The Inland Northwest Informer
Information For Storm Spotters, Cooperative Observers And Everyone
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Fall/Winter 2020 - Volume 27

May 2020: An Atypically Strong Severe Weather Event

By Ed Townsend, Science and Operations Officer and Marcus Austin, Warning Coordination Meteorologist

Lime sized hail, wind gusts over 60 mph, and torrential downpours were frequently seen and reported on Saturday, May 30th across much of central Oregon to south-central Washington. While severe thunderstorms are not uncommon and occur every year in this area, predominantly between May and late August, the May 30th episode stands out from past events due to the wide coverage of storms, their intensity, and the high-end nature of some of the severe events they produced. NWS Pendleton generally issues between 20-30 severe thunderstorm warnings on average* but on May 30th, NWS Pendleton would go on to issue 17 severe thunderstorm warnings throughout the afternoon and early evening. [*NWS Pendleton averages around 26 warnings based on Iowa State University Iowa Environmental Mesonet processing of NWS text warning data over the last 20 years since 2001.]

Damage from severe thunderstorm winds on exposed power line tower near Shaniko, OR.. Photo by Erik Pytlak, Bonneville Power Administration.

Storms developed early in the day in northern Klamath and Crook counties of southern/central Oregon, and moved north to north-northeast across the Columbia Basin by early evening. Initially storms were discrete, with supercells observed in parts of central Oregon (featuring a rotating, tilted updraft and were capable of very large hail and damaging winds). These individual storms tracked northward, eventually morphing into clusters of storms or lines with bow echoes apparent at times, with intense damaging winds and large hail.

Environmentally, the large scale setup and ingredients for severe storms was seen in advance with messaging beginning several days ahead of the event. Ample moisture with surface dew points in the lower 50s in central Oregon to mid 60s in the Columbia Basin were in place by late morning on the 30th, along with a moist lower atmosphere. This moisture would combine with peak heating to promote moderate instability during the afternoon. Meanwhile, a strong upper level low near the central California coast early in the day would lift northward into the region along with a strong corridor of winds aloft. These strong winds aloft would help produce the needed wind shear to give rise to rotation in developing storms and provide potential for increased longevity. The arrival of large scale forcing for ascent from the upper low side-by-side with a broad surface low in south-central Oregon and its north-south oriented front would then set the stage for the initial storm development that would occur. Storms would then go on to track north to northeast with time as the surface low evolved and deepened into southeast Washington late in the day.

The storms with the greatest severity were observed early in the afternoon as a concentrated swath of extreme straight line winds were put down by a supercell in central Oregon between 1:45 PM and 3:00 PM in an area stretching from Culver, OR to Metolius, OR. Peak wind

