



WY Conditions & Outlooks:

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

January 20, 2022



Presentation Outline

- Current Conditions
- Outlooks
- How to Get Involved



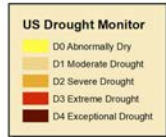
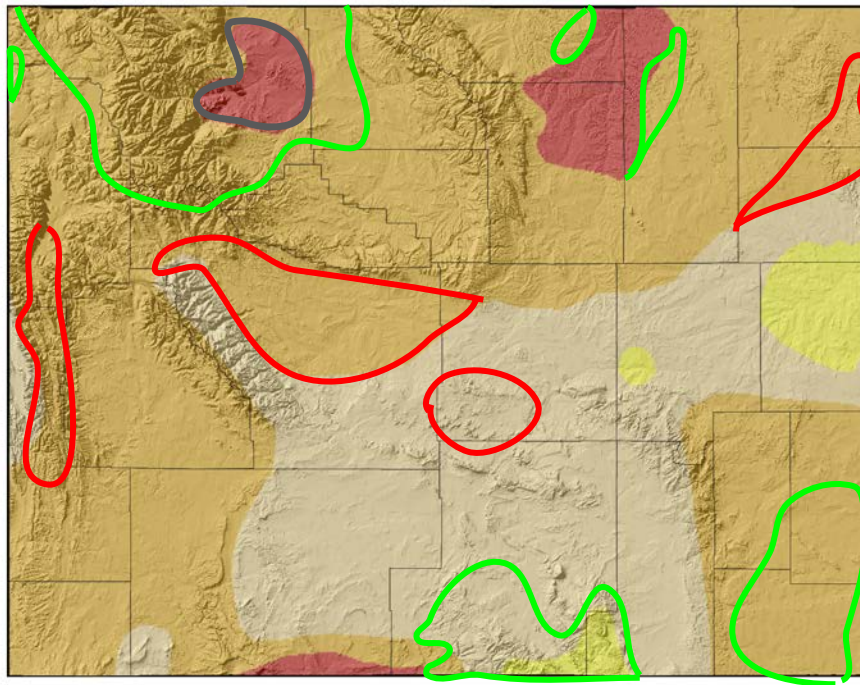
Current Conditions

US Drought Monitor for January 18, 2022

(Released Thursday, January 20, 2022)

Valid 8 a.m. EDT

US Drought Monitor for 18 Jan 2022



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

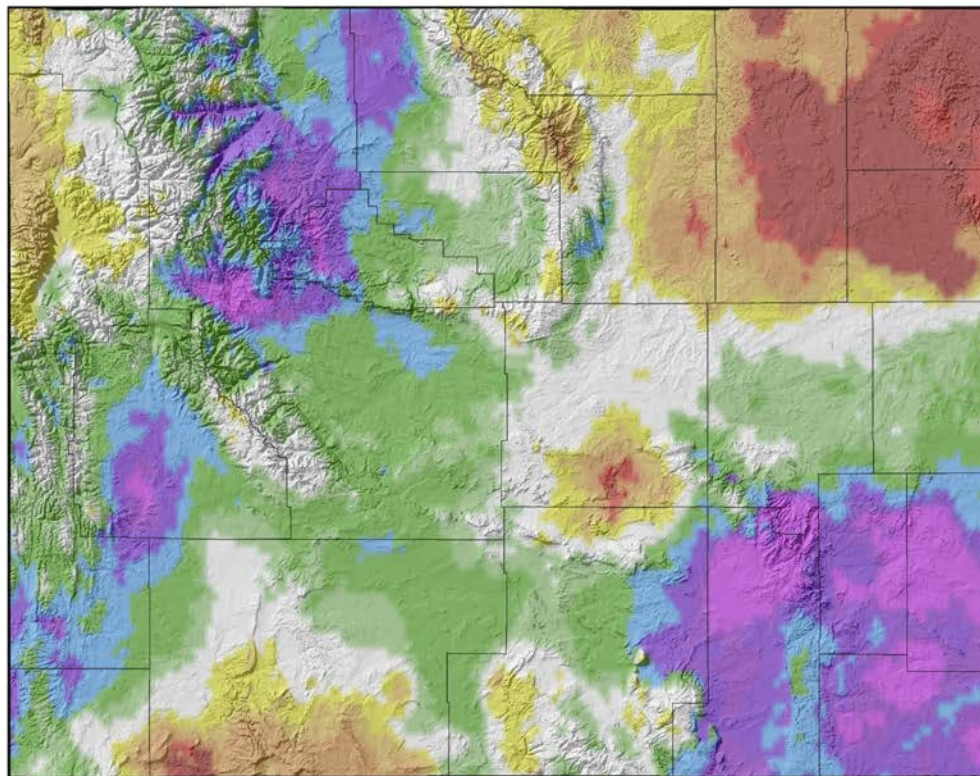
Improvements in the north-central and northwest as well as the southeast but also **degradations** in the far northeast and central/west-central parts of the state.

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>

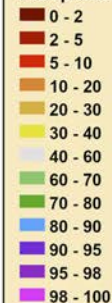
Map Layout Created 20 Jan 2022 <http://www.wrds.uwyo.edu>

14-Day Precipitation Percentile (06 Jan 2022 to 19 Jan 2022)

14-Day Precipitation (Percentile) for 06 Jan 2022 to 19 Jan 2022



Precipitation Percentile



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

Daily precipitation data from PRISM Climate Group, Copyright ©2021, PRISM Climate Group, Oregon State University, <http://prism.oregonstate.edu>
Map Created 20 Jan 2022 <http://www.wrds.uwyo.edu>
Daily percentiles created from PRISM daily precipitation grids

Above Median:

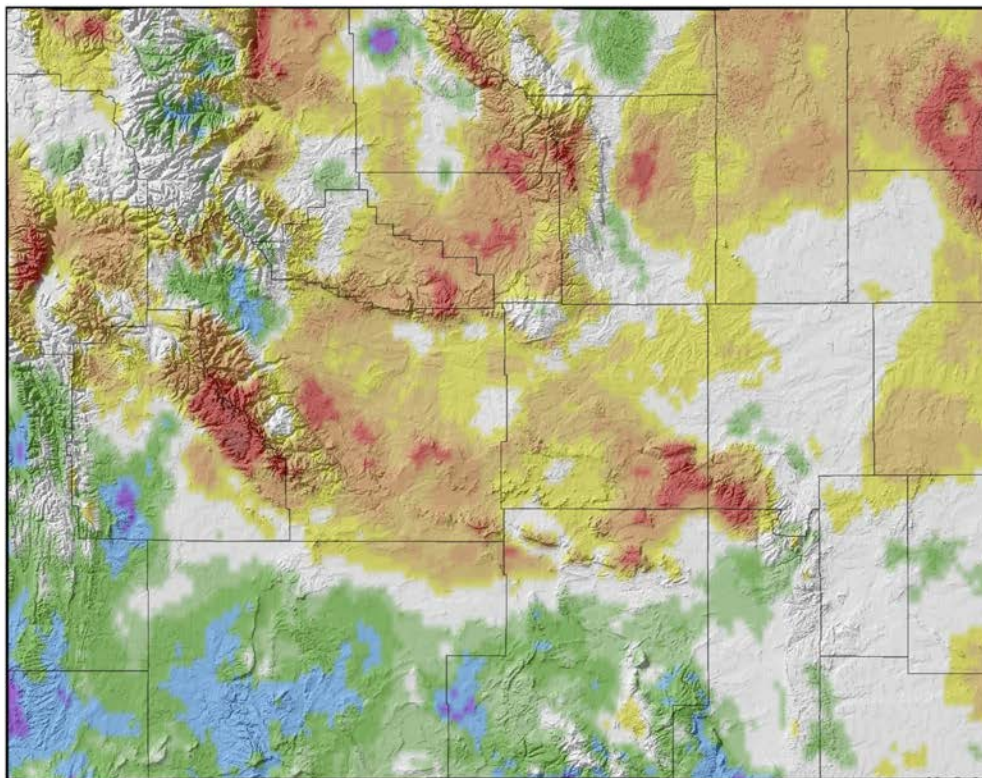
- Southeast
- Western Big Horn and Washakie
- Eastern Park
- Fremont
- Sublette/Lincoln/parts of Uinta
- Northern Sweetwater
- Parts of Carbon along with Albany, Laramie, Goshen, and Platte Counties

Below Median (Areas of Concern):

- Northeast
- Southern Sweetwater
- South-central Natrona

90-Day Precipitation Percentile (22 Oct 2021 to 19 Jan 2022)

90-Day Precipitation (Percentile) for 22 Oct 2021 to 19 Jan 2022



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:

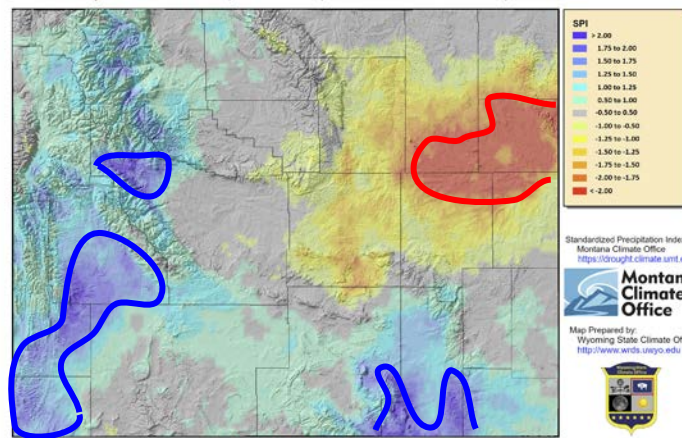
- Southwest and South-central
- Minor other areas

Below Median (Areas of Concern):

- Much of northern two-thirds WY

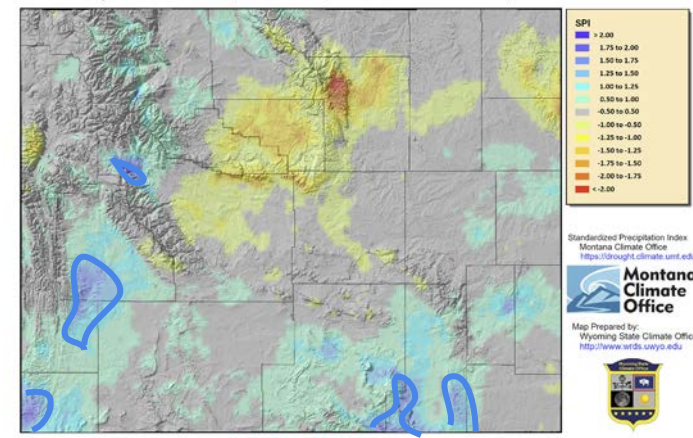
30-Day Standardized Precipitation Index (20 Dec 2021 to 18 Jan 2022)

30-Day
→



Provisional data, subject to revision
Standardized Precipitation Index Created by Montana Climate Office <https://drought.climate.umt.edu>
Map Created 20 Jan 2022 <http://www.wrds.uwyo.edu>

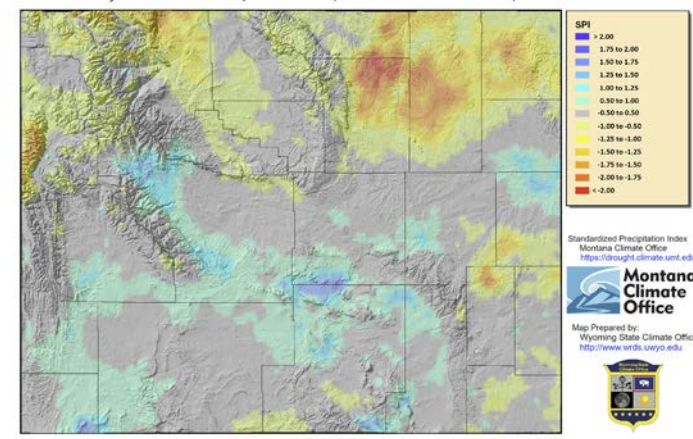
60-Day
→



Provisional data, subject to revision
Standardized Precipitation Index Created by Montana Climate Office <https://drought.climate.umt.edu>
Map Created 20 Jan 2022 <http://www.wrds.uwyo.edu>

365-Day Standardized Precipitation Index (19 Jan 2021 to 18 Jan 2022)

1-Year
→



Provisional data, subject to revision
Standardized Precipitation Index Created by Montana Climate Office <https://drought.climate.umt.edu>
Map Created 20 Jan 2022 <http://www.wrds.uwyo.edu>

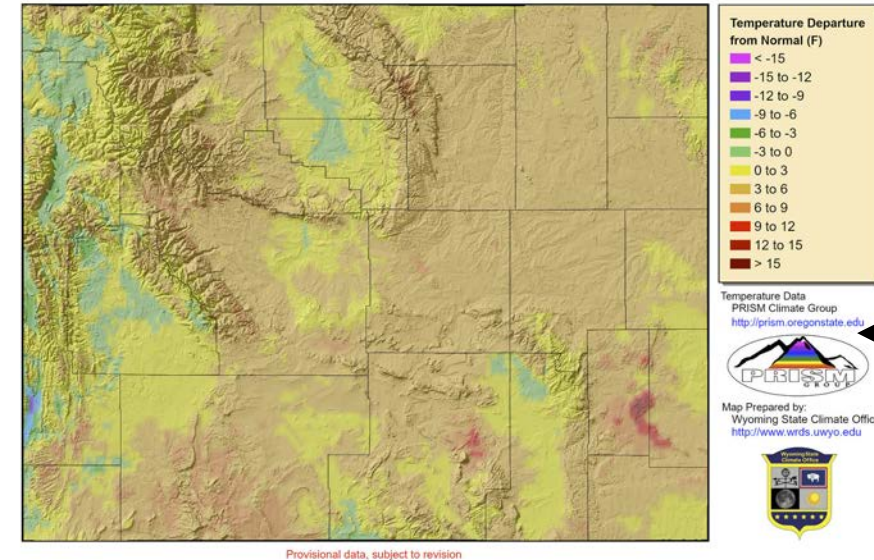
Standardized Precipitation Index (SPI)

