncertainty.





— BUREAU OF —
RECLAMATION



Tony Bergantino
WRDS & State Climate Office
antonius@uwyo.edu

Casey Cheesbrough
Bureau of Land Management (BLM)
ccheesbrough@blm.gov

The Wyoming Conditions Monitoring Team (WCMT) organized and hosted this webinar. The WCMT is a collaborative effort of state, federal, tribal, and university partners that monitor conditions & impacts throughout the state on a weekly basis – and communicate this information to the U.S. Drought Monitor among others.

Learn more at:
<https://drought.wyo.gov>

Aaron Fiaschetti
USGS
afiaschetti@usgs.gov

Kevin Foley
USDA NRCS
kevin.foley@usda.gov

George Finnegan
Bureau of Reclamation
gfinnegan@usbr.gov

Alex Caruthers
NOAA NWS MBRFC
alex.caruthers@noaa.gov

Tony Anderson
National Weather Service
Cheyenne
tony.anderson@noaa.gov

Dannele Peck
USDA Northern Plains Climate Hub
dannele.peck@usda.gov

Thank you!