



Surprise! What a Spring!

Ryan Sandler, *Warning Coordination Meteorologist*



**Summer began on
June 21st at
2:13 am PDT.**

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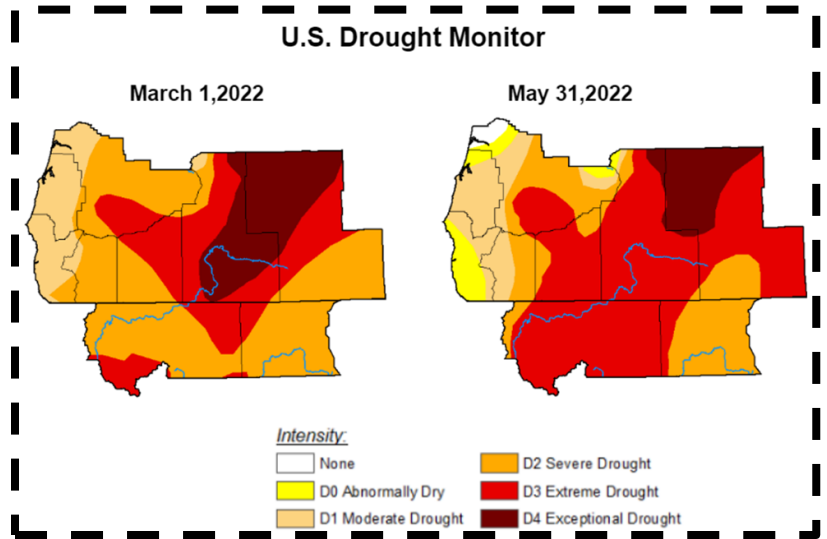
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Sometimes, surprises are a good thing. The weather this spring was probably welcomed by many because it came during a severe drought. Keep in mind that meteorologists define spring as March through May. Let's take a look at the temperatures this past spring for the City of Medford which has 112 years of record-keeping. Temperature-wise it was a couple of degrees cooler than average for Medford but it probably felt colder than that because the previous spring of 2021 was so much warmer and sunnier.

The real difference was rainfall in the valleys and snowfall in the mountains. It was wetter than normal with so much snow in the mountains in April that the snowpack grew when it normally melts. At the beginning of April, there was only 38 inches of snow on the ground at Crater Lake National Park. The snowpack peaked on April 13th at 87 inches and by the end of April, it was still as high as 62 inches.

On the maps below you can see that although drought was still widespread across the region, it had improved, especially near the coast and in Douglas County. In addition, further improvements occurred during the first half of June as above-normal precipitation and cool temperatures continued.

The only exception to this was across parts of Siskiyou County, California which did not receive enough spring rain and snow to make up for an extremely dry winter.



You might be wondering if a cool spring can be related to a cooler than normal summer. Just your luck, our meteorologists have been hard at work figuring this

out. Looking at Medford, when April and May are cooler than normal, the summer months of June, July, and August also tend to be cooler than normal. So far, June has been staying true to form, but we will have to wait to see how July and August turn out. I know what you're thinking, what about rainfall? Well, there was no statistical relationship between April and May rainfall and the summer rainfall amounts.

As of this writing (6/16/22), Medford had not reached 90 degrees yet and the 7-day forecast was not showing a high near 90. The 8-14 day outlook, which runs through the end of June, showed a tilt toward cooler than normal temperatures. If that held true then was possible that Medford's first 90-degree temperature didn't occur until July! However, as the weather quickly turned warmer on the 21st, and Medford did reach its first 90-degree day, followed quickly by the first 100-degree day on the 25th. Just for some climatological context, the all-time record for the latest 90-degree temperature in Medford is July 4th. After multiple hot summers in a row, I think most people would consider it a pleasant surprise to have a cooler summer.

