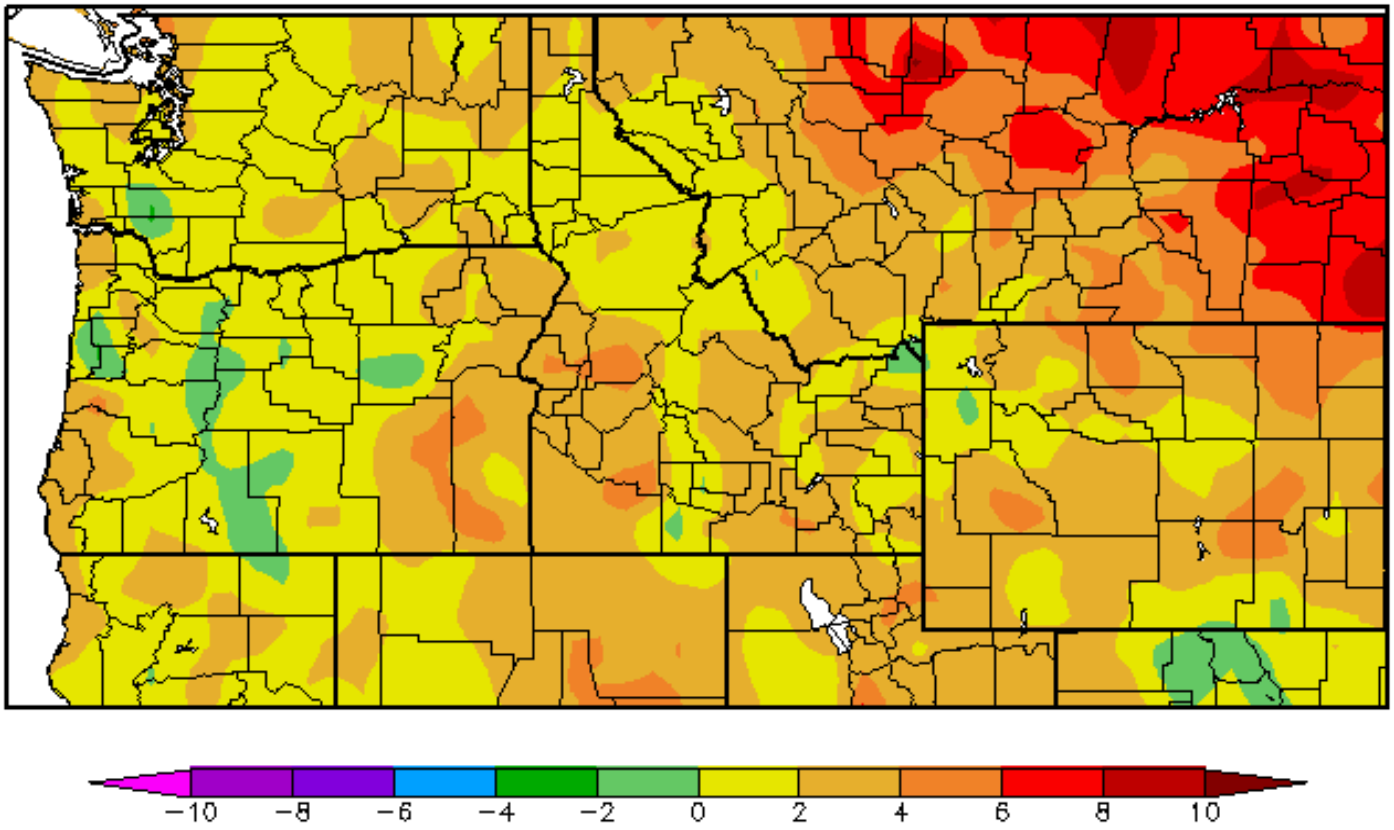
The Month In Review

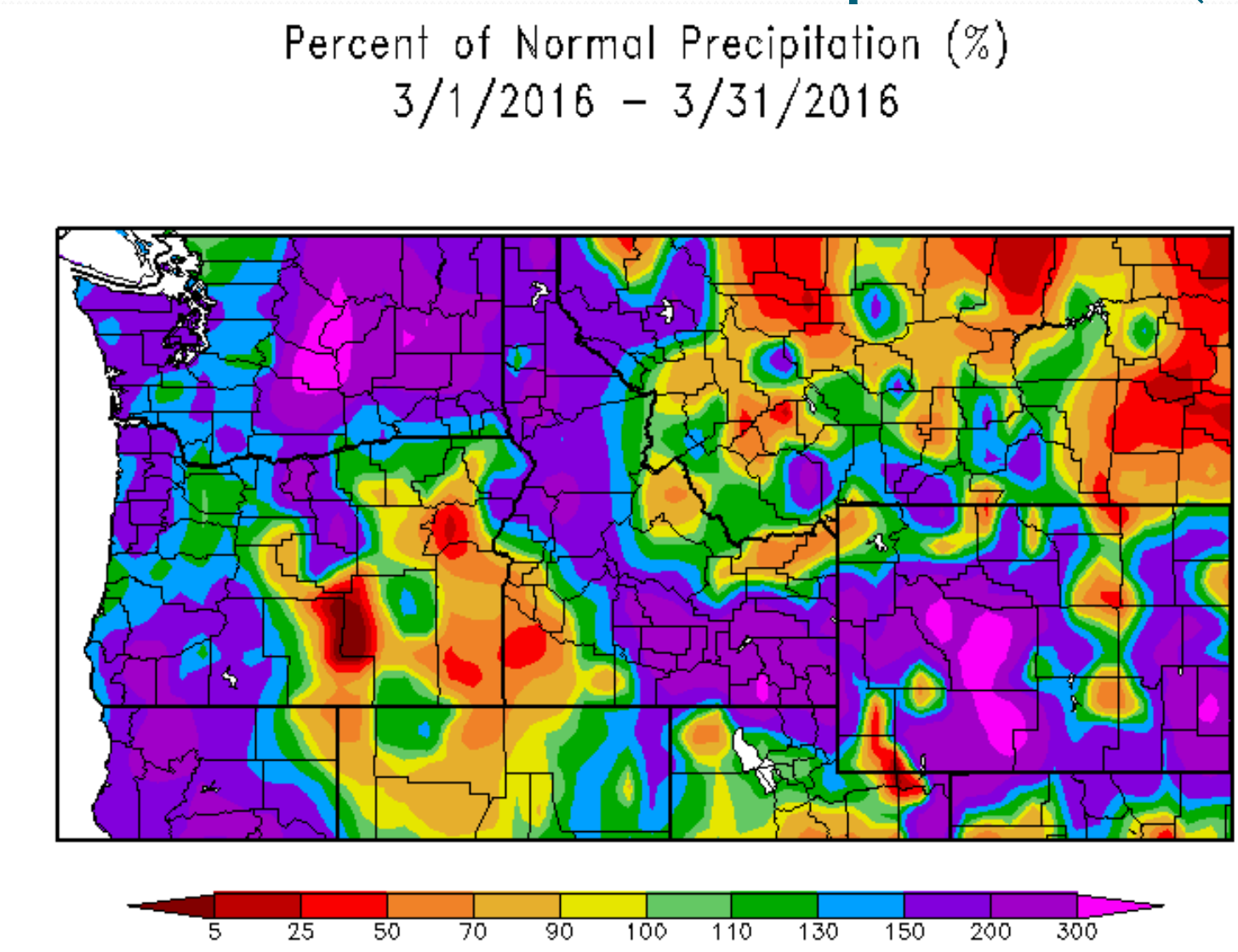
March 2016

