National Weather Service - Medford, Oregon

Fall 2023
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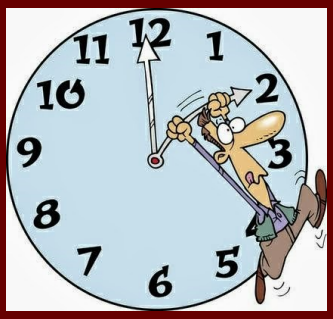
The Crater Chronicle

Fall began September 22nd at 11:50 pm PDT.



Daylight Savings Time ends November 5th!

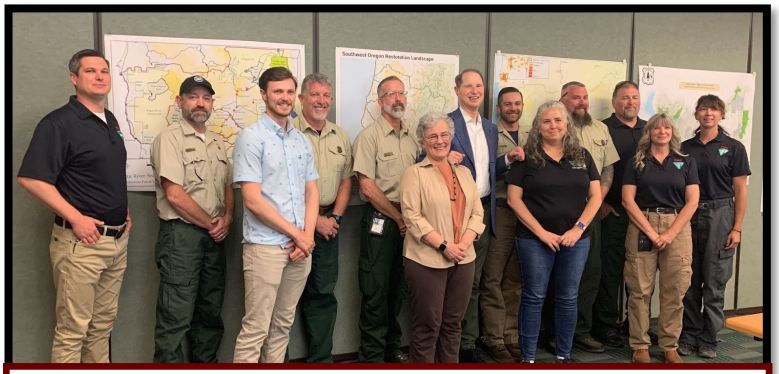
Remember to set your clocks back one hour!

Inside This Issue

Lightning and Preseason Planning

Miles Bliss, *Forecaster*

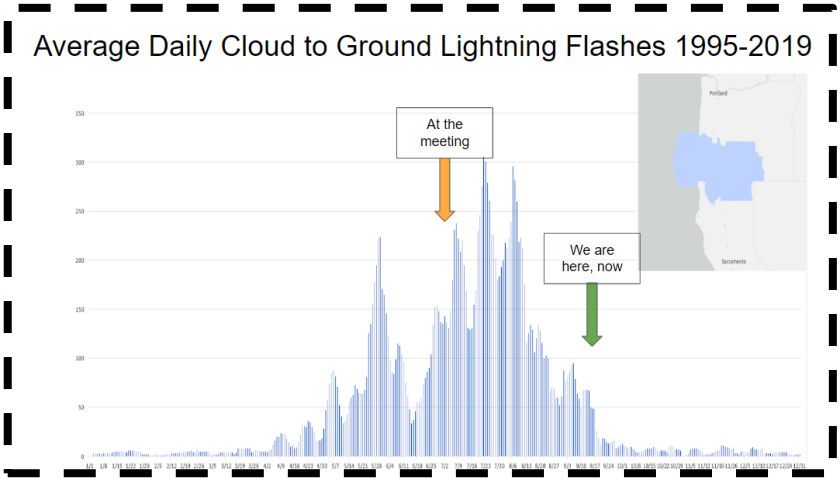
A healthy winter helped to keep the start of the 2023 fire season quiet from a weather perspective. After a summer with another record setting heat wave and extratropical remnants firing off thunderstorms day after day, the fire season made itself present. Before this, however, a multi-agency meeting was organized to help make sure everyone was ready. Even Oregon Senators Wyden (who attended in person) and Merkley joined in the discussion as well.



Employees from ODF (beige shirts) and BLM (black shirts) as well as a representative of local forest conservationists pictured with Senator Wyden and Miles Bliss (NWS Medford)

The NWS Medford office provided an update on the weather and what the season might look like going forward. The region, denoted by blue in the upper right corner of the graphic below, was just entering the seasonal peak in lightning activity when this meeting took place. We discussed how a change from a La Nina pattern to an El Nino pattern would play into the looming lightning impact. As expected, lightning did play a critical factor in the presence of fire on the landscape.

