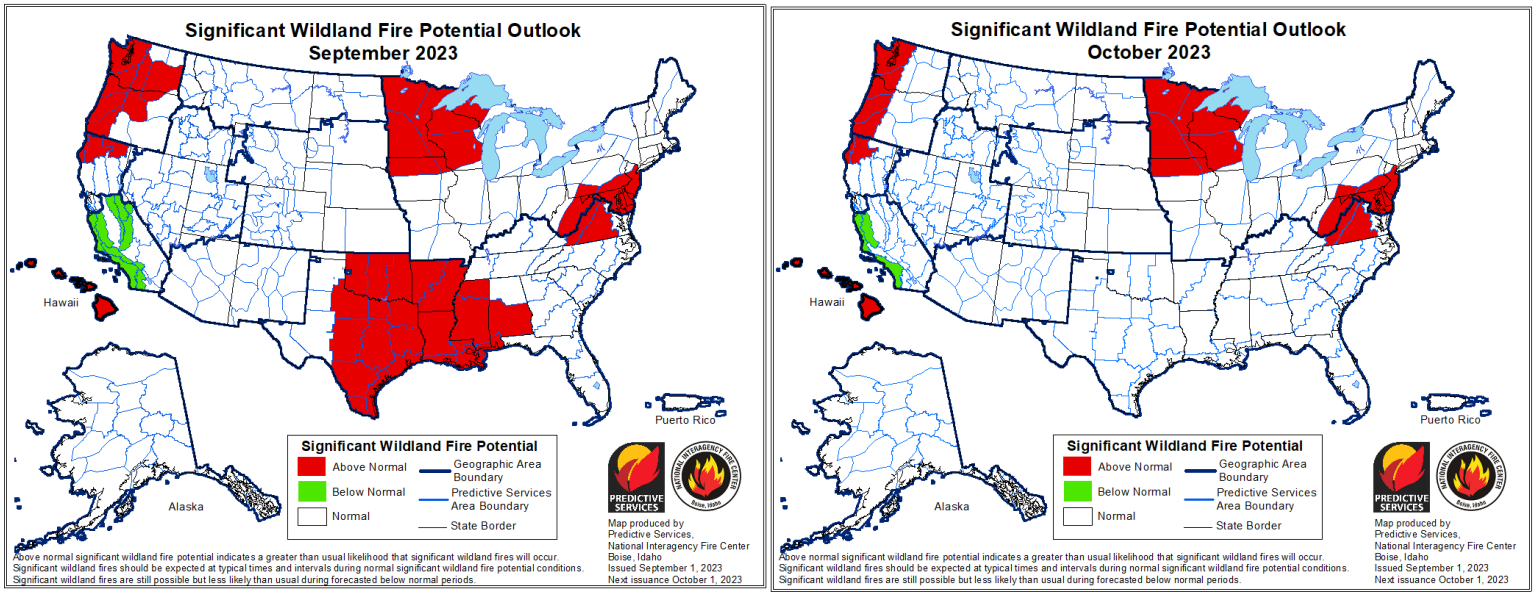
September 2023 - Wildland Fire Outlook

September 3, *2023*



Significant Wildland Fire Potential -- September, October 2023 (September 1, 2023, National Interagency Fire Center).
https://www.predictiveservices.nifc.gov/outlooks/outlooks.htm.

SUMMARY

A variable yet persistent flow of monsoon moisture limited fire activity in August (typically one of our drier months, and with peak fire indices). Long-term weather monitoring sites in Moose indicates this was the second wettest August in more than 60 years. Over the past 30 days, area weather stations received from 1 to 3+ inches of rain. Soil moisture is forecast to remain 30 percent wetter than normal through November. Outlooks for fall call for warmer than normal temperatures and variable yet near-normal moisture patterns, with weather trends correlated to development of a strong *El Niño* event.

- Fire danger is at Moderate for Bridger-Teton National Forest / Grand Teton National Park and no fire restrictions are in place. Last year at this time we moved from Moderate to High Fire Danger, and at the end of August 2021 we moved out of Stage 1 Fire Restrictions.
- **Normal fire potential** for September through the end of the season, per the Great Basin Coordination Center's monthly outlook: https://gacc.nifc.gov/gbcc/predictive/docs/monthly.pdf
- Daily updates for GBCC Fire Potential Briefing and outlooks: https://gacc.nifc.gov/gbcc/outlooks.php

During an average fire season, based on a 20-year fire history from 2001-2020, Bridger-Teton National Forest will average 52 unplanned fires (32 natural starts per year, and 20 human-caused fires) for an average of 16,522 acres per year. Grand Teton National Park will average 10 unplanned fires (six natural starts per year, and four human-caused fires) for an average of 1332 acres per year. Current information on fire conditions, indices and fire activity is at www.tetonfires.com, with regional and national outlooks at https://gacc.nifc.gov/gbcc/dispatch/wy-tdc/home/predictive-services/outlooks.

1. 30-day and 60-day Temperatures

The past 30-day and 60-day periods were mostly warmer than normal except for higher elevations in the Tetons and eastern Wind River mountains.

