

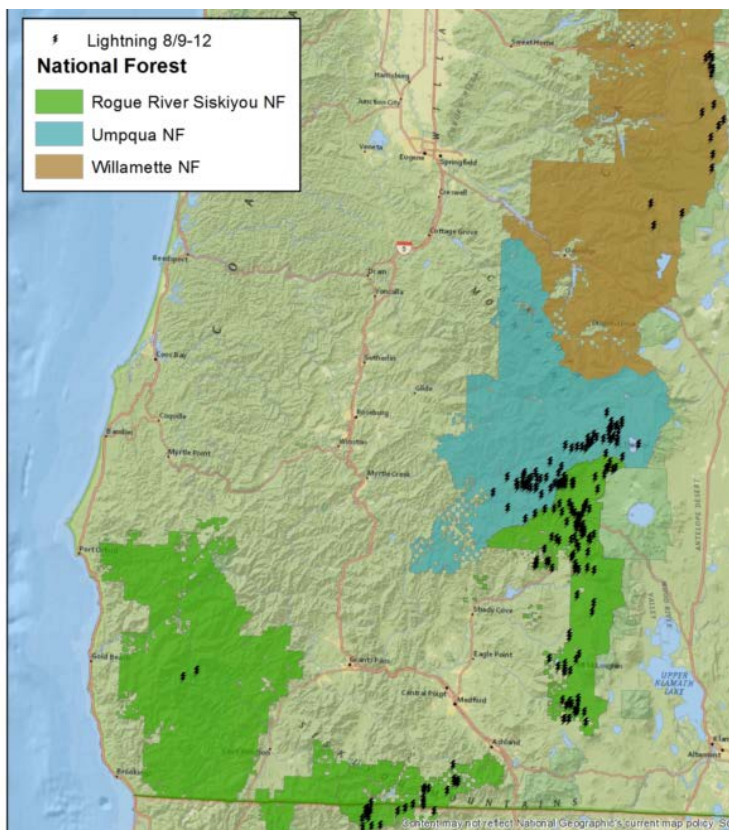
# Long-term Assessment for the WIF, UMF, & RSF

**Date:** Aug 21, 2017

**Analysts:** Rick Stratton and Morgan Pence

## Background & Purpose

On August 9-12, the Willamette (WIF), Umpqua (UPF), and Rogue River-Siskiyou (RSF) National Forests received about 215 lightning strikes, which resulted in approximately 118 fires<sup>1</sup>. Precipitation received was variable and ranged from no rain or a trace, to greater than an inch (Stella Remote Automated Weather Station [RAWS] on the RSF)<sup>2</sup>. Prior to this event, on Aug. 8th there were 3 uncontained large fires burning on the three forests (WIF: Whitewater, RSF: Blanket Creek and Chetco Bar), with 9 uncontained large fires in the PNW. Currently there are 24 large fires in the PNW on the IMSR, with 11 of those on the WIF, RSF, and UPF (4 of those being complexes)<sup>3</sup>. The purpose of this abbreviated assessment is to provide line officers and fire managers information on the climatology of the area and short-, near-, and long-term fire weather and behavior outlooks and discussion.



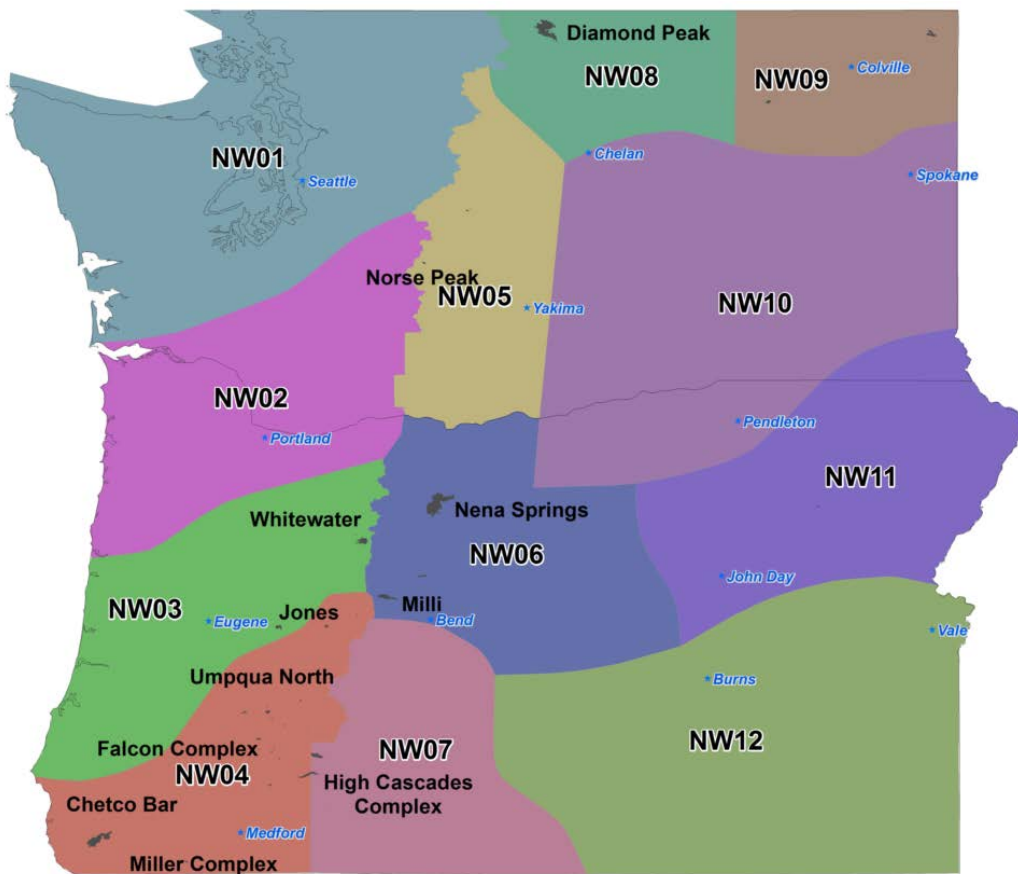
<sup>1</sup> As shown in the Integrated Reporting of Wildland Fire Information (IRWIN) Observer for WIF, UPF. RSF non-human starts with a discovery date Aug. 9-12.

<sup>2</sup> Western Regional Climate Center (<https://raws.dri.edu>)

<sup>3</sup> National Incident Management Situation Report (IMSR)

