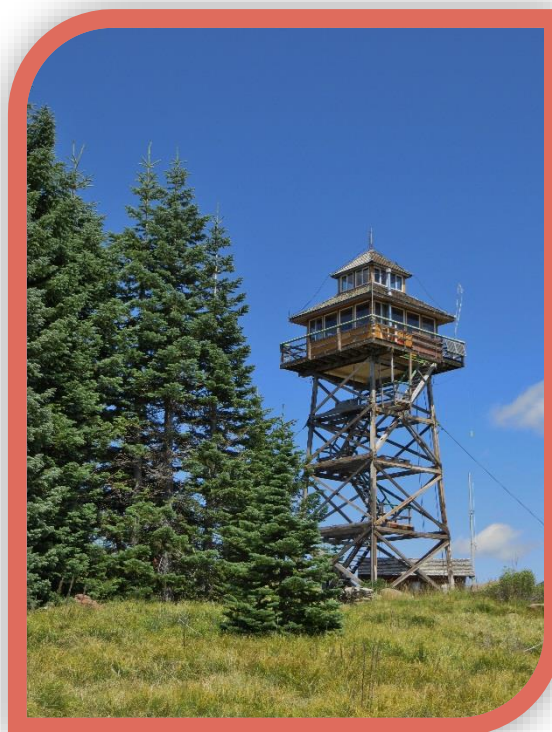


2020 FIRE WEATHER REPORT – WFO PQR



2020 Fire Weather Summary

The 2020 fire season was historic on multiple levels. The forecast area experienced several catastrophic and deadly wildfires in early September. Communities were devastated and several lives lost. These deadly wildfires were not confined to the Cascades. The Echo Mountain Complex, just a few miles east of Lincoln City devastated the coastal community of Otis. The magnitude of these fires was something the Portland Fire Weather area has not experienced since the Tillamook burns over 50 years ago. It is extremely rare to have a 100,000 acre fire within the forecast area. In 2020 the Beachie Creek and Riverside Fires each scorched over 175,000 acres. The Holiday Farm fire ravaged the McKenzie River corridor, burning over 173,000 acres and destroying over 400 structures, including the entire community of Blue River. The Lionshead Fire, which started on the east slopes of the Cascades near Mt. Jefferson, blew west across the Crest and merged with the Beachie Creek Fire. The Echo Mountain Complex, although much smaller at around 2500 acres, destroyed hundreds of homes in the community of Otis. Spot forecast requests were close to average. The majority of wildfire spots occurred late in the season for the large wildfires, after IMET support had ended. Spot forecast service was utilized during the recovery phase. There were four Red Flag events during the 2020 season, all for wind/RH and dry/unstable conditions. Overall, national IMET support was the fourth highest on record. There were nearly 190 missions in 2020, well above the average of 113. The Portland office fulfilled six IMET dispatch requests, two in California, one in Central Oregon and the rest in the PQR fire weather area. The COVID-19 pandemic presented additional complications from firefighting efforts, incident management to forecast office operations and much more.



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Lightning Days

Table one shows the lightning frequency, by area, for the 2020 season.

**TABLE 1 - 2020 LIGHTNING DATA
(MAY THROUGH OCTOBER)**



AREA	# LIGHTNING DAYS 2020	AVE. # DAYS (LAST 25 YEARS)	PERCENT AVE.
ZONES 601/612/664	1	5.68	17.6%
ZONES 602/603/665	3	7.12	42.1%
ZONES 604/667	6	8.33*	72.0%
ZONES 605/607/660/663	5	11.68	42.8%
ZONES 606/608	5	13.04	38.3%

**** Average over 27-year period.**

DATA OBTAINED FROM NATIONAL WEATHER SERVICE AND NORTHWEST COORDINATION CENTER

Examination of the above lightning table shows a general pattern of well below-normal lightning frequency for the Portland Fire Weather area. This reverses a trend of above-normal lightning activity that occurred in 2019. The majority of the lightning days occurred in mid-June and mid-September. The latter period was AFTER the Labor Day Firestorm and occurred during a change to a wetter weather pattern. Overall fuel conditions reached a peak in mid-August and the first half of September, but plummeted in the latter half of September. The 2020 fire season started slow, with zone-average Energy Release Component (ERC) averages in single digits into early July. It was fortunate that below-normal lightning frequency occurred during the peak portion of fire season. Spring precipitation (March-May) was generally below normal, especially April 2020. Many areas received below normal precipitation in April, in the bottom 33% percentile range (see figure 1 next page). However, well below-normal rainfall was noted over much of the south

Washington coastal areas, as well as the far north Oregon coast and Coast Range. Another way to analyze the lack of precipitation is to use the Standardized Precipitation Index (SPI). Figure 2 (next page) shows the north half of the forecast area was generally about 1.0 standard deviations below normal, with a small area of 1.5 to 2.0 standard deviations below normal in the far north Oregon Coast Range extending to the Willapa Hills of southwest Washington. The south half fared better, generally at 0 or just slightly below normal.

May 2020 was wet, with much of the forecast area recording 110 to 150 percent of normal rainfall. The south half of the forecast area was generally wetter than the north. The central Oregon coast and coastal valleys received 150 to 200 percent of normal precipitation. The wet pattern carried into June. The majority of the area had 110 to 200 percent of normal rainfall. The wettest areas were southwest Washington, the north and central Willamette Valley and adjacent Cascade foothills.

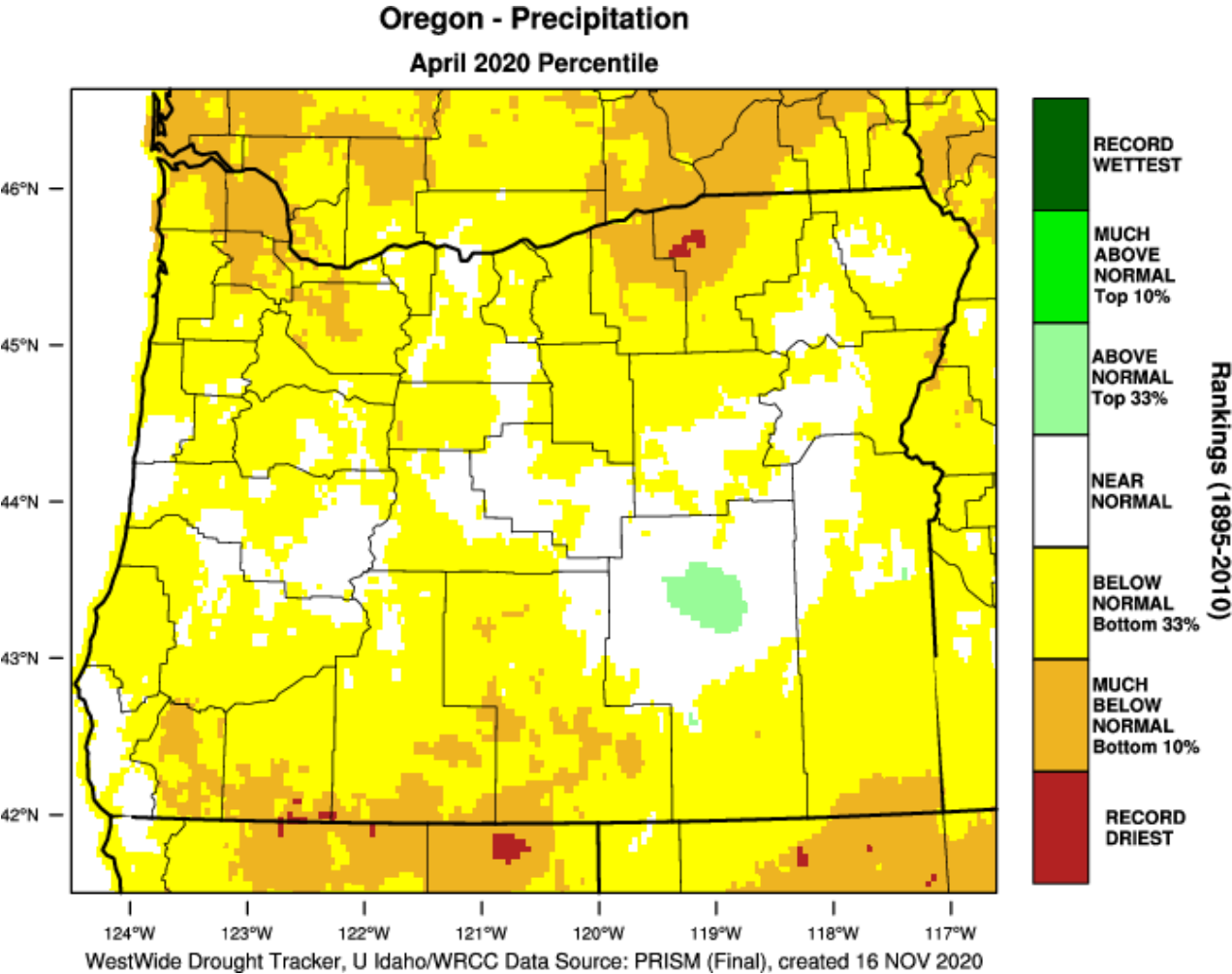


Figure 1 – April 2020 Precipitation Percentile



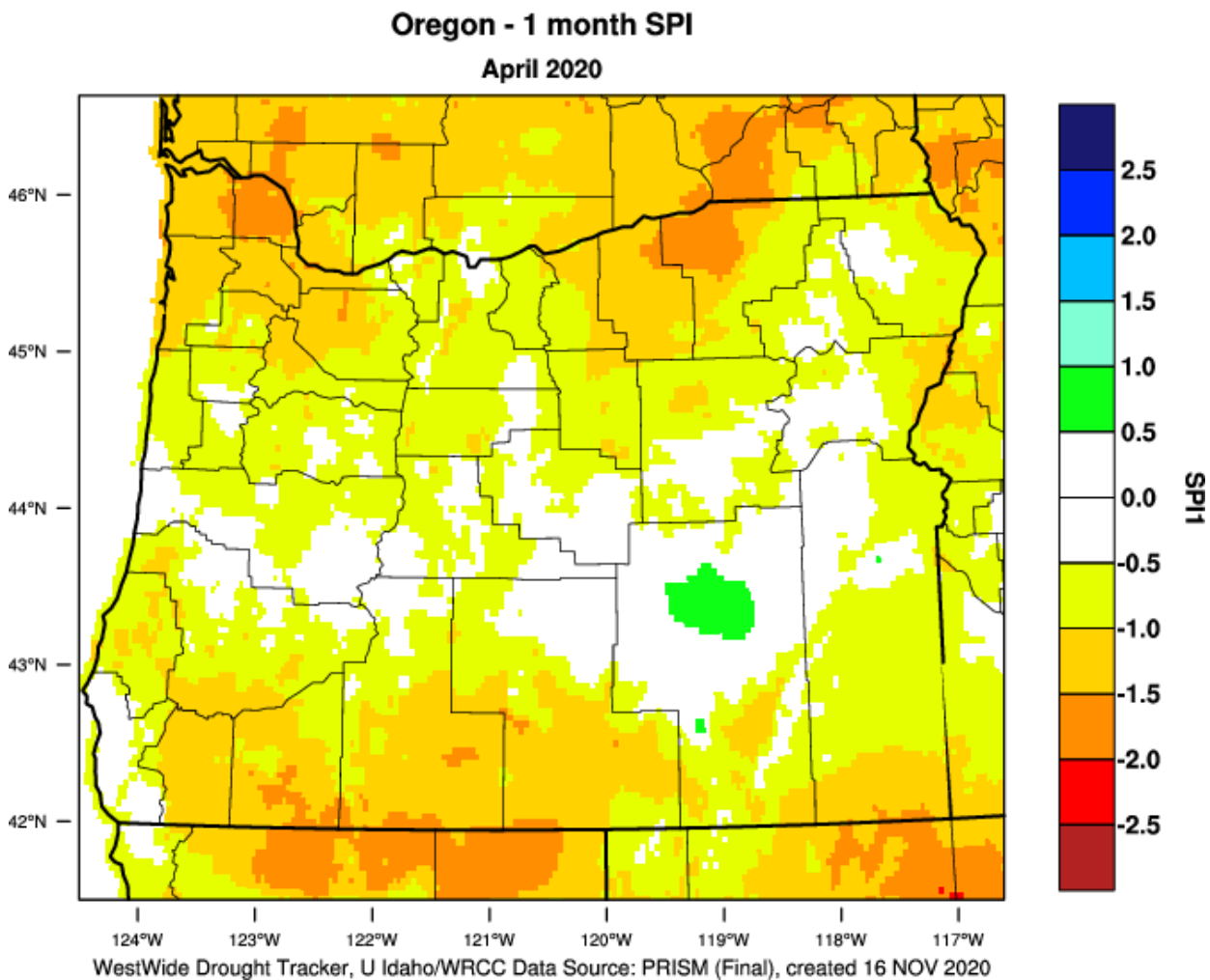


Figure 2 – April 2020 Standardized Precipitation Index (SPI)

