WY Conditions & Outlooks:

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

July 20, 2023

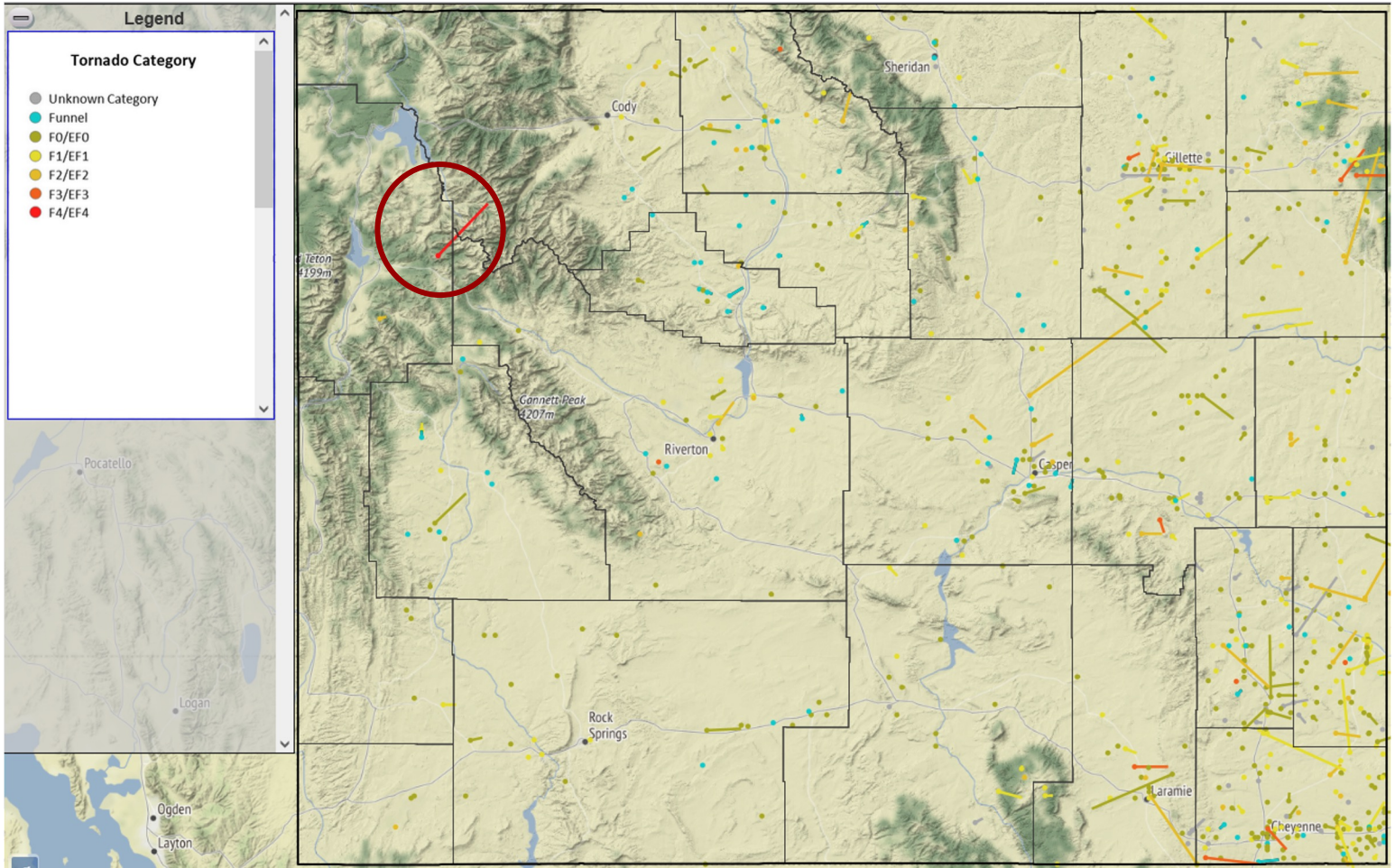
Presentation Outline

- **Current Conditions:** Overview
  - Drought, Temperature, Precipitation, Soils
  - Streamflow
  - Water Calls & Allocations
- **Outlooks:** Temperature & Precipitation
  - Fuels' Status & Wildland Fire Outlook
- **Highlight of the Month**
  - Wildland Fire Information & Resources
- **Questions**

Current Conditions

WRDS
Water Resources Data System

36 years ago tomorrow: Afternoon of 21 July 1987
Wyoming's only known F4 Tornado



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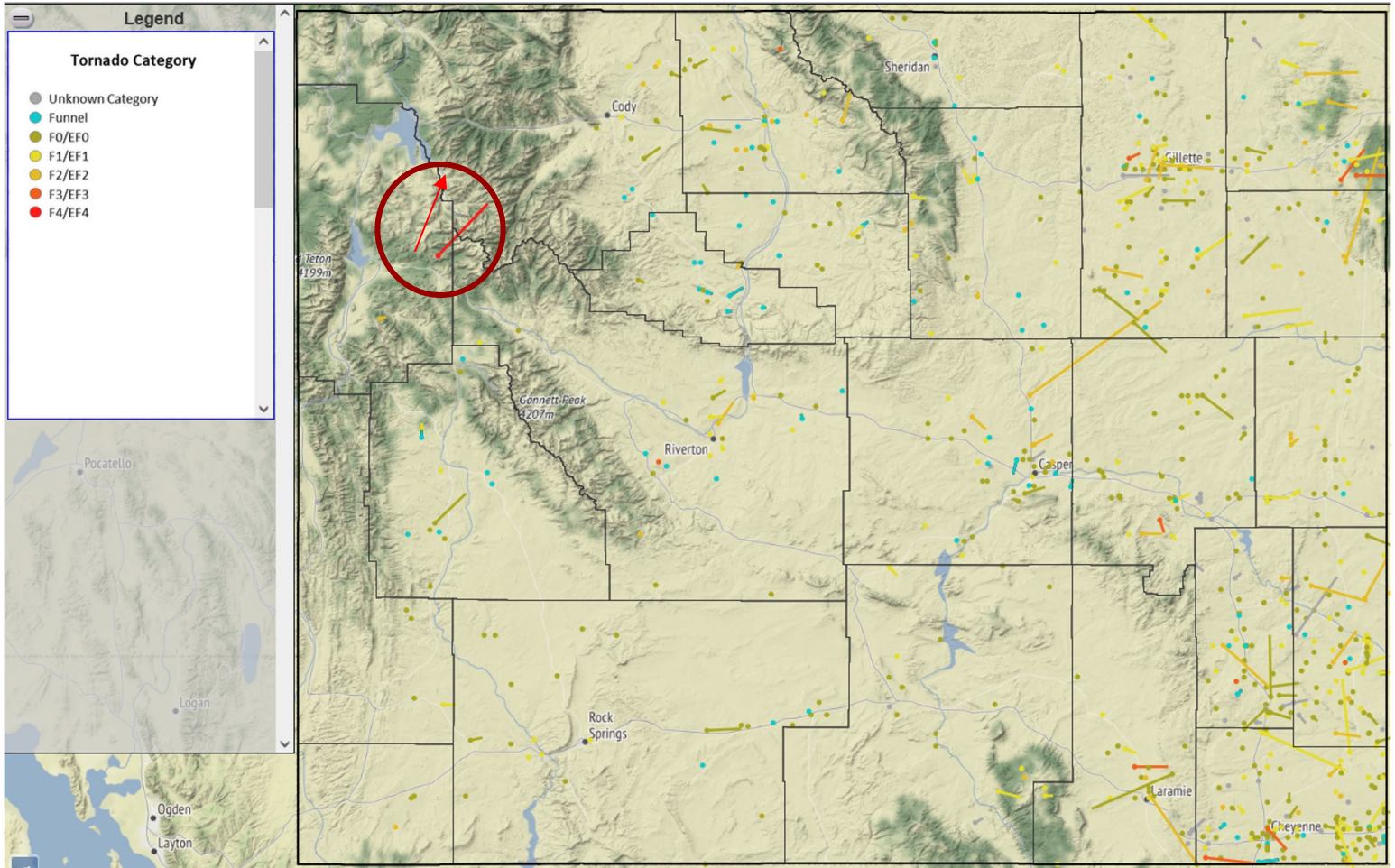
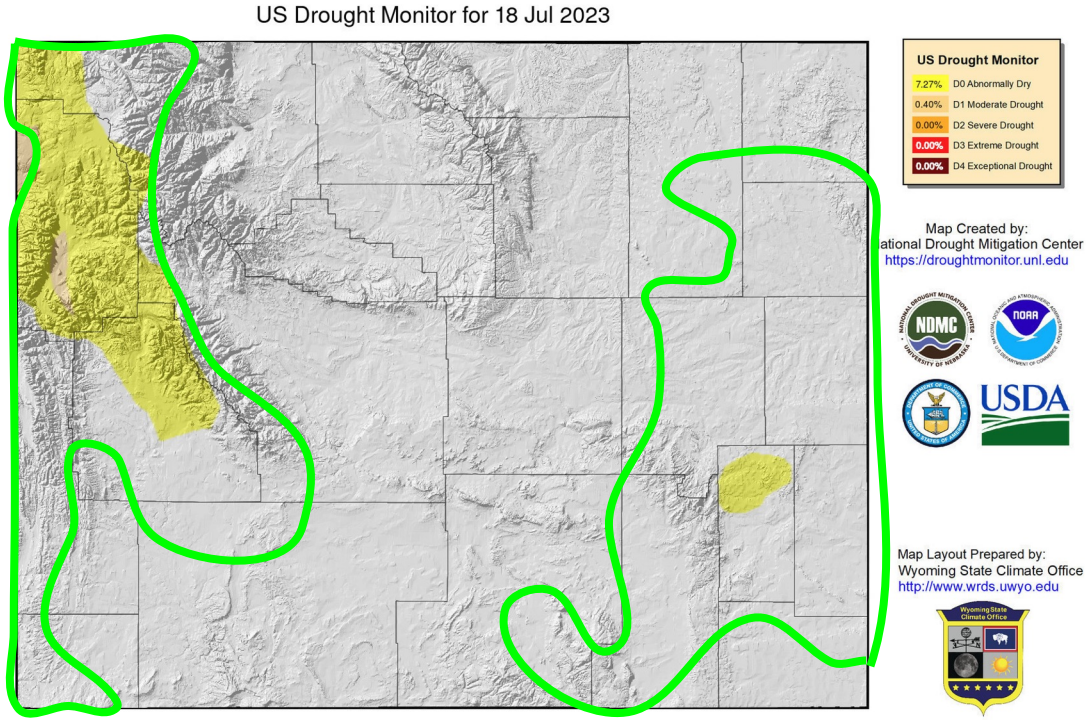


US Drought Monitor for July 18, 2023

(Released Thursday, July 20, 2023)

Valid 8 a.m. EDT

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



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 20 Jul 2023 http:/www.wrds.uwyo.edu

https://youtu.be/45MQ1GB-uTc

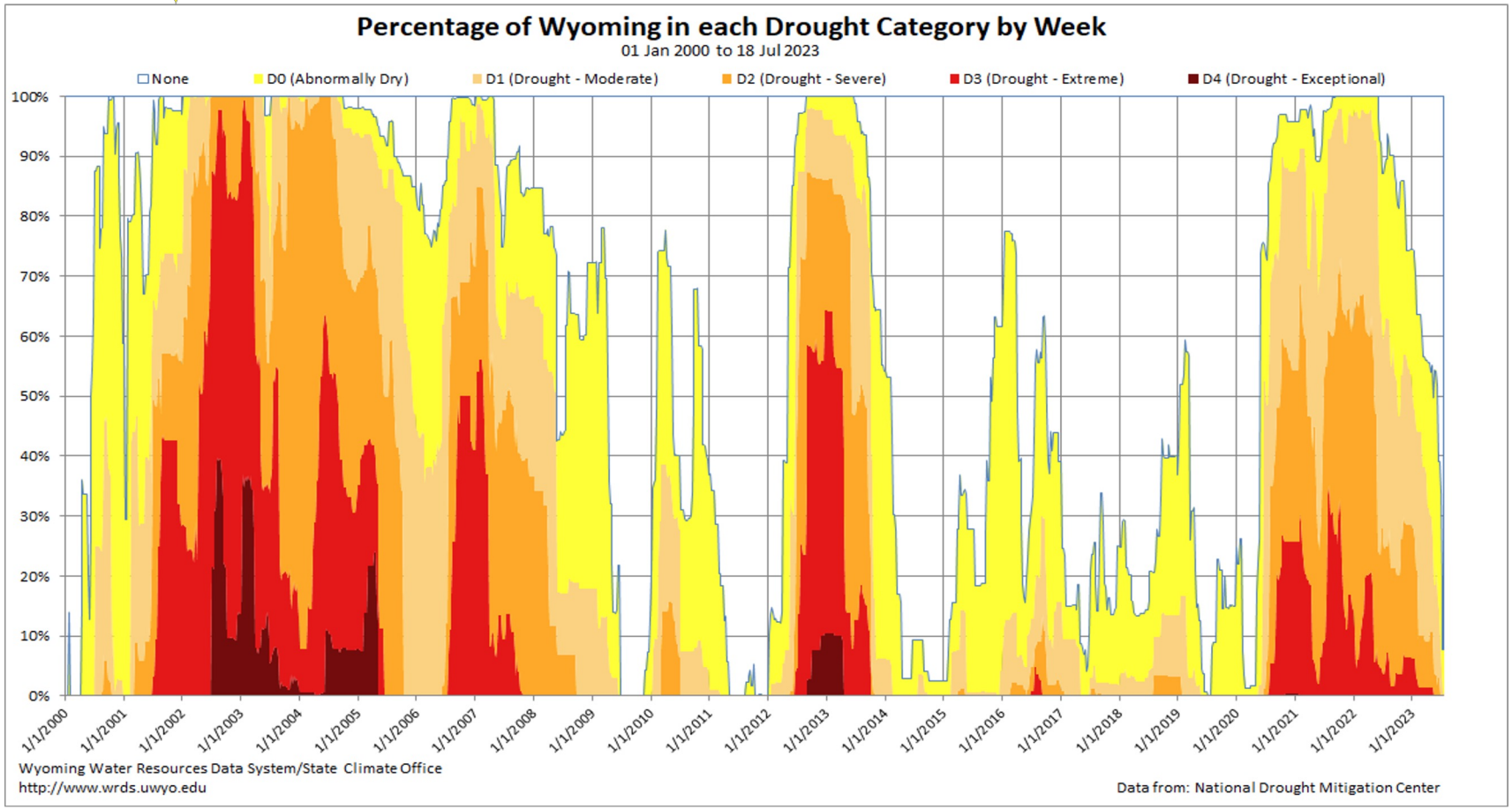
Improvements since the last webinar <u>almost</u> everywhere that had some sort of drought level present.

https://droughtmonitor.unl.edu

droughtmonitor.unl.edu

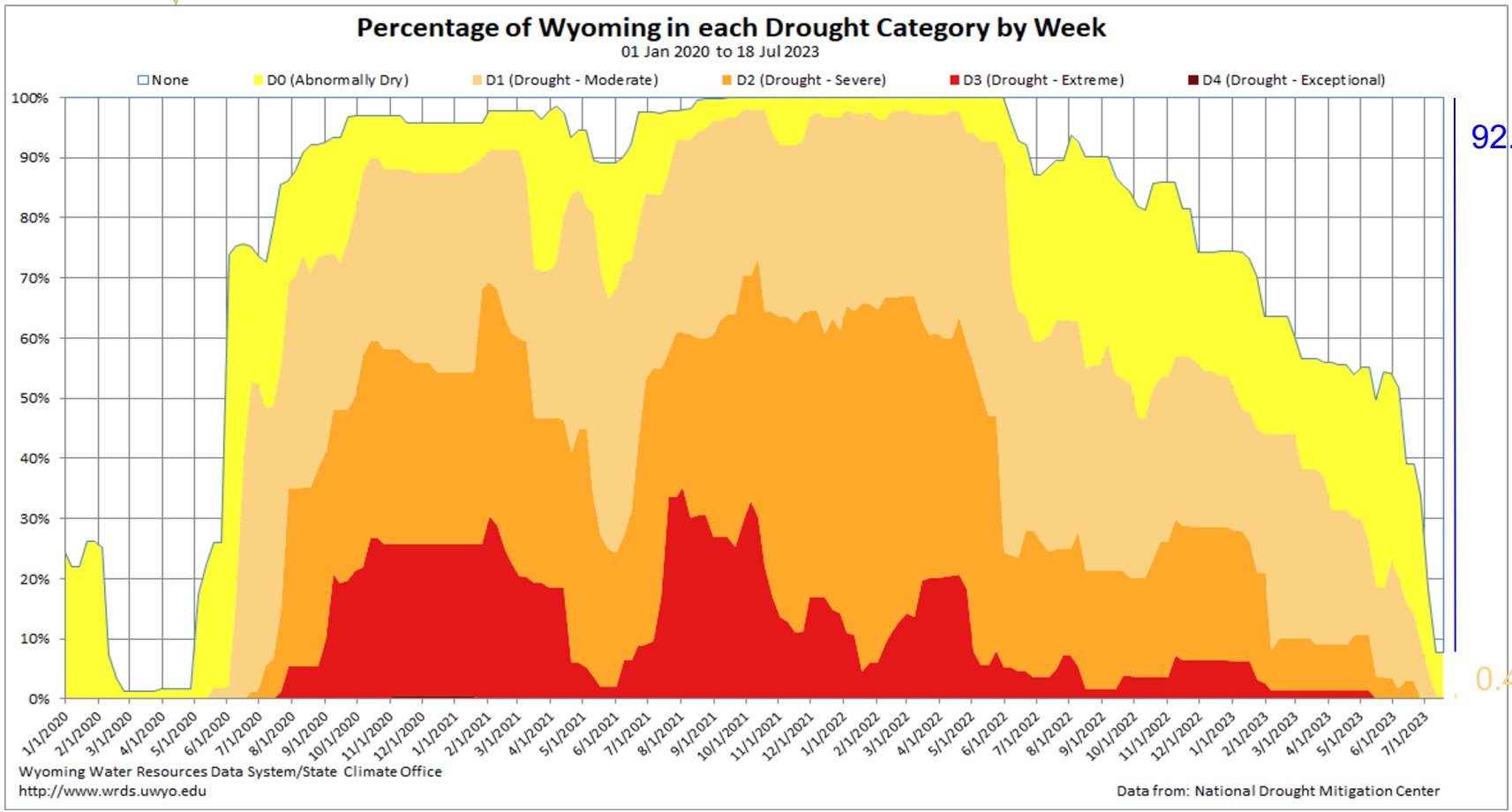
A decrease of 15.92% from the last Webinar

