National Weather Service - Medford, Oregon

Fall 2020
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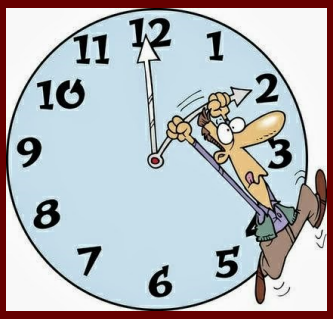
The Crater Chronicle

Fall Began September 22nd at 6:30 am PDT.



Daylight Savings Time Ends November 1st! -

Remember to Set Your Clocks Back One Hour!

Inside This Issue

National Weather Service's Decision Support for the Almeda Drive Fire

Ryan Sandler, *Warning Coordination Meteorologist*

On the late morning of Tuesday, September 8th, what came to be known as the Almeda Drive Fire started in Ashland near Interstate 5. By day's end, this fire which spread north along Interstate 5, had become the worst weather-related natural disaster to ever occur across southern Oregon's populated Rogue Valley.

NWS Medford began expressing concern in the forecast discussion for a "significant east wind" event 5 days prior to the fire. This was followed by a fire weather watch and red flag warning 3 to 4 days prior to this historic fire. By Tuesday afternoon, September 8th, winds at the Rogue Valley Airport were gusting to 40 mph along with a relative humidity as low as 4%. Based on our research dating back to 1948, the Rogue Valley Airport had never seen a combination of such high winds and low humidity combined. To make matters worse, severe drought had developed across the Rogue Valley resulting in extremely dry vegetation.

Earlier in the morning, before ignition of the Almeda Drive Fire, NWS Medford participated in a Fire Chiefs' virtual meeting noting that extreme fire behavior will occur during the day from strong winds, hot temperatures, and very low humidities. Unfortunately, fire-fighting resources had been stretched very thinly across the entire West

Picture of the Almeda Drive Fire looking over the town of Phoenix during the evening of the 8th.

Coast due to so many wildfires. WFO Medford's decision support caused local fire agencies to keep all of their resources available and call in additional personnel for overtime before this fire broke out.

The Almeda Drive Fire burned more than 3,200 acres, mostly across an urban area. There were 2,357 structures destroyed, mostly homes and businesses in the cities of Phoenix and Talent. Thousands of people were evacuated, including six NWS Medford employees and their families. Despite the rapid spread of the Almeda Drive Fire in an urban area, the loss of life was limited to only three people. The NY Times has an excellent 4-minute video story on the fire at https://nyti.ms/362gyRA

Devastation from the Almeda Drive Fire in the area of Phoenix and Talent in southern Oregon. Screenshot from video shot by Jackson County on September 8, 2020.

Opening Pathways at Medford

Miles Bliss, *Forecaster*

At the Medford Weather Service Office, 2020 has been a year of new experiences and no, we aren't just referring to the conditions COVID-19 has placed us in. 2020 has placed us under the leadership of Christine Riley, our new Meteorologist in Charge, and we also had a Pathways internship spot at our office. The last Pathways position at our office was in 2009, so it was a surprise when we learned we were getting one 11 years later and we were excited when Luke Rogers joined our staff for the summer. This program was created for those currently enrolled in either high school, college, or trade schools with an interest in meteorology, hydrology, data science, and technology. Pathways students have the opportunity to gain paid experience, all while expanding their research and improving their oral and writing skills. For some, this means interning at national centers, or more commonly, at local forecast offices.

Luke was a wonderful addition to our staff over the summer. I personally worked with Luke on a few occasions as we explored the topics of marine and aviation forecasting. I was impressed with his desire to learn and grow his skill set, and knew that I wanted to share his enthusiasm for weather with all of you.

Miles Bliss (M.B.): Being from the Midwest, describe your impressions of SW Oregon vs your expectations.

Luke Rogers (L.R.): My first impression when I first arrived in June was, I'm not in the Upper Midwest anymore. Driving through the Rogue Valley, and even every time I drive around the area today, I cannot stop looking at the vibrant and beautiful landscape with mountains all around me. Before arriving in Medford, I didn't know what to expect, I didn't know a lot about the geography and landscape of the area. Yes, I did a little research by looking at pictures and looking on Google Earth, but those two things does not do it justice.

M.B. What was your favorite weather element to learn about here?

L.R. This is a tough one, but my favorite weather element to learn about has to be Fire Weather. The Fire Weather side of meteorology is so unique compared to winter weather or even severe weather.

M.B. What did you think would be the greatest challenge of this position/job/office when you started?

L.R. I guess the biggest challenge from a meteorology and operations standpoint was definitely not knowing anything about the different types of weather that impact the area, compared to what I'm used to in SE Minnesota. In school, I was never taught anything with regards to Fire Weather, Marine Weather, and Mountain Meteorology, so that was my biggest challenge.