Cascade Snow Depth and Pre-Season Precipitation

GOVERNMENT CAMP SNOW DEPTH: The 2019-20 North Oregon Cascade snowfall season got off to a slow start. The first day of measured snow depth at Government Camp was November 25th. By the end of November a 17-inch snow depth was measured. December showed minimal improvement. In fact, snow depth had diminished to 3 inches by the end of the month. Figure 3 (next page), shows the Snow Water Equivalent (SWE) on December 31, 2019. Note that northwest Oregon basins were at 25-50% of SWE. Southwest Washington basins did not fare much better, with SWE readings 25-50% of average as well. January 2020 brought much improved conditions. Government Camp snow depth reached a maximum reading of 70 inches on the 15th and 17th. The month ended with a 28-inch snow depth. Typically, snowpack reaches a seasonal peak in March. This did not occur in 2020. Government Camp snow depth hovered in the 20 to 30 inch range during February and the first half of March. Snow depth diminished to 11 inches on March 23rd,

but recovered to 28 inches at the end of the month. Snow cover normally persists through at least the end of May. In 2020, warm and dry April conditions reduced the snow depth to zero by the 16th. The largest single-day jump was 15 inches on January 13th.

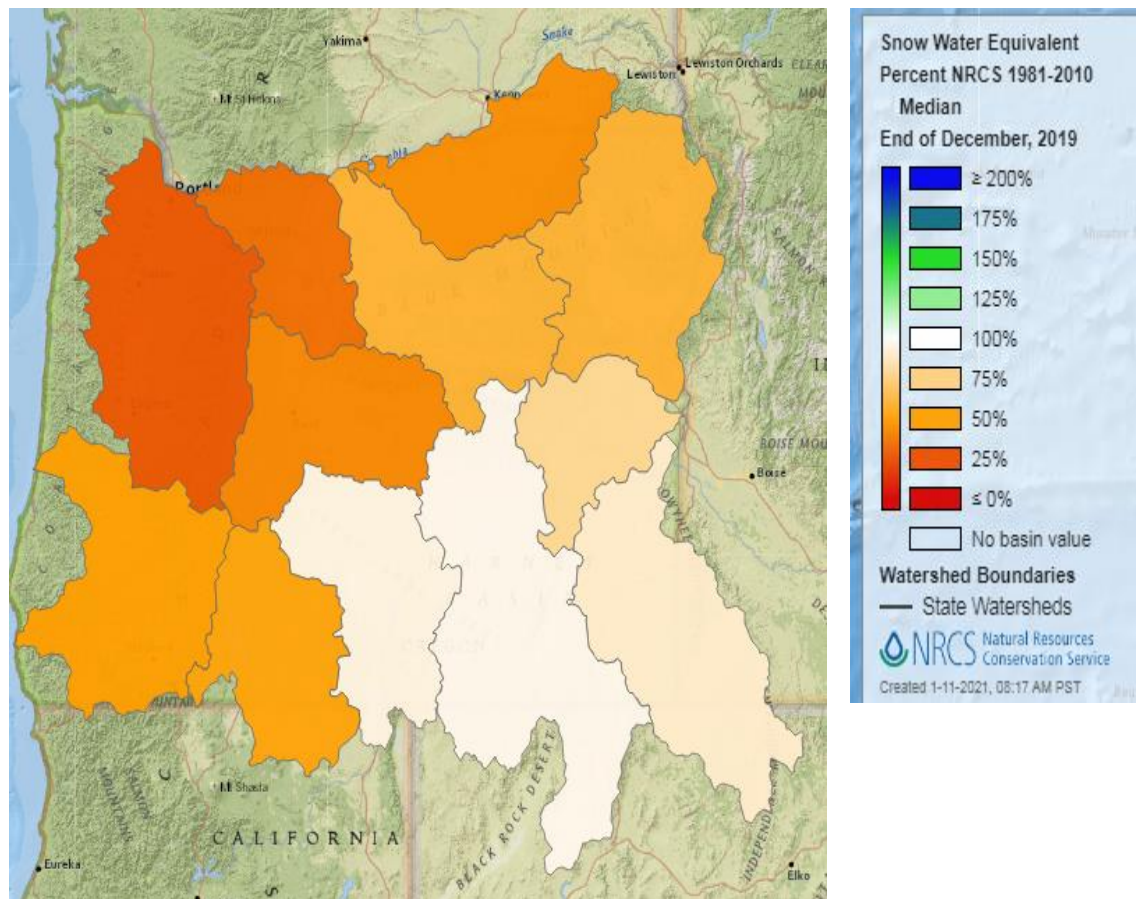


Figure 3 – December 2019 Snow Water Equivalent Percent of Normal

GOVERNMENT CAMP PRECIPITATION: The overall pre-season precipitation (November through May) was 87% of average. This was the third consecutive year for below-normal pre-season precipitation. December 2019 had just 6.04 inches of precipitation, or 42% of normal. January and February 2020 precipitation monthly totals were well above normal. The 22.02 inches in January was almost 200% of normal. Spring precipitation (March-May) ended up about 75% of normal. Above-normal May 2020 precipitation helped to ease the deficit accrued in March and April.

Above-normal precipitation was noted in January, February and May 2020. The remaining wet-season months had below normal precipitation. The 4.30 inches in November 2019 was just 32.7% of normal.

Figure 4 (next page) shows the 2019-20 precipitation summary for Government Camp.

2019-2020 WET SEASON GOVERNMENT CAMP

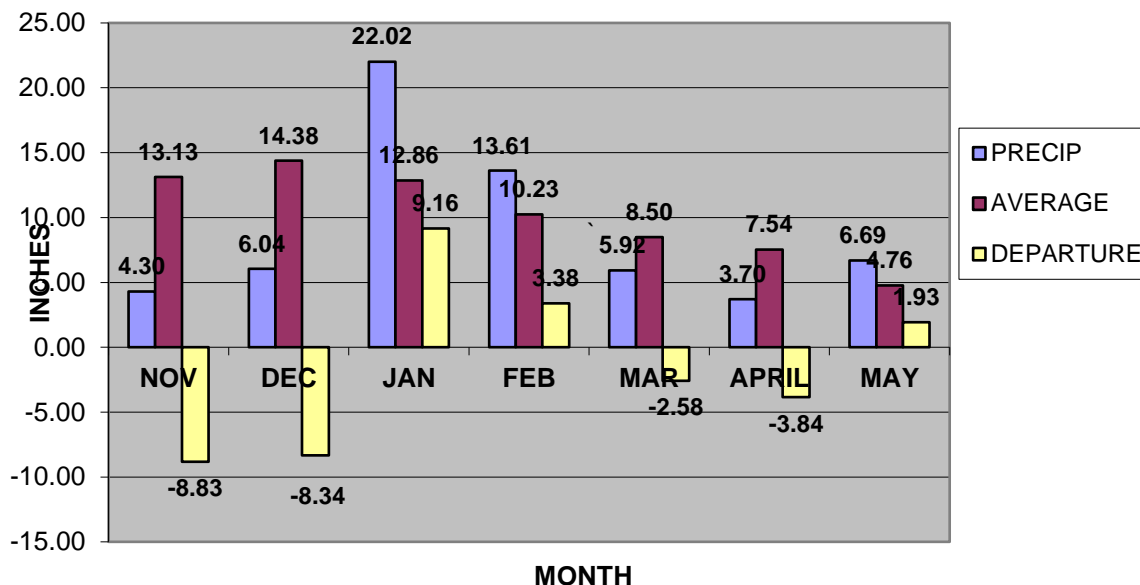


Figure 4 – Government Camp Precipitation Nov 2019 through May 2020

OTHER NOTES: The Portland airport recorded 70.6% of average winter and spring precipitation. This marks the third consecutive year winter/spring precipitation was below 80% of average. The Eugene airport had just 52% of normal November-May precipitation.

2020 FUEL CONDITIONS NOTES

The highest ERC values occurred in early September (see Appendix 1). Several RAWS sites recorded historic ERC values. Critical ERC values (80th percentile or greater) occurred in excess of 40 days in several fire weather zones. For example, fire zone 608, recorded zone-average ERC values above the 80th percentile on 54 days. Emigrant RAWS, at the south end, recorded a daily maximum of 83 on September 15th, well above the 97th percentile value of 71. Extreme fuel conditions occurred over the coastal zones as well. Critical ERC values were noted on 43 days in the central coast zone 612. The 97th percentile ERC for Goodwin Peak RAWS is 44. On September 9th a reading of 52.9 was noted. Not only was the overall ERC magnitude extraordinary, but the duration of critical fuel conditions was just as impressive. Zone-average ERC values showed a considerable drop in late September, but a minor secondary peak occurred in early October. Several zones reached 80th percentile or greater values during the first couple

weeks of October. Off-season Red Flag fuel criteria were established in 2019 and continued to be used for the 2020 season. Per user input, primarily NWCC, DNR and ODF, it was decided to use 100-hr fuel moisture values of 10% or less for off-season Red Flag criteria.

The overall fuel condition severity during the 2020 season cannot be understated. Nearly all fire zones recorded the highest daily ERC values during or just after the Labor Day Firestorm. Many stations had unprecedented ERC values. The peak summer fire season was relatively long, generally on the order of two months. Typically, critical fuel conditions can linger well into September and 2020 was no exception. In 2020, it was not until mid to late October when zone-average ERC values fell into the single-digits.

The newest fire zone 663 that covers much of the Mt. Adams district of the Gifford Pinchot NF contains one RAWS station, Buck Creek. The 90th percentile ERC value for this site is 66. Zone 660, that covers much of the western portion of the Gifford Pinchot NF, has a 90th percentile ERC of 41. There is a large climatological contrast between zones 660 and 663 and this is clearly noted in the vastly different 90th percentile values. In 2019, Buck Creek RAWS did not exceed its 90th percentile ERC value of 66. The highest 2019 value was 64.9 on August 6th. In contrast, Buck Creek exceeded its 80th percentile value of 62 on 46 days in 2020 and had 26 days above the 90th percentile. The peak 2020 ERC value was 76.3 on September 9th. There were 66 days when the average 100-hour fuel moisture value was less than 10 percent. The lowest reading was 6.4 on September 9th.

Many fire weather zones, especially the Cascades, Oregon Coast Range and Willapa Hills, had single-digit zone-average ERC values from early June into the first few days of July. Despite predictions of above-normal fire potential throughout the northwest, it appeared fire severity may buck the forecast trends, based on early-season fuel conditions. However, these early-season predictions came to fruition, as evidenced by the deadly fires in early September. One of these deadly fires, the Echo Mountain Complex, occurred in the coastal zone 601. Cedar Creek RAWS recorded an ERC of 46.9 September 9th. The 97th percentile value is 42. Extreme fuel conditions were prevalent across the entire fire weather area in early September, including the coast. The combination of zones 601 and 664, which covers the south Washington coast, coastal lowlands and west portion of the Willapa Hills, had zone-average ERC values above the 90th percentile on 17 days and 33 days above the 80th percentile.

