



WY Conditions & Outlooks:

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

November 17, 2022



Presentation Outline

- **Current Conditions: Overview**
 - Streamflow
- **Outlooks: Temperature & Precipitation**
- **How to Get Involved**
- **Questions**

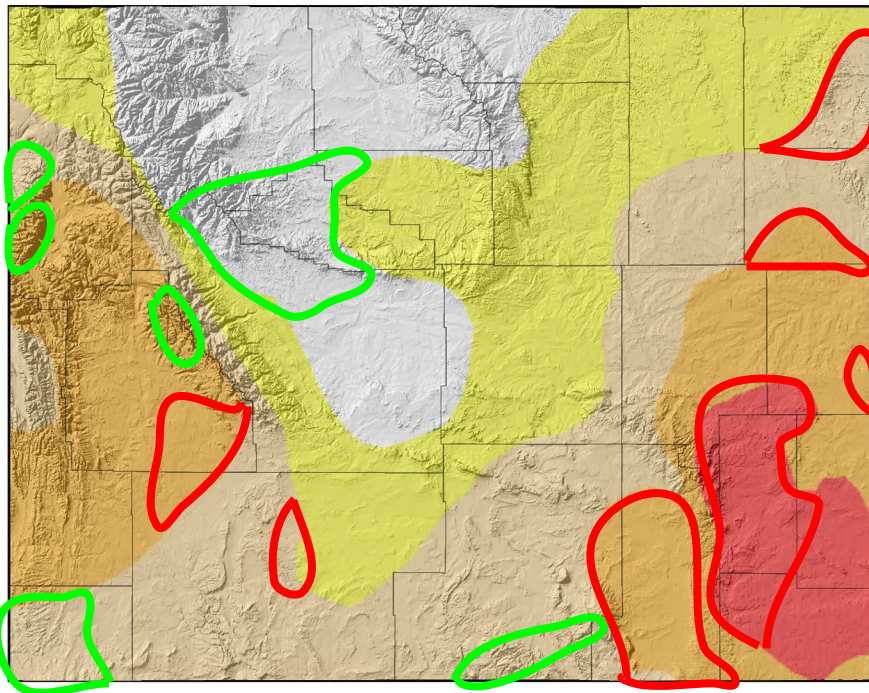


Current Conditions

US Drought Monitor for November 15, 2022

(Released Thursday, November 17, 2022)
Valid 8 a.m. EDT

US Drought Monitor for 15 Nov 2022



US Drought Monitor	
24.78%	D0 Abnormally Dry
28.19%	D1 Moderate Drought
22.18%	D2 Severe Drought
8.45%	D3 Extreme Drought
0.00%	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

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

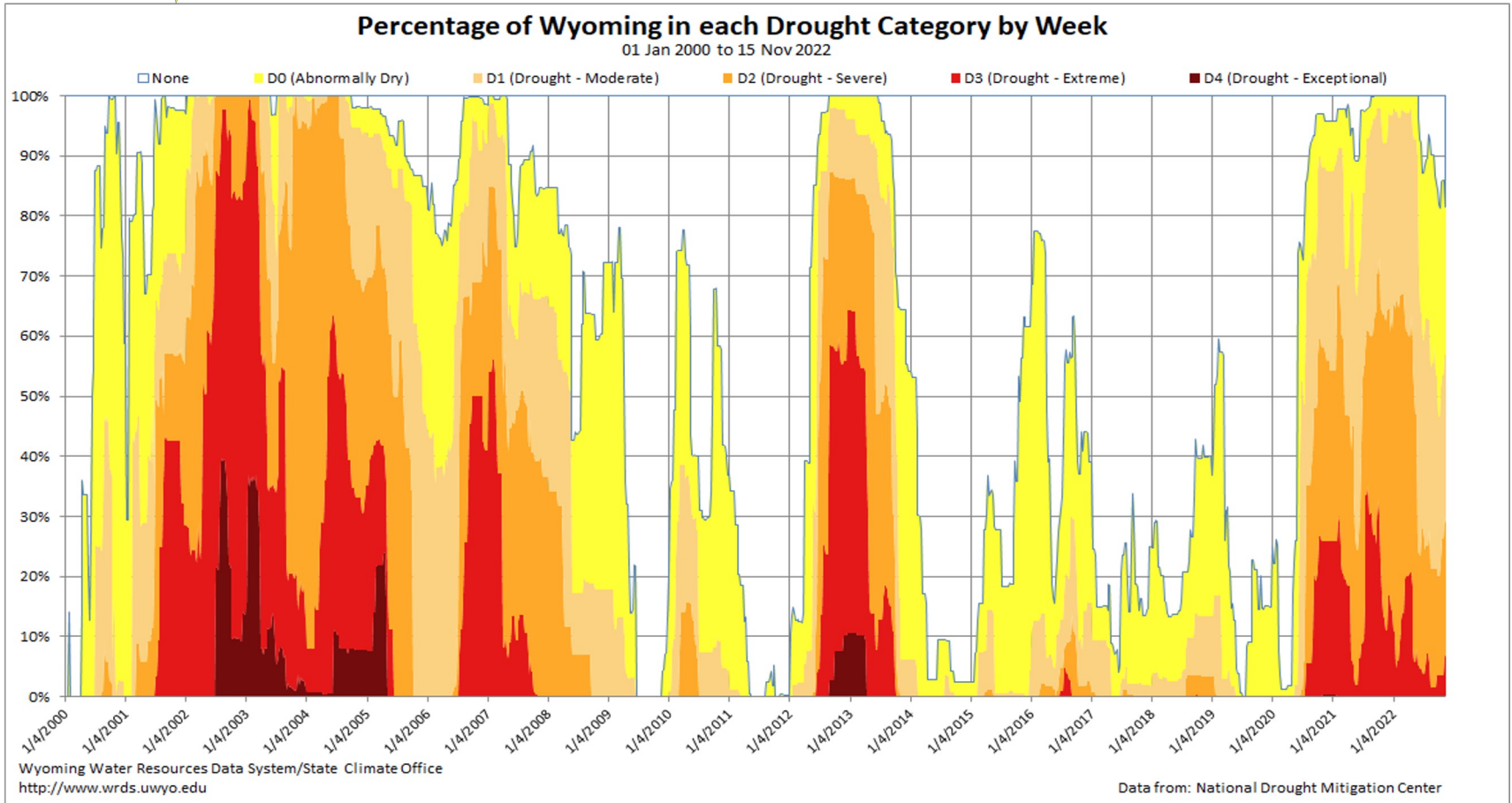
Improvements and **degradations** since the last webinar. Recent precipitation in the west resulted in **Improvements** in some areas. **Degradations** in the east and southeast continue resulting from continued lack of precipitation.

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 17 Nov 2022 <http://www.wrds.uwyo.edu>

<https://droughtmonitor.unl.edu>

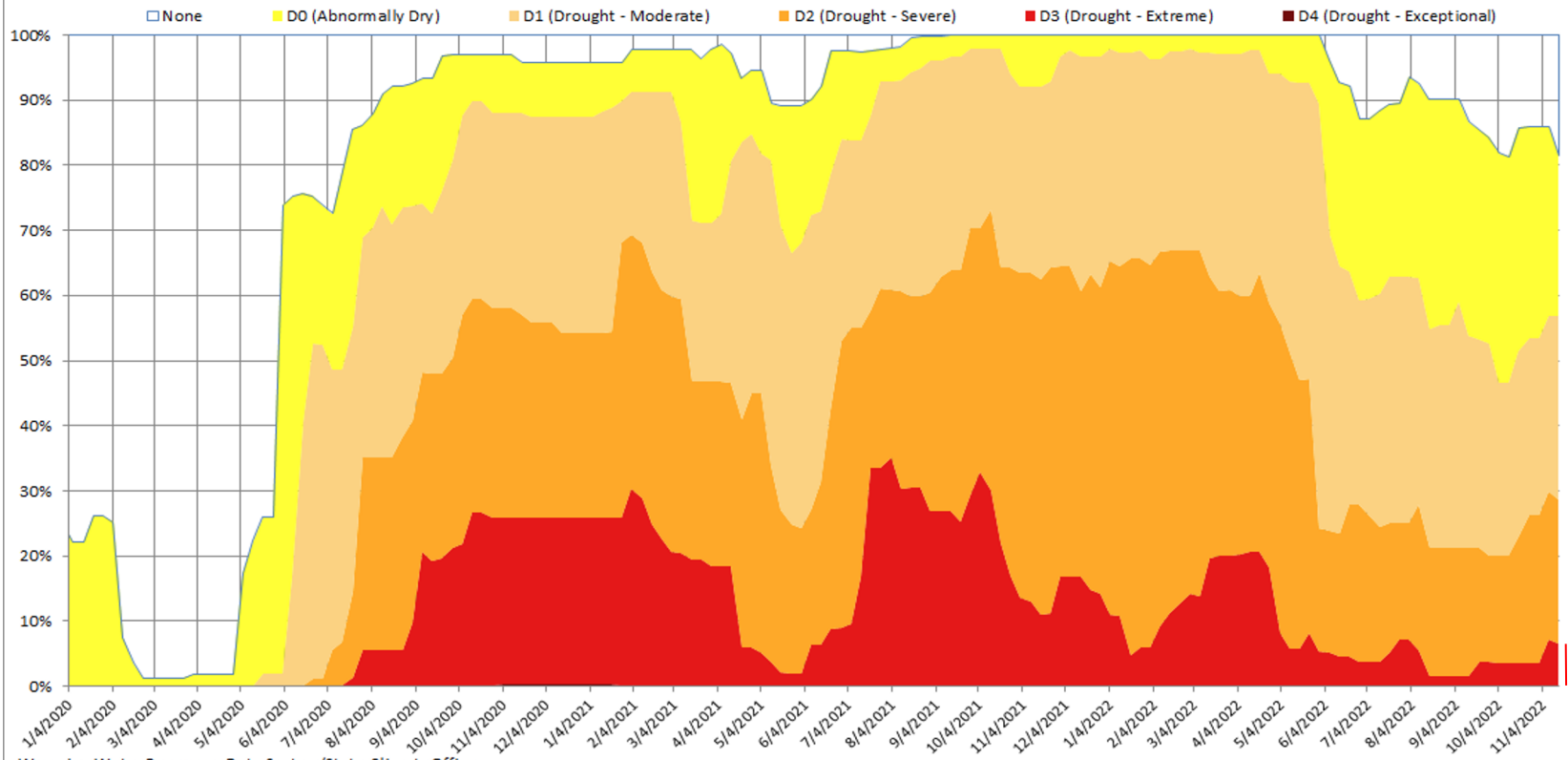
Wyoming Area Affected: 81.59% D0-D4 ; 56.81% D1-D4





Percentage of Wyoming in each Drought Category by Week

01 Jan 2020 to 15 Nov 2022



Wyoming Water Resources Data System/State Climate Office
<http://www.wrds.uwyo.edu>

Data from: National Drought Mitigation Center

14-Day Precipitation Percentile (03 Nov 2022 to 16 Nov 2022)

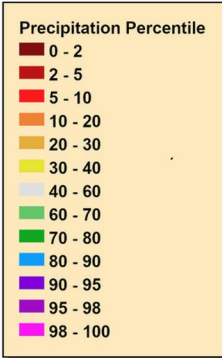
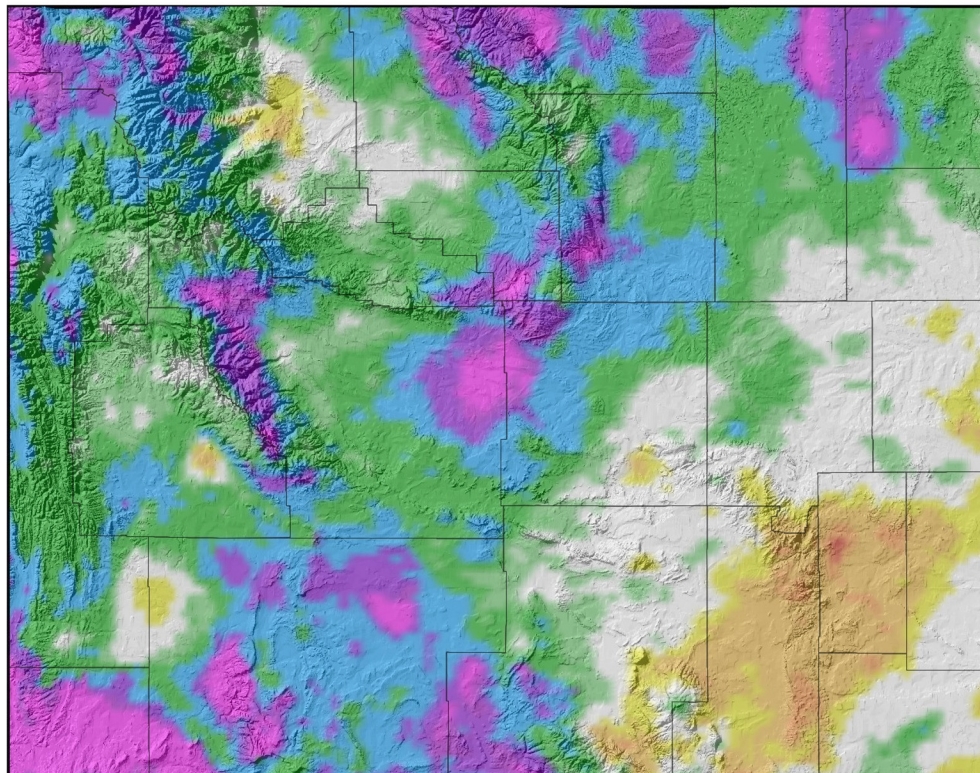
14-Day Precipitation (Percentile) for 03 Nov 2022 to 16 Nov 2022

Above Median:

- Much of Wyoming

Below Median (Areas of Concern):

