



## Cold Water Safety

Spencer Higginson, Service Hydrologist

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It may be hard to believe, especially with the cold weather and large snowpack from this winter, but it's already time for the cold-water reminder! Before we know it, Memorial Day will be here along with many other opportunities to visit our local swimming holes. It's always exciting when we get to head back to the rivers and lakes, not just to gaze at them from the banks, but to get in or get on the water! The water is especially nice on those first few hot days of the year. However, this is when the water is at its most dangerous. 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. The water that continues to feed the rivers is a combination of snow melt and groundwater. Snowmelt is obviously very cold but groundwater is also held at a cold temperature as it travels through the soil protected from sunlight and warm weather.

As the seasons change from winter to spring to summer, we welcome warmer weather and the chance to get outside a little more. Inevitably, we look for more recreational opportunities near the water. Sooner or later the forecast will come that calls for temperatures in the 90s or even 100s. We feel the call of the rivers and lakes. We look forward to the chance to beat the heat by moving our activities into the water. It doesn't take long to figure out that the rivers are still very cold!

**Spring Began on  
March 20th at  
2:24 pm PDT.**

You'd think that the cold water is ideal for cooling off on those hot days. However, cold water poses a serious threat. Cold water begins to weaken a person the moment they enter the water. This is when the involuntarily gasps can occur due to the shock of entering very cold water and a person can be rendered helpless immediately by cold shock. 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.

The other way the cold water can affect someone is through prolonged exposure. From the moment a person enters the water, their body heat is being extracted. Water conducts heat away from the body about 25 times faster than air. Organs will begin to shut down if they get 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 comes a reduction in oxygen reaching your muscles. When this happens, strength is diminished. Most of us have experienced this when our hands were exposed to cold 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.

The most common victim of cold water is a very fit, teenage boy. This is also the group least likely to be willing to wear a life preserver.



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.

## Mt. Ashland Radar - KMAX - Fun Facts

Christine Riley, *Meteorologist In Charge*

Did you know that the radar the forecasters use to issue flash flood warnings, severe thunderstorm warnings, and let our partners know about hazardous weather conditions is located on the top of Mount Ashland? That big white ball at the top of Mt. Ashland next to the ski lifts, yes, that is our radar!

On a lovely mid January day this year, Meteorologist in Charge, Christine Riley, took a day off to see the radar up close for the first time. She trekked 2.5 miles to the top of Mt. Ashland via snowshoe for a worthwhile scene, the bright white radar dome against a brilliant blue sky.

Snowshoeing isn't the only way to arrive at the radar, and not the most efficient way when conducting maintenance on the radar. Our staff of Electronic Technicians use a snowcat to lug equipment to the top of the mountain to perform preventative maintenance and for emergency maintenance. The technicians have even used the chair lift to access the site in some circumstances.



Here are some other fun facts about our radar: It is located at 7,532 feet, is the 2nd highest National Weather Service radar in the Contiguous United States, and it is set at a -0.2° elevation scan. With most NWS radars, the scanning begins with 0.5° elevation meaning the center-line of the radar beam antenna is angled 0.5° above the ground. Why in the world would we set our radar to a -0.2° elevation scan? With our radar at over 7,500 feet, we need to see what is happening below it!

Now you know a little bit more about that big white ball at the top of Mt. Ashland. Next time you see it on a ski trip, or as you view it from the Rogue Valley, remember what a unique radar location it is and how useful it is to the team at NWS Medford!



## A Spring to our Social Media

Miles Bliss, *Forecaster*



This past November the Medford forecast office lost access to its Facebook account. There was an outpouring of annoyance from the people who follow our account. And yet, it was delightful to know that people in our area want to be informed of the weather and that we are actually reaching people when we post something. And if you haven't noticed, WE'RE BACK!

It takes more to keep people safe than we can do building a forecast. People need to receive the message and understand how to respond to that information. To do this well, it is important we work with our partners. Our office is making an effort to share content our partners generate. This allows us to help get you the information you may need to obtain resources or take recommended actions based on the forecast. So keep an eye out for us sharing our partners' content!