M.B. Did you ever exceed your own expectations during your time here and can you describe that situation?

L.R. Yes, plenty of times and I have to thank Brad, Brian, and Miles for that. After I got some experience shadowing these professionals within the NWS, they allowed me to take the "driver's seat" at the particular forecasting desk they were working that day. I was able to exceed my own expectations and accomplish so many duties, responsibilities, and goals by working with AWIPS and GFE to come up with a forecast I was confident about (obviously they were there to help guide me and question me on certain things). Being able to come up with a forecast and then issuing products, like the Area Forecast Discussion, based on my forecast was so rewarding.

M.B. In what ways did COVID impact your time here?

L.R. Oof, I don't know where to start, but COVID impacted my time in many ways, like it's doing for everyone. One example of COVID impacting my time here, was that when I first arrived and started in Medford, I had to quarantine and telework from home for two weeks. That was tough, because I wanted that time to really start meeting everybody and making those relationships right from the start. However, the biggest way that COVID impacted me was that it forced me to be able to only work 2 shifts per week in the office, instead of 4 or 5.

M.B. What was your favorite restaurant during your time here?

L.R. That's a tough one, but my two favorite restaurants have to be in In-N-Out Burger and also Vim Thai, a Thai restaurant here in Medford.

M.B. What are your goals moving forward/how will you utilize your experience here in the future?

L.R. Some goals moving forward after my time in Medford include, finishing my last semester of school and getting my diploma so I can apply for an official position in the NWS. Use the friendships and bonds I created here in Medford to help guide me and give advice about getting into the NWS. I will definitely use the knowledge, experience, and skills that I have gained from working at the Medford office.

M.B. What was your project topic and your words of wisdom on the topic? Thoughts on the folks you've met?

L.R. The research project that I did this summer as the Pathways Intern focused on both meteorology and agriculture, combining those two topics into a project that focused on outreach for the agriculture community. Coming into this summer as the Pathways Intern, I asked myself, why not intertwine two subjects that I am very passionate about? Meteorology and the study of the weather has always been at the forefront for me as a passion, but agriculture, in particular the dairy industry, has always been a close second. I felt like I would get the most out of this research project if I not only focus on one, but two subjects that I'm very passionate about. To me, agriculturalists/farmers with some knowledge of meteorology, and meteorologists with some knowledge of agriculture, endless opportunities, partners, and connections could arise between the two fields of work. The many different farmers/ranchers were all very nice, they welcomed me with open arms and offered the opinions, knowledge, and experiences. The overall experience with meeting these farmers/ranchers was great.

M.B. Do you have advice for students in the local community that are looking to study meteorology or otherwise interested in the earth/atmosphere dynamic?

L.R. Advice I have is to not let the math and physics scare you! If I can accomplish the math and physics, anybody can, as long as you are willing to put in the work. Also, if you have a passion for anything, and it doesn't have to be in meteorology, why not make a career out of it!

Pathways positions like the one Luke participated in offer both students and offices to learn new forecasting and communication techniques. This program is a great way to get those interested in aiding the National Weather Service's mission to protect life and property the experience and knowledge necessary.

For more information on the Pathways program and other internship opportunities, check out the links below:

