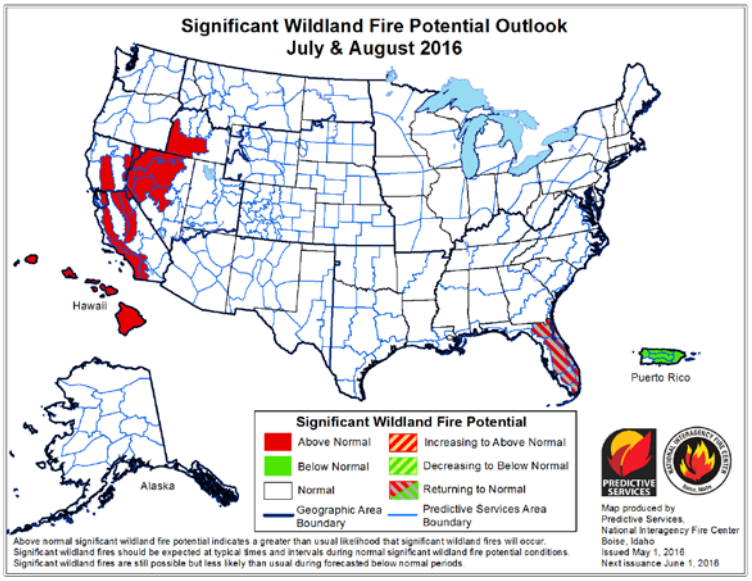
TETON INTERAGENCY FIRE

2016 WILDLAND FIRE OUTLOOK

June 6, 2016



Significant Wildland Fire Potential for July-August 2016 (issued June 1, 2016).
http://www.predictiveservices.nifc.gov/outlooks/month2_outlook.png

SUMMARY

This fire season continues to be affected by strong El Niño/Southern Oscillation (ENSO) conditions, which may have supported a wet-to-dry and a warmer winter pattern then normal. An outlook for a transition to La Niña conditions later this summer or fall may lead to a transition to a dry fall, though the timing and local impact of this transition is uncertain. An outlook for neutral and/or La Niña conditions this summer may also impact monsoonal moisture flow from the Southwest into Wyoming.

This pattern (as tracked in national climatological rankings at http://www.ncdc.noaa.gov/temp-and-precip/climatological-rankings/) featured:

PRECIPITATION – Wetter, then Drier

- Early winter precipitation was above normal, followed by below normal precipitation in late winter/spring.
- At the Moose, WY weather station, early winter precipitation (Oct-Jan) was 119% of normal while late winter/spring precipitation (Feb-May) was 85% of normal.
- For April, the Teton climate division was the 29th driest since 1895. For the water year, October through April, the Teton climate division is trending slightly drier than normal for this period.
- Overall precipitation for Wyoming, from January-April, was 105th driest period out of a122-year period of record.

TEMPERATURE – Much Warmer than Normal

- For January-April, Wyoming was 117th warmest out of a122-year period of record.
- In the Teton climate division, January through April was the 6th warmest period on record.

Regional outlooks indicate a normal fire season, with potential for below-normal to the south and east of the Teton Interagency area. The transitioning El Niño / La Niña conditions may lead to wetter than normal July/August period and a drier than normal fall, with the potential for late season fire activity.

During a normal season, Bridger-Teton National Forest will have 67 fires for 3290 acres and Grand Teton National Park will have 12 fires for 789 acres (based on a 40-year fire history).

CLIMATE AND FUELS OUTLOOK

(1) Area Snowpack and Streamflow

Snowpack, accumulated precipitation, and streamflow in western Wyoming tracked in the normal to slightly above-normal ranges, with a north/south differential in snowmelt – earlier in the north, later in the south.

Table 1: Percent of 30-Year Average Snow Water Content and Precipitation by Basin. 6/3/16. (http://www.wrcc.dri.edu/snotelanom/snotelbasin). *=Analysis may not be valid measure of conditions.

	Snow Water Content	Total Precipitation (Water YTD)
Snake River	70 % *	94 %
Upper Green River	155 % *	99 %
Yellowstone	58 %	88 %
Wind River	160 % *	112 %