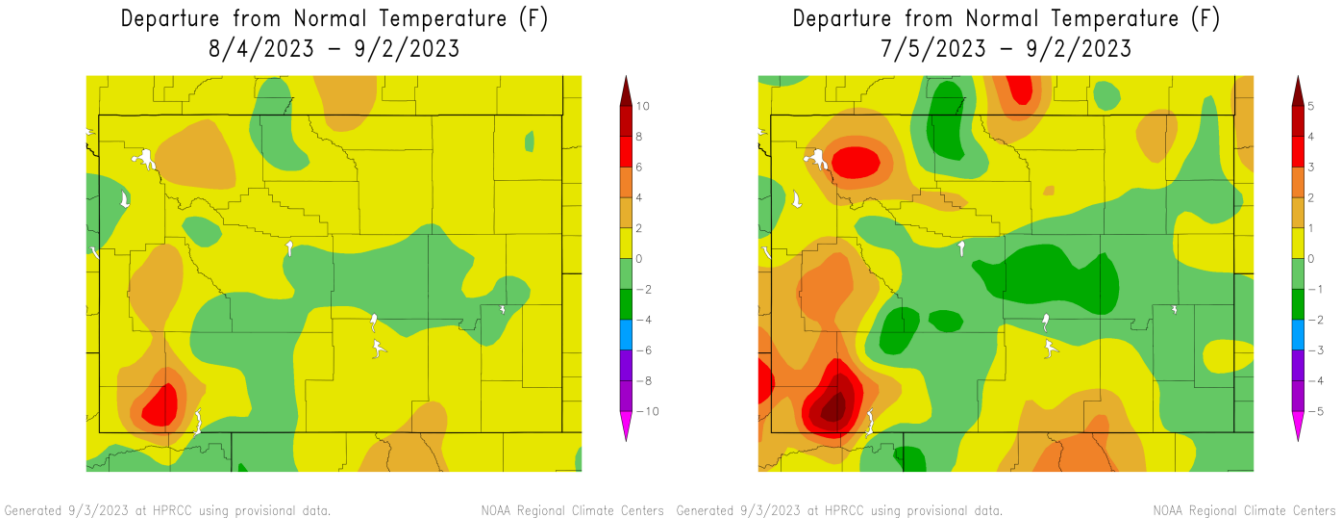


Figure 1a (left) and 1b (right). Wyoming, Departure from Normal Temperature, past 30 and 90 days.

2. Precipitation

Area precipitation for the past 30 and 90 days recorded wetter than normal conditions.

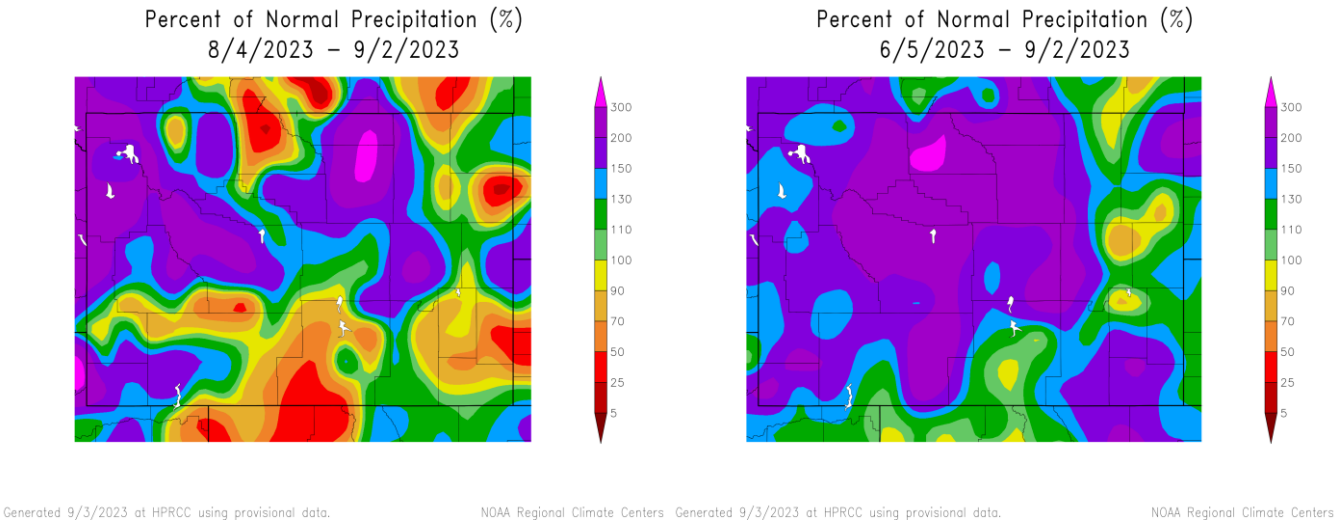
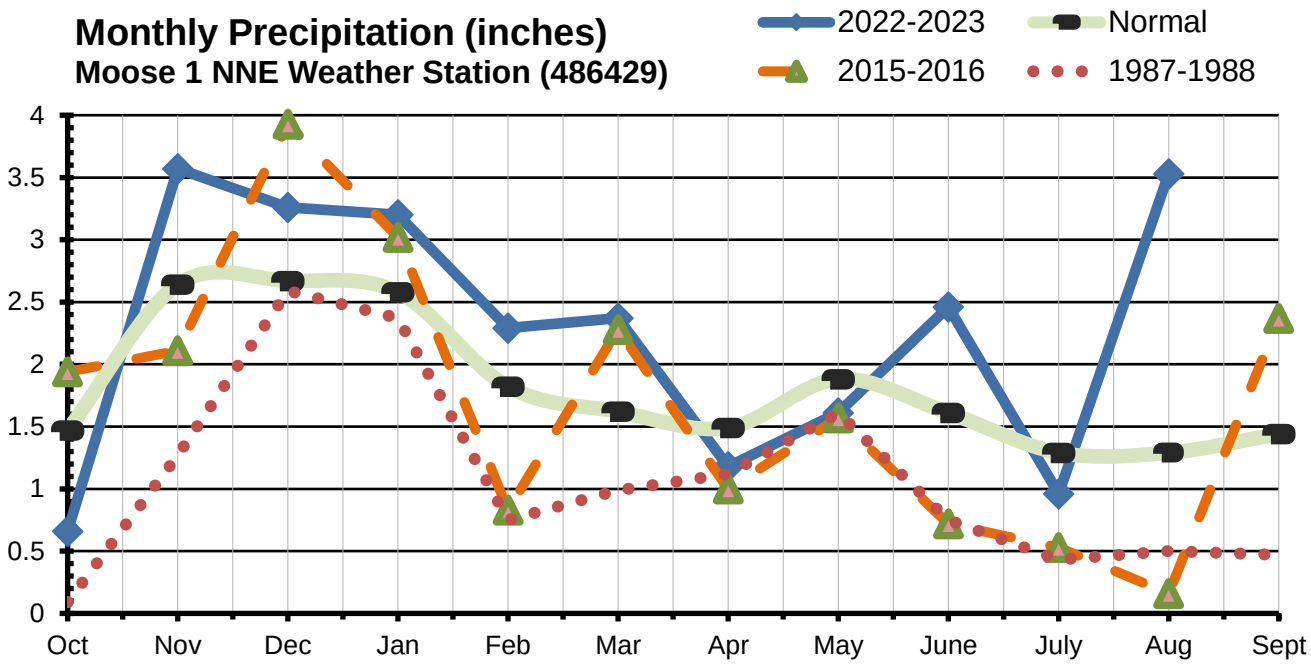