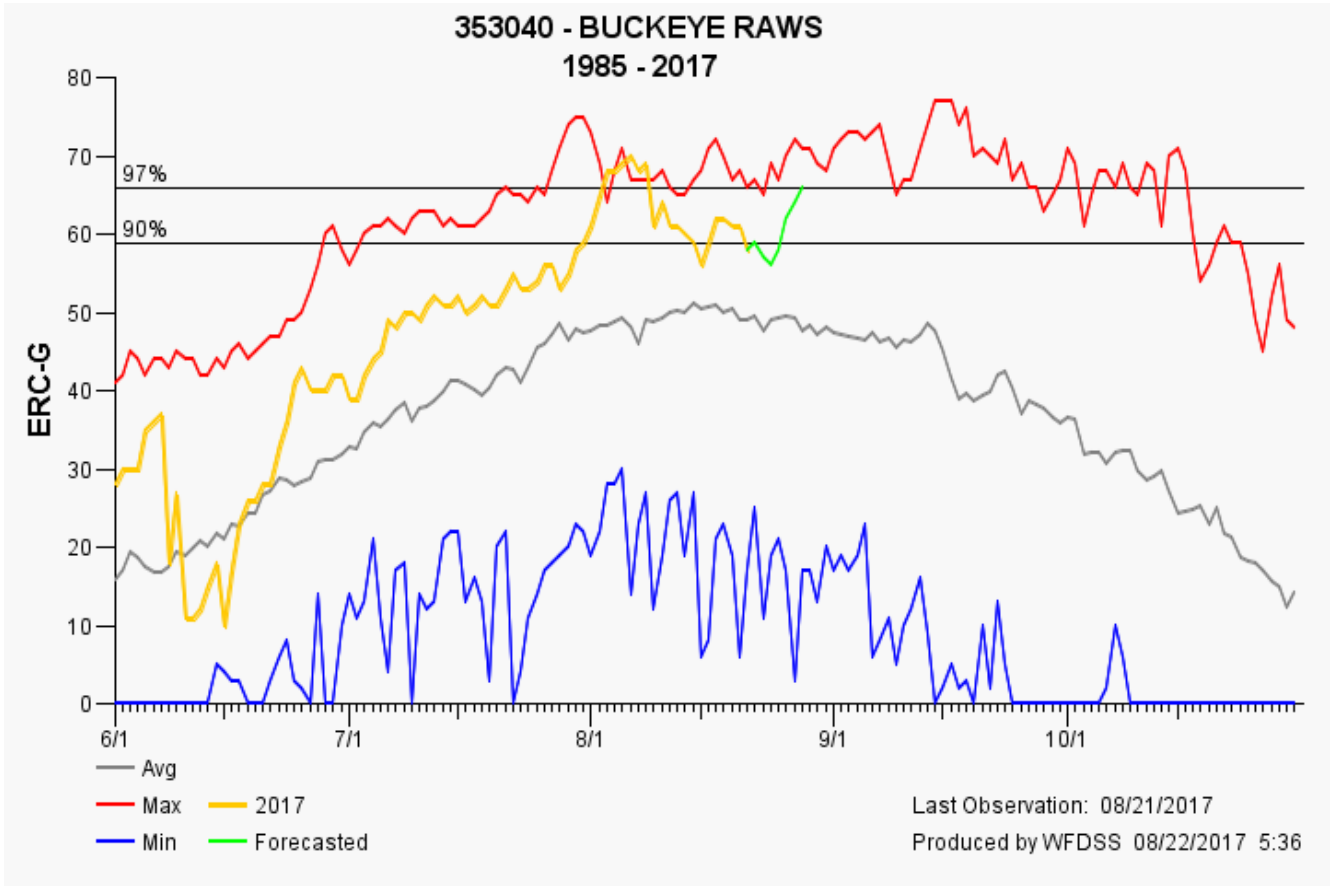
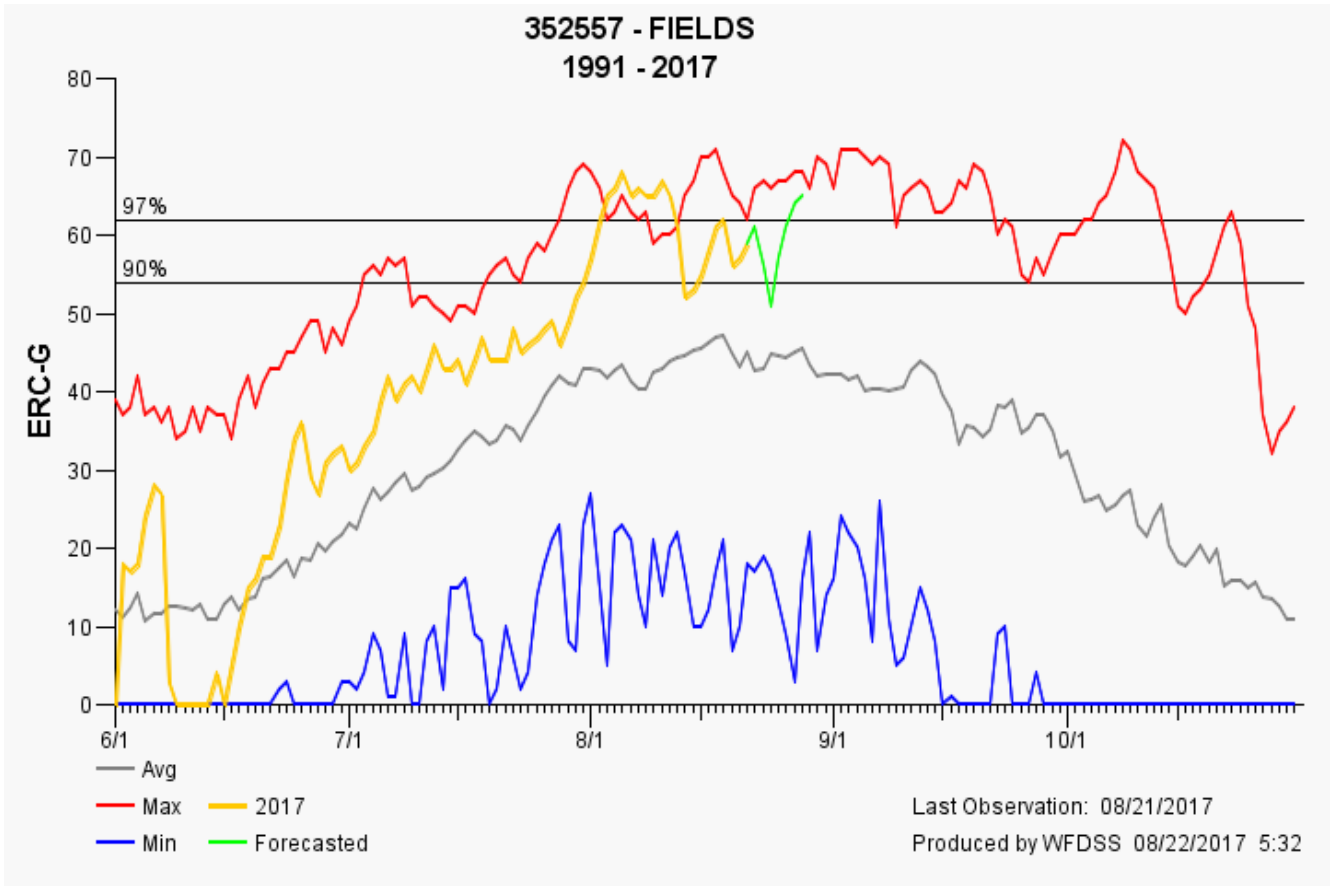
## Predictive Service Areas in PNW

