WY Conditions & Outlooks:

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

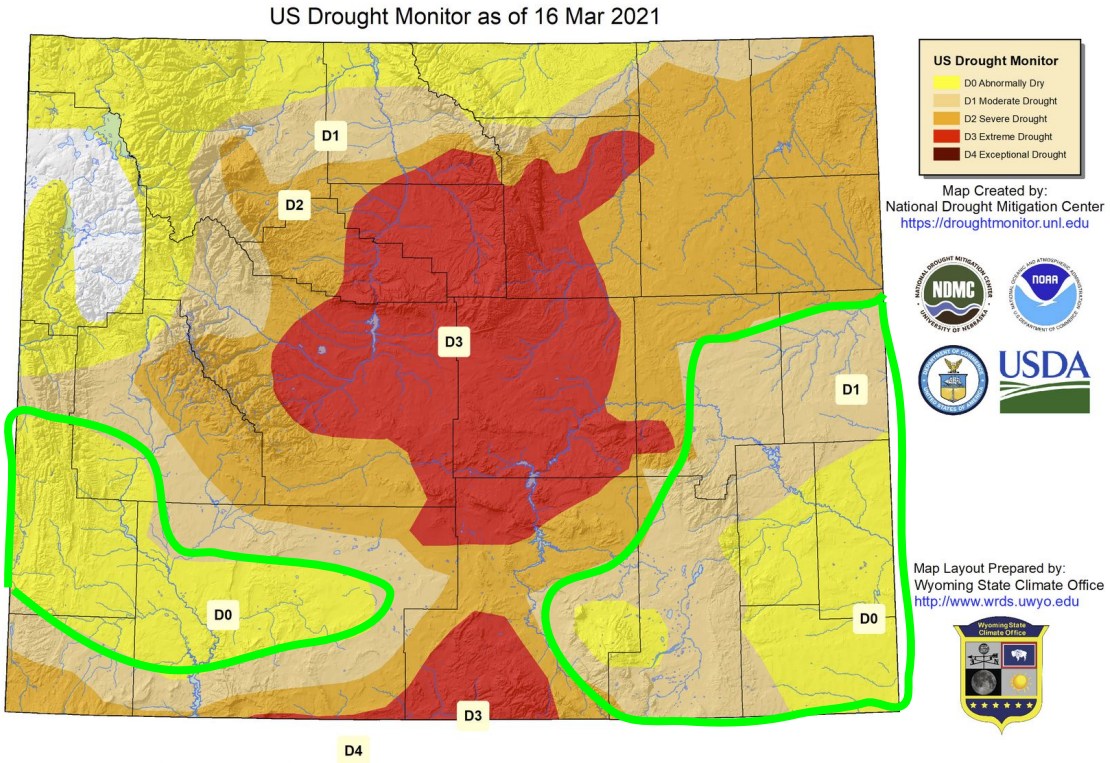
March 18, 2021

Current Conditions

US Drought Monitor for March 16, 2021

(Released Thursday, March 18, 2021)

Valid 8 a.m. EDT



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

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

Heavy snows in eastern Wyoming and long-term precipitation percentiles in the southwest have **prompted improvements** this week in the east central and southeast plains as well as southwest.

https://droughtmonitor.unl.edu

droughtmonitor.unl.edu

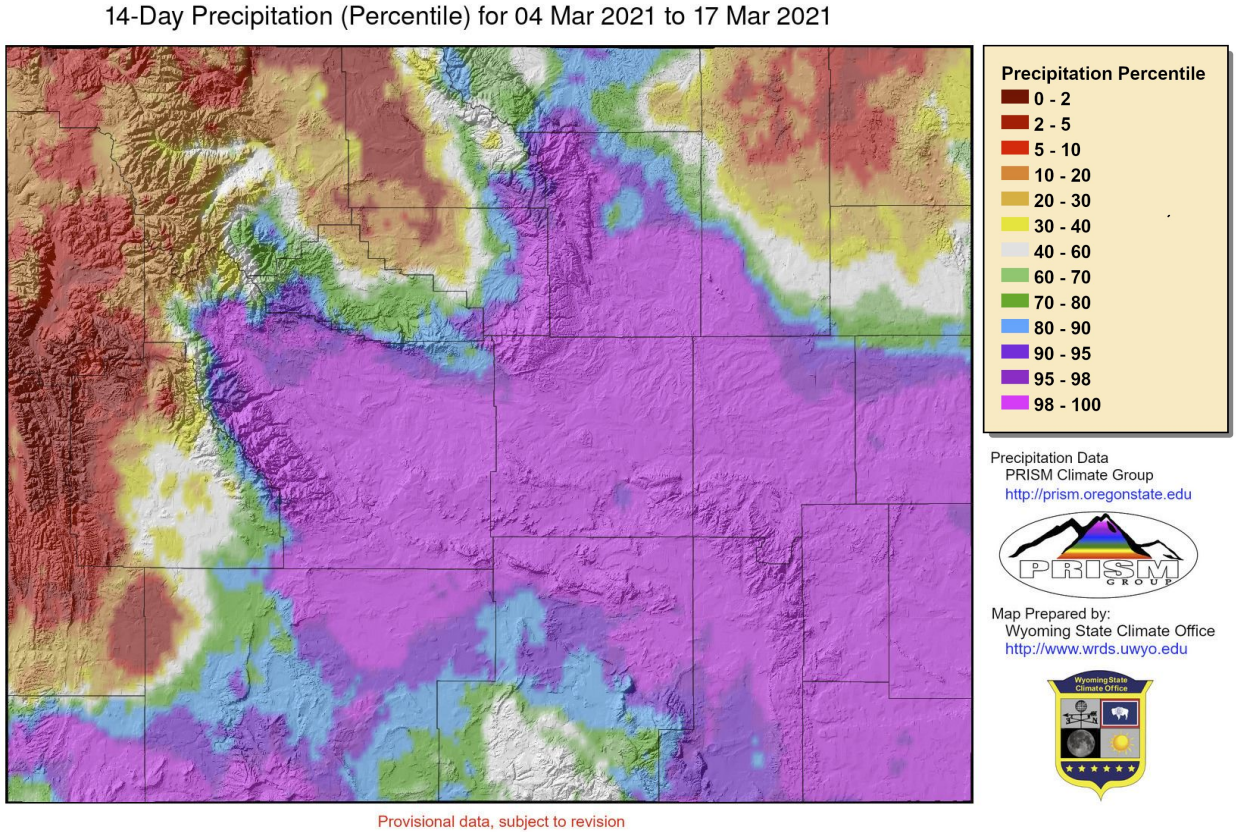
14-Day Precipitation Percentile (04 Mar 2021 to 17 Mar 2021)

Above Median:

- Central
- East-central
- South

Below Median (Areas of Concern):

- Northeast
- Bighorn Basin
- Lincoln, Teton, Park, Sublette



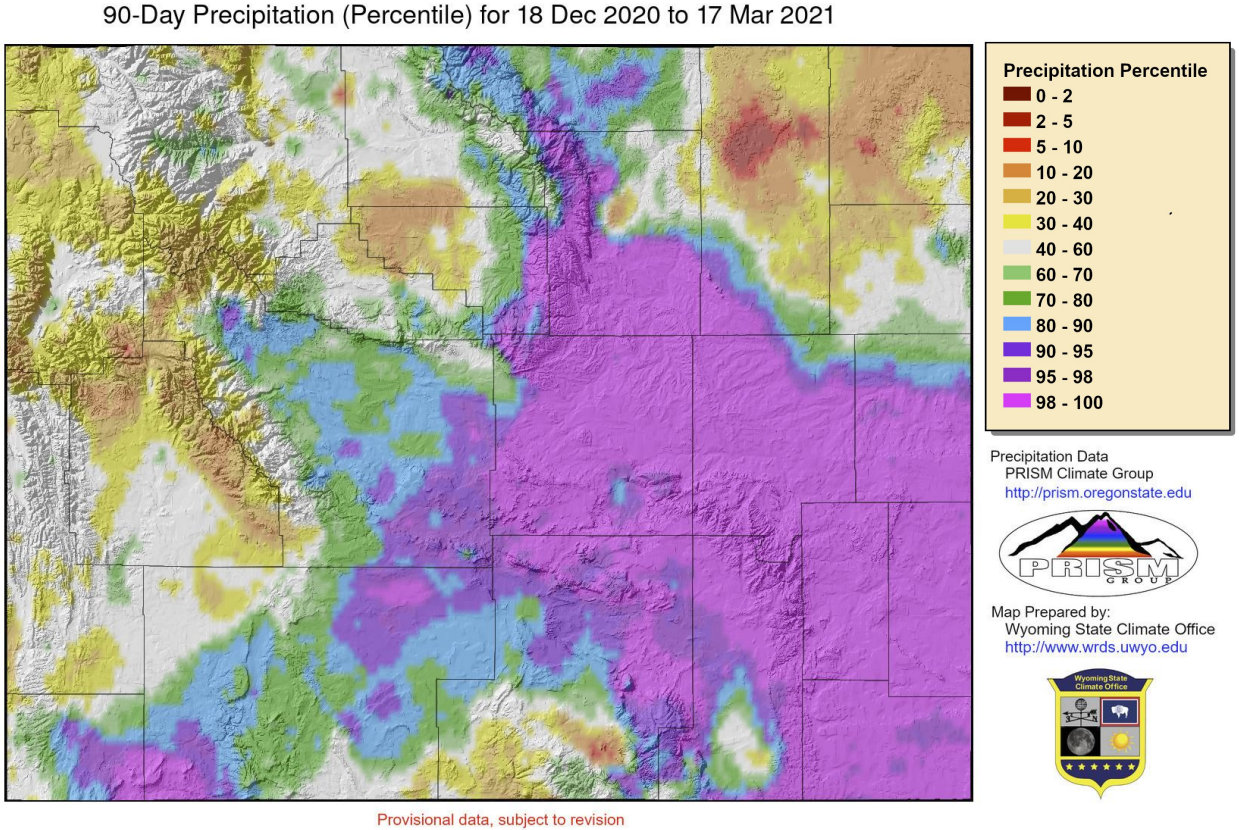
90-Day Precipitation Percentile (18 Dec 2020 to 17 Mar 2021)

