Long-term Outlook for Fire Season 2017 in PNW

Date: Sept. 11, 2017

Analysts: Rick Stratton and Morgan Pence

Background & Purpose

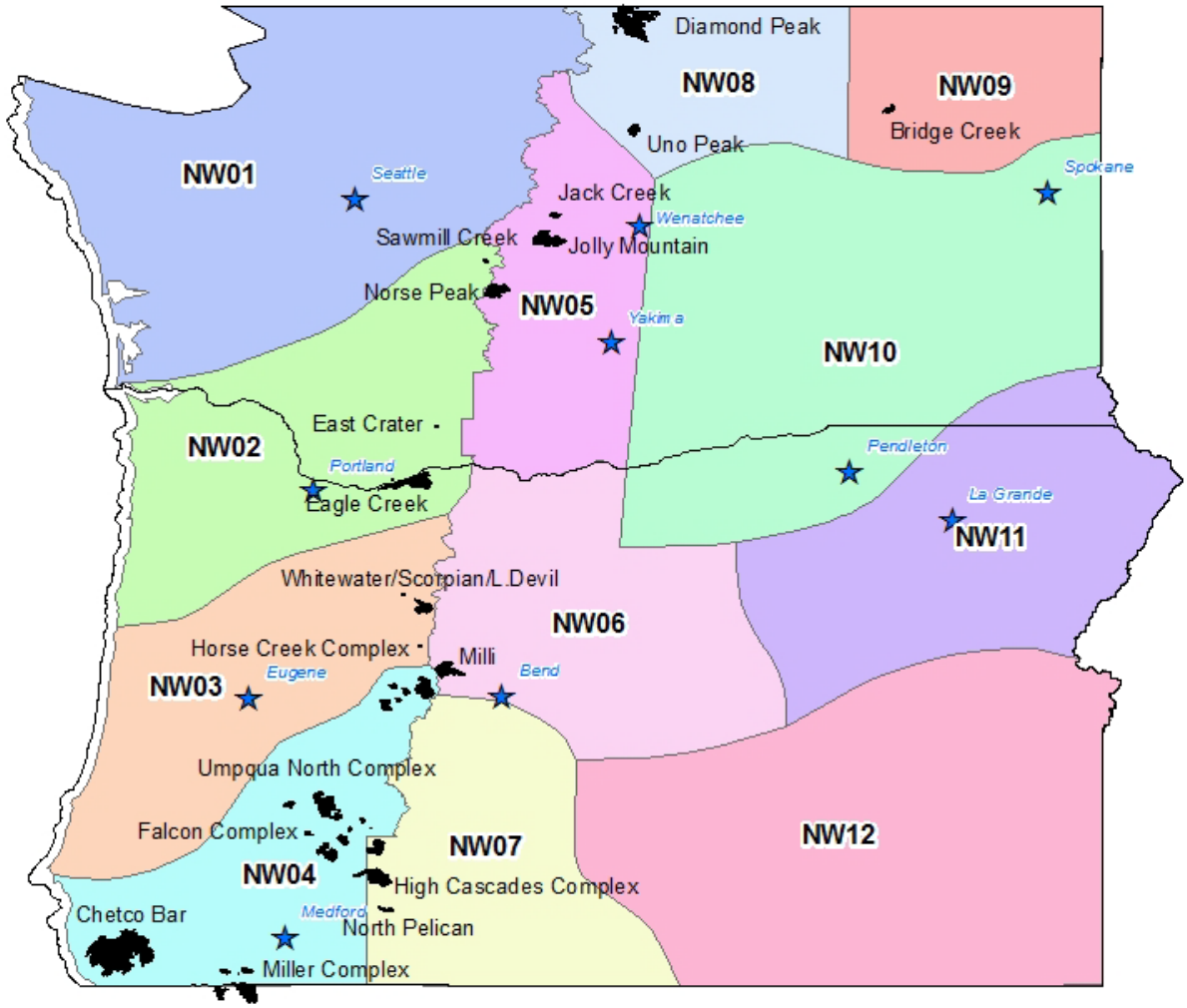
On August 9-12, lightning ignited several fires in Oregon and Washington. Precipitation received varied from no rain or a trace, to greater than an inch (Stella Remote Automated Weather Station [RAWS] on the RSF). Prior to this event, on Aug. 8th there were 9 uncontained large fires burning in the Pacific Northwest; including Whitewater (WIF), Blanket Creek (RSF), Spruce Lake (CLP), Diamond Creek (OWF), Chetco Bar (RSF), and Indian Creek (MHF). PNW moved to Preparedness Level 5 on August 12th. In the roughly four weeks that followed, the geographic area has received little to no rain and experienced record ERCs in many PSAs. Several of the lightning-caused fires have merged and are now being managed as complexes. There have been additional starts, and as of Sept. 8th there are 21 uncontained large fires, 9 Type 1 IMT's, and 11 Type 2 IMT's in PNW. The purpose of this abbreviated assessment is to provide line officers and fire managers information on the climatology of the area these fires are currently burning in, and short, near, and long-term fire weather and behavior outlooks and discussion.

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.

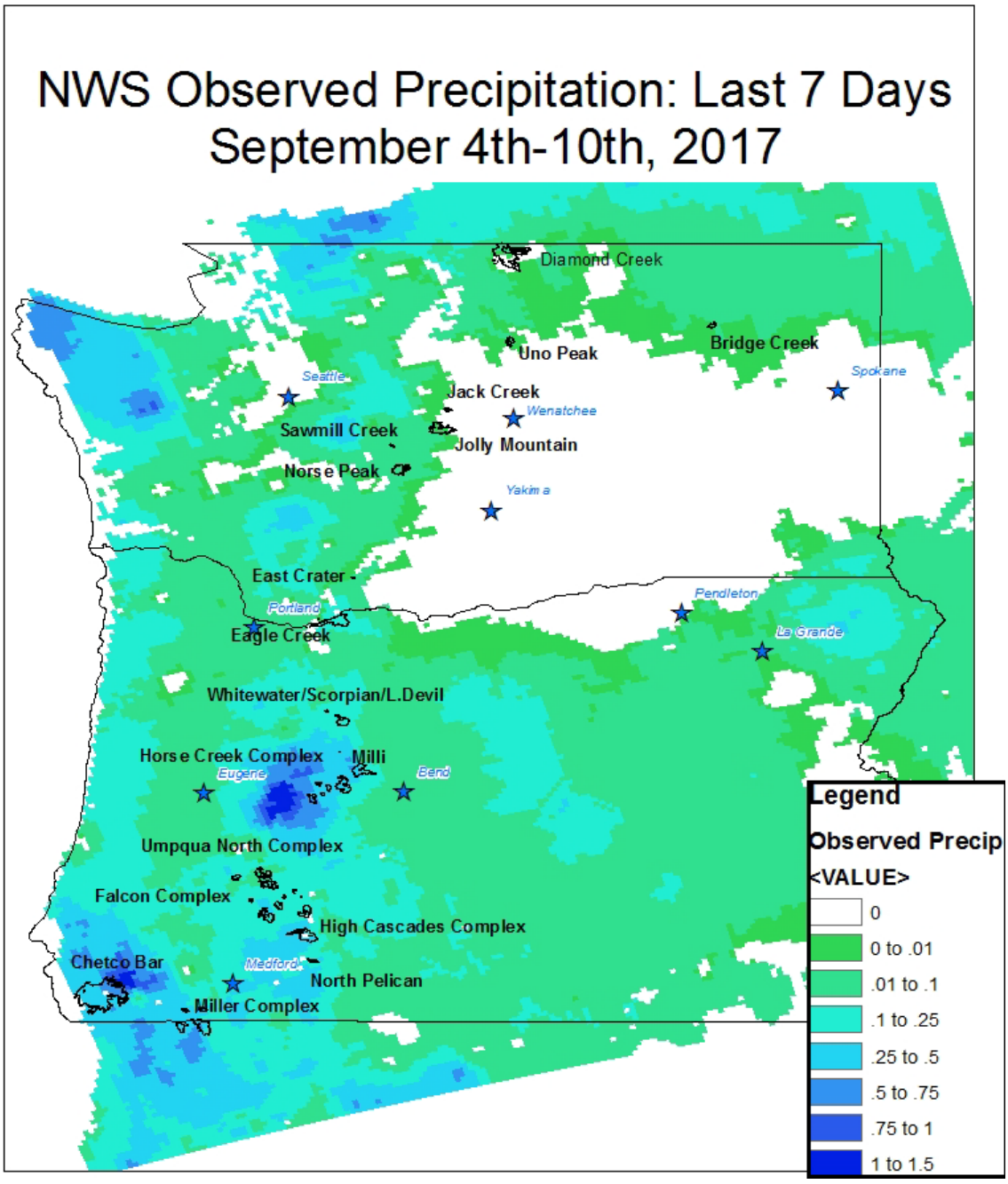
Fire Name	PSA
Diamond	NW08
Bridge Creek	NW09
Ferry Point/Uno	NW08
Jack Creek	NW05
Jolly Mountain	NW05
Sawmill Creek	NW02
Norse Peak	NW05
East Crater	NW02
Eagle & Indian Creek/Archer Mtn.	NW02
Whitewater/Scorpion/Little Devil	NW03
Milli	NW06
Horse Creek Complex	NW04
Umpqua North Complex	NW04

Falcon Complex	NW04
High Cascades Complex	NW07
North Pelican	NW07
Chetco Bar	NW04
Miller Complex	NW04



Recent Precipitation

September 6-10th brought varied amounts of precipitation to the geographic area, with the greatest amounts observed over the southern Cascades and SW Oregon. The Washington fires received minimal rain. Below is a graphic and table of this welcomed precipitation event.

