



WSR-88D Radar & Those Who Keep it Running!

Connie Clarstrom, *Lead Forecaster*

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National Weather Service Medford WSR-88D radar located at the top of Mount Ashland (also known by those on the mountain as the BRT, “Big Round Thing”).

An essential tool to diagnosing severe weather is the National Weather Service WSR-88D radar. The radar tells us about what is going on inside thunderstorms - is there large hail, strong winds, or extremely heavy rain? This data allows meteorologists at the NWS to warn the public of severe weather as soon as severe storms develop and are diagnosed. The radar runs continuously for 365 days a year and can complete a full scan of storms in as little as 3 to 5 minutes. Given its importance in helping identify severe weather, NWS electronic technicians make it a top priority to keep the radar equipment in good running condition and to correct any problems as soon as possible.

Here at the Medford office, a staff of three electronics technicians, along with an electronics system analyst who provides overall management and specialized guidance, performs the maintenance on the WSR-88D radar, as well as other NWS equipment. Our technicians check the radar system on a daily basis and travel to the radar approximately 4 times per month to perform routine and/or essential maintenance. During the cold season months, this journey is performed by driving a snowcat vehicle along a 4 mile route from the ski base area to the top of Mount Ashland. Hazards need to be monitored along the route to the radar that include taking extra caution during high winds and white out



The snowcat vehicle used to reach the radar in winter months.

**Spring Began on
March 19 at
9:30 pm PDT.**



Electronics technician, Paul Halleck, digs out a path to reach the radar access door.

conditions and staying on the lookout for large snow drifts. During the summer, the journey can be completed using 4 wheel drive and following a designated path. When major upgrades are being performed, specialized technicians will visit the radar and work with our electronics technician staff to implement these upgrades. One such upgrade was the addition of dual polarization capability to the radar in 2012. This significantly enhanced the radar's ability to interpret the particles in the atmosphere, such as snow, ice, rain or hail and has allowed for improved detection of severe storms.

Please join the meteorologists here at NWS Medford in thanking our electronics technicians staff Matt Wymore, David Kauwe, and Paul Halleck, as well as our electronics systems analyst, Darren Dixon, for maintaining this essential equipment.



Electronics technician, Matt Wymore, digging out access to the radar door.

Frequently Asked Questions:

Probability of Precipitation a.k.a “PoP”

John Lovegrove, *Meteorologist-In-Charge*

Chance of rain. Scattered showers. Isolated thunderstorms. Snow. All of these statements (and many others) are used by forecasters to convey a sense of confidence in a precipitation forecast. We call this type of statement a “probability of precipitation” or PoP. For something that is included in every forecast this is actually a kind of complex item. Every forecast has a PoP and sometimes it is zero.

What makes the PoP a bit complex, is that it can mean two different things depending on how it is used. Kind of like “minute” can be both a measure of time and something that is tiny. The difference is how you say it. The PoP is the same way. It can mean the absolute probability that rain will fall or it can mean areal coverage. Let’s look at each of these in more detail.

First of all, any precipitation forecast must be for a measureable amount and that is 0.01 inch. Anything less than that is called a trace and traces don’t count. One more bit of background information. All National Weather Service forecasts are based upon a system of grid boxes across the country. In the NWS Medford area, we have over 16,000 of these 2.5 by 2.5 kilometer boxes and forecasters use various techniques to populate the boxes with forecast elements. When you use the point-and-click forecast feature on our webpage, you are sampling one of those boxes. Some forecasts, especially those on NOAA Weather Radio, use a grouping of boxes to create the forecast.

