













WY Conditions & Outlooks:

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

September 21, 2023















Presentation Outline

- Current Conditions: Overview
- Outlooks:
 - Temperature & Precipitation
 - Fuels Status & Wildland Fire Outlook
- Highlight of the Month
 - NOAA National Weather Service's website
 - Forecast Points Page & other features
- Questions















Current Conditions



US Drought Monitor for September 19, 2023

(Released Thursday, September 21, 2023) Valid 8 a.m. EDT

US Drought Monitor for 19 Sep 2023





Map Created by: National Drought Mitigation Center https://droughtmonitor.unl.edu







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

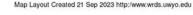


Drought Level	Percentile			
None	>30			
D0 (Abnormally Dry)	21 to 30			
D1 (Moderate Drought)	11 to 20			
D2 (Severe Drought)	6 to 10			
D3 (Extreme Drought)	3 to 5			
D4 (Exceptional Drought)	0 to 2			

How are Drought categories assigned? https://youtu.be/45MQ1GB-uTc

Improvements since the last webinar. Last of the D0 was removed.

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 (Duff) of the University of Nebraska-Lincoln. The U.S. Drought Monitor website is hosted and maintained by the NDMC. http://droughtmonitor.unl.edu







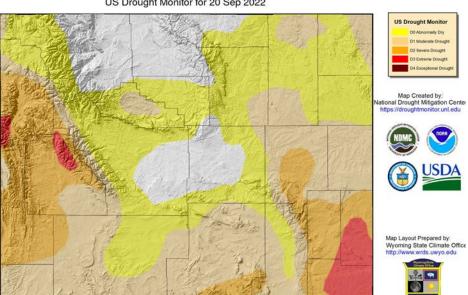






One Year Ago

US Drought Monitor for 20 Sep 2022

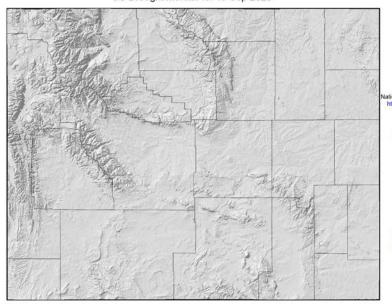


The U.S. Drought Monitor, is a weekly map of drought conditions produced jointly by the National Oceanic and Atmospheric Administration, the U.S. Department of Agriculture, and the National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln. The U.S. Drought Monitor website is hosted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

Map Layout Created 10 Dec 2022 http://www.wrds.uwyo.edu

Today

US Drought Monitor for 19 Sep 2023





Map Created by: National Drought Mitigation Center https://droughtmonitor.unl.edu















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 21 Sep 2023 http://www.wrds.uwyo.edu



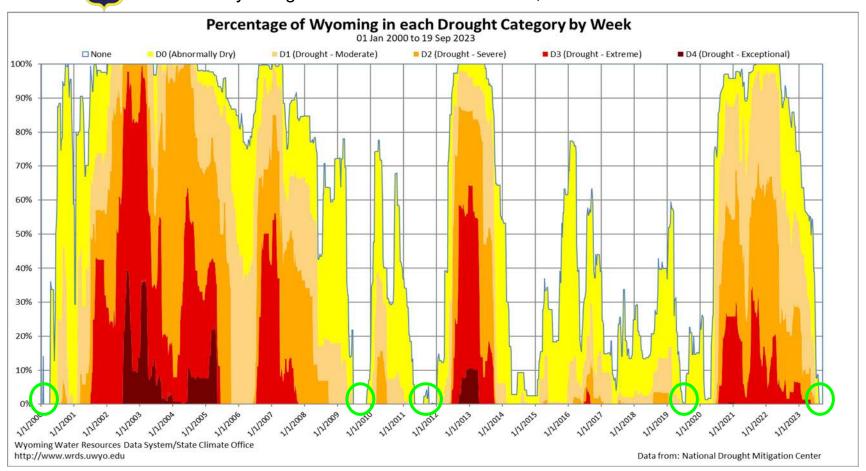




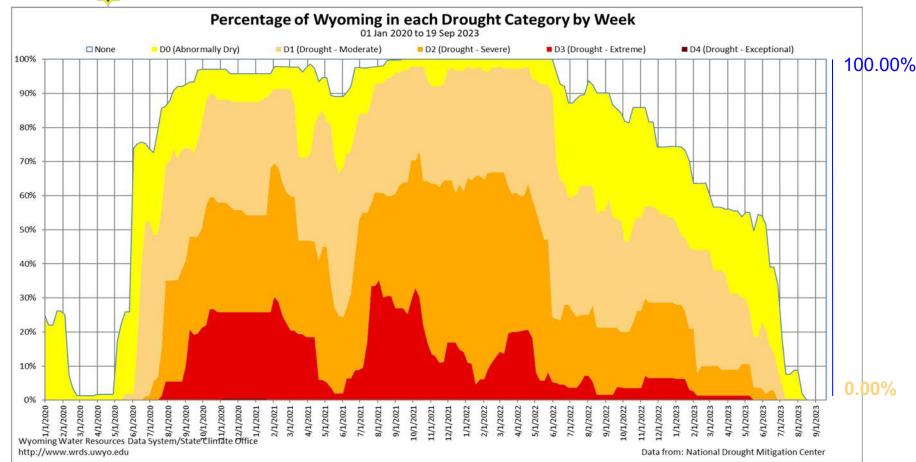




Wyoming Area Affected: 0.0% D0-D4; 0.0% D1-D4









14-Day Precipitation Percentile (07 Sep 2023 to 20 Sep 2023)

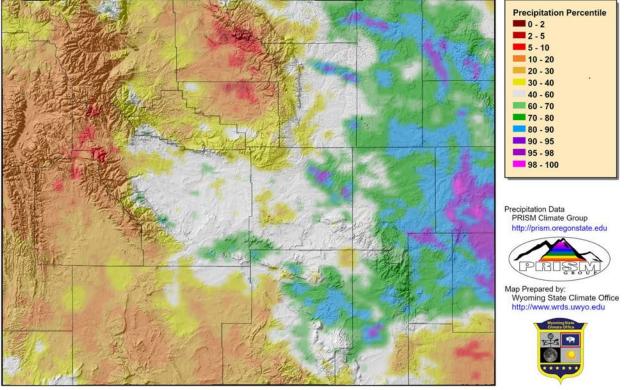
14-Day Precipitation (Percentile) for 07 Sep 2023 to 20 Sep 2023

