



# WY Conditions & Outlooks:

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

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May 20, 2021



# Presentation Outline

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- Current Conditions
- Outlooks
- How to Get Involved



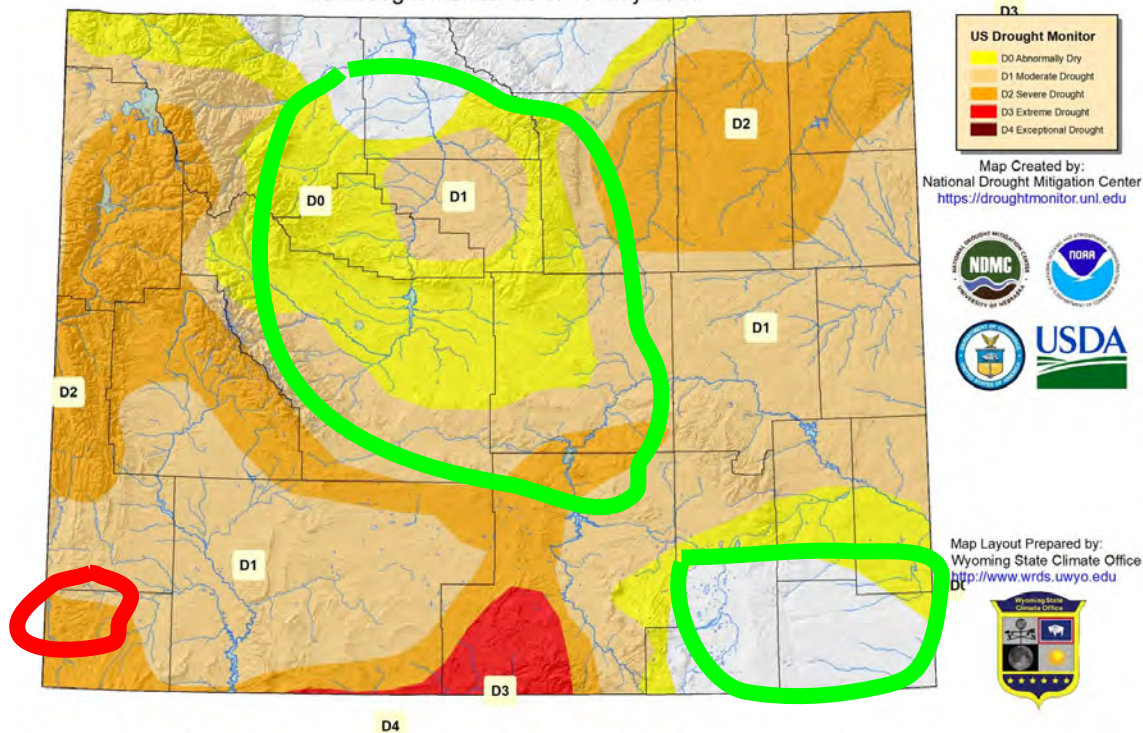
# Current Conditions

# US Drought Monitor for May 18, 2021

(Released Thursday, May 20, 2021)

Valid 8 a.m. EDT

US Drought Monitor as of 18 May 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>



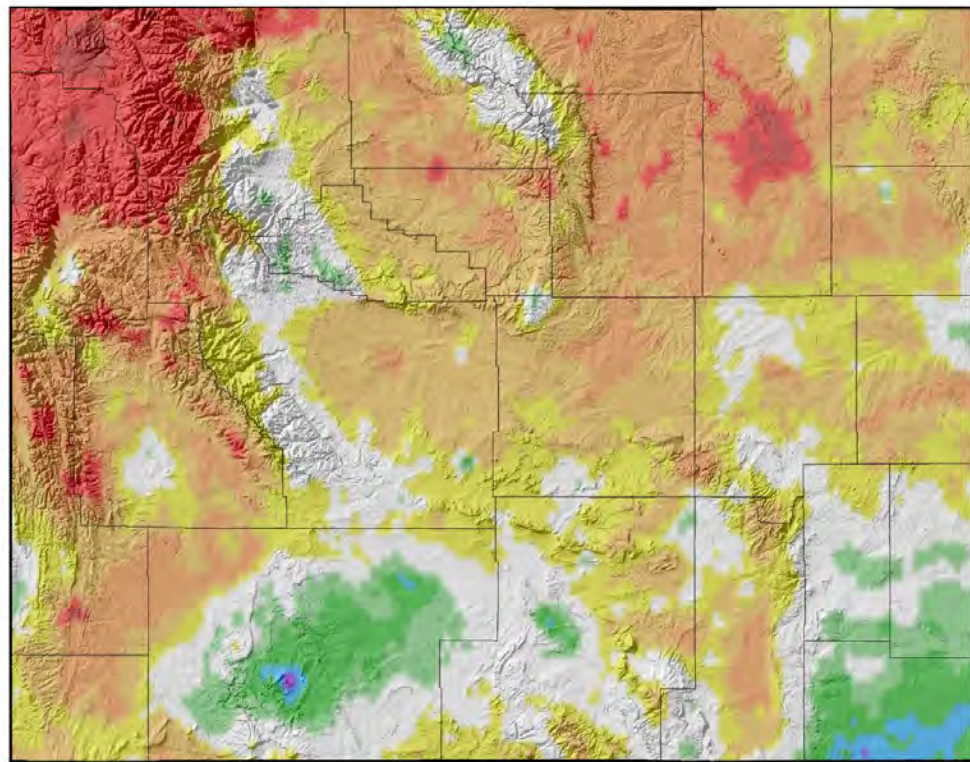
Drought Level	Percentile
None	>30
D0 (Abnormally Dry)	21 to 30
D1 (Moderate Drought)	11 to 20
D2 (Severe Drought)	6 to 10
D3 (Extreme Drought)	3 to 5
D4 (Exceptional Drought)	0 to 2

Continued wetness in southeast and central Wyoming has prompted **improvements** in the last two weeks while dry conditions have led to **degradation** in the west.

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>

# 14-Day Precipitation Percentile (06 May 2021 to 19 May 2021)

14-Day Precipitation (Percentile) for 06 May 2021 to 19 May 2021



**Above Median:**

- Central Sweetwater County
- Southeast

**Below Median (Areas of Concern):**

- West
- Bighorn Basin
- Northeast

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



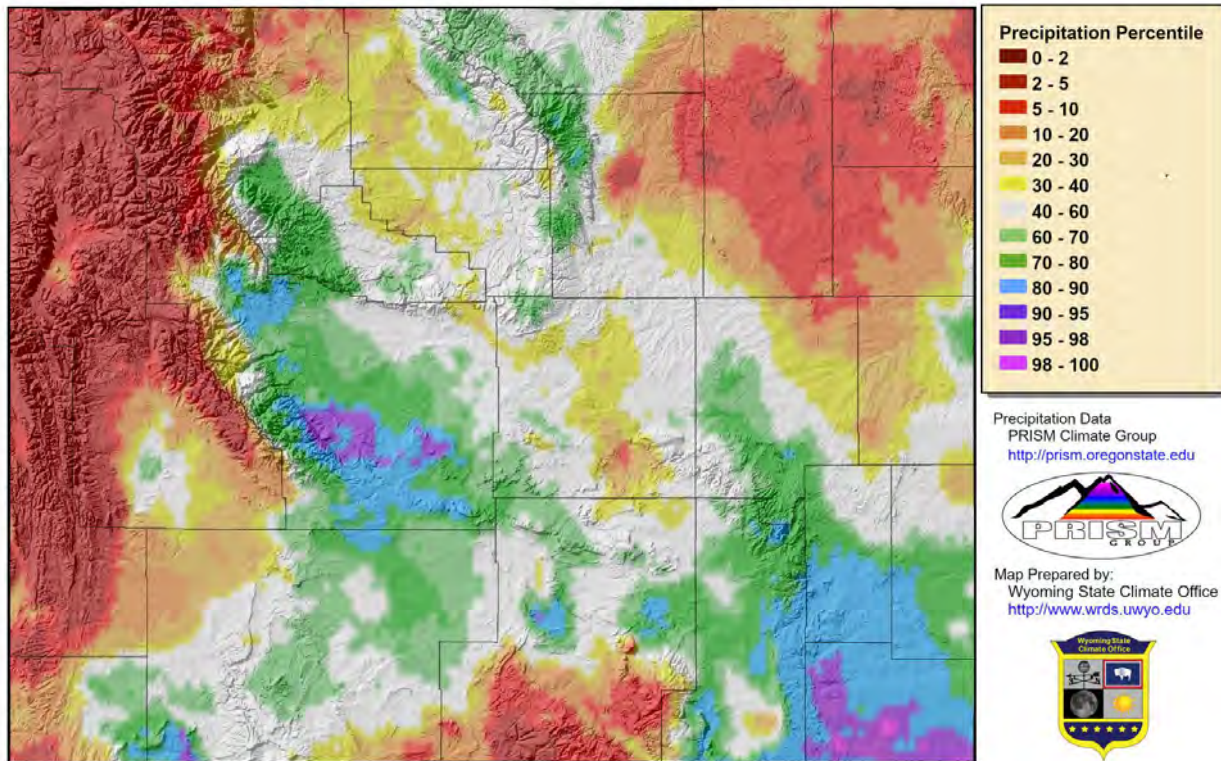
Map Prepared by:  
Wyoming State Climate Office  
<http://www.wrds.uwyo.edu>




Provisional data, subject to revision

# 90-Day Precipitation Percentile (19 Feb 2021 to 19 May 2021)

90-Day Precipitation (Percentile) for 19 Feb 2021 to 19 May 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

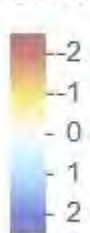
Above Median:

- Fremont into Sweetwater Counties
- Bighorns
- Southeast

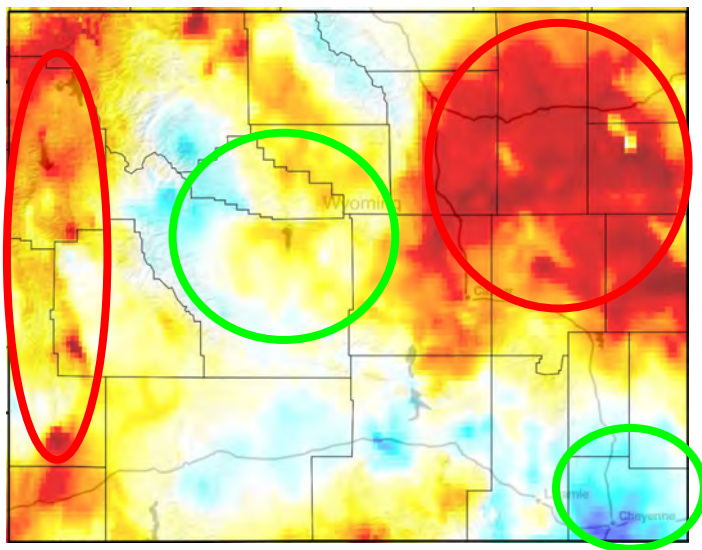
Below Median (Areas of Concern):

- West
- Southcentral Carbon
- Northeast

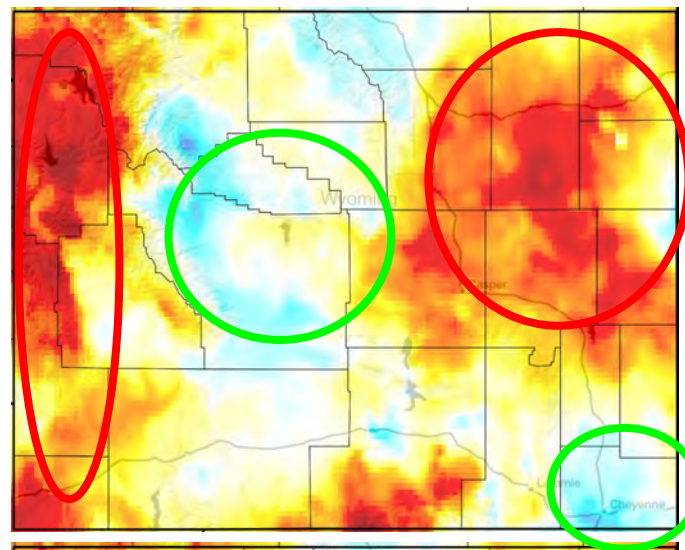
Current SPI



30-Day



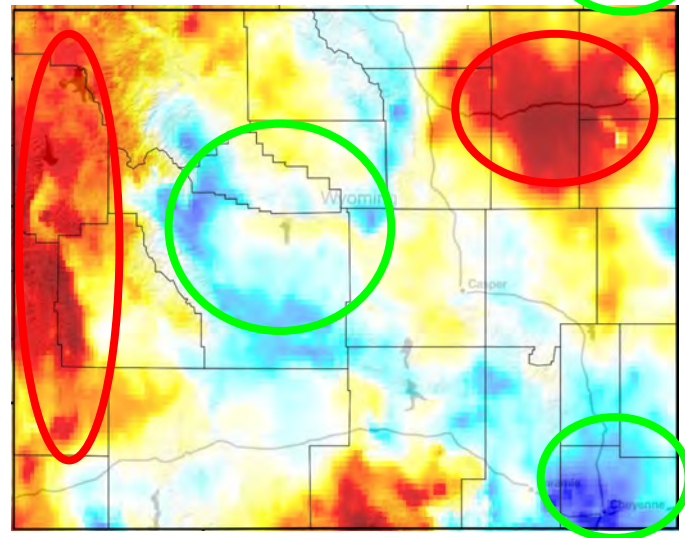
60-Day

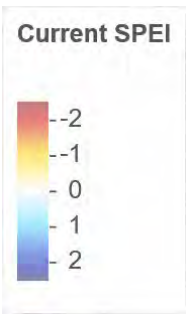


## Standardized Precipitation Index (SPI)

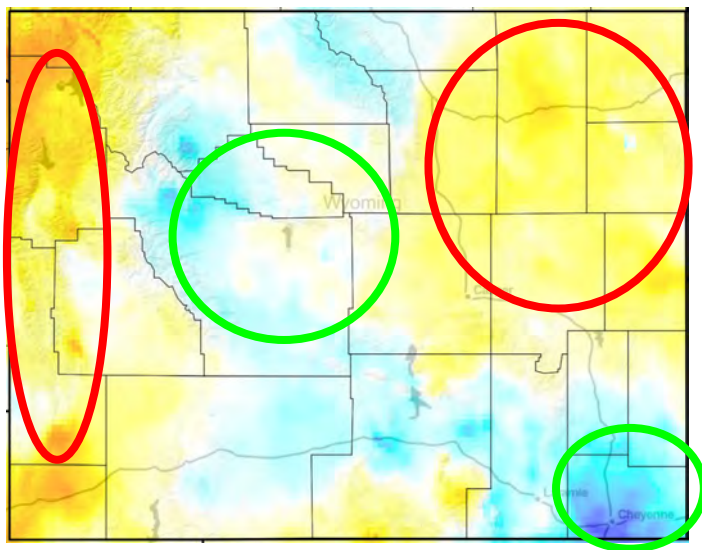
- Wet conditions in Central & SE WY removed D0
- Dry conditions in Western Wyoming caused further degradation of conditions. NE dryness expanding.