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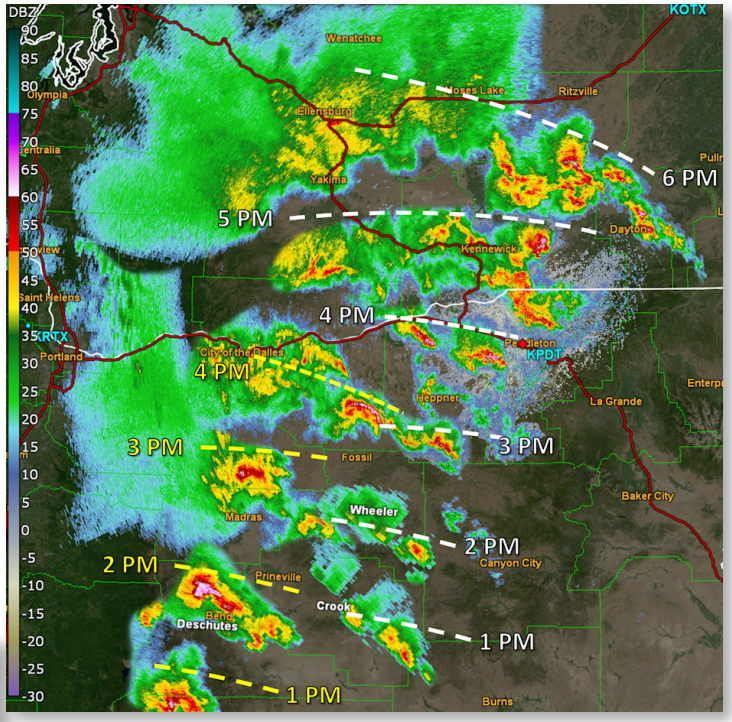
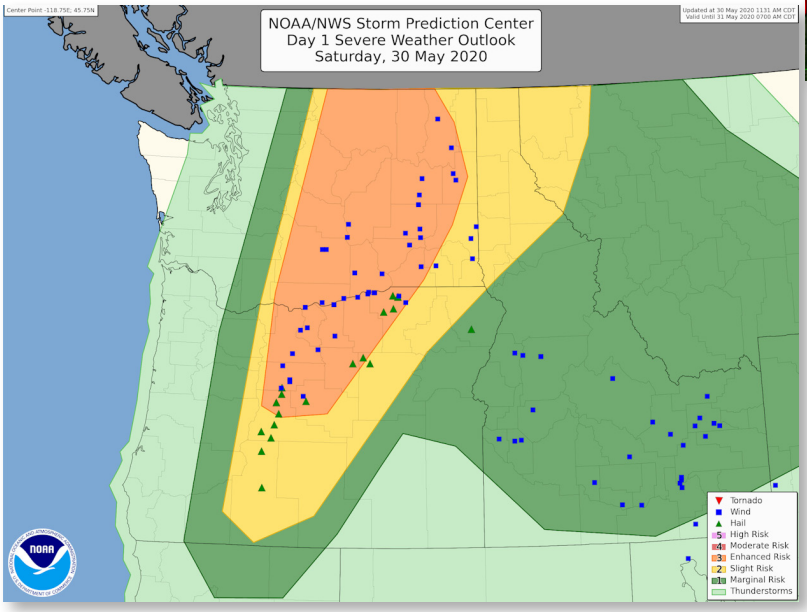
speeds were determined to range from 70-115 mph based on a storm damage assessment with the more significant damage including: destruction of multiple agricultural outbuildings, partial or total roof removal of at least two manufactured homes, and the toppling of two high-tension power lines.

While no tornado was confirmed, these extreme straight line winds were equally capable of significant and life-threatening damage. For reference, winds within an EF-1 tornado range from 86 to 109 mph. Elsewhere, hailstones exceeded golf ball size and peaked at 2 inches from reports provided by Deschutes, Grant (OR), and Umatilla counties. Thunderstorm wind gusts were reported in excess of 70 mph across multiple areas including Jefferson, Sherman, Umatilla, Benton, Wasco and Grant (WA) counties that day. Ultimately, this widespread severe weather event led to the issuance of over 60 local storm reports between 1 and 7 PM PDT. ❖



Radar composite image summary (above) from May 30, 2020 depicting the hourly evolution of the severe thunderstorm event from 1 PM to 6 PM PDT across central OR to south central WA. Yellow and white lines delineate the leading edge of storms in Pacific Daylight Time.



Local storm reports (left) issued by the NWS Pendleton office on May 30, 2020. Over 60 storm reports were issued in the NWS Pendleton area that included reports of large hail, wind reports, wind damage, and flash flooding.

Photo (right) of thunderstorm cell, taken from Emigrant Hill looking generally north on May 30th. Photo by T.W. Earle.