Above Median:

- North-central
- Central
- Southwest
- East-central
- Southeast

Below Median (Areas of Concern):

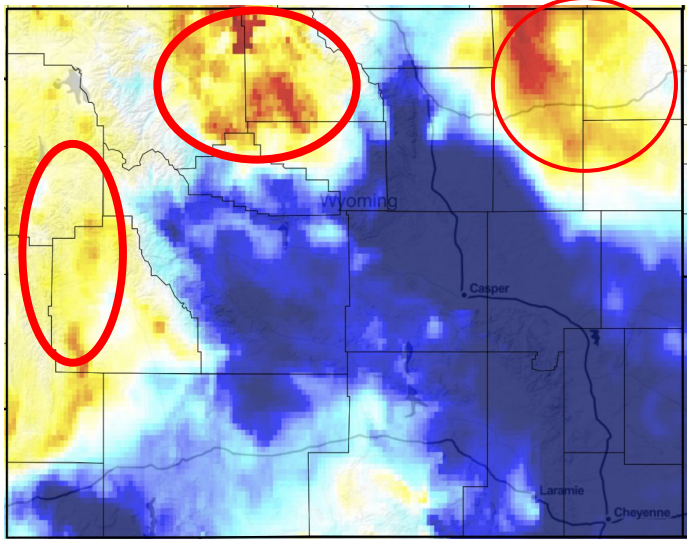
- Northeast
- Wind River Range
- Far South-central
- Northwest



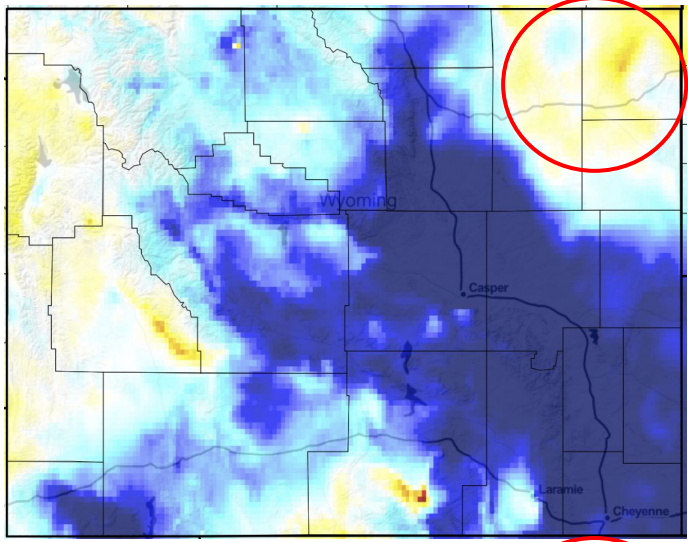
WRDS
Water Resources Data System

Current SPI
-2
-1
0
1
2

30-Day



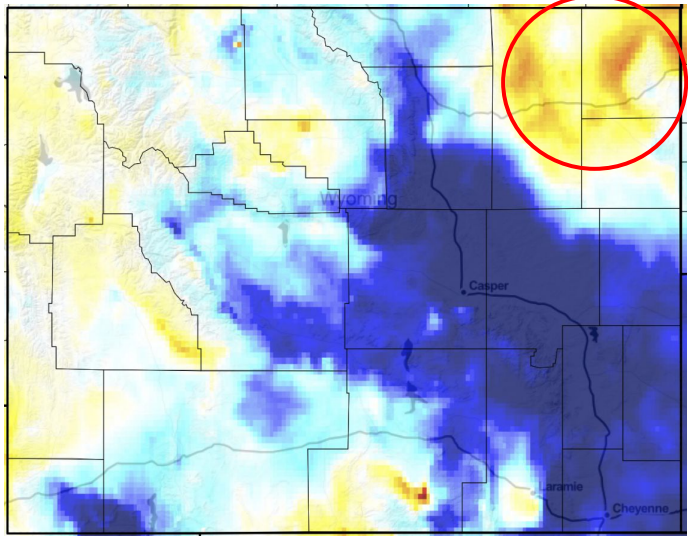
60-Day



Standardized Precipitation Index (SPI)

- Wet SPIs allowed improvement in plains in US Drought Monitor
- Emerging negative SPIs in Western Wyoming are a concern as well as the northeast corner

90-Day



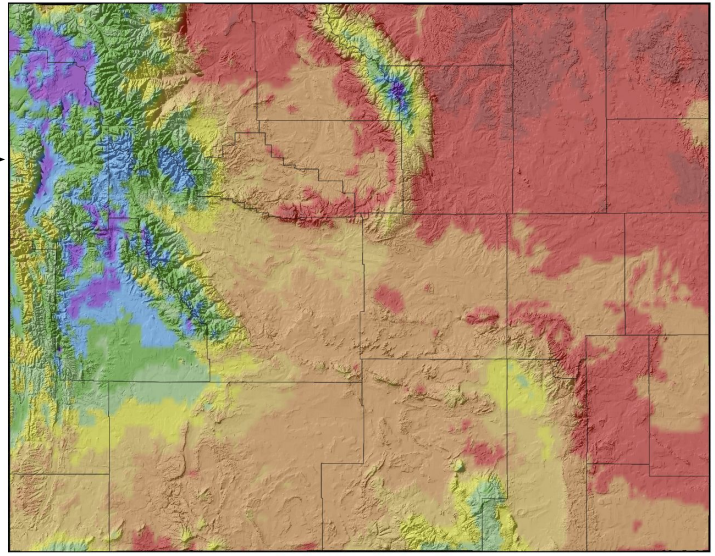
https://drought.climate.umt.edu

WRDS Water Resources Data System

14-Day Average Minimum Temperature (04 Mar to 17 Mar)

- Nighttime lows below freezing

14-Day Average Minimum Temperature for 04 Mar 2021 to 17 Mar 2021



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

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

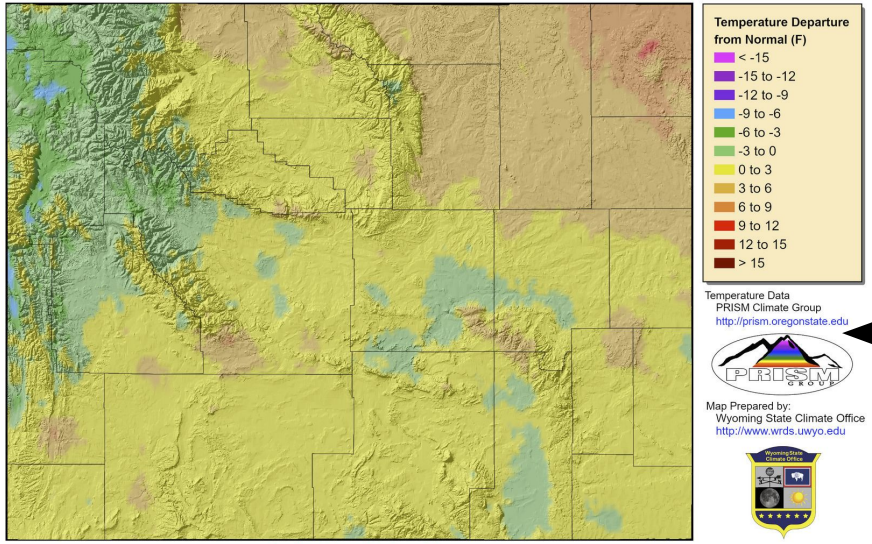
Provisional data, subject to revision

Daily Temperature data from PRISM Climate Group, Copyright ©2021, PRISM Climate Group, Oregon State University, http://prism.oregonstate.edu
Map Created 18 Mar 2021 http:/www.wrds.uwyo.edu
Temperature averages created from PRISM daily temperature grids

14-Day *Departure from* Normal Average Minimum Temperature

- Northeast above average
- West-central/Northwest below average

14-Day Average Minimum Temperature (Departure from 1991-2020 Average) for 04 Mar 2021 to 17 Mar 2021



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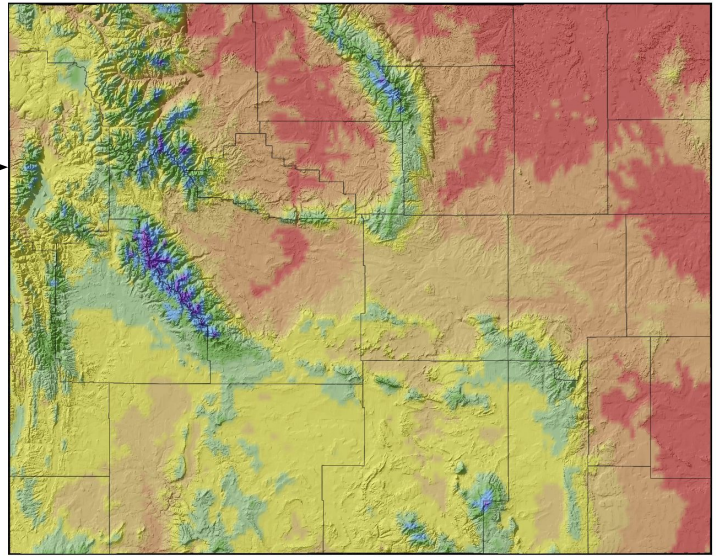
Map Created 18 Mar 2021 http:/www.wrds.uwyo.edu
Temperature averages created from PRISM daily temperature grids