90-Day

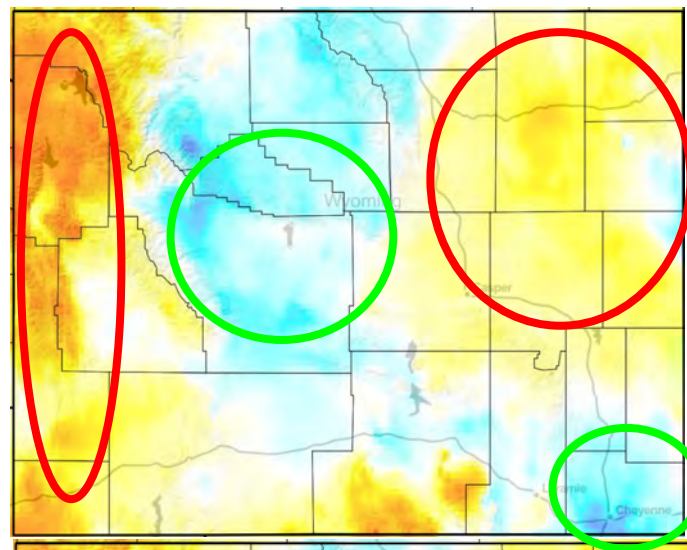




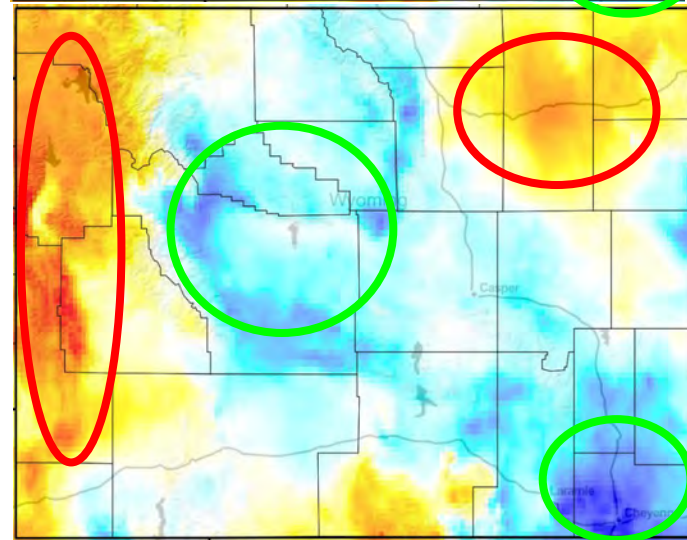
30-Day



60-Day



90-Day



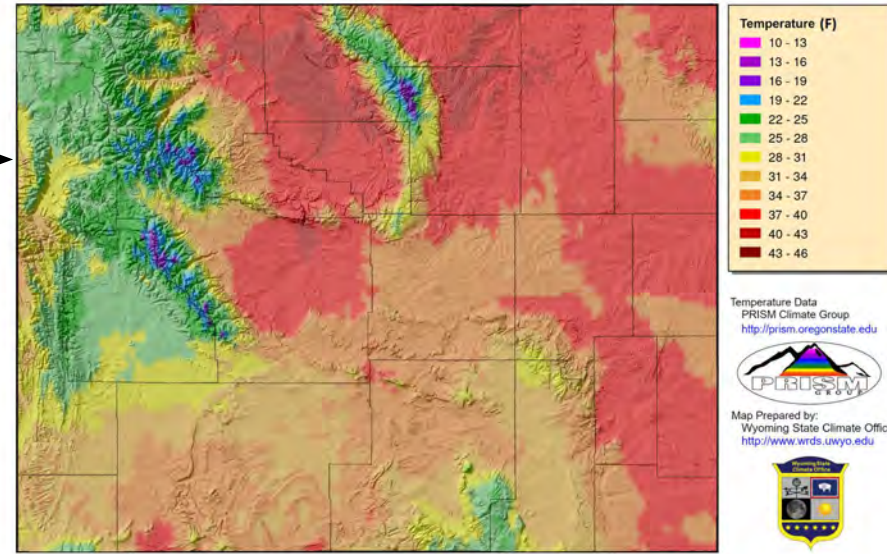
## Standardized Precipitation Evapotranspiration Index (SPEI)

- Wet conditions in Central & SE WY removed D0
- Dry conditions in Western Wyoming caused further degradation of conditions. NE dryness expanding.



# 14-Day Average Minimum Temperature (06 May to 19 May)

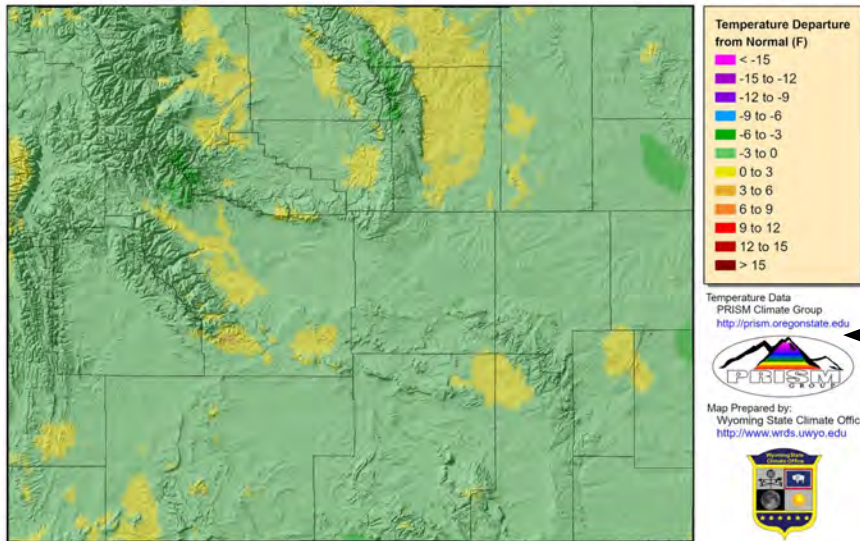
- Higher elev nighttime lows below 32F



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

14-Day Average Minimum Temperature (Departure from 1991-2020 Average) for 06 May 2021 to 19 May 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>  
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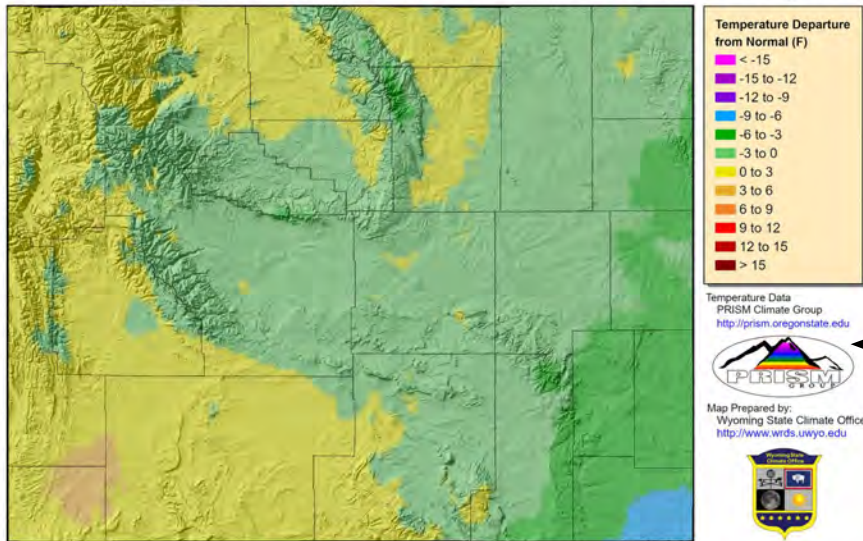
# 14-Day *Departure from Normal* Average Minimum Temperature

- Mostly 0-3F below average
- Spotty areas up to 3F above average

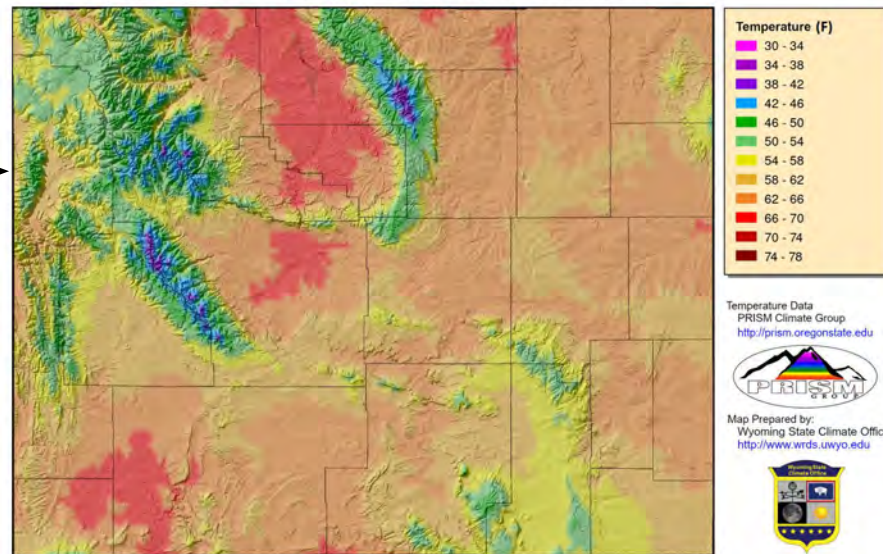
# 14-Day Average **Maximum** Temperature (06 May to 19 May)

- Daytime highs well above freezing

14-Day Average Maximum Temperature (Departure from 1991-2020 Average) for 06 May 2021 to 19 May 2021



14-Day Average Maximum Temperature for 06 May 2021 to 19 May 2021



Daily Temperature data from PRISM Climate Group, Copyright ©2021, PRISM Climate Group, Oregon State University, <http://prism.oregonstate.edu>  
Map Created 20 May 2021 <http://www.wrds.uwyo.edu>  
Temperature averages created from PRISM daily temperature grids

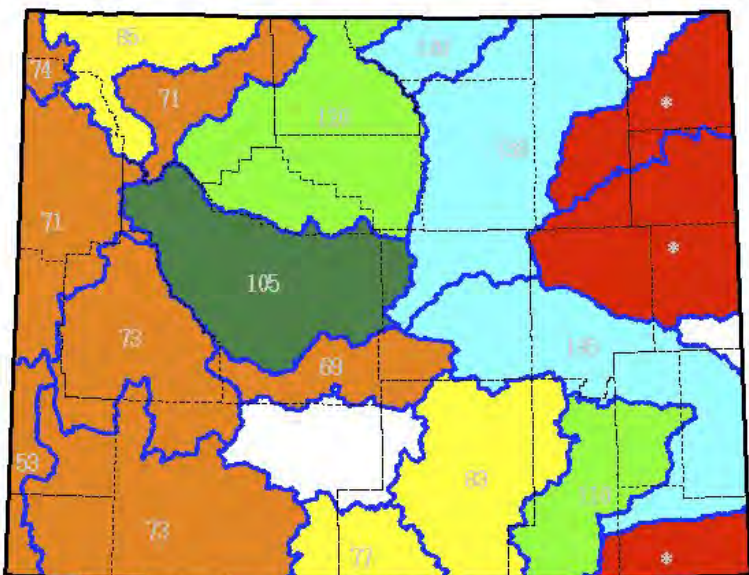
# 14- Day *Departure from Normal* Average **Maximum** Temperature

- Southeast 3-9F below average
- Far west, southwest, lower elev north-central 3F above average

# Basin Snow Water Equivalent (SWE) Percent of Median

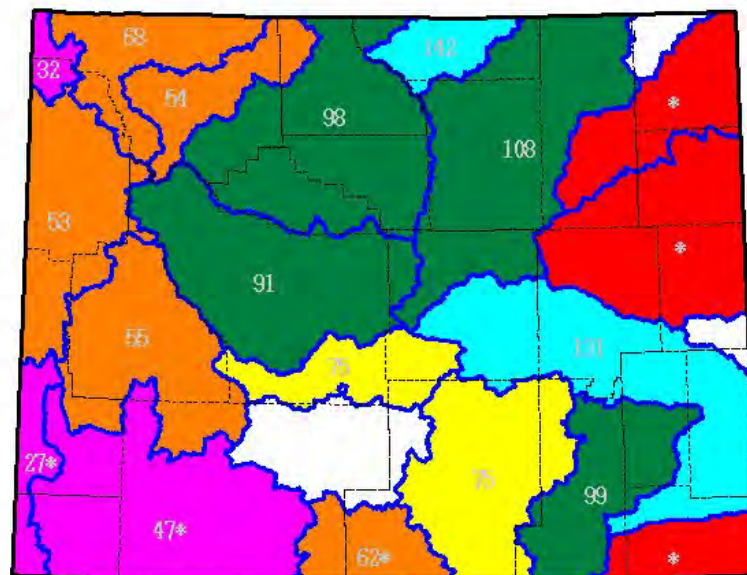
## 2 Weeks Ago (06 May 2021)

SWE % of Median as of Thursday, 06 May 2021



## Today (20 May 2021)

SWE % of Median as of Thursday, 20 May 2021



Produced by the Wyoming Water Resources Data System: <http://www.wrds.uwyo.edu>  
Data may not provide a valid measure of conditions.