National Weather Service
Pendleton, Oregon

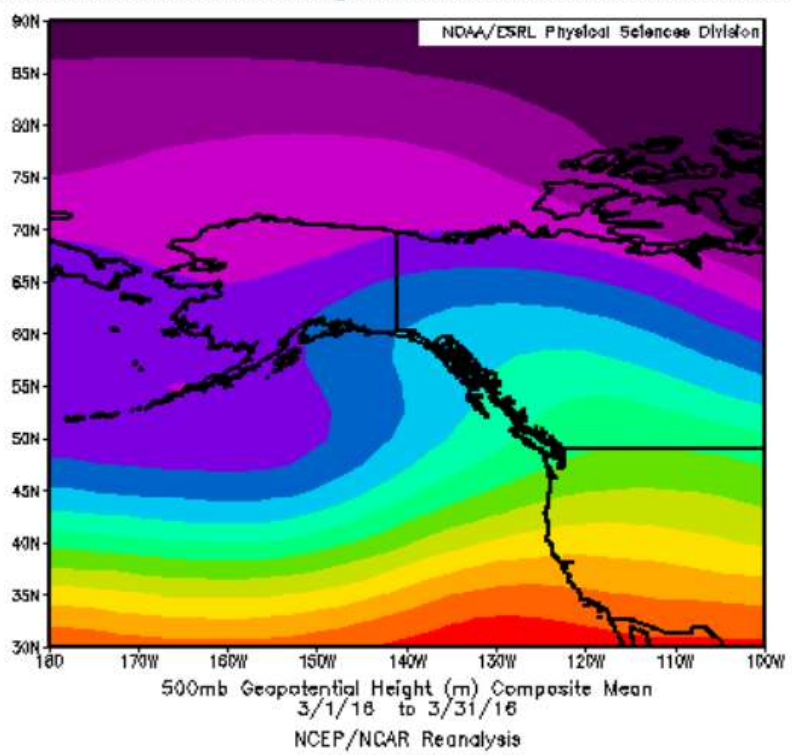
Departure From Normal Temperature (F)