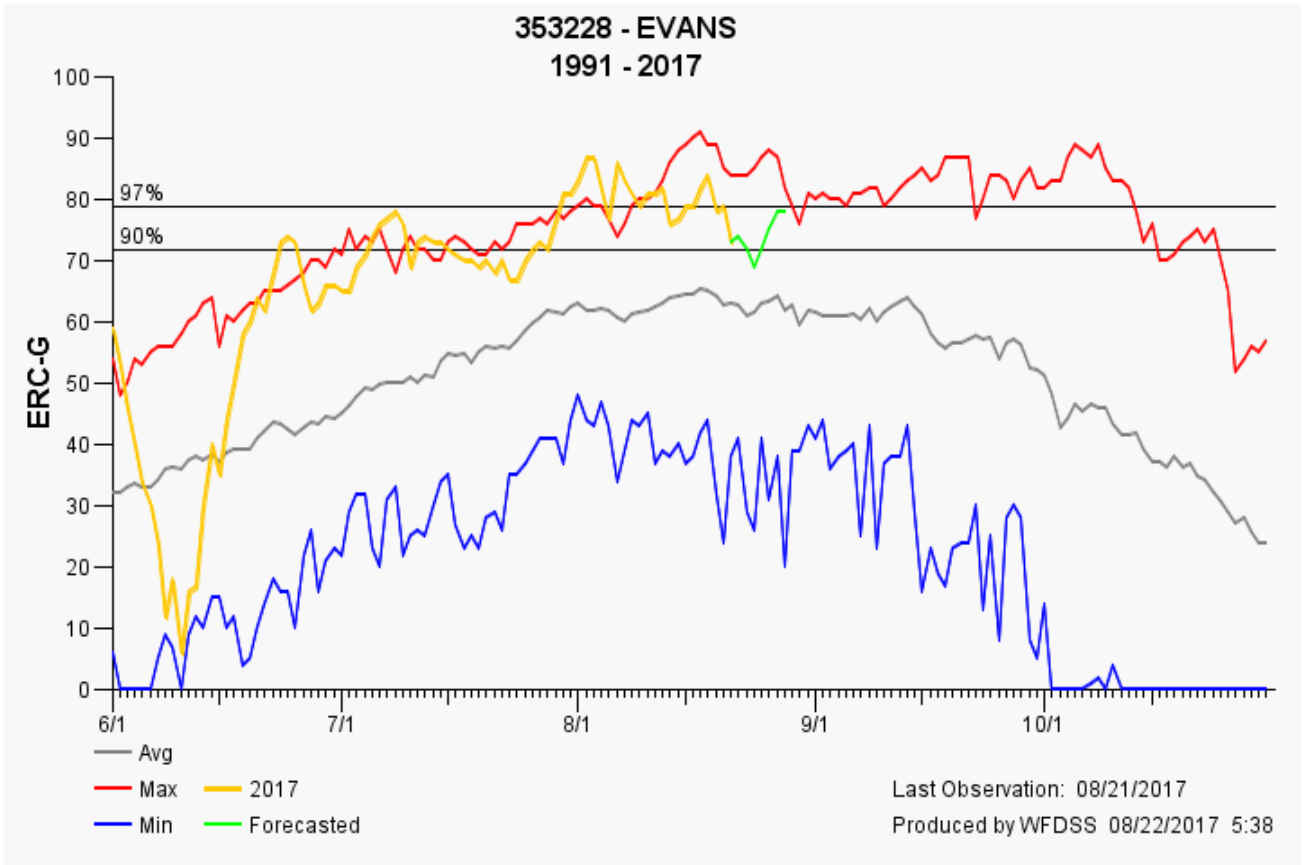
Predictive Service Areas (PSAs) are sub-geographic areas of similar climate, fuels, and topography defined by Geographic Area Coordination Center (GACC) Meteorologists for forecasting purposes. They are similar in definition to Fire Danger Rating Areas (FDRAs), but generally encompass a larger area. Ideally, a PSA would be a conglomerate of one or more FDRAs. In PNW, there are 12 PSAs; note the current fires in each area. This document will report information by PSAs or National Forest.



## Climatology

How does current fire danger compare to historical? Looking at ERCs on the WIF (Fields; NW03), UPF (Buckeye; NW03/04), and RSF (Evans; NW04), the ERCs are between the **90<sup>th</sup> and 97<sup>th</sup> percentile**, with the short-term forecast initially down, but turning up later in the week (shown in green).

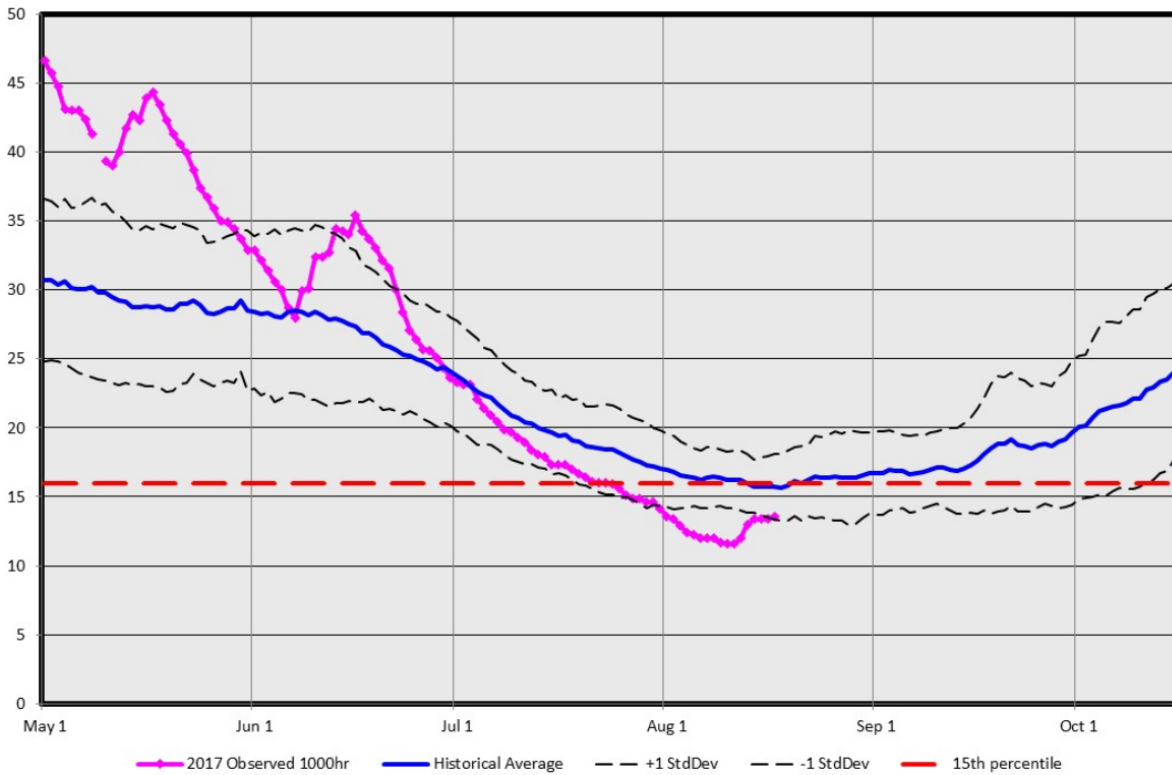




1000-hr dead fuel moistures are hovering between **10 to 15%** (abt. the 15% percentile).