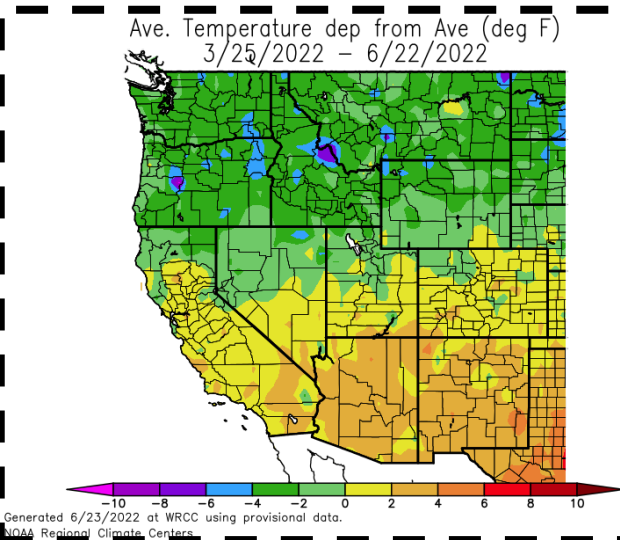
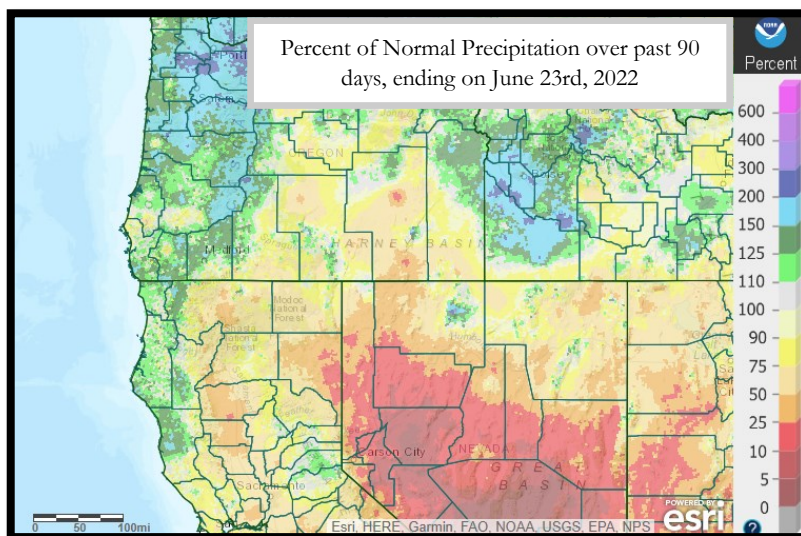


Drought Update & Fire Season Outlook

Brett Lutz, *Lead Forecaster*

Fire Season & Drought Update:

The 2022 Fire Season was declared by the Oregon Department of Forestry's Southwest Oregon District on June 1st. Fortunately, plentiful spring precipitation over the northwestern portion of the forecast area, indicated by the figure to the right, combined with cooler than normal temperatures across all areas (see image below) have kept fire danger mostly low to moderate across the Medford, Oregon NWS forecast area, thus far. Purely based on climatology, however, we know that the hottest and driest months of the dry/fire season are ahead of us. Also, the long term drought of recent years yields plenty of concern for the ability for vegetation to dry out quickly such that it's receptive to carrying fire. So, how is the 2022 Fire Season looking? Here's our latest perspective on that.



