



WY Conditions & Outlooks:

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

August 19, 2021



Presentation Outline

- Current Conditions
- Outlooks
- How to Get Involved



Current Conditions

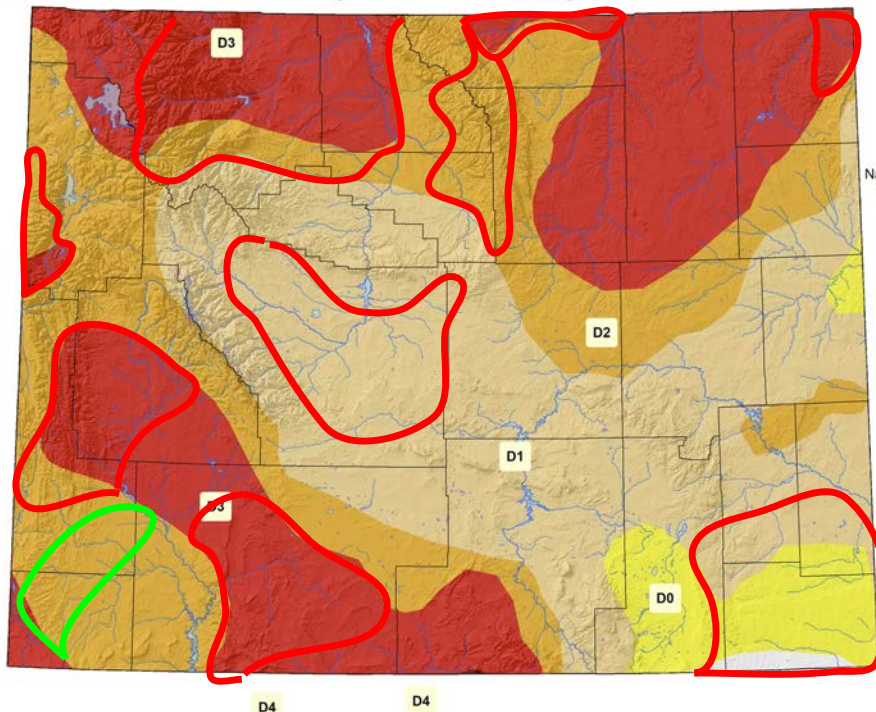
US Drought Monitor for August 17, 2021

(Released Thursday, August 19, 2021)

Valid 8 a.m. EDT

D4

US Drought Monitor as of 17 August 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>

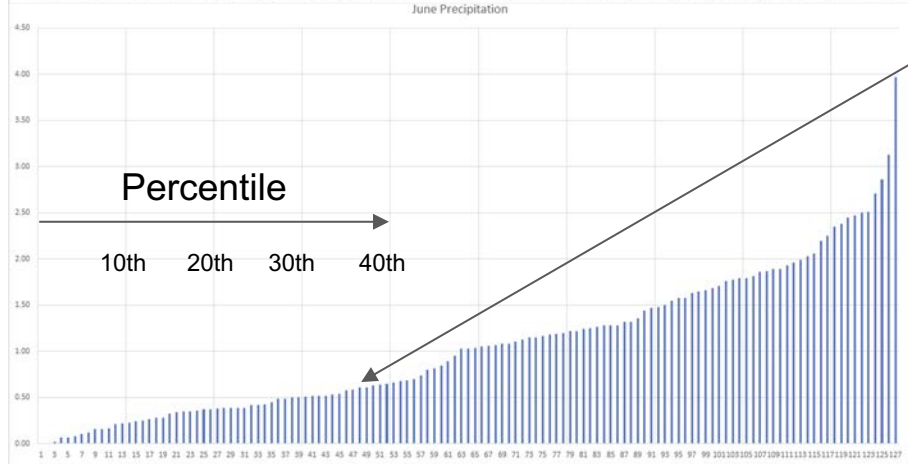
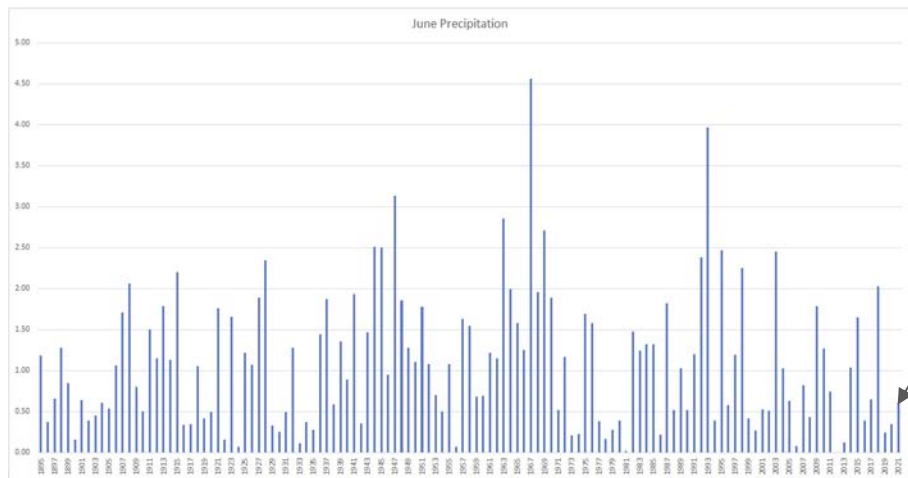


Drought Level	Percentile
None	>30
D0 (Abnormally Dry)	21 to 30
D1 (Moderate Drought)	11 to 20
D2 (Severe Drought)	6 to 10
D3 (Extreme Drought)	3 to 5
D4 (Exceptional Drought)	0 to 2

Improvements in southwest Wyoming since the last webinar followed by several **degradations** over much of the rest of the state.

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>

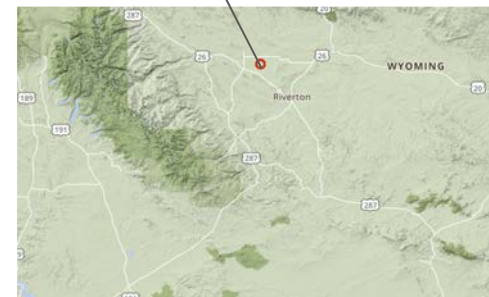
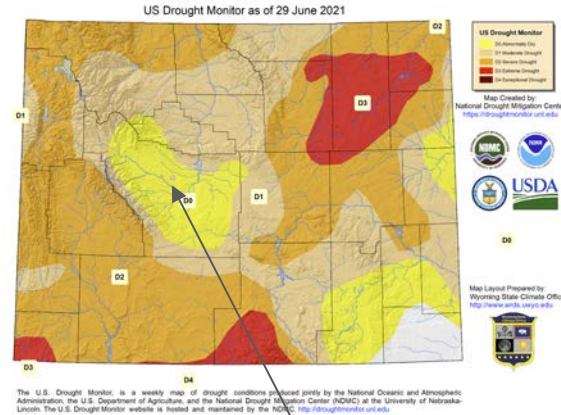
Input to the US Drought Monitor



June Precipitation Totals

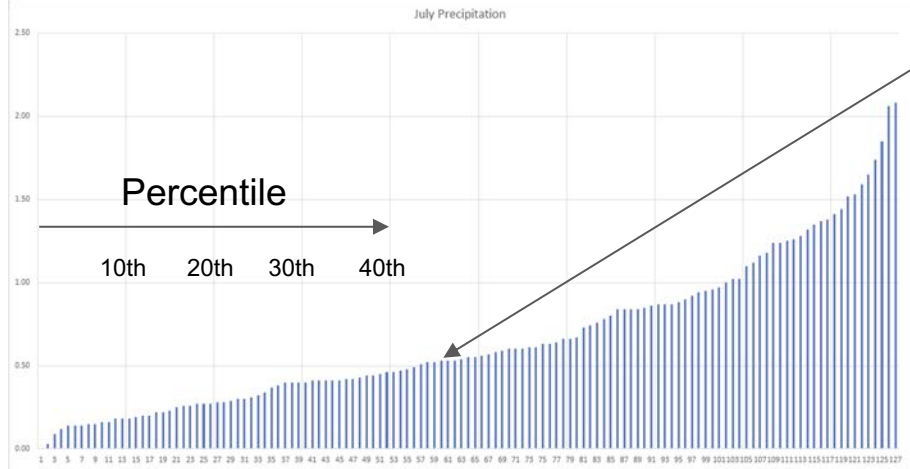
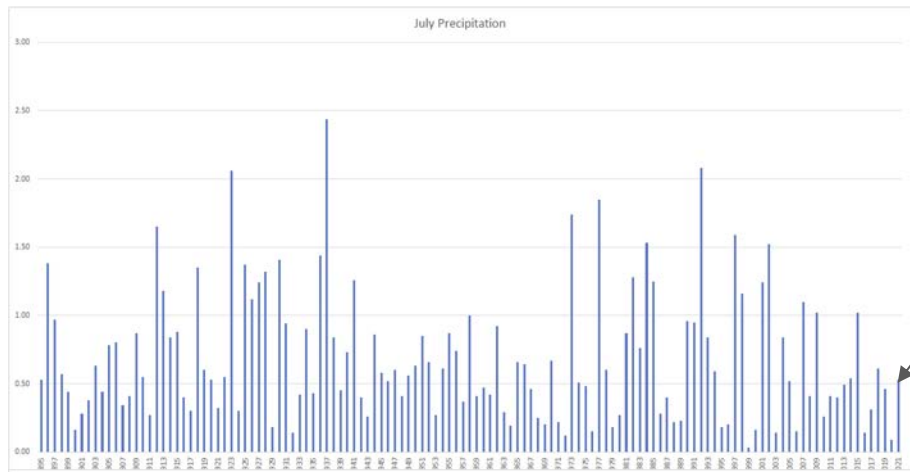
0.61"

0.61"



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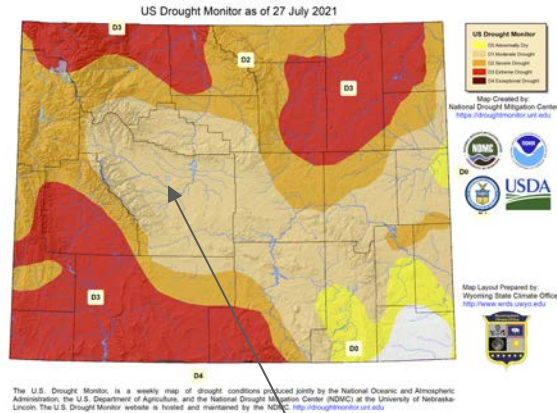
Input to the US Drought Monitor



July Precipitation Totals

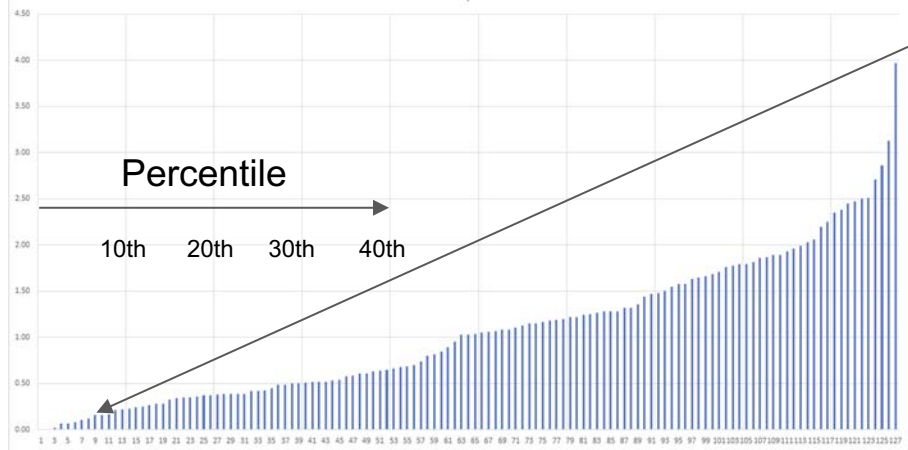
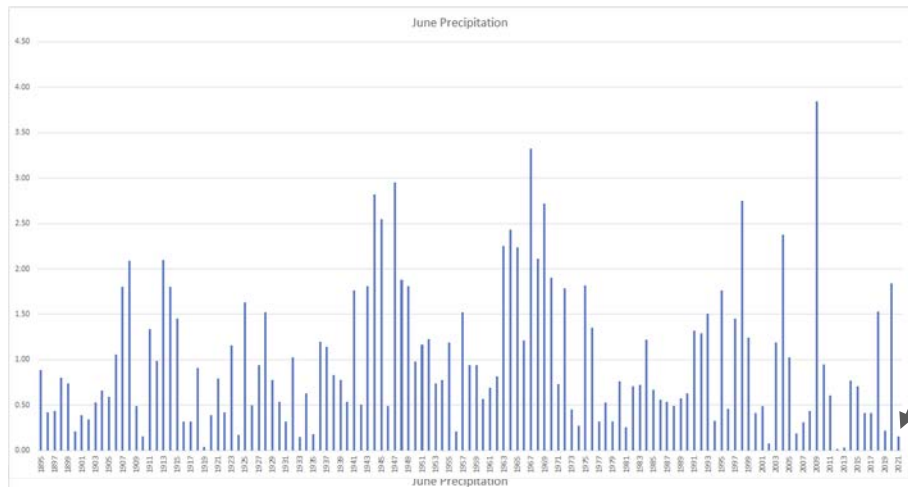
0.53"

0.53"

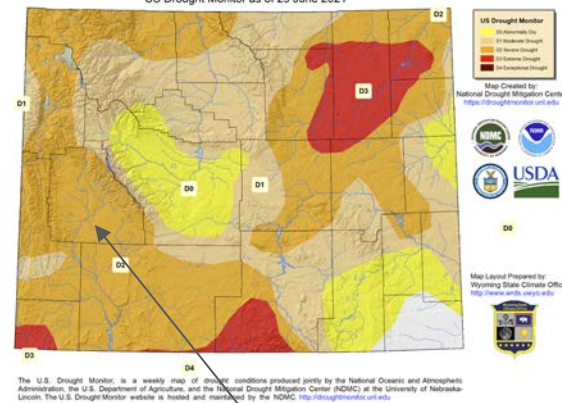


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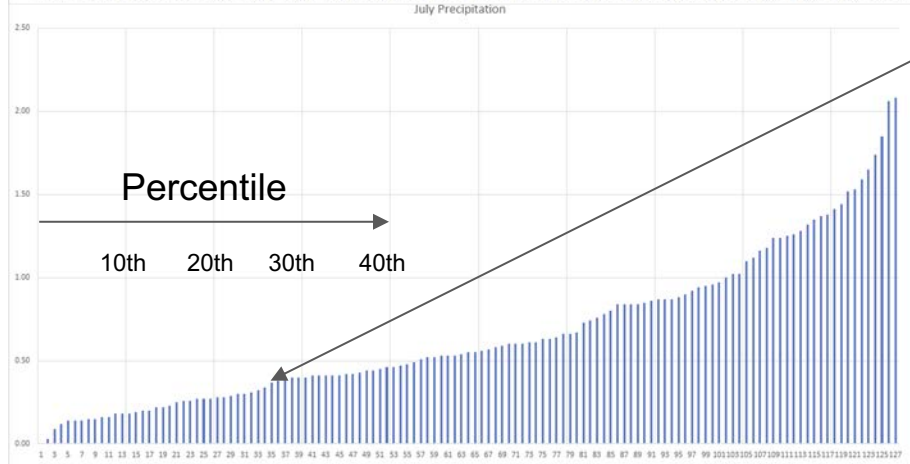
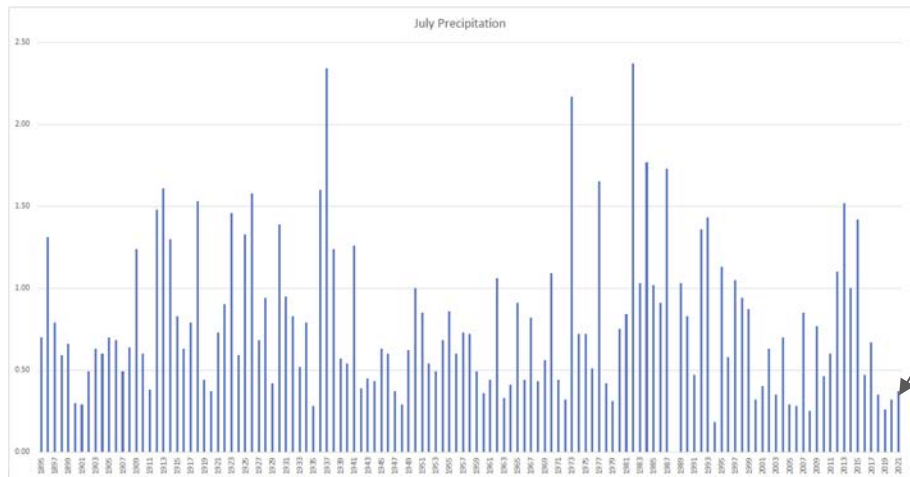


June Precipitation Totals



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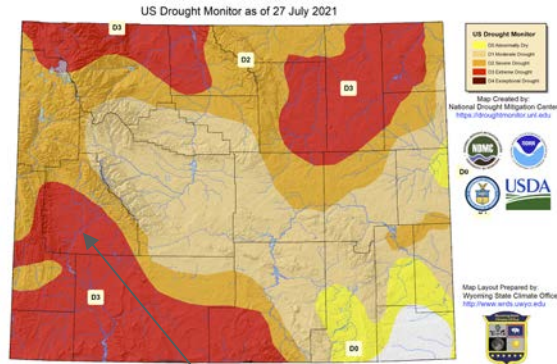
Input to the US Drought Monitor