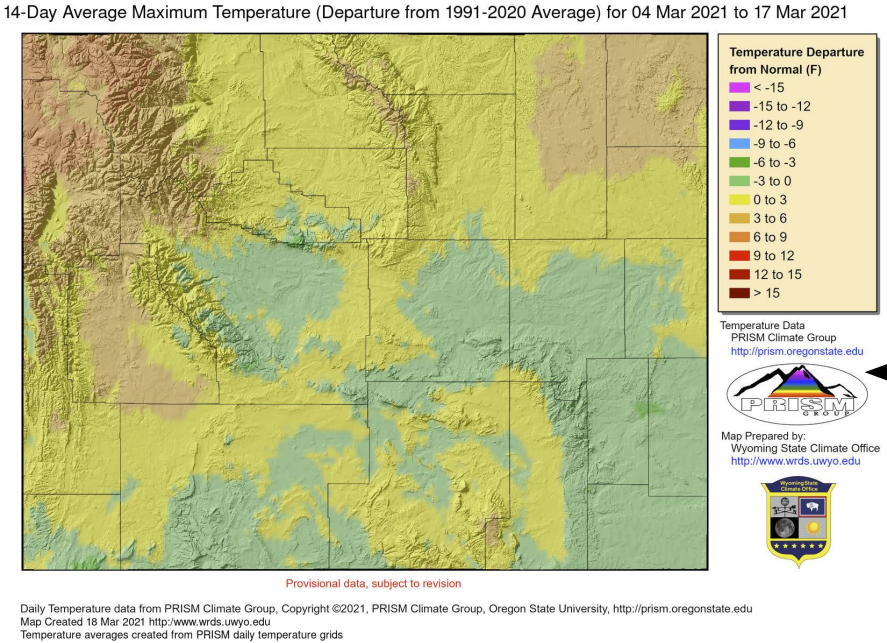
14-Day Average Maximum Temperature (04 Mar to 17 Mar)

- Daytime highs mostly above freezing



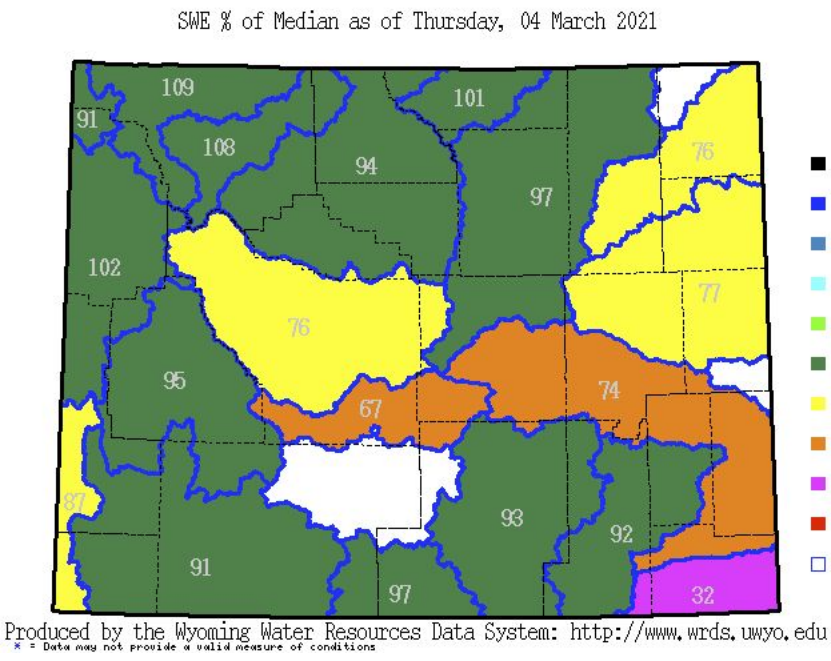
14- Day *Departure from* Normal Average Maximum Temperature

- NE & NW above average
- Remainder at or below average

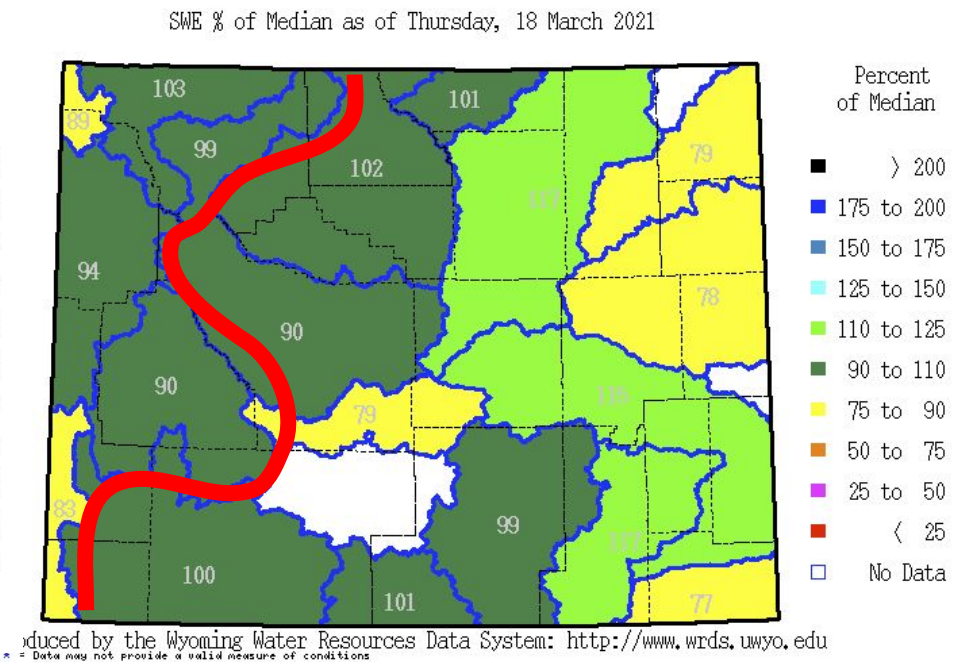


Basin Snow Water Equivalent (SWE) Percent of Median

2 Weeks Ago (04 Mar 2021)



Today (18 Mar 2021)



http://www.wrds.uwyo.edu/wrds/nrcs/snowmap/snowmap.html

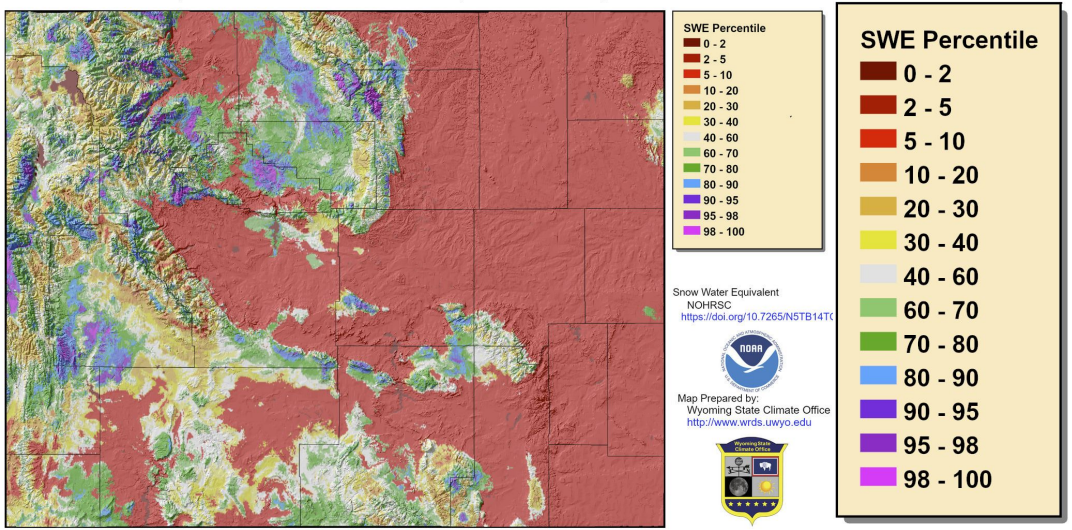
Western basins declined. Snow great benefit to eastern ⅔ - ¾ of state.

Modeled Snow Water Equivalent (SWE)

2-Week Comparison

04 Mar 2021

Snow Water Equivalent Percentile for 04 Mar 2021 (2004-2021 Period)

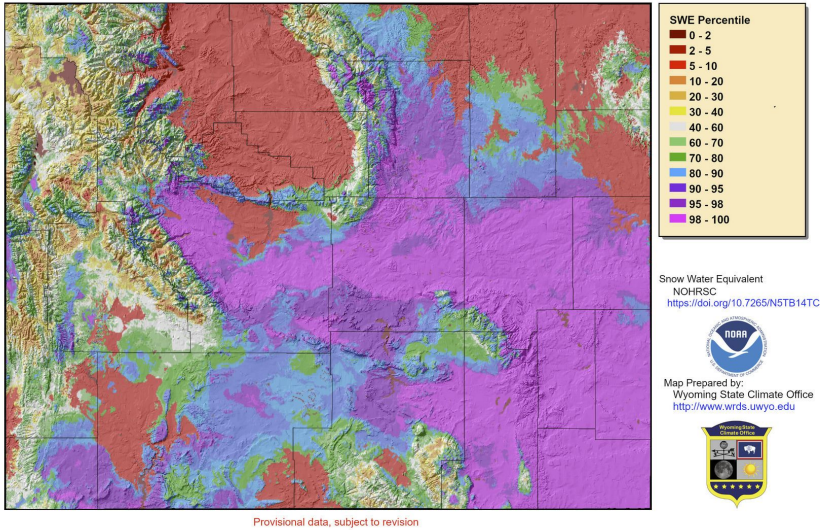


Provisional data, subject to revision

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 04 Mar 2021 - http://www.wrds.uwyo.edu