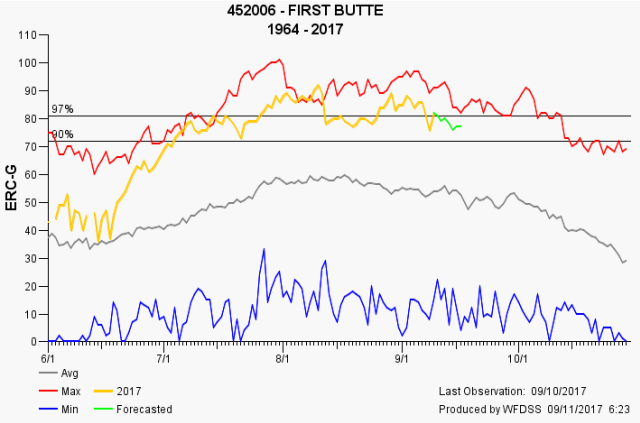

NWS Observed Precipitation: Last 7 Days
September 4th-10th, 2017
Diamond Creek
Uno Peak
Bridge Creek
Spokane
Seattle
Jack Creek
Wenatchee
Sawmill Creek
Jolly Mountain
Norse Peak
Yakima
East Crater
Pendleton
Portland
Eagle Creek
La Grande
Whitewater/Scorpian/L.Devil
Horse Creek Complex
Milli
Eugene
Bend
Umpqua North Complex
Falcon Complex
High Cascades Complex
Chetco Bar
Medford
North Pelican
Miller Complex
Legend
Observed Precip
<VALUE>
0
0 to .01
.01 to .1
.1 to .25
.25 to .5
.5 to .75
.75 to 1
1 to 1.5

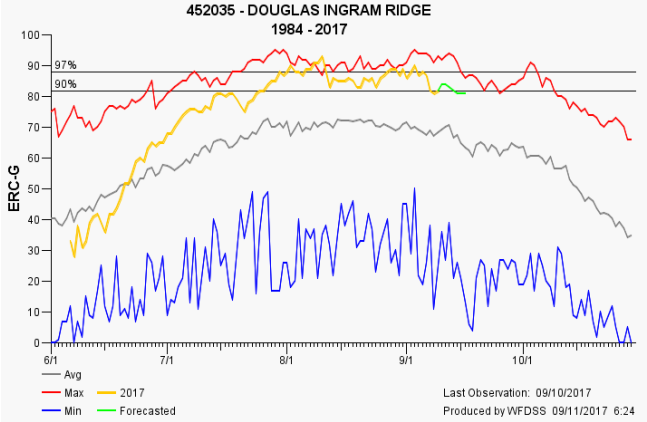
Fire (North to South)	Closest Station(s)	5-Day Total	PSA
Diamond	First Butte	0	NW08
	Hozomeen	0.01	
Bridge Creek	Gold Mountain	0	NW09
Ferry Point/Uno	Camp 4	0	NW08
	Douglas Ingram Ridge	0	
Jack Creek	Dry Creek	0	NW05
Jolly Mountain	Swauk	0	NW05
	Peoh Point	0	
Sawmill Creek	Lester	0.01	NW02
	Green Water	0	
Norse Peak	Green Water	0	NW05
	Sawmill	0	
East Crater	Buck Creek	0	NW02
	Dry Creek	0	
Eagle/Archer/Indian	Three Corner Rock	0.04	NW02
	Log Creek	0.2	
Whitewater/Scorpion/L. Devil	Boulder	0.33	NW03
	Yellowstone	0.01	
Milli	Colgate	0.11	NW06
Horse Creek Complex	Pebble	0.05	NW04
Umpqua North Complex	Grandad	0.14	NW04
	Toketee	0.21	
Falcon Complex	Buckeye	0.49	NW04
	Stella	0.25	
High Cascades Complex	Stella	0.25	NW07
	Zim	0.79	
North Pelican	Seldom	0.16	NW07
Chetco Bar	Agness	0.41	NW04
	Quail	0.21	
	Red Mound	0.34	
Miller Complex	IV Airport	0.83	NW04
	Squaw	0.12	

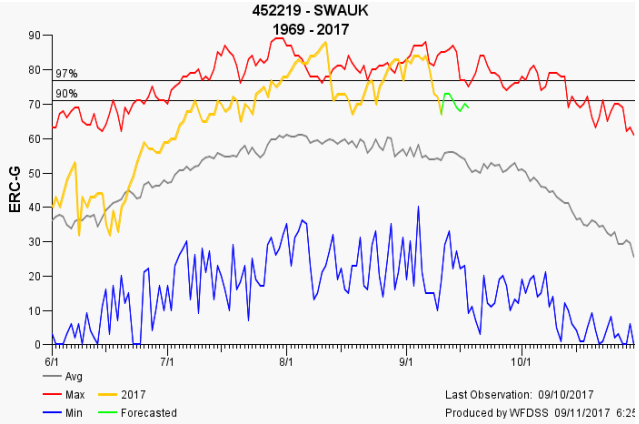
Climatology

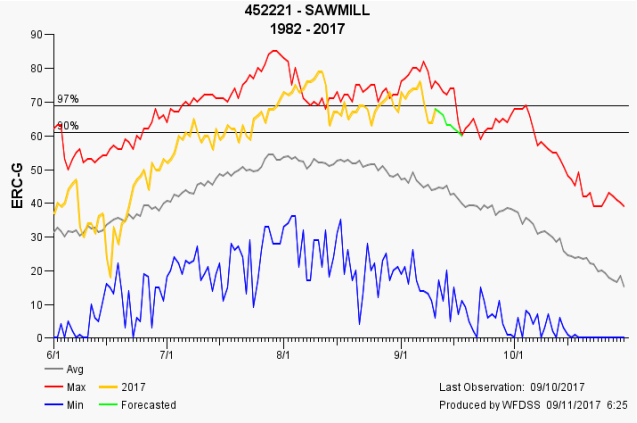
How does current fire danger compare to historical? Below are ERCs graphs across the geographic area from north to south. The Washington stations (First Butte, Douglas Ingram, Swauk, and Sawmill) have ERCs between the 90th to 97th Percentile (yellow line) and are forecast to take a small dip in the forecast period (green line), but remain above average.

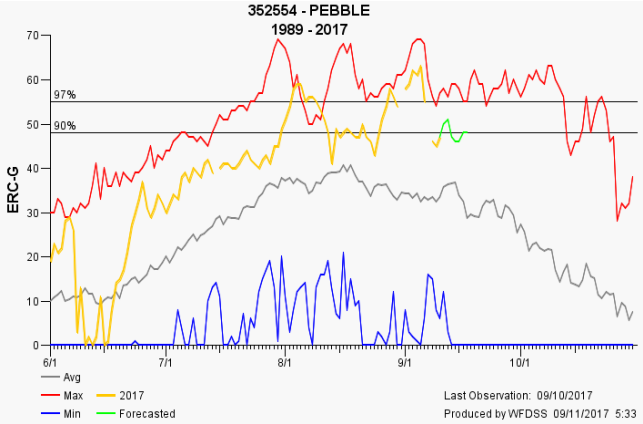
The Oregon stations (Pebble, Buckeye, Evens, and Quail 2) reflect a dip in ERCs due to recent moisture and some reached average levels (grey line). However, the forecast period shows Quail and Pebble returning to 90th percentile ERC conditions.