Areas of concern emerging. And improvement

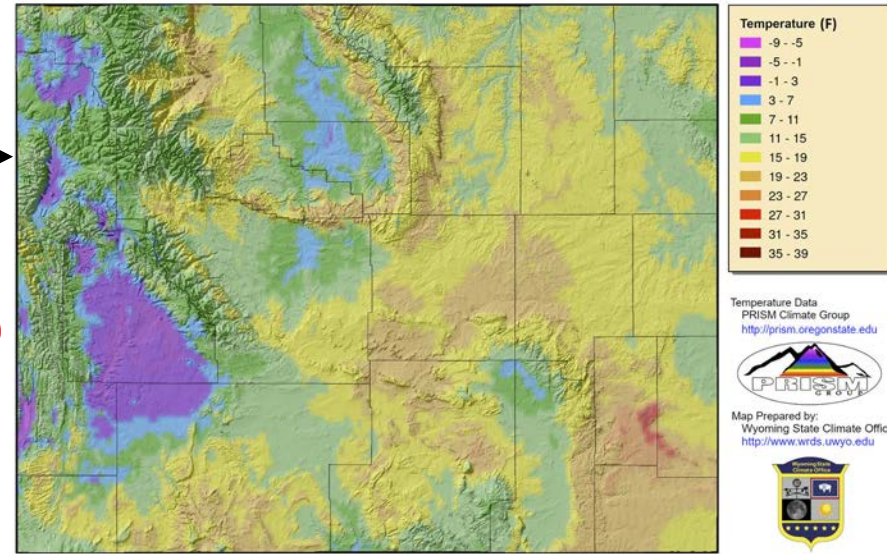
14-Day Average Minimum Temperature (06 Jan to 19 Jan)

- Lows mostly below freezing
- Coldest in Upper Green (Sublette County)

14-Day Average Minimum Temperature (Departure from 1991-2020 Average) for 06 Jan 2022 to 19 Jan 2022



Provisional data, subject to revision



Provisional data, subject to revision

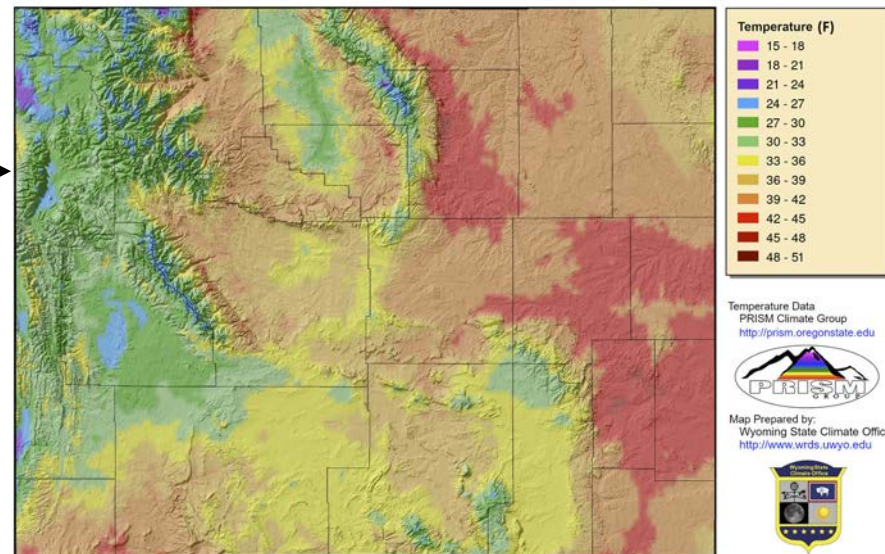
Daily Temperature data from PRISM Climate Group, Copyright ©2021, PRISM Climate Group, Oregon State University, <http://prism.oregonstate.edu>
Map Created 20 Jan 2022 <http://www.wrds.uwyo.edu>
Temperature averages created from PRISM daily temperature grids

14-Day *Departure from Normal* Average Minimum Temperature

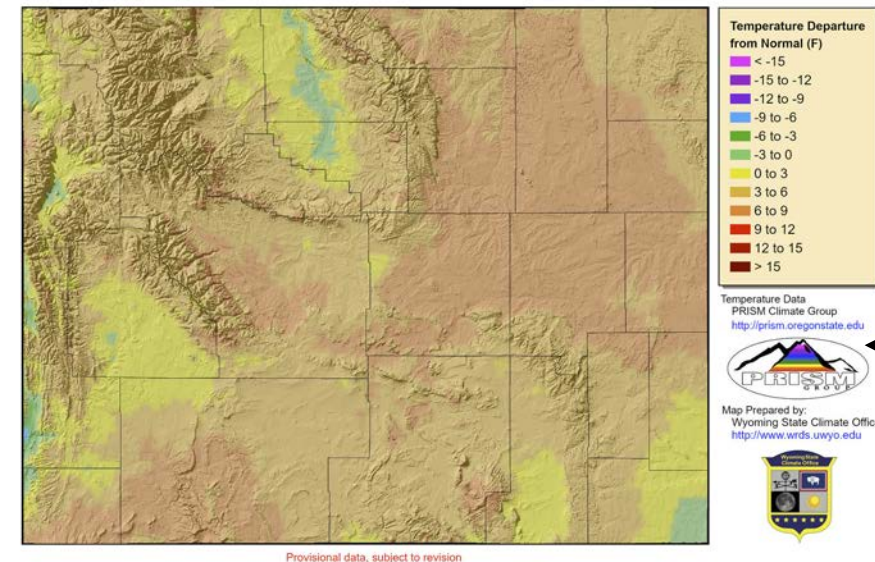
- Above average for much of state 3-6F mostly
- Bighorn Basin and far west with departures up to 3F below average

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

- High elevations <32F for highs
- 40-45F west of BH and Laramie Rng & SW



14-Day Average Maximum Temperature (Departure from 1991-2020 Average) for 06 Jan 2022 to 19 Jan 2022



14- Day *Departure from Normal* Average Maximum Temperature

- 3-9F for much of the state
- Far SE, West, and Bighorn Basin some areas 3F below average.

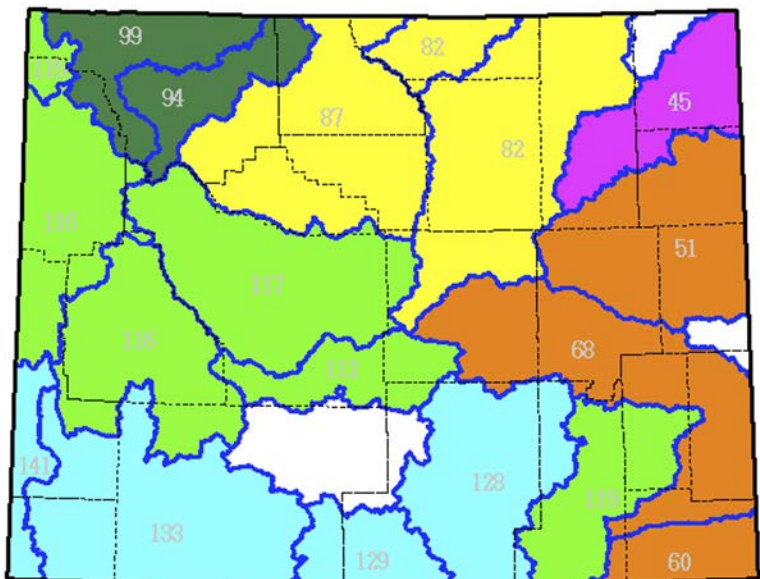
Provisional data, subject to revision

Daily Temperature data from PRISM Climate Group, Copyright ©2021, PRISM Climate Group, Oregon State University, <http://prism.oregonstate.edu>
Map Created 20 Jan 2022 <http://www.wrds.uwyo.edu>
Temperature averages created from PRISM daily temperature grids

Basin Snow Water Equivalent (SWE) Percent of Median

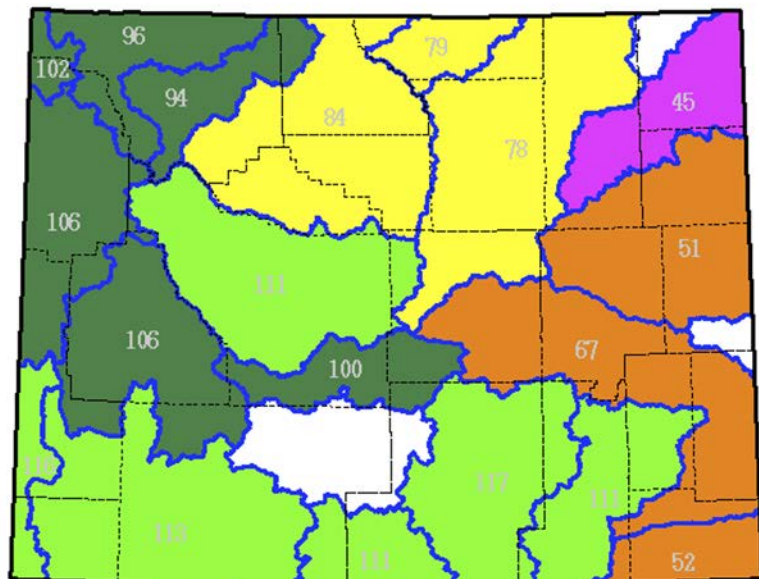
2 Weeks Ago (06 Jan 2022)

SWE % of Median as of Thursday, 06 January 2022



Today (20 Jan 2022)

SWE % of Median as of Thursday, 20 January 2022

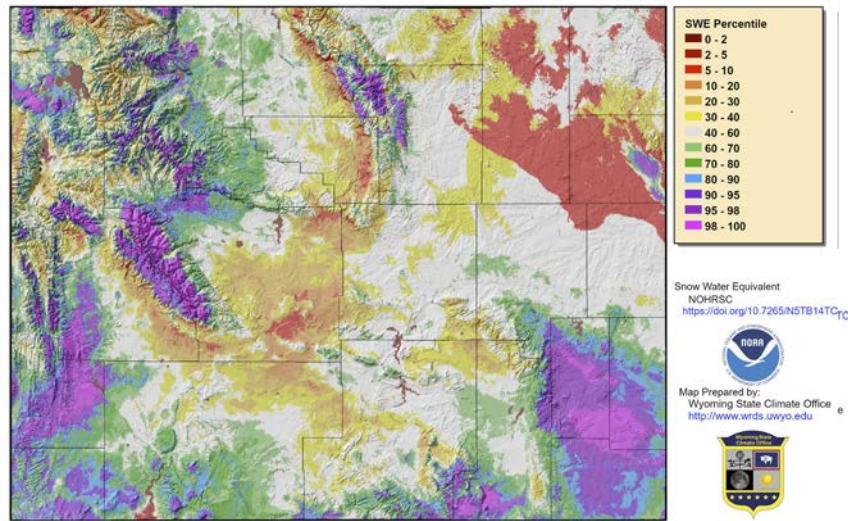


Modeled Snow Water Equivalent (SWE)

2-Week Comparison

06 Jan 2022

Snow Water Equivalent Percentile for 06 Jan 2022 (2004-2021 Period)

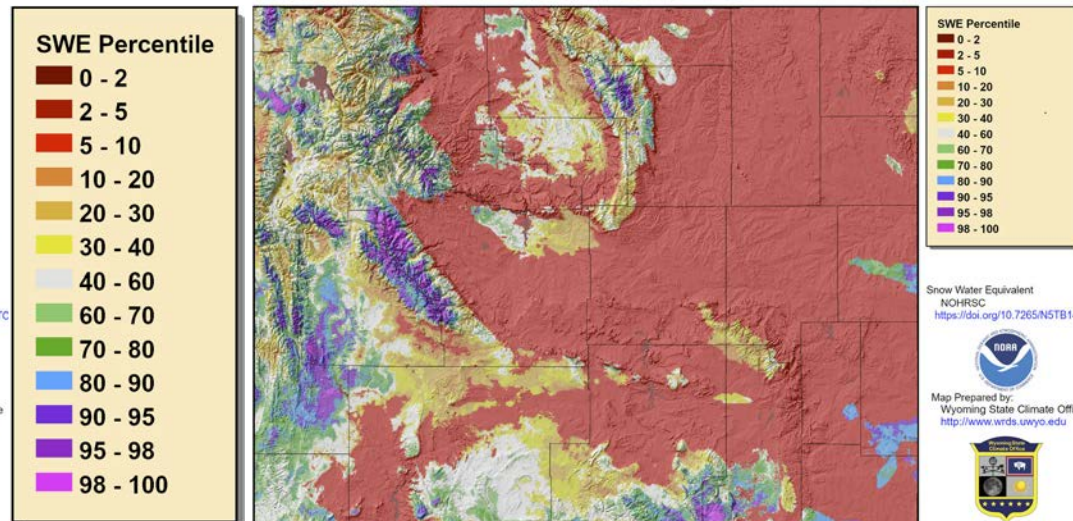


Provisional data, subject to revision

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/N5TB14TC>
Daily Percentiles and Percents created by Wyoming State Climate Office
Map Created 06 Jan 2022 - <http://www.wrds.uwyo.edu>

20 Jan 2022

Snow Water Equivalent Percentile for 20 Jan 2022 (2004-2021 Period)



Provisional data, subject to revision

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/N5TB14TC>
Daily Percentiles and Percents created by Wyoming State Climate Office
Map Created 20 Jan 2022 - <http://www.wrds.uwyo.edu>