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Data may not provide a valid measure of conditions.

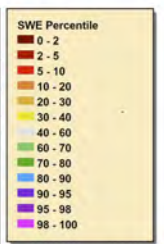
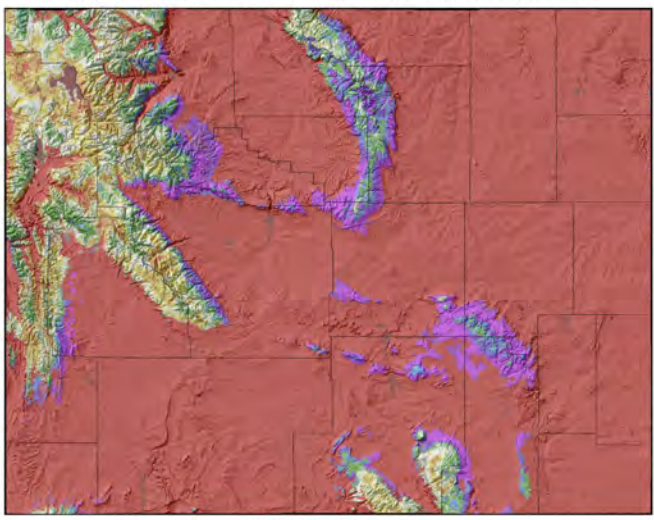
Some basins are melted out. Percentages at this point are not good indicators of conditions.

# Modeled Snow Water Equivalent (SWE)

## 2-Week Comparison

06 May 2021

Snow Water Equivalent Percentile for 06 May 2021 (2004-2021 Period)



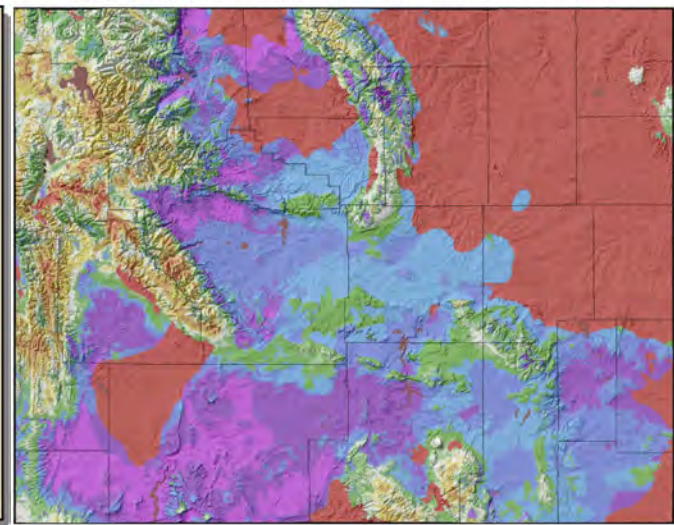
Snow Water Equivalent  
NOHRSC  
<https://doi.org/10.7265/NSTB14TC>

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

Modeled Snow Water Equivalent from National Operational Hydrologic Remote Sensing Center. 2004. Snow Data Assimilation System (SNODAS) Data Products at NSIDC, Version 1. Boulder, Colorado USA. NSIDC: National Snow and Ice Data Center.  
doi: <https://doi.org/10.7265/NSTB14TC>  
Daily Percentiles and Percents created by Wyoming State Climate Office  
Map Created 06 May 2021 - <http://www.wrds.uwyo.edu>

15 Apr 2021

Snow Water Equivalent Percentile for 15 Apr 2021 (2004-2021 Period)



Snow Water Equivalent  
NOHRSC  
<https://doi.org/10.7265/NSTB14TC>

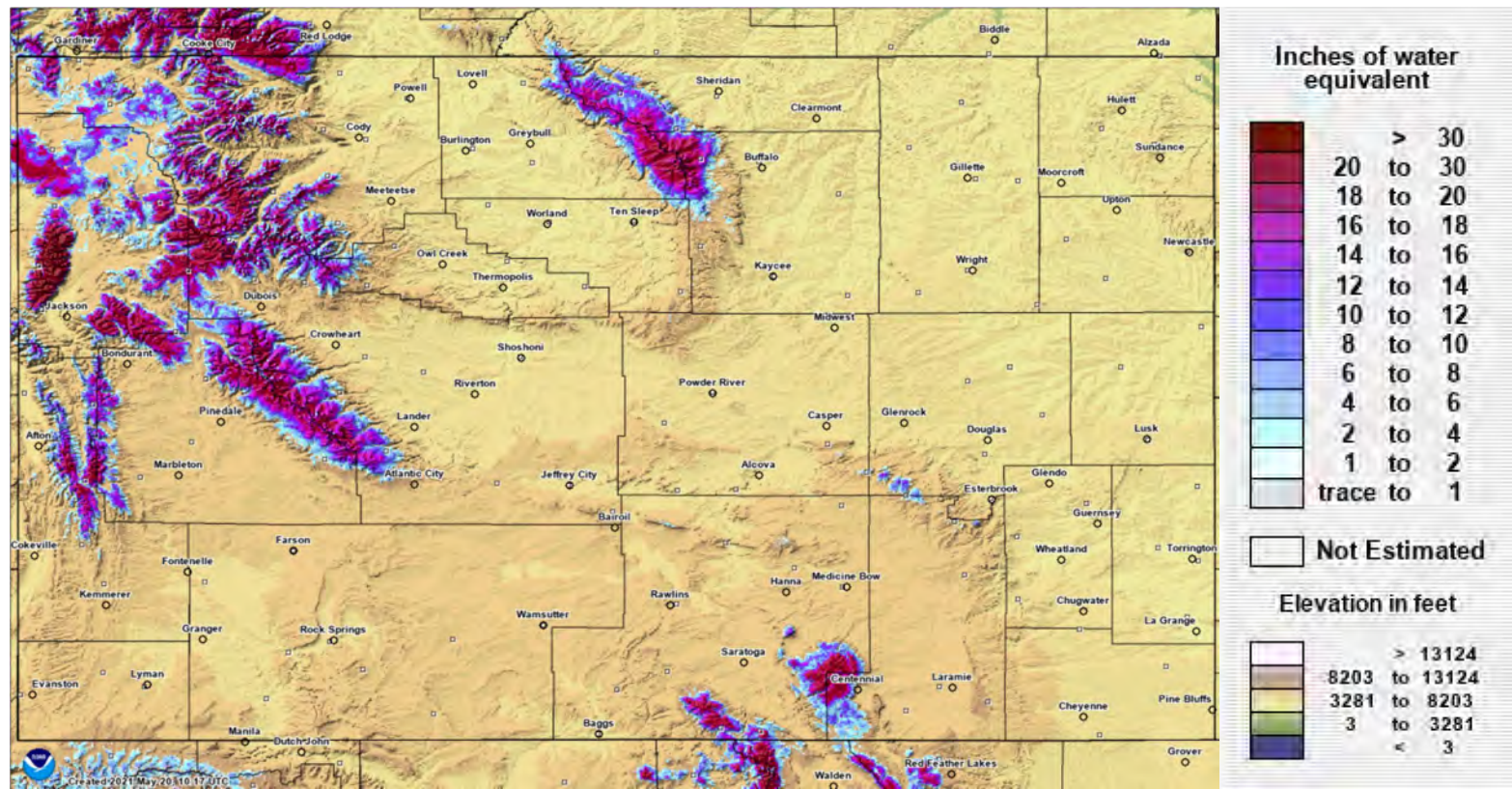
Map Prepared by:  
Wyoming State Climate Office  
<http://www.wrds.uwyo.edu>

Modeled Snow Water Equivalent from National Operational Hydrologic Remote Sensing Center. 2004. Snow Data Assimilation System (SNODAS) Data Products at NSIDC, Version 1. Boulder, Colorado USA. NSIDC: National Snow and Ice Data Center.  
doi: <https://doi.org/10.7265/NSTB14TC>  
Daily Percentiles and Percents created by Wyoming State Climate Office  
Map Created 15 Apr 2021 - <http://www.wrds.uwyo.edu>

Storms of the last two days have improved lower elevation snow levels in central and southern Wyoming.

# Modeled Snow Water Equivalent (SWE)

20 May 2021



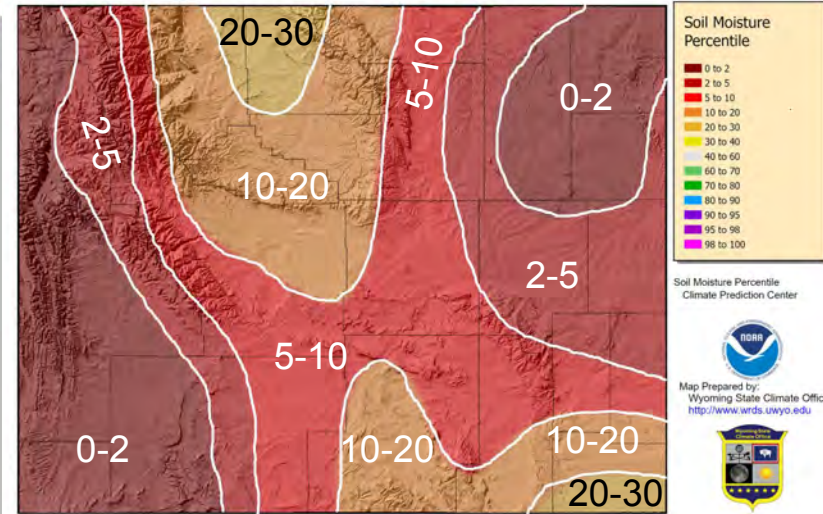
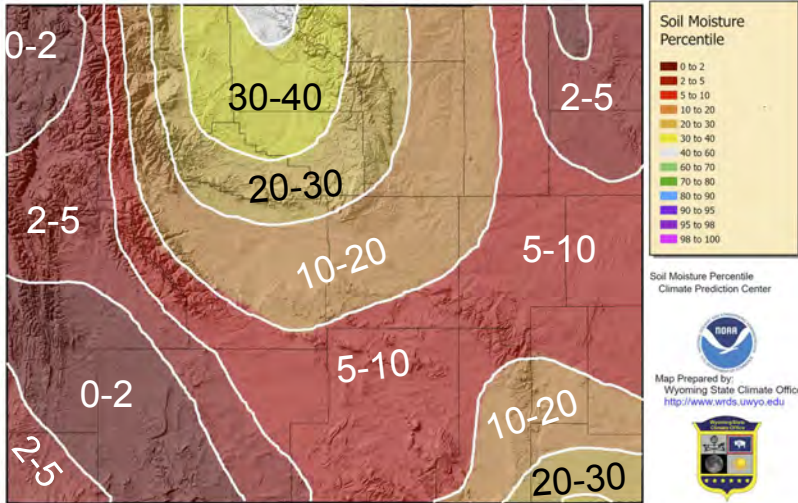
# Soil Moisture Percentile

Two Weeks Ago  
05 May 2021

19 May 2021

Soil Moisture Percentile for 05 May 2021

Soil Moisture Percentile for 19 May 2021



Modeled Soil Moisture Percentile [https://www.cpc.ncep.noaa.gov/products/GIS/GIS\\_DATA/USDM\\_Products/soil/soil\\_percentile.php](https://www.cpc.ncep.noaa.gov/products/GIS/GIS_DATA/USDM_Products/soil/soil_percentile.php)  
Map Created 06 May 2021 <http://www.wrds.uwyo.edu>