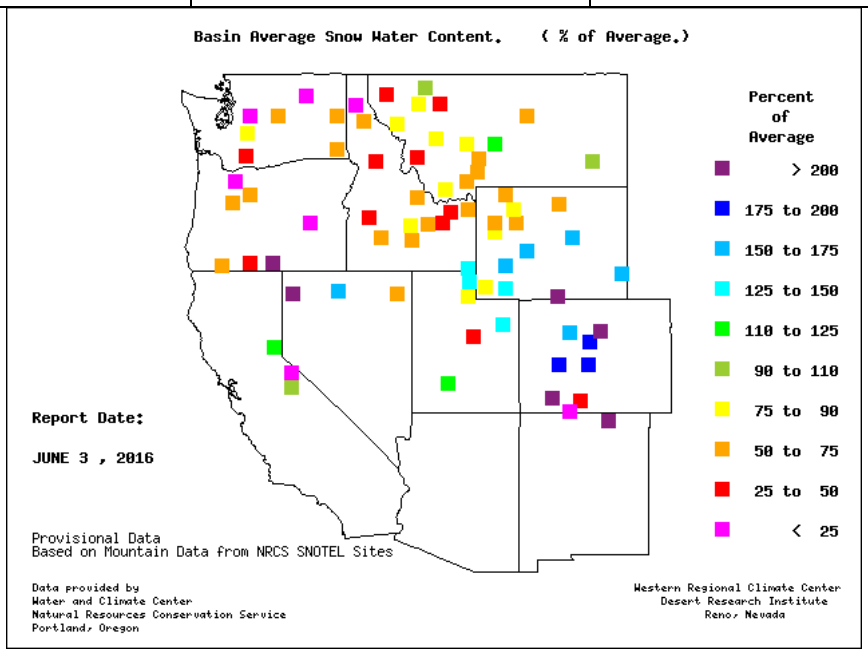


Figure 1a: Basin - Percent of Average - Snow Water Content

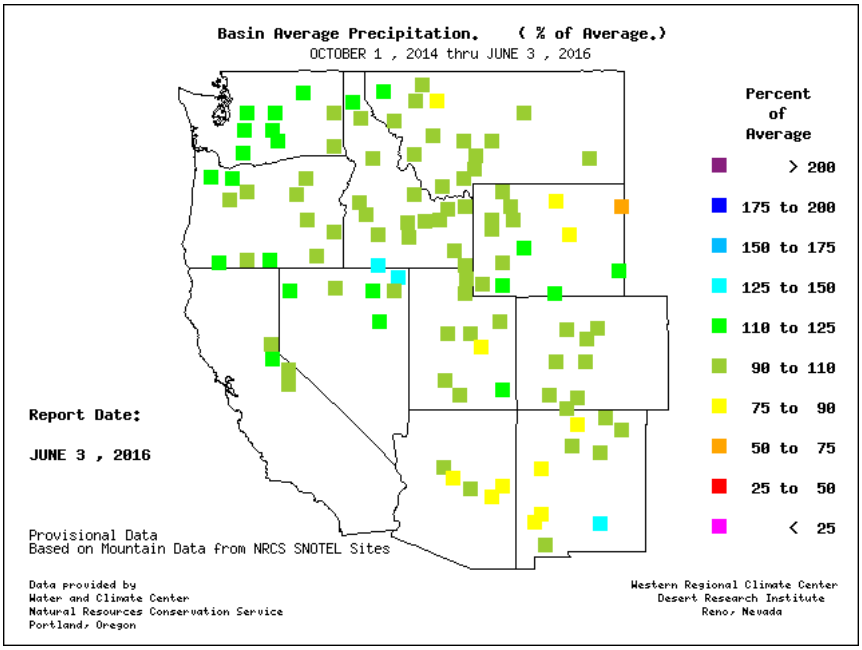


Figure 1b: Basin – Percent of Average – Precipitation

Figures 1 c-e. SNOTEL Water Year to Date, Snow Water Equivalent for Grassy Lake (North Zone), Elkhart Park Guard Station (East Zone), and Snider Basin (West Zone). All sites exhibited slightly early snowmelt compared to average. For total accumulated precipitation for the water year-to-date (beginning October 1), the northern and eastern sites are tracking with normal and the western site above normal.

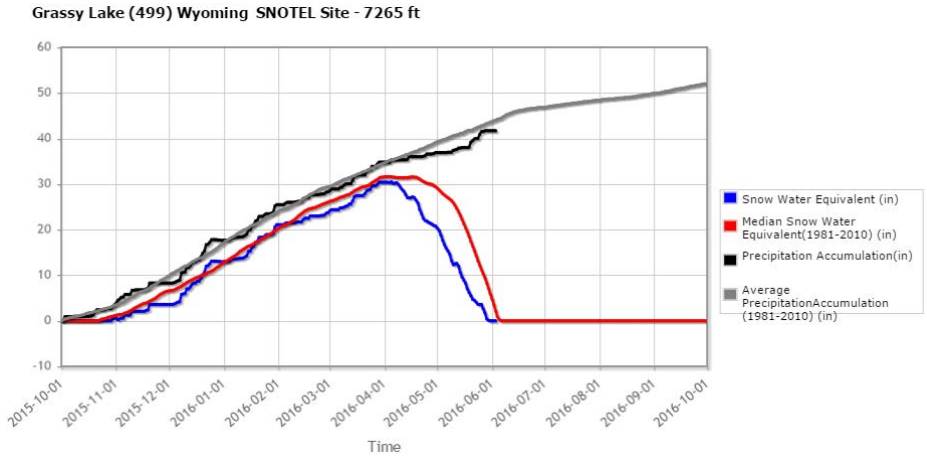


Figure 1c: Grassy Lake Snotel (Teton Zone). http://wcc.sc.egov.usda.gov/nwcc/site?sitenum=499

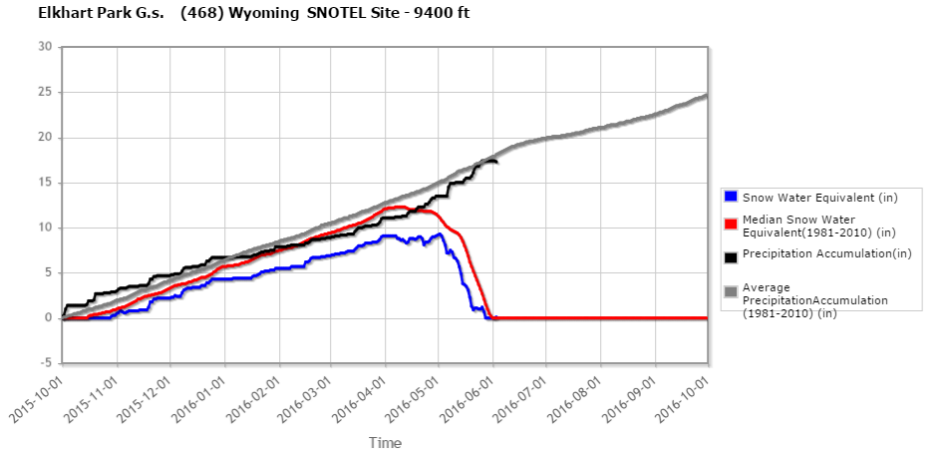


Figure 1d: Elkhart Snotel (Wind River Zone). http://wcc.sc.egov.usda.gov/nwcc/site?sitenum=468

