



WY Conditions & Outlooks:

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

July 15, 2021

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



Presentation Outline

- Current Conditions
- Outlooks
- How to Get Involved



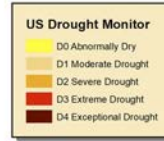
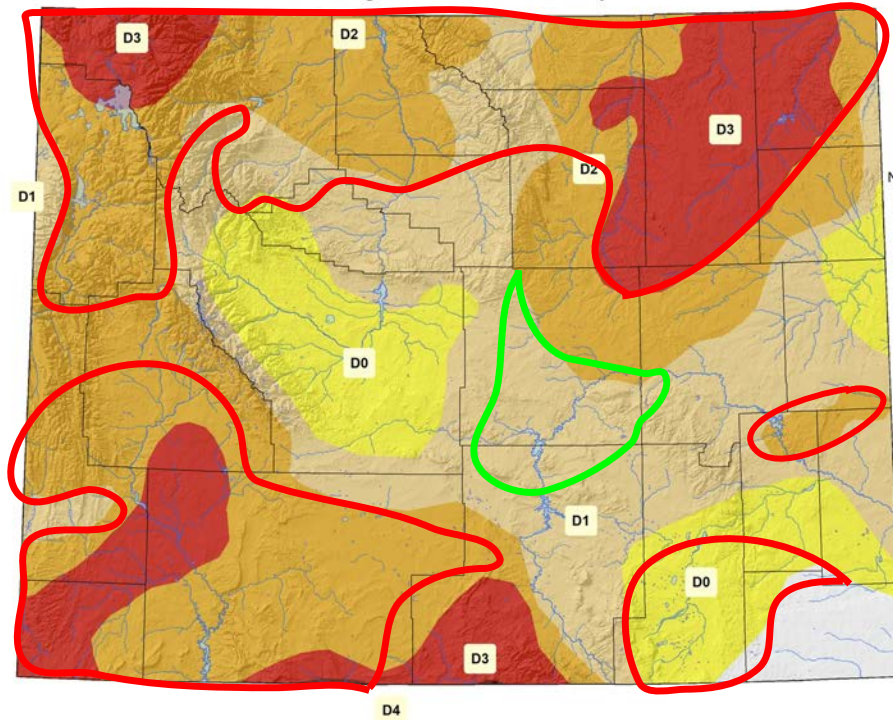
Current Conditions

US Drought Monitor for July 13, 2021

(Released Thursday, July 15, 2021)

Valid 8 a.m. EDT

US Drought Monitor as of 13 July 2021



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

Improvements in central Wyoming since the last webinar followed by several **degradations**.

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>

<https://droughtmonitor.unl.edu>



droughtmonitor.unl.edu



What IS the US Drought Monitor?

In its simplest terms, it is a weekly depiction of drought conditions showing the extent, severity, and time scale of impacts.

Uses, among other parameters, Precipitation, Streamflow, Reservoir Levels, Temperature, Evaporative Demand, Soil Moisture, Vegetation Health, Impact Reports.

Not all parameters have the same weight.

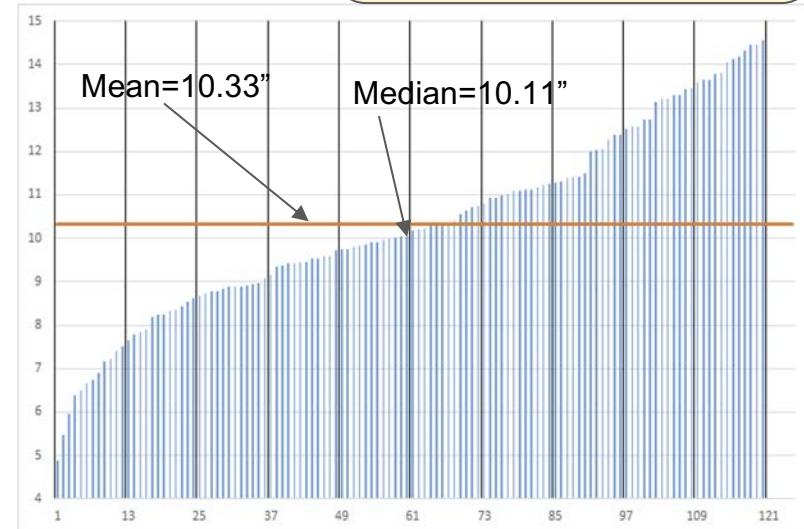
Parameters are evaluated in terms of **percentiles** (not as percents of average or mean) and overlain on a map.

A consensus of parameters determines drought category.

Categories rarely line up. Human intervention to draw actual lines. WCMT provides input to US Drought Monitor.

<https://drought.wyo.gov/Education/Education.html>

Not just precipitation
Not a forecast
Not a model
Not a drought declaration



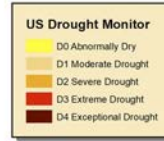
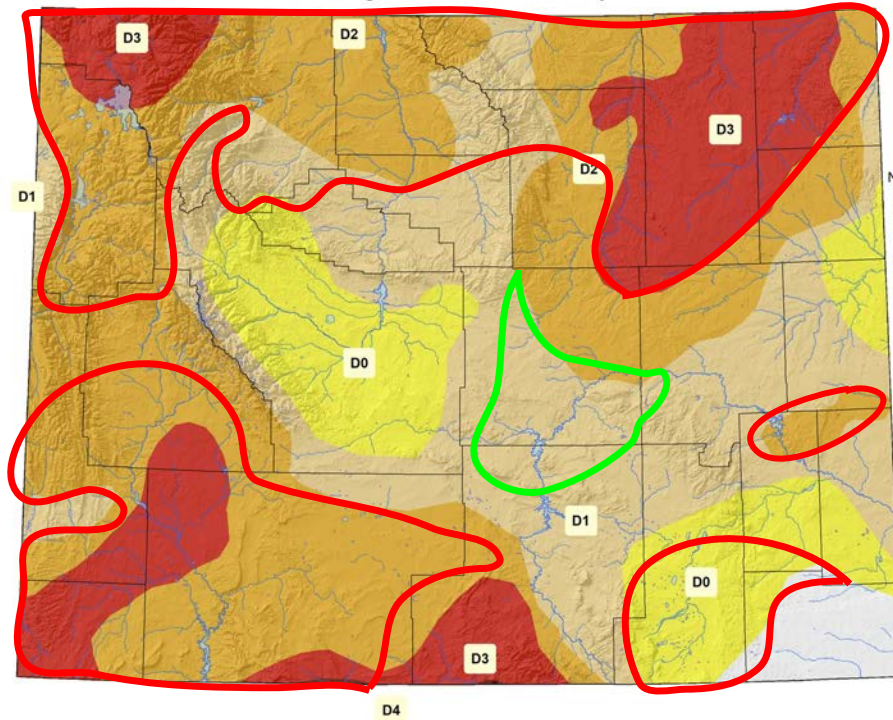
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<https://droughtmonitor.unl.edu>



droughtmonitor.unl.edu



14-Day Precipitation Percentile (01 Jul 2021 to 14 Jun 2021)

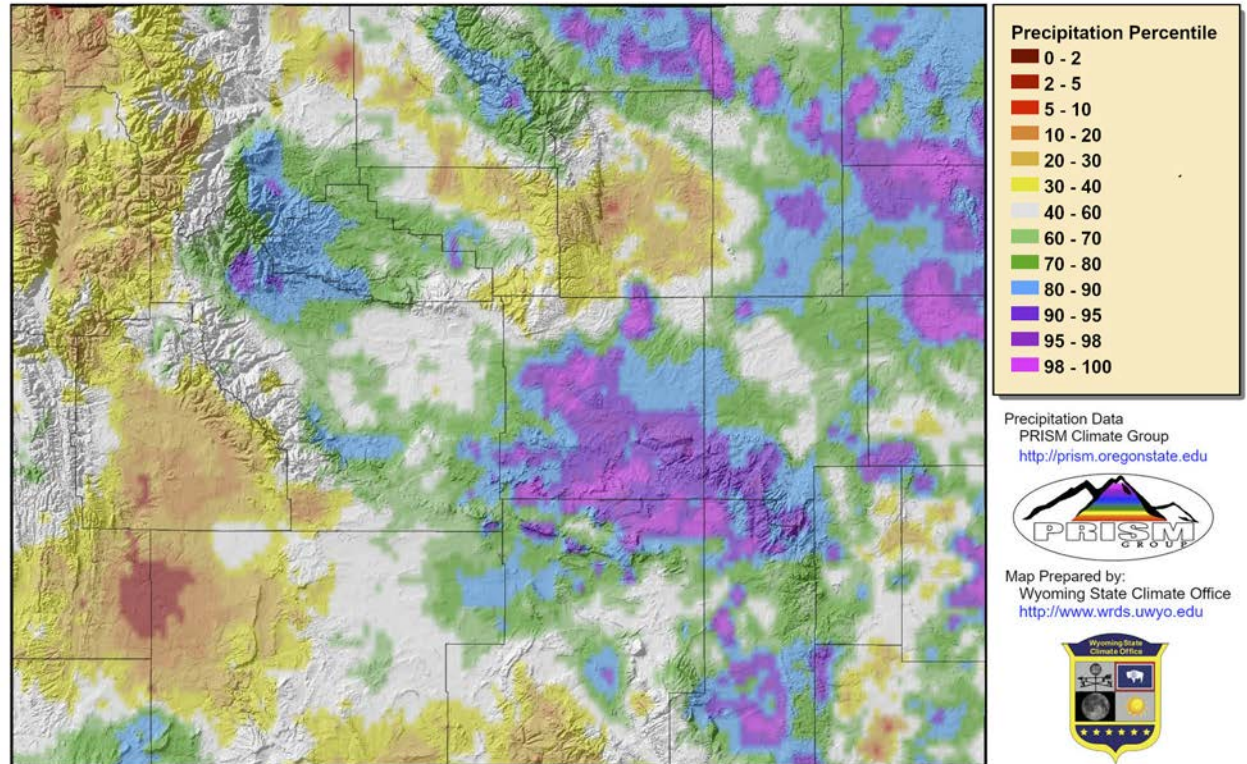
14-Day Precipitation (Percentile) for 01 Jul 2021 to 14 Jul 2021

Above Median:

- Far north central
- Central
- Southeast
- Northeast
- Parts of northwest

Below Median (Areas of Concern):

- West/southwest
- North and south central



Provisional data, subject to revision

Daily precipitation data from PRISM Climate Group, Copyright ©2021, PRISM Climate Group, Oregon State University, <http://prism.oregonstate.edu>
Map Created 15 Jul 2021 <http://www.wrds.uwyo.edu>
Daily percentiles created from PRISM daily precipitation grids



90-Day Precipitation Percentile (19 Mar 2021 to 16 Jun 2021)

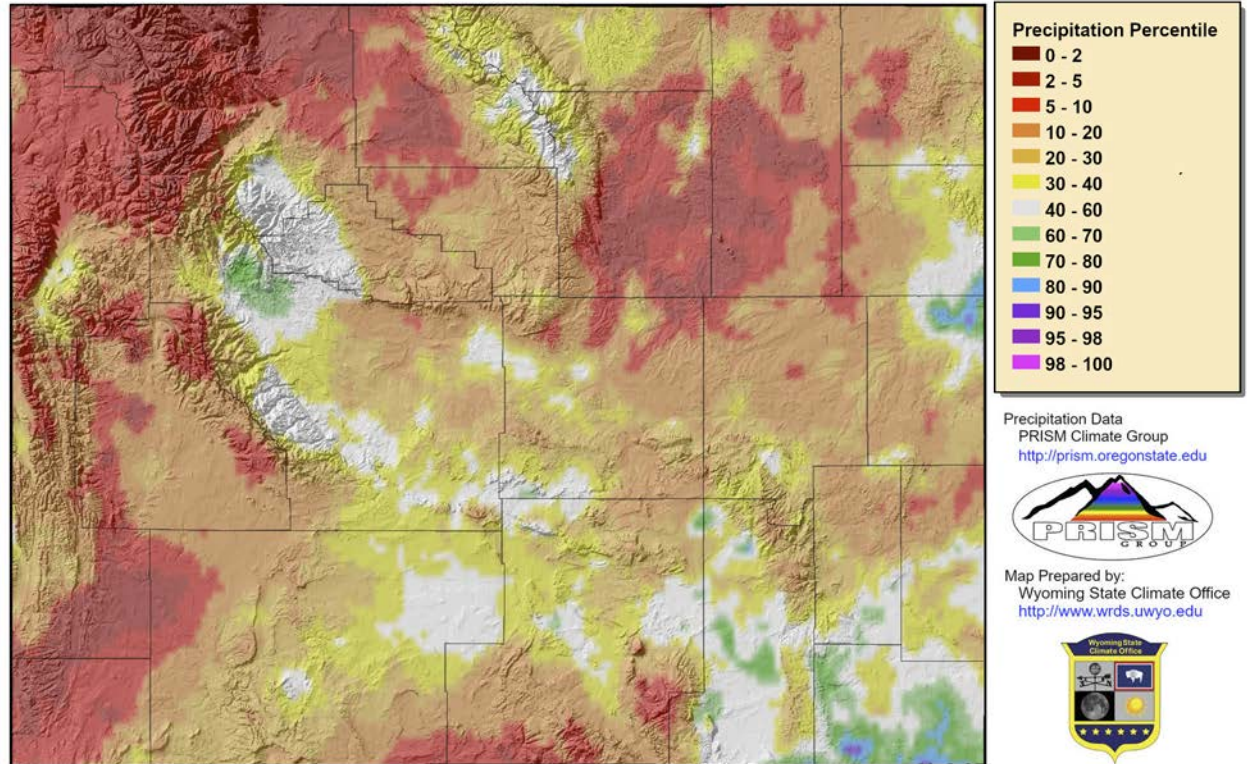
90-Day Precipitation (Percentile) for 16 Apr 2021 to 14 Jul 2021

Above Median:

- SE Weston/NE Niobrara Counties
- Minor spots in Fremont County
- Laramie County
- Parts of the Laramie Valley.

Below Median (Areas of Concern):

- Most everything else.

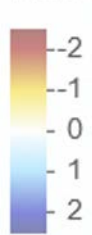


Provisional data, subject to revision

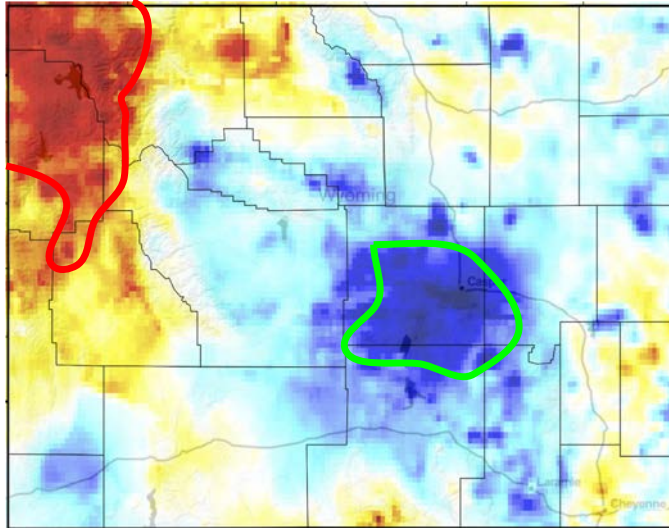
Daily precipitation data from PRISM Climate Group, Copyright ©2021, PRISM Climate Group, Oregon State University,
<http://prism.oregonstate.edu>
Map Created 15 Jul 2021 <http://www.wrds.uwyo.edu>
Daily percentiles created from PRISM daily precipitation grids



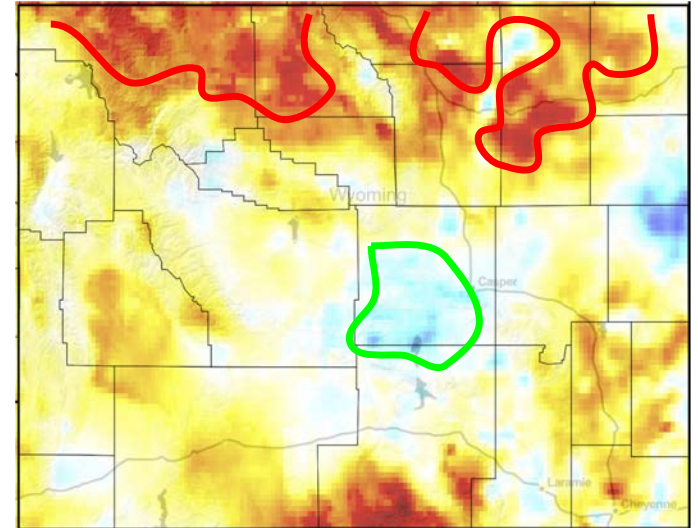
Current SPI



30-Day



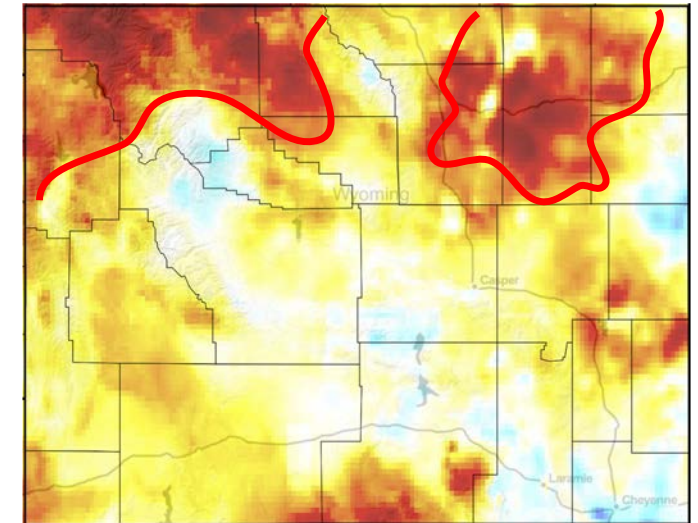
60-Day

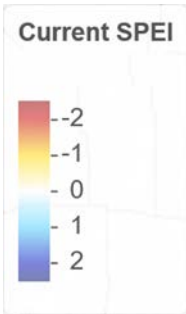


Standardized Precipitation Index (SPI)

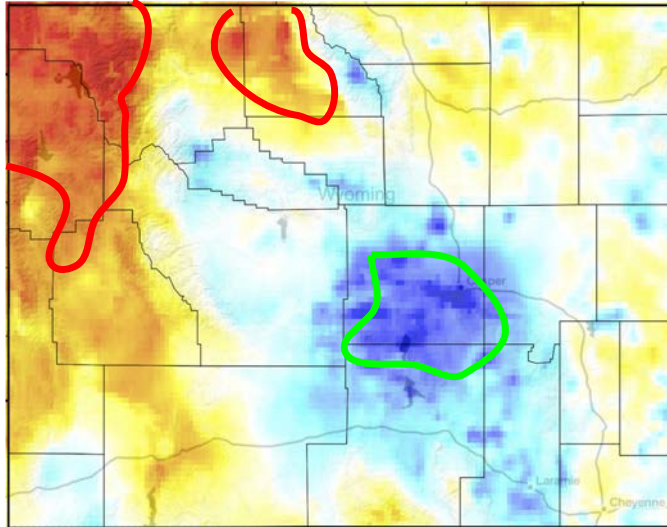
- Wet areas caused some improvement
- Dry conditions in Northeast/Northcentral Wyoming causing further degradation of conditions.

