



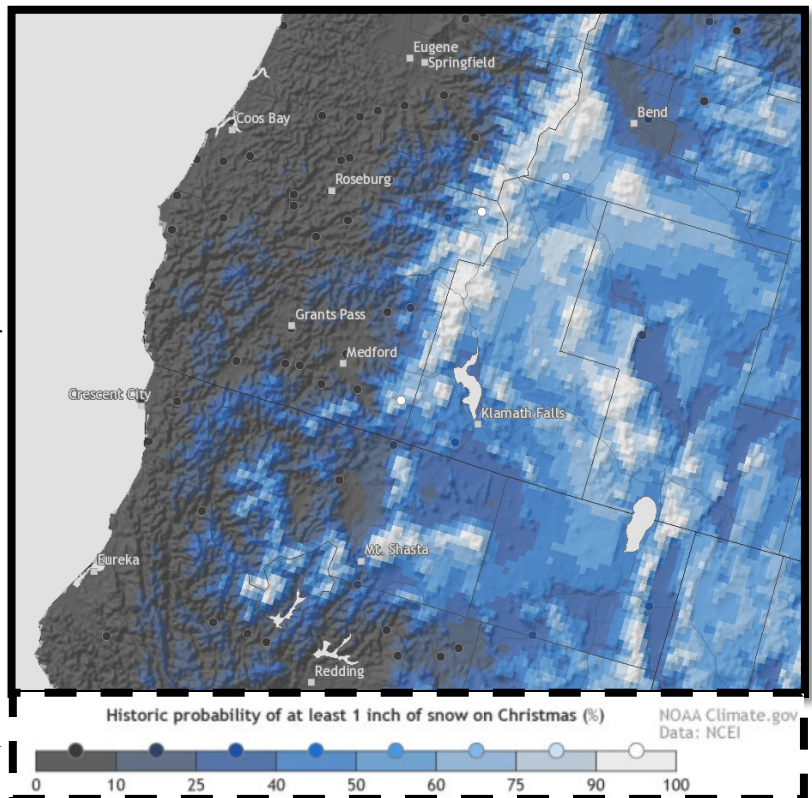
I'm Dreaming of a White Christmas

Ryan Sandler, *Warning Coordination Meteorologist*

I grew up in Brockton, Massachusetts, so you might think I had a decent shot of seeing a White Christmas. Well, before I get ahead of myself, let's define what a "White Christmas" actually is. A White Christmas means having at least 1 inch of snow on the ground at 7 am on Christmas morning. To really get into the weeds, snow depth is measured to the nearest whole inch. If you only measured one-half inch of snow depth then you would round it up to 1 inch, meeting the official definition of a White Christmas.

Okay, getting back to my thoughts about my White Christmas chances in Brockton, which is about 25 miles south of Boston. In the most recent 1991-2020 climate normal period, the chance of a White Christmas in Brockton was a measly 19% which is only about 1 out of every 5 years. This matches my recollection as a kid that we hardly ever had snow on the ground on Christmas morning.

Southern Oregon has been my home since 1998. The image to the right shows the chance of a White Christmas using a sophisticated interpolation method. The greatest chances of a White Christmas are in the Cascades, Fremont-Winema National Forest, Mt. Shasta Region, and Warner Mountains in Modoc County. This comes as no surprise as these are higher elevation areas. *cont. on next pg.*



Have a question you'd like to see answered in the next edition? Send it our way! The next issue will be published in March 2024 for the Spring edition.

Submit a Question for the Next Issue of the Crater Chronicle's "Ask A Meteorologist" Column!