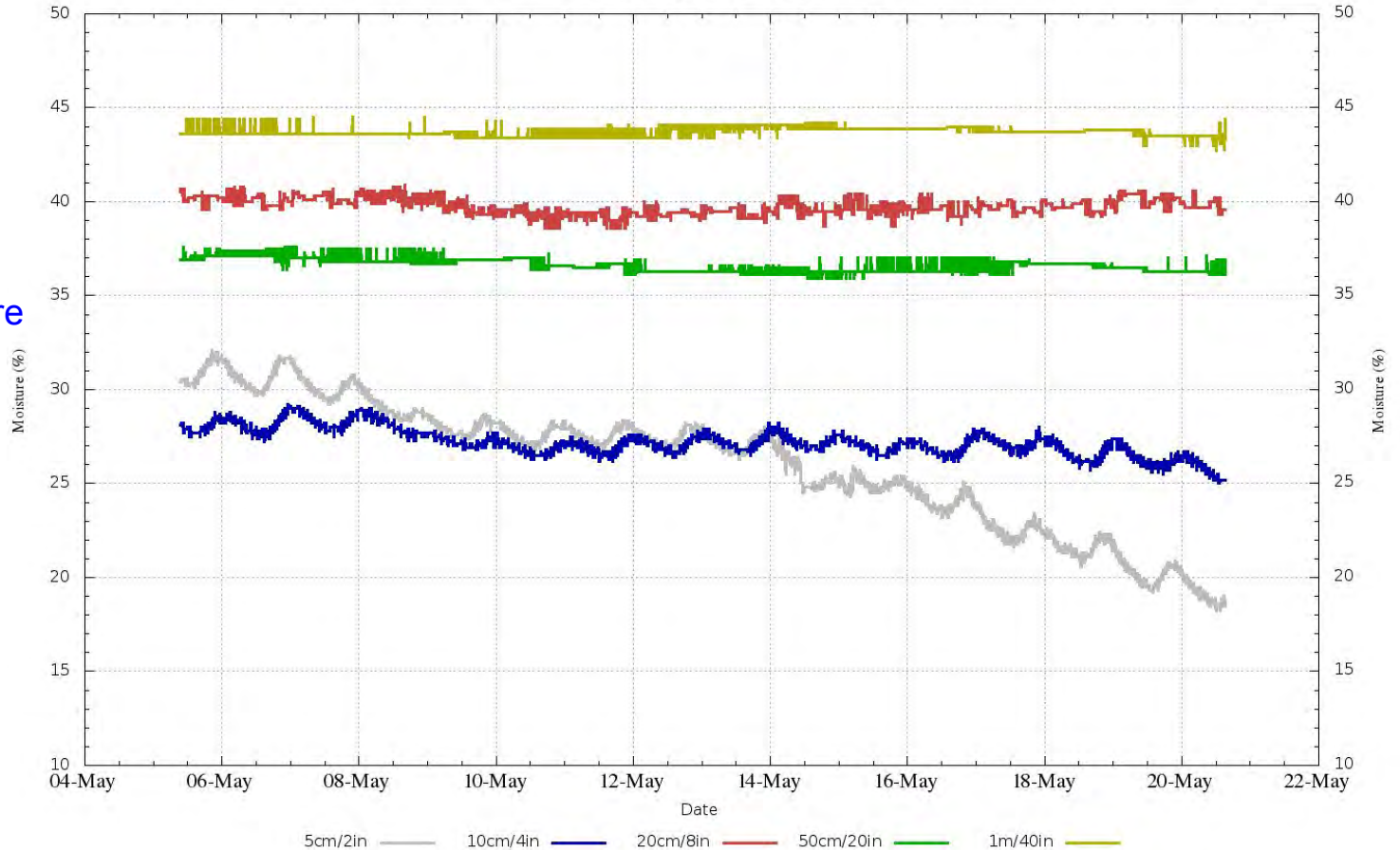
Modeled Soil Moisture Percentile [https://www.cpc.ncep.noaa.gov/products/GIS/GIS\\_DATA/USDM\\_Products/soil/soil\\_percentile.php](https://www.cpc.ncep.noaa.gov/products/GIS/GIS_DATA/USDM_Products/soil/soil_percentile.php)  
Map Created 20 May 2021 <http://www.wrds.uwyo.edu>

Soil Moisture has remained the same or worsened in all places except a bit of improvement in central Carbon County



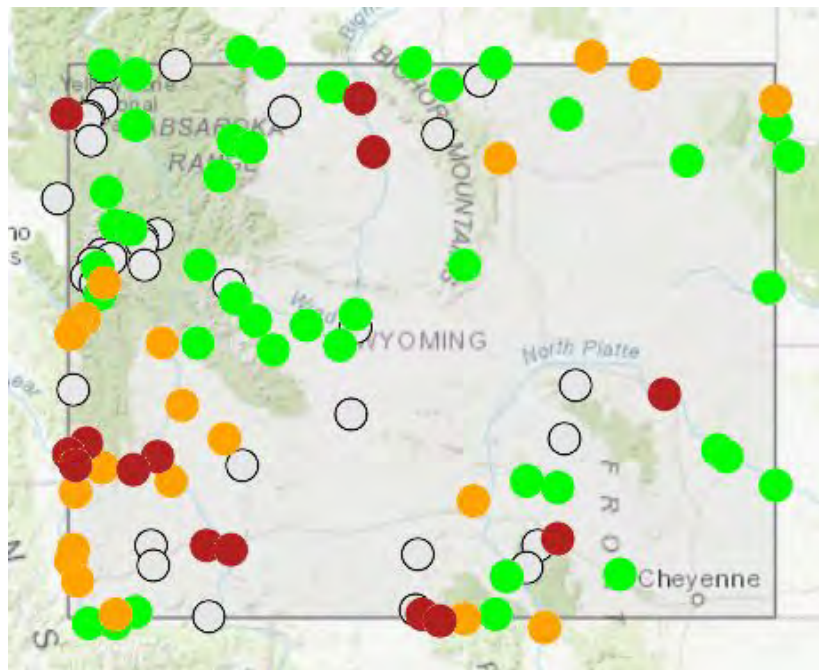
# Soil Moisture at Sheridan Mesonet Station

Sheridan - 2021-05-20 15:20:00











Slowly losing moisture at shallow (2"-4") depths

Current (7-day average) streamflow compared to historical streamflow for this time of year

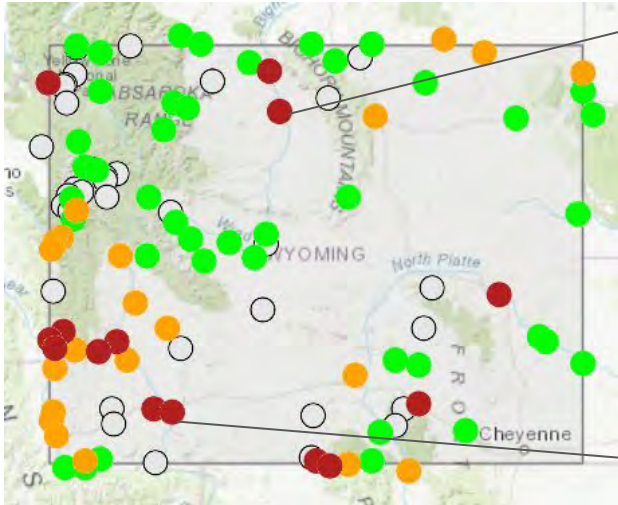


- White dots are higher elevation sites still in ice.
- Flows generally normal to below normal.
- Above normal conditions observed last month are gone.
- Green, Bear, North Platte, Powder and Bighorn Basins are below normal.

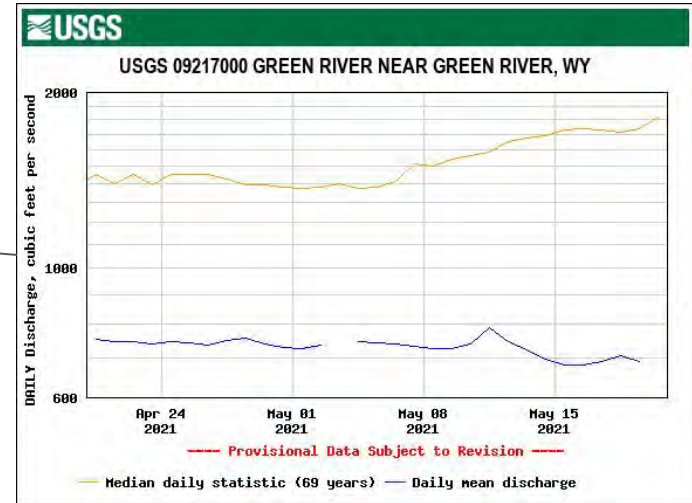
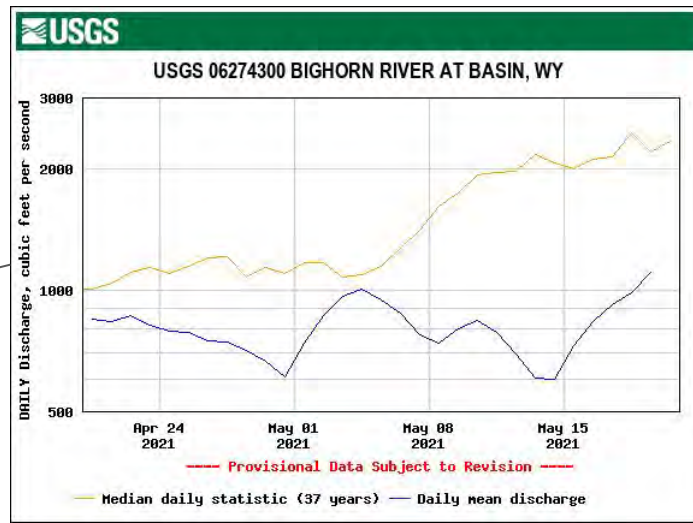
Explanation - Percentile classes							
							
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked

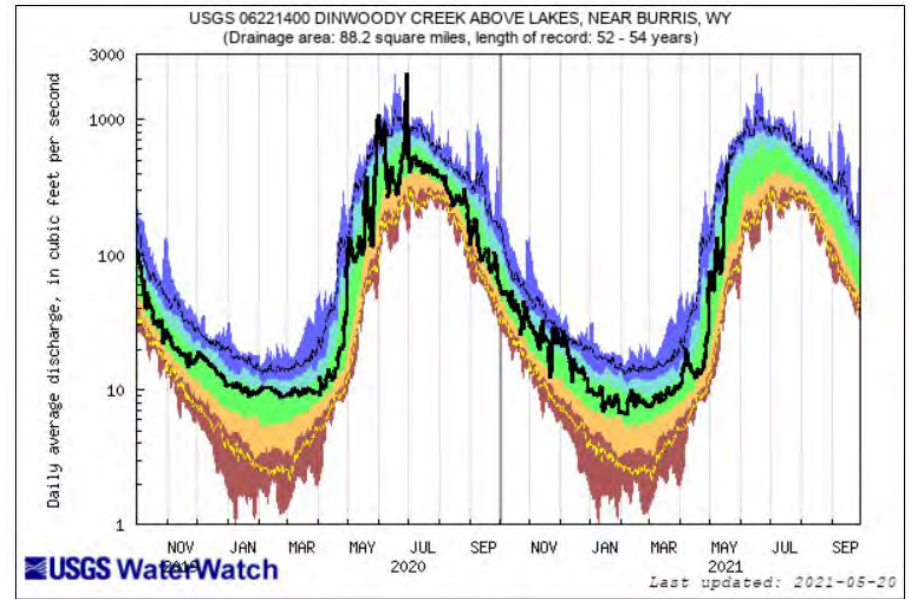
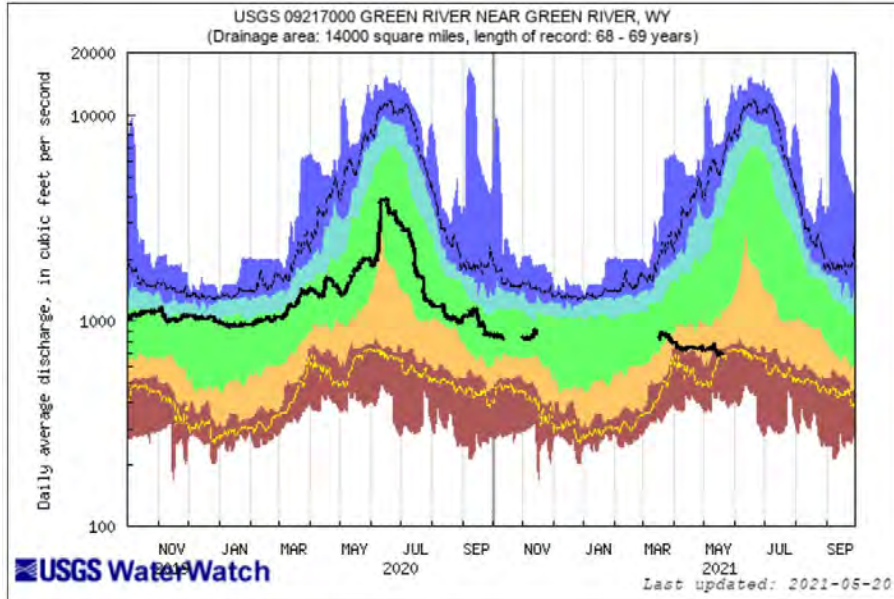


## A closer look at select dry areas



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



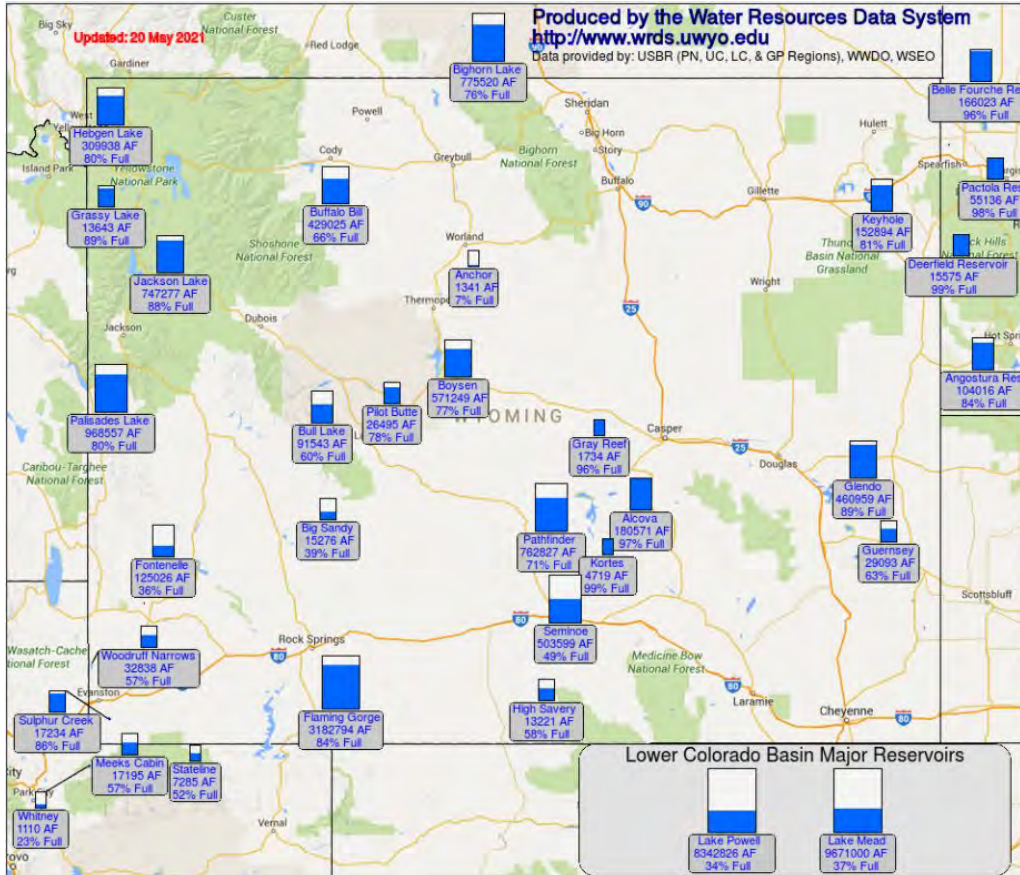


- Most streams at, to significantly below, normal.
- A few higher-elevation streams at higher end of “normal”.