Figure 2a (left) and 2b (right). Wyoming, Percent of Normal Precipitation, past 30 and 90 days.

Precipitation tracking at Moose 1 NNE WY Climate Weather Station -- an automated Climate Reference Station in the dispatch area -- is representative for lower elevation sites in Grand Teton National Park and some North Zone sites. The station recorded 3.53” of rain in August – 274% of normal for the month and 123% of normal for the water year-to-date, compared to 103% water YTD for last year at this time and 89% for 2016, a prior active fire

year. It was the second wettest August in the Moose-area period of record beginning 1959, with the wettest August in 1978 recording 4.18". Compared to a 30-year precipitation record, the past three months received 166% of normal. July was drier than normal and June/August wetter.



		Feb	Mar	April	May	June	July	August	YTD total
Precipitation	1987-88	0.75	0.99	1.12	1.61	0.75	0.43	0.5	12.47
(inches)	1999-00	5.04	1.03	0.4	1.38	0.59	0.36	0.53	14.38
	2015-16	*0.83*	*2.28*	*1*	*1.57*	*0.72*	0.53	0.16	18.09
	2021-22	0.45	1.17	3.1	2.49	1.72	0.4	1.85	21.03
	Normal	*1.88*	*2.58*	*1.82*	*1.62*	*1.61*	*1.29*	*1.29*	*20.36*
	2022-23	**2.29**	**2.37**	**1.18**	**1.61**	**2.46**	**0.96**	**3.53**	**25.09**
Percent of NORMAL	*1987-88*	40%	63%	75%	84%	47%	33%	39%	61%
	1999-00	267%	66%	27%	72%	37%	28%	41%	71%
	2015-16	46%	141%	67%	84%	45%	41%	12%	89%
	2021-22	25%	72%	208%	132%	107%	31%	143%	103%
	2022-23	**126%**	**146%**	**79%**	**86%**	**153%**	**74%**	**274%**	**123%**

Table 2 - Graph and Table: Precipitation, Moose Weather Station (Grand Teton National Park).

3. Drought Monitor

As of September 1, Wyoming is no longer experiencing drought or abnormally dry conditions, compared to early June, when most of the state was in abnormally dry or drought conditions, or August 1, when northwest Wyoming was abnormally dry. This is the first time in three years that Wyoming has been drought-free.

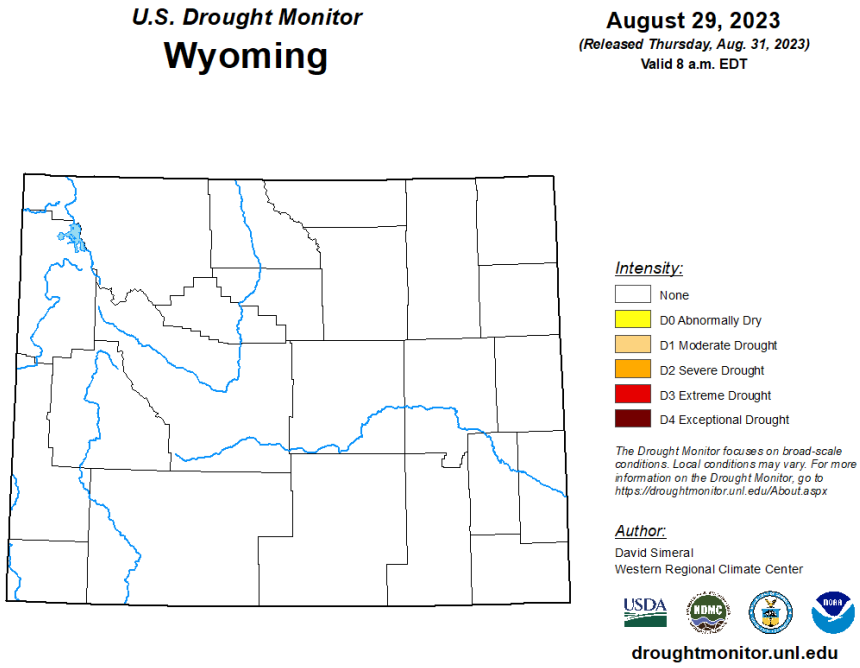


Figure 3a. U.S. Drought Monitor – Wyoming. August 29, 2023. [Wyoming | U.S. Drought Monitor (unl.edu)]

