



## King Tides & Spectacular Waves: What's the difference?

Brian Nieuwenhuis, *Lead Meteorologist*

**E**very winter, people flock to the Pacific Northwest coast to experience the spectacular display of crashing waves on our rugged and rocky shores. Many articles and social media posts will display images of towering explosions of ocean water, labeling them as “King Tides,” but these are actually separate phenomena. So what are King Tides? Do they have anything to do with the massive crashing surf at places like Shore Acres and Arch Rock?

A “King Tide” is an un-official term for the Perigean Spring Tide, a higher than normal tide (frequently the highest high tides of the year). This typically occurs during a new or full moon (when the sun and moon are aligned with Earth, and when the Moon is closest to the earth, typically between November and February). Here along the Oregon coast, a “King Tide” is only about a foot or two higher than a normal high tide.

Meanwhile, large waves are produced by strong wind storms at sea. The biggest waves we see here in Oregon originate from storms that spin across distant oceans near Japan or the Aleutian Islands of Alaska, though big storms right here offshore of our own state can make for humongous waves too. These waves, or “swells,”



Crashing waves at Shore Acres, OR. Picture courtesy of Brian Nieuwenhuis, NWS Medford.

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 2025 for the Spring edition.

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

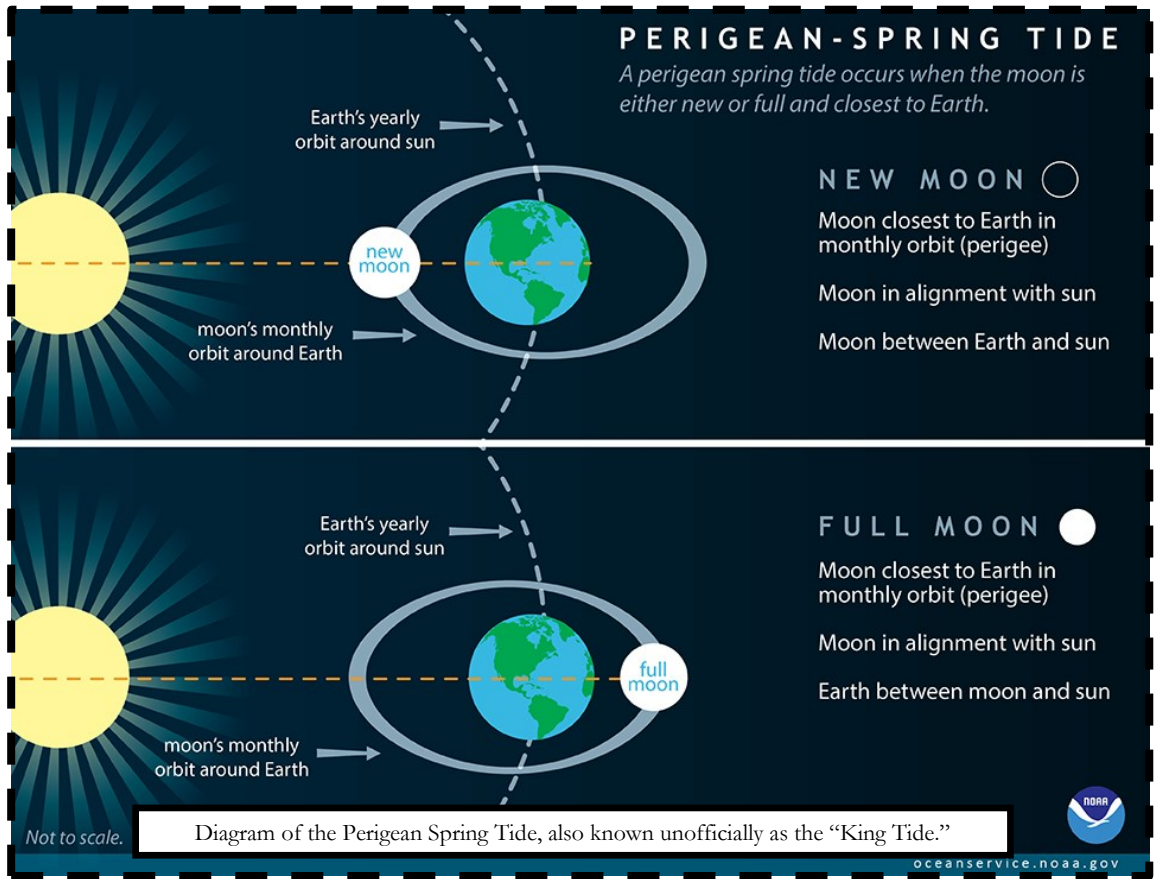
E-mail:  
Misty.Firmin@noaa.gov

### INSIDE THIS ISSUE

<i>King Tides vs Spectacular Waves</i>	1-2
<i>Where to Find Road Conditions</i>	2
<i>Winter Travel Safety</i>	3
<i>One NOAA</i>	4
<i>Field Trip to the Radar</i>	4
<i>Tsunami Warning, No Tsunami?</i>	5
<i>Earthquake Preparedness</i>	6
<i>Measuring Snow</i>	6
<i>About Us</i>	7

can be significantly larger than the tide itself, breaking at heights of 20 to 30 feet.

Compared to storm built waves, a “King Tide” doesn't do much by itself other than raising water levels higher than normal. However, if a storm moves onshore or a large swell arrives on top of that extra high “King Tide,” there is an increased chance for erosion, flooding, or beach inundation, all of which we have seen many times along the Oregon coast, especially during heavy rains or high river flows.



So, a King Tide itself may not be all that interesting alone, but the extra high water levels of the King Tide can add that little extra something that can make storm watching along our beautiful coast just a bit more spectacular than normal!

### 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 resources 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](http://www.weather.gov/mfr)  
541-773-1067 , we're here 24/7/365