- Southeast



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



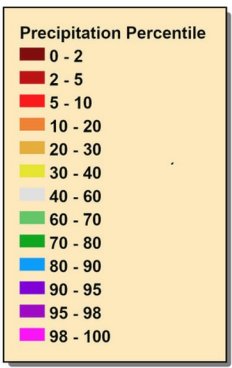
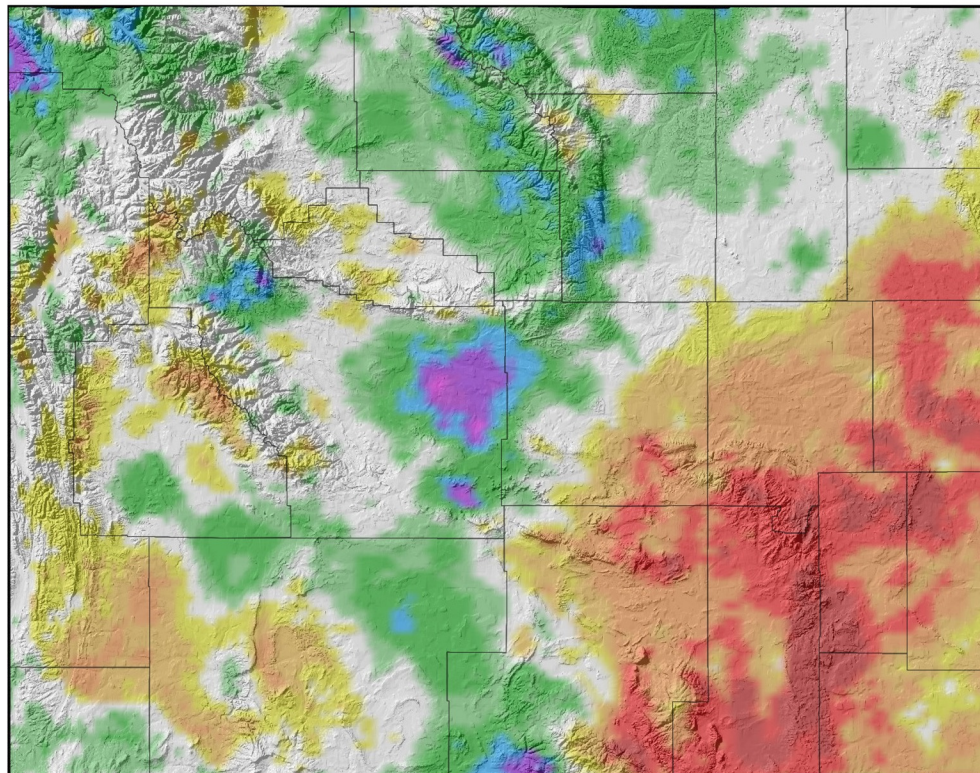
Map Prepared by:
Wyoming State Climate Office
<http://www.wrds.uwyo.edu>



Provisional data, subject to revision

90-Day Precipitation Percentile (19 Aug 2022 to 16 Nov 2022)

90-Day Precipitation (Percentile) for 19 Aug 2022 to 16 Nov 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

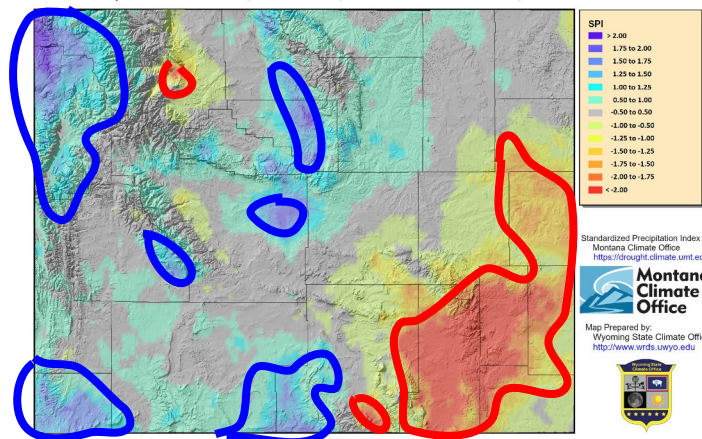
Above Median:

- Far NW/SW
- Central (N to S)

Below Median (Areas of Concern):

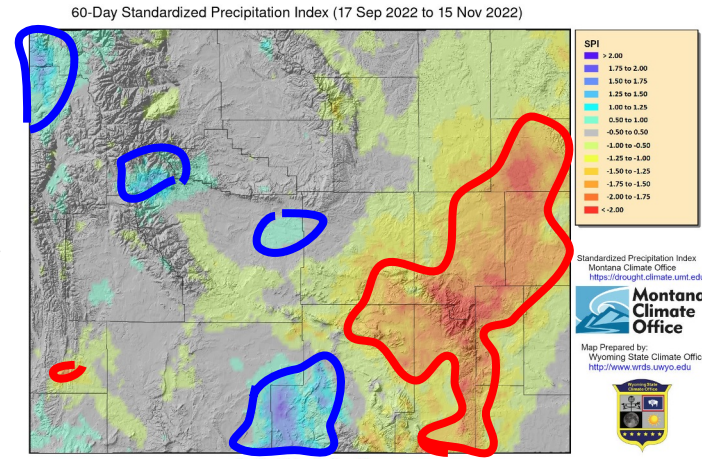
- Southeast Quarter
- Weston

30-Day
→



Standardized Precipitation Index Created by Montana Climate Office <https://drought.climate.umt.edu>
Map Created 17 Nov 2022 <http://www.wrds.uwyo.edu>

60-Day
→

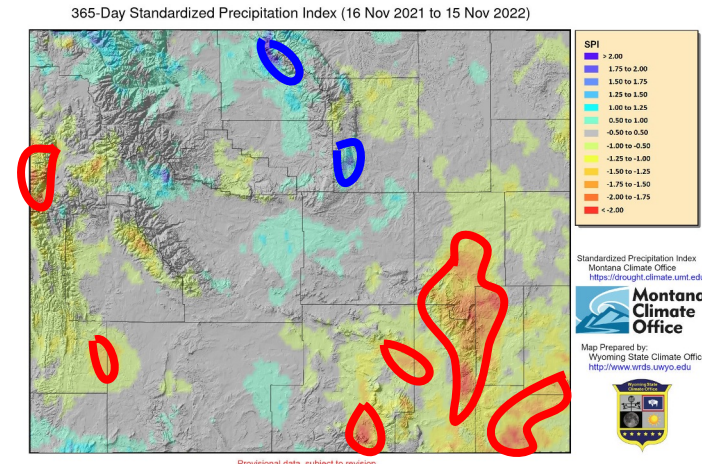


Standardized Precipitation Index Created by Montana Climate Office <https://drought.climate.umt.edu>
Map Created 17 Nov 2022 <http://www.wrds.uwyo.edu>

Standardized Precipitation Index (SPI)

Short term: West and South Central/Central
Long term: East/Southeast.

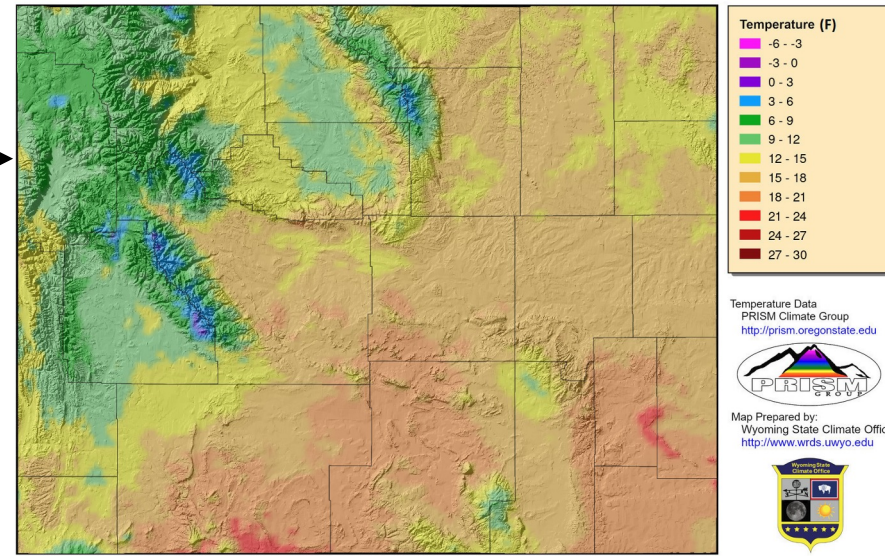
1-Year
→



Standardized Precipitation Index Created by Montana Climate Office <https://drought.climate.umt.edu>
Map Created 17 Nov 2022 <http://www.wrds.uwyo.edu>

14-Day Average Minimum Temperature (03 Nov to 16 Nov)

- Night time lows dropping below freezing Statewide. Mostly below 20F

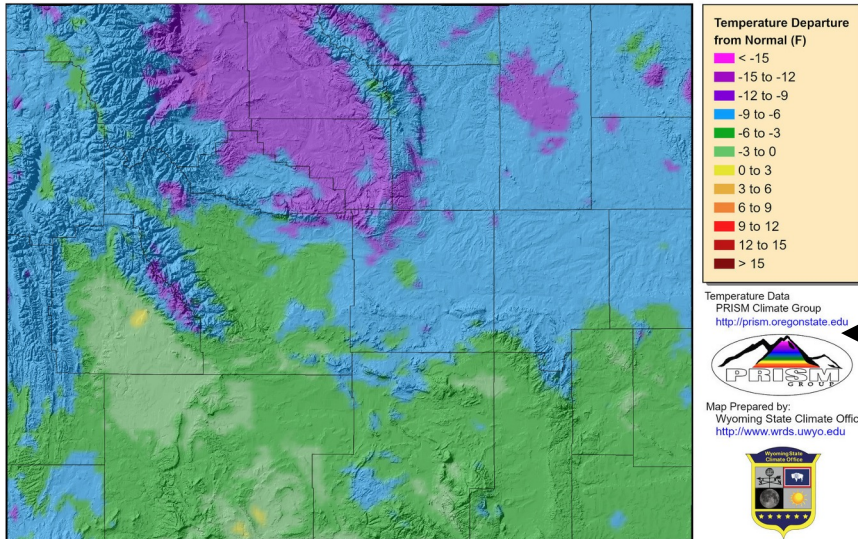


Temperature Data
PRISM Climate Group
<http://prism.oregonstate.edu>

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



14-Day Average Minimum Temperature (Departure from 1991-2020 Average) for 03 Nov 2022 to 16 Nov 2022



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

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



14-Day *Departure from Normal* Average Minimum Temperature

- Isolated pockets +/-3F of average
- Bighorn Basin up to 12F below average
- Generally North 6-9F below average
South 3-6F below average

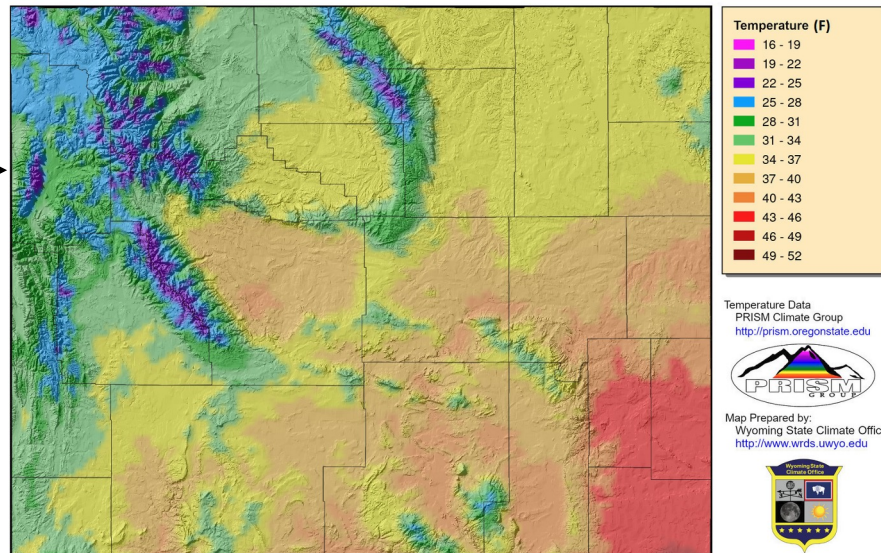
Provisional data, subject to revision

Daily Temperature data from PRISM Climate Group, Copyright ©2021, PRISM Climate Group, Oregon State University, <http://prism.oregonstate.edu>
Map Created 17 Nov 2022 <http://www.wrds.uwyo.edu>
Temperature averages created from PRISM daily temperature grids

Provisional data, subject to revision

14-Day Average **Maximum** Temperature (03 Nov to 16 Nov)

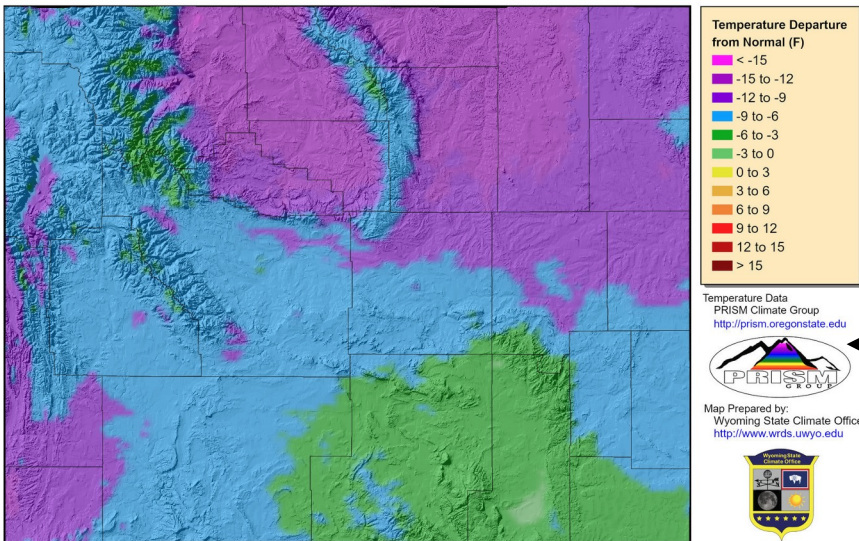
- Lower elevations above freezing still
- Mid 40s in southeast



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 17 Nov 2022 <http://www.wrds.uwyo.edu>
Temperature averages created from PRISM daily temperature grids

14-Day Average Maximum Temperature (Departure from 1991-2020 Average) for 03 Nov 2022 to 16 Nov 2022



Provisional data, subject to revision

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

- Lower Elevation North & West 9-12F below avg
- Albany/Carbon/Laramie Counties 3-6F below avg
- Rest 6-9F below average