90-Day

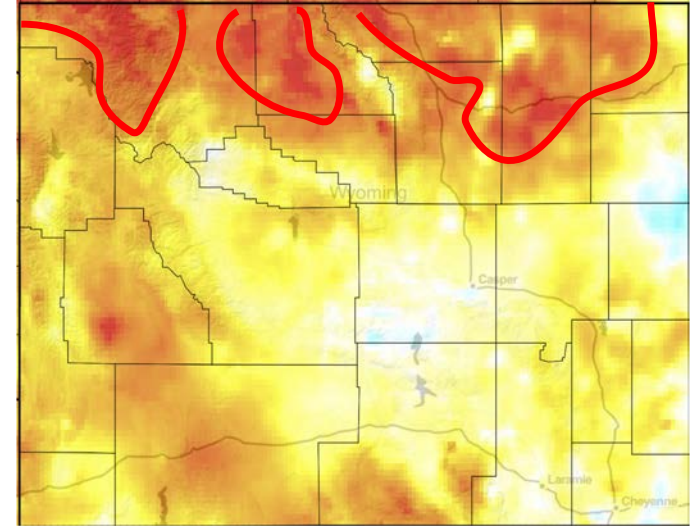




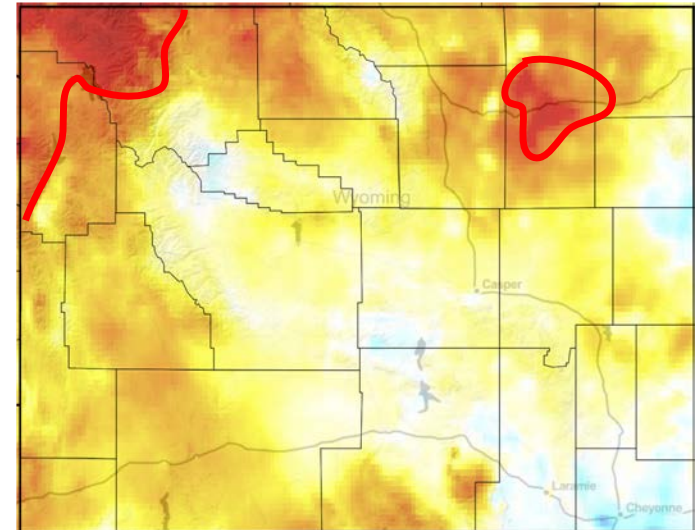
30-Day



60-Day



90-Day



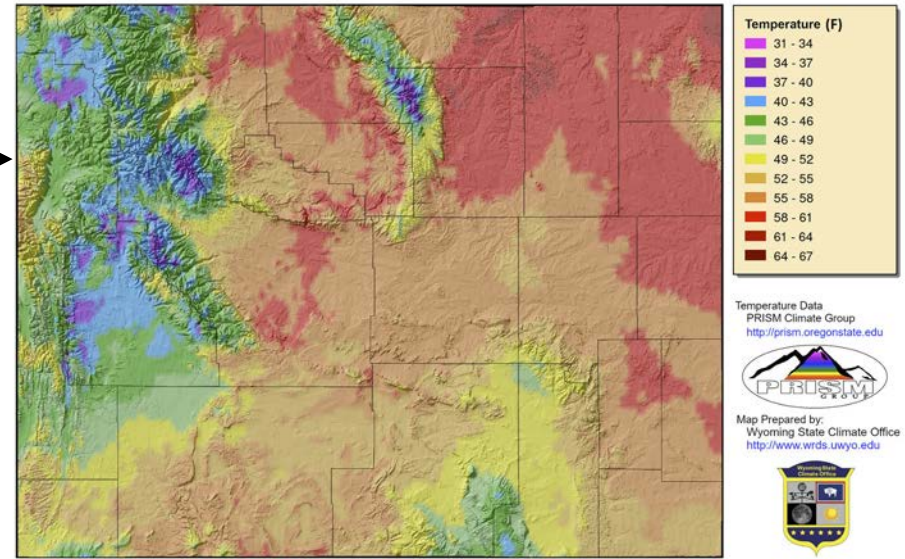
Standardized Precipitation Evapotranspiration Index (SPEI)

- Wet areas caused some improvement
- Dry conditions in Northeast/Northcentral Wyoming causing further degradation of conditions.

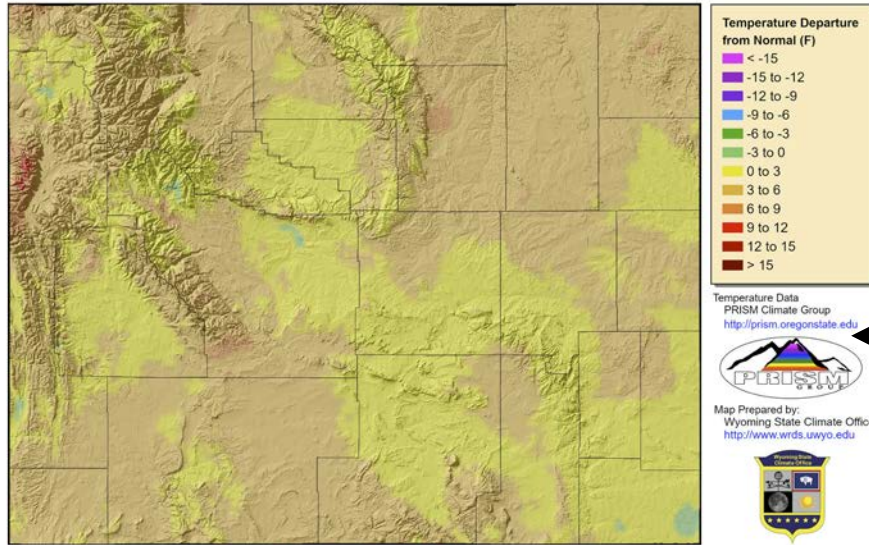
14-Day Average Minimum Temperature (01 Jul to 14 Jul)

- Higher elevation nighttime lows above 32F

14-Day Average Minimum Temperature for 01 Jul 2021 to 14 Jul 2021



14-Day Average Minimum Temperature (Departure from 1991-2020 Average) for 01 Jul 2021 to 14 Jul 2021



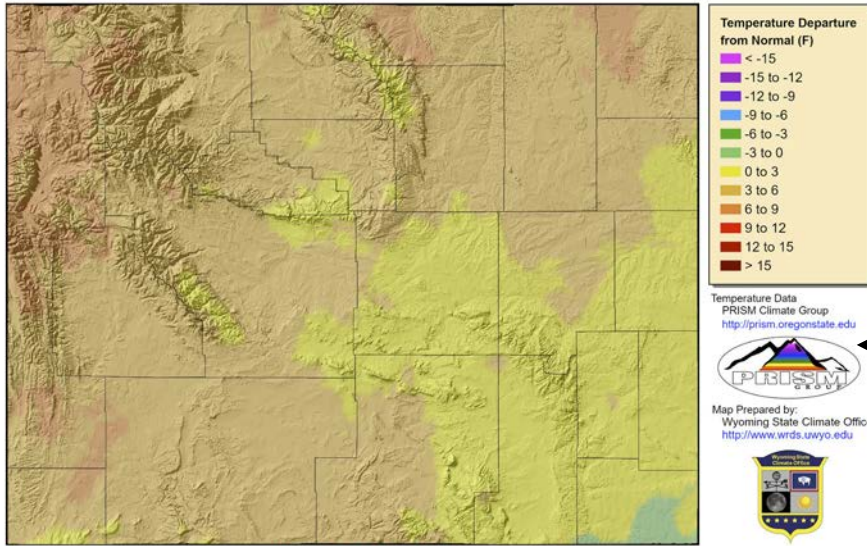
14-Day *Departure from Normal* Average Minimum Temperature

- Mostly up to 6F above average
- Higher in Tetons
- Below average in a few isolated spots

14-Day Average **Maximum** Temperature (01 Jul to 14 Jul)

- Lowest Daytime highs mostly >60F
- 85-95 in low parts northcentral/northeast

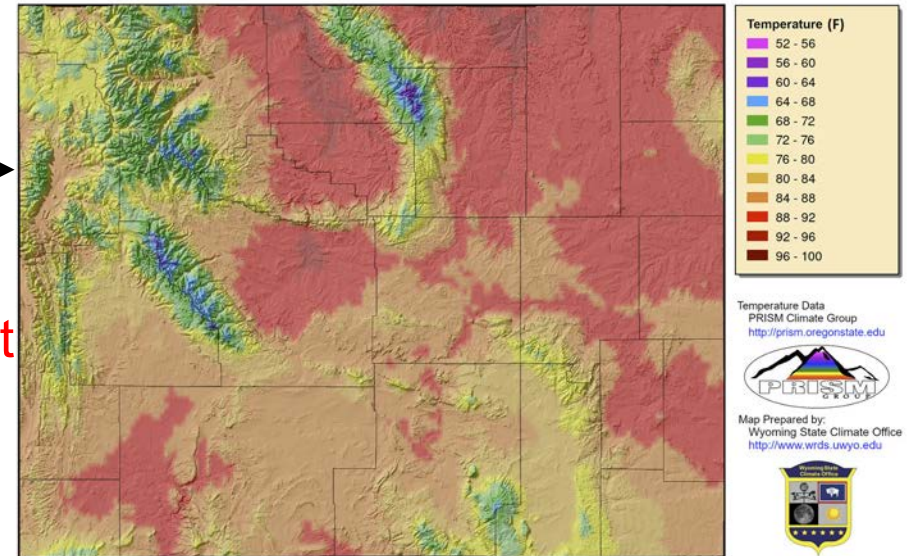
14-Day Average Maximum Temperature (Departure from 1991-2020 Average) for 01 Jul 2021 to 14 Jul 2021



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 15 Jul 2021 <http://www.wrds.uwyo.edu>
Temperature averages created from PRISM daily temperature grids

14-Day Average Maximum Temperature for 01 Jul 2021 to 14 Jul 2021



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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 15 Jul 2021 <http://www.wrds.uwyo.edu>
Temperature averages created from PRISM daily temperature grids

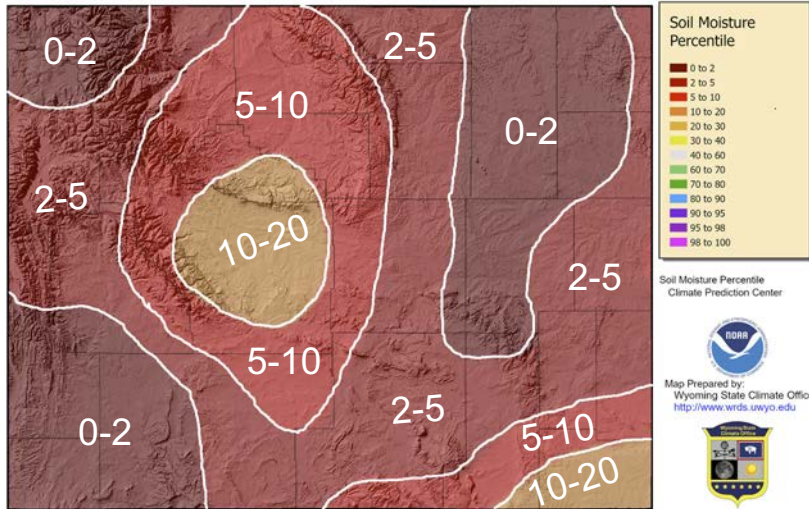
14- Day *Departure from Normal* Average **Maximum** Temperature

- Far SE 0-3F below average
- NW and far north 6 to 9F above

Soil Moisture Percentile

Two Weeks Ago
01 Jul 2021

Soil Moisture Percentile for 01 Jul 2021

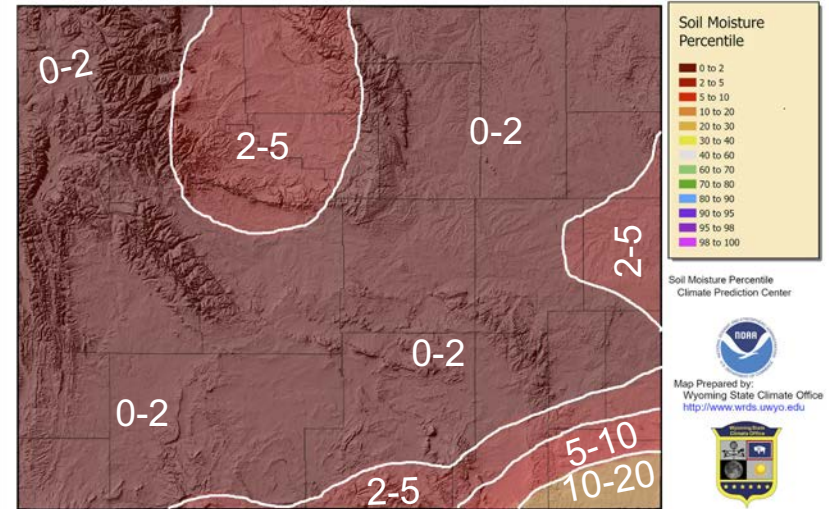


Provisional data, subject to revision

Modeled Soil Moisture Percentile https://www.cpc.ncep.noaa.gov/products/GIS/GIS_DATA/USDM_Products/soil/soil_percentile.php
Map Created 02 Jul 2021 <http://www.wrds.uwyo.edu>

14 Jul 2021

Soil Moisture Percentile for 14 Jul 2021



Provisional data, subject to revision

Modeled Soil Moisture Percentile https://www.cpc.ncep.noaa.gov/products/GIS/GIS_DATA/USDM_Products/soil/soil_percentile.php
Map Created 15 Jul 2021 <http://www.wrds.uwyo.edu>