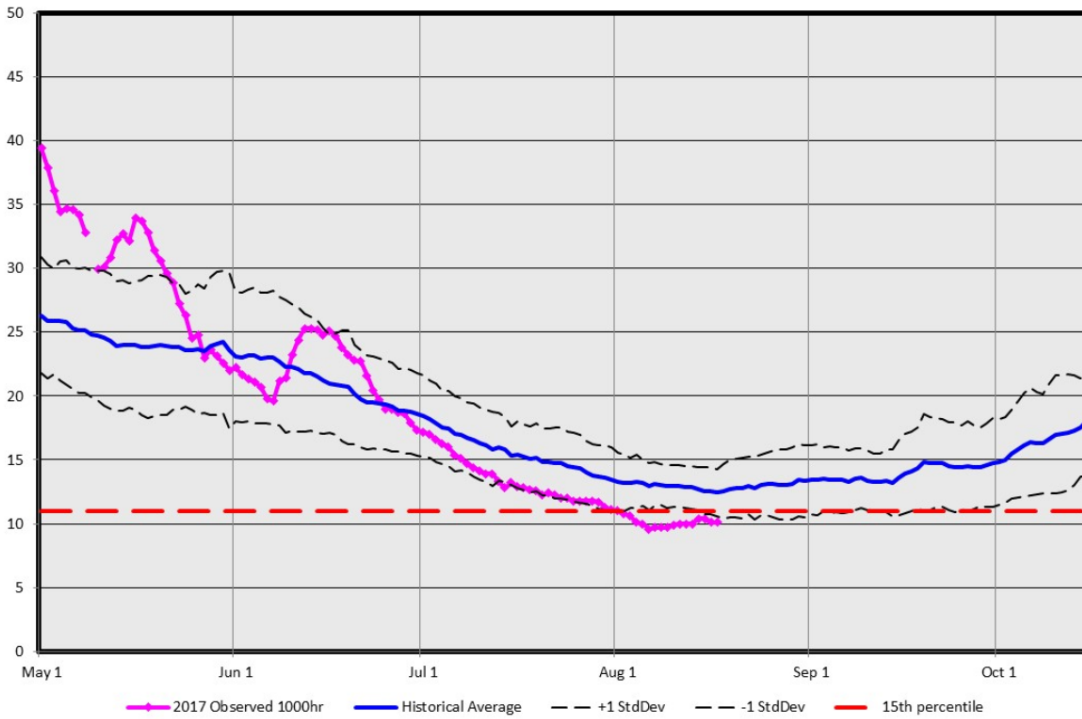
## 2017 NW03 1000hr

Last NFDRS ob: 8/17/2017



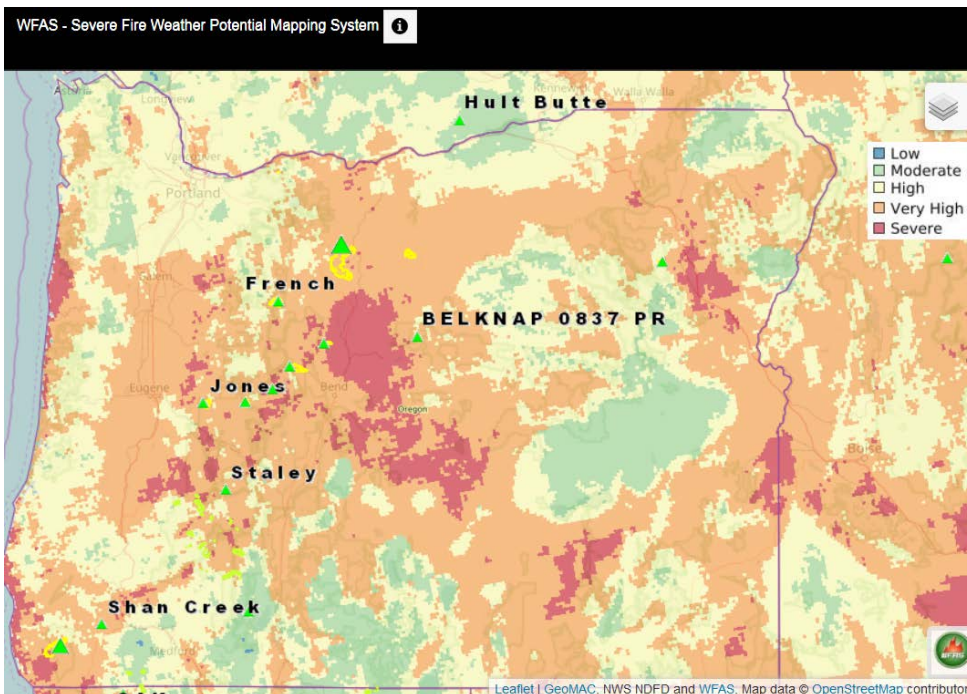
# 2017 NW04 1000hr

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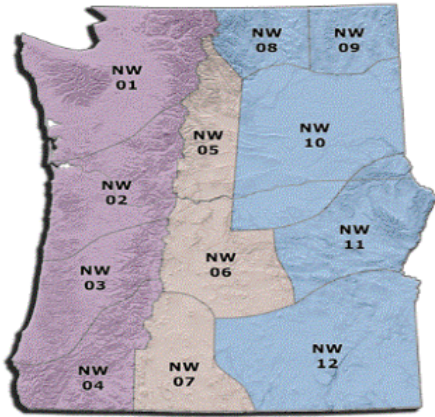
## Short-term Outlook (next 3 days)

The WFAS severe fire weather potential mapping system provides users with a tool to spatially assess conditions for the current day, tomorrow, and the day after tomorrow. An example from Aug. 21 is provided below. For more information about this product visit <https://m.wfas.net/>, and click on the layer icon in the upper right.



## Mid-term Outlook (7 to 14 days)

Pacific Northwest 7-day significant fire potential outlook is provided below (a mixed bag, but generally **normal to elevated**) (<https://gacc.nifc.gov/nwcc/content/products/fwx/guidance/DL.pdf>).



### Legend

#### Fire Environment (FEN) 4 levels

<b>Minimal</b>	- The Overall Fire Environment suggests a very low risk for Large fires ( <b>less than 1% chance</b> )
<b>Normal</b>	- The Overall Fire Environment suggests a <b>normal</b> risk for large fires ( <b>1 - 4% chance</b> )
<b>Elevated</b>	- The Overall Fire Environment suggests a moderately high risk for large fires ( <b>5 - 19% chance</b> )
<b>High Risk</b>	<b>The risk for large fire(s) is very high (≥ 20%)</b> Triggers: 1. ⚡ (Significant Lightning) 2. BEN (Critical Burn Environment)

The assessment of the overall fire environment considers multiple factors including **weather, lightning amount** and **fuel dryness**. Large Fire probabilities are derived objectively via statistical methods. **High Risk** levels (≥ 20% probability of a large fire) are almost always due to significant lightning as burning conditions alone rarely result in a large fire probability much above about 10%.

## Pacific Northwest 7 Day Significant Fire Potential

Monday, August 21, 2017



Predictive Service Areas	ytd	tdy	Tue	Wed	Thu	Fri	Sat	Sun
NW01								
NW02								
NW03								
NW04			⚡					
NW05								
NW06			⚡	⚡				
NW07			⚡	⚡				
NW08								
NW09								
NW10								
NW11			⚡	⚡				
NW12								

**Fire Potential:** A weak upper-level ridge is expected to persist through Tuesday morning, bringing gradual warming and drying to the region. Through this period, much uncertainty exists regarding human ignitions surrounding the eclipse event. We do know that any new starts will be greeted by very receptive fuels, given the at or near record ERC/fuel moisture values across the region. The saving grace here looks to be the lack of gusty winds and instability that would otherwise increase fire behavior.