Above Median:

Eastern Plains (Except Laramie County)

Below Median (Areas of Concern):

- Bighorn Basin
- Laramie County
- Southwest
- West



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 21 Sep 2023 http://www.wrds.uwyo.edu

Daily percentiles created from PRISM daily precipitation grids



90-Day Precipitation Percentile (23 Jun 2023 to 20 Sep 2023)

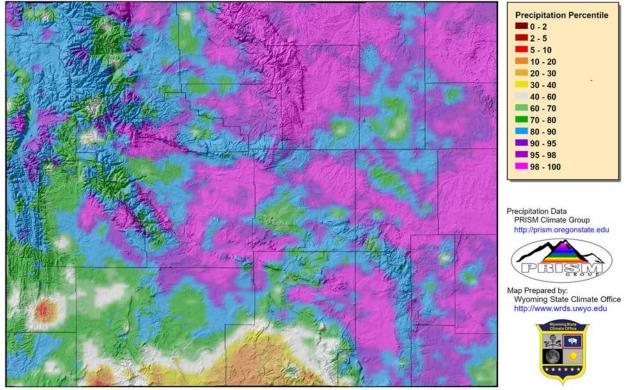
90-Day Precipitation (Percentile) for 23 Jun 2023 to 20 Sep 2023

Above Median:

Most of Wyoming

Below Median (Areas of Concern):

 Little Snake Basin (southern Carbon and Sweetwater Counties)



Provisional data, subject to revision

Daily precipitation data from PRISM Climate Group, Copyright ©2021, PRISM Climate Group, Oregon State University, http://prism.oregonstate.edu

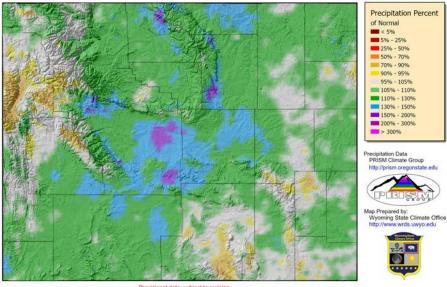
Map Created 21 Sep 2023 http://www.wrds.uwyo.edu Daily percentiles created from PRISM daily precipitation grids



"Year"-to-Date Precipitation (Percent of Average)

Current Water Year

Water-Year Precipitation (Percent of 1991-2020 Average) for 01 Oct 2021 to 20 Sep 2023

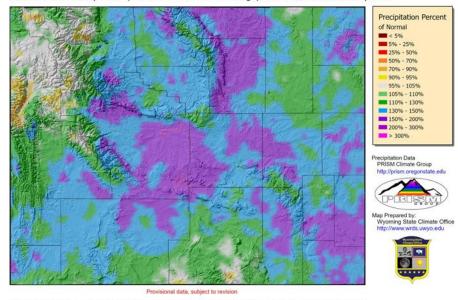


Provisional data, subject to revision

Monthly and Normal precipitation data from PRISM Climate Group, Copyright @2021, PRISM Climate Group, Oregon State University, http://prism.oregonstate.edu Map Created 21 Sep 2023 http://www.wrds.uwyo.edu Daily averages created from PRISM daily precipitation grids

Current Calendar Year

Calendar-Year Precipitation (Percent of 1991-2020 Average) for 01 Jan 2023 to 20 Sep 2023



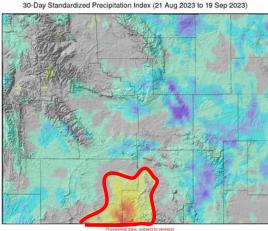
Monthly and Normal precipitation data from PRISM Climate Group, Copyright @2021, PRISM Climate Group, Oregon State University, http://prism.oregonstate.edu

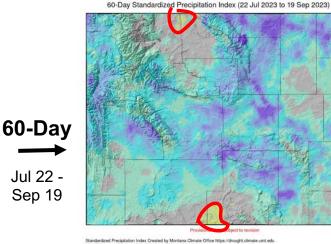
Map Created 21 Sep 2023 http://www.wrds.uwyo.edu Daily averages created from PRISM daily precipitation grids

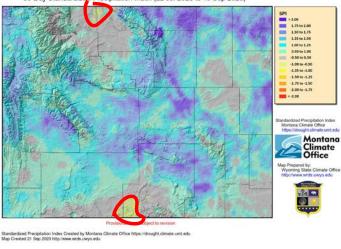


30-Day

Aug 21 - Sep 19







Standardized Precipitation Index Created by Montana Climate Office https://drought.climate.umt.edu Map Created 21 Sep 2023 http://www.wrds.uwvo.edu

Standardized Precipitation Index (SPI)

Short term: Little Snake, northern Park/Big Horn

County Line

Long term: Minor dry side in the Tetons

1-Year

Sep 19

1.75 to 2.00 1.50 to 1.75

> 1.00 to 1.25 0.50 to 1.00 -0.50 to 0.50

-1.00 to -0.50 -1.25 to -1.00

-1.50 to -1.25

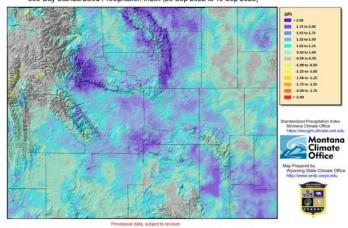
-1.75 to -1.50

Montana Climate Office Montana Climate

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

-2.00 to -1.75





Standardized Precipitation Index Created by Montana Climate Office https://drought.climate.umt.edu Map Created 21 Sep 2023 http://www.wnds.uwyo.edu

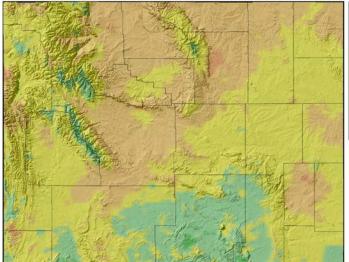


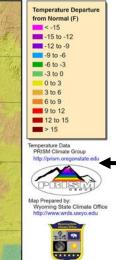
14-Day Average Minimum Temperature (07 Sep to 20 Sep)

Highest elevation mins below freezing

14-Day Average Minimum Temperature (Departure from 1991-2020 Average) for 07 Sep 2023 to 20 Sep 2023

- Northwest generally low to mid-30s to mid-40s
- BH/Wind Basins, much of plains mid-40s to mid-50s