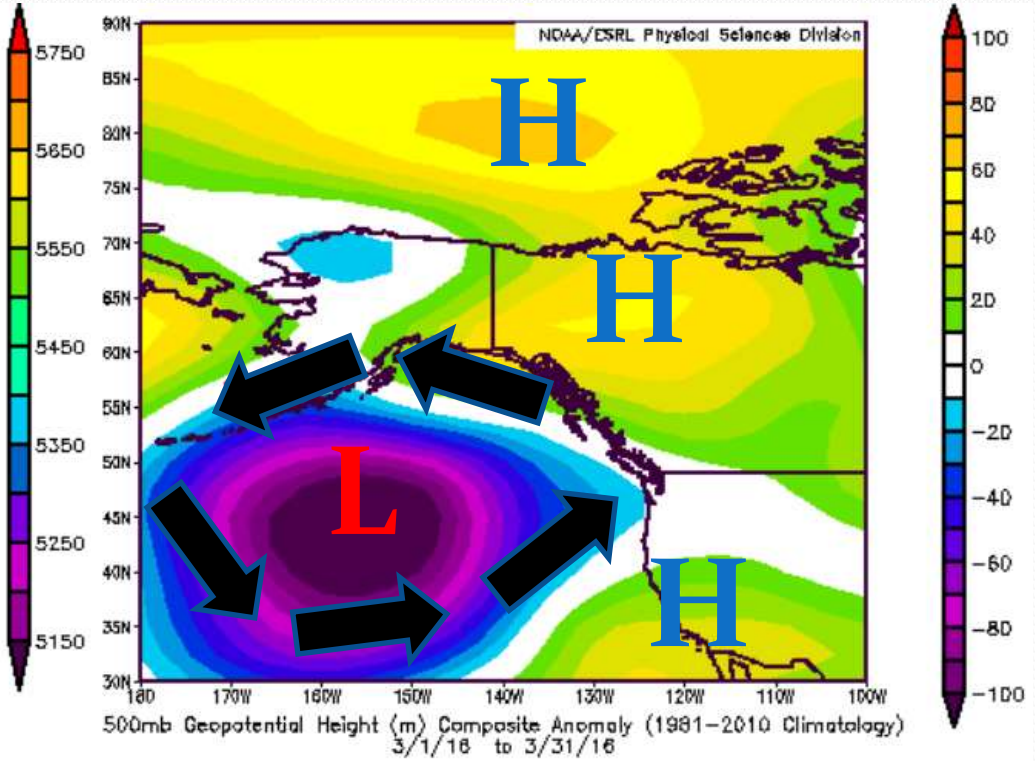


Percent of Normal Precipitation (%)



