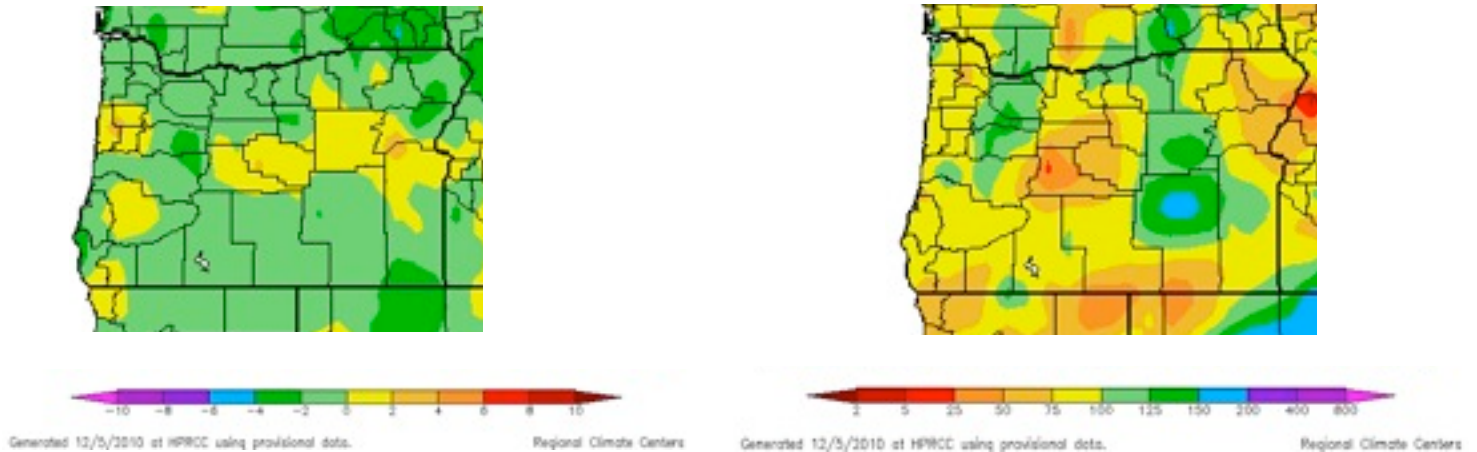


# Oregon Climate Service

December 2010

## November 2010 Temperature and Precipitation



Figures 1a and b: a) Departure from Normal Temperature (°F) and b) Percent of Normal Precipitation for March (source: HPRCC)

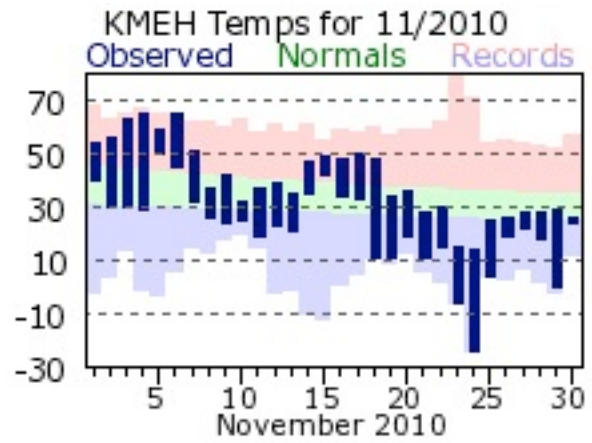
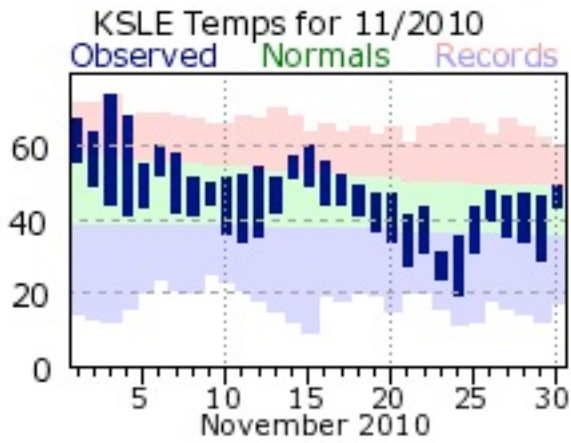
November is typically one of the wettest months in Oregon. This month started off dry and warm across much of the state, but ended with below average temperatures, rare November snow on the valley floor and abundant snowfall in the Oregon Cascades.