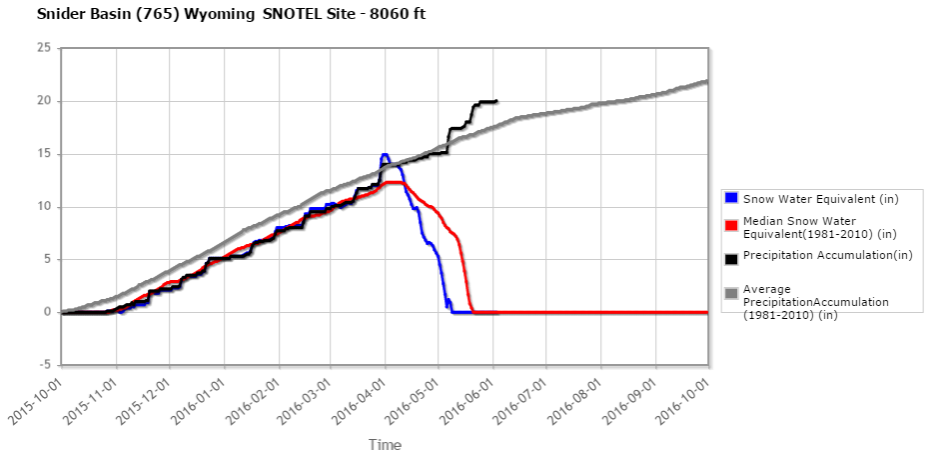


Figure 1e: Snider Basin Snotel (Wyoming Range Zone). http://wcc.sc.egov.usda.gov/nwcc/site?sitenum=765

(2) Year-to-Date Precipitation for Area Weather Stations

Area precipitation for the water year to date (October through May) reflects some impact of El Nino conditions, with average moisture overall but drier conditions north and wetter south. Precipitation tracking at the Moose weather station, which is representative for lower elevation sites in Grand Teton National Park and some North Zone sites, recorded a drying trend in the spring (75% of average precipitation for April/May, with 103% normal for water year-to-date). Yet area-wide moisture tracking (figures 2a and 2b) has recorded a wet trend over the past three months in the southern and eastern portions of the Teton Interagency zone. Additional references document trends in snowpack, precipitation, and a weakening El Niño, which is expected to transition to neutral or La Niña conditions over the summer and fall (Figure 4).

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

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	YTD total
Monthly Precipitation	1987-88	0.09	1.27	2.59	2.37	0.75	0.99	1.12	1.61	10.79
(inches)	1997-98	1.11	2.28	1.36	5.2	1.9	2.42	3.92	2.6	20.79
	1999-00	0.08	0.67	2.03	2.27	5.04	1.03	0.4	1.38	12.9
	2014-15	0.54	3.55	3.26	2.31	1.57	0.67	0.8	3.83	16.53
	Normal	2.58	1.82	1.62	1.49	1.88	2.58	1.82	1.62	*16.17*
	2015-16	1.94	2.11	3.93	3.02	0.83	2.28	1	1.57	**16.68**
Percent of NORMAL	1987-88	6%	60%	102%	92%	40%	63%	75%	84%	70%
	1997-98	76%	86%	51%	202%	104%	149%	263%	138%	129%
	1999-00	6%	32%	80%	88%	267%	66%	27%	72%	83%
	2014-15	37%	134%	122%	90%	86%	41%	54%	204%	102%
	2015-16	**132%**	**80%**	**147%**	**117%**	**46%**	**141%**	**67%**	**84%**	**103%**

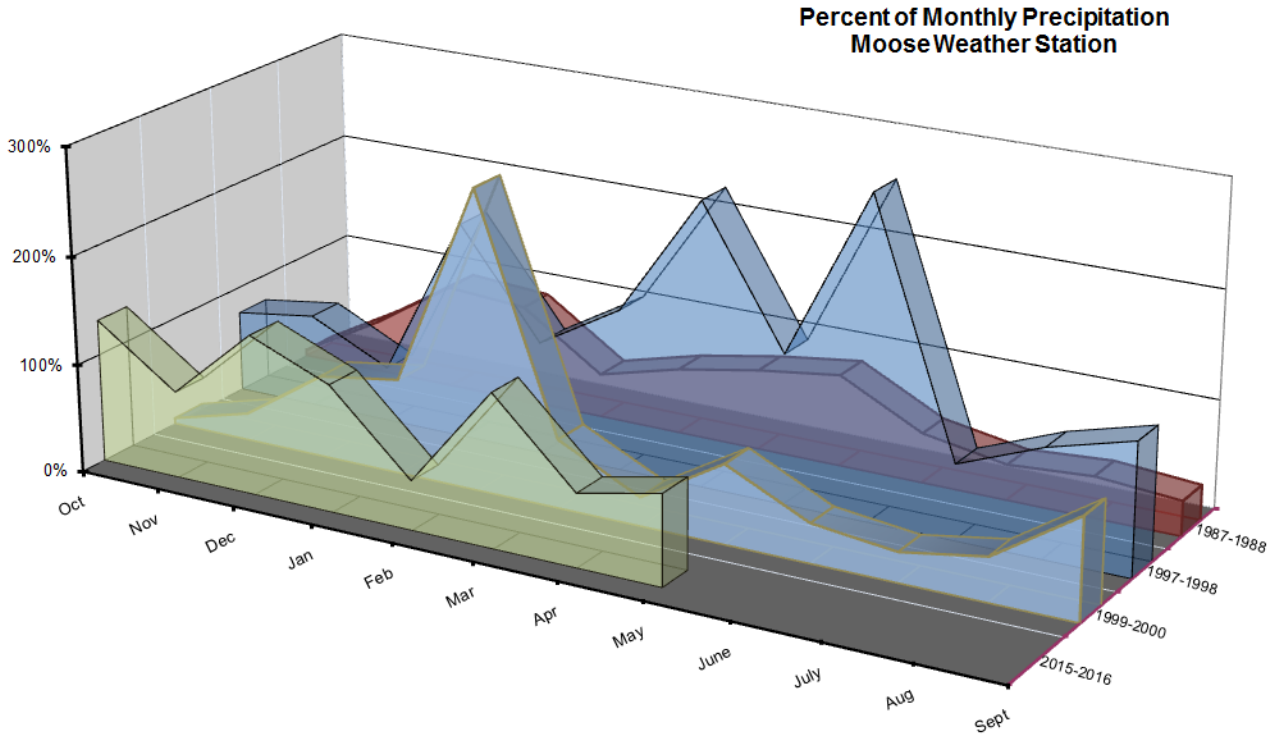


Figure 2a. Wyoming, Current Precipitation – Departure from Normal -- for the past 30 days (ending June 3, 2016), Western Wyoming exhibits a range of normal to above-normal rainfall, compared to normal for this period. Central and eastern Wyoming received significant spring rainfall (from 4-8+ inches above normal for the past 30 days) while Northwest Wyoming received normal to slightly below normal precipitation.
NRCS - Departure from Normal - Permalink.