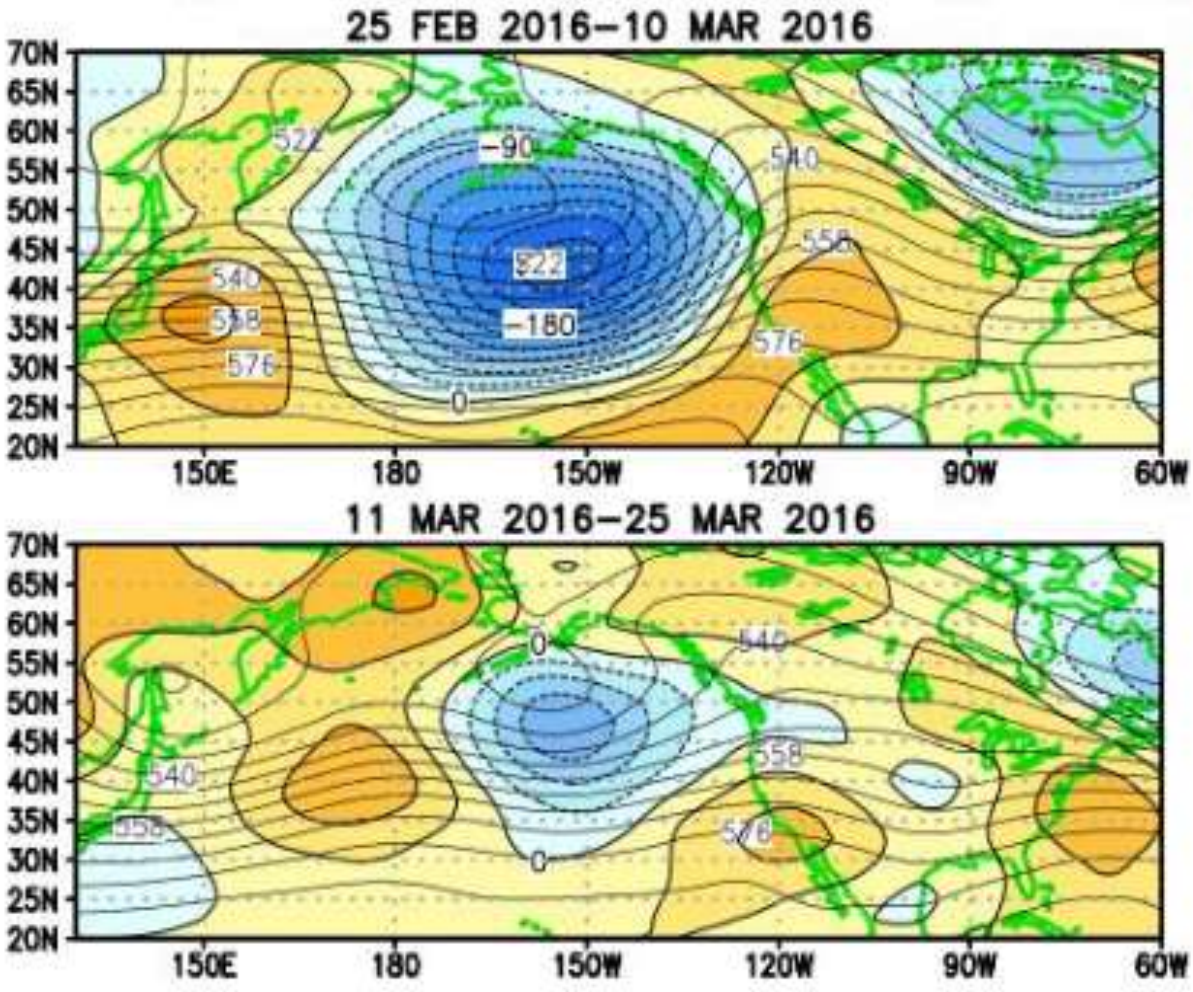
March 2016
Synoptic Weather Pattern





The mean synoptic pattern for the month of March 2016 was characterized by a large, anomalous trough of low pressure south of Alaska. There was an upper level ridge of high pressure located across NW Canada and over the Arctic Ocean through the month. There was another upper level ridge centered over the Southwestern US, extending from southern California, east to Arizona and New Mexico. With the upper level trough extending to the Oregon/Washington coast, the Pacific Northwest was under a west to southwest flow much of the time. This brought slightly above average temperatures and above average precipitation totals to much of the region. The main exception to this was over south central and southeast Oregon where precipitation totals ended below average for the month. With the ample moisture and marginal temperatures snowfall was fairly heavy in the mountains…above 3000 feet in Washington and above 4500 feet in Oregon for the month.

March 2016 Detailed Upper Level Pattern Analysis



- The first 10 days of March were characterized by a large upper trough off the West coast of North America, with a strong Pacific jet noted.
- The second half of the month saw a relaxation in the prior pattern, with a weaker negative anomaly south of Alaska, but a general westerly flow continued into the Pacific Northwest.

Top 10 March Record Warm Daily Max & Minimum Temperatures

City	Rank	March 2016 Max T	Warmest March Max T Record
Ellensburg, WA	#1	76 on 3/31	75 on 3/11/2005
Yakima, WA	#4	78 on 3/31	80 on 3/27/2015

City	Rank	Mar 2016 Min T	Warmest March Min T Record
Pendleton Exp. Sta.	#4 (T)	52 on 3/5	58 on 3/04/1987
Meacham, OR	#6 (T)	42 on 3/5	47 on 3/14/2015
Hermiston, OR	#6 (T)	49 on 3/5	54 on 3/13/2003
Long Creek, OR	#7 (T)	47 on 3/5	55 on 3/04/1987
Pendleton, OR	#9 (T)	51 on 3/5	57 on 3/04/1987
Redmond, OR	#10	46 on 3/5	53 on 3/04/1987

Top 10 Record Warmest Average Minimum Temperatures for March

City	Rank	March 2016 Avg Min T	Warmest March Avg Min T Record
Meacham, OR	#2	29.7	30.4 in 1968
Hermiston, OR	#2	35.4	37.9 in 2003
Kennewick, WA	#3	39.4	41.4 in 2003
Yakima, WA	#4	34.2	36.9 in 1983
Ellensburg, WA	#5	32.6	34.4 in 2015
Dayville, WA	#5	35.0	37.1 in 1983
Long Creek, OR	#7	30.1	31.1 in 1984
La Grande, OR	#8	32.9	34.7 in 1978
Mt Adams RS.	#9 (T)	30.9	35.3 in 1983
Prineville, OR	#10	30.2	36.3 in 1900
The Dalles, OR	#10	38.2	41.8 in 1983