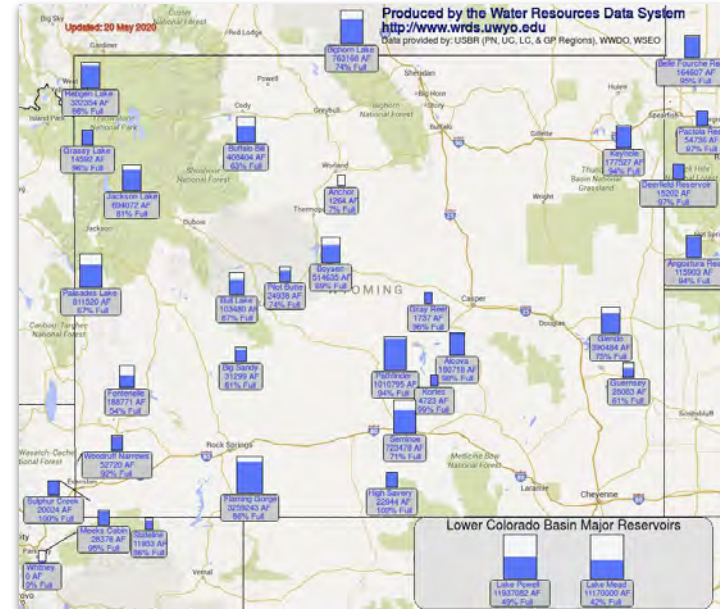
Explanation - Percentile classes						Flow
lowest-10th percentile	5	10-24	25-75	76-90	95 90th percentile-highest	
Much below Normal		Below normal	Normal	Above normal	Much above normal	

# Reservoir Storage (5/20/21)

- Overall, small gains in some, small losses in others from last month. Statewide similar volume.
- Statewide storage volumes slightly lower than 1 year ago.



**2020**



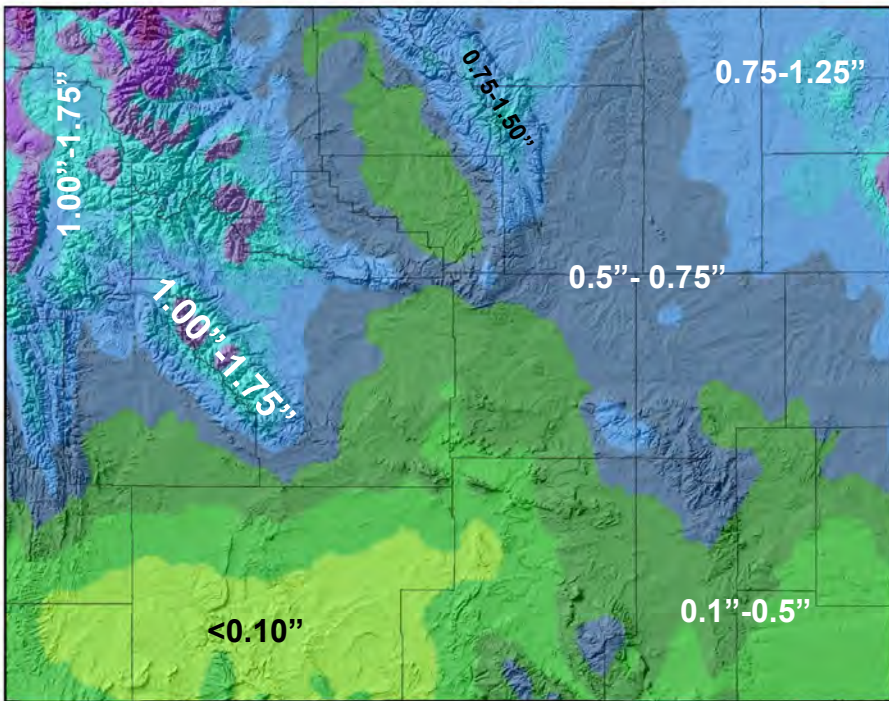


# Forecasts & Outlooks

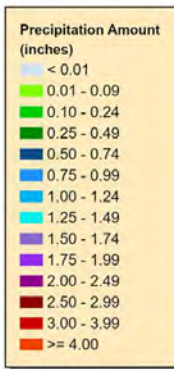


# 7-Day Quantitative Precipitation Forecast May 20 - 26

7-Day Quantitative Precipitation Forecast 20 May 2021



Provisional data, subject to revision



Forecast:  
Weather Prediction Center



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



- Quantitative Precipitation Forecast = Liquid Precipitation Forecast
- Scattered rain showers & thunderstorms lower elevations over next week
- Rain/snow mix above 8000ft with Snow above 9000ft and perhaps lower in NW WY this weekend.

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 20 May 2021 <http://www.wrds.uwyo.edu>

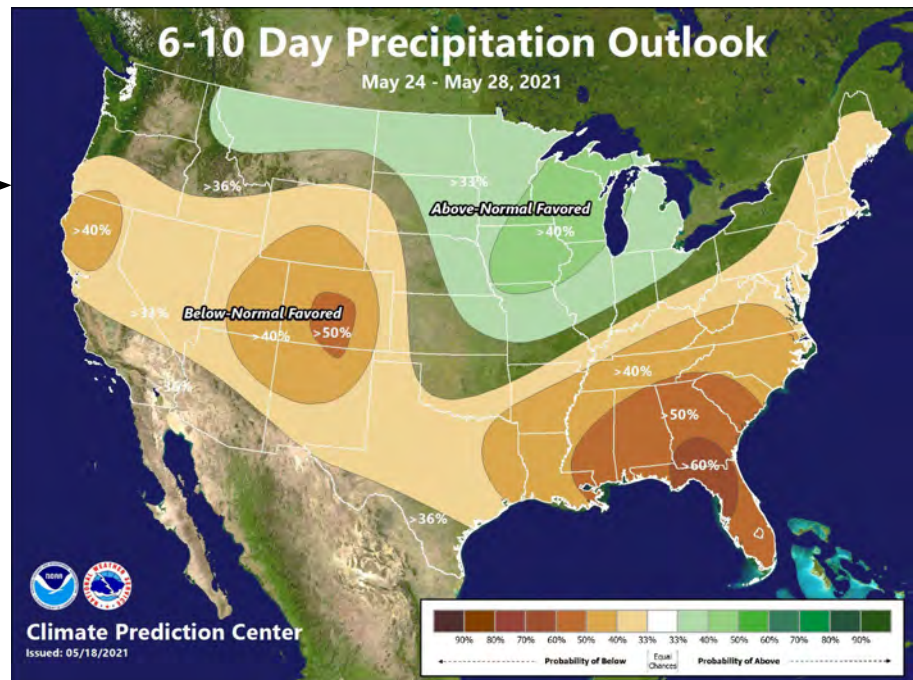
<https://bit.ly/3bZXQeN>



# 6-10 Day Precipitation Outlook

May 24 - 28

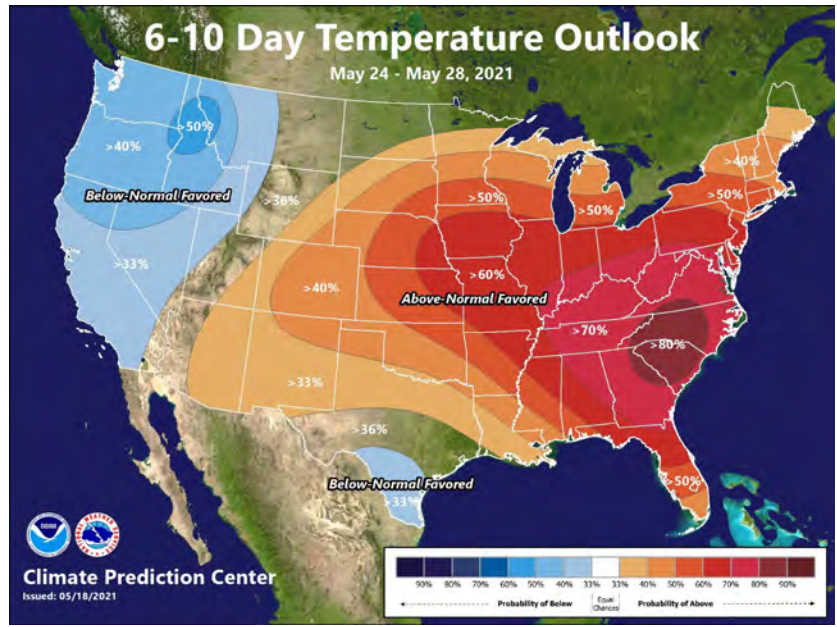
- Probability = Chance
- Below normal chances of precipitation favored



# 6 - 10 Day Temperatures

- Mix of below, equal chances, & above normal temperatures favored for Wyoming.

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

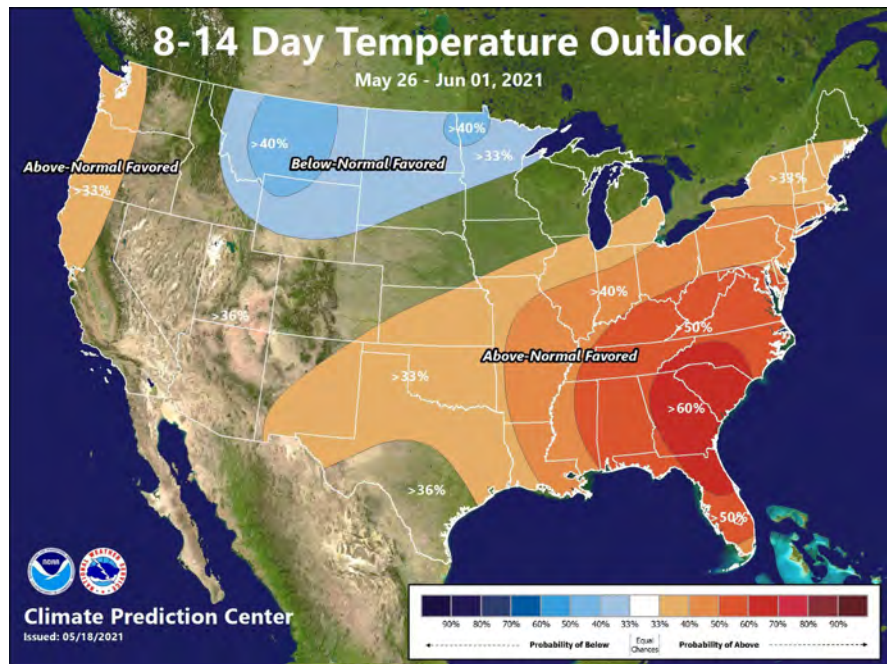
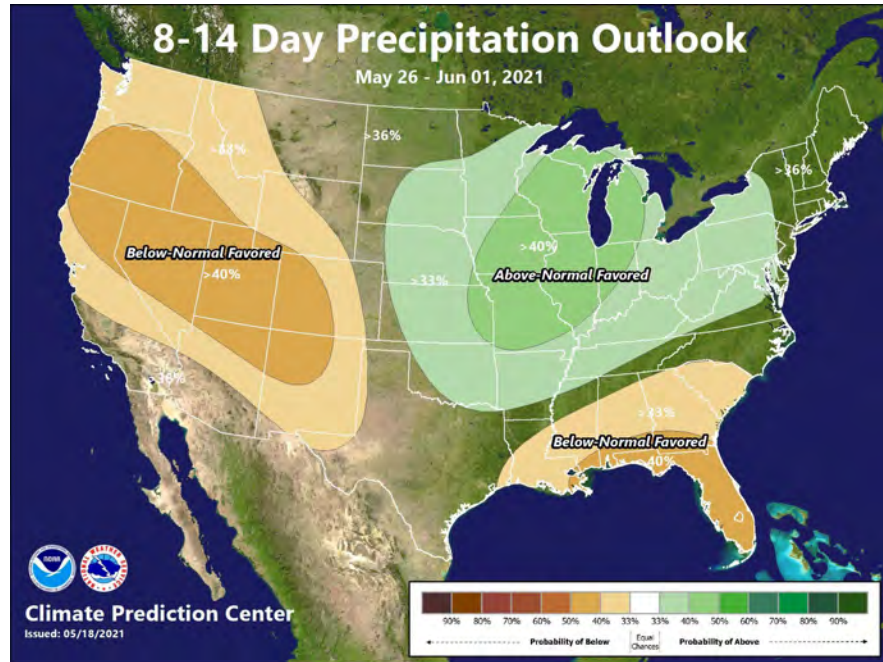




# 8-14 Day Precipitation Outlook

May 26 - June 1

- Probability = Chance
- Equal Chances to Slightly Below normal precipitation favored for WY.