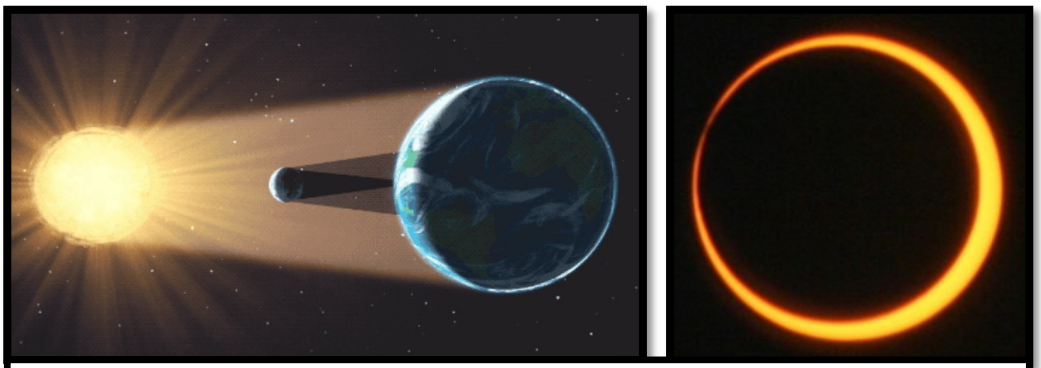
Having a weather ready nation means planning ahead, and when weather predictions lose precision beyond a ten day time frame, alternative information sources must be used. Often, this means relying on climatology to inform us of the possibilities going forward. For lightning going forward, marked by the green arrow, Autumn marks a significant downward trend in activity.



Are You Ready for the Annular Solar Eclipse on October 14th, 2023?

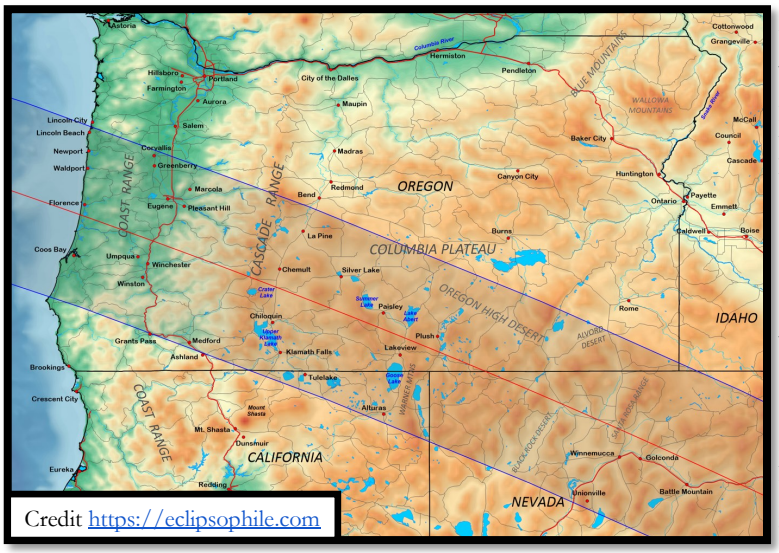
Mike Stavish, *Science Operations Officer*

What is an "annular" solar eclipse? An annular solar eclipse is when the Moon passes between the earth and the sun, but at a point when the Moon is near its farthest point from earth. As a result, from the perspective of those in the Moon's shadow on earth, the Moon appears as a dark disk on top of a larger, bright disk, creating what looks like a ring around the Moon. This has been referred to as "the ring of fire."



An annular solar eclipse occurs when the Moon passes between the Sun and Earth, casting a shadow over parts of Earth, blocking most of the face of the Sun for observers in those locations (left). From the observer's perspective (right). Credit: NASA's Goddard Space Flight Center.

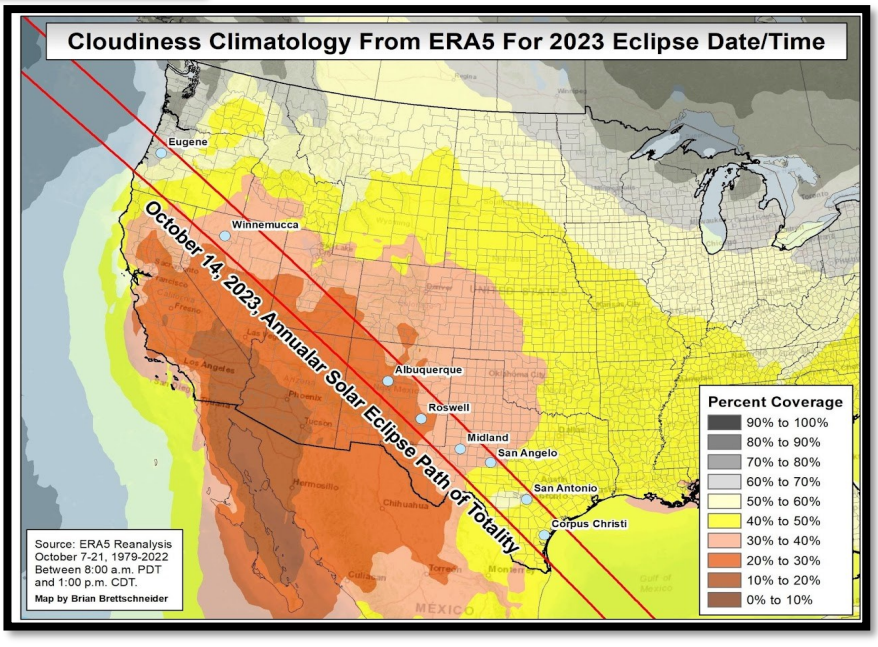
How will this differ from the total solar eclipse that occurred in August of 2017? During a total solar eclipse, people in the center of the moon's shadow on earth experience a total eclipse where the sun is completely blocked. However, in this case, the Sun's corona, or outer atmosphere, can be visible.