Fire zone 603, the Central Oregon Coast Range, recorded 80th-percentile zone-average ERC values on 48 days, with 31 days above the zone-average 90th percentile. Village Creek, Rockhouse and Devils Graveyard ERC values exceeded their respective 80th percentile values over 50 days. Devils Graveyard ERC was above its 80th percentile an incredible 86 days.

The 1000-hr fuel moisture values generally reach a minimum of 12-14% in late August or early September. It is rare to have 1000-hr values as low as 10%. However, in zone 663, the 1000-hr fuel moisture values dropped to 8.45% in mid-September. Zone 608 showed a minimum 10-day 1000-hr average of 10.75 in mid-September.

Red Flag Warning Statistics for 2020

Table two shows the Red Flag verification statistics for the 2020 fire season.

TABLE 2 (ALL WARNINGS)

ZONE	# RFW	CORRECT RFW (A)	INCORRECT RFW (B)	MISSED EVENTS (C)	POD A/(A+C)	CSI A/(A+B+C)	FAR (1-[A/(A+B)])
601	2	2	0	0	1.000	1.000	0.000
664	2	1	1	0	1.000	0.500	0.500
612	2	2	0	0	1.000	1.000	0.000
602	2	2	0	0	1.000	1.000	0.000
665	2	1	1	0	1.000	0.500	0.500
603	3	2	1	0	1.000	0.667	0.333
604	4	4	0	0	1.000	1.000	0.000
667	2	2	0	0	1.000	1.000	0.000
605	2	2	0	0	1.000	1.000	0.000
606	2	2	0	0	1.000	1.000	0.000
607	2	2	0	0	1.000	1.000	0.000
608	2	2	0	0	1.000	1.000	0.000
660	2	2	0	0	1.000	1.000	0.000
663	2	2	0	0	1.000	1.000	0.000
TOTALS (ALL)	31	28	3	0	1.000	0.903	0.097
LIGHTNING	0	0	0	0	0.000	0.000	0.000
WIND/RH	17	16	1	0	1.000	0.941	0.059
HAINES 6	14	12	2	0	1.000	0.857	0.143

NUMBER OF WARNED EVENTS: 4

EVENTS PRECEDED BY A WATCH: 2

MISSED EVENTS: 0

NOTE: Refer to the Annual Operating Plan for complete Red Flag criteria.

WARNING NOTES – Looking back, the 2019 season was typical with 24 total zones warned. There are usually 2-3 Red Flag events in any given fire season. There were

four events during the 2020 season. Two events encompassed most, if not all, of the fire weather forecast area. There were no Red Flag lightning events during the 2020 fire season. Normally, the fire weather area experiences at least one Red Flag lightning episode. All 2020 Red Flag events occurred after August 1st.

The Labor Day Firestorm was an unprecedented offshore event that started the afternoon of September 7 and persisted through early September 10. The Portland Forecast Office uses the KOTH-KGEG (North Bend, OR to Spokane, WA) surface gradient as a basis to gage synoptic-scale offshore events. A gradient of around -18 to -20 mb typically signifies a strong large-scale event. The peak gradient during the Labor Day Firestorm was close to -25 mb. The strong low pressure system produced a snowstorm in the Northern Rockies and led to extreme east wind west of the Cascades. The Beachie Creek Fire, originating in the upper portion of the Santiam River Canyon, grew from a few hundred acres to over 120,000 acres in a matter of hours. There remains a degree of uncertainty regarding the Beachie Creek Fire footprint. Was the extremely large fire perimeter a result of explosive growth of the Beachie Creek Fire, or was the main contributor numerous fire starts from downed power lines that merged with the original Beachie Creek Fire? The Beachie Creek, Riverside and Holiday Farm mega-fires burned thousands of structures, resulted in several fatalities and caused tens of thousands evacuations. Entire communities, such as Blue River, Gates and Otis suffered complete devastation. The Firestorm was also responsible for several fires in the Molalla ODF Unit of the North Oregon Cascade foothills.

Fire weather forecasters took notice of this evolving event several days in advance, informing users via daily briefings and social media outlets. A Fire Weather Watch was issued a little more than three days in advance. The Watch was upgraded to a Red Flag Warning with nearly 48 hours lead time. All 14 fire weather zones verified. It is rare for a Red Flag event to impact such a large area and have such a lengthy duration. Red Flag Warnings were issued around 1600 PDT on September 5th and remained in effect through the evening of the 9th and, in some cases, until the morning of the 10th.

The Firestorm resulted in extremely poor air quality across much of the Pacific Northwest. Air quality in the north and central Willamette Valley was, at times, the worst in the world. Air Quality Index readings over 200 are considered “Very Unhealthy”. There were occasions when air quality readings in the Portland and Salem areas exceeded 500. Dense smoke persisted for days and had a profound impact on daytime temperatures. Shortly after the Firestorm, strong high pressure remained over the forecast area. Under normal circumstances, afternoon high temperatures in the middle to upper 80s would not have been out of the question. The thick smoke cover resulted in maximum temperatures in the upper 60s to lower 70s.

Event Lead Times

Tables 3 and 4 show the respective warning and watch lead times for all events in 2020.

TABLE 3 – WARNING LEAD TIMES

EVENT	# ZONES WARNED	AVE. ZONE LEAD TIME
<i>August 14 (Wind/RH)</i>	2	24 HRS 34 MINS
<i>Aug 15-16 Dry/Unstable)</i>	14	45 HRS 25 MINS
<i>September 2 (Wind/RH)</i>	1	5 HRS 58 MINS
<i>Sep 7-10 (Wind/RH)</i>	14	46 HRS 37 MINS
<i>OVERALL AVE. LEAD TIME</i>		42 HRS 05 MINS

TABLE 4 – WATCH LEAD TIMES

EVENT	# ZONES IN WATCH	AVE. ZONE LEAD TIME
<i>August 14 (Wind/RH)</i>	2	33 HRS 50 MINS
<i>Aug 15-16 (Dry/Unstable)</i>	NO WATCH ISSUED	NA
<i>September 2 (Wind/RH)</i>	NO WATCH ISSUED	NA
<i>Sep 7-10 (Wind/RH)</i>	14	77 HRS 32 MINS
<i>OVERALL AVE. LEAD TIME</i>		74 HRS 25 MINS



Belknap Hot Springs – Willamette NF (photo by Scott Weishaar)

August 14 Event: WIND/RH

- **0510 PDT August 13** – Watch issued for zones 603 and 604. Valid morning August 14 through the evening.
- **1426 PDT August 13** – Watch upgraded to Warning. Valid 1100 to 2300 August 14.
- **1 ZONE VERIFIED:** Zone 603 did not verify. Devils Graveyard RAWS only met criteria for two hours. Finley RAWS did not verify at all.

August 15-16 Event: DRY/UNSTABLE

- **1426 PDT August 13** – Warning issued all zones. Warning valid 1100 to 2300 August 15 for zones 601, 602, 603, 664 and 665. Warning valid 1100 August 15 through 2300 August 16 for remaining zones.
- **12 ZONES VERIFIED:** 12Z SLE August 15 sounding yielded a mid-level Hanes 6 and high-level Haines 5. The 00Z August 16 sounding produced a mid-level Haines 6 and high-level Haines 4. RH 25% or less for several hours at many RAWS sites. Zones 664 and 665 (southwest Washington) did not verify. RH above 25 percent at Huckleberry, Abernathy Mtn and Castle Rock RAWS.
- This was counted as a separate event due to the cause change (wind/RH to Dry/Unstable). Separate warnings were issued for corresponding zones. Five zones met criteria before 1100 PDT initial valid time.

September 2 Event: WIND/RH

- **0827 PDT September 2** – Warning issued for zone 604 (McMinnville southward) valid 1400 to 2000 PDT September 2.
- **WARNING VERIFIED** – Eugene airport and Willow Creek RAWS met criteria.

September 7-10 Event: WIND/ RH (Labor Day Firestorm)

- **0629 PDT September 4** – Watch issued for all zones EXCEPT 607, 608 and 663. Valid time generally morning September 7 through evening September 9.
- **0558 PDT September 5** – Watch issued for zones 607, 608 and 663. Valid time morning September 7 through evening September 9.
- **1608 PDT September 5** – Watch upgraded to Warning all zones. Valid time 1200 September 7 through 2200 September 8. Watch remained in effect 2201 September 8 through 2200 September 9.
- **0627 PDT September 6** – Remaining watches changed to warnings. Warning valid time for all zones now 1100 September 7 through 2000 September 9. Decided to treat this as an extension of the original warning and NOT count it as a separate event.
- **VERIFICATION: All zones verified. Watch lead times as much as 88 hours. Warning lead times 48 to 55 hours. Several airport and RAWS sites observed 40-50 mph wind gusts, with numerous spotter reports of much higher estimated wind gusts. Technically, zone 664 did not meet wind nor RH criteria. KM Mountain CWOP was closest with 29% RH and one wind report of 9 mph with gusts to 24 mph. Huckleberry RAWS, a notoriously poor wind site, did not come close to meeting wind criteria. Therefore, used the caveat in the Annual Operating Plan that states if Red Flag conditions are met in zone 601, it is assumed these conditions exist in zone 664. The Firestorm resulted in numerous fire starts from downed power lines and explosive growth on existing wildfires.**

NFDRS Verification

The Portland office switched to all-points NFDRS forecast in 2009, instead of zone trend forecasts. It was shown by neighboring forecast offices that individual point forecasts yielded higher verification scores versus zone trend forecasts. Prior to 2009, the Portland office provided individual NFDRS forecasts for eight sites: Village Creek, Pebble, Fields, South Fork, Wanderer's Peak, Horse Creek, Yellowstone, and Canyon Creek. Table five (next page) shows the 2020 NFDRS verification statistics for the above listed sites. The values in red indicate improvement over the 2019 scores.

NFDRS has undergone a significant change and a new version was implemented in test mode for the 2020 fire season. The majority of the program, including many algorithms were changed. One of the most significant changes was a vast reduction in the number of fuel models used in the new NFDRS system. Another major change was the production of 7-day NFDRS forecasts. The Portland office provided forecaster input into the day-one NFDRS forecast, similar to the legacy NFDRS forecasts. No forecaster manipulation was provided for the automated days 2-7 output. Agency

Fire staff continue to make some NFDRS modifications in WIMS for their RAWS stations. The primary change will be to re-examine and establish new ERC break points. This, in turn, will impact the fuels portion of Red Flag Warning criteria for some NWS sites.



TABLE 5 – 2020 SITE-SPECIFIC NFDRS VERIFICATION

SITE	TEMPERATURE			HUMIDITY			WIND		
	FCST MAE	PERS. MAE	SCORE	FCST MAE	PERS. MAE	SCORE	FCST MAE	PERS. MAE	SCORE
<i>Village Creek</i>	3.78	5.91	36.04%	8.41	14.09	40.31%	1.27	1.40	9.29%
<i>Pebble</i>	3.79	6.90	45.07%	9.72	16.05	39.44%	1.26	1.13	-11.50%
<i>Fields</i>	3.66	6.34	42.27%	9.55	14.16	32.56%	1.78	1.90	6.32%
<i>South Fork</i>	3.81	6.19	38.45%	8.88	14.67	39.47%	1.17	1.14	-2.63%
<i>Wanderer's Peak*</i>	3.78	7.35	48.57%	9.21	16.17	43.04%	1.21	1.47	17.69%
<i>Horse Creek</i>	3.72	6.64	43.98%	9.59	15.68	38.84%	0.90	0.90	0.00%
<i>Yellowstone</i>	4.00	7.06	43.34%	8.91	15.11	41.03%	1.42	1.47	3.40%
<i>Canyon Creek</i>	4.82	8.10	40.49%	11.85	19.31	38.63%	1.28	1.38	7.25%

NOTES: *Wanderer's Peak RAWS stopped reporting during the Labor Day Firestorm. It is assumed the station was burned over by the Riverside Fire. Canyon Creek RAWS suffered a lengthy outage. A total of 110 NFDRS forecasts were issued for Canyon Creek, which was well below the average of 170 for all stations.*

Table six (below) shows the 2020 NFDRS verification statistics by zone. Improvement in temperature, RH and wind are shown in blue. Red values indicate lower scores. Overall, temperature and humidity scores were higher compared to 2019. A major contributing factor was significantly higher July and August scores. Generally, persistence fares better in those months with high pressure and fewer big-change days. June and September results were lower than average. Wind scores were lower for all zones when compared to 2019. Office performance goals are 40% for temperature, 30% for RH and 10% for wind. Table seven (next page) shows prior year's overall scores. Considerable forecaster effort has been taken to improve wind scores. Roughly one-third of the Portland fire weather area RAWs sites exhibit minimal daily wind speed variation at NFDRS observation time, with 10-minute average wind speeds 3 mph or less. This makes persistence difficult to beat. Prior to 2014, the average overall wind score was at or slightly above 0 percent. Forecasters have achieved a wind score of 10 percent or better 5 times since 2013.