## 8 - 14 Day Temperatures

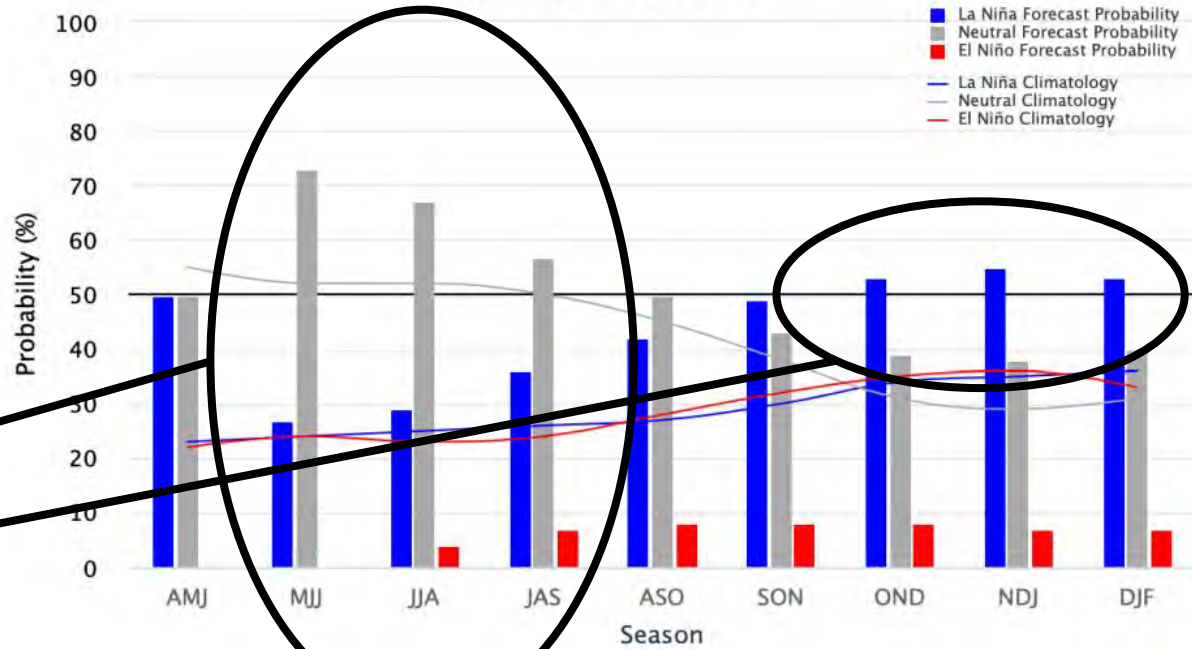
- Equal Chances to Below Normal temperatures favored for WY.



- Note: WY's weather is not as strongly connected to ENSO due to our distance from the ocean
- Coming out of La Nina to neutral = more precipitation possible?
- Slight indication of another La Nina next summer & fall = dry long-term?

Early-May 2021 CPC/IRI Official Probabilistic ENSO Forecasts

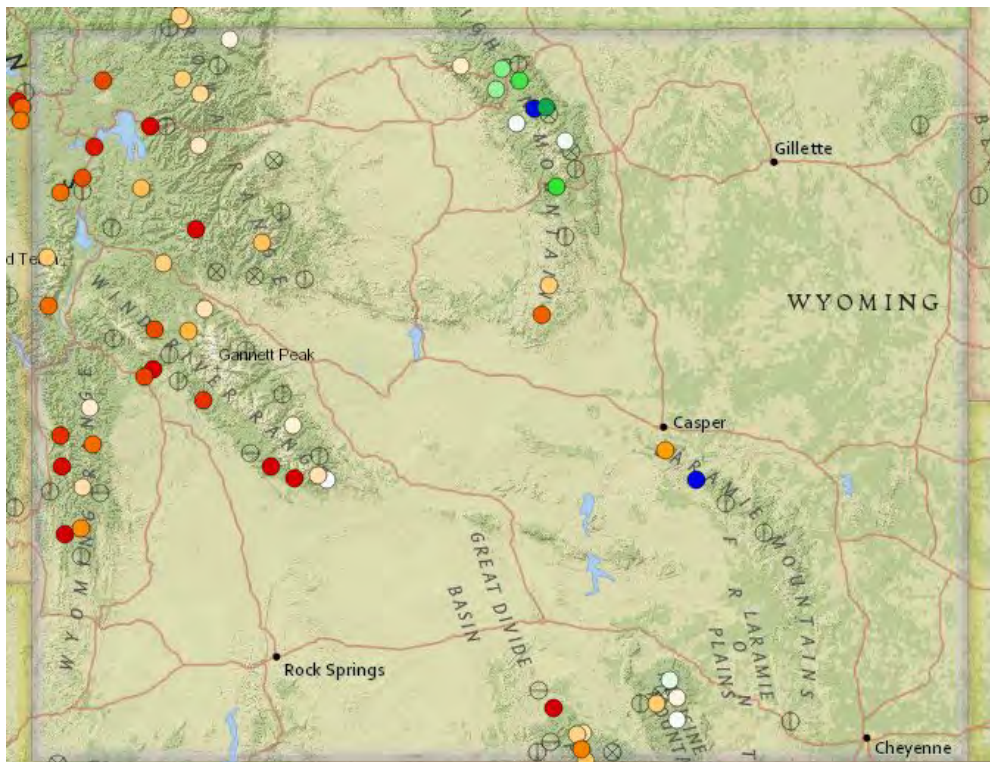
ENSO state based on NINO3.4 SST Anomaly  
Neutral ENSO: -0.5 °C to 0.5 °C







# Wyoming Snotel Snapshot Update

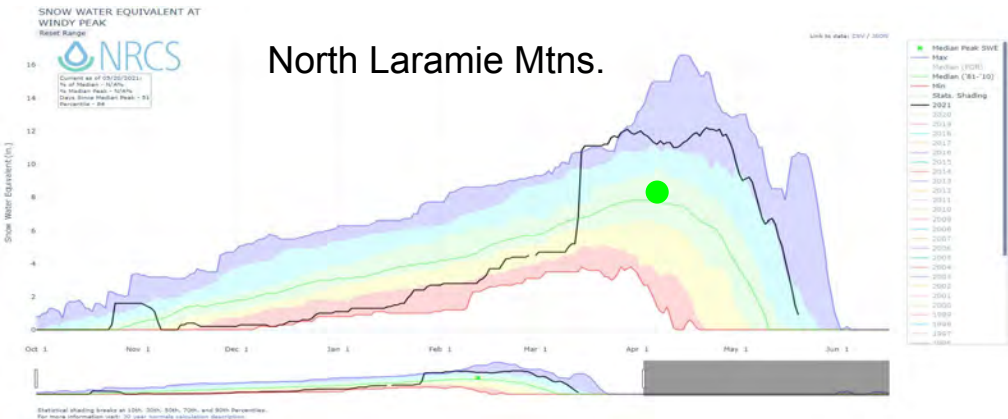


Snotel Sites - (Snow Telemetry) - are monitoring stations measuring snowpack, precipitation, temperature & other climate conditions.

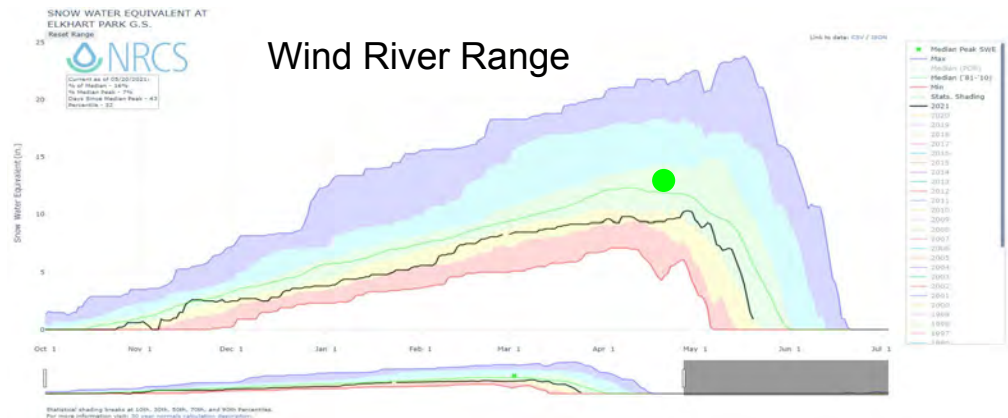
- Pockets of near to above normal in Big Horn Mountains and North Laramie Range.
- However, Wind River Range, Wyoming Range, and high terrain in NW Wyoming remain below to well below normal with majority of snow melted out ahead of schedule.



# Wyoming Snotel Snapshot Update



- Southeast Wyoming mountains were aided by the Blizzard in March but now majority of the snow in Laramie Mountain Range has melted out.
- Areas exceeded or reached average peak snow water equivalent values (green dot).



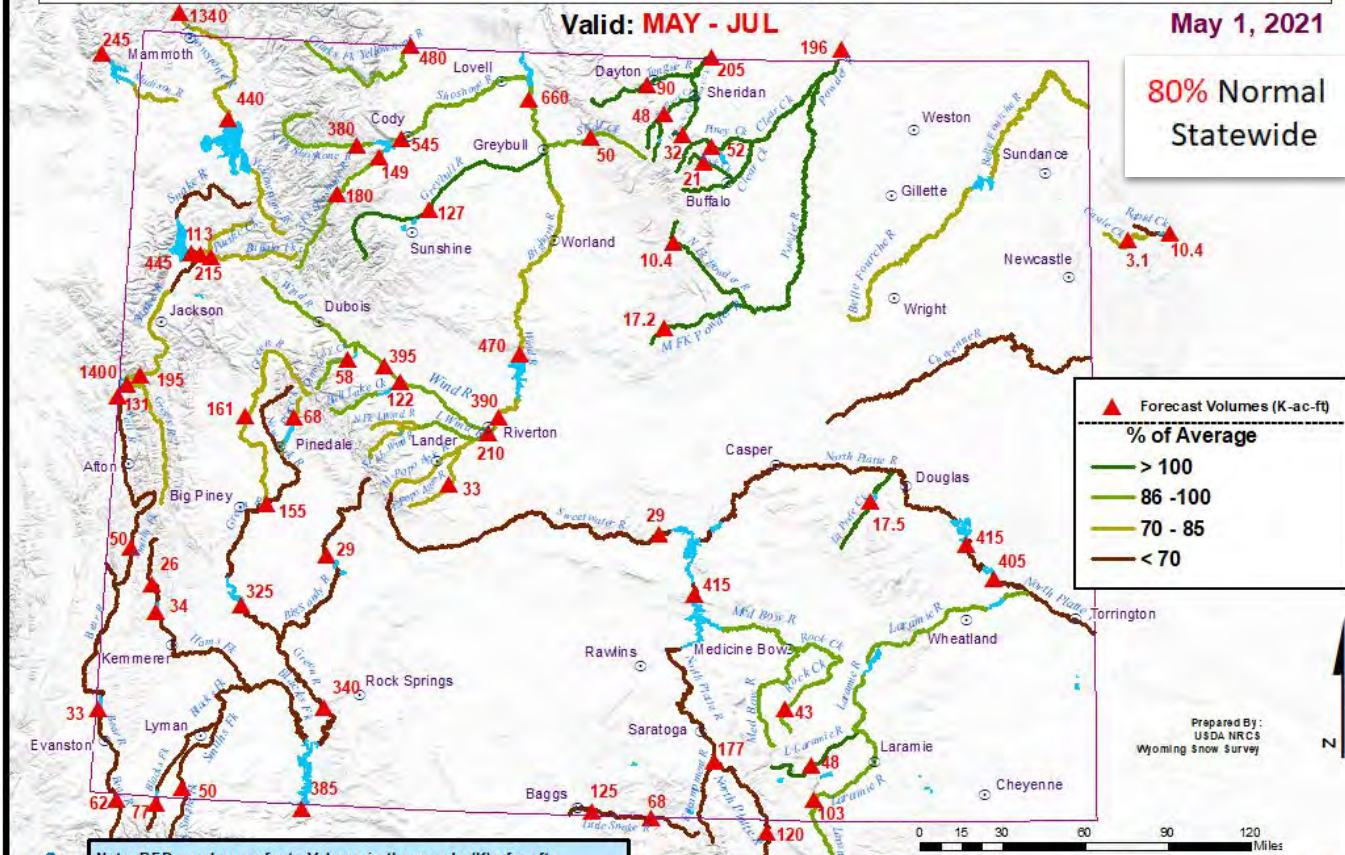
- Many sites in the Wind River Range have mostly melted out ahead of schedule and did not reach average peak snow water equivalent values (green dot).

# Wyoming Water Supply Outlook

Valid: MAY - JUL

May 1, 2021

80% Normal  
Statewide



▲ Forecast Volumes (K-ac-ft)

-----  
% of Average

- > 100
- 86 - 100
- 70 - 85
- < 70

Note: RED numbers refer to Volume in thousands (K) of ac-ft. One ac-ft is the volume necessary to cover 1 acre at a depth of 1 foot. 1 ac-ft is roughly equal to 326,000 gallons of water.

Forecasted volumes represent full natural flow and do not take into account diversions due to irrigation and other water management practices.