Credit https://eclipsophile.com

Pictured left is a schematic showing how the Moon's shadow will travel across our region on October 14th. The darkest region will be along the path indicated by the red line as the Moon's shadow moves from southeast to northwest. As you progress outward from the red line, the percentage of the sun that will be blocked decreases. Areas within the blue lines will still experience the moon fully within the sun with a visible "ring of fire."

One question people are concerned with is, "What will the weather be like and is it possible we won't be able to see the eclipse due to clouds?" For the period of October 7th through the 21st across southern Oregon and Northern California, the total cloud cover typically ranges from 40 to 60%, with the lesser likelihood of cloud cover occurring south of the Umpqua and east of the Cascades (see below). In general this means that there is a 40 to 60 percent chance we'll have some cloud cover that may obscure the view of this eclipse. This cloud cover may or may not necessarily be associated with precipitation - i.e. low clouds and fog could be the culprit with lesser clouds affecting the higher terrain views of the sky.



In order to get the best forecast for viewing the eclipse, stay tuned to the National Weather Service forecast at weather.gov/mfr and head for the least cloudy areas. At the time of this writing, the forecasts for the eclipse are still very uncertain. Remember to never look directly at the sun as this can cause severe eye injury. To look at the eclipse you must look through safe solar viewing glasses or a safe handheld viewer. ***Regular sunglasses are not safe for viewing the eclipse!*** Please reference: https://solarsystem.nasa.gov/eclipses/2024/apr-8-total/safety/ for additional advice and resources.

Another Record Hot Summer

Alexis Hermansen, *Forecaster*

It was another warm summer, and we've got the details to show it! First, however, we need to explain how we at the NWS categorize meteorological seasons. For many, people wonder why meteorologists say a new season starts before the date that you usually see on the calendar. Simply put, we run on our own time!

Astronomical seasons (what we see on the calendar) are determined by the equinoxes and solstices that occur once a season. Equinoxes occur in the fall and spring while solstices occur in the summer and winter, and they vary year to year. For meteorologists in the northern hemisphere, we simplify the seasons by going at the start of a month. This makes our data and records straight forward with specific start and end times. Meteorological summer always begins June 1 and ends August 31.

2023	Astronomical Seasons	Meteorological Seasons
Spring	March 20	March 1
Summer	June 21	June 1
Fall	September 23	September 1
Winter	December 21	December 1

With that settled, we can begin looking into how this summer turned out. This summer in Medford is now the third warmest when comparing average temperatures from June through August. The bottom left image shows the top 10 records for average temperatures since 1911 with 2021 topping the list.. A quick review of these numbers shows that the past three years are within the top 5 warmest summers on record. To note, 2022 is tied for fifth place with 2014 for an average temperature that is just below 75 degrees. Looking further, this shows that nine out of the 10 warmest summers have occurred in the past two decades.

Average Temperatures June-August		
#1	2021	76.8°
#2	2015	76.4°
#3	2023	75.6°
#4	2017	75.5°
#5	2022	74.9°
–	2014	74.9°
#7	2013	74.0°
#8	1967	73.9°
#9	2016	73.8°
#10	2003	73.7°

Breaking down the summer into each month (June, July, August), August 2023 has become the second warmest August on record with an average temperature of 78.4 degrees, just 0.6 degrees behind 2022. July 2023 ranks as the fourth warmest month, averaging 78.7 degrees.

The brunt of the heat was in mid-August where triple digit highs were found from August 13 through August 16. The warmest day was August 14 at 111 degrees, and this now sits as the warmest high record for the day. Low temperatures were between 69 and 75 degrees for the same period. The warmer mornings combined with the hot afternoons led to temperatures averaging in the upper 80s and low 90s.

Halloween Weather

Ryan Sandler, *Warning Coordination Meteorologist*

When I was a kid, Halloween was my favorite holiday but it had nothing to do with weather. It had everything to do with getting free candy by simply pressing a doorbell or knocking on a door. Back then we used pillow cases to maximize how much candy we could carry and traded candy bars with our friends. As an adult, my Halloween fun is giving away candy but now I worry about the weather for trick-or-treaters. As a meteorologist, that got me thinking about the climatological conditions on Halloween like the chance for receiving at least measurable rain (0.01") as well as the range for coldest and warmest Halloween temperatures.