Soil Moisture Percentile

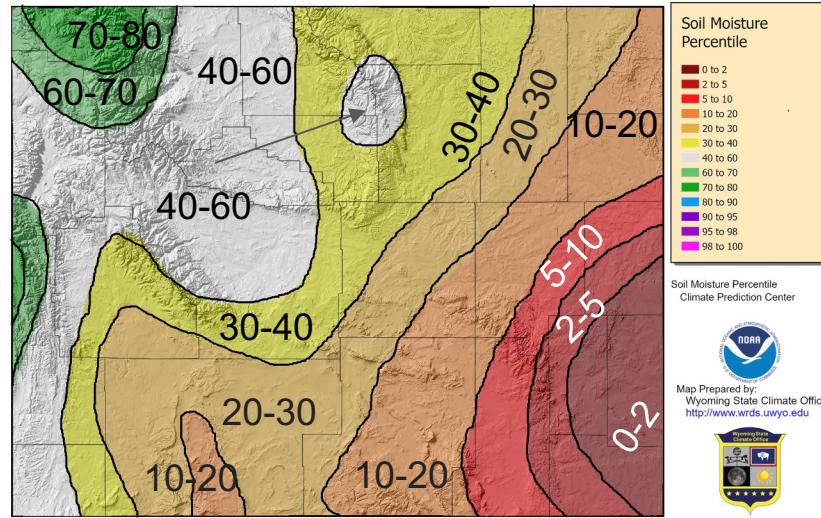
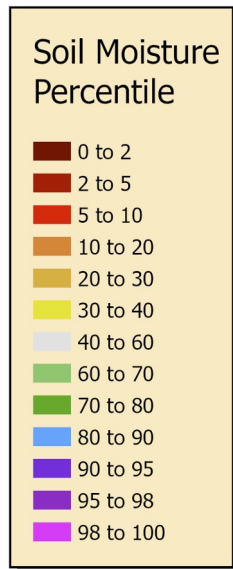
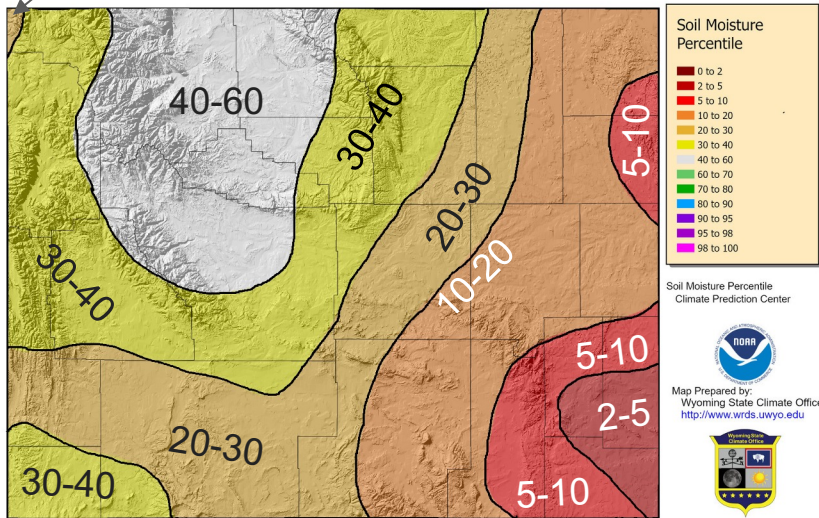
Two Weeks Ago

16 November 2022

20-30

Soil Moisture Percentile for 03 Nov 2022

Soil Moisture Percentile for 16 Nov 2022



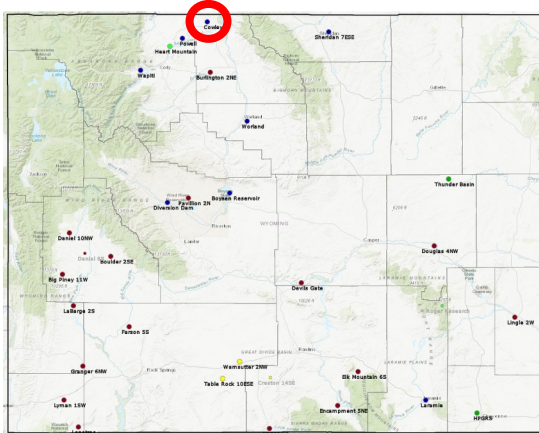
Modeled Soil Moisture Percentile https://www.cpc.ncep.noaa.gov/products/GIS/GIS_DATA/USDM_Products/soil/soil_percentile.php
Map Created 04 Nov 2022 <http://www.wrds.uwyo.edu>

Modeled Soil Moisture Percentile https://www.cpc.ncep.noaa.gov/products/GIS/GIS_DATA/USDM_Products/soil/soil_percentile.php
Map Created 17 Nov 2022 <http://www.wrds.uwyo.edu>

Provisional data, subject to revision

Provisional data, subject to revision

The view from Cowley Station (1315 - 16 Nov 2022)



Cowley (CYMW4): 16 Nov 2022, 1315 MST

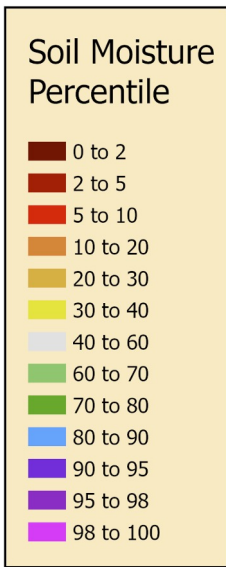
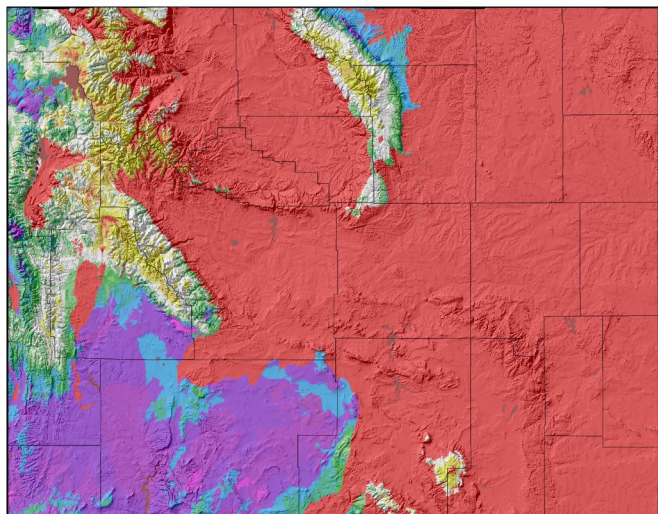
Snow

Two Weeks Ago

November 17, 2022

Snow Water Equivalent Percentile for 03 Nov 2022 (2004-2021 Period)

Snow Water Equivalent Percentile for 17 Nov 2022 (2004-2021 Period)

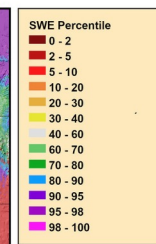
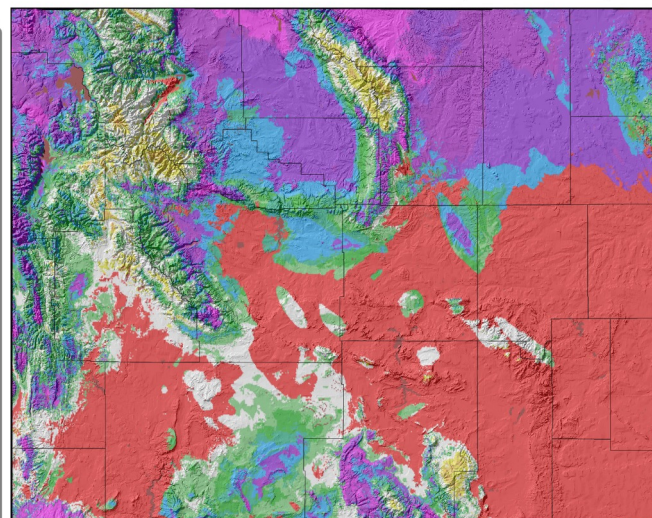


Snow Water Equivalent
NOHRSC
<https://doi.org/10.7265/N5TB14TC>

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



Provisional data, subject to revision



Snow Water Equivalent
NOHRSC
<https://doi.org/10.7265/N5TB14TC>

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



Provisional data, subject to revision

Modeled Snow Water Equivalent from National Operational Hydrologic Remote Sensing Center, 2004, Snow Data Assimilation System (SNOWAS) 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 17 Nov 2022 - <http://www.wrds.uwyo.edu>

Modeled Snow Water Equivalent from National Operational Hydrologic Remote Sensing Center, 2004, Snow Data Assimilation System (SNOWAS) 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 03 Nov 2022 - <http://www.wrds.uwyo.edu>

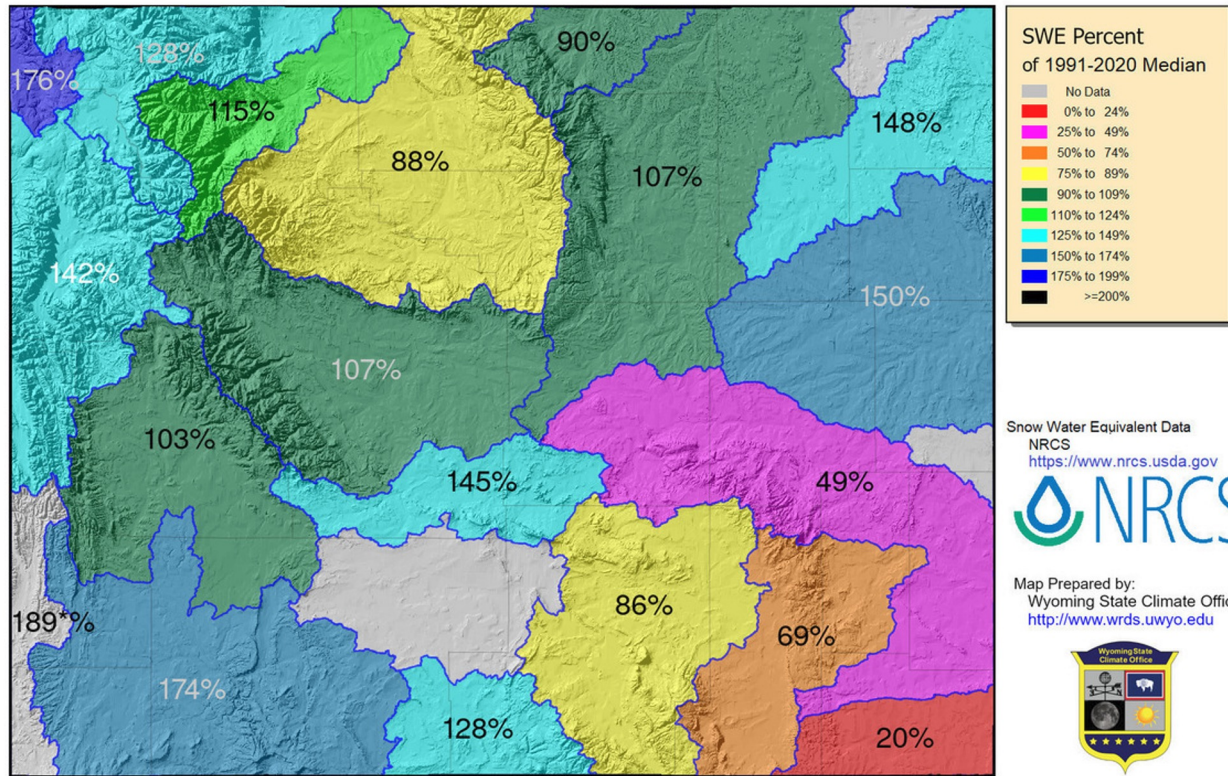
Losses in the Green, but improvements in many other areas – except central and southeast Wyoming.

Snow Water Equivalent by Basin (17 Nov 2022)

Snow Water Equivalent Percent of Median (1991-2020) for 17 Nov 2022

Still early in the season.

Upper Bear River Basin is still “asterisked” meaning that, while a percentage **MAY** be calculated, it is of little significant value at this point.



Provisional data, subject to revision

Basin Snow Water Equivalent Data from Natural Resources Conservation Service Water and Climate Center <https://www.nrcs.usda.gov>
Map created by Wyoming State Climate Office 17 Nov 2022

* Percentages denoted by an asterisk represent data that may not provide a valid measure of conditions. This is most usually seen near the end of the snow season where normal values may be very low or the melt out curve is so steep that a slight variation in days may result in abnormally high or low percentages.