Alright, let’s look at the absolute probability meaning. When this use of PoP is employed, the key words in the forecast will be similar to: slight chance, chance, likely and nothing at all. This will show up in the forecast as “slight chance of showers”, “rain likely” or just plain “snow”, for example. In this case, the forecaster is stating the chance that something will fall. That chance ranges from 0% all the way up to 100%. If the chance is 14% or less, nothing will be mentioned. Likewise if the chance is 80% or



more, no qualifier is used. The forecast simply says “rain”, “snow” or some such. Here is the breakdown that we use:

- 0 to 14% - None
- 15 to 24% - Slight chance
- 25 to 54% - Chance
- 55 to 74% - Likely
- 75 to 100% - None

The areal coverage meaning of PoP is used when the forecaster has high confidence precipitation will occur. The PoP then means how much of an area will receive measurable precipitation. If a PoP of 40% is given for Jackson County, then about 40% of Jackson County is expected to have precipitation. This meaning for PoP will appear in forecasts with words such as “isolated” or “scattered”. Here is the breakdown of terms used in forecasts:

- 0 to 14% - None
- 15 to 24% - Isolated
- 25 to 54% - Scattered
- 55 to 74% - Numerous
- 75 to 100% - None

By knowing the use of these key words, you can have a better insight into what the meteorologist intends for the forecast .

Outlook for the 2016 Fire Season:

Brett Lutz, *Forecaster*

With above normal precipitation and a strong snowpack across the forecast area this spring, the likelihood of an early and severe 2016 Fire Season is greatly diminished. That said, we do expect that we will have a fire season in our area, but acreage burned should be down from that of each of the last 3 years and timing should be closer to normal. Thus, large fires are expected to be a concern from about mid-July through August.

More specifically, the first two weeks of April may spark some concern of an early fire season across the area, as record high temperatures are highly likely on Wednesday, April 6th and Thursday, April 7th, after a period of moderate to locally strong east winds across mid and upper elevations. However, as often occurs in the spring, climate models indicate that we will snap back to more typical spring conditions for the latter portion of April, with temperatures closer to normal and periods of precipitation. Currently, the month of May looks to be wetter than normal with near normal temperatures. Thus, while we'll probably drop off to near normal snowpack by mid-April due to the above normal period of temperatures early in the month, more typical conditions to possibly wetter than normal in May should stave off an early fire season. Additionally, the healthy snow pack will, of course, protect the high country from wildfire concerns.

While the summer is most likely to be above normal for temperatures per Climate Prediction Center outlooks, past years in the wake of very strong El Niños and, consequently, good water years have not yielded temperatures significantly higher than normal for the duration of the summer. However, one clear concern as we head into fire season in July and August will be “jackpots” of dead and downed vegetative debris that has accumulated due to plant stress from the 2 to 4 year drought that has just about ended across the forecast area. Heavy snowfall in December and January also damaged and downed a tremendous number of trees this winter, and this tree debris will be a real concern for an increased probability of lightning ignitions and helping spread fires. Good water years such as this also tend to yield healthy grass and brush crops in the spring that, once cured, can help fires spread more rapidly than they otherwise would.

“That said, we do expect that we will have a fire season in our area, but acreage burned should be down from that of each of the last 3 years and timing should be closer to normal.”



Pyrocumulus from the Stouts Creek Fire on the afternoon of July 30th, 2015 taken from west of the Medford-Rogue Valley International Airport. This fire was started accidentally by someone mowing their lawn at 1pm local time on a day with a Red Flag Warning in effect. It severely burned over 11,000 acres in just 2 days and smoked in much of southwest Oregon for over a week. Photo credit: Brett Lutz

As summer goes on, there are some indications from climate models that the monsoon on the east side may be stronger than normal in July and August. This could very well result in above normal precipitation from showers and thunderstorms during this time period, though confidence in the forecast that far out is fairly low.

National areas of most concern for wildfires this year are the Northern Rockies, southwestern United States, and the Great Lakes Region.

Since southwestern Oregon and northern California almost always, inevitably dry out enough that wildfires are a very real concern, we encourage you to establish defensible space around your home by trimming grass, brush, and tree debris. Please see www.firewise.org for further information.

So... You Want To Be a Meteorologist?

Ryan Sandler, *Warning Coordination Meteorologist*

I've given meteorologist career day presentations since the early 1990s and a lot has changed from those pre-internet days. There has been a relative explosion in the number of young people who want to become meteorologists. When I was in high school, way back in the early to mid-1980s, weather enthusiasts were limited to watching local television meteorologists, a brand new cable station called "The Weather Channel", and grainy VHS tapes showing tornadoes. Other than the actual weather, these were all we had to encourage our passion for meteorology.