2020 Fire Season Recap

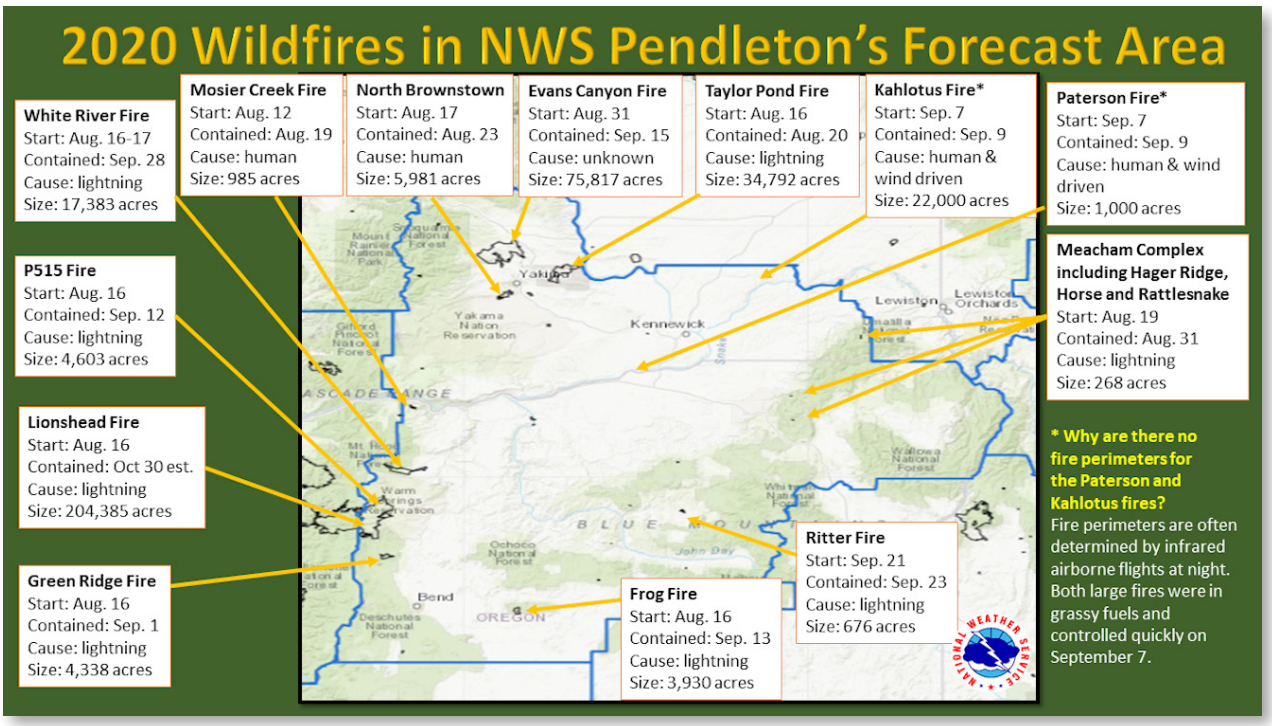
By Mary Wister, Incident Meteorologist / Fire Weather Program Leader

Mother Nature threw a major curve ball this summer across the western United States. What started off as a quiet fire season suddenly turned into wildfire madness by the middle of August. Many people will blame the year 2020 and understandably so. We've been faced with curve balls thrown in every direction this year, including weather and wildfires.

The historic Labor Day windstorm responsible for numerous wind-driven fires in eastern Washington and northeast Oregon was caused by a cold frontal passage with a highly unusual north-to-south track for early September. In addition, the desert Southwest failed to experience the typical monsoon that ends their fire season by early July. Record-setting heat and low rainfall were observed across the four-corner states, extending their fire season longer than previous years. California—it's difficult to explain the multiple fires in California without throwing hands up in the air from exasperation. As of October 16, over 8,500 fires have burned over 4.1 million acres of land in California alone.

According to the Northwest Area Coordination Center in Portland, there have been 1,571 fires in Washington and 1,825 fires in Oregon that have combined burned nearly 1.5 million acres of land. Sadly, almost 80% of the number of fires in the inland Northwest were human caused compared to lightning. Numerous thunderstorms on August 16 were responsible for some of the most significant fires in eastern Washington and eastern Oregon--Lionshead, White River, Green Ridge, Frog, and Taylor Pond. Lionshead was the second largest fire in the Pacific Northwest at 204,469 acres. Pearl Hill, east of Bridgeport, WA was the largest fire at 223,730 acres that burned predominantly through dry grass.

Labor Day, September 7, was a devastating day for this area. Northeast winds gusting to 45-55 mph caused downed trees and electrical wires, rapidly spreading fires, and blowing dust. At least several homes were lost in Basin City and Prosser and multiple structures were burned throughout the region. Three railroad bridges in Benton and Franklin Counties were also destroyed. The northeast winds continued for several days, and



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this caused the Lionshead Fire in the Warm Springs Reservation to spread over the Cascade crest and down the western slopes, eventually merging with the Beachie Creek Fire. Fires in Washington and Oregon claimed 14 lives in early September, and the nation shared our mourning during this tragic loss.

Poor air quality for over a week in early September added to the mix as wildfire smoke blanketed the Pacific Northwest. Air Quality Advisories were issued throughout Washington and Oregon with monitors reporting conditions considered unhealthy or hazardous. Moderate to heavy rainfall that was observed from the coast to the Cascades with two separate systems during the second half of the September helped to suppress fires and alleviate the hazardous air quality.