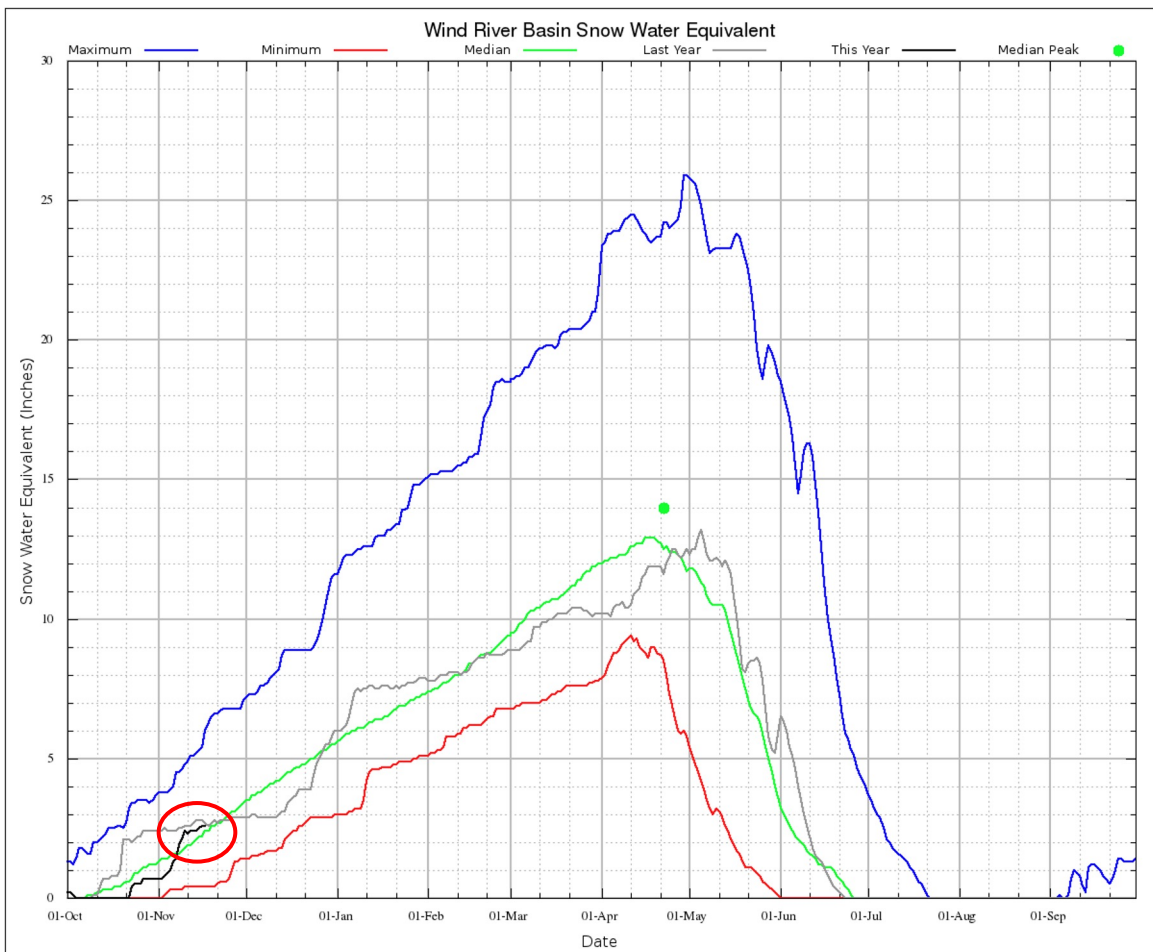
Snow Water Equivalent Data
NRCS
<https://www.nrcs.usda.gov>



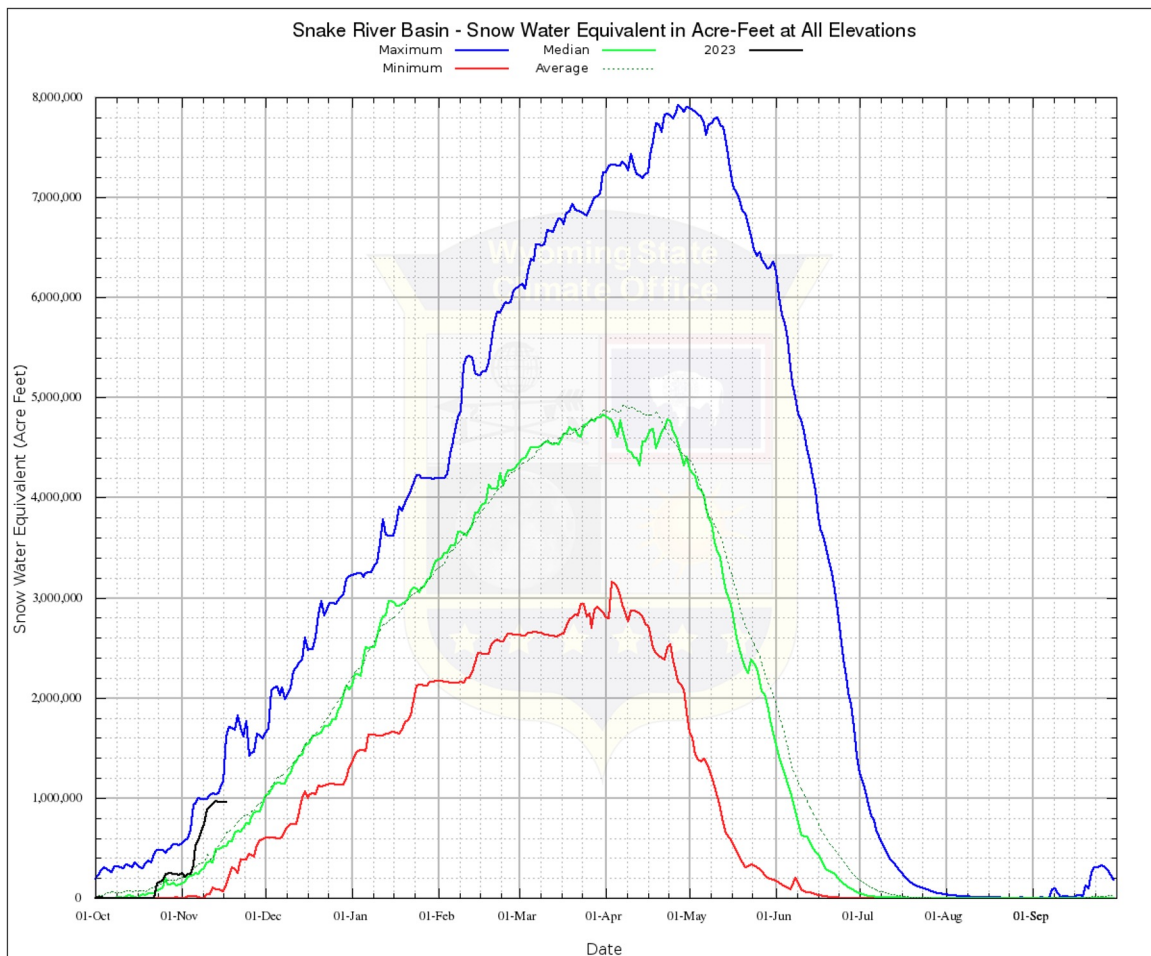
Map Prepared by:
Wyoming State Climate Office
<http://www.wrds.uwyo.edu>



Wind River Basin Max, Min, Median snowpack through the year with last year's and this year's trace.



Snake River Basin Max, Min, Median, and Average snowpack volume through the year with this year's trace.

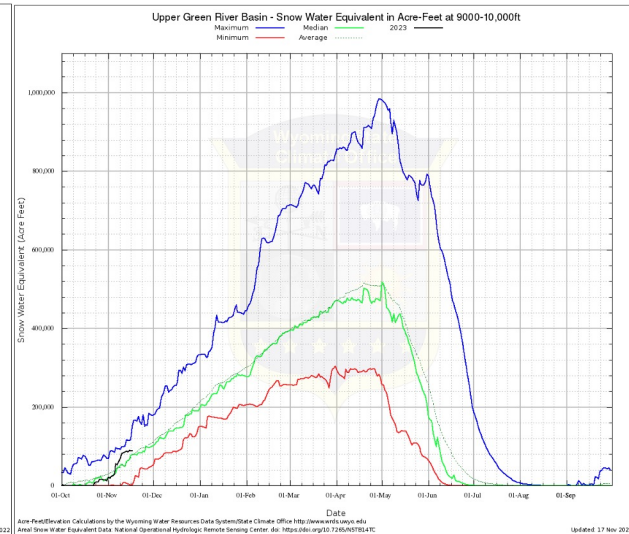
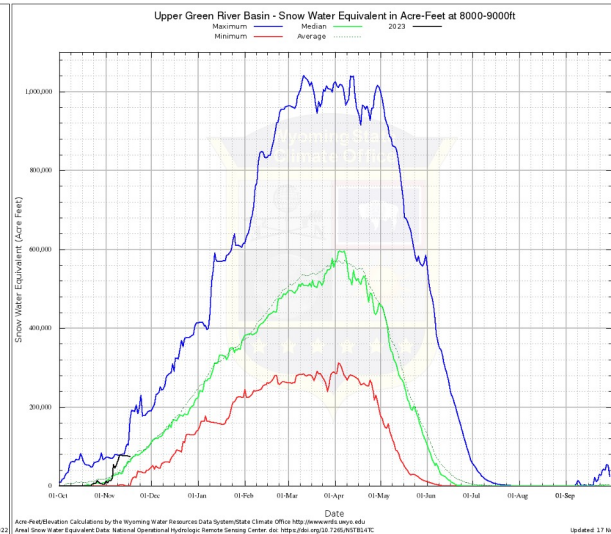
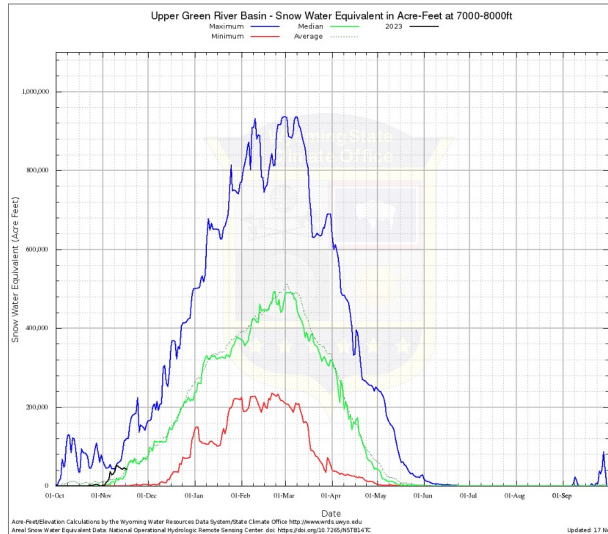


Snow Water Volume Upper Green by Elevation (17 Nov 2022)

7000-8000 ft

8000-9000ft

9000-10,000ft



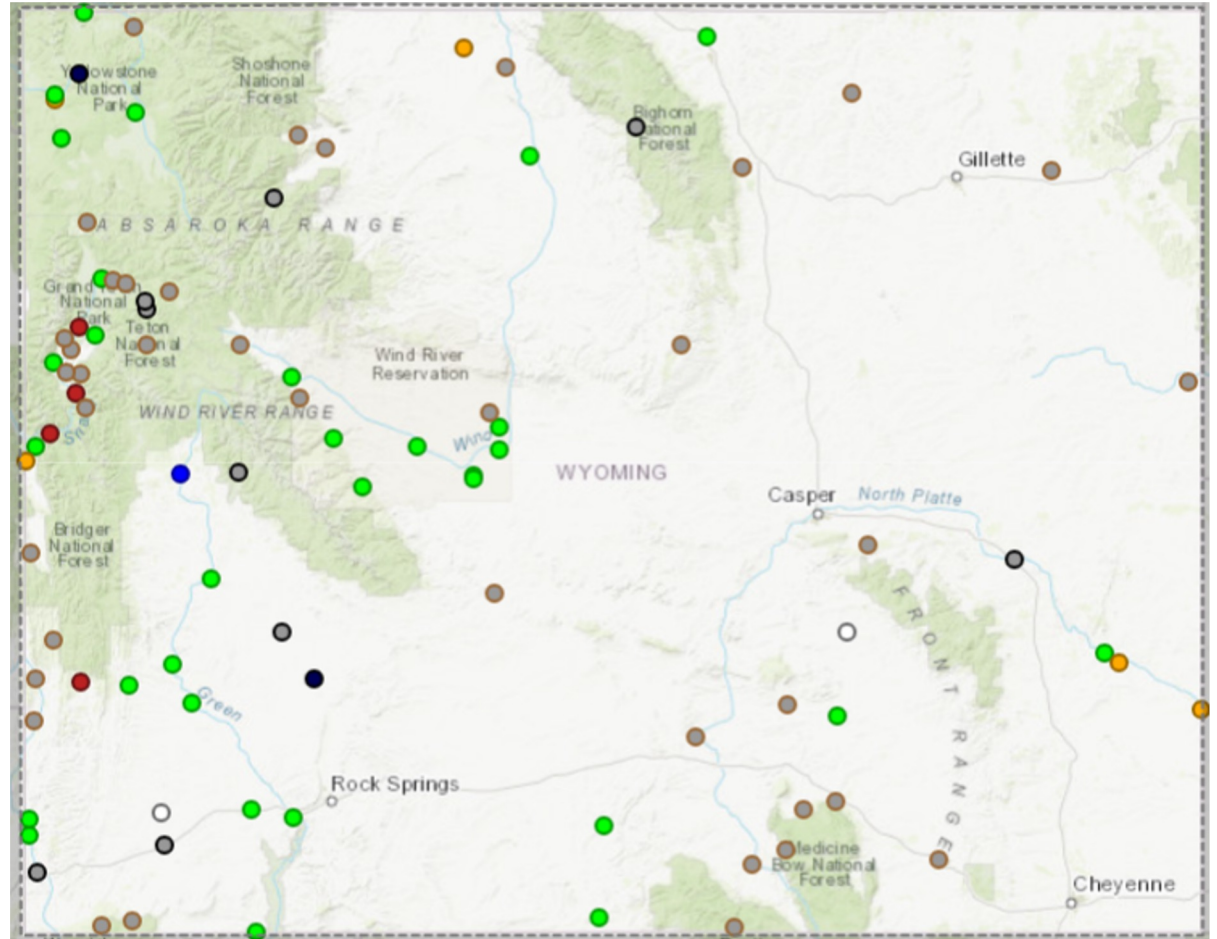
Raw Volumes - Does not take into account the three **-ations**: sublimation, evaporation, infiltration

Current Streamflow Conditions (Nov 17, 2022)

