The Inland Northwest Informer
Information For Storm Spotters, Cooperative Observers And Everyone
A Publication Of WFO Pendleton, Oregon
Fall/Winter 2015 - Volume 17

Winter Outlook Calls For Strong El Niño

By Mike Murphy, Meteorologist

By now many have likely heard rumblings that a strong El Niño event will be affecting our weather pattern for the upcoming winter season. The Climate Prediction Center (CPC) has stated that an El Niño is currently ongoing in the tropical Pacific Ocean and that there is now approximately a 95 percent chance it will continue through the upcoming winter. The El Niño should peak in intensity during the early winter months before gradually weakening during the spring of 2016. Most computer models are forecasting the Niño 3.4 region to stay above +1.5°C through late 2015 and early 2016, making this a strong El Niño event. There is also the potential for this year's El Niño to peak above +2.0°C. If this is the case, it will join only a handful of years on record to accomplish this feat. The previous years on record that had Niño 3.4 region indices above +2.0°C were 1957-58, 1972-73, 1982-83 and most recently 1997-98. The Niño 3.4 region is the area in the tropical Pacific where sea surface temperature anomalies are typically measured to indicate the occurrence and strength of a La Niña or El Niño event.

Looking at the current ENSO conditions there is a large stretch of above average sea surface temperatures across the tropical Pacific with sea surface anomalies of +2 to +3.5°C as of mid-October (See Figure 1, below). This large area of above normal sea surface temperatures is forecast to persist through the winter months and will likely have an impact on the atmospheric weather patterns over our region. During well-defined El Niño years the typical atmospheric pattern is to have a stronger sub-tropical jet stream develop over southern California and along the southern tier of the US from Texas to Florida. An upper level low pressure system then forms in the Gulf of Alaska with a ridge of high pressure extending from parts of Alaska, western Canada, the Pacific Northwest and the northern Plains. This keeps the brunt of the Polar Jet Stream, and Arctic air aimed at the northern Great Lakes and New England area (See Figure 2, pg. 2).

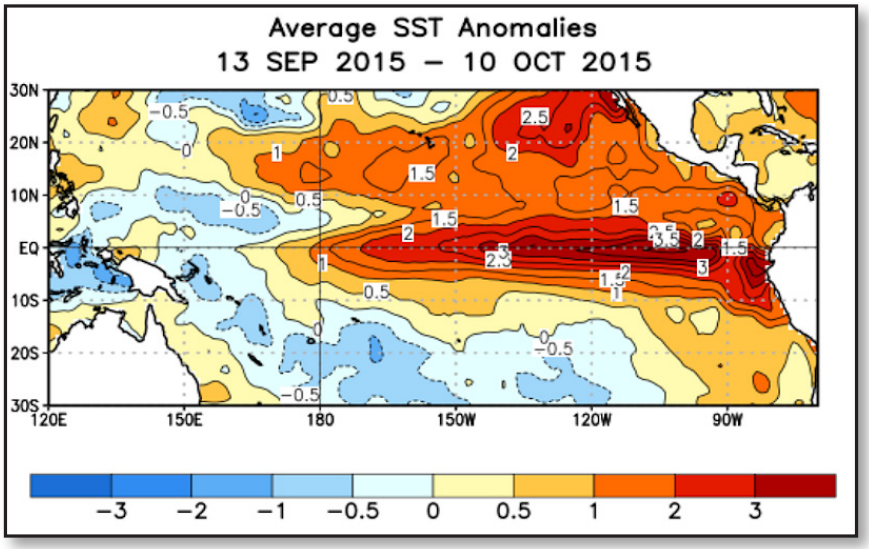

Figure 1. Sea Surface Temperature Anomalies centered on the week of October 10th, 2015 show a large area of +2 to +3.5°C anomalies extending along the equator from near the South American coast west toward the Dateline. This is a classic El Niño sea surface temperature pattern.

Based on a small set of previous strong El Niño years the interior Pacific Northwest (Eastern Washington & Eastern Oregon) typically can expect near to above normal temperatures (±0 to +3°F) from November through March during these years. During these same years the region saw near to slightly below average precipitation amounts (See Figures 3 and 4 on page 2). It is important to remember that not all El Niños or even all strong El Niños are alike, and in fact can produce very different weather patterns on a local or even region scale. There are also many other factors that

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Banner Image by T.W. Earle

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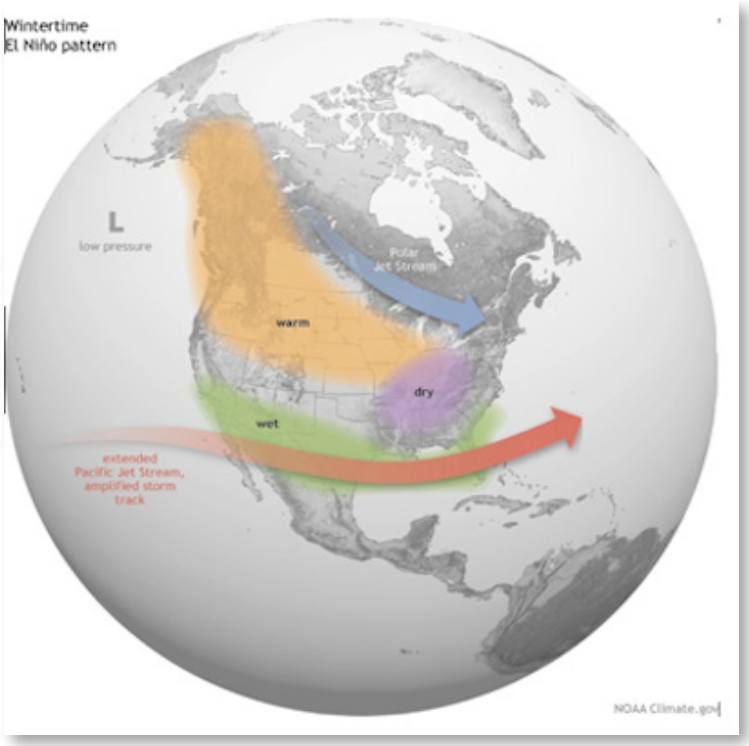

Figure 2. Typical wintertime El Niño pattern across the western part of the northern hemisphere.

will contribute to the weather pattern during the upcoming winter months, including the Pacific Decadal Oscillation (PDO), the anomalous warm "Blob" of water off the Pacific Northwest coast (as aptly named by Washington state climatologist Nicholas Bond), and the phase of the Pacific North-American index (PNA), just to name a few.

In summary, the odds may be tilted toward slightly above average temperatures and below average precipitation amounts in our area, but there is still a chance for parts of the region to see near or below average temperatures and/or near to above average precipitation amounts. Even though there are greater chances for above average temperatures and below average precipitation in the Pacific Northwest for the three month period, the day to day weather can still vary considerably.

