NATIONAL WEATHER SERVICE - MEDFORD, OREGON

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The Crater Chronicle

Blizzard: What it Really Means

Miles Bliss, *Meteorologist*

Within the public setting, a blizzard is commonly used to refer to the entirety of a strong winter storm. However, within the meteorological community, blizzards are a small subsection of winter storms and do not necessarily need an ongoing storm to occur. A ground blizzard refers to when there is pre-existing snow that is lofted in the air by strong winds, resulting in blizzard conditions. Therefore, a winter storm does need to be ongoing for blizzard warning conditions to be met.

The idea that fresh falling snow is not needed for blizzards, can sometimes be surprising and the misconception stems from how blizzards are defined vs when they most commonly occur. The NWS will issue blizzard warnings when white out conditions reduce visibility to ¼ mile or less in the presence of either gusting or sustained winds of 35 mph or greater. This condition is met most commonly while a winter storm is ongoing, but because these conditions can be met anytime snow is on the ground, confusion arises.

This warning definition is what causes blizzards to be a subset of winter storms. The hazard that is being warned for is the reduction in visibility resulting from white out conditions and is not directly related to the amount or presence of falling snow. Here at the Medford office, we also look for these conditions to be met for at least three hours. This time component exists for us because in our mountainous terrain, ground blizzards are not uncommon. This is due to the large volumes of snow pack and the prevalence of strong winds at high elevations. With few roads at higher elevations and our stringent warning conditions, blizzard warnings are not a commonly issued product.

Bonus Blizzard Facts: The definition stems from the central United States, where for long durations, strong winds could stir up fresh snowfall well after a winter storm was over. In Antarctica blizzards are associated with winds spilling over the edge of the ice plateau at an average velocity of about 100 mph.

Traffic camera showing whiteout conditions in North Dakota during a ground blizzard. Photo: NOAA

Have a topic you'd like to see covered in the next edition? Send it our way! The next issue will be published in March/April 2021 for the Spring edition.

Submit a question for the next issue of the Crater Chronicle's "Ask A Meteorologist" Column!

E-mail: Misty.Firmin@noaa.gov

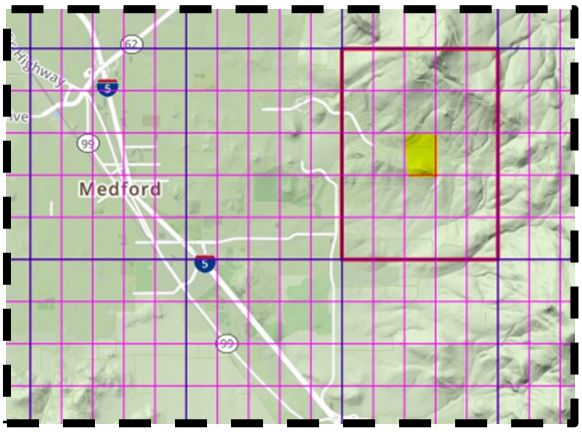
INSIDE THIS ISSUE

I Don't Live at the Airport so What's the Climate at my House?