⇒ https://www.weather.gov/eeo-diversity/eeo_student_research_opportunities

⇒ https://wpo.noaa.gov/About/Internships

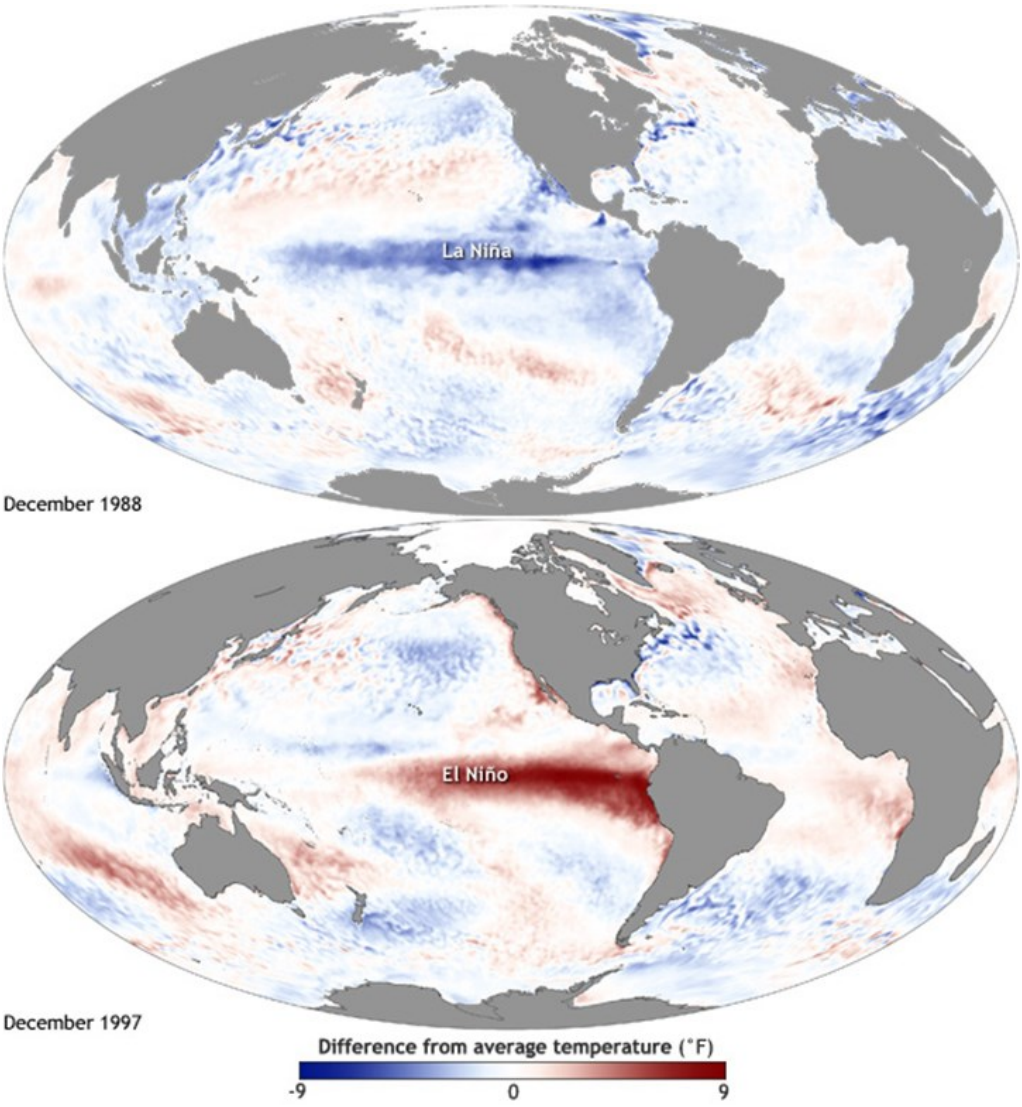
⇒ https://www.weather.gov/ncep/student_internships

La Nina & Southwestern Oregon

Shad Keene, *Lead Forecaster*

What is La Niña?

La Niña is part of a phenomenon that involves changing ocean temperatures near the equator in the central and eastern Pacific Ocean and their broader impacts on global climate. This phenomenon of changing ocean and atmospheric conditions is called the El Niño–Southern Oscillation, or ENSO for short. Michelle L'Heureux, a NOAA ENSO expert, characterizes ENSO as "one of the most important climate phenomena on Earth due to its ability to change the global atmospheric circulation, which in turn, influences temperature and precipitation across the globe." La Niña means cooling ocean temperatures in the central and eastern tropical Pacific waters, and this has different effects on global temperatures than El Niño, which refers to warming of the same tropical ocean waters.



What does La Niña mean for October-March in Southwestern Oregon?

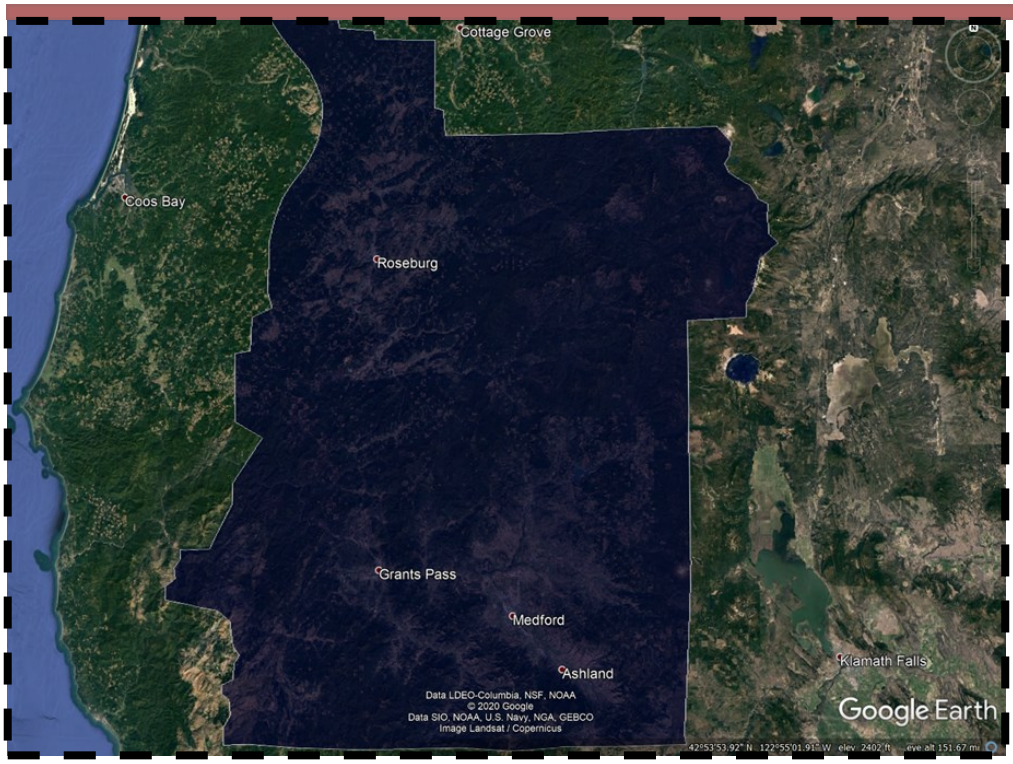
https://www.pmel.noaa.gov/elnino/what-is-la-nina