Temperature (F) 25 - 28 28 - 31 46 - 49 Temperature Data PRISM Climate Group 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 21 Sep 2023 http://www.wrds.uwyo.edu Temperature wareages created from PRISM daily iempWYerature grids

14-Day Departure from Normal

Average Minimum Temperature

- 3-6F above average central and north central
- 0-3F below average south central
- 0-3F above average remainder

Provisional data, subject to revision

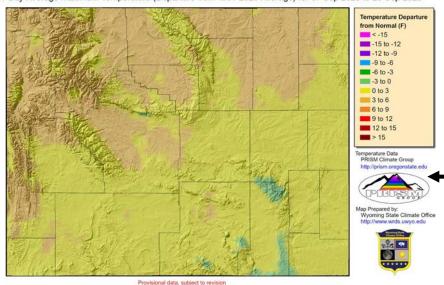


14-Day Average Maximum

Temperature (07 Sep to 20 Sep)

• Highs in the low-70s to low-80s except for higher elevations in the mid-50s to mid-60s

14-Day Average Maximum Temperature (Departure from 1991-2020 Average) for 07 Sep 2023 to 20 Sep 2023



Temperature (F) 49 - 52 70 - 73 73 - 76 79 - 82 emperature Data PRISM Climate Group http://prism.oregonstate.edu Wyoming State Climate Office

Provisional data, subject to revision

Map Created 21 Sep 2023 http://www.wrds.uwyo.edu

Temperature averages created from PRISM daily tempWYerature grids

14- Day *Departure from* Normal

Daily Temperature data from PRISM Climate Group, Copyright @2021, PRISM Climate Group, Oregon State University, http://prism.oregonstate.edu

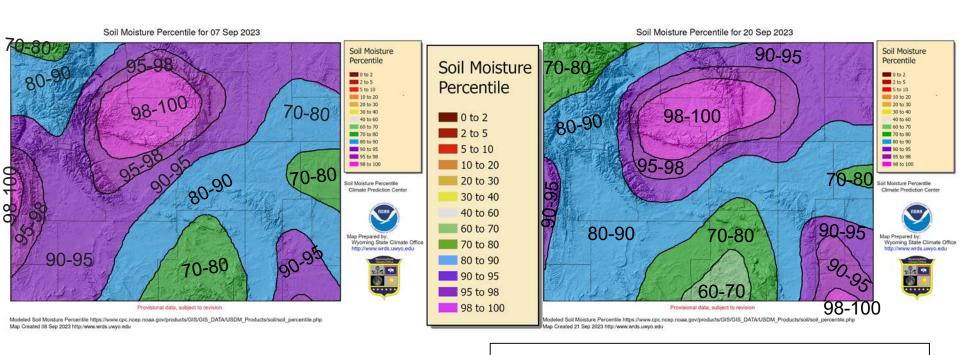
Average Maximum

- 0-3F below average Larante Paragerature 3-6F above average in west and north
- 0-3F above average elsewhere



Soil Moisture Percentile

Two Weeks Ago 20 Sep 2023

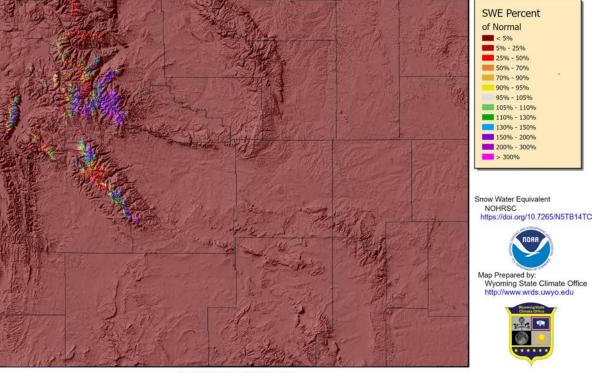


Still above median but degradation in south central and west. Improvements in east.



Snow

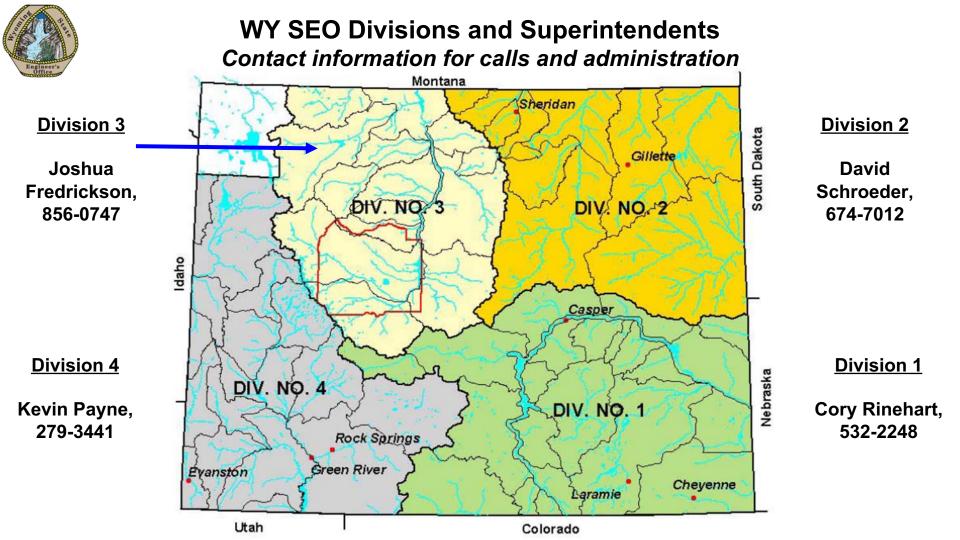
Snow Water Equivalent Percent of Average (2004-2020) for 21 Sep 2023



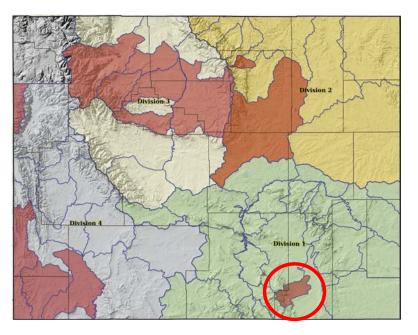
Provisional data, subject to revision

Modelled 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 Percentages created by Wyoming State Climate Office Map created 21 Sep 2023