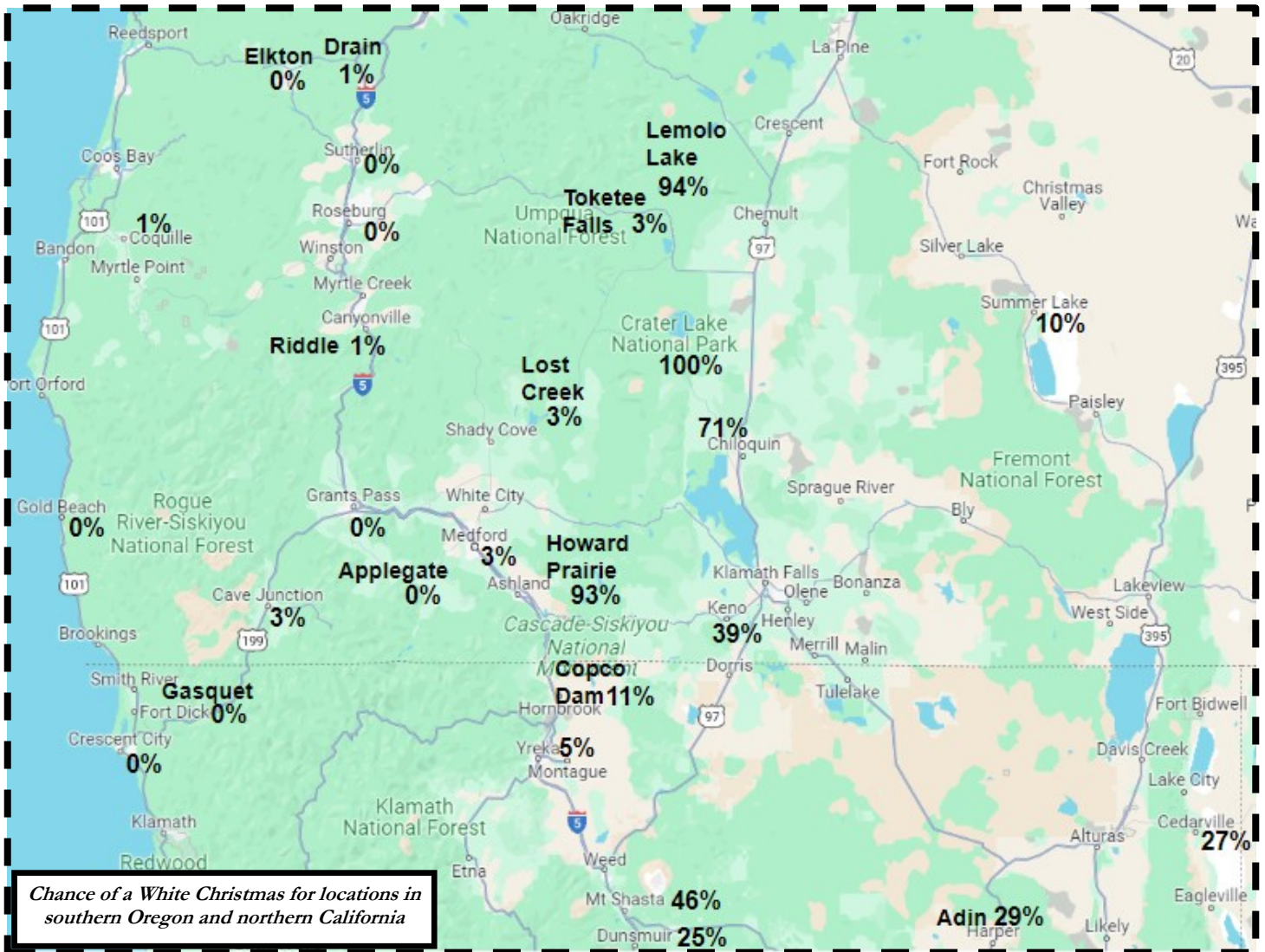
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Many of us have watched a lot of Christmas movies where there is always a healthy amount of snow on the ground. I think Hollywood has us believing that across most of the country it is typical to experience a White Christmas. However, a better than 50% chance of a White Christmas is mostly limited to the northern tier of states and higher elevations in the West. For example, the chances of a White Christmas are less than 50% in Milwaukee, WI, Cleveland, OH, Boston, MA, Cheyenne, WY, and Salt Lake City, UT.

Let's look closer to home again. The map below shows the chances of a White Christmas for locations in our region as listed in the NOAA National Centers for Environmental Information (NCEI) database. Most areas have little chance for a White Christmas, especially in the lower valleys west of the Cascades and coastal areas. The chances approach 50% in Mt. Shasta City, and are highest at Chilouquin (71%), Lemolo Lake (94%), and Crater Lake (100%).