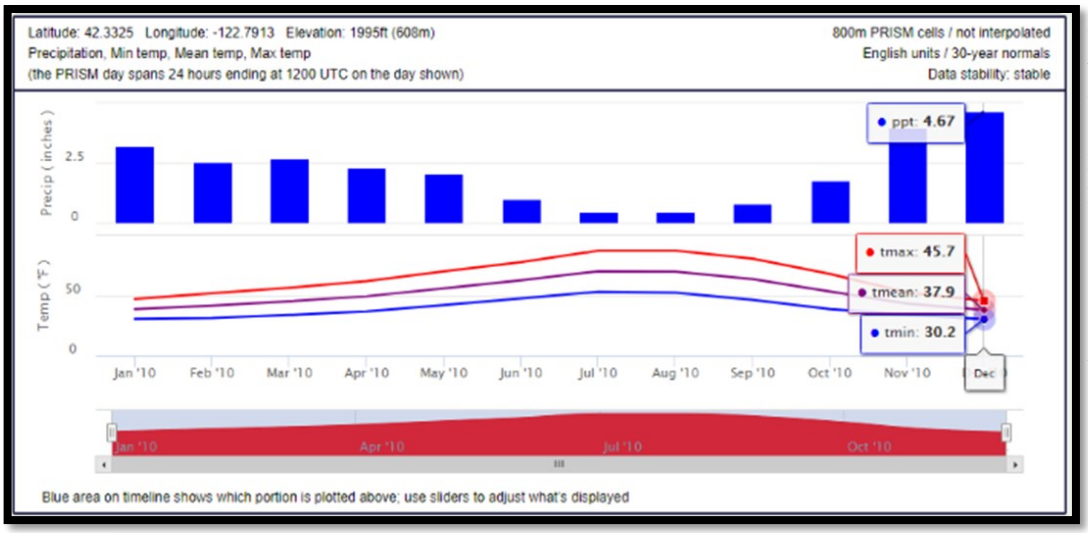
Ryan Sandler, *Warning Coordination Meteorologist*

I never knew anyone who lived at the airport except for that Tom Hanks character who spent months living at a New York airport in "The Terminal." That movie was actually based on a real-life person who lived nearly 18 years at Charles de Gaulle Airport in Paris. Anyway, except for that one guy, no one lives at the airport but many of the National Weather Service official reporting weather stations and climate sites are at airports.

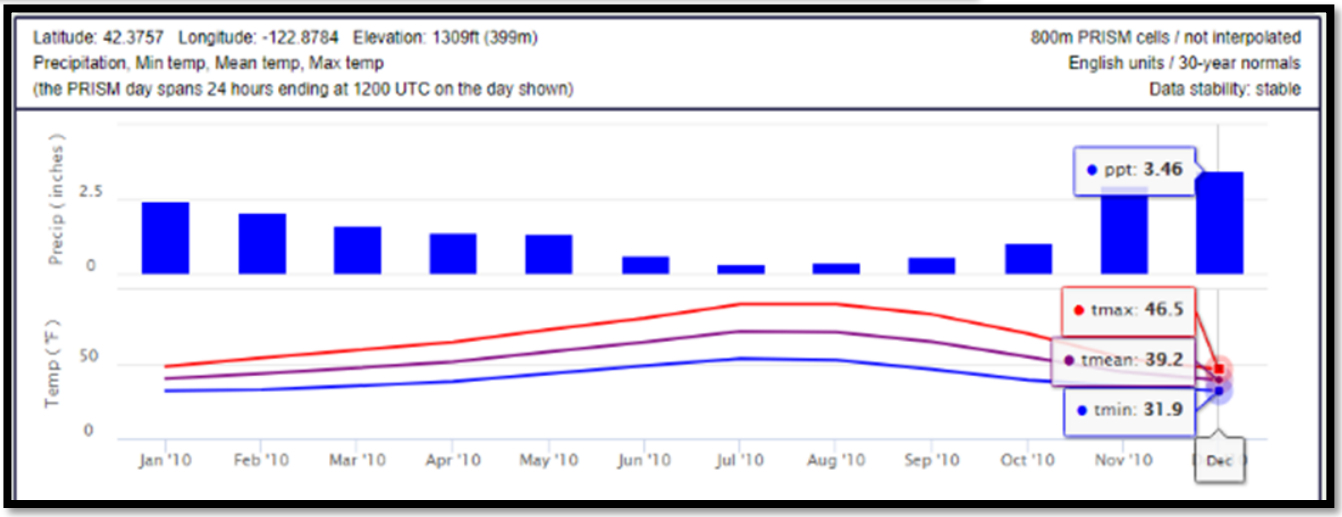
You can easily find 30-year climate data for these airport weather stations but what about your house? You could set up a weather station at your house and archive the daily data for 30 years but no one has that much time and patience. Welcome to the PRISM Climate Group. What does PRISM stand for? Parameter-elevation Regressions on Independent Slopes Model. Are you still with me because they actually have a really cool website with climate graphics. Take a test drive at https://prism.oregonstate.edu/normals/



The coolest thing I've found on their website is at https://prism.oregonstate.edu/explorer/ You can find your neighborhood's monthly temperature and precipitation at an 800 meter (½ mile) resolution. I'll show you my Medford neighborhood example on a hillside about 600 feet above the airport. My neighborhood grid box is highlighted in yellow (right).