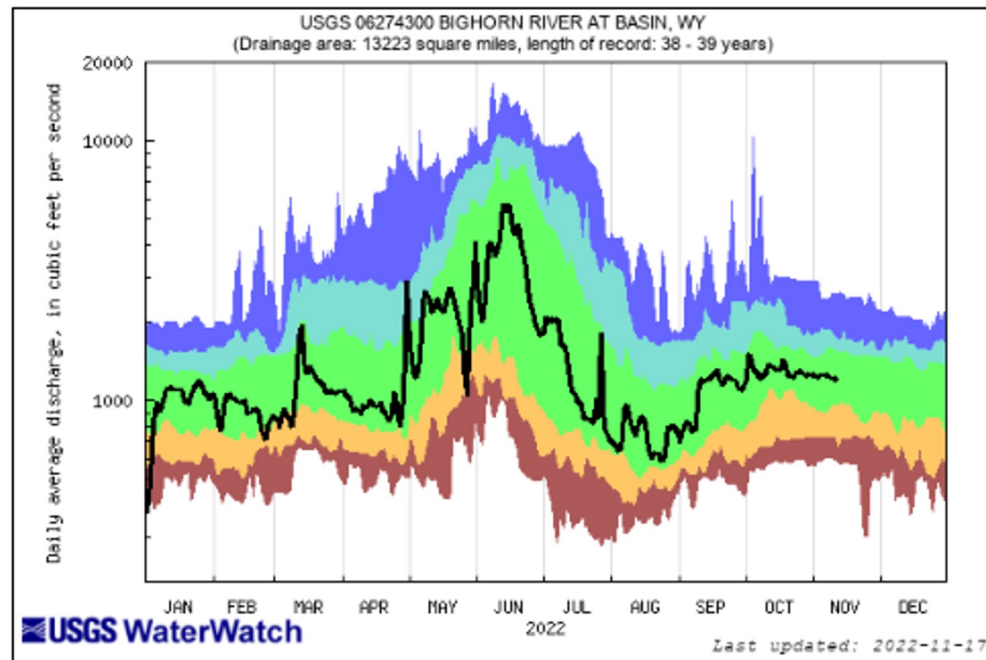
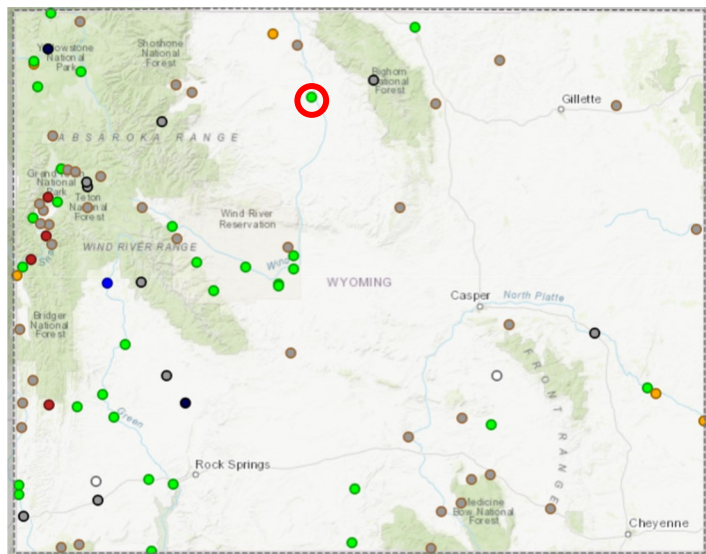
Streamflow Status

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



Select WY Streamflows

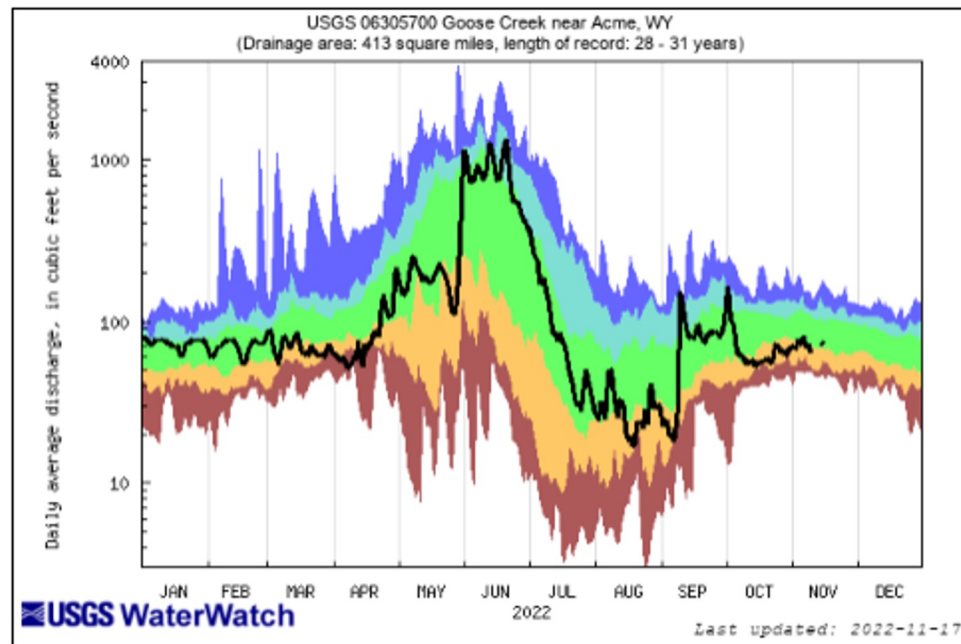
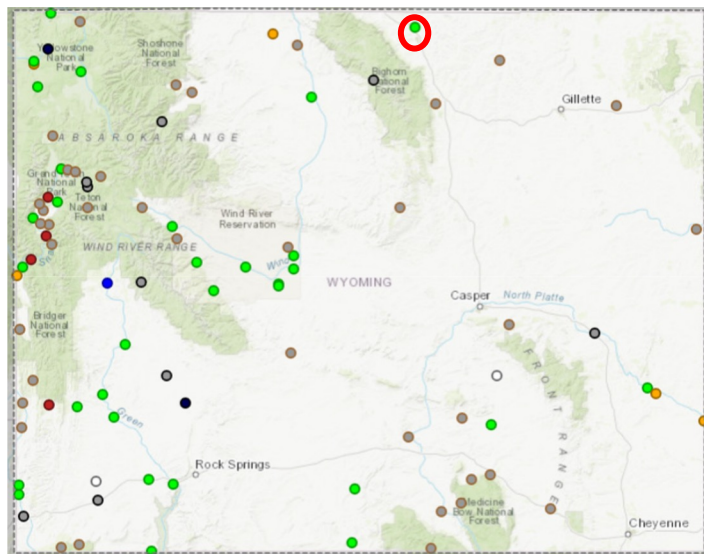


<https://dashboard.waterdata.usgs.gov/>

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

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

Select WY Streamflows



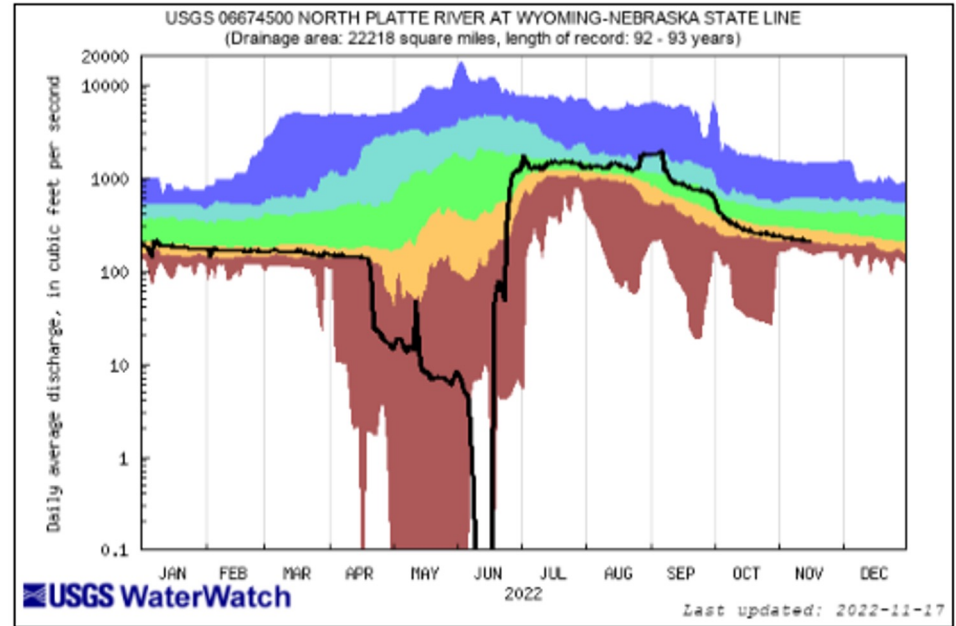
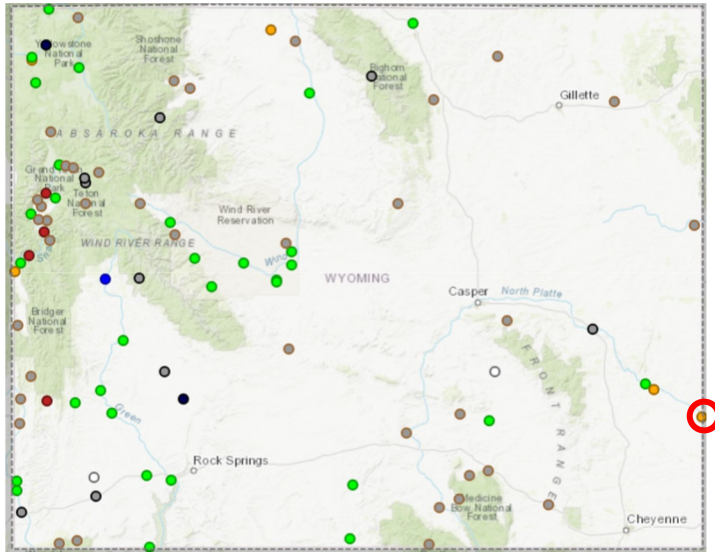
<https://dashboard.waterdata.usgs.gov/>

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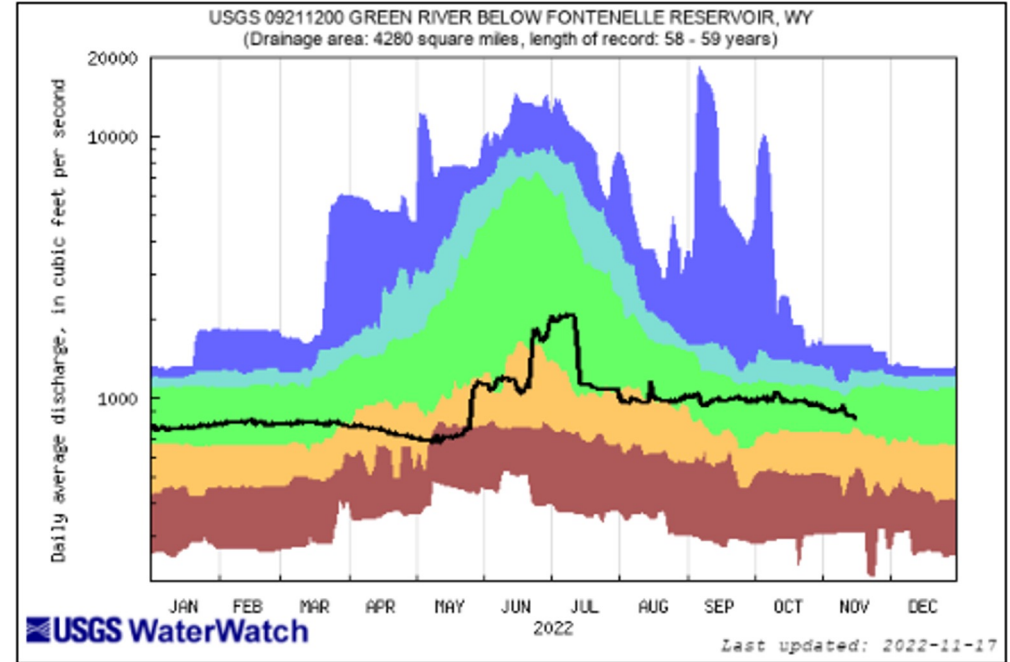
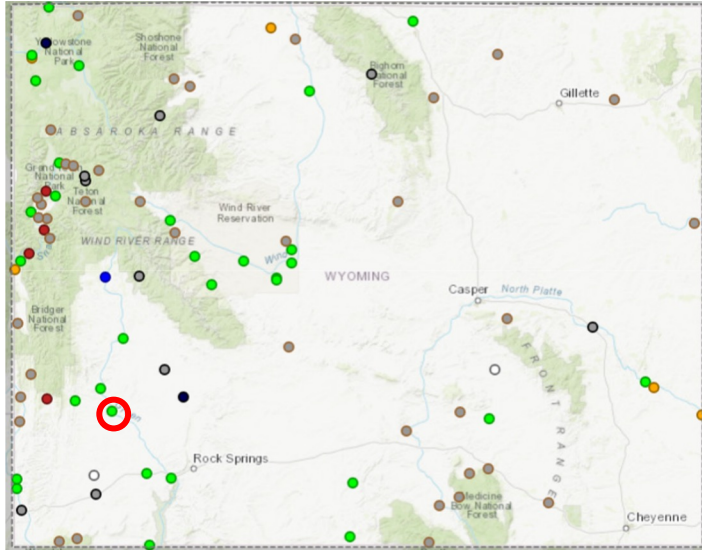