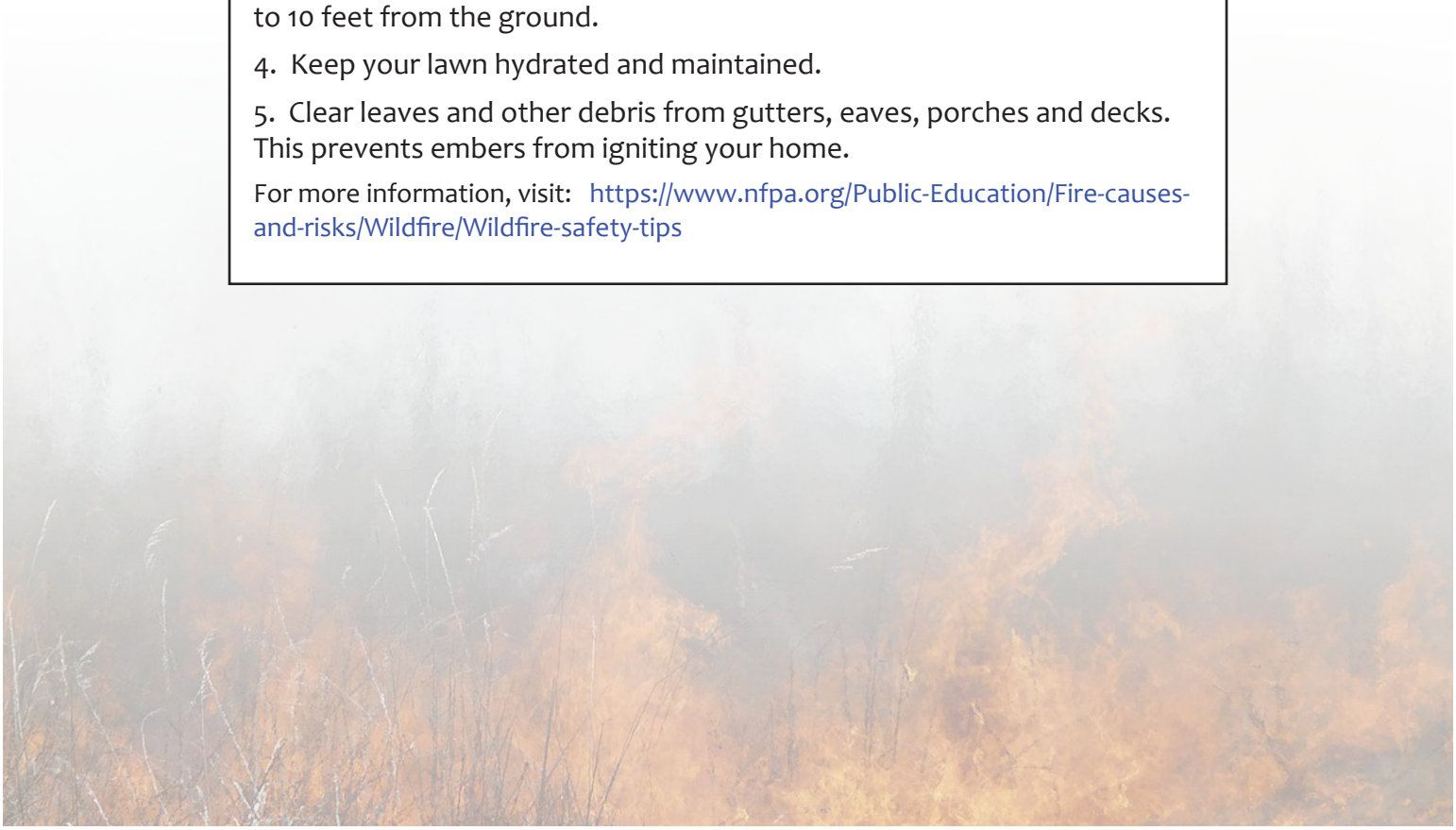
As we count the days until the end of 2020, we can look back on this year and remain positive; adversity will make us stronger. Let's just hope Mother Nature is kinder in 2021.

For more information on fire weather and wildland fire management, visit the Northwest Interagency Coordination Center website at: https://gacc.nifc.gov/nwcc/ ❖

Remember — You can help minimize damage from wildfires by maintaining your property and landscaping. Here are a few tips for cleaning your property and preventing fire spread:

1. Remove dead vegetation at least 10 feet away from your home.
2. Remove flammable material such as propane tanks and firewood stacks, keeping them at least 30 feet away from your home and outbuildings.
3. If you have trees on your property, prune so the lowest branches are 6 to 10 feet from the ground.
4. Keep your lawn hydrated and maintained.
5. Clear leaves and other debris from gutters, eaves, porches and decks. This prevents embers from igniting your home.

