National Weather Service - Medford, Oregon

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The Crater Chronicle

Frigid Fun in the Sun

Spencer Higginson, *Service Hydrologist*

You guessed it! Time for another reminder about the dangers of cold water. Last year this reminder was sent out during a cold spell so maybe it seemed a bit out of place. We've already had a warm stretch this year, so maybe you've already pictured yourself enjoying some time at the lake or river or even in the ocean. No matter what body of water is calling you, enjoy it! The water is such a great place to have fun. It's especially great on those first hot days of the year. Just please face this season with caution. As we've said before, hot weather does not equal warm water; especially early in the season.

By Memorial Day, most of the rain has stopped, yet the rivers are running strong due to snow melt and frigid groundwater. As the season changes from winter to spring to summer, we welcome the warmer weather and the chance to get outside a little more. Sooner or later the forecast will call for temperatures in the 90s or even 100s. We will feel the call of the water. It doesn't take long to figure out that the rivers are still very cold!

You'd think that the cold water is ideal for cooling off on those hot days. However, cold water poses a serious threat of cold water shock or hypothermia. Cold water shock is when the body involuntarily gasps due to the shock of entering very cold water. If the person is submerged, the gasp draws the icy water into the lungs and drowning begins immediately. There is very little time to rescue the person as they often remain submerged leaving bystanders to wonder where they are and when they will surface. By the time they know something is wrong, it is usually too late.

Hypothermia comes on through prolonged exposure to the cold water. This can even happen on a hot, summer day. From the moment a person enters the water, their body heat is being extracted at a rate about 25 times faster than air. Organs will begin to shut down if they get

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Spring Began on March 19th at 8:06 pm PDT.

too cold so your body's natural response is to reduce blood flow to your extremities in order to protect your core temperature. With the reduced blood flow to your extremities, strength and dexterity are lost. Most of us have experienced this when our hands were exposed to cold temperatures and we then find we've lost much of our grip strength. This weakness makes it more and more difficult to swim and control your muscles. If exposure continues, the body will get to the point where they are incapable of self-rescue.

There are ways to protect yourself and those around you.

1. Wear a life preserver. Most people don't want to wear a life preserver when swimming and that is understandable. However, a life preserver is like a seat belt. It is far better to wear it and not need it than to not wear it and need it. Never attempt to rescue someone without a life preserver of your own. Ideally you should have your own life preserver and a floatation device for the other person.
2. If people are unwilling to wear a life preserver, have some sort of floatation device on a rope that can be thrown to a person in distress. Even a life preserver can be thrown to a person and the rope can be used to pull them to shore.
3. Take frequent breaks from the water to allow your body time to warm up. As soon as you notice any diminished grip strength in your hands, get out before it is too late. Pay attention to those around you and encourage them to take breaks; especially smaller children.

Enjoy the beautiful waters of southern Oregon and northern California. Take the precautions that will allow your time on the water to be looked back on with fondness and not with regret.

COOP Corner: Elk River Salmon Hatchery Earns 50 Year Award

Tom Wright, *Observation Program Leader*

Elk River Salmon Hatchery Staff, left to right: Josh Mayo, Jack Rees, Brenden Churchwell, Ryan Gertken, and NWS Medford Meteorologist in Charge Christine Riley

The staff of the Elk River Salmon Hatchery (ODFW) was presented the 50 year length of service award on February 15, 2024. Located along the scenic Elk River 5 miles east of Port Orford, OR, the Elk River Salmon Hatchery (officially known as Port Orford 5E) is the wettest official observing location in WFO Medford's forecast area (by far) and one of the top five wettest official climate sites in the entire western United States!

During their 50+ years, the staff of the hatchery have taken nearly 20,000 observations and missed only 423 times, which is a report rate of 99.97%. A virtually uninterrupted climate record like that is rare and very valuable. Nevertheless, the staff was incensed at the missing observations and wanted to know who was responsible!

Over the course of their stellar tenure, they've recorded over 525 feet of rain! Their wettest year was 2016/17 with 177.13 inches of rain, and in one day alone (Nov 19, 1996), they recorded almost a foot of rain (11.65 inches) - their wettest day on record.

At only 150 feet above sea level, the site receives very little snow. However, they have reported measurable snow 32 times with their heaviest one day total being 5 inches on Feb 13, 1990. Although subjective in nature, their biggest snowstorm was probably in January of 1972 when they recorded 7.5 inches of snow over a three day period, and snow remained on the ground for nearly two weeks.