As you can see from the chart below (data since 1980), the odds are good that it won't rain on trick-or-treaters especially when you consider that most of the trick-or-treating occurs for just part of the day, between 5 and 9 pm. Of course, there is more to Halloween weather than just rain. What about temperatures? Also listed in the chart below are the coldest, warmest, and normal high temperatures on Halloween since 1980. Typically, cool weather was prevalent, but there have been some milder days.

	Chance of Measurable Rain (=<0.01")	Coldest High Temp/Year	Warmest High Temp/Year	Normal Temperature
North Bend	58%	52°F / 2003	68°F / 1980, 1989, 2008	60°F
Roseburg	49%	45°F / 2006	75°F / 1993	60°F
Brookings	45%	53°F / 1988	74°F / 1993	61°F
Medford	30%	44°F / 1998	75°F / 2015	61°F
Mt Shasta City	24%	43°F / 2003	71°F / 2020	58°F
Klamath Falls	23%	40°F / 2003	67°F / 2022	57°F

For southern Oregon and northern California, Halloween is close to the dividing line between the wet and dry seasons. Temperatures are falling fast and nights are getting longer. I think this holiday is just what is needed to keep your "spirits" up before winter takes hold.

Airglow

Danny Schmiegel, *Summer Pathways Student*


Picture courtesy: Andre Hagested

The horizon of the photo pictured to the left seem to be showing an atmospheric optical phenomena called "Airglow". Airglow, first described scientifically in 1868, can occur at three different times. There is *dayglow, twilightglow, and nightglow*. Dayglow is technically the brightest, but the sun is brighter so it is overpowered by sunlight. Nightglow, which I believe has been captured with this picture, is when the "glow" is brighter than the stars and appears around 10º above the horizon line.

I hope this is a good "what", but here's the "how". Nightglow is specifically the end result of a process called *Chemiluminescence*. This long word essentially describes the following: during the day, the sun beats down on the upper atmosphere which is 60-200 miles above the Earth. The powerful ultraviolet radiation from the sunlight reacts with molecules containing nitrogen and oxygen, the two most abundant elements in our atmosphere, and breaks them apart. As the sun sets beyond the horizon, these molecules start to rebuild themselves. As they rebuild, they give off light. This light is *EXTREMELY* faint, which leads to the glow appearing on the horizon where there is more atmosphere available to see. The Chemiluminescence process is unique to nightglow. Dayglow and twilight glow are more focused on resonant and fluorescent processes, but those are a whole different beast in and of themselves.

Different colors of airglow are caused by the chemiluminescence of differing elements. This picture shows a mix of yellow and red glow which is most likely caused by reactions with oxygen/hydroxide (red) and sodium (yellow).

Another important thing to note is how airglow is different from the auroras borealis. Aurora Borealis is caused by solar wind, creates distinct structures of light and is primarily in the higher latitude regions such as the Arctic/Antarctic regions. Airglow is a global phenomena, caused by solar radiation, and is more uniform in its luminosity. Glowing lights are not unique to the North; it can be seen right in our backyard of Oregon, it just takes a little effort and patience.

Tanker Base Tour

Roberta Thornton, *Administrative Support*

In August, staff from the NWS Medford forecast office were invited to tour the US Forest Service Tanker Base. NWS meteorologists provide weather products that aid in the safe deployment of aerial suppression, air attack, and retardant drops.

The tanker base provides vital aviation support and collaboration among local, state, and federal agencies, covering a five county area (Jackson, Josephine, Coos, Curry and Douglas Counties) for the Oregon Department of Forestry (ODF). The base enhances initial attack and extended attack firefighting capability on all lands in Oregon and northern California, as well as providing Very Large Air Tanker (VLAT) support through the area.


NWS Medford meteorologists listen to VLAT pilots


NWS Medford meteorologists listen to VLAT pilots

The use of aircraft to drop fire retardant to suppress wildfires is an important wildland firefighting tool. Aerial supervision planes coordinate, direct, and evaluate air tanker operations. Air attack planes coordinate fixed wing and helicopter aerial firefighting over wildland fires. They provide vital eyes in the sky for firefighters on the ground and ensure safe aviation operations. Aerial supervision pilots and air tactical supervisors communicate with firefighters on the ground, other fire aircraft, and airtanker pilots. As a lead plane, they fly the line first to gauge safety, and release white smoke to show airtanker pilots where to drop fire retardant. Large Air Tankers (LATs) can deliver from 2,000 to 4,000 gallons of fire retardant to support firefighters on the ground. Very Large Air Tankers (VLATs) are capable of delivering over 8,000 gallons of fire retardant to support firefighters on the ground.

National Weather Service - Medford, Oregon

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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.