Statewide, averaged over the entire month, temperatures were at or around normal. The month started out with a couple of unseasonably warm Indian summer days. A few cities in the Willamette Valley (Corvallis, Salem, Portland) recorded temperatures above 70 °F on November 3. The observed temperature of 74 °F in Salem and 73 °F in Astoria were the highest recorded temperature for the month of November ever at those stations. As the month progressed, temperatures continued to get cooler and temperatures around Thanksgiving were well below normal. Minimum temperatures plummeted much below zero in eastern Oregon and Meacham shattered its minimum temperature record on November 23 with a frigid -24 °F. The previous lowest temperature for that date was 2 °F, set in 2007 (see page 2).

Precipitation was slightly below normal statewide. Most stations in the Willamette Valley closed out the month slightly above normal. Portland Airport recorded 6.63" of rain, the rainiest November on record since 2006.

Snow on the valley floor in November is unusual, but not unprecedented. In Corvallis, which has a long record of snowfall measurements dating back to 1896, the 0.25" of snow measured at Hyslop Farm was only the 10th November snow on record. Temperatures plummeted from the mid 40s on the afternoon of the 22nd to lows in the mid 20s overnight; rain switched to snow, leading to slick roads and school closings around the mid-valley. Temperatures remained at or below freezing for the day of the 23rd.

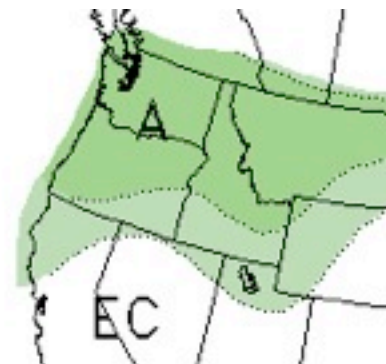
Though snow commonly falls in the mountains in November, this year, a robust early season snowfall allowed ski resorts to open earlier than usual. Mt. Hood Timberline had its earliest opening in 15 years. It has been a great start to the winter for skiers and other snow enthusiasts; mountain snowpack is above normal and most ski areas were able to open in November.



Figures 2 a and b. Graphs showing observed temperatures (minimum and maximum, dark blue bars) plotted against the normals (green) and records (red and blue) for Salem, OR (left) and Meacham, OR (right) from NWS Portland and NWS Pendleton.

These graphs show a warm period at the beginning of the month and a cool period around Thanksgiving at two stations: Salem (west of Cascades) and Meacham (east of Cascades). The month started out with daytime maximum temperatures well above average and declined through the month, with the exception of a period of slightly above average temperatures mid-month. The below average minimum and maximum temperatures around Thanksgiving at both stations were the coldest of the season, which holds true for many stations both east and west of the Cascades.

### Three-Month Outlook



Figures 3 a and b. Three-Month Outlook for a) temperature and b) Precipitation for the Pacific Northwest from Climate Prediction Center/NOAA

NOAA's three month outlook from the Climate Prediction Center for the months of December - January - February shows equal chances for much of Oregon for above or below average temperatures. Extreme northwest Oregon has a greater probability of below average temperatures in the three month period (Figure 3a). The entire state has a greater chance of above average precipitation over the winter (DJF) months. The darker green color corresponds to a slightly greater probability of a than the lighter green that covers southeastern Oregon (Figure 3b).

# November Station Records

## Maximum Temperatures

station	date	new record (°F)	old record (yr)	yrs in record
The Dalles	November 1	70	67 (1985)	62
Astoria	November 3	73	68 (1970)	120
Salem	November 3	74	71 (1975)	118
McMinnville	November 3	73	71 (1975)	116
Meacham	November 5	65	64 (1949)	62

## Minimum Temperatures

station	date	new record (°F)	old record (yr)	yrs in record
Joseph	November 23	-9	9 (2007)	117
Long Creek	November 23	-10 (tied)	-10 (1993)	63
Meacham	November 23	-24	2 (2007)	62
Pendleton (Dntn)	November 23	-7	0 (1993)	120
Joseph	November 24	-9	9 (1898)	117
Long Creek	November 25	-8	-4 (1993)	63
Meacham	November 26	4	7 (2007)	62
Pendleton (Dntn)	November 27	-6	-4 (1993)	120