18 Mar 2021

Snow Water Equivalent Percentile for 18 Mar 2021 (2004-2021 Period)



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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.
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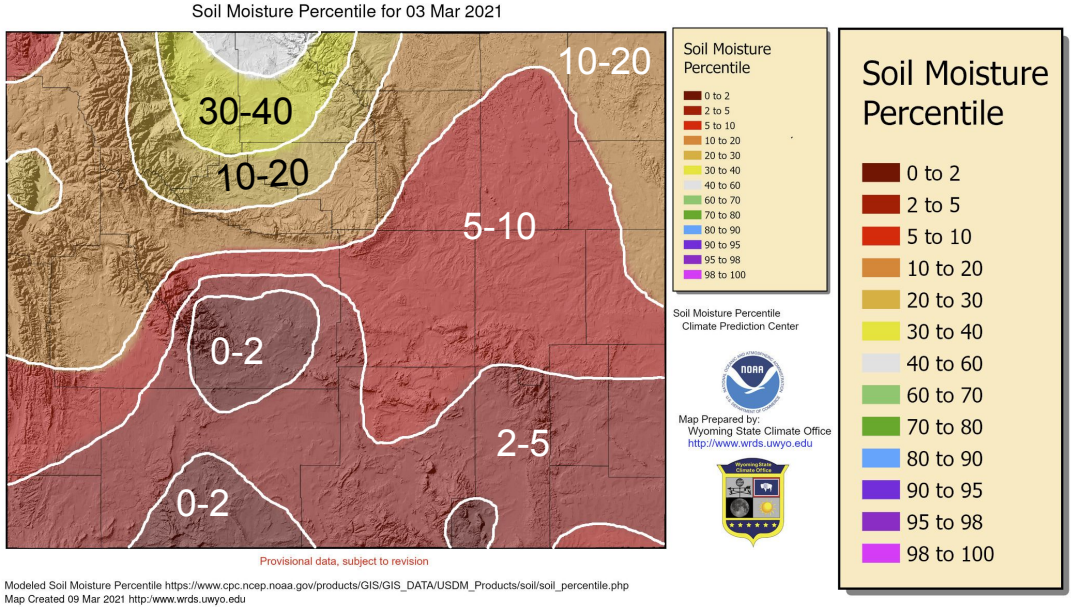
Daily Percentiles and Percents created by Wyoming State Climate Office
Map Created 18 Mar 2021 - http://www.wrds.uwyo.edu

http://www.wrds.uwyo.edu/snow/Current_SWE_Ptile.html

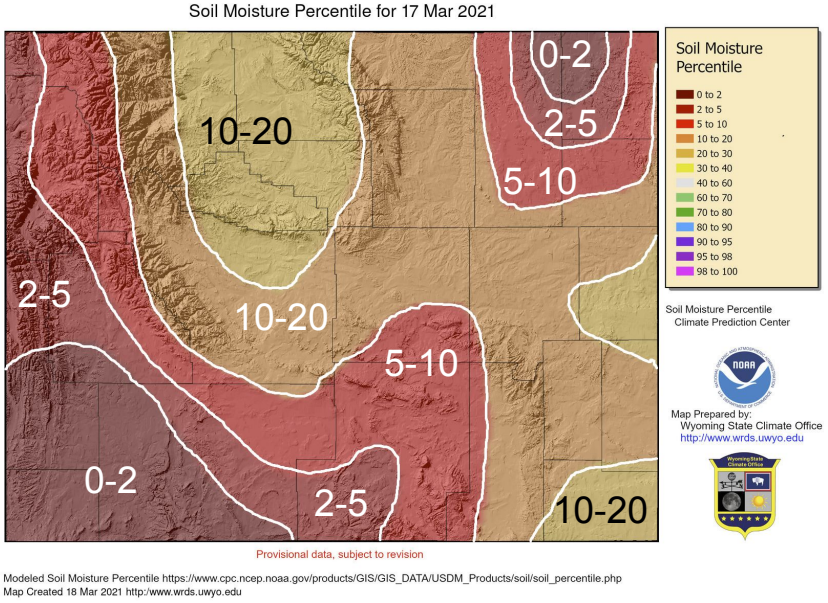
Large gains in plains SWE from storm

Soil Moisture Percentile

03 Mar 2021



17 Mar 2021

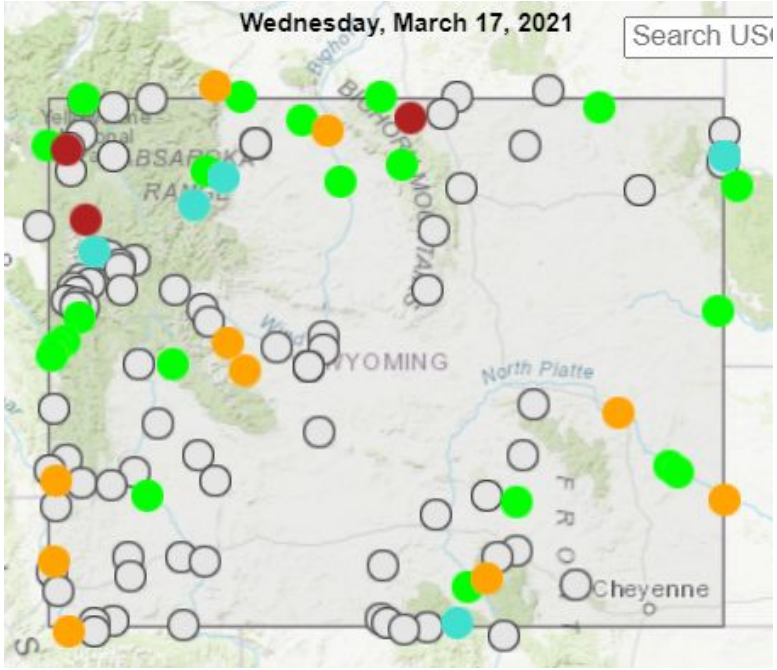


http://www.wrds.uwyo.edu/Soil/Current_SoilMoisture_Ptile.html

Soil Moisture has improved in central and eastern & southeastern Wyoming. Worsening elsewhere. More than half the state still at less than 10th percentile.

Streamflow 3/17/21

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



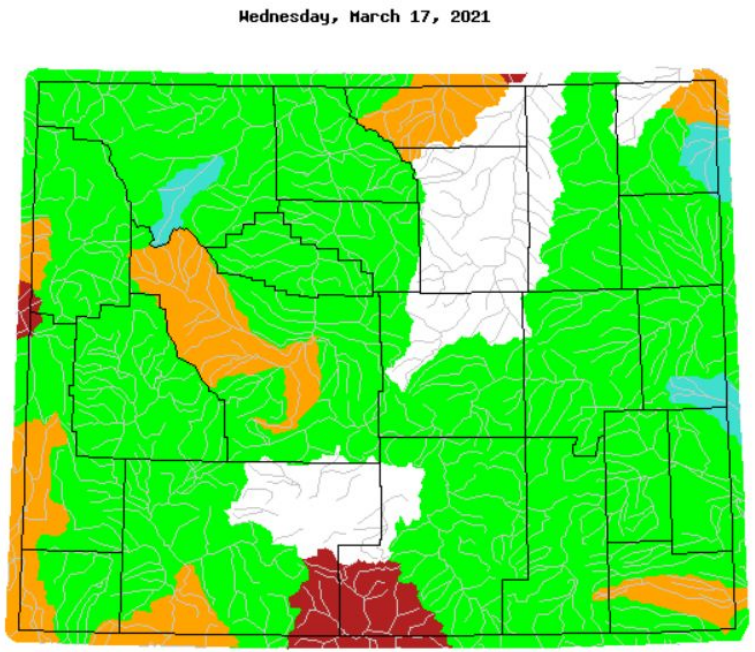
- Most streamgages still affected by ice and not reporting flows (white dots)
- Flows generally a little below normal for mid-March

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		

https://waterwatch.usgs.gov

Streamflow 3/17/21

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



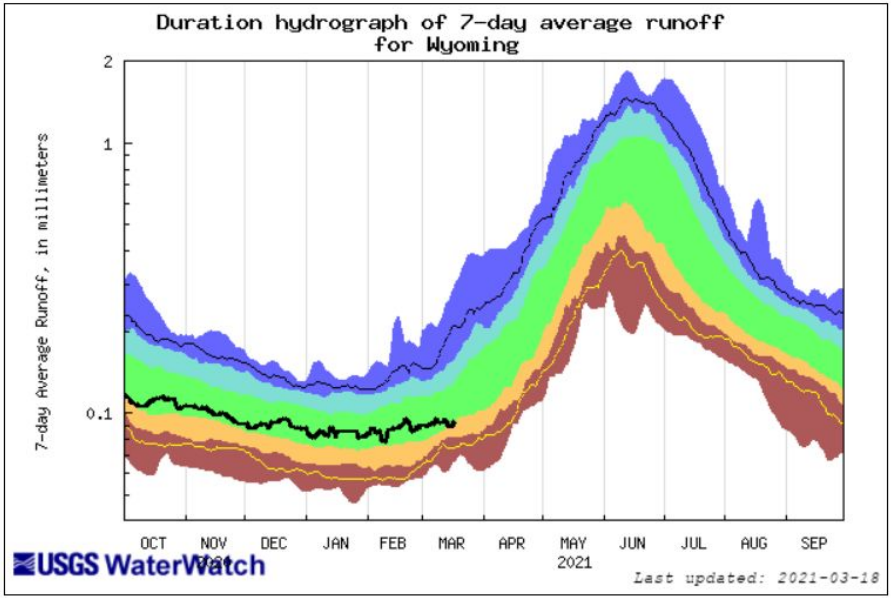
- Estimates of streamflow conditions by basin
- Map based only on ice-free streams (very few data points)
- All streamflow conditions products more accurate and valuable May-Nov

Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	No Data
	Much below normal	Below normal	Normal	Above normal	Much above normal		

https://waterwatch.usgs.gov

Streamflow 3/18/21

Area-based Runoff Duration Hydrograph for Wyoming

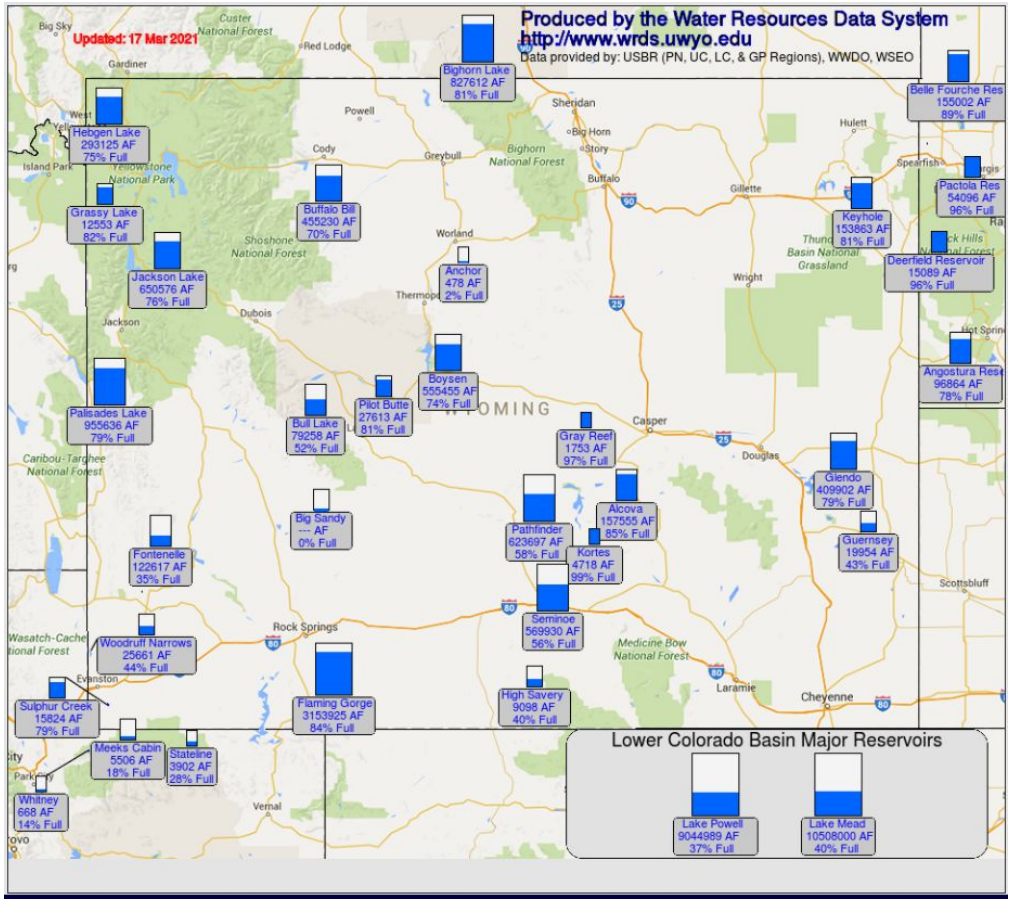


- Statewide streamflow conditions
- Slightly below normal currently
- Based only on ice-free streams (very few data points)
- All streamflow conditions products more accurate and valuable May-Nov (ice-free)

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

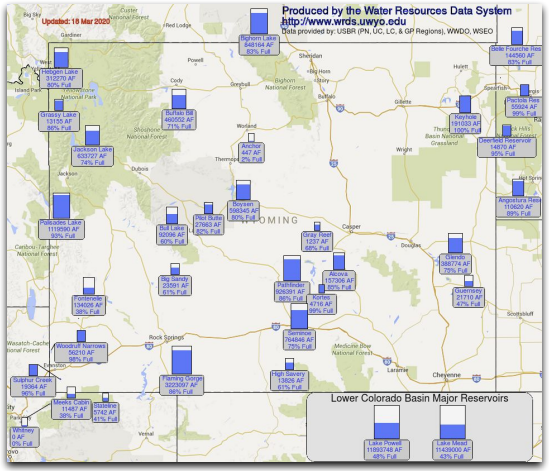
https://waterwatch.usgs.gov

Reservoir Storage (3/17/21)



- Slightly less storage as compared to a year ago statewide
- Most notably lower in Seminoe, Pathfinder, Palisades, Big Sandy and Woodruff Narrows.

2020



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

Wind River Reservation: Conditions & Impacts

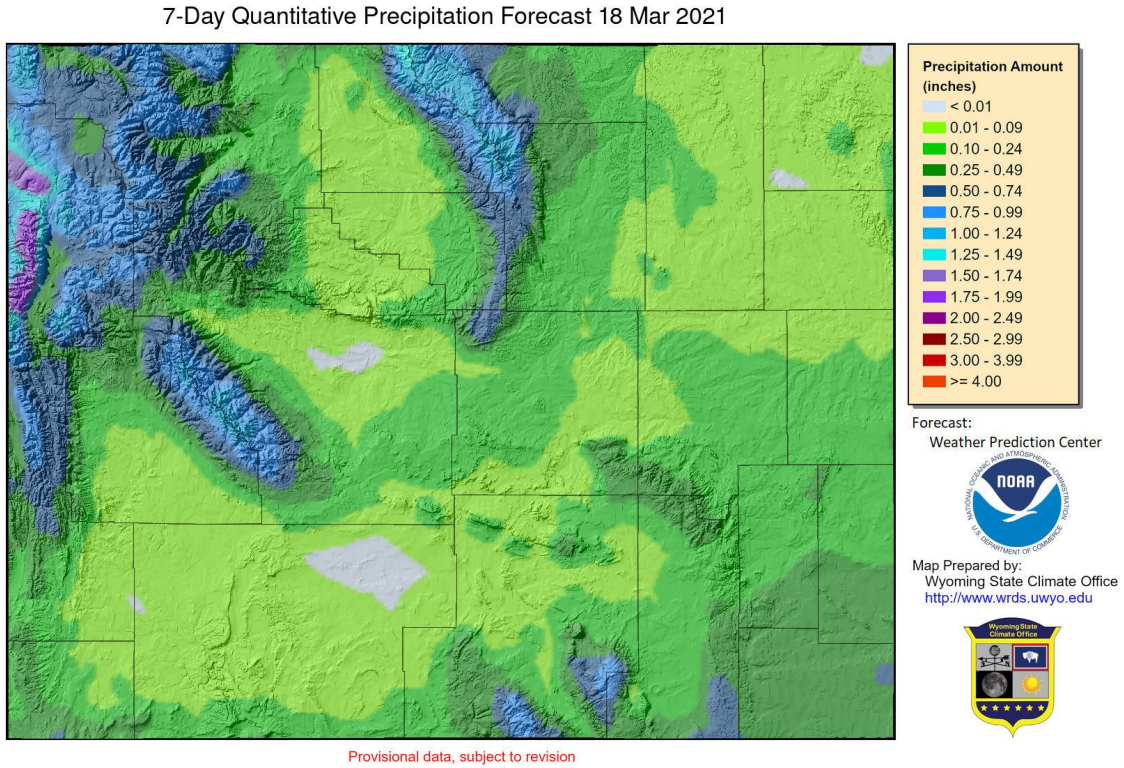
- The entire Wind River Reservation picked up good moisture recently
- Report from area producer that after the first snow, ground was still dry underneath where he had plowed for hay and calves; after most recent storm ground was wet to a decent depth
- Foothills and mountains received significantly more than basins, but still good amount of precip for range, fields, and ditches in the basin
- Right about 90-100% of average SNOTEL for Wind River Reservation - beware of significant change in conditions - last year this time ~113% of average and ended in severe drought
- Hay prices are still high - recent moisture did not help feed prices due to extreme drought across the West last growing season
- The recent moisture did not result in a significant uptick in runoff, a lot of the moisture went straight into the ground
- Just happy to see the snow; live to fight another day
- Guardedly (cautiously, warily) optimistic for more moisture in the next couple of weeks

Wind River Reservation: Hobbs Park SNOTEL

Wind River Reservation: Hobbs Park SNOTEL
March 4, 2021 - Elevation: 10,100’

Forecasts & Outlooks

7-Day Quantitative Precipitation Forecast
March 18 - 25

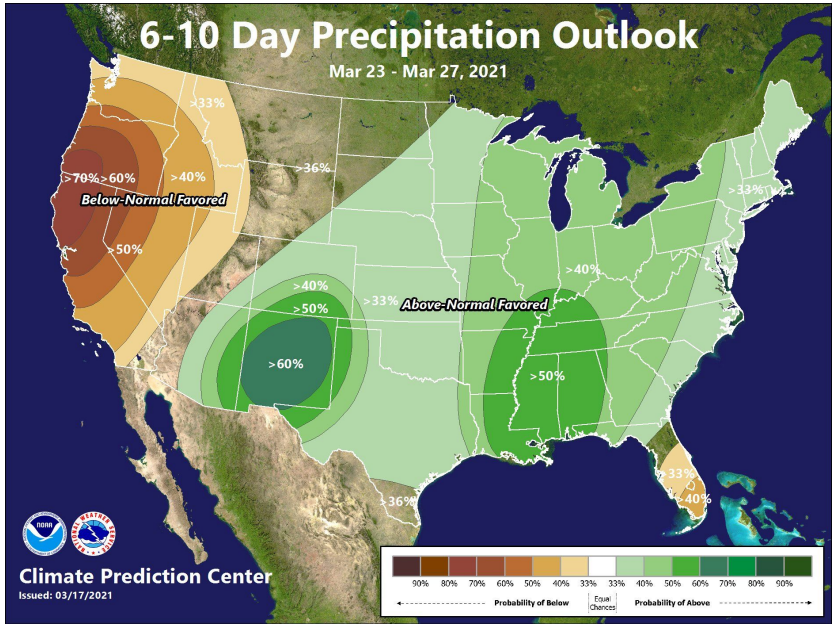


The Quantitative Precipitation Forecast shows the liquid amount of forecasted precipitation over the next 7 days
The Forecast is created by the National Weather Service Weather Prediction Center
Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, National Centers for Environmental Prediction,
and Weather Prediction Center - https://www.wpc.ncep.noaa.gov
Map Layout Created 18 Mar 2021 http://www.wrds.uwyo.edu