https://www.climate.gov/news-features/blogs/enso/what-el-ni%C3%B1o%E2%80%93southern-oscillation-enso-nutshell

La Niña conditions are occurring and are expected to continue through the winter, according to the Climate Prediction Center. How could this affect our local weather this fall and winter?

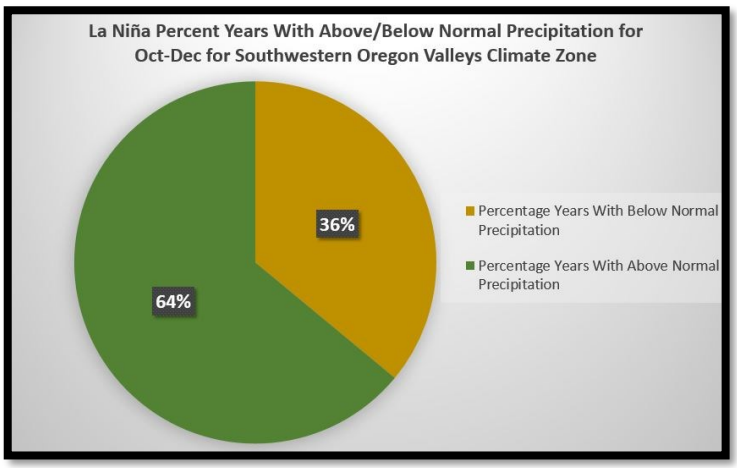
The National Weather Service has developed an excellent tool called the "Local Climate Analysis" tool, or LCAT. LCAT analyzes millions of data points and provides meteorologists clues for how various climate zones and sites across the country are changing with time and how weather and climate responds to different ENSO conditions. We're going to briefly explore how La Niña may impact our fall and winter months, October through March, based on LCAT output. We'll focus on a climate zone that covers much of Southwestern Oregon, where at least 4 major wildfires have burned this summer.

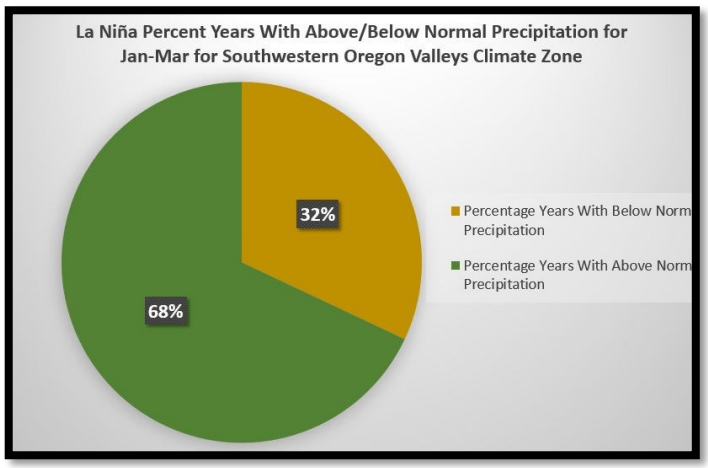
Here's a look at the climate zone that we'll be focusing on, shaded in dark blue below and including Roseburg, Grants Pass, Medford, Ashland, and Cave Junction. *(pictured on next pg.)*



Good news! After months of drought and major wildfires, LCAT shows us that above normal precipitation is favored during La Niña conditions. Looking at the period of 1950-2019, in 64% of the years with La Niña conditions this climate zone overall experienced above normal precipitation, when compared to 1981-2010 normals (below left).