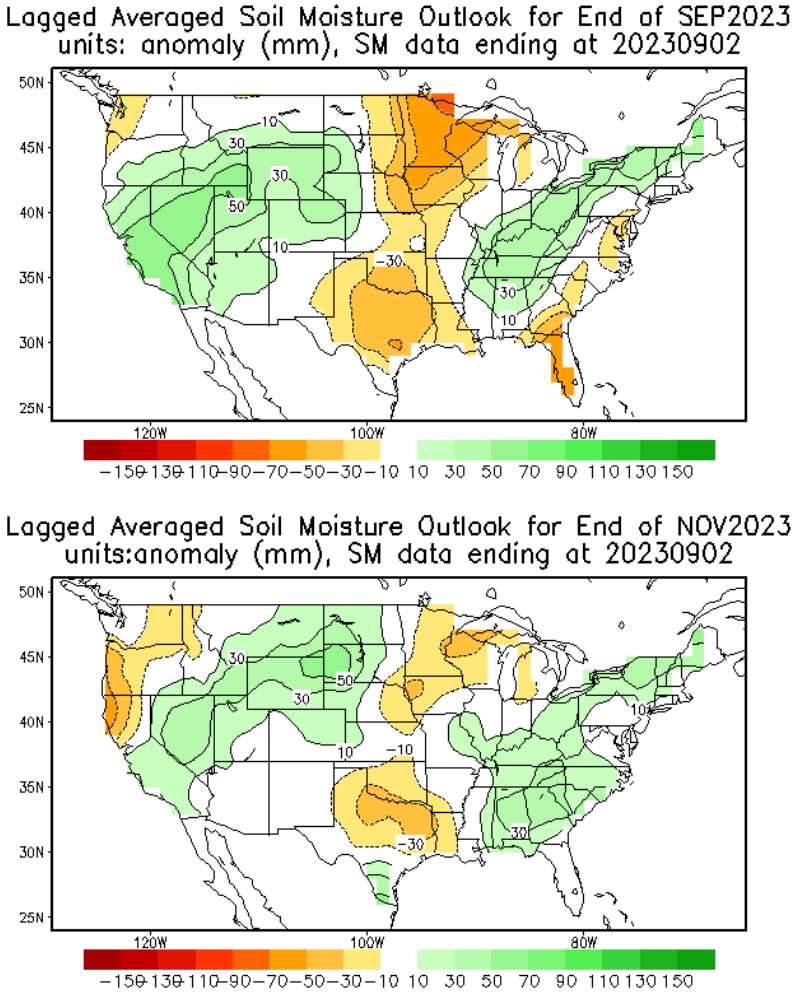


Figure 3b. Soil Moisture Outlooks for end of September and November, 2023.
https://www.cpc.ncep.noaa.gov/products/Soilmst_Monitoring/US/Outlook/CAS/SM.shtml

4. Fuel Moisture

Sampling in Bridger-Teton National Forest and Grand Teton National Park from early to late August reflects effects of monsoon moisture. Most fuels are wetter than normal or normal, though lower elevation sagebrush sites have approached critical during dry periods. Live Woody Conifer in some sites greened up early and declined. For Grand Teton, conifer moisture has been approaching critical (yellow in second chart below) since mid-July. This is illustrated in the third chart below, which tracks conifer moisture at the driest 90th percentile. Note: the National Fuel Moisture Database is unavailable.

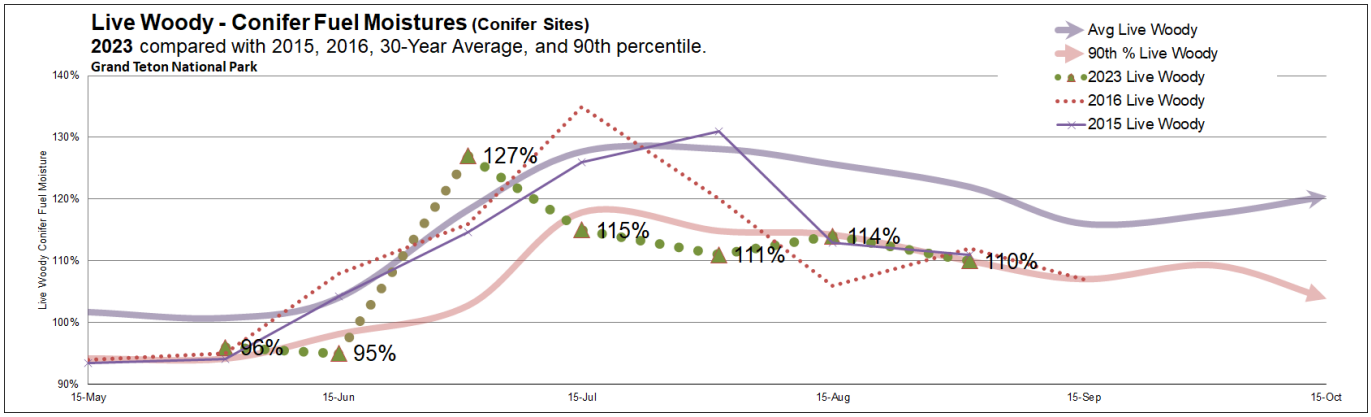
SITE TYPE	FUEL TYPE	East Zone BTNF (8/1)	West Zone BTNF (9/1)	North Zone BTNF (8/1)	Grand Teton NP (9/1)
Sagebrush	LH Grass				82%
	LW Sagebrush	137%	155%	142%	87%
Conifer	LH Grass			160%	127%
	LW Lodgepole	108%	120%		111%
	LW Fir (Douglas/Subalpine)	SF: 113%	SF: 101%	DF: 126%	DF: 108%
	1000 Hour Dead	15%	14%	12%	16%