## Precipitation (liquid water equivalent)

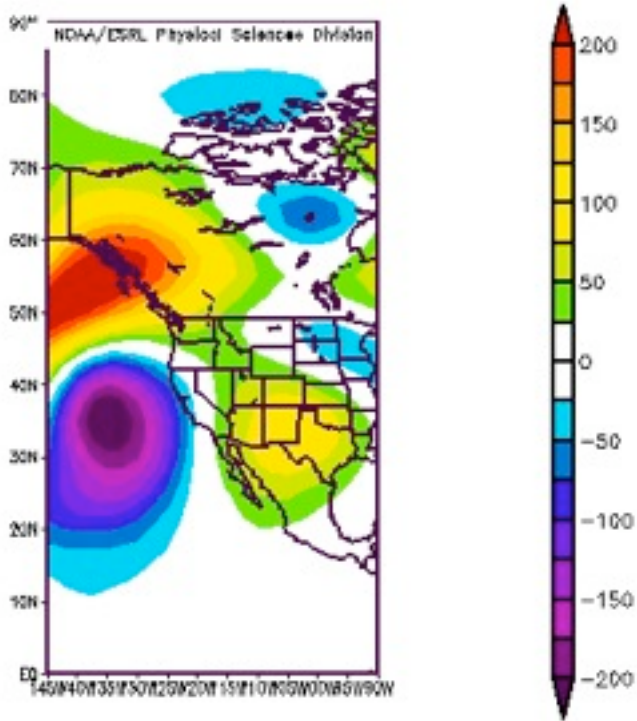
city	date	new record (in.)	old record (yr)	yrs in record
Astoria	November 1	2.31''	1.5'' (1933)	120
Troutdale	November 17	1.3''	1.14'' (2007)	62

Tables 1, 2, 3. Individual station records for maximum temperature, minimum temperature and precipitation for selected stations in Oregon (via NWS and OSU)

# Rare November snow hits valley floor

Snow in the mountains and coastal hills and throughout the Willamette Valley before Thanksgiving is rare, but not unprecedented. On the afternoon of November 22, a slow moving arctic front passed through Oregon - dropping temperatures and bringing precipitation in the form of snow to low elevations.

Figure 4 shows negative 500mb anomalies, indicating a low pressure system off the coast. The 500mb slice of the atmosphere is useful to look at for the presence of areas of strong low and high pressure and the presence of ridges and troughs. The area of yellow and green in the western US indicates positive height anomalies, and usually means clockwise flow. In the winter, air from the the arctic and the continent is cool and is not moderated by the warmer ocean. The combination of these two ingredients - cold arctic air and a storm system with moisture are a recipe for low elevation snow.



**Figure 4. NCEP reanalysis 500mb height anomalies composite (Nov 23 and 24, 2010). Cool colors indicate negative anomalies, warm colors indicate positive anomalies. (Credit NOAA ESRL PSD)**

CoCoRaHS spotters reported a few inches of snow in the Coast Range and Cascade Mountain foothills. One spotter reported flurries on the Oregon Coast. Schools closed throughout the Willamette Valley (story on next page) due to icy conditions.

# SUV and Snow Plow Collide during whiteout conditions on Santiam Pass



Photo credit: Oregon State Police

An SUV, driven by a 25-year old Scappoose man, collided head-on with a snow plow on Oregon 22 on the Santiam Pass November 22<sup>nd</sup>. Despite severe damage to the vehicle, the SUV driver had only minor injuries.

The SUV driver was traveling eastbound on the highway at about 10:15 a.m. when he followed a left turn through white-out conditions and smashed into a westbound snow plow.

The driver of the Oregon Department of Transportation plow was not injured.

Story credit: The Oregonian

## Winter Storm in Ontario



Photo credit: Argus Observer

A winter snowstorm struck Ontario, OR on Wednesday, December 2, closing public schools and forcing the Oregon Department of Transportation to rotate highway and street crews in 12 hour shifts to keep roads clear.

Several cars spun out on the snowy streets and temporarily blocked traffic, though the snow did not force a closure of the freeway lanes.

Story credit: Larry Meyer, Argus Observer

## Unusually Early Snow Leads to Traffic Delays, Accidents, and School Closures near Portland



Photo credits: Doug Begthel, the Oregonian

A car slid off NW West Union Rd. at NW 148th Pl. and rolled into the ditch after the driver lost control in icy conditions. The driver was transported from the scene as a precaution. The icy streets delayed traffic in the area. Delays were excessive during the morning commute on eastbound HWY 26 near Portland.

Many schools in the greater-Portland area were closed just prior to Thanksgiving since driving conditions were deemed unsafe.

Story credits: Doug Begthel, Kelly House, the Oregonian

## Snowpack

An active start to the winter season with plenty of storm systems has provided for a robust mountain snowpack. Most of the state is above average (compared to 1971-2000 normals) for this point in the year. The Grande Ronde, Powder, Burnt and Imnaha Basins are slightly below normal, but it is still early in the season. Though there is snow in the Coast Range, there are only 2 functioning SNOTEL sites in the Coast Range, in NW Oregon. Therefore, the average over the entire range ends up being reported as zero.