Throughout the past 25 years along came weather web pages; blogs; online courses; the movie "Twister"; storm chaser YouTube videos; affordable home weather stations viewable on your computer and smart phones; and smart phone weather apps. Today, young adults just starting their professional careers grew up with all of these technologies to promote their weather passion and nudge them toward meteorology degrees. This would normally be a good thing, if it weren't for the law of supply and demand.

According to the Bureau of Labor Statistics, in 1994 there were 6,600 meteorologist jobs in the United States. Twenty years later, in 2014, there were 11,800 jobs. That's a 79% increase in twenty years which sounds pretty good on the demand side.

Now let's take a look at the supply side. In 1994, there were about 400 Bachelor degrees awarded in meteorology. The estimate for 2012 was about 750 Bachelor degrees. Each year there are only a few hundred entry level meteorology jobs available for new graduates across the country. Therefore the supply of students is outstripping the demand and it's getting worse every year. In 2014, we had two entry level job openings at our weather office in Medford and there were 130 well qualified applicants for only two positions.

This is a frustrating situation for new meteorology graduates. They followed their passion and took difficult classes in calculus, physics, chemistry, computer science, statistics, and meteorology. In addition to good grades, those who received job offers typically had other qualities which stood out such as a strong computer programming background, communication skills, or outstanding references received through networking in paid or unpaid internships.

Many recent graduates who were both skilled and lucky enough to land a meteorology entry-level job will likely work rotating shifts, weekends, and night shifts. Most are happy to do so because weather has been in their DNA since they were young and their dream has come true. For those who don't land a job in meteorology they will either continue their education for an advanced degree, or decide to work in another field, which may or may not be related to meteorology.

The Bureau of Labor Statistics sums up meteorologist job prospects well with "*Prospective atmospheric scientists should expect continued competition because the number of graduates from meteorology programs is expected to exceed the number of job openings requiring only a bachelor's degree. Workers with a graduate degree should have better prospects than those whose highest level of education is a bachelor's degree.*" You can check out their website at <http://www.bls.gov/ooh/life-physical-and-social-science/atmospheric-scientists-including-meteorologists.htm>



"Here's a resume for the meteorologist position that looks interesting."