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

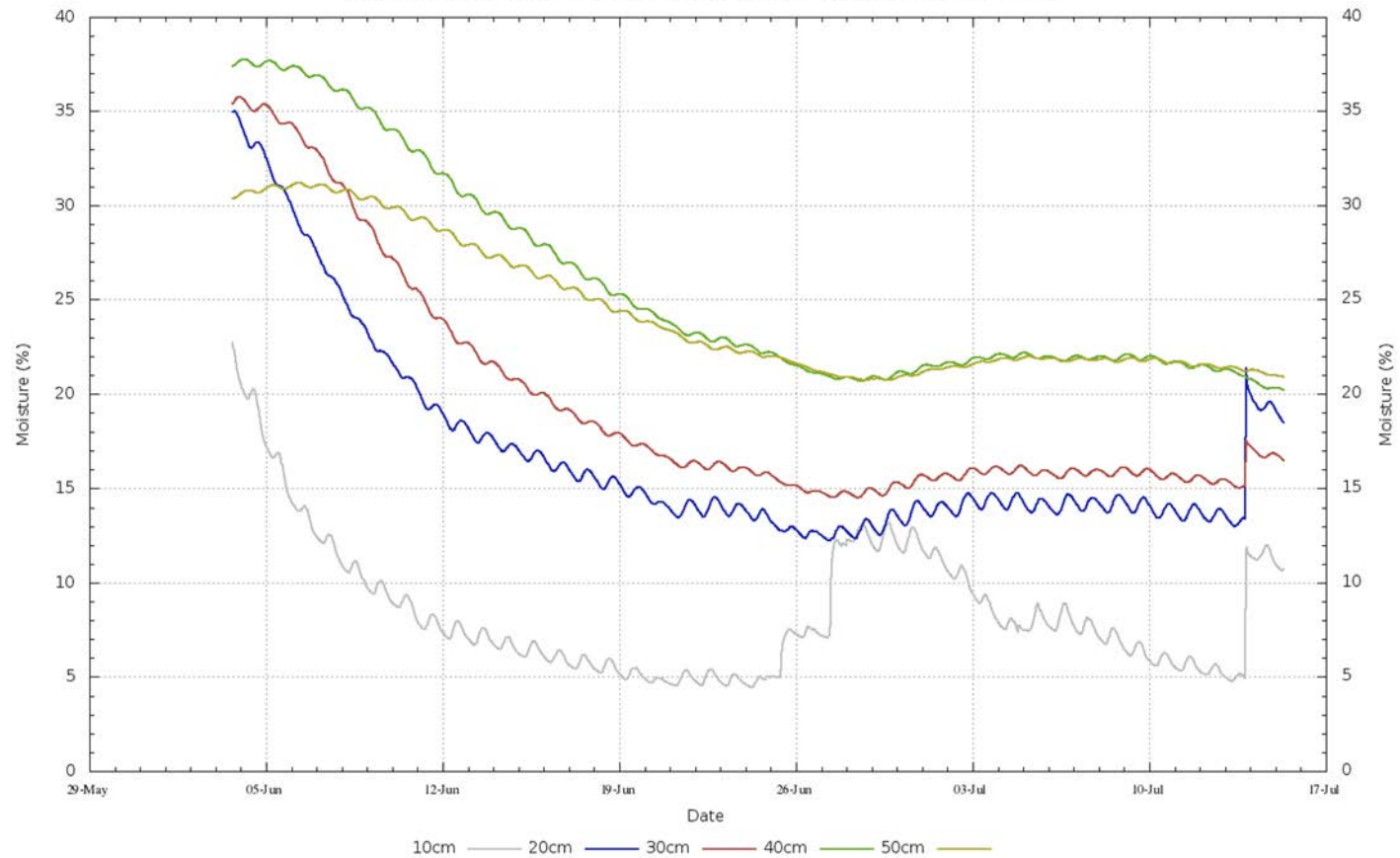
Soil Moisture has gone down one category almost statewide



Soil Moisture at Thunder Basin Grasslands

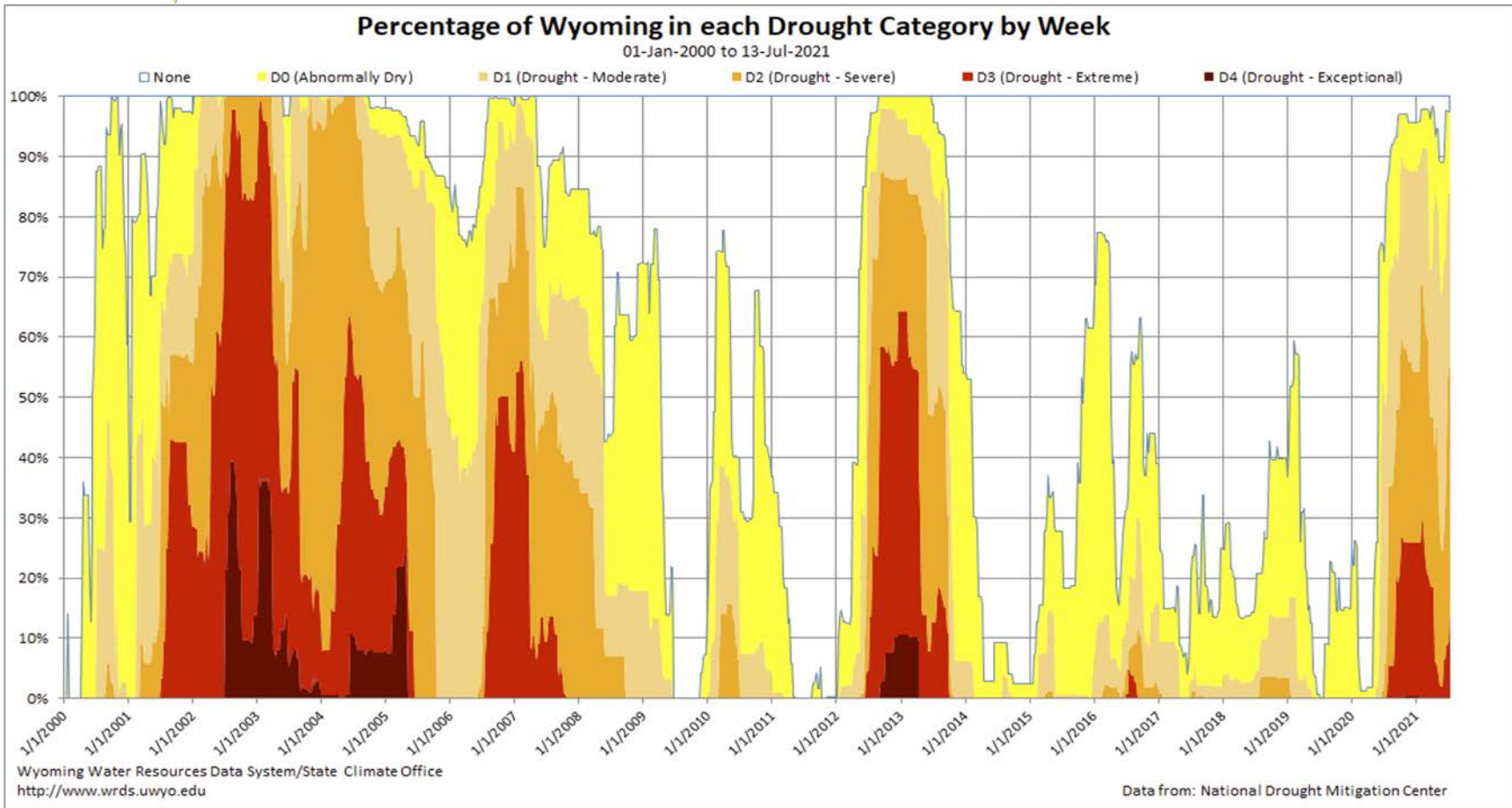
Campbell/Converse County Line Area

Thunder Basin Grasslands - 2021-07-15 07:30:00 (Created Thu Jul 15 08:35:01 MDT 2021)

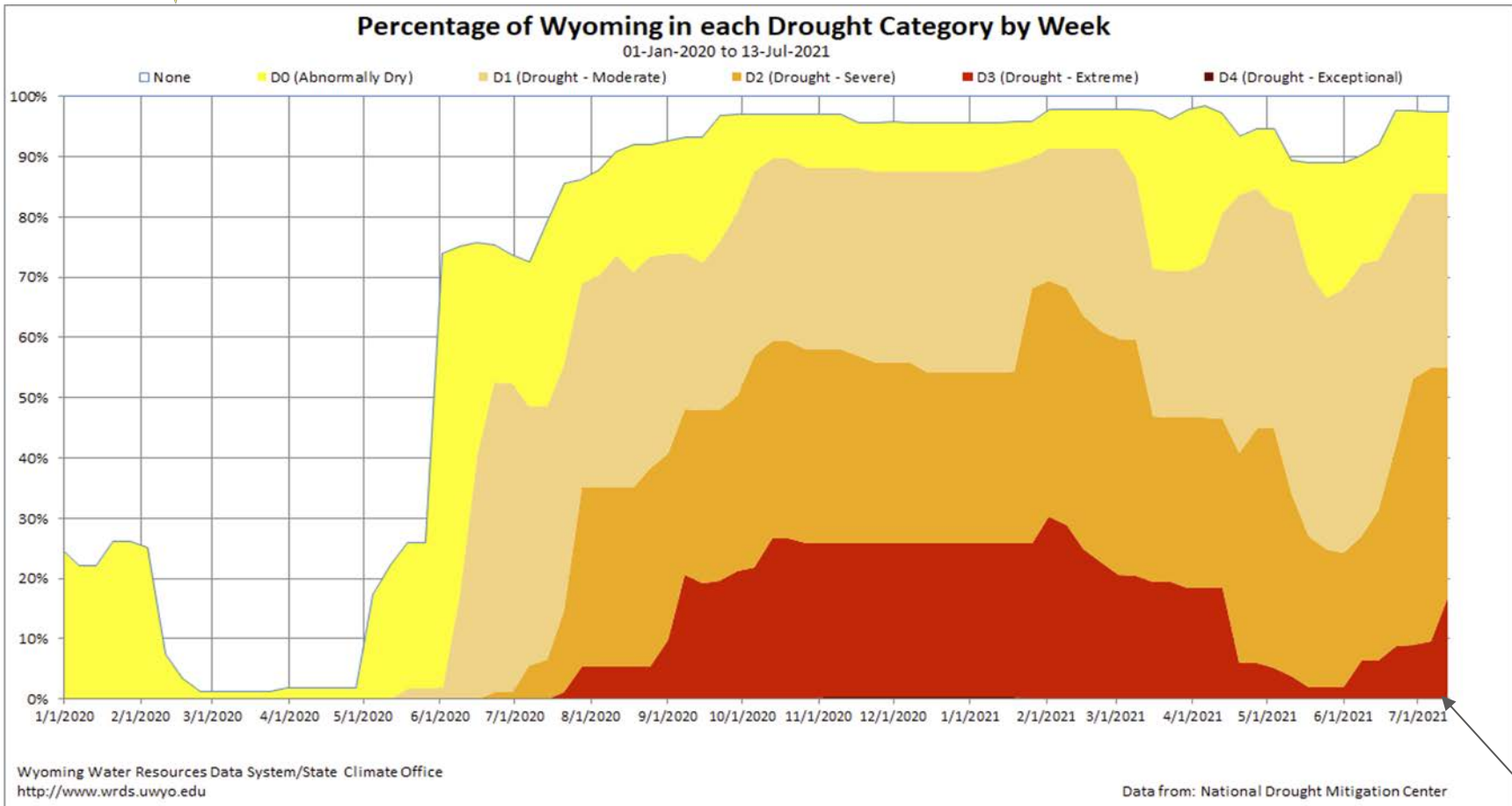


Late June Precip leveled the decline at deeper depths.

Precip in last few days caused another spike but already declining.



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



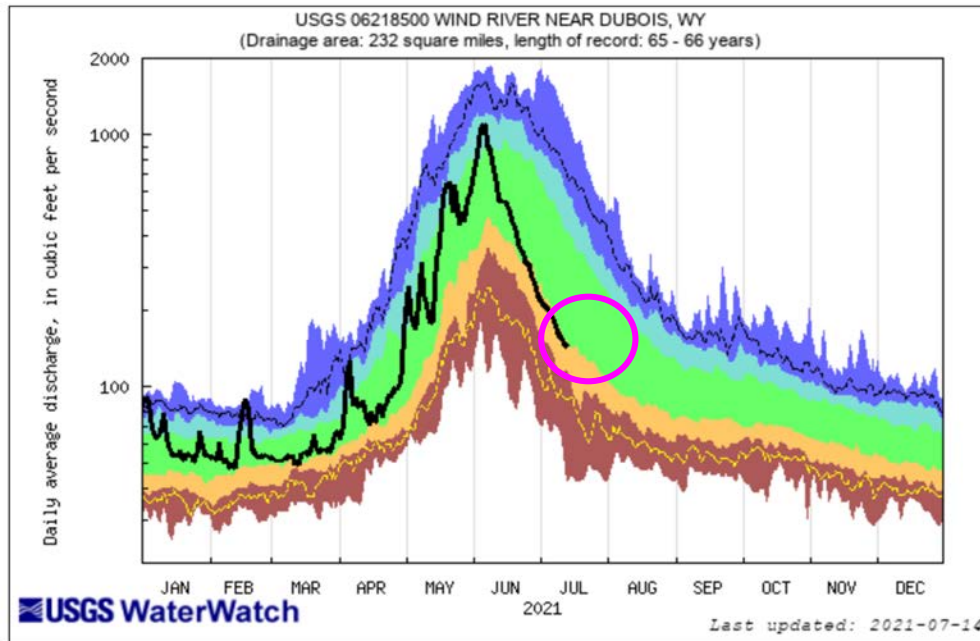
<http://www.wrds.uwyo.edu/drought/droughttimeline.html>

D4: 0.08%



Current Flow: (updated 07/14/21)

Where should we be on the hydrograph



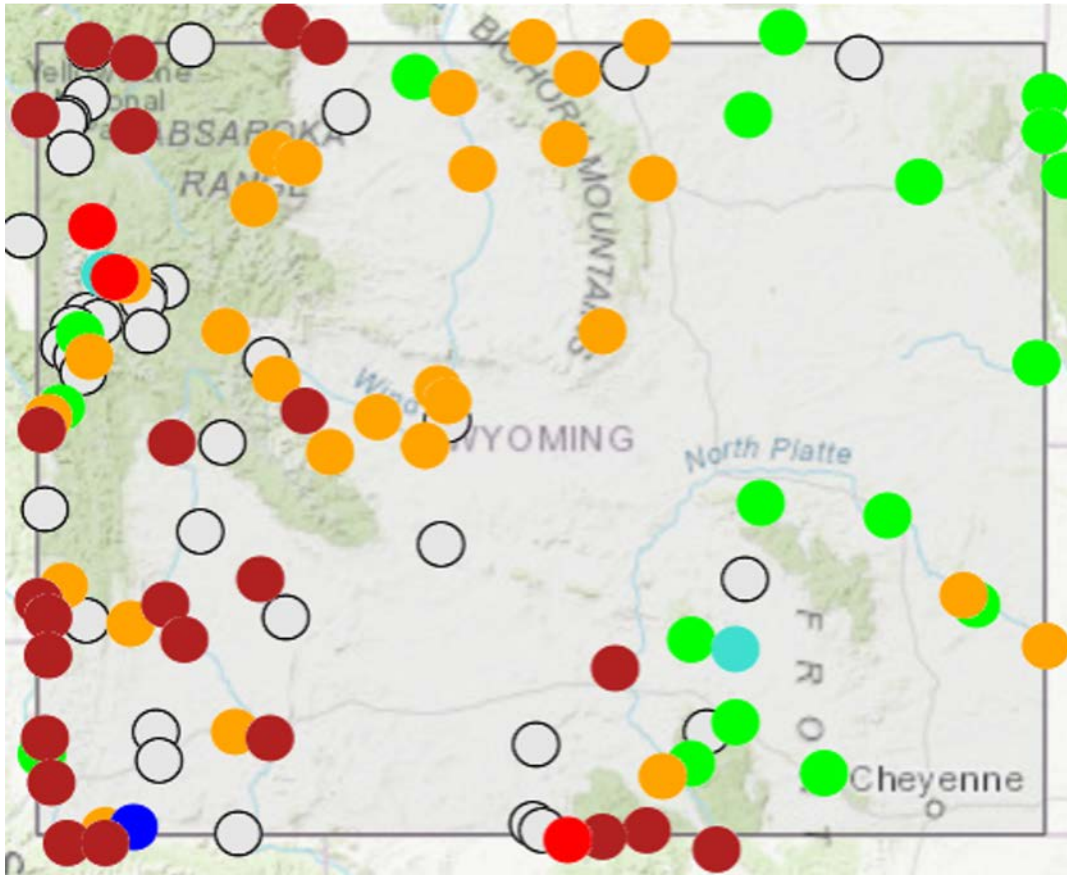
- On the falling limb of runoff or near baseflow.
- Should have good water supply conditions depending on location (proximity to mountains).

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			

<https://waterwatch.usgs.gov>



Current 7-Day Average Streamflow



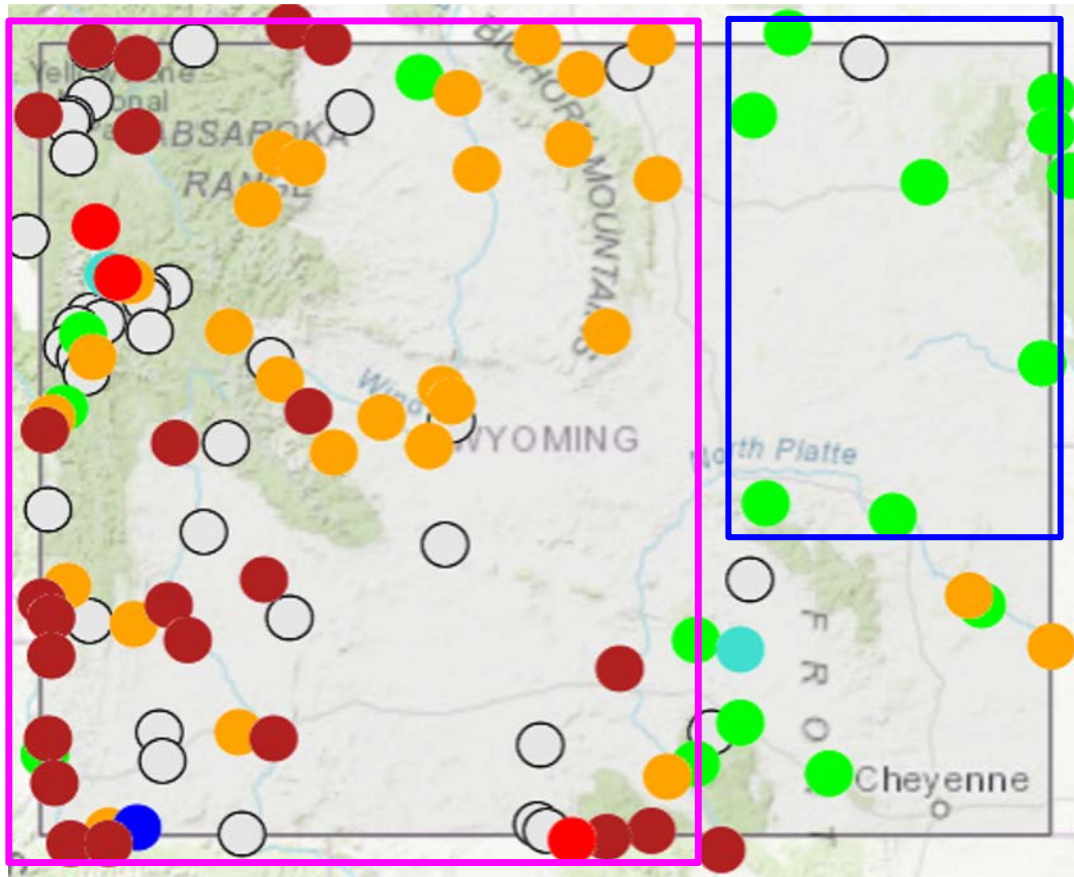
- “Normal” 25-75 percentile.
- White = not ranked or missing data
- Generally “Green” is still below the median/average.