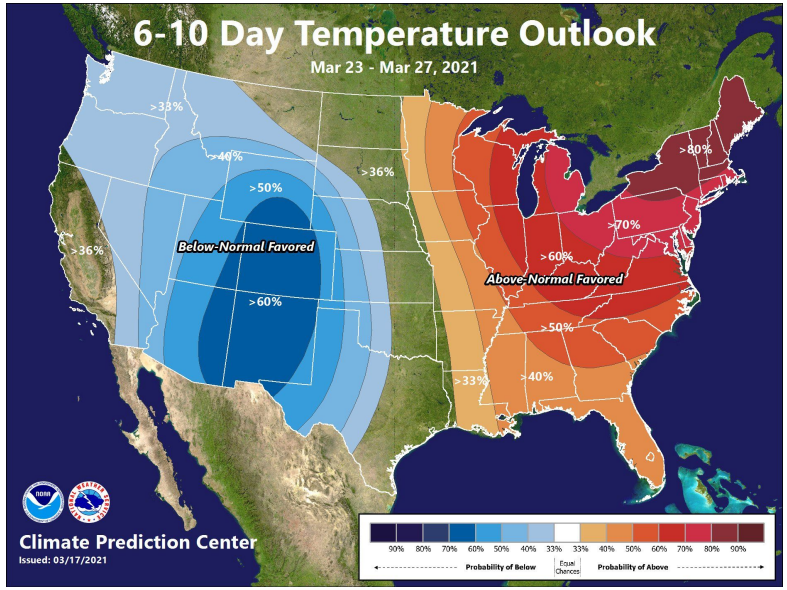
- Quantitative Precipitation Forecast = Liquid Precipitation Forecast
- Sunday - High Plains Rain & High Terrain Snow initially
- Transition to all snow during the day Sunday into next Monday and lingering into Tuesday.

https://bit.ly/3bZXQeN

6-10 Day Precipitation
March 23 - 27



- Probability = Chance
- Equal Chances (near normal) precipitation favored



6 - 10 Day Temperature

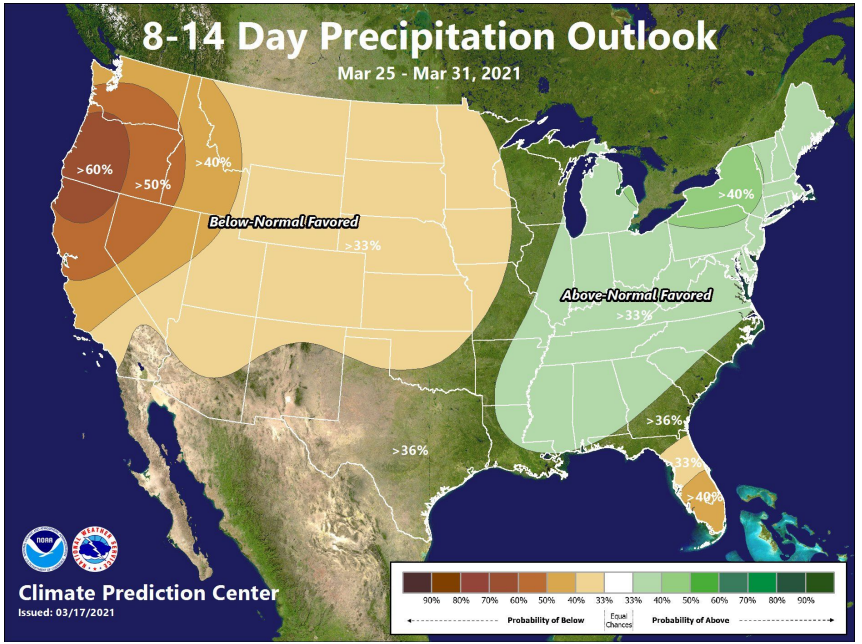
- Below normal temperatures favored for the state.

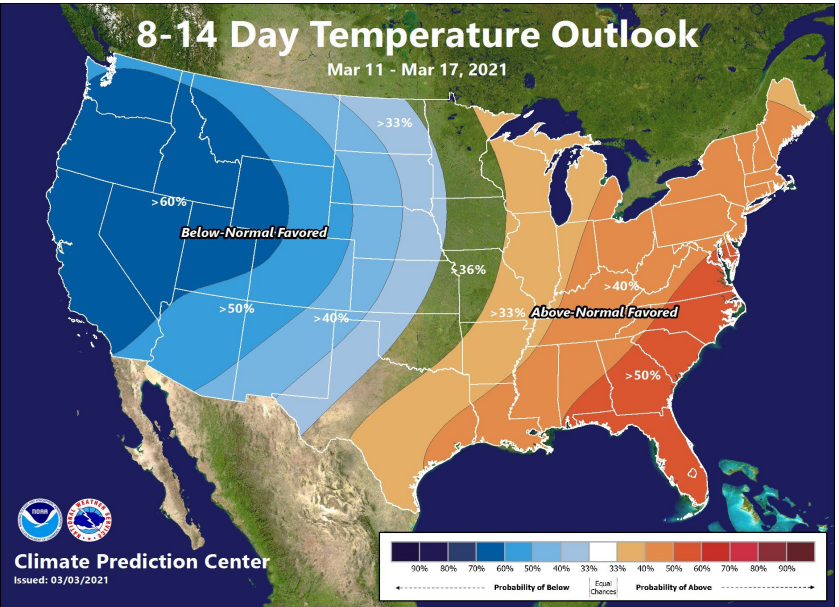
http://bit.ly/3kq3LxA

8-14 Day Precipitation

March 25 - 31

- Probability = Chance
- Slightly Below normal precipitation favored for the state.





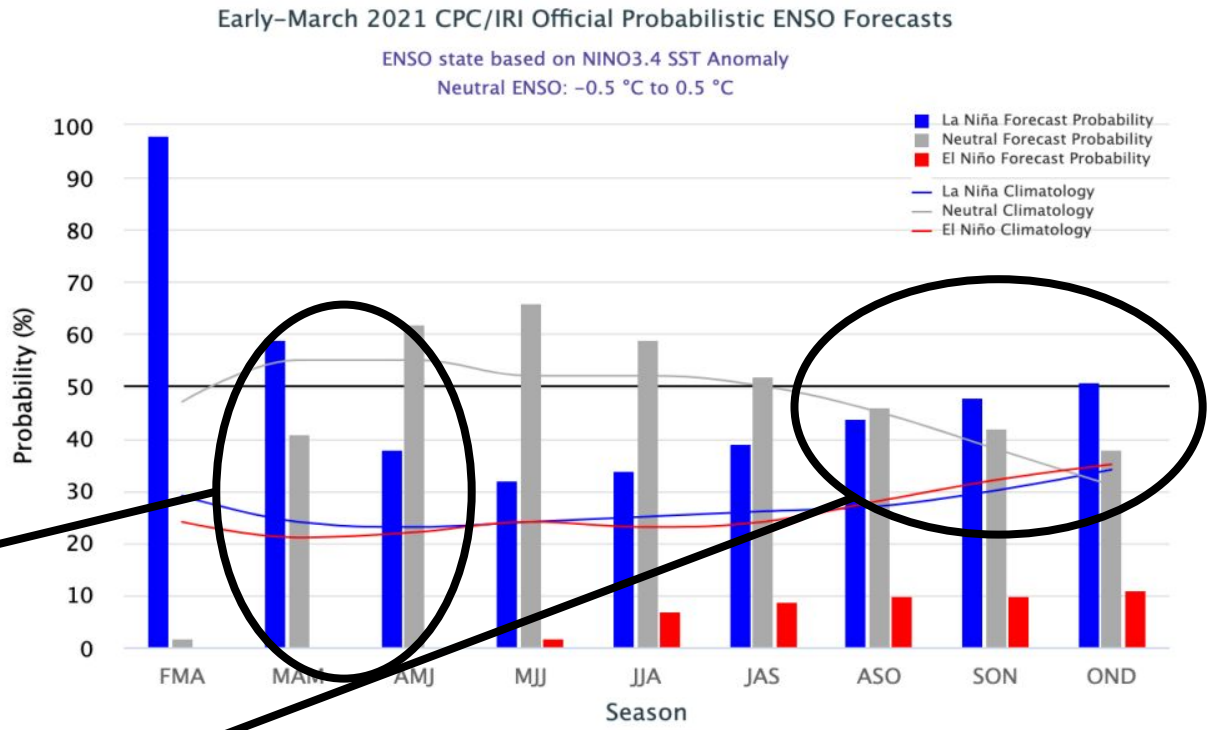
8 - 14 Day Temperature

- Below normal temperatures favored for the state.