The National Weather Service in Medford thanks them for their impressive record and dedication to the monitoring of our nation's climate!

Somewhere Over the Fog Bow

Marc Splide, *Meteorologist*

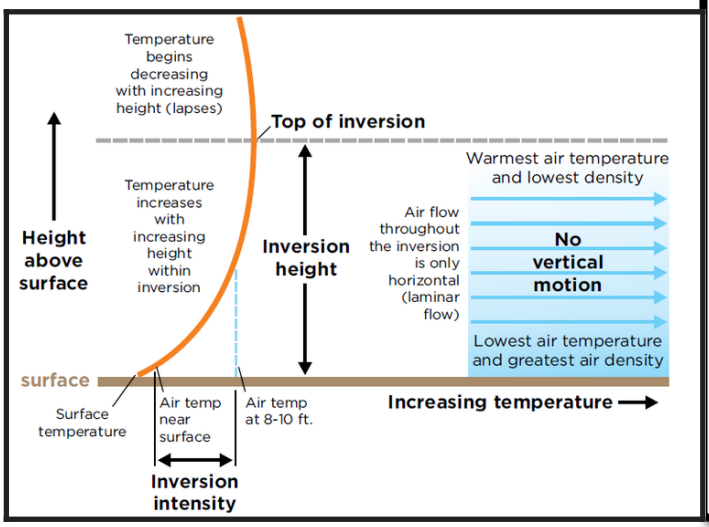
I find weather phenomena fascinating. On a pre-Christmas hike at Prescott Park, December 23, 2023, my family and I arrived at the parking lot around 10 am to begin a normal hike up Roxy Ann Peak. We were greeted by fog, which is a common occurrence for early winter. So, I wasn't surprised when we started out like this:

But, I wasn't prepared to witness a more unusual phenomenon a little later.

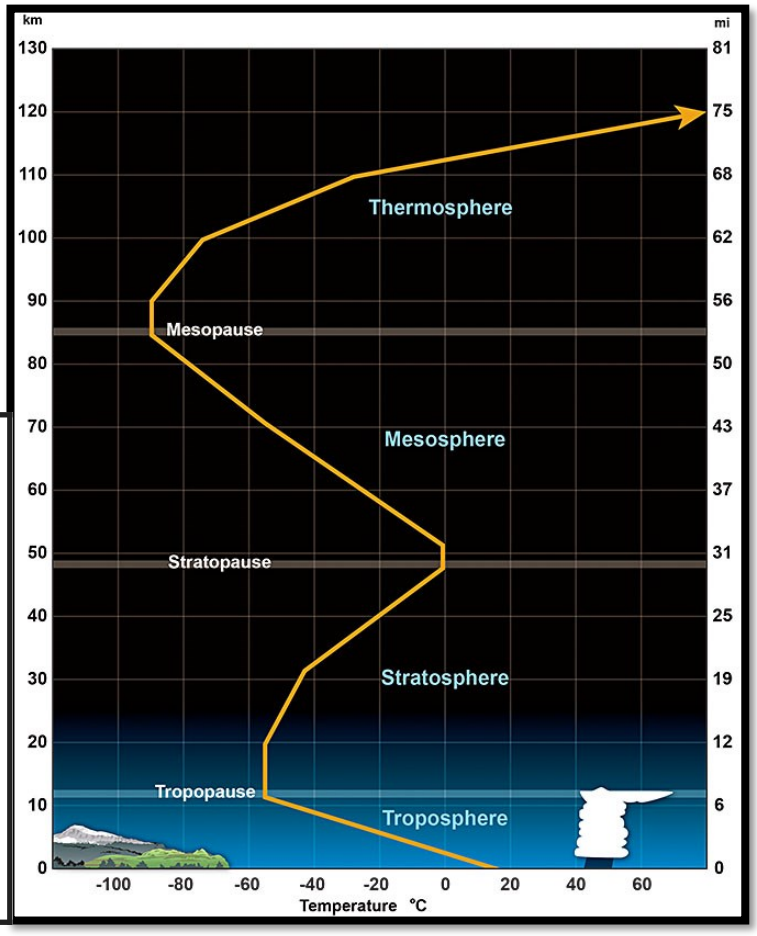
I like hiking to the top of Roxy Ann because it affords me the opportunity to see some truly amazing sights when the lower atmosphere is "turned over". What do I mean by "turned over"? In the lower atmosphere or troposphere (where most of our weather occurs), temperatures usually decrease with height (~6.5°C/km or 11.7°F/km) (see schematic bottom right), so the higher in altitude you go, the colder it gets.