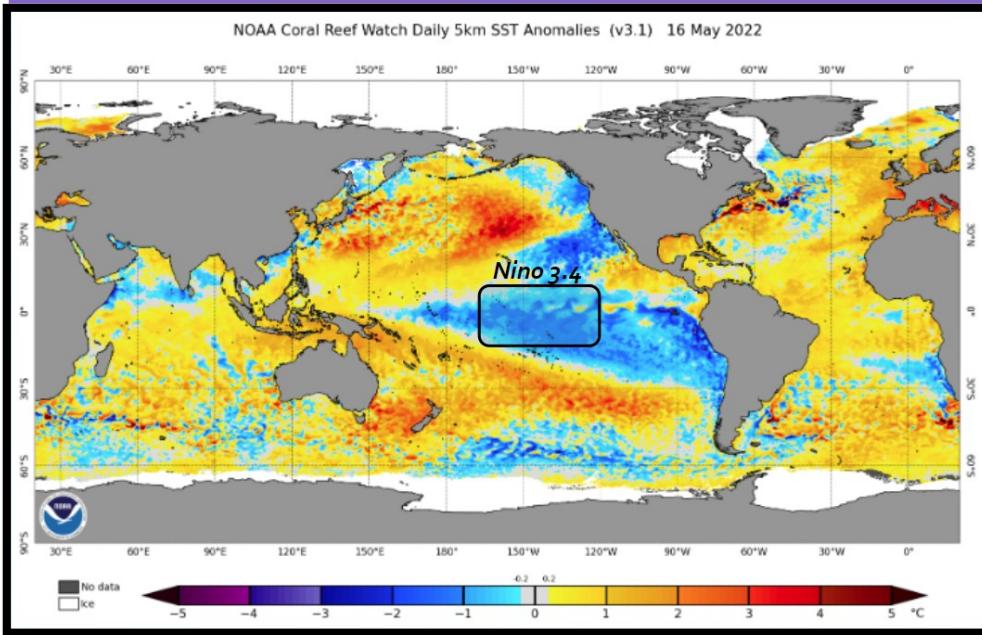
First 90 degree Fahrenheit Day at the Rogue Valley-Medford International Airport:

Our records for Medford go back to 1912. That's 110 years of records! On June 21st we reached 90 degrees Fahrenheit for the first time this year. The average first date of reaching 90 is currently May 24th. The last time it took this long or longer to reach that temperature threshold was 2010, when it took until June 24th. In 1953 it did not reach 90F in Medford until July 4th. In addition to the 1953 date, there have only been 8 other years when it took until June 21st or later to reach 90F in Medford. Those years were 1921, 1942, 1964, 1971, 1980, 1981, 1998, and 2010.

Why Does This Matter?

Correlation does not always equate to causation. However, if we look at years within the past 20 years when it took until June for Medford to reach 90F, they were all light fire seasons: 2019, 2011, 2010, and

2002. That's likely because cool springs usually come with healthy precipitation amounts that result in a shorter period of time when vegetation is dry enough to burn out of control. Also, the patterns that result in cool and wet springs often repeat, usually to a lesser degree, through the summer. So, low pressure troughs in the spring often result in at least periodic cool



downs going into the summer. 2002 is notable in that it reached 90 for the first time on June 11th, well sooner than this year. It is also the exception to the “light fire season” because of the infamous Biscuit Fire, which burned nearly 500,000 acres, and began on July 12th during a lightning storm and was not declared fully contained until December 31st.

Is La Nina Playing a Role In Keeping Us Cool?

As of this writing, we were still experiencing La Nina conditions in the equatorial Pacific Ocean, meaning that sea surface temperatures (SSTs) in an area known as the Nino 3.4 Region remain more than 0.5 degrees

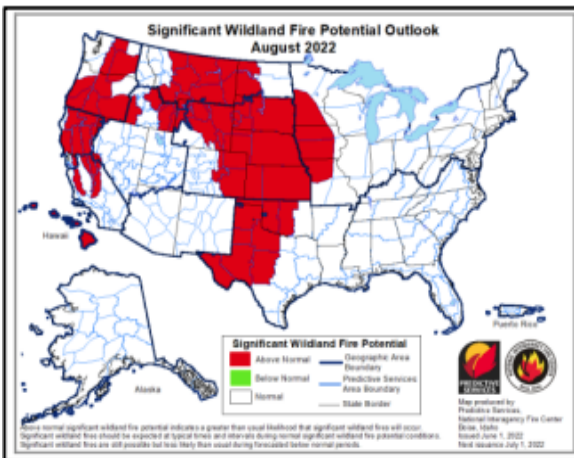
Celsius cooler than normal. This usually equates to stronger than normal high pressure in the Gulf of Alaska during the winter and spring months, resulting in more northwesterly flow over the Pacific Northwest from the colder waters of the Gulf of Alaska, especially along and near the coast. On average, La Nina summers tend to be near to cooler than normal across the northwestern portion of our forecast area, generally for our southwestern Oregon areas west of the Cascades. The colder than normal waters also presently to our northwest can also help to keep us cooler when the wind blows from there, which it often does during the summer due to semi-permanent high pressure offshore, known as the North Pacific High.