Alas, most of us will not see a White Christmas on any given year based on these statistics. However, we live in a beautiful area where most of us can drive less than a few hours and play in the snow on Christmas Day. Just be sure to check the forecast and road conditions before venturing out!

Backcountry Recreation Hazards: Avalanches

Miles Bliss, *Meteorologist*



Photo from Nick Meyers- Head of Mt. Shasta Avalanche Center (MSAC). Miles Bliss (NWS), left, discusses the orographic impacts of the 14kft Mt. Shasta with Cory, Sam, and Eric from MSAC, right.

Have you ever gone out into the woods during winter? I enjoy going into the backcountry to ski. Other people enjoy getting out there for snowboarding, snowmobiling, and snowshoeing, among other things - I'm sure I'm still missing some ways people move about when there is snow on the ground.

There are a variety of factors to consider when heading out for these winter activities to make sure you're safe out there. So, my next question is: Have you ever thought about avalanches?

We do, and so does the Mt. Shasta Avalanche Center (MSAC). In December 2023, the MSAC crew drove up to our office to discuss our operations, how we can support each other, and to help support the professional development of both staffs.

While discussing our operations, we kept coming back to how important it is to "KBYG" - Know Before You Go - which is the avalanche community's call to action before you go out into avalanche country. If you have never heard about this or you want to learn more about avalanche terrain and how to mitigate your risk while in it, visit the [MSAC webpage](#).

The NWS is becoming more in tune with the avalanche community's messaging and has begun to develop avalanche specific weather pages - [here is ours](#). These pages have weather forecast information for common avalanche prone areas and other popular backcountry recreation sites. Be on the lookout for updates as we revamp this page into a more user-friendly map & graphical forecast style (here is an example from the [Salt Lake City office](#)). If you think we are missing an important backcountry forecast location, please reach out to us so that we can incorporate it into our revamp!

Where to Find Road Conditions when Snow Affects Travel

Misty Firmin, *Lead Meteorologist*

When snow is occurring or has just ended, we receive A LOT of calls at the office from people asking what the road conditions are like. As much as we would like to be able to tell callers about road conditions, we simply can not. This is because we are meteorologists; we forecast the weather. If we were to give road conditions, that would be the equivalent of calling the Department of Transportation for a weather forecast. We can give you a forecast for an ideal window when snow will be less likely to impact travel, but we simply can not judge what ideal road conditions are. What may seem like ok or ideal road conditions for one of us in the office, may be considered highly treacherous for the caller. Aside from that, we will just simply look at area webcams for an idea on what road conditions are, which are the same sources available to the public. So when we receive a call inquiring about road conditions, we refer the callers to either [tripcheck.com](#) or 511 if they are looking for Oregon road conditions. If they are looking for California road conditions, we refer them to the Caltrans website, [dot.ca.gov](#).



For a weather forecast:
www.weather.gov/mfr
 541-773-1067 , we're here 24/7/365



For Oregon Road Conditions:
www.tripcheck.com
 Call: 511 (while in OR)



For California Road Conditions:
www.dot.ca.gov/
 Call: 511 (while in CA) or 1-800-427-ROAD (7623)

Tales From the COOP* - Weather Observing: A Labor of Love or Just Labor?

Tom Wright, *NWS Medford Observation Program Leader (OPL)*

Unfortunately (or maybe fortunately, depending on your perspective - like that of our boss who isn't always thrilled with the unusual things that regularly happen in COOP), there were no particularly interesting close calls or funny things that happened in COOP over the last quarter for me to report on. I did find some mountain lion tracks up in Douglas County, a dead coyote near our site in Tiller, and a pig's head on the side of the road near Drain. But what else is new in southern Oregon and northern California? On the positive side, our automated gauge up above Tiller seems to have survived this year's deer and elk season with no new bullet holes!



Tom Wright snowshoes to the observation platform at Crater Lake National Park

So, instead, I'd like to take this opportunity to thank our weather observers for what they go through on a regular basis. We've entered that time of year again where taking daily weather observations becomes more difficult - a colder, wetter, darker, windier, and lonelier affair. This is especially true in those locations where snow is common.

All of our observers have to trudge through the morning muck to collect weather data, at least occasionally. But a significant number of folks have the added difficulty of having to regularly measure snow, snow depth, and lug the rain gauge inside to melt the snow and acquire the resulting "precipitation" data.