However, the atmosphere sometimes becomes inverted when strong high pressure builds in. The sinking air allows for clear nights, and mostly calm winds closer to the ground. This, in turn, allows radiation to escape to space. As such, the cold air collects in the valleys, while surrounding higher terrain is comparatively warmer (ie - the temperature increases with height). We meteorologists refer to this as a temperature inversion.

The graphics below show what a temperature inversion looks like (left) compared to the "typical" atmosphere (right). *cont. on next pg.*

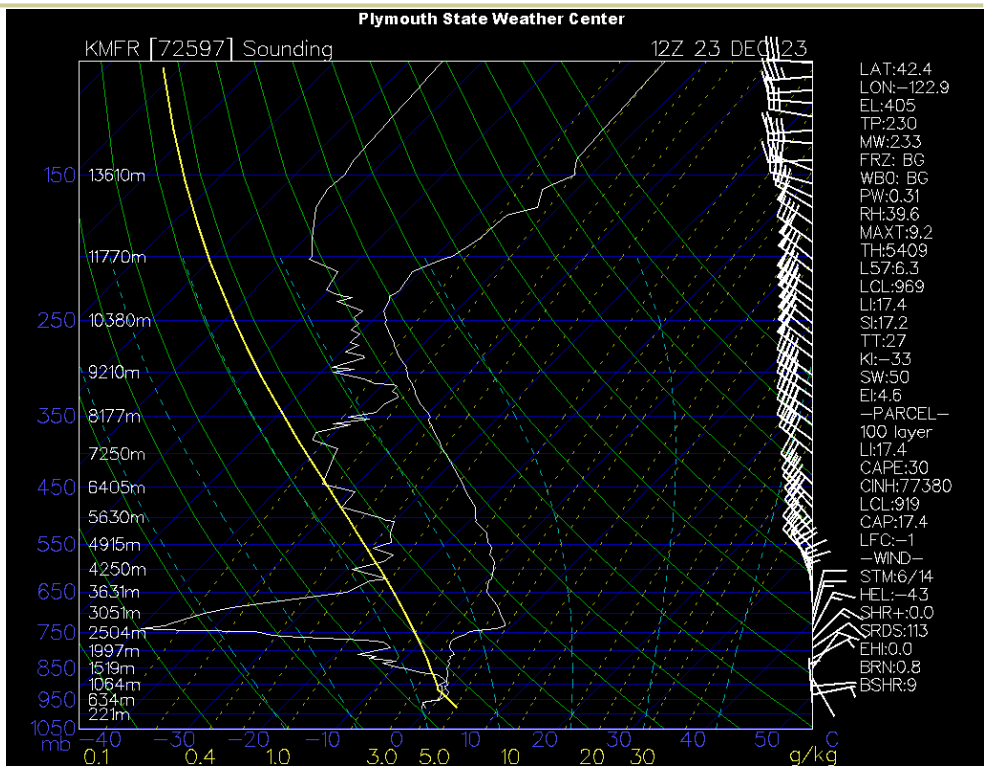


credit: North Dakota State University)



Depiction of typical atmospheric temperature profile (credit: NOAA)

The balloon observations taken here at our office in Medford (2x/day and 365 days/year) measure temperature, dewpoint (humidity), pressure and winds. The Skew-T diagram to the right is a fancy way of displaying the data. Temperatures (right-most white line) on the morning of December 23rd increased with height up to around 2500 feet (~750m), then slowly decreased thereafter with another noticeable inversion at around 8000 ft (2500m). The low-levels were very moist (saturated) with strong subsidence occurring at ridge level. Note the drying above 5000 ft (~1500m) and especially above 8000 ft (~2500m). The dewpoint (left-most white line) almost goes off the chart to the left which is very dry! So, again, with the moisture present in the low-levels, it wasn't surprising that we were met with fog that morning. In fact, there was very dense fog on the drive up to the parking lot!