Lost a lot of snow cover in the last two weeks

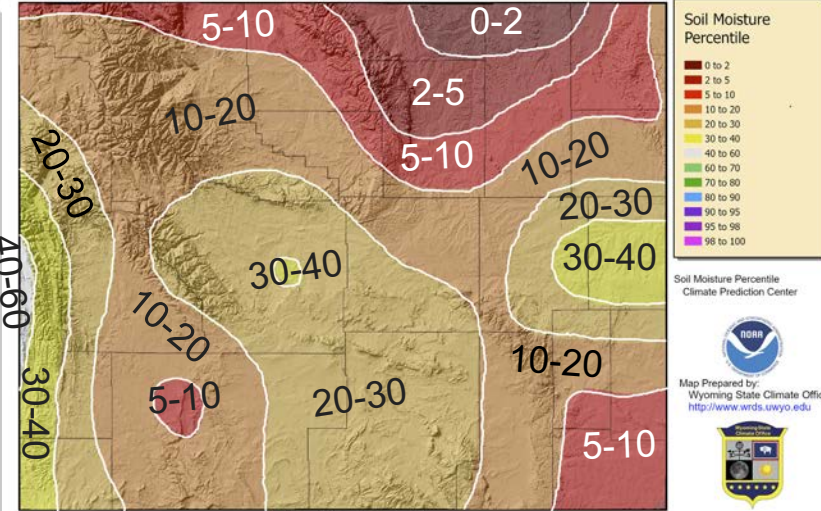
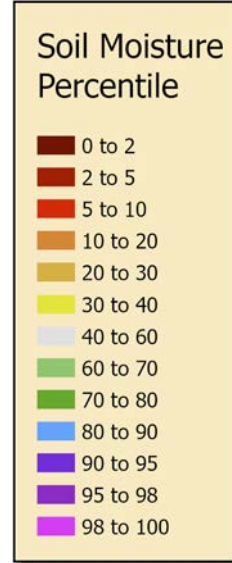
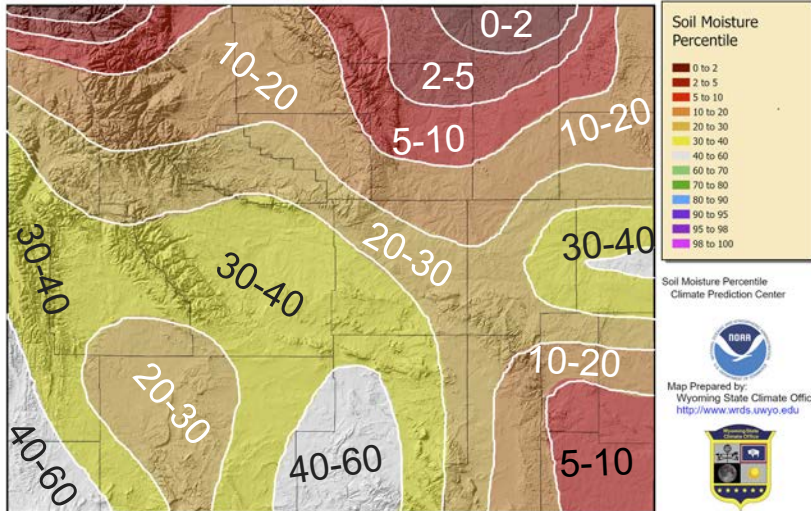
Soil Moisture Percentile

~Two Weeks Ago
04 Jan 2022

Soil Moisture Percentile for 04 Jan 2022

19 Jan 2022

Soil Moisture Percentile for 19 Jan 2022



Modeled Soil Moisture Percentile https://www.cpc.ncep.noaa.gov/products/GIS/GIS_DATA/USDM_Products/soil/soil_percentile.php
Map Created 05 Jan 2022 <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
Map Created 20 Jan 2022 <http://www.wrds.uwyo.edu>

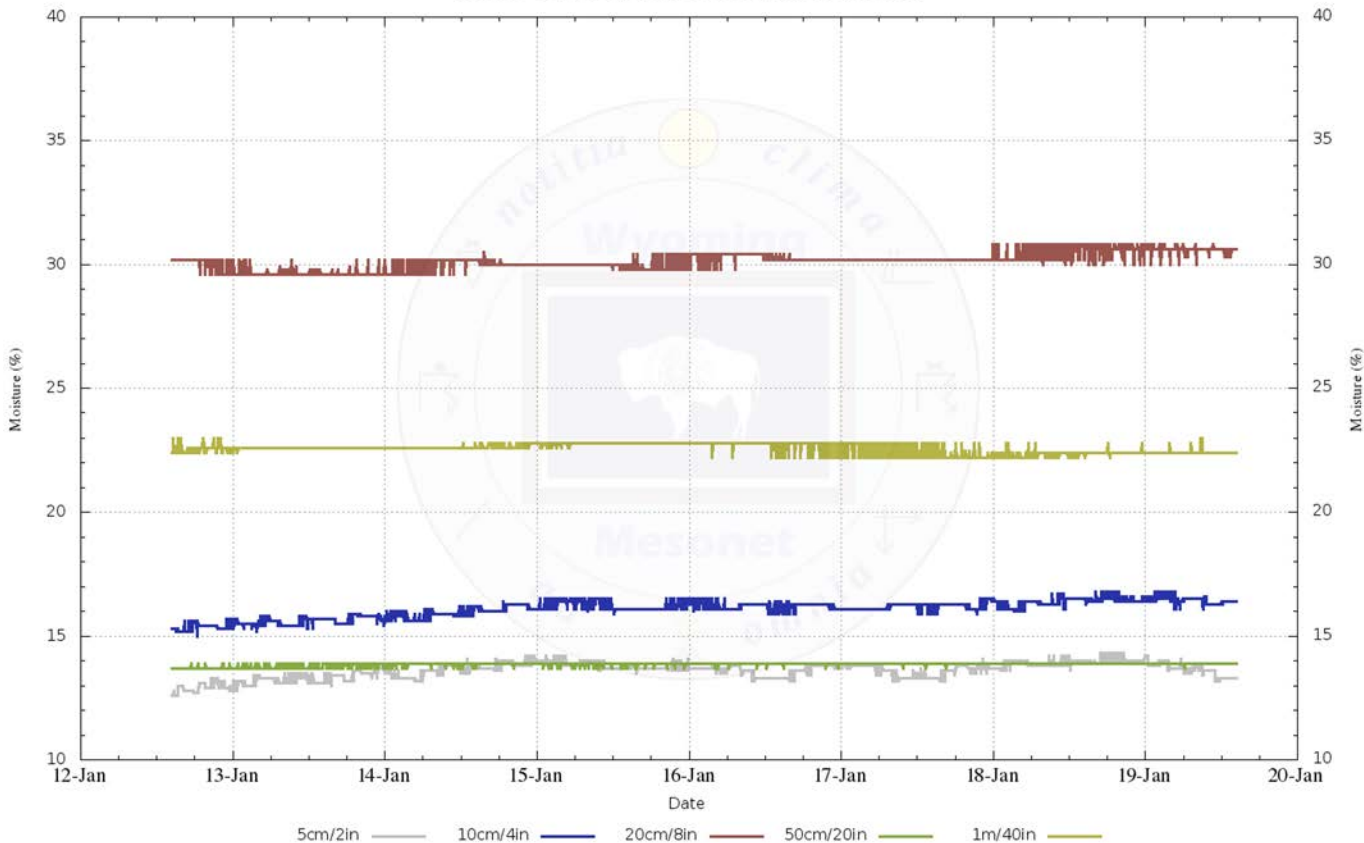
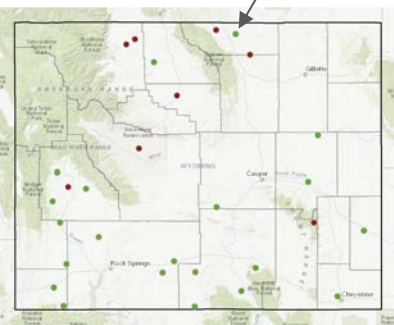
Conditions deteriorating especially in northeast and the southwest and central regions. Some slight improvement in northwest Wyoming.



Soil Moisture at Sheridan

~7 Miles ESE Sheridan

Sheridan - Soil Moisture (Graph Created 14:22 19-Jan-2022)

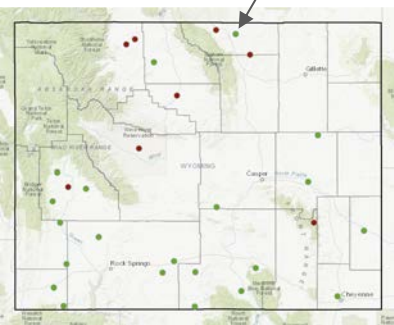


Barely-perceptible rise in soil moisture at shallow depths.

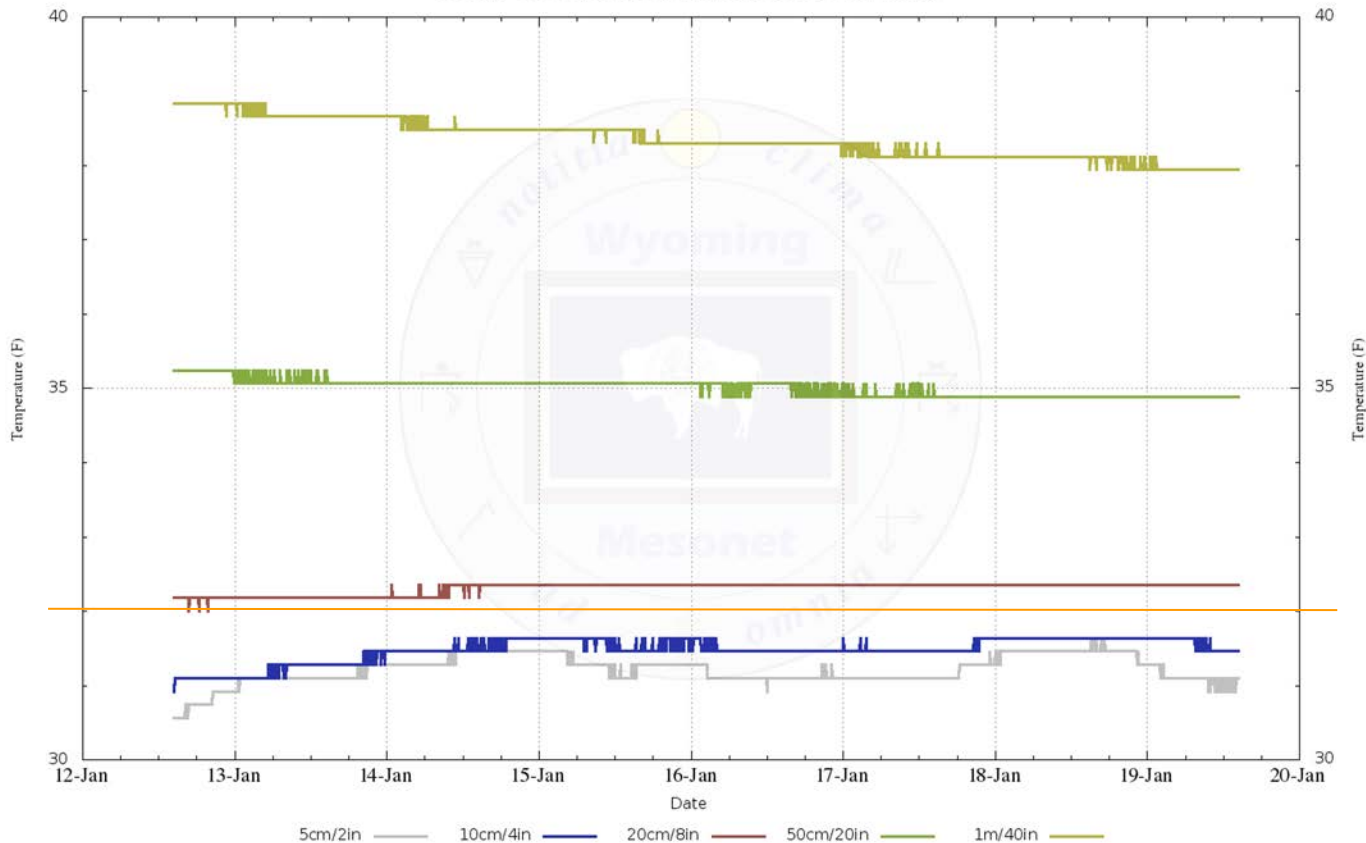


Soil Temperature at Sheridan

~7 Miles ESE Sheridan



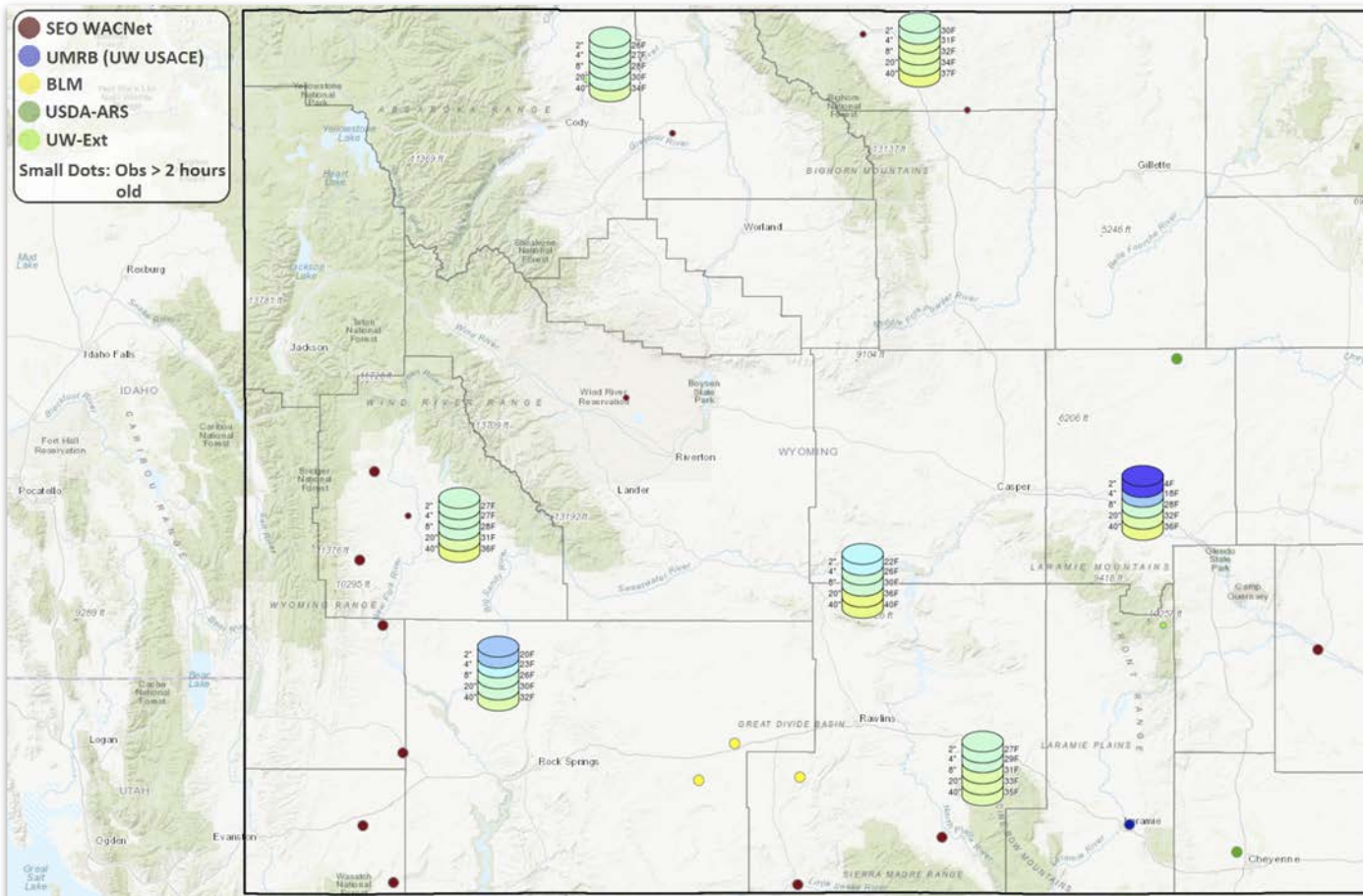
Sheridan - Soil Temperature (Graph Created 14:22 19-Jan-2022)



Blanket of snow has insulated the ground but soil temperatures gradually dropping.