Oregon WFOs Visit Oregon State University

John Lovegrove, *Meteorologist-In-Charge*



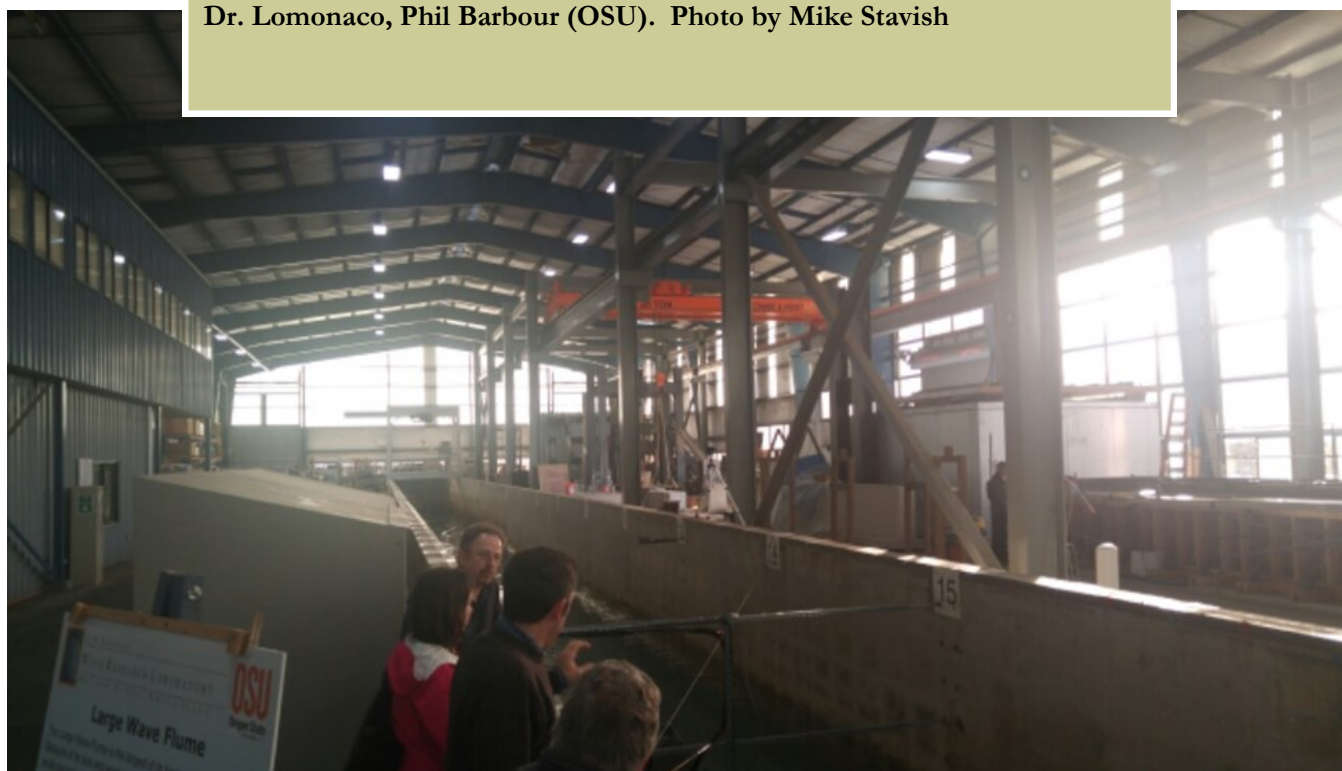
On January 27th, representatives from three Oregon WFOs met with the staff of the College of Earth, Oceanic and Atmospheric Sciences at Oregon State University. The day started with a presentation by the National Weather Service on our mission, organization and tools. We also discussed possible areas where we could collaborate. Between 25 and 30 faculty and graduate students attended the presentation and asked a number of insightful questions. The remainder of the day consisted of a series of meetings with OSU professors to discuss their work and areas of interest.

NWS staff from multiple forecast offices attended, including Portland MIC David Bright and SOO Bill Schenieder; from Pendleton acting SOO Doug Weber; and from Medford MIC John Lovegrove and SOO Mike Stavish.

Many thanks go to OSU senior research associate Phil Barbour for coordinating the university part of the visit. Phil and John were classmates at OSU. Phil also arranged a visit the previous day to the Hinsdale Wave Laboratory on campus. The tour guide was Dr. Pedro Lomonaco, director of the lab and included viewing the largest wave flume in North America.

This was a successful visit that opened many doors between OSU and the NWS. We mentioned several times that students and faculty are more than welcome to visit our offices. It also came up a few times that the NWS is not a source of funding but we can help secure grants by using operations tie-ins and letters of support. Our future meetings can include forecasters and interns, as we can afford. This was just the first step in what we hope to be a fruitful relationship.

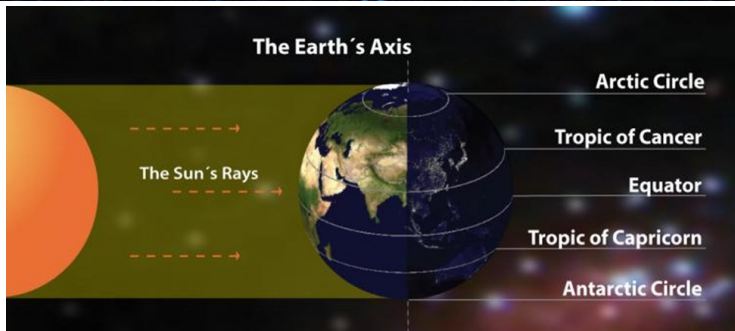
Touring Hinsdale Lab (left to right – Kathie Dello (OSU), John Lovegrove, Dr. Lomonaco, Phil Barbour (OSU)). Photo by Mike Stavish



Astronomy Happenings

Misty Duncan, *Meteorologist Intern*

The vernal equinox occurred on March 19th at 9:30 pm PDT this year; marking the astronomical start of spring and the point when the earth's equator was perpendicular to the sun's rays. From the equinox onward, the northern hemisphere will continue to tilt farther toward the sun, until it reaches the summer solstice, which is the astronomical start of summer. On June 20th at 3:34 pm PDT, the northern hemisphere will have tilted as far as it will toward the sun and then begin tilting away. The summer solstice is the longest day of the year with over 15 hours of daylight!