My neighborhood's climate data is shown with average monthly December numbers for precipitation, high, low, and mean temperatures (pictured left). Compare this to the Rogue Valley International Airport climate data (pictured below). The airport is drier and a little warmer which makes sense because it's 600 feet lower in elevation and has more of an urban heat island effect.



There are a lot of interesting things you can find by hunting around on the PRISM website. My favorite feature is the Explorer interactive tool. This tool is not perfect but hopefully it puts you in the climate ballpark for your neighborhood.

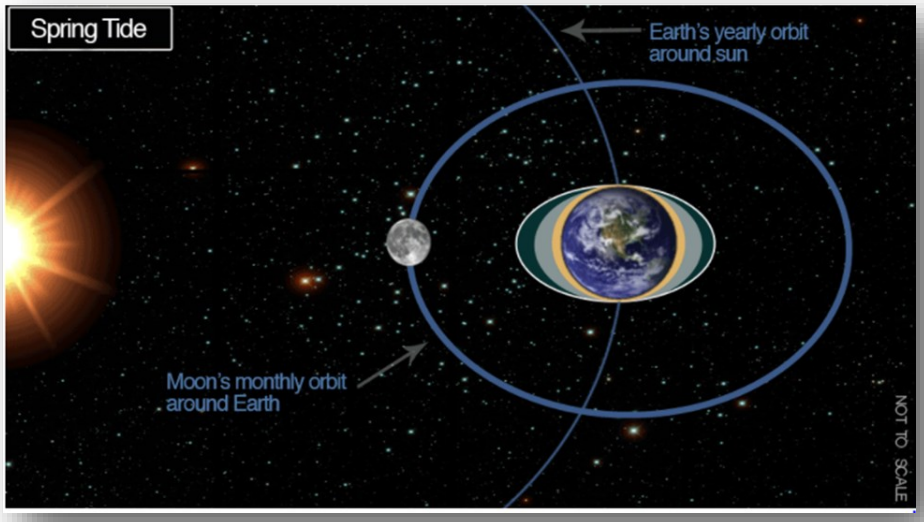
High Water: What are King Tides?

Brian Nieuwenhuis, *Meteorologist*

Rogue River Jetty during High Surf event on 1/10/2021. Photo Courtsey Luke Martinez

Every winter, exceptionally high tides , also known as "King Tides" arrive along the Pacific Northwest coastline, and when coupled with stormy conditions and large waves, these tides can threaten area beaches and other coastal areas with flooding and much higher than normal wave action. So what are these "King Tides", and what makes them different from other high tides throughout the year?

While not a scientific term, "King Tide" does well to describe the highest high tides of the year, which for coastal Oregon, occur in late December into early January. To understand where these exceptionally high tides originate, we have to understand the forces that push and pull the Earth's oceans every day. Tides are essentially the rise and fall of water levels around the earth's oceans due to the gravitational pull of the moon and the sun and their relative positions to each other. While the moon exerts the most influence and is responsible for the majority of tidal actions, the sun plays an important role as well. During a typical month, the highest tides occur around the dates of the full and new moons, when the sun and the moon are aligned and the gravity of both are pulling in the same direction. These are "Spring Tides," not named for the season, but for the "springing forth" of the tide. During half-moon periods, the pull of the moon and sun are offset and work against each other, resulting in lower than normal tides, or "Neap Tides."