Wyoming Area Affected: 7.66% D0-D4 ; 0.40% D1-D4



http://www.wrds.uwyo.edu/drought/droughttimeline.html

WRDS
Water Resources Data System



http://www.wrds.uwyo.edu/drought/droughttimeline.html

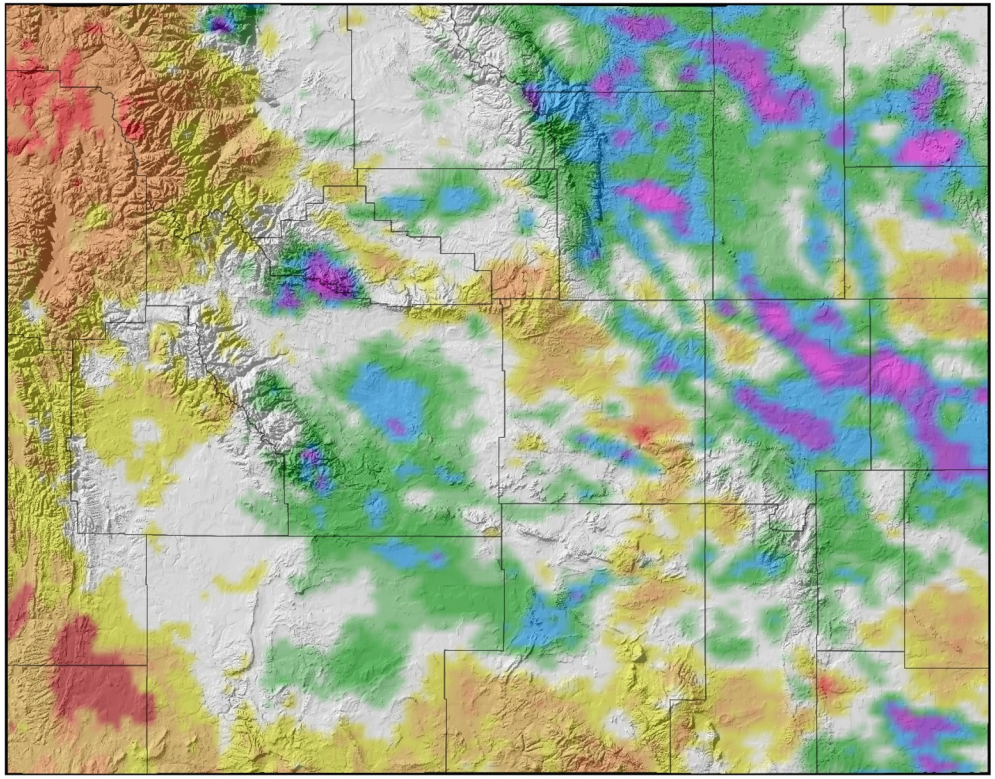
14-Day Precipitation Percentile (06 Jul 2023 to 19 Jul 2023)

Above Median:

- Southern Laramie, Northeast with exceptions
- Southern Fremont, Northeastern Sweetwater, Northwestern Carbon

Below Median (Areas of Concern):

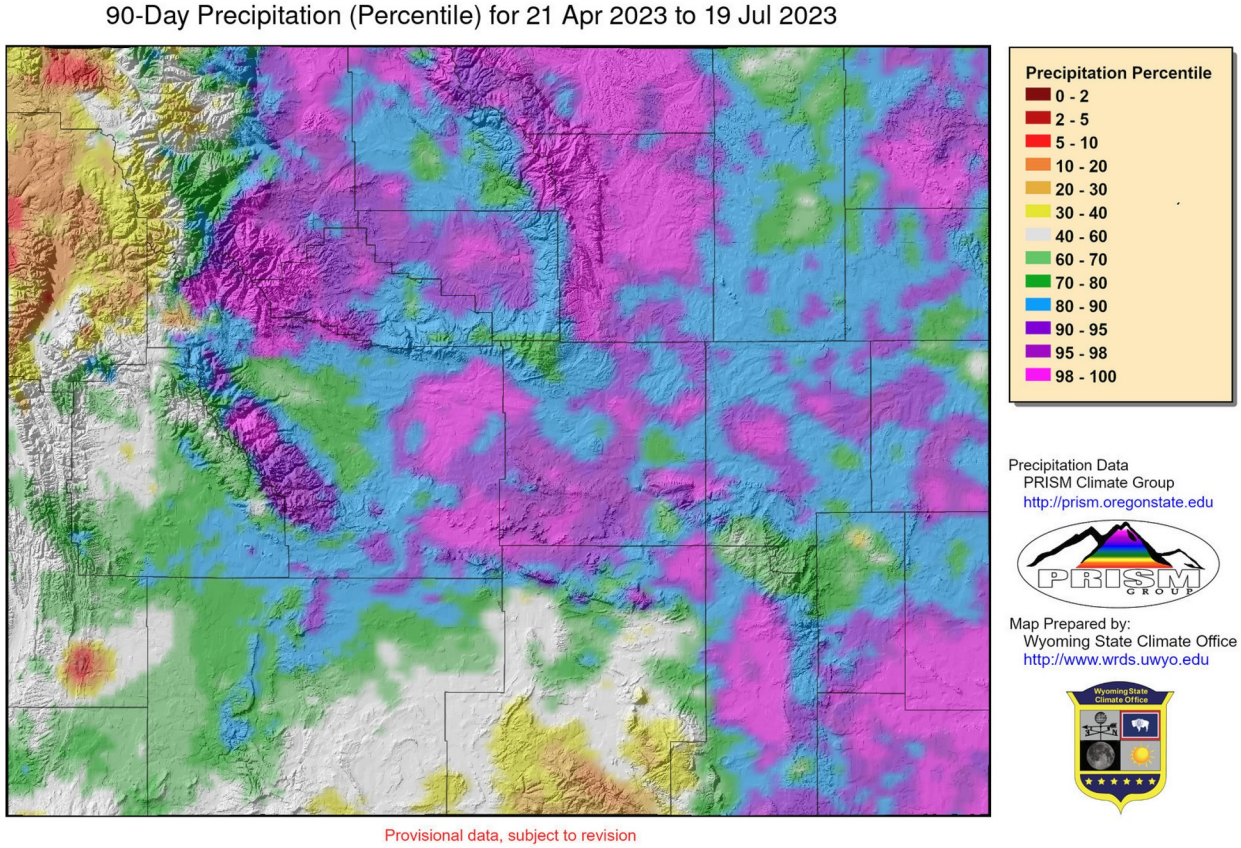
- Far southern Carbon, Sweetwater
- Uinta, Lincoln, Teton, Western Park
- Southern Goshen and Albany
- Southern Weston/Northern Niobrara



90-Day Precipitation Percentile (21 Apr 2023 to 19 Jul 2023)

Above Median:
- Much of Wyoming

Below Median (Areas of Concern):
- Northwest Wyoming
- Little Snake Basin



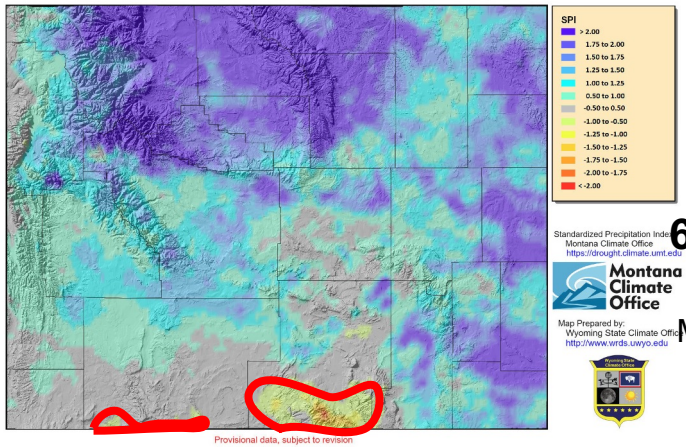
WRDS Water Resources Data System

Standardized Precipitation Index (SPI)

Short term: Southern Carbon
Long term: Tetons

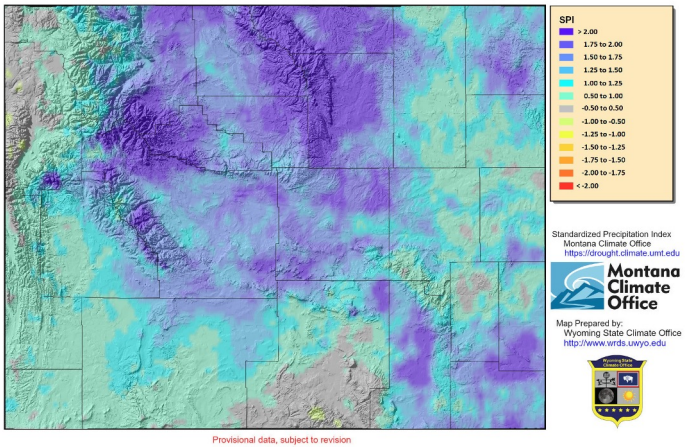
30-Day →

Jun 19 - Jul 18

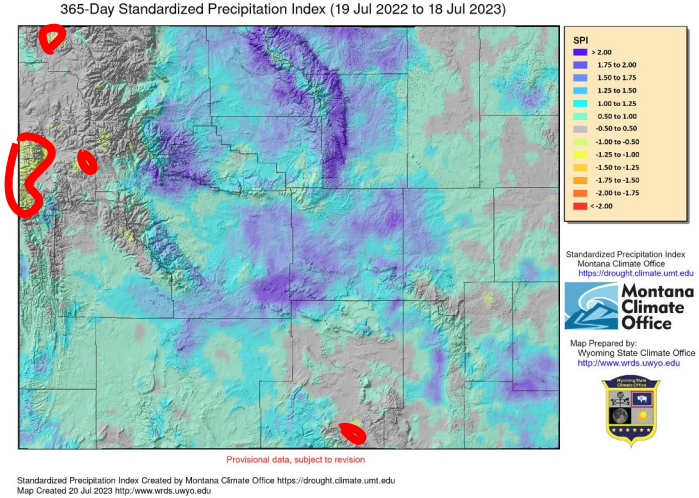


60-Day →

May 20 - Jul 18



1-Year →



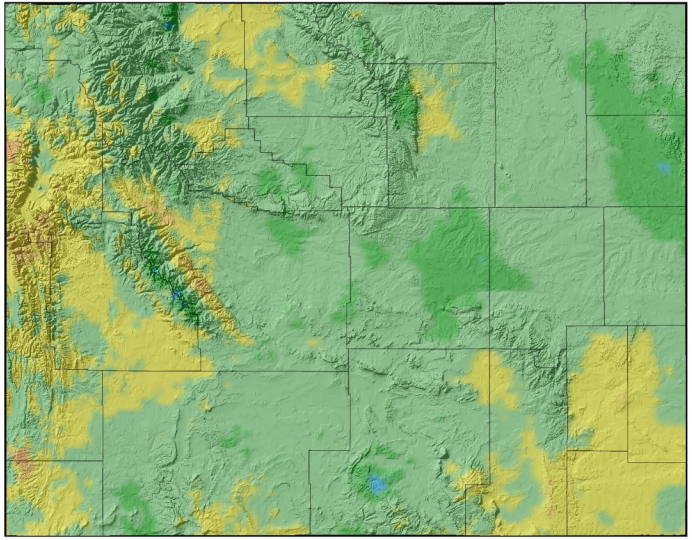
https://drought.climate.umt.edu

WRDS Water Resources Data System

14-Day Average Minimum Temperature (06 Jul to 19 Jul)

- Highest elevation mins right about freezing
- Northwest generally 30s to low 40s
- BH Basin, much of the plains 50s

14-Day Average Minimum Temperature (Departure from 1991-2020 Average) for 06 Jul 2023 to 19 Jul 2023



Temperature Departure from Normal (F)
- < -15
- -15 to -12
- -12 to -9
- -9 to -6
- -6 to -3
- -3 to 0
- 0 to 3
- 3 to 6
- 6 to 9
- 9 to 12
- 12 to 15
- > 15

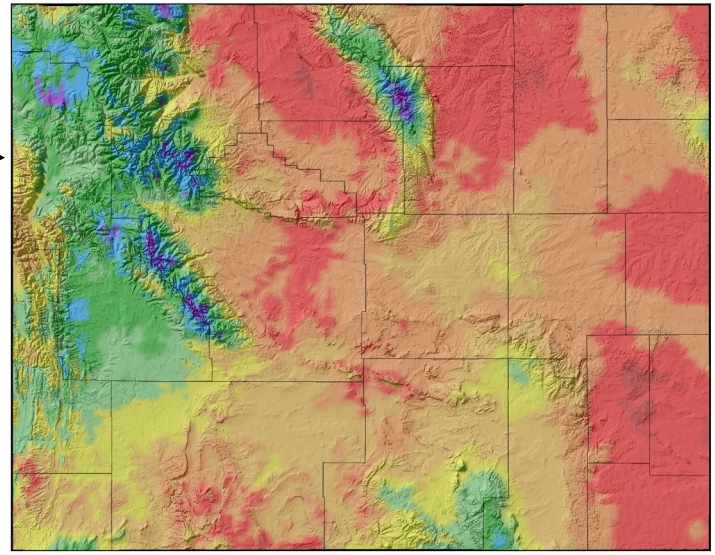
Temperature Data
PRISM Climate Group
http://prism.oregonstate.edu

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 20 Jul 2023 http://www.wrds.uwyo.edu
Temperature averages created from PRISM daily tempWYerature grids

14-Day Average Minimum Temperature for 06 Jul 2023 to 19 Jul 2023



Temperature (F)
- 27 - 30
- 30 - 33
- 33 - 36
- 36 - 39
- 39 - 42
- 42 - 45
- 45 - 48
- 48 - 51
- 51 - 54
- 54 - 57
- 57 - 60
- 60 - 63

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14-Day *Departure from* Normal Average Minimum Temperature

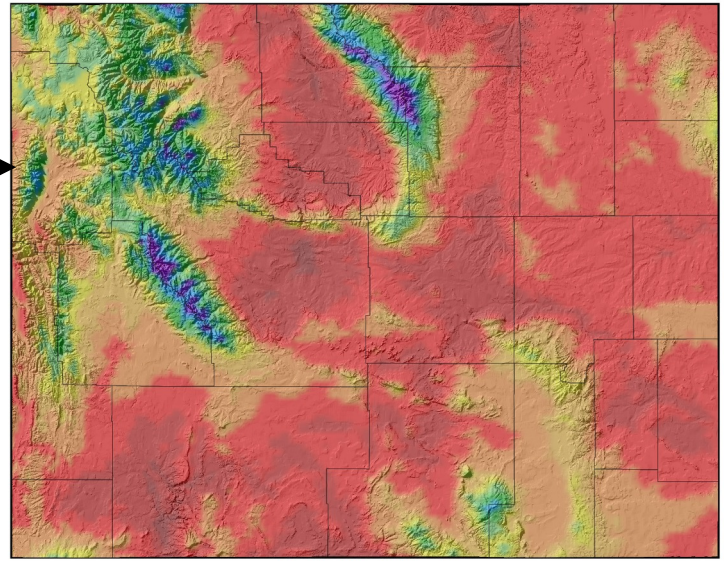
- Above average in southeast and scattered western areas along with northern Bighorn Basin, 0-3F above
- Remainder 0-3F below average with Natrona, Crook, and Weston (along with scattered other areas) being 3-6F below average

WRDS Water Resources Data System

14-Day Average Maximum Temperature (06 Jul to 19 Jul)

- Highs in the 80s except for higher elevations

14-Day Average Maximum Temperature for 06 Jul 2023 to 19 Jul 2023



Temperature (F)
54 - 57
57 - 60
60 - 63
63 - 66
66 - 69
69 - 72
72 - 75
75 - 78
78 - 81
81 - 84
84 - 87
87 - 90

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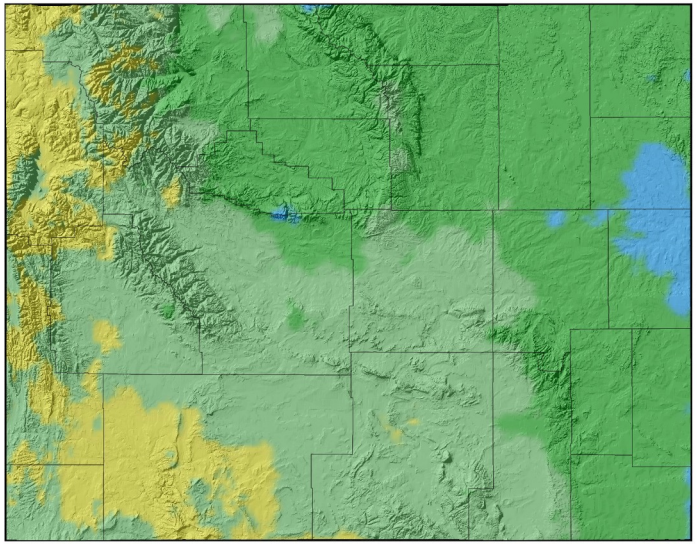
14-Day Average Maximum Temperature (Departure from 1991-2020 Average) for 06 Jul 2023 to 19 Jul 2023



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12 to 15
> 15

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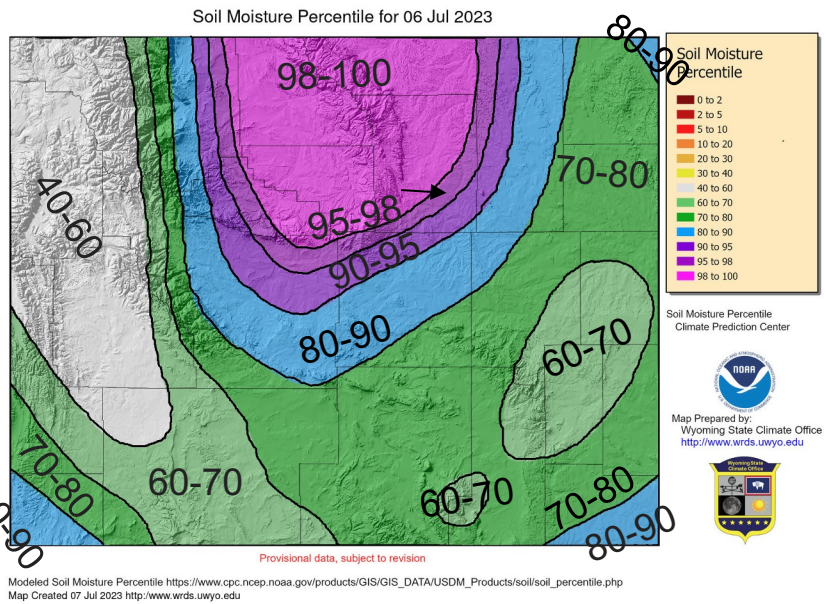
Temperature averages created from PRISM daily tempWYerature grids