This outlook does not mean there will not be any winter storms this year. There will still be large storm systems, there will still be snow, and there will still likely be artic outbreaks of very cold air at times. Compare the Climate Prediction Center's temperature and precipitation outlooks (Figures 5 & 6) for December through February with the average from the combined six previous strong El Niño analog years above. It is quite evident that the Climate Prediction Center believes the strong El Nino will have an extensive impact on the weather

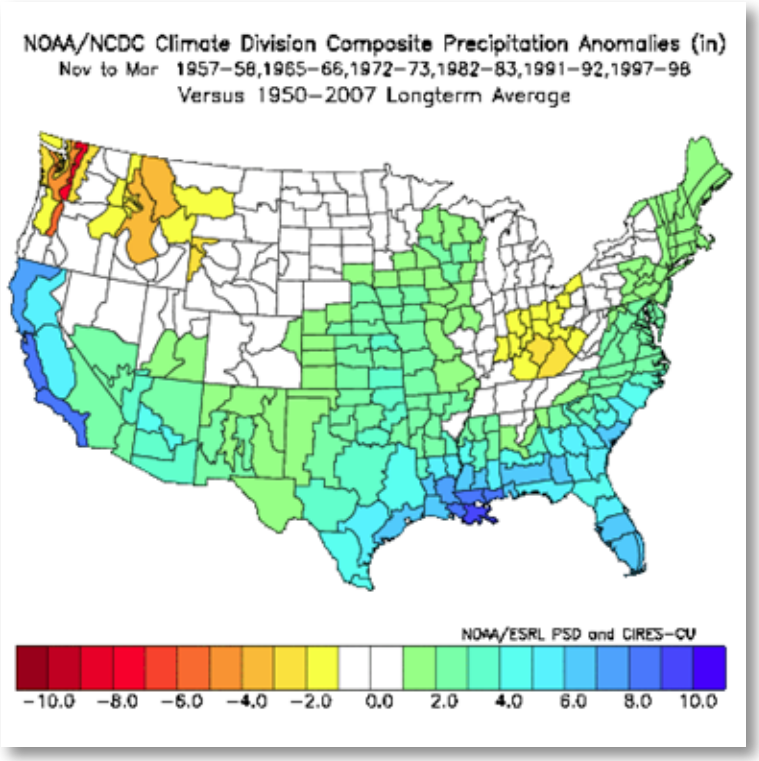

Figure 4. Average precipitation anomalies during previous November – March strong El Niño years. Note the near to below average precipitation over the Pacific NW.

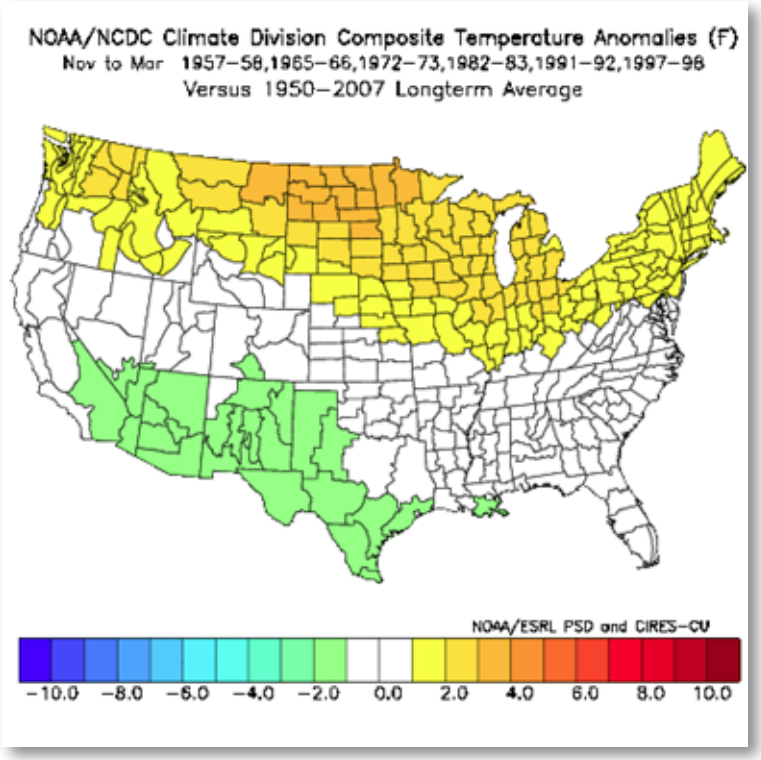

Figure 3. Average temperature anomalies during previous November – March strong El Niño years. Note the warmer than average temperature anomalies in the Pacific NW.

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across North America through the winter months. The area that stands the highest probabilities for near average temperatures and precipitation amounts this upcoming winter is in Central Oregon. Don't lock those skis or snowmobiles in storage just yet; there is still hope for some typical winter weather in the Pacific Northwest this year! ❖

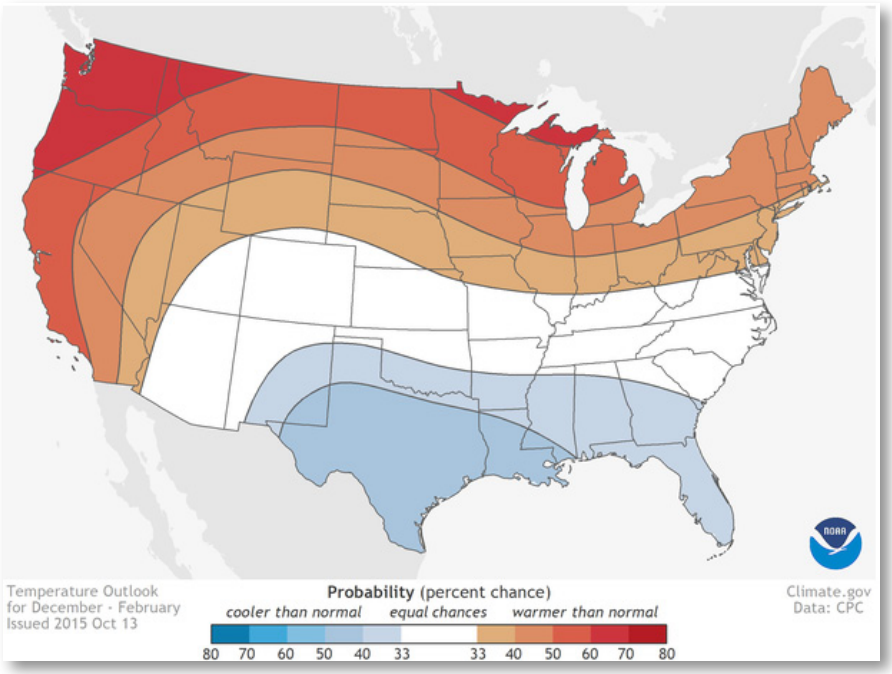
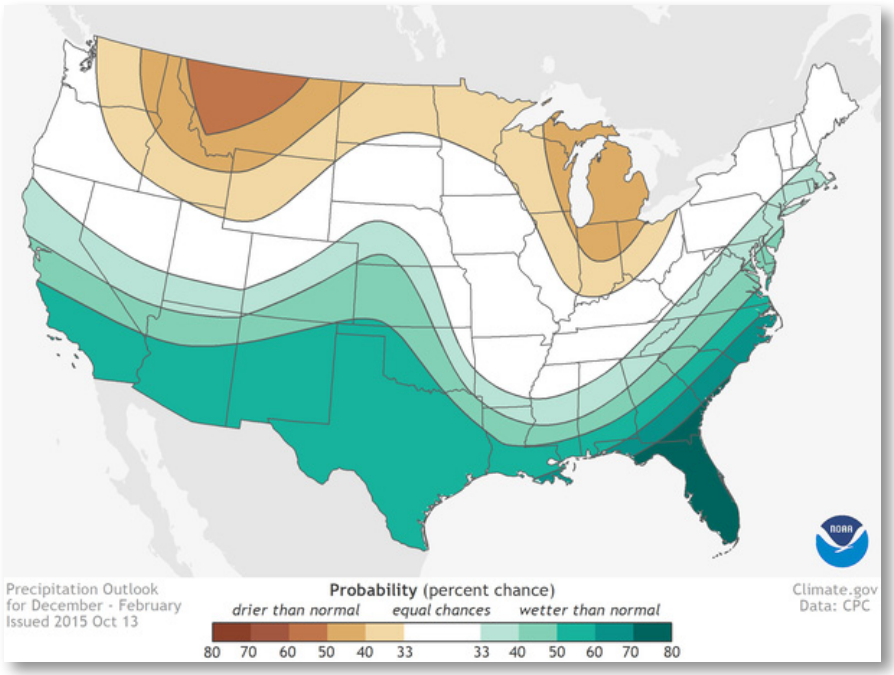