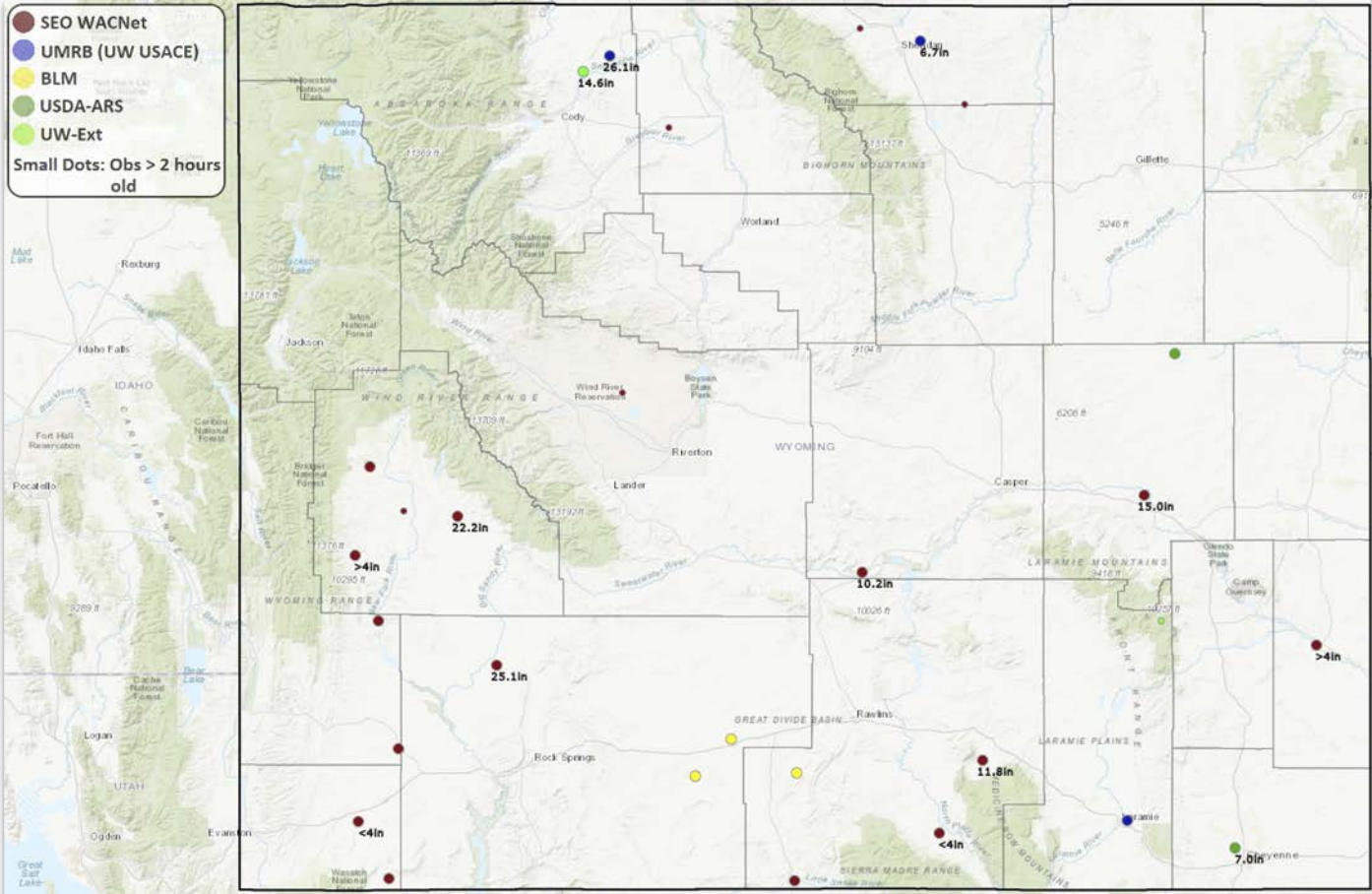
Soil Temperatures at 0700, 20 Jan 2022



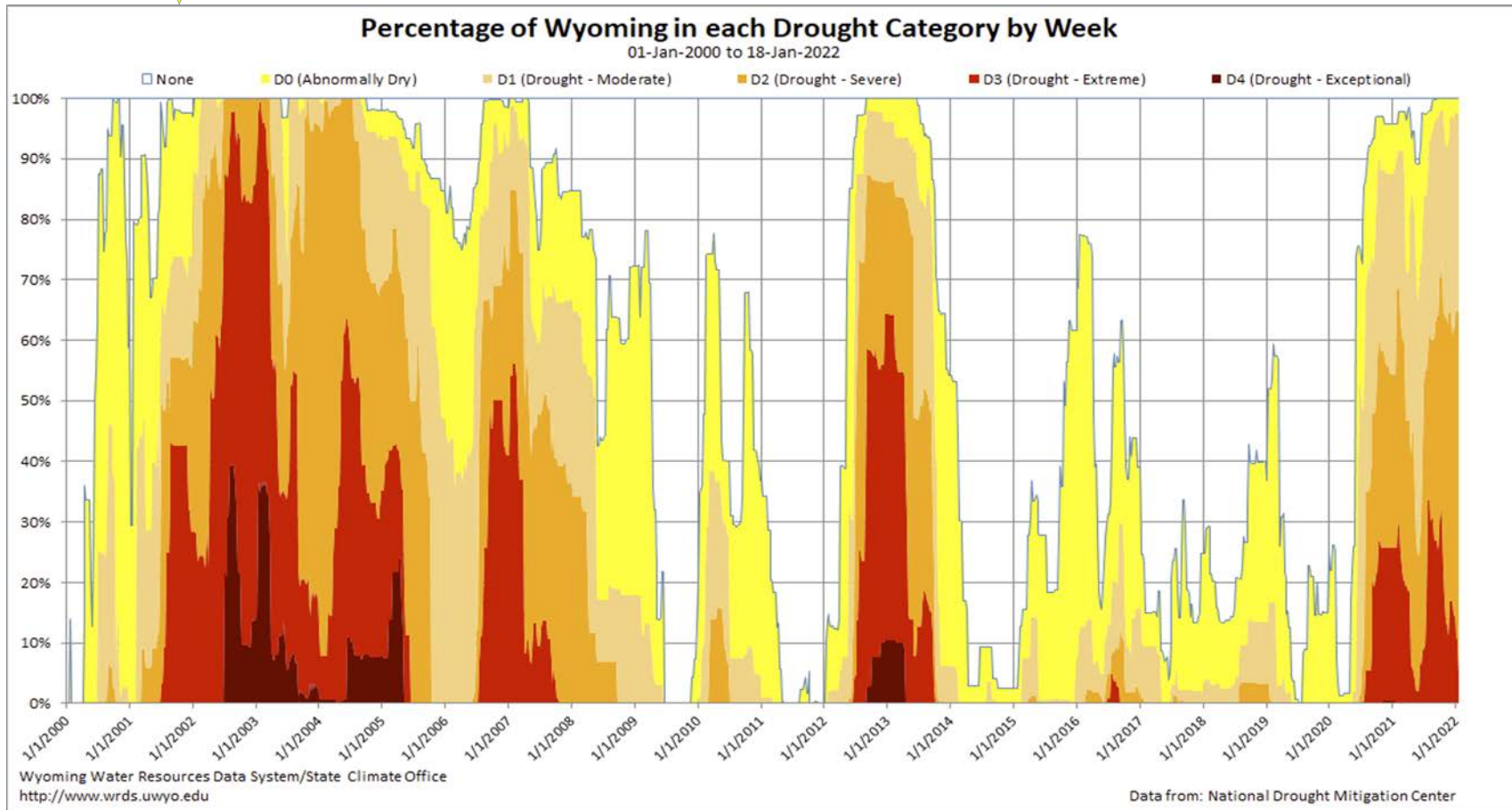


Frost Depths at 0700, 20 Jan 2022

- SEO WACNet
 - UMRB (UW USACE)
 - BLM
 - USDA-ARS
 - UW-Ext
- Small Dots: Obs > 2 hours old



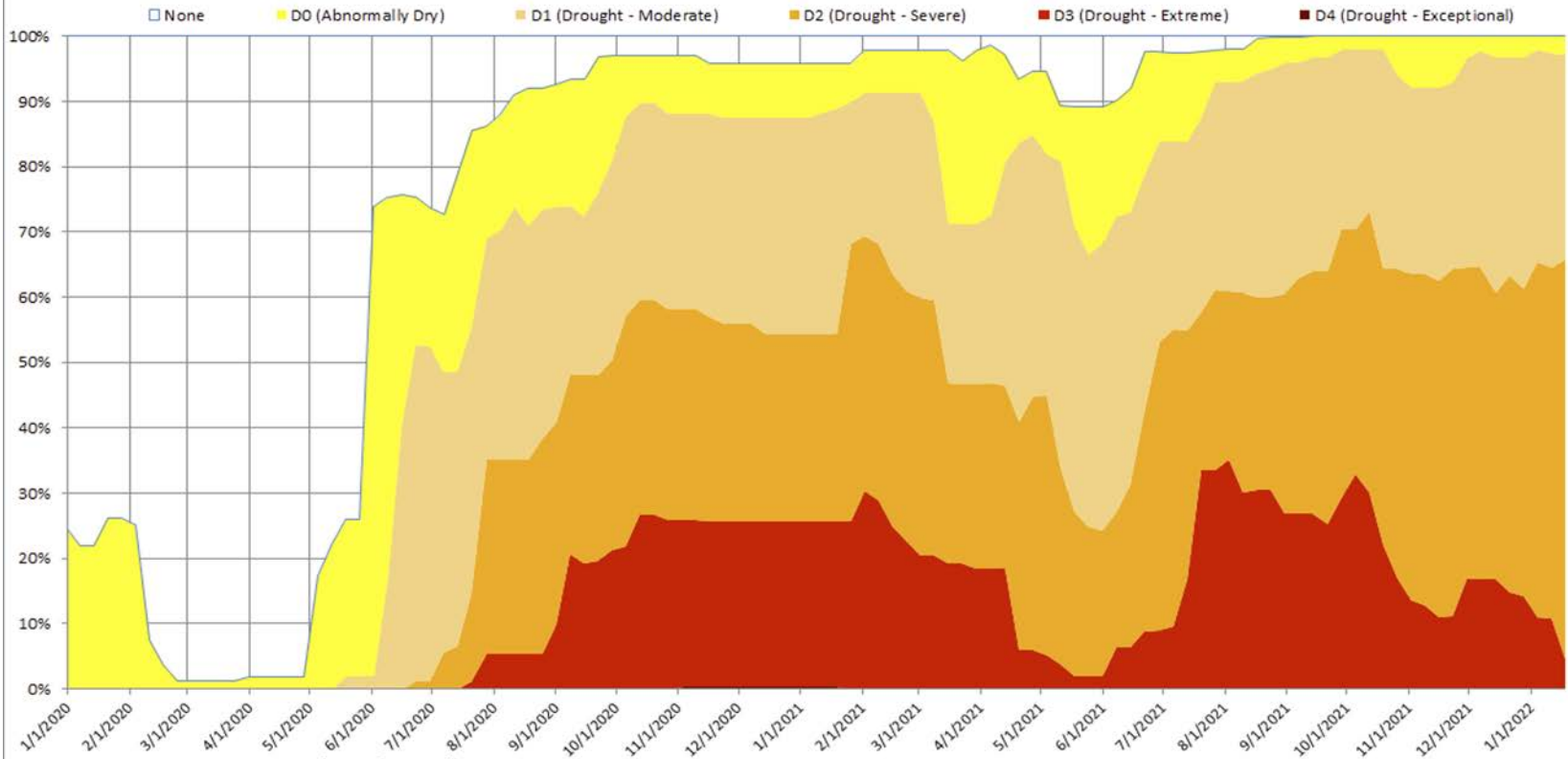
Wyoming Area Affected: 100% D0-D4 ; 97.21% D1-D4