For more information, visit: https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Wildfire-safety-tips



Winter 2020-2021 Outlook

By Roger Cloutier, Meteorologist

Currently, there is a La Niña Advisory in effect for this coming winter of 2020-2021. A La Niña has several effects on the Pacific Northwest. La Niña conditions are when the sea surface temperatures (SSTs) over the tropics are cooler than normal (in our case, the eastern tropical Pacific Ocean) due to an increase in the easterly trade winds. This increase of the easterly trade winds over the tropics leads to upwelling of deep colder water to the surface in the tropical Pacific. A La Niña can have a variety of effects on the Pacific Northwest region. However, typically it leads to an increase in precipitation and heavy storms (rain or snow). Thus the Cascades and the eastern/northeast mountains are likely to see above average precipitation, mainly snow in the winter months. This is good news for the ski resorts, but maybe not so good news for people who have to commute in wintry conditions over the mountains. On the other hand, if temperatures are warmer than normal, much of the precipitation could fall as rain, leading to a below normal amount of snowpack in the mountains, and that may possibly lead to river and stream flooding.

In Figure 6 (below), the solid black line on the left side of the image shows a history of the SSTs up to the present time, and then an ensemble forecast of SSTs for the next 6 to 10 months. In this case, SSTs were mostly above normal during the 2019-2020 winter. However, since spring time, the SSTs have been decreasing. They, along with stronger easterly trade winds, have caused La Niña conditions to exist. The forecast is for a La Niña event this fall and coming winter, with a peak around November to February (i.e. the coldest SSTs), and then a gradual warming of SSTs in the spring of 2021. The current chances of a La Niña event happening is currently at about a 75% chance. On the right hand side of the image are monthly forecasts of the SSTs, which shows consistent month to month colder than normal SSTs for the eastern tropical Pacific…i.e. typical La Niña SST conditions.

In Figure 7 (page 6, right), the three-month temperature outlook for December, January and February 2020-2021 shows the Pacific Northwest having near equal chances of having above