Figure 5. CPC's December – February temperature probability forecast. Much of the area has a 50 – 70% chance for above normal temperatures during this period.

Figure 6. CPC's December – February precipitation probability forecast. Much of the area has between 33 – 40% chance for below normal precipitation amounts while Central Oregon has equal chances for above, below or near normal precipitation amounts.



Severe Weather Pummels Inland Northwest

By Mike Murphy, Meteorologist

On May 31st and June 1st 2015 parts of eastern Oregon and Southern Washington were affected by severe thunderstorms which produced damaging winds, large hail, frequent cloud to ground lightning and torrential downpours. These thunderstorms developed out ahead of an eastward moving trough of lower pressure and associated front. There was also a relatively moist and unstable air-mass over eastern Washington and Oregon during this time which the storms were able to tap into. Many of the typical ingredients that meteorologists look for prior to severe thunderstorm development were present, including an unstable atmosphere, a change in wind direction and speed with height (shear), a lifting mechanism (in this case the trough of low pressure and associated front) and hot surface temperatures. Conditions set up nearly perfectly for thunderstorms to produce very strong winds, especially as they moved off the Blue Mountains and into the Lower Columbia Basin. Thunderstorms initially developed around 3:00 PM on May 31st over north-central Oregon and

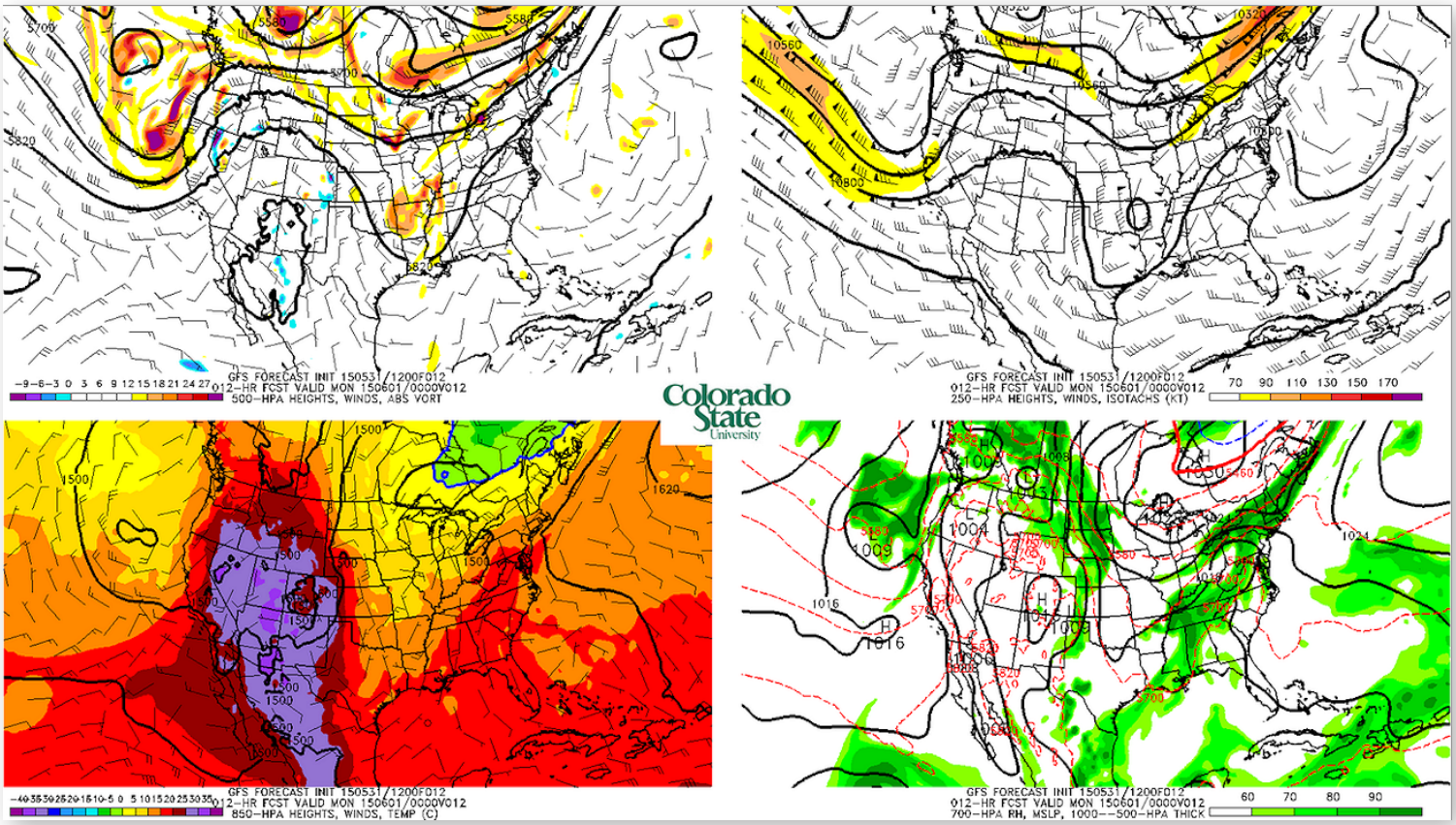


Figure 7. GFS model forecast initialized at 1200 UTC on May 31st 2015, valid at 0000 UTC June 1st 2015. Upper left panel shows 500mb heights, vorticity and wind. Upper right panel shows 250mb heights and wind. The lower right panel shows 700mb humidity, 1000-500mb thickness and mean sea level pressure. Finally, the lower left panel shows 850mb heights, winds and temperatures.