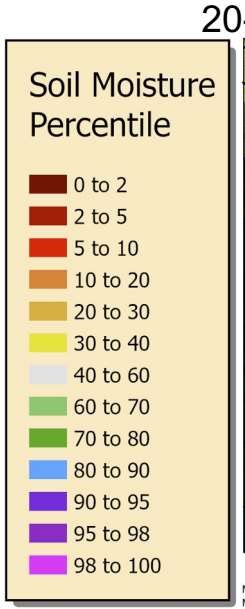
14- Day *Departure from* Normal Average Maximum Temperature

- SE, NW, Far West 0-3F above average
- Remaining SW 2/3s of WY 0-3F below average
- Greater (-) departure as go south, 3-6F below avg
- North and east 3-6F below average except

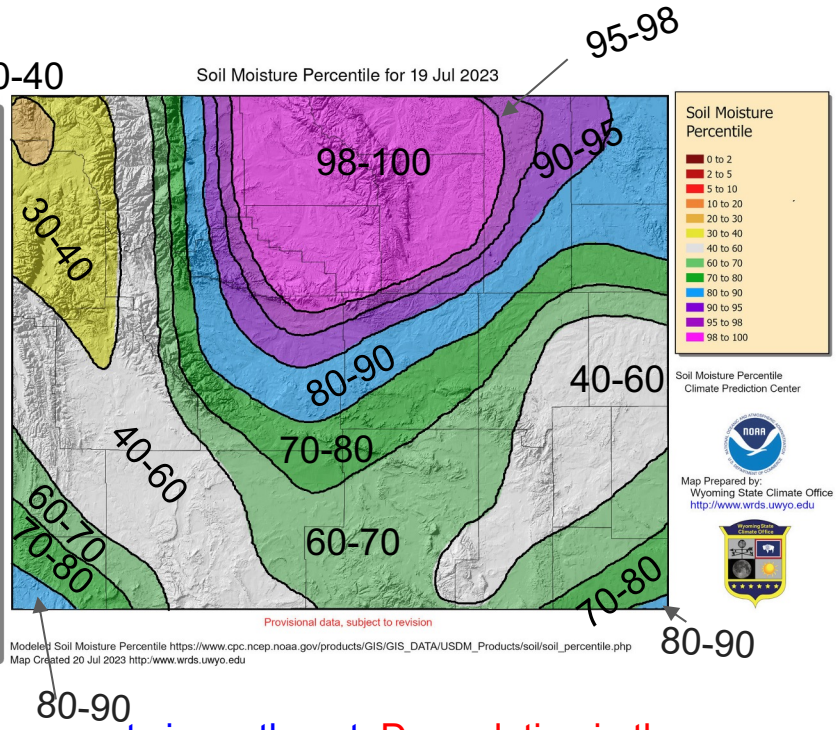
Soil Moisture Percentile

Two Weeks Ago





19 July 2023



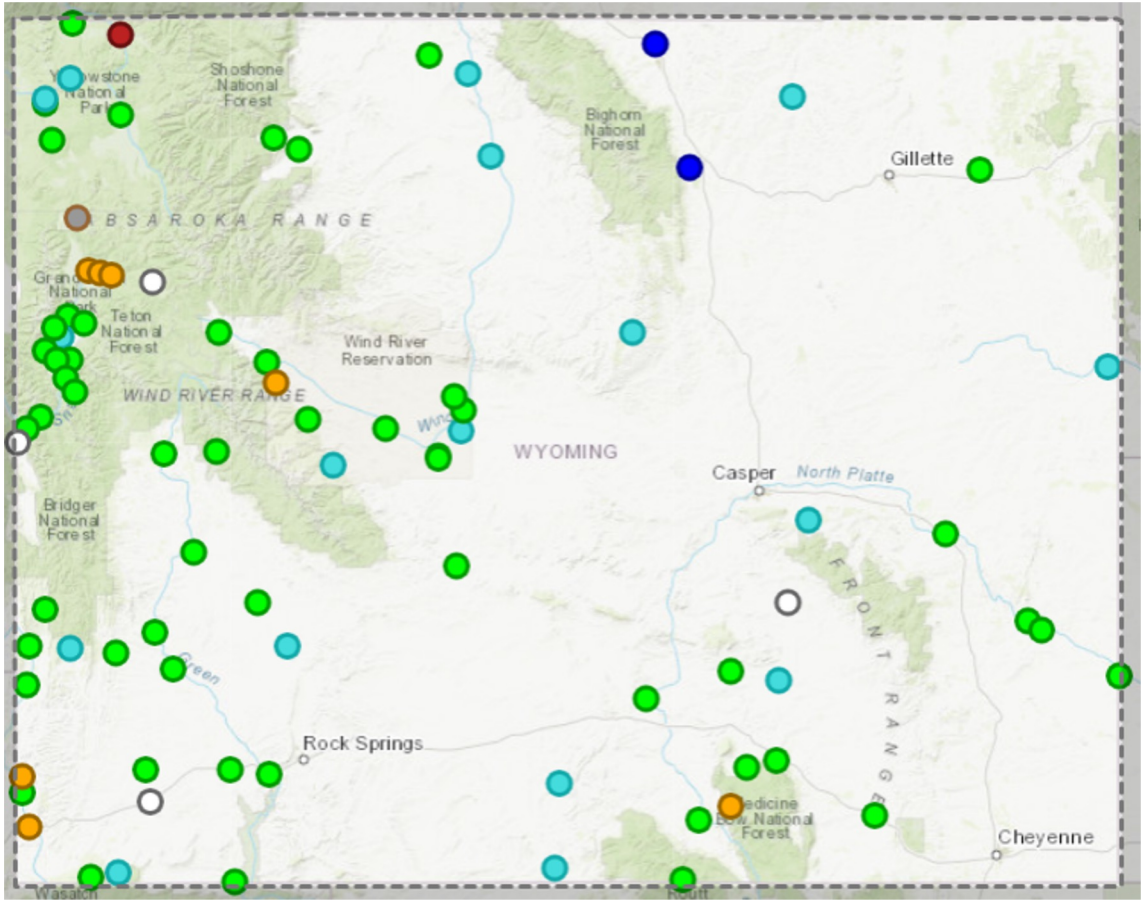
http://www.wrds.uwyo.edu/Soil/Current_SoilMoisture_Ptile.html

Improvements in northeast. Degradation in the northwest extending down into Sweetwater County and then eastward covering much of southeast WY

Current Streamflow Conditions (July 19, 2023)

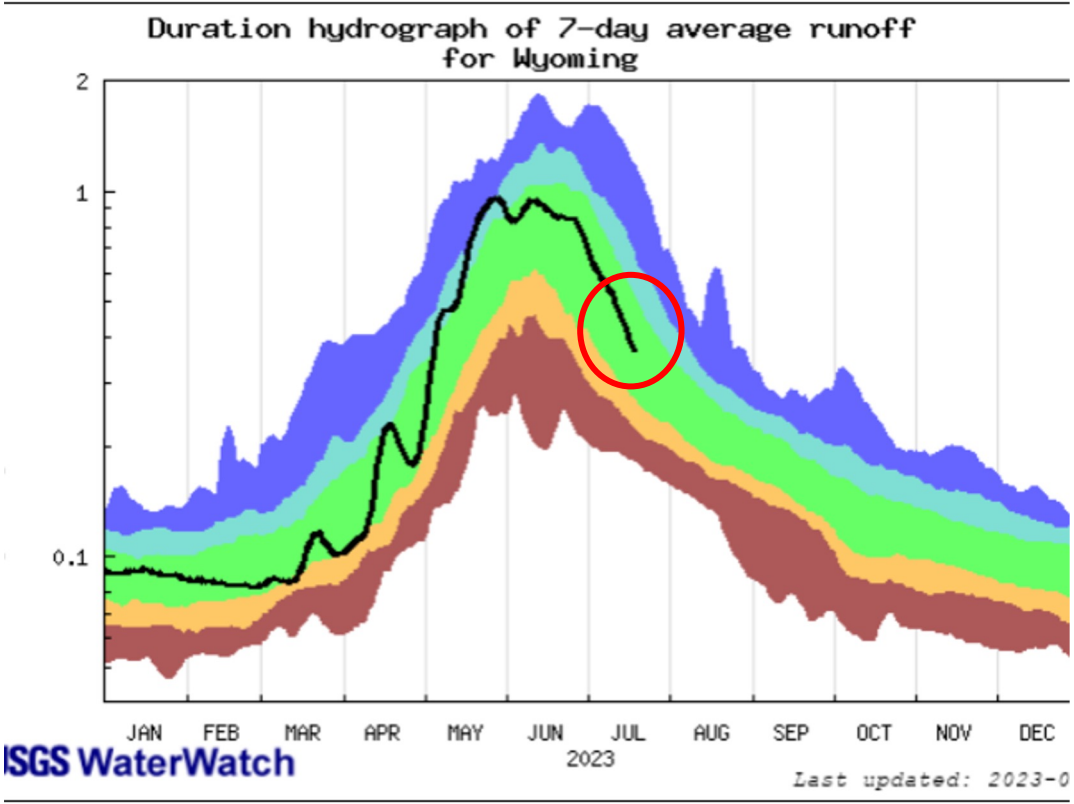
Streamflow Status

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	



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

WY Duration Hydrograph of 7-day runoff



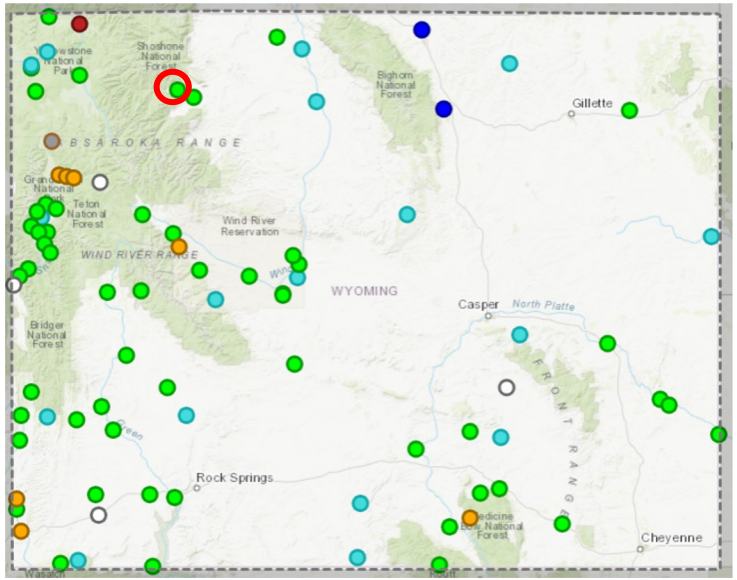
Spring Streamflow

- Falling limb of hydrograph.
- Summer rains helping to sustain normal & above flow conditions

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

https://waterdata.usgs.gov/

Select WY Streamflows

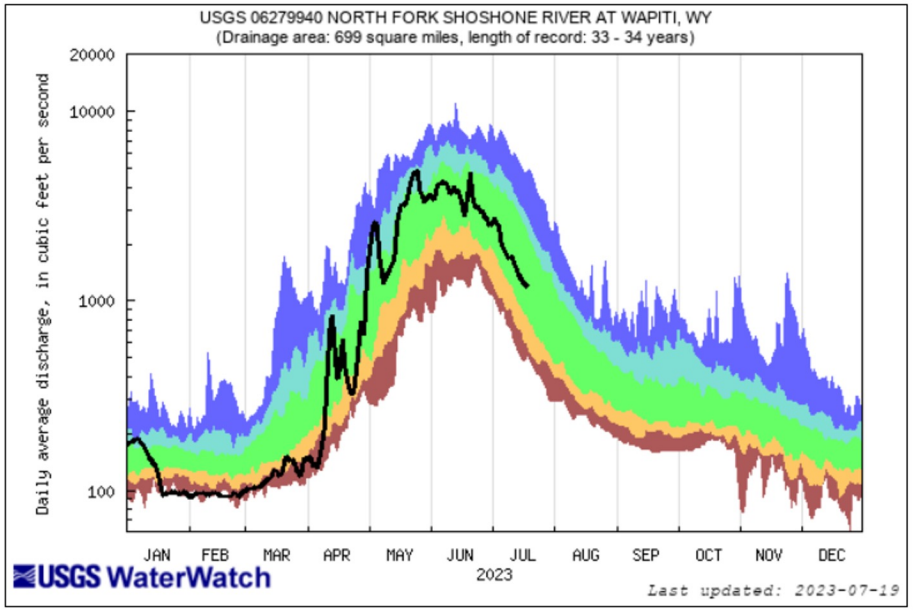


https://dashboard.waterdata.usgs.gov/

https://waterdata.usgs.gov/

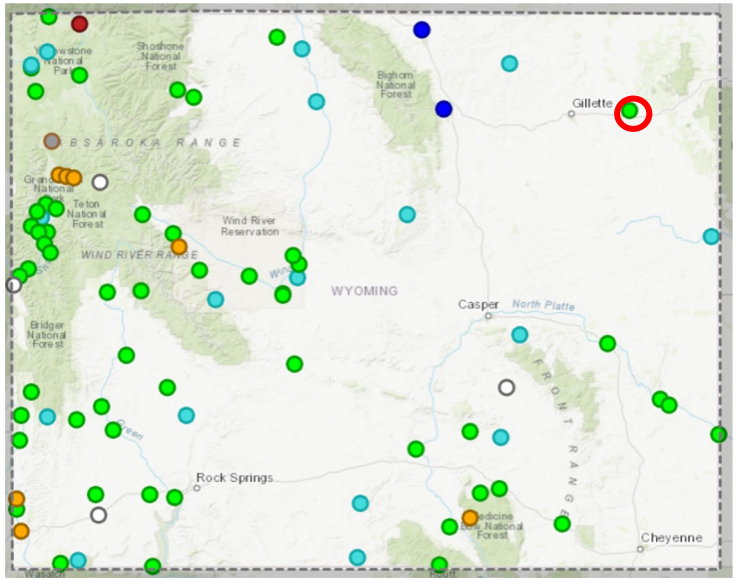
North Fork Shoshone River, WY

Last updated July 19, 2023



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

Select WY Streamflows

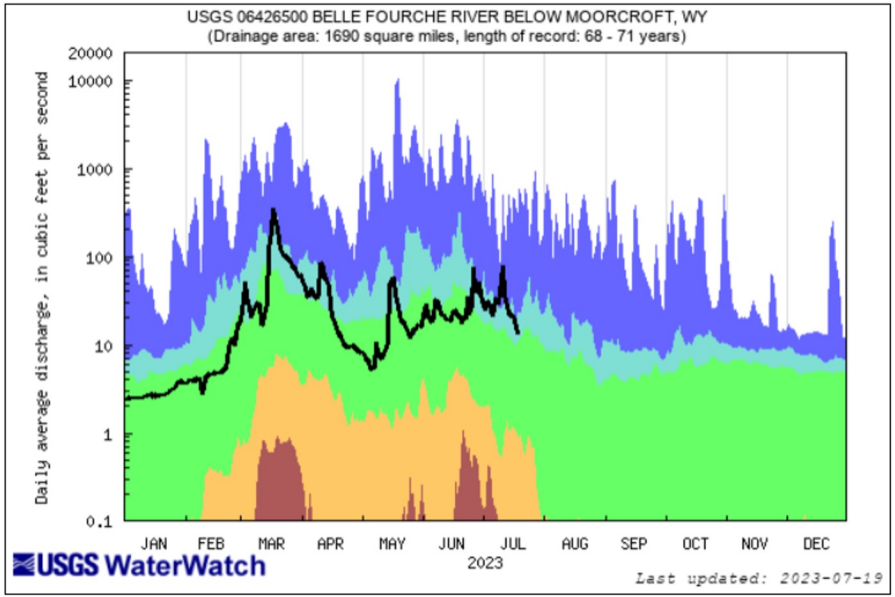


https://dashboard.waterdata.usgs.gov/

https://waterdata.usgs.gov/

Belle Fourche below Moorcroft, WY

Last updated July 19, 2023



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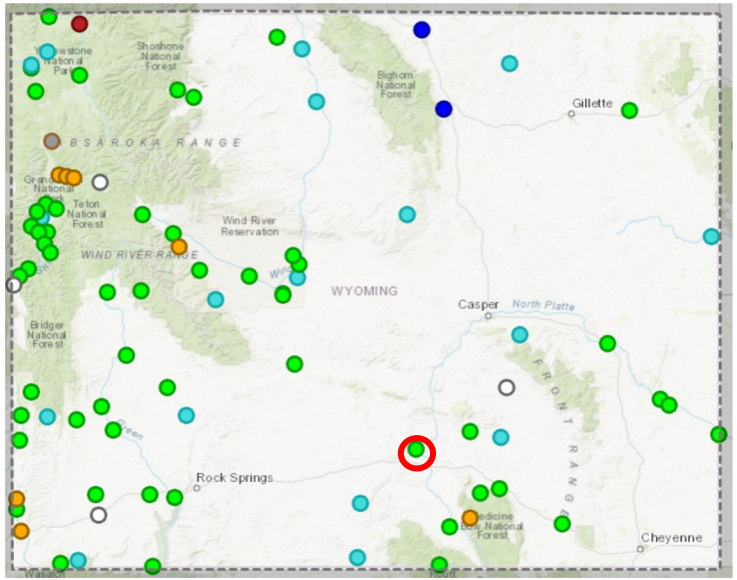
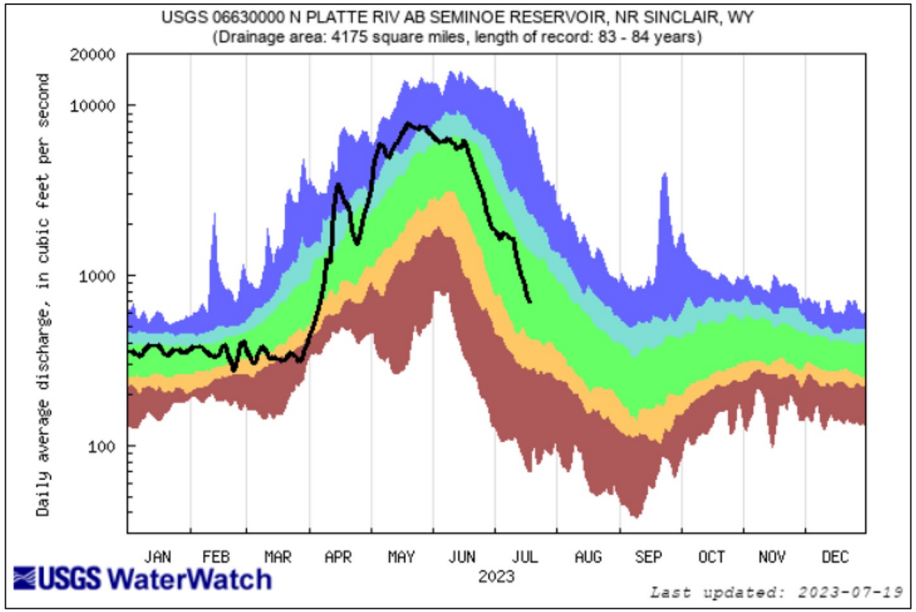