Top 10 Record Warmest Average Max Temperatures for March

City	Rank	March 2016 Avg Max T	Warmest March Avg Max T Record
Hermiston, OR	#6	60.3	64.5 in 2015
Meacham, OR	#7	47.5	54.9 in 2015
Ellensburg, WA	#8	56.0	61.8 in 2015
Walla Walla, WA	#8 (T)	57.9	63.0 in 2004
Yakima, WA	#9	59.3	64.6 in 2015

Top 10 Record Warmest Average Temperatures for March

City	Rank	March 2016 Avg T	Current March Avg T Record
Meacham, OR	#4	38.6	41.0 in 2015
Hermiston, OR	#5	47.8	49.7 in 2015
Ellensburg, WA	#6	44.3	48.1 in 2015
Yakima, WA	#6	46.7	50.1 in 2015

Top 10 Record Daily Max Precipitation for March

City	Rank	March 2016 Max Daily Precip	Record March Max Daily Precip
Ellensburg (City)	#1	1.20" on 3/6	1.00" on 3/04/2009
Ellensburg (Arpt)	#2	0.78" on 3/5	0.83" on 3/03/2009
Hermiston, OR	#5	0.35" on 3/20	0.56" on 3/25/2006
Fossil, OR	#7	0.68" on 3/7	1.30" on 3/30/1994
Yakima, WA	#8	0.53" on 3/5	0.73" on 3/15/1987

Top 10 Record Monthly Max Precipitation for March

City	Rank	March 2016 Monthly Precip	Record March Max Monthly Precip
Ellensburg (City)	#2	2.50"	3.40" in 1971
Ellensburg (Arpt)	#3	2.25"	2.42" in 2011
Pasco, WA	#3	1.18"	1.43" in 2009
Hermiston, OR	#3	1.21"	1.65" in 2012
Yakima, WA	#4	1.82"	2.63" in 1957
Meacham, OR	#6	5.53"	7.68" in 2009
Walla Walla, WA	#7	3.23"	4.33" in 1983

March
Significant Weather

March 1st Rain & Wind Event

Location	Rain Total	Peak Wind
Pendleton, OR	0.24"	49 MPH
Meacham, OR	0.68"	17 MPH
Redmond, OR	Trace	45 MPH
Pasco, WA	0.15"	31 MPH
Walla Walla, WA	0.13"	45 MPH
Yakima, WA	0.24"	42 MPH
Hermiston, OR	0.11"	32 MPH
Ellensburg, WA	0.33"	26 MPH
The Dalles, OR	0.14"	43 MPH
Easton, WA	0.44"	N/A

A storm system moved through the area beginning on the last day of February and continuing into the first of the month. This weather system brought periods of rain and wind to much of the region. Rainfall totals generally ranged from a tenth to a third of an inch in the lower elevations with a half inch to one inch in the mountains. Gusty winds peaked between 45 – 50 MPH over much of northern and central Oregon.