Percentage of Wyoming in each Drought Category by Week

01-Jan-2020 to 18-Jan-2022

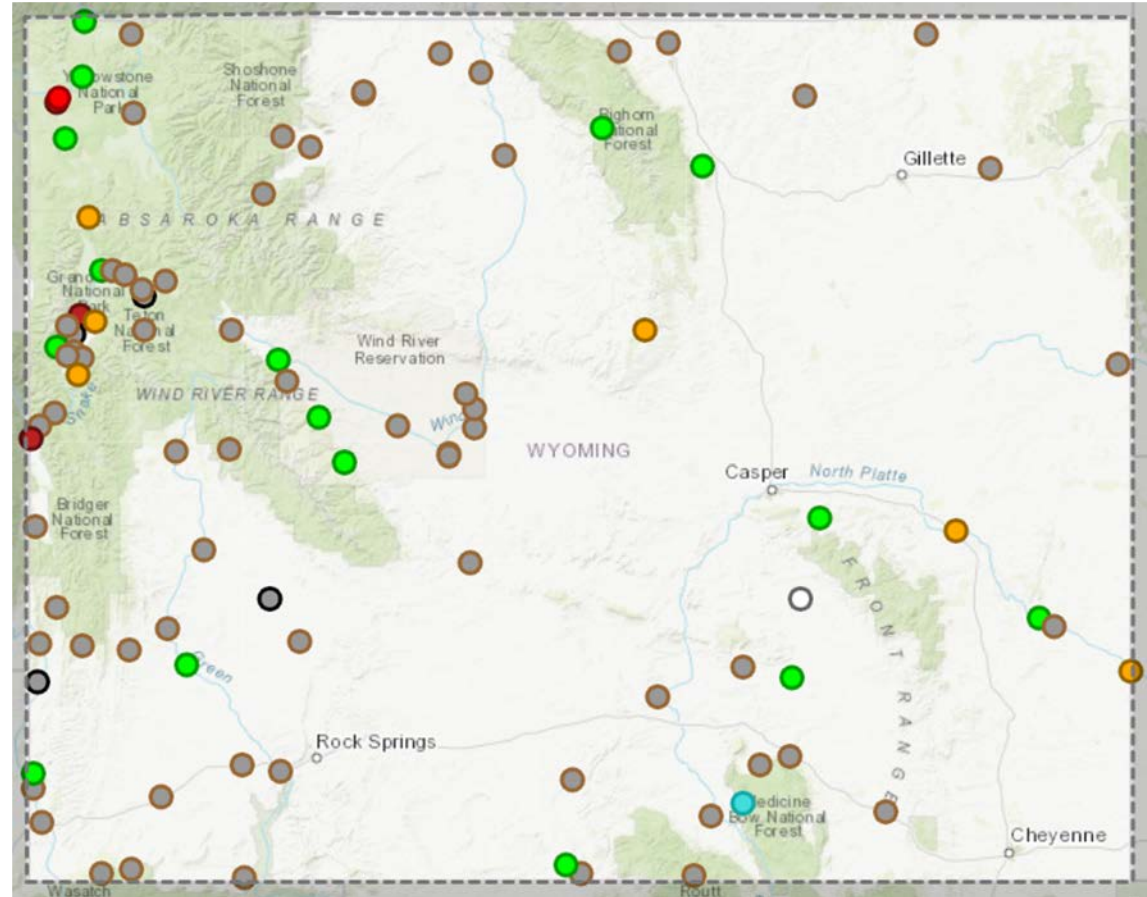


Current Streamflow Conditions (January 20, 2022)

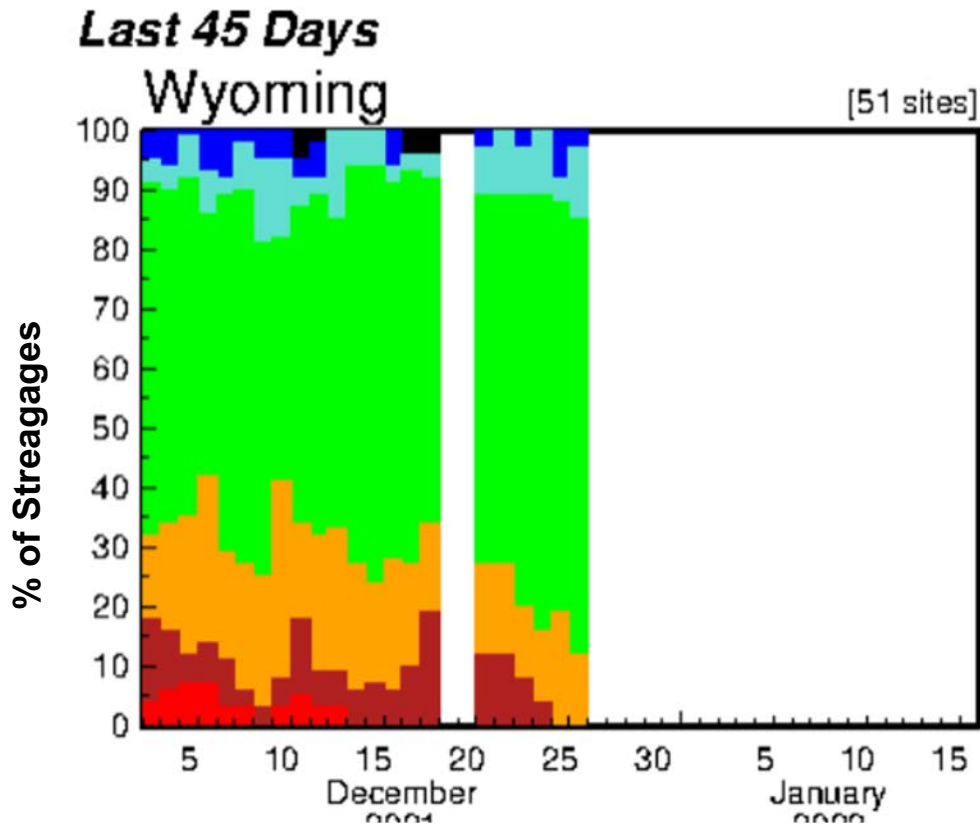
Streamflow Status

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



Flow Trends since Early December



Only sites with 30 yrs record and no missing values.

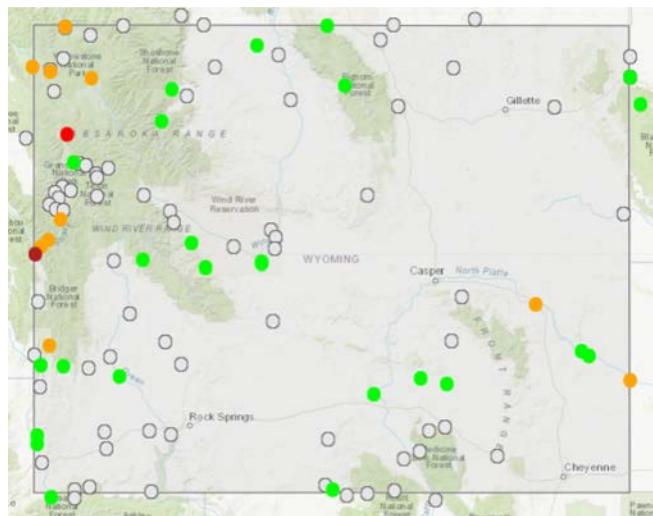
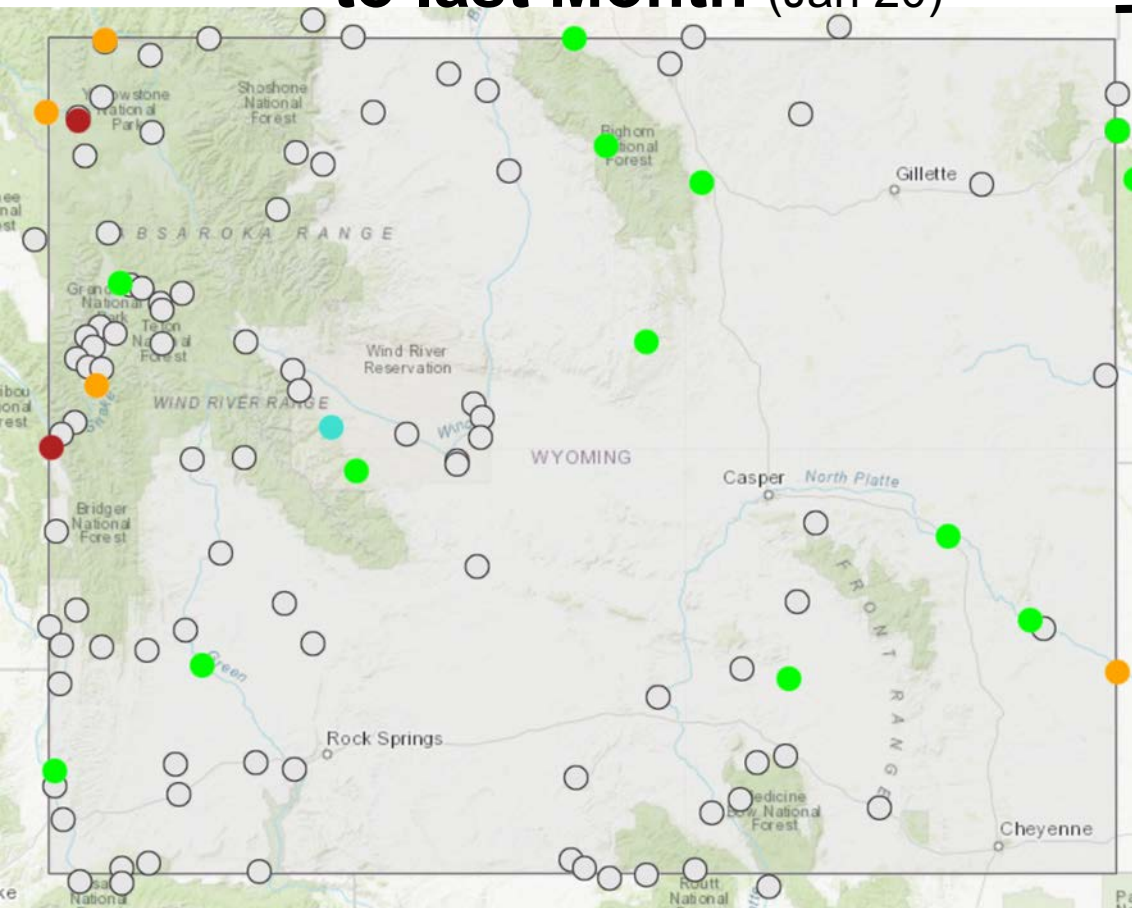
Stable conditions- December

Current data not available because of ice

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

7-Day Avg Compared to last Month (Jan 20)