July Precipitation Totals

0.37"

0.37"

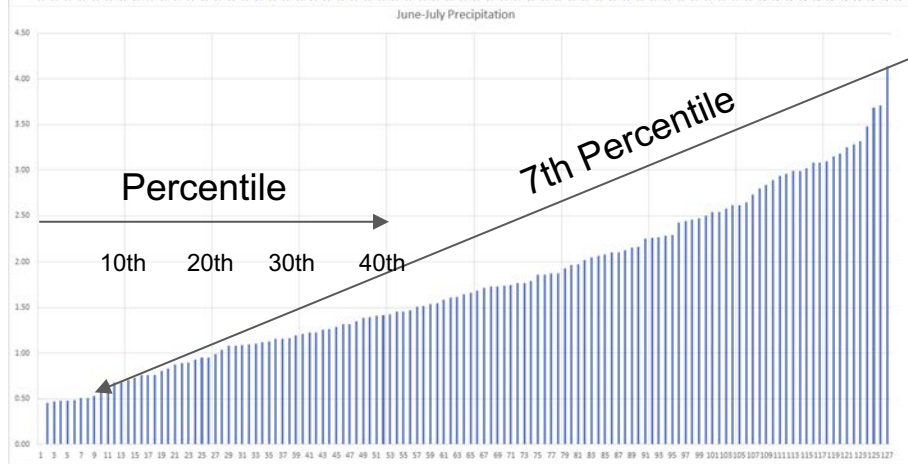
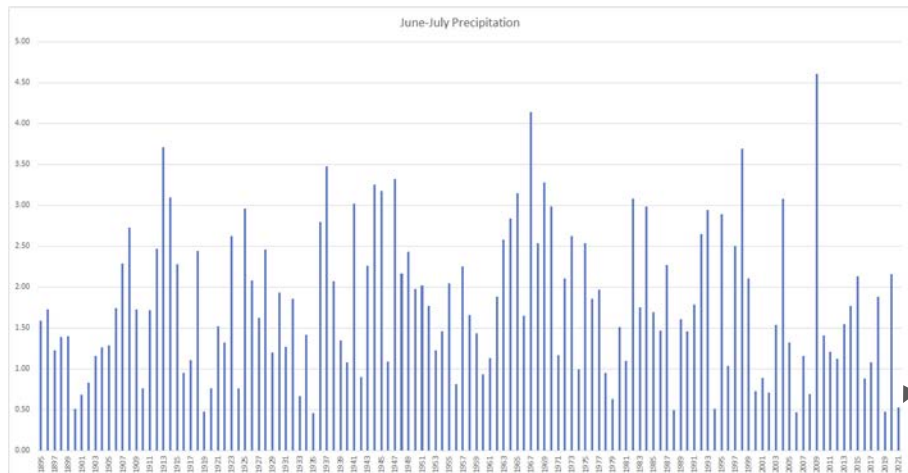


The U.S. Drought Monitor is a weekly map of drought conditions produced jointly by the National Oceanic and Atmospheric Administration, the U.S. Department of Agriculture, and the National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln. The U.S. Drought Monitor website is hosted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

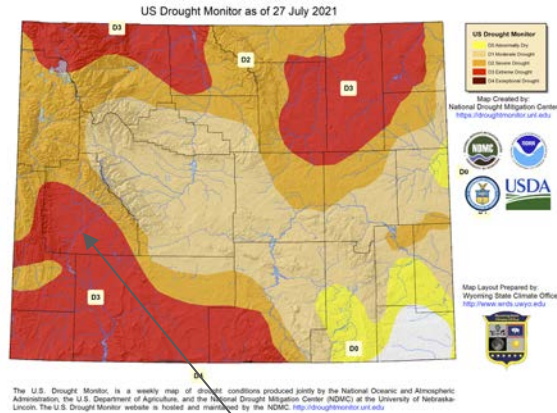


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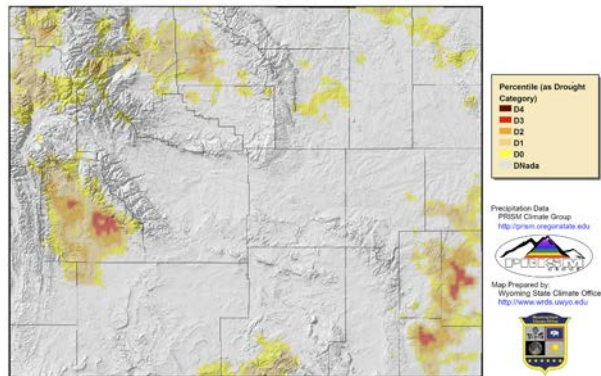
June-July
Precipitation
Totals



Drought Level	Percentile
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Input to the US Drought Monitor

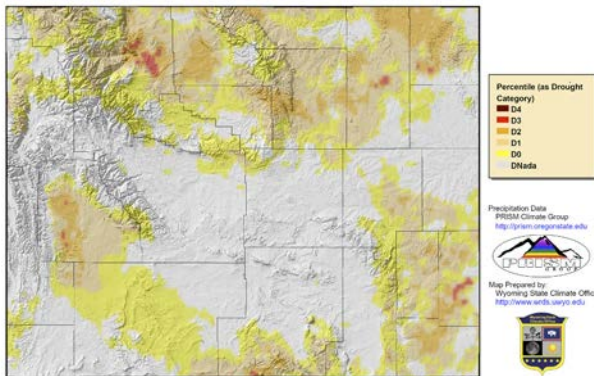
60-Day Precipitation Percentile (as Drought Category) for 19 Jun 2021 to 17 Aug 2021



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 18 Aug 2021 <http://www.wrds.wyo.edu>
Daily percentiles created from PRISM daily precipitation grids

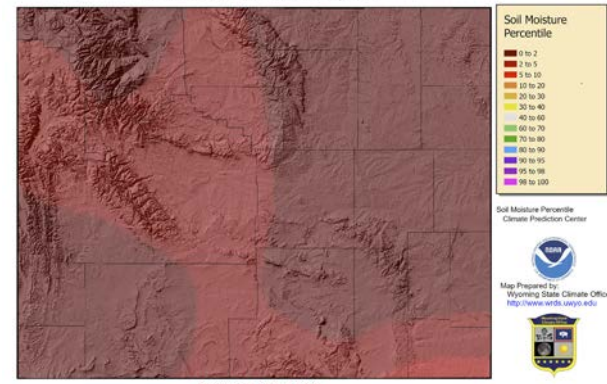
90-Day Precipitation Percentile (as Drought Category) for 20 May 2021 to 17 Aug 2021



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 18 Aug 2021 <http://www.wrds.wyo.edu>
Daily percentiles created from PRISM daily precipitation grids

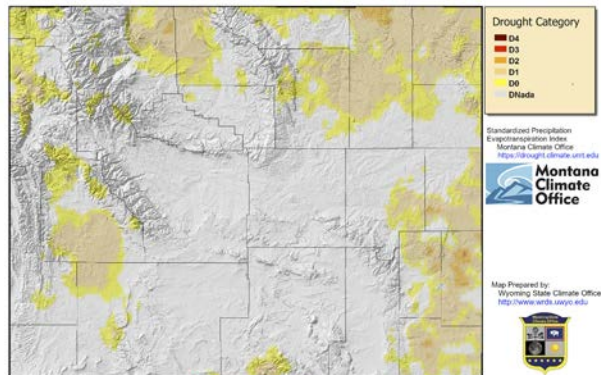
Soil Moisture Percentile for 16 Aug 2021



Provisional data, subject to revision

Modified Soil Moisture Percentile https://www.cpc.ncep.noaa.gov/products/GIS/GIS_DATA/USDM_Products/soilmoist_percentile.php
Map Created 17 Aug 2021 <http://www.wrds.wyo.edu>

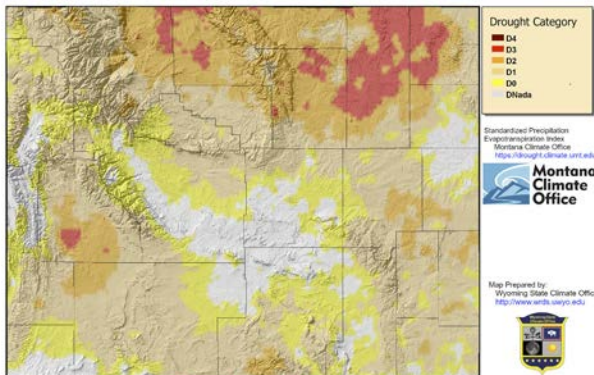
60-Day Standardized Precipitation Evapotranspiration Index as Drought Category (19 Jun 2021-17 Aug 2021)



Provisional data, subject to revision

Standardized Precipitation Evapotranspiration Index Created by Montana Climate Office <https://drought.climate.umt.edu>
Map Created 19 Aug 2021 <http://www.wrds.wyo.edu>

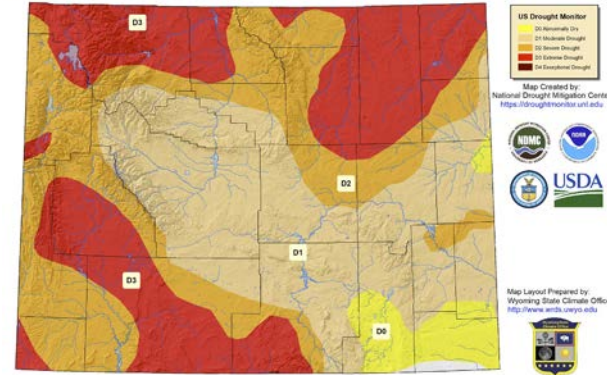
90-Day Standardized Precipitation Evapotranspiration Index as Drought Category (20 May 2021-17 Aug 2021)



Provisional data, subject to revision

Standardized Precipitation Evapotranspiration Index Created by Montana Climate Office <https://drought.climate.umt.edu>
Map Created 19 Aug 2021 <http://www.wrds.wyo.edu>

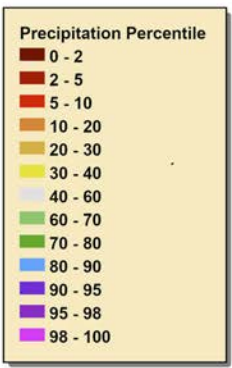
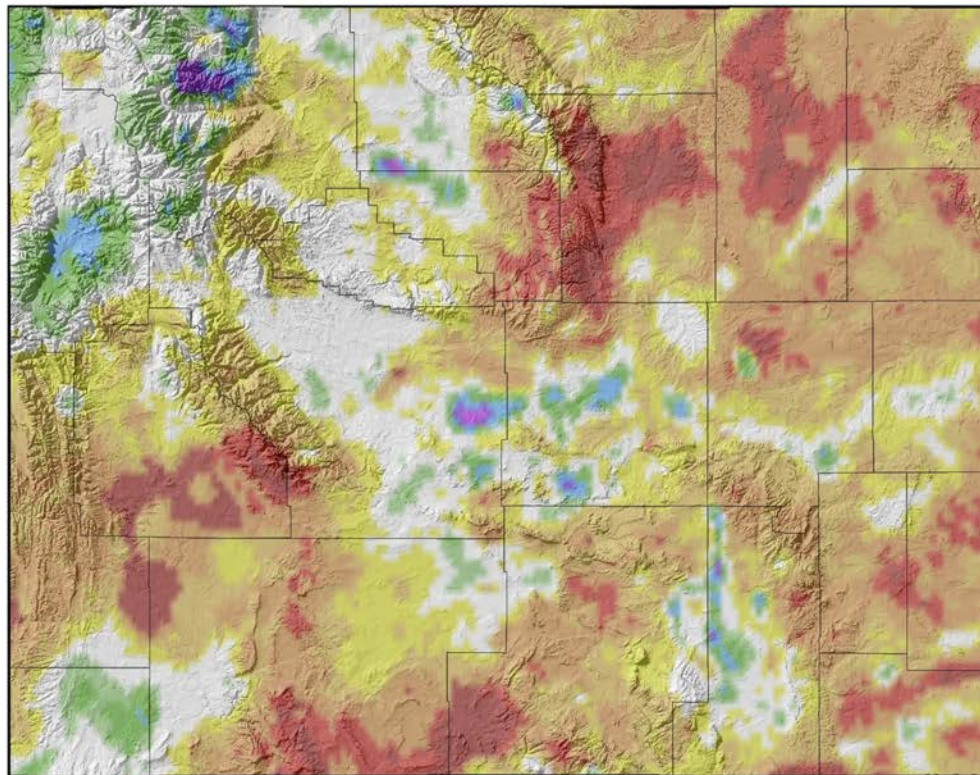
D4 US Drought Monitor as of 17 August 2021



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.umt.edu>

14-Day Precipitation Percentile (05 Aug 2021 to 18 Aug 2021)

14-Day Precipitation (Percentile) for 05 Aug 2021 to 18 Aug 2021



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

Above Median:

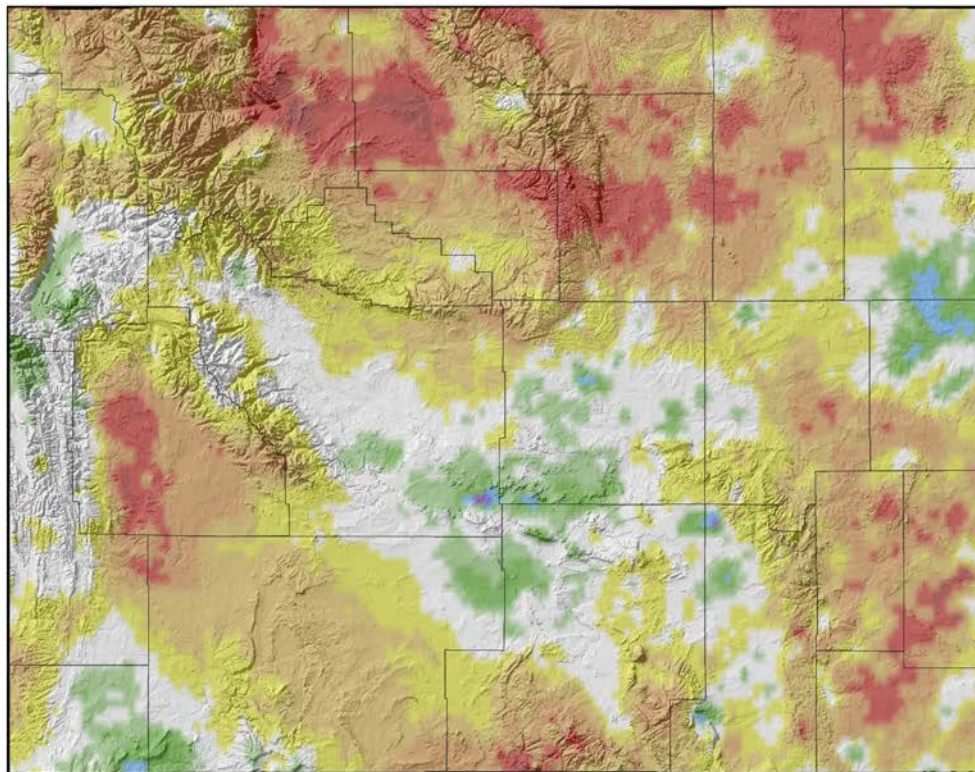
- Northwest
- Some Central and South Central
- Little in Southwest

Below Median (Areas of Concern):

- Bighorns
- Eastern Quarter
- Southwest

90-Day Precipitation Percentile (21 May 2021 to 18 Aug 2021)

90-Day Precipitation (Percentile) for 21 May 2021 to 18 Aug 2021



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



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



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Daily precipitation data from PRISM Climate Group, Copyright ©2021, PRISM Climate Group, Oregon State University,
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Map Created 19 Aug 2021 <http://www.wrds.uwyo.edu>
Daily percentiles created from PRISM daily precipitation grids

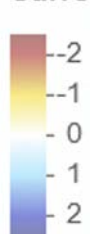
Above Median:

- Central
- Weston/Niobrara
- Southern Teton / Northern Lincoln Counties
- Little southwest

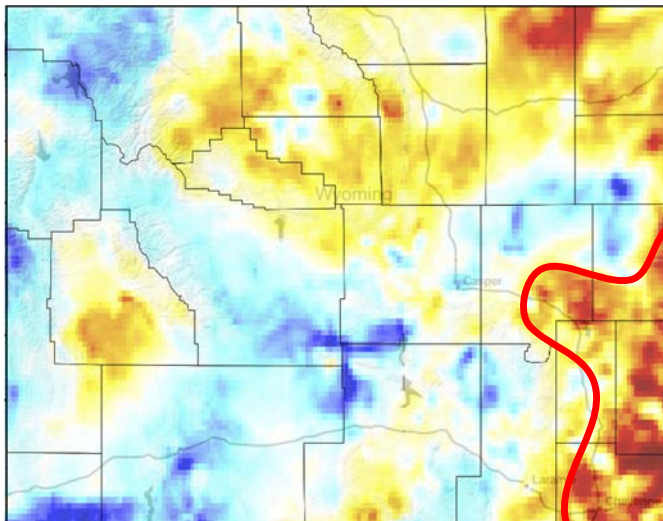
Below Median (Areas of Concern):