What About the Ongoing Long Term Drought?

Cooler and wetter conditions this spring have lessened drought conditions across the forecast area, but have helped to grow a lot of fine vegetation, such as grasses and weeds. Locations in the northwestern portion of the area, such as Coos and Douglas counties, have received much more of this cool and wet weather than areas to the south and east. Areas in, around, and especially south of Mount Shasta City, CA have not seen much in the way of improvement. The latest official US Drought Monitor is pictured right.

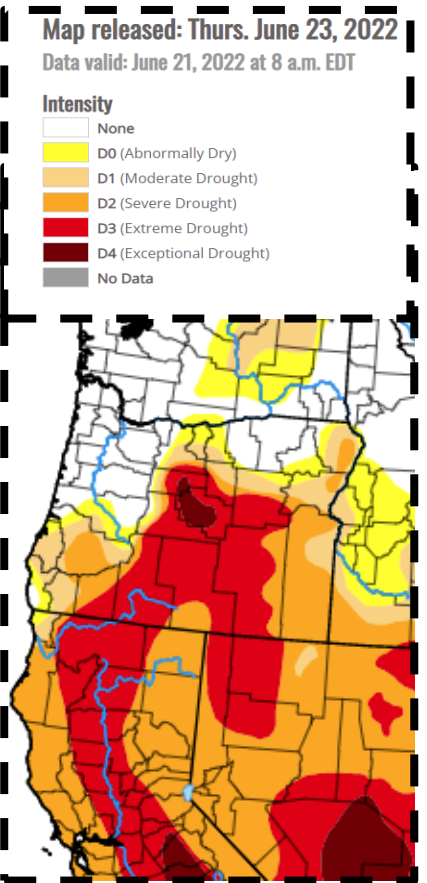
What is the Latest Fire Season Outlook, then?

A look at recent years with similar climatic signals indicates that July and August are likely to be warmer than normal from about Medford, OR southeastward. Predictive Services is still expecting above average fire activity across our area this summer, especially

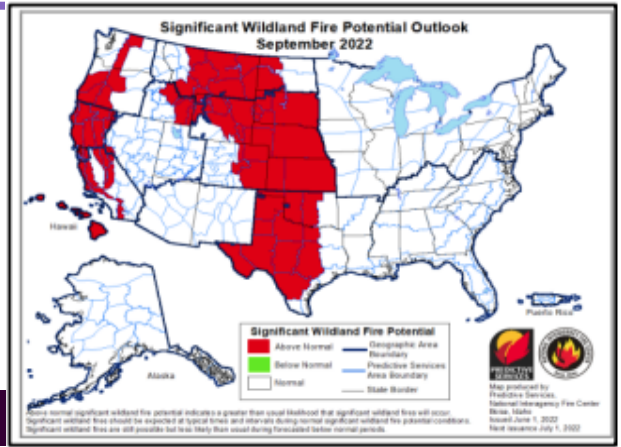


in August (left) and September (next pg.). This makes sense due to the fact that the fairly wet spring has grown a lot of fine fuel (grass, weeds, and brush) that will dry out once its life cycle is over and we get later into summer. Fine fuel can carry fire from one place to another quite easily, to the larger dead material on forest floors and, eventually, to the trees.

Overall, due to the ongoing La Nina and drought conditions, as well as the colder than normal SSTs offshore, the likelihood of significant fire activity along and near the coast is lower than over the more parched and fire prone southeastern portions of the forecast area. So, the potential for fire and high severity wildfire this fire season is greater the further south and east one goes from the coast.



All that said, ultimately, fire season severity is mostly driven by the timing, duration, and intensity of precipitation events, lightning, heat waves, and wind events. All of these parameters are difficult to predict beyond a week in advance. Therefore, given the potential for this fire season and its unknown outcome, we encourage everyone to prepare for this fire season by developing their own evacuation plans and doing what they can to create defensible space around their home. That way, if fire does threaten your home, you're more likely be able to leave at a moments notice and, therefore, stay safe. Visit www.weather.gov/mfr/wildfire for safety and prevention tips.