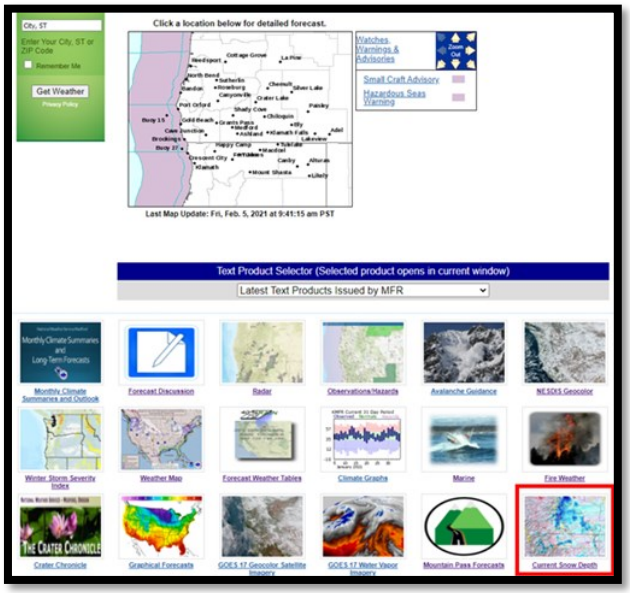
However, the orbit of the moon is not a perfect circle, and once every 28 days or so, the moon is at its closest point to Earth, or its perigee. When the perigee aligns with the full or new moon, the moon's gravity is slightly stronger, making the spring tide even higher. Along those same lines, the earth's orbit around the sun is also not perfectly circular, and Earth approaches its closest point to the sun around January 2nd of every year. When the earth and moon are both in or near perigee, and a full or new moon occurs, the gravitational forces are at their strongest, and the tides are at their highest. This is the "King Tide," a result of a kind of cosmic alignment that we can observe ourselves in the flows of the ocean.

The National Weather Service in Medford keeps a close eye on the tidal charts whenever a strong storm approaches, especially during the winter when these exceptional high tides can combine with wind and waves to produce coastal flooding and enhanced wave action. The docks at Port Orford, the beach at Sunset Bay, the waterfront RV park in Harbor, and even inland areas like Highway 101 south of Coos Bay are examples of places that can potentially see impacts from the resulting high water levels. High tides, especially the exceptional King Tides, are just one of the many important factors that must be considered in the forecast and warning decision process.

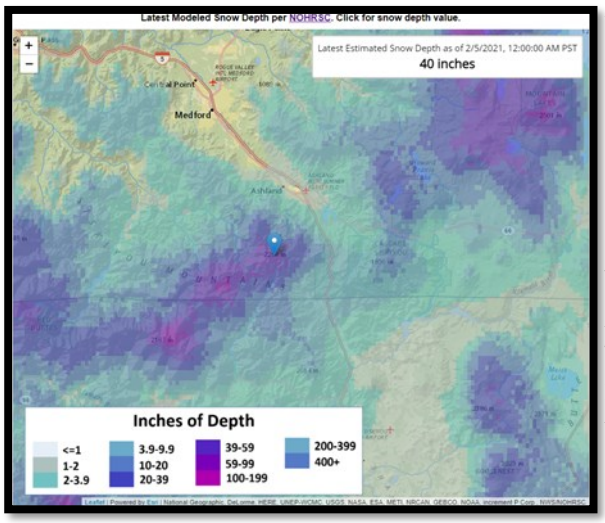
Local Snow Depth Maps

Shad Keene, *Lead Forecaster*

We've recently added a set of snow level maps to our home page to help with snow-related decision-making and for overall situational awareness of current snow depth and how it compares to normal.



The first map is an interactive snow depth map, so a user can click anywhere on the map and see the estimated snow depth readout at the top right of the image. The snow depth is updated daily. The data is created at the National Operational Hydrologic Remote Sensing Center (NOHRSC). The NOHRSC uses snow depth observations from multiple sources, satellite data, and model data to create the modeled snow depth imagery. You can read more about this process here. Earlier this winter when my family went to get a Christmas tree in the Cascades and do some hiking around Mt Ashland and Grizzly Peak, I took a ruler and found that the modeled snow depth from NOHRSC was within a few inches of the actual depth.