- Southcentral
- Northern Third
- Southeast
- Upper Green

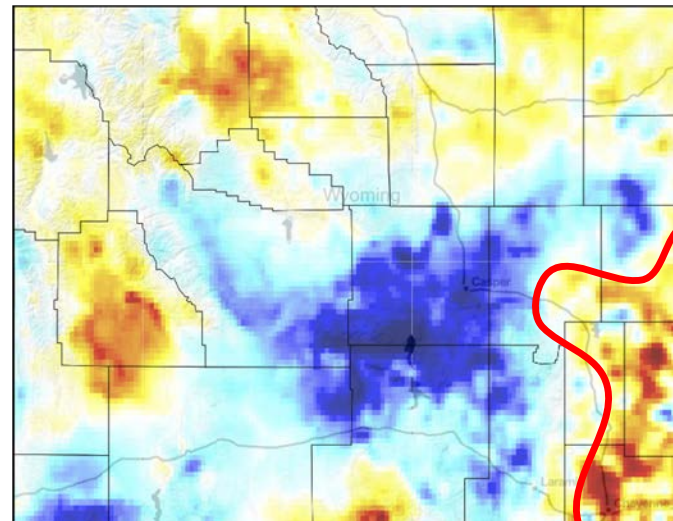
Current SPI



30-Day



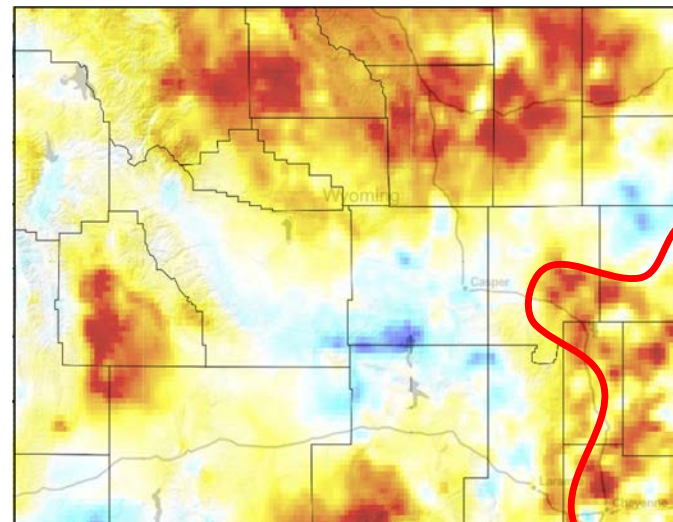
60-Day

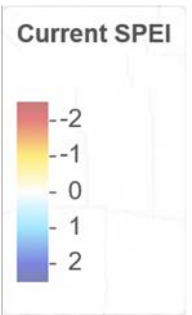


Standardized Precipitation Index (SPI)

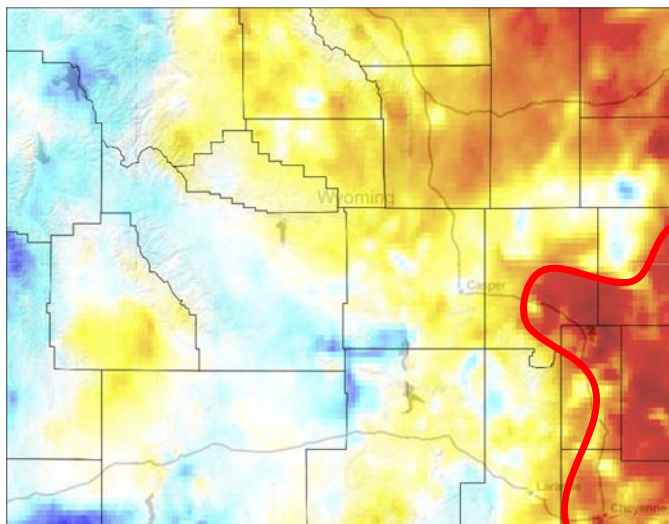
- Long-term dryness resulted in drought expansion in several areas around the state.

90-Day

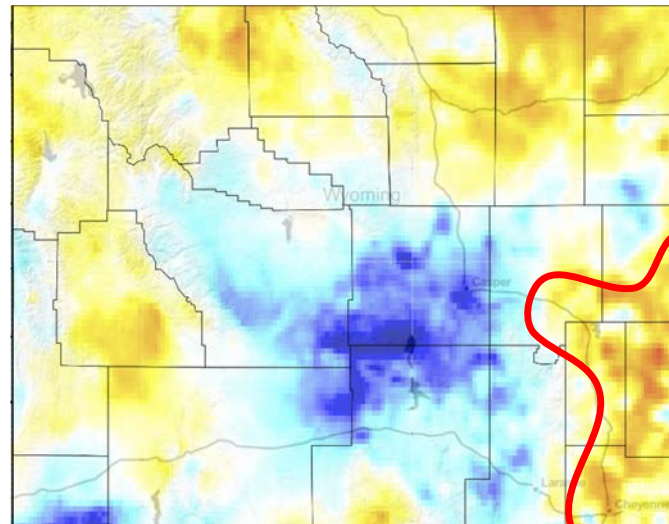




30-Day



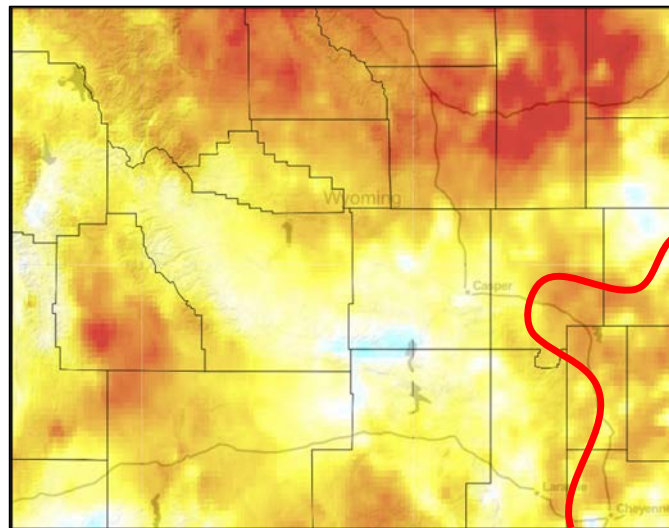
60-Day



Standardized Precipitation Evapotranspiration Index (SPEI)

- Long-term dryness resulted in drought expansion in several areas around the state.

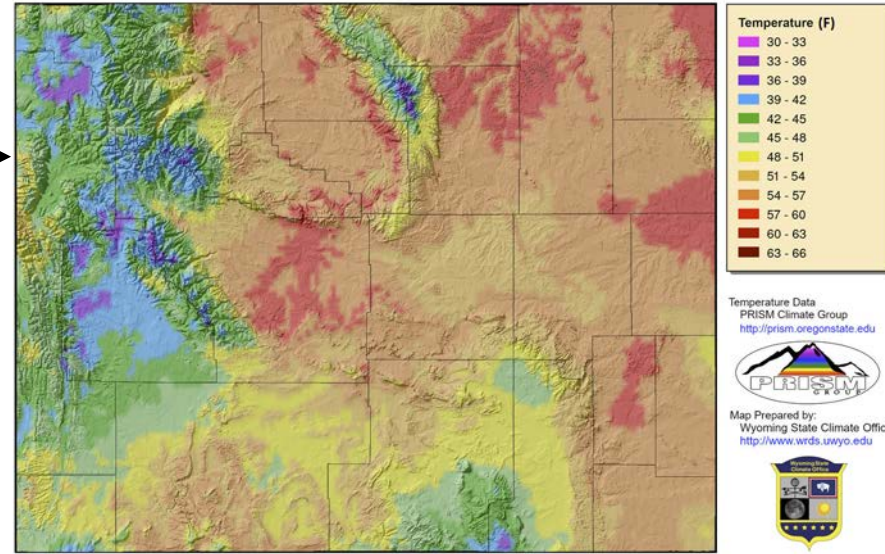
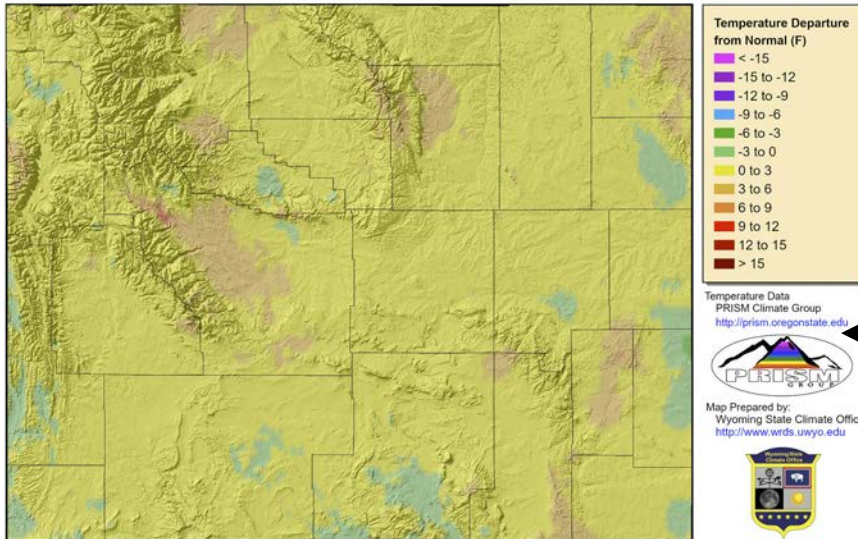
90-Day



14-Day Average Minimum Temperature (05 Aug to 18 Aug)

- Higher elevation night time lows above 32F, coolest in west and south central

14-Day Average Minimum Temperature (Departure from 1991-2020 Average) for 05 Aug 2021 to 18 Aug 2021



Daily Temperature data from PRISM Climate Group, Copyright ©2021, PRISM Climate Group, Oregon State University, <http://prism.oregonstate.edu>
Map Created 19 Aug 2021 <http://www.wrds.uwyo.edu>
Temperature averages created from PRISM daily temperature grids

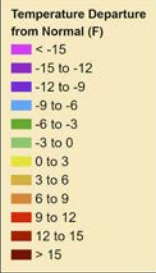
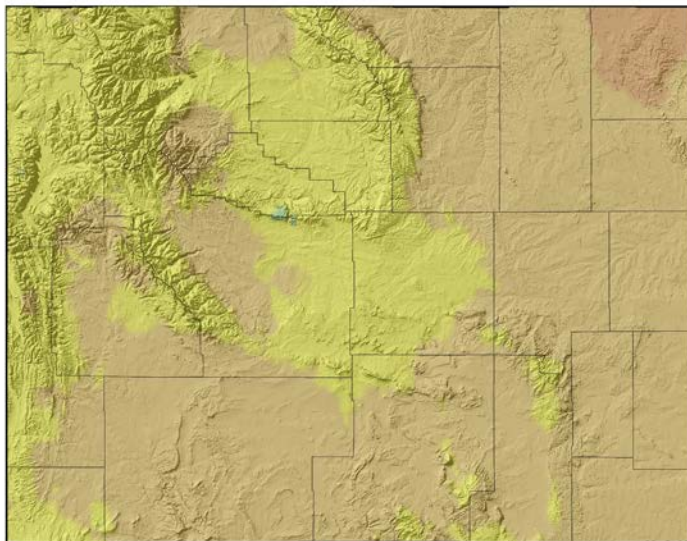
14-Day *Departure from Normal* Average Minimum Temperature

- Mostly up to 3F above average

14-Day Average **Maximum** Temperature (05 Aug to 18 Aug)

- Lowest Daytime highs mostly >60F
- 90-95 in low parts northcentral/east

14-Day Average Maximum Temperature (Departure from 1991-2020 Average) for 05 Aug 2021 to 18 Aug 2021



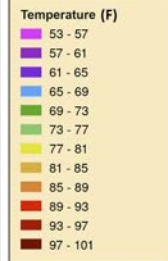
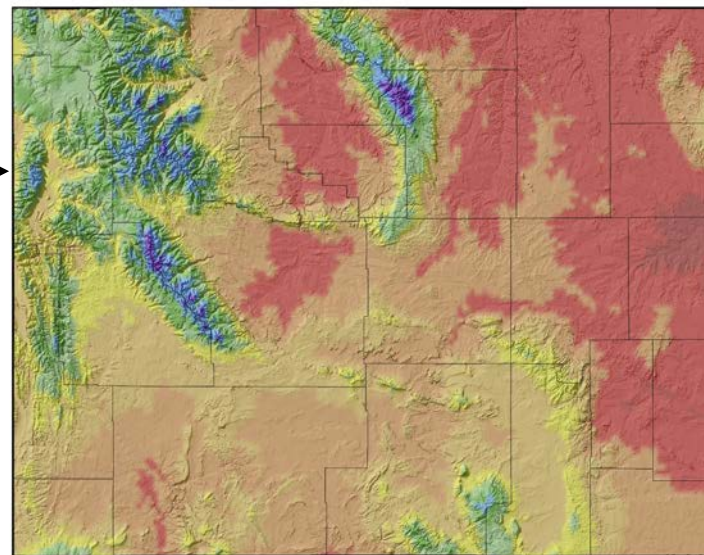
Temperature Data
PRISM Climate Group
<http://prism.oregonstate.edu>



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



Provisional data, subject to revision



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



Map Prepared by:
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Provisional data, subject to revision

Daily Temperature data from PRISM Climate Group, Copyright ©2021, PRISM Climate Group, Oregon State University, <http://prism.oregonstate.edu>
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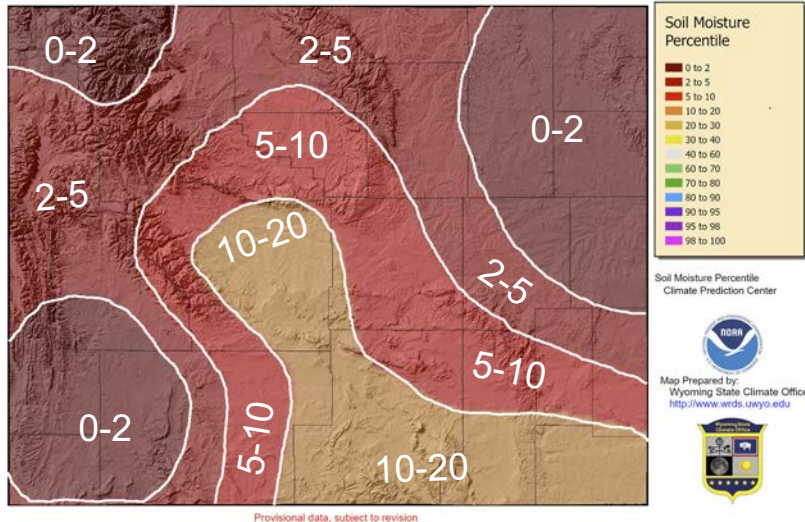
14- Day *Departure from Normal* Average **Maximum** Temperature

- Mostly 3-6F above average
- 0-3F above far west and central
- 6-9F above in Crook County

Soil Moisture Percentile

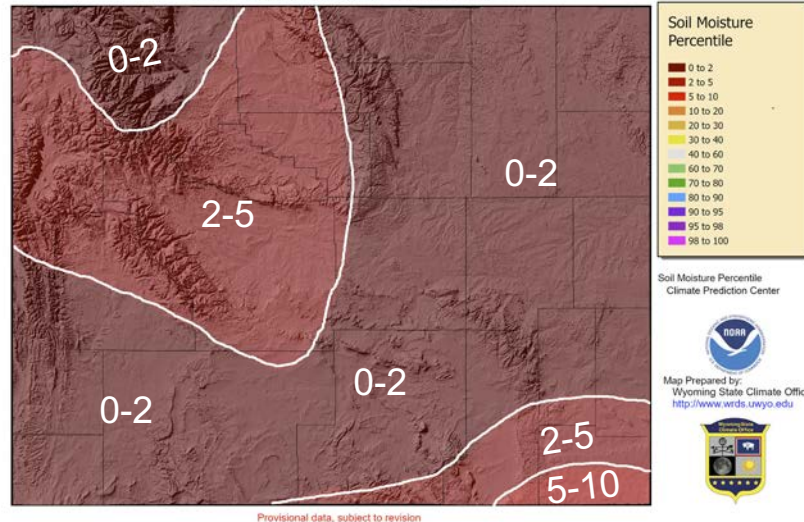
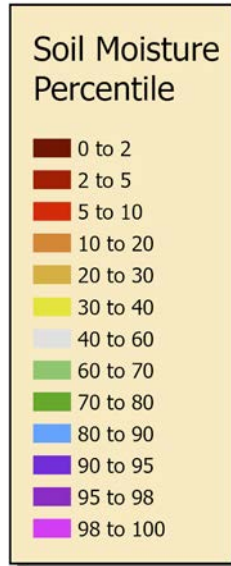
Two Weeks Ago
05 Aug 2021

Soil Moisture Percentile for 05 Aug 2021



18 Aug 2021

Soil Moisture Percentile for 18 Aug 2021



Modeled Soil Moisture Percentile https://www.cpc.ncep.noaa.gov/products/GIS/GIS_DATA/USDM_Products/soil/soil_percentile.php
Map Created 19 Aug 2021 <http://www.wrds.uwyo.edu>