TABLE 6 – 2020 NFDRS VERIFICATION

ZONE	TEMPERATURE	HUMIDITY	WIND
601	29.20%	31.10%	5.31%
664	35.62%	34.52%	-3.16%
602	38.85%	36.21%	9.00%
665	36.88%	31.33%	14.86%
603	34.30%	34.42%	11.35%
604	35.43%	30.17%	12.15%
667	26.89%	22.19%	12.16%
605	42.81%	35.34%	6.71%
606	38.22%	35.81%	3.33%
607	43.05%	38.26%	-3.64%
608	43.74%	37.57%	-4.11%
612	29.74%	34.14%	10.38%
660	40.43%	39.35%	10.50%
663	43.76%	39.22%	0.00%
ALL	38.04%	35.43%	7.61%

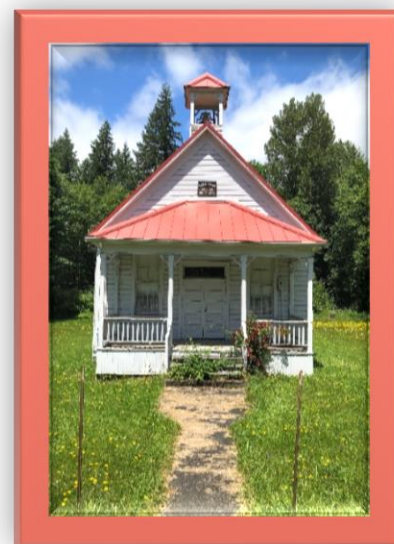


TABLE 7 – OVERALL NFDRS VERIFICATION PRIOR YEARS

2019 ALL	33.22%	28.64%	12.50%
2018 ALL	36.61%	29.56%	15.20%
2017 ALL	40.26%	31.99%	13.83%
2016 ALL	44.29%	35.33%	14.06%
2015 ALL	37.95%	31.42%	7.37%
2014 ALL	39.43%	34.64%	10.66%
2013 ALL	32.92%	31.07%	1.00%
2012 ALL	36.2%	30.2%	-2.2%
2011 ALL	37.4%	32.2%	7.5%
2010 ALL	38.5%	28.1%	5.5%
2009 ALL	40.5%	33.7%	4.0%



Forecasts and Services

SPOT FORECASTS

Fire season 2020 was unprecedented due to the number of costly, mega-fires, COVID-19 pandemic and extended peak portion of fire season. The pandemic brought prescribed burning activities to a virtual standstill. This is shown by the low number of prescribed burn spot forecast requests. There were 30 requests in 2020 compared to 50 in 2019. Nearly half of the 2020 prescribed burn spot requests occurred in the October through December period. Wildfire spot requests in 2020 were above the average of around 75. In 2020 there were 98 wildfire spot

forecast requests. This is over twice as many compared to 2019. The total would have been much higher, but Incident Meteorologists provided lengthy support on the larger fires. Roughly one-third of the total spot requests pertained to recovery efforts on the Holiday Farm Fire. These spot forecasts fell under the Search and Rescue (SAR) category. Initially, Lane County EOC requested spot forecast updates every six hours. The USFS is a major user of the spot forecast service. However, in 2020, the COVID-19 pandemic curtailed the vast majority of prescribed burning activities. The USFS had just two prescribed burn requests, both from the Willamette NF. The most prescribed burn requests were from the Oregon Military at Camp Rilea, on the north Oregon coast. The Wildland Fire Division of the Oregon Military made 14 prescribed burn requests, or nearly one-half of the yearly total. The Fish and Wildlife Service (USFWS) typically conducts spring and fall burning projects and is another primary spot forecast user. The USFWS had just five prescribed burn spot requests, all in October.

The earliest prescribed burn spot request was January 22nd, for the Saddle Rx project in the McKenzie district of the Willamette NF. The latest, December 2nd, was from the Oregon Military for the TA 1 Piles project. The earliest wildfire spot request was April 13th, from Washington Department of Natural Resources (DNR), for the Astro fire. The latest wildfire request occurred December 4th, also from DNR, for the WA-PCS-0300 fire.

The majority of spot requests (108 or 52%) occurred in September. Another 35 requests occurred in August, nearly all for wildfires. Surprisingly, November had the most prescribed burn spot requests (6), followed by 5 in October.

The use of spot forecasts continues to become more diverse. There were 80 non-fire related spot requests. However, nearly two-thirds of these were for wildfire disaster recovery efforts and could, indirectly, be attributed to wildfire. There were five spray forecast requests, eight for public safety and three HAZMAT requests. Figure 5 (page 18) shows the 2020 spot breakdown by month.

Historically, the Willamette National Forest has been one of the primary users of the spot forecast program. The Willamette NF accounted for 41 of the 51 Forest Service spot forecast requests. The Mt. Hood/Gifford Pinchot had 9 spot requests and the Siuslaw NF had 1 wildfire request. The US Forest Service accounted for about 25 percent of all spot requests. Typically, the Forest Service provides for nearly 50 percent of all spot requests. Other agencies that were prominent in the spot forecast program included the Oregon Department of Forestry (ODF) and Department of Natural Resources (DNR). Mountain Rescue Units are becoming more familiar with the spot forecast program, accounting for several requests in 2020.

Fire season 2018 had one large, costly fire in the forecast area requiring the need for an Incident Management Team (IMT). There were no large fires in 2019 that met Type 1 or Type 2 IMT support thresholds. The 2020 season saw several extremely large wildfires necessitating the need for several IMTs. The larger fires, Beachie Creek, Riverside, Holiday Farm and Lionshead, had Type 1 or Type 2 team coverage for several weeks. A NIMO team was assigned to Beachie Creek in late August, followed by a Pacific Northwest Type 2 team, Southwest Area Type 1 team and another Northwest Type 2 team, before transitioning back to the local unit. These large and deadly

wildfires were not confined to just the Cascades. The Echo Mountain Complex, a few miles east of the coastal town of Lincoln City, burned around 2,500 acres and virtually destroyed the community of Otis.

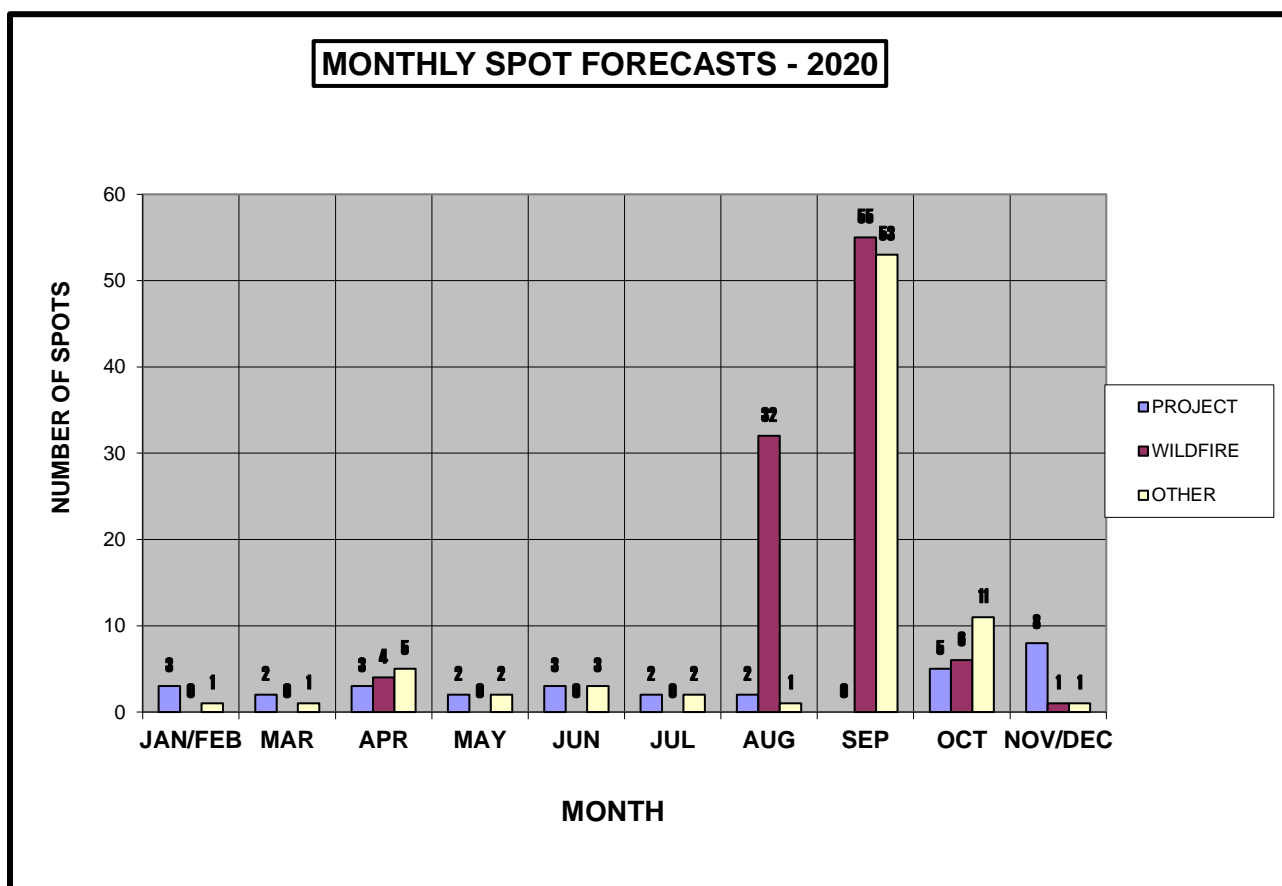


Figure 5 - 2020 SPOT FORECASTS (BY MONTH)

Table 8 (page 20) shows the annual spot forecast data from 1995 to 2020. Spot frequency showed a dramatic increase from 2000 to 2003, but due to the change in forecast area responsibility and agency requirements for prescribed burns, 2004 spot totals were much lower. Also, some units/districts curtailed prescribed burn activities starting in 2004 due to budget constraints, staffing concerns, or a number of other reasons. The number of prescribed burn spot requests in 2020 was the lowest since at least 1995. There were 145 prescribed burn spot requests in 2018, 50 in 2019 and just 30 in 2020. The COVID-19 pandemic had a large role in the reduced prescribed burn efforts. Agencies were able to conduct some fall burning following strict COVID-19 safety protocols. Fall burning activities tend to be more frequent compared to the spring. Prescribed fall burn spot requests (Oct-Dec) accounted for nearly 45% of the total project spot forecasts. There are two annual BLM spray operations conducted in early spring. These are the Tyrell Seed Orchard and Horning Seed Orchard units. Another 30% of the prescribed spot forecast requests originated from the National Park Service (NPS). They have become more involved in the spot forecast program over the past couple of years.

Most spots in one day – 13 on September 8th. 12 on September 9th.