Don't be shy about sharing our content either. Our mission is to protect lives and property, and when possible help out the economy. We need help to do this because our voice only goes so far. As we amplify our partners' voices, help us amplify the forecast by sharing our content!



If you're reading this, then you're probably aware the area we forecast for has some pretty quirky terrain. As a result we don't have observations everywhere. This can be troublesome for us trying to understand where we need to adjust the forecast. When we get storm reports, this gives us a baseline to do just that. So don't be shy about sharing the weather impacts in your area. Our social media posts are a great place to send us your observations if you aren't able to call. If it's safe to do so, try to include a picture of any damage or measurement you made!

## Why Lowland Snow in February & Early March?

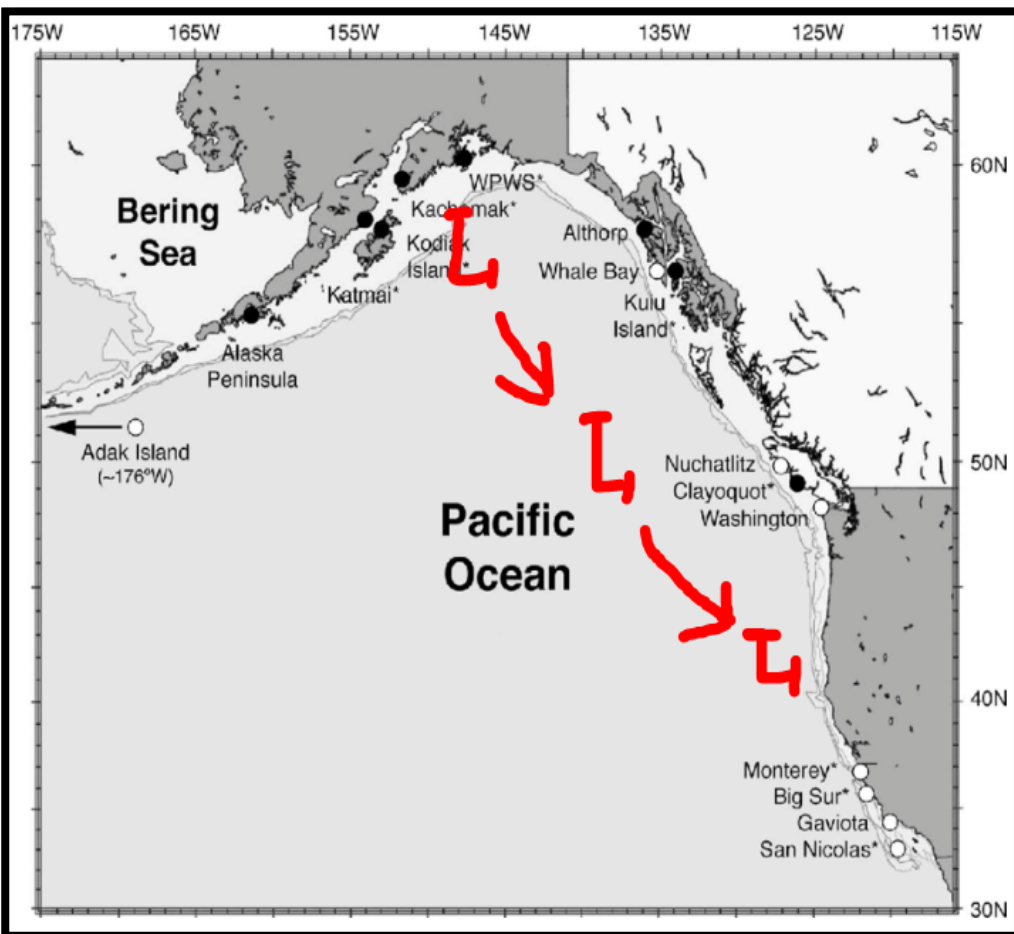
Mike Petrucelli, *Forecaster*

Some of you might be asking, what's up with all this low elevation snow from around the middle of February into the first week in March? Well, a lot has to do with where the storms originate and the track of these storms. Over the last few weeks, storms have generally come in from the Gulf of Alaska and they are typically cold because of where they are coming from. Storms that move in from the Gulf of Alaska typically bring in a colder air mass that can result in lower snow levels compared to storms that come in from the west or southwest. The image below shows an example of a storm track where the storm originates Gulf of Alaska and moves southeastward to off the Oregon Coast.