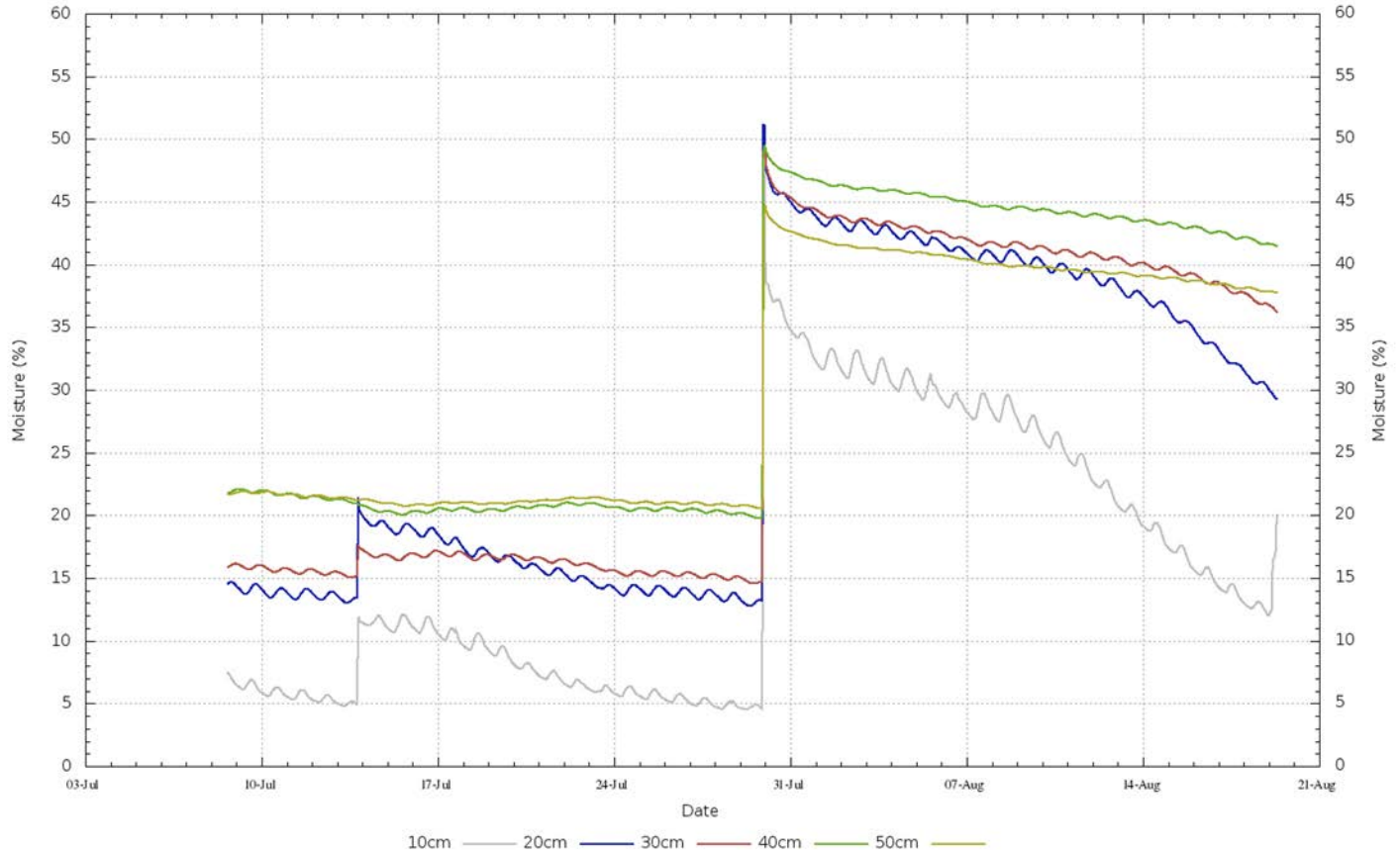
Soil Moisture at Thunder Basin Grasslands

Campbell/Converse County Line Area

Thunder Basin Grasslands - 2021-08-19 07:30:00 (Created Thu Aug 19 08:35:01 MDT 2021)

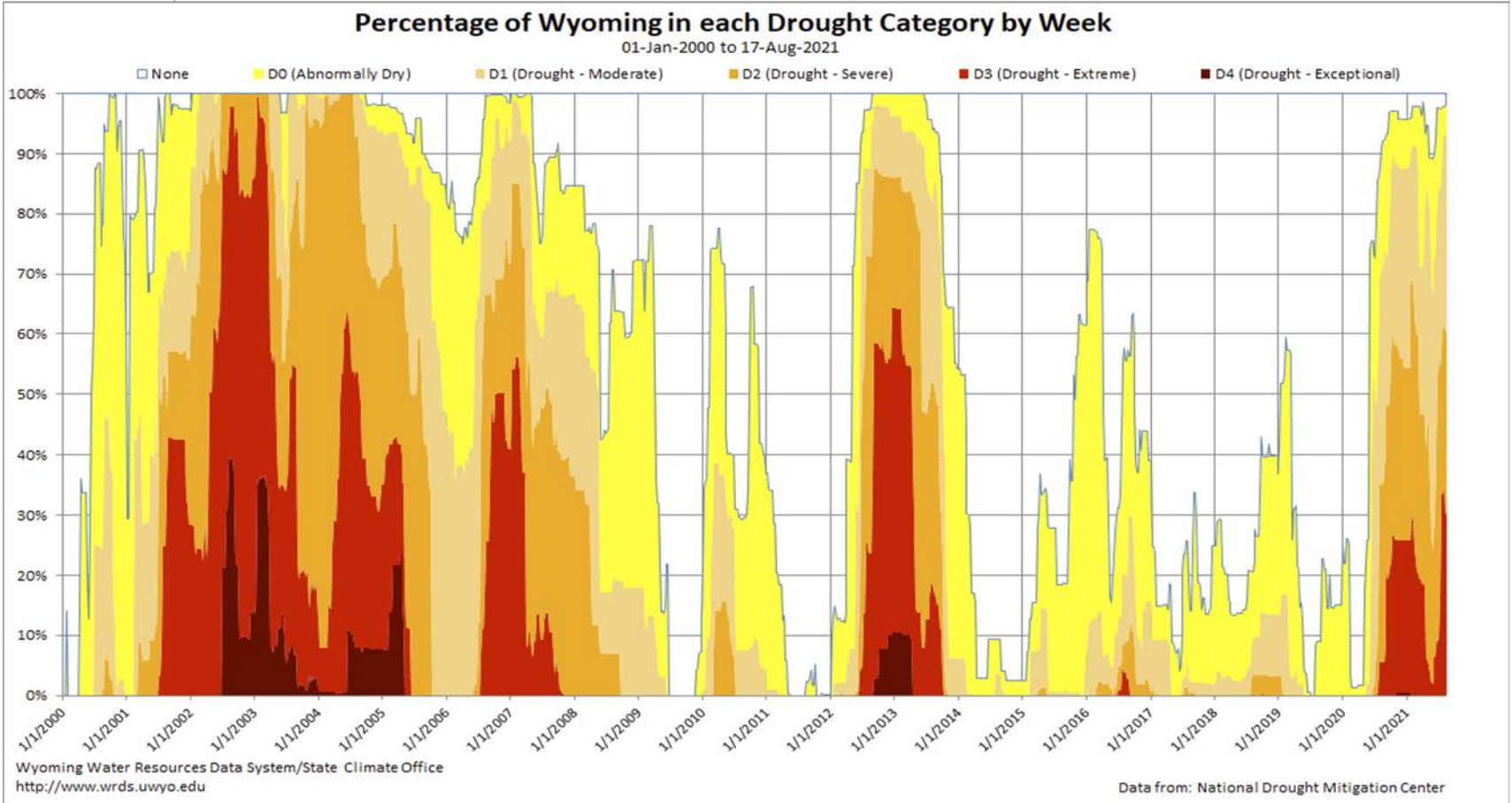
Precip on 12-13 and 29 July caused some increase. Last night's precipitation starting to show up at shallow depth.

Declining rapidly at shallower depths.





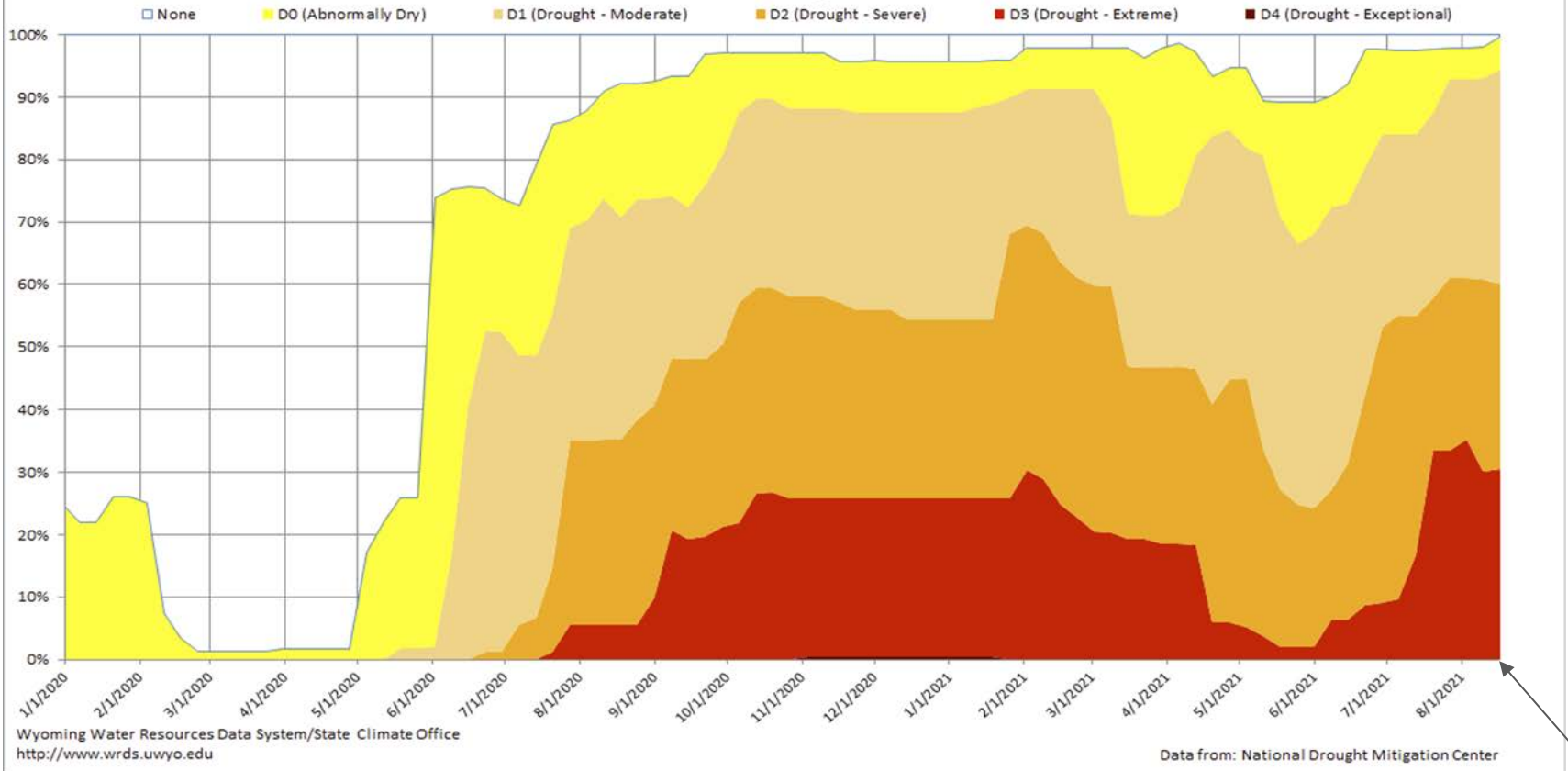
Wyoming Area Affected: 99.58% D0-D4 ; 94.31% D1-D4





Percentage of Wyoming in each Drought Category by Week

01-Jan-2020 to 17-Aug-2021



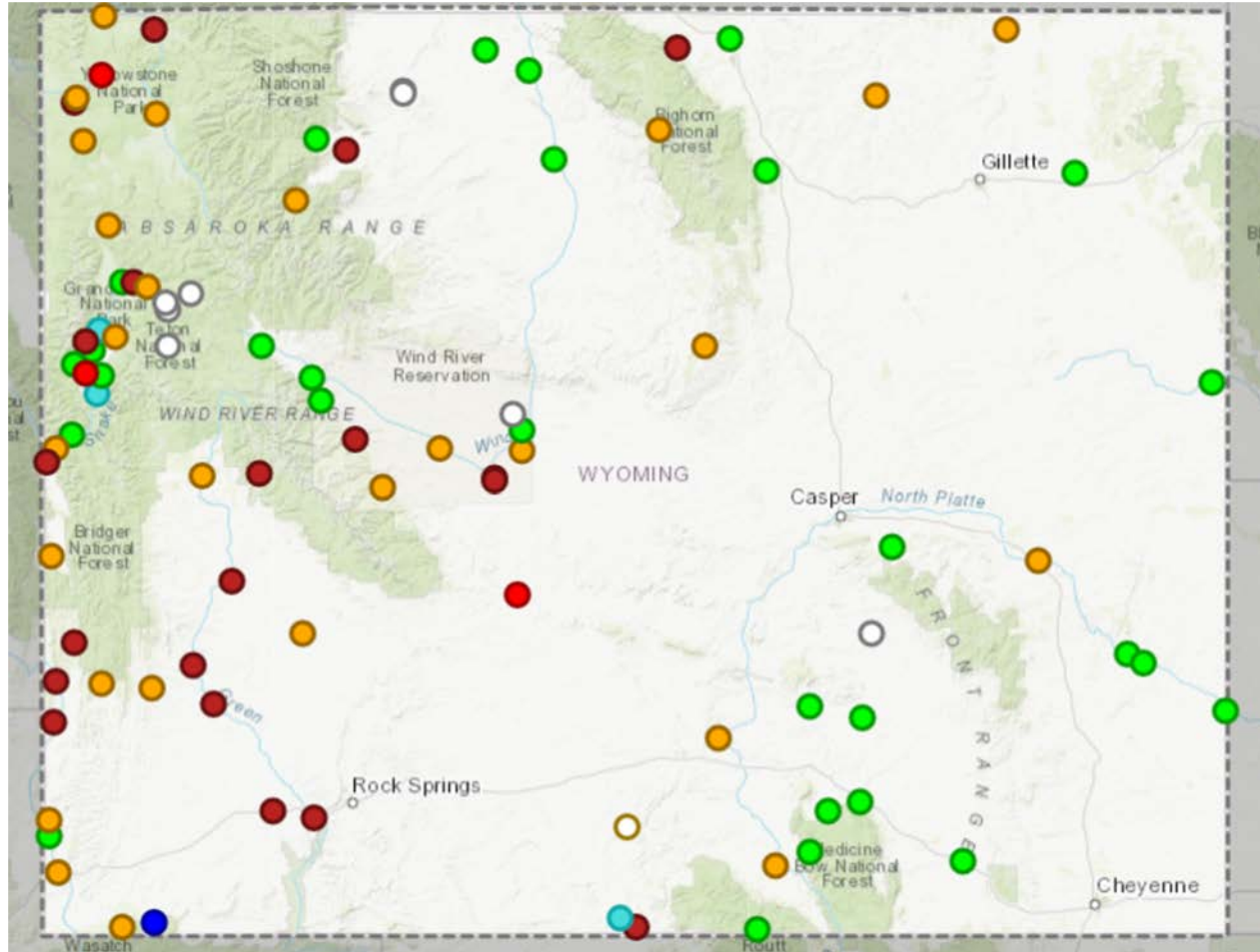
D4: 0.02%

Current Streamflow Conditions (August 18, 2021)

Stream Flow Status

Streams: Flow status

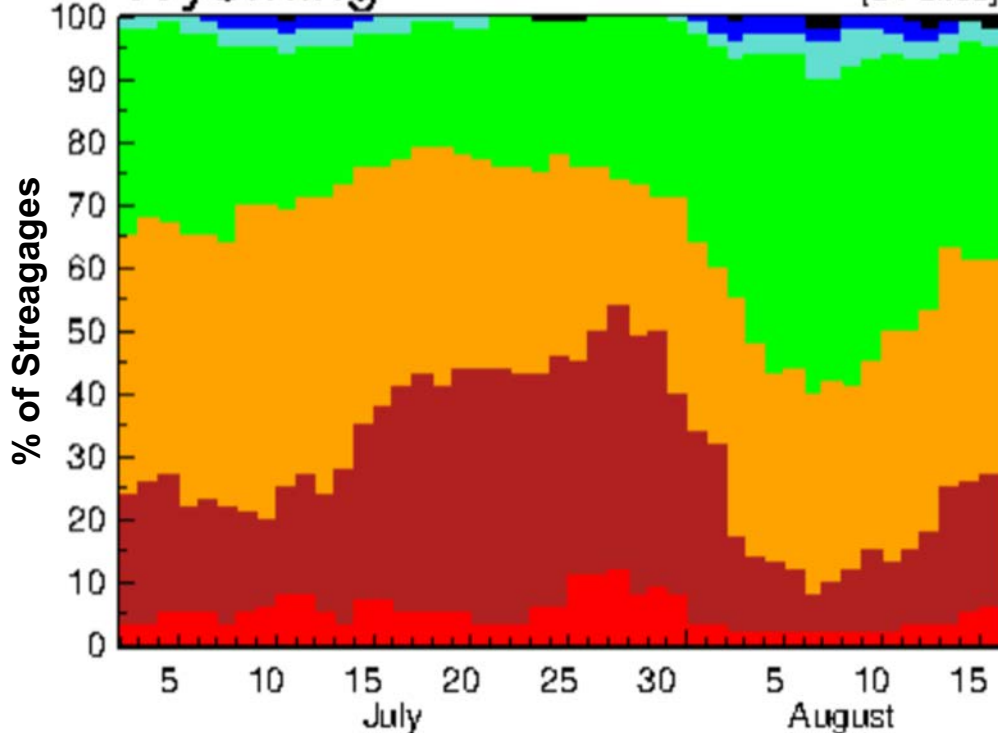
	All-Time Low for this Day	0 th percentile (minimum)
	Much Below Normal	<10 th percentile
	Below Normal	10 th – 24 th percentile
	Normal	25 th – 75 th percentile
	Above Normal	76 th – 90 th percentile
	Much Above Normal	>90 th percentile
	All-Time High for this Day	100 th percentile (maximum)
	Not Flowing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



Flow Trends since early July

**Last 45 Days
Wyoming**

[51 sites]



Only sites with 30 yrs record and no missing values.