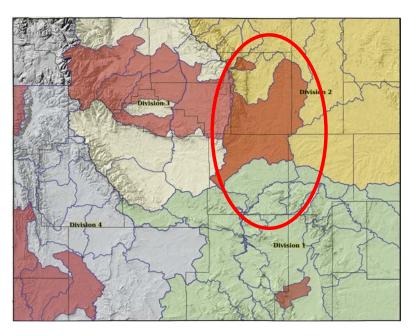






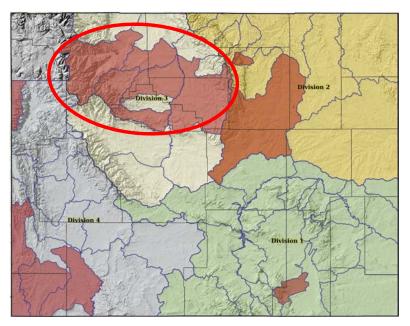
- 1. July 17, 2023 call on Little Laramie River and Tribs, District 4B, to a priority date of Spring, 1881.
- 1. August 15 call on Little Laramie River and Tribs, District 4B, to a priority date of 1876 and 1875.
- 1. August 15 call on Little Laramie River and Tribs, District 4B, to a priority of 1875.





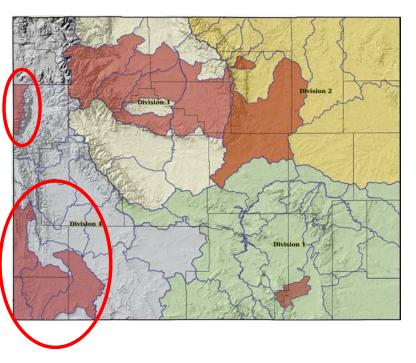
- 1. July 28, 2023 call on the North Fork Powder River, District 8, for shepherding of water from storage to headgates.
- 1. August 29, 2023 call on French Creek and Tribs, District 3, to a priority right of June 1, 1884.





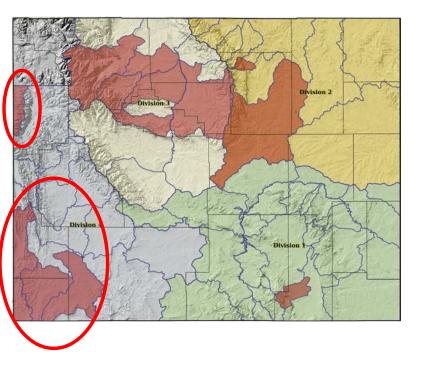
- 1. July 31, 2023 call on Greybull River and tribs, District 8 and 16, to a priority date of 1/27/1913.
- 2. August 22, 2023 call on Paint Rock Creek and Medicine Lodge Creek, District 6, to a priority dates of 6/8/1906 and 7/26/1906.
- 3. August 31, 2023 call on Gooseberry Creek, District 13, to a priority date of 12/21/1906.
- 4. September 7, 2023 call on Owl Creek and tribs, District 5, to a priority date of 1/25/1900.
- 5. September 7, 2023 call on Bennett-Little Rock Creek, District 9, to a priority date of 5/8/1900.





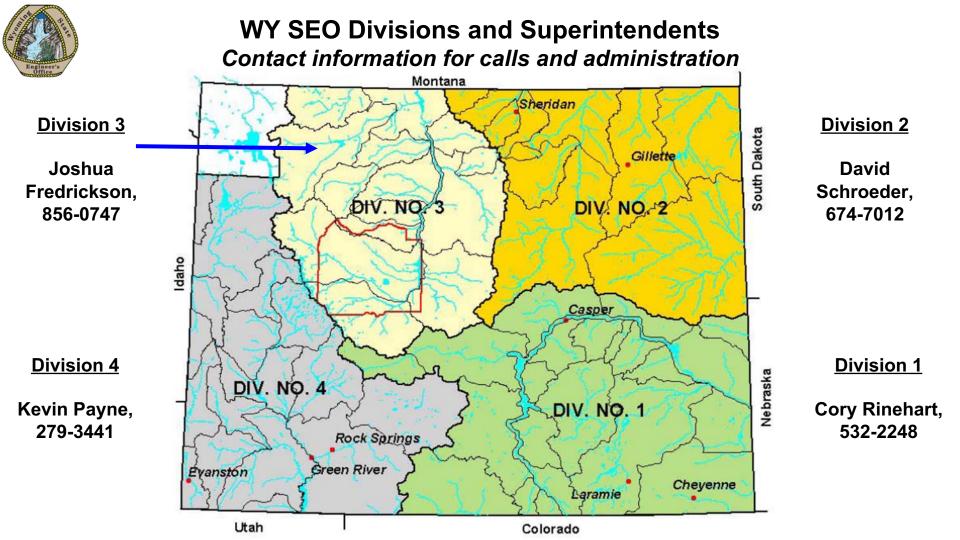
- 1. July 11, 2023 call on Smith's Fork River and tribs, District 3, to a priority date of April, 1875.
- 2. July 14, 2023 call on Black's Fork River and Tribs, District 15, to a priority date of 10/29/1909.
- 3. July 27, 2023 call on East Fork of Smith's Fork River and Tribs, District 3, to a priority date of 01/04/1910.
- 4. July 31, 2023 call on Teton Creek and Tribs, District 13, regulated to meet the Roxanna Decree.





Division 4 continued

- 5. August 2, 2023 call on Smith's Fork and Bear River and Tribs, regulated to monitor diversions per Bear River Compact.
- 6. September 4, 2023, call for storage water out of China Lake Reservoir, District 3.