https://dashboard.waterdata.usgs.gov/

https://waterdata.usgs.gov/

North Platte River ab Seminoe Reservoir, WY

Last updated July 19, 2023



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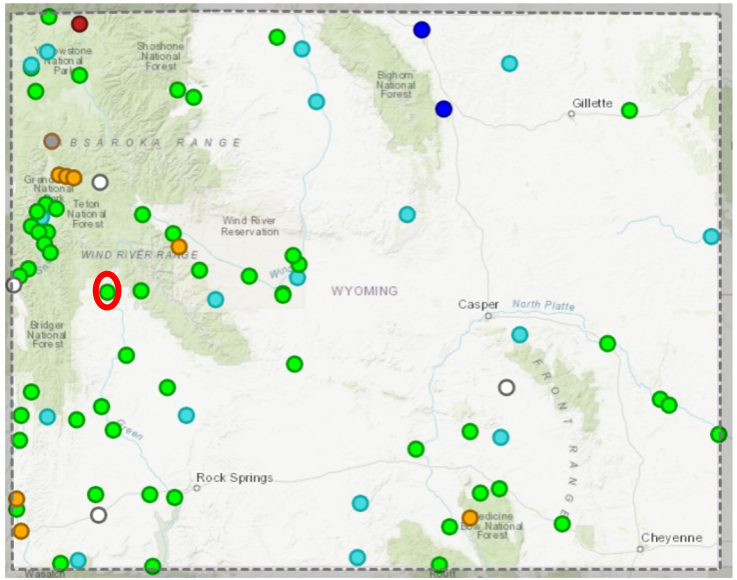
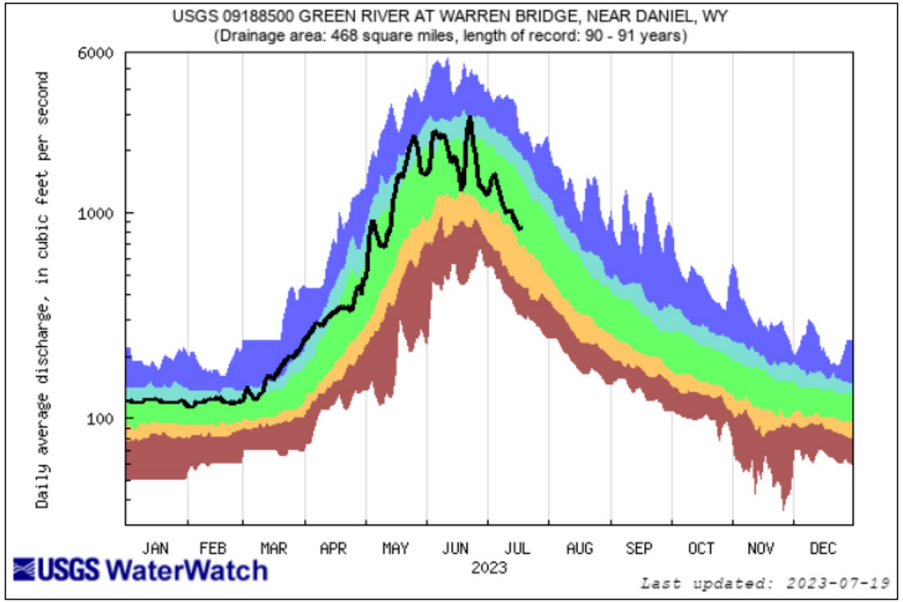


https://dashboard.waterdata.usgs.gov/

https://waterdata.usgs.gov/

Green River near Daniel, WY

Last updated July 19, 2023

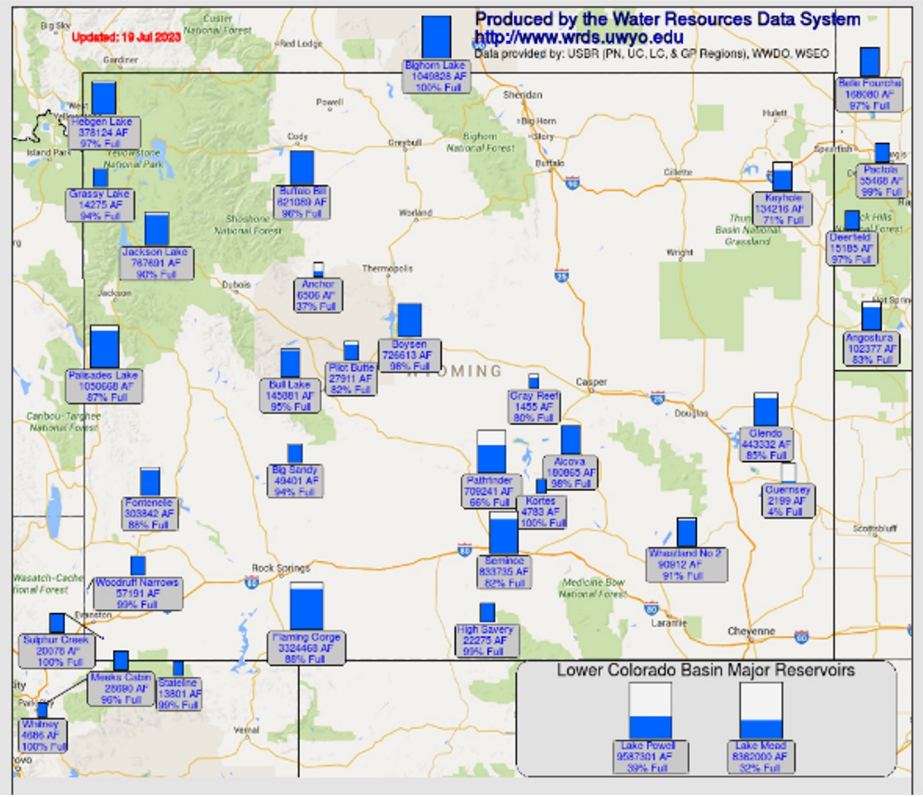


Explanation - Percentile classes							
lowest-10th percentile	5	10-24	25-75	76-90	95	90th percentile -highest	Flow
Much below Normal		Below normal	Normal	Above normal	Much above normal		

WY Reservoirs

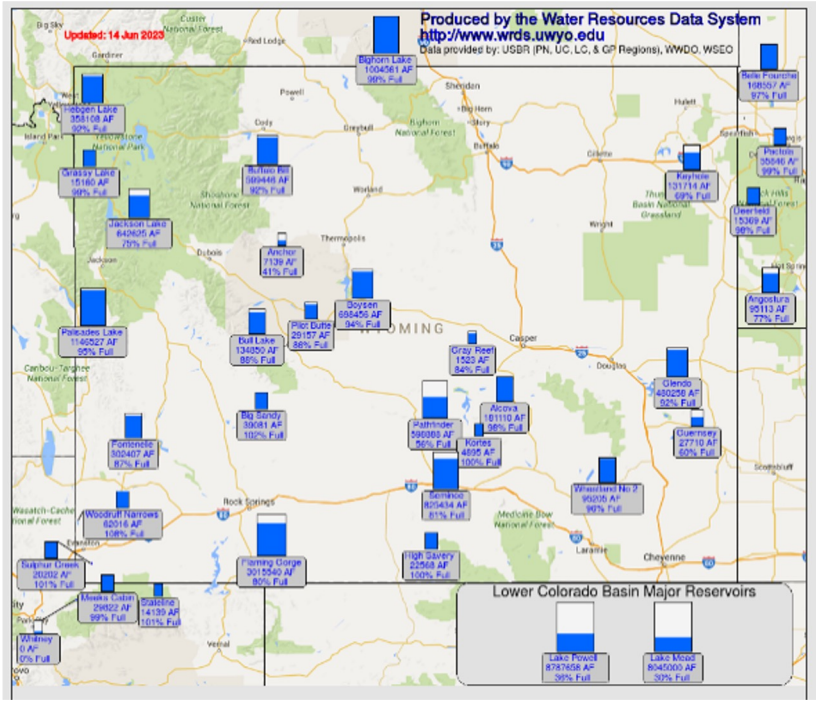
- Small increases in most reservoirs
- Most are more than 85% full

July 19, 2023



http://www.wrds.uwyo.edu/surface_water/teacups.html

June 15, 2023



WY SEO Divisions and Superintendents

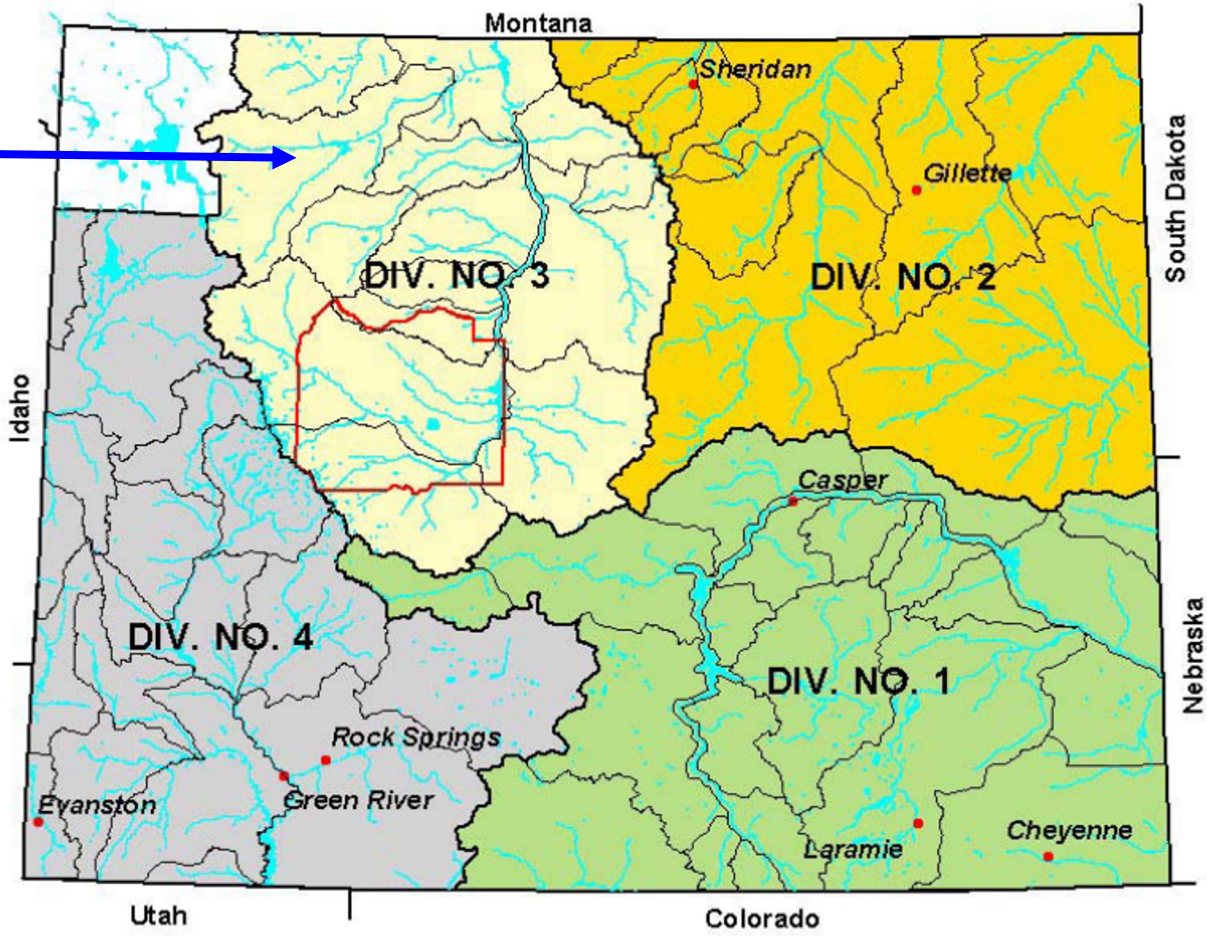
Contact information for calls and administration

Division 3

Joshua Fredrickson, 856-0747

Division 2

David Schroeder, 674-7012



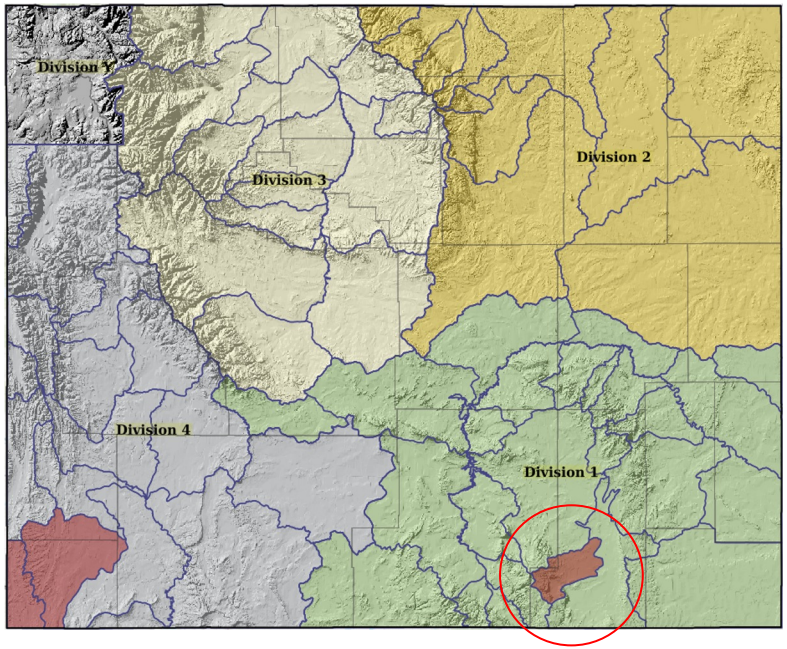
Division 4

Kevin Payne, 279-3441

Division 1

Cory Rinehart, 532-2248

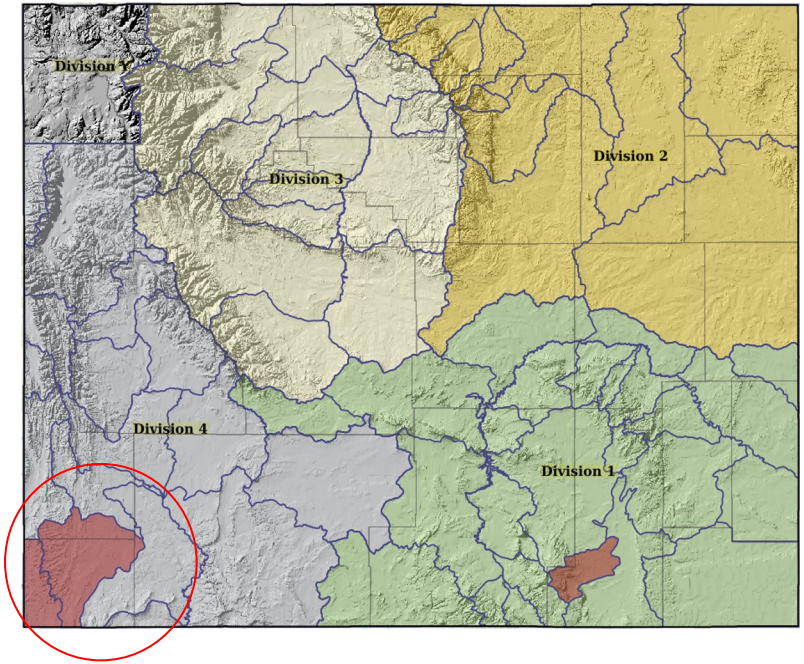
Division 1



1. July 17, 2023 call on Little Laramie River and tribs, District 4B, to a priority date of May, 1882.

1. July 17, 2023 call on Little Laramie River and Tribs, District 4B, to a priority date of Spring, 1881.

Division 4



1. July 11, 2023 call on Smith's Fork River and tribs, District 4, to a priority date of April, 1875.

1. July 14, 2023 call on Black's Fork River and Tribs, District 15, to a priority date of 10/29/1909.

WY SEO Divisions and Superintendents

Contact information for calls and administration

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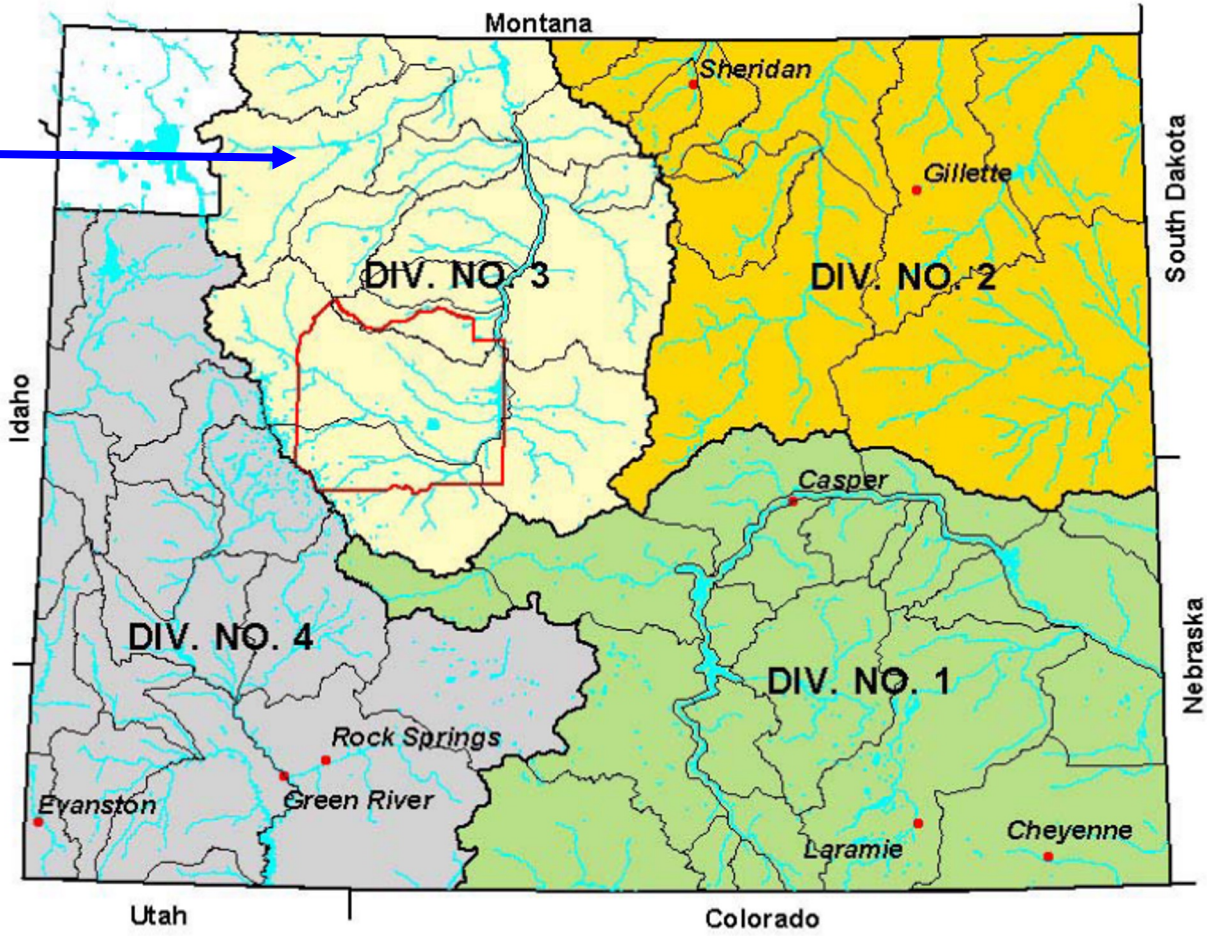
Division 2