http://bit.ly/3kw1WPF

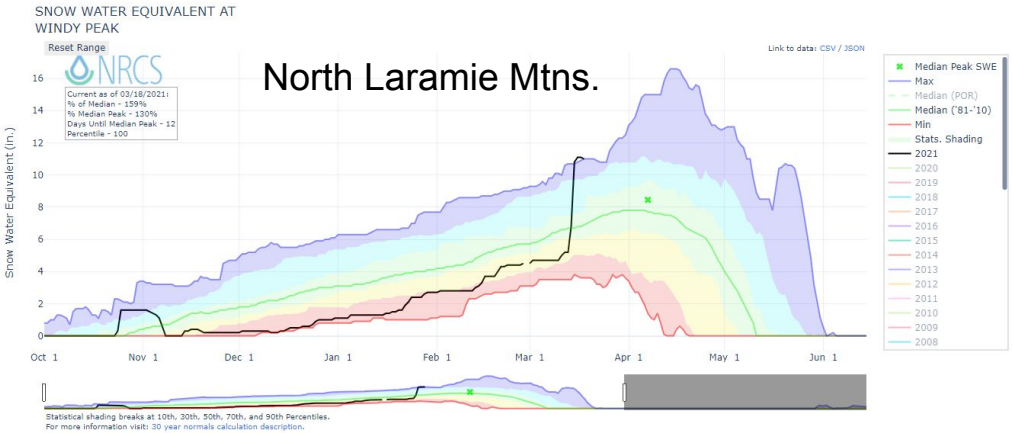
- Note: WY's weather is not as strongly connected to ENSO due to our distance from the ocean

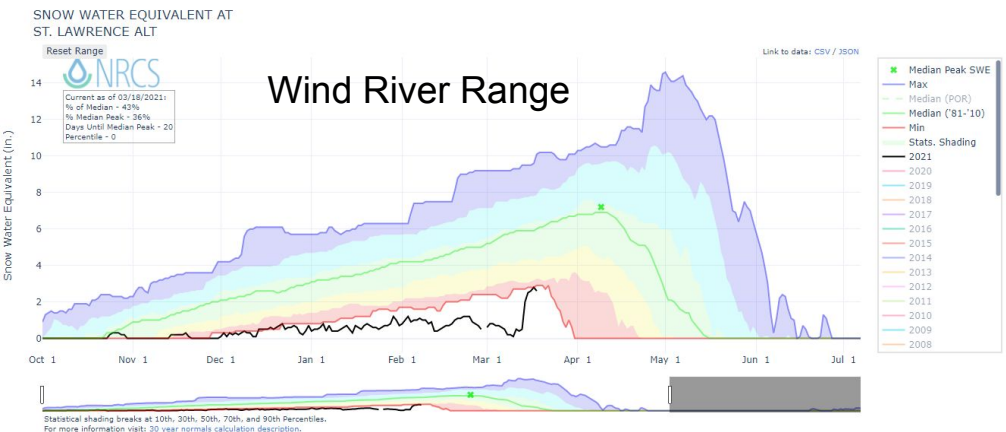
- Coming out of La Nina to neutral = more precipitation possible!
- Slight indication of another La Nina next summer & fall = dry long-term?



https://bit.ly/30cxMaS

Wyoming Flood Potential Update





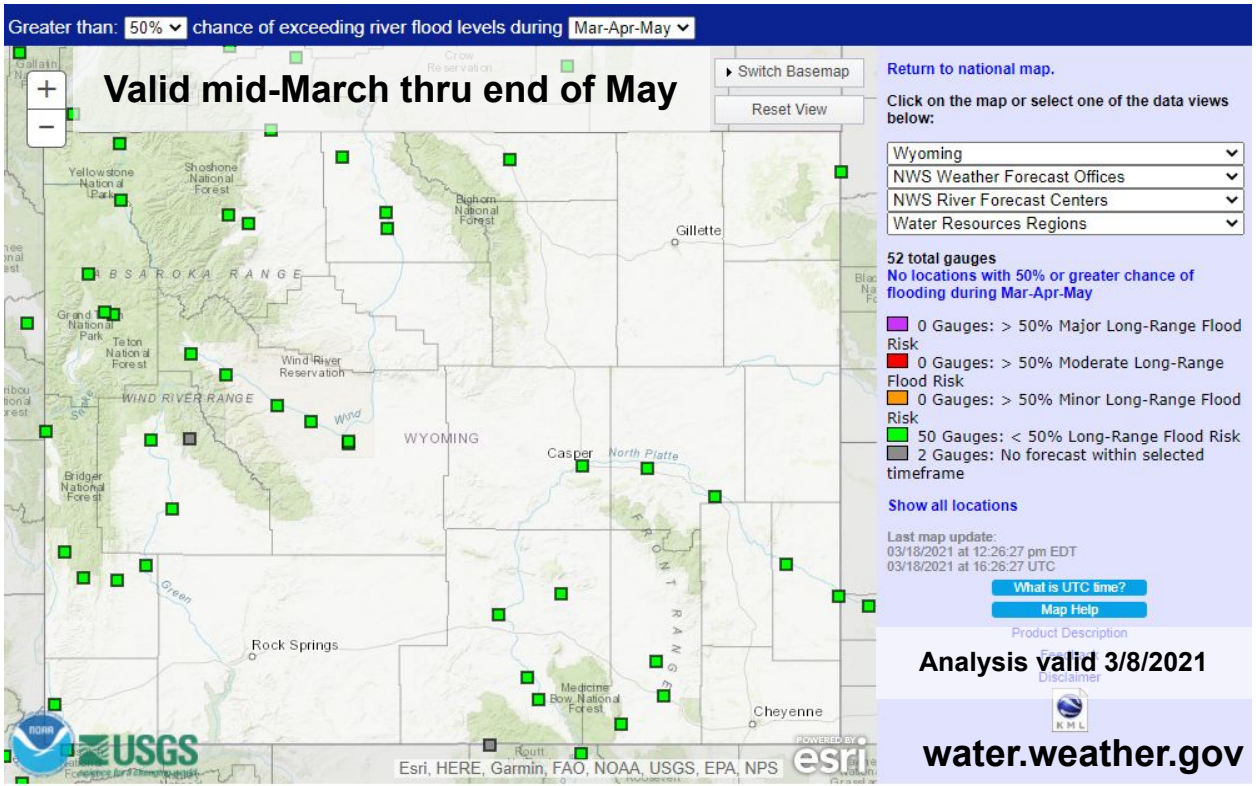
Snotel Sites - (Snow Telemetry) - are monitoring stations measuring snowpack, precipitation, temperature & other climate conditions.

Seasonal data of select snotel sites from this past storm show localized significant increases in Snow Water Equivalent (SWE).

However, some sites are still well below normal and could use more. Others sites are now near or above median values for the season.

https://bit.ly/2ON67uT

Wyoming Flood Potential Update



No to Low probability of riverine flooding expected through end of May.

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.

NWS Long Range River Flood Outlooks

NOAA U.S. Spring Outlook & Flood Risk

Review. And, did you know … ?

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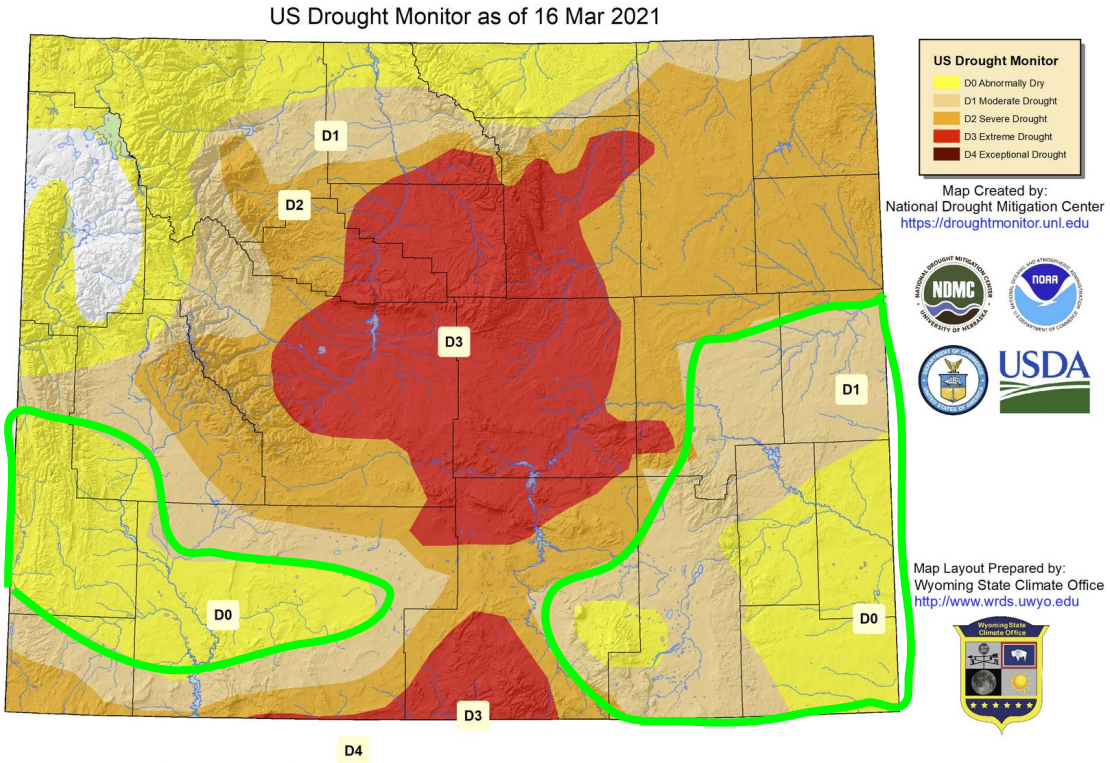