Looking at January through March, the story is very similar. Odds favor a wetter than normal winter for the Southwestern Oregon Valleys climate zone (below right). And these odds don't just apply to the valleys. Crater Lake National Park has observed above normal precipitation during 74% of the years with La Niña conditions! Interestingly, the connection between above normal precipitation and La Nina does not hold for some Northern California locations like Mount Shasta City, CA.



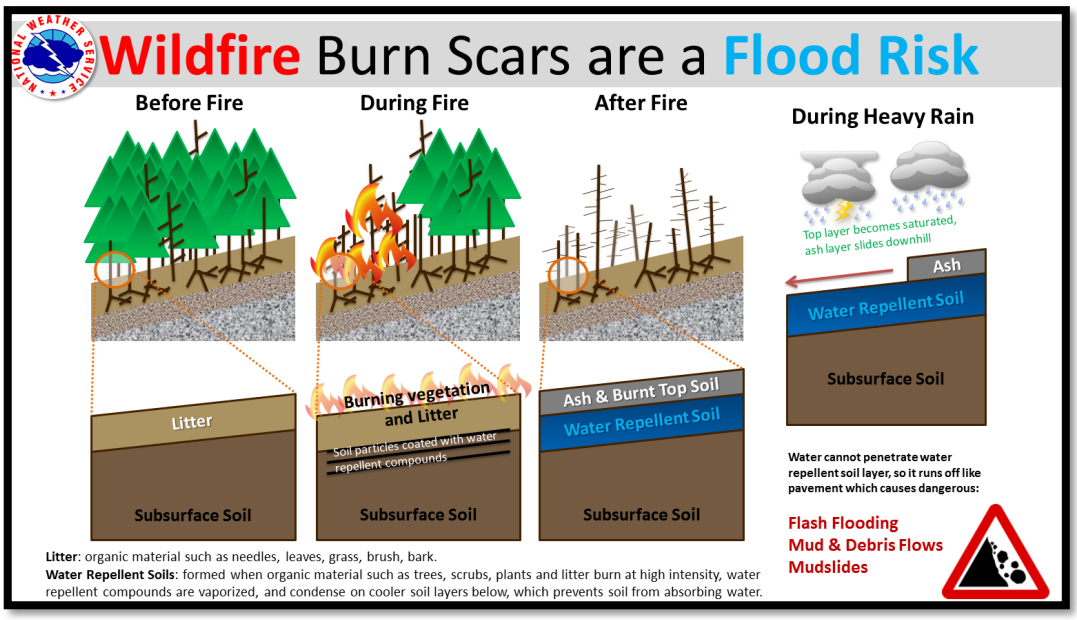


Does all this mean Southwestern Oregon will definitely have a wetter than normal fall and winter?

Long answer short--no. It simply means that this historical perspective tells us there are higher probabilities for a wetter than normal fall and winter in the Southwestern Oregon Valleys climate zone. There are also many other factors, some known and some unknown, that contribute to the expected precipitation for this fall and winter. Additionally, even though we really need rainfall and snowpack this winter to alleviate the drought conditions, hazards of course can accompany significant rainfall, and residents should be prepared for this. Southern Oregon and Northern California haven't experienced much in the way of flooding in the past few winters, so please be prepared. A few websites that can help you prepare for winter hazards are https://www.weather.gov/safety/flood and https://www.weather.gov/safety/winter.

Flood Risk After Fire

Connie Clarstrom, *Lead Forecaster*



Wildfires & Flood Risk

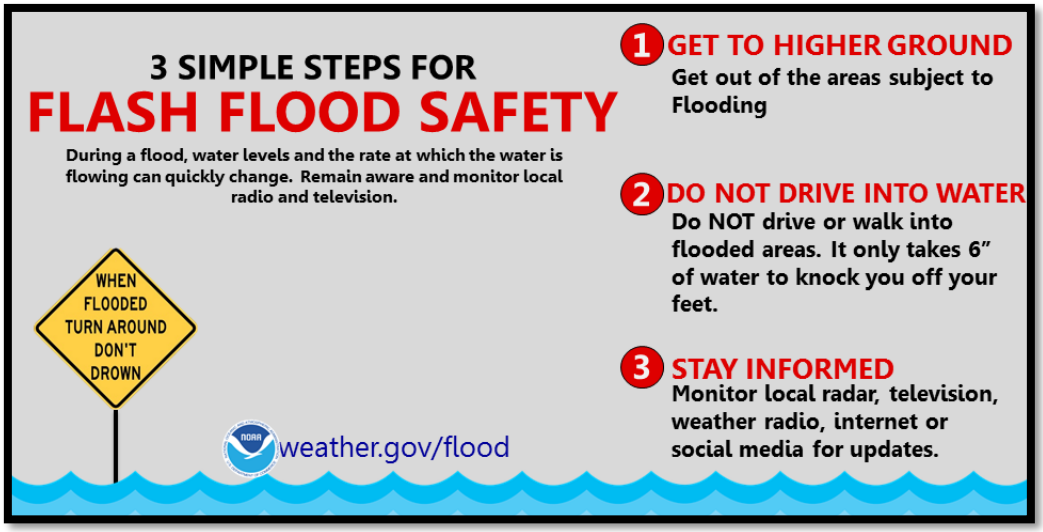
Flooding after wildfires is a serious risk. Wildfires cause long lasting damage to the landscape and can result in increased danger for flash floods, mudslides and debris flows, especially for areas within or downhill/downstream of burned areas.