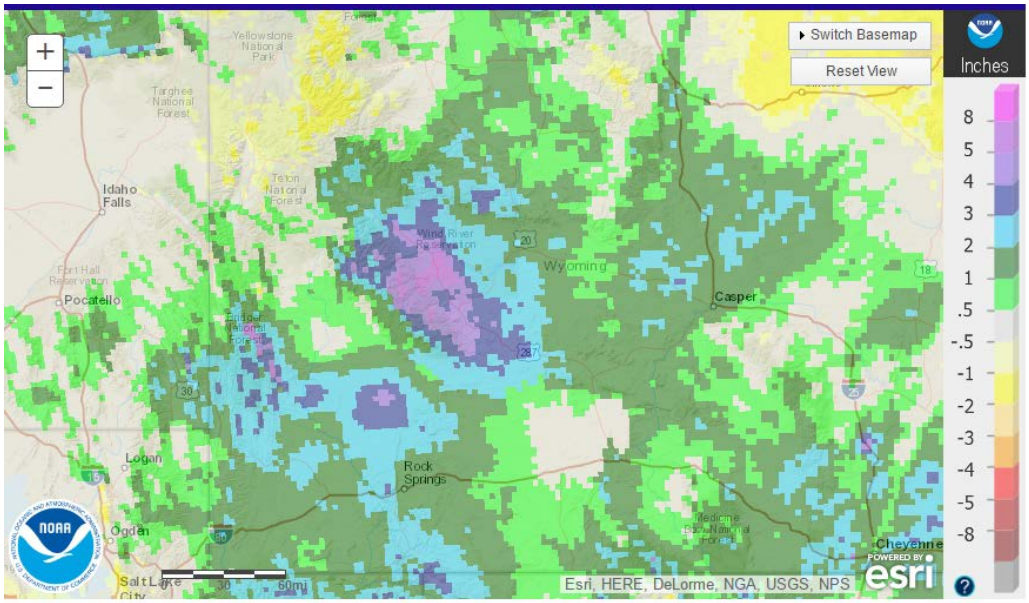
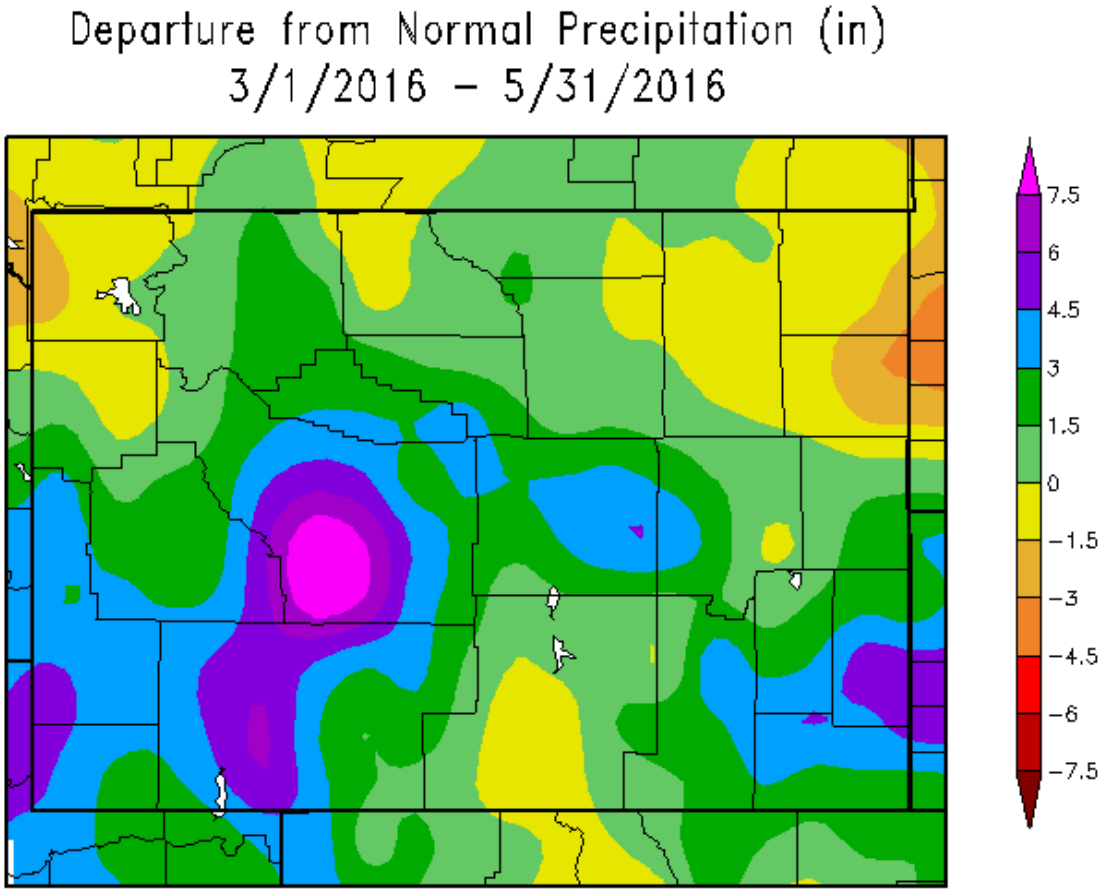


Figure 2b. This pattern is echoed in the past three months of Precipitation – Departure from Normal.
http://www.hprcc.unl.edu/products/maps/acis/hprcc/wy/Last3mPDeptHPRCC-WY.png



Generated 6/5/2016 at HPRCC using provisional data.
Regional Climate Centers

(3) Drought Monitor

The current drought map for the U.S. West shows 55% of the West in some stage of drought conditions, compared to 75% at this time last year. In Wyoming, 19% of the state exhibits some stage of drought, compared to 28% at this date last year.