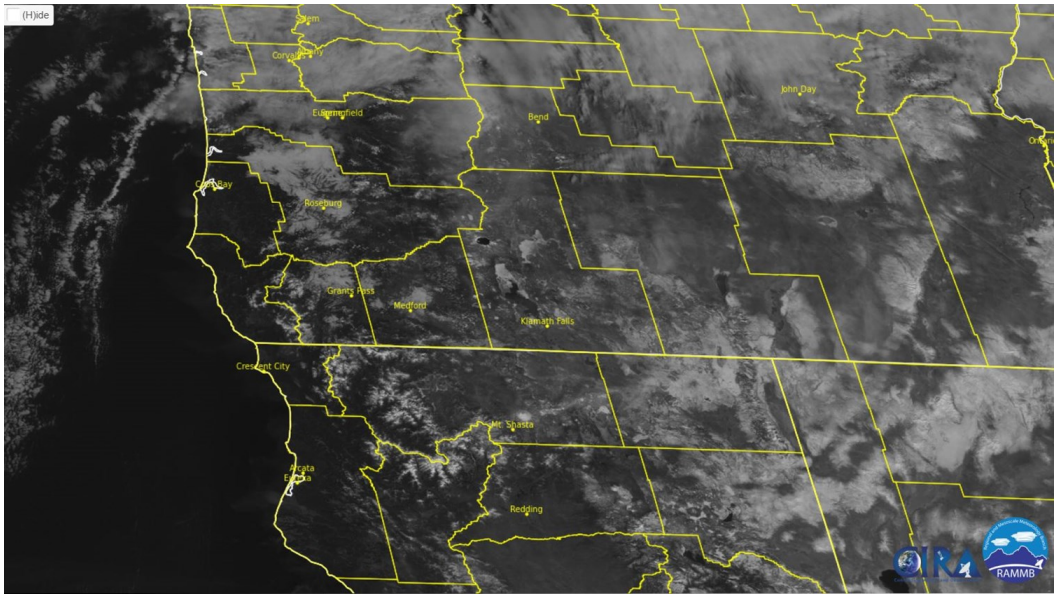
Another potentially useful map is the estimated "Past 24 Hour Snowfall" map. This can provide an idea about what unmaintained roads might be like if you plan to travel or just a general awareness of snowfall across the forecast area.

We hope you find this imagery useful! Please share any ways you find this imagery useful, suggestions you have to improve the layout, or any problems you may have to noel.keene@noaa.gov.