Behind all this, a low pressure system is expected to move down the BC coast and then track eastward across southern BC/northern WA starting Tuesday afternoon. This will generate a threat of isolated t-storms for southern Oregon zones in the evening. On Wednesday, these chances improve for Oregon zones east of the Cascade crest and possibly the southern Cascades and Blues in WA. Thursday will be the culminating day as the low's cold front is expected to move through the region, significantly increasing wind potential east of the Cascades in WA and adding a chance of t-storms to the Columbia Basin and high mountain zones of WA.

**Note that any lightning produced over the next week will be accompanied by little to no rainfall and have a high probability of causing new starts.**

Pay close attention to NWS fire weather forecasts.

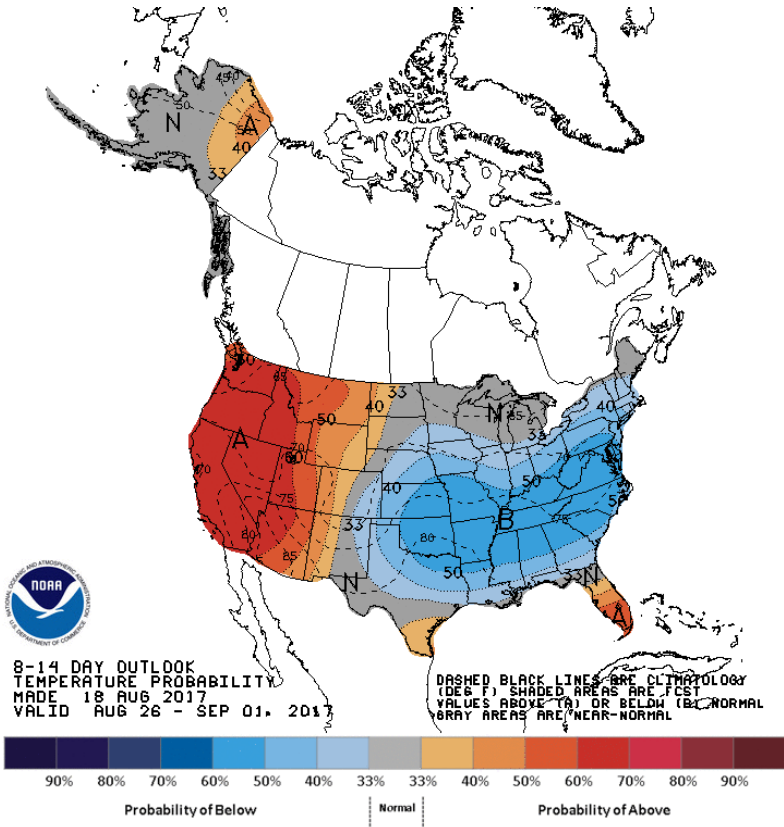
Please call NWCC Predictive Services (503) 808-2737 with any questions.

#### Preparedness Level:

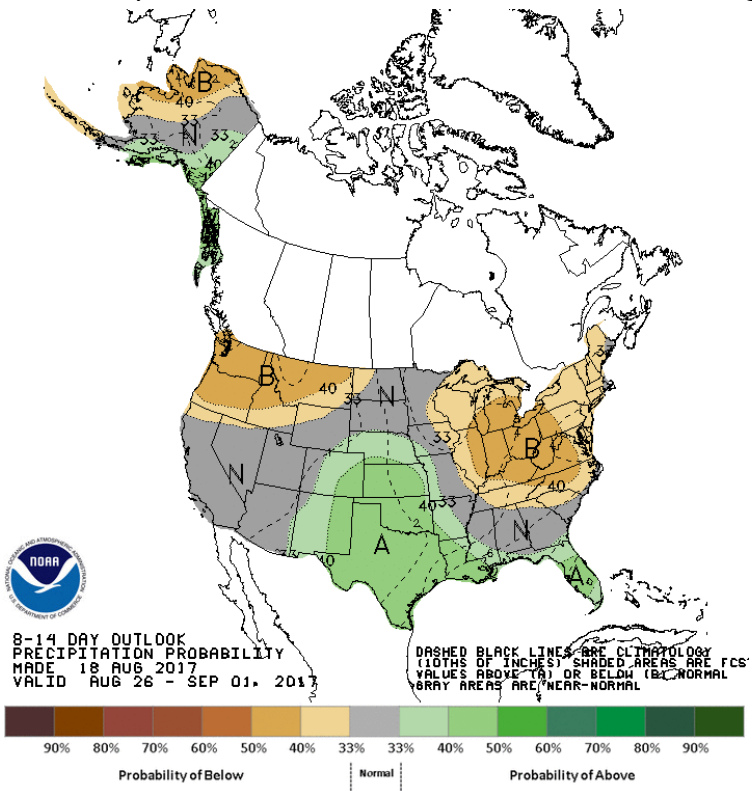
Northwest: 5  
National: 5

- Josh Clark

8 to 14 day outlook is a 60 to 70% chance for **above average temperatures**.



8 to 14 day outlook is a 40 to 50% chance of **below average precipitation**.



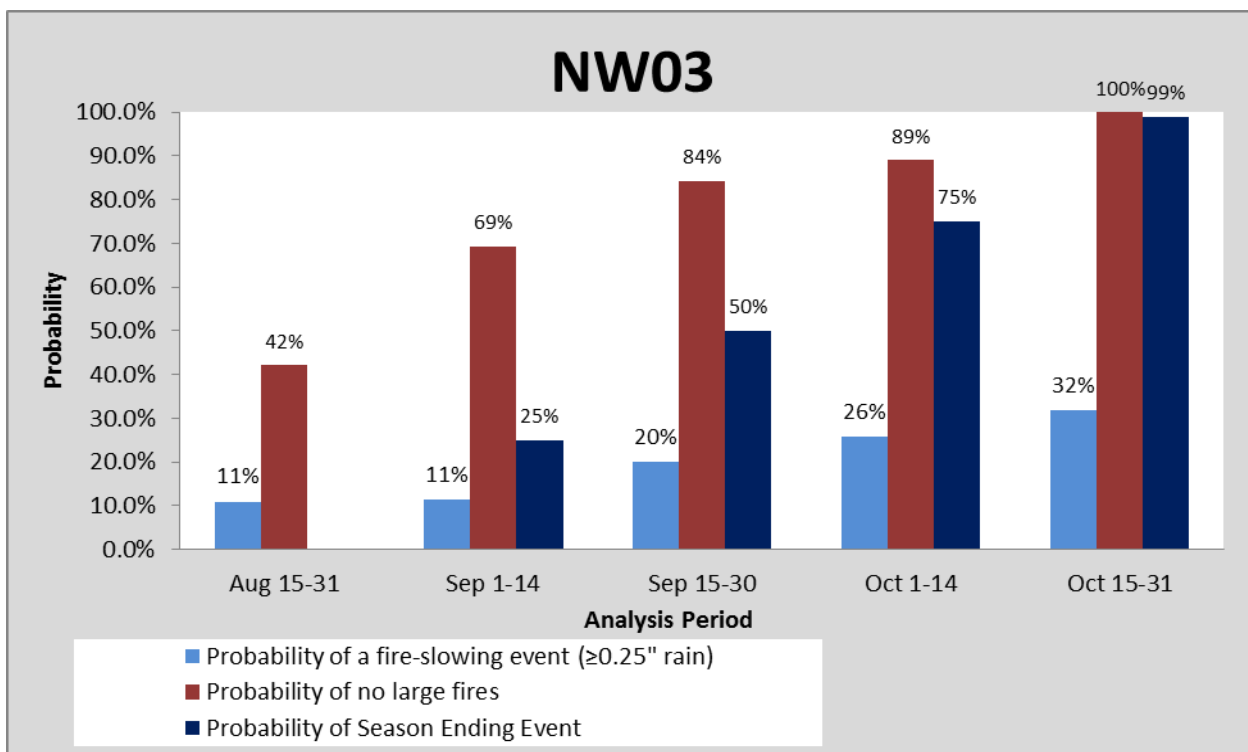
## Long-term Outlook (3-months)