began to expand while moving northeastward. By 4:30 PM thunderstorms were moving through Condon and Fossil, OR along the route 19 corridor. These storms produced penny size hail 3 miles south of Fossil at 4:25 PM. By 5:45 PM the thunderstorms had advance to the northeast and were now approaching Arlington and Lexington, OR along the Route 74 corridor. The storms continued to produce large hail, which now reached the size of quarters just south of Lexington. At 7:00 PM, the line of thunderstorms was now approaching the Hermiston, Stanfield, Echo Oregon area and had begun to increase its forward motion. Wind gusts to near 50 mph along with blowing dust were reported near the intersection of US Highway 395

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and Interstate 84 just south of Stanfield, OR at this time. The storms then continued to accelerate northeastward, affecting Pendleton from 7:15 to 7:30 PM. Wind gusts to near 70 mph along with blowing dust reducing visibility to near zero miles was also reported by National Weather Service employees at the Pendleton airport. Heavy downpours, small hail and frequent cloud to cloud lighting were also reported while in Pendleton. The storms continued on, heading directly toward Walla Walla. They arrived, and affected the Walla Walla area from 8:00 to 8:30 PM with many of the same impacts that were felt in Pendleton. There were also numerous downed or damaged trees along with several areas losing power. The thunderstorms then weakened while moving through Dayton, WA and out of the area between 9:00 to 10:00 PM.

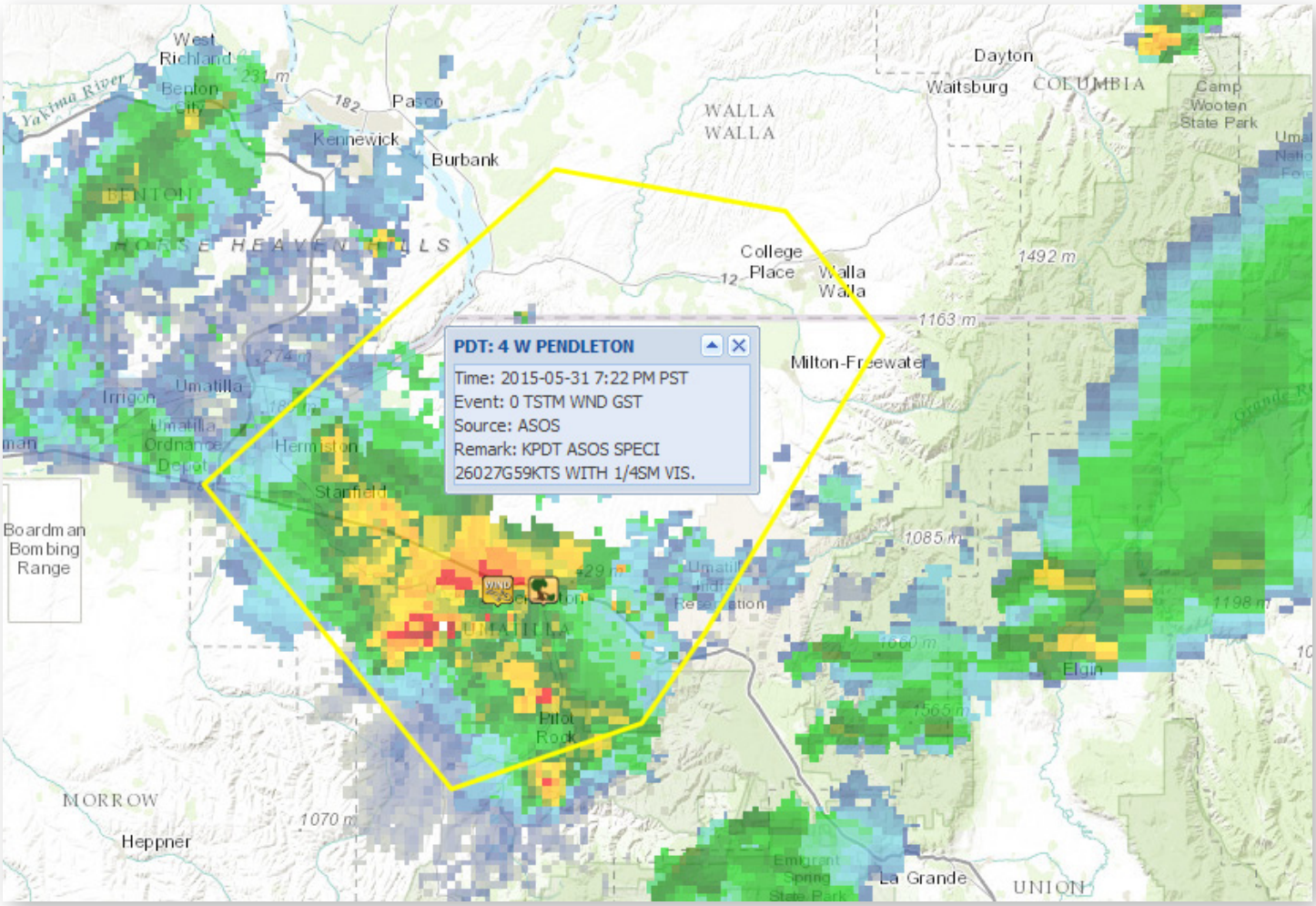

Figure 2. Radar reflectivity from 7:10 PM on May 31st, 2015. This image shows the severe thunderstorms moving into Pendleton and toward Walla Walla. This storm produced wind gust to near 70 MPH, brief heavy rain, small hail and frequent cloud to ground lightning at Pendleton. The National Weather Service in Pendleton issued a severe thunderstorm warning for the City of Pendleton and surrounding areas at approximately 6:55 PM, giving a lead time of 25-35 minutes, as the storm rolled through the city between 7:20-7:30 PM.

Additional storms formed the following day, during the afternoon hours on June 1st, 2015. They initially developed between 1:00 and 2:00 PM over northeast Grant, southeast Umatilla and Union counties. Strong to occasionally severe thunderstorms continued to affect southeast Umatilla, Union and Wallowa counties into the late afternoon hours. The thunderstorms on this day mainly produced heavy rain, frequent lightning and hail. Hail size primarily ranged from the size of pennies to the size of ping pong balls from these storms (see figure 3). These storms stopped producing severe weather and moved northeast out of the area toward Lewiston, Idaho by around 6:00 PM in the evening. ❖