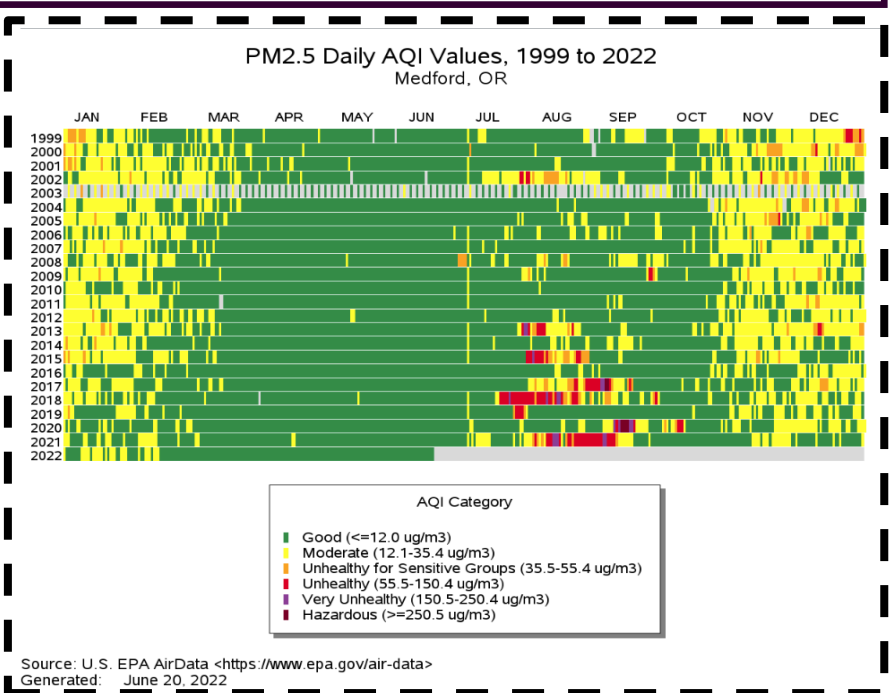
Preparing for Wildfire Smoke

Roberta Thornton, *Administrative Assistant*

Southern Oregon has always experienced wildland fires and smoke. It's a good idea to be prepared. The past few years have been particularly difficult. Since 2013, the number of days with unhealthy air quality during the summer months due to wildfire smoke has dramatically increased. Wildfire smoke during the year 2021 produced 29 days of poor air quality that was considered Unhealthy for all groups.

Everyone should avoid breathing smoke if at all possible. In addition to irritating your eyes and throat, the small particles can cause headaches and bronchitis. Smoke has severe consequences for people with chronic heart and lung disease, as well as older people and children.

Start by checking air quality every day:
 => Oregon DEQ - [Interactive Maps](#)



Example of box fan with filter attached. It's important to be sure the arrow on the filter is pointing toward the fan.

=> U.S. Environmental Protection Agency's Air Quality Index (AQI) - Enter your location @ AirNow.gov
 When inside your home, there are some things you can do to keep indoor air as clean as possible. Close all windows and doors. If you have an air conditioner, run it with a clean filter, but remember to close the fresh air intake. Refrain from frequent vacuuming as vacuuming can stir up particles inside your home.

This video demonstrates how to convert a box fan into an effective air filter: <https://www.pscleanair.gov/525/DIY-Air-Filter>

If you decide to purchase masks, it is not recommended that you use paper dust masks as they are not designed for smoke. Before buying, do a little research about which masks are designed to protect from small particles.

- [EPA: Protect Your Lungs from Wildfire Smoke or Ash](#)

After the Flames—The Hidden Dangers of Wildfire, Part 1

Spencer Higginson, *Service Hydrologist*

I was 9 years old in 1988 when the wildfires were raging through Yellowstone National Park. Almost 800,000 acres of Yellowstone burned that year. As a child, I pictured a landscape devoid of...well, everything. I pictured 800,000 acres of ash. I pictured a scar where nothing could live for decades. Thankfully, I was way off base.