March 5 – 6th Rain/Wind/Flooding

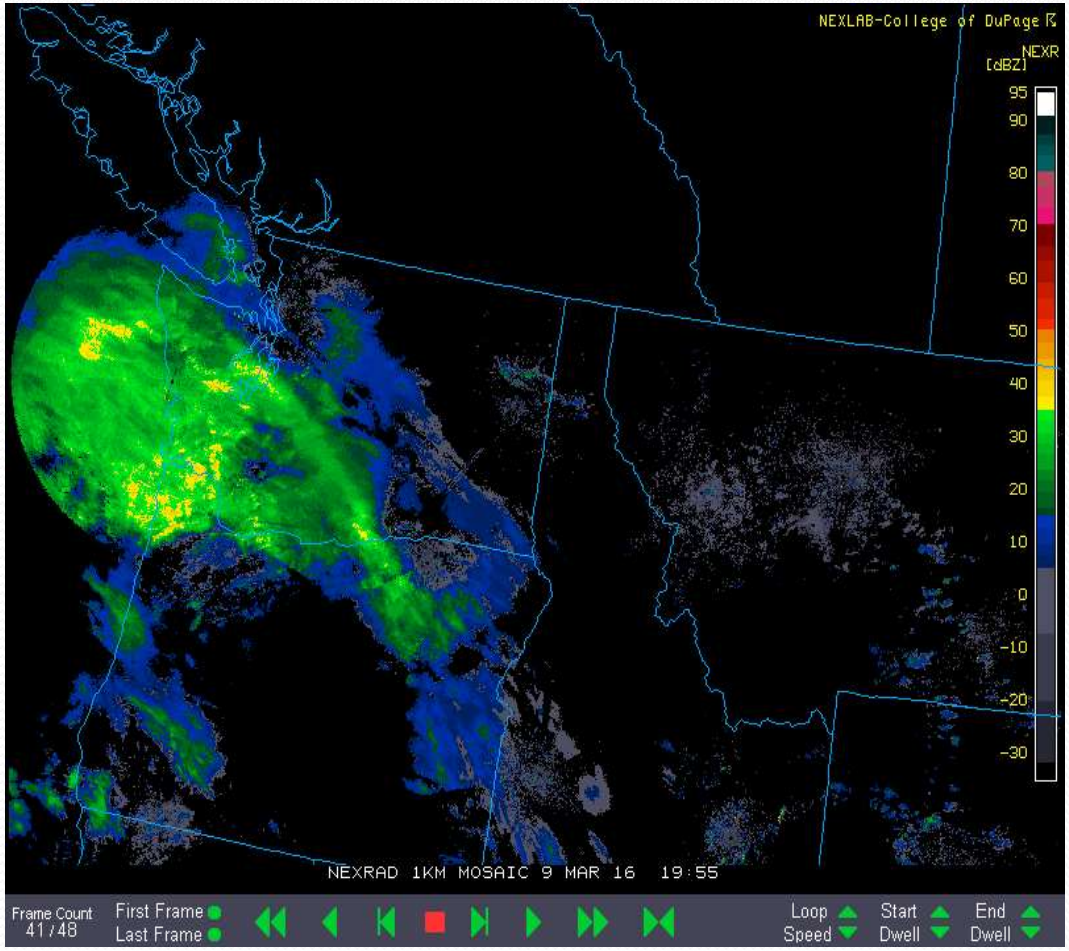
Location	2 Day Precip	Peak Wind
Pendleton, OR	0.15”	44 MPH
Meacham, OR	0.56”	20 MPH
Redmond, OR	0.19”	35 MPH
Pasco, WA	0.32”	31 MPH
Walla Walla, WA	0.54”	42 MPH
Yakima, WA	0.63”	33 MPH
Hermiston, OR	0.25”	33 MPH
Ellensburg, WA	1.00”	36 MPH
The Dalles, OR	0.31”	31 MPH
John Day, OR	0.27”	37 MPH

Local Storm Reports for Wind (MPH) & Flooding During this Storm System

Date & Time	LAT	LON	Wind Speed	Type of Report	CITY	COUNTY	SOURCE
3/6/2016 4:37	45.68	-118.58	64	NON-TSTM WND GST	1 WNW CAYUSE	UMATILLA	MESONET
3/6/2016 5:55	45.99	-118.18	75	NON-TSTM WND GST	3 WSW KOOSKOOSKIE	UMATILLA	MESONET
3/6/2016 6:14	46.11	-118.07	67	NON-TSTM WND GST	5 ESE DIXIE	WALLA WALLA	MESONET
3/6/2016 6:24	46.04	-118.22	51	NON-TSTM WND GST	4 ESE WALLA WALLA EAST	WALLA WALLA	MESONET
3/6/2016 7:19	45.6	-118.7	56	NON-TSTM WND GST	5 SSW MISSION	UMATILLA	MESONET
3/6/2016 15:00	46.56	-120.55	None	FLOOD	3 W UNION GAP	YAKIMA	EMERGENCY MNGR
3/6/2016 15:00	46.59	-120.53	None	FLOOD	YAKIMA	YAKIMA	EMERGENCY MNGR

March 8 – 14th Rain/Wind/Snow

Location	7 Day Precip	Peak Wind
Pendleton, OR	0.58”	53 MPH
Meacham, OR	1.84”	21 MPH
Redmond, OR	0.33”	45 MPH
Pasco, WA	0.27”	42 MPH
Walla Walla, WA	0.98”	48 MPH
Yakima, WA	0.90”	41 MPH
Hermiston, OR	0.20”	52 MPH
Ellensburg, WA	0.80”	34 MPH
The Dalles, OR	0.99”	41 MPH
La Grande, OR	0.67”	46 MPH



A series of upper level troughs and associated surface low pressure systems move through the Pacific Northwest during this time. This brought unsettled weather, with periods of rain, gusty winds and even mountain snow to much of the region during this week. Precipitation totals were highest along the East slopes of the Cascades, north to the Yakima and Kittitas Valleys.