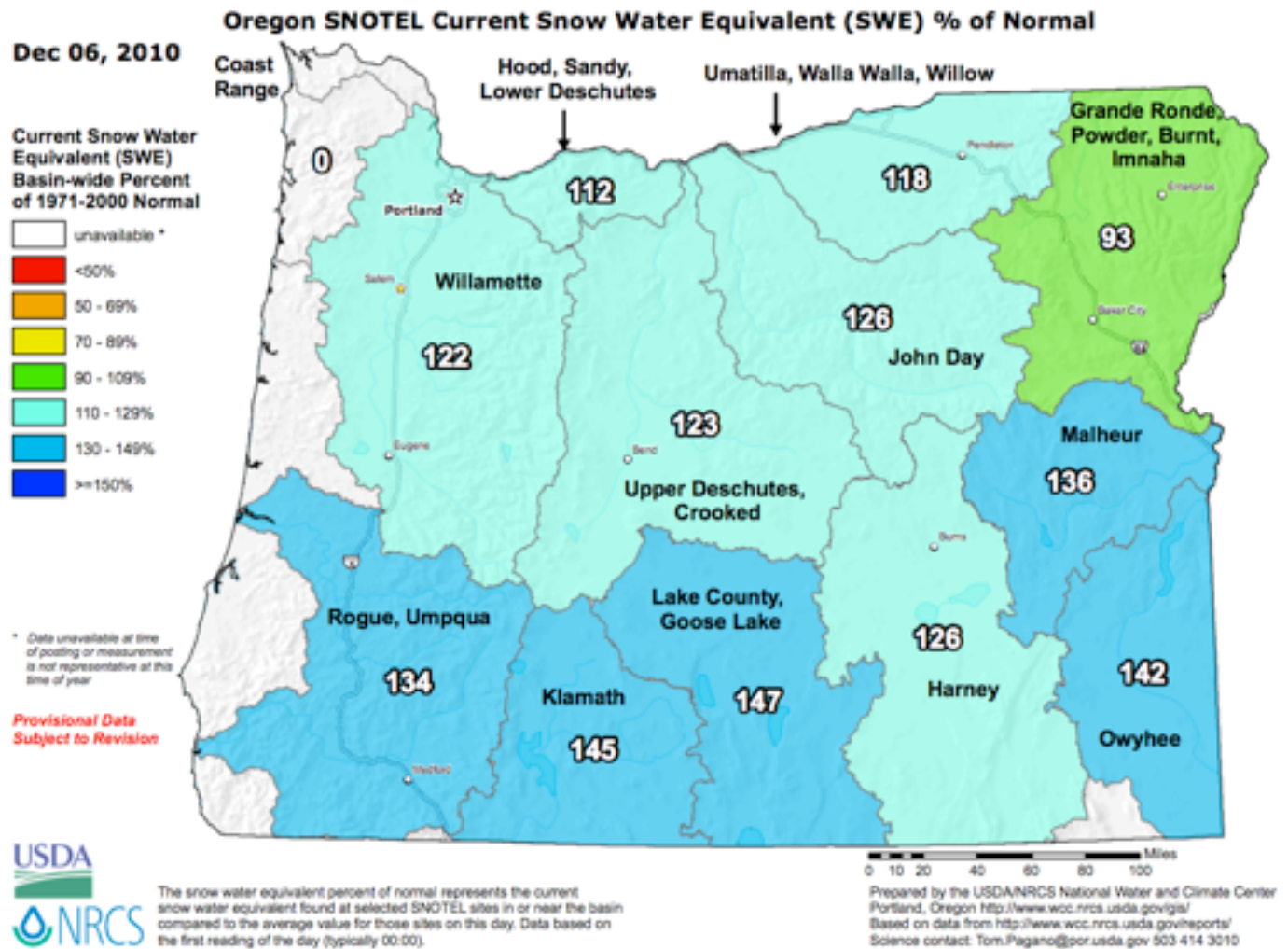


Figure 5. Oregon SNOTEL measurements as of December 6, 2010 by major river basin (credit: NRCS)

## Website update

We're working on our new website to replace the old site that died as a result of a fatal server crash. Look for us at the same address ([www.ocs.oregonstate.edu](http://www.ocs.oregonstate.edu)) in the New Year!

Oregon Climate Service

College of Oceanic and Atmospheric Sciences

326 Strand Ag Hall

Oregon State University

Corvallis, OR 97331