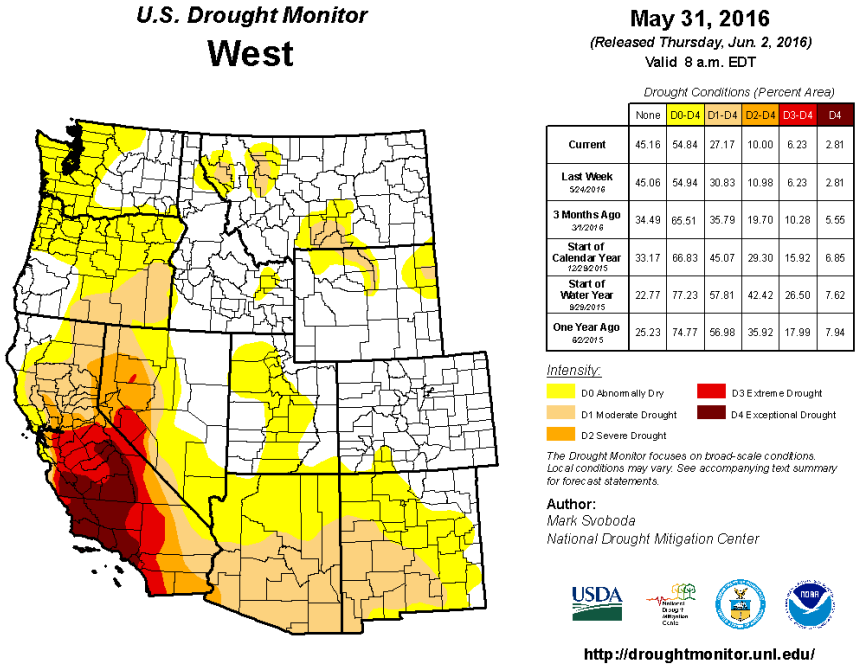


Figure 3a. U.S. Drought Monitor – West.
http://droughtmonitor.unl.edu/Home/RegionalDroughtMonitor.aspx?west

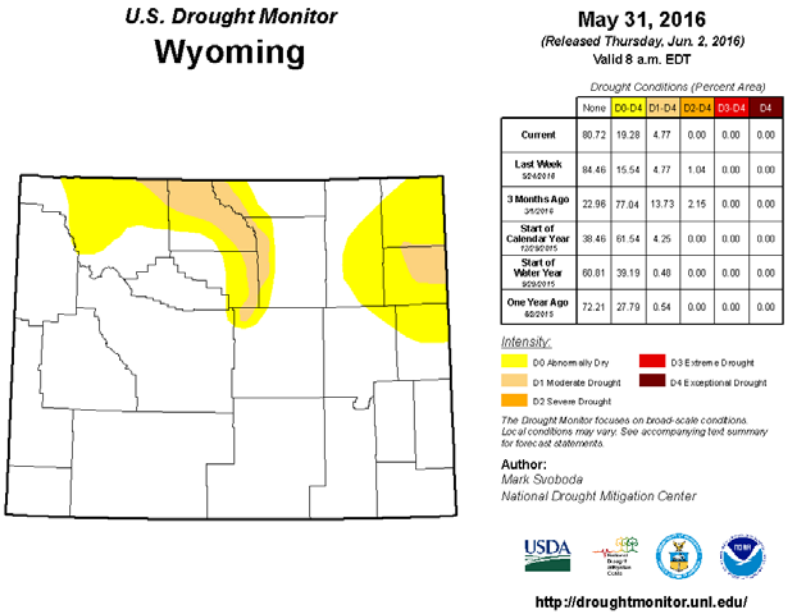


Figure 3b. U.S. Drought Monitor – Wyoming.
http://droughtmonitor.unl.edu/Home/StateDroughtMonitor.aspx?WY

(4) Oceanic Nino Index

The Oceanic Niño Index (ONI) (http://ggweather.com/enso/oni.htm) has become the de-facto NOAA standard for identifying El Niño (warm) and La Niña (cool) events in the tropical Pacific. The current strong El Niño conditions have persisted for 13 months, comparable if not stronger than the prior El Niño conditions in 1997-1998, which lasted 13 months in total. La Niña conditions are favored to develop during the summer of 2016, with a 75% chance of La Nina during the fall and winter 2016-17. Current updates can be found at http://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/enso.shtml.

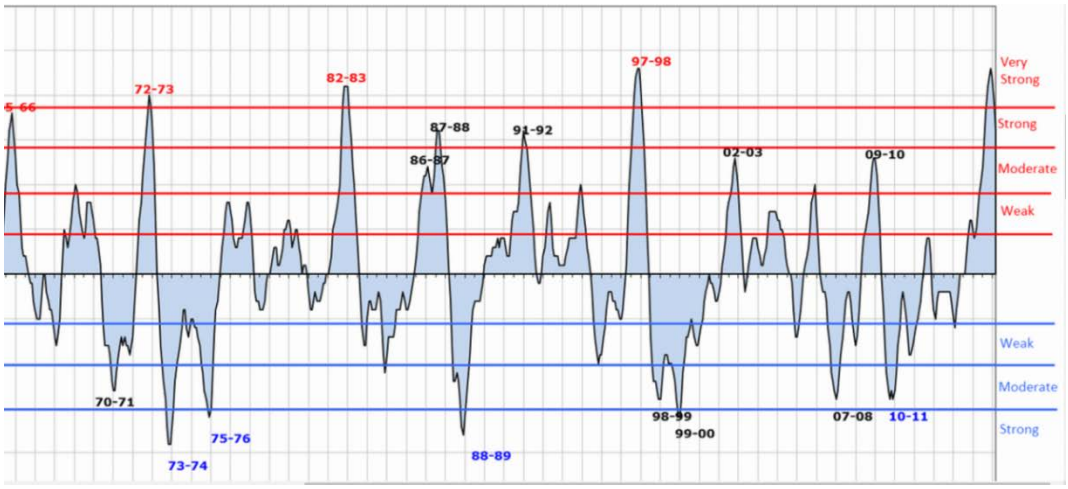


Figure 4. Oceanic Niño Indicator (cropped) tracks strong El Niño conditions, similar to the last strong El Niño in 1997-98. http://ggweather.com/enso/oni.htm.