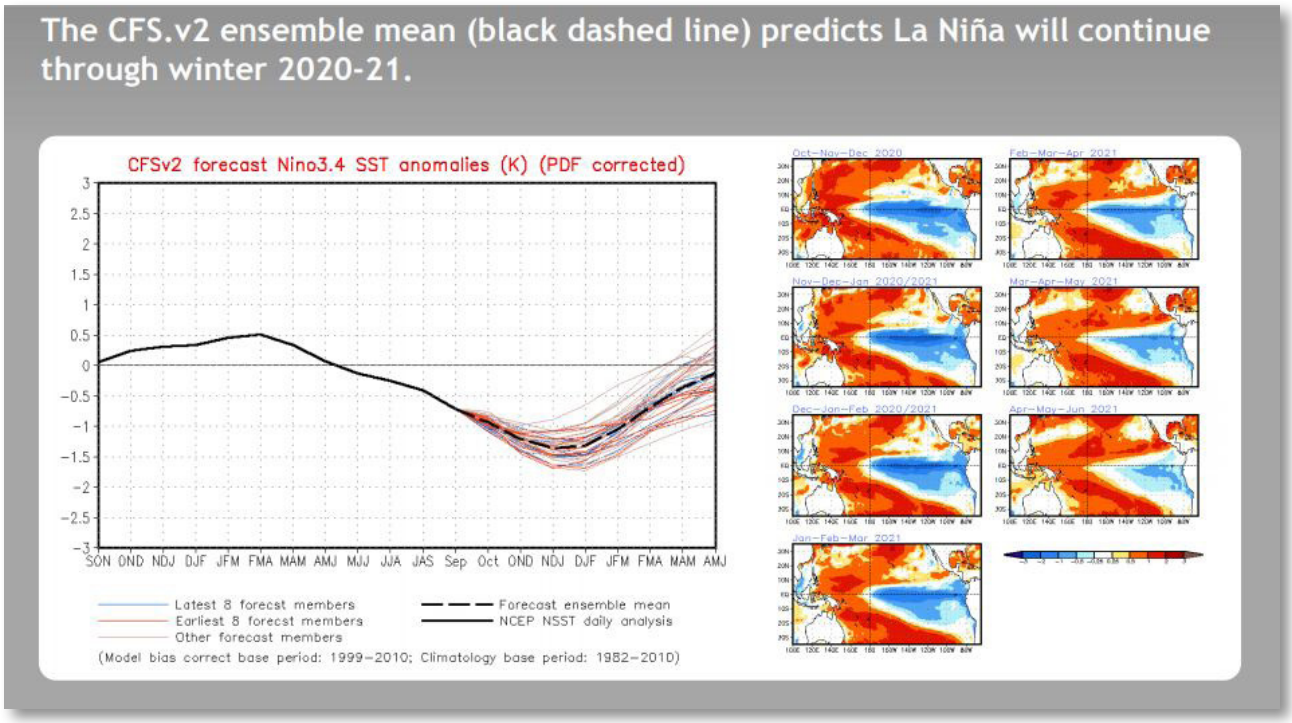


Figure 6. An ensemble prediction of Sea Surface Temperatures over the eastern tropical Pacific Ocean through the fall and winter into next spring.

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or below normal temperatures, except for extreme southern Oregon, where temperatures are forecast to be above normal. In northern Washington, temperatures are expected to be below normal.

In Figure 8 (below, left), it is predicted that the Pacific Northwest will have a wetter than normal winter of 2020-2021, except for extreme southern Oregon, which will have equal chances of above or below normal precipitation.

Figures 7 and 8 indicate that this coming winter will be near normal for temperatures, but with above normal precipitation. This would suggest an abundance of snow over the mountains, and maybe a couple significant snowstorms in the lower elevations, or possibly heavy rain events instead, depending on temperatures and snow levels. Temperatures will have an equal chance of being above or below normal. In the higher mountains, it is usually cold enough for mainly snow, but in the lower elevations, the precipitation type will be more dependent on the temperatures/snow levels. ❖

For the latest seasonal outlook discussion and graphics, visit the CPC at: https://www.cpc.ncep.noaa.gov/products/predictions/90day/

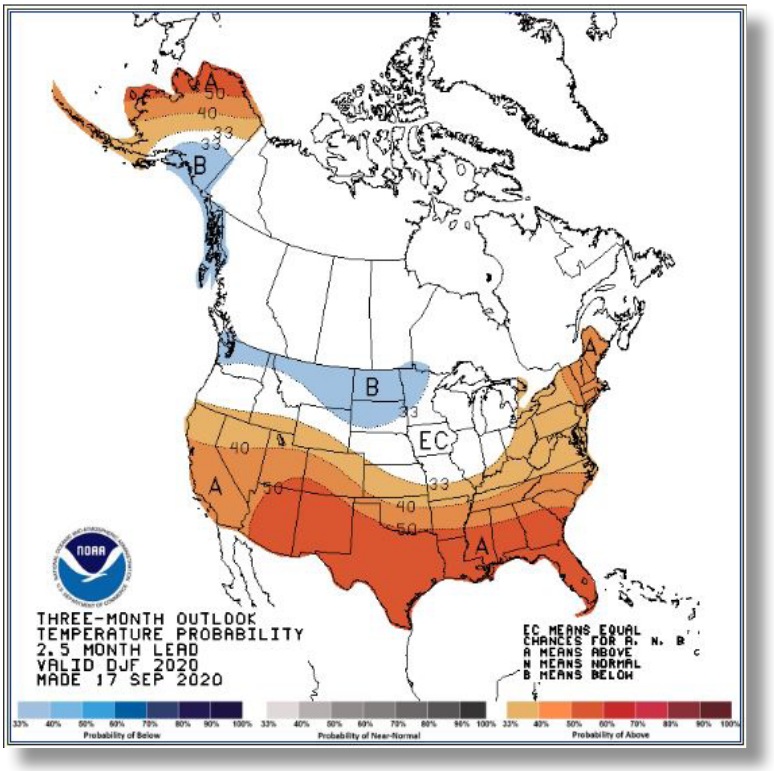


Figure 7 (Right) CPC's December – February temperature probability forecast.