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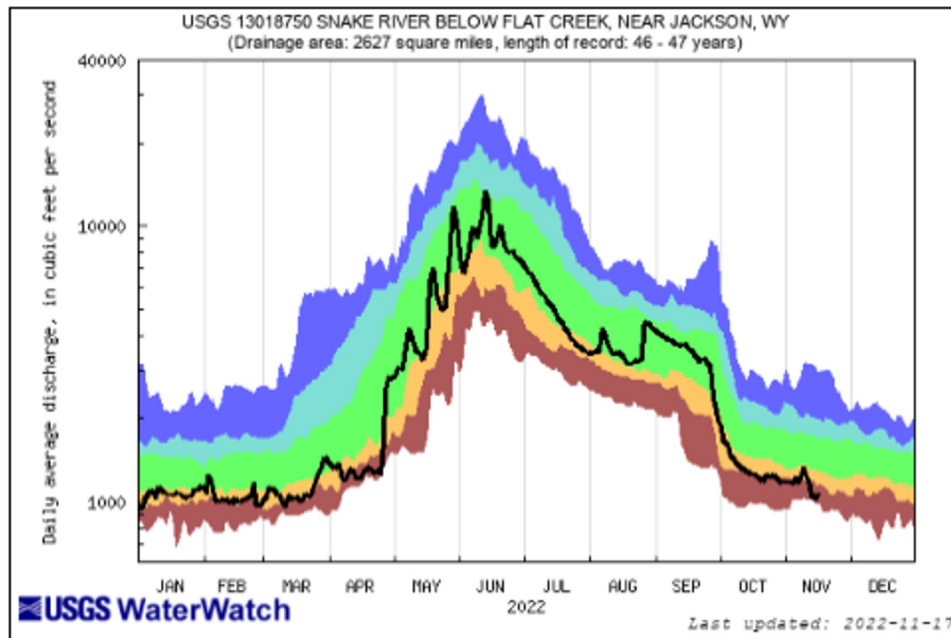
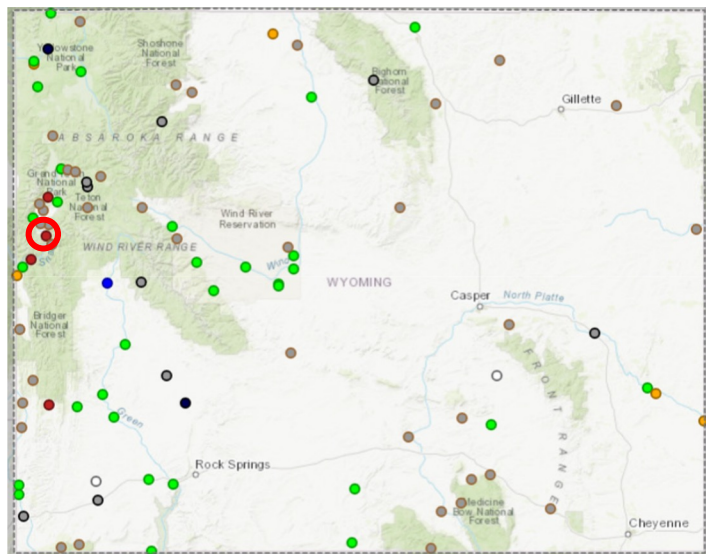
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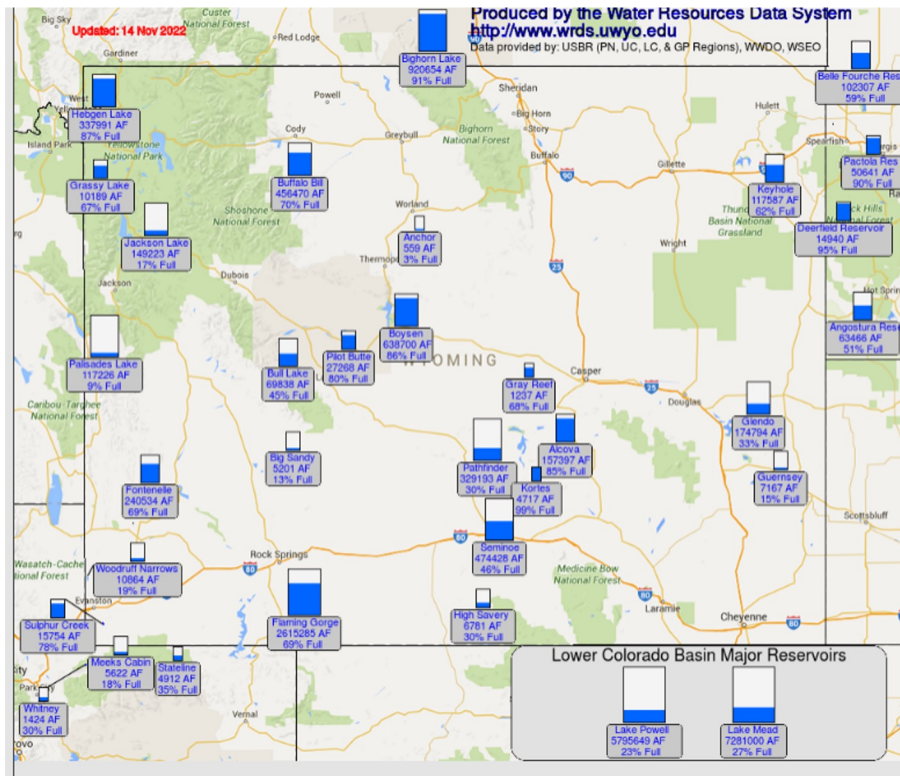
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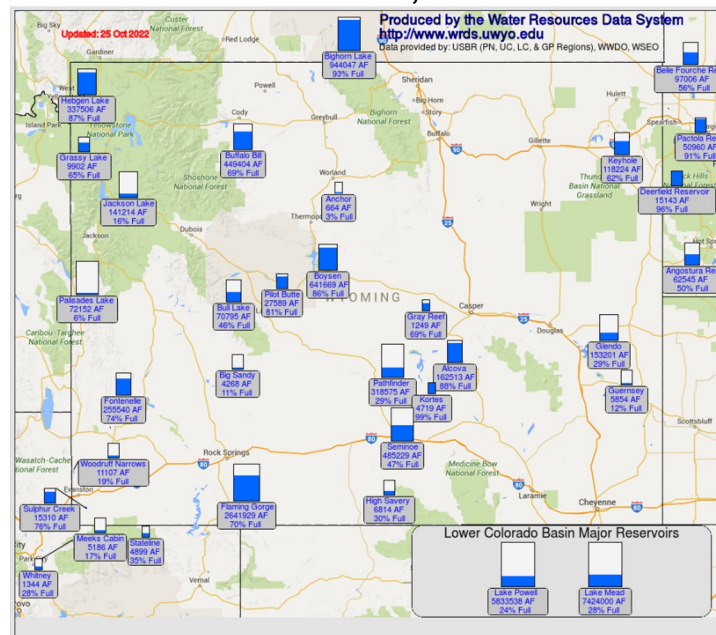
WY Reservoirs (Nov 17, 2022)

Nov 17, 2022

- Minor changes in contents



Oct 27, 2022





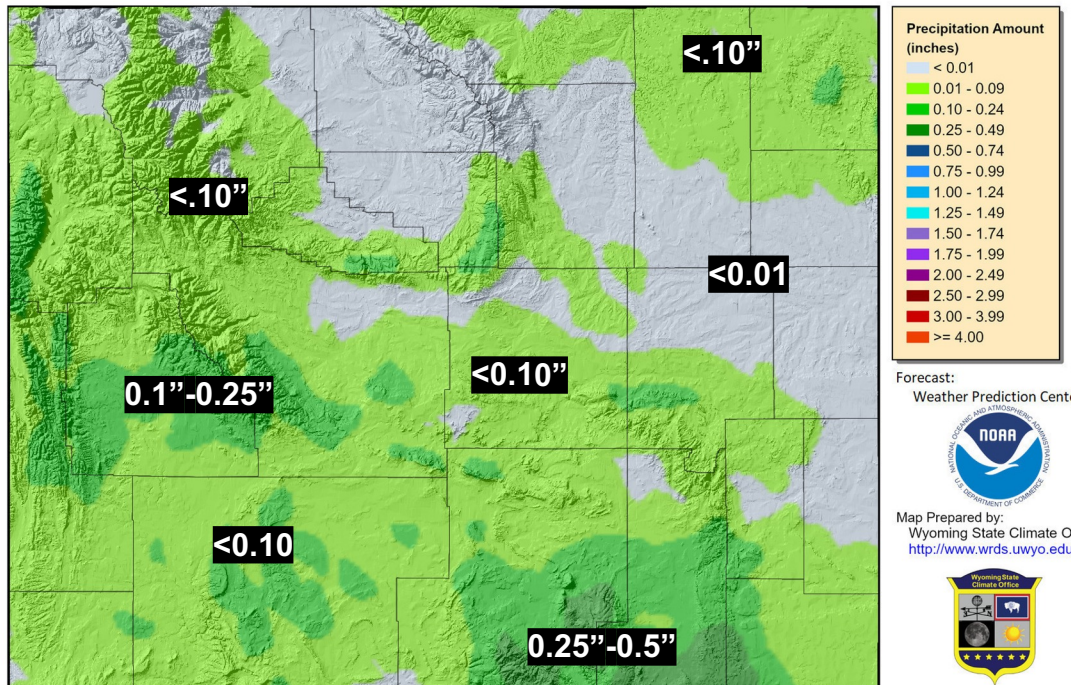
Forecasts & Outlooks



7-Day Total Precipitation Forecast

November 17-November 24

7-Day Quantitative Precipitation Forecast 17 Nov 2022



Provisional data, subject to revision

- Precipitation mostly all focused for today with another possible round of snow next Wednesday.
- Light to Moderate snow Today
 - Briefly heavy in far SE WY through early afternoon and ending through the evening.
- Dry Friday through Tuesday.

Friday, November 18, 2022

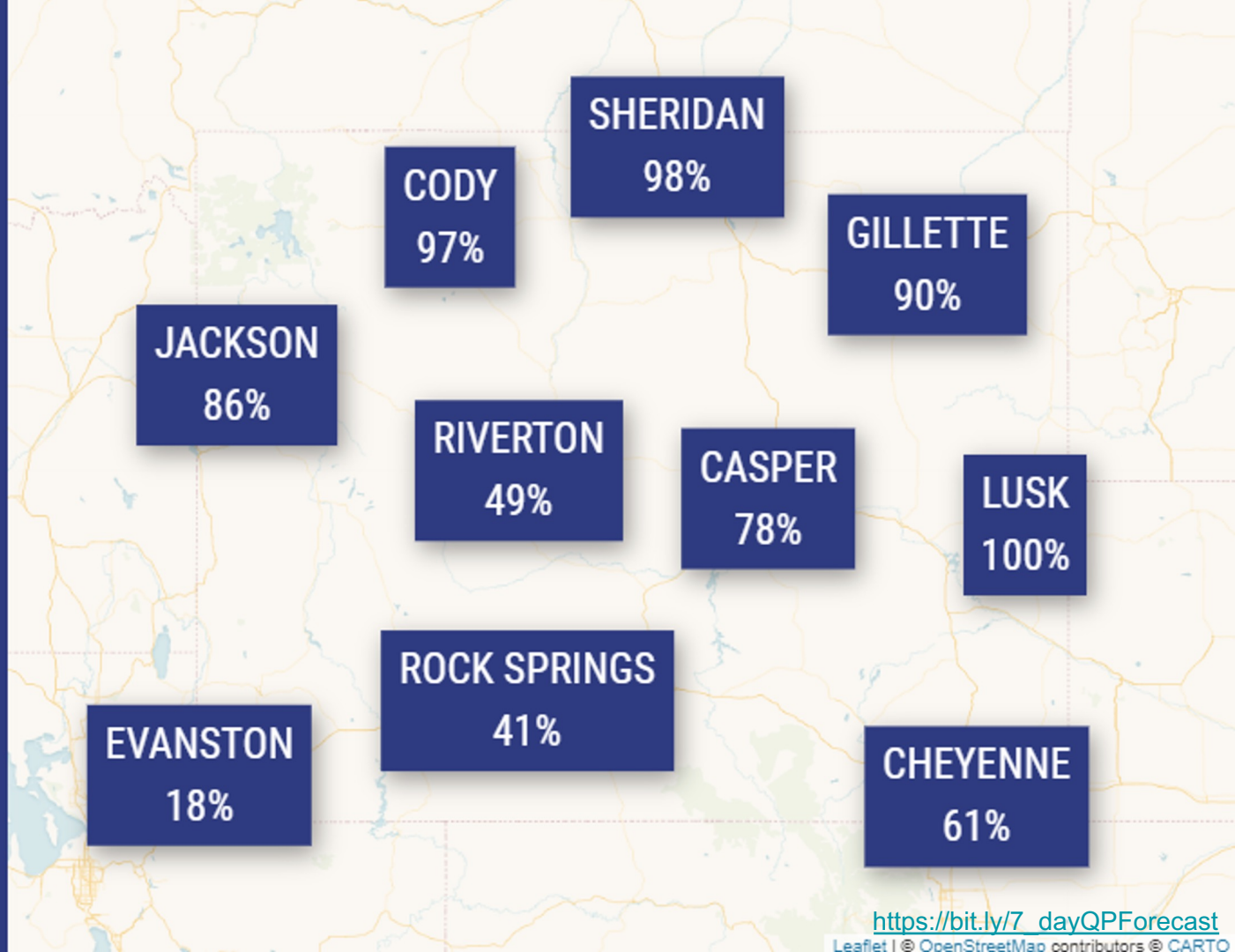
Chance of Low Temp 0°F or Below

This graphic displays the probability of the temperature reaching or falling below 0°F.

Turning very Cold Friday



Issued: Thu, Nov 17, 2022, 8 AM



https://bit.ly/7_dayQPFforecast

Leaflet | © OpenStreetMap contributors © CARTO



8-14 Day Temp & Precip Outlook

https://bit.ly/CPC8_14Day

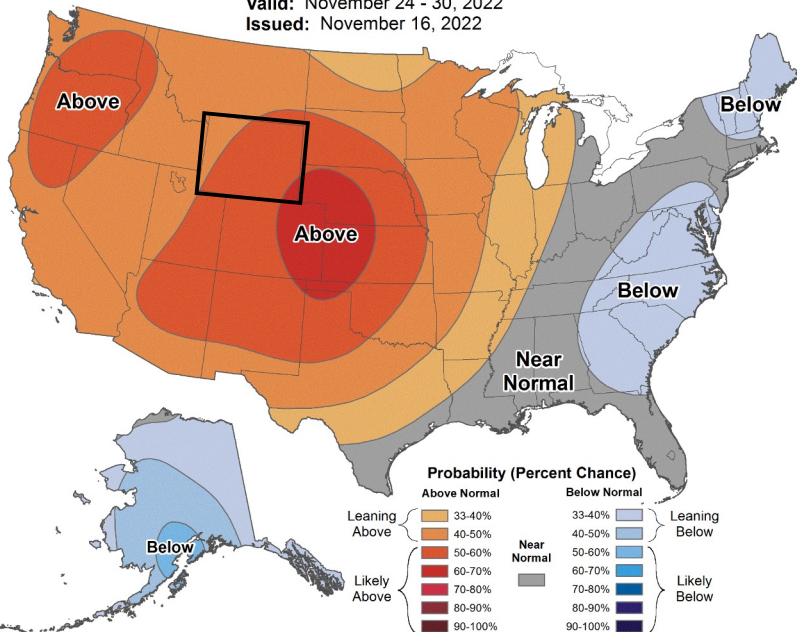
November 24-30



8-14 Day Temperature Outlook



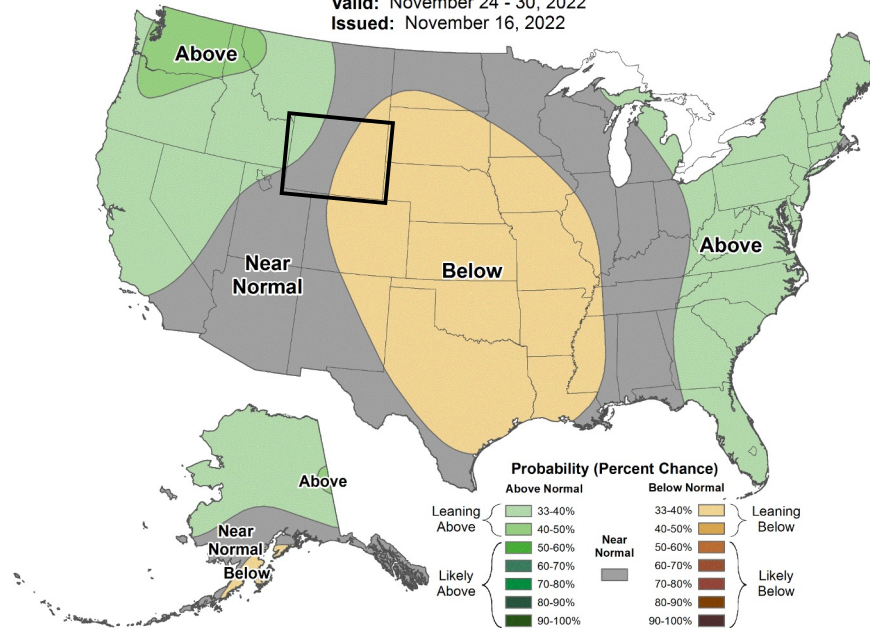
Valid: November 24 - 30, 2022
Issued: November 16, 2022