### Probability of Large Fires, Fire-slowing, and Season-ending Events

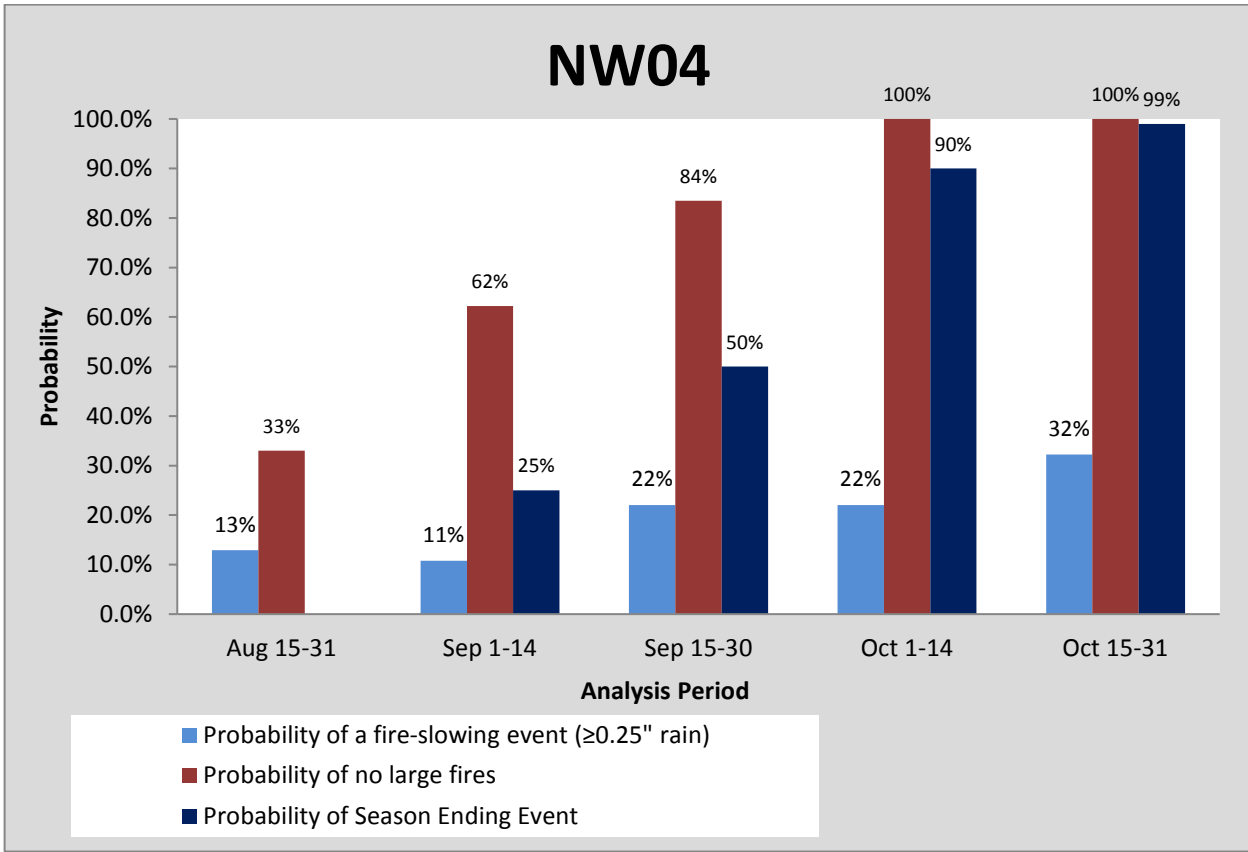
Below are column charts for PSA 3 and 4 based on the probability of experiencing another large fire, a fire-slowing event, or a season-ending event. The large fire occurrence data was obtained from NWCC (T. Marsha) for an 8-year period. A large fire differs in size based on the PSA, so think of this as the probability of a fire requiring a type 1 or 2 team.

Season-slowing information was obtained through a query of the PSA Special Interest Groups (SIGs)—a group of RAWs. A  $\frac{1}{4}$ " of rain was selected as a fire-slowing event, as several forecast areas use this criteria as a "wetting rain." Fires that receive approximately a  $\frac{1}{4}$ " of precipitation are likely to see fire movement pause for 2 to 4 days.

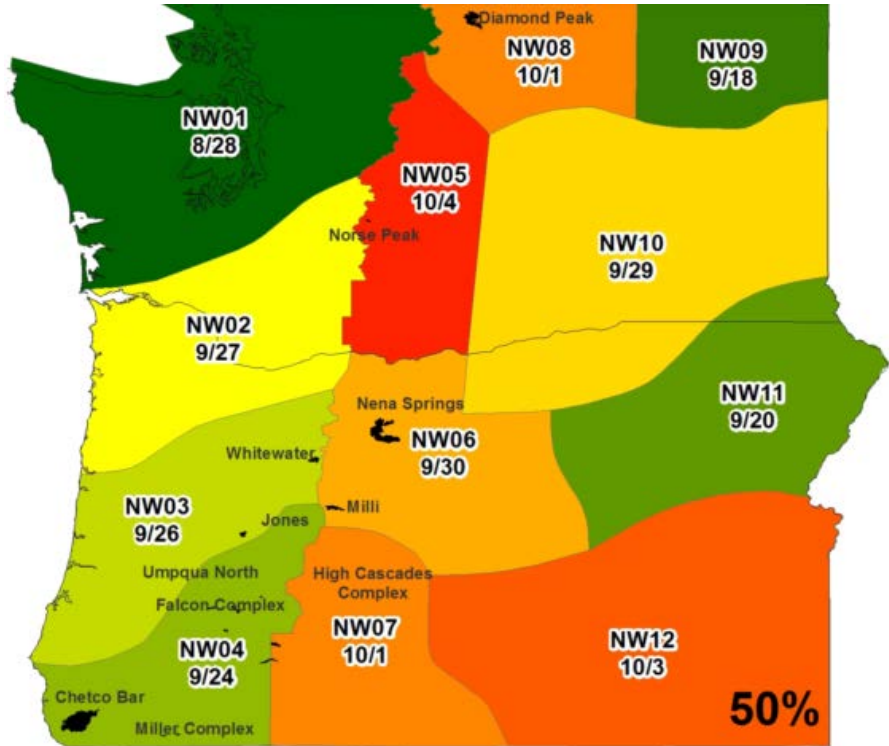
A season-ending event consists of a fire-slowing event followed by a persistent combination of environmental factors that end the fire season. NWCC develops waiting-time distribution functions—or TERM events—for each PSA by using a SIG. Season-ending estimates were constructed from the Predictive Services 7-day significant fire potential product from 1994 to 2012. The product determines the probability of a significant fire occurring based on historical dryness and fire occurrence. The analysis results assume end of season when three or more consecutive "green" days occur (1% probability of a significant fire event). All PSA TERM files are at the bottom of the "Fire Analysis" page of the NWCC website (<http://gacc.nifc.gov/nwcc/predict/fban-ltan.aspx>).