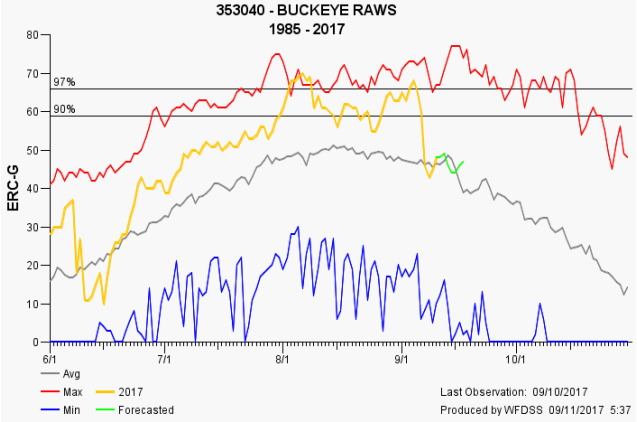


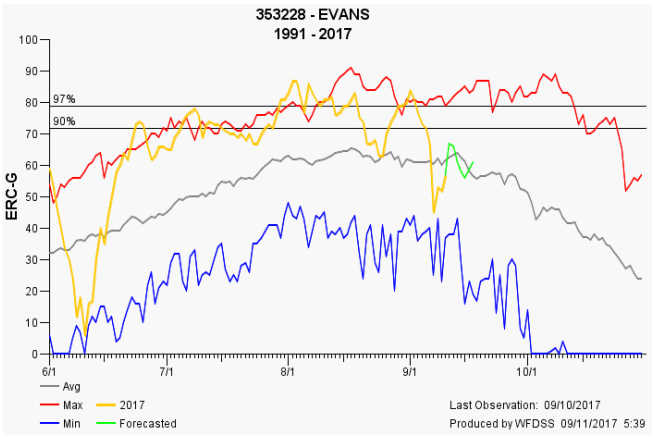


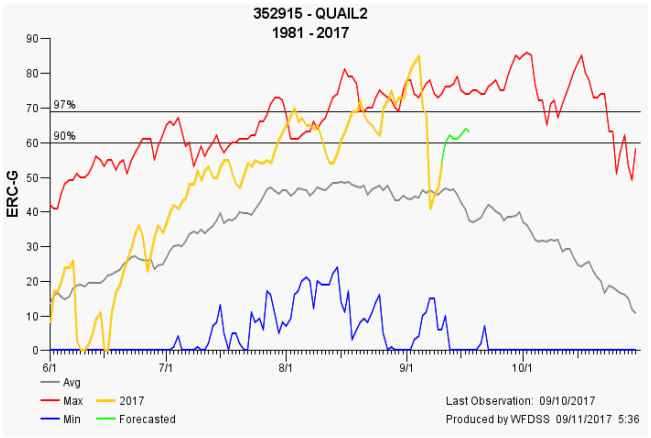




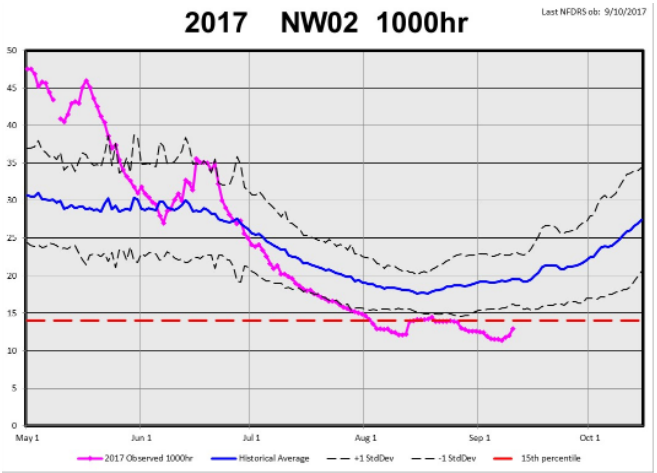


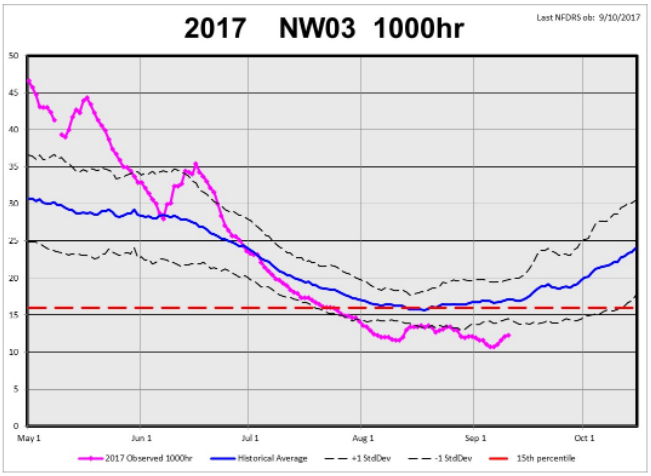


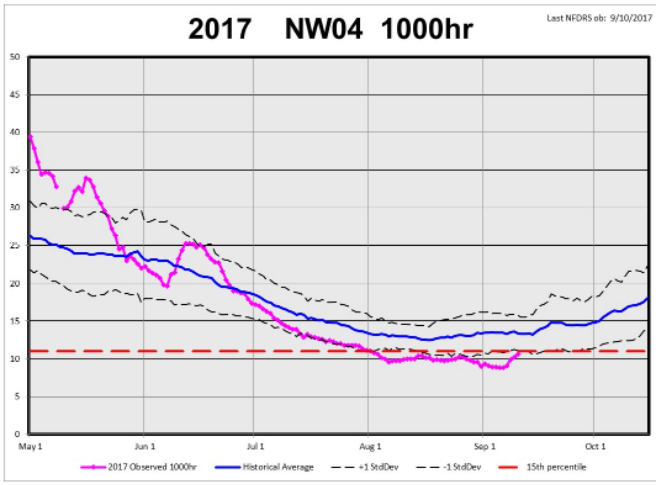


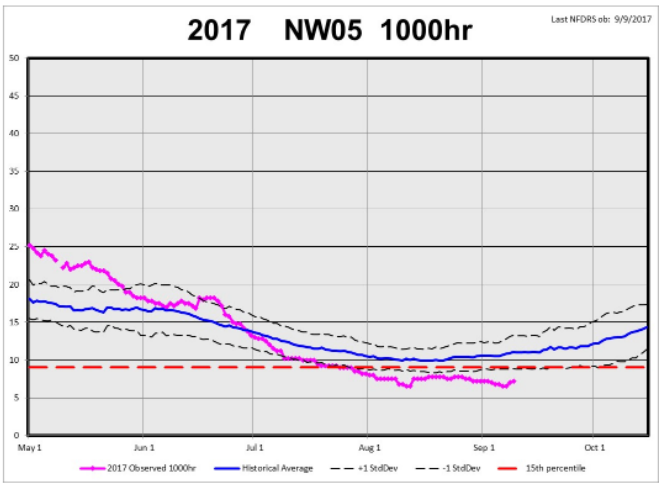


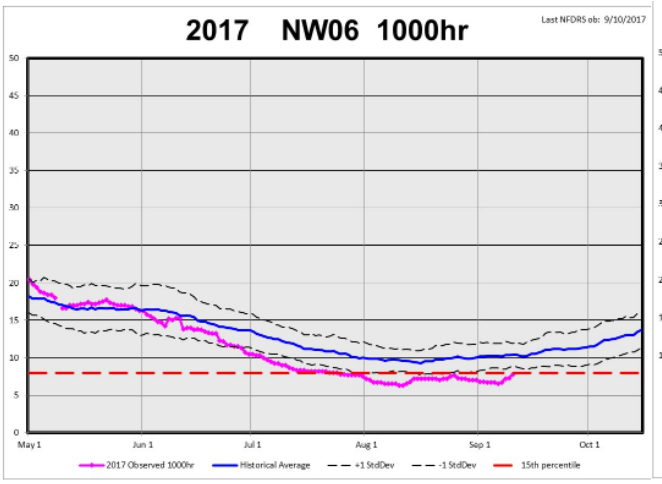
1000-hr dead fuel moistures are between **7 to 11%** (below the 15% percentile).

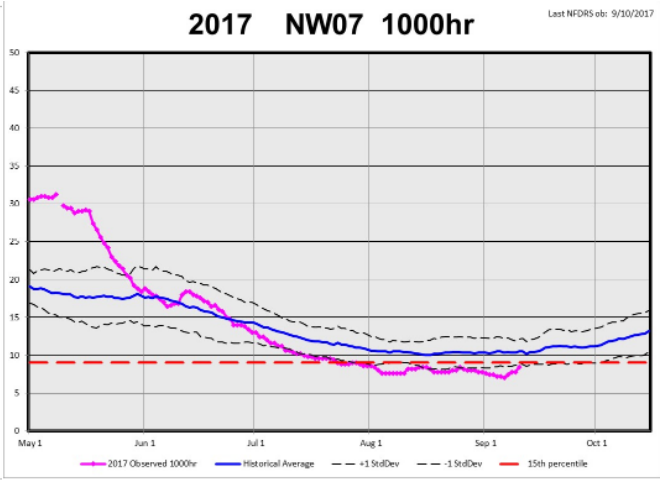


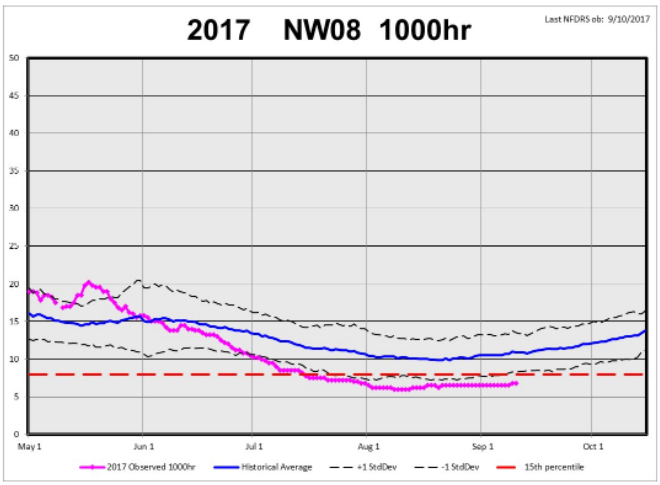






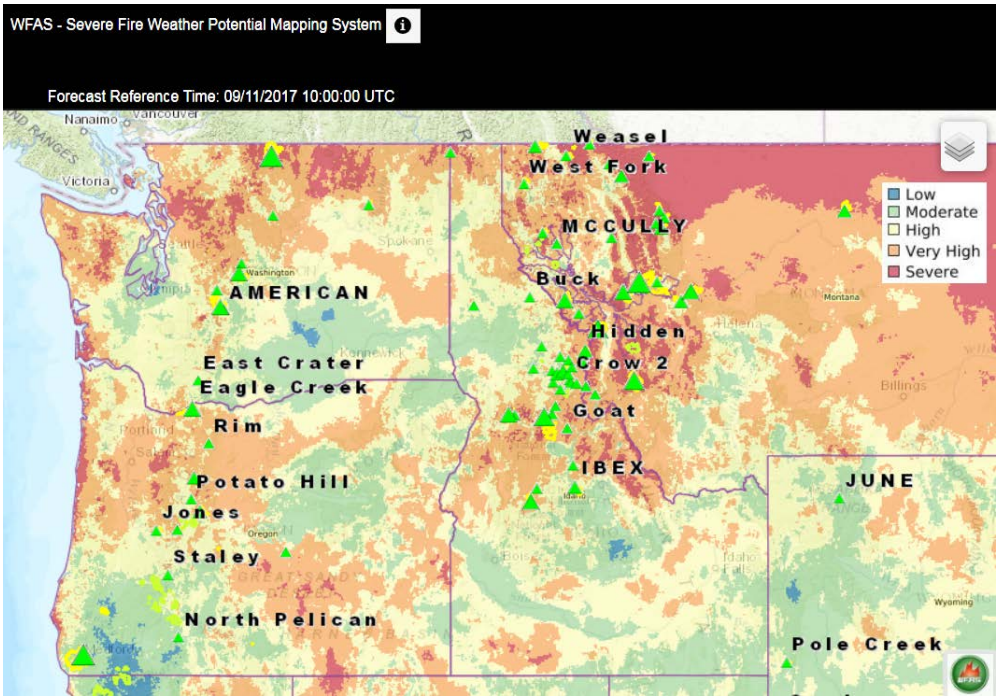






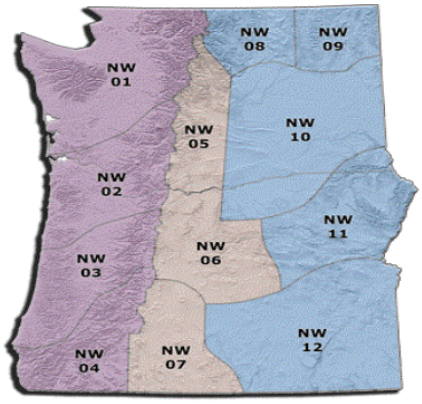
Short-term Outlook (next 7 days)

It is important to remember that we were at historic highs last week, and instead of 97th+ percentile ERCs, we are now hovering around the 90th percentile. As such, **conditions are still suitable for active fire behavior and growth**. To really moderate burning, it will take another one or two pulses of moisture and/or extended cooler temps and higher RHs. A good predictor of daily, broad-scale burning conditions is the WFAS severe fire weather potential mapping system. This website provides users with a tool to spatially assess conditions for the current day, tomorrow, and the day after tomorrow. An example from Sept. 11 is provided below. For more information about this product visit **https://m.wfas.net/,** and click on the layer icon in the upper right to view user options.



Mid-Term Outlook (7 to 14 days)

Pacific Northwest 7-day significant fire potential outlook is provided below. Conditions are expected to be **minimal/moderate** across most of the geographic area (https://gacc.nifc.gov/nwcc/content/products/fwx/guidance/DL.pdf).



Legend

Fire Environment (FEN) 4 levels

Minimal - The Overall Fire Environment suggests a very low risk for Large fires (**less than 1% chance**)

Normal - The Overall Fire Environment suggests a normal risk for large fires (**1 - 4% chance**)

Elevated - The Overall Fire Environment suggests a moderately high risk for large fires (**5 - 19% chance**)

High Risk **The risk for large fire(s) is very high (≥ 20%)**
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, September 11, 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 warming and drying trend, today into tomorrow, will bring a rebound to the ERC values and fire activity. However, potential for large fires remains minimal to normal for most areas, nudging into the elevated category today for portions of Oregon where winds will become gusty out of the East. Elsewhere today, winds will be lighter around 5 mph and generally out of the west.

A cold front will bring a few showers to southern Oregon late today, with a better chance for rain showers across Eastern Oregon Tuesday into Wednesday. There is a potential for isolated lightning during this time, bringing moderate initial attack needs.

Northwest winds will become gusty Wednesday and Thursday as much cooler, fall-like, temperatures sink into the region. Although cool, humidity values will remain on the low side for areas east of the Cascades. The combination of dry gusty winds will promote an increase in fire activity.

Pay close attention to NWS fire weather planning forecasts, spot forecasts, and IMET forecasts for the weather details in your area.

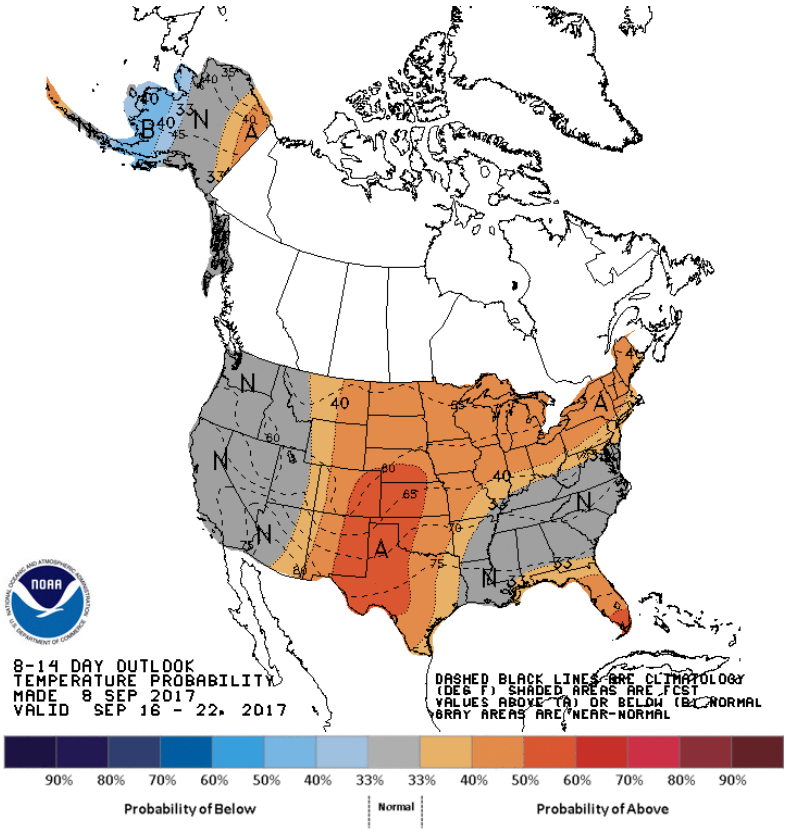
Please call NWCC Predictive Services (503) 808-2737 with any questions.