I only have to snowshoe into Crater Lake National Park's automated precipitation gauge a few times a year (shown in photo), but the staff at the park do it every day - as do dozens of our other volunteers at mountain locations. While this can seem like a thankless job, these observations are very important to us.

One of the most important steps of the forecasting process is to look out the window. Since we can't do that over most of our forecast area, we rely heavily on the observations of these dedicated folks to tell us what's going on.

If you are an observer at one of our 83 Cooperative Observer Program sites, please accept a hearty thank you from NWS Medford for helping to monitor our nation's weather and climate!

*COoperative Observing Program

Burn Scars and Rain Gauges

Spencer Higginson, *Service Hydrologist*

Wildfires have become much more prevalent in the last decade. As more and more burn scars dot the landscape, the task of forecasting for flash flooding and/or debris flows has become more and more difficult.

There are many unknowns when trying to predict how a burn scar will react to heavy rain. One of the first things you'll see out of a burn scar is debris moving downhill. Over the years, rocks and other debris become caught up in trees and other vegetation which prevent its movement downhill. After a fire, the vegetation is often consumed and the debris that has been stationary, is now free to continue down the slope, impacting roads or whatever else is downhill. Wind also impacts a burn scar by moving ash and dust around or it can blow down the fire-weakened trees. These trees can end up on roads, homes, campgrounds, trails, or any number of other targets. Geology plays a huge role in how a burn scar will respond. Some soils are much more stable than others. Some allow for water to percolate through while remaining in place while other soils become mobile very easily with even just a little water. Over the many decades, counties, states, and the federal government have put a lot of time and effort into mapping soil types and geological structure throughout the country. While it is not perfect, this helps us to have a fairly good idea of the types of soils in a burn scar and how it may respond.



New rain gauge installed on the Tyee Complex burn scar in Douglas County

While geology is a huge factor in a burn scar's response, rainfall is the largest trigger of a burn-scar response. The US Geological Survey (USGS) has been studying rainfall intensities and how they impact different soil types after a wildfire. Most of their efforts have been in southern California because the geology there lends itself to larger, more frequent debris flows. However, over the last 5+ years, the USGS has been expanding their research to other parts of the country. After a wildfire, the USGS will use information gathered by BAER Teams (see previous issues of the Crater Chronicle to read about BAER Teams) to create predictive maps of the burned area. These maps list probabilities of flash flooding and debris flows, given different rainfall intensities. These USGS maps are helpful for visualizing which areas are at the greatest risk, but without knowing how much rain fell over the burn scar, we cannot verify their prediction. Sometimes it takes more rain than they predicted to trigger flash flooding or a debris flow. Sometimes it takes less. The only way to dial in the threshold is to know how much rain fell in the burn scar and to know what the response was within the burn scar. It's easy to find out the response within the burn scar but there is only one way to know how much rain fell, and that is with rain gauges.



Ryan Sandler (left) & Spencer Higginson (right) from NWS Medford inspecting the recently installed rain gauge in the Tyee Complex burn scar.

About a year ago, the National Weather Service (NWS) installed a weather station in the McKinney Fire burn scar in Siskiyou County, California. The McKinney burn scar has been very active with dozens of debris flows occurring throughout the burn scar after several storms. Because it was so active, we needed to get a good idea of the rainfall amounts that were triggering the response. The rain gauge was placed on a ridge that is very near the headwaters of the three most active drainages. Since then we have been able to dial in on a threshold for debris flows in the McKinney. The threshold was actually lower than predicted by the USGS, and this has allowed the NWS to alert homeowners and public works more accurately based on expected rainfall.

In early December, the NWS installed another weather station on Rattlesnake Ridge within the Tyee Complex in Douglas County. The motivation behind installing a gauge in the Tyee Complex is that there are a number of homes along Hubbard Creek which sit below a burned slope within the Tyee Complex. This is an area that has been prone to debris flows even without a recent wildfire. The NWS wants to dial in a threshold quickly so that homeowners can be warned when needed but not over-warned to the point that they no longer take the warnings seriously. The weather station will dramatically improve our ability to accomplish our mission of saving lives and property.