Non-fire spot requests: 64 Search and Rescue requests*

5 Spray Mission request

3 HAZMAT requests

8 Public Safety Requests

- **Of the 64 SAR requests, over 50 were from Lane County EOC for recovery efforts on the Holiday Farm Fire.**

First prescribed spot request: Jan 22, 2020

Saddle Rx

Willamette NF

Last prescribed spot request: Dec 2, 2020

TA 1 Piles

Oregon Military

First wildfire spot request: Apr 13, 2020

Astro Fire

WA DNR

Last wildfire spot request: Dec 4, 2020

WA-PCS-0300

WA DNR

**Most Requests Single Incident/Project: Lane County EOC
Beachie Creek Fire**

60 Spot Requests

29 Spot Requests



Nehalem River Valley pasture near Jewell, OR in the Coast Range – Photo by Scott Weishaar



TABLE 8 – ANNUAL SPOT FORECAST DATA

YEAR	PROJECT*	WILDFIRE	TOTAL
1995	104	15	119
1996	64	51	115
1997	58	9	67
1998	52	31	83
1999	58	54	112
2000	89	20	109
2001	125	70	195
2002	123	147	270
2003	117	132	249
2004	71	21	92
2005	55	29	84
2006	120	96	216
2007	70	25	95
2008	61	73	134
2009	57	58	115
2010	69	51	120
2011	128	93	221
2012	106	51	157
2013	128	25	153
2014	103	96	199
2015	87	84	171
2016	157	35	192
2017	126	240	366
2018	145	68	213
2019	117	40	157
2020	110	98	208

* = *INCLUDES TRAINING SPOTS, SEARCH AND RESCUE, AND OTHER MISC. REQUESTS.*

Figure 6, page 21, shows the yearly spot forecast totals since 1995. Seasonal spot totals exhibited a consistent trend from 2008 to 2010, with an average of about 125 spots per season. The 2011 spot season was the busiest since the 2003 transfer of fire weather zones 609, 610, and 611 to the Pendleton office. The 2013 spot tally was a little unusual due to the low number of wildfire spots, but 2014 more than made up for the previous year's low number. The 2017 spot forecast distribution showed one primary peak period, from August through October. There were 258 spot requests during the 3-month period, which is nearly twice the normal seasonal average. Several large, lengthy and costly wildfires in 2017 resulted in a multitude of spot forecast requests. There were several days in 2017 when 6 or more wildfire spot requests were submitted. There were 13 spot requests on September 8th, 2020 and 12 more on the 9th. Three or four spot requests constitute a typical busy spot forecast day for the Portland Forecast Office. The annual average for spot requests since 2008 is 185. The 2020 total was about 10% above the 11-year average.

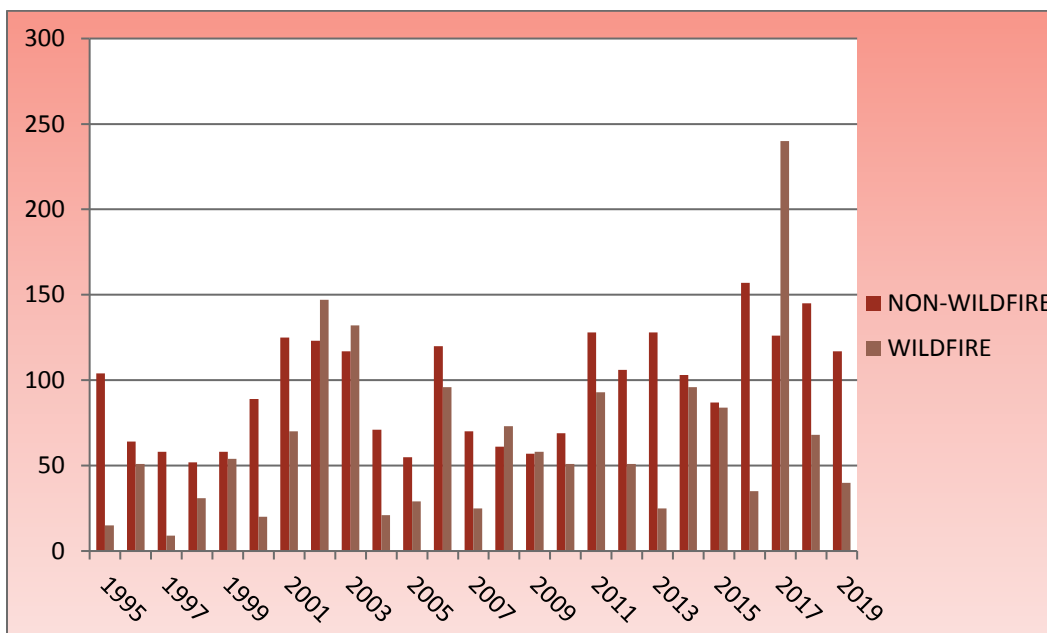


Figure 6 – Annual Spot Forecast Totals

TURN-AROUND TIME

Turn-around times (figure 7 below) have been fairly consistent over the past several years. Wildfire spot request turn-around time in 2020 was about one minute less than compared to 2019. Prescribed burn request turn-around time for 2020 was also about one minute less compared to 2019. Turn-around time was not counted for next-day spots. Average turn-around time for all other non-wildfire or non-prescribed burn spots was around 30 minutes, or about three to four minutes less than 2019.

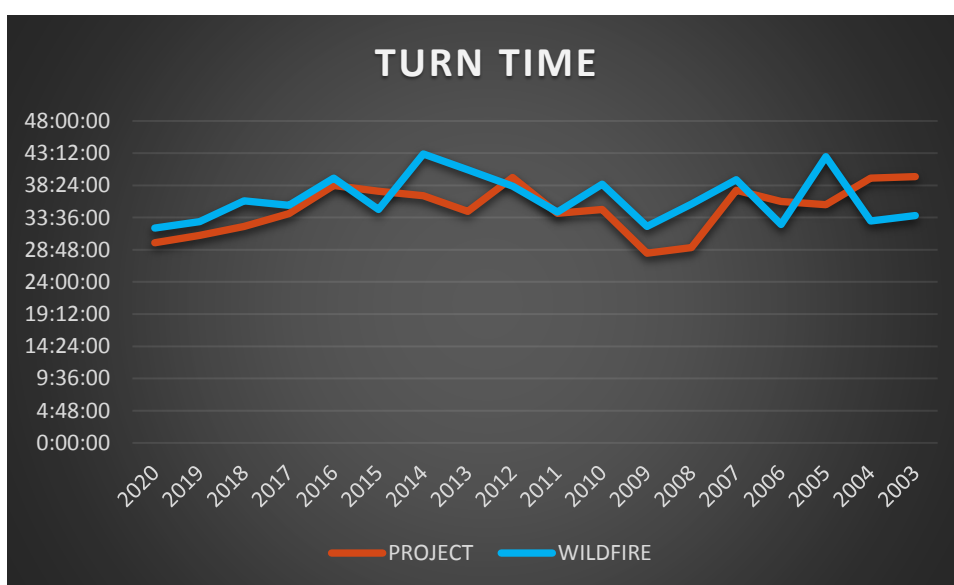


FIGURE 7- ANNUAL SPOT FORECAST TURN-AROUND TIME

Table 9 (below) shows the average spot forecast turn-around time for prescribed burn and wildfire spot forecast requests. The recommended turn-around times are 45 minutes for wildfire spots and 60 minutes for prescribed burn requests.

TABLE 9 – TURN-AROUND TIMES

YEAR	PROJECT	WILDFIRE
2020	29:51	32:02
2019	30:57	33:00
2018	32:16	36:05
2017	34:11	35:26
2016	38:23	39:30
2015	37:32	34:48
2014	36:52	43:05
2013	34:30	40:43
2012	39:35	38:17
2011	34:13	34:24
2010	34:47	38:33
2009	28:17	32:16
2008	29:07	35:38
2007	37:41	39:14
2006	36:01	32:33
2005	35:30	42:42
2004	39:30	33:06
2003	39:42	33:54

* *PROJECT TIMES ONLY INCLUDE PRESCRIBED BURN SPOTS*



Old barn near Vernonia, OR – Photo by Scott Weishaar

LARGE FIRES AND IMET DISPATCHES

The 2020 wildfire season in the Portland Fire Weather Forecast area was historic in nature. Multiple large, costly and deadly wildfires occurred. Nearly all of these large fires happened during the Labor Day Firestorm. The 2017 Eagle Creek Fire was the most recent significantly large wildfire at nearly 50,000 acres. In 2020 there were three fires in excess of 120,000 acres. Below-normal lightning activity, especially during the peak portion of fire season, prevented the 2020 season from being even worse. Spring burning was generally non-existent due to COVID-19. The pandemic had major changes on Incident Management Team efforts during the entire fire season and the Labor Day Firestorm mass evacuations.

Significant rainfall occurred in mid to late September, putting a significant damper on the fire season. However, warm and dry conditions in the first half of October resulted in several fire zones reaching critical fuel conditions. The 10-day zone-average ERC for zone 608 jumped from 26 at the end of September to 40 in the October 1-10 period. This was just under the zone-average 80th percentile.



Gilkey Covered Bridge, Scio, OR – Photo by Scott Weishaar

Table 10 (below) shows the largest fires of the 2020 fire season.

TABLE 10 – MAJOR FIRES

FIRE NAME	AGENCY	SIZE	START DATE	CONTAIN DATE	CAUSE
Lionshead Fire	USFS – Deschutes, Willamette, Mt. Hood	204,469*	August 16, 2020	November 13, 2020	Lightning
Beachie Creek	USFS Willamette NF	193,573	August 16, 2020	October 28, 2020	Unknown
Holiday Farm Fire	USFS – Willamette NF	173,333	September 7, 2020	October 26, 2020	Unknown
Echo Mountain Complex	ODF – Western Oregon District	2,552	September 7, 2020	September 21, 2020	Unknown
Riverside Fire	USFS – Willamette, Mt. Hood	138,054	September 8, 2020	December 3, 2020	Human
Chehalem Mountain Fire	Private Land	875	September 8, 2020	September 14, 2020	Human
North Clackamas Complex	ODF - Molalla	2,585	September 7, 2020	September 29, 2020	Unknown
Big Hollow Fire	USFS – Gifford Pinchot	24,995	September 8, 2020	October 20, 2020	Unknown

The listed Lionshead Fire acreage covers the entire footprint. Close to 110,000 acres of the total burned in the Mt. Hood and Willamette NF.

Appendix 2 provides additional information on several of the largest fires.



Mt. Adams looking WNW from Highway 97 – Photo by Scott Weishaar

The Portland office filled **6** IMET requests.