After a few minutes of walking, we broke into an area of clearing (an area of drier air perhaps coming in at ridge level and about 6 hours after the sounding above was taken). With the sun behind us, we witnessed a fog bow:

Fog bows are similar to rainbows, but are formed by tiny (microscopic) water droplets suspended in the air and, as the name suggests, are associated with fog. Sunlight passes through the tiny droplets resulting in refracted light and the bow is the result. They are also called **white rainbows or ghost rainbows** because the very small droplet sizes only result in weak colors, sometimes appearing as a reddish hue on the outer edge and a bluish hue on the inner edge. You can tell if the droplets are larger (more color) or smaller (little or no color). In our case, the droplets were very small, as we couldn't discern any color at all.

After a few more minutes of walking, we saw the fog bow dissipate (pictured above) as the drier air eroded the fog from above. Roxy Ann Peak is amazing if you have a chance to go up on a day when it is foggy on the valley floor. You never know what you may see!

Top of Roxy Ann Peak above fog layer.

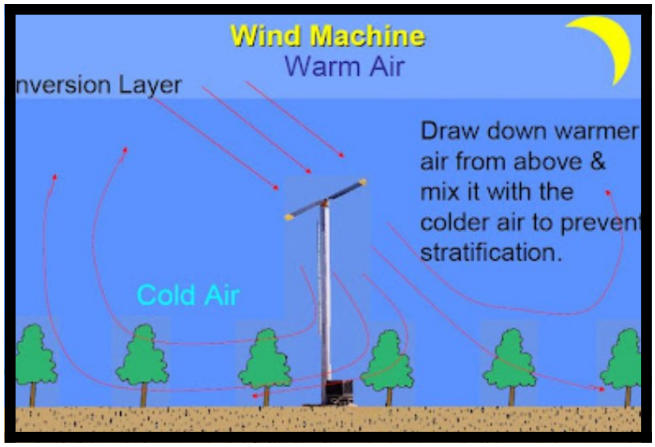
Why So Many Wind Machines in the Orchards?

Ryan Sandler, *Warning Coordination Meteorologist*

Tree fruits, such as apples, pears, cherries, peaches, and prunes were brought across the Plains in covered wagons to Ashland, Oregon in the mid-1800s. The first commercial orchard in the Rogue Valley was planted in 1885. Apple production boomed in the late 1800s and early 1900s. By 1930, however, over 94% of the apple acreage had been removed and pears became the #1 orchard crop in the Rogue Valley. Growers realized that the region's warm days, cool nights, and heavy clay soils were better suited to growing pears than apples. Fast forward to today, and wine grapes dominate with more than 6,000 acres in the Rogue Valley.

What hasn't changed is the need to protect orchards from frosts and freezes. An environmentally friendly way to do this is by wind machines which have been used extensively since the 1970s. In the Rogue Valley, the primary frost/freeze season runs from March through May when fruit trees are reaching full bloom and post bloom.

A wind machine's most effective warming occurs on clear and calm nights when a radiation inversion forms. At night, the ground cools rapidly with relatively warmer air aloft. Near the ground, temperatures in the early morning can reach well below freezing while warmer air is near and above the top of the wind machines. One wind machine can warm an area of nearly 10 acres if the temperature inversion is strong.