(5) Fuel Moisture

Fuel moisture sampling has been initiated in Grand Teton National Park and Bridger-Teton National Forest. Greenup was normal, though some lower-elevation sites are exhibiting an earlier greenup due to lower-elevation snowmelt. Initial fuel sampling measurements show live woody moistures in conifers slightly drier than normal. zother indicator fuels, including 1000-hour fuels, are trending normal.

(6) Long-term Temperature and Precipitation Trends and Outlook

WARMER WINTER. This winter was 0-4 degrees warmer than normal in the Teton Interagency area, which may be a reflection of El Niño conditions, and supported earlier snowmelt in low elevation sites.

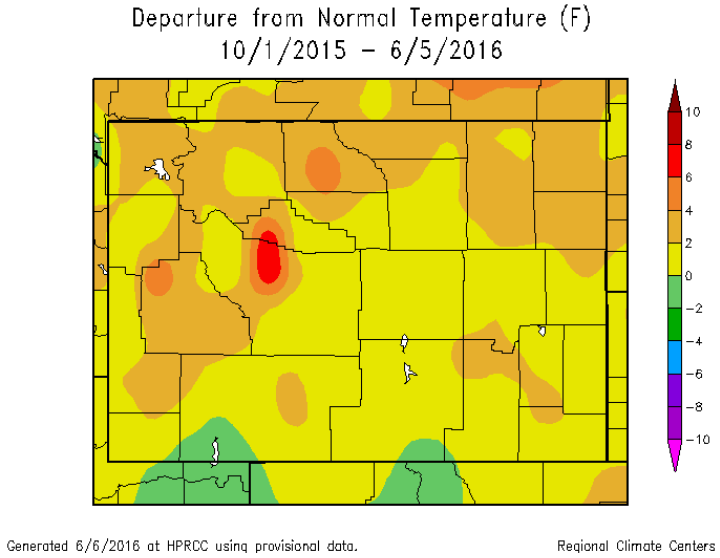
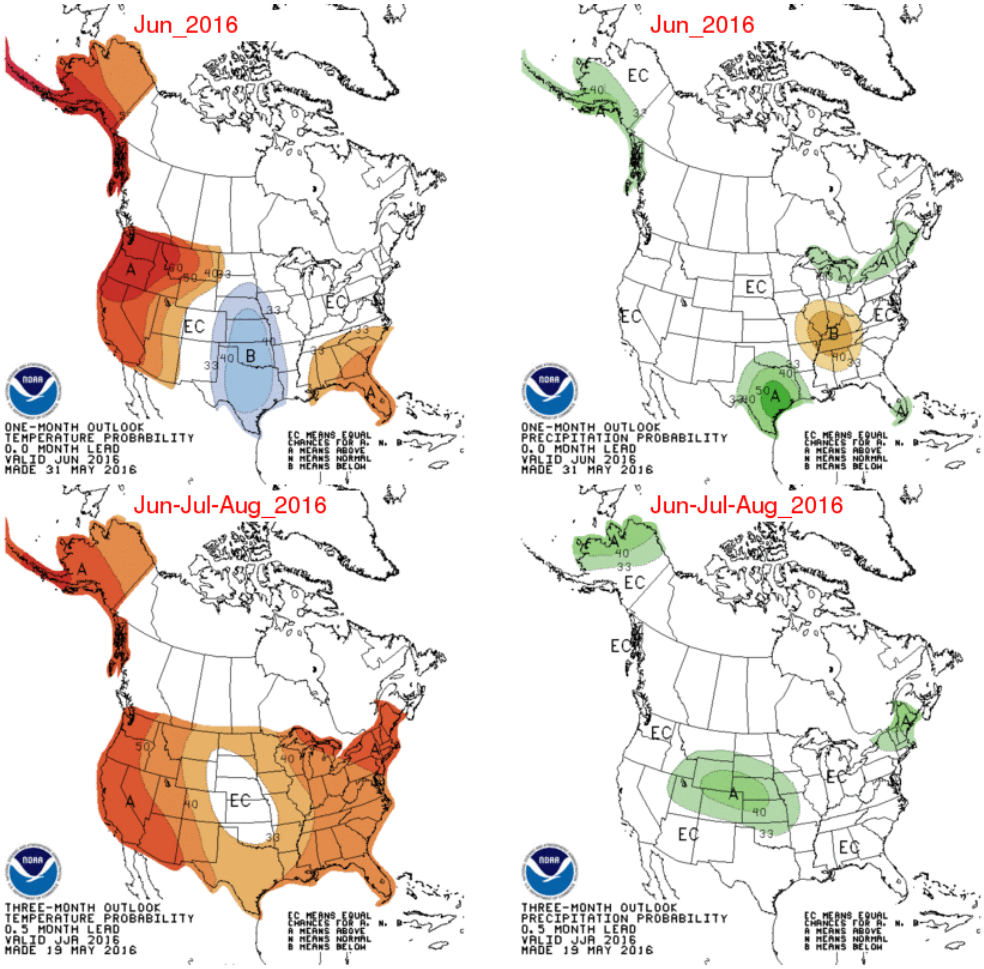


Figure 6a. Departure from Normal Temperature, Wyoming, Oct. 1 2015 through June 5, 2016 (Water Year-to-Date). http://www.hprcc.unl.edu/products/maps/acis/hprcc/wy/WaterTDeptHPRCC-WY.png

SEASON OUTLOOKS: Outlooks from the Climate Prediction Center reflect expectations for weakening El Niño conditions and transition to neutral and La Niño conditions by fall, with potential impacts on the US West. The 30- and 90-day temperature outlook (left) calls for above normal temperatures throughout the summer. The precipitation outlook (right) calls for normal June moisture and above-normal moisture for June-July-August. (*http://www.cpc.ncep.noaa.gov/products/predictions/90day/*).



TEMPERATURE ***PRECIPITATION***

Figure 6b: June and June through August, 30- and 90-day Outlook.