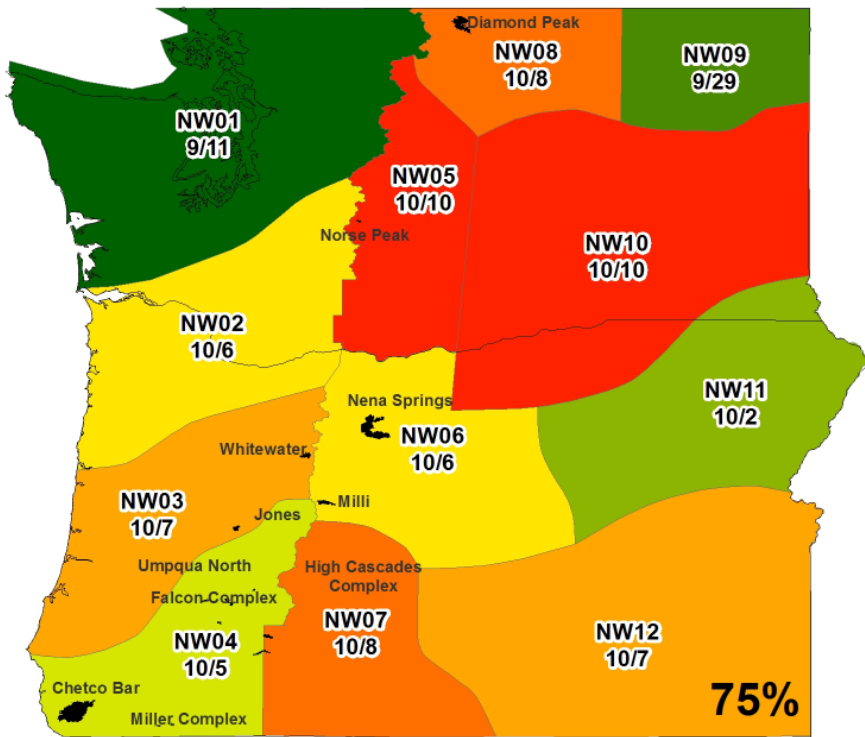




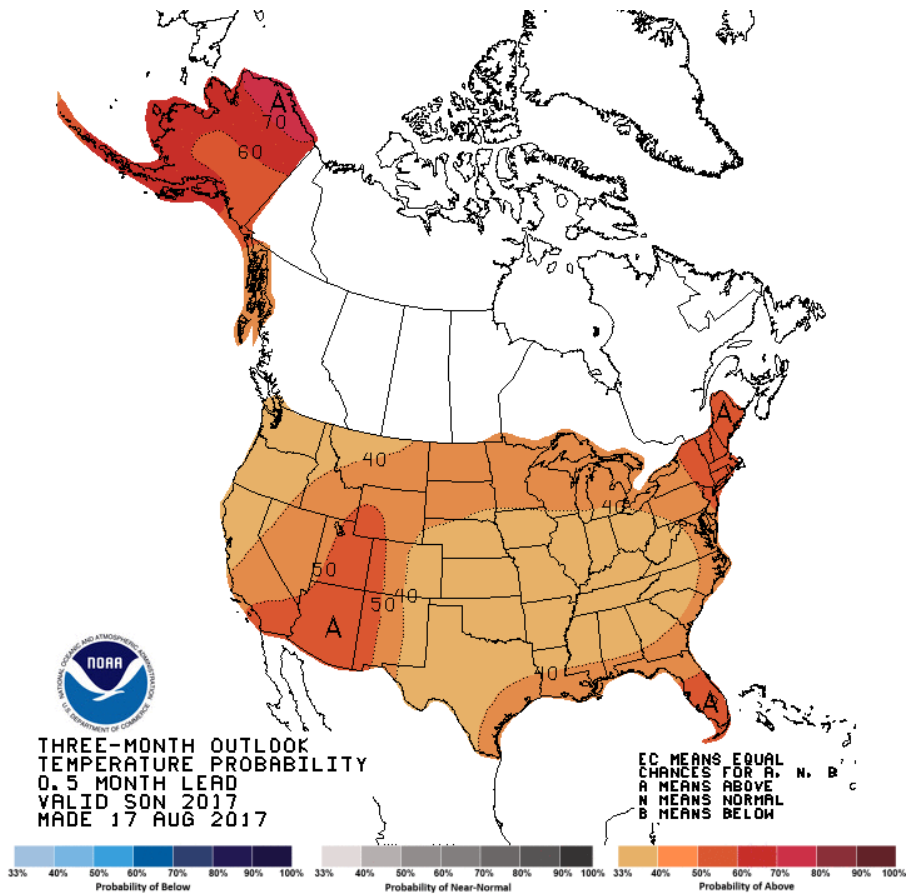


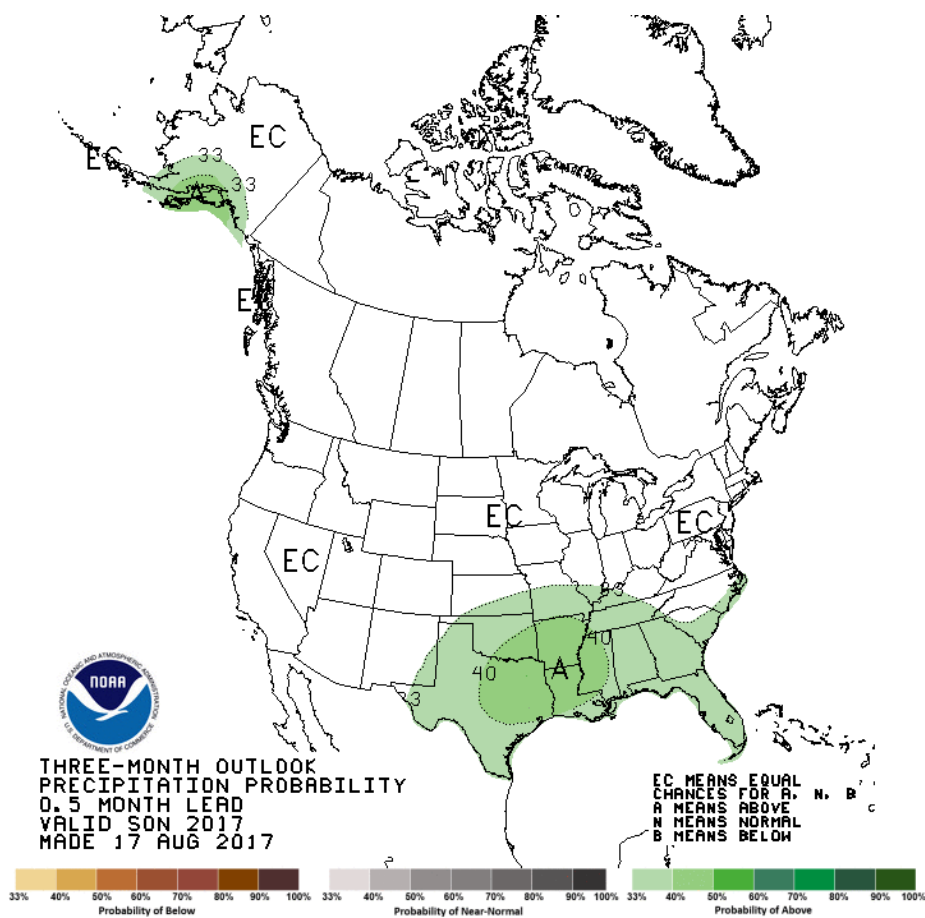
Below is the PSAs colored by season-end date for OR. The top is the 50% probability of a season-ending event by the given date. The bottom is the 75% probability.