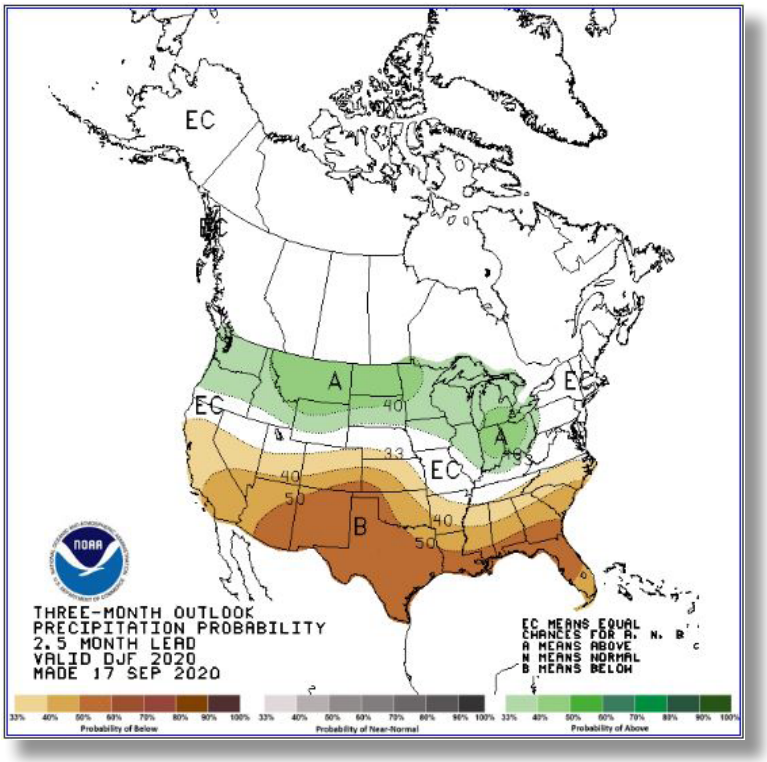


Figure 8 (Left) CPC's December – February precipitation probability forecast. .

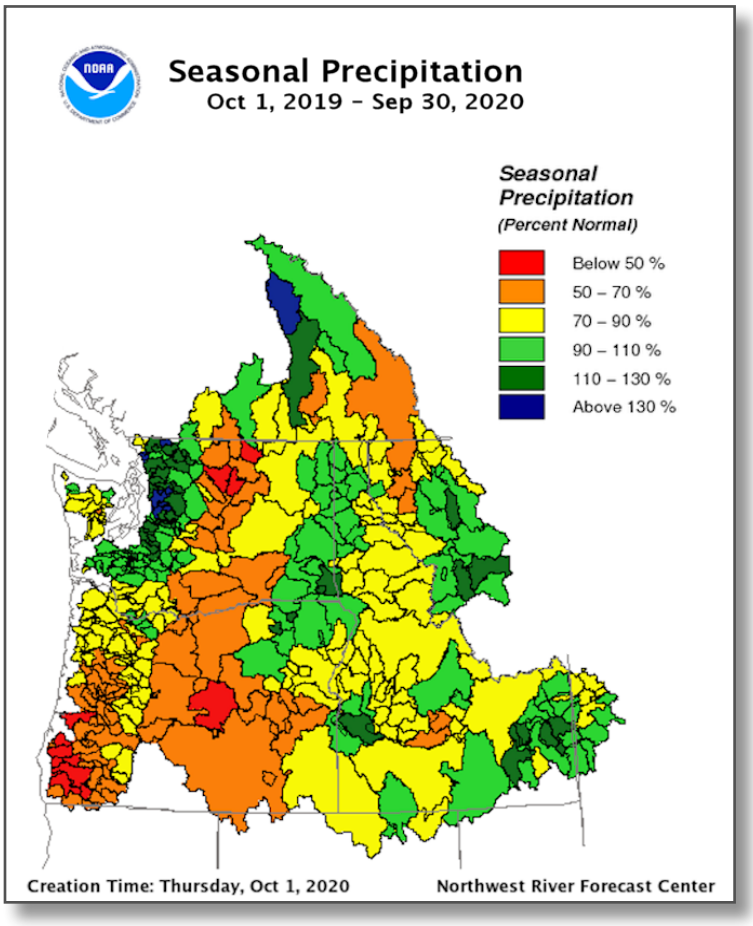
Water Year Precipitation
October 2019 - September 2020

By Marilyn Lohmann, Service Hydrologist

Location	Amount In Inches	Percent of Normal
Bend	6.69	59%
Heppner	8.33	60%
John Day City	8.93	68%
La Grande	20.19	122%
McNary Dam	4.85	57%
Madras	5.79	55%
Meacham	41.24	129%
Milton Freewater	15.63	95%
Moro	7.12	63%
Pelton Dam	6.16	55%
Pendleton Airport	10.31	79%
Pilot Rock	11.24	78%
Prineville	7.50	70%
Redmond Airport	6.08	68%
The Dalles	9.31	64%
Wallowa	16.51	94%
Wickiup Dam	11.85	56%
Cle Elum	18.78	84%
Dayton	15.15	79%
Ellensburg	5.15	57%
Hanford	3.96	57%
Ice Harbor Dam	8.14	74%
Mill Creek Dam	19.63	105%
Mt Adams RS	32.64	71%
Prosser	4.21	47%
Sunnyside	3.70	49%
Whitman Mission	11.98	83%
Yakima Airport	3.95	48%