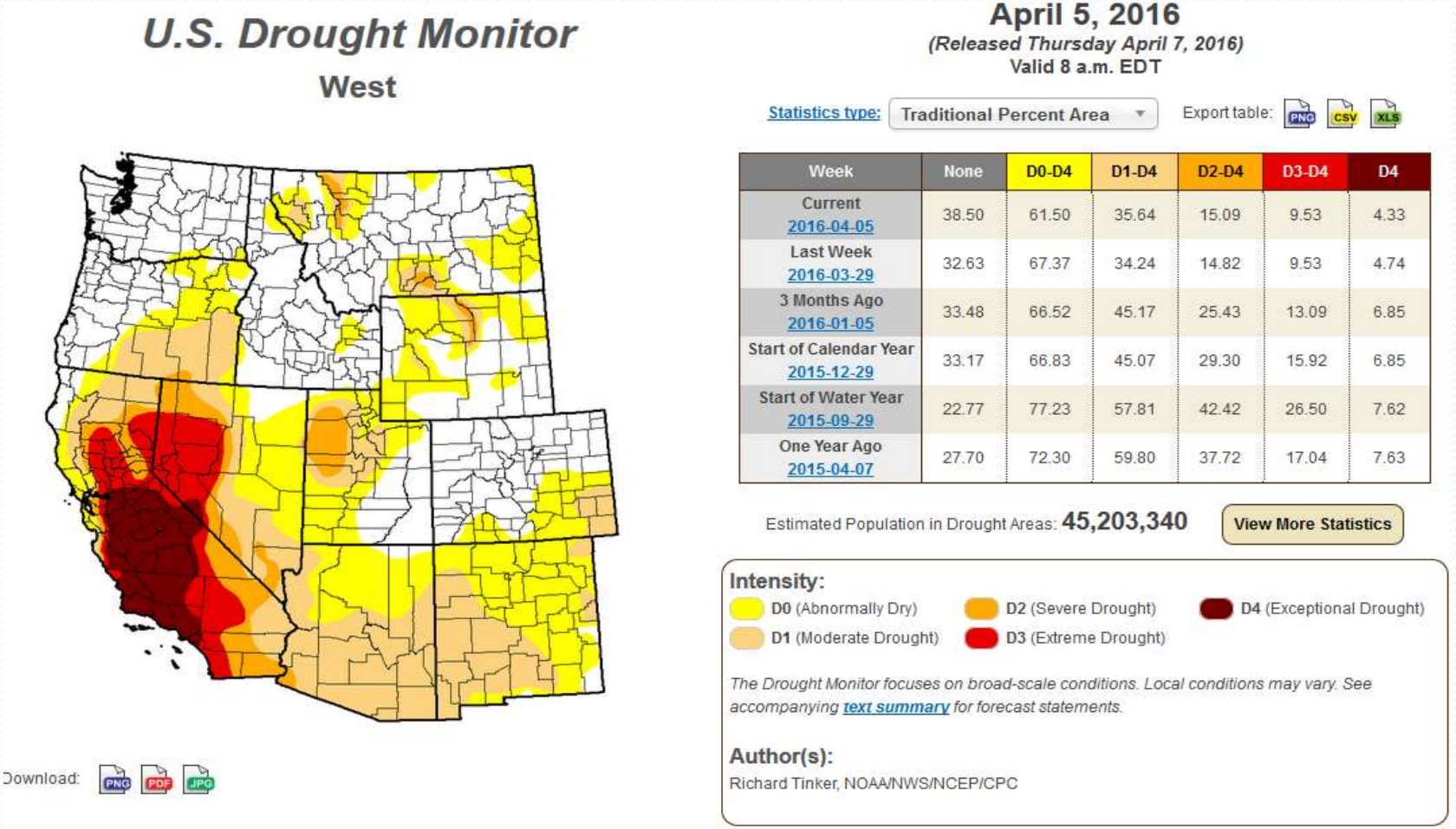
March 20 – 22nd Rain/Wind/Snow

Location	3 Day Precip	Peak Wind
Pendleton, OR	0.49”	39 MPH
Meacham, OR	1.03”	20 MPH
Redmond, OR	0.05”	37 MPH
Pasco, WA	0.41”	26 MPH
Walla Walla, WA	1.28”	30 MPH
Hermiston, OR	0.58”	38 MPH
Dayton, WA	1.62”	32 MPH
Heppner, OR	0.51”	35 MPH
Milton Freewater	1.11”	N/A
Whitman Mission	0.64”	33 MPH
Echo, OR	0.61”	38 MPH

This weather system brought steady, soaking rain to northeast Oregon and southeast Washington. Moderate snow was observed in the Blue Mountains, above 3800 feet (see reports below)

Date & Time	LAT	LON	Snow Total	Type of Report	CITY	COUNTY	SOURCE	REMARK
3/22/2016 13:00	45.55	-118.48	3	SNOW	4 NW MEACHAM	UMATILLA	COCORAHS	ELEVATION 3800 FEET
3/22/2016 14:00	45.89	-117.29	1.5	SNOW	1 SE FLORA	WALLOWA	COCORAHS	ELEVATION 4408 FEET
3/22/2016 15:00	45.7	-118.11	5	SNOW	5 SSW SPOUT SPRINGS	UMATILLA	MESONET	HIGH RIDGE SNOTEL. ELEVATION 4920 FEET.
3/22/2016 15:00	46.12	-117.85	6	SNOW	2 NNW SKI BLUEWOOD	COLUMBIA	MESONET	TOUCHET SNOWTEL. ELEVATION 5530 FEET
3/22/2016 15:00	45.98	-117.95	11	HEAVY SNOW	9 SW SKI BLUEWOOD	WALLOWA	MESONET	MILK SHAKES SNOTEL. ELEVATION 5580 FEET.