David Schroeder, 674-7012



Division 4

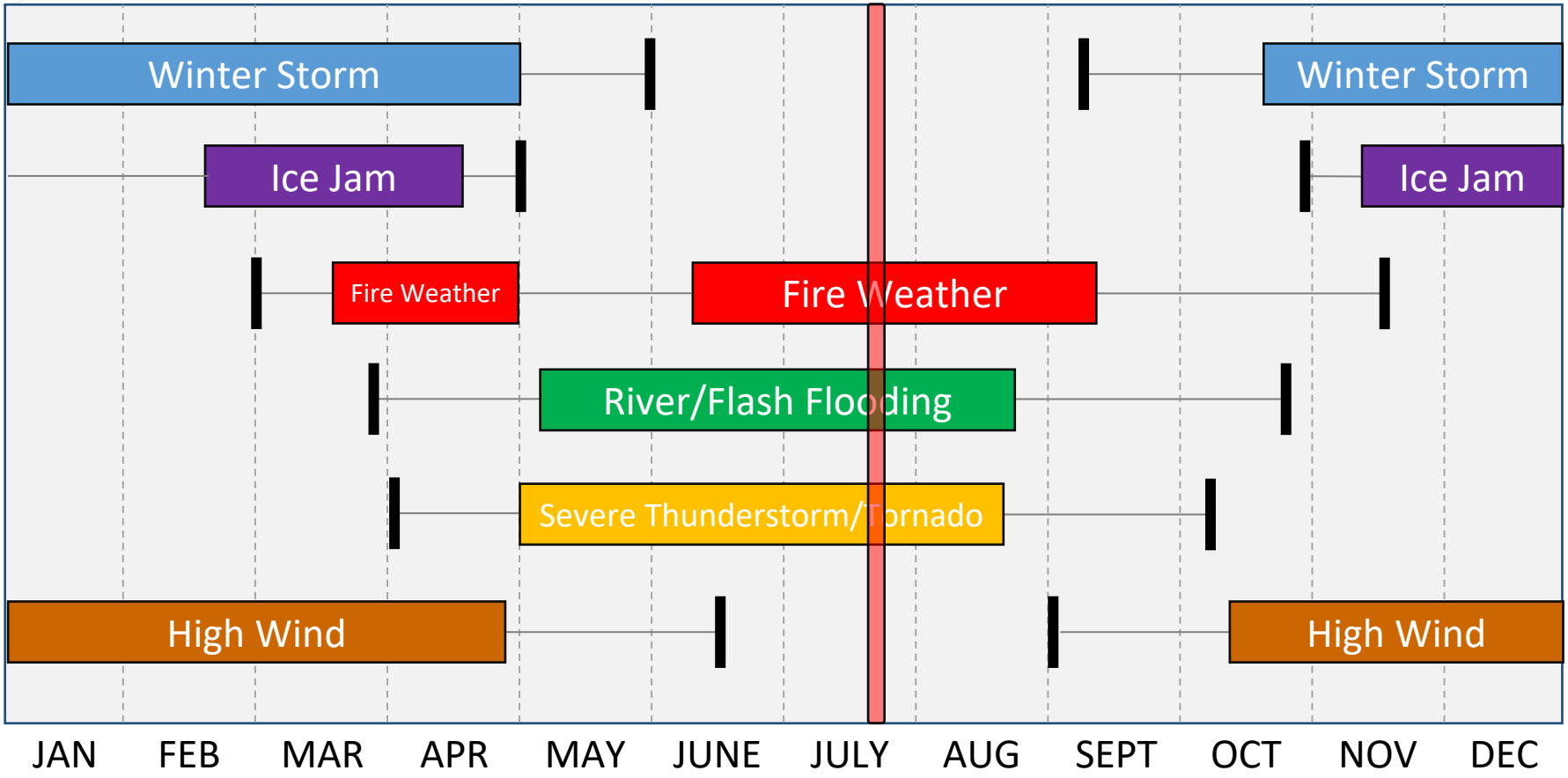
Kevin Payne, 279-3441

Division 1

Cory Rinehart, 532-2248

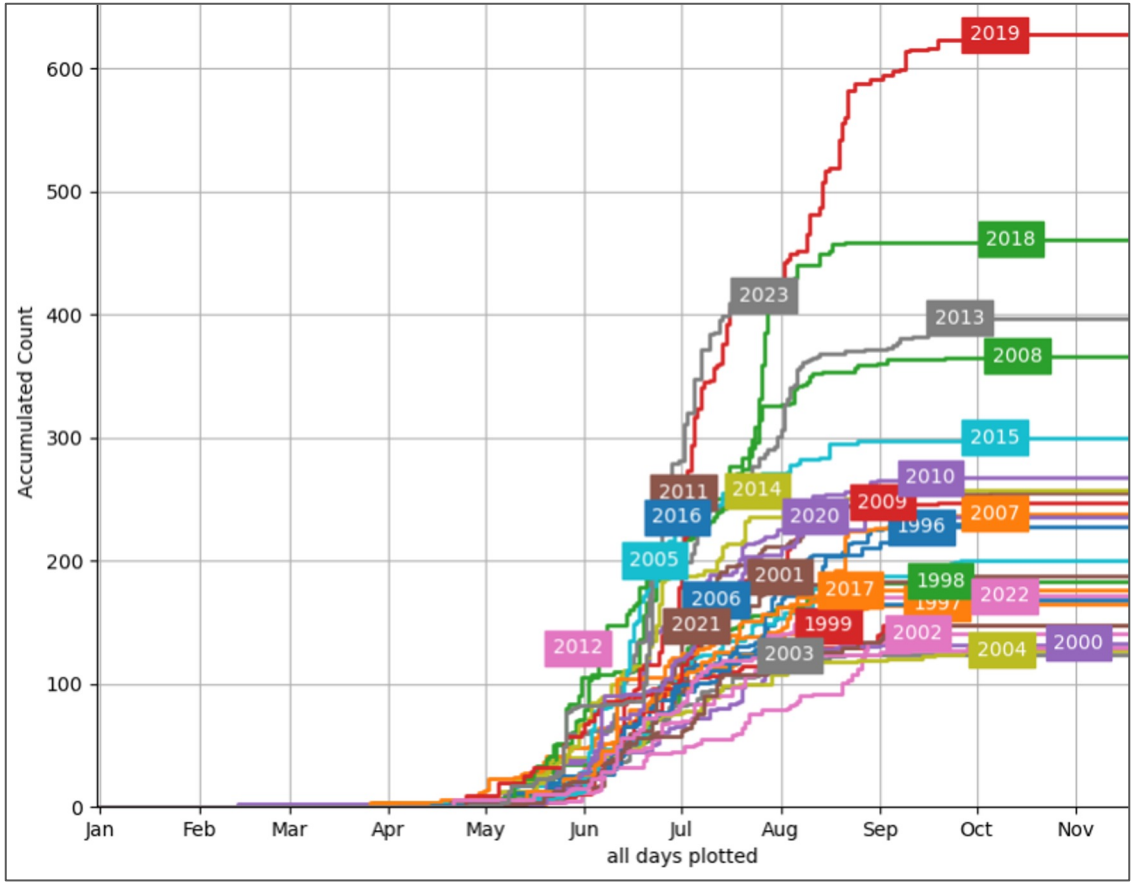
Weather Info & Forecasts

WY Weather Hazard "Calendar"



WY Severe Tstorm + Tornado Warning Count

Through 7/19/23

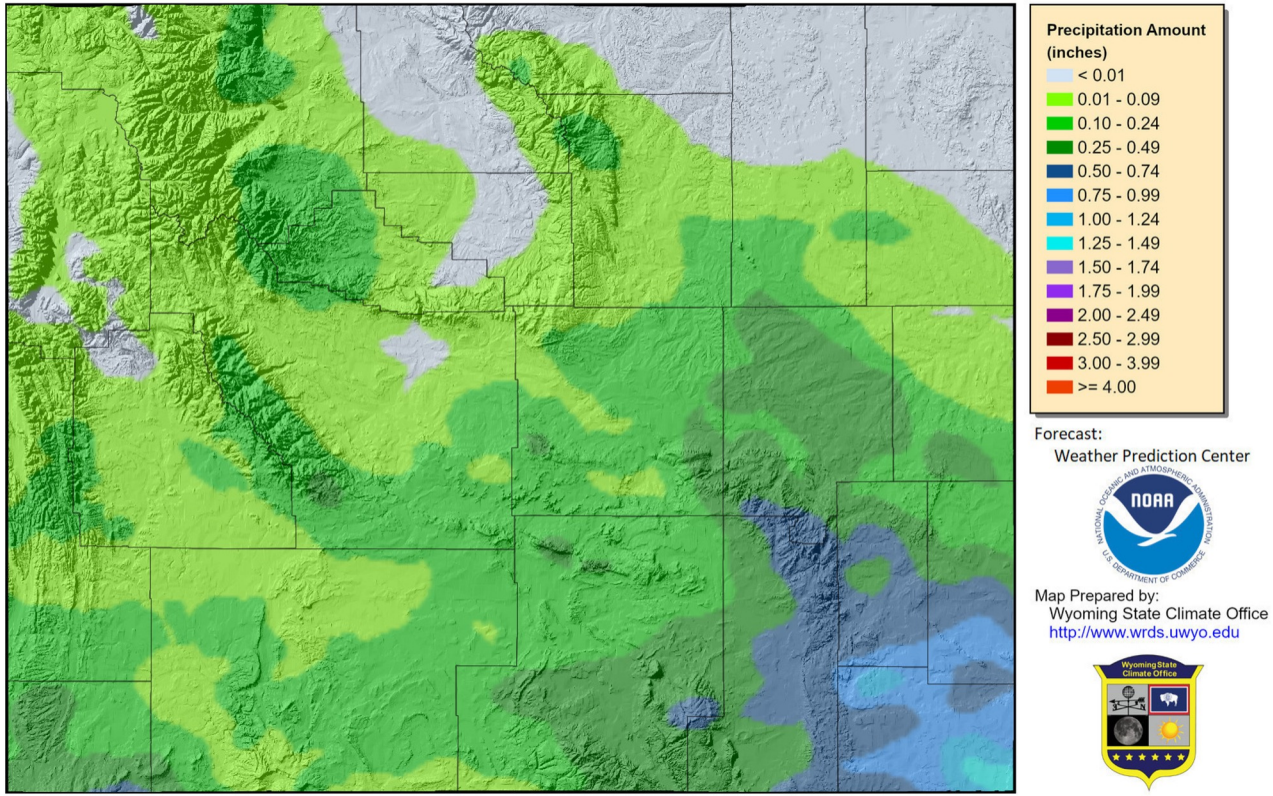


- On pace for record number of convective thunderstorm warnings
- Coincides with the wet weather late May through early July that WY has experienced
- Already a “Top 3” most active year by this statistic
  - 28 years of record
  - “Top 10% most active”

https://mesonet.agron.iastate.edu/plotting/auto/?q=44

7-Day Total Precipitation Forecast

Through 7/26/23



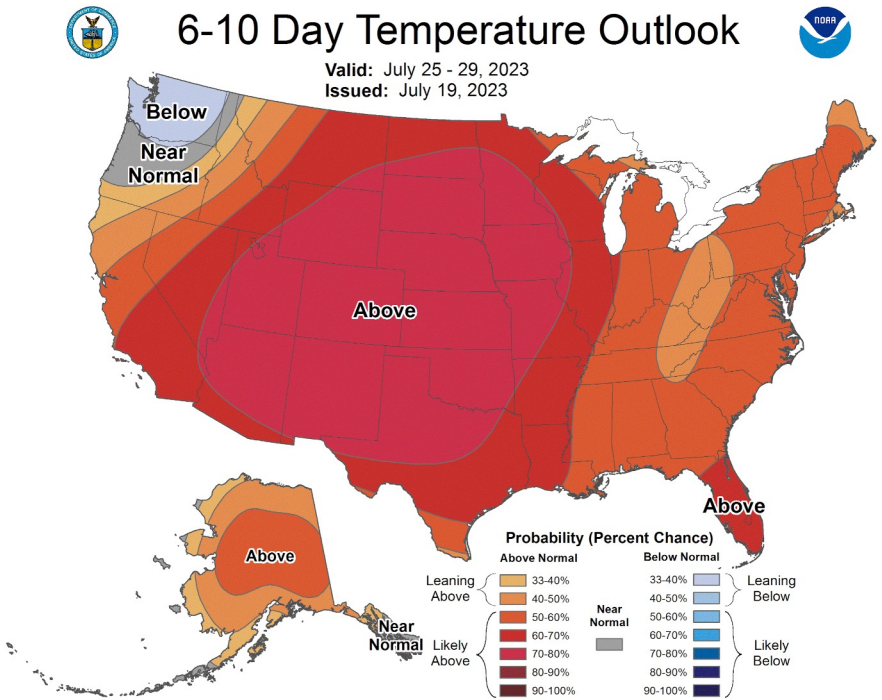
- Weather system forecast to bring 0.5 to 1.0” of rainfall to southeast WY this afternoon into the overnight hours
- Fairly dry this weekend through most of next week
- Isolated mountain showers and thunderstorms still possible

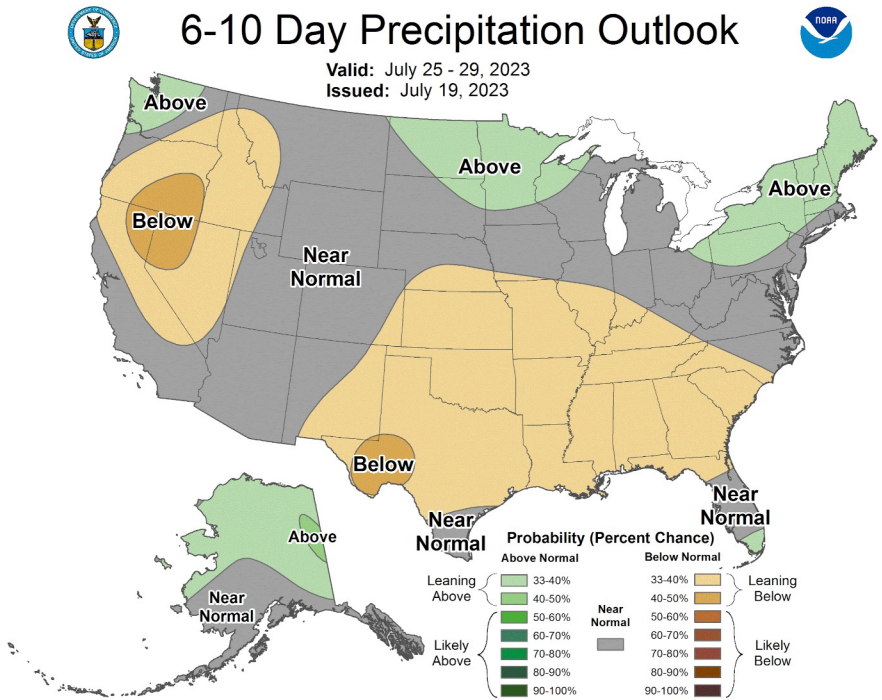
https://bit.ly/7_dayQPForecast

6-10 Day Outlooks

(Jul 25 - 29)