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

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

## Winter Travel Safety

Mike Petrucelli, *Meteorologist*

**D**riving in winter is not the same as other times of the year. During times of lower elevation snow, conditions can change rapidly from just plain wet roads, to snow covered roads within just a few miles. Here are some things drivers can do to be better prepared:

- ✓ **Focus on Driving:** Since conditions can change quickly, it's important to know what's ahead of you and eliminate any distractions. For example, don't be preoccupied with your cell phone and keep your hands on the wheel.
- ✓ **Prepare ahead of time:** Check road conditions before heading out. Visit [TripCheck.com](http://TripCheck.com) or call 511. Call the National Weather Service in Medford for the latest forecast specific to your travel routes. While we can't give folks road conditions, we can provide what type of weather you might encounter along your route. It's also a good idea to let others (family members, friends, etc.) know of your travel plans. Tell them where you are going, and what route you are traveling, and keep them updated on any travel changes.
- ✓ **Be diligent and drive defensively in bad weather:** Watch for pedestrians and bicyclists who may be obscured by heavy rain or snow. Give extra room for vehicles ahead of you since stopping distances are greater in wet and, especially snow covered roads.
- ✓ **Do not detour during times of winter storms:** Many times during times of winter storms, the alternate route suggested by your mobile app on your phone is often times not the best choice as some of these roads are not as well maintained and are not on a high priority list for snow removal compared to major routes. For example, Forest Service roads are maintained less frequently.
- ✓ **Be prepared to encounter more traffic** if you are traveling the day before, the day of or the day after a holiday.
- ✓ **Make sure you have Winter driving essentials:**





## National Marine Fisheries Service to Co-locate with National Ocean Service and National Weather Service Medford

In an effort to create a more unified National Oceanic and Atmospheric Administration (NOAA), the National Weather Service in Medford has redesigned its office space to allow for NOAA employees from the National Ocean Service and National Marine Fisheries Service to work together in the Medford NOAA facility. As a result, the National Weather Service in Medford, National Ocean Service, and National Marine Fisheries Service recently held a ribbon cutting ceremony to celebrate the successful completion of these efforts.