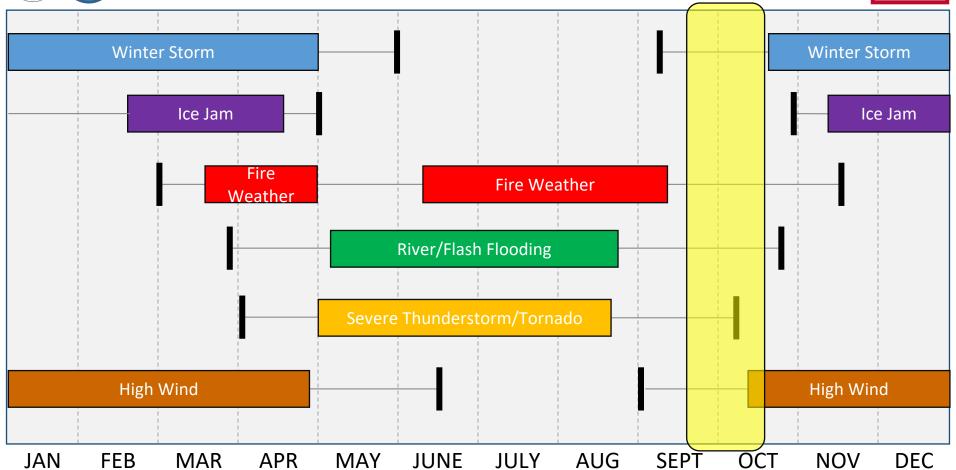


Weather Info & Forecasts



NWS Wyoming Typical Hazard Calendar

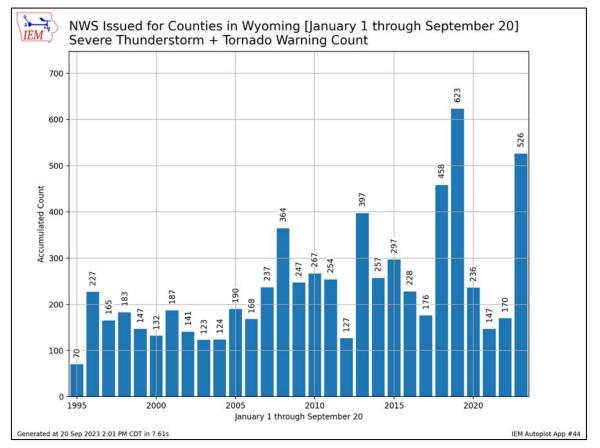






WY Severe Weather Season Stats

Through 9/20/23



- Active spring, summer, and early autumn for hazardous Wyoming weather
- 2023: 2nd highest
 Severe Thunderstorm
 Warnings + Tornado
 Warnings in modern
 radar era
- 2018 & 2019 were previous big years



7-Day Total Precipitation Forecast

Through 9/28/23

Precipitation Amount

(inches)

< 0.01 0.01 - 0.09 0.10 - 0.24

0.25 - 0.49 0.50 - 0.74

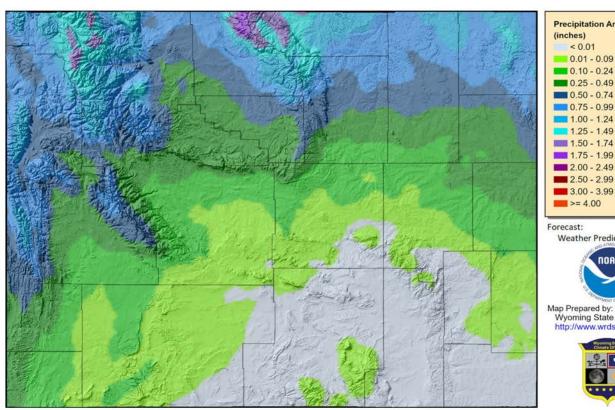
0.75 - 0.99 1.00 - 1.24 1.25 - 1.49 1.50 - 1.74 1.75 - 1.99

2.00 - 2.49 2.50 - 2.99 3.00 - 3.99

>= 4.00

Wyoming State Climate Office

http://www.wrds.uwyo.edu

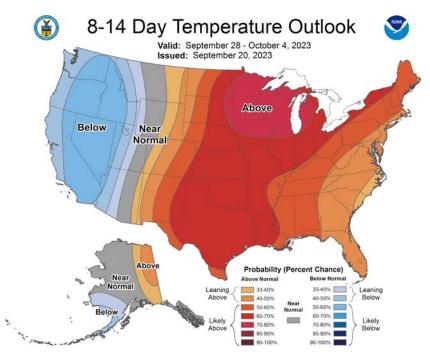


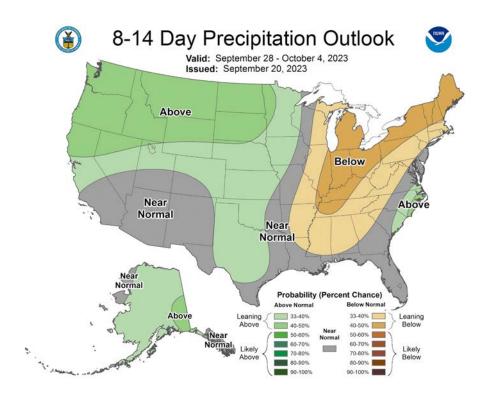
- Wet weather system moving across the north tonight through Saturday
- South central and southeast largely missed by this next system Weather Prediction Center
 - Then mostly dry statewide through the middle of next week



8-14 Day Outlooks

(Sep 28 - Oct 4)





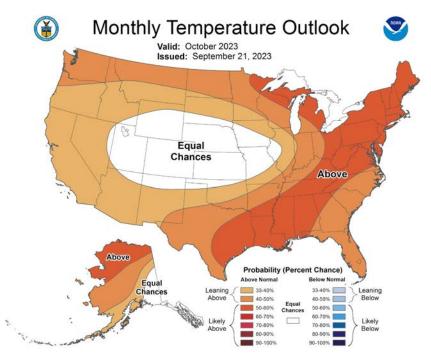
Lean toward above normal in east

Lean toward above normal precipitation statewide

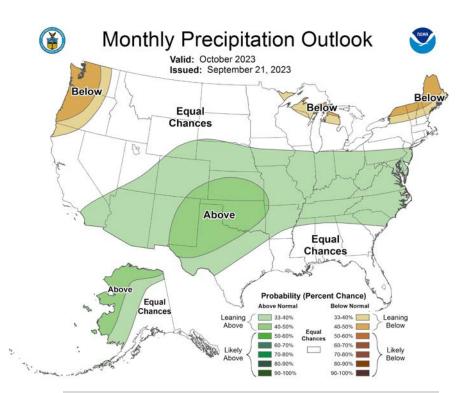


1-Month Outlooks

(October)



No clear signal from the global weather pattern: Near climatology is best forecast



No clear signal from the global weather pattern: Near climatology is best forecast



The Farmer's Almanacs vs. NWS Outlooks

- Both use large-scale climate indicators to make predictions
- There is often some skill in both, given large-scale weather patterns are being assessed
- <u>Difference #1:</u> Vague with lack of specificity vs. CPC scientific rigor
- <u>Difference #2:</u> Only one "release" of information each year vs. CPC seasonal outlooks updated monthly
- Difference #3: Presented in "tabloid" fashion ⇒ dramatic, hyped, advertisement-funded vs. CPC data, paid for by tax \$

"Old Farmer's Almanac" (since 1792)