LA NINA IMPACTS: A forecasted shift to La Niña conditions in the Pacific Ocean has been correlated with national and regional fire activity in prior years. Monthly and seasonal risk assessment maps from the Desert Research Institute offer a visual analyses of the changing risk (Figure 6c & 6d, http://www.wrcc.dri.edu/enso/ensorisk/index.html). For Wyoming, the ENSO Climate Risk maps during La Niña conditions indicate an increased risk of "dry extremes" for July-August-September and a lesser risk for warm extremes. However, it is unclear when effects from shifting El Niño / La Niña conditions will have impact. For additional ENSO background, see http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf.

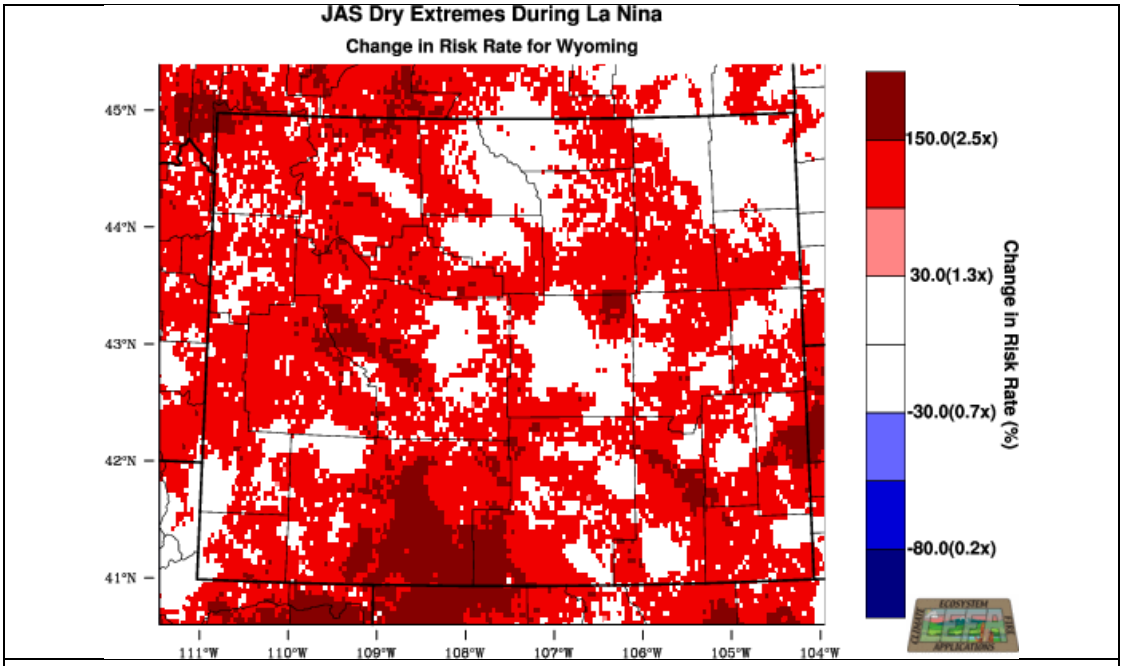


Figure 6c: ENSO Climate Risk, Desert Research Institute. Dry Extremes, July-Aug-Sept. http://www.wrcc.dri.edu/enso/ensorisk/lanina/precip/aso/index.html

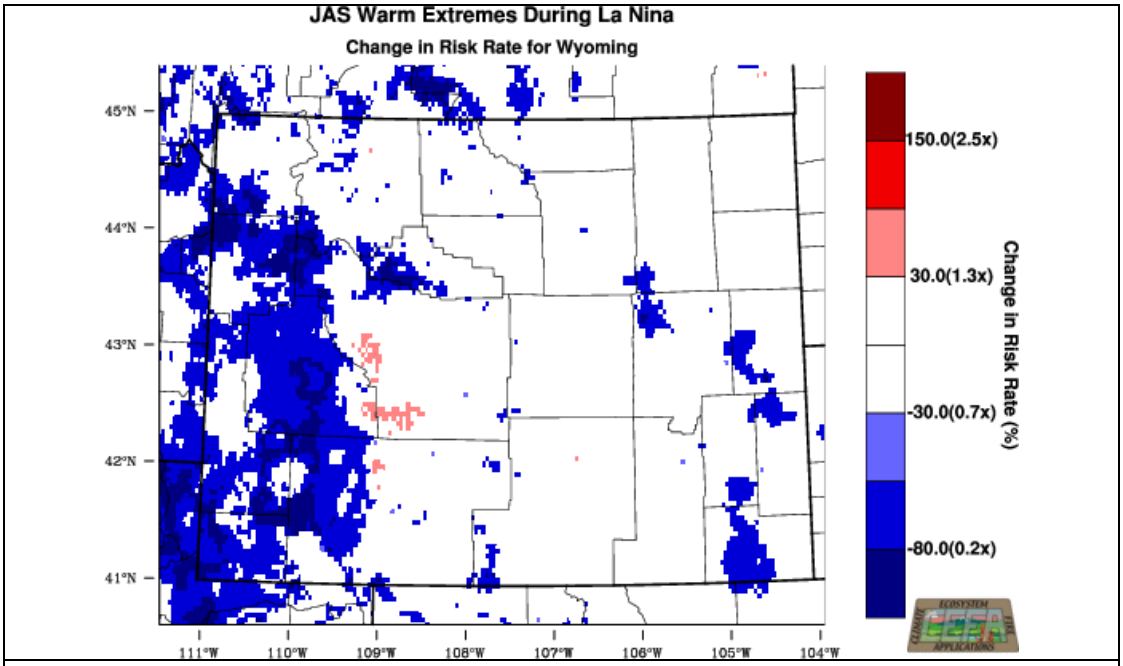


Figure 6d: ENSO Climate Risk, Desert Research Institute. Warm Extremes, July-Aug-Sept. http://www.wrcc.dri.edu/enso/ensorisk/lanina/temp/jas/index.html

GEOGRAPHIC AREA OUTLOOKS

The Teton Area fire zone is within the Great Basin Geographic Area. Fire seasons in our zone 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) and share common trends of fire activity. The season outlooks excerpted below support an outlook for normal fire activity in the Teton Interagency Dispatch zone and neighboring units, with potential for above-normal fire activity in western areas of the Great Basin geographic area. El Nino conditions are expected to diminish over the summer, which can support wetter summers and drier falls.