Preparedness Level:

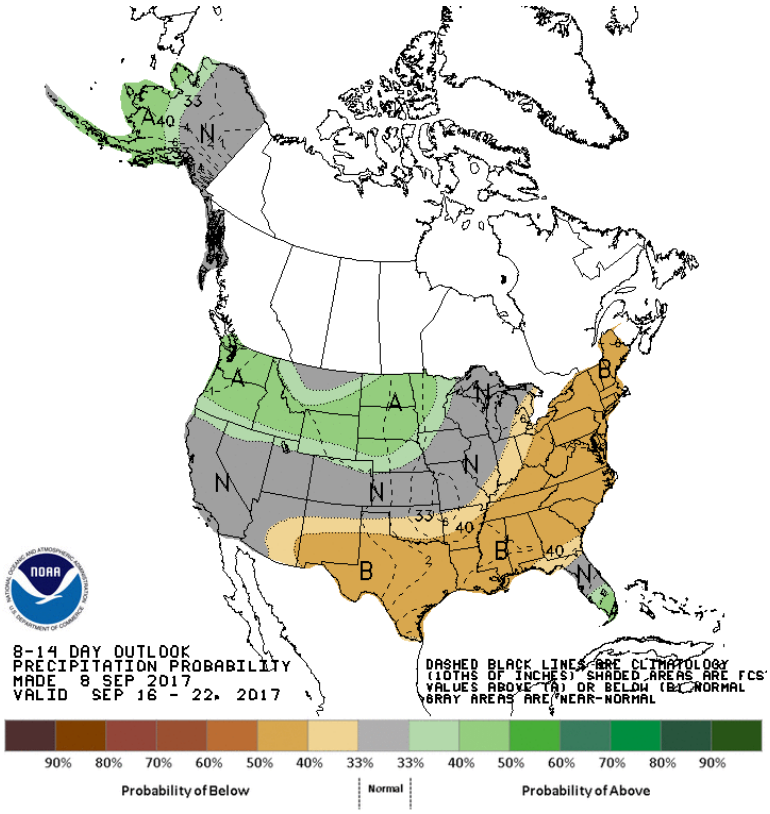
Northwest:5
National: 5

- Amanda Graning

8 to 14 day outlook shows likelihood of **normal temperatures**.



8 to 14 day outlook is a 33 to 50% chance of **above average precipitation**.



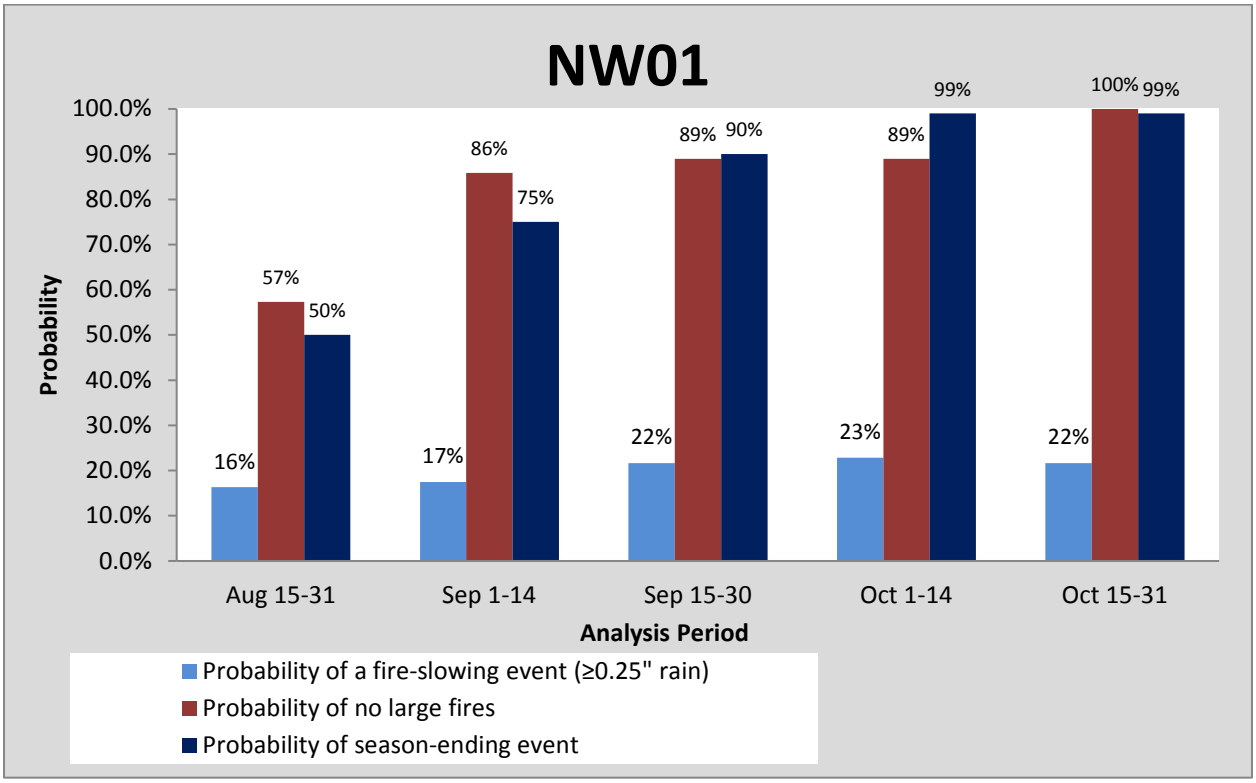
Long-term Outlook (3-months)

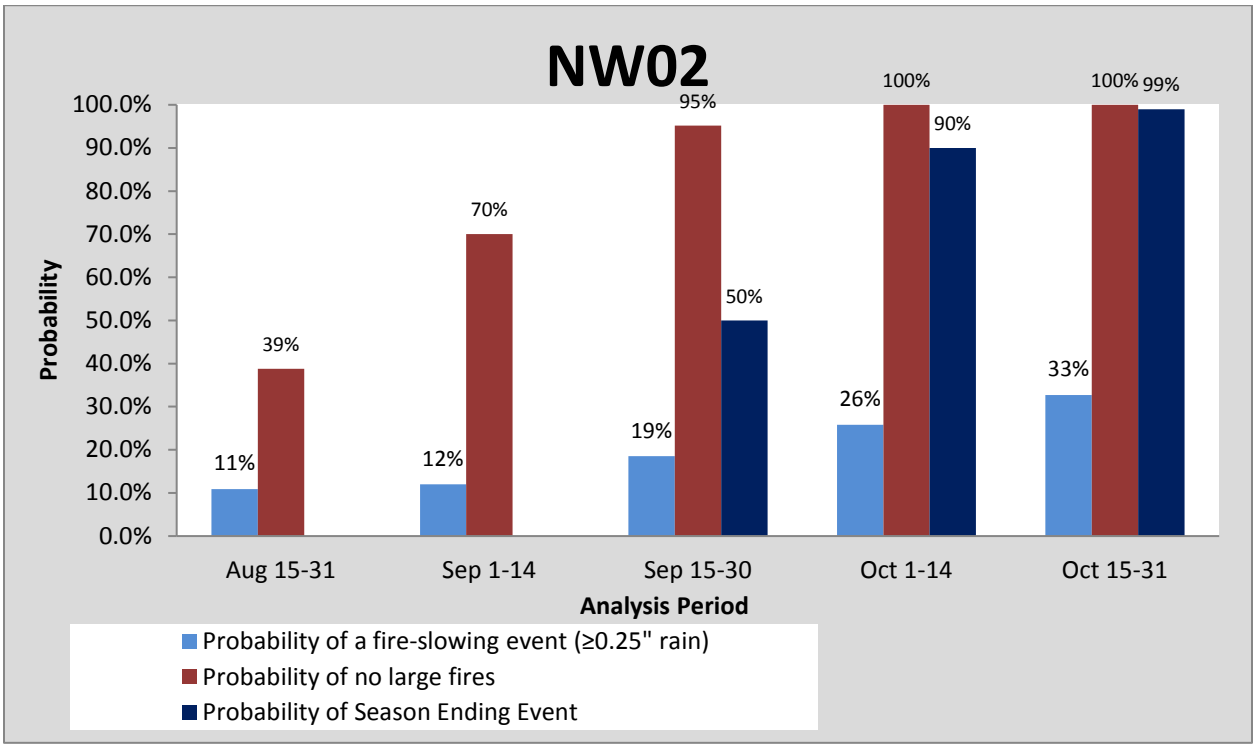
Probability of Large Fires, Fire-slowing, and Season-ending Events

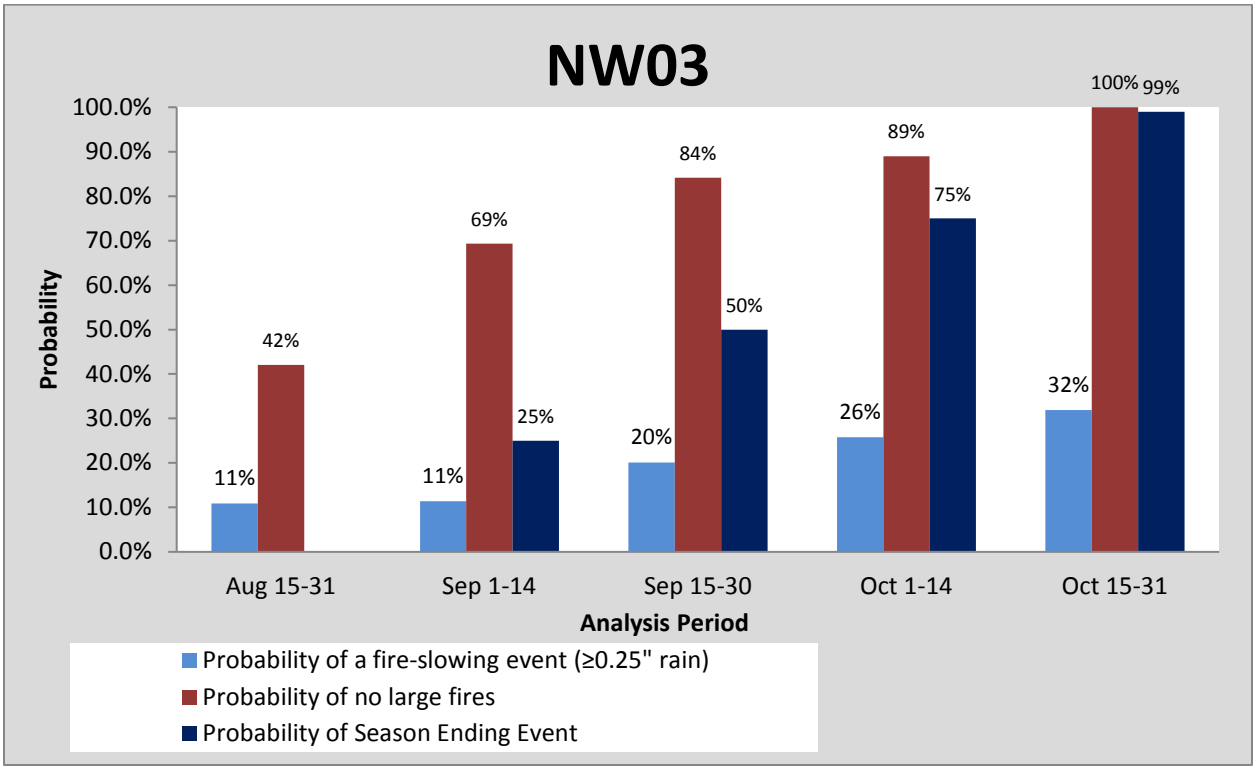
Below are column charts for each PSA based on the probability of getting another large fire, a fire-slowing event, and a season-ending event. The large fire occurrence data was obtained from NWCC (T. Marsha; 8.2015) for an 8-year period. A large fire differs in size based on the PSA, so think of this as the probability of a fire requiring a type 1 or 2 team.