Three-month outlooks for temperature (**slightly above average**) and precipitation (**equal chances**) (i.e., no clear signal).



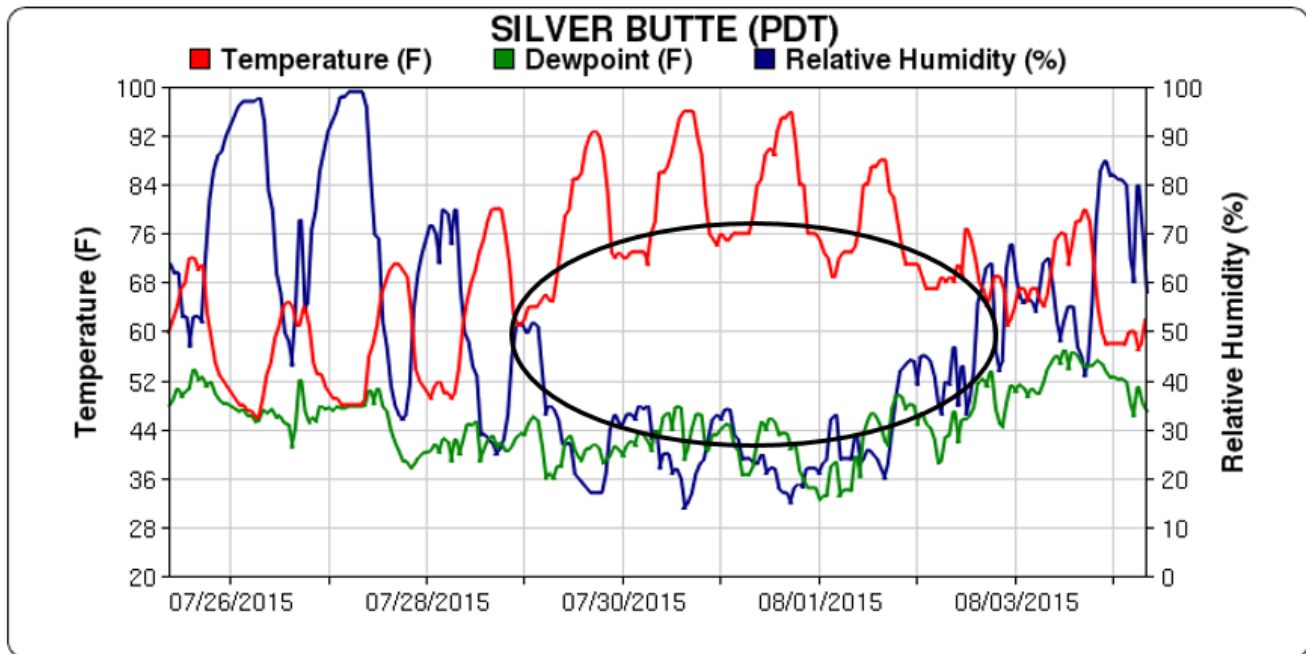


## Large Fire Growth Triggers

Typically large fires on the western slopes of the Cascade Mountains grow in size on relatively few days during the lifespan of the fire. These growth days are often associated with wind events, warm and dry air masses, atmospheric instability, or the alignment of fuels, slope, and aspect. Localized thunderstorms can contribute to these large fire movements, but are difficult to predict where they will materialize and how or if they will affect the fire. However, there are three key events that have high forecast accuracy and particularly troublesome on fires on the WIF, UPF, and RSF. They are (1) poor nighttime recoveries, (2) moderate to strong offshore wind patterns (i.e., east winds), and (3) thermal troughs with unstable air mass (Haines of 5 or 6). Per a discussion with John Saltenberger, meteorologist at Predictive Services, the frequencies of such events from now till the end of September, are estimated at **6 poor nighttime recoveries, 4 strong offshore events, and 4 thermal troughs/high Haines.**

1. Poor ridgetop recoveries often precede large fire growth the following day. The table is from the Stouts Creek Fire on the UPF in 2015. Note the poor nighttime recoveries and the associated growth.

	Max Nightly (early am) RH	Min Daily RH	High Temp (F)	ERC	Est. of Daily Growth (ac) from IR & VIIRS
29-Jul	52%	17%	93	63	0
30-Jul	35%	14%	96	66	6,509
31-Jul	34%	15%	96	68	6,173
1-Aug	33%	20%	88	70	4,342



2. Strong, easterly winds can blow across the western slopes of the Cascade Mountains when a thermal trough moves to the Oregon coastline and high pressure increases east of the Cascades. This strong downslope wind usually brings low relative humidity and poor humidity recovery at night. This Foehn wind can occur any time of the year, but are most problematic during late August, September, and October. East wind events can persist for 24 to 48 hours or longer with surface winds commonly 30 to 50 mph. Generally, wind velocities reach maximum strength during the night and early morning hours.
3. Thermal troughs are a critical fire weather pattern in the Pacific Northwest. This elongated area of low atmospheric pressure tends to boost temperatures, drop humidity, and increase instability. Often the thermal trough develops near the Pacific coastline of Washington and Oregon then progresses gradually inland and eastward over the following days. They are commonly associated with Haines 5 and 6 days. The presence of thermal troughs have been associated with rapid rates of spread, extreme fire behavior, and plume-dominated fires. All three forest, but particularly the UPF, have a rich history of such events, including Rattle 2008, Tumblebug, Boze, and Rainbow 2009, Lonesome and Garwood 2011, and more recently Deception Creek 2014 and Chetco Bar 2017.

## Summary Points

- It is likely that August will continue to be hot and dry with equal chances of precipitation (i.e., not likely). The probability that large fires will increase in size is high, with a low chance of a fire-slowng event and no chance of a season-ending event.
- Moving into September, the chance of above average temperatures is higher than normal, with an equal chance of precipitation. New large fire probability begins to diminish as the probability of season-ending events increase. Late Sept. or the first week in October is typically when fire seasons come to a close.
- There is a lot of small- to medium-sized fires on the landscape. With a few exceptions, the fires are generally in “ok” locations, and the predicament we find ourselves in is a tedious waiting game. It can be likened to a three horse race. One horse is the chance for a fire-slowng event moderating conditions—like the modest precipitation we received Aug. 9-12. The pro with this horse winning is it stalls fire growth for 2 to 4 days, BUT the horses again go to the starting line. The 2<sup>nd</sup> horse is a season-ending event—successive season-slowng events culminating in the termination of the fire season. Lastly, is the dreaded horse—the large fire trigger. The *sequence* of this race or races will define the final lap of the fire season.
- We have a lot of fire on the landscape, on a wide breath of the Cascades, and at multiple elevations and exposures. It is **highly likely** that a few of these fires will experience severe weather and double or triple in size before the fire season comes to a close. Be aware not only of your fire and personnel, but the adjoining fire(s) behavior and movement.