Now there are a few additional factors that determine how much snow, specifically low elevation snow we will get. First, the track of the storm. There are times when storms that come from the Gulf of Alaska move mainly over the land which does not give it a chance to pick up much moisture from the ocean, resulting in little or no precipitation. On the other hand, if the storms have a more over water trajectory (moves mainly over the water), it will pick up more moisture and usually results in more widespread precipitation. From the middle of February into the first week of March, storms from the Gulf of Alaska tracked primarily over the water (similar to the image below) which gave them an opportunity for them to pick up moisture over the ocean.

Second, how cold is the air mass? In each of these cases, the storms brought in a very cold air mass that was quite cold for this time of the year. It was cold enough for snow levels to drop down to many of the

westside valley floors, and close to or at the beaches at times.



Third, is the intensity of the precipitation. For example, if the precipitation is heavy enough it can drag the colder air aloft to the surface. Moderate to heavy snow can also result in snow sticking on the roads and the ground, especially at night when ground and road temperatures drop near or below freezing. An example of this happened in the early morning hours on February 28th where many westside valleys and coast looked like a winter wonderland.

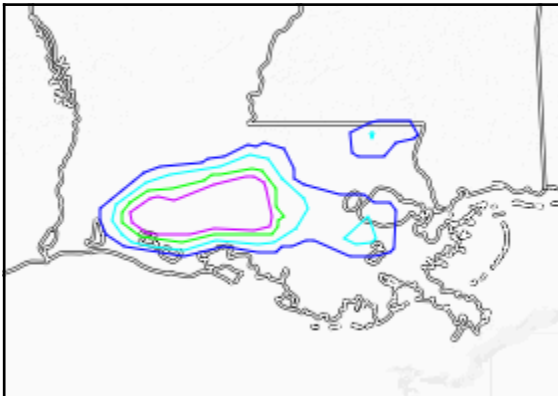
## Lightning Nowcasts Using GOES Satellites & A Machine-Learning Algorithm - *LightningCast*

Mike Stavish, *Science and Operations Officer*

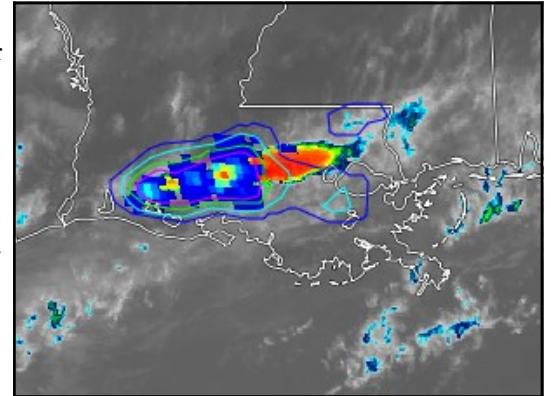
This thunderstorm season, forecasters will begin applying a new complement to their suite of forecasting tools called *LightningCast*. *LightningCast* is a machine-learning, or AI-based algorithm that uses satellite imagery to produce lightning probability forecasts up to 60 minutes in the future.

The GOES-R series of geostationary satellites, including the current GOES-West, produces 16 baseline channels of data, extensive RGB (red-green-blue) composites, channel differences, cloud-drift winds, and a number of derived products including fire hot spots. The new GOES also produces observations of lightning using an instrument called the Geostationary Lightning Mapper, or GLM. *LightningCast* produces its probabilistic forecasts using 4 baseline channels and the data from the GLM. Of particular value is that the forecasts can predict where lightning strikes may soon occur even before any echoes are showing up on radar.

The lightning forecasts are valuable in that they can provide a scientific basis for providing a consistent form of probabilistic decision support services to stakeholders in emergency management, aviation and fire weather. For instance, the forecasts can be used to aid in issuing an Airport Weather Warning, which are sent largely to protect against a lightning mishap while refueling aircraft. Forecasts of lightning can also be used to inform personnel managing large outdoor events or operations. Safety is the main motivation here, but guidance may also be valuable for fire weather initial attack operations.