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https://droughtmonitor.unl.edu

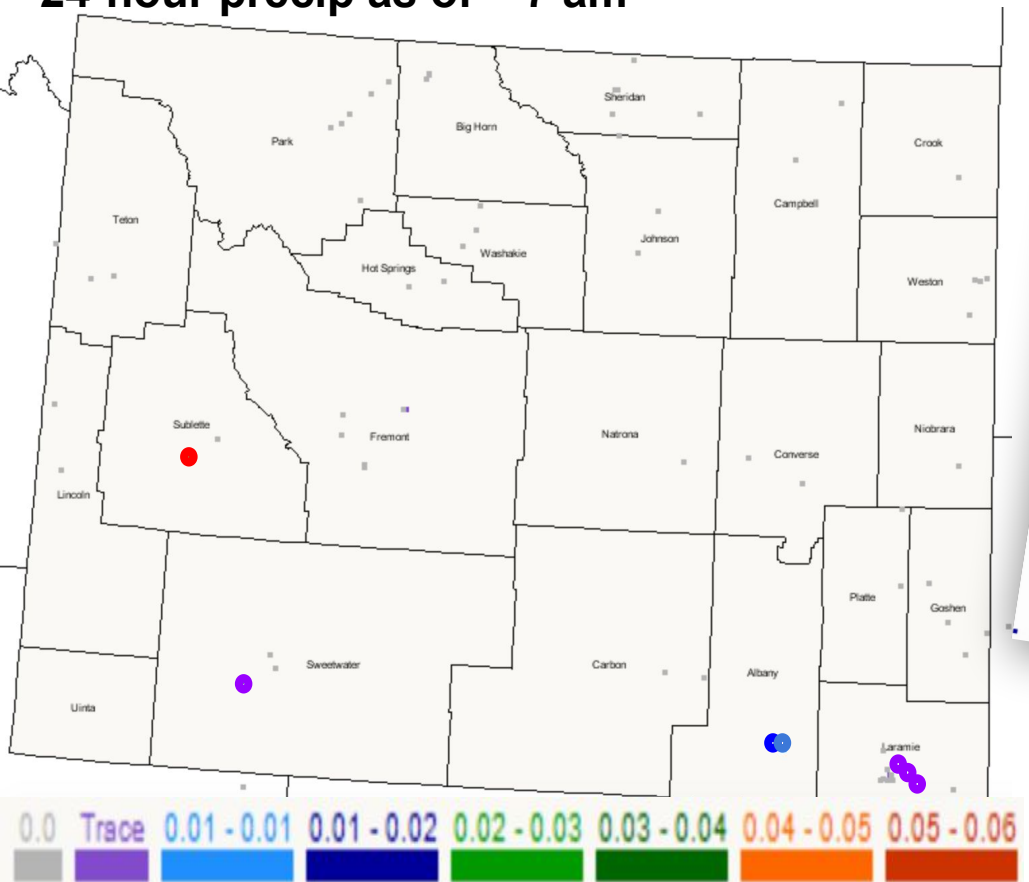
droughtmonitor.unl.edu

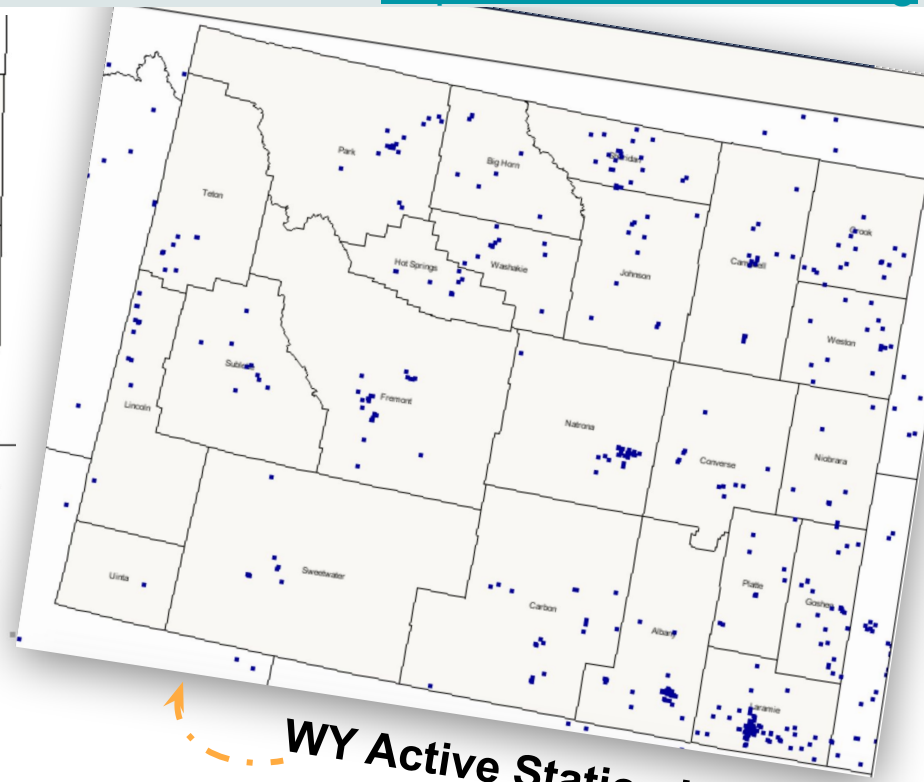
USDA Northern Plains Climate Hub
U.S. DEPARTMENT OF AGRICULTURE
University of Wyoming Extension

CoCoRaHS Mapping System

https://www.cocorahs.org

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



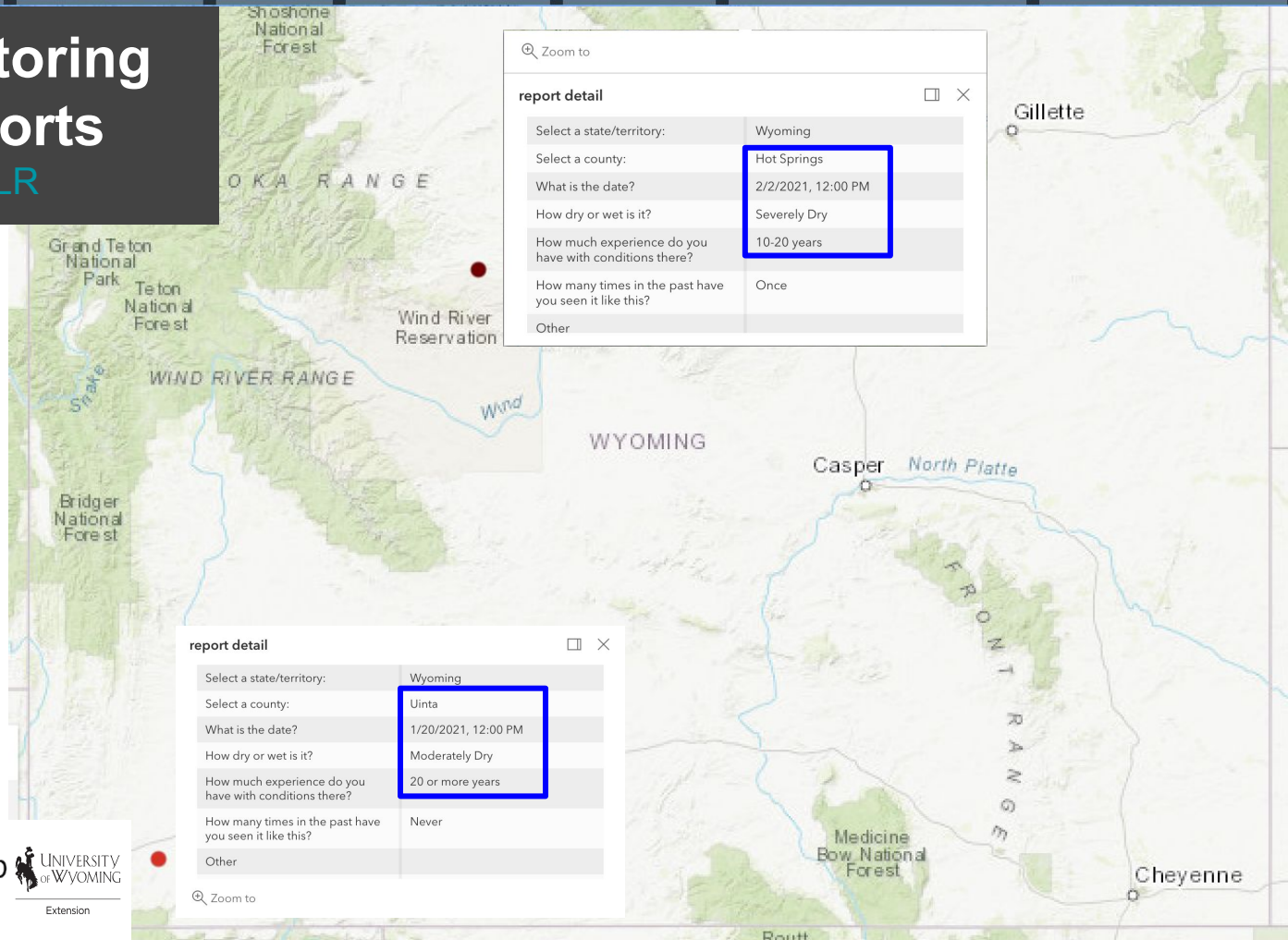


WY Active Station Locations

Condition Monitoring Observer Reports

http://bit.ly/3c4WRLR

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



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U.S. DEPARTMENT OF AGRICULTURE
University of Wyoming Extension

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CoCoRaHS
https://www.cococrahs.org

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

Thank you! Questions?