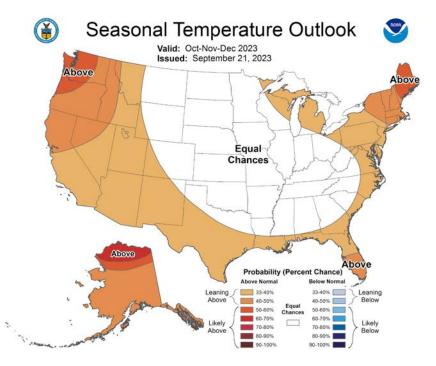


"Farmer's Almanac" (since 1818)

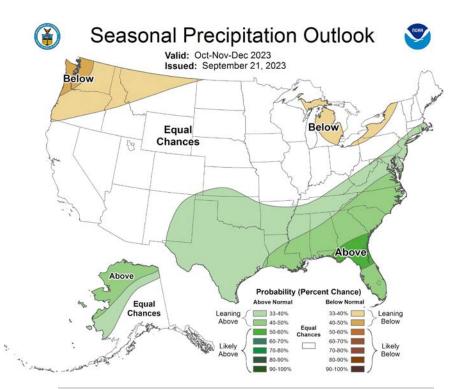


3-Month Outlooks

(Oct-Nov-Dec)



No clear signal from the global weather pattern: Near climatology is best forecast



No clear signal from the global weather pattern: Near climatology is best forecast



Fuel Moisture and Energy Release Component (ERC): Definitions and Explanations

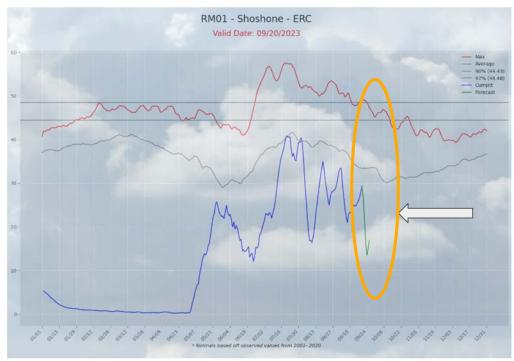
- Live Fuel Moisture- Influenced by seasonality, species characteristics and available moisture (soil and air).
- <u>Dead Fuel Moisture</u>- Influenced by precipitation and relative humidity. 4 Size Classes based on "Time Lag", the amount of time it takes the fuel to adjust to closely resemble the humidity of its surrounding environment.
 - 1 Hour Fuels
 - Less than 1/4" diameter.
 - Fine flashy fuels that respond quickly to weather changes. Computed from observation time temperature, humidity, and cloudiness.
 - o 10 Hour Fuels
 - 1/4 to 1" diameter.
 - Computed from observation time temperature, humidity, and cloudiness. Or can be an observed value, from a standard set of "10-Hr Fuel Sticks" that are weighed as part of the fire weather observation.
 - o 100 Hour Fuels
 - 1 to 3" diameter.
 - Computed from 24-hour average boundary condition composed of day length, hours of rain, and daily temperature/humidity ranges.
 - 1000 Hour Fuels
 - 3 to 8 " diameter.
 - Computed from a 7-day average boundary condition composed of day length, hours of rain, and daily temperature/humidity ranges.
- <u>Energy Release Component (ERC)-</u> Related to the available energy (BTU) per unit area (square foot) within the flaming front at the head of a fire. ERC is a composite fuel moisture index as it reflects the contribution of all live and dead fuels to potential fire intensity.