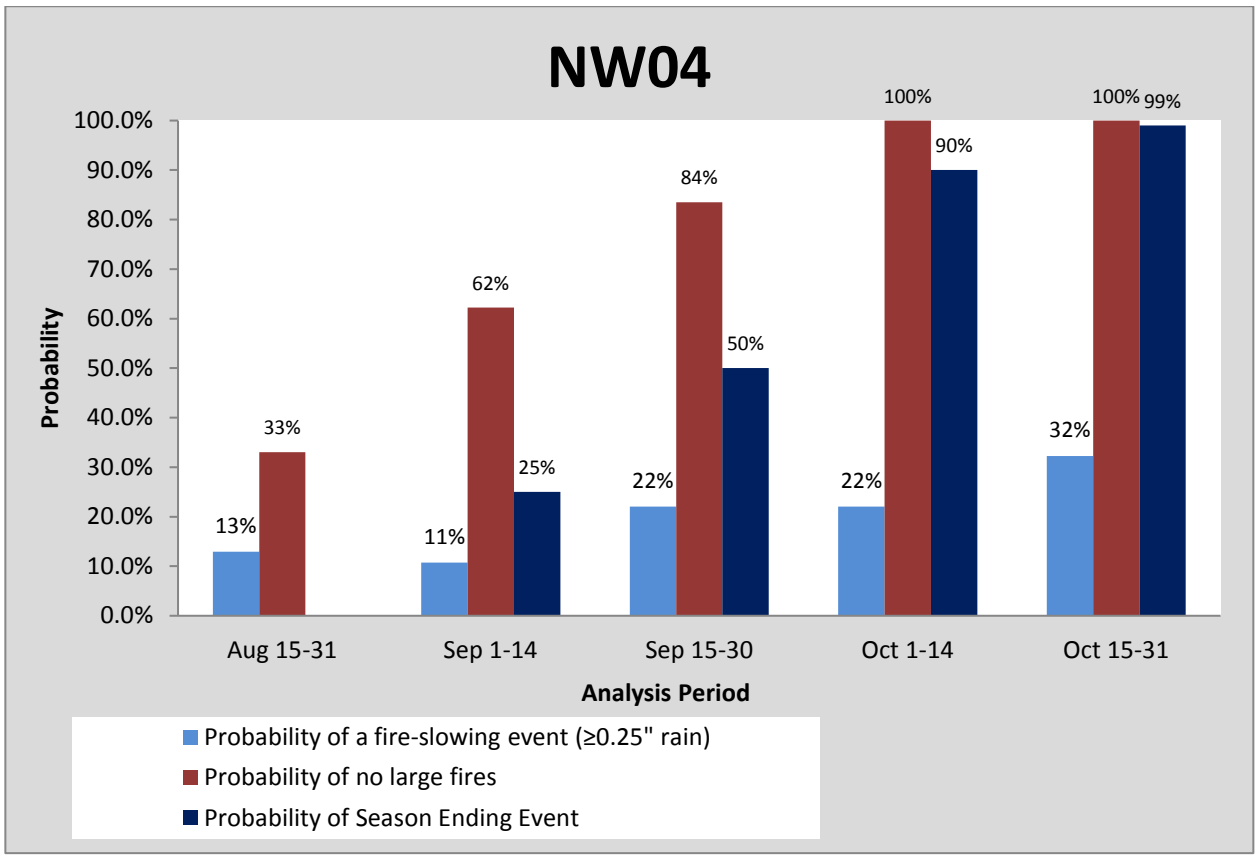
Fire-slowing information was obtained through a query of the PSA Special Interest Groups (SIGs)—a group of RAWS. A ¼" over a 3-day period was selected as a fire-slowing event, as several forecast areas use this criteria as a "wetting rain." Fires that receive approximately a ¼" of precipitation are likely to see fire movement pause for 2 to 4 days. **This past weekend several fires in Oregon received a fire-slowing event**. It should be noted that the fire-slowing bar is likely underrepresented in some PSAs in the later-half of Sept. and October because some of the precipitation received is snow.

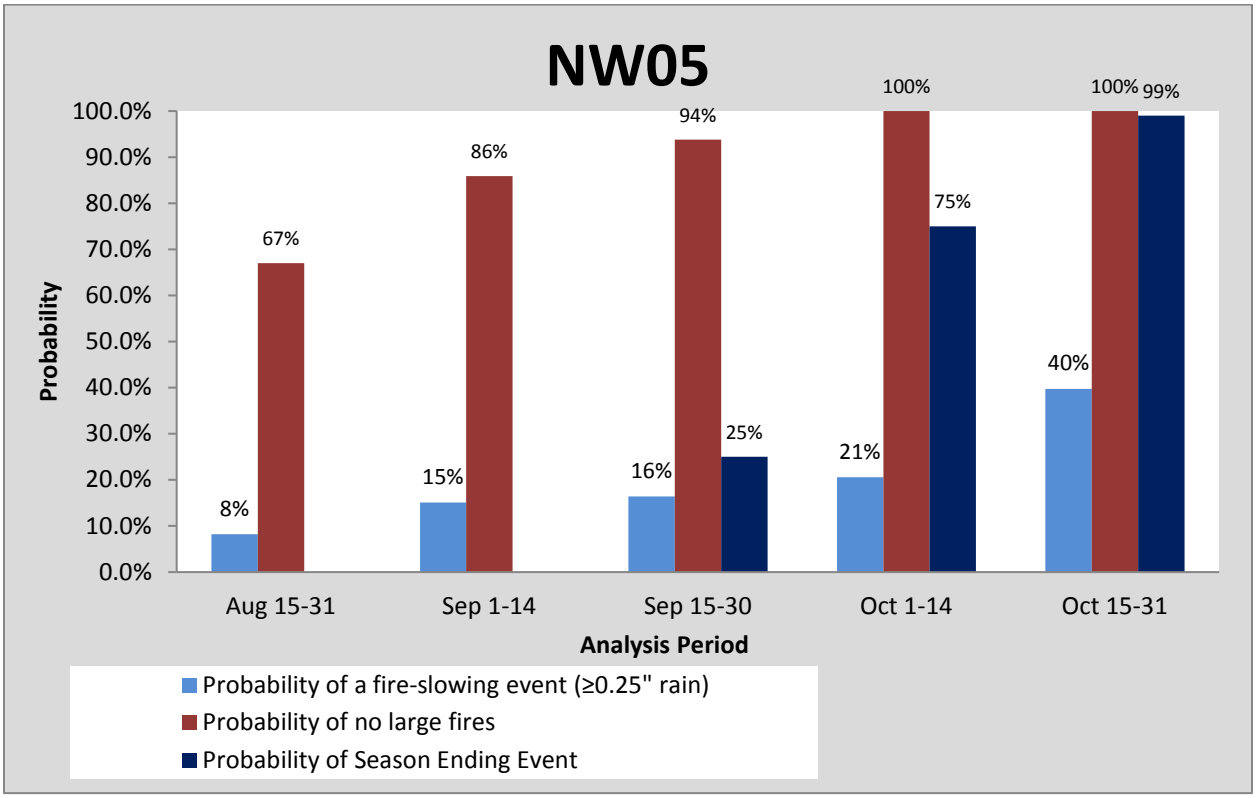
A season-ending event consists of a fire-slowing event followed by a persistent combination of environmental factors that end the fire season. NWCC develops waiting-time distribution functions—or TERM events—for each PSA by using a SIG. Season-ending estimates were constructed from the Predictive Services 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).

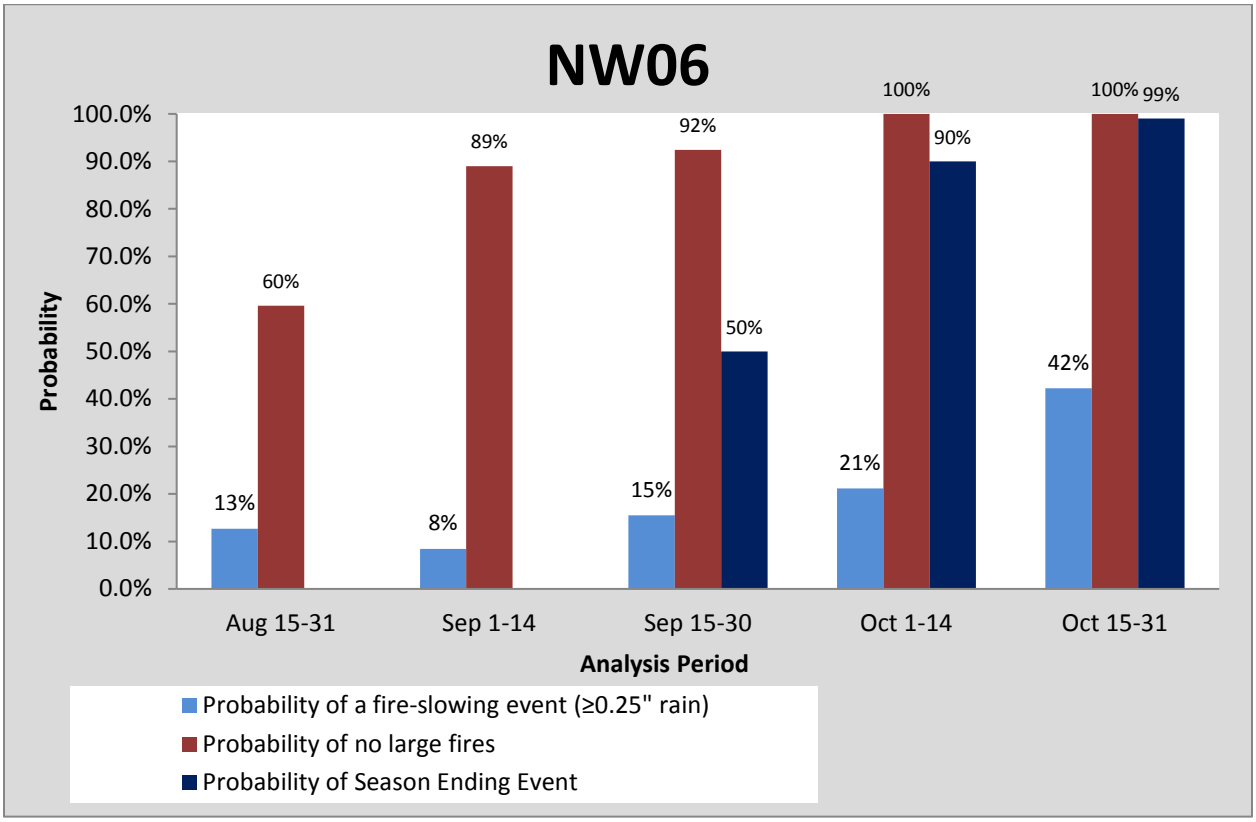

NW01
Probability
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
16%
57%
50%
17%
86%
75%
22%
89%
90%
23%
89%
99%
22%
100%
99%
Aug 15-31
Sep 1-14
Sep 15-30
Oct 1-14
Oct 15-31
Analysis Period
Probability of a fire-slowing event (≥0.25" rain)
Probability of no large fires
Probability of season-ending event