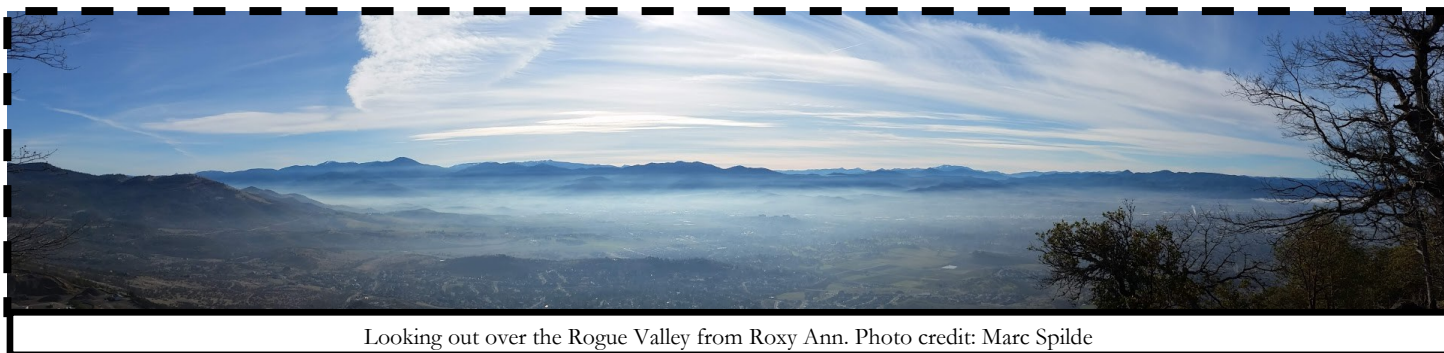
Wintertime Air Stagnation

Danny Schmiegel, *Meteorologist*

The impact of air stagnation has arrived in the valleys this season. Air stagnation is caused by an “inversion” in the atmosphere, but what does that actually mean, and why does it degrade the quality of air in the valleys?

An inversion is a specific situation in the atmosphere where temperature increases as elevation increases, instead of decreasing as elevation increases. This warming is a result of the fact that colder air is more dense than warm air, causing the cold air to sink to low elevations and pushing the warmer air up. But what makes the air so cold? Throughout the night, the earth sheds, or radiates, its heat that it gained from the sun in the previous day. When the earth is releasing heat, it causes the air close to the cold ground to cool. Due to the fact that cold air is heavier than the surrounding air, it will begin to sink to lower elevations, i.e., the valleys. The air that is collected in the valley is now officially in what is called a “cold pool”.

This cold pool, being denser than the air above it, has a very hard time getting mixed around when winds blow over the mountains. The warm air that sits just above the relatively colder air, acts as a lid and traps pollutants in the valleys (pictured below). Air pollutants can come from exhaust, smoke, or even simple dust.



Looking out over the Rogue Valley from Roxy Ann. Photo credit: Marc Spilde

Thankfully, we work around the clock to make sure that if there is a situation of air stagnation, we do our best to let you know. The National Weather Service and state air quality agencies recommend that individuals minimize burning, or needless exhaust production. However, life must go on. Therefore it is also recommend that individuals with respiratory illnesses should follow their physician’s advice for dealing with diminished air quality, such as wearing N95 masks which are effective at filtering out the majority of harmful air particulates.



Six Basic Steps for Properly MEASURING SNOW

Accurate and timely snowfall measurements are extremely important to your National Weather Service office, your community, local media, and many others. Here are the six steps you need to know for measuring snow:

- 1 Supplies**
Ruler or yard stick
24" X 24" white board, flag
- 2 Planning**
Find an open area away from tall objects, but sheltered from wind
- 3 Set-up**
Set up before snow begins
Put your board out and mark it with the flag
- 4 Measuring Snow**
Record your total to the nearest tenth of an inch
Wipe the board off after measuring
Measure once daily at the same time, after measuring place the board on top of snow
- 5 When Snow Stops**
Measure as soon as the snow stops to avoid lower totals due to melting, settling and drifting
- 6 Reporting**
weather.gov social media
SEND us your report!

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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, under the direction of Meteorologist-In-Charge, Christine Riley.

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.