Current Fuels Conditions: ERC

RM01-Shoshone



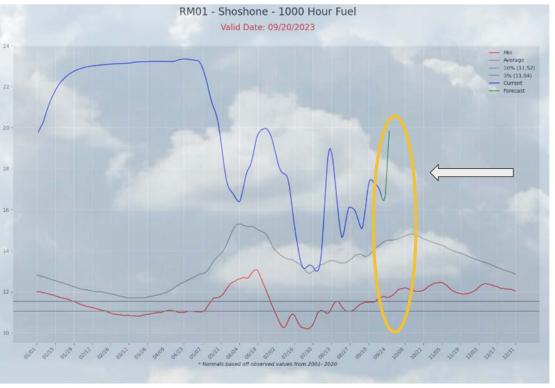




Current Fuels Conditions: 1,000Hr Dead Fuels

RM01-Shoshone



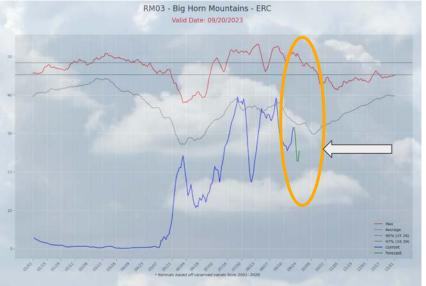


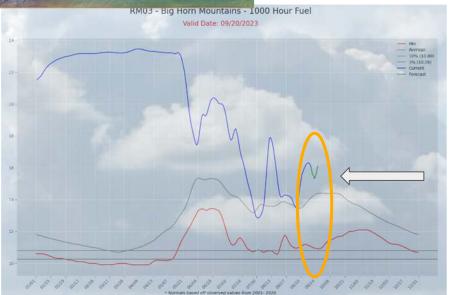


Current Fuels Conditions: ERC and 1,000Hr Dead Fuels

RM03-Bighorn Mountains





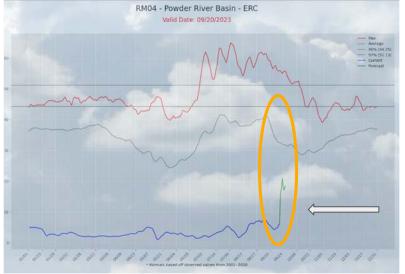


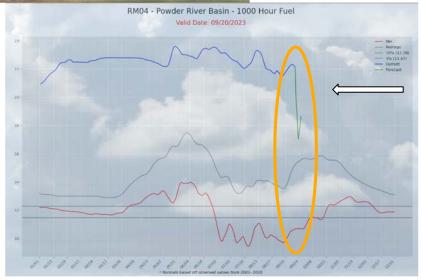


Current Fuels Conditions- ERC and 1,000Hr Dead Fuels

RM04-Powder River Basin



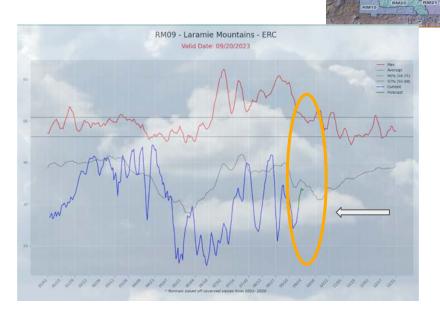


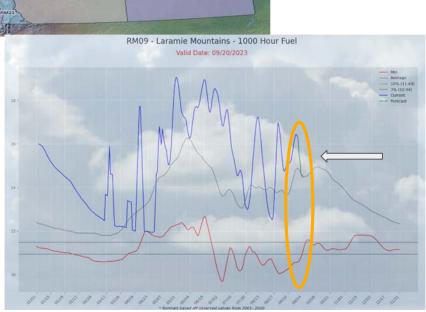




Current Fuels Conditions-1,000Hr Dead Fuels and ERC

RM09-Laramie Mountains





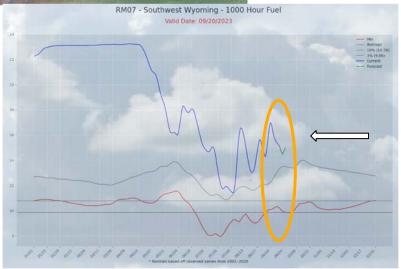


Current Fuels Conditions- ERC and 1,000Hr Dead Fuels

RM07-Southwest Wyoming





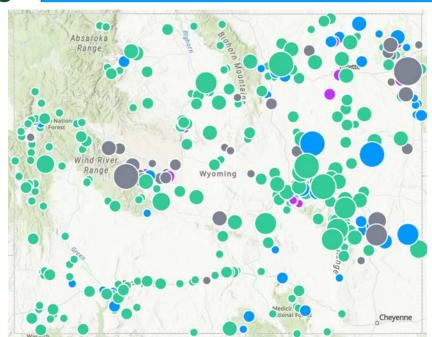


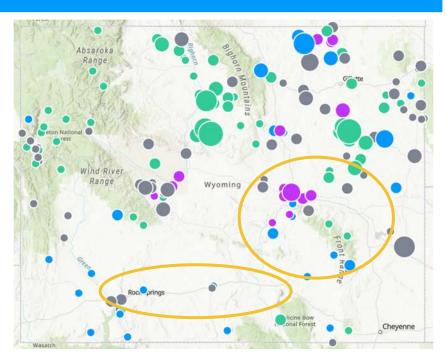


Fire Occurrence 2022 vs 2023

INSPECTOR

v2.0.26





2022 2023



Fire Size: 2022 vs 2023

Description			
Greater than 0 but less than or equal to 0.25 Acres			
0.26 to 9.9 Acres			
10.0 to 99.9 Acres			
100 to 299 Acres			
300 to 999 Acres			
1000 to 4999 Acres			
5000 to 9999 Acres			

Incident Type: WF State: US-WY

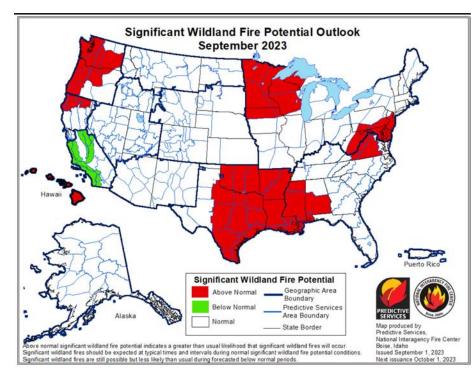
	2022					
otal .	390					V
Class G	1	0.26 %				
Class D	5	1.28 %				
class F	6	1.54 %				
Class E	7	1.79 %		\\		
Class C	43	11.03 %				
Class B	126	32.31 %				
Class A	202	51.79 %		JIBSS F	Class D	Class G
Size Class	Number of Incidents	Percentage	Class A	Class B	Class D	s C Class G

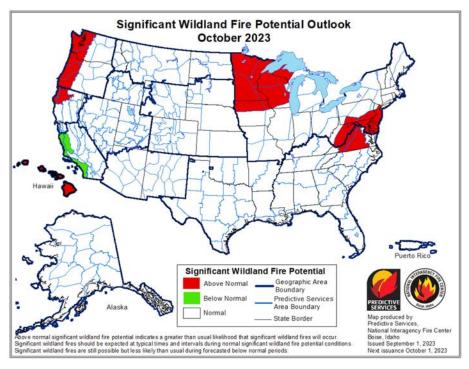
Incident Type: WF

State: US-WY



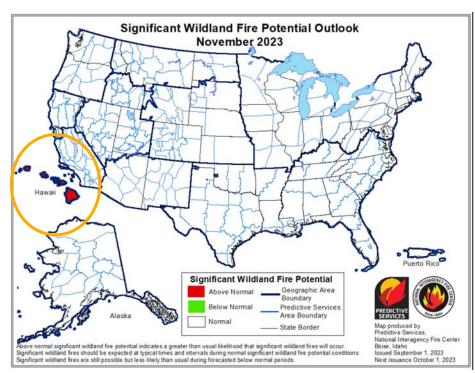
National Fire Danger Outlook

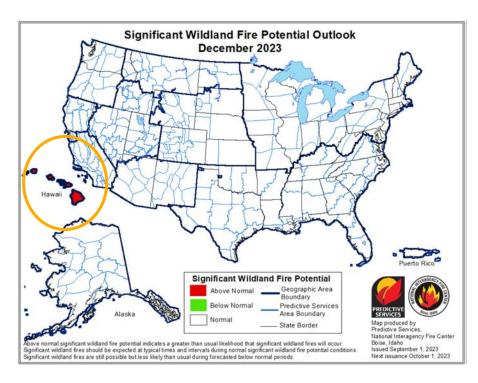






National Fire Danger Outlook



















Highlight of the Month:

National Weather Service: Top Weather Websites

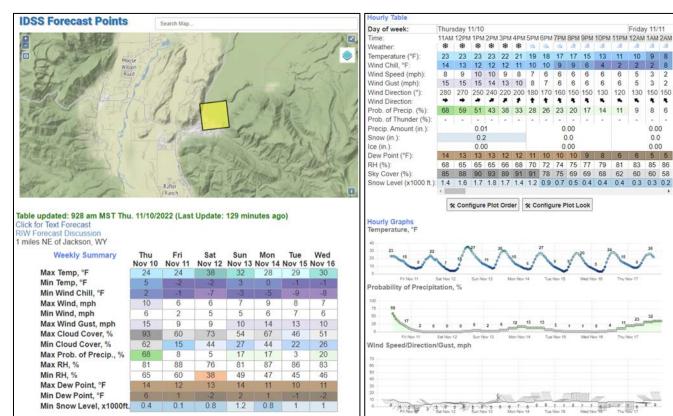
- IDSS Forecast Points Page
- Probabilistic Snow Forecast Page
- WY Weather Decision Support Page