https://bit.ly/CPC6_10Day



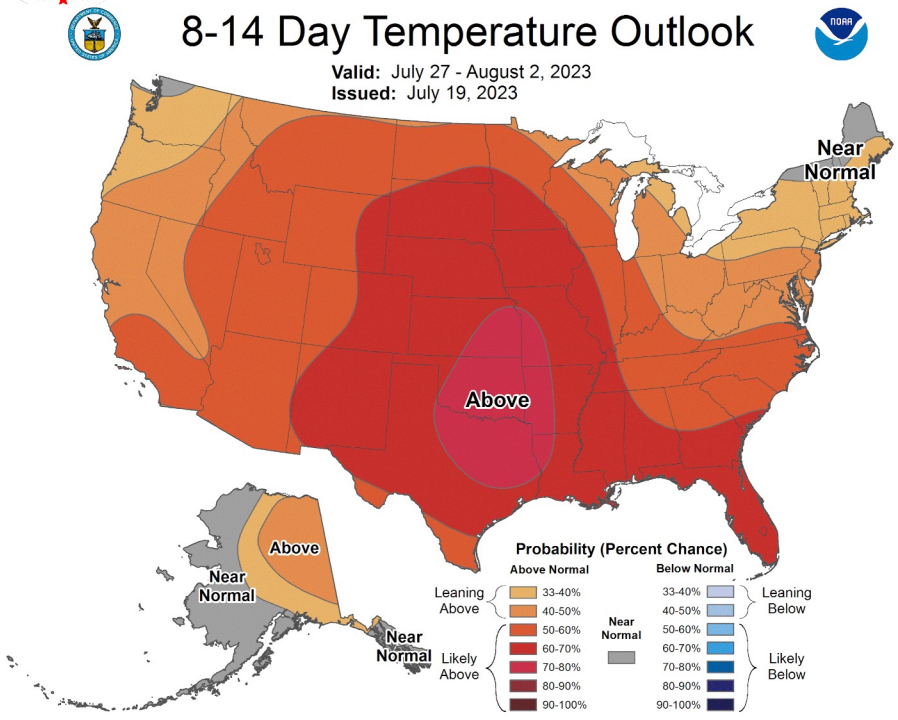


Very strong signal for above normal temperatures

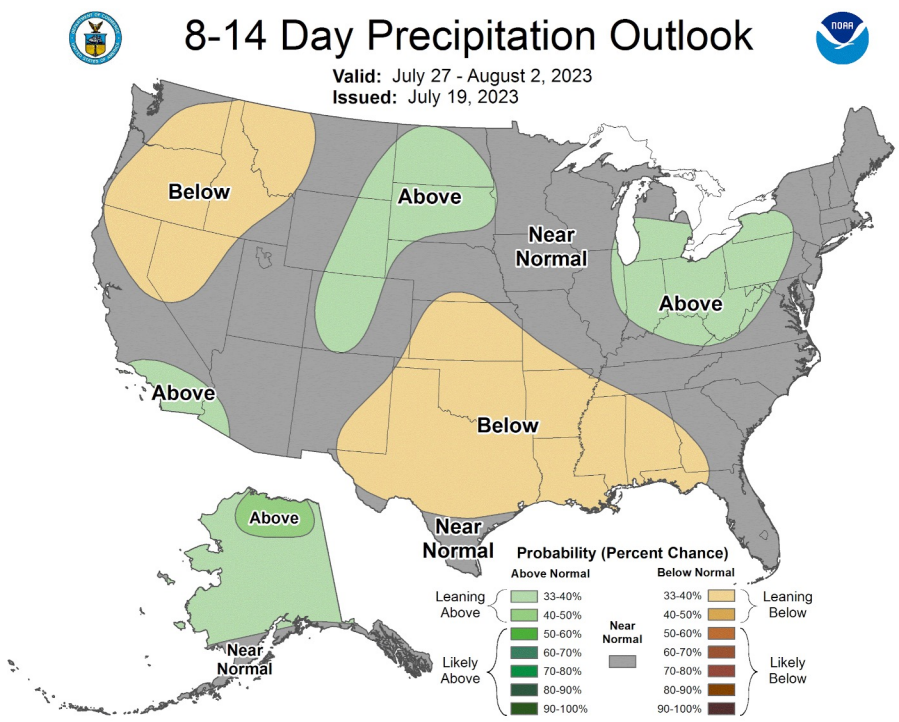
Near climatology is best forecast

8-14 Day Outlooks
(Jul 27 - Aug 2)

https://bit.ly/CPC8_14Day



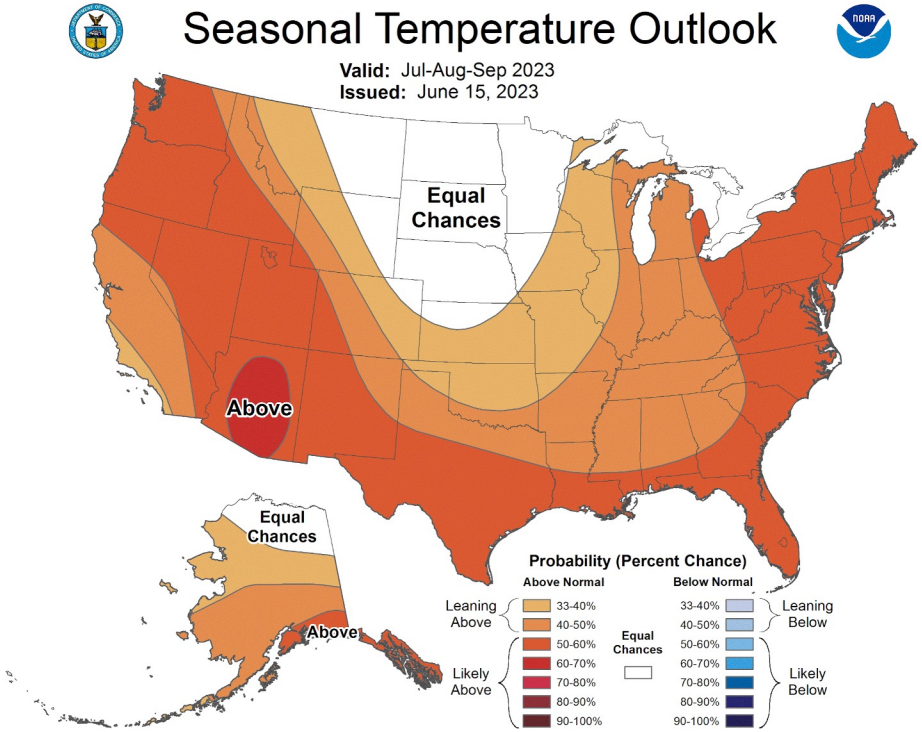
Warmer than normal remains most likely

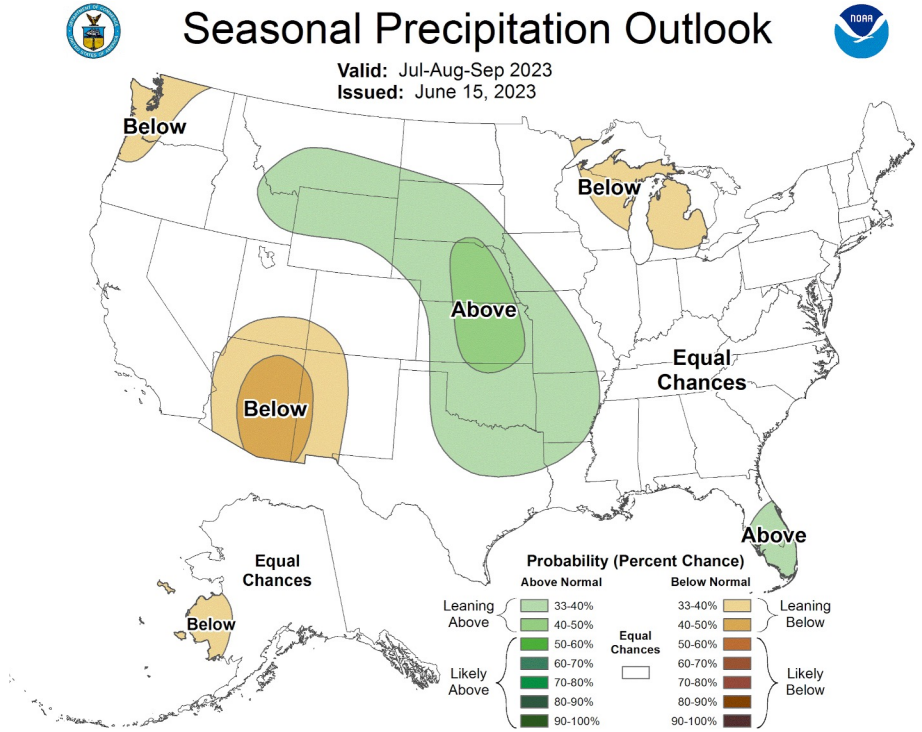


Weak signal for above-normal precipitation across eastern Wyoming

3-Month Outlooks
(Jul-Aug-Sep)

https://bit.ly/CPC_Seasonal





Lean toward above normal, most likely in southwest

Weak signal for above-normal precipitation across north ⅔ of Wyoming

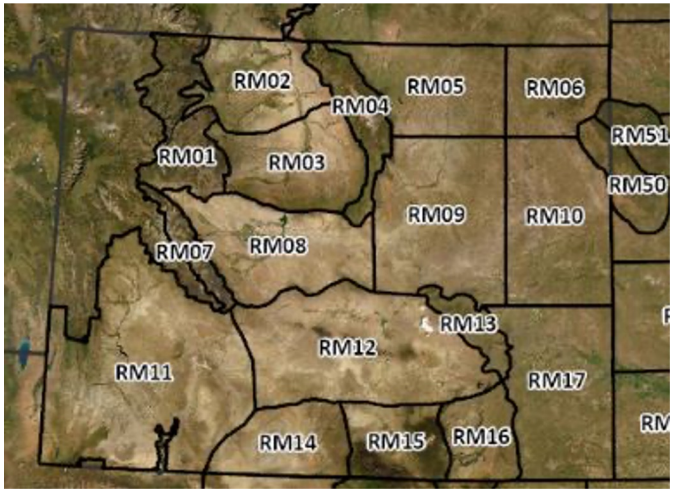
Fuel Moisture and Energy Release Component (ERC) -Definitions and Explanations

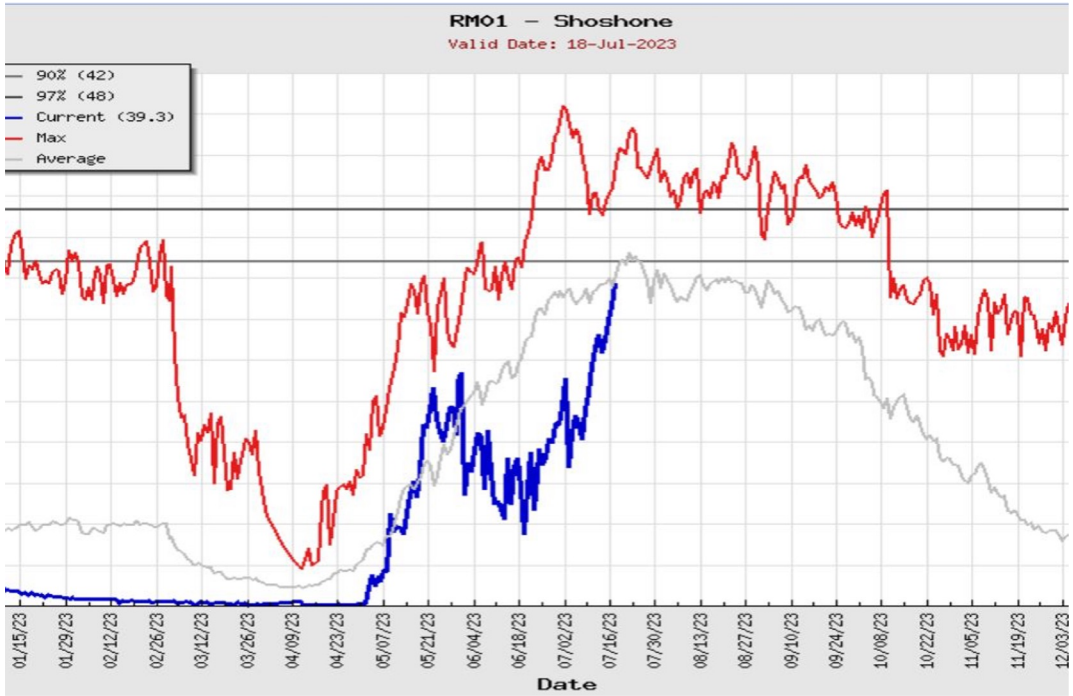
- **Live Fuel Moisture-** Influenced by seasonality, species characteristics and available moisture (soil and air).

- **Dead Fuel Moisture-** Influenced by precipitation and relative humidity. 4 Size Classes based on “Time Lag”, simply explained as the amount of time it takes the fuel to adjust to closely resemble the humidity of its surrounding environment.
  - **1 Hour Fuels**
    - Less than 1/4" diameter.
    - Fine flashy fuels that respond quickly to weather changes. Computed from observation time temperature, humidity, and cloudiness.
  - **10 Hour Fuels**
    - 1/4 to 1" diameter.
    - Computed from observation time temperature, humidity, and cloudiness. Or can be an observed value, from a standard set of "10-Hr Fuel Sticks" that are weighed as part of the fire weather observation.
  - **100 Hour Fuels**
    - 1 to 3" diameter.
    - Computed from 24-hour average boundary condition composed of day length, hours of rain, and daily temperature/humidity ranges.
  - **1000 Hour Fuels**
    - 3 to 8 " diameter.
    - Computed from a 7-day average boundary condition composed of day length, hours of rain, and daily temperature/humidity ranges.

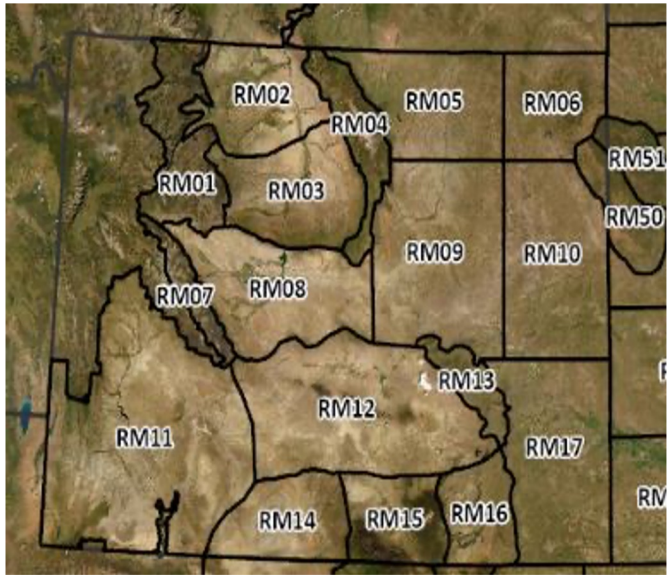
- **Energy Release Component (ERC)-** Related to the available energy (BTU) per unit area (square foot) within the flaming front at the head of a fire. The ERC is considered a composite fuel moisture index as it reflects the contribution of all live and dead fuels to potential fire intensity.

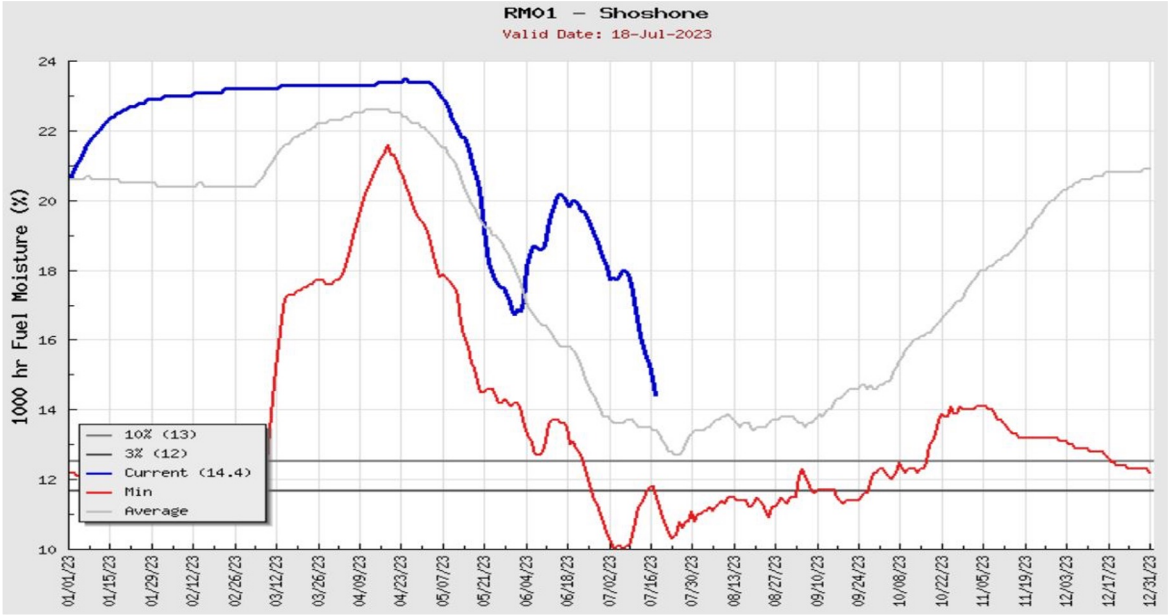
Current Fuels Conditions- 1,000Hr Dead Fuels and ERC



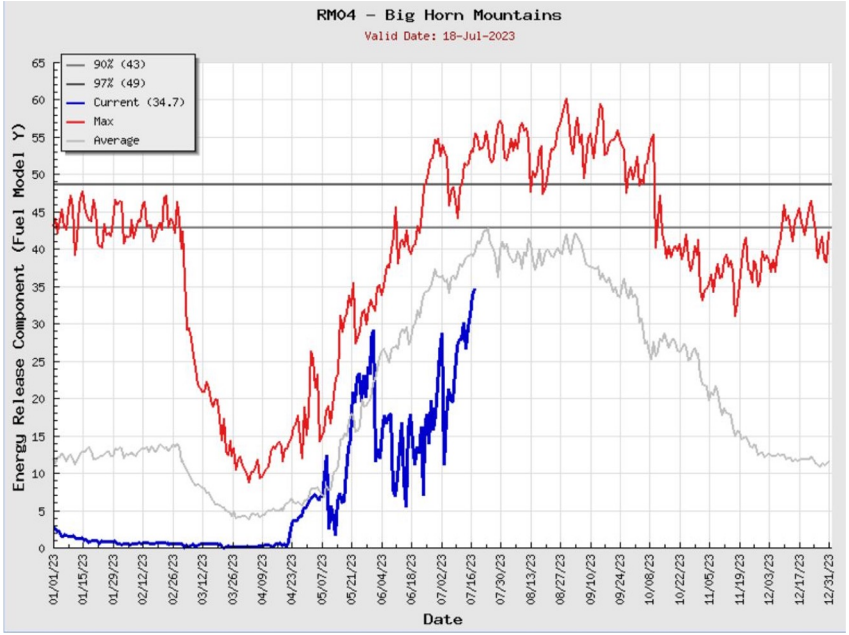


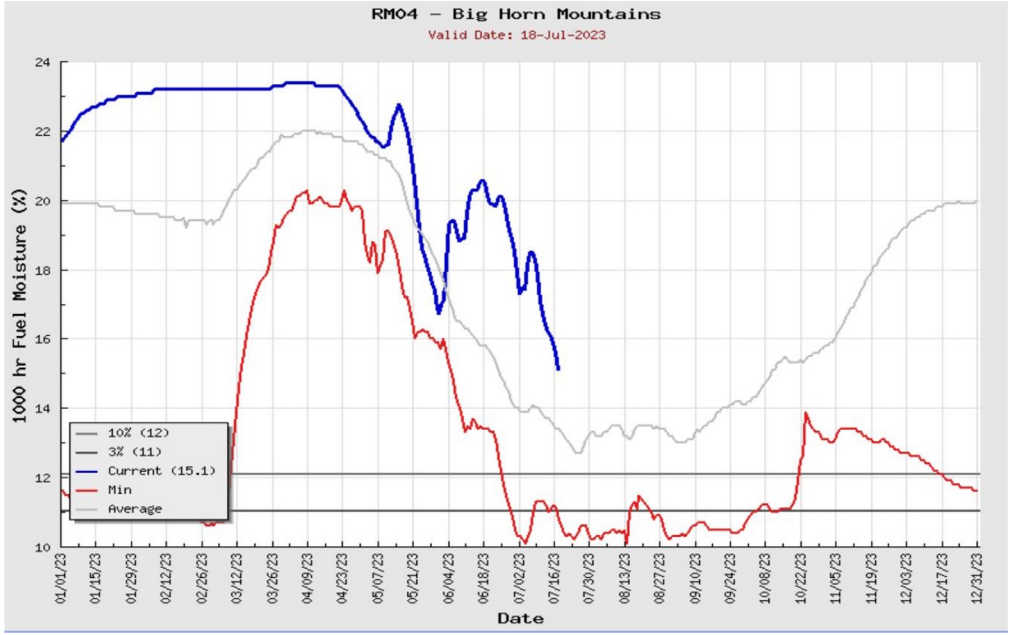
Current Fuels Conditions- 1,000Hr Dead Fuels and ERC