Explanation - Percentile classes							
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked

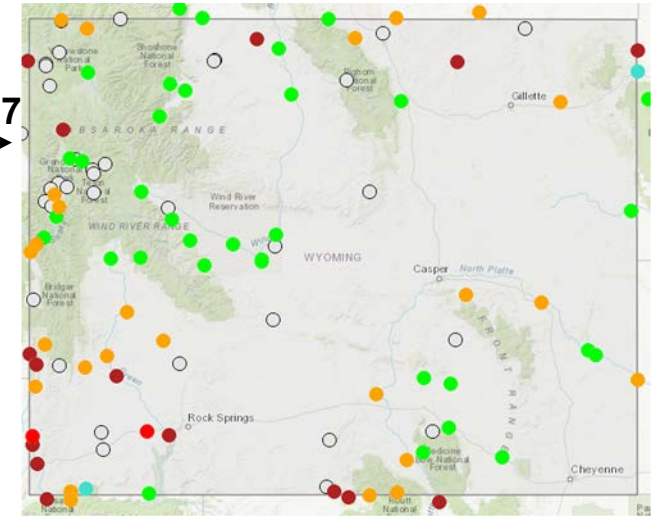
<https://waterwatch.usgs.gov>



7-Day Avg Compared to last Month (July 15)



June 17
→



Explanation - Percentile classes							
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked

<https://waterwatch.usgs.gov>

Pink Box = Decreasing flow

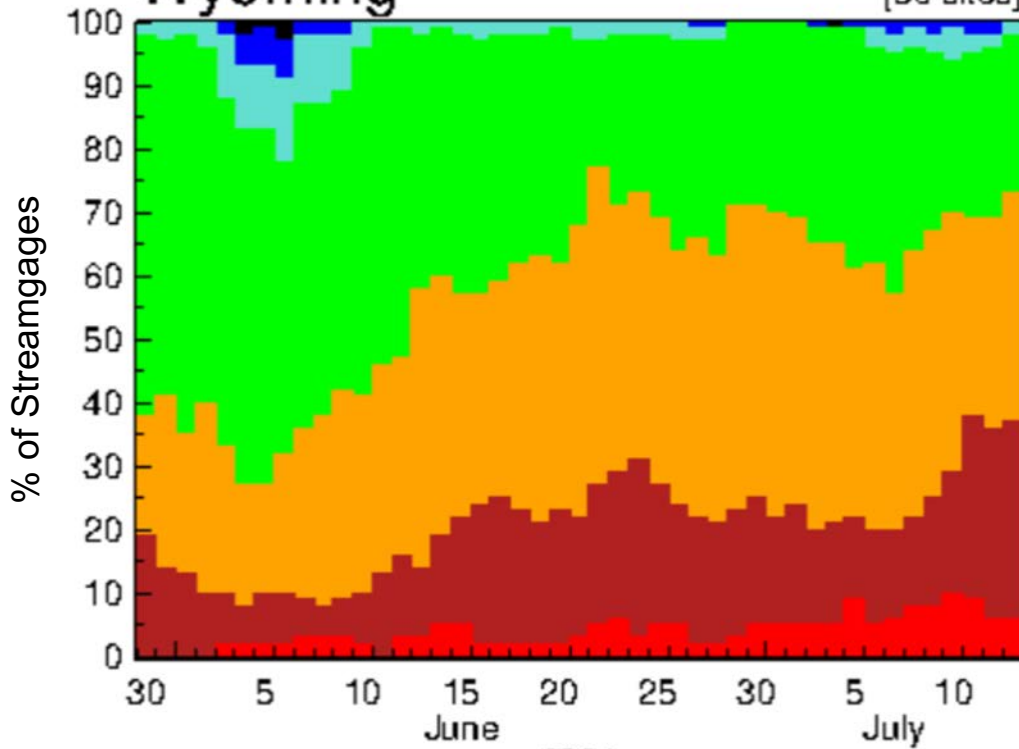
Blue Box = Improvements in flow (recent rains ~ July 5) or other.



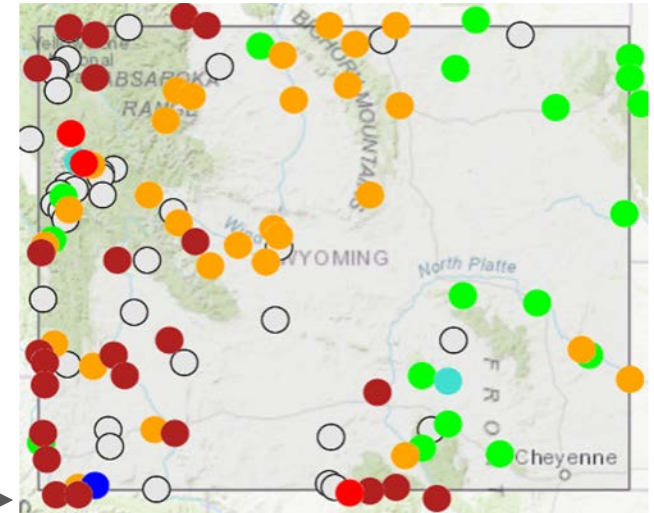
Flow Trends since early June

**Last 45 Days
Wyoming**

[50 sites]



7-day avg- July 15



Explanation - Percentile classes							
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranke

<https://waterwatch.usgs.gov>

7 Sites- Lowest recorded for this day



Current Streamflow Compared to US Drought Monitor (July 15)

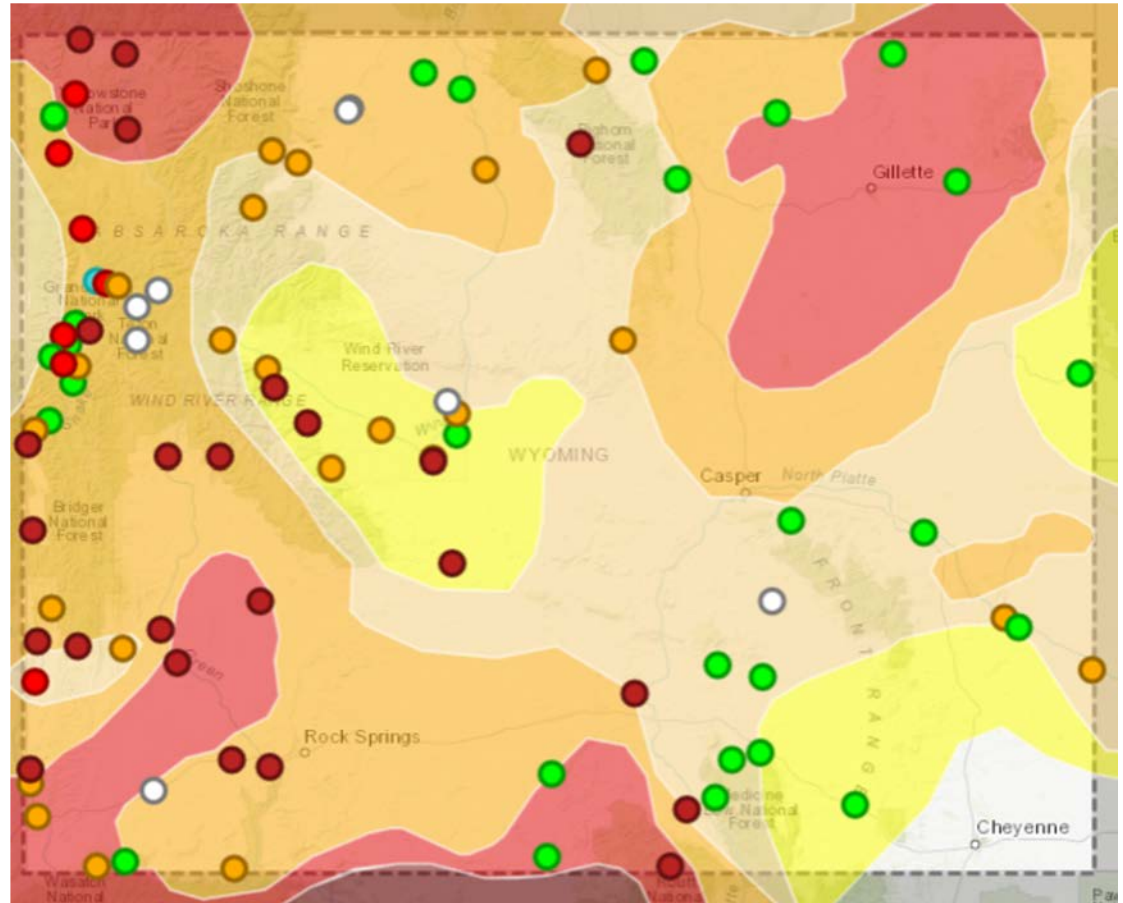
Streams: Flow status

- All-Time Low for this Day (minimum) 0th percentile
- Much Below Normal <10th percentile
- Below Normal 10th – 24th percentile
- Normal 25th – 75th percentile
- Above Normal 76th – 90th percentile
- Much Above Normal >90th percentile
- All-Time High for this Day (maximum) 100th percentile
- Not Flowing 0 cubic feet per second
- Above NWS Flood Stage See Comments
- Not Ranked See Comments

Stream Flow Status

USDM Intensity Categories

- Abnormally Dry
- Moderate Drought
- Severe Drought
- Extreme Drought
- Exceptional Drought



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

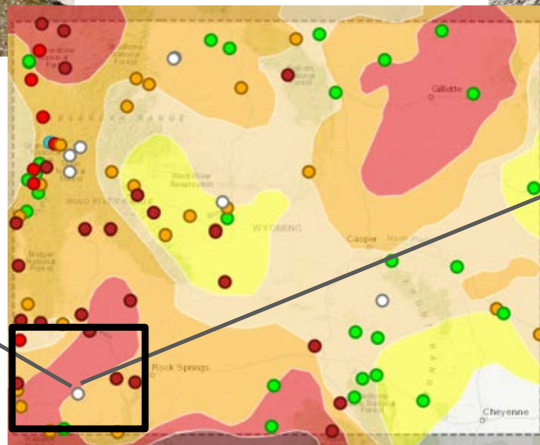


Low Conditions

09219200 blacks fk ab smiths fk



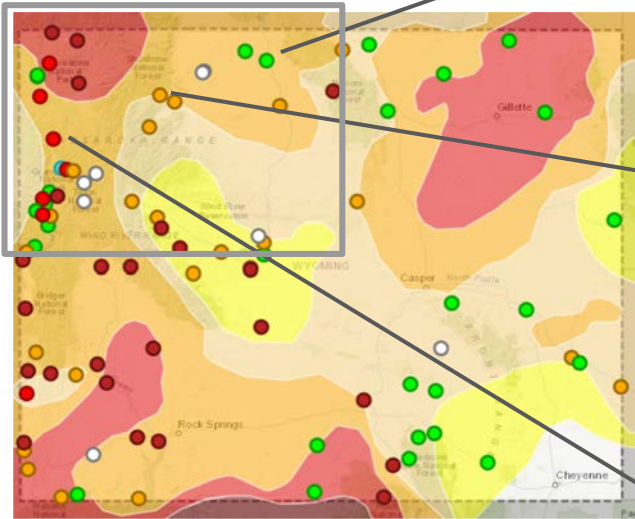
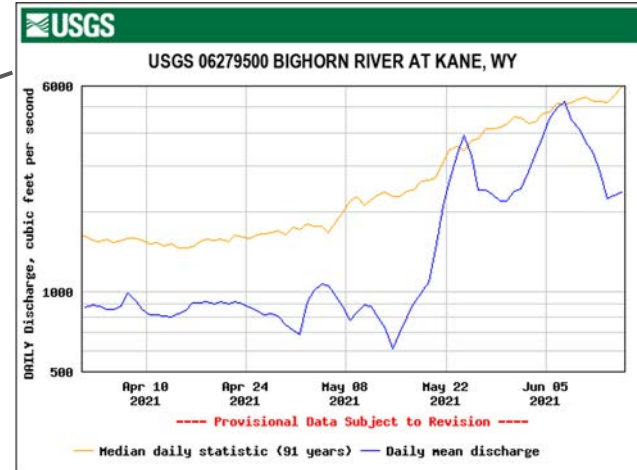
09222400 muddy Ck Hampton



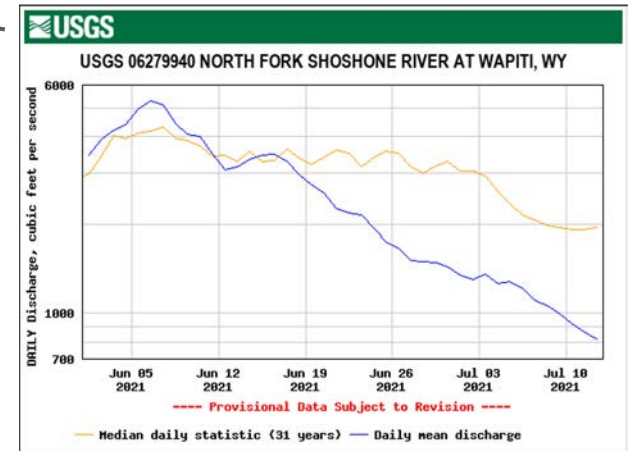
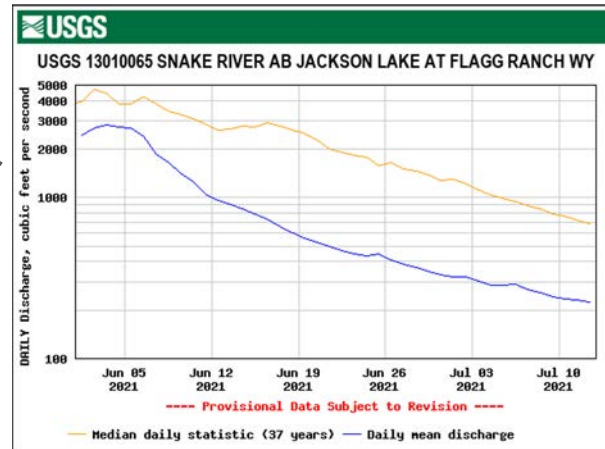
<https://dashboard.waterdata.usgs.gov/>



Northwest WY Streamflows

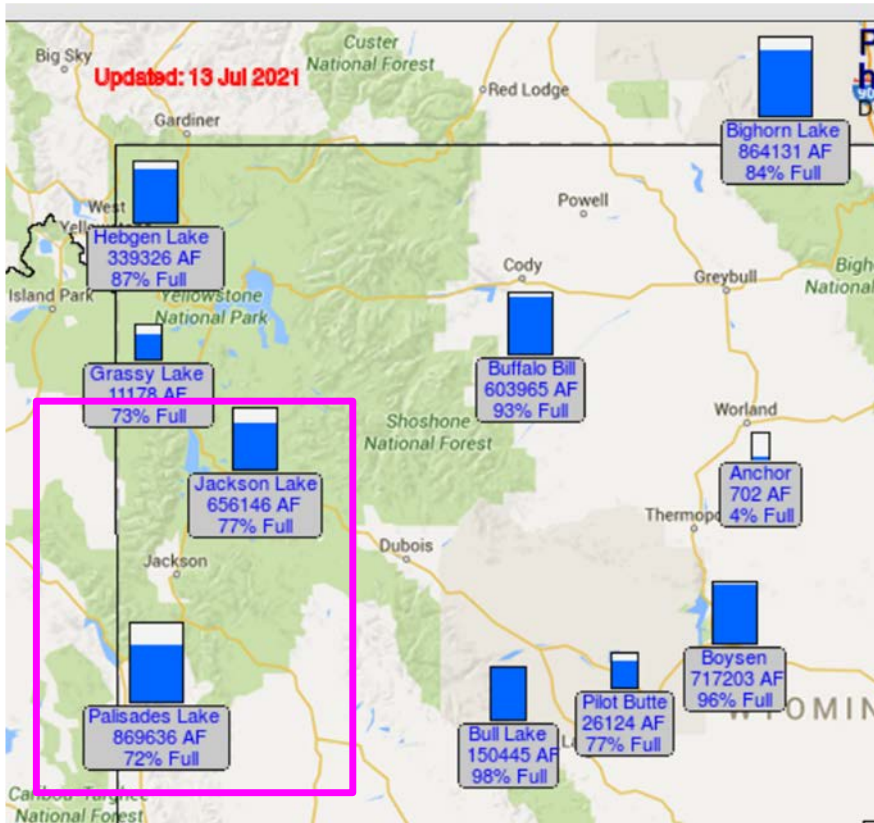


<https://dashboard.waterdata.usgs.gov/>
<https://waterdata.usgs.gov/>





Northwest WY Reservoirs (Updated 07/13/21)