As a wildfire burns, the perimeter of the fire is tracked and everything within that perimeter is added to the number of acres burned. This usually includes even large islands of unburned areas within the perimeter. If the unburned island is large enough, it may be subtracted from the total. When a wildfire burns, it can be very erratic. Fire behavior is very dependent on daytime and nighttime temperatures, humidity, fuels available, terrain, winds, land use, management practices, etc. Some combinations of these elements lead to devastating fire behavior (high severity burn; all organic material except large trees consumed, white ash) while other combinations lead to minimal change (Unburned or Low severity burn; minimal ash, organic material remains) or even beneficial improvements to the forest. In some areas the fire will consume most of the fuel available, leaving almost a moonscape feel to it. Other areas you may have a hard time even recognizing that the fire passed through. And of course, you'll find everything in between.



High severity burn where only large trees remain, all other organic material was consumed and a deep layer of white ash remains

Another misconception I had about wildfires is that the threat from the wildfire went away as soon as the final flame was out. We've all seen the fires that have torn through towns over the last few years. We've seen this happen in the Rogue Valley and in several river valleys along the I-5 corridor in Oregon, as well as several towns in northern California. People are still reeling from the aftermath of fires in these areas. The fire is the most visible, immediate, and unpredictable threat from a wildfire and there just isn't much an individual can do to stop it once the fire is on its way. Because of this,

there is certainly great relief in having a fire declared "out." Unfortunately, there are other threats that remain, even once the fire is out. Most people don't understand the threats after a fire and they let their guard down. In many cases, however, the danger is far from over.



Unburned/Low Soil Burn Severity; most organic material intact

Fires can dramatically change the landscape in appearance but also in hazards and in function. Some of the life and safety hazards after a fire include:

- ⇒ Hazard trees - trees that are partially burned and are no longer stable and at risk of falling.
- ⇒ Stump holes - holes left by stumps and roots that have completely burned away; usually full of ash so they are difficult to see.
- ⇒ Water quality - ash and debris in runoff but also heavy metals that can be washed into streams after the soil has been burned.
- ⇒ Flash flooding - much quicker/higher runoff response than pre-fire conditions.

- ⇒ Debris flows - rock and sediment flowing due to instability in the soils caused by the fire.
- ⇒ Roads - Roads can become unstable if tree roots burn out under a road or if an increase in runoff and debris clog culverts and cause erosion on road fill. Driving in or downhill of a burn scar can be dangerous as there can be an increase in debris rolling off of hillsides. Trees can fall across a road creating a risk for fast-moving vehicles, or even a risk of

trapping motorists if the tree falls behind them on a single-access road. *Cont. on next pg.*

There are numerous other challenges after a fire that are not necessarily life and safety threats. Many of these issues are on a much larger scale than individuals can manage on their own.

Always be careful and attentive when you enter an area impacted by wildfire. Be especially careful when there is wind and rain as these weather conditions can cause additional problems in a burn scar.

So how are the post-wildfire risks and dangers managed after the fire is out? Watch for part 2 in the next edition of the Crater Chronicle, coming in the Fall.

National Weather Service Medford Visits Klamath Regional Airport

Christine Riley, *Meteorologist in Charge*

The National Weather Service supports local airports in a variety of ways, including specialized warnings. An airport weather warning is issued when sustained winds or wind gusts are expected to reach 35 knots or 40 mph. These warnings are also issued at the Medford airport if an inch of snow is expected, or a half inch of snow at the Klamath airport.



In late April, forecaster Mike Petrucelli and I had the opportunity to visit the Klamath Regional Airport. The purpose of the visit was to update our agreement with the airport regarding the Airport Weather Warning, or as the forecasters like to refer to it, the AWW. In addition to updating our agreement, we met with the Airport Operations Manager and discussed how they receive their weather information and what action they take based on various weather conditions.

The highlight of the trip was a special detour to the runway where we were able to watch F-15s take off as part of a daily exercise. What a thrilling experience to be so close to these incredible jets! If you don't believe how close we were, take a look at the picture above.