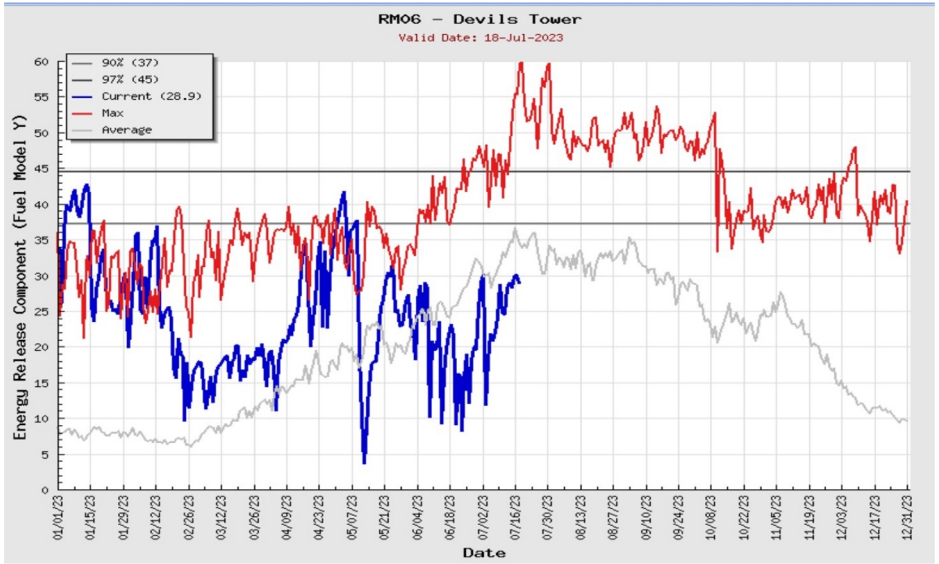


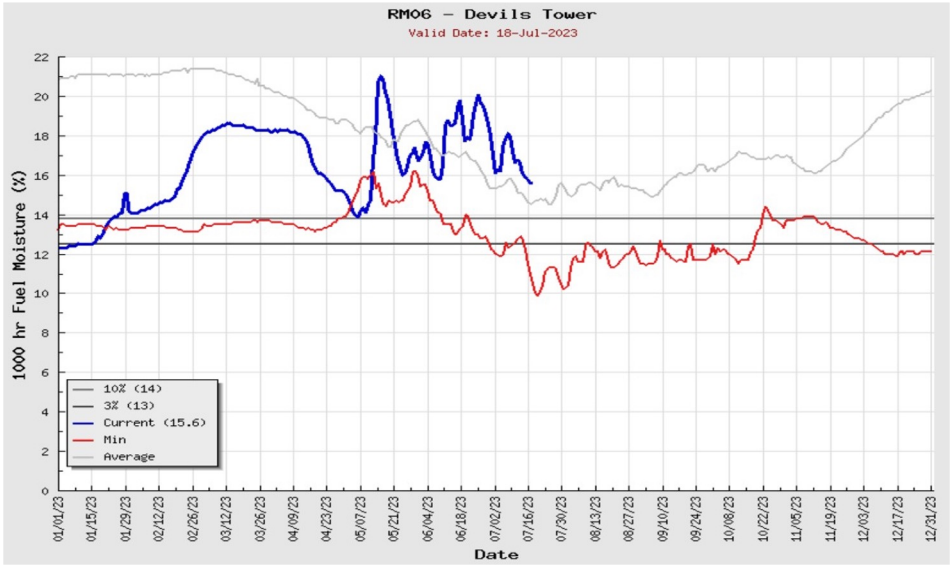
Current Fuels Conditions- 1,000Hr Dead Fuels and ERC



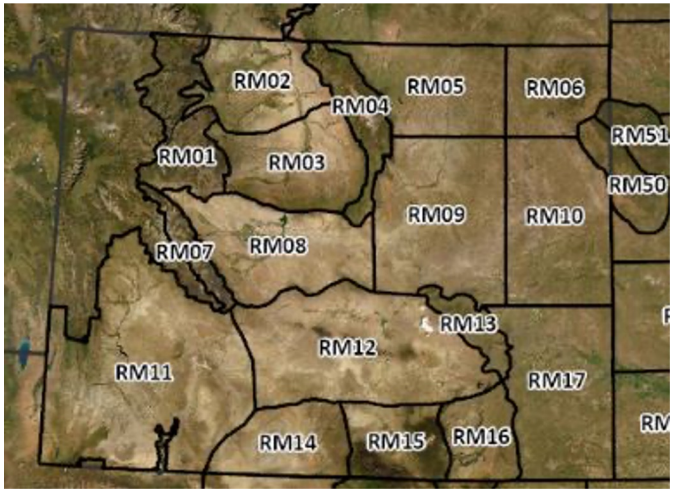


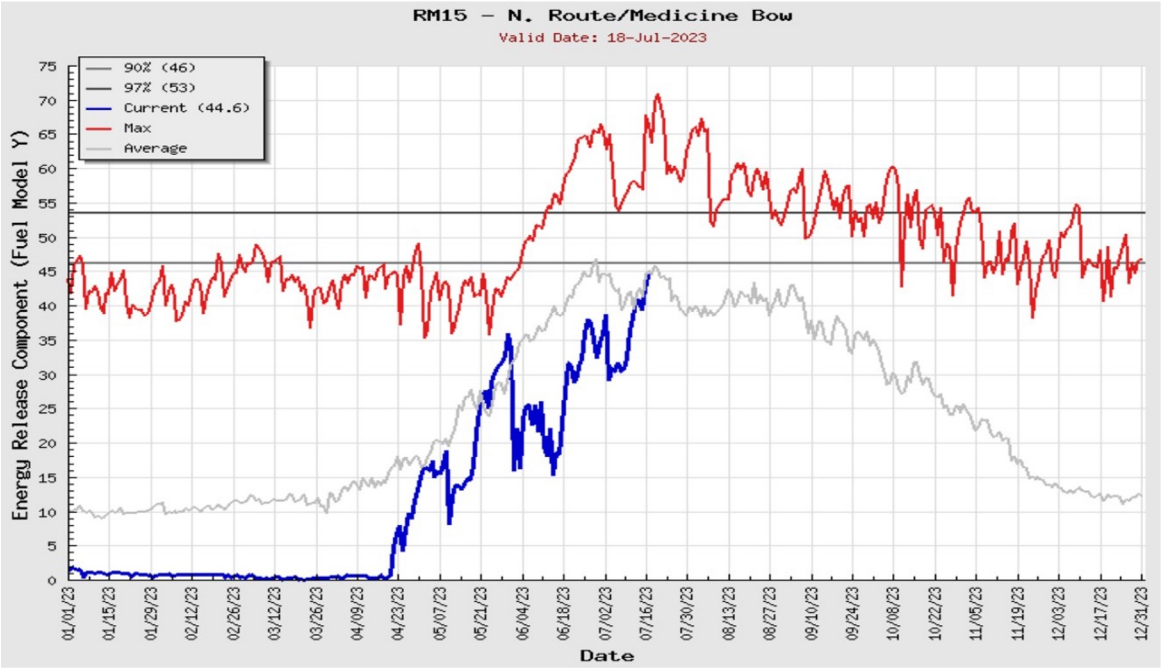
Current Fuels Conditions- 1,000Hr Dead Fuels and ERC



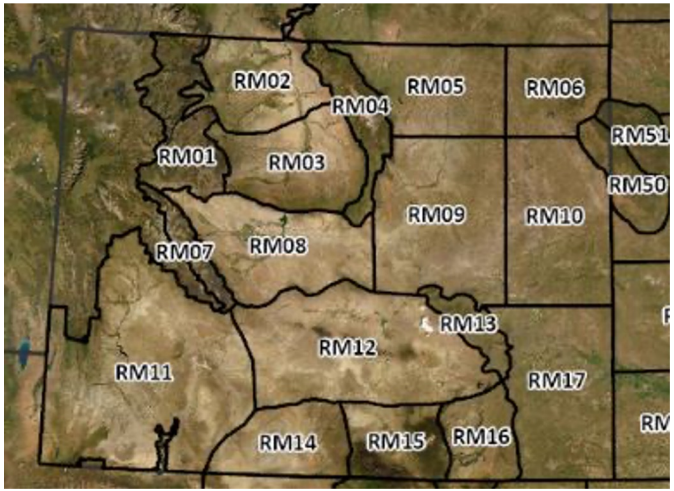


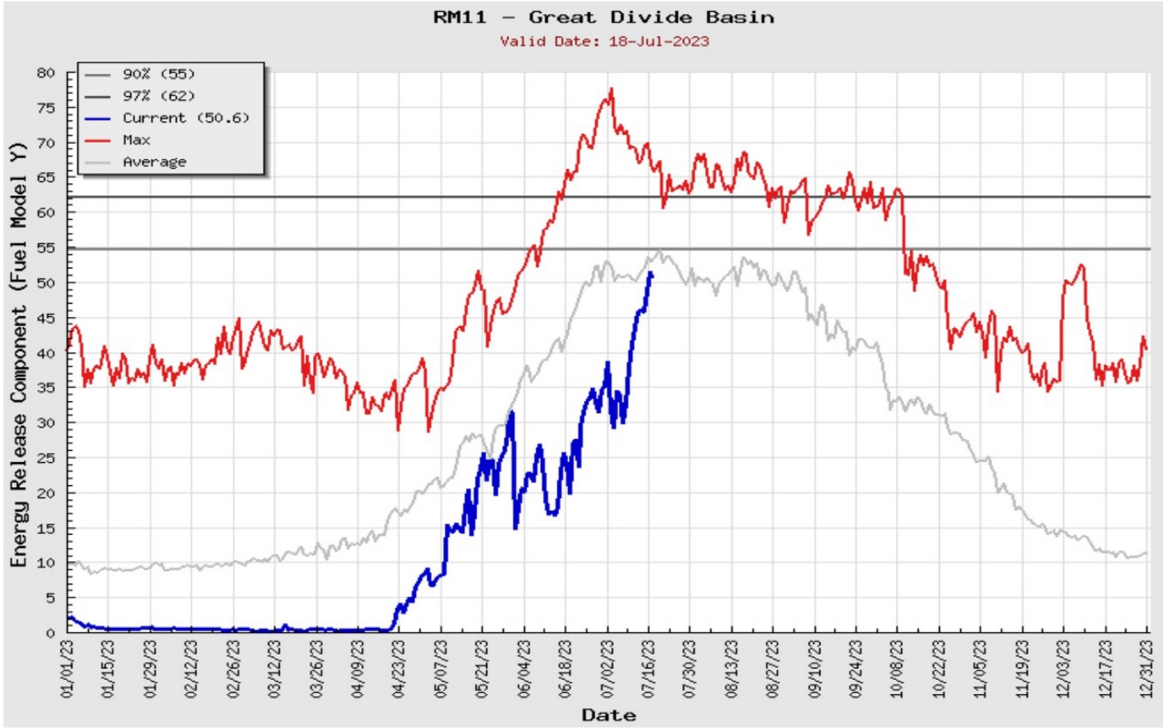
Current Fuels Conditions- 1,000Hr Dead Fuels and ERC



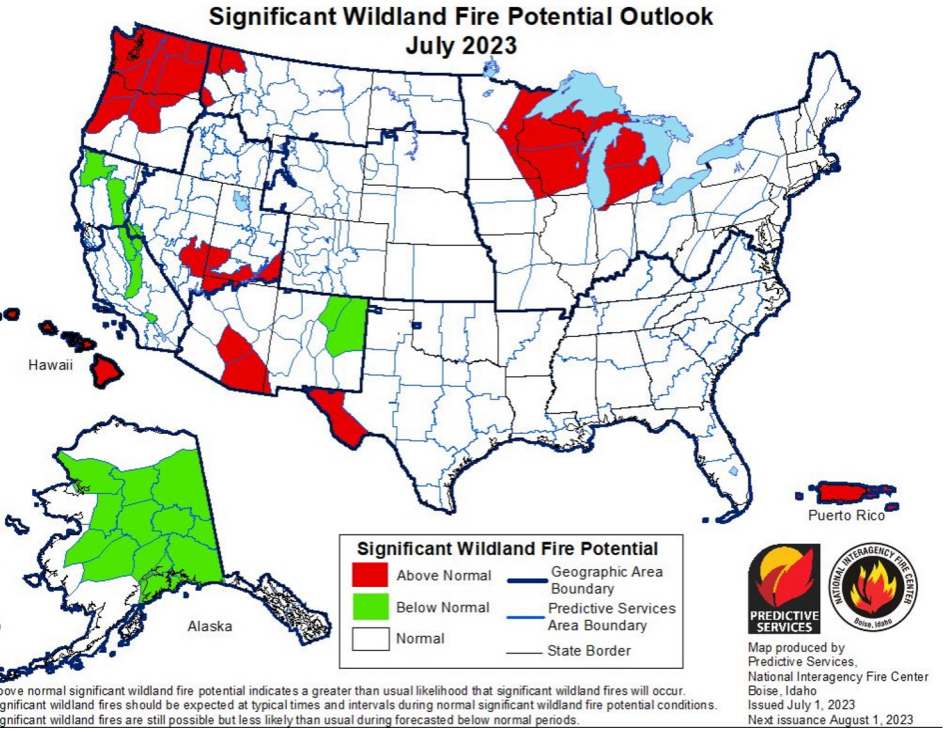


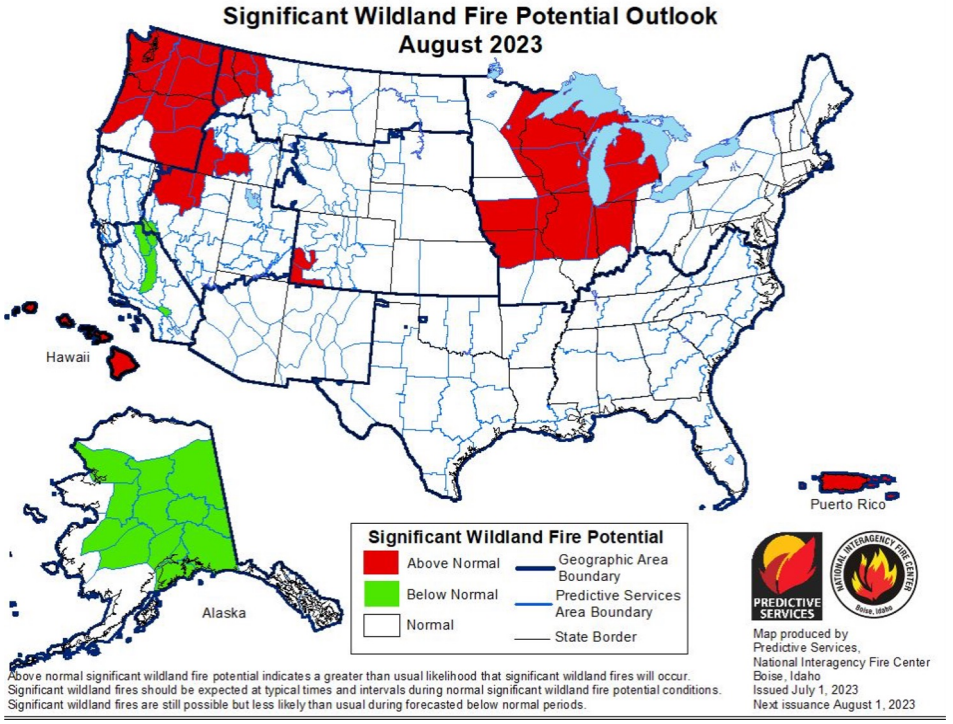
Current Fuels Conditions- 1,000Hr Dead Fuels and ERC