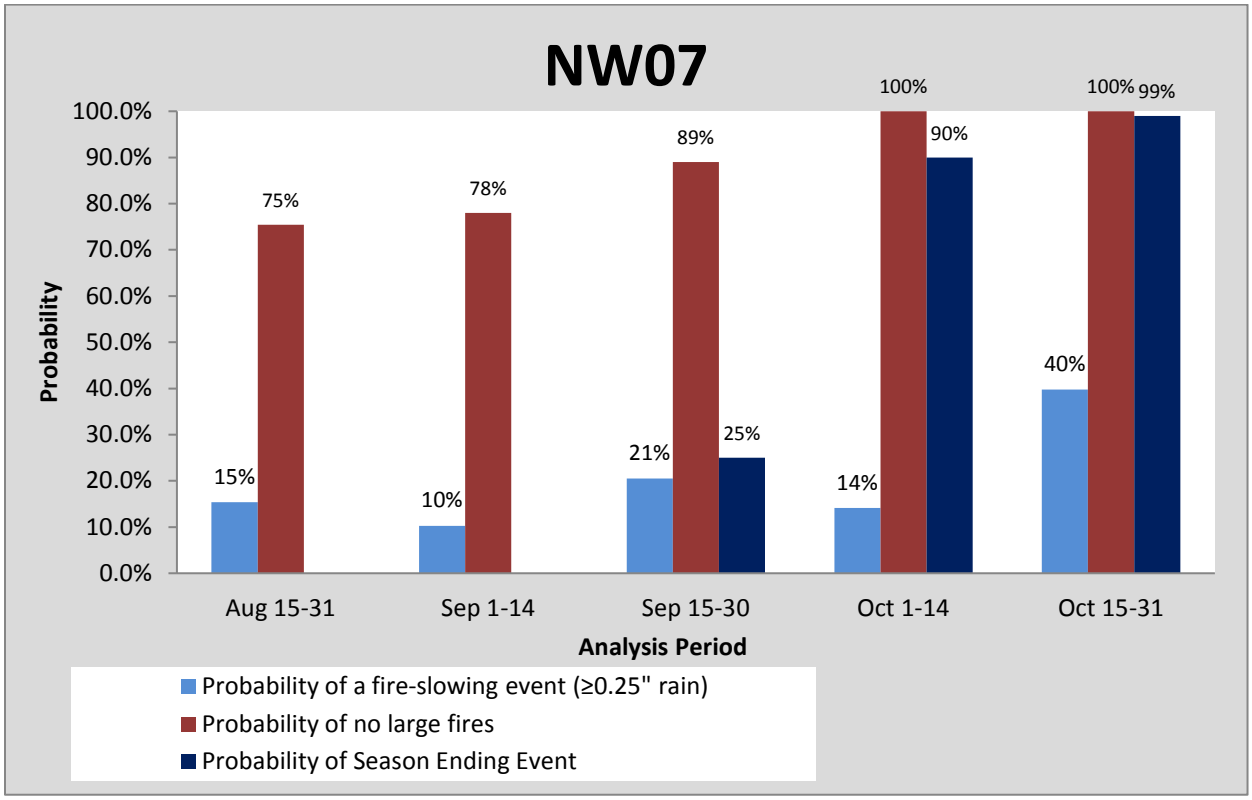

NW02
Probability
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
11%
39%
12%
70%
19%
95%
50%
26%
100%
90%
33%
100%
99%
Aug 15-31
Sep 1-14
Sep 15-30
Oct 1-14
Oct 15-31
Analysis Period
Probability of a fire-slowing event (≥0.25" rain)
Probability of no large fires
Probability of Season Ending Event


NW03
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Probability
11%
42%
11%
69%
25%
20%
84%
50%
26%
89%
75%
32%
100%
99%
Aug 15-31
Sep 1-14
Sep 15-30
Oct 1-14
Oct 15-31
Analysis Period
Probability of a fire-slowing event (≥0.25" rain)
Probability of no large fires
Probability of Season Ending Event


NW04
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Probability
13%
33%
11%
62%
25%
22%
84%
50%
22%
100%
90%
32%
100%
99%
Aug 15-31
Sep 1-14
Sep 15-30
Oct 1-14
Oct 15-31
Analysis Period
Probability of a fire-slowing event (≥0.25" rain)
Probability of no large fires
Probability of Season Ending Event


NW05
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Probability
8%
67%
15%
86%
16%
94%
25%
21%
100%
75%
40%
100%
99%
Aug 15-31
Sep 1-14
Sep 15-30
Oct 1-14
Oct 15-31
Analysis Period
Probability of a fire-slowing event (≥0.25" rain)
Probability of no large fires
Probability of Season Ending Event


NW06
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Probability
13%
60%
8%
89%
15%
92%
50%
21%
100%
90%
42%
100%
99%
Aug 15-31
Sep 1-14
Sep 15-30
Oct 1-14
Oct 15-31
Analysis Period
Probability of a fire-slowing event (≥0.25" rain)
Probability of no large fires
Probability of Season Ending Event