% of normal increased Aug 1-8

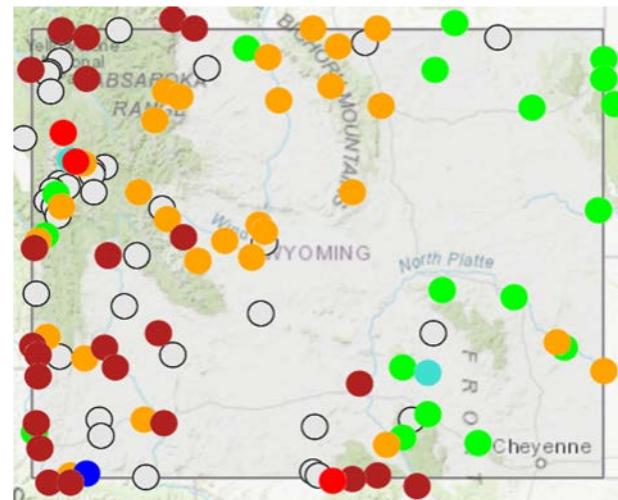
Lowest recorded for this period

- Firehole River near W.Yellowstone
- New Fork River near Big Piney
- Green River near La Barge

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

7-Day Avg Compared to last Month (Aug 18)

July 15
→



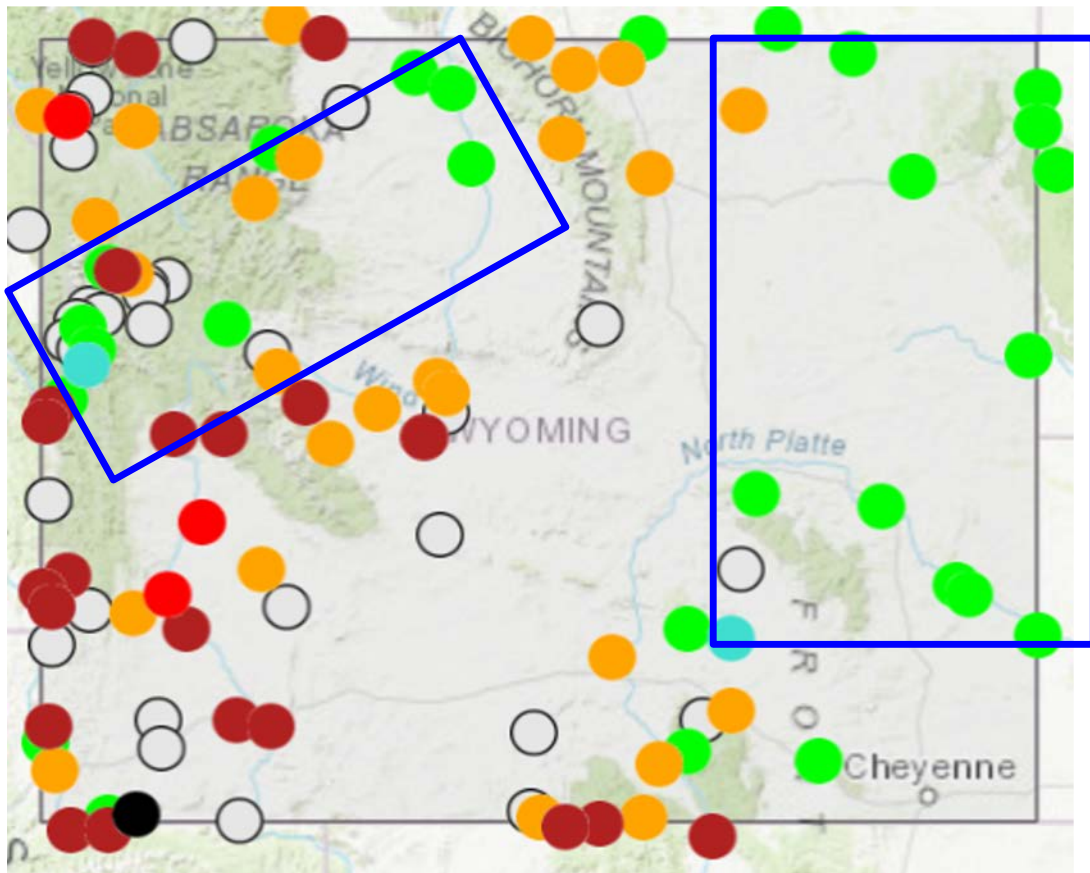
Explanation - Percentile classes

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

<https://waterwatch.usgs.gov>

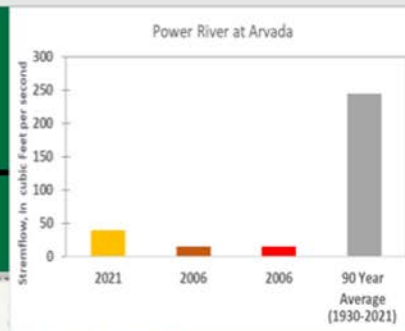
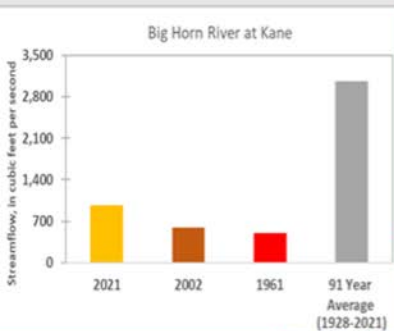
Pretty Similar to last month

Blue Boxes = Normal flow (likely from management)



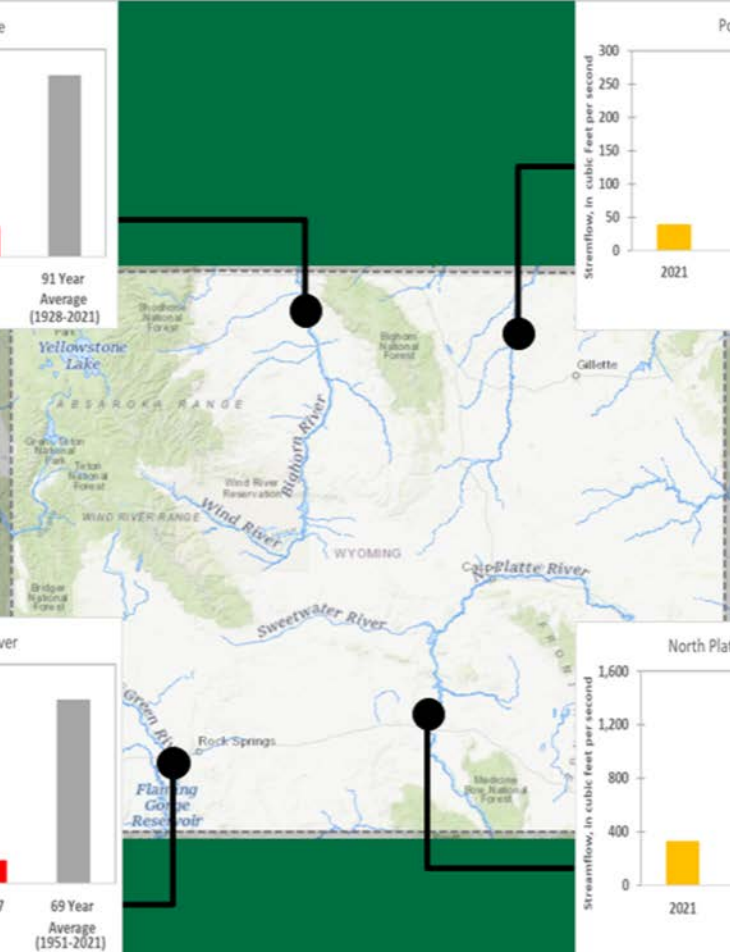
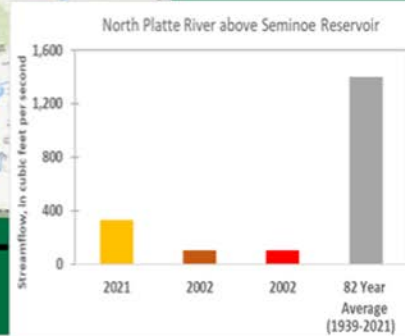
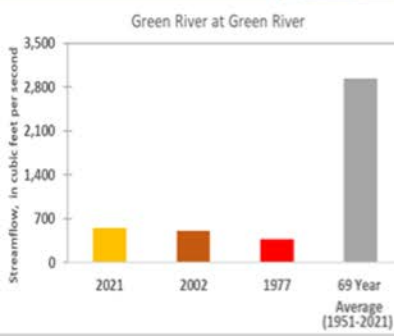


Average July Flows Compared to Historical Minimums

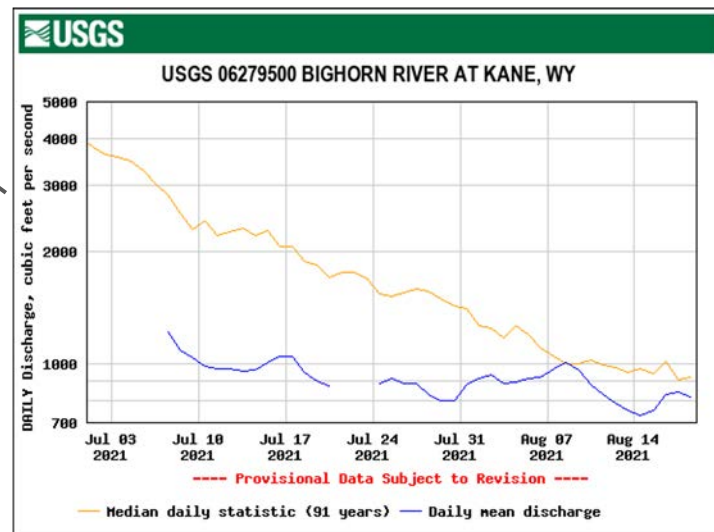
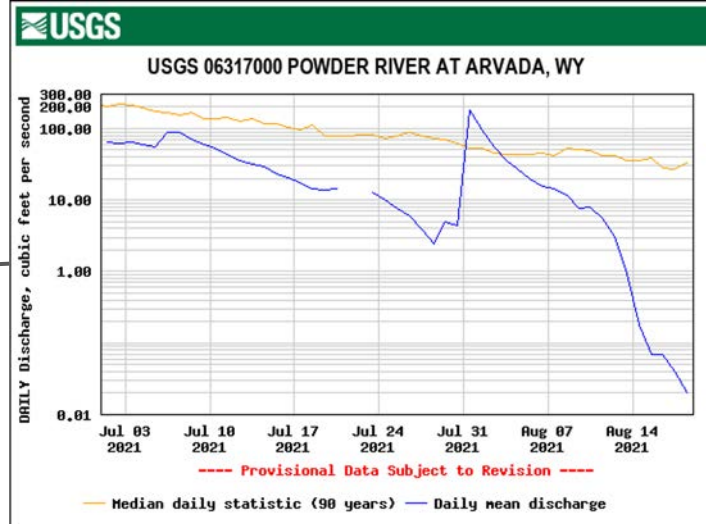
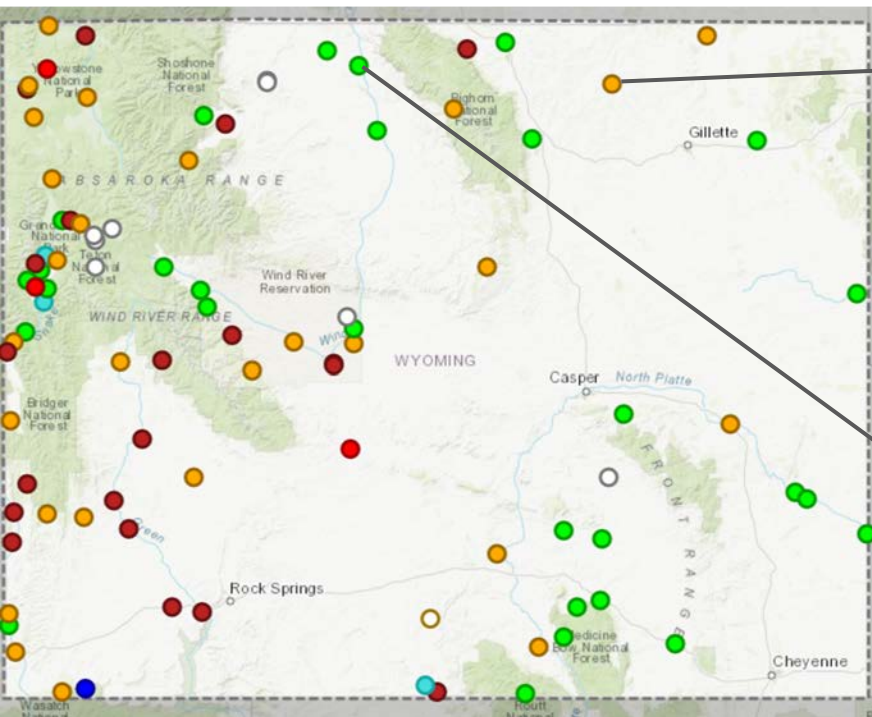


Average Streamflows

- Average streamflow during July 2021
- Average streamflow during July with the lowest flow in the past 20 years.
- Average streamflow during July with the lowest flow on record.
- Average streamflow during July for period of record.

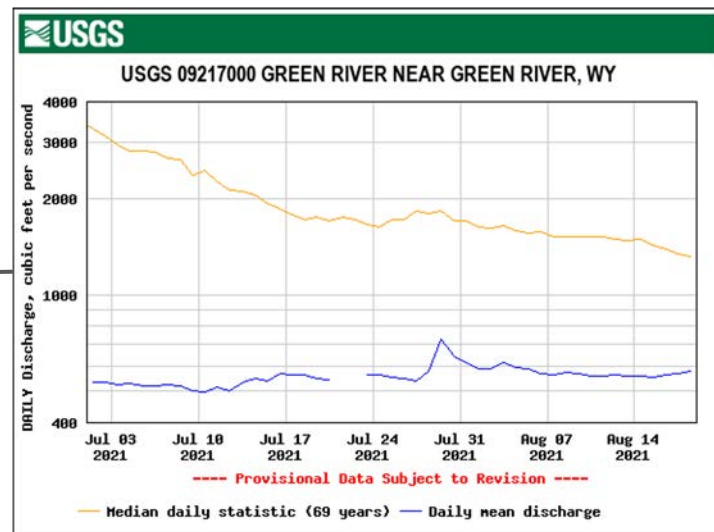
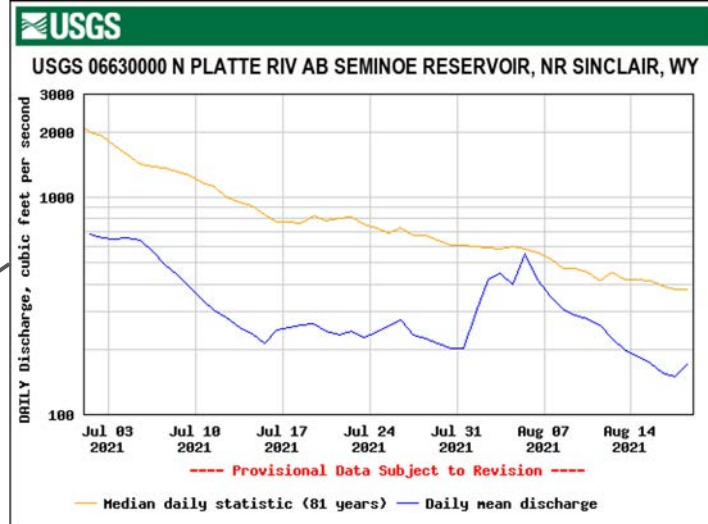
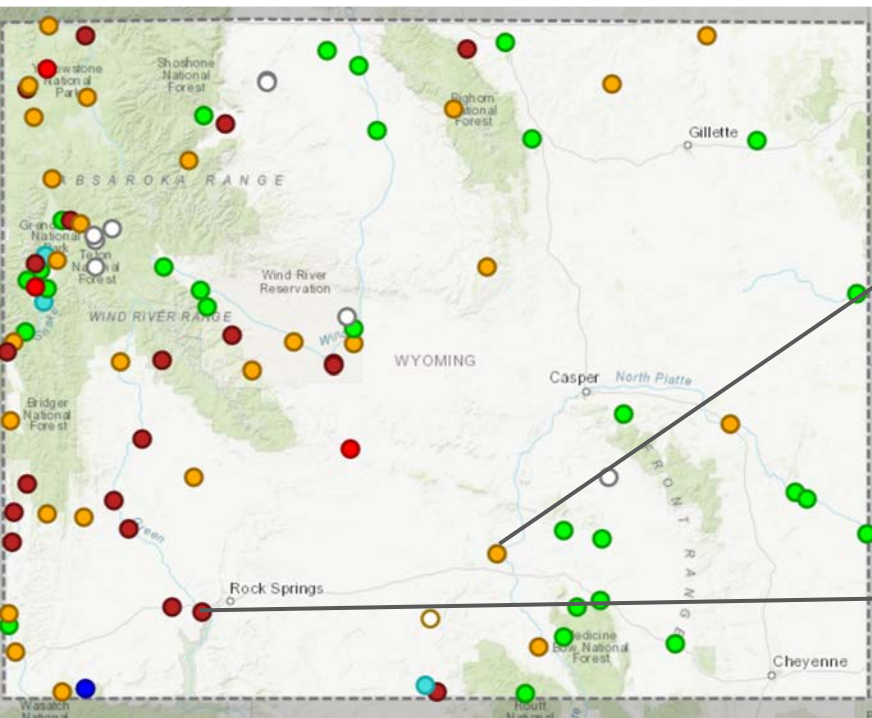