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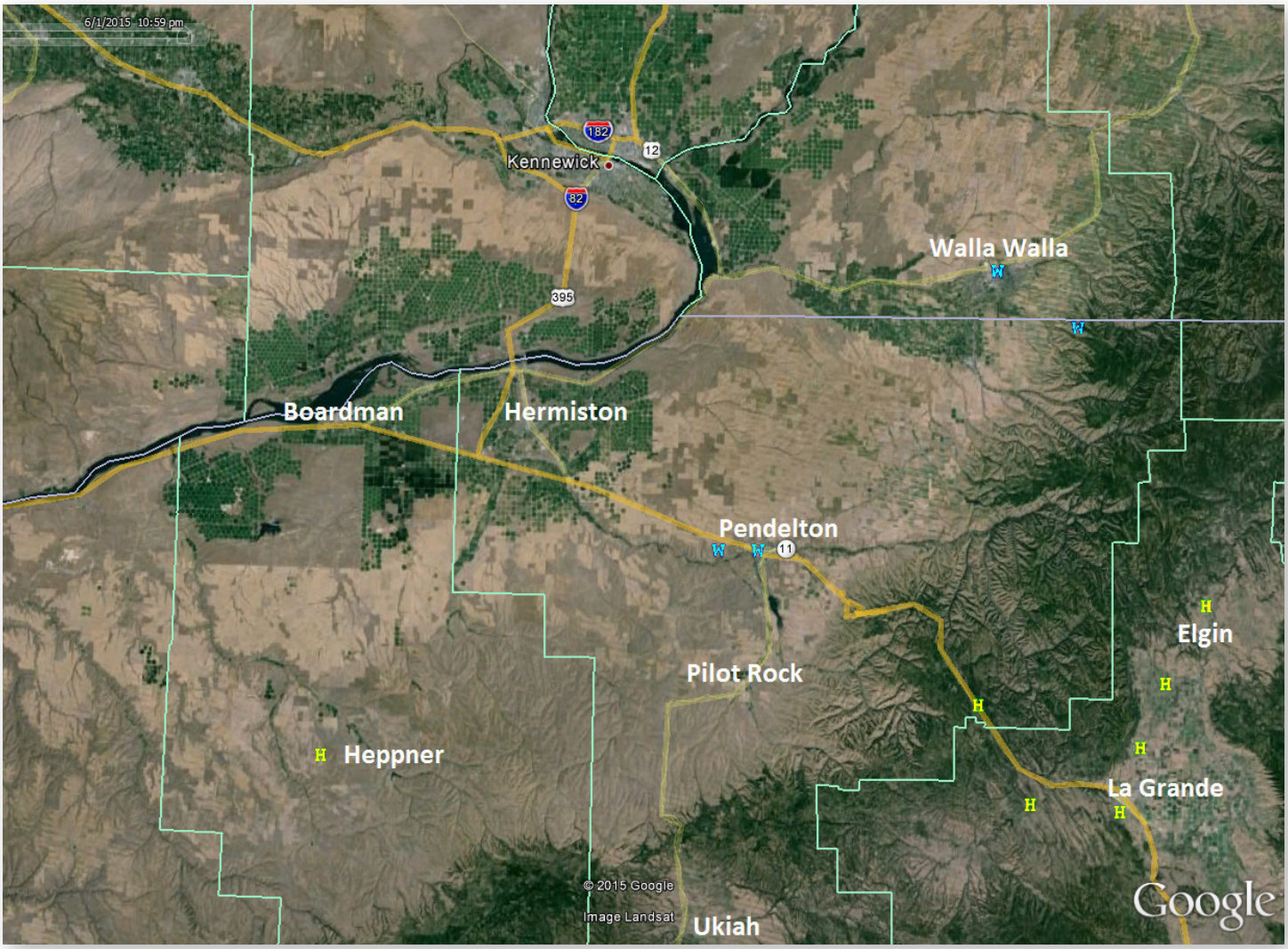


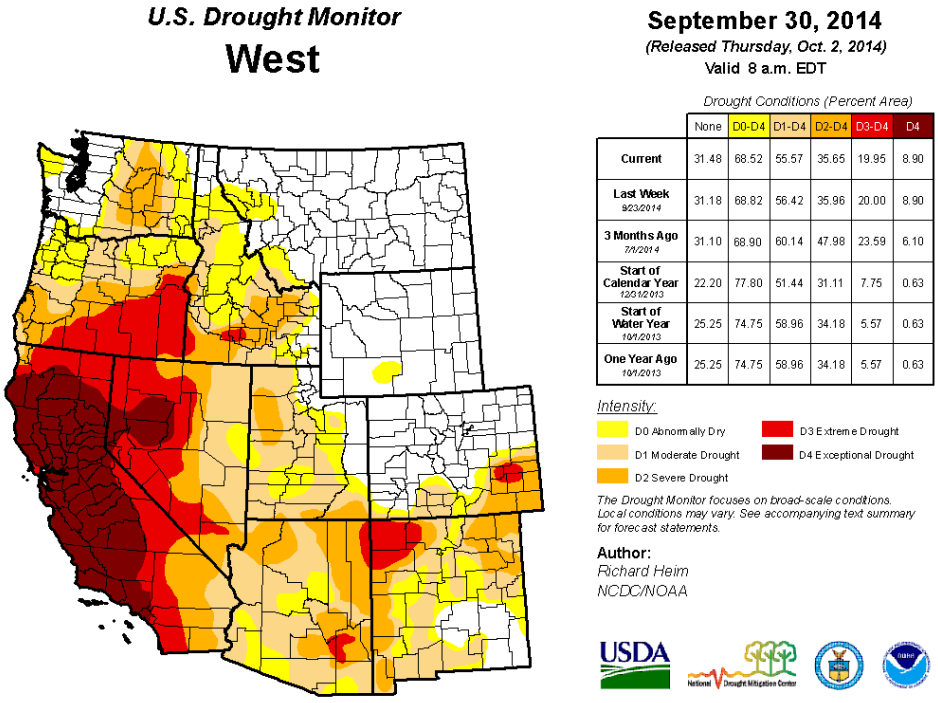
Date & Time (UTC)	MAG (Inches or MPH)	TYPETEXT	CITY	STATE	REMARK
05/31 2325	0.75	HAIL	3 S FOSSIL	OR	THE SPOTTER REPORTED HEAVY RAIN WITH A MAJORITY OF THE HAIL DIME SIZED_ WITH THE LARGEST STO
05/31 2325	1.75	HAIL	S SUMMERVILLE	OR	OBSERVER REPORTED GOLBAL SIZED HAIL FOR 10 MINUTES.
06/01 0000	0.25	HAIL	1 WNW LA GRANDE	OR	REPORTS OF PEA SIZED HAIL AND HEAVY RAIN_ WITH SOME URBAN PONDING AROUND DRAINAGE ARES.
06/01 0000	0.5	HAIL	1 WNW LA GRANDE	OR	REPORTS OF DIME SIZED HAIL AND HEAVY RAIN_ ACCOMPANIED BY SOME PONDING ON THE STREETS.
06/01 0010	0.88	HAIL	1 S LA GRANDE	OR	REPORTS OF NICKLE SIZED HAIL IN LA GRANDE.
06/01 0027	1	HAIL	1 S LA GRANDE	OR	QUARTER SIZE HAIL REPORTED BY THE LOCAL LAW ENFORCEMENT.
06/01 0110	1	HAIL	5 S LEXINGTON	OR	OBSERVER MEASURED QUARTER SIZE HAIL.
06/01 0110	None	FUNNEL CLOUD	3 N LA GRANDE	OR	REPORTED A FUNNEL CLOUD NORTH OF LA GRANDE 3 MILES.
06/01 0119	1.75	HAIL	6 SW IMBLER	OR	A MEMBER OF THE PUBLIC MEASURED GOLF BALL SIZED HAIL 6 MILES SW OF IMBLER.
06/01 0125	1	HAIL	NNW IMBLER	OR	THE OBSERVER REPORTED QUARTER SIZE HAIL.
06/01 0220	65	TSTM WND GST	4 W PENDLETON	OR	SQUALL LINE HIT NWS OFFICE WITH 65 MPH WINDS AND 0 VISIBILITY IN BLOWING DUST.
06/01 0222	68	TSTM WND GST	4 W PENDLETON	OR	KPDT ASOS SPECI 26027G59KTS WITH 1/4SM VIS.
06/01 0230	None	TSTM WND DMG	PENDLETON	OR	REPORT OF TREES SNAPPED OR UPROOTED DUE TO HIGH WINDS AND HEAVY RAIN ASSOCIATED WITH A TH
06/01 0303	None	TSTM WND DMG	WALLA WALLA	WA	POWER OUT IN WALLA WALLA DUE TO STRONG WINDS.
06/01 0315	64	TSTM WND GST	3 WSW KOOSKOOSKIE	OR	MEASURED 42G64.
06/01 0317	None	TSTM WND DMG	WALLA WALLA	WA	ROOF DAMAGE.
06/01 0321	None	TSTM WND DMG	WALLA WALLA	WA	POWERLINES DOWN IN 4 PLACES.
06/01 0339	None	TSTM WND DMG	WALLA WALLA	WA	POWERLINE DOWN SOUTH PALOUSE AND L STREET.
06/01 2028	1.5	HAIL	2 NNE KAMELA	OR	PUBLIC REPORTED PING PONG BALL SIZE HAIL ON I-84 SE OF MEACHAM.
06/01 2035	0.75	HAIL	MEACHAM	OR	PUBLIC REPORTED DIME SIZE HAIL.
06/01 2125	1	HAIL	9 W LA GRANDE	OR	PUBLIC REPORTED DIME SIZED HAIL AT 245 PM_ BUT HAD 1 INCH HAIL 20 MINUTES PRIOR.
06/01 2141	0.88	HAIL	SPRAY	OR	
06/01 2145	0.88	HAIL	SUMMERVILLE	OR	DIME SIZE TO NICKEL SIZE HAIL.
06/01 2236	1	HAIL	3 N ELGIN	OR	QUARTER SIZE HAIL.