The tilt of the earth on both the vernal and autumnal equinoxes.

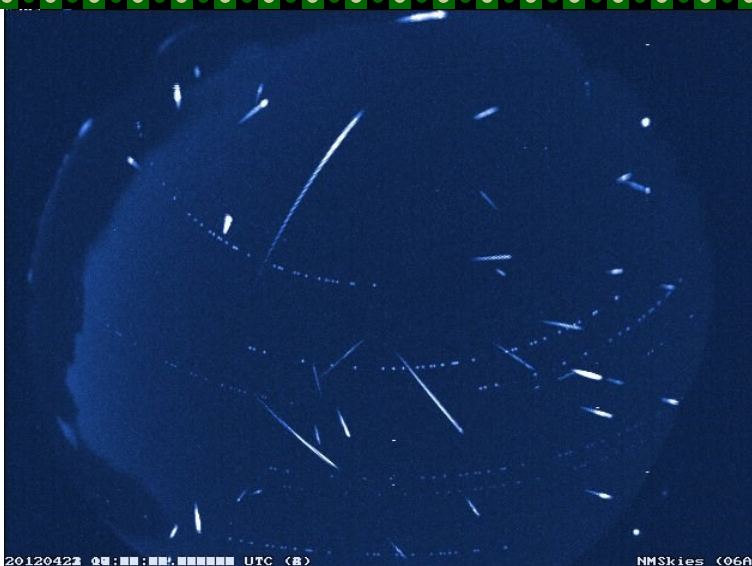
According to Earthsky.org, this was the earliest spring equinox since 1896! They explained that this is because of the way Pope Gregory XIII changed the calendar so that leap years would not occur on years that ended in "00", unless the number was divisible by 400. So the year 1900 was not a leap year, but 2000 was because it's divisible by 400.

This will make each subsequent equinox during leap year in this century begin just a little bit sooner than the previous leap year.



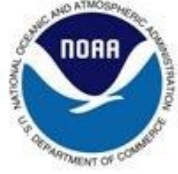
When something rare happens, often the phrase "once in a blue moon" pops in my mind. Blue moons aren't as rare as the phrase makes it seem considering they occur on average once every 2 to 3 years. However, there are two different ways to define a blue moon. The one I'm most familiar with, is when there are two full moons in one month. In this situation, the second full moon is called the blue moon. The other, original definition is when there are four full moons in one season as opposed to the typical three. When this happens, the third full moon is called the blue moon. The full moon on May 21st will be a blue moon according to the latter definition and will be the last one by this definition until May of 2019.

- ◆ The Lyrid meteor shower, produced by the Comet Thatcher, typically runs from April 16th through the 25th. This year it will peak on the night of the 22nd where you could be able to see up to 20 meteors per hour. Unfortunately, the full moon is also on the 22nd of April, so only the brightest of meteors will be visible. If you are patient and/or dedicated enough, look to the northeast for the constellation Lyra which is where this meteor shower will radiate from and maybe you'll get lucky!
- ◆ The Eta Aquarids meteor shower peaks on the 6th of May this year. This meteor shower is produced by the famous Comet Halley and typically runs from April 10th to May 28th. Weather permitting, viewing conditions will be better for this shower compared to the Lyrid meteor shower thanks to the new moon that also falls on the 6th. Be prepared to see up to 30 meteors per hour during this event. Just look to the south for the constellation Aquarius and enjoy the show!



Composite image of Lyrid and non-Lyrid meteors, seen over New Mexico from April 21-23, 2012. (NASA/MSFC/Danielle Moser). Retrieved from: https://www.nasa.gov/connect/chat/lyrids2012_chat.html#.VvLIVuIrj9N

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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, under the direction of Meteorologist-In-Charge John Lovegrove.