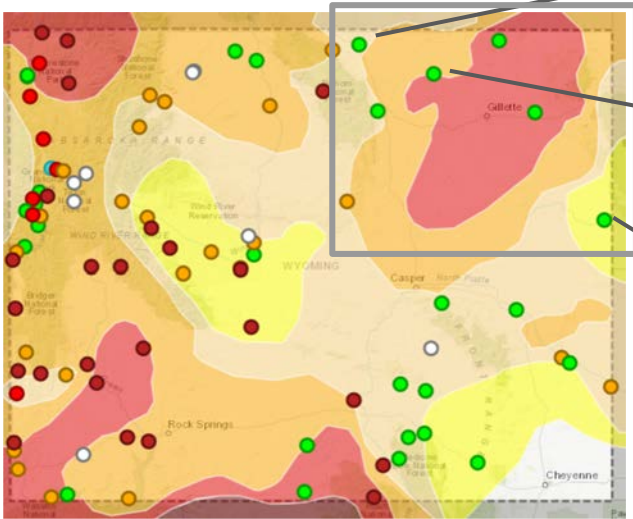
http://www.wrds.uwyo.edu/surface_water/teacups.html

Compared to June

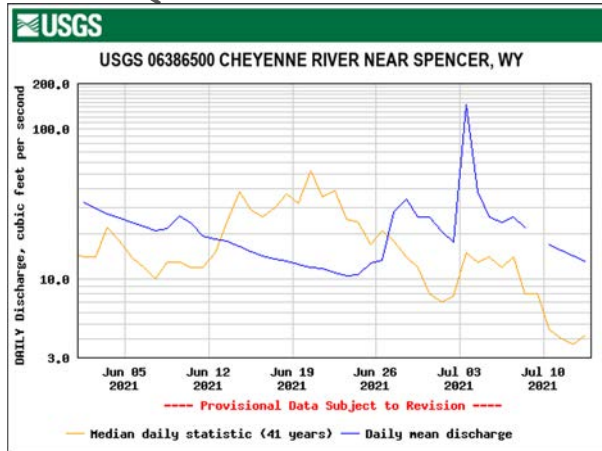
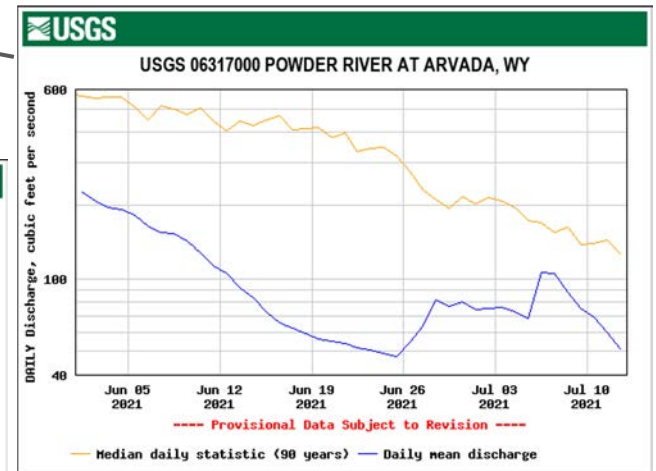
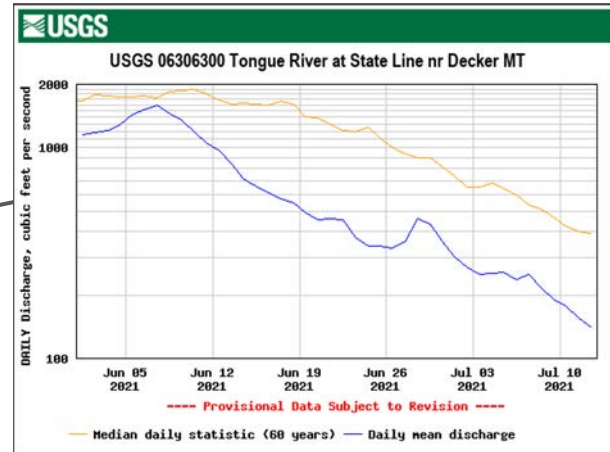
- Reservoirs in Bighorn basin maintained storage.
- Reservoirs in Snake lost storage.



Northeast WY Streamflows

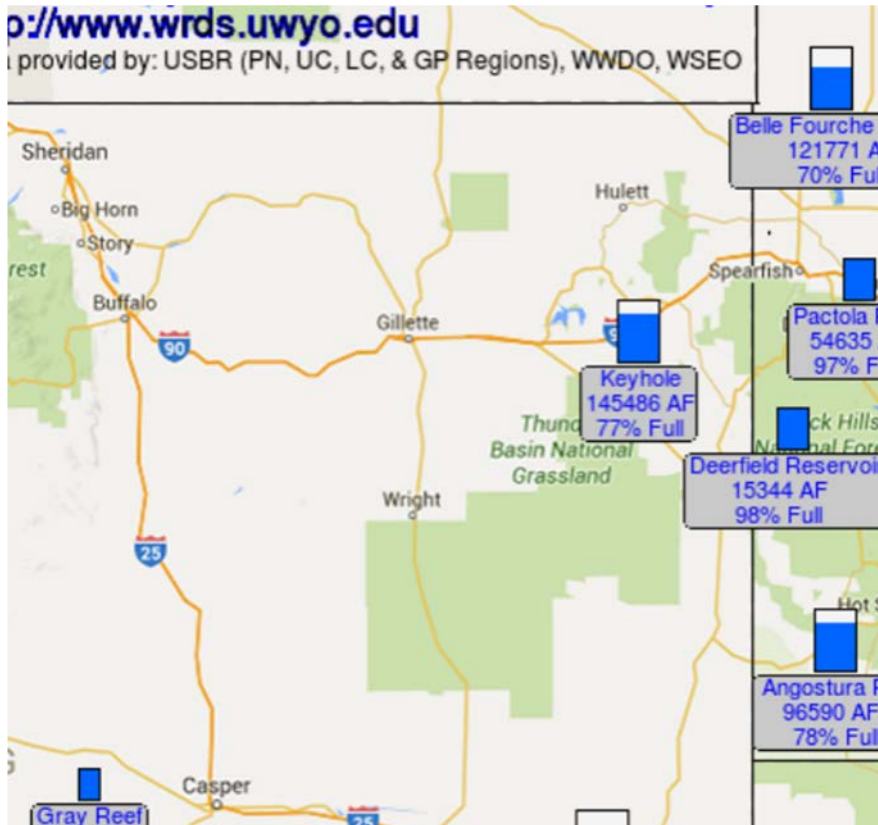


<https://dashboard.waterdata.usgs.gov/>
<https://waterdata.usgs.gov/>





Northeast WY Reservoirs (Updated 07/13/21)

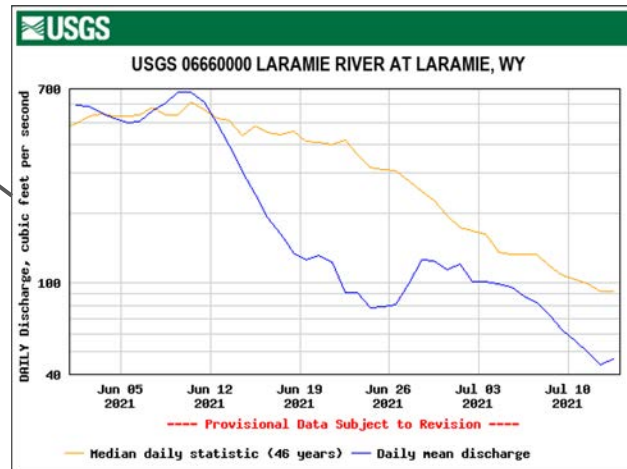
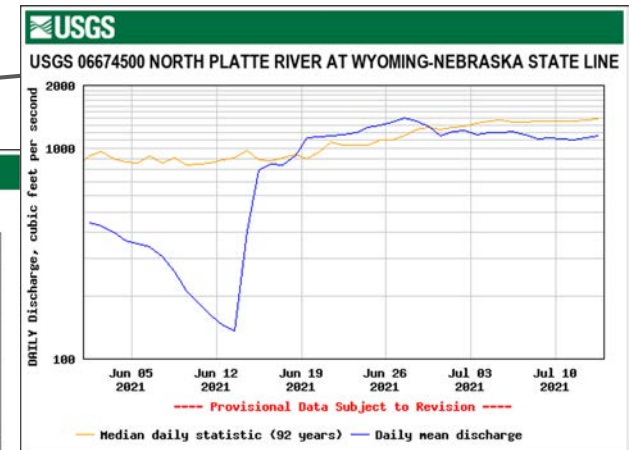
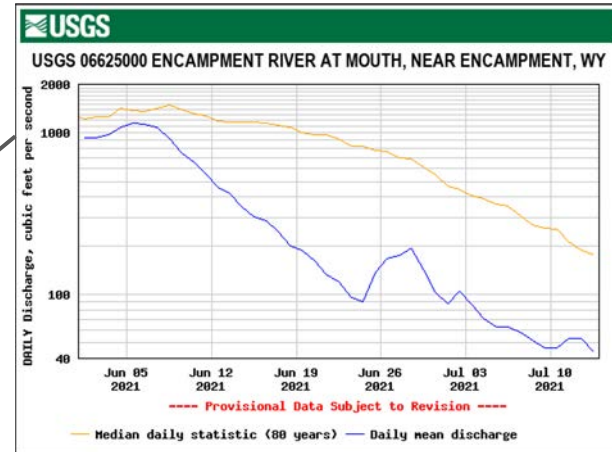
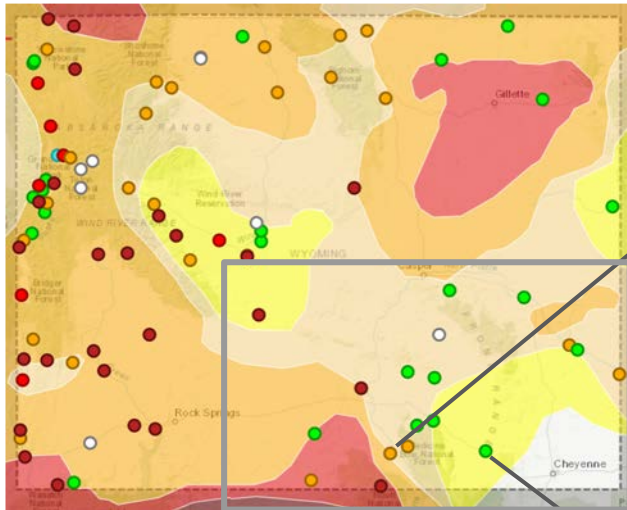


http://www.wrds.uwyo.edu/surface_water/teacups.html

- Compared to June
Reservoirs in gained storage or maintained storage.



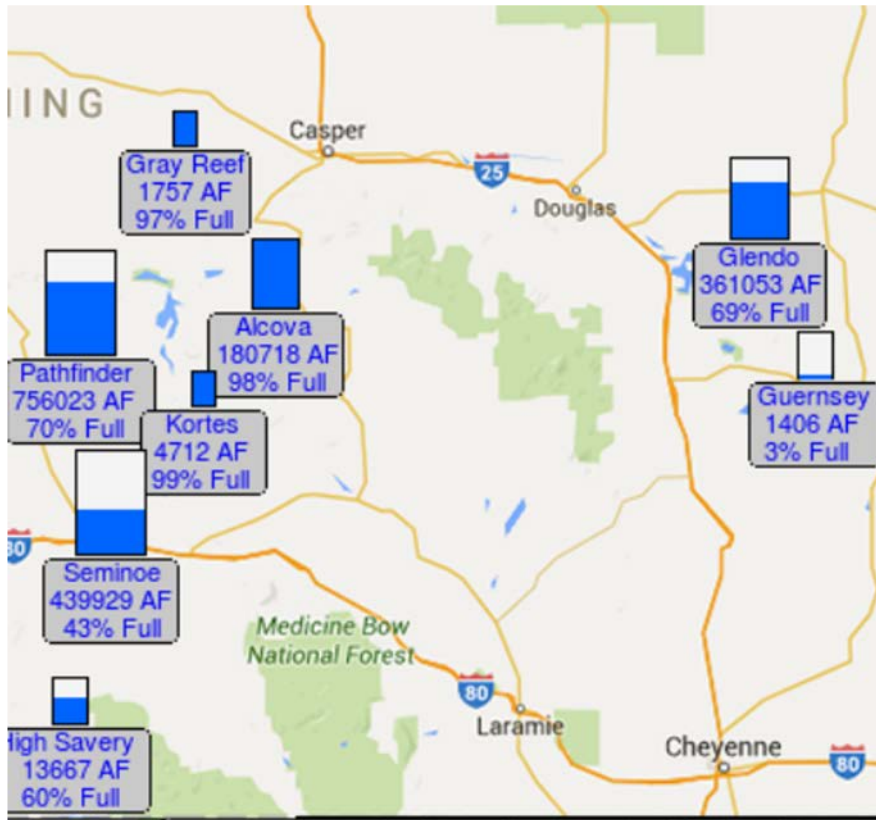
Southeast WY Streamflows



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



Southeast WY Reservoirs (Updated 07/13/21)



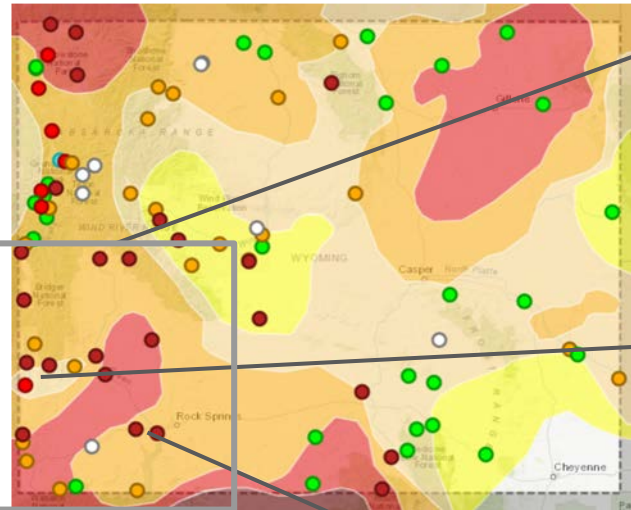
http://www.wrds.uwyo.edu/surface_water/teacups.html

Compared to June

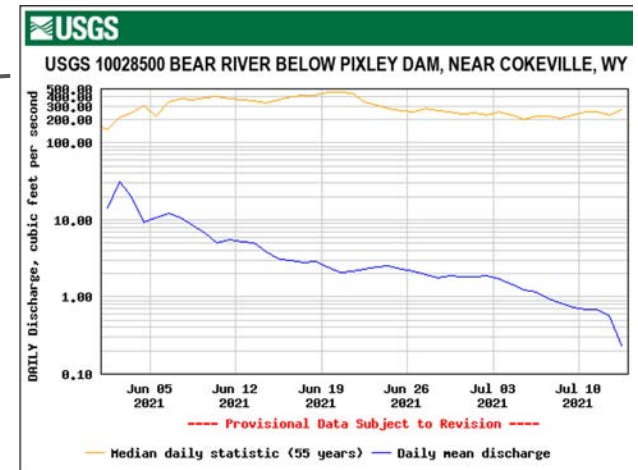
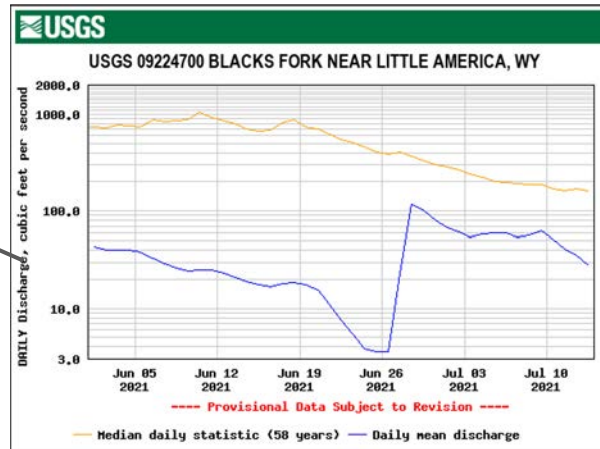
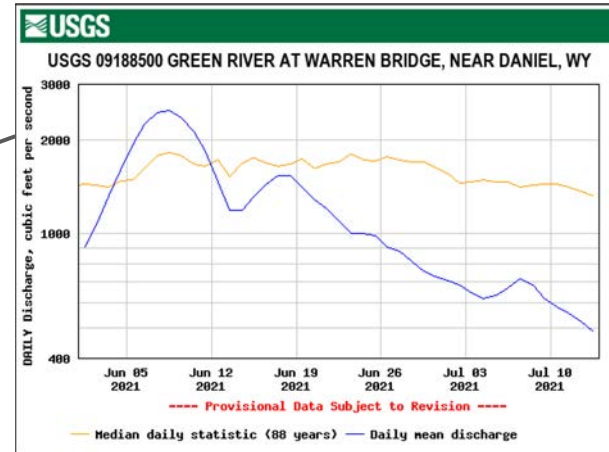
- Reservoirs lost storage.