Critical Fuel Moisture Status - Teton Interagency Fire

Grand Teton National Park (2023)

Based on Fuel Moisture Sampling

	1-Jul	15-Jul	1-Aug	15-Aug	1-Sep	15-Sep
1000 Hour - in Conifer	39	17	15	22	16	-
Live Herb - in Conifer	216	133	142	115	127	-
Live Woody - Conifer	127	115	111	114	110	-
LH - Grasses in Sagebrush	173	127	106	101	82	-
Live Woody - Sagebrush	218	143	113	110	87	-

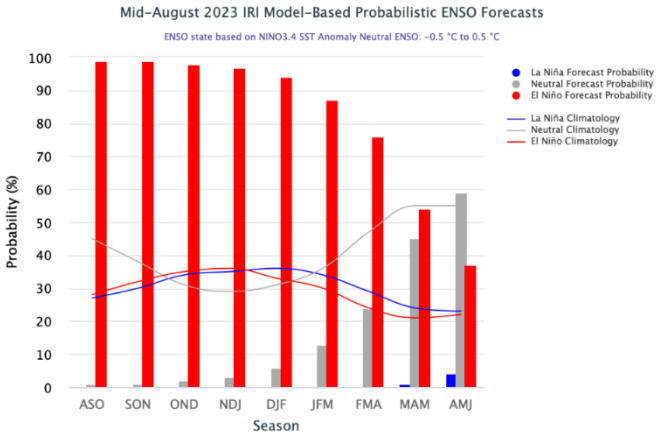


5. El Niño / La Niña / ENSO-Southern Oscillation)

The mid-month ENSO Forecasts (Figure 5 below - IRI – International Research Institute for Climate and Society | Quick Look (columbia.edu) tracks *El Niño* (warm) and *La Niña* (cool) events in the tropical Pacific. *El Niño* conditions are forecast to continue through early winter of 2024, with a 2/3rd chance of a

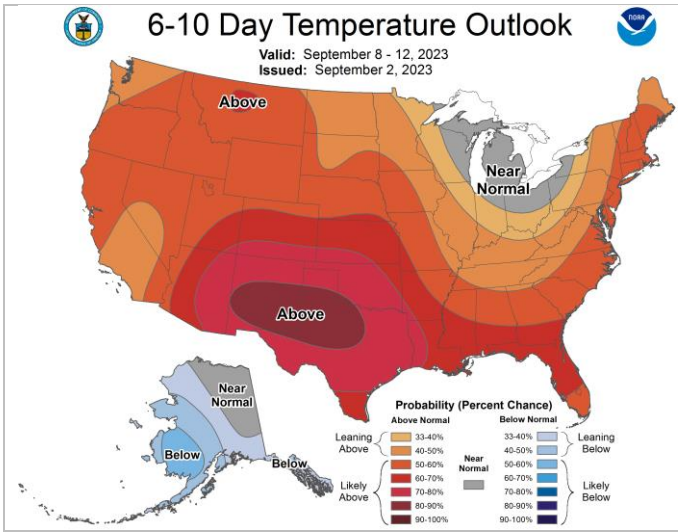
strong event from October 2023-January 2024. In winter months, *El Niño* effects may lead to warmer than normal temperatures from Alaska through the Pacific Northwest to the central Rockies.

Current *El Niño* conditions will likely continue, with high probabilities for *El Niño* conditions through August-December and continuing near or above 80% through March 2024.