Flash floods, Mudslides & Debris Flows

Heavy rain can produce flash floods, mudslides & debris flows over burned areas from wildfires. Water repellent soils are formed when organic material such as trees, scrubs, plants and litter burn at high intensity (high temperatures), causing water repellent compounds to become vaporized which then condense on cooler soil layers below the surface. This prevents the soil from absorbing water after a fire. During heavy rains, water cannot penetrate water repellent soil layers, so it runs off similar to water running off pavement. This can cause dangerous flash flooding, debris flows and mudslides. Click here for a detailed graphic on this process.

How can I be Prepared?

- ✓ Have an evacuation/escape route planned that is least likely to be impacted by flash flooding or debris flows.
- ✓ Have an Emergency Supply Kit available.
- ✓ Stay informed before and during any potential event; know where to obtain National Weather Service (NWS) Outlooks, Watches and Warnings via the NWS website, Facebook, Twitter, or All Hazards NOAA Weather Radio.
- ✓ Be alert if any rain develops. Do not wait for a warning to evacuate should heavy rain develop.
- ✓ Call 911 if you are caught in a Flash Flood or Debris Flow.
- ✓ Contact local officials for additional risk information and potential mitigation efforts.



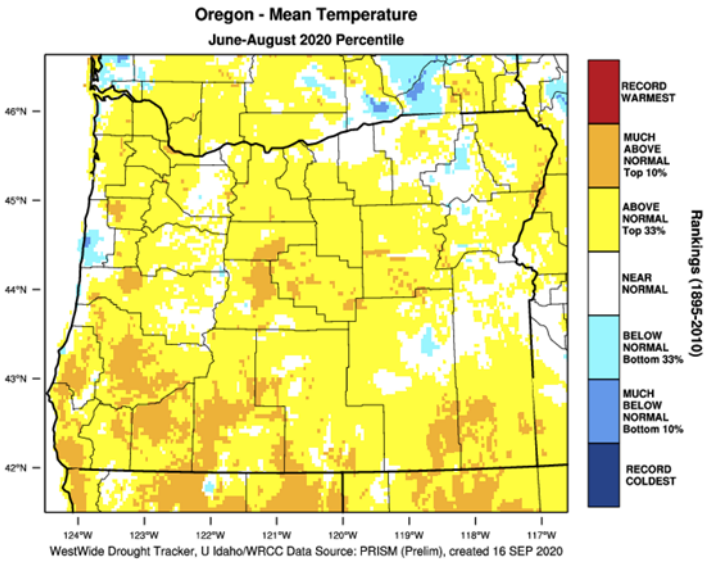
For more information on Flash Flood Safety visit https://www.weather.gov/safety/flood-hazards. Also to obtain information on the National Flood Insurance Program please visit https://www.floodsmart.gov/wildfires.

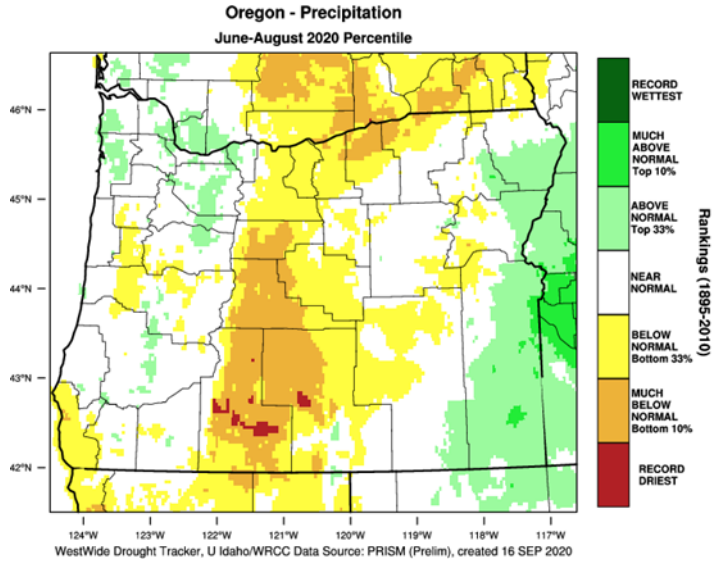
A Sweltering Summer and Smoke

Ryan Sandler, *Warning Coordination Meteorologist*

We define meteorological summer as June, July, and August because they typically are the three hottest months of the year. Although in southern Oregon and far northern California, September is about as warm as June. Let's take a look at how our meteorological summer ranked this year for temperatures and precipitation.