Figure 3. Local Storm Reports from May 31st and June 1st 2015. Several of these storms produced wind gusts of 60 to 70 mph, along with hail over 1 inch in diameter. Remember that a severe thunderstorm is defined as having either wind gusts at or above 58 mph and/or hail 1 inch or greater in diameter.

Drought Update

By Marilyn Lohmann, Service Hydrologist

Following the relatively dry year of 2014, drought conditions worsened across northeast Oregon, south central and southeast Washington during 2015. At the end of September 2014, the NOAA Monitor Product showed extreme drought (D3) confined to the southeast portion of Oregon (as seen in figure 1) with some lesser degree of drought over the remainder of Eastern Washington and Eastern Oregon. As the current water year starts, we have extreme drought (D3) over most of Eastern Washington and Eastern Oregon (see figure2). How did we get here? If we look back at the precipitation from October 2014 through September 2015, most locations had 60 to 80 percent of their normal precipitation, but the times that the precipitation fell and also the lack of winter snowpack was what turned a dry year into a more severe drought. The fall months had near normal precipitation, followed by an above normal amount of precipitation in December, but temperatures were much warmer than normal, with little snowpack accumulating in the mountains. The generally drier than normal conditions prevailed through the first part of 2015, with above normal temperatures, with well below normal snowpack for the mountains.



◄ *Figure 1. Drought Monitor* ***September 2014***

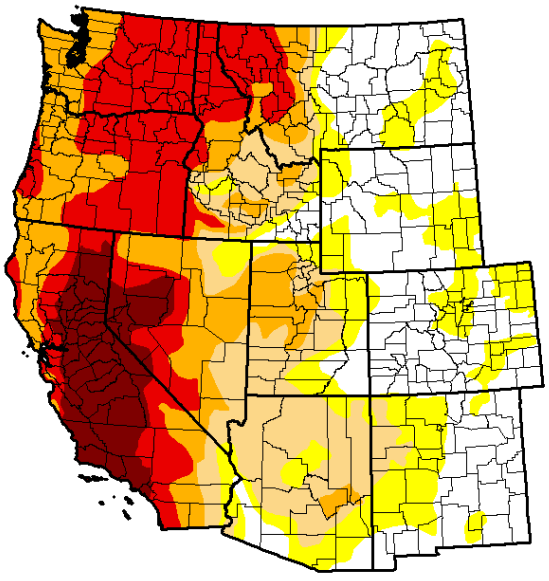


Figure 2. Drought Monitor ***October 2015*** ➤

On April 1, 2015, many mountain snow measuring locations across the Pacific Northwest were at record low values. (See Figure 3) Precipitation for April was well below normal with amounts 25 to 50 percent of normal, with the meager snowpack melting out about 1 month earlier than normal. The only bright spot through the year was in May, when a series of storms brought well above normal precipitation.

In March, drought declarations were issued for several river basins in Washington, including the Yakima and Walla Walla and for Crook County in Oregon. Early season

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water supply forecasts had water volumes of 50 to 70 percent of normal. As the dry and warm spring continued, the declarations were expanded to cover all of Washington and much of Eastern Oregon as water supply forecasts dropped to 25 to 50 percent of normal. Junior water right holders in the Yakima Basin were told to expect only 44 percent of their normal amounts with many other water projects turning off water by late August due to low reservoir conditions.