8-14 Day Precipitation Outlook



Valid: November 24 - 30, 2022
Issued: November 16, 2022



Favored signal for above normal temperatures across all of WY

Split signal of slightly below normal precipitation east and slightly above west across Wyoming



3-Month Temp & Precip Outlook

December-January-February 2022-2023

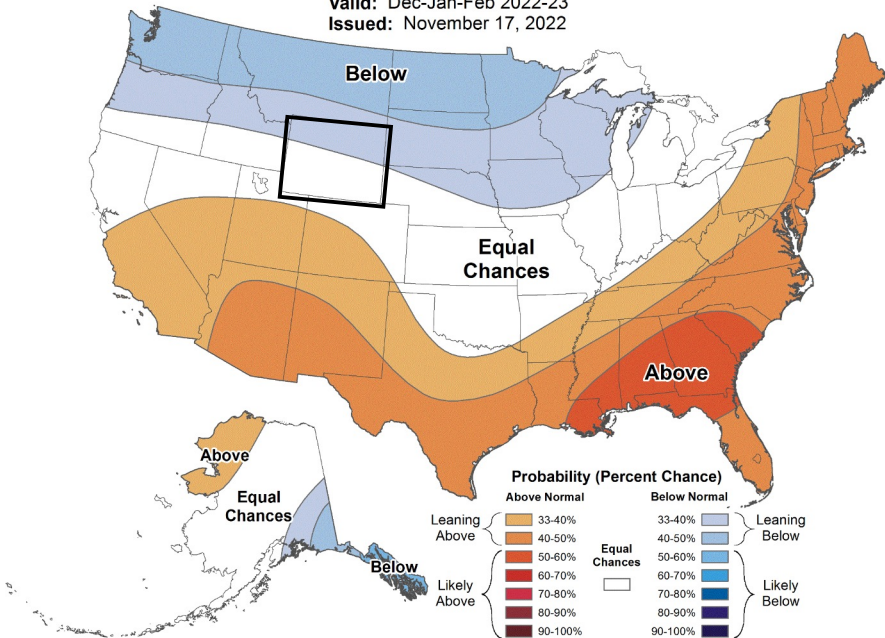
https://bit.ly/CPC_Seasonal



Seasonal Temperature Outlook



Valid: Dec-Jan-Feb 2022-23
Issued: November 17, 2022



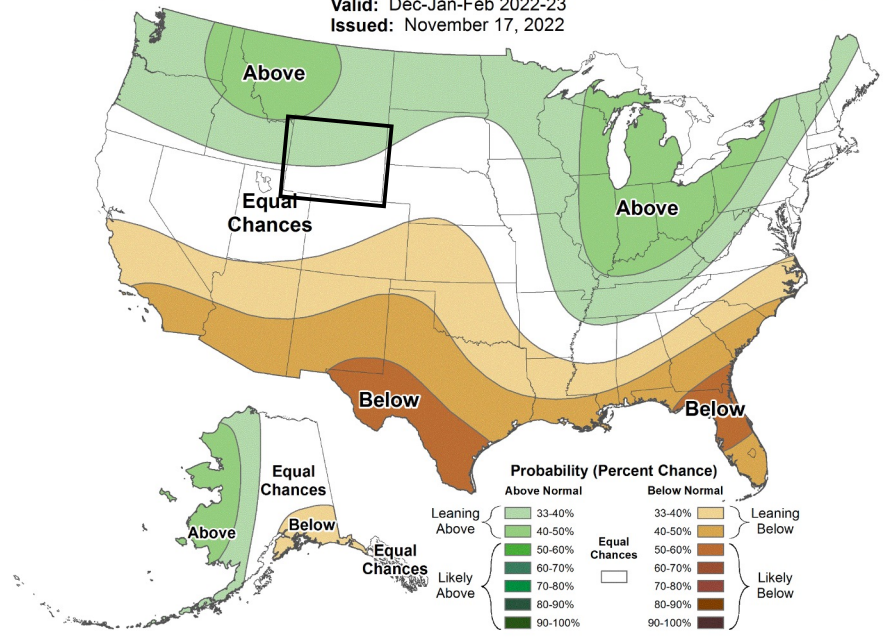
Favored slightly below normal temperatures signal for north tier of WY, otherwise near normal elsewhere



Seasonal Precipitation Outlook



Valid: Dec-Jan-Feb 2022-23
Issued: November 17, 2022



Weak above normal signal for north tier of Wyoming, otherwise neutral

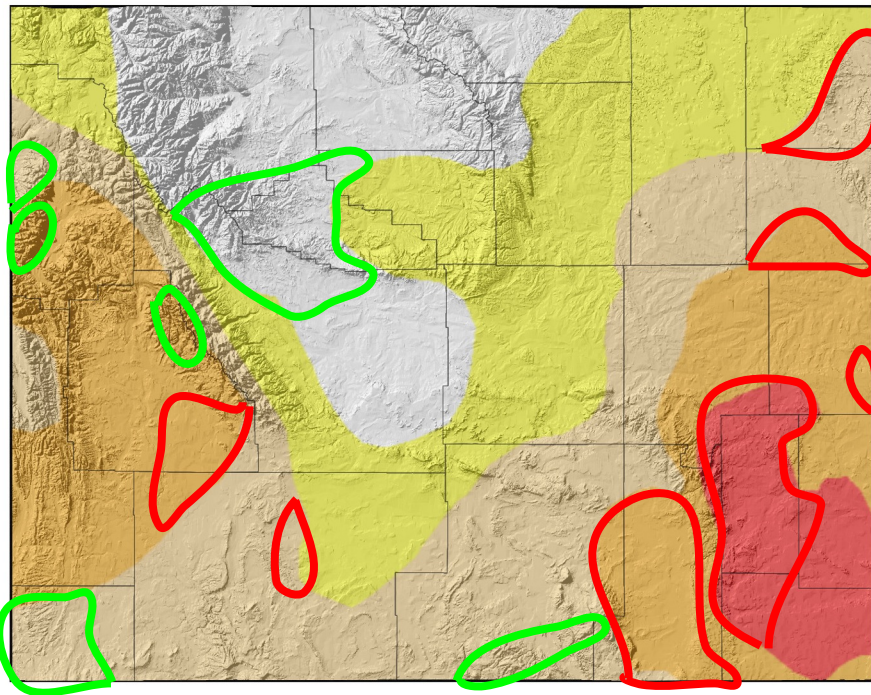


How to get involved ...

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(Released Thursday, November 17, 2022)
Valid 8 a.m. EDT

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D4 (Exceptional Drought)	0 to 2

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

Improvements and **degradations** since the last webinar. Recent precipitation in the west resulted in **Improvements** in some areas. **Degradations** in the east and southeast continue resulting from continued lack of precipitation.

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>

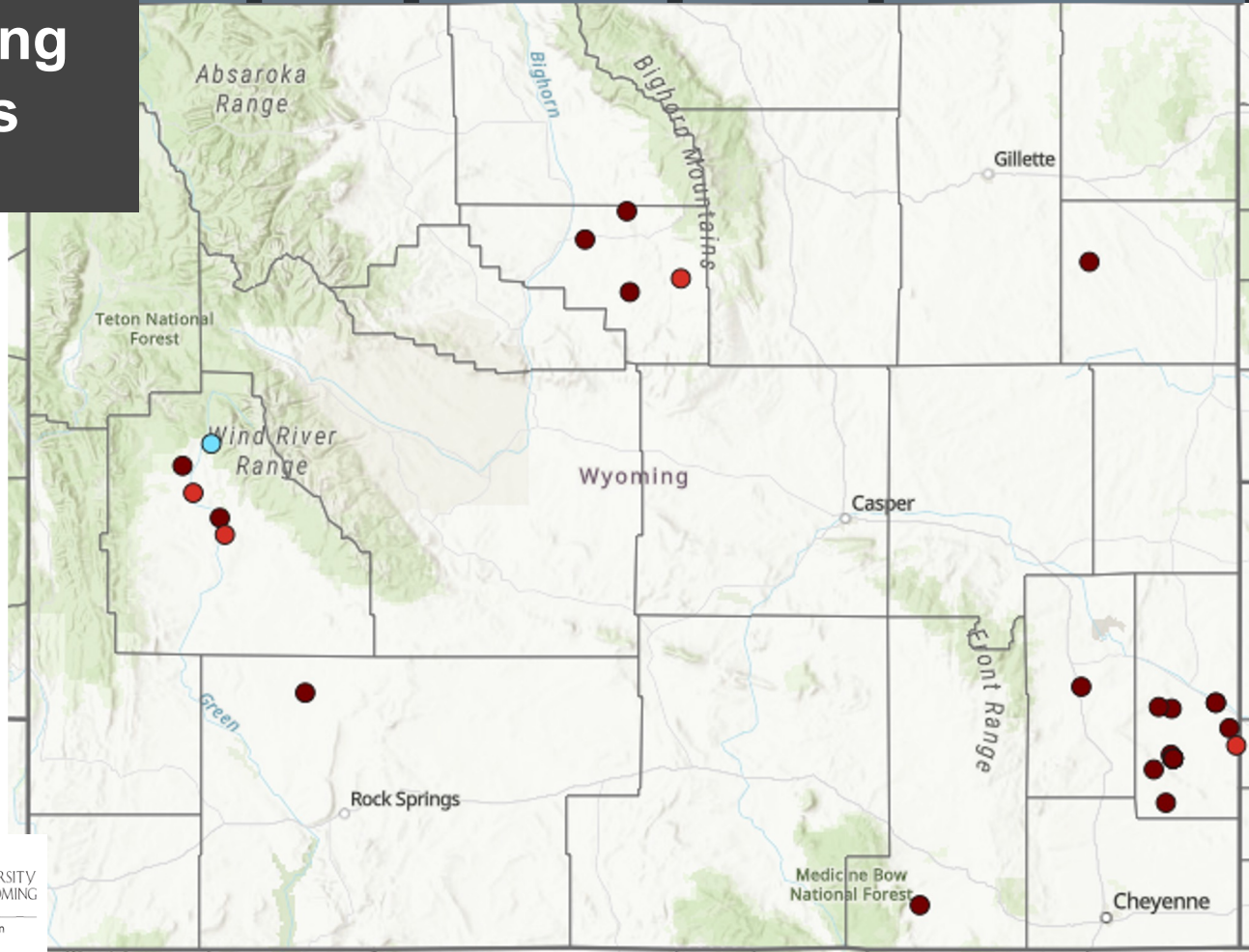
Map Layout Created 17 Nov 2022 <http://www.wrds.uwyo.edu>

<https://droughtmonitor.unl.edu>

Condition Monitoring Observer Reports

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

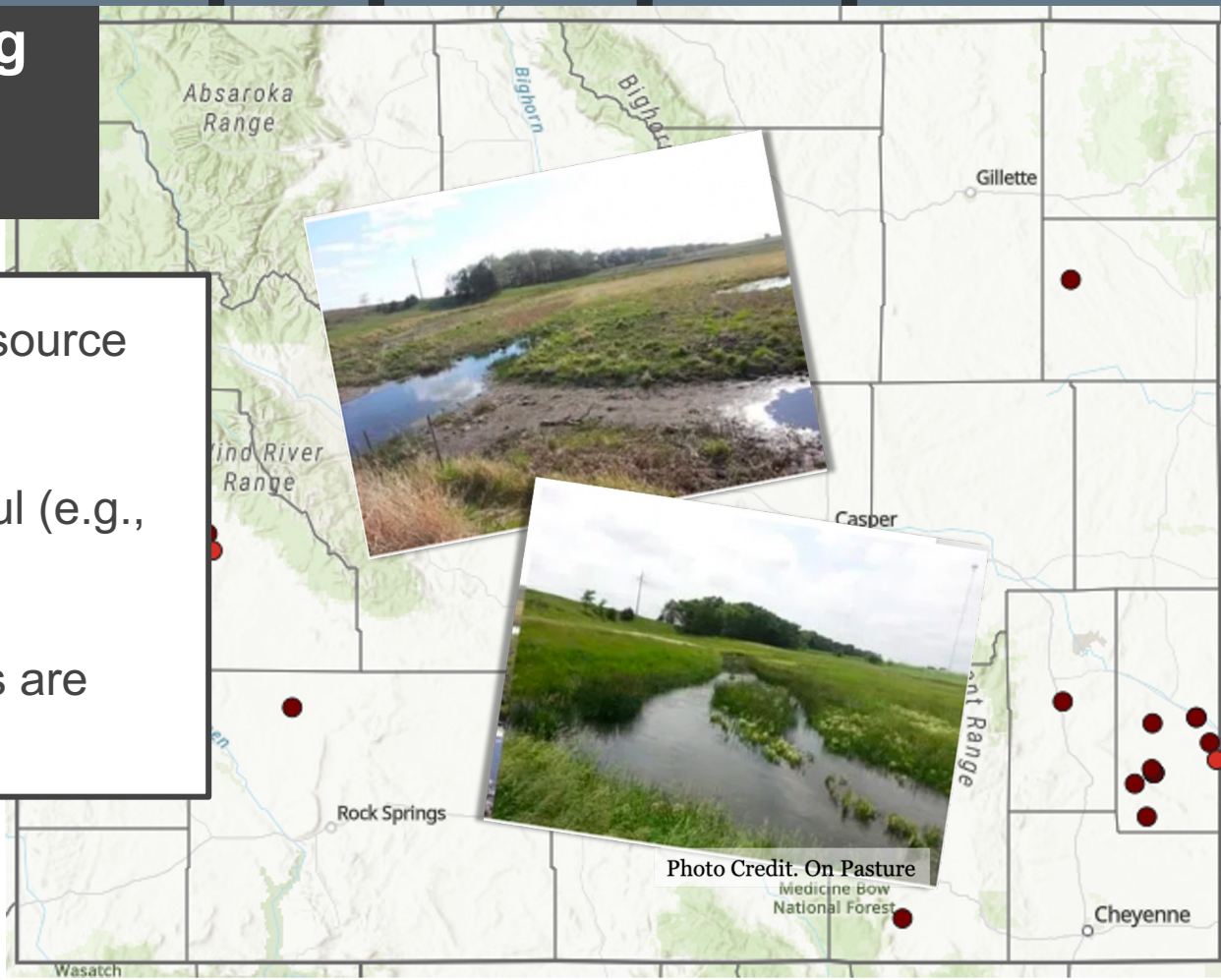
- Severely Dry
- Moderately Dry
- Mildly Dry
- Near Normal
- Mildly Wet
- Moderately Wet
- Severely Wet



Condition Monitoring Observer Reports

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

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



CoCoRaHS COMMUNITY COLLABORATIVE RAIN, HAIL & SNOW NETWORK
"Because every drop counts"

Home | Countries | States | View Data | Maps | My Data | My Account | Admin | Logout

My Data Entry : **Daily Precipitation Report Form**

For observations spanning more than 24 hours, please use the [multiple day accumulation report](#).