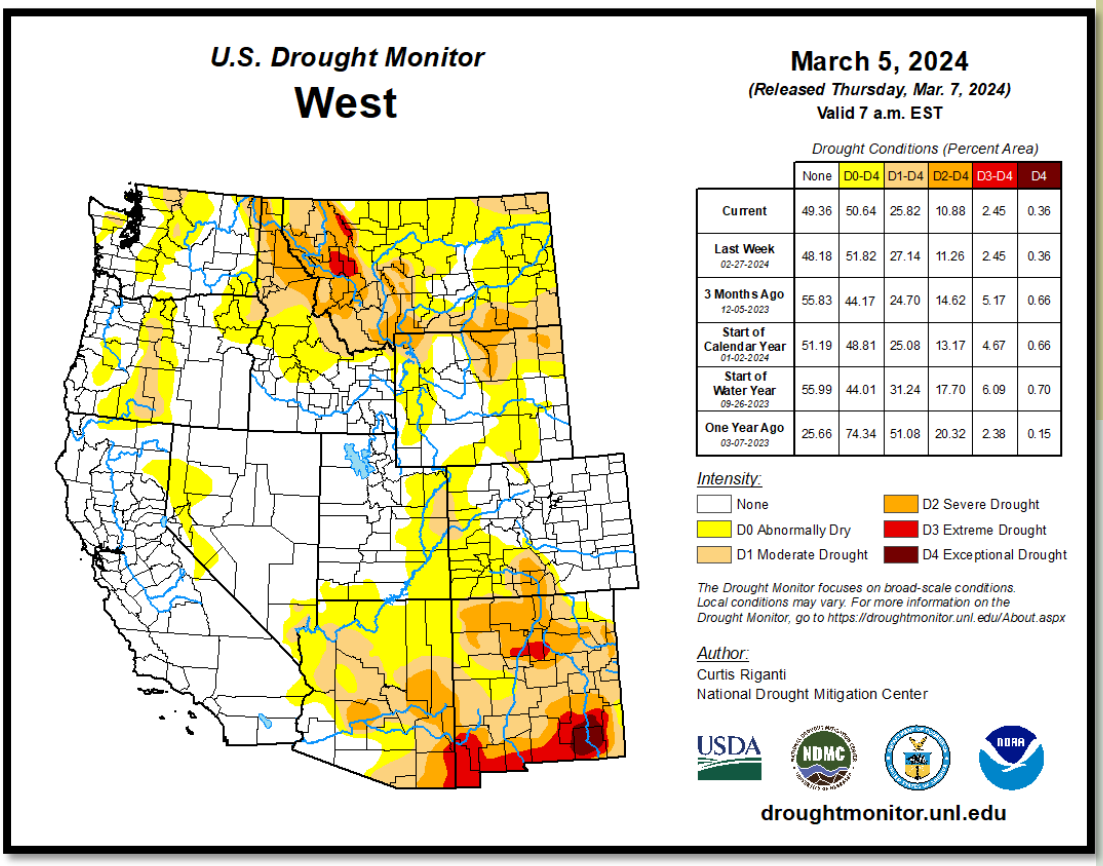
Wind machines will not be effective when a cold air mass moves into the area with well below freezing temperatures throughout the entire layer. Luckily, most frosts and freezes occur under a temperature inversion when protection can occur during both the spring bloom and fall harvest.

A warming climate has made spring freezes less common but these still occur on a relatively frequent basis in the Rogue Valley. For example, at the Rogue Valley Airport in Medford, the normal date for the last spring freeze in the 20th Century was late April but occurs now in early April.

Winter Precipitation

Danny Schmiegel, *Meteorologist*

Southern Oregon typically sees more precipitation during the winter months when the storm door is open for systems to float off the Pacific Ocean and bring ample water to the region. This water, possibly falling as rain or snow, gets soaked up into the ecosystem. Thankfully, water mitigates the real-life dangers of droughts, such as water scarcity and future hazardous wildfire potential. As of early March, the current water year status indicated that all climate sites in southern Oregon and northern California were reporting at least 10% above normal precipitation or greater, with locations such as North Bend, OR at +13% and Mt Shasta City, CA being +29%. In other words, we are receiving adequate, and in some cases, ample precipitation amounts. Although this is an optimistic start for the water year heading into the summer and subsequent fire season, there are some parts of the region experiencing drought and abnormally dry conditions. The National Integrated Drought Information Systems (NIDIS) is reporting "Abnormally Dry" for portions of Jackson and Douglas counties and most areas east of the cascades, with portions of Klamath and Lake Counties falling into the "Moderate Drought" category.



Despite the optimistic start for the water year, the water is not always a boon. In extreme circumstances, it can also be dangerous and costly. In January, Oregon experienced a series of extratropical cyclones that brought devastating ice storms to the Willamette Valley and Portland Metropolitan area that resulted in millions of dollars of damage to infrastructure and the death of 17 people. Heavy amounts of snow, while good for the region's snowpack, was an issue for Siskiyou Summit* along I-5 where traffic was stopped for a total of 18 hours due to heavy snowfall.

Another danger due to winter precipitation is avalanches. For those that like to explore the mountains in the winter months, this is a very real threat. On Presidents Day, an avalanche fell 3 miles down Mount Shasta. The avalanche was reported as a D4 (very dangerous) and was naturally caused as it rushed down an avalanche gulch bringing down trees and creating 60 feet walls of snow.

Water is arguably our most precious resource. The summers bring minimal rain, so the time when we get our supply of moisture is now.

*If you would like to see the current mountain pass forecast follow this link:
https://www.weather.gov/mfr/pass_forecasts

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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.