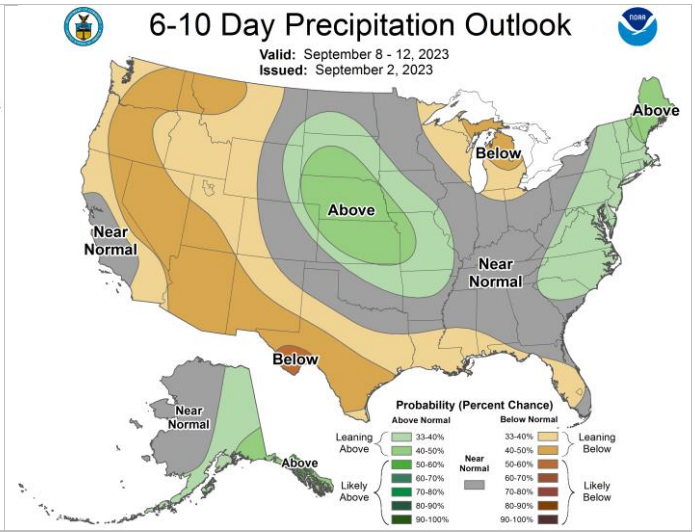


6. Temperature and Precipitation Outlooks

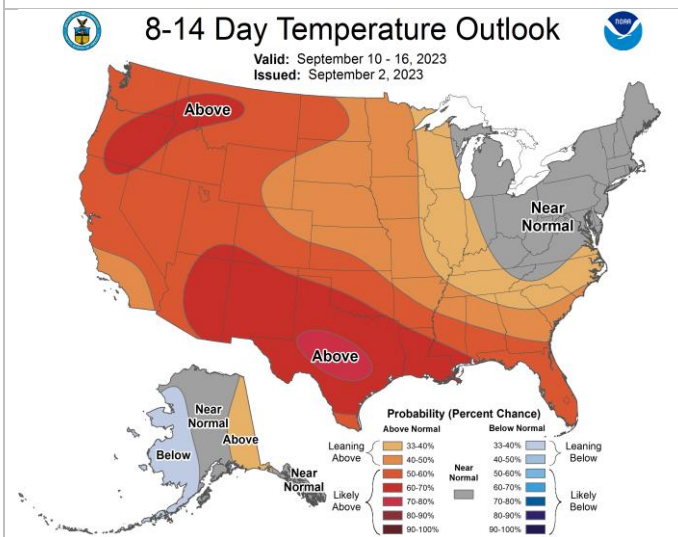
Outlooks through November call for warmer temperatures and variable but near normal precipitation.



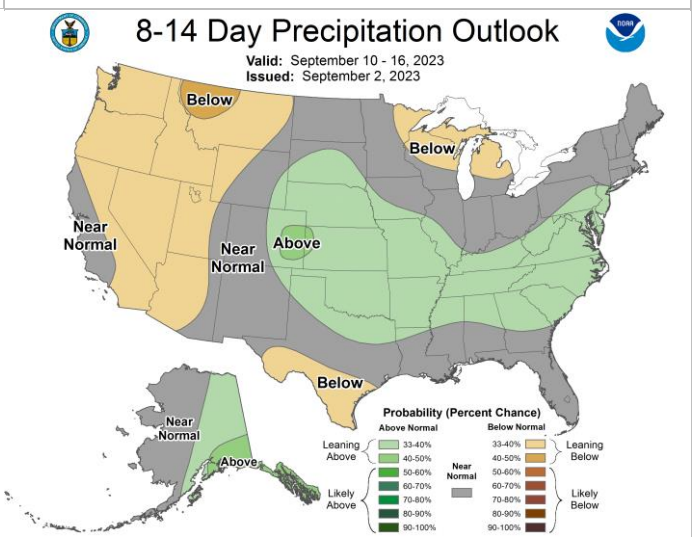
[6-10 Day Temperature Outlook]



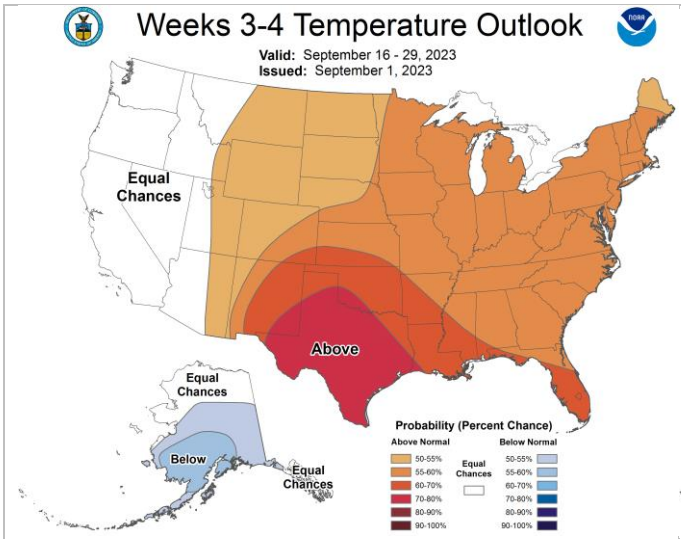
[6-10 Day Precipitation Outlook]



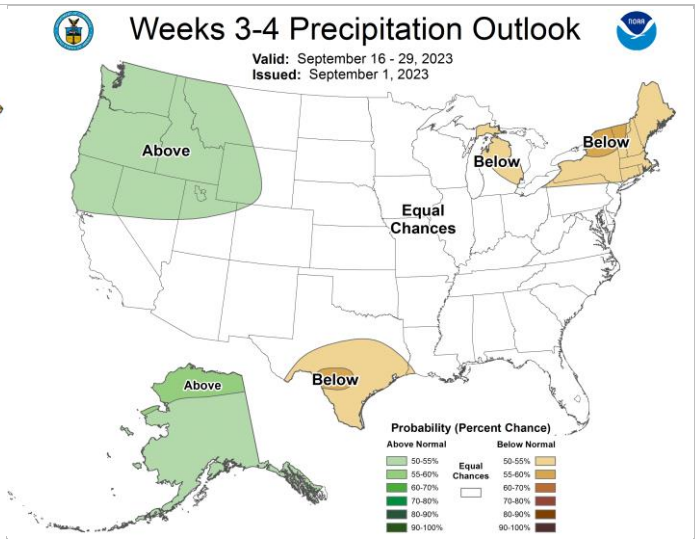
[8-14 Day Temperature Outlook]