1. RED SALMON COMPLEX (15 DAYS)

IMET: JON BONK
 DATES: July 29th through August 14th, 2020
 LOCATION: ICP – Willow Creek, CA
 Incident – CA-SRF-000656
 14NE Willow Creek, CA
 IMT: California Type 2 Team 14 - IC Johnson
 CAUSE: Lightning

2. GREEN RIDGE FIRE (13 DAYS)

IMET: JON BONK
 DATES: August 20th through September 2nd, 2020
 LOCATION: ICP – Sisters Middle School Sisters, OR
 Incident – ODF-955049-021
 12NW Sisters primarily on ODF land
 IMT: Aug 20-22 Pac NW Type 2 Team 11 - IC Lawson
 Aug 22 – Sep 2 ODF Type 1 Team 3 – IC Smith
 CAUSE: Lightning

3. BEACHIE CREEK FIRE (15 DAYS)

IMET: SCOTT WEISHAAR
 DATES: September 4th through September 19th, 2020
 LOCATION: ICP – Gates Elementary School (Sep 4-7) Gates, OR
 Chemeketa Comm. College (Sep 8-19), Keizer, OR
 Incident – OR-WIF200299
 Fire began in Opal Creek Wilderness, Detroit RD
 2S Jawbone Flats, OR
 IMT: Pac NW Type 2 Team 13 – IC Brian Gales (Sep 4-17)
 SW Area Type 1 Team 2 – IC Pierson (Sep 17-19)
 OSFM Green Team – IC Hallman
 CAUSE: Unknown

4. BEACHIE CREEK FIRE (10 DAYS)

IMET: SHAWN WEAGLE - REMOTE
 DATES: September 11th through September 20th, 2020
 LOCATION: ICP – Chemeketa Comm. College, Keizer, OR

Incident – OR-WIF-200299
 Fire began in Opal Creek Wilderness, Detroit RD
 IMET worked remote from Forecast Office
 IMT: Pac NW Type 2 Team 13 – IC Brian Gales (Sep 11-17)
 SW Area Type 1 Team 2 – IC Pierson (Sep 18-20)
 OSFM Green Team – IC Hallman
 CAUSE: Unknown

5. BEACHIE CREEK FIRE (7 DAYS)

IMET: JON BONK
 DATES: October 9th through October 15th, 2020
 LOCATION: ICP – Chemeketa Comm. College, Keizer, OR
 Incident – OR-WIF-200299
 Fire began in Opal Creek Wilderness, Detroit RD
 IMT: Pac NW Type 2 Team 8 – IC Stock
 CAUSE: Unknown

6. SQF COMPLEX (15 DAYS)

IMET: JON BONK
 DATES: October 19th through November 3rd, 2020
 LOCATION: ICP – Porterville Fairgrounds, CA
 Incident – CA-SQF-002622
 Fire began in Sequoia NF
 25N Kernville, CA
 IMT: California Type 2 Team 13 – IC Wakoski (Oct 19-21)
 Eastern Area Gold Team – IC Pisarek (Oct 21-Nov 3)
 CAUSE: Unknown

TRAINING AND OUTREACH ACTIVITIES

The COVID-19 pandemic virtually eliminated all fire weather outreach activities. Wildland fire course instruction, fire weather refreshers and RT-130 sessions were curtailed. Fire weather training was provided for newer forecasters, with assistance from NWCC. Some fire weather outreach was provided via virtual platforms. Table 11 (next page) summarizes the few outreach accomplishments for 2020.

TABLE 11 – TRAINING AND EDUCATIONAL OUTREACH ACTIVITIES

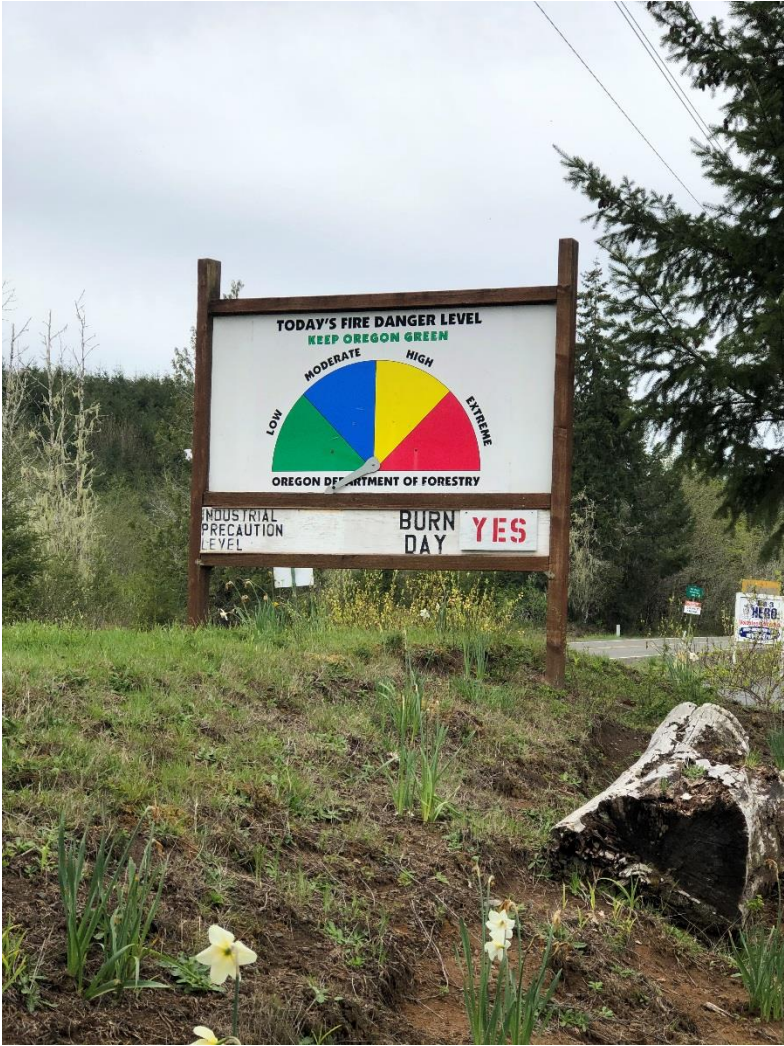
DATES	ACTIVITY	AGENCY/USER	INSTRUCTOR
March 10-11, 2020	VIRTUAL IMET CEE	NWS	BONK
March 18-19, 2020	VIRTUAL IMET CEE LITE	NWS	BONK
April 16, 2020	IN-HOUSE FIRE WX TRAINING	NWS	WEISHAAR
April 30, 2020	NFDRS TRAINING	NWS	SALTENBERGER
May 8, 2020	NFDRS TRAINING	NWS	SALTENBERGER
May 20, 2020	IN-HOUSE FIRE WX TRAINING	NWS	WEISHAAR
June 18, 2020	FIRE WX OUTLOOK	LINCOLN CO. EM	WEISHAAR

FORECAST SERVICES NOTES:

Dedicated Fire Weather Shifts begin:	June 7, 2020
7-Day Coverage Begins:	June 7, 2020
940 AM User Briefings Begin:	June 7, 2020
1115 AM GACC Coordination Calls Begin:	June 8, 2020
1115 AM GACC Coordination Calls End:	October 9, 2020
Fall Land Management (5-day) Begins:	October 12, 2020
Dedicated Fire Weather Shifts end:	October 23, 2020

Appendix 1: 2020 Fuel Indices

The following tables (pages 29-40) show the 10-day average fuel indices from June 1 through October 20.



*ODF Fire Danger Rating Sign near Mist, OR
Photo by Scott Weishaar*



2020 FUELS SUMMARY ZONES 601/664					
	ERC AVE	F100 AVE	F1000 AVE		
DATE	<i>Red ERC values indicate 90th percentile or greater (26.5)</i>				
Jun 1-10	1.51	21.75	33.52	HUCKLEBERRY STATS: <i># DAYS ERC >22:</i> 35 <i>41.5 – SEP 10</i> <i>40.5 – SEP 11</i> <i>40.4 – SEP 12</i> CEDAR STATS: <i># DAYS ERC >25:</i> 29 <i>46.9 – SEP 9</i> <i>46.1 – SEP 11</i> <i>45.5 – SEP 10</i>	
Jun 11-20	0.06	26.13	39.02		
Jun 21-30	0.47	19.94	35.25		
Jul 1-10	0.83	24.36	34.80		
Jul 11-20	4.75	18.26	30.56		
Jul 21-31	16.40	14.92	24.63		
Aug 1-10	20.16	16.40	21.08		
Aug 11-20	27.07	14.99	19.17		
Aug 21-31	17.87	19.07	20.99		
Sep 1-10	29.81	14.04	19.05		
Sep 11-20	21.00	17.57	18.34		
Sep 21-30	6.24	24.56	26.62		
Oct 1-10	10.85	18.04	24.96		
Oct 11-20	0.39	27.48	30.85		
ERC 22 – 80TH PCTL			ERC 26.5 – 90TH PCTL	33	17

PEAK ERC DAYS: 40.93 SEP 9, 2020

DAYS F100 </= 10: 3

38.30 SEP 10, 2020

LOWEST AVE F100: 8.89 SEP 10, 2020

36.60 SEP 8, 2020

2020 FUELS SUMMARY ZONE 602					
	ERC AVE	F100 AVE	F1000 AVE		
DATE	<i>Red ERC values indicate 90th percentile or greater (32.5)</i>				
Jun 1-10	4.55	20.15	30.62	MILLER STATS:	
Jun 11-20	0.34	25.72	36.47	# DAYS ERC >30: 47	
Jun 21-30	3.12	17.88	32.19	48.9 – SEP 9 47.0 – SEP 10 45.1 – SEP 8	
Jul 1-10	3.25	22.08	31.37	SOUTH FORK STATS:	
Jul 11-20	11.62	16.62	27.47	# DAYS ERC >29: 50	
Jul 21-31	22.81	14.06	22.46	60.1 – SEP 10 58.6 – SEP 9 56.0 – SEP 8	
Aug 1-10	26.78	15.19	19.27	RYE MT. STATS:	
Aug 11-20	34.06	13.42	17.32	# DAYS ERC >29: 43	
Aug 21-31	29.74	16.38	17.44	49.6 – SEP 10 49.4 – SEP 9 48.2 – SEP 11	
Sep 1-10	39.57	12.77	16.25	#	#
Sep 11-20	28.21	16.98	16.09	DAYS	DAYS
Sep 21-30	7.68	24.54	24.98	ERC >	ERC
Oct 1-10	14.78	17.53	23.69	26.5	>32.5
Oct 11-20	0.11	28.11	31.38		
ERC 26.5 – 80 TH PCTL		ERC 32.5 – 90 TH PCTL		44	24

PEAK ERC DAYS: 48.72 SEP 10, 2020

48.57 SEP 9, 2020 # DAYS F100 </= 10: 3

44.78 SEP 8, 2020 LOWEST AVE F100: 7.70 SEP 10, 2020

2020 FUELS SUMMARY ZONE 603					
	ERC AVE	F100 AVE	F1000 AVE		
DATE	<i>Red ERC values indicate 90th percentile or greater (45.0)</i>				
Jun 1-10	10.40	17.11	26.09	VILLAGE STATS:	
Jun 11-20	5.12	20.70	27.75	# DAYS ERC >42: 52	
Jun 21-30	17.36	14.50	23.74	63.3 – SEP 9	
Jul 1-10	21.17	15.78	20.83	62.5 – SEP 10	
Jul 11-20	31.55	13.01	18.10	58.9 – SEP 8	
Jul 21-31	40.42	11.77	15.52	ROCKHOUSE STATS:	
Aug 1-10	40.95	13.32	14.43	# DAYS ERC >51: 50	
Aug 11-20	48.79	10.82	13.29	73.2 – SEP 10	
Aug 21-31	43.21	13.65	13.73	71.4 – SEP 9	
Sep 1-10	50.67	10.83	12.83	68.3 – SEP 11	
Sep 11-20	36.92	15.55	13.46	DEVILS GYARD STATS:	
Sep 21-30	13.56	22.79	21.70	# DAYS ERC >36: 86	
Oct 1-10	16.89	17.70	22.31	# DAYS ERC > 39.4	# DAYS ERC >45.0
Oct 11-20	5.07	23.65	26.75		
ERC 39.4 – 80 TH PCTL			ERC 45.0 – 90 TH PCTL		
					48
					31

PEAK ERC DAYS: 58.08 SEP 9, 2020

57.35 SEP 10, 2020 # DAYS F100 </= 10: 6

54.70 SEP 8, 2020 LOWEST AVE F100: 7.34 SEP 10, 2020

2020 FUELS SUMMARY ZONE 604					
	ERC AVE	F100 AVE	F1000 AVE		
DATE	<i>Red ERC values indicate 90th percentile or greater (41.75)</i>				
Jun 1-10	20.63	16.01	21.79	FINLEY STATS: # DAYS ERC >38: 48 52.9 – SEP 9 49.6 – SEP 8 48.3 – SEP 10 WILLOW CK. STATS: # DAYS ERC >41: 43 51.3 – SEP 9 49.0 – SEP 8 47.6 – SEP 10	
Jun 11-20	12.12	18.88	22.78		
Jun 21-30	24.32	14.45	20.52		
Jul 1-10	28.74	14.45	18.03		
Jul 11-20	35.26	13.65	16.38		
Jul 21-31	39.82	13.08	15.05		
Aug 1-10	40.62	13.60	14.37		
Aug 11-20	45.36	12.07	13.73		
Aug 21-31	42.99	13.64	13.60		
Sep 1-10	45.30	12.74	13.43		
Sep 11-20	29.51	17.13	14.50		
Sep 21-30	21.91	19.59	18.42		
Oct 1-10	19.02	19.32	19.30		
Oct 11-20	12.13	21.46	22.23		
ERC 37.0 – 80TH PCTL			ERC 41.75 – 90TH PCTL		
					53
					36