A *LightningCast* forecast over TX. Shown are contours of lightning probability within the next hour (Left). Forecasts are often overlaid on other imagery, such as GOES Geostationary Lightning Mapper and Infrared imagery (Right). NOAA/CIMSS



### Change is in the Air! New People at NWS Medford

Misty Firmin, *Lead Forecaster*

Since my time here, which I started in 2013, the staff at the NWS Medford office has been relatively consistent with only a handful folks leaving and/or retiring during that time. In the last year, however, we've seen big changes in our staff as some of our more experienced forecasters have left and/or retired. We've seen the departure of two lead forecasters, which led to two internal promotions, and another lead forecaster retired at the end of 2022; we'll be filling that position with a forecaster from Texas. Additionally, one of our electronics technicians recently retired as well. As if all that change wasn't enough, over the next 2 to 5 years, we'll see some of our longest employed folks retire, including our Warning Coordination Meteorologist, the Science and Operations Officer, the Electronics System Analyst, and the Information Technician Officer. To fill the recent forecaster vacancies, we've seen the arrival of our three newest entry level employees, each with varying backgrounds and experience. One comes from California, one from Iowa, and the other from Arizona. We look forward to incorporating their perspectives in our operations and to help NWS Medford provide better decision support for our partners.

## Why is it so Hard to Forecast Freezing Temperatures at Your House?

Ryan Sandler, *Warning Coordination Meteorologist*

This is the time of year when we start thinking about our big gardening plans. The first question may be “when should I start planting?” There are many rules of thumb that people use to figure out when to start their garden. In the Rogue Valley, I’ve heard people say not to plant before Mother’s Day. I’ve also heard others say not to plant before Memorial Day if you really want to be safe from freezes.

Location	Elevation (Feet)	90% Chance 32F After	50% Chance 32F After	10% Chance 32F After
Bandon	20	Jan 31	Mar 9	Apr 7
Gold Beach	50	Dec 16	Feb 16	Mar 25
Medford Airport	1330	Mar 17	Apr 8	Apr 30
Ashland (*Cold Spot)	1750	Apr 20	May 6	May 27
Grants Pass	920	Mar 15	Apr 8	May 1
Cave Junction	1280	Apr 14	May 1	May 23
Ruch	1550	Apr 15	May 4	May 23
Roseburg	420	Feb 18	Mar 19	Apr 13
Riddle	680	Feb 27	Mar 31	Apr 27
Winchester	460	Mar 5	Mar 31	Apr 26
Mount Shasta	3590	Apr 29	May 15	Jun 5
Yreka	2630	Apr 14	Apr 30	May 20
Klamath Falls	4100	May 22	Jun 9	Jun 26

**Normal spring freeze (32°F) dates for southwest Oregon & northern California based on 1991-2020 data.**

Using Jackson County as an example, a wide variety of microclimates makes for variable planting dates at different locations. The 1991-2020 climatology at the Medford Airport shows a 50% chance of a freeze after April 8th (see table above). Unfortunately, if you try to garden at the airport, you will likely meet resistance from airport security so you’ll have to garden somewhere else. Somewhere else might be Ruch where there is a 50% chance of freezing temperatures after May 4th. Ruch is only 200 feet higher in elevation than the Medford Airport but the 50% freeze date is about 4 weeks later than the Medford Airport.

That brings us to why it’s so hard to forecast a freeze at your house. There are so many micro-climates across the region and even within the same valley depending on slight changes in elevation. Keep in mind that temperatures are generally taken at eye-level. You likely have plants and flowers very close to the ground which can experience temperatures a few degrees colder than eye-level readings during clear and calm conditions.

To avoid planting before a killing freeze, you want to know the information in the table above so you can look at the probabilities and make an informed decision based on your risk tolerance. Are you willing to risk a 90%, 50%, or 10% chance of freezing temperatures after you plant? You should also consider if you can take preventive action by keeping up with the National Weather Service temperature forecast for your area. Good luck and may you see a bumper crop!

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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.