Select WY Streamflows



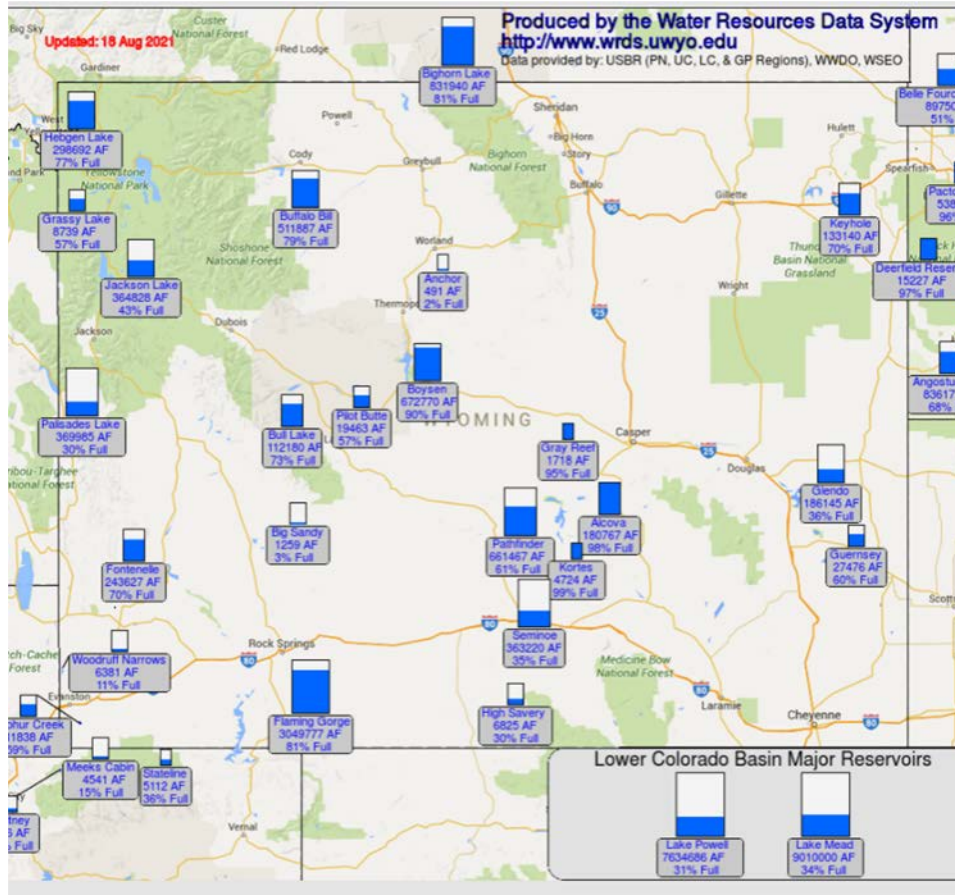
<https://dashboard.waterdata.usgs.gov/>
<https://waterdata.usgs.gov/>

Select WY Streamflows



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

WY Reservoirs (Updated 08/18/21)



Compared to July

- Most reservoirs decreased in volume
- Boysen, Bighorn, and Flaming Gorge are 80% full or more.



State Engineer's Office Divisions and Districts



Districts having
some regulation
in effect

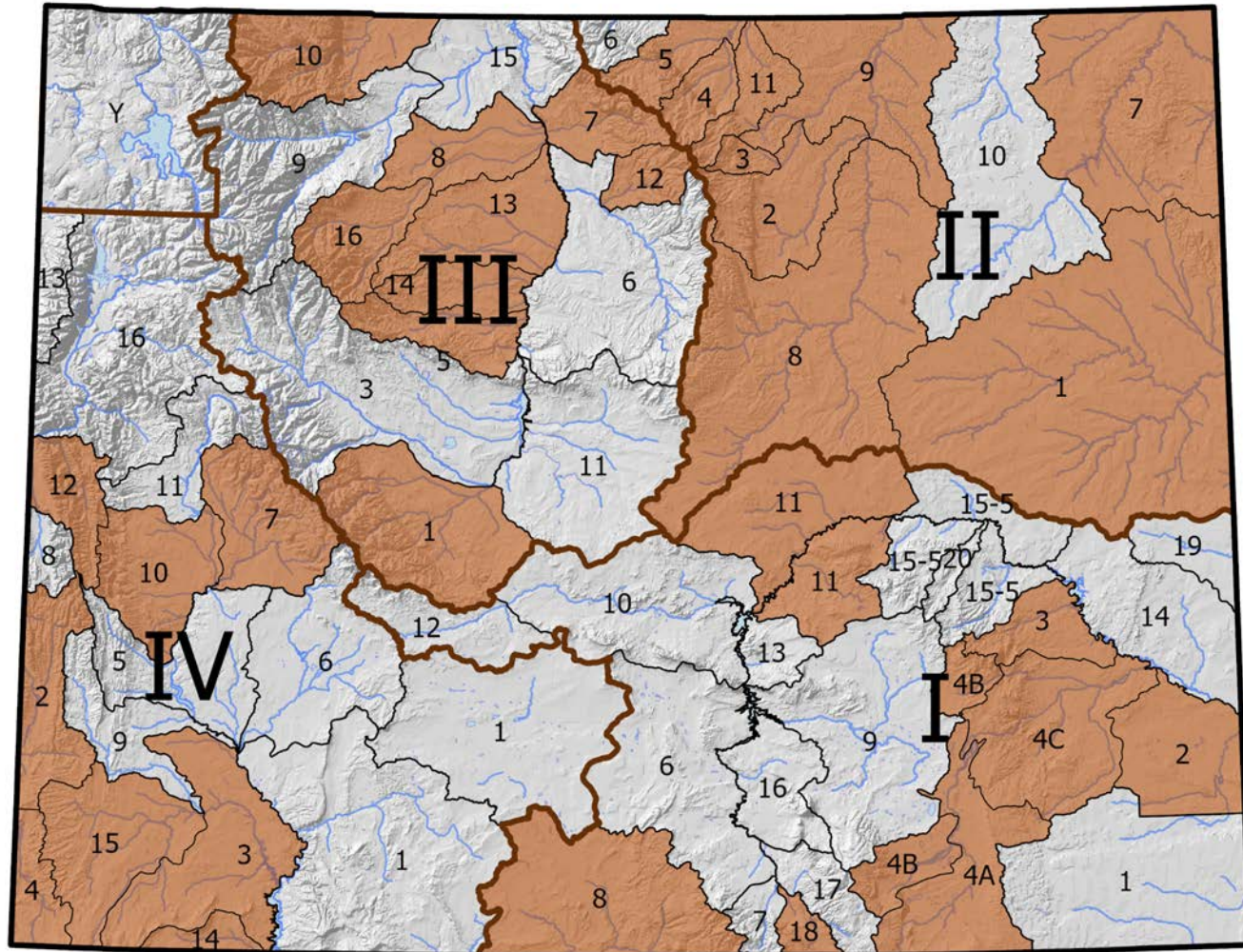
Division Superintendents:

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





Based on Reclamation's announcement of continual declining hydrologic conditions for the Colorado River system, 125,000 acre-feet of water from Flaming Gorge Reservoir will be released to protect storage elevations in Lake Powell.

These releases will be staged July through October, and will likely result in Flaming Gorge water elevation dropping an additional 3.5 feet by mid-autumn.

No Wyoming water rights are tied to the water being released, so **no Wyoming water right holders will be affected.**

	Jul	Aug	Sep	Oct	Nov	Dec	
	(kaf)	(kaf)	(kaf)	(kaf)	(kaf)	(kaf)	Sum
Flaming Gorge Reservoir	13	42	43	27	0	0	125
Blue Mesa Reservoir	0	14	18	4	0	0	36
Navajo Reservoir	0	0	0	0	10	10	20
Sum:	13	56	61	31	10	10	181 kaf

From Gov. Gordon's press release on July 16, 2021, and BOR 24-Month study released same day.

<https://content.govdelivery.com/accounts/WYGOV/bulletins/2e86b89?reqfrom=share>

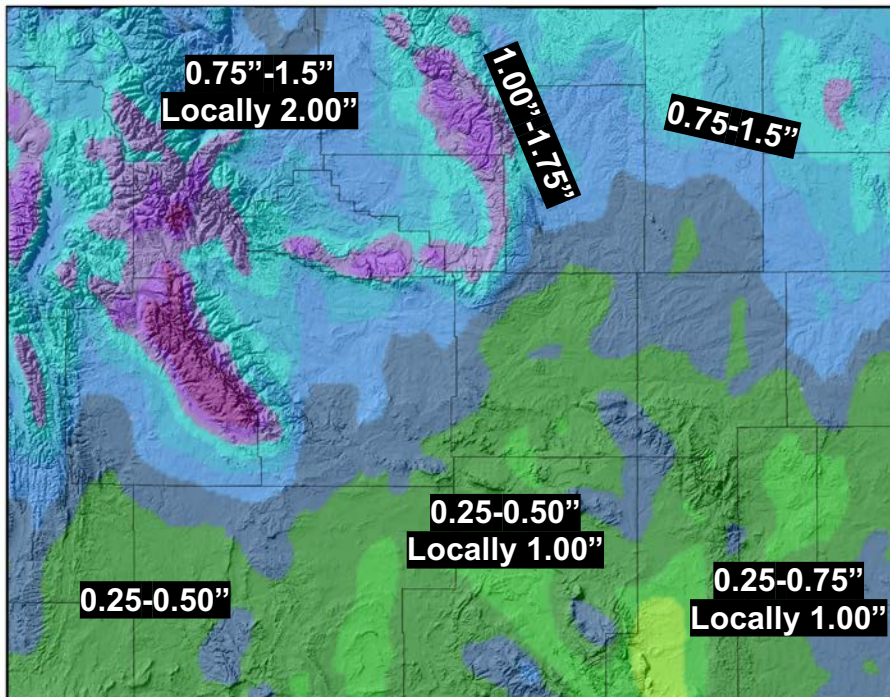


Forecasts & Outlooks



7-Day Quantitative Precipitation Forecast August 19 - 26

7-Day Quantitative Precipitation Forecast 19 Aug 2021



Forecast:
Weather Prediction Center



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



Provisional data, subject to revision

- Quantitative Precipitation Forecast = Liquid Precipitation Forecast
- Widespread Showers and embedded thunderstorms across WY Today/Friday & lighter round late Saturday/into early Sunday.
- Drier and warmer conditions return Sunday into early next week.

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 19 Aug 2021 <http://www.wrds.uwyo.edu>

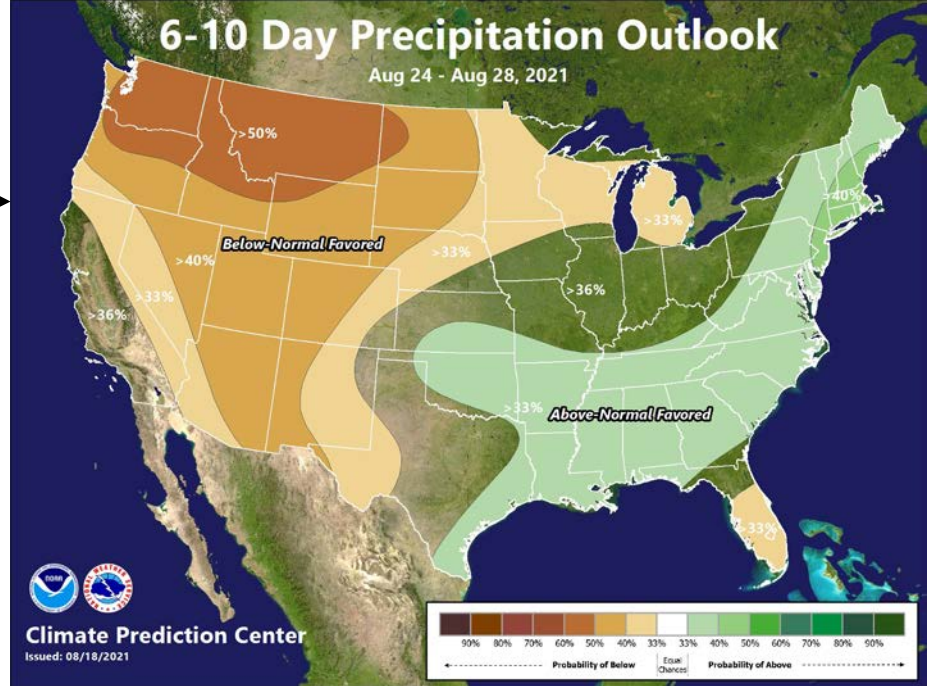
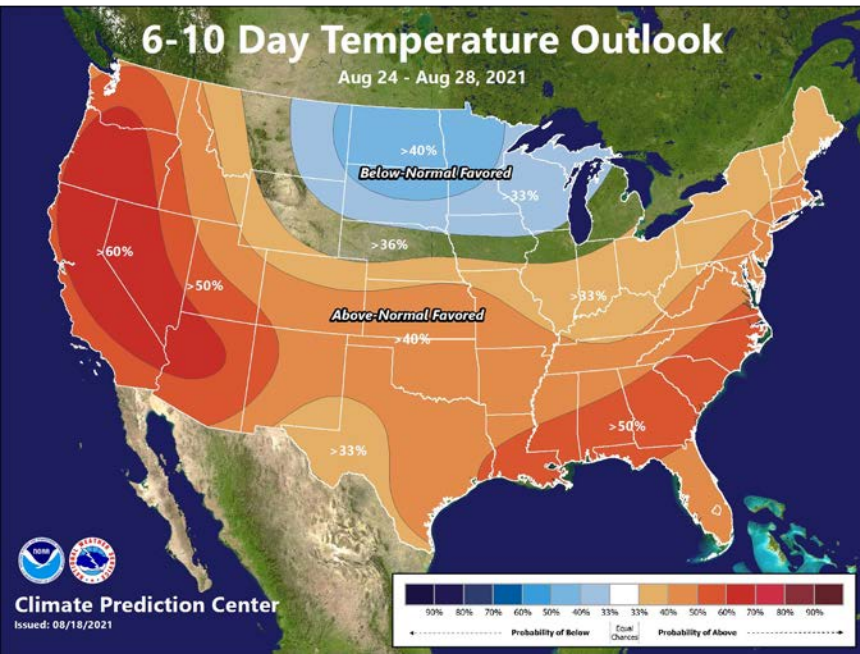
<https://bit.ly/3bZXQeN>



6-10 Day Precipitation Outlook

August 24 - 28

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



6 - 10 Day Temperatures

- Mixture of slightly below normal, neutral, and slightly above normal across the state