Excerpts of National and Regional Outlooks from "National Wildland Significant Fire Potential Outlook" (June 1, 2016, NIFC Predictive Services). http://www.nifc.gov/nicc/predictive/outlooks/monthly_seasonal_outlook.pdf.

National - Weather and Climate Outlooks: El Niño conditions continue to decrease as the equatorial Pacific cools further. The latest model projections continue this trend with neutral conditions expected by early summer and an increasing chance of La Niña conditions developing by fall.

National - Fuel Conditions and Fire Season: Timing Fuel conditions across the eastern states have largely returned to normal and brought a reduction in the potential for significant fires as green-up is close to fully completed.

Robust fine fuel crops remain across the Southwest and Great Basin, as well as some lower elevation areas of California. These fine fuel crops are likely to lead to periods of increased fire activity in these areas throughout fire season especially when associated with dry and windy periods.

Fire activity began in May across the Southwest and is likely to continue until the monsoon begins. From there a gradual transition north and west into the Great Basin, California and the Northwest will occur through June and July. In Alaska moisture is beginning to leave the Area leading to increased fire activity. A number of holdover fires from the 2015 fire season have reemerged. Limited snowpack that melted off early and long daylight periods should lead to increased fire activity throughout June and into July.

Mountain snowpack is greatly decreased across much of the West after a warm end to of April. Snowpack in these areas still provided enough moisture to produce a normal onset of fire activity in the higher elevations. Generally speaking the remainder of the U.S. has normal to below normal fuel conditions which indicates normal increases in fire activity should be expected throughout the fire season in these areas

Great Basin: Significant wildland fire potential is expected to be above normal for the southwestern portions of the Great Basin in June. While these areas will return to normal in July, northwestern portions of the Area will become above normal in July and August. Wet May conditions will likely continue into early June.

This should prevent most areas over the northern half of the Great Basin from rapidly jumping into significant fire activity. However, southern Nevada, southern Utah and the Arizona Strip have been much drier and will experience increasing fire activity by early June. By late June through August a good grass crop should increase fire danger for areas of northwestern Nevada and southern Idaho that typically get only brief monsoonal effects. Warmer and drier conditions are expected to develop across the Great Basin by mid to late June, with a more rapid curing of the fuels in the low to mid elevations and decreasing live fuel moisture, along with more rapid high elevation snow melt.

A normal onset of the summertime monsoon is expected, and will most likely target far southern Nevada, the Arizona Strip and Utah. Above normal precipitation across much of Nevada and Utah into far southern Idaho has produced an above average grass crop. The grasses have cured out over far southern areas of the Great Basin, which has been much drier in recent weeks and will remain drier in the weeks to come.

Farther north, the curing process is beginning, especially in the lower elevations and on south facing slopes. However, live fuel moisture still remains above normal. Timbered higher elevations have seen mainly normal snowpack, except below normal across higher terrain of southern Nevada and the Arizona strip. Cooler storm systems have brought some snow to the higher elevations recently and this has delayed the melting across Nevada and Utah.

Above normal fire potential is expected in June in southern Nevada, the Arizona Strip and southwestern Utah as lower elevation fuels are mostly cured and will cure rapidly in higher elevations through early to mid-June, especially in areas that have more grass than in recent years. Normal fire potential is expected in June across the rest of the Great Basin, however fuels will see an acceleration to the curing process from mid to late month as warmer and drier conditions return. Some areas of the western Snake River

Plain, which have not seen as much precipitation in recent months, may be shadowed from precipitation in the coming weeks and those fuels may cure out early.

By July, southern Nevada, the Arizona Strip and most of Utah should transition to moist, monsoonal conditions, with the above normal fire potential focus shifting to drier areas of the Great Basin which have two to three times more grass than in recent years. These areas include western and northern Nevada into parts of southwestern and southern Idaho. The higher elevations may have more of a delay in fire activity until later in July and August once the snow melts and fuel moisture decreases. Fire potential may return to normal later in September.

CURRENT FIRE ACTIVITY

Fire Activity: Teton Interagency Dispatch Center

Early season wildland fire activity is typically limited by fuel conditions. The current season is trending toward normal, with more fires and fewer acres than normal.

Table 2: Year-to-Date Fire Activity (Unplanned Ignitions).

	Bridger-Teton National Forest		Grand Teton National Park	
	Fires	Total Acres	Fires	Total Acres
June 5, 2007	2	5.1	1	0.1
June 1, 2008	1	0.1	0	0
June 1, 2009	1	0.1	0	0
June 1, 2010	4	0.4	0	0
June 1, 2011	1	5.0	0	0
May 25, 2012	2	0.35	1	0.1
June 1, 2013	1	0.1	0	0
June 1, 2014	3	0.3	0	0
June 8, 2015	5	7.8	0	0
40-year AVERAGE (to June 1)	*1.5*	*8.1*	*0.4*	*1.0*
Year-to-Date to June 4, 2016	**3**	**0.23**	**0**	**0**

For further information, contact: **Ron Steffens**
Long Term Fire Analyst, Grand Teton National Park | 307 739 3675 | ron_steffens@nps.gov

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Selected Sources

- Precipitation Tracking: http://water.weather.gov/precip/.
- Snow / Snotel Tracking: http://www.wcc.nrcs.usda.gov/snotel/Wyoming/wyoming.html
- Climate Prediction Center, Three-Month Outlooks: *http://www.cpc.ncep.noaa.gov/products/predictions/90day/*
- *Regional outlooks from "National Wildland Significant Fire Potential Outlook" (June 1, 2016, NIFC Predictive Services):* http://www.nifc.gov/nicc/predictive/outlooks/monthly_seasonal_outlook.pdf.
- Great Basin Predictive Services/Outlooks: http://gacc.nifc.gov/gbcc/outlooks.php.
- Teton Interagency Fire and Dispatch Center: http://www.tetonfires.com.