Dec 16



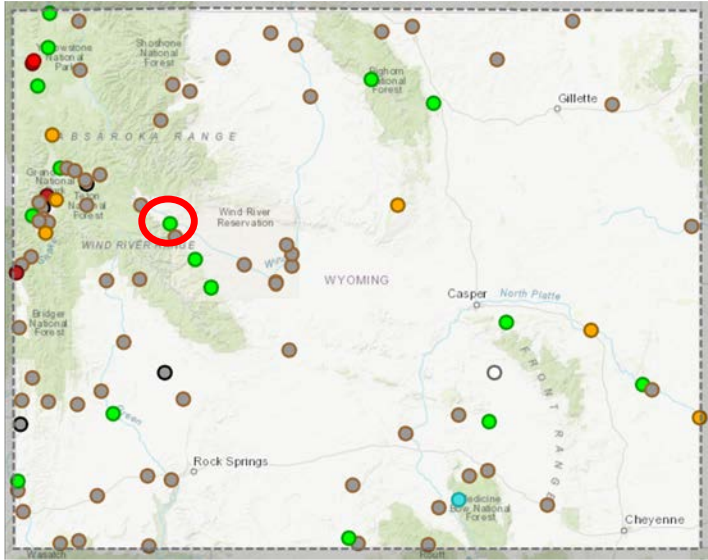
Explanation - Percentile classes

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

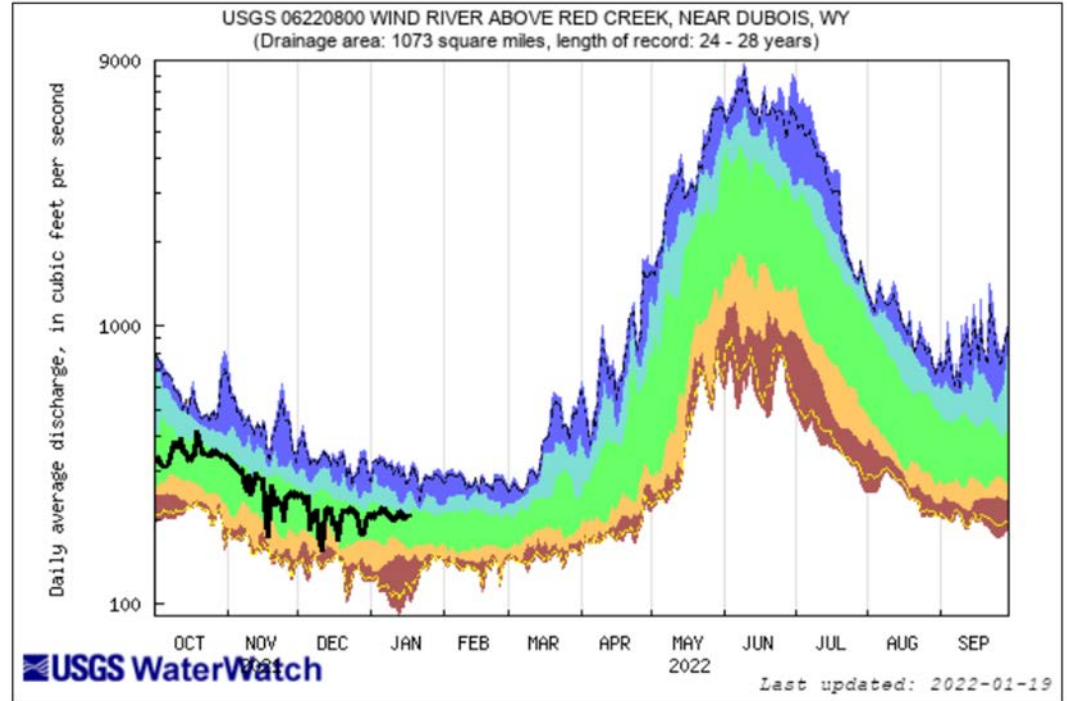
<https://waterwatch.usgs.gov>

- Majority of sites in ice

Select WY Streamflows

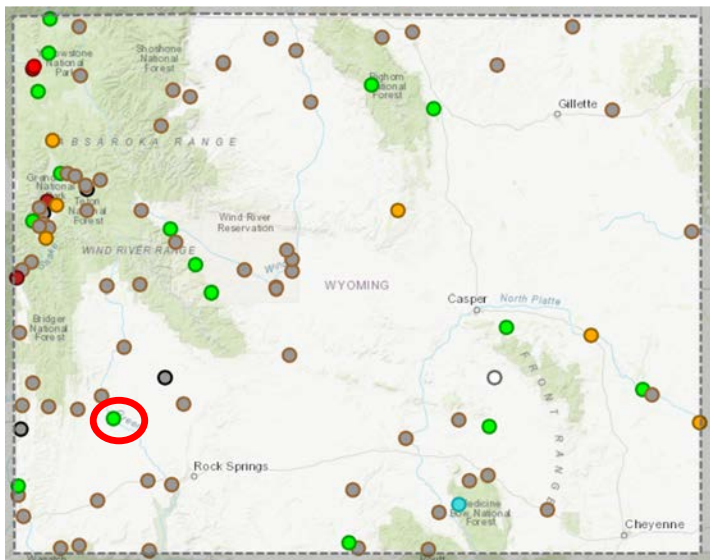


Wind River above Red Creek, nr Dubois, WY Last updated Jan 20, 2022



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

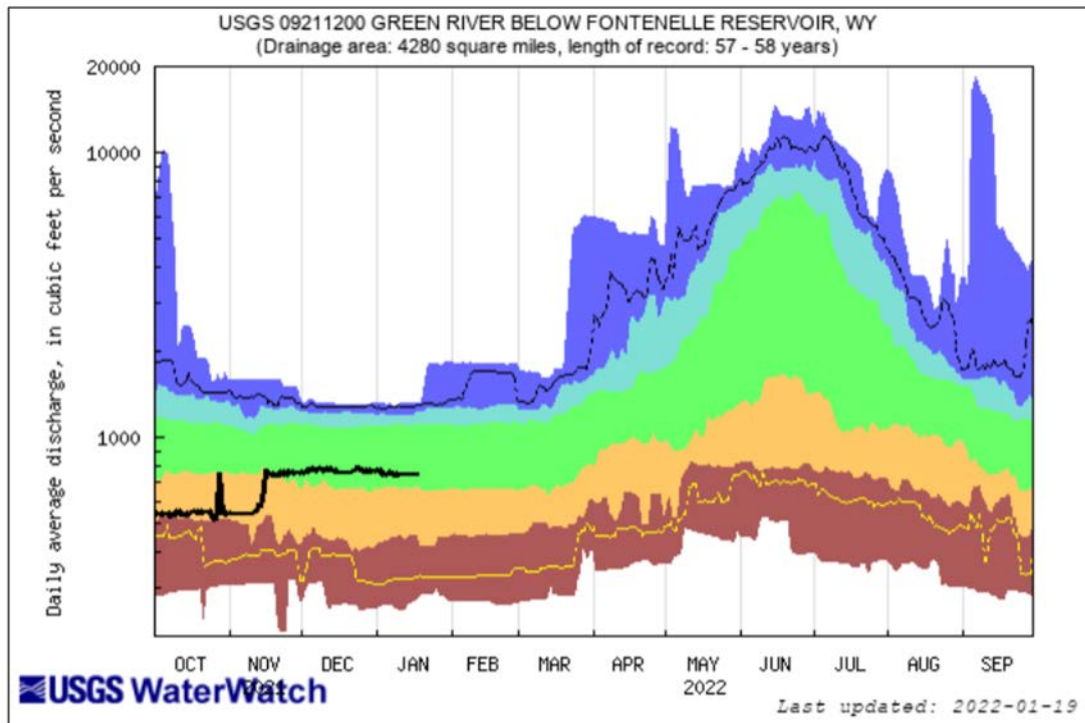
Select WY Streamflows



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

Green River below Fontenelle Reservoir, WY

Last updated Jan 20, 2022

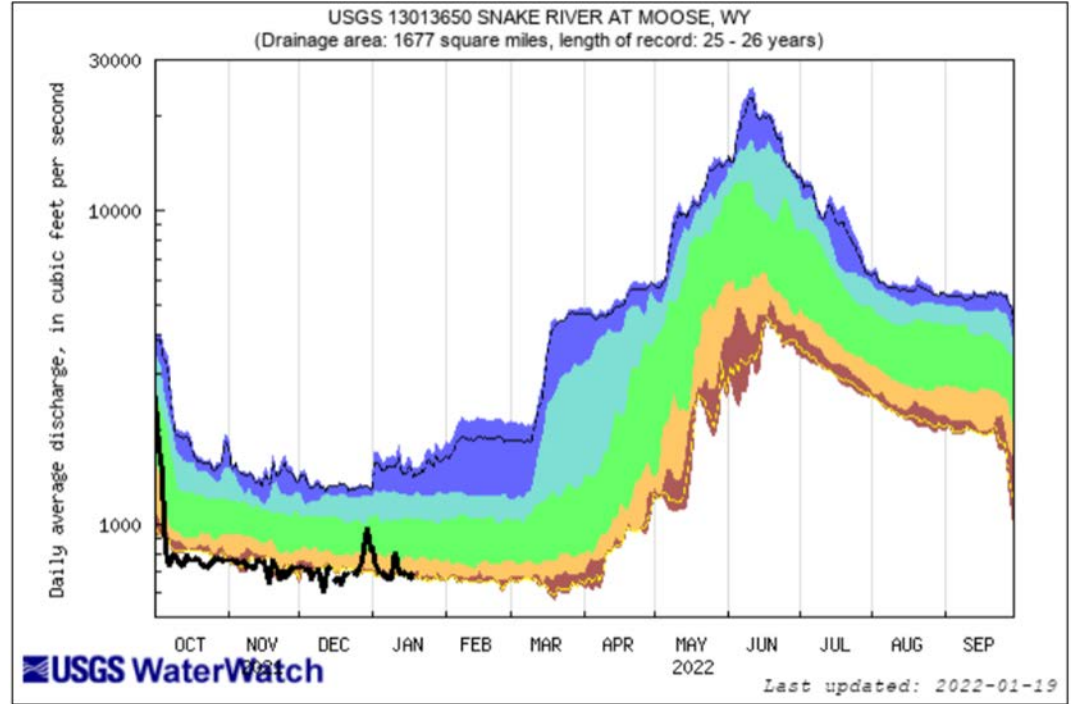
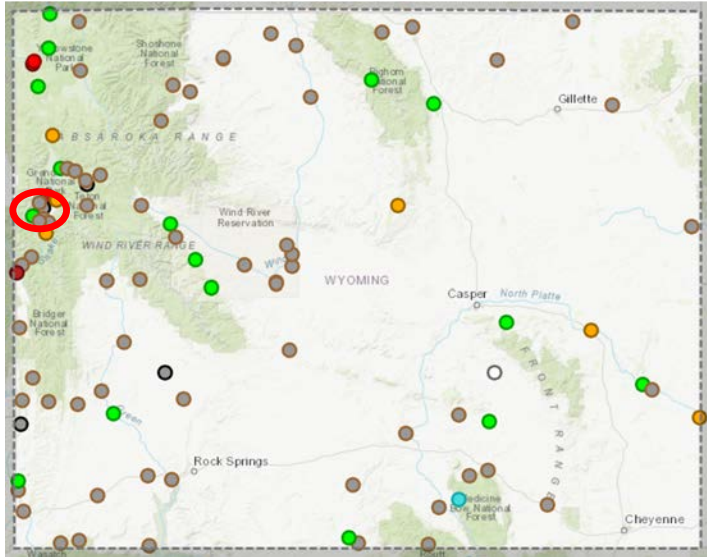


Explanation - Percentile classes						
lowest-10th percentile	5	10-24	25-75	76-90	95	90th percentile -highest
Much below Normal	Below normal	Normal	Above normal	Much above normal		Flow

Select WY Streamflows

Snake River at Moose, WY

Last updated Jan 20, 2022



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

Explanation - Percentile classes

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

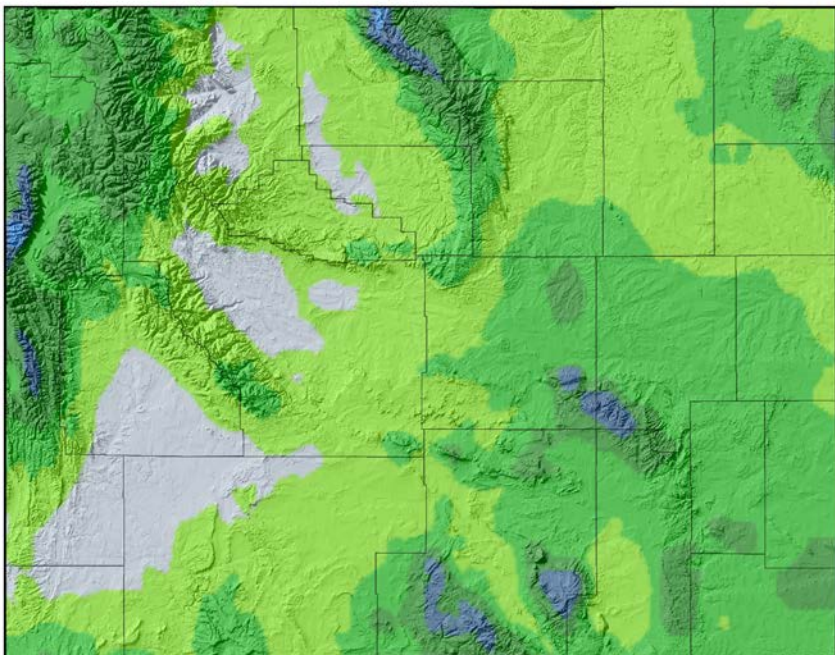


Forecasts & Outlooks



7-Day Quantitative Precipitation Forecast January 19-26

7-Day Quantitative Precipitation Forecast 19 Jan 2022



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

- Light snow possible in western mountains and northern Laramie Range
- Next system is likely a moisture starved arctic front on Monday
- Drier pattern likely through the end of the month
- No game-changing snow in the near future

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 Jan 2022 <http://www.wrds.uwyo.edu>

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



6-10 Day Outlooks January 21 - 25

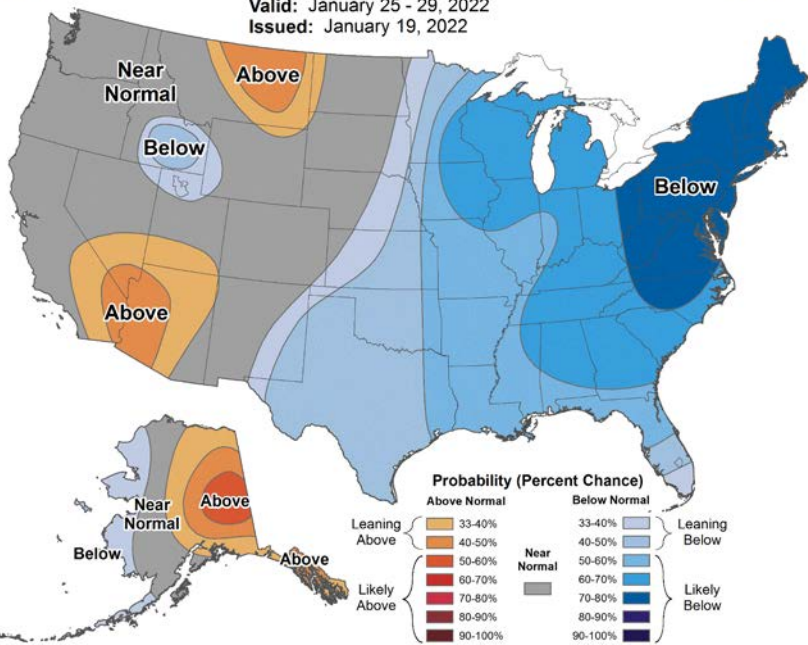
Probability = Chance



6-10 Day Temperature Outlook



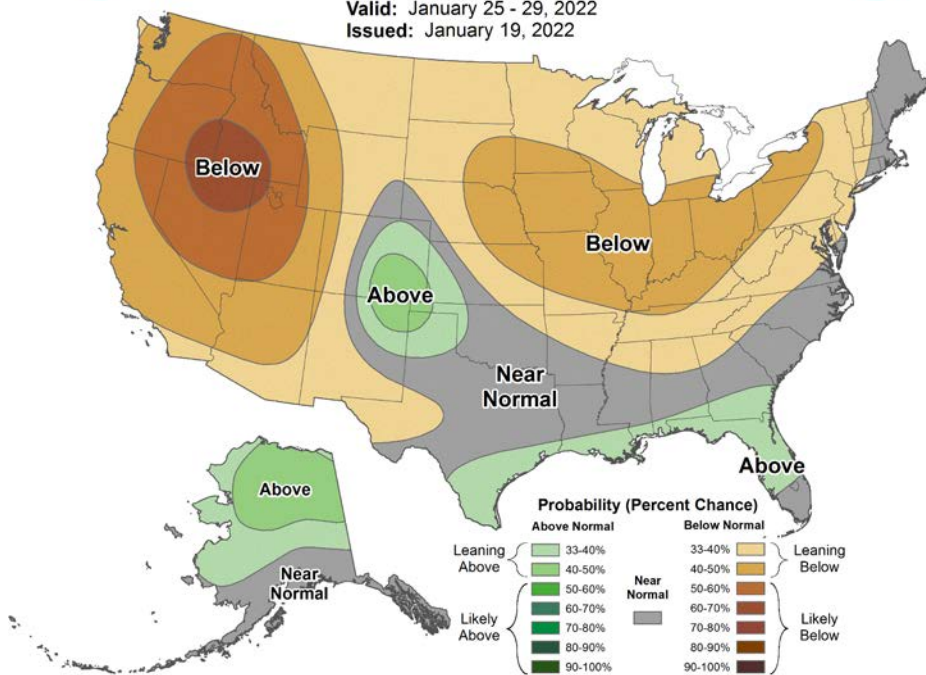
Valid: January 25 - 29, 2022
Issued: January 19, 2022