Further compounding the drought were the well above normal temperatures seen through the summer with 2 heat waves, one in early June and another stretching from late June into early July. This put additional pressure on the already limited water supply, with the NOAA Drought Monitor showing D3 – Extreme Drought over much of the region. We will see short-term improvement over the next few months as storm systems bring rain and snow to the region, but will need to wait until late winter and spring to see any longer term improvements. For more information on the NOAA Drought Monitor, visit www.drought.gov ❖

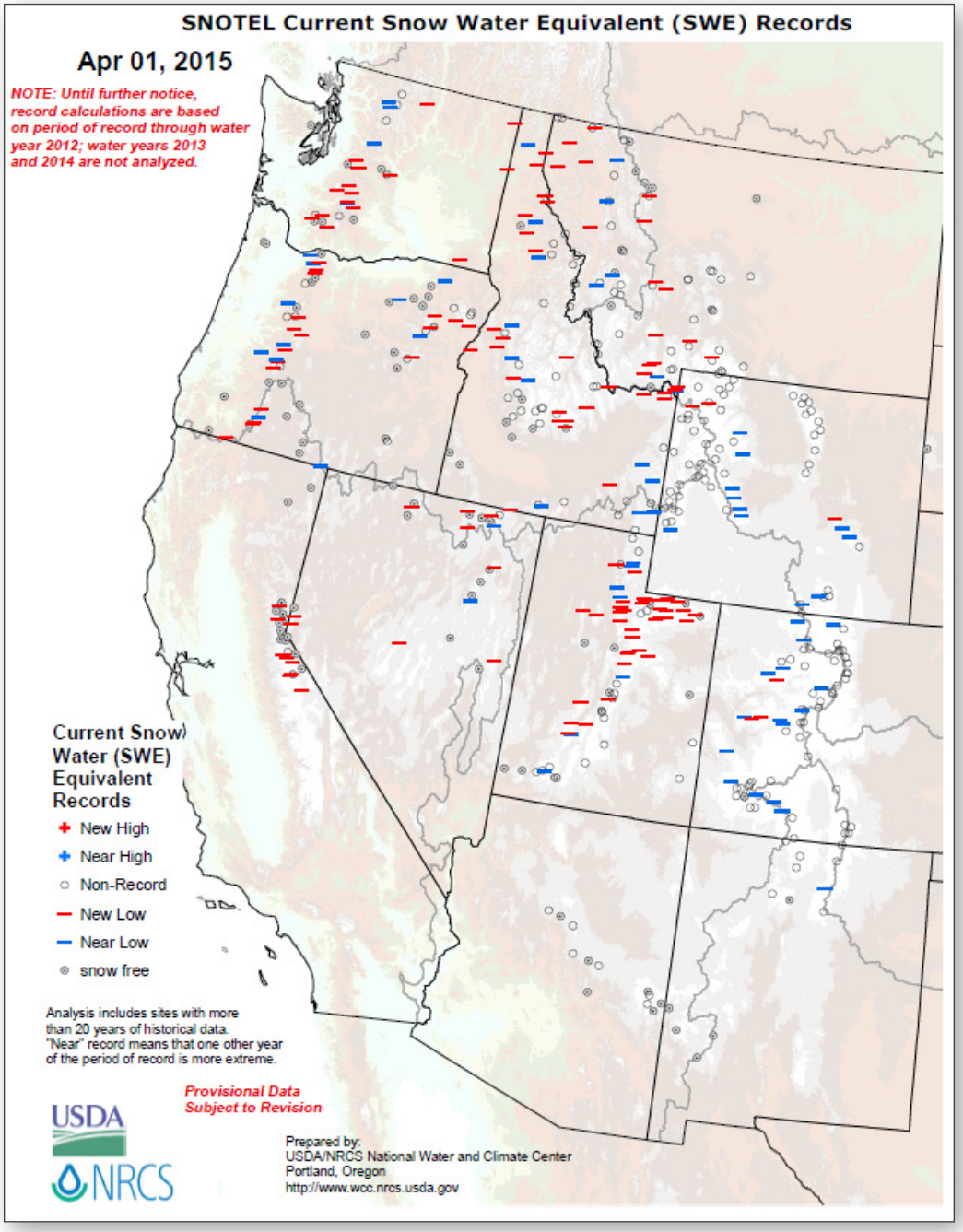

Figure 3. Courtesy Natural Resource Conservation Service – April 2015 Record Low Snowpack

Severe Weather Spotter Training

By Dennis Hull, Meteorologist

The National Weather Service and emergency management conducted spotter training across eastern Washington and Oregon last Spring. Our trainers were Senior Forecaster Vince Papol, Forecaster Doug Weber, Intern Mike Murphy, and Warning Coordination Meteorologist Dennis Hull. Come next March, be sure to check the headlines on weather.gov/pendleton for the 2016 spotter training schedule. ❖

Weather Spotter Class - Wasco County, May 20, 2015,
Meteorologist Dennis Hull instructing and certifying.
Photos courtesy of Kristy A. Beachamp, Emergency Manager
Wasco County Sheriff's Office - Emergency Management

2015 Fire Season Recap

By Mary Wister, Meteorologist

Wildfires are a natural part of the life cycle of forests in the Pacific Northwest. The number and intensity of wildfires vary from one fire season to another. The 2015 fire season was one of the most active in recent years--not only across the United States but also in eastern Washington and eastern Oregon. At the time of publication, over 9 million acres of land have burned in the United States. According to the National Fire News produced by the National Interagency Fire Center (NIFC), this has been the largest acreage burned since 2006. In the NWS Pendleton's County Warning Area, the large wildfires (wildfires encompassing 1000 acres or more) burned over 705,000 acres in 2015.

We can only hope that the devastating impacts from several wildfires will never be witnessed again. We watched in fear as 43 homes were destroyed and another 50 structures were damaged by the Canyon Creek Complex near the towns of John Day, Canyon City and Prairie City with firefighting suppression incredibly difficult due to extreme fire behavior. Meanwhile, the Grizzly Bear Complex in the Wenaha-Tucannon Wilderness burned five homes and threatened 45 other homes during critically dry and unstable atmospheric conditions. The town of Roosevelt, Washington, was close to a devastating loss as well when gusty winds and dry grassy fuels allowed the Highway 8 wildfire to spread rapidly, burning over 33,000 acres. Thanks to the quick action of local and state firefighters, most of the damage caused by the Highway 8 fire was from outbuildings and several barns rather than homes. The County Line 2 fire in the Warm Springs Reservation threatened the beautiful Kah-Nee-Ta resort and guests were forced to evacuate, but firefighters did a tremendous job suppressing the fire and saving the resort and numerous other infrastructures. Reportedly, four homes were destroyed by the County Line 2 fire.

Hot and dry conditions prevailed during June, July and August. Record-setting high temperatures were observed in most locations throughout the season, and precipitation amounts were well below normal. The late winter season was also warmer than normal, and snowpack was dreadfully low during the early spring. The drought conditions set the stage for significant wildfires. The first significant wildfires began in late June when lightning storms triggered a 14,357-acre grass fire called the Saddle Lakes fire near Mattawa, WA and multiple new fire starts near Dayville, OR identified as Sugarloaf, West Fork, and Corner Creek fires. Additional storms developed in central and northeast Oregon in early July, and these storms