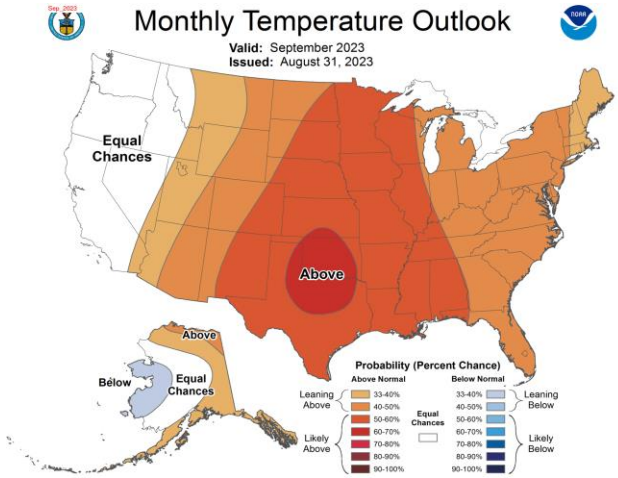
[8-14 Day Precipitation Outlook]

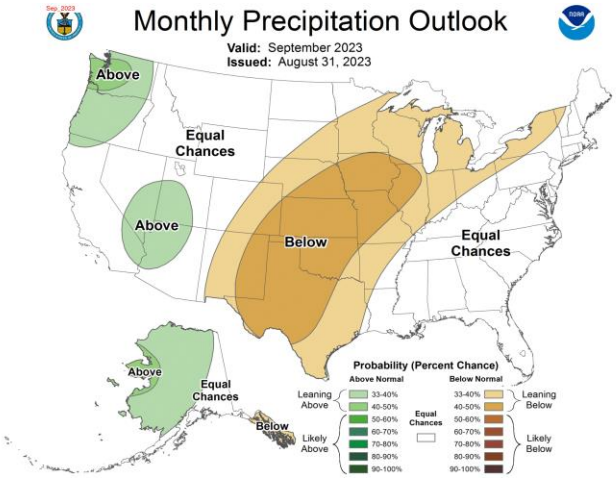


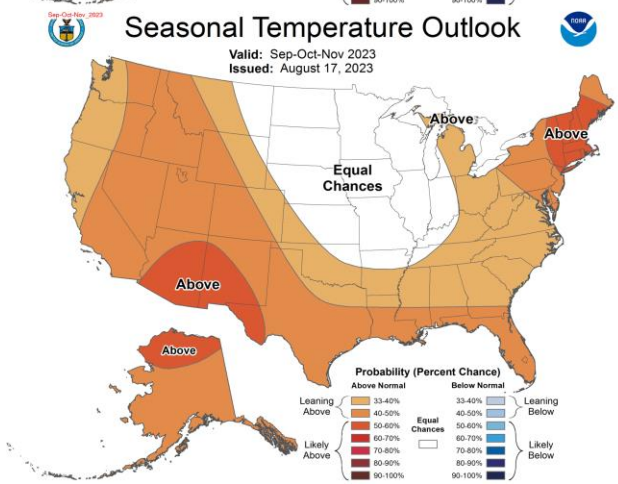
[3-4 Week Temperature Outlook]

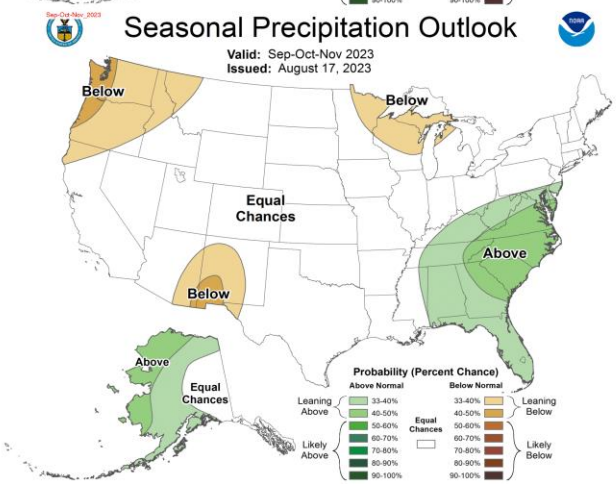


[3-4 Week Precipitation Outlook]









Temperature

Precipitation

GEOGRAPHIC AREA OUTLOOKS

The Teton Interagency response zones are within the Great Basin Geographic Area. Fire activity and trends also track with similar conditions in adjacent areas within the Rocky Mountain and Northern Rockies geographic areas, which converge within the Greater Yellowstone Area (GYA).

The excerpts from the current "National Wildland Significant Fire Potential Outlook" (NIFC Predictive Services) support an outlook for normal fire activity in the Teton Interagency Dispatch area and the Great Basin Geographic Area for the rest of the fire season.

National – Executive Summary (excerpts)

Significant fire activity continued to increase through August, with the national preparedness level increasing from three to four (scale one to five) on August 17. Significant fire activity increased across most geographic areas in August, including the Southern Area, but decreased in the Southwest Area. A significant rainfall event August 20-23 resulted in decreased activity across the Great Basin, Rocky Mountain, and Northern Rockies Geographic Areas. Alaska continued with elevated activity through mid-month before decreasing rapidly at the end of the month while Hawai'i was very active in August as well, including the Lahaina Fire. Year-to-date acres burned for the US is well below the 10-year average at 38%, with a slightly below average number of fires as well, about 96% of average.

Past Weather and Drought

Warmer and drier than normal conditions were prevalent near and west of the Cascades in August, while a significant rainfall event August 20-23 due to the remnants of Hurricane Hilary resulted in well above normal precipitation from southern California through the Great Basin into the northern Rockies. Temperatures were also near average in this area. While the North American Monsoon brought welcome rainfall to the Southwest and Colorado, temperatures were above normal with precipitation below normal for August, with an expansion of drought. Record breaking temperatures were observed across Texas, the Lower Mississippi Valley, and Gulf Coast as a prolonged heat wave lasted much of August. Flash drought conditions resulted with much of east Texas and Louisiana in extreme to exceptional drought. Meanwhile, drought continued on the central Plains into the Upper Midwest, with drought expanding across northern Montana into northern North Dakota. Drought expanded across much of the Hawai'ian Islands as well. Drought improvement was limited to small areas in the Mojave Desert, Carolinas, and Lower Michigan.