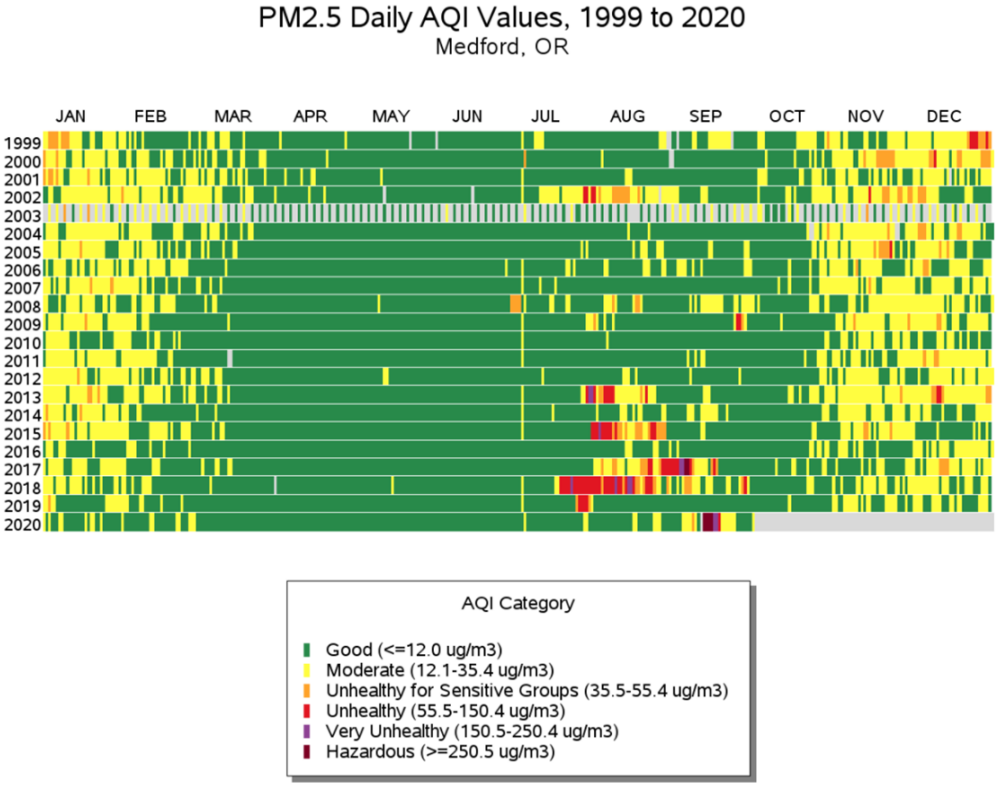
The graphics below show temperatures above normal to much above normal while precipitation was near normal from the Cascades west and drier than normal east of the Cascades.





But wait, you are probably scratching your head and saying I know this was a drier than normal summer just about everywhere…and you would be correct. The distribution of rain is important. For example, at the Rogue Valley Airport, there were 99 consecutive days without measurable rain (<.01") from June 17th through September 23rd. This was tied for the 4th longest dry streak in 110 years! So, early June was wet but then it was really dry through September unless you were lucky enough to be under any thunderstorm downpours. Also, the graphics above do not include September which was a very warm and dry month.

So what about smoke? The air quality was great through meteorological summer but then came the September swoon. In early September there were huge wildfires up-and-down the West Coast. In Medford, the air quality for an entire week was in the unhealthy to hazardous range. These readings were the worst levels ever reached since 1999 when air quality data became available. To recap, the meteorological summer began wet and cool. However, it soon became hot and dry, and these conditions persisted with the Medford weather station reporting 18 days of 100+ degree temperatures through September.



National Weather Service Medford KMAX Radar Upgrade: Looking towards another 20 years of Service!

Connie Clarstrom, *Lead Forecaster*

The KMAX WSR-88D doppler radar, operated by NWS Medford Oregon and located on the top of Mount Ashland, received a significant upgrade this last month in September. The KMAX radar is one of a network of 159 operational WSR-88D doppler radars operated by the National Weather Service. The WSR-88D radars were designed to last 25 years, and the KMAX WSR-88D radar has exceeded its life-span. The recent upgrade was part of a program called the NEXRAD Service Life Extension Program (SLEP) that was put in place to refurbish and upgrade the radars in order to extend their time in service for another 20 years or more.