The 2019-2020 water year got off to a slow start with most locations seeing below normal precipitation for October. November was very dry with amounts of 10 to 35 percent of normal. December was slightly better, but still quite dry with amounts 40 to 70 percent of normal. January saw much better precipitation amounts with near to above normal reports. February had a mix of precipitation with very low amounts seen in locations along and near the east slopes of the Cascades, but well above normal amounts in northeast Oregon and southeast Washington that led to record flooding in those areas. March ended up mainly drier than normal, while April was once again very dry with amounts from 10 to 40 percent of normal. May and June were wetter than normal outside of those locations just east of the Cascades. Very dry conditions were seen region wide during July, August and September, with a number of locations seeing no measurable precipitation through July and August. ❖

Full-sized Precipitation graphic: https://go.usa.gov/x7P8p



STAFF SPOTLIGHT

Cole Evans

Cole was born and raised in Bloomington, Indiana. He gained an interest in meteorology at a young age when an F3 tornado struck the town of Martinsville just north of home, where he witnessed the destruction that weather is capable of first-hand.

Cole went to Valparaiso University in northwest Indiana to study meteorology. He worked on creating a forecast model blend for lake-effect snow in the Great Lakes, as well as launching weather balloons during the North American Solar Eclipse of 2017. Cole's interest in tropical cyclone research began after he worked with Penn State University faculty to cluster tropical cyclone forecast trajectories in order to capture more accurate solutions for global forecast models. He graduated from Valparaiso University with honors in the spring of 2018.

Cole continued his work in tropical cyclone research at Indiana University, where he pursued a Masters degree in atmospheric sciences through his work with the Naval Research Laboratory's hurricane forecasting model. While in graduate school, Cole worked a summer internship at a private research company in Boston, where he created air quality mapping tools for the company via Python. He graduated Indiana University in the spring of 2020, and joined the Weather Service just three months later in August. He has never experienced the Pacific Northwest, and is excited to face the forecasting challenges of central Oregon and Washington first-hand, be it wildfires, snowstorms, or thunderstorms. His interests include hiking, reading, and jogging, as well as experiencing the natural wonders of the western United States for the first time. ❖

Matthew Callihan

Matt was born just outside of Atlanta, GA and grew up in Charlotte, NC. One of his earliest memories was watching a distant lightning storm with his dad on their front porch, and from that moment on he has been fascinated with weather. He grew up in the southeast where humidity, pop-up storms, and hurricanes are just part of the summertime. Matt graduated from the University of North Carolina at Charlotte with a B.S. in Meteorology in 2009. He then continued studies towards a master's degree in Earth Science, focusing on hydrology and climatology with a concentration in snow science. This allowed him to work with research scientists at the Cooperative Institute for Research in the Atmosphere (CIRA) and Colorado State University. He worked on several projects during his time in Colorado, including beetle kill, remote sensing projects, and snow surveys. He took took on a teaching assistantship with his university upon his return, and taught Earth Science labs. Until then public speaking was not one of his favorite activities, but conquering that fear opened another door that he never thought would be possible.

Matt wanted to get back to more short-term forecasting after his graduate career, and decided to move into television. After a 6-month internship with Time Warner Cable News in Charlotte, NC, he accepted a weekend meteorologist position at KEZI–TV in Eugene, OR in 2015. A year later he returned to his home state of North Carolina as a weekend meteorologist at WCTI–TV in New Bern, NC where he covered Hurricane Matthew and Tropical Storm Hermine. Four years of coastal, humid forecast environments were enough, and he was ready to return to the first state he professionally forecasted in – Oregon. He joined the Pendleton office in August 2020. He loves to snowboard, ski, mountain bike, hike, play soccer, golf and disc golf. ❖

Photo Album

Thick smoke blanketed most of eastern Oregon and southeastern Washington for much of September 2020. Photo by A. Adams

One of many spectacular October sunsets viewed from the NWS Pendleton office. Photo by T.W. Earle.

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