IDSS Forecast Points

Hourly Weather Forecasts for Your Location

- On-demand, user-generated location forecast
- Great for weather timing
- 1.5 x 1.5 mile forecast boxes
- Updated forecast every 3 hours
- Hourly data for most weather elements over the next 7 days
- Uses same database as our main website, just presented in a "modern, aestheticallypleasing" layout



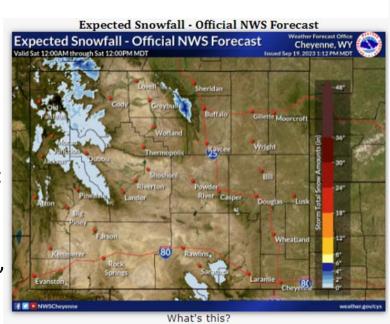
weather.gov/forecastpoints



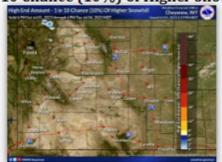
Probabilistic Snow Forecasts

What's the Range of Possibilities?

- Uses ensemble forecasting to give a sense for the "range of possibilities"
- Great for understanding:
 - "At least this much"
 - "Most likely amount"
 - "How bad could this be, even if it's unlikely"

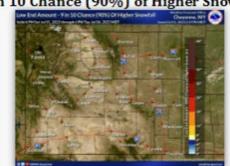


High End Amount 1 in 10 Chance (10%) of Higher Snowfall



What's this?

Low End Amount 9 in 10 Chance (90%) of Higher Snowfall



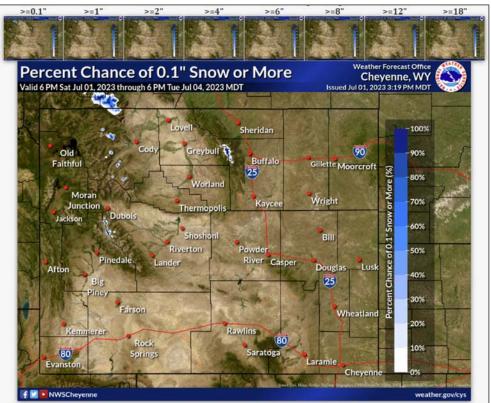
What's this?

weather.gov/cys/winter



Probabilistic Snow Forecasts (cont.)

What's the Range of Possibilities?



		Experi	Totals by L mental - Leave feed 0500PM to 12/15/20 What's this?	dback							
	Sn		y. Selected R Plots Bar Plot	İS	Chan	ce of S	eeing	More	Snow	Than	
Location	Low End Snowfall	Expected Snowfall	High End Snowfall	>=0.1"	>=1"	>=2"	>=4"	>=6"	>=8"	>=12"	>=18
Greybull Airport, WY	0	0	<1	35%	0%	096	096	096	096	096	09
Lander Airport, WY	0	<1	<1	33%	096	0%	0%	096	096	096	09
Riverton Airport, WY	0	0	<1	35%	096	096	096	096	096	096	09
Thermopolis, WY	0	<1	<1	41%	196	096	0%	0%	0%	096	09
Buffalo, WY	<1	2	5	95%	83%	62%	22%	496	096	096	09
Afton Airport, WY	0	<1	1	7196	6%	096	0%	096	096	096	09
Kemmerer Airport, WY	0	<1	1	57%	996	0%	0%	096	0%	096	09
Casper, WY	1	3	5	98%	92%	74%	21%	196	0%	096	09
Cody Airport, WY	0	0	<1	35%	0%	0%	0%	0%	096	096	09
Big Piney, WY	0	0	<1	12%	0%	0%	0%	0%	0%	096	09
Pinedale, WY	0	0	<1	12%	0%	0%	0%	0%	0%	096	09
Green River, WY	0	0	<1	41%	1%	0%	0%	096	096	096	09
Rock Springs, WY	0	0	<1	4196	196	0%	0%	096	0%	096	09
Jackson, WY	0	0	<1	35%	096	0%	0%	0%	0%	0%	09
YNP Lake Yellowstone. WY	0	<1	<1	49%	0%	0%	0%	0%	096	0%	09
Worland, WY	0	0	<1	1296	0%	0%	0%	096	0%	096	09

- Scroll down on page to see threshold forecasts:
 - Percent Chance of 1", etc.
- Table for popular locations on local pages
- Box and Bar plots available too



WY Weather Decision Support Page

https://www.weather.gov/cys/current_wydss

- One-Stop Wyoming Statelevel webpage for overview of impact levels, latest hazards, radar, weather stories, and decision support packets when 'elevated' to 'high' impacts are expected.
- Wyoming Weather Impact Level graphic updated twice a week (Mon/Thur).
- Segmented by hazard/season at top of page.



Weekly Weather Impact Level: Low

Overview:

 Scattered to numerous showers and thunderstorms are expected today and Friday. High elevation snow expected, especially Thursday night through Friday night, mainly across the northwest mountains.

Cold Saturday morning temperatures in valley locations and western WY.
 Freeze Watch in effect for portions of western WY Friday evening through Saturday morning.

 High winds likely across southeast WY wind prone locations Saturday morning.

 A ridge of high pressures builds over WY leading to warmer and drier conditions Sunday through Tuesday.

_	7.00 AH	
d .	Legend:	ı
	Limited/None	ŀ
	Low	
	Moderate	
	High	

September 21, 2023

Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday
Scattered to numerous showers and thunderstorms. High elevation snow.	Cooler with scattered to numerous showers and thunderstorms. High elevation snow.	Cool with scattered showers across northern WY. High winds likely for wind prone areas of southeast WY.	Warmer and drier with mostly sunny skies.	Continued warming with dry conditions.	Mild and sunny.	Chance of showers acros northern WY.

This is updated on Mondays and Thursdays before noon. For more forecast details, refer to the forecast, severe, winter, hydrology, and fire tabs on the webpage.















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The WY 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 WY weekly - and communicate this info to the U.S. Drought Monitor & others.

Learn more at:

https://drought.wyo.gov

Thank you!