Southwest WY Streamflows

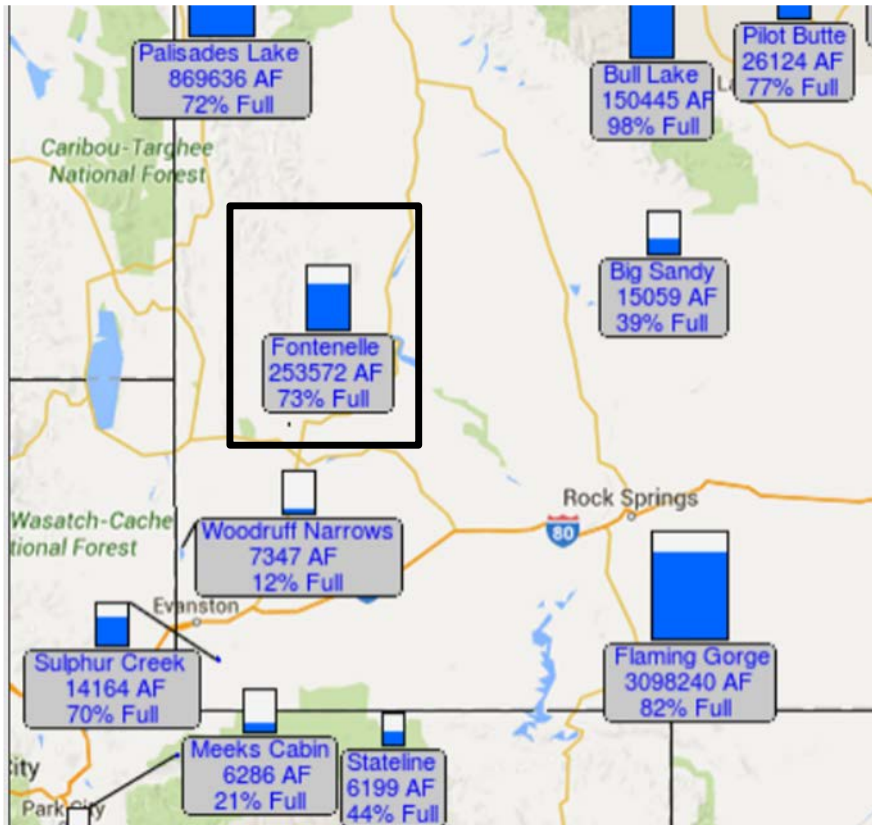


<https://dashboard.waterdata.usgs.gov/>
<https://waterdata.usgs.gov/>





Southwest WY Reservoirs (Updated 07/13/21)



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

Compared to June

- Most reservoirs lost stored water except for Fontenelle (black box).
- Flaming Gorge lost 1%.



State Engineer's Office Divisions and Districts



Districts having
some regulation
in effect

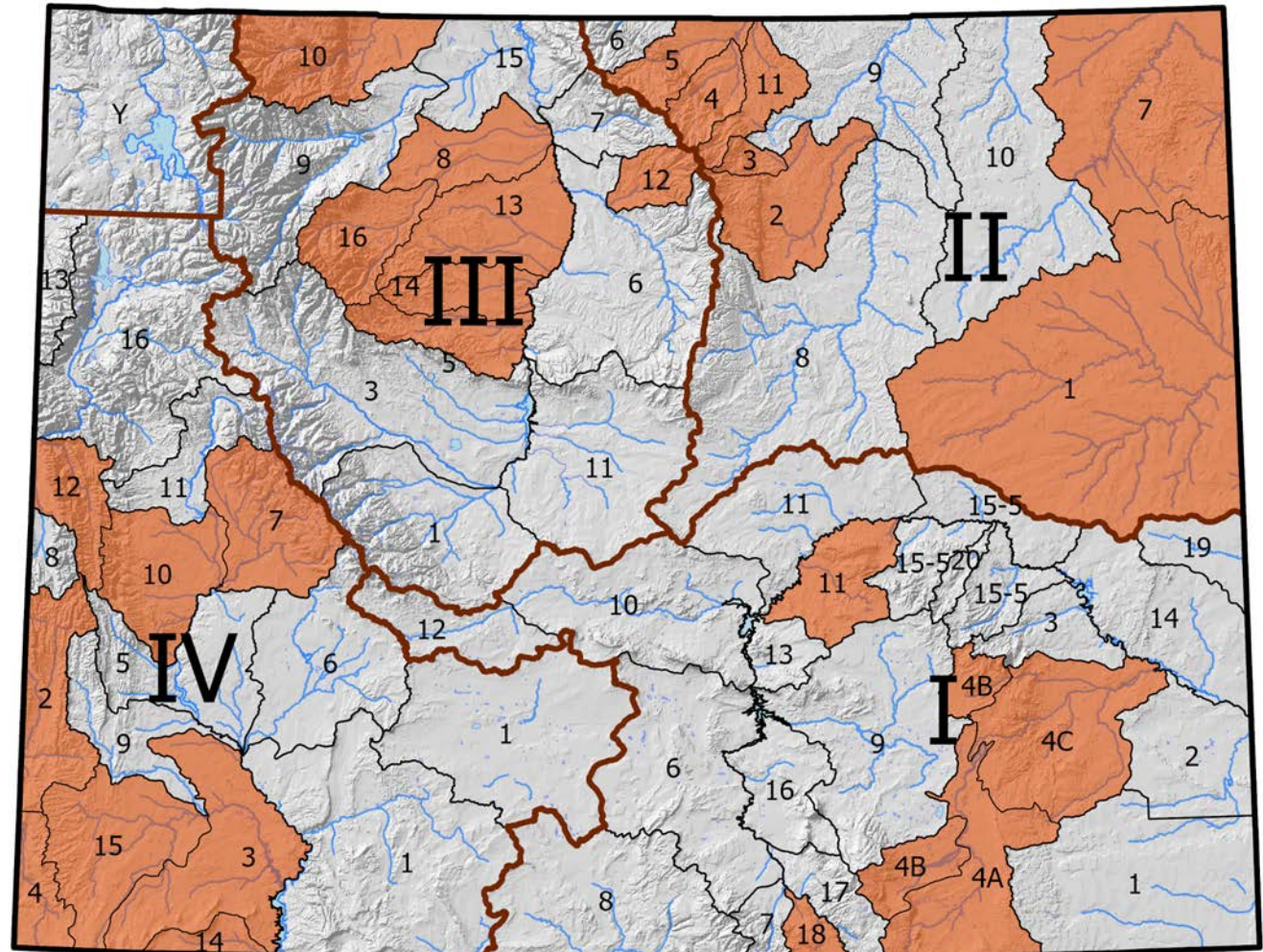
Division Superintendents:

Div I: Brian Pugsley
brian.pugsley@wyo.gov

Div II: David Schroeder
d.schroeder@wyo.gov

Div III: Loren Smith
loren.smith@wyo.gov

Div IV: Kevin Payne
kevin.payne@wyo.gov



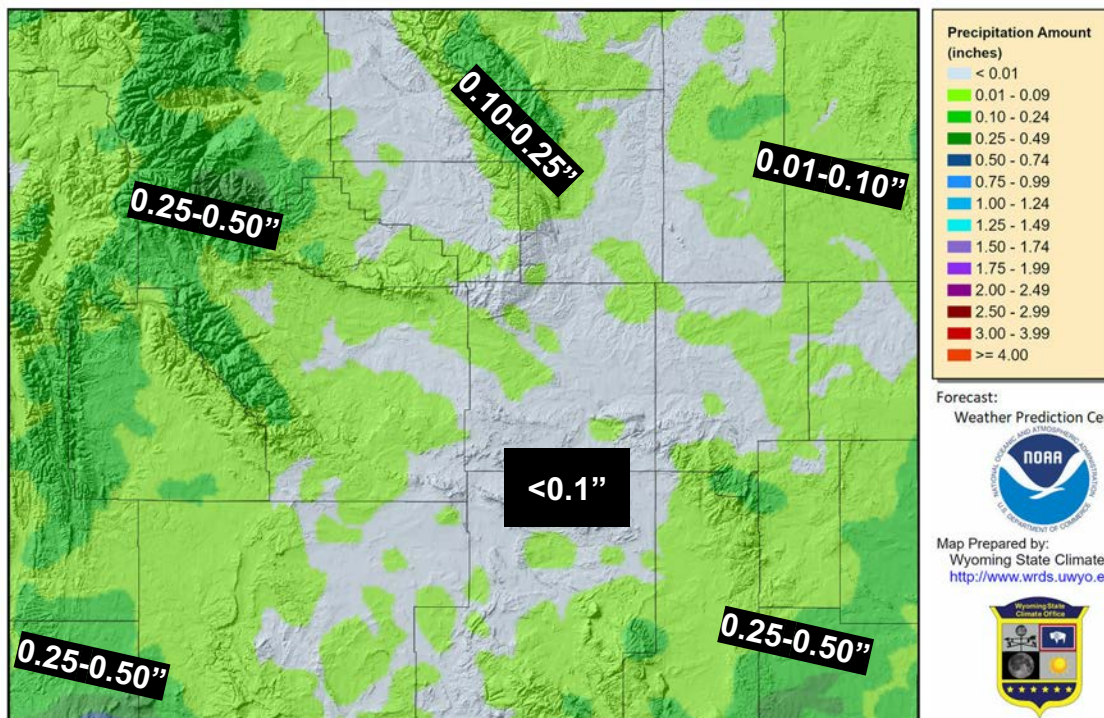


Forecasts & Outlooks



7-Day Quantitative Precipitation Forecast June 15 - 22

7-Day Quantitative Precipitation Forecast 15 Jul 2021



Provisional data, subject to revision

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 15 Jul 2021 <http://www.wrds.uwyo.edu>

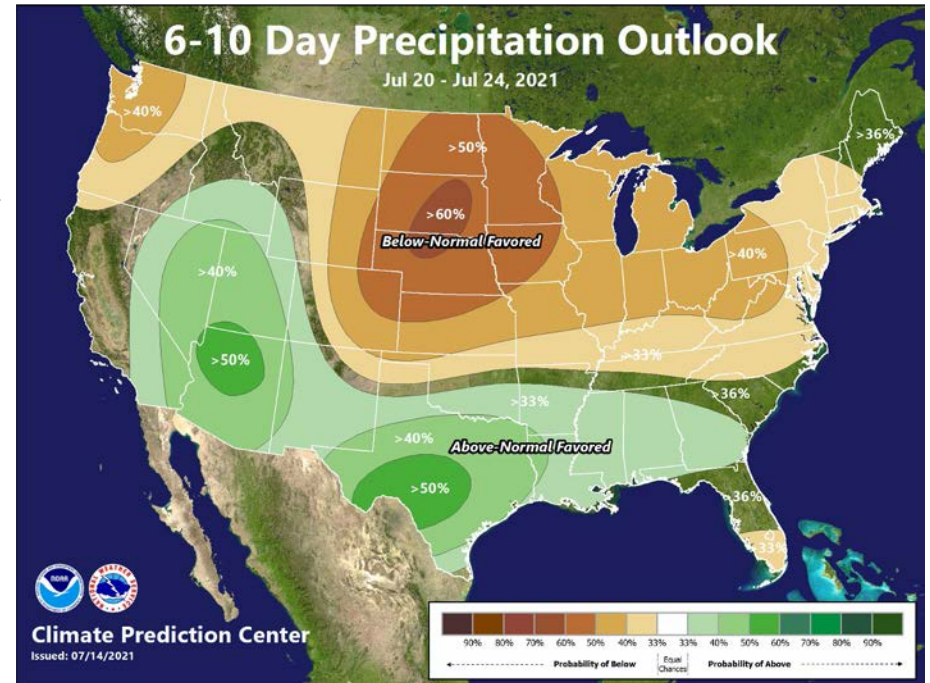
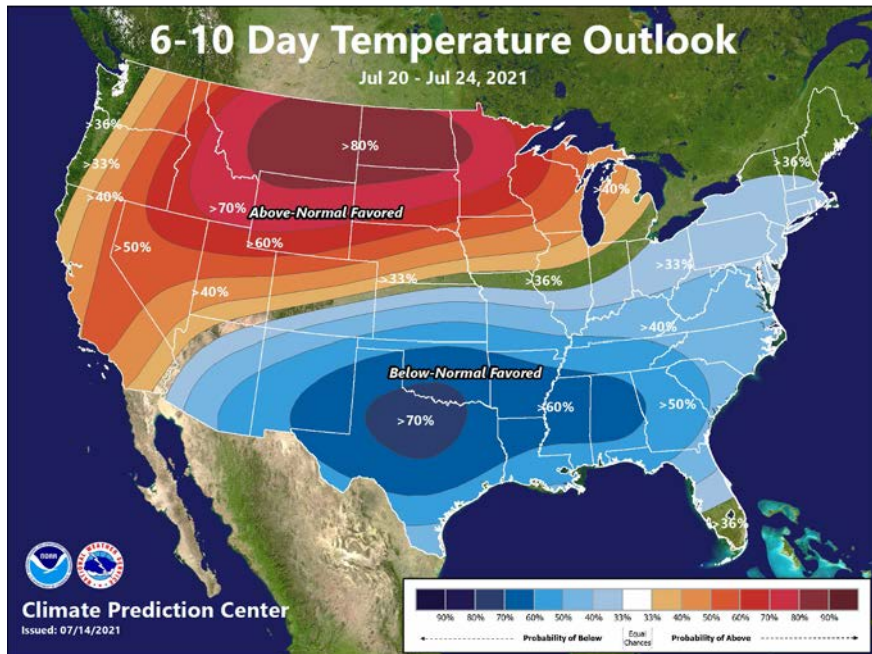
- Quantitative Precipitation Forecast = Liquid Precipitation Forecast
- Isolated storms today into the weekend for the entire state of Wyoming.
- Most precipitation will occur Saturday afternoon and next Thursday afternoon. Surface high pressure builds into Wyoming Sunday Afternoon.

<https://bit.ly/3bZXQeN>



6-10 Day Precipitation June 20 - 24

- Probability = Chance
- Below normal chances of precipitation favored for central/eastern WY



6 - 10 Day Temperatures

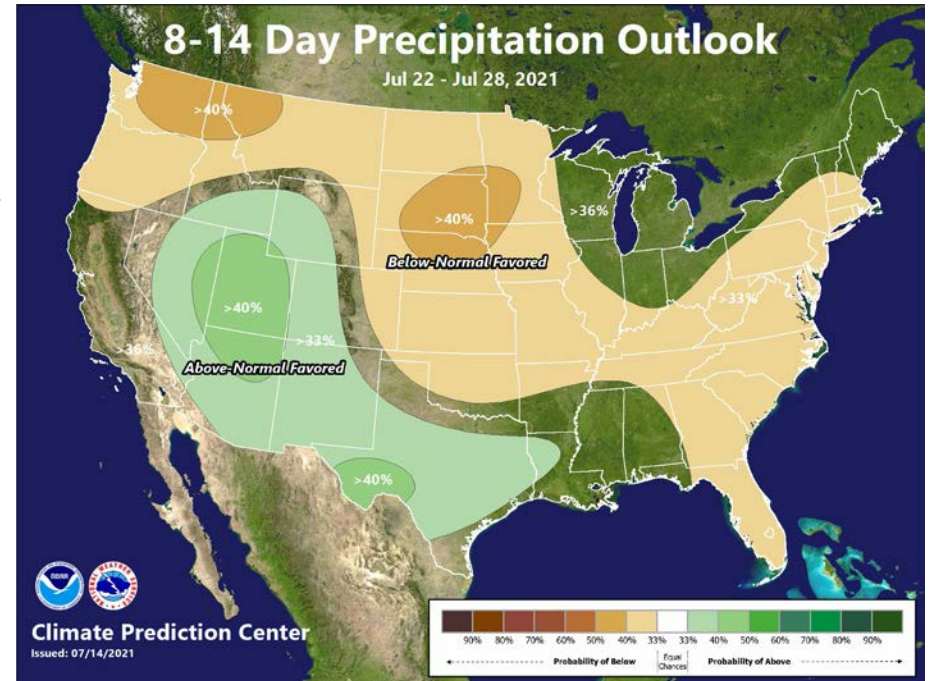
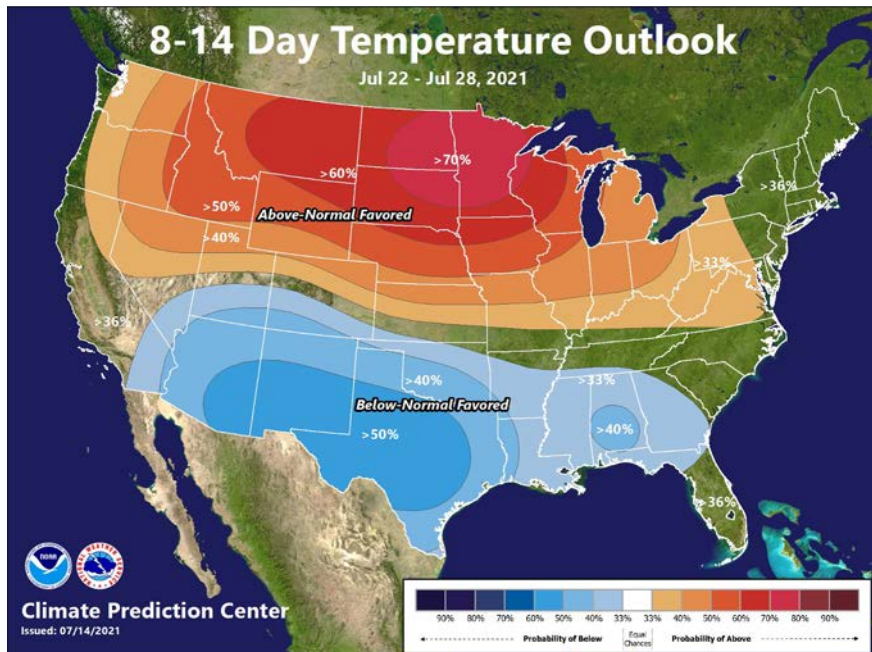
- Strong signal for Above Normal temperatures favored for Wyoming.