GOES-West: Improving the Ability to Discern Snow from Clouds

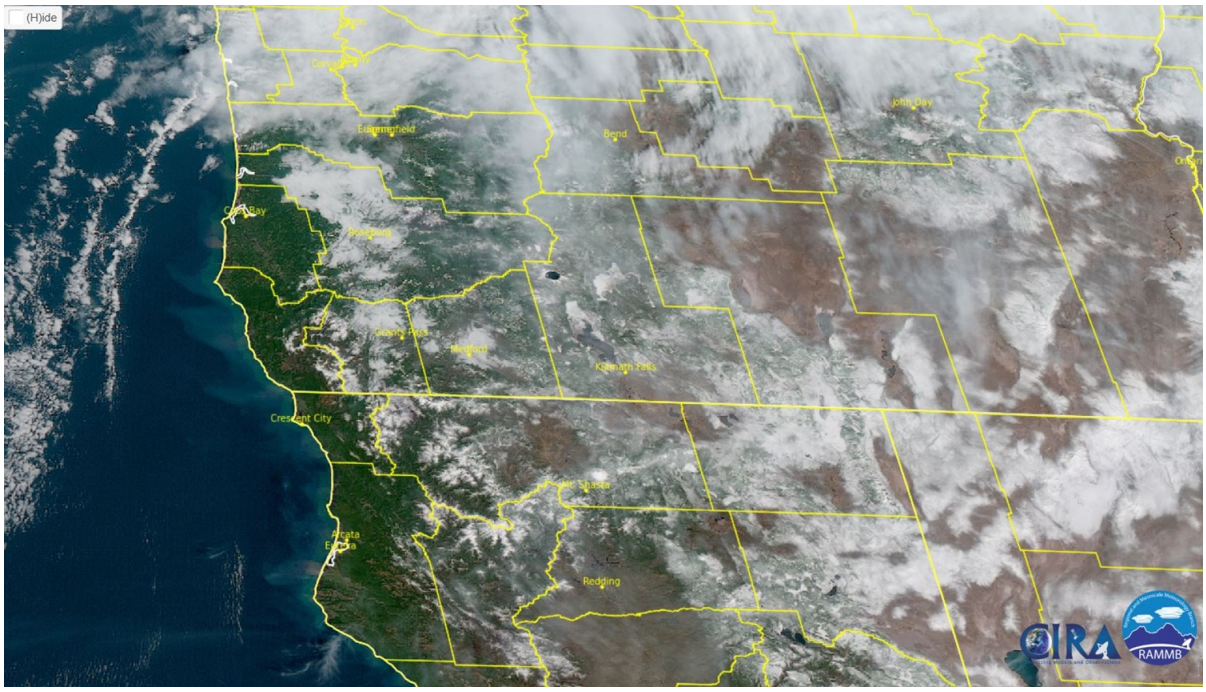
Marc Spilde, *Meteorologists*

Satellites can tell us a lot about our environment. Meteorologists use satellites to determine where clouds/storms are moving, whether or not clouds are comprised of liquid or ice, the differences between land and water, where snow is on the ground, and even to track lightning and smoke from wildfires. Until recently, satellites were mostly black and white, which made certain weather elements difficult to discern from one another. GOES-West imagery now, however, has the ability to do just that.



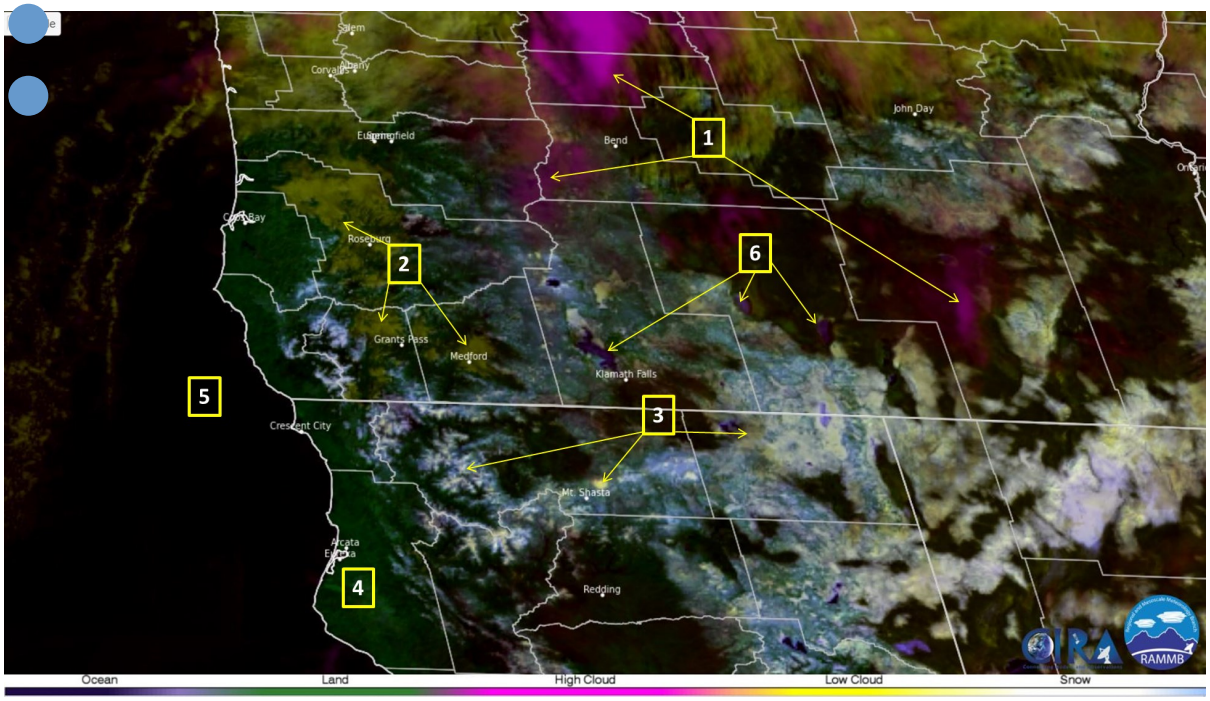
First, can you tell the difference between the snow on the ground, ice covered lakes and/or the low clouds and fog in some of the valleys in our area? Take a look at thie satellite image pictured on the right, taken on Feb 4, 2021, following a particularly snowy pattern. The red