NW07
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Probability
15%
75%
10%
78%
21%
89%
25%
14%
100%
90%
40%
100%
99%
Aug 15-31
Sep 1-14
Sep 15-30
Oct 1-14
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Analysis Period
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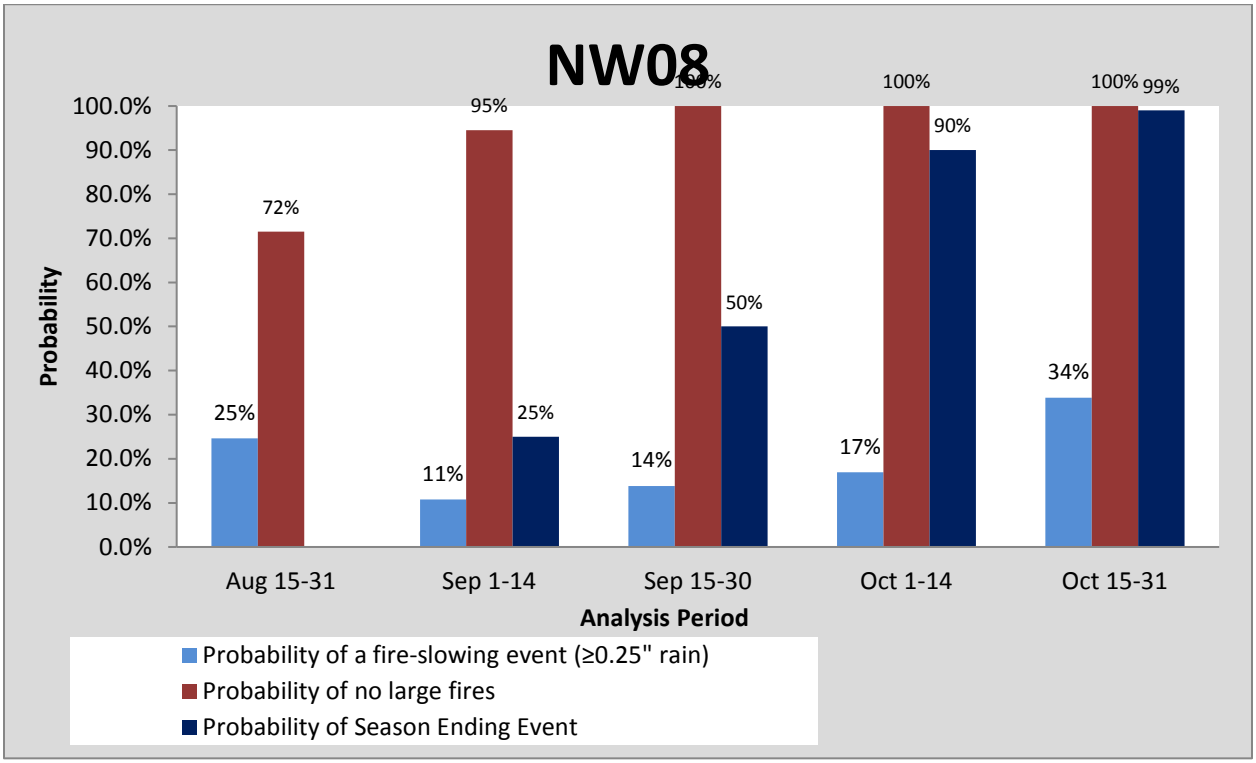
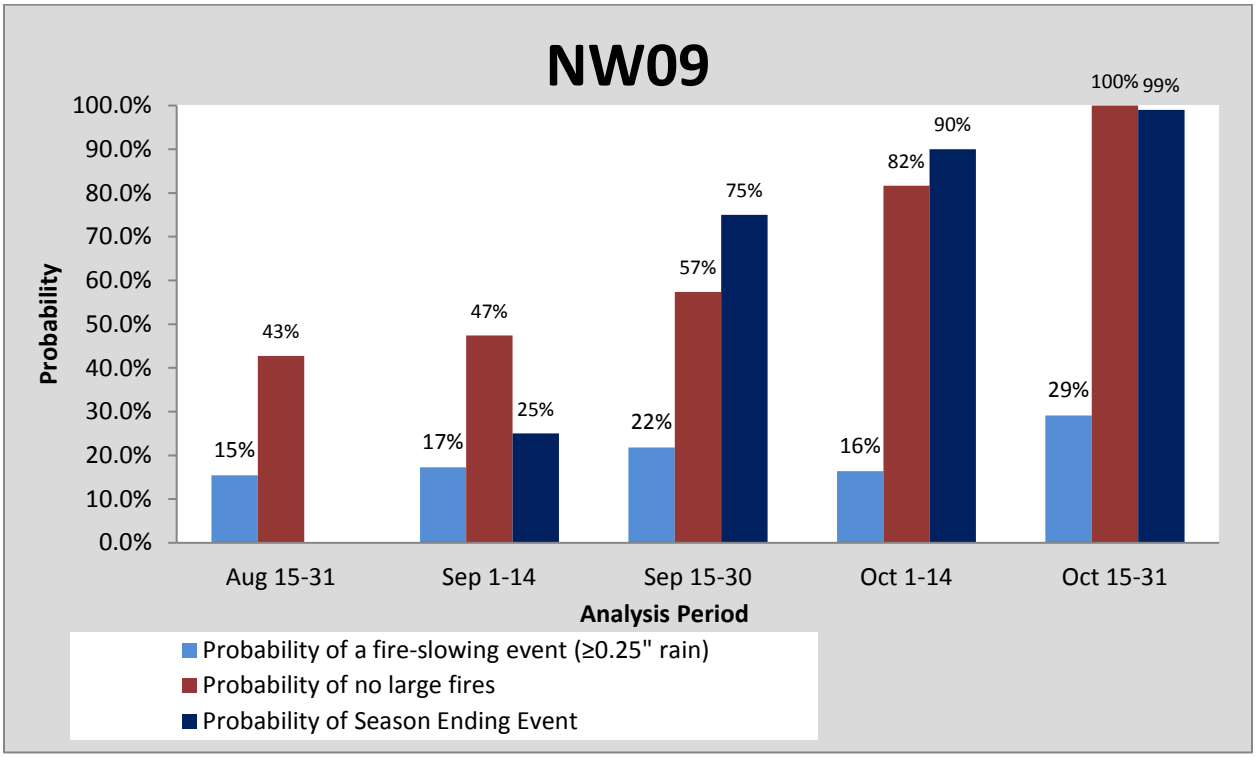
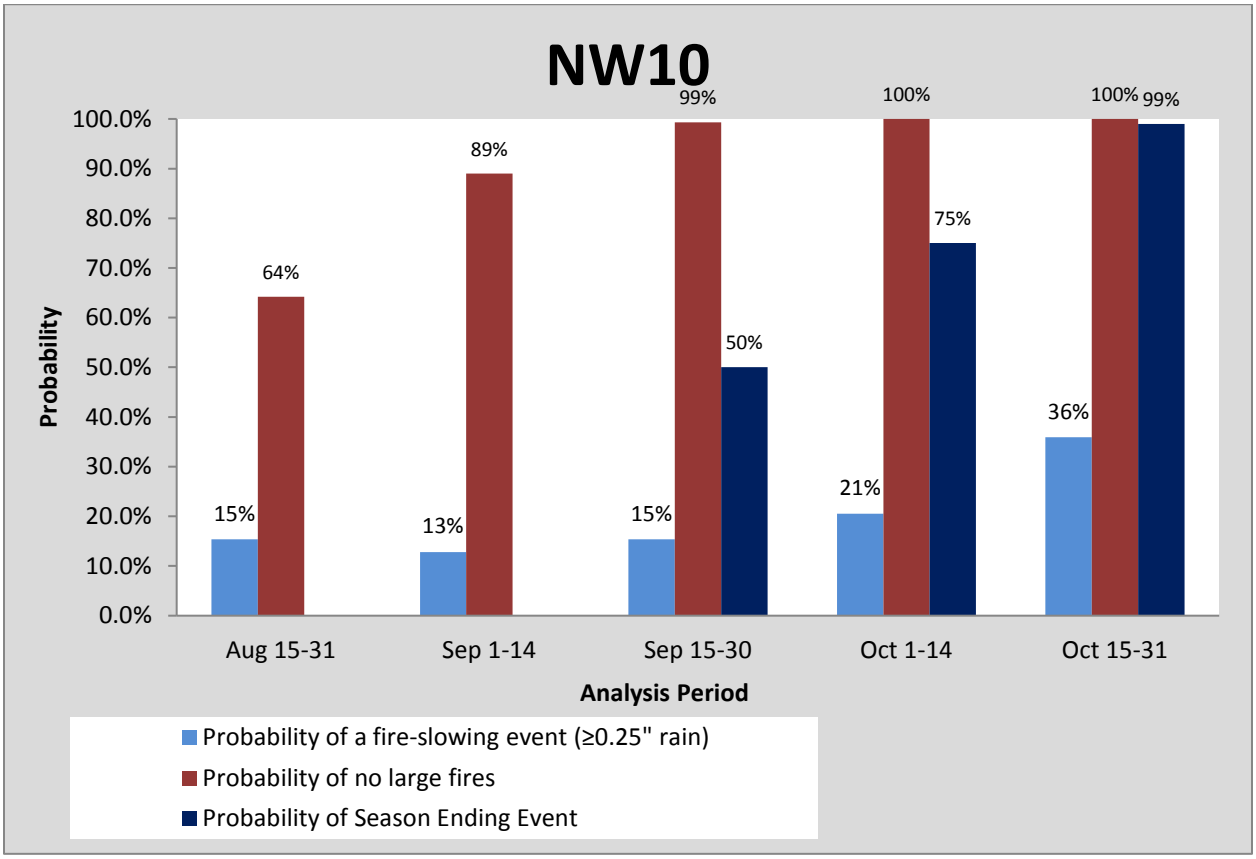
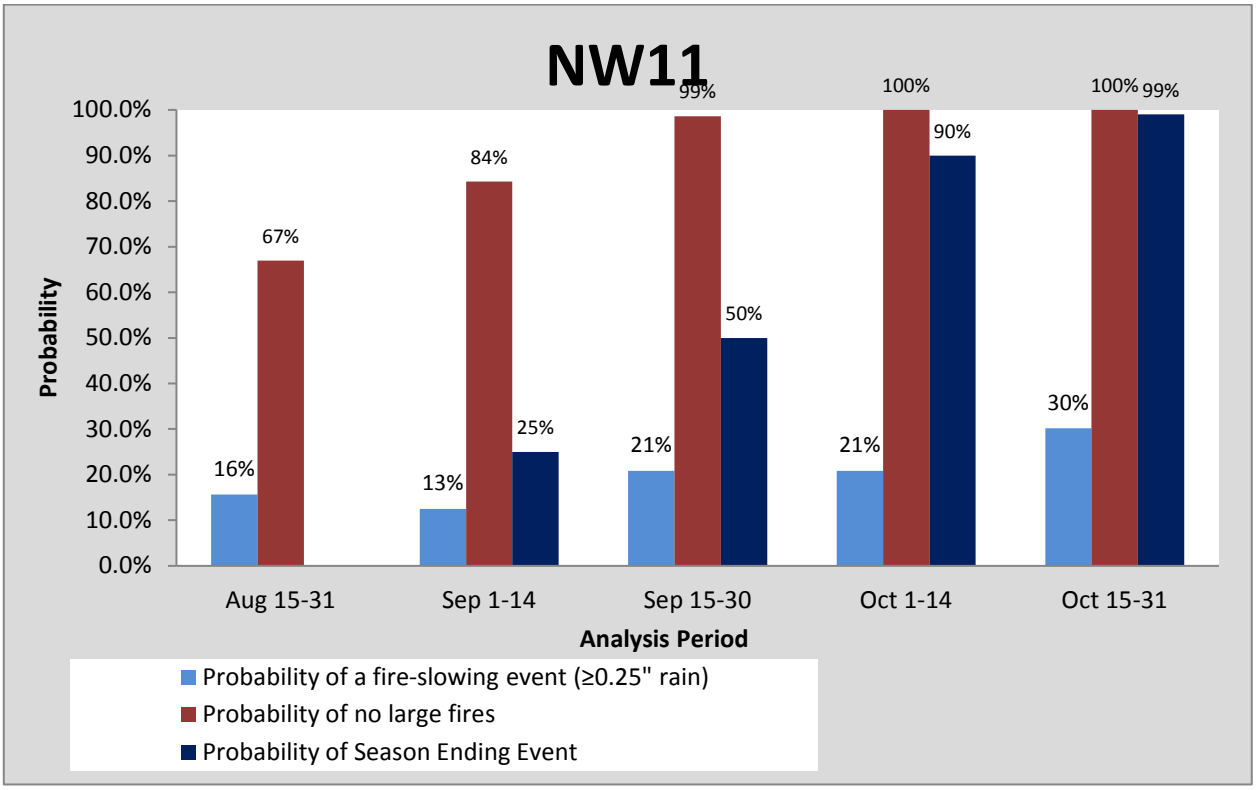
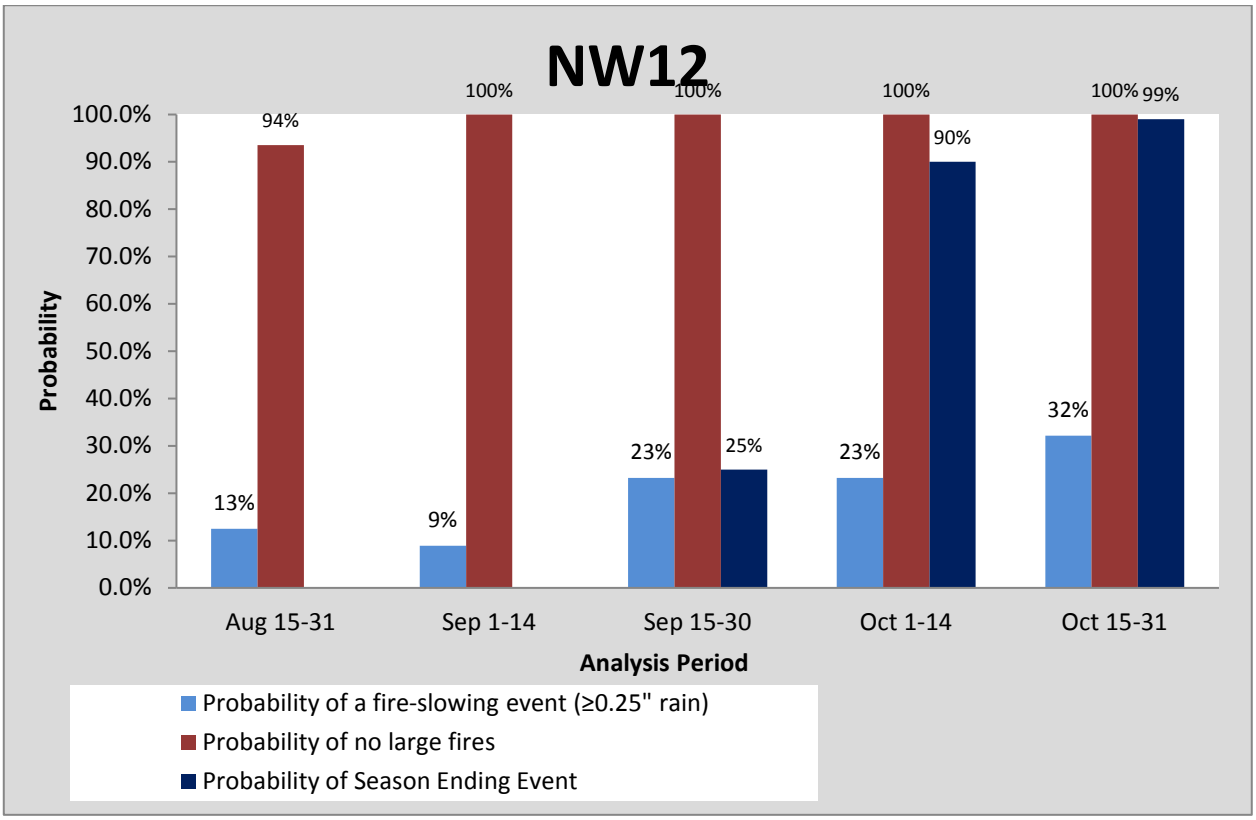

NW08
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Probability
25%
72%
11%
95%
25%
14%
100%
50%
17%
100%
90%
34%
100%
99%
Aug 15-31
Sep 1-14
Sep 15-30
Oct 1-14
Oct 15-31
Analysis Period
Probability of a fire-slowing event (≥0.25" rain)
Probability of no large fires
Probability of Season Ending Event