<http://bit.ly/3kq3LxA>



8-14 Day Precipitation June 22 - 28

- Probability = Chance
- Mix of Above, Equal Chances, to Slightly Below normal precipitation.



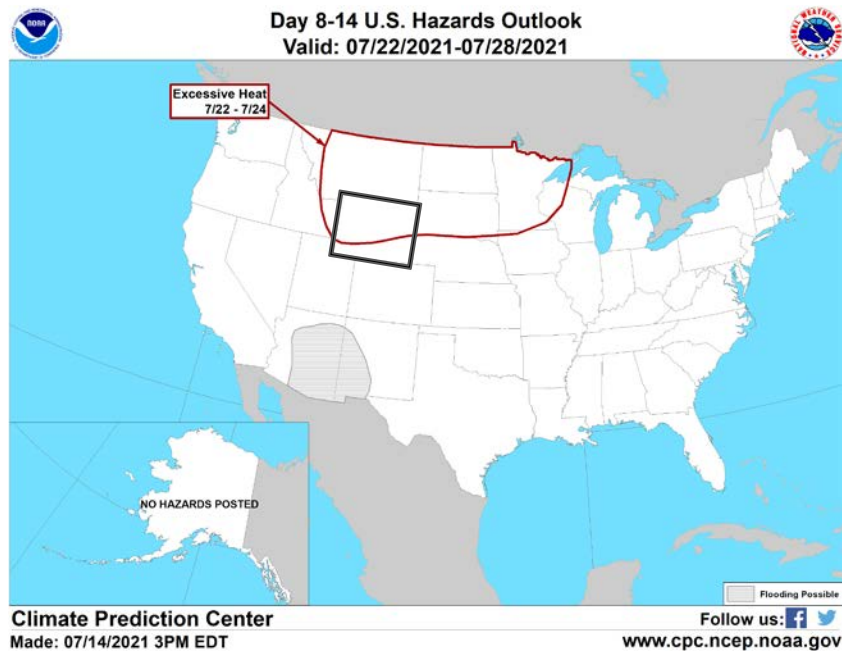
8 - 14 Day Temperatures

- Above Normal temperatures favored for the entire state of Wyoming.

<http://bit.ly/3kw1WPF>



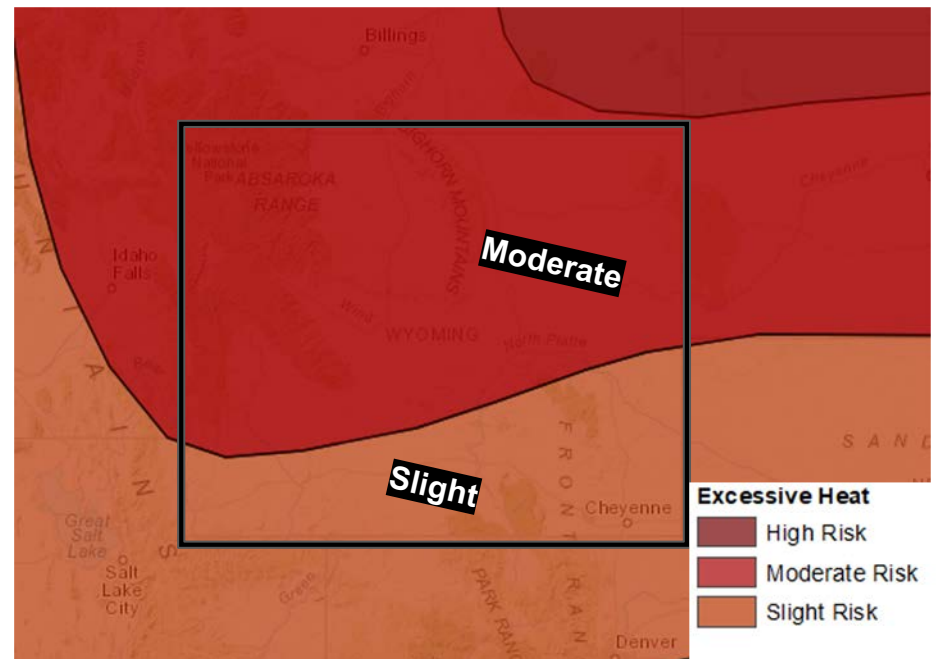
Climate Prediction Center 8-14 Day Hazard Outlook: July 22-28



Excessive Heat Risk

<https://bit.ly/3bdHfov>

Climate Prediction Center 2-week Hazard Outlook: July 22- Aug 5



Excessive Heat Builds mid-next week



Fuels Status: Energy Release Component

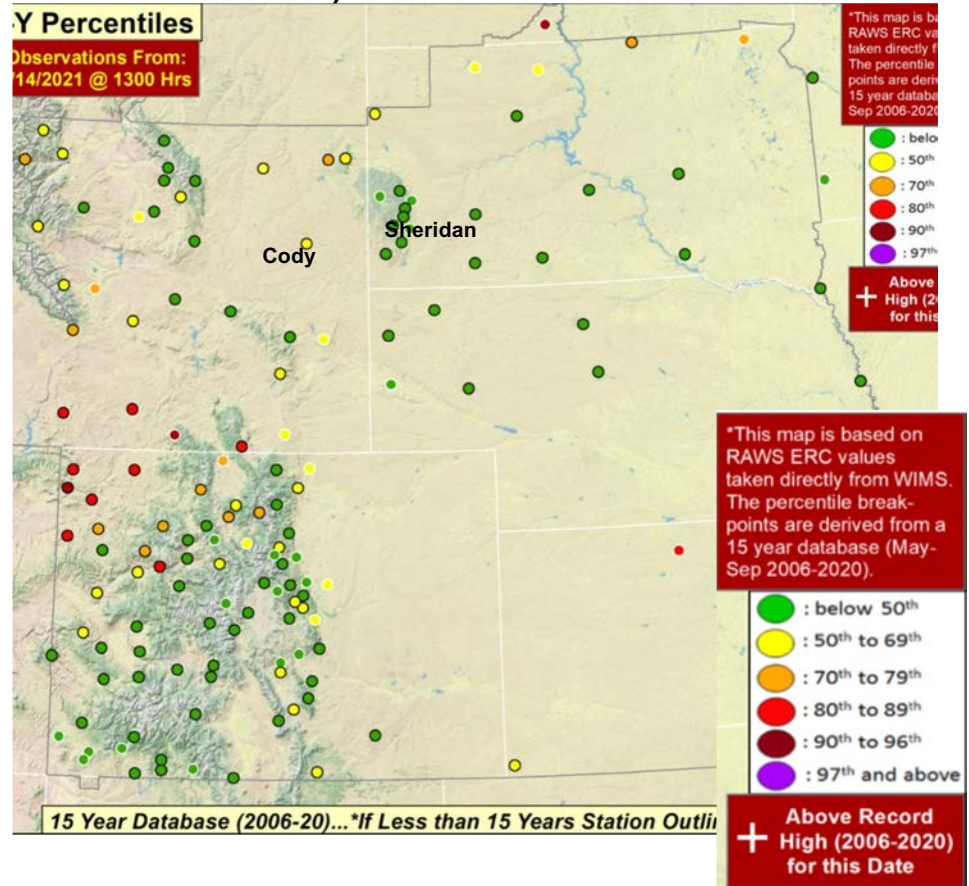
(Observation 07/14/21)

ERC= Energy Release Component

- Potential total energy released per unit area within flaming zone of fire.
- Combines live & dead fuel moistures from all size classes.
- Percentiles based on May-September values from last 15 years.

Currently in Wyoming

- Dramatic dips in ERC since last reporting.
- Northeast/ Central moderated.
- Southwest still very dry.
- Direct Correlation to Drought!
- Fuels starting to cure low to mid elevations across Wyoming, cheatgrass cured.
- At high elevations, fuels still approaching peak green-up.



<https://gacc.nifc.gov/rmcc/predictive/outlook/ercmap.png>



2021 Wildfire Activity to Date

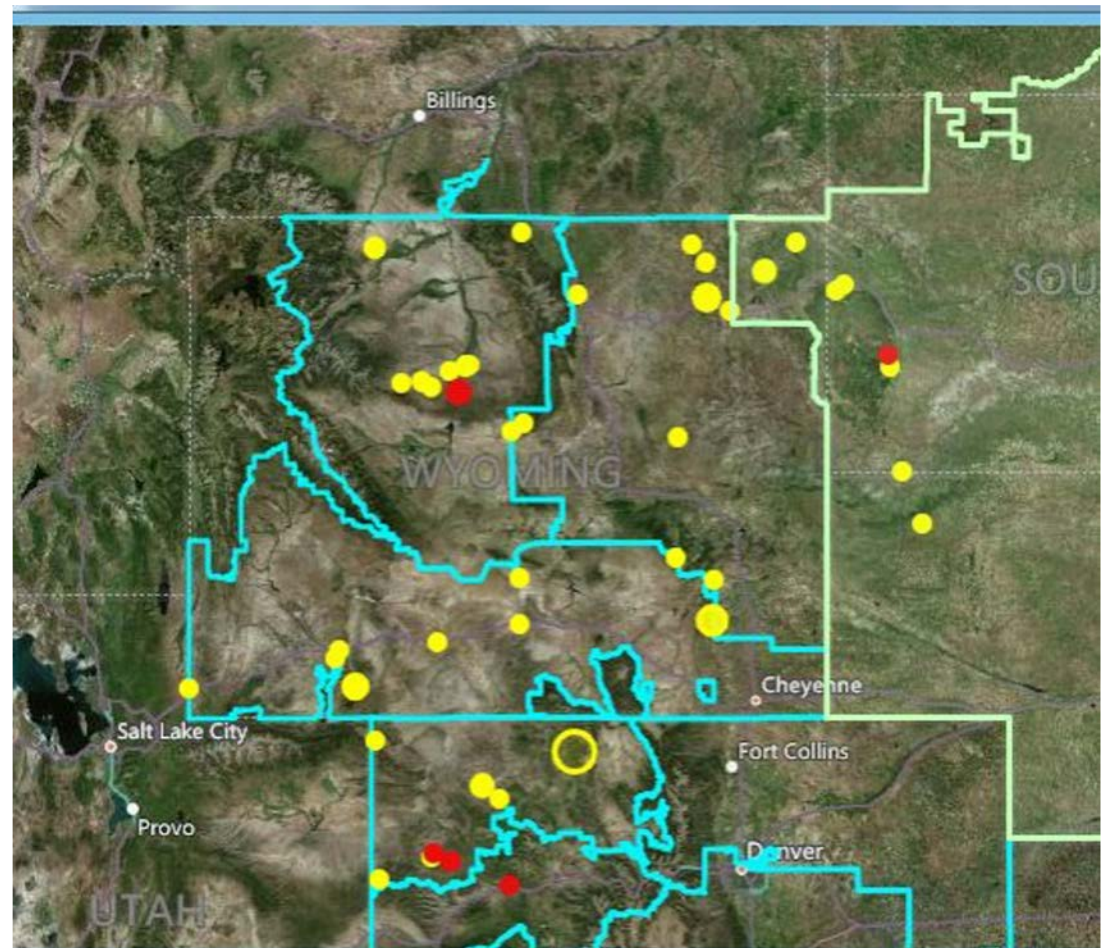
Recent/Active Fires as of 07/15/2021

- No new large fires in WY.
 - Middle Fork at 75 acres/ Gravel Fire at 105 acres.
- Fires burning actively in a variety of fuel types.
- Increased fire activity neighboring states as well.

New Fires Initial Attack Age < 30 hrs ●

Ongoing Fires Age < 10 days & Updated < 5 days ●

Prescribed Fires Age < 10 days & Updated < 5 days ●



<https://gacc.nifc.gov/rmcc/index.php>

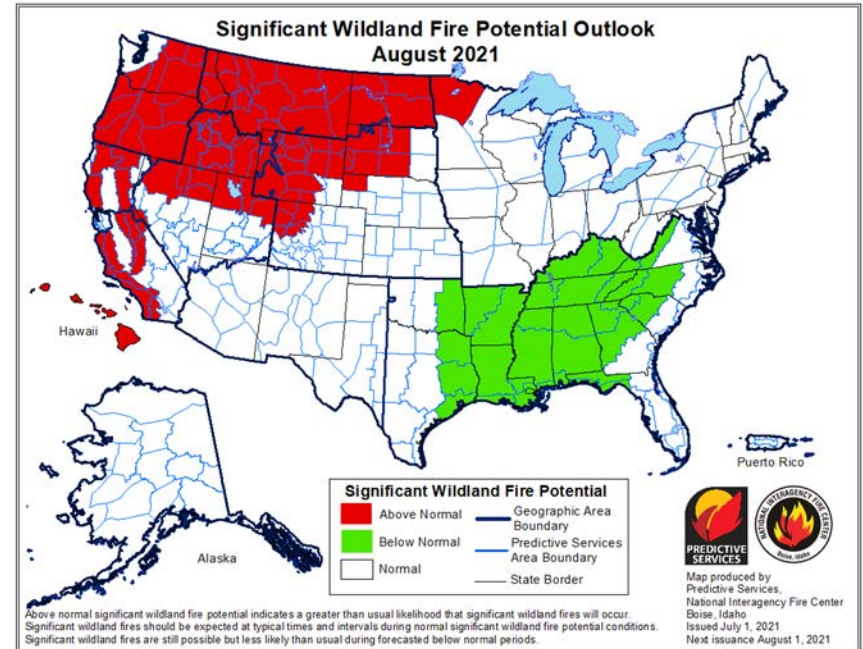
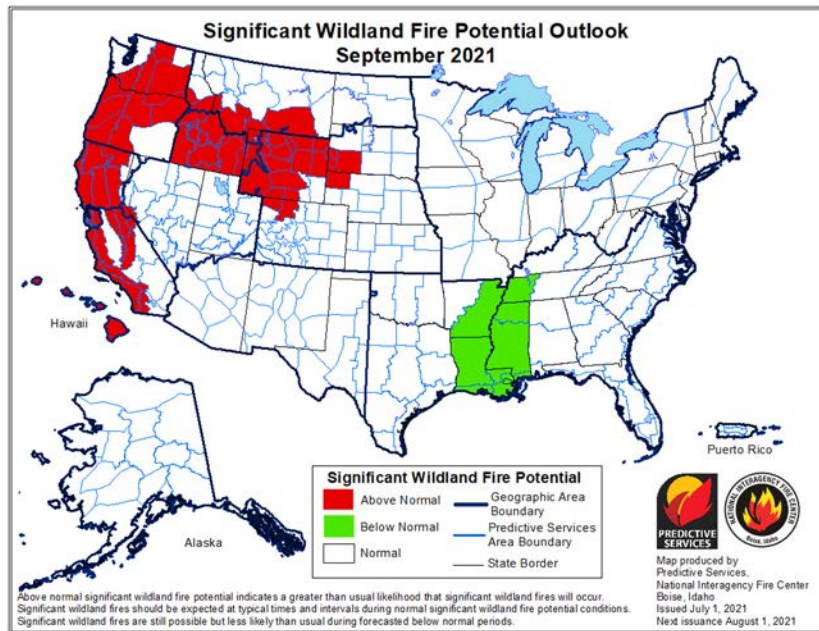


Wildland Fire Outlooks

August 2021

Issued July 1, 2021

- No major shift in Danger from last month to this month. Still significant for WY.
- Maintaining the 1-2 months fire occurrence ahead of schedule.



September 2021

- Most of Wyoming into Above Normal Significant Wildfire potential by September.
- Concerning due to the consistency between July and August.

<https://bit.ly/3wmjIzC>



How to get involved ...