visible, which is Band 2 on the GOES-West Advanced Baseline Imager (ABI), shows clouds, snow and ice, but in light gray/white, while land and water show up as dark gray or black. It takes an experienced observer to distinguish these characteristics from one another.



Utilizing the multi-spectral bands (visible/infrared) from the ABI and applying RGB curves (Red, Green, Blue), the satellite imagery can begin to differentiate between snow, ice, land, water and even smoke.

The image to the right , the Geocolor RGB, utilizes different ABI bands to help bring out some of the surface features. So, it's easier to distinguish land and water from atmospheric features. However, it's still very difficult to see differences between snow, ice and clouds because they are all mostly white.



In the image to the left, the Day Snow Cloud Layers RGB has a lot going on! It utilizes six of the ABI's 16 bands to create this daytime image. High ice clouds (cirrus) can be seen as pink (1), while warmer, lower and primarily liquid clouds (stratus) show up as yellow (2). Snow on the ground shows up as white/bluish-white (3) and land areas (4) show up as dark green. Ocean water and lakes show up as black, but lakes covered in ice (6) show up as purple. Mid-level clouds, not shown, show up as an orange hue.

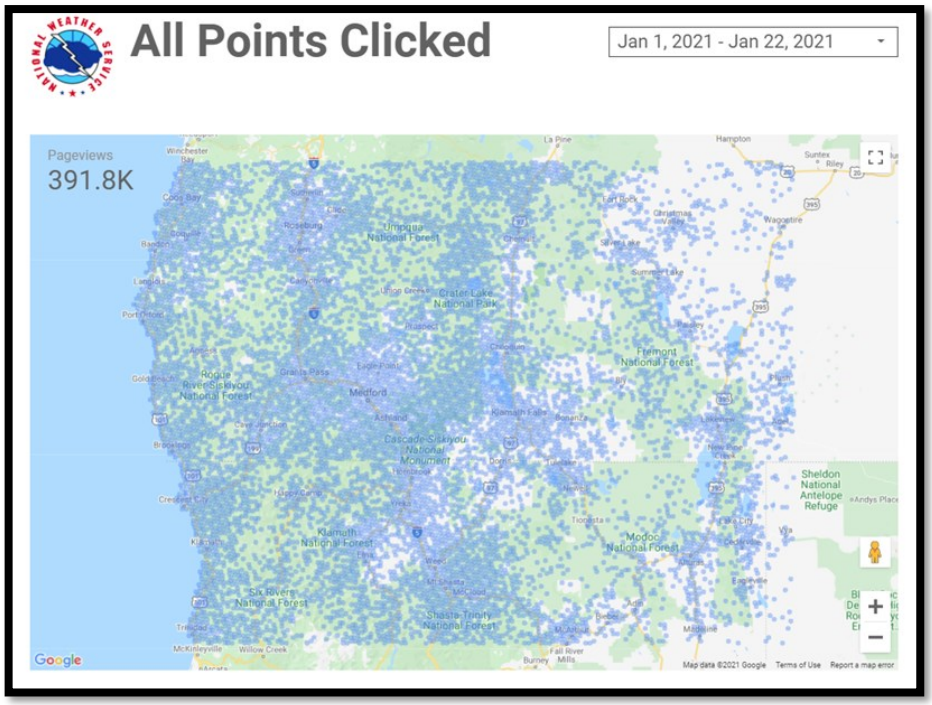
So, as you can see, current GOES-West imagery provides remarkable detail to help forecasters distinguish many different environmental phenomena.