PEAK ERC DAYS: 52.10 SEP 9, 2020

49.30 SEP 8, 2020 # DAYS F100 </= 10: 2

47.95 SEP 10, 2020 LOWEST AVE F100: 9.96 SEP 10, 2020

2020 FUELS SUMMARY ZONE 605					
	ERC AVE	F100 AVE	F1000 AVE		
DATE	<i>Red ERC values indicate 90th percentile or greater (40.5)</i>				
Jun 1-10	5.61	18.82	29.93	HORSE CK. STATS: # DAYS ERC >34: 55 66.1 – SEP 14 63.0 – SEP 13 61.1 – SEP 12,15 EAGLE CK. STATS: # DAYS ERC >36: 47 55.4 – SEP 9 55.1 – SEP 10 50.6 – SEP 8	
Jun 11-20	1.06	24.70	34.81		
Jun 21-30	6.36	16.55	30.19		
Jul 1-10	11.45	16.99	25.71		
Jul 11-20	24.77	13.42	21.30		
Jul 21-31	36.03	11.52	17.17		
Aug 1-10	36.12	13.45	15.41		
Aug 11-20	43.44	11.50	14.53		
Aug 21-31	37.27	14.47	14.94		
Sep 1-10	46.66	11.43	13.98		
Sep 11-20	42.42	12.62	12.88		
Sep 21-30	20.96	20.44	18.60		
Oct 1-10	28.91	14.30	18.30		
Oct 11-20	4.66	24.96	25.62		
ERC 35.0 – 80TH PCTL			ERC 40.5 – 90TH PCTL		
					48
					30

PEAK ERC DAYS: 57.80 SEP 10, 2020

56.85 SEP 9, 2020 # DAYS F100 </= 10: 8

54.05 SEP 11, 2020 LOWEST AVE F100: 6.59 SEP 10, 2020

2020 FUELS SUMMARY ZONE 606					
	ERC AVE	F100 AVE	F1000 AVE		
DATE	<i>Red ERC values indicate 90th percentile or greater (45.0)</i>				
Jun 1-10	5.59	18.57	29.69	YELLOWSTONE STATS:	
Jun 11-20	0.46	24.76	34.90	# DAYS ERC >38: 54	
Jun 21-30	6.48	16.23	30.13	66.4 – SEP 9 66.4 – SEP 14 66.2 – SEP 10	
Jul 1-10	13.76	16.07	25.11	BRUSH CK. STATS:	
Jul 11-20	25.46	13.46	20.83	# DAYS ERC >39: 53	
Jul 21-31	36.56	11.62	17.10	63.6 – SEP 10 62.2 – SEP 9 59.9 – SEP 11	
Aug 1-10	38.01	13.36	15.30	GREEN MTN STATS:	
Aug 11-20	47.00	10.69	14.07	# DAYS ERC >41: 52	
Aug 21-31	44.25	12.78	13.63	68.2 – SEP 13 68.1 – SEP 10 66.3 – SEP 9	
Sep 1-10	52.39	10.56	12.69	#	#
Sep 11-20	45.65	12.28	12.04	DAYS	DAYS
Sep 21-30	24.75	19.75	17.22	ERC >	ERC
Oct 1-10	35.56	13.21	16.44	38.25	>45.0
Oct 11-20	9.81	23.50	22.79		
ERC 38.25 – 80 TH PCTL			ERC 45.0 – 90 TH PCTL		
			52		30

PEAK ERC DAYS: 62.00 SEP 10, 2020

61.83 SEP 9, 2020 # DAYS F100 </= 10: 12

59.55 SEP 11, 2020 LOWEST AVE F100: 6.55 SEP 10, 2020

2020 FUELS SUMMARY ZONE 607							
	ERC AVE	F100 AVE	F1000 AVE				
DATE	<i>Red ERC values indicate 90th percentile or greater (48.33)</i>						
Jun 1-10	2.70	20.80	33.91	LOG CREEK STATS: # DAYS ERC >36: 21 53.4 – SEP 13 52.8 – SEP 10 52.6 – SEP 15 RED BOX STATS: # DAYS ERC >45: 25 61.4 – SEP 10 59.7 – SEP 14 59.6 – SEP 13 WANDERER'S PEAK STATS: # DAYS ERC >46: 3 51.1 – SEP 8 47.4 – SEP 7 46.8 – SEP 6			
Jun 11-20	6.33	27.94	41.81				
Jun 21-30	2.45	17.21	35.51				
Jul 1-10	4.09	20.62	32.37				
Jul 11-20	14.79	14.77	26.56				
Jul 21-31	29.62	11.82	20.67				
Aug 1-10	31.78	13.94	17.56				
Aug 11-20	40.91	11.75	16.03				
Aug 21-31	35.14	15.17	16.16				
Sep 1-10	45.88	11.64	14.96				
Sep 11-20	46.79	11.16	13.00	# DAYS ERC > 42.33			
Sep 21-30	20.40	21.71	19.79			# DAYS ERC > >48.33	
Oct 1-10	30.25	12.95	19.44				
Oct 11-20	1.73	28.14	29.00				
ERC 42.33 – 80TH PCTL			ERC 48.33 – 90TH PCTL		19		
					10		

PEAK ERC DAYS: 57.10 SEP 10, 2020

56.50 SEP 13, 2020 # DAYS F100 </= 10: 14

55.80 SEP 14, 2020 LOWEST AVE F100: 6.97 SEP 11, 2020

2020 FUELS SUMMARY ZONE 608					
	ERC AVE	F100 AVE	F1000 AVE		
DATE	<i>Red ERC values indicate 90th percentile or greater (49.0)</i>				
Jun 1-10	7.70	18.64	28.90	PEBBLE STATS: # DAYS ERC >39: 39 61.8 – SEP 10 61.3 – SEP 9 61.2 – SEP 15	
Jun 11-20	0.61	25.72	35.80		
Jun 21-30	4.49	16.40	31.71		
Jul 1-10	13.07	15.70	26.60	EMIGRANT STATS: # DAYS ERC >55: 54 83.0 – SEP 15 82.5 – SEP 16 81.6 – SEP 9	
Jul 11-20	25.99	12.87	21.53		
Jul 21-31	38.93	10.88	17.18		
Aug 1-10	40.07	12.78	15.11	SUGARLOAF STATS: # DAYS ERC >39: 54 74.2 – SEP 10 73.6 – SEP 15 73.5 – SEP 9	
Aug 11-20	49.63	10.45	13.86		
Aug 21-31	46.98	12.35	13.39		
Sep 1-10	59.68	8.97	11.95	# DAYS ERC > 42.0	
Sep 11-20	57.07	10.05	10.75		
Sep 21-30	26.23	19.22	16.84		
Oct 1-10	40.11	11.63	16.35	# DAYS ERC > 42.0	# DAYS ERC >49.0
Oct 11-20	13.69	22.23	22.19		
ERC 42.0 – 80 TH PCTL			ERC 49.0 – 90 TH PCTL		
					54
					28

PEAK ERC DAYS: 69.34 SEP 10, 2020

69.08 SEP 15, 2020 # DAYS F100 </= 10: 21

68.50 SEP 9, 2020 LOWEST AVE F100: 5.54 SEP 10, 2020

2020 FUELS SUMMARY ZONE 612					
	ERC AVE	F100 AVE	F1000 AVE		
DATE	<i>Red ERC values indicate 90th percentile or greater (33.5)</i>				
Jun 1-10	3.17	19.62	30.98	CANNIBAL STATS: # DAYS ERC >25: 47 49.1 – SEP 9 48.8 – SEP 10 46.4 – SEP 11 GOODWIN PEAK STATS: # DAYS ERC >28: 55 52.9 – SEP 9 50.0 – AUG 16 49.6 – SEP 8	
Jun 11-20	7.25	25.05	34.92		
Jun 21-30	3.10	18.19	30.85		
Jul 1-10	8.25	18.24	26.73		
Jul 11-20	18.43	15.76	22.67		
Jul 21-31	26.42	14.47	19.38		
Aug 1-10	26.94	16.29	17.98		
Aug 11-20	34.08	13.53	16.67		
Aug 21-31	25.40	17.46	18.21		
Sep 1-10	35.72	12.98	16.58		
Sep 11-20	28.20	16.47	15.93		
Sep 21-30	12.16	21.71	21.68		
Oct 1-10	17.27	17.53	21.06		
Oct 11-20	4.90	23.61	25.82		
ERC 26.5 – 80TH PCTL			ERC 33.5 – 90TH PCTL		43
					16

PEAK ERC DAYS: 46.70 SEP 9, 2020

42.38 SEP 8, 2020 # DAYS F100 </= 10: 2

41.25 SEP 10, 2020 LOWEST AVE F100: 8.77 SEP 10, 2020

2020 FUELS SUMMARY ZONE 660					
	ERC AVE	F100 AVE	F1000 AVE		
DATE	<i>Red ERC values indicate 90th percentile or greater (41.6)</i>				
Jun 1-10	2.79	21.33	33.72	DRY CREEK STATS:	
Jun 11-20	6.00	26.77	40.76	# DAYS ERC >51: 28	
Jun 21-30	3.58	16.82	34.13	67.3 – SEP 10 66.1 – SEP 13 65.5 – SEP 12	
Jul 1-10	3.57	21.22	31.89	3 CORNER STATS:	
Jul 11-20	13.64	15.13	26.69	# DAYS ERC >30: 23	
Jul 21-31	26.35	12.39	21.22	51.1 – SEP 13 48.3 – SEP 10 47.4 – SEP 12,16	
Aug 1-10	30.54	13.99	17.90	LARCH MT. STATS:	
Aug 11-20	38.92	12.20	16.31	# DAYS ERC >29: 39	
Aug 21-31	29.60	16.45	17.24	52.6 – SEP 10 49.3 – SEP 9 48.6 – SEP 12	
Sep 1-10	41.07	12.14	16.08	#	#
Sep 11-20	41.56	12.27	14.04	DAYS	DAYS
Sep 21-30	12.02	23.69	22.25	ERC >	ERC
Oct 1-10	22.92	14.64	21.33	35.8	>41.6
Oct 11-20	6.00	29.21	31.54		
ERC 35.8 – 80 TH PCTL			ERC 41.6 – 90 TH PCTL		
			22		13

PEAK ERC DAYS: 54.60 SEP 10, 2020

52.95 SEP 13, 2020 # DAYS F100 </= 10: 10

52.30 SEP 12, 2020 LOWEST AVE F100: 7.06 SEP 11, 2020

2020 FUELS SUMMARY ZONE 663								
	ERC AVE	F100 AVE	F1000 AVE					
DATE	<i>Red ERC values indicate 90th percentile or greater (67.0)</i>							
Jun 1-10	32.89	13.16	17.35	BUCK CREEK STATS: # DAYS ERC >62: 46 76.3 – SEP 9 76.1 – SEP 13 76.0 – SEP 10 # DAYS F100 <10: 66 6.41 – SEP 9 6.49 – SEP 10 6.61 – SEP 11				
Jun 11-20	22.01	17.09	20.14					
Jun 21-30	36.56	11.32	17.68					
Jul 1-10	41.91	11.56	15.10					
Jul 11-20	52.50	9.85	13.18					
Jul 21-31	61.04	8.48	11.34					
Aug 1-10	62.66	8.96	10.16					
Aug 11-20	67.27	8.18	9.53					
Aug 21-31	66.60	9.06	9.30					
Sep 1-10	71.34	8.02	8.89					
Sep 11-20	67.41	8.62	8.45					
Sep 21-30	38.30	17.88	13.59					
Oct 1-10	41.25	13.10	14.90				# DAYS ERC > 62.0	# DAYS ERC >67.0
Oct 11-20	9.27	22.98	23.33					
ERC 62.0 – 80TH PCTL			ERC 67.0 – 90TH PCTL			46	26	