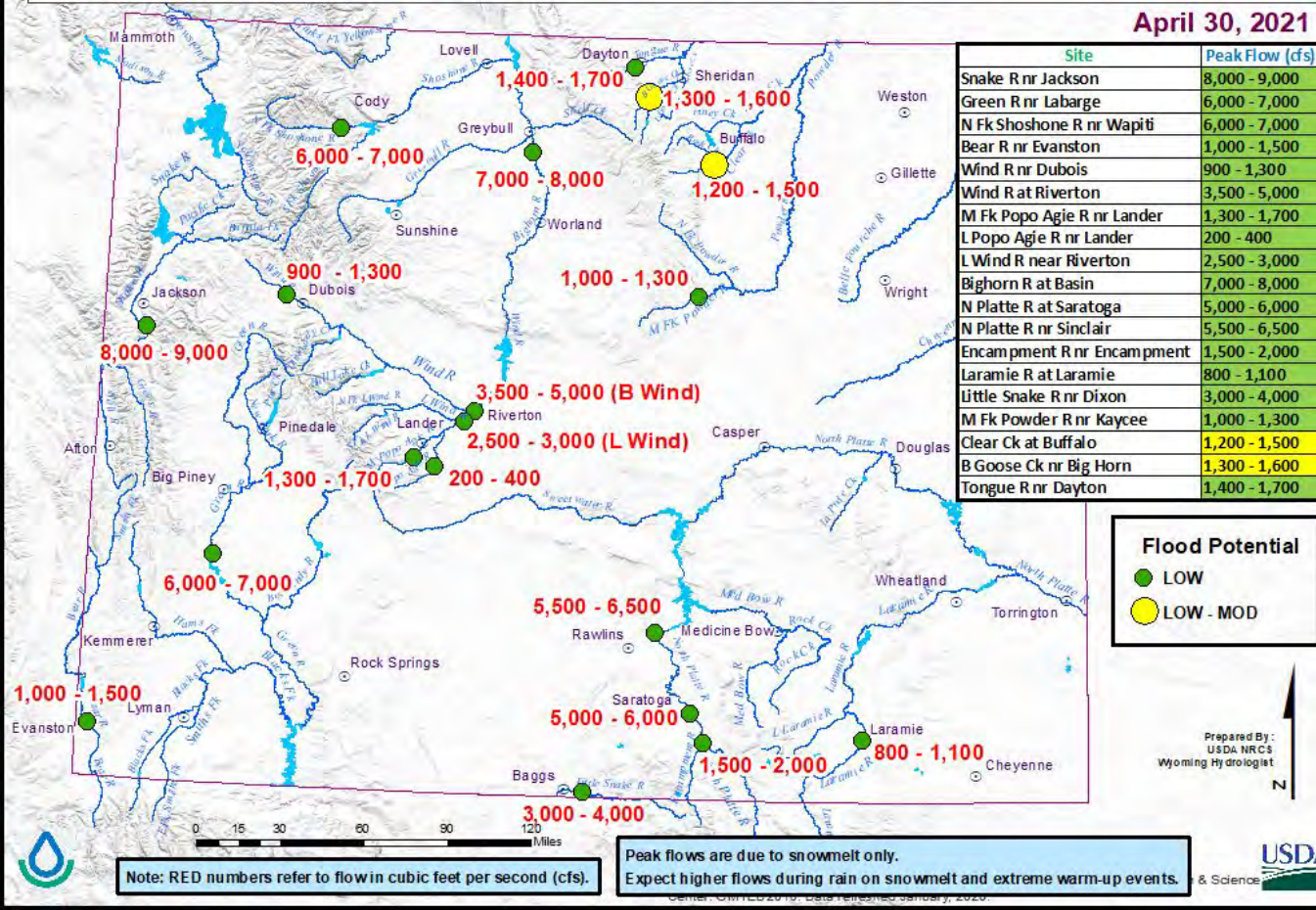
wcc.nrcs.usda.gov/snow/

Prepared By:  
USDA NRCS  
Wyoming Snow Survey

# Runoff 2021 Peak Flow Forecast

April 30, 2021

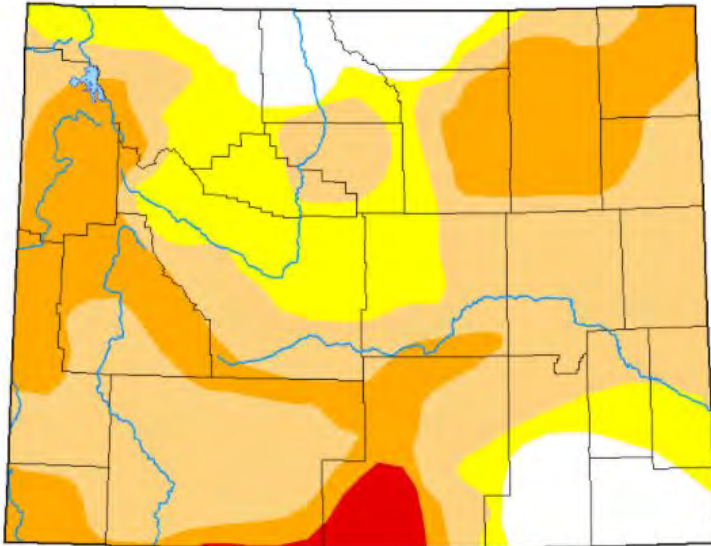
wcc.nrcs.usda.gov/snow/





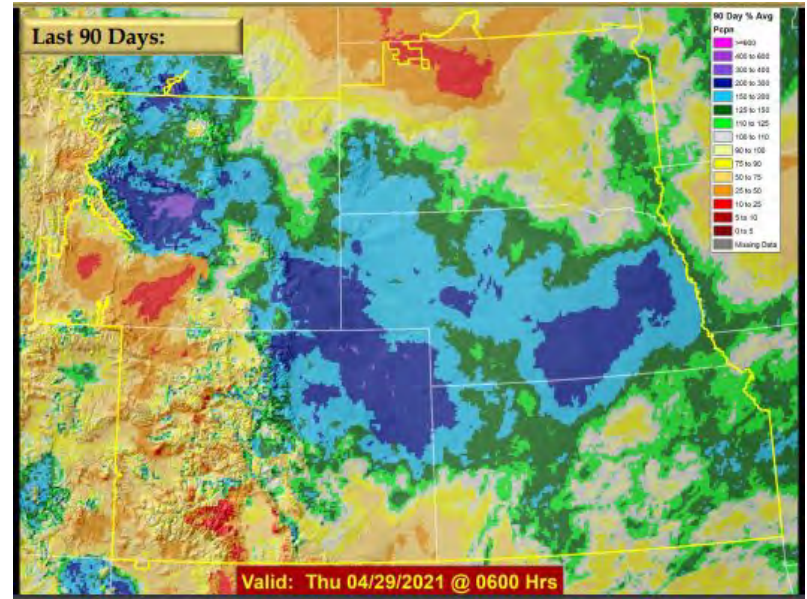
# Fuels Status: Green-up and Wildland Fire Outlook

U.S. Drought Monitor



<https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?WY>

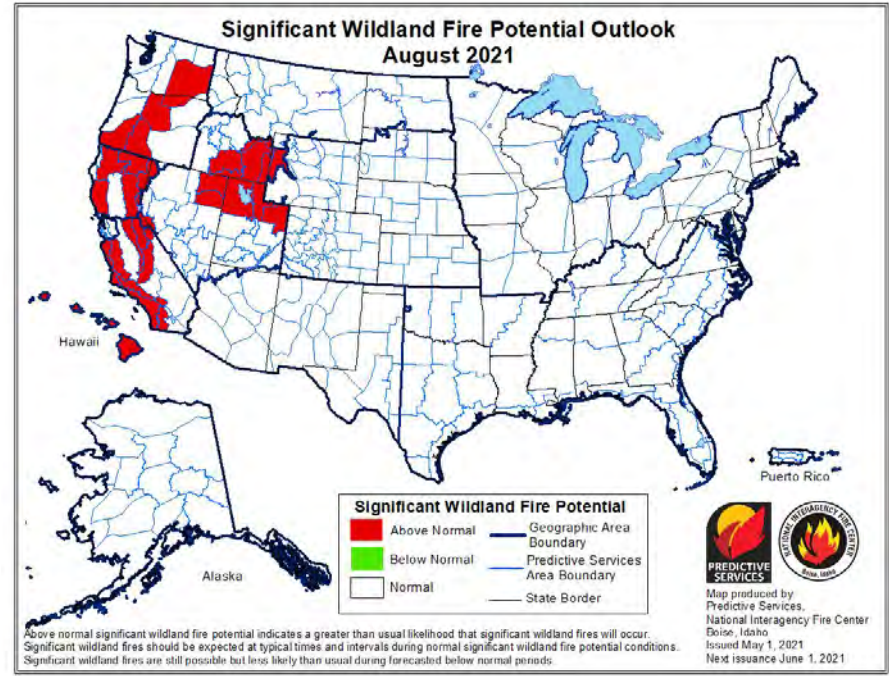
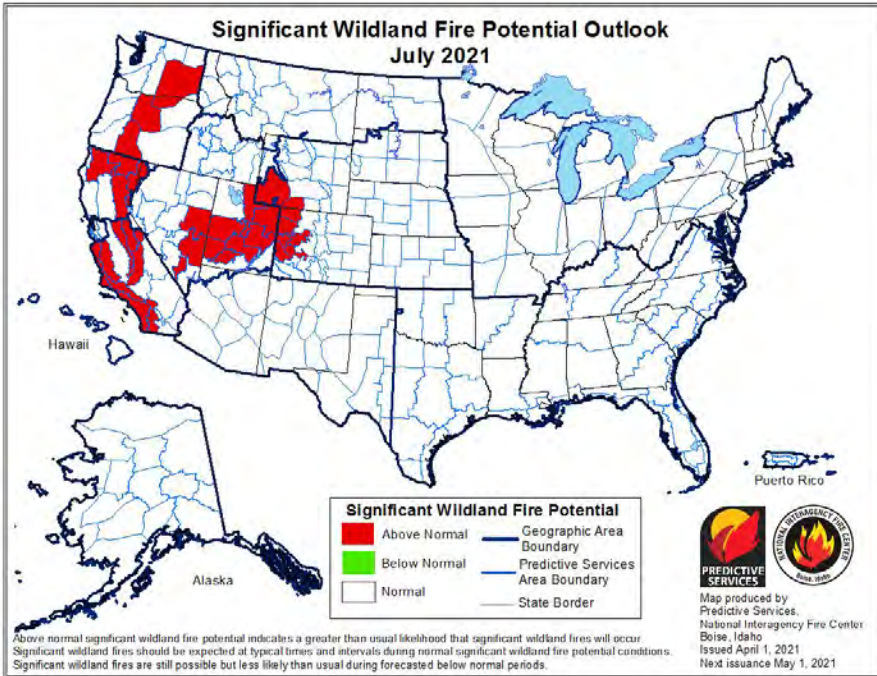
Long Term Percent of Normal Precipitation



[https://gacc.nifc.gov/rmcc/predictive/outlook/Seasonal\\_Outlook.pdf](https://gacc.nifc.gov/rmcc/predictive/outlook/Seasonal_Outlook.pdf)



# What's that mean for fire season?





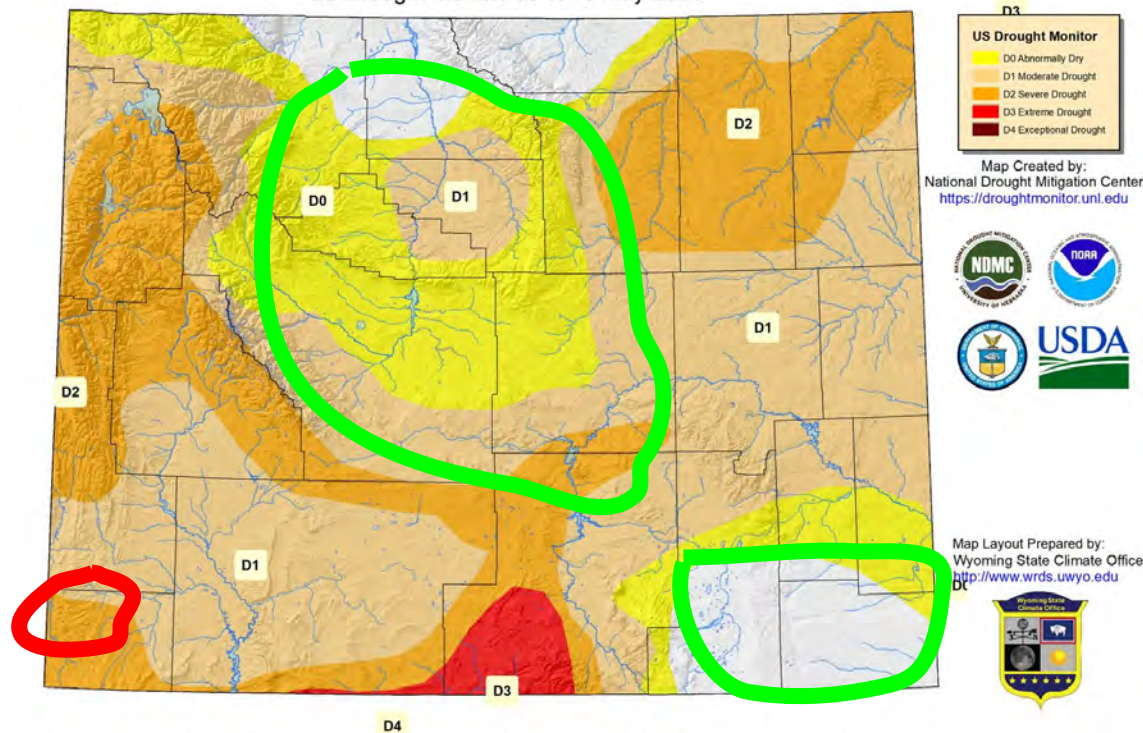
# How to get involved ...