Learning Where Our Users Check the Forecasts the Most

Mile Bliss, *Meteorologist*

At the Medford forecast office we are working to help create a weather ready nation and access to our forecast is critical to that mission. The NWS web presence consistently ranks in the top 3 in the US federal government in terms of web traffic, and it ranks about 750 out of over a billion websites in the world. This is without formal marketing or extensive search engine optimization.

Part of creating a more weather ready public in our forecast area is ensuring the forecast being accessed is created with our users in mind. We do this with a science based approach, utilizing the analytics available to us from Google Analytics. This lets us increase our focus on understanding the perspectives of our customers, including you as part of the public.



The sort of information we seek is how many people look at our forecast and where the forecast is requested for.

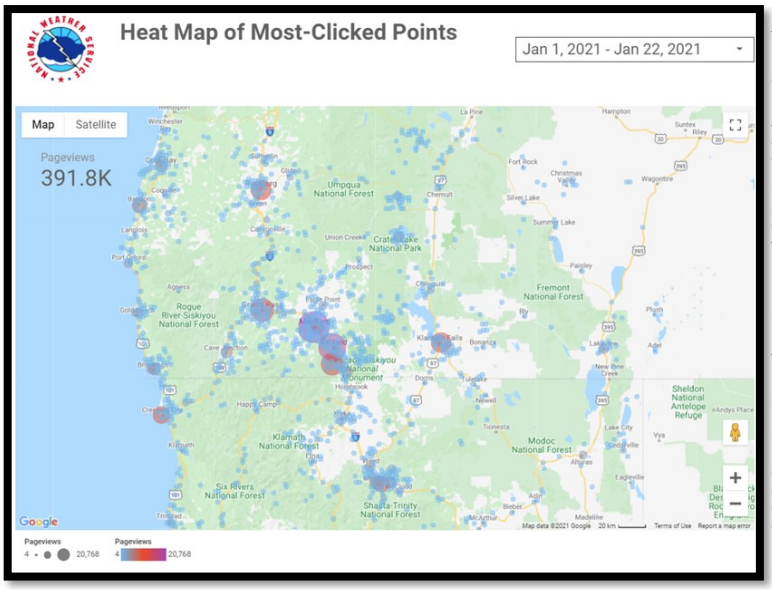
We have access to limited information collected from interactions with our webpage. This includes:

- The latitude and longitude of the point clicked.
- What time the point was clicked.
- If the interaction came from a mobile device or desktop.
- The name of links accessed on our webpage.

Based on this information, we are able to plot up to 10,000 of the requested forecasts for a given time range onto a map. Above is an image showing the location of all forecasts requested since the New Year as of Jan 22, 2021. Talk about a busy map! And that's not including the points over the 10,000 limit we weren't able to plot.

What jumped out to us, besides the sheer number of people viewing our forecasts, was that forecasts were being viewed throughout our whole forecast area. Sure, there's some gaps in our national forests, but we don't expect many people to visit such remote places regularly.

The next image (below) shows a "heat map" of the most-clicked points for our forecast area using the same data as the map above. For some context, this was before our first chance for low elevation snow of the 2020/21 winter season. We assume our population centers are typically busy click points, but now we are able to confirm it. With the chance for low elevation snow looming, the heatmap made the population centers pop more than usual.



After analyzing the data, we have a message for you. We see and hear you. We see all of you clicking away from our population centers. Like those of you clicking at the recreation areas such as Mt. Ashland, Diamond Lake, Willamette Pass Resort and more. We hear all of you clicking east of the Cascades making bullseyes in places such as Christmas Valley, Lakeview, Bonanza and others.

We will use this information to ensure that as we build the forecast, increased attention and scrutiny is given to the areas where our forecast is being accessed so often. We also learned that many of you using our forecast do so in the early morning hours. The analytics has helped us realize that sending updates before 7 AM and 8 AM will ensure that the bulk of those using our forecast are getting our latest thoughts.

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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 Meteorologist-In-Charge Christine Riley.