In addition to the connections built by being co-located, this will help create a better atmosphere for collaboration and allow each group to participate in joint efforts that support NOAA's mission and expand each office's partner base to better serve southern Oregon, northern California, and efforts along the whole west coast. Examples of these partnerships include sharing information and efforts around tradi-

tionally under-served communities, marine forecasting, coastal flooding and other hazards.



The National Weather Service in Medford is already unique in that the office and the National Ocean Service have worked closely together in the same space for the last 5 years. The addition of the National Marine Fisheries Service staff will enhance NOAA's regional efforts. NOAA's cross-

program regional presence in Medford strives to improve and increase NOAA's services and efforts across southern Oregon and northern California.



## NWS Medford Provides a Tour for Adventurous Middle Schoolers Hiking Up Mt. Ashland

Brad Schaaf, *Warning Coordination Meteorologist*

On October 10th, NWS Medford partnered with Ruch Middle School to participate in a field trip for the ages. Fifty middle school students hiked to the top of



Mount Ashland to visit the KMAX RADAR to learn more about how RADAR works and how meteorologists use RADAR to save lives. The backdrop for this learning session was unmatched as students and teachers got to see the inner workings of our NWS RADAR system and had outside views that were nothing short of spectacular.

Leading the tour was electronics technician Adam Sullivan (pictured below) whose specialization on RADAR systems helped make the inner workings of the RADAR more relatable to the students. Kids asked insightful questions like how quickly the dish spins, how much the energy bill is each month, and why is the RADAR on top of the mountain.

I got to quiz the kids and teachers on what the RADAR actually "sees" and explained how the RADAR distinguishes rain from hail and snow. I then went into the warning decision making process and answered questions



about how meteorologists use the data.

## December 5th, 2024—Tsunami Warning...but no Tsunami??

Misty Firmin, *Lead Meteorologist*

It was a quiet weather day in Operations at NWS Medford when we all got the earthquake alert on our cell phones. We were all wondering, “Is this a test?”, “Is this Cascadia?”. Eventually, when we didn’t feel any shaking, and noted the earthquake occurred near Cape Mendocino, we checked with our neighbors at the Eureka, CA office, offering assistance if they needed it. Within minutes (if that), we received the tsunami warning from the National Tsunami Warning Center (NTWC), and it was no longer a quiet day in Operations. Phones were ringing off the hook, calls were being made, NOAA Weather Radios were going off with tsunami warnings, national conference calls were happening...it was the busiest I have been on shift in a long time. The most common questions we were getting from the public and our partners were “is this real” and “what are the expected tsunami wave heights”. We knew the answer to the first, “yes, it’s real” but the answer to the second was a harder one. We didn’t have that information, and neither did the NTWC. You might be wondering “why is there a tsunami warning when there is no known height of the tsunami?” To quote my colleague Brian Nieuwenhuis, our Geological Hazards guru:

*“If an earthquake magnitude reaches a preset threshold in certain areas, the NTWC automatically issues a warning. In this case, an earthquake of 7 or higher occurred along the “Cascadia” area (even though it was not on the Cascadia fault line) and this triggered an automatic Warning. This is because any tsunami generated by the earthquake would be already hitting the coastline before there was any time to otherwise verify if one was actually created. Better safe than sorry, especially given the number of lives at risk.*

*In the same vein, there were no wave heights provided in the warning because it takes roughly 45 minutes, along with observations from tidal stations and DART buoys, to calculate a wave height. Again, the tsunami would already be hitting the coast by the time that data arrived. So while we won’t know a height in one of these local events, the more important message is “get to higher ground now,” not “get to higher ground if the wave is big enough.”*

*In short, think of this in the same lines as a Tornado warning. Ideally, we issue a warning because we see the signs of a tornado on radar, before we have any ground truth that one actually exists. Also, we don’t include a EF scale rating in the warning because we don’t know how strong it is yet. We issue despite not knowing because, even though nothing may actually happen, if it does it would have huge implications for people’s lives and property. The Tsunami warning is the same way, just on a much larger scale.”*