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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>

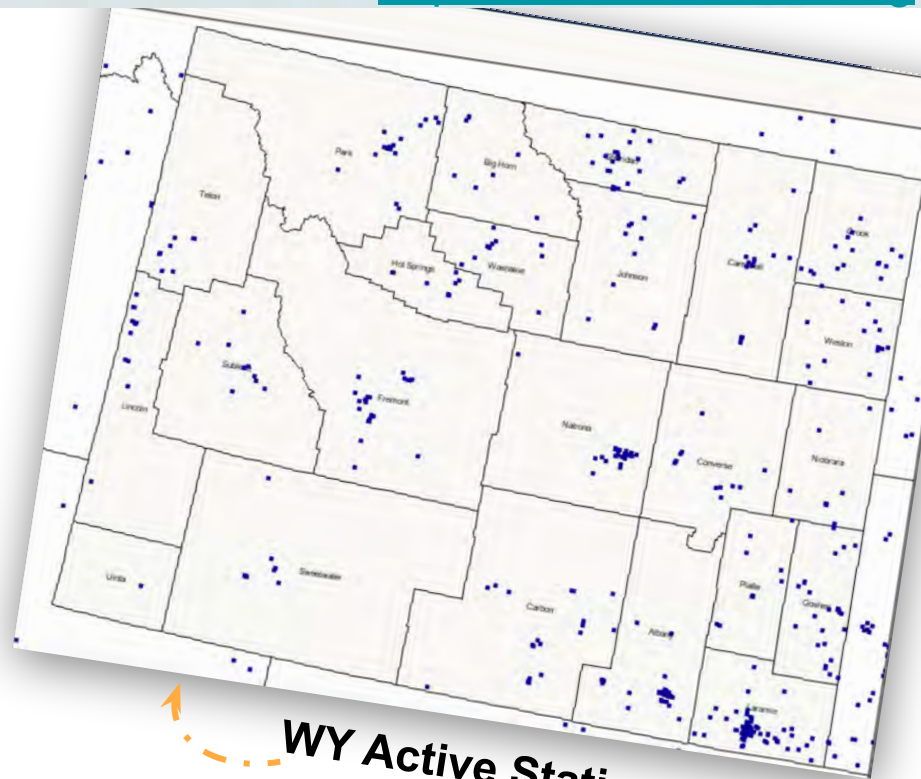
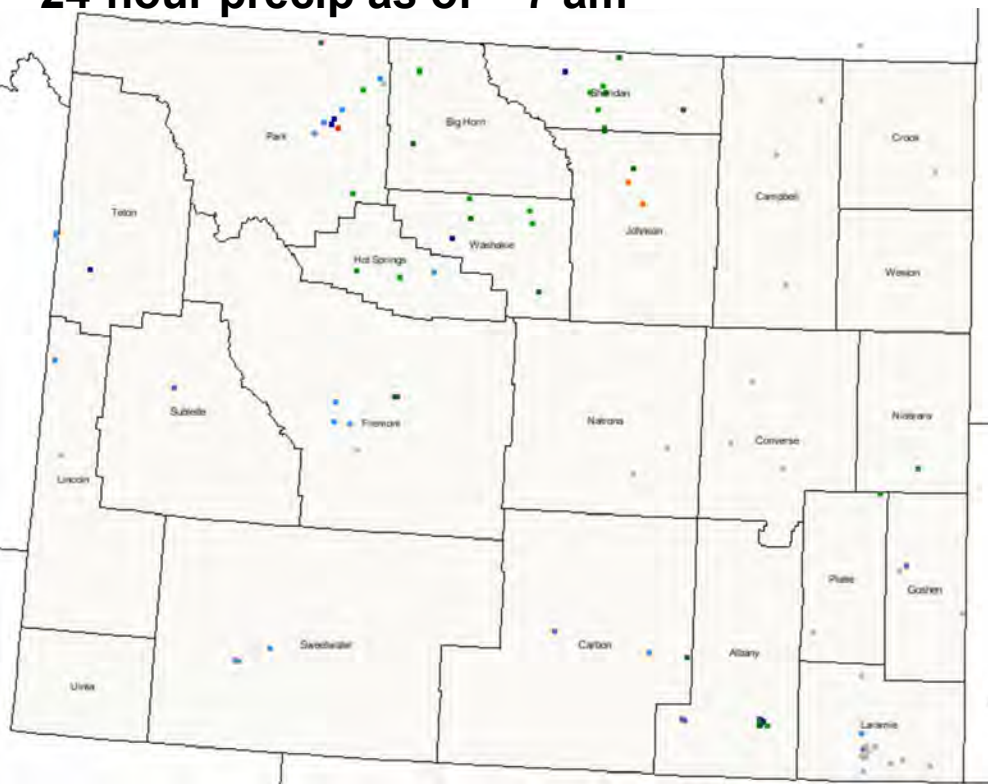




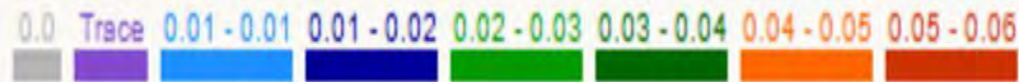
# CoCoRaHS Mapping System

<https://www.cocorahs.org>

**May 20, 2021:  
24-hour precip as of ~ 7 am**



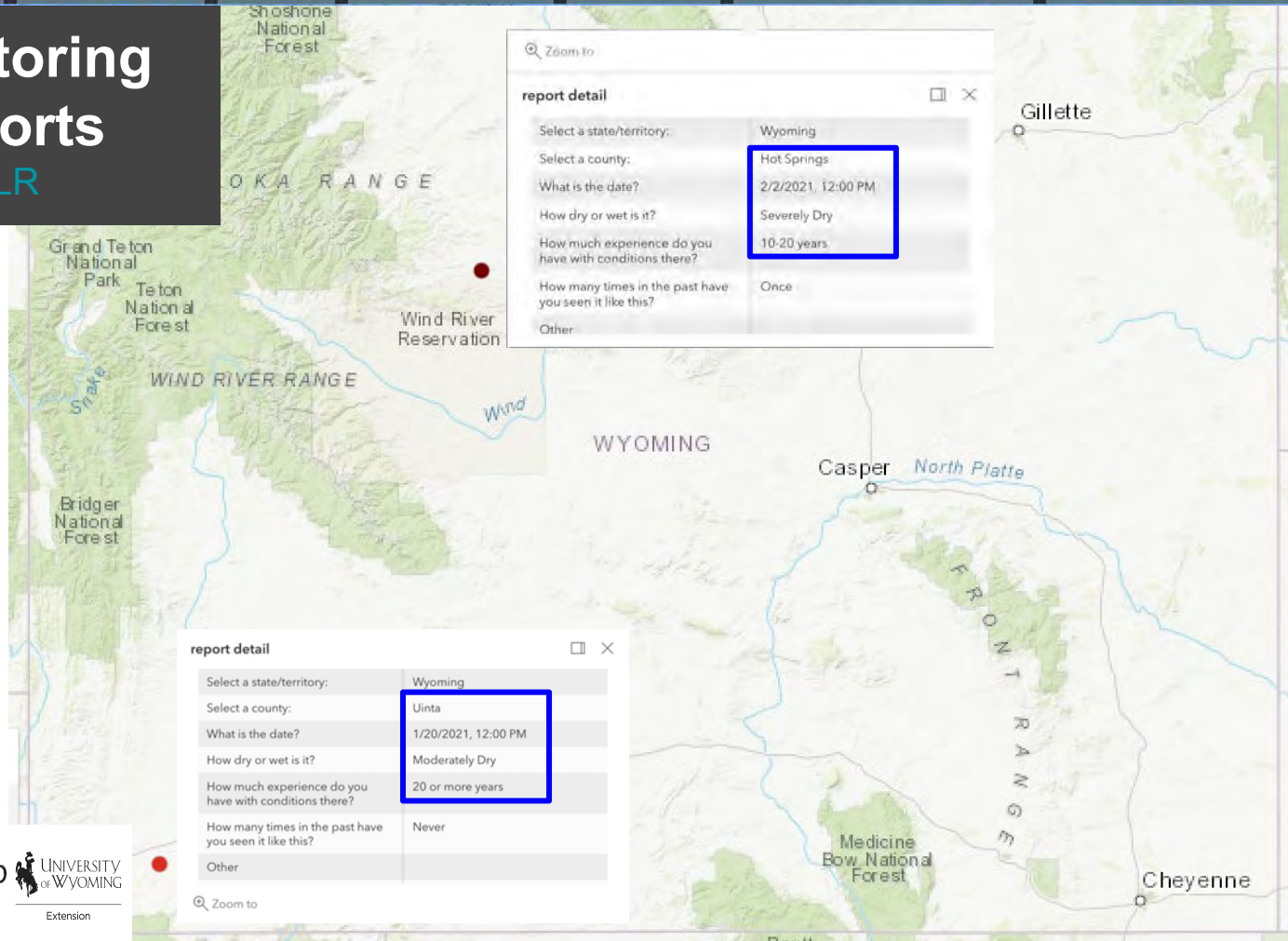
**WY Active Station Locations**



# Condition Monitoring Observer Reports

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

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



Zoom to

**report detail**

Select a state/territory:	Wyoming
Select a county:	Hot Springs
What is the date?	2/2/2021, 12:00 PM
How dry or wet is it?	Severely Dry
How much experience do you have with conditions there?	10-20 years
How many times in the past have you seen it like this?	Once
Other	

Zoom to

**report detail**

Select a state/territory:	Wyoming
Select a county:	Uinta
What is the date?	1/20/2021, 12:00 PM
How dry or wet is it?	Moderately Dry
How much experience do you have with conditions there?	20 or more years
How many times in the past have you seen it like this?	Never
Other	

Zoom to

# 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

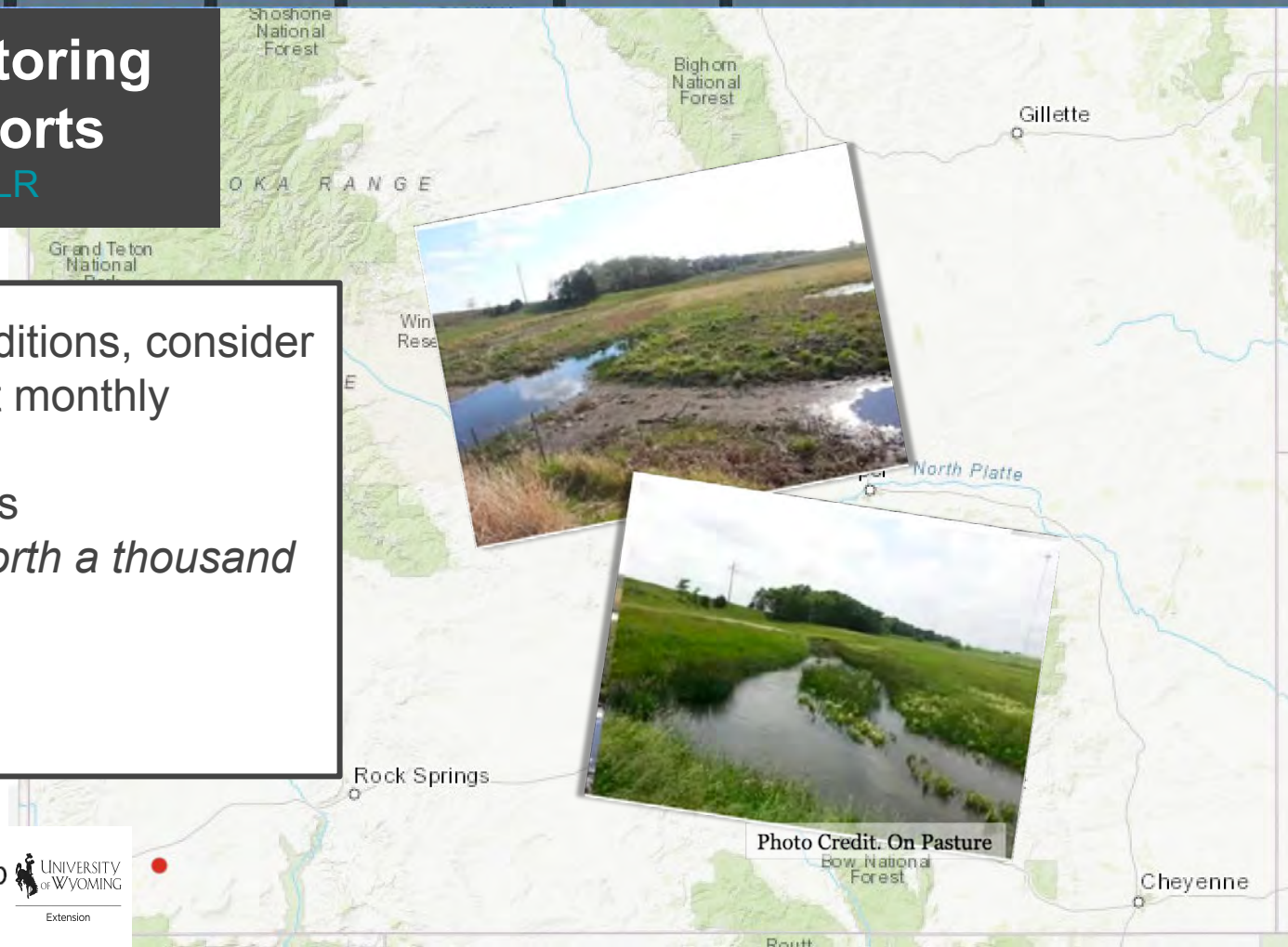


Photo Credit. On Pasture



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## **CoCoRaHS**

<https://www.cocorahs.org>

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## **Condition Monitoring Observer Reports (CMOR)**

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

# Thank you! Questions?