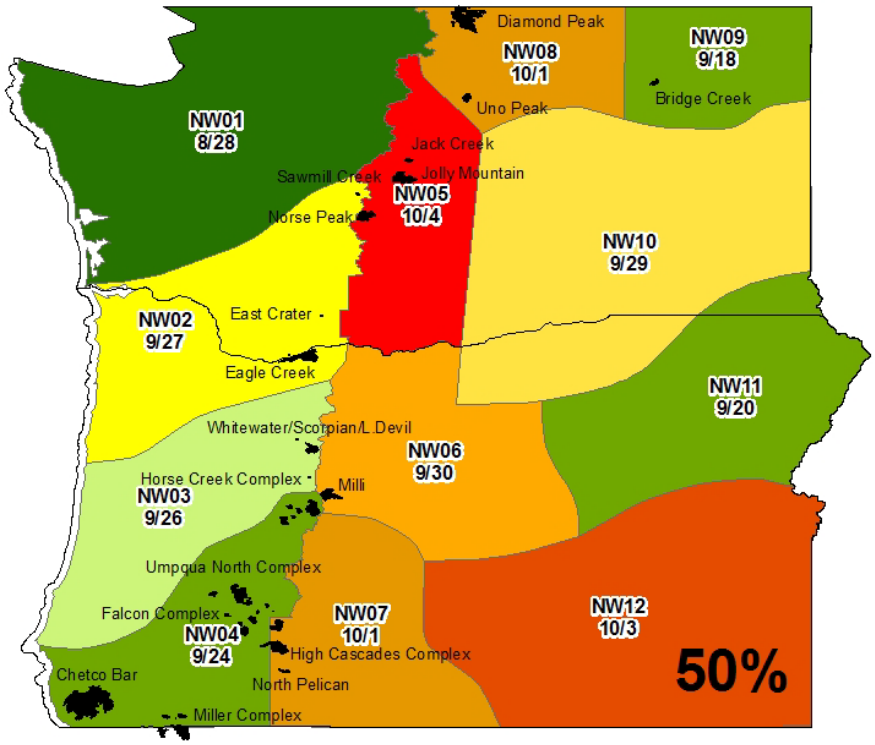

NW09
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Probability
15%
43%
17%
47%
25%
22%
57%
75%
16%
82%
90%
29%
100%
99%
Aug 15-31
Sep 1-14
Sep 15-30
Oct 1-14
Oct 15-31
Analysis Period
Probability of a fire-slowing event (≥0.25" rain)
Probability of no large fires
Probability of Season Ending Event

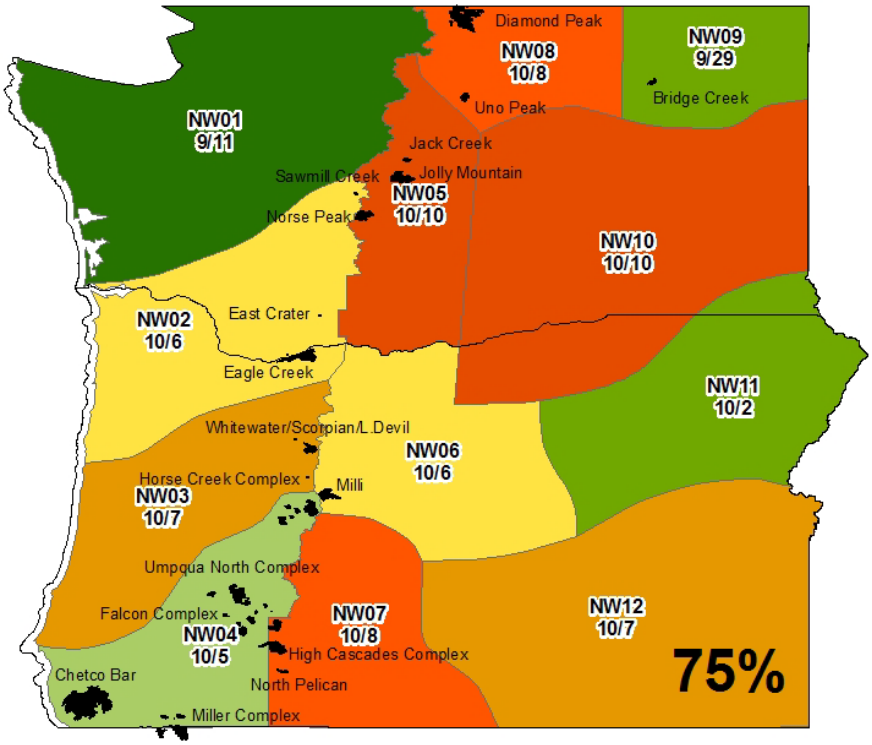

NW10
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Probability
15%
64%
13%
89%
15%
99%
50%
21%
100%
75%
36%
100%
99%
Aug 15-31
Sep 1-14
Sep 15-30
Oct 1-14
Oct 15-31
Analysis Period
Probability of a fire-slowing event (≥0.25" rain)
Probability of no large fires
Probability of Season Ending Event


NW11
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Probability
16%
67%
13%
84%
25%
21%
99%
50%
21%
100%
90%
30%
100%
99%
Aug 15-31
Sep 1-14
Sep 15-30
Oct 1-14
Oct 15-31
Analysis Period
Probability of a fire-slowing event (≥0.25" rain)
Probability of no large fires
Probability of Season Ending Event

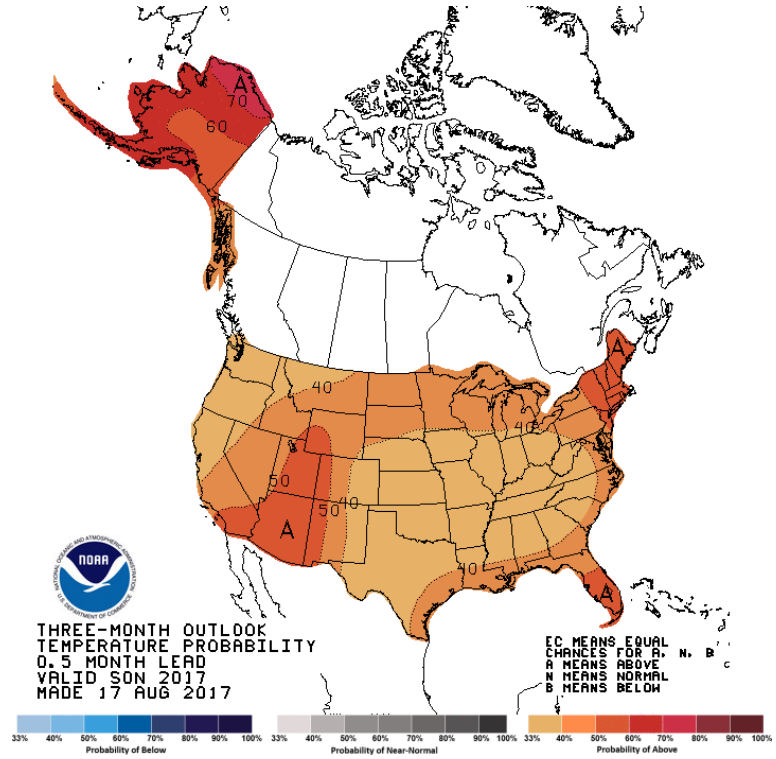

NW12
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Probability
13%
94%
9%
100%
23%
100%
25%
23%
100%
90%
32%
100%
99%
Aug 15-31
Sep 1-14
Sep 15-30
Oct 1-14
Oct 15-31
Analysis Period
Probability of a fire-slowing event (≥0.25" rain)
Probability of no large fires
Probability of Season Ending Event

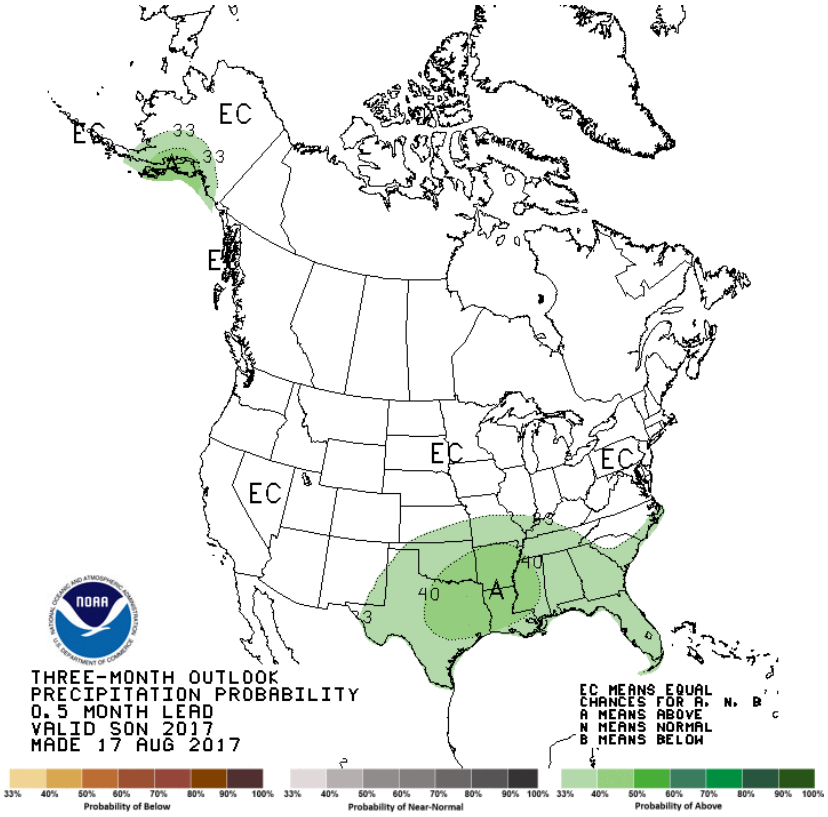
Below is the PSAs colored by season-end date for the geographic area. The top graphic is the 50% probability and the lower one is the 75% probability.





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





Discussion

- This weekend most of the fires received a fire-slowing event. This was great news—not just that moisture was received but it appears we have now transitioned to a typical fall weather pattern. High, but moderated temperatures are likely to persist the remainder of the week with additional moisture predicted on the weekend and then again the following week.

- A few of the fires in WA received no precipitation, a trace, or less than a tenth. We will need to keep an eye on these fires near critical values as they are the ones most likely to experience growth in the coming week (i.e., Uno, Diamond Creek., Sawmill Creek, Norse Peak, and Jolly).

- There is hundreds of miles of uncontained fire line in moderate to heavy fuels. We are likely going to have fire on the landscape for several more weeks. Remember, less moisture over a longer duration has more of an impact on halting fire spread than a larger amount of precipitation at one time. This is particularly true this year given the very dry, large dead fuels.

- The large fire triggers to watch for in the coming weeks are strong winds associated with frontal passages and thunderstorms and an extended drying period, particularly with high Haines and poor nighttime recoveries.

- We will need to be very thoughtful where we construct new containment lines, in light of the favorable moderating conditions and impending season-end. We will not be able to construct containment lines around all of the fires, and should only expose firefighters where there is still a high risk to critical resources and values.