During September, the KMAX WSR-88D received one of the most difficult and important upgrades associated with the Service Life Extension Program. Technicians refurbished and replaced the pedestal, one of the most critical components of the radar, which is necessary for antenna rotation and positioning to capture data in all directions. The components are extremely heavy and required the radome to be removed by crane then replaced when the work was completed.

The pedestal refurbishment is the third major project of the NEXRAD Service Life Extension Program, a series of upgrades that will keep our nation's radars viable into the 2030s. NOAA's National Weather Service, the United States Air Force, and the Federal Aviation Administration are investing $150 million in the eight-year program. The first project was the installation of the new signal processor, and the second project was the refurbishment of the transmitter. The fourth project will be the refurbishment of the equipment shelters. The Service Life Extension Program will be complete in 2023.

For additional information on the Service Life Extension Program and a video showing a pedestal replacement of a WSR-88D, please go to https://www.roc.noaa.gov/WSR88D/SLEP/SLEP.aspx.

The KMAX WSR-88D radar data and other products from the National Weather Service in Medford, Oregon can be found https://weather.gov/Medford.

No Radar?! No Problem!

How Meteorologists Warn for Thunderstorms when Radar is Down

Charles Smith, *Meteorologist*

While the KMAX radar was undergoing part of it's Service Life Extension Program (SLEP) upgrade, meteorologists at the NWS Medford had to rely on other tools to analyze thunderstorms. This is not the first time a weather forecast office has had to use other means to evaluate the strength of thunderstorms. We are trained for such instances when the radar fails during convective events. Meteorologists have many tools at their disposal to analyze the atmosphere. Without radar, we use satellite data, and lightning and surface observations to evaluate storm strength. Even when we do have radar data, we still use these instruments to help us gauge the strength of thunderstorms and aid us in our decision making. Satellites can analyze the temperatures at the top of the storm cloud, helping us understand storm strength and position. NOAA's newest satellites can be reprogrammed to observe sections of the atmosphere every 30 seconds. These scanning strategies help us significantly, whether the radar is functional or not, by allowing us to see the development of storms from a top down view. There are two ground based lightning detection networks we use to see lightning, National Lightning Detection Network and Earth Networks Global Lightning Network. In addition to these ground based detection networks, our new satellites also have lightning observing capabilities and can observe intracloud (within the cloud, not cloud to cloud) lightning. Research shows that large increases of lightning within a storm has been correlated with the occurrence of severe weather shortly thereafter. So if we observe this "lightning jump" on satellite, it increases our confidence that a storm is close to severe criteria. Lastly, surface observations from both our spotters (humans) and automated stations tell us what is happening on the ground, which meteorologists call "ground truth". Surface observations are important as we can compare what is happening under one storm to infer similarities with other storms in the area. Overall, we're not helpless when our dear KMAX radar is not working as all of these other observation networks to help us in the warning decision process. This is our home and community too and we will continue to serve you by protecting life and property with the tools we have available to us.

For more info on the new GOES satellites:

⇒ https://www.goes-r.gov/

GOES Satellite Imagery:

⇒ https://www.star.nesdis.noaa.gov/GOES/sector.php?sat=G17&sector=pnw

⇒ https://rammb-slider.cira.colostate.edu/?sat=goes-17

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Our Vision

Professionals focusing on science, teamwork, and customer service to design and deliver the best decision-support information to our community.

Our Mission

Our team at the National Weather Service Office in Medford strives to deliver the best observational, forecast, and warning information through exceptional customer service, extensive training and education, maintaining quality electronic systems, and relying upon an outstanding team of weather spotters and cooperative observers. We do this within the overall mission of the NWS to build a Weather-Ready Nation:

To provide weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community.

Our Values

Trust, Integrity, Professionalism, Service, Teamwork, Ingenuity, Expertise, and Enthusiasm.

About Us

The Weather Forecast Office in Medford, Oregon, is one of more than 120 field offices of the National Weather Service, an agency under the National Oceanic and Atmospheric Administration and the United States Department of Commerce. The Weather Forecast Office in Medford serves 7 counties in southwestern Oregon and 2 counties in northern California, providing weather and water information to more than a half-million citizens. We are also responsible for the coastal waters of the Pacific Ocean from Florence, Oregon, to Point St. George, California, extending 60 miles offshore. The office is staffed 24 hours a day, 7 days a week, and 365 days a year by a team of 26 meteorologists, hydrologists, electronic technicians, hydrometeorological technicians, and administrative assistants, under the direction of the Meteorologist-In-Charge, Christine Riley.