On a personal note, I've had a passion for aviation since working as a forecaster at the National Weather Service office in Monterey, CA which served 7 airports, including San Francisco International Airport (SFO) and San Jose International Airport. While in Monterey I was able to watch an Airbus A380 land from the SFO tower, plug in with air traffic controllers, visit United headquarters in Chicago IL, and visit the FAA Command Center in Warrenton,VA. One of my favorite moments was providing weather support for air traffic during Super Bowl 50. It was my first work trip after having my oldest son, seen here at 5 months old, dressed up for the event (pictured right).

I'm happy to continue staying connected with the aviation community as part of my job at the NWS in Medford. It also helps earn me cool mom points for my two boys!



Just Give Me the Lat & Lon

Miles Bliss, *Forecaster*

One of the tools we have to track rainfall is the Fischer Porter, commonly used by our COOP observers. This device measures the rainfall by the weight of the catch bucket, as it rests upon a metallic bar that bends with increased weight. The weighing sensor is very sensitive and can detect changes of one hundredth of an inch of precipitation in a matter of several seconds. This rain water gets held in a basin until it can be serviced and the rainfall data collected.

At the start of each month an NWS employee goes out, collects the rainfall data from the gauges, and the basin is emptied. In some cases, as with the gauge known as 15 miles NE of Tiller, Douglas County, it is simpler for us to be given a latitude and longitude than a set of directions because of the gauge's remoteness. This is just the way I like it, a small adventure to break up the monotony of sitting at a desk.



This little adventure involved visiting a gauge that is located in a mountainous area at the southern end of the Umpqua National Forest along the Umpqua divide (site and observation equipment pictured above). The scenic drive up takes you through heavy timber until a clearing opens up with a small creek babbling through it. Along the way deer, squirrels, birds, and wildflowers were abundant.

As a forecaster, visiting our rain gauges allows us to connect with the real time conditions the area is experiencing, leading to greater levels of situational awareness. It also allows us to simply get out of the office. This site in particular had been saturated by recent spring rains and it almost felt humid as clouds continued to develop along the ridgetops.

Jess Valley Observations Are A Family Affair Again

Tom Wright, *Observation Program Leader*

Jess Valley, CA is a lush valley in the middle of the Warner Mountains in an otherwise arid eastern Modoc County. NWS Medford has maintained a Cooperative Observation Station in the valley for over 90 years. For the majority of those years, the observations have been taken by the same family.

Walter Cantrall began taking observations in Jess Valley in November of 1929 under the California Division of Water Resources and continued until 1973. Mr. Cantrall maintained a nearly perfect observation record for his entire tenure, and during this impressive run of service, he observed some dramatic weather with temperatures ranging from -33°F to 105°F, numerous blizzards, floods, thunderstorms, wind storms, and heavy rain and snow. In recognition of his tireless efforts and dedication, Mr. Cantrall received the prestigious John Campanius Holm Award in 1967.

After Mr. Cantrall's death in 1973, the observing duties were taken over by his grandson, Randy Christensen. Not to be



NWS COOP Observer Randy Christensen
Photo by NWS OPL, Tom Wright - June 23, 2022, Jess Valley, CA

outdone by his grandfather, Mr. Christensen continued the fine tradition of nearly perfect observing for the next 23 years. He saw temperatures that ranged from -28°F to 98°F as well as a combined total of 35 feet of rain and 121 feet of snow! And those were just the official observations - he tells stories of temperatures as low as -40°F in the valley and crippling snow storms which forced him to walk miles to and from his truck.

Mr. Christensen moved into town to make it easier for his five children to attend school, at which time, the observations were taken up his neighbor, Mr. Duane McGarva. Mr. McGarva kept with the high standards set by his predecessors for over two decades and was instrumental in maintaining the valuable climate

record of Jess Valley.

But the Cantrall/Christensen legacy isn't over yet. On June 16, 2022, Mr. Chistensen took up the torch of weather observing in Jess Valley again.