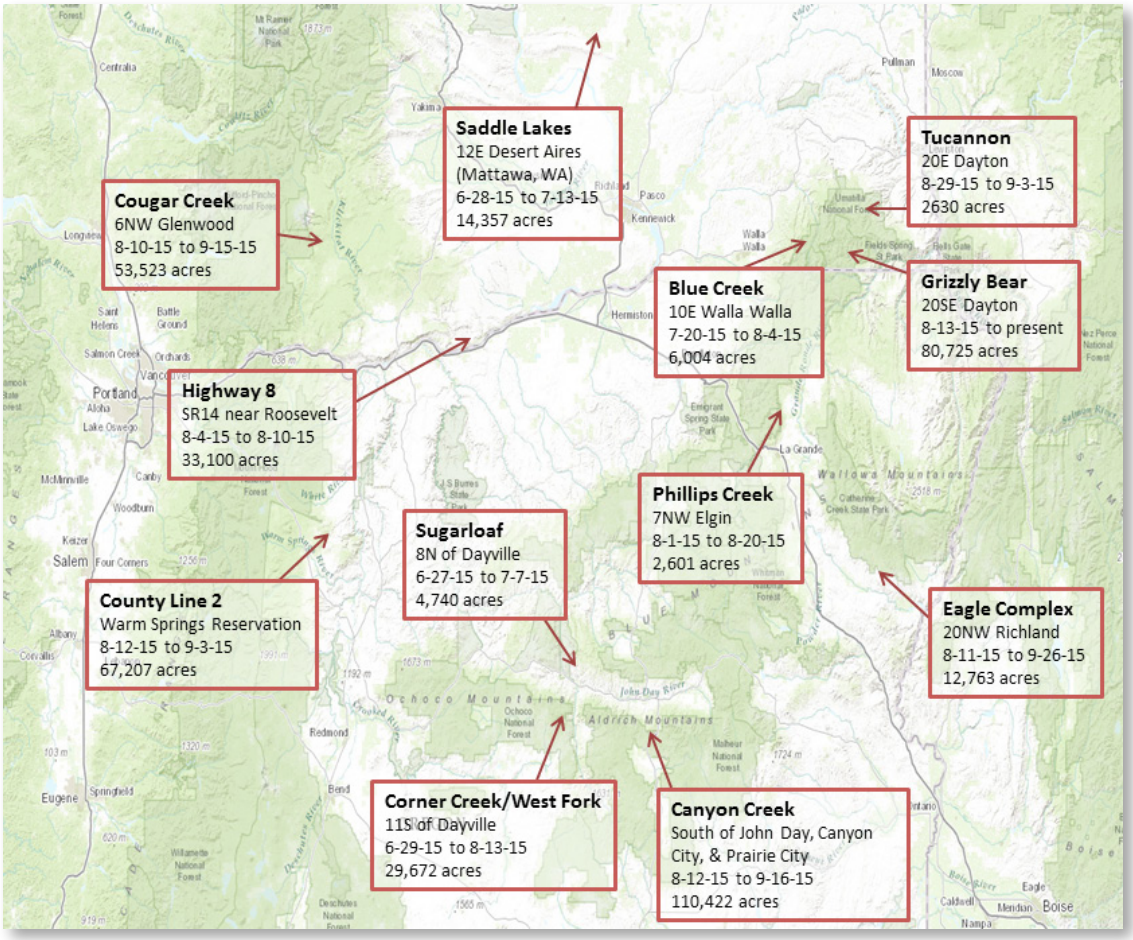

Image 1. Map of the significant wildfires within NWS Pendleton's County Warning Area since January 2015. (Fires under 1000 acres are not shown)

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produced heavy rain. This allowed faster suppression of the Sugarloaf fire, but the Corner Creek and the West Fork fires continued through the month of July. All three fires combined burned 35,328 acres near Dayville.

After a brief lull in fire activity during mid- to late-July, primarily due to the lack of lightning from thunderstorms, fires erupted throughout the Pacific Northwest at the beginning of August. Lightning-caused fires were to blame for the Grizzly Bear Complex, Cougar Creek Complex, Eagle Complex, and the Canyon Creek Complex. By mid-August, hot and unstable atmospheric conditions were extreme, and large fire growth was inevitable. On August 13, 2015, the National Multi-Agency Coordinating Group (NMAC) increased the National Fire Preparedness Level (PL) to its highest point, PL-5. The PL ranges from one, indicating minimal activity, to five, indicating very high activity. As stated in their news release, "A PL-5 depicts the complexity that fire managers are encountering to assure that adequate firefighting resources are available for protections of life, property and our nation's natural resources." During this time, NIFC pulled resources from the military as well as firefighters from Canada, New Zealand and Australia to aid in the efforts across the Pacific Northwest.

As summer winded down around Labor Day, so did the significant wildfires. Although dry vegetation persisted throughout the month, temperatures and relative humidity were no longer at critical levels. By the end of September, all significant wildfires were fully contained or in mop up status. ❖

***Remember**—You can help minimize damage from wildfires by maintaining your landscaping. Here are a few tips for cleaning your property and preventing fire spread:*

1. *Remove dead vegetation at least 10 feet away from your home.*
2. *Remove flammable material such as propane tanks and firewood stacks at least 30 feet away from your home and outbuildings.*
3. *If you have trees on your property, prune so the lowest branches are 6-10 feet from the ground.*
4. *Keep your lawn hydrated and maintained.*
5. *Clear leaves and other debris from gutters, eaves, porches and decks. This prevents embers from igniting your home.*

Phillips Creek Fire on August 3, 2015.
Photo courtesy of Trevor Lewis, Inciweb

For more information and helpful tips on wildfire preventative maintenance for home or property owners, visit

http://firewise.org/wildfire-preparedness/be-firewise/home-and-landscape.aspx

Cooperative Program Highlights

A number of volunteers from the NWS Pendleton office's Cooperative Observation Program received service awards this summer in appreciation for their continued dedication and support of providing daily weather observations. Recipients of awards included Marvin Grassl of Connell, WA for 35 years of service and John Etter of Pilot Rock, OR for 15 years of service, Congratulations to everyone! Other awards were presented at different dates and locations, and can be seen on the following highlights pages. ❖

Marvin Grassl, from outside of Connell WA, was presented an award for 35 years of service in the NWS Cooperative Program Marvin's station is Connell 12SE in the Columbia Basin of Washington.

Scott Thompson (right), representing the City of Bend Water Reclamation Facility, was presented an institutional award for 25 years of service in the NWS Cooperative Program by Meteorologist-In-Charge Mike Vescio. The facility is located about 7 miles northeast of downtown Bend, Oregon.

Mark Cook of Sunnyside, WA was presented an award for 15 years of service in the NWS Cooperative Program. Mark's station is located near his floral shop business in downtown Sunnyside, WA. Mark also maintains another cooperative weather station at his residence.

Cooperative Program Highlights

John Etter (center) from Pilot Rock was presented an award for 15 years of service in the NWS Cooperative Program by Meteorologist-In-Charge MikeVescio (left). Also present was Michael Murphy, Meteorologist-Intern (right). John's father, Bill Etter, was the station's observer from 1954 until his passing in 1999. The original station was established in 1908. John's station is Pilot Rock 1SE, located on the southeast edge of Pilot Rock in central Umatilla County OR.

Dennis Beechler (left), of Tygh Valley, OR was presented an award for 10 years of service in the NWS Cooperative Program by Warning Coordination Meteorologist Dennis Hull (right). Before retiring and moving to Tygh Valley, Dennis worked at the Bear Springs Ranger Station, and maintained the automated weather station there.The current station is located at his residence in Tygh Valley in north-central Oregon..

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