[Français](#)

Enter My New Reports

- Daily Precipitation
- Multi-Day Accumulation
- Hail
- Significant Weather
- Monthly Zeros
- Condition Monitoring Report
- Soil Moisture
- Evapotranspiration
- Ice Accretion - Pilot

FROST Reports

- Frost
- Optics
- Snowflake
- Thunder

List/Edit My Reports

- Daily Precipitation
- Multi-Day Accumulation
- Hail
- Significant Weather
- Condition Monitoring Report
- Soil Moisture
- Evapotranspiration

FROST Reports

- Frost
- Optics
- Snowflake
- Thunder

Precipitation Report Form Submit Reset

Station Number : **WY-AB-138**

Station Name : **Laramie 1.8 ENE**

** Denotes Required Field*

Observation Date

Observation Time

Gauge Catch: in. **Gauge Catch: Rain and Melted Snow to the nearest hundredth inch that has fallen in the gauge during the past 24 hours, or T for trace, or NA for unknown.*

Observation Notes: (This will be available to the public.)

24-hr Snowfall

in. **Snowfall:** Accumulation of new snow in inches to the nearest **tenth**

in. **Snowfall SWE:** Melted value from core to the nearest **hundredth**

Snowpack (Total Snow and Ice on Ground at Observation Time)

in. **Snowpack Depth:** Total snow and ice (new and old) in inches to the nearest **half inch**

in. **Snowpack SWE:** Melted value from core to the nearest **hundredth**

Duration Information

If a time is unknown or the storm has not ended leave it blank.

Precipitation Began AM PM

Precipitation Ended AM PM

Heaviest Precipitation Began AM PM

Heaviest Precipitation Lasted minutes

These times are:

Additional Information

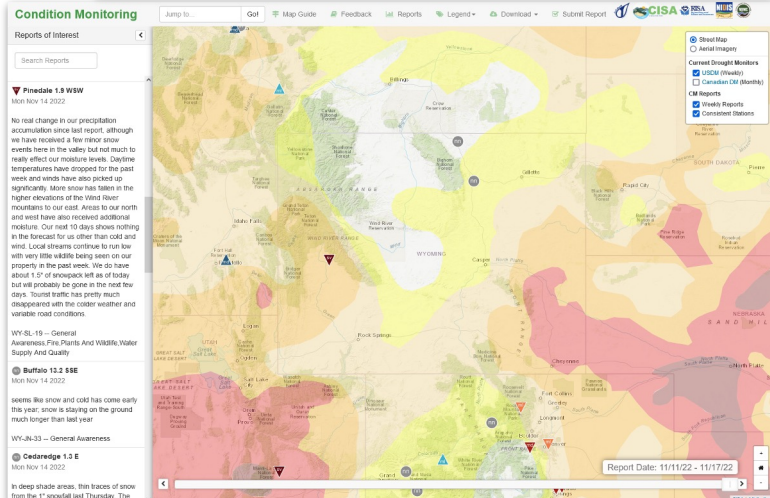
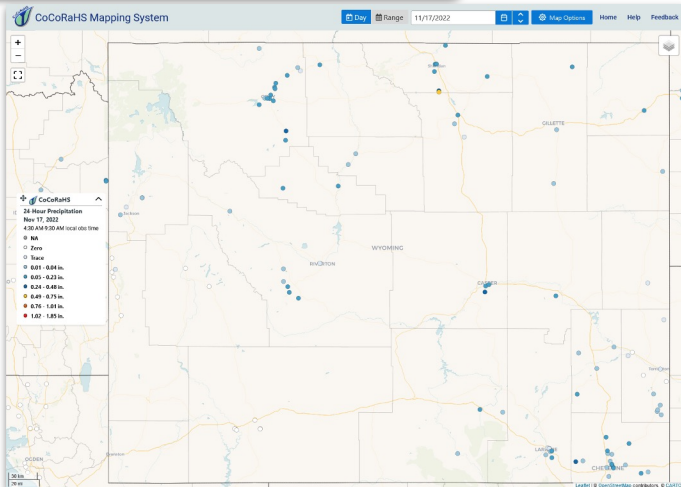
Any Flooding?

Yes No **Did you record hourly precipitation (or other detailed time increments) for this storm?**
 yes, CoCoRaHS personnel may request a copy of this data later, so please save it.

Submit Data Reset

For questions or comments concerning this web page please contact info@cocorahs.org.
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 Privacy Policy - Data License - Wyoming Climate Center - All rights reserved.

<https://www.cocorahs.org>





CoCoRaHS Mapping System

<https://www.cocorahs.org>

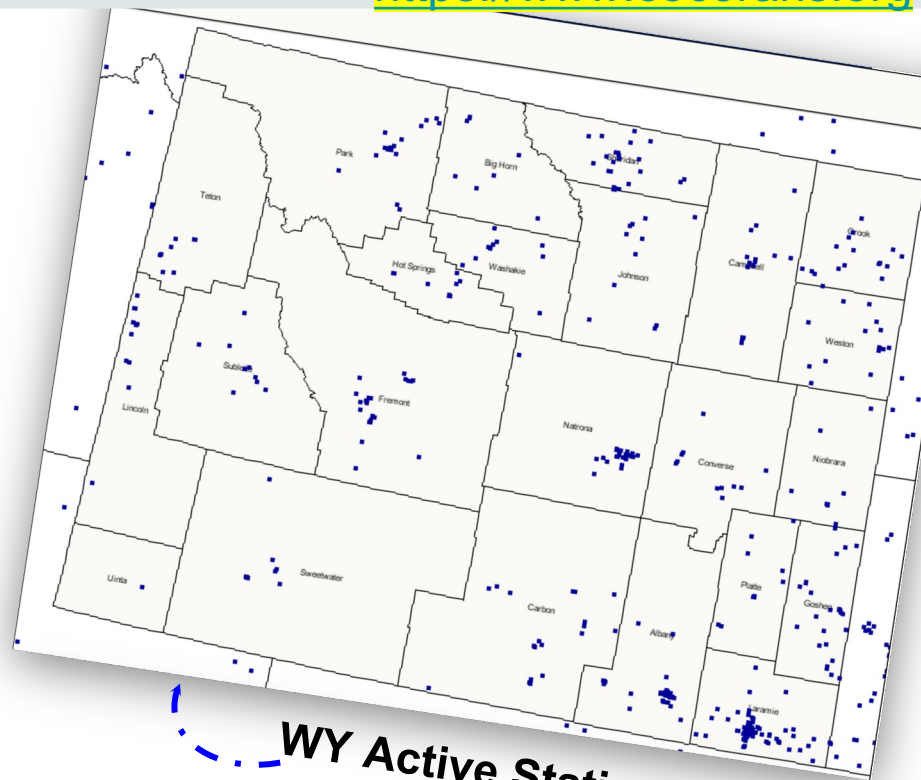
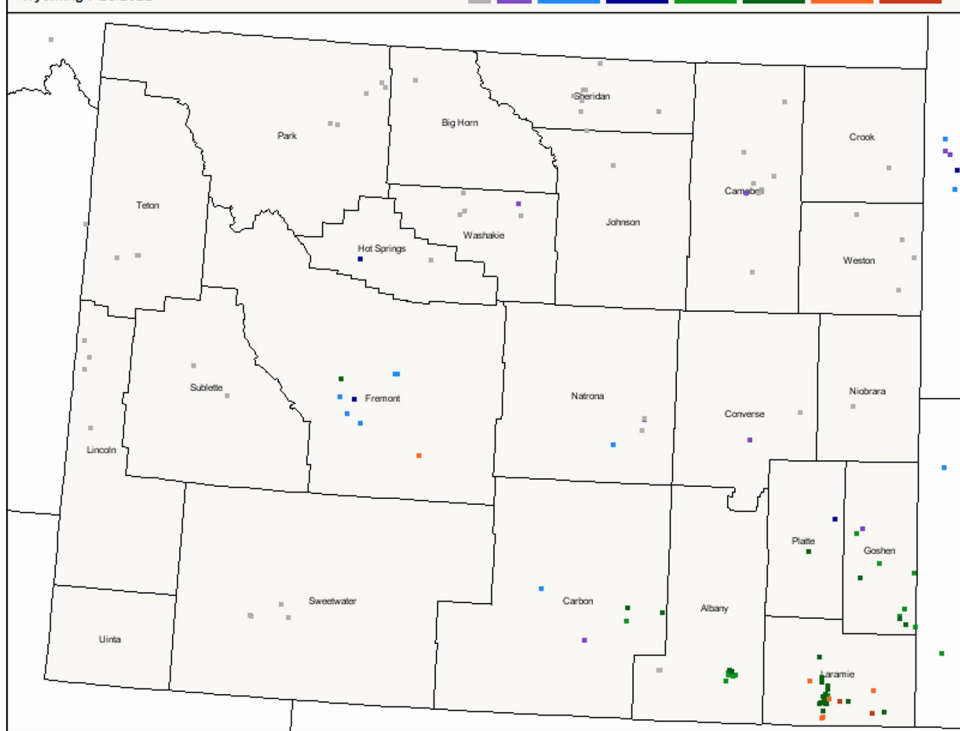
Oct 27th, 2022:

24-hour precip as of ~ 7 am

Daily Precipitation (inches x.xx), for the 24 hour period ending ~7:00 am

Wyoming 7/28/2022

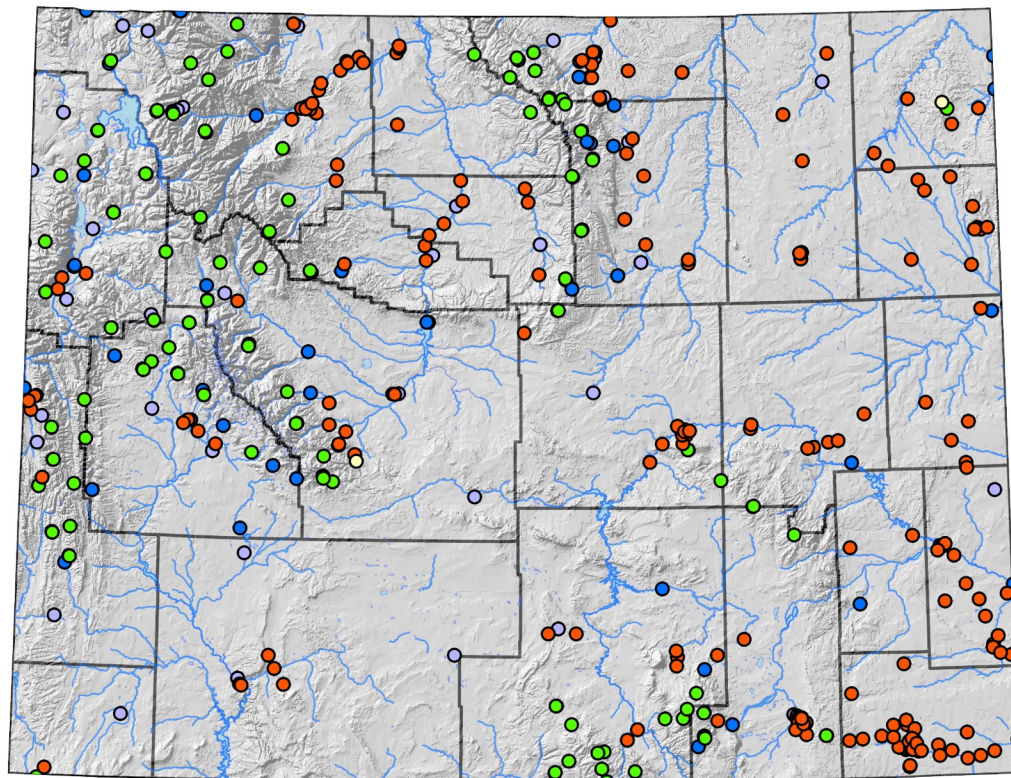
0.0 Trace 0.01 - 0.07 0.08 - 0.14 0.15 - 0.36 0.37 - 0.87 0.88 - 1.31 1.32 - 1.47



WY Active Station Locations

Different networks of stations
and their locations for the data
used to generate Precipitation
Grids for 01 Oct 2022

Stations used for Precipitation Grids 01 Oct 2022



Network

- COCORAHs
- COOP
- HYD
- MADIS
- SNOTEL
- USCRN

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

Stations used by PRISM Climate Group for Precipitation Grids of 12 Apr 2022, Copyright ©2022, PRISM Climate Group, Oregon State University,
<http://prism.oregonstate.edu>
Map created 26 Oct 2022



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The Wyoming Conditions Monitoring Team (WCMT) organized and hosted this webinar. The WCMT is a collaborative effort of state, federal, tribal, and university partners that monitor conditions & impacts throughout the state on a weekly basis – and communicate this information to the U.S. Drought Monitor among others.

Learn more at:

<https://drought.wyo.gov>

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Thank you! Questions?