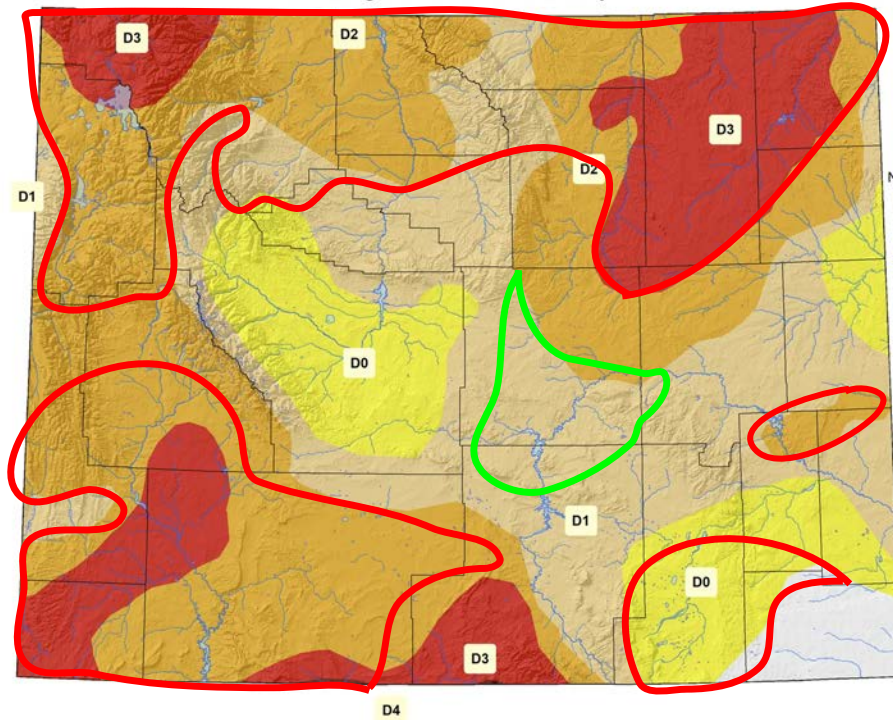


US Drought Monitor for July 13, 2021

(Released Thursday, July 15, 2021)

Valid 8 a.m. EDT

US Drought Monitor as of 13 July 2021



US Drought Monitor

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- 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

Improvements in central Wyoming since the last webinar followed by several **degradations**.

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>

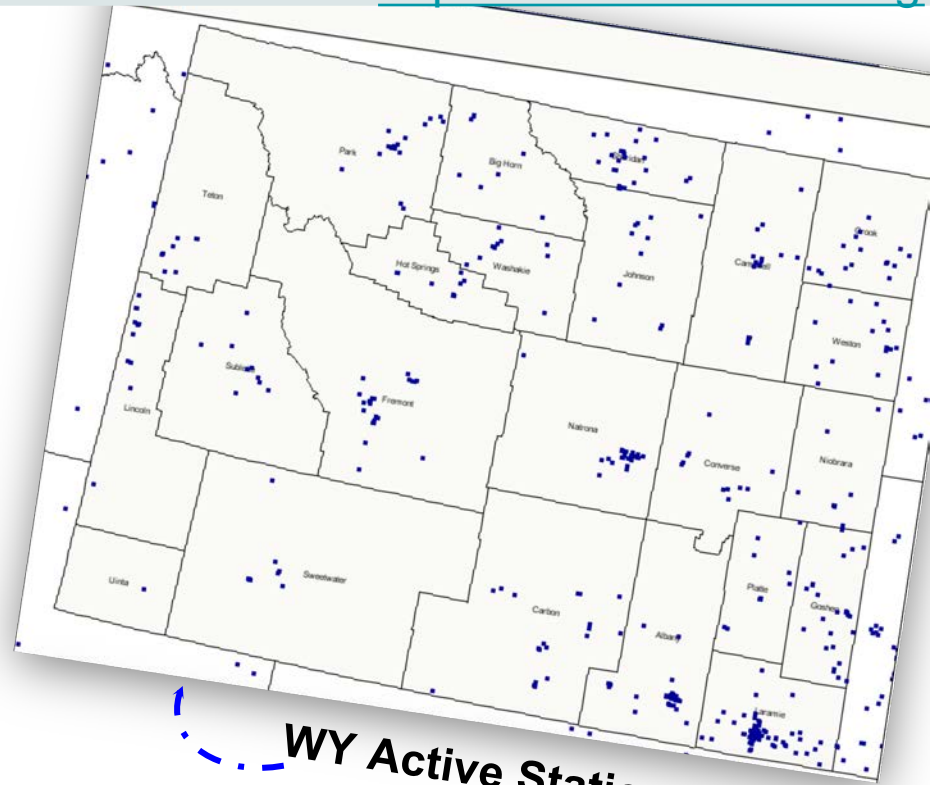
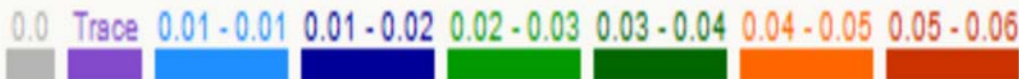
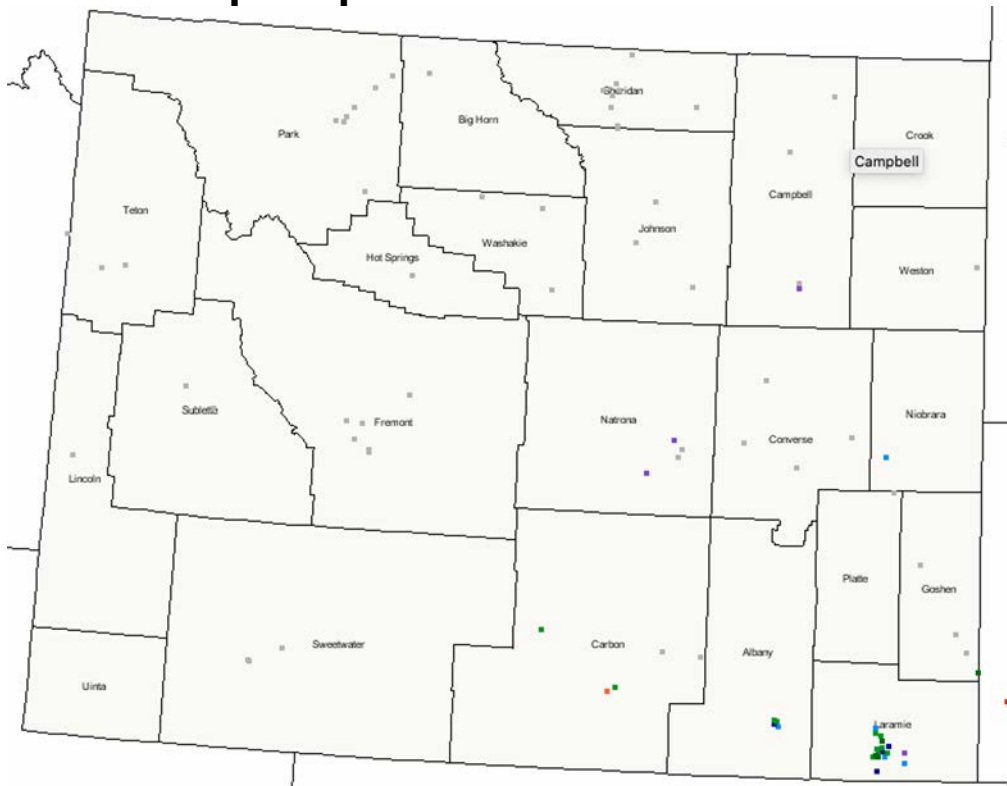


July 15, 2021:
24-hour precip as of ~ 7 am



CoCoRaHS Mapping System

<https://www.cocorahs.org>



WY Active Station Locations

Overview

Crops

Livestock

Fire

Surface Water

Wildlife

Freshwater Fish

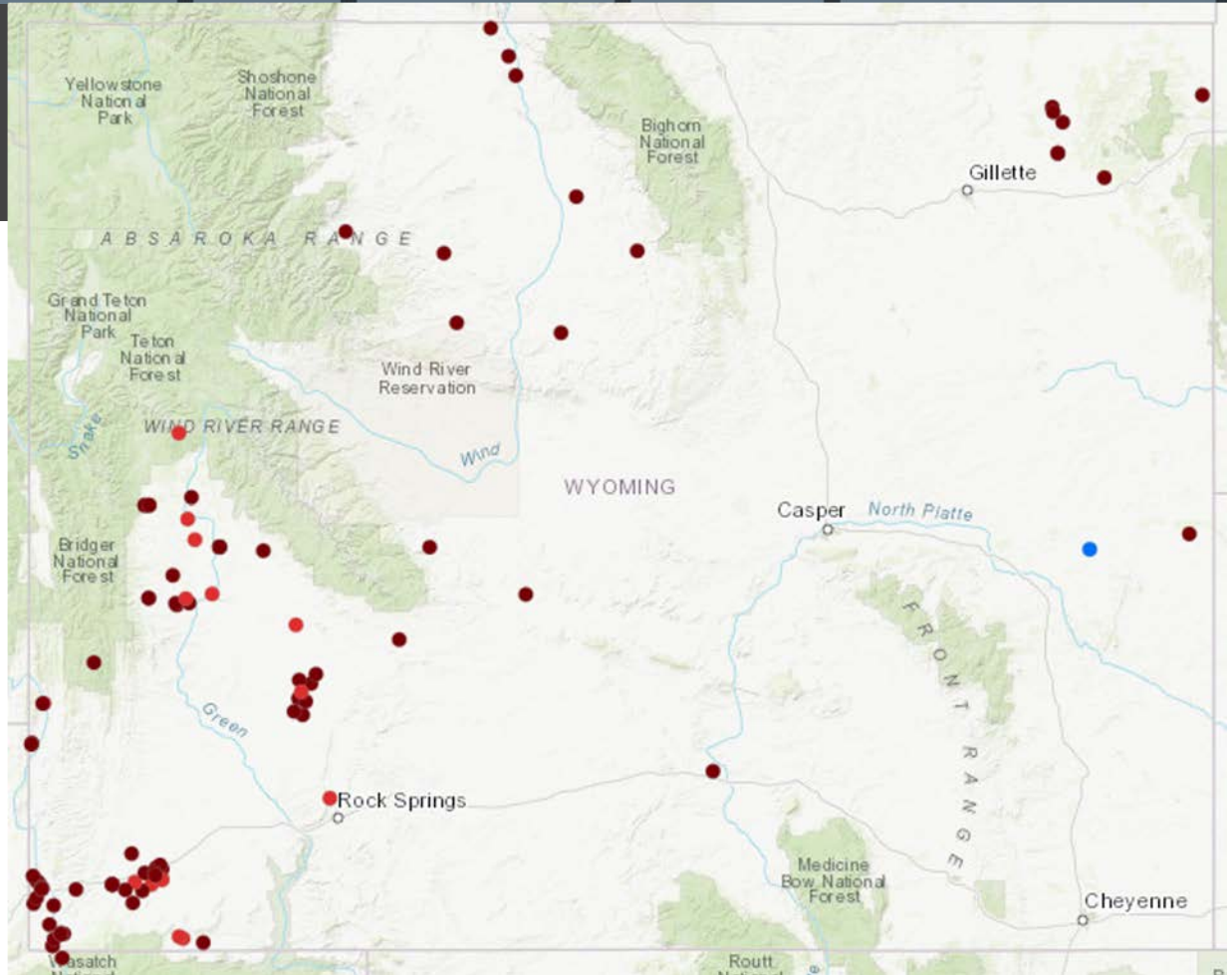
Household

Community Hydropower

Condition Monitoring Observer Reports

<http://bit.ly/3c4WRLR>

- Severely Dry
- Moderately Dry
- Mildly Dry
- Near Normal
- Mildly Wet
- Moderately Wet
- Severely Wet



Overview

Crops

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Surface Water

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Freshwater Fish

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Condition Monitoring Observer Reports

<http://bit.ly/3c4WRLR>

- Regardless of conditions, consider submitting a report monthly
- Comparison photos
 - *A picture is worth a thousand words!*
- Web browsers

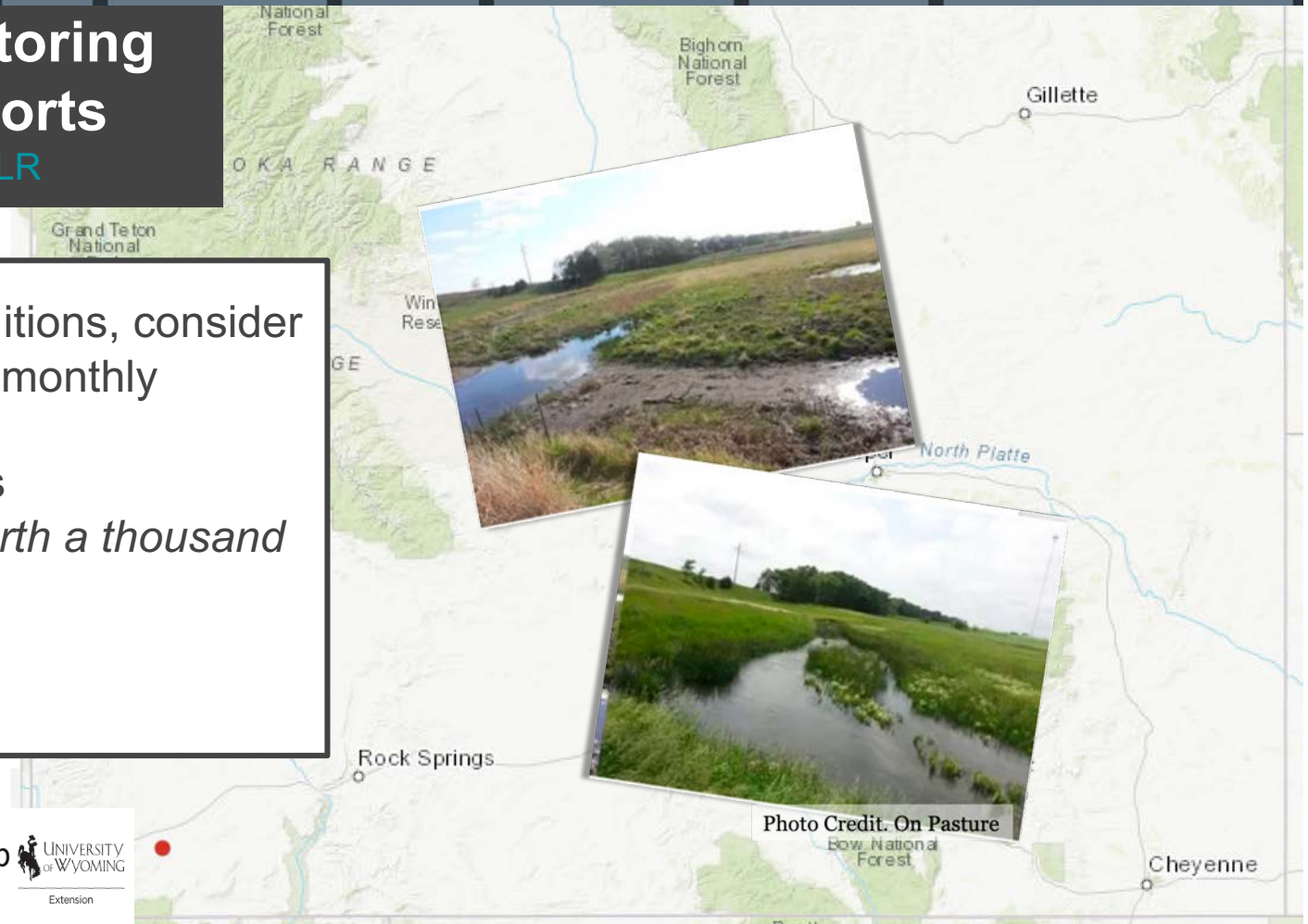


Photo Credit: On Pasture

Overview

Crops

Livestock

Fire

Surface Water

Wildlife

Freshwater Fish

Household

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Getting started with the field app

Reporting on a mobile device is easy. CMOR uses Esri's Survey123 field app. Go to the app store on your mobile device and download the Survey123 field app.

Click on "Continue without signing in."

To take full advantage of the geo-location capabilities, choose "Allow While Using App." This will let it pinpoint your location.

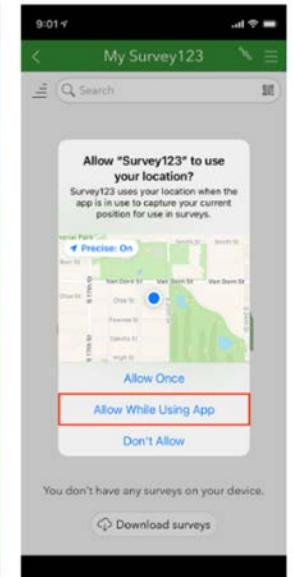


Then, use the link or the QR code:
go.unl.edu/CMOR

which will prompt you to download the survey.

This survey is open to the general public, so you won't need to log in.

CMOR Fact Sheet includes
'*how to*' submit a *report* via
the *field app*
<https://bit.ly/3gxxxyUE>





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What IS the the USDM?
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WY Drought Info & Resources
<https://drought.wyo.gov>

CoCoRaHS
<https://www.cocorahs.org>

Condition Monitoring Observer Reports (CMOR)
<http://bit.ly/3c4WRLR>

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Thank you! Questions?