NWS Medford cannot thank volunteers like these enough. It is through their selfless efforts that we are able to get weather information from very remote, data-sparse locations within our forecast area. Thank you to them and to all the volunteers who help to monitor our nation's climate! We couldn't do it without you!

Communicating Uncertainty

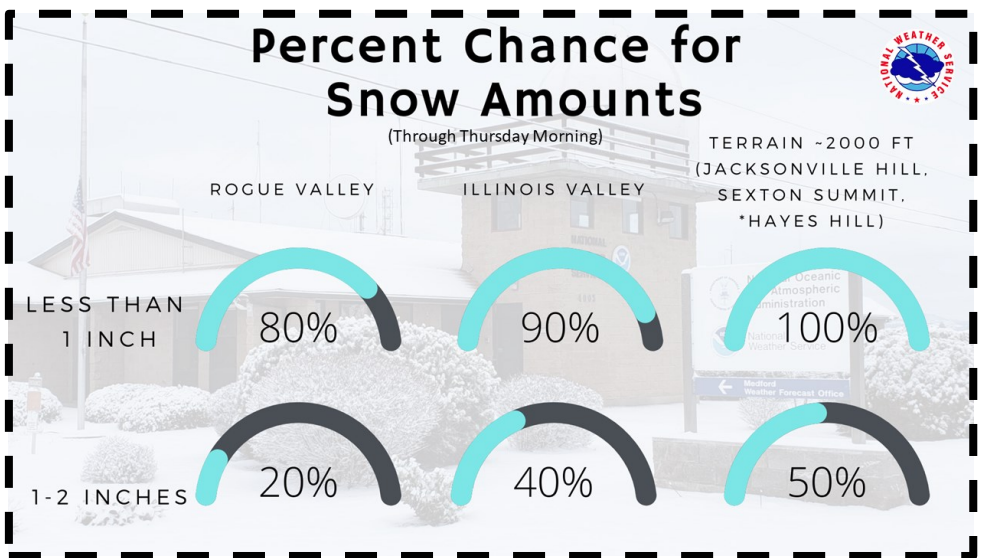
Mike Stavish, *Science and Operations Officer*

Since at least 1974, countless studies have demonstrated that the best way to provide valuable information to the users of weather forecasts is to effectively communicate probabilistic information. (NOAA STI Jan 2022)

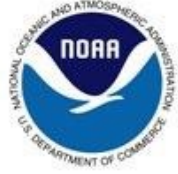
Hence, the National Weather Service has been shifting gears in how we communicate weather information and the role of the meteorologist is gradually changing. As the number and skill of weather computer models continues to increase, forecasting the weather has largely become a data management challenge. We are no longer hung up on trying to “out-forecast the model” in order to provide our customers with the best forecast. The new vision of the local NWS meteorologist is a skilled professional who manages and interprets a multitude of ever-increasing meteorological data and synthesizes it into intelligent forecast messaging in terms of probabilistic information for key stakeholders and the public.

For instance, we can give probabilistic ranges of accumulating snow or rainfall. Instead of saying that “rain is likely today,” we can instead state that there’s a 70 percent chance of getting 0.05”, and a 50 percent chance of getting 0.20”, and perhaps, that there’s a 20 percent chance of a half an inch. This data may not be useful to everyone, but it certainly is for some, and those folks may have significant investments at stake. Consider also ranges of snowfall, or wind gusts, minimum daily temperatures, or the chance of a severe thunderstorm.

Using clear, concise and consistent wording with explicit probabilistic information, in addition to providing innovative graphical forecasts communicating the same context, we are making headway into increasing the value of our forecast for a variety of users. The example shown to the right was previously used to communicate snowfall ranges.



NATIONAL WEATHER SERVICE - MEDFORD, OREGON



National Weather Service
Medford Weather Forecast
Office
4003 Cirrus Drive
Medford, OR 97504-4198



Phone: (541) 773-1067
Email: ryan.sandler@noaa.gov

Newsletter Editor:
Misty Firmin, Meteorologist
Email: misty.firmin@noaa.gov

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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, hydro-meteorological technicians, and administrative assistants.