PEAK ERC DAYS: 76.30 SEP 9, 2020

76.10 SEP 13, 2020

DAYS F100 <= 10: 66

76.00 SEP 10, 2020

LOWEST AVE F100: 6.41 SEP 11, 2020

2020 FUELS SUMMARY ZONE 665					
	ERC AVE	F100 AVE	F1000 AVE		
DATE	<i>Red ERC values indicate 90th percentile or greater (34.5)</i>				
Jun 1-10	9.37	18.76	26.76	ABERNATHY STATS: # DAYS ERC >28: 29 46.0 – SEP 10 45.5 – SEP 12 44.5 – SEP 11 CASTLE ROCK STATS: # DAYS ERC >33: 28 42.1 – SEP 8 42.0 – SEP 9 39.9 – SEP 10	
Jun 11-20	3.08	23.12	30.94		
Jun 21-30	10.02	16.26	27.38		
Jul 1-10	9.19	20.44	26.31		
Jul 11-20	16.66	16.32	23.79		
Jul 21-31	26.95	13.54	19.97		
Aug 1-10	29.56	14.84	17.65		
Aug 11-20	34.14	13.63	16.62		
Aug 21-31	28.04	16.84	17.49		
Sep 1-10	34.74	14.39	16.72		
Sep 11-20	24.91	17.84	16.92		
Sep 21-30	6.79	25.05	25.29		
Oct 1-10	10.00	19.95	25.01		
Oct 11-20	0.25	27.80	32.85		
ERC 30.5 – 80TH PCTL			ERC 34.5 – 90TH PCTL	35	10

PEAK ERC DAYS: 42.95 SEP 10, 2020

42.40 SEP 9, 2020 # DAYS F100 </= 10: 0

40.55 SEP 8, 2020 LOWEST AVE F100: 10.81 SEP 10, 2020

Appendix 2: 2020 Large Fire Statistics

Oregon Wildfires					
Name	Counties (in PQR CWA)	Start Date	Control Date	Total Acres ***	Fatalities **
Beachie Creek	Marion/Clackamas/Linn	8/16/2020 (~11 AM)	31-Oct-20	~193,500	5 public
Echo Mountain Complex	Lincoln	9/7/2020 (~1145 PM)	Sep 30, 2020	~2,550	None reported
Holiday Farm	Lane/Marion	9/7/2020 (~820 PM)	26-Oct-20	~173,400	1 public
Lionshead	Marion/Linn/very small portion in Clackamas	9/7/2020 (~1130 PM)	13-Nov-20	~110,000	None reported
Riverside	Clackamas	9/8/2020 (~Midnight)	3-Dec-20	~138,000	None reported

Washington Wildfires					
Name	Counties (in PQR CWA)	Start Date	Control Date	Total Acres	Fatalities
Big Hollow	Skamania	9/8/2020 (~430 AM)	20-Oct-20	~25,000	None reported

Name	# Evacuated **	Towns Burned	Comments
Beachie Creek	33388	Mill City, Gates, portions of Lyons, portions of Detroit (also from Lionshead fire)	1288 structures lost, including 470 homes. *** Updated info: 486 residences destroyed, 36 non-residential commercial properties destroyed, 801 other minor structures destroyed. 160 additional structures damaged.
Echo Mountain Complex	1339	Otis, Neotsu, and vicinity of Rose Lodge	293 structures total loss, 22 others significant damage. *** Updated info: 293 residences destroyed. 160 additional residences damaged. No report on additional structures.
Holiday Farm	~800 supported by Red Cross, likely far more actually evacuated	Vida, Nimrod, areas west of McKenzie Bridge, and areas north/east/south surrounding Leaburg	*** 431 residences destroyed, 24 non-residential commercial properties destroyed, 313 other minor structures destroyed. 65 additional structures damaged.

Lionshead	147	Portions of Detroit (also from Beachie Creek Fire), Idanha, communtiy/resort of Breitenbush	Stats are only for portion of the fire in the PQR CWA, ignition points are approx locations along a line where fire nearly simultaneously crossed Cascade crest into PQR CWA. Acreage listed is rough approximation of burned area in PQR CWA. *** Evacuated persons and structure damage/destroyed numbers only appeared in 209 after fire spread west of the Cascade Crest. Presumed all were in PQR CWA; Responder injuries unclear as to which CWA they occurred. 264 residences destroyed, 14 non-residential commercial properties destroyed, 2 other minor structures destroyed. 70 additional structures damaged.
Riverside	75462	Portions of outer Estacada along with the smaller communities of Springwater, Dodge, Elwood, Colton, Fernwood, and Glen Avon.	Contained 12/03/2020 @ 1500 hrs; *** 56 residences destroyed, 0 non-residential commercial properties destroyed, 83 other minor structures destroyed. 19 additional structures damaged.

	# Evacuated		Comments
Big Hollow	Unclear	Recreational areas south of Swift Reservoir and East of Yale Lake	Contained 11/13/2020 @ 0900 hrs; ** 209 reported recreational residences were evacuated, however, no specific numbers were listed. *** No structure loss was reported

Appendix 3: Beachie Creek Fire – A Closer Look

From Inciweb:

The Beachie Creek Fire was first detected on August 16, 2020 approximately 2 miles south of Jaw Bones flats in rugged terrain deep in the Opal Creek Wilderness. A Type 3 team was ordered to manage the fire on the day it was detected and implemented a full suppression strategy. A hotshot crew tried to hike to the fire within the first 24 hours. They were unable to safely access and engage the fire due to the remote location, steep terrain, thick vegetation and overhead hazards. Fire managers continued to work on gaining access, developing trails, identify lookout locations, exploring options for access and opening up old road systems. The fire was aggressively attacked with helicopters dropping water. A large closure of the Opal Creek area and recreation sites in the Little North Fork corridor was immediately signed and implemented. The fire remained roughly 20 acres for the first week. On August 23rd, the Willamette National Forest ordered a National Incident Management Organization (NIMO) Team to develop a long-term management strategy. This is a high-caliber team which has capacity to do strategic planning. The fire grew slowly but consistently and was roughly 200 acres by September 1st, fueled by hot and dry conditions.

At the beginning of September, a Type 2 Incident Management Team (PNW Team 13) assumed command of the fire. The fire size was estimated to be about 500 acres on September 6th. On that day, the National Weather Service placed Northwest Oregon under a critical fire weather warning due to the confluence of high temperatures, low humidity and rare summer easterly winds that were predicted to hit upwards of 35 mph in the Portland area on Labor Day. The unique wind event on September 7th created an extreme environment in which the fire was able to accelerate. The winds were 50-75 miles per hour, and the fire growth rate was about 2.77 acres per second in areas of the Beachie Creek fire. This allowed the fire to reach over 130,000 acres in one night. Evacuation levels in the Santiam Canyon area went directly to level 3, which calls for immediate evacuation. Additionally, PNW Team 13 was managing the Beachie Creek Fire from their Incident Command Post established in the community of Gates. That evening, a new fire start began at the Incident Command Post forcing immediate evacuation of the Team and fire personnel. From the night of September 7th, these fires became collectively known as the Santiam Fire. Ultimately, the Santiam Fire name reverted back to Beachie Creek Fire in order to reduce confusion for the communities in the area. The Incident Command Post was re-established in Salem at Chemeketa Community College. At the end of the wind event, the Lionshead Fire also merged with the Beachie Creek Fire having burned through the Mount Jefferson Wilderness.

After the night of the wind event, the Beachie Creek Fire was managed under unified command by PNW Team 13 and the Oregon State Fire Marshal and the focus shifted to recovery and preservation of life and property. On September 17th, a Type 1 IMT (SW Team 2) assumed command of the fire. Growth on the fire slowed and the fire reached 190,000 acres. A second Type 1 team (PNW 3) took over command of the Beachie Creek Fire, along with the Riverside Fire to the north, on September 29th. Evacuation levels were lowered or removed as fire activity slowed. At the beginning of October, seasonal fall weather moved over the fire producing several inches of rain. During these weeks, a BAER (Burned Area Emergency Response) team assessed the burned landscape and habitats to try to evaluate damage. On October 8th, PNW Team 8, a Type 2 team took over management of the fire. Focus efforts on the ground shifted from suppression and mop-up to suppression repair. On October 14, the fire was downgraded and transitioned command to local Type 3 Southern Cascades team. The acreage topped out at 193,573 acres. Closures remain in place to keep the public safe from hazards like falling trees and ash pits that can remain hot and smolder for months after the wildfire event.

Additional Commentary

Initially, the Incident Command Post (ICP) was set up at Gates Community Church. The IMT members had arrived September 2nd and 3rd, while the initial IMET arrived mid-afternoon September 4th. Management functions moved across the street to the elementary school by early afternoon September 5th. Labor Day, September 7th, started sunny and clear, with a slight down-slope (NE-E) wind. The wind became light and variable by late morning. At 1400 PDT Beachie Creek Lookout reported increasing east wind, with gusts 20-25 mph. Shortly thereafter, the IMET issued a weather update alerting crews and other fire personnel increasing wind would spread into the lower elevations and ICP by late afternoon. By 1600 PDT thick smoke had pushed into Gates and down-canyon to the west, with eye-level wind gusts 10-15 mph.

The wind continued to intensify through the evening. The sleeping and camping area at the church was deemed off-limits due to danger from falling limbs and trees. At 2100 PDT, the Operations de-brief was held in a

large yurt in front of the school. The wind was strong enough to rock the yurt and slightly displace it. The meeting ended at 2132 PDT. At this time, fire was noticed along the chain-link fence a few feet from the yurt. Additional fires had started in the back of the school, approximately 100 to 200 feet away from the building. IMT members and other firefighting personnel worked to suppress these erupting fires. Shortly after 2200, the order was given to evacuate the area. Another fast-moving fire, approximately one-half mile away, was racing toward ICP. The initial meeting location was Mill Creek School, about 3 miles west. However, the bridge leading directly to the school was under construction repair and out of service. This entailed a circuitous detour to Lyons, several miles away, and then back to Mill City. The IMET finally reached the destination around 2245 PDT, but realized the site was compromised due to fire. The FBAN(t) relayed the message to retreat to Stayton, about 20 miles west. It was shortly after midnight when the IMT and fire-fighting personnel gathered at Stayton High School, and close to 0100 PDT Tuesday, September 8 when Plans personnel sheltered in place by sleeping in vehicles.

At 0600 PDT, September 8, IMT personnel re-convened for further instructions from the Incident Commander. It was not until 0800 PDT when the directive was given to meet at Keizer Station, near Volcano Stadium. At approximately 1000 PDT Logistics had secured Chemeketa Community College as the new ICP.

Gates Elementary School was nearly a complete loss. The catering and shower units were destroyed. The church across the street remained intact, with little to no apparent damage. However, the sleeping and camping area, on the west side of the church grounds, sustained significant impacts. Large downed limbs littered the north part of the camping area. Worse yet, fire had penetrated the south end, where some IMT personnel had campers and camping trailers. Many of these were completely destroyed. Operations returned to the burned-over Gates ICP on the 8th and 9th to retrieve as many personal belongings as possible. The overall devastation was incredible. Virtually the entire town burned. A majority of Mill City was destroyed as well. The Lionshead Fire to the east, which

merged with Beachie Creek, took out a significant portion of Detroit and Breitenbush.

Beachie Creek Aftermath Photos



Gates Elementary School – FBAN and IMET work area in the back end





Gates Elementary School – Another view of ICP





South end of sleeping/camping area. This is where some IMT members had campers and trailers. The rubble in this photo is what remained of the SITL's brand new camping trailer and pickup.



Friendly chicken checking out the surroundings. The rubble in the background is part of the catering unit.