Climate and Fire Potential Outlooks

Climate Prediction Center and Predictive Services monthly and seasonal outlooks depict likely above normal temperatures for the West, South, and East Coast into fall. Below normal precipitation is likely for the Southwest and likely into the broader Four Corners region as the North American Monsoon should continue to be below average this summer. Below normal precipitation is also forecast in portions of the Pacific Northwest, northern Rockies, and perhaps the western Great Lakes and Upper Midwest. Short-term below normal rainfall is likely for portions of the Southeast and Texas, but above normal rainfall is forecast from eastern portions of the Plains into the Southeast and Ohio Valley late summer into fall.

El Niño continues in the equatorial Pacific Ocean, with the warmest sea surface temperature (SST) anomalies in the eastern equatorial Pacific Ocean. SSTs are consistent with a moderate El Niño, and atmosphere responses to El Niño are being observed. The Climate Prediction Center forecasts El Niño conditions continuing through winter, with a 66% chance of a strong El Niño developing this fall and early winter. Other teleconnection patterns, such as the Madden Julian Oscillation (MJO), Pacific Decadal Oscillation, and Pacific-North American Pattern may influence weather and climate during the outlook period, but El Niño will be the main driver through the outlook period.

Great Basin

There was increased fire activity during early to mid-August across much of the Great Basin, but diminished by late August due to several widespread, long-duration rain events. Cool and moist conditions are expected for early September before any prolonged drying takes place.

Temperatures over the last 30 days have been near normal across much of the Great Basin, while precipitation has been 150-300% of average across most of the geographic area except for parts of southeast Utah where precipitation was near or slightly below normal. The Evaporative Demand Drought Index Flash Drought Monitor shows no drought conditions for the past month and the longer-term US Drought Monitor has also improved. Only a small area in southern Utah and far southern Nevada remains in moderate drought, while over 90% of the region is drought free.

Fuel moisture is above normal across the entire Great Basin due to several pushes of monsoon moisture, including a heavy, long duration precipitation event in late August due to the remnants of Hurricane Hilary. Many desert areas in Nevada received more than their normal summer precipitation amounts in just three days during that late August event. Before this heavy rain event, live fuel moisture in the sage was running near or slightly above normal, and its likely these levels will increase somewhat by the start of September when new measurements come in. Fire activity remains low across the Great Basin, with minimal growth on current large incidents, and few new significant fires.

Normal significant fire potential is expected through the rest of the traditional fire season and into the normal dormant periods of November and December. Despite areas of significant carry-over fuels in parts of northwest Nevada and southern Idaho, the prolonged wet and cool weather of August is expected to continue into early September. In far southern areas, the above normal monsoon activity of the past month combined with statistically reduced chances of large fires late in the season and rapidly shortening daylight hours are likely to result in the end of fire season.

For additional graphics, see Great Basin Coordination Center – Seasonal Outlook for September-December 2023: which notes that "A developing 'Strong' El Nino will have significant effects on weather across the Great Basin in the coming months. A warming/drying trend in most areas is expected during the 2nd week of September while overall September weather is expected to be wetter and warmer than normal."

CURRENT FIRE ACTIVITY

Teton Interagency Dispatch Center - Intelligence

Variable yet persistent monsoon flow supported thunderstorms and above-normal precipitation in August, with limited fire activity as a result. **A total of 69 abandoned non-escape campfires have been reported to date this year** compared to 104 at this time last year and 155 in 2021.

Year-to-Date Fire Activity for Teton Dispatch Center, September 2, 2023. 2023 Fire Numbers and Stats.xlsx.

Teton Interagency Fire Management Area Totals	Human Fires	Human Acres	Natural Fires	Natural Acres	RX Fires	RX Acres	Abandoned Non-escape Campfires
	9	0.95	6	0.7	5	249.25	55

Selected Sources

- Precipitation Tracking: https://water.weather.gov/precip/
- Precipitation Tracking focused on Snotel sites, Wyoming (beta site)
- Climate Prediction Center, Three-Month Outlooks: https://www.cpc.ncep.noaa.gov/products/predictions/90day/

- Drought.gov Portal / Fire: https://www.drought.gov/drought/data-maps-tools/fire
- Drought.gov Portal / Wyoming: https://www.drought.gov/states/wyoming
- Intermountain West Climate Dashboard: https://wwa.colorado.edu/climate/dashboard.html
- "National Wildland Significant Fire Potential Outlook" (first of each month during fire season, NIFC Predictive Services): https://www.nifc.gov/nicc/predictive/outlooks/monthly_seasonal_outlook.pdf.
- Great Basin Area – Predictive Services/Outlooks: https://gacc.nifc.gov/gbcc/outlooks.php.
- Rocky Mountain Area – Predictive Services/Outlooks: https://gacc.nifc.gov/rmcc/outlooks1.php.
- Teton Interagency Dispatch: www.tetonfires.com / https://gacc.nifc.gov/gbcc/dispatch/wy-tdc/home/.

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For further information, contact Teton Interagency Fire:

Ron Steffens. Long Term Fire Analyst, Grand Teton National Park | 307 739 3675 | ron_steffens@nps.gov