6-10 Day Precipitation Outlook



Valid: January 25 - 29, 2022
Issued: January 19, 2022



No significant temperature signal
Slight warm NE and slight cool SW

Dry signal across most of the state with
stronger signals to the west



8-14 Day Outlooks January 27 to February 2

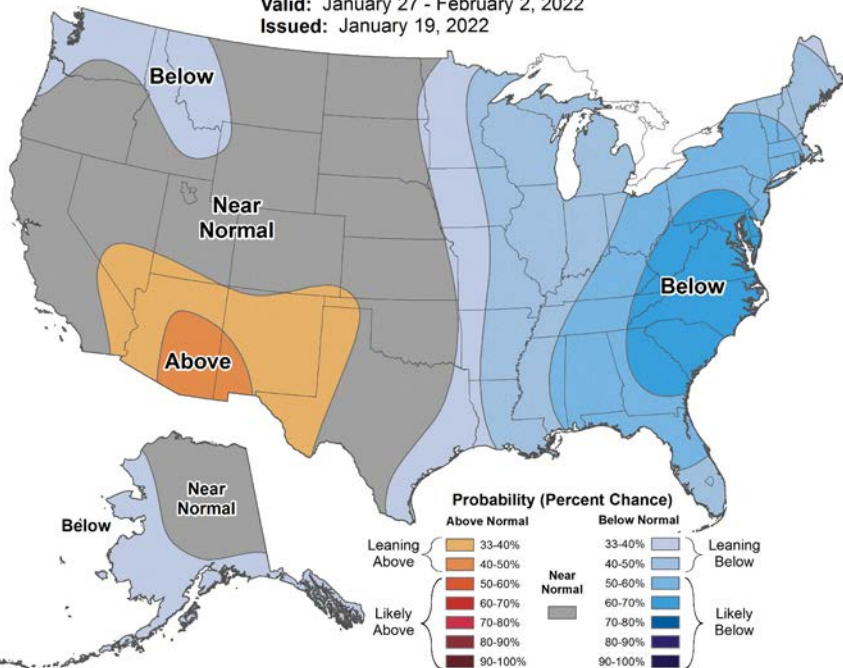
Probability = Chance



8-14 Day Temperature Outlook



Valid: January 27 - February 2, 2022
Issued: January 19, 2022



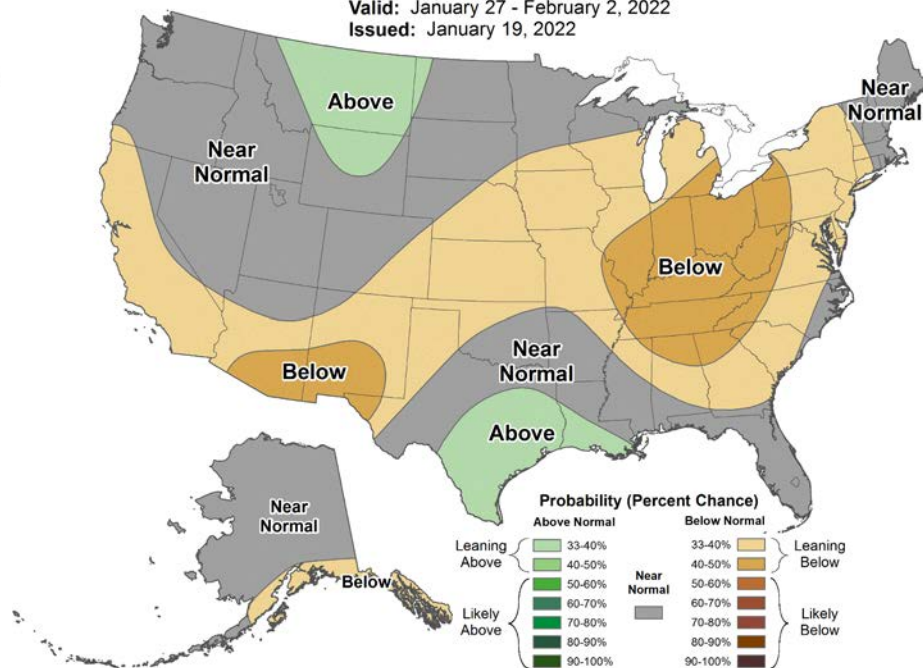
No significant warm or cool signal in extreme NW



8-14 Day Precipitation Outlook



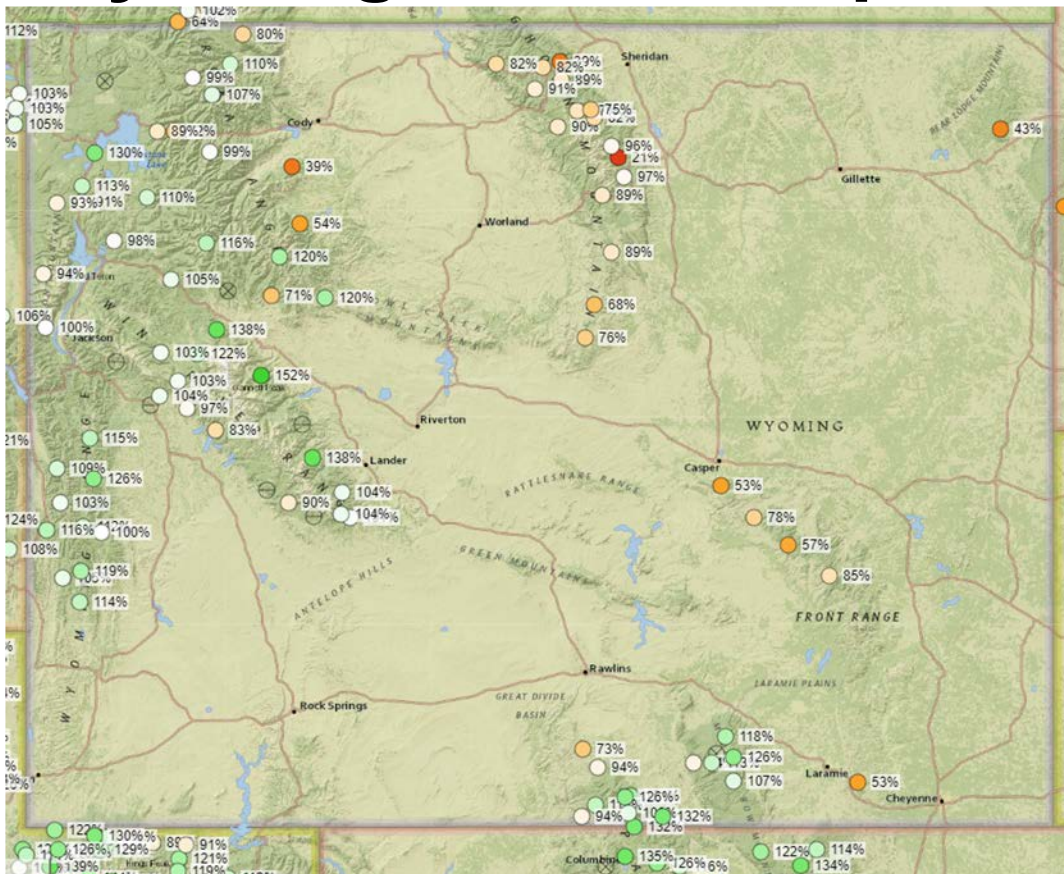
Valid: January 27 - February 2, 2022
Issued: January 19, 2022



Weak wet signal in north-central otherwise no significant dry or wet signal



Wyoming Snotel Snapshot Update

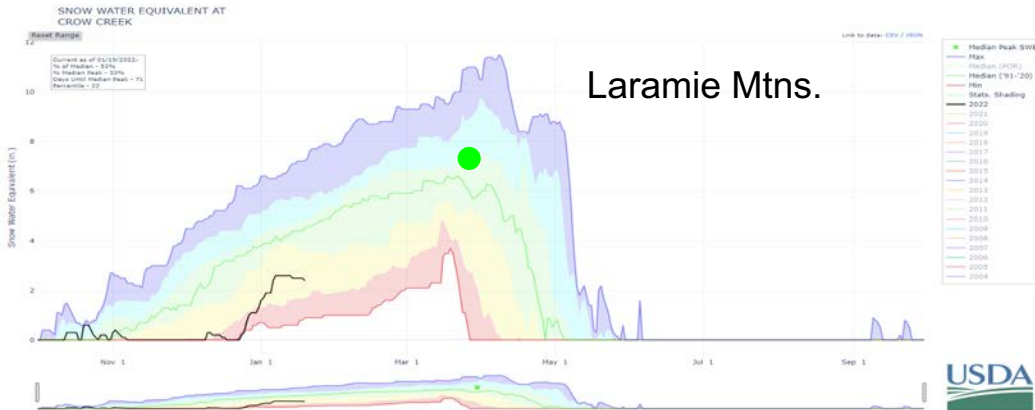


Snotel Sites - (Snow Telemetry) - are monitoring stations measuring snowpack, precipitation, temperature & other climate conditions.

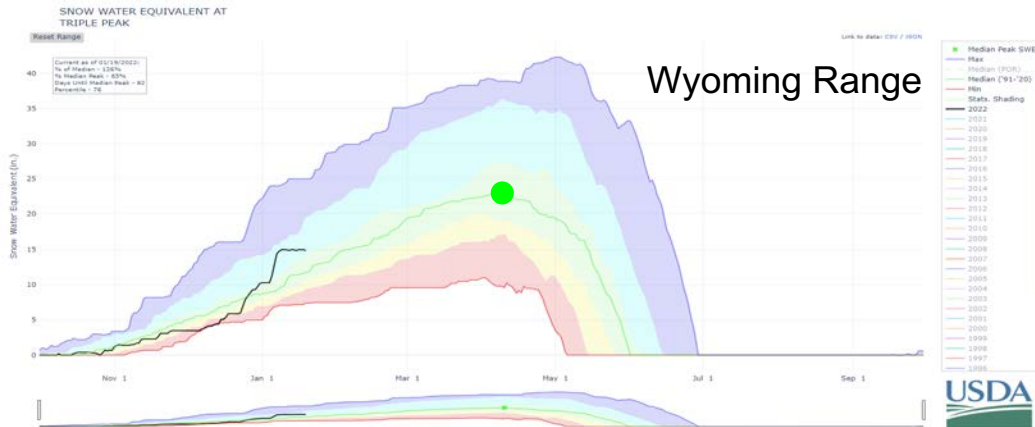
- Robust snows of December pushed the western mountains near to above normal. January dried out and there have been decreases relative to the median.
- However, southwest flow left areas in Black Hills, Big Horns, and the Laramie Range in the rain shadow. These areas remain below the median.



Wyoming Snotel Snapshot Update



Laramie Mtns.

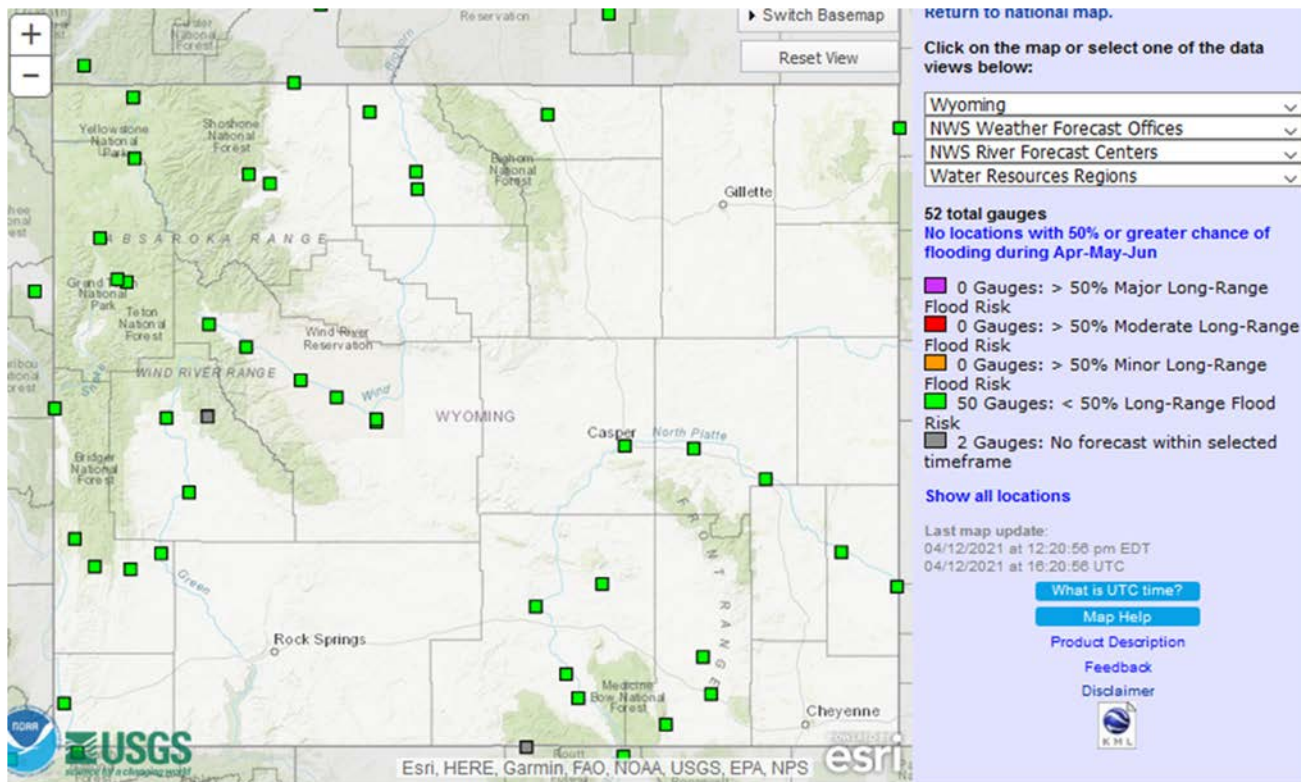


Wyoming Range

- Laramie Mountains started the year poorly.
- The beneficial snows of December were not enough to push snowpack up to the median.
- Western mountains benefited more consistently from the heavy snows of December and early January. Snowpack moved from below normal to well above and then drew back as drier weather persisted.
- Conditions remain above normal across the western mountain ranges.