**NATIONAL WEATHER SERVICE**  
**TSUNAMI SAFETY**  
**FOR YOU AND YOUR FAMILY**  
 NOAA

**How a Tsunami Works**  
 Most tsunamis are caused by large earthquakes below or near the ocean floor.

- 1 A plate shifts abruptly, causing an earthquake, and displacing water.
- 2 Waves are generated and move out in all directions across the ocean, some traveling as fast as 500 mph.
- 3 As waves enter shallow water, they compress, their speed slows, and they build in height.
- 4 The wave height increases, and associated currents intensify, becoming a threat to life and property.

weather.gov/tsunamisafety

**NATURAL Tsunami Warning Signs**

- Feel a strong or long earthquake
- See a sudden rise or fall of the ocean
- Hear a loud roar from the ocean

Any of these could mean a tsunami is coming. Get quickly to high ground or inland!

tsunami.gov

**Tsunami Ready Community**  
 In Case of Earthquake, Go to High Ground or Inland  
 TsunamiReady

**TSUNAMI EVACUATION ROUTE**

During this event, further analysis proved this earthquake had been a strike/slip earthquake (horizontal movement), which typically doesn’t produce a tsunami, so the warning was cancelled. In the end, this event turned out to be a really good “real life exercise” where all parties involved activated their tsunami procedures and since

the tsunami didn’t actually happen, there was no damage to property and lives weren’t lost. It also serves as a good reminder to review your own tsunami procedures for you and your loved ones.



# WFO Medford Supports Earthquake Preparedness in October 2024

Brad Schaaf, *Warning Coordination Meteorologist*

Throughout the month of October, WFO Medford has been supported earthquake preparedness in multiple ways. Our ribbon cutting ceremony coincided during the Great Shakeout, and all who attended took part in an earthquake drill at 10:17 am on October 17th. This included Deputy Director Michelle Mainelli, Western Region Director Dr. Cooper, Deputy Regional Administrator for the West Coast Region of the National Marine Fisheries Scott Rumsey, NOAA West Regional Coordinator Nicole Fernandes, and more. Participation in these drills is essential to show the public that earthquakes can affect everyone in the west, and



therefore they should participate as well.



Beyond the Great Shakeout, WFO Medford staff also participated in a statewide Cascadia exercise called Iron OR on the week of Halloween. Specifically, we sent lead forecaster Brian Nieuwenhuis to Douglas County who stood up their Emergency Operations Center (EOC) to support their Cascadia response efforts. In doing so, we also got to test out virtual EOC software from FEMA which would allow our office to support them even if we weren't able to send a meteorologist on site.

Closer to home, we supported Jackson County by sending in weather reports for their response efforts since they did not open their EOC. However, we did get a chance to embed with them as we sent Hydrologist Spencer Higginson and Electronics Technician Del Woodside to shadow Jackson County roads on behalf of Jackson County emergency management to learn more about how they would survey bridges for damage after an earthquake. The goal here was to utilize our office talents, which included civil engineering, to learn more about damage markers for the storm survey process in our area. WFO Medford continues to look for ways to support our partners and is excited to embrace the whole office concept in order to do so.

**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!

## NATIONAL WEATHER SERVICE - MEDFORD, OREGON



National Weather Service  
Medford Weather Forecast  
Office  
4003 Cirrus Drive  
Medford, OR 97504-4198



Phone: (541) 773-1067

Fax: (541) 776-4344

Newsletter Editor:

Misty Firmin, Lead Meteorologist

Email: [misty.firmin@noaa.gov](mailto:misty.firmin@noaa.gov)

## Visit Our Website!

<http://www.weather.gov/medford>



[www.facebook.com/NWSMedford](http://www.facebook.com/NWSMedford)

facebook



<https://x.com/NWSMedford>

## 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 the Meteorologist-In-Charge.

## 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.*