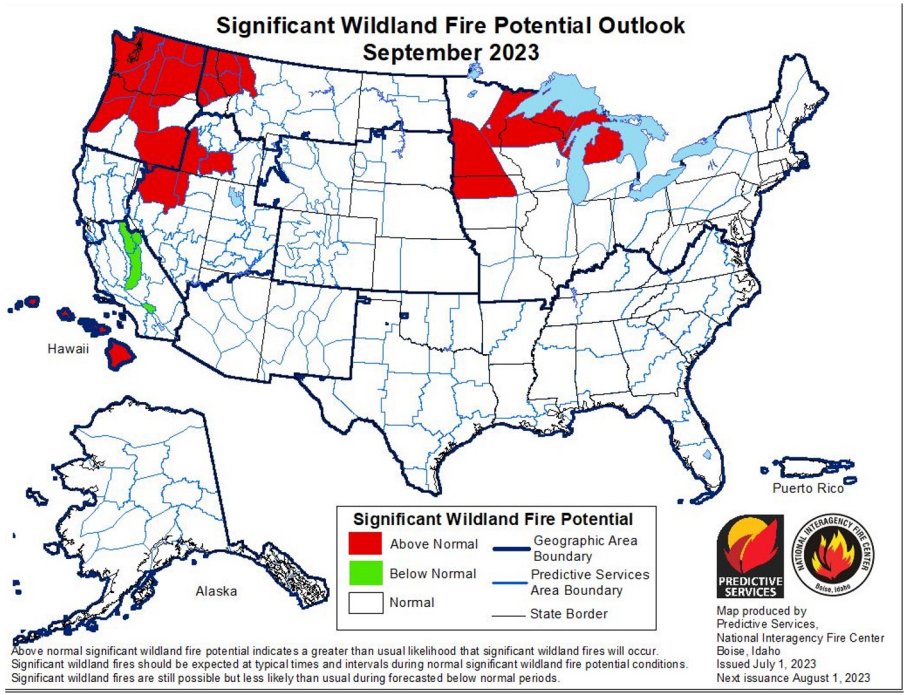


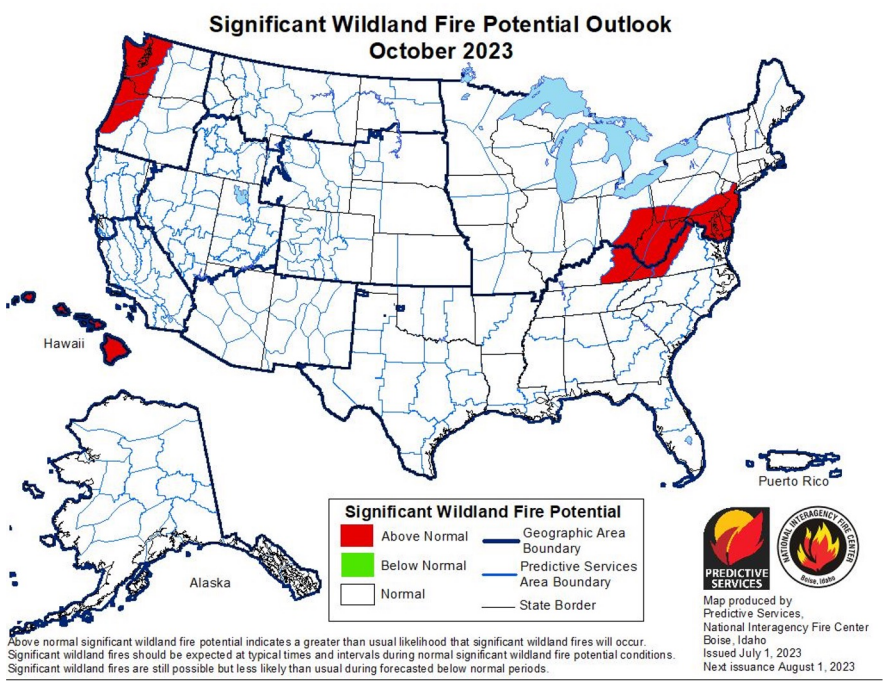
National Fire Danger Outlook





National Fire Danger Outlook





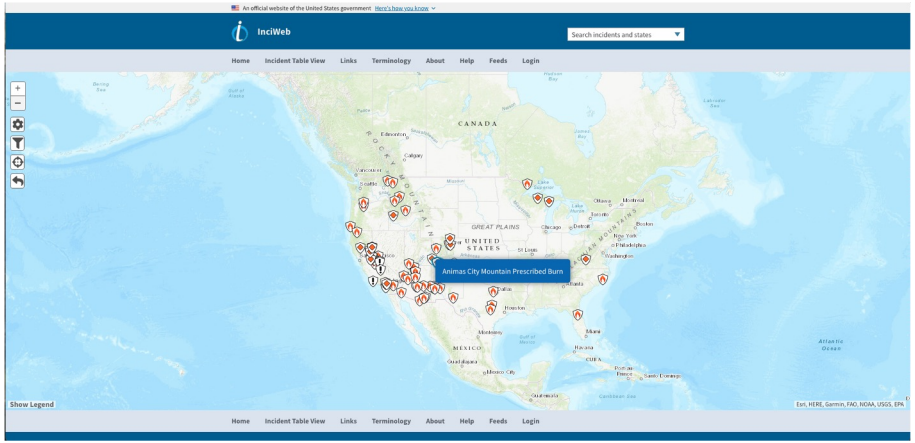
Highlight of the Month:

Wildland Fire Information and Resources

Wildland Fire Information- Current Incidents

Inciweb

- https://inciweb.wildfire.gov/
- Used for large wildfires and some prescribed fires
- Only as good as the people making inputs



Incident Overview

Click on the following words to see related information.

News *Maps* *Closures* *Photos* *Videos* *Announcements*

Expand Image: [Full Size]

The Spring Creek Fire transitioned from a Type 3 to a Type 4 incident on Monday, July 17th. This change to a smaller organization is possible due to the successful suppression efforts; additional containment; and decreased fire behavior and intensity. Thank you for your support of the teams and firefighters assigned to this fire.

The Spring Creek Fire started on Saturday, June 24. Firefighters and aircraft worked to keep the fire to about 200 acres on a mix of private and Bureau of Land Management-administered land. Hot, dry, windy conditions aligned with terrain on June 26, causing the fire to make a significant run growing to more than 2,500 acres. Rocky Mountain Area Complex Incident Management Team Two assumed command of the fire June 28.

The varied fuels and extreme terrain presented substantial challenges to firefighters during containment efforts. Crews used a variety of tactics including direct handline against the black fire's edge and indirect tactics where terrain would not allow firefighters to safely engage.

Firefighters are now mopping up hotspots, providing suppression repair to disturbed firelines and patrolling firelines. Personnel are removing equipment no longer needed on the fireline. Smoke will be intermittently present for some time both from the smoldering fire and from exposed oil shale.

Spring Creek Road and High Mesa Road are open to restricted traffic only. Please avoid these areas if possible and drive with caution with increase in fire personnel on the roadway.

Closures: There are no closure orders in place at this time.

Evacuations: There are no evacuations at this time. Residents are encouraged to register with Garfield County's emergency notification system at: Garfield County Emergency Communications Authority (**garco911.com**). All evacuation orders will be conducted through the Sheriff's office. Call recorded message line at 970-981-3401 for current evacuation information

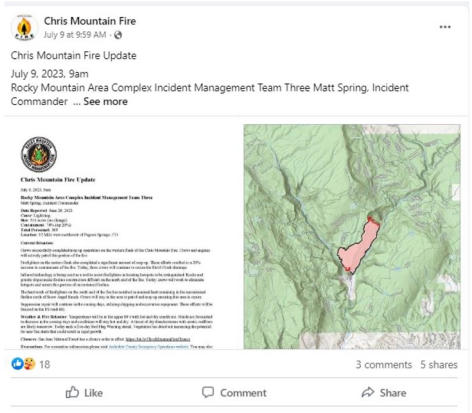
Temporary Flight Restrictions: There is a TFR (FDC 03/0215) in place for air space over the Spring Creek Fire to reduce impacts to fire aviation operators. Fire aviation response is halted or delayed if an unauthorized aircraft enters the TFR. Temporary flight restrictions also apply to unmanned aircraft system (UAS) or drones. If you fly, we can't!

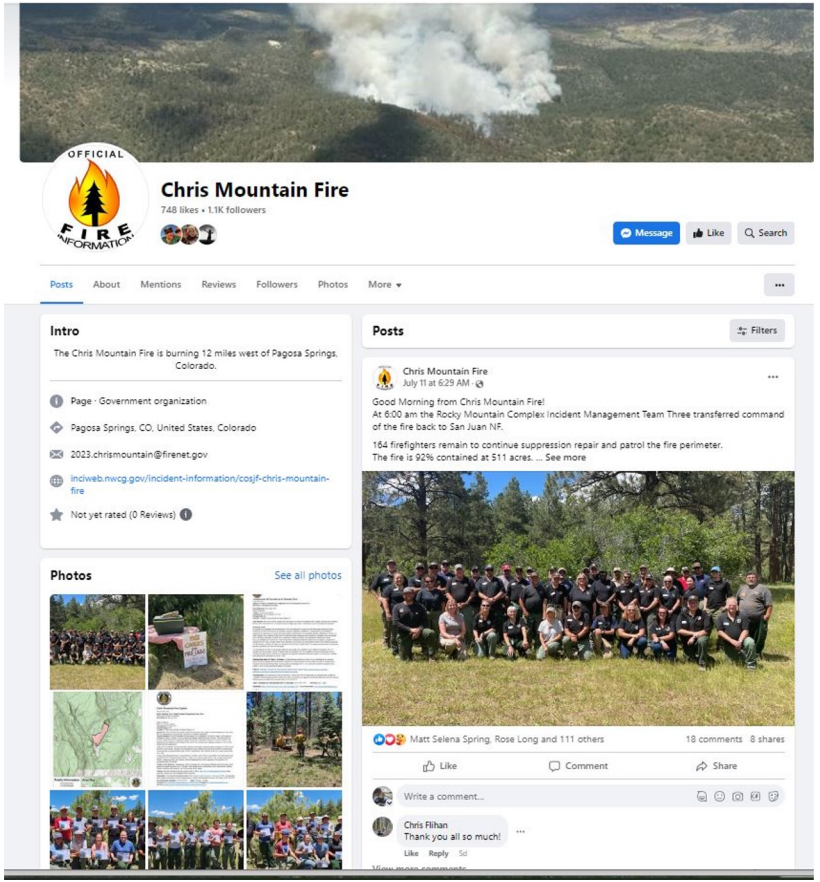
Additional information can also be found on the **Upper Colorado River Interagency Fire Management Unit Facebook page** and older information on the ***Spring Creek Fire Facebook page*** Additional information may be found on the **Bureau of Land Management website** or by calling 970-200-6195.

Wildland Fire Information- Current Incidents

Facebook

- Individual profiles for fires
- Easily accessible from mobile devices
- Allows back and forth with Incident Mgmt Team
- Variety of content such as maps, videos, photos etc…
- Notifications of public meetings may be posted here.

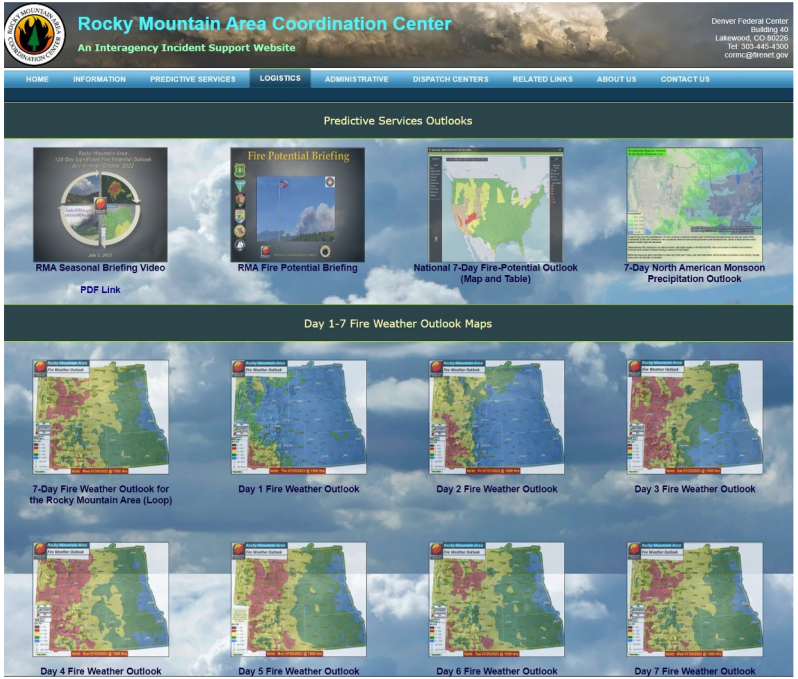




Wildland Fire Information- RMACC Predictive Services

Rocky Mountain Area Coordination Center

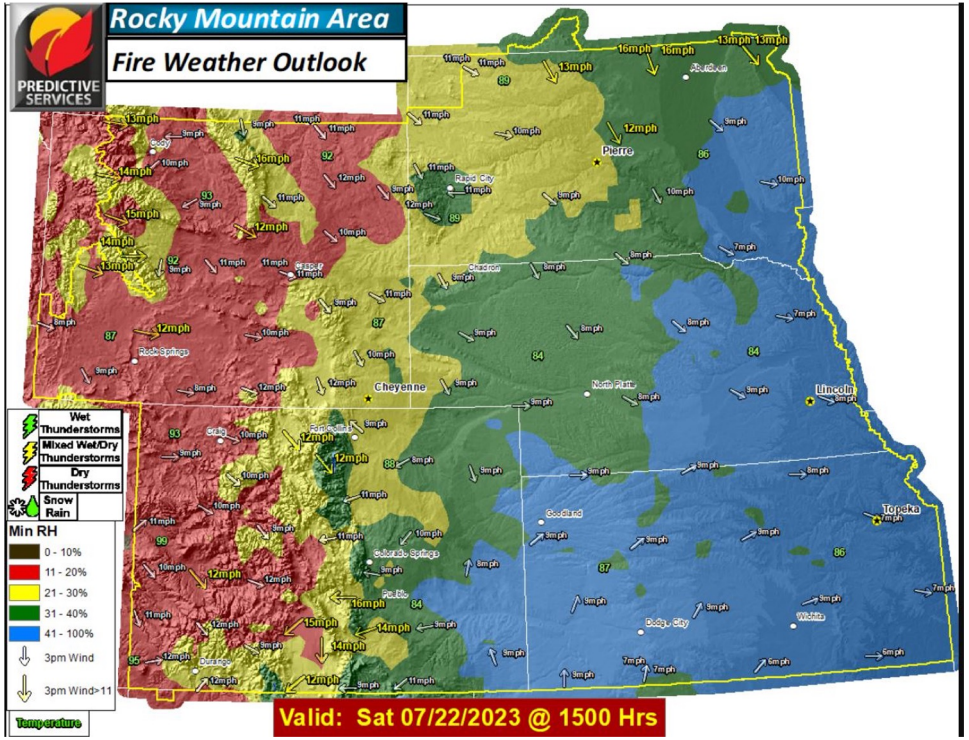
- Variety of products and outlooks
- Video formats for seasonal and weekly outlooks for Rocky Mtn Area (RMA)
- Heavily focused on fire weather- Fuels Conditions not as much
- Quality and consistency dependent on staffing



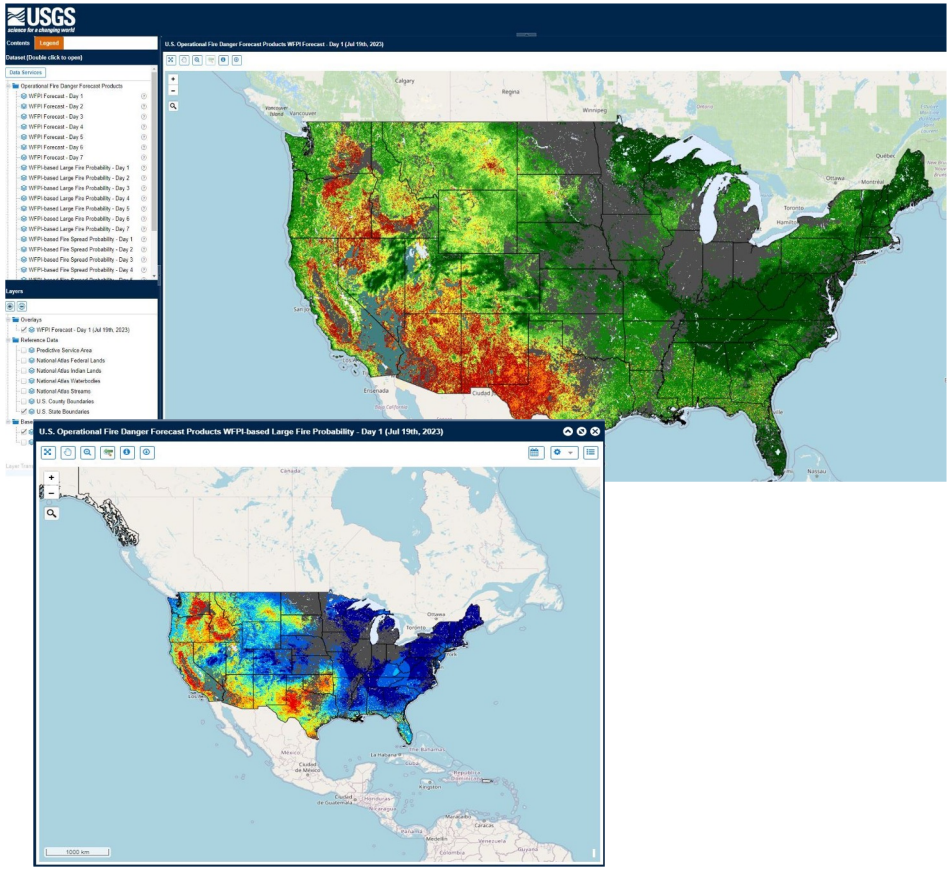
Wildland Fire Information- RMACC Predictive Services

Fire Weather Outlook

- Weather based, must be cross referenced with fuels condition.
- Temperature, Humidity, Wind (HDW)
- Video Briefing



Wildland Fire Information- Fire Danger and Outlooks- Newer Products



Wildland Fire Potential Index

- Vegetation greenness, 10-hour dead fuel moisture, wind speed, rain, and temperature
- NDVI- Normalized Difference Vegetation Index
  - Allows comparison between current values and historical values to determine Relative Greenness.

Challenges

- Coupling forecast weather conditions to existing fuels conditions has always been challenging.
- Red Flag Warnings are a good example
- Recent developments in remote sensing and data interpretation are helping reduce human workload.
- Snow Flags, Green-Up, etc… used to be human inputs

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Get Involved!

Submit a *Condition Monitoring Observer Report*

The WY 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 WY weekly – and communicate this info to the U.S. Drought Monitor & others.

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

Thank you!

Name of Website	Brief Description + Frequency Updated	URL
NIFC Predictive Services Outlooks	Daily and Monthly dependent on product	https://www.nifc.gov/nicc/predictive-services/outlooks
Rocky Mountain Area Coordination Center- Predictive Services (ERC, and Fuel Moisture Map)	Daily	https://gacc.nifc.gov/rmcc/predictive/erc_bi_100_1000_map.htm
Rocky Mountain Area Coordination Center- Predictive Services (Outlooks)	Daily and Weekly	https://gacc.nifc.gov/rmcc/outlooks1.php
Iowa State University IEM NWS Automated Data Plotter	Daily	https://mesonet.agron.iastate.edu/plotting/auto/?q=44
USGS Fire Danger Forecast Tools	Daily	https://www.usgs.gov/fire-danger-forecast