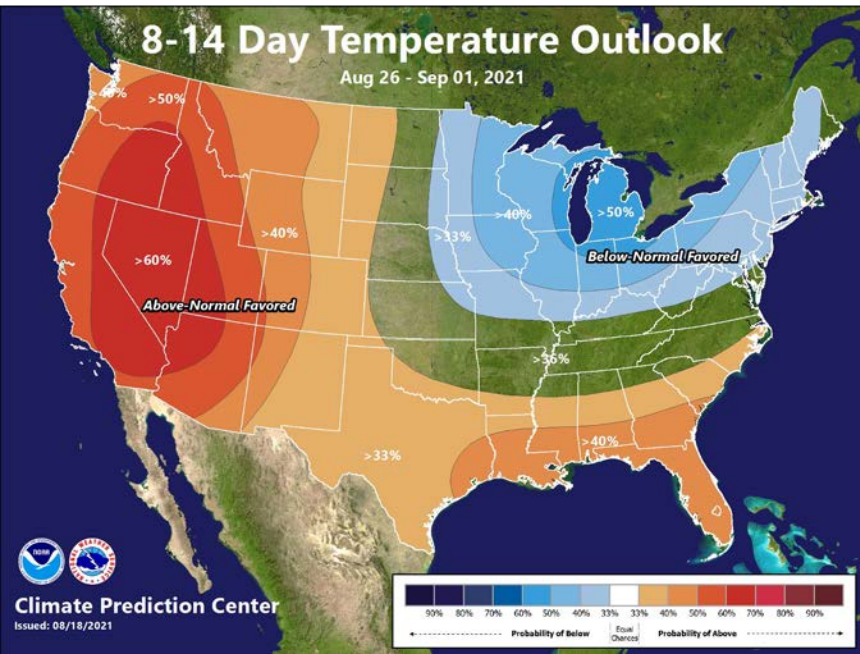
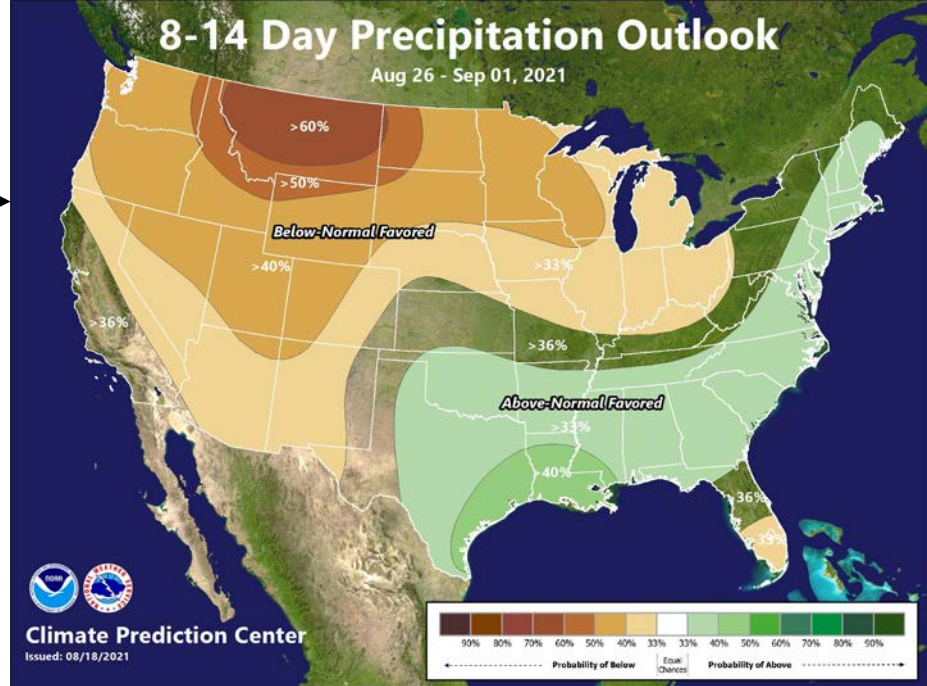
<http://bit.ly/3kq3LxA>



8-14 Day Precipitation Outlook

August 26 - September 1

- Probability = Chance
- **Below normal** precipitation favored late August into September.



8 - 14 Day Temperatures

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

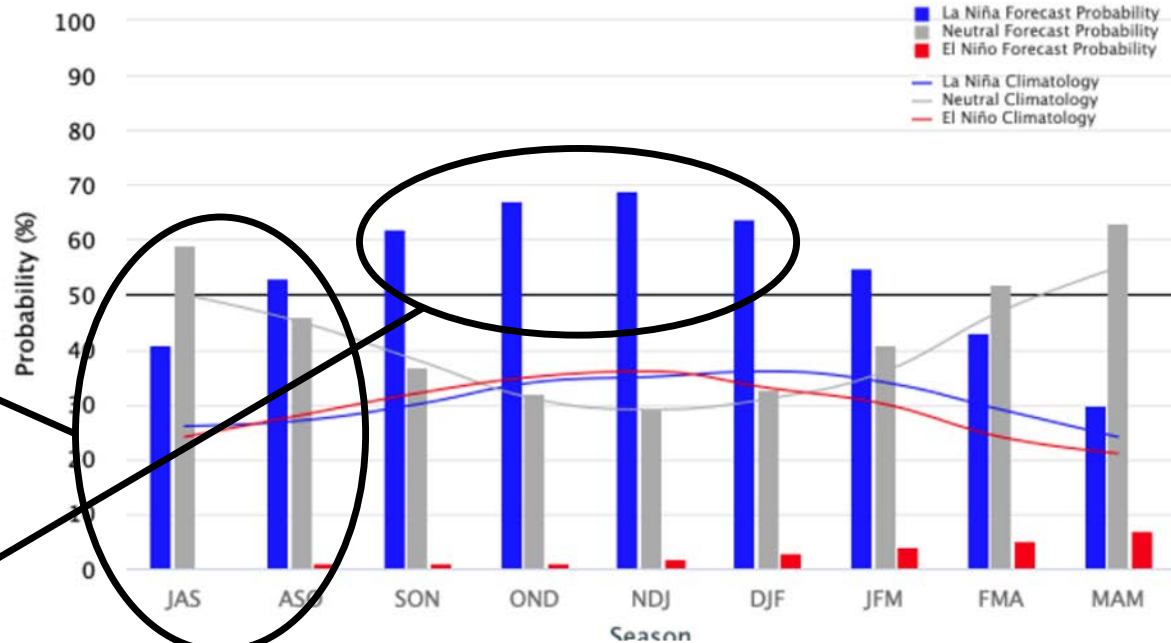
<http://bit.ly/3kw1WPF>



- Note: WY's weather is not as strongly connected to ENSO due to our distance from the ocean
- Neutral ENSO conditions currently
- Indication of another La Nina fall & winter 2021-2022. Drier winter Again? All depends on storm track.

Early-August 2021 CPC/IRI Official Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: -0.5 °C to 0.5 °C





Fuels Status: Energy Release Component

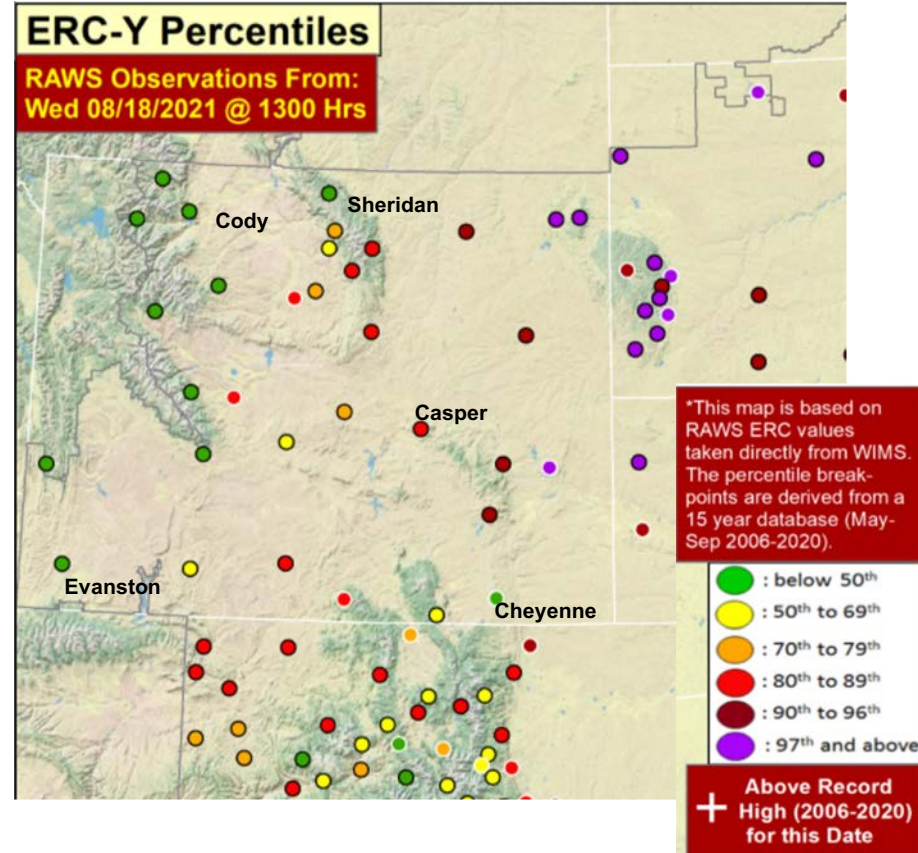
(Observation 08/18/21)

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

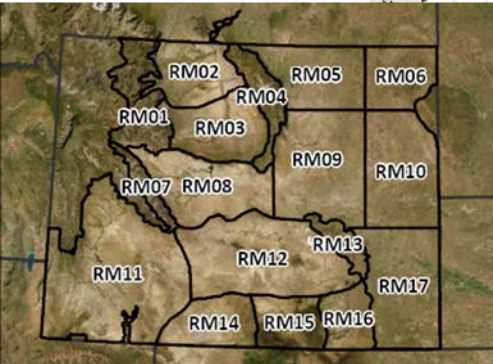
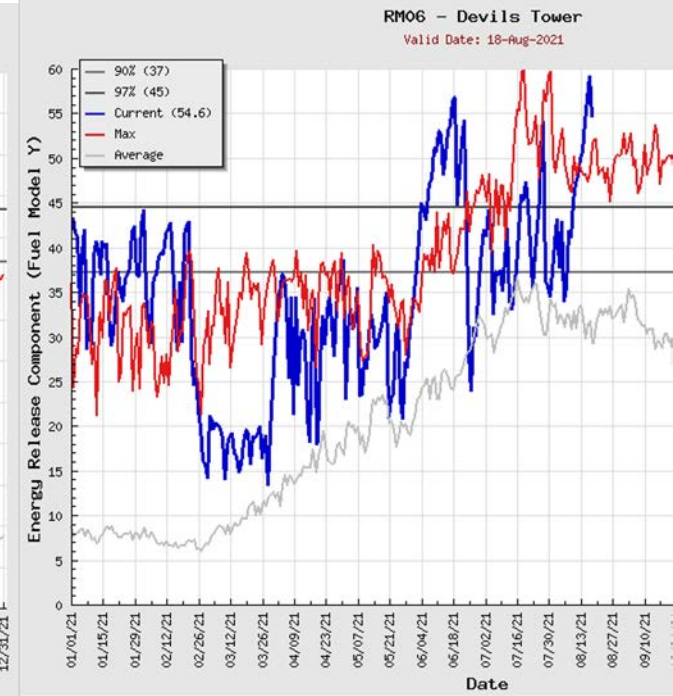
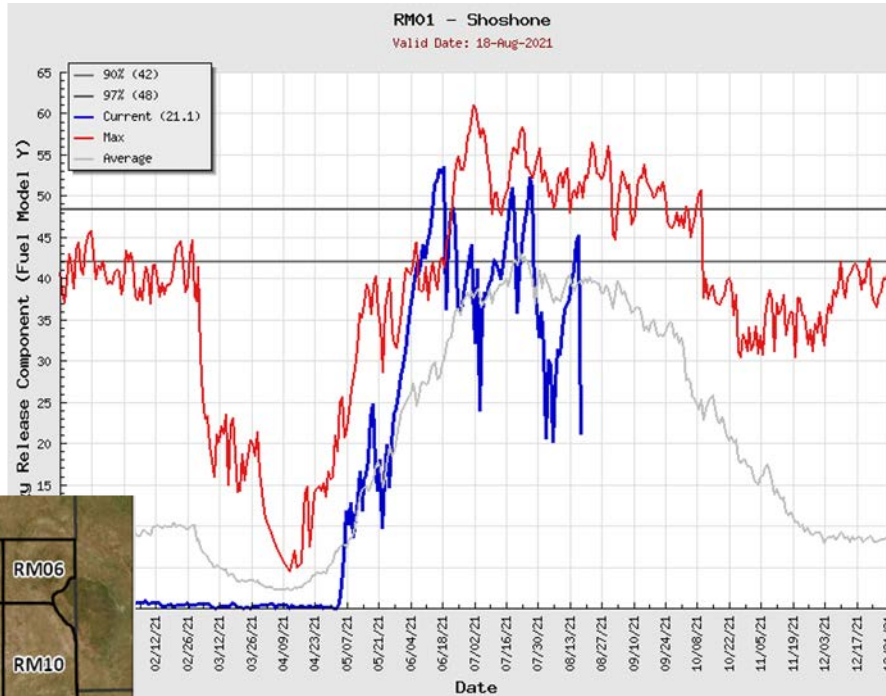
- Eastern Wyoming (especially northeastern) values are quite high.
- Timing of current precip event affected westernmost stations first..
- Direct Correlation to Drought!
- Low elevation fuels cured where moisture has been lacking. Periodic moisture in other areas keeping things green.
- Warmer drier weather returning next week.





Fuels Status: Energy Release Component

(Observation 08/18/21)

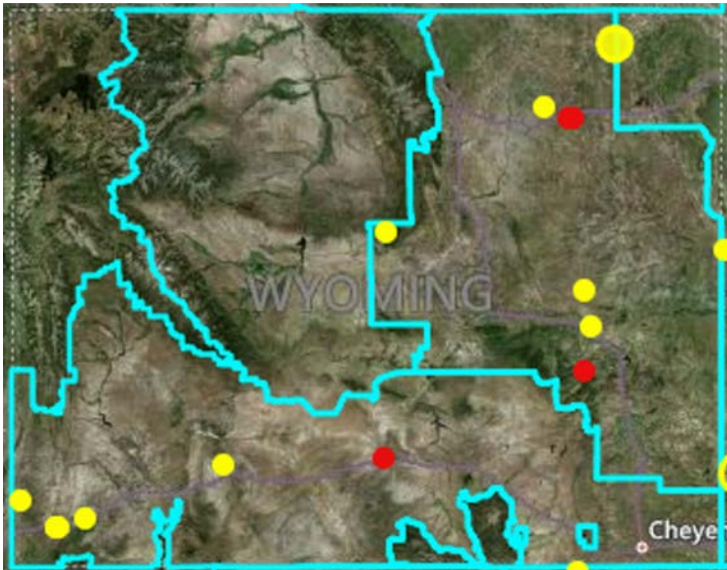




2021 Wildfire Activity to Date

A National Picture

Issued 08/19/21



- New Fires Initial Attack Age < 30 hrs ●
- Ongoing Fires Age < 10 days & Updated < 5 days ●
- Prescribed Fires Age < 10 days & Updated < 5 days ●

Active Incident Resource Summary							
GACC	Incidents	Cumulative Acres	Crews	Engines	Helicopters	Total Personnel	Change in Personnel
AICC	1	10,358	1	0	0	24	-6
NWCC	37	1,045,222	197	533	79	9,189	-220
ONCC	11	1,220,237	146	810	48	10,407	546
OSCC	3	5,429	8	14	5	379	184
NRCC	38	712,951	55	308	42	4,277	234
GBCC	11	95,456	18	18	17	914	-228
SWCC	1	1,296	0	1	0	7	-12
RMCC	3	19,381	4	47	3	279	84
EACC	4	4,378	1	33	1	191	102
SACC	1	125	0	8	0	22	0
Total	110	3,114,835	430	1,772	195	25,689	216

Wyoming Fires

Issued 08/16/21

- Fire occurrence has been limited.
- Initial Attack efforts remain successful.

<https://www.nifc.gov/nicc/sitreprt.pdf>

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

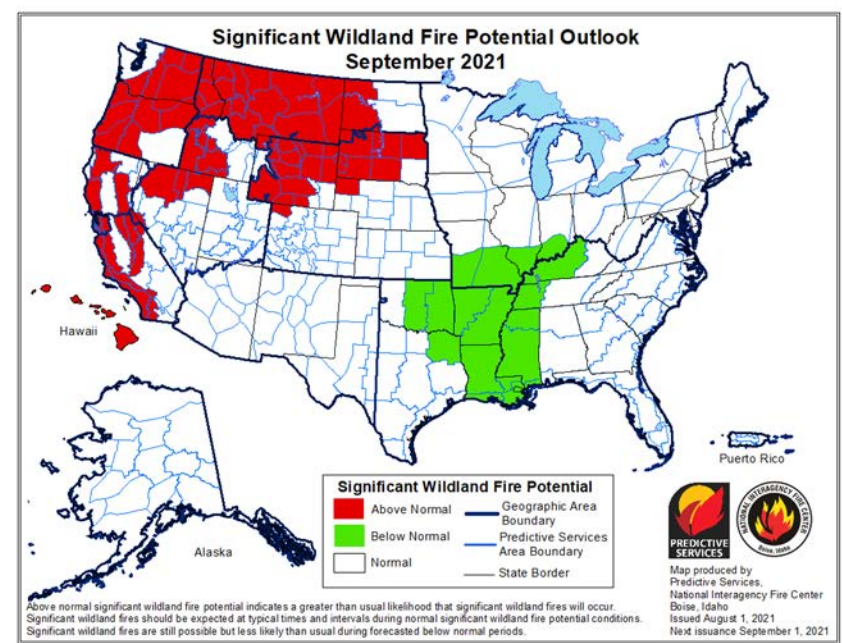
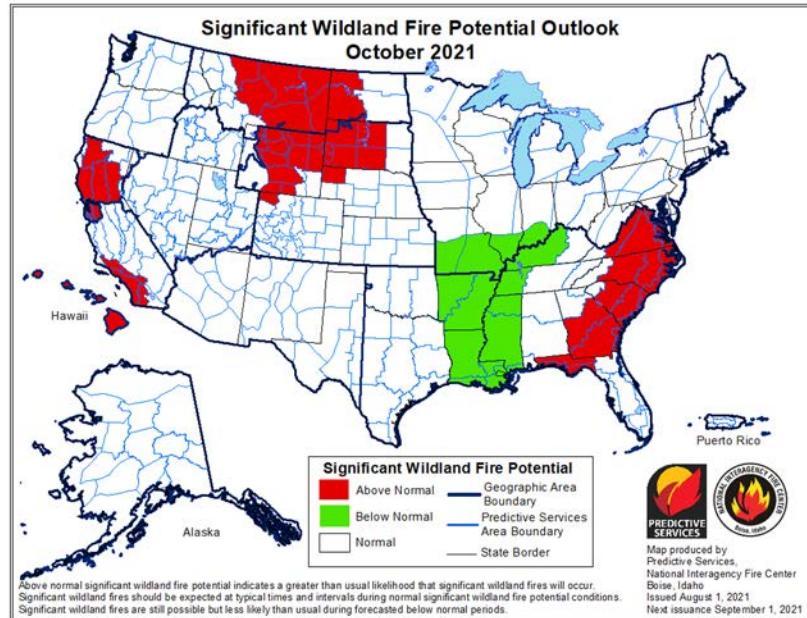


Wildland Fire Outlooks

September 2021

Issued August 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.