Missouri River Basin (Wyoming) Flood Potential Update



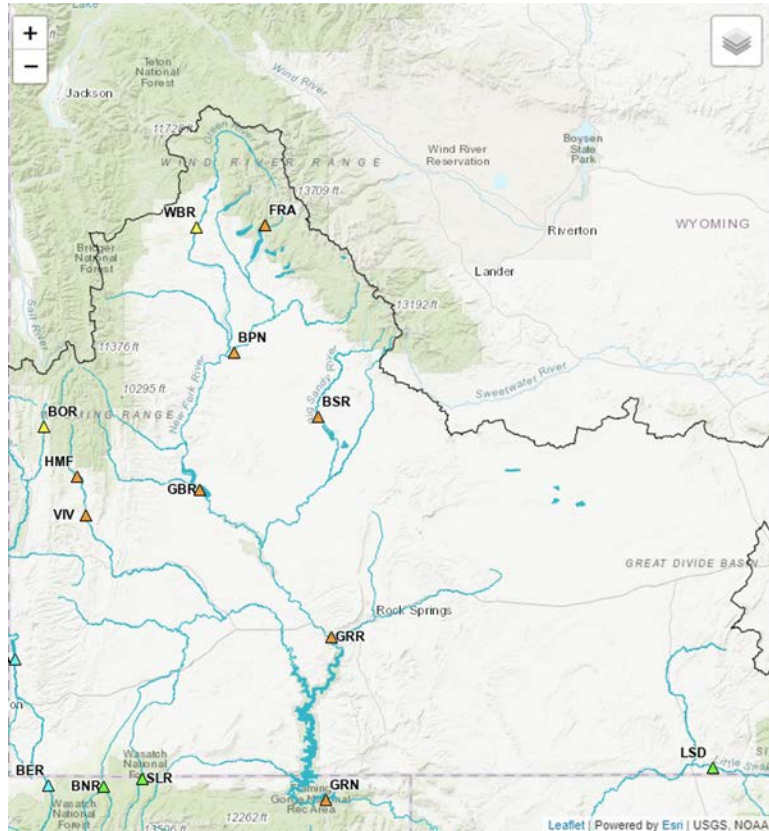
No riverine flooding is expected through June.

This graphic depicts the NWS river forecast locations, colored by the highest flood category expected during the next 90-days. All Wyoming stations are projected to stay below Flood Stage.

Please note that river ice action is **NOT** accounted for in our river forecast model.



Colorado River Basin (Wyoming) Flood Potential Update



- ▲ < 30%
- ▲ 30-50%
- ▲ 50-70%
- ▲ 70-90%
- ▲ 90-100%
- ▲ 100-110%
- ▲ 110-130%
- ▲ 130-150%
- ▲ 150-200%
- ▲ 200-300%
- ▲ 300-500%
- ▲ >500%
- ▲ Regulated
- △ No Forecast

Seasonal (April through July) water supply forecasts in Wyoming and the Colorado River Basin range from approximately 75% to 100% of average.

Runoff forecasts significantly lower (relative to median) than current SWE may reflect the affects of dry conditions in the fall of '21.

Seasonal peak flows are roughly linearly correlated with seasonal streamflow volumes.

Flooding potential is currently low, but can change depending on the future snow accumulation and weather.

Peak flow forecasts will begin to be issued in March.

www.cbrfc.noaa.gov



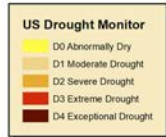
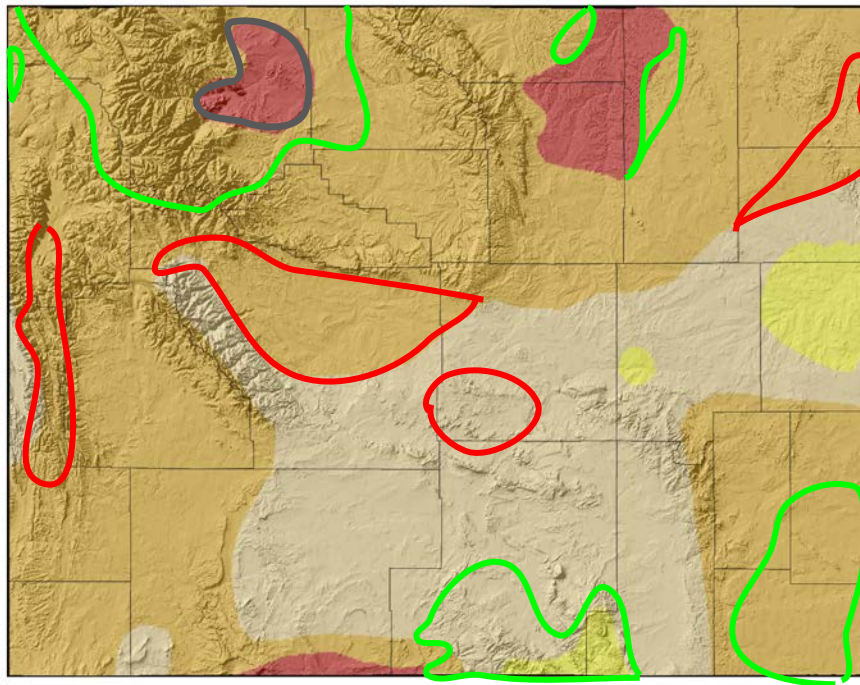
How to get involved ...

US Drought Monitor for January 18, 2022

(Released Thursday, January 20, 2022)

Valid 8 a.m. EDT

US Drought Monitor for 18 Jan 2022



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 the north-central and northwest as well as the southeast but also **degradations** in the far northeast and central/west-central parts 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>

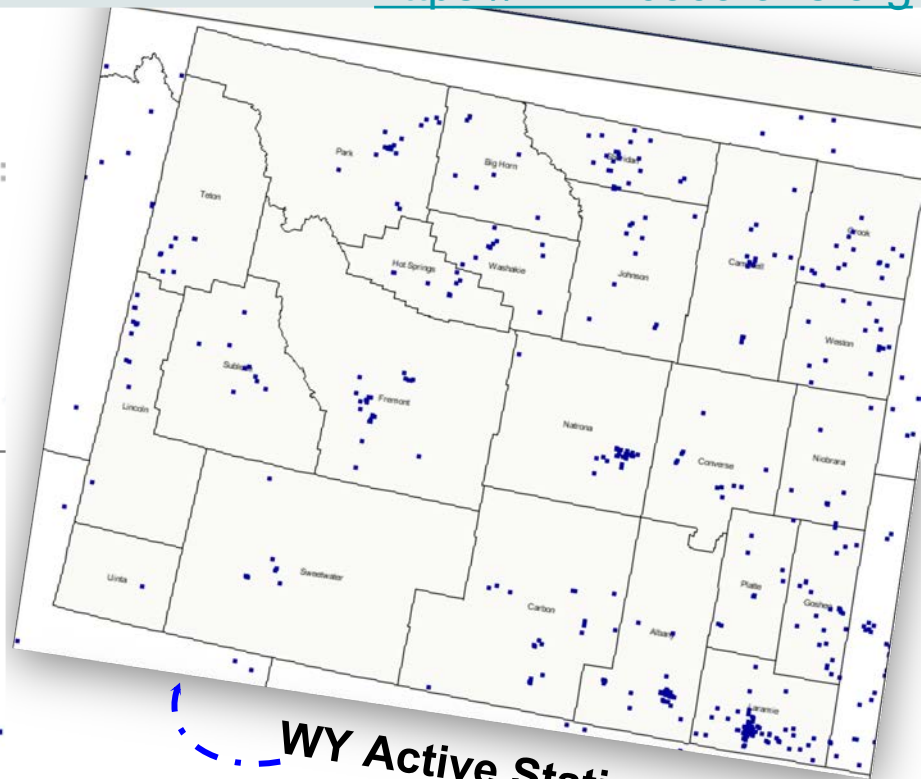
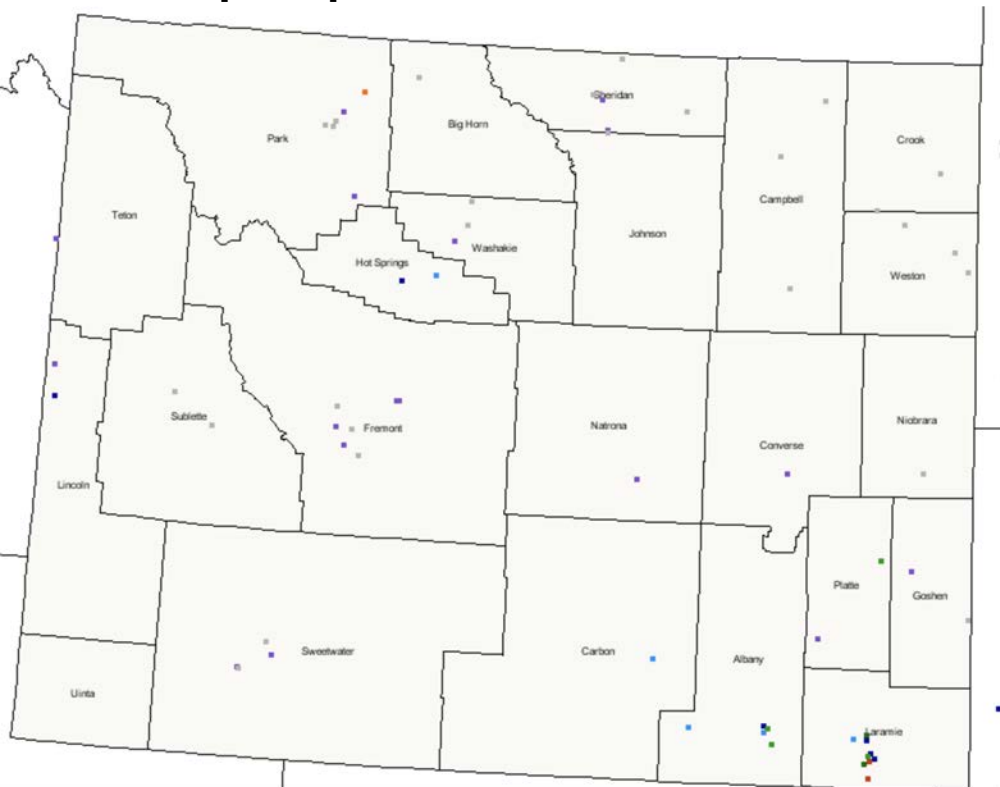
Map Layout Created 20 Jan 2022 <http://www.wrds.uwyo.edu>



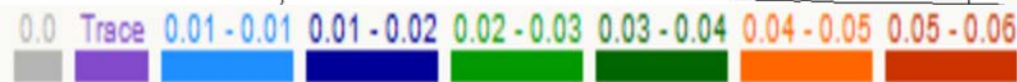
CoCoRaHS Mapping System

<https://www.cocorahs.org>

**January 20, 2022:
24-hour precip as of ~ 7 am**



WY Active Station Locations



Condition Monitoring Observer Reports

<https://bit.ly/CMOReports>

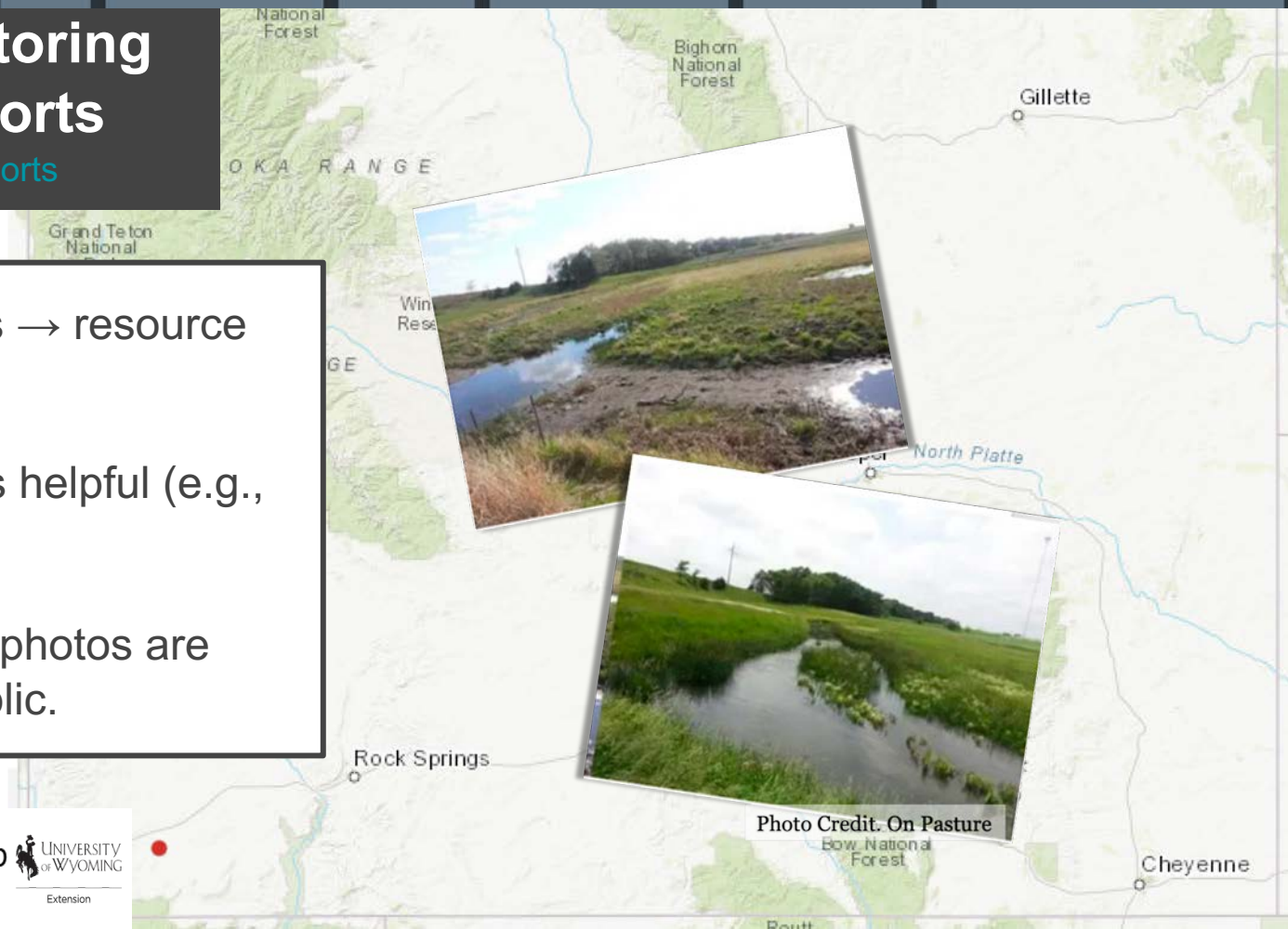
- Severely Dry
- Moderately Dry
- Mildly Dry
- Near Normal
- Mildly Wet
- Moderately Wet
- Severely Wet



Condition Monitoring Observer Reports

<https://bit.ly/CMOReports>

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





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WY Drought Info & Resources

<https://drought.wyo.gov>

CoCoRaHS

<https://www.cocorahs.org>

Condition Monitoring Observer Reports (CMOR)

<https://bit.ly/CMORreports>

Thank you! Questions?