October 2021

- Most of Wyoming remains in Above Normal Significant Wildfire potential through October.
- Concerning due to potential length of fire season.

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



How to get involved ...

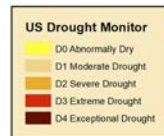
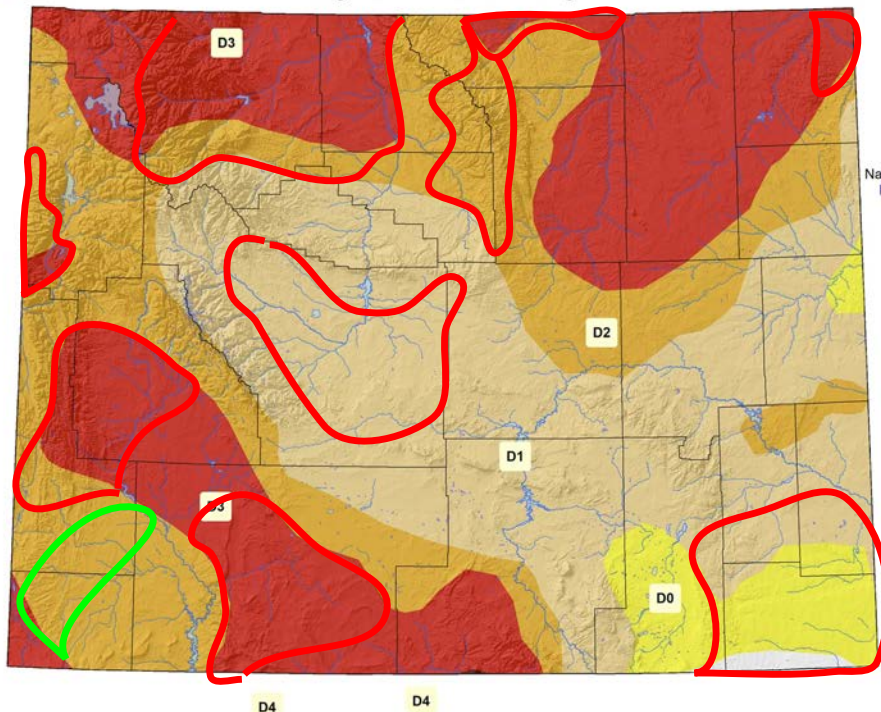
US Drought Monitor for August 17, 2021

(Released Thursday, August 19, 2021)

Valid 8 a.m. EDT

D4

US Drought Monitor as of 17 August 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 southwest Wyoming since the last webinar followed by several **degradations** over much of the rest of the state.

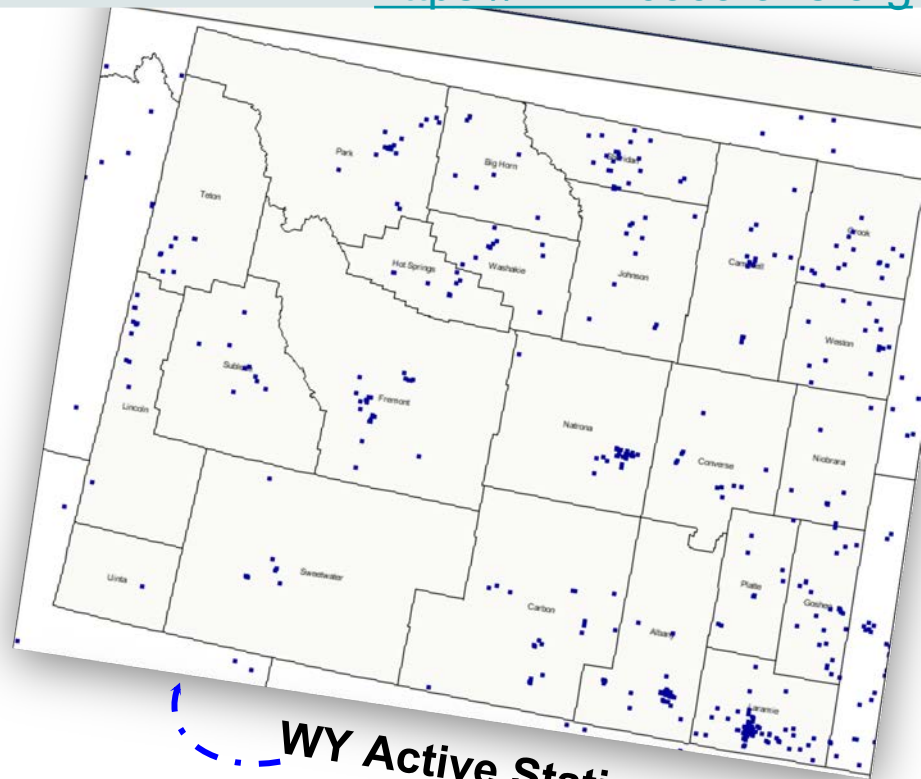
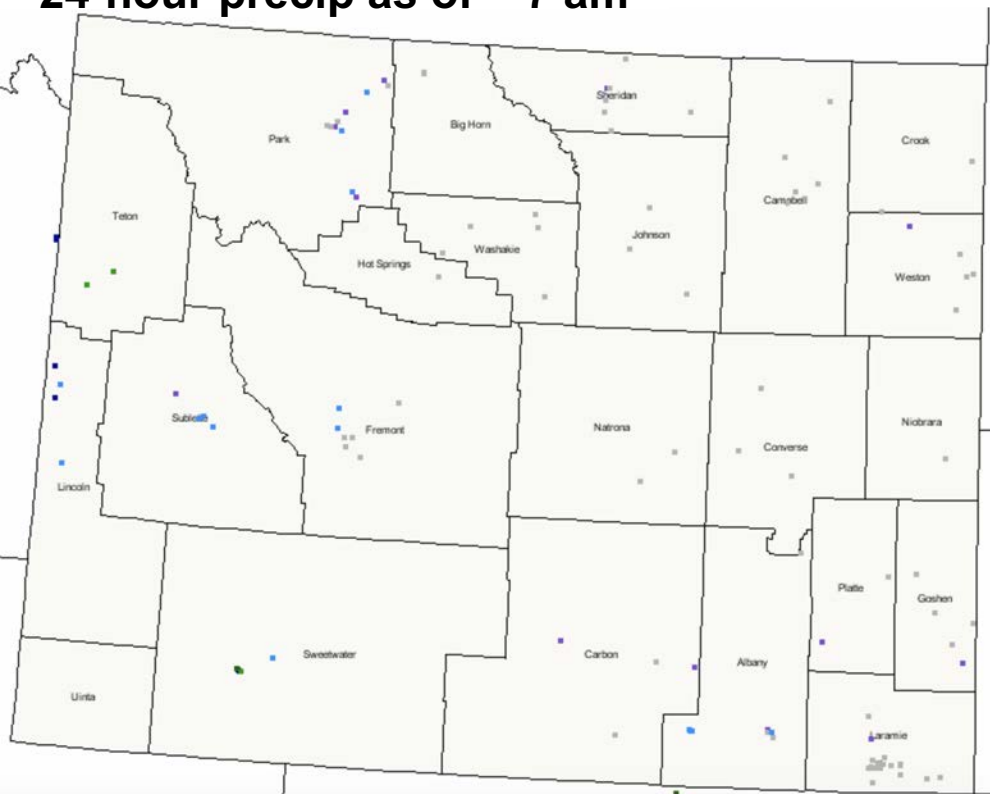
The U.S. Drought Monitor, is a weekly map of drought conditions produced jointly by the National Oceanic and Atmospheric Administration, the U.S. Department of Agriculture, and the National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln. The U.S. Drought Monitor website is hosted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



CoCoRaHS Mapping System

<https://www.cocorahs.org>

August 18, 2021:
24-hour precip as of ~ 7 am



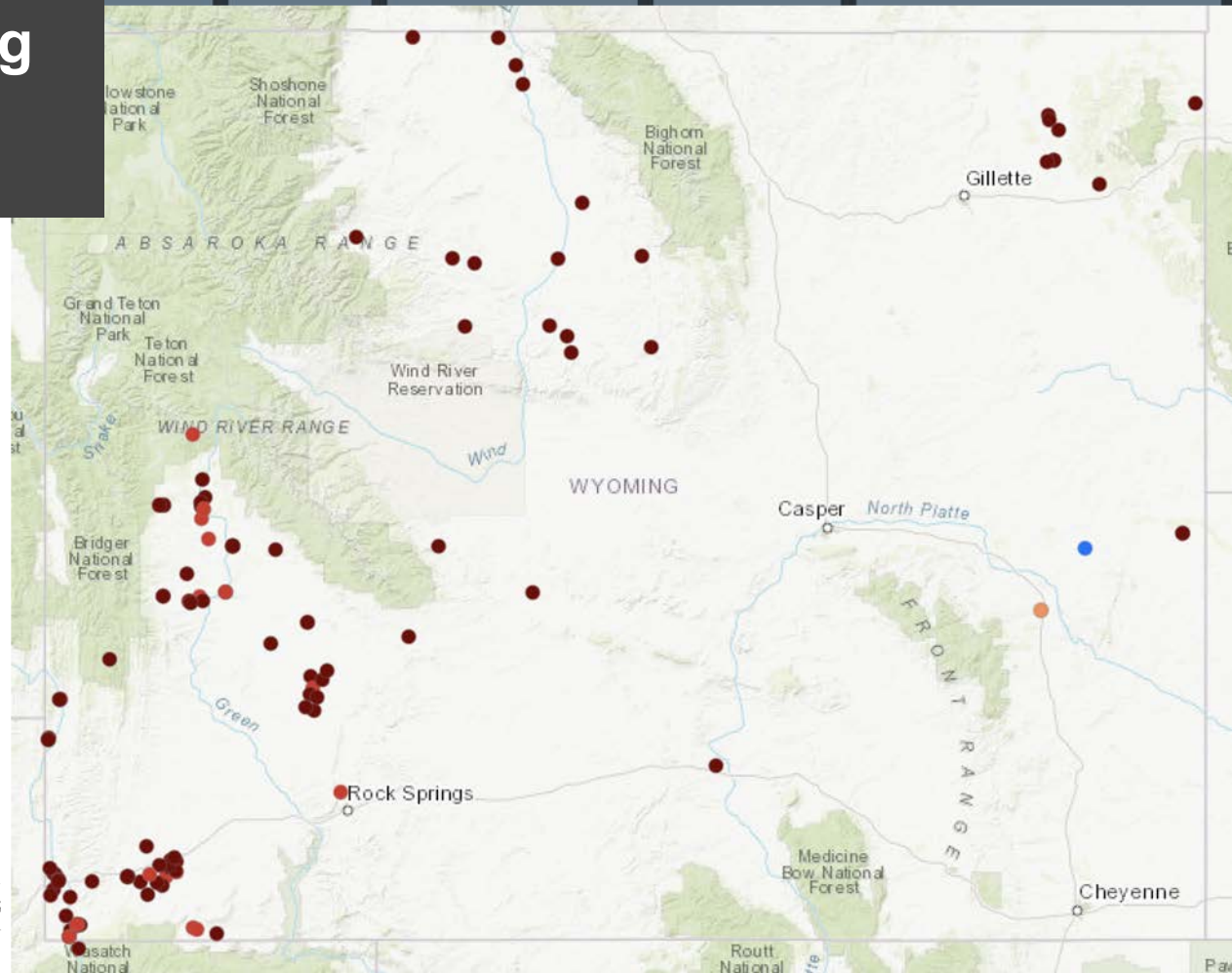
WY Active Station Locations



Condition Monitoring Observer Reports

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

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



Condition Monitoring Observer Reports

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

- Comparison photos
- Regular reporting is helpful (e.g., monthly)
- **Note:** Reports and photos are available to the public.

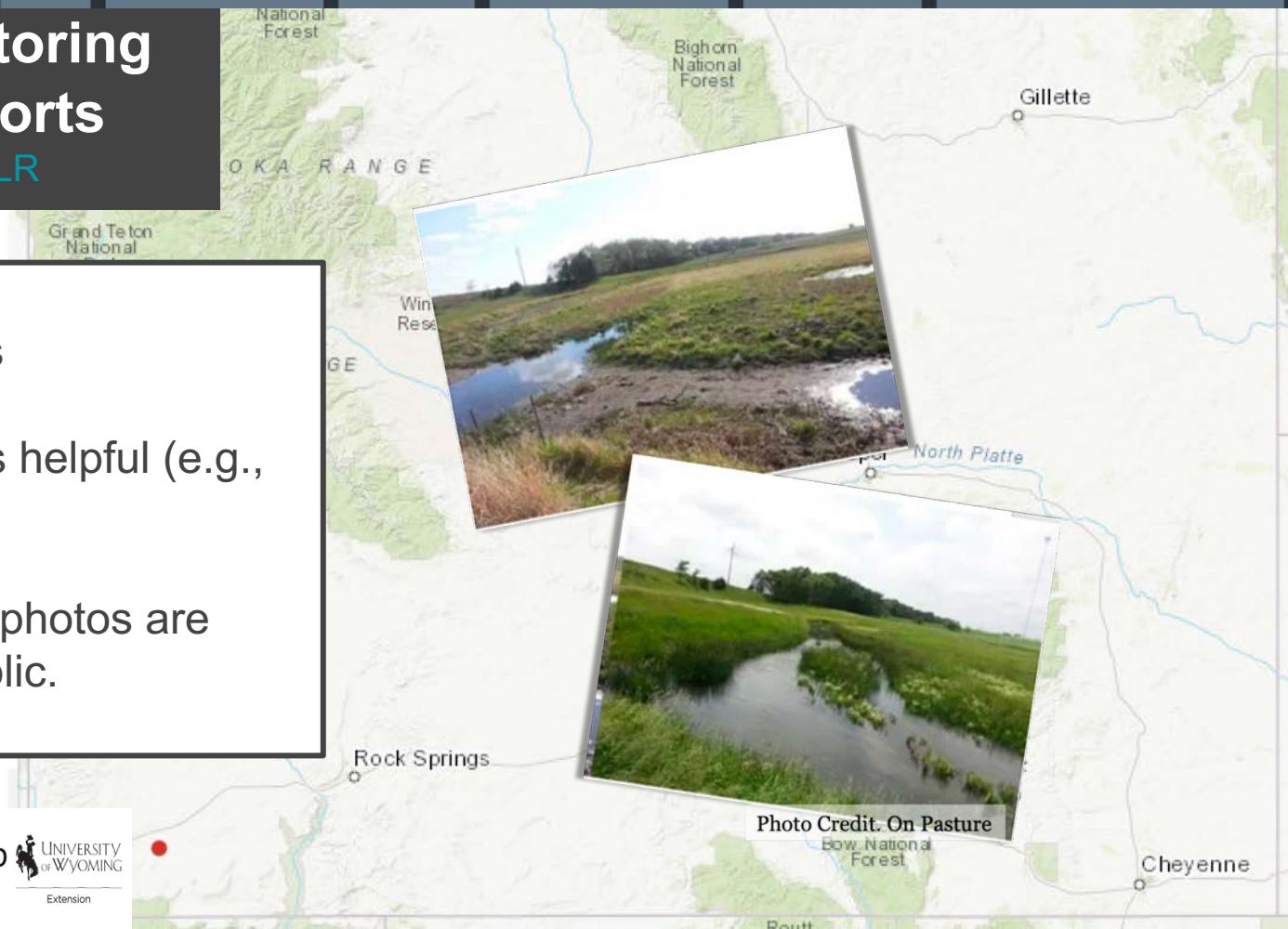


Photo Credit. On Pasture



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Anthony Schultz

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anthony.schultz@wyo.gov

WY Drought Info & Resources

<https://drought.wyo.gov>

CoCoRaHS

<https://www.cocorahs.org>

**Condition Monitoring
Observer Reports (CMOR)**

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

Thank you! Questions?