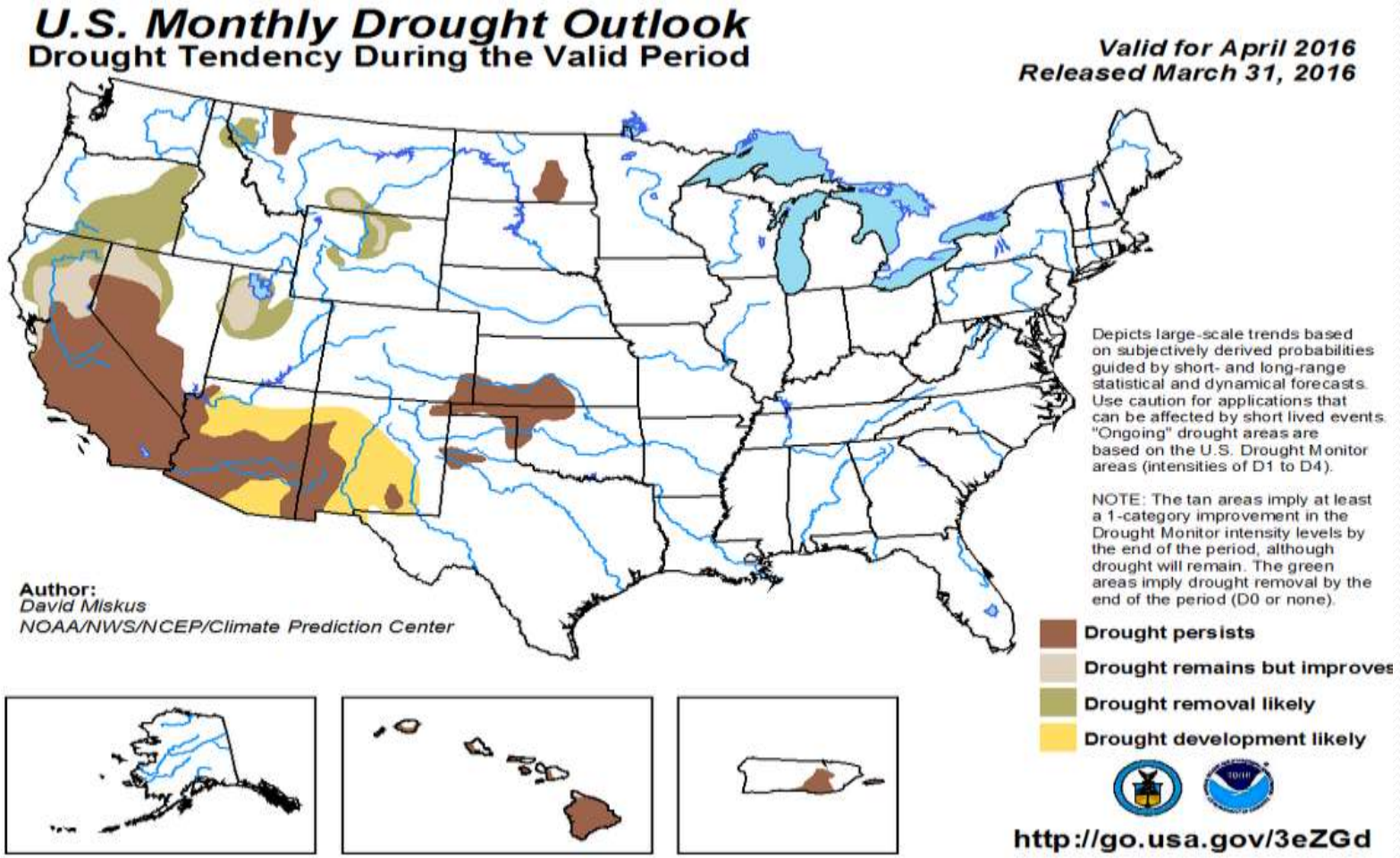
Drought Conditions Improving



Week	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current 2016-04-05	38.50	61.50	35.64	15.09	9.53	4.33
Last Week 2016-03-29	32.63	67.37	34.24	14.82	9.53	4.74
3 Months Ago 2016-01-05	33.48	66.52	45.17	25.43	13.09	6.85
Start of Calendar Year 2015-12-29	33.17	66.83	45.07	29.30	15.92	6.85
Start of Water Year 2015-09-29	22.77	77.23	57.81	42.42	26.50	7.62
One Year Ago 2015-04-07	27.70	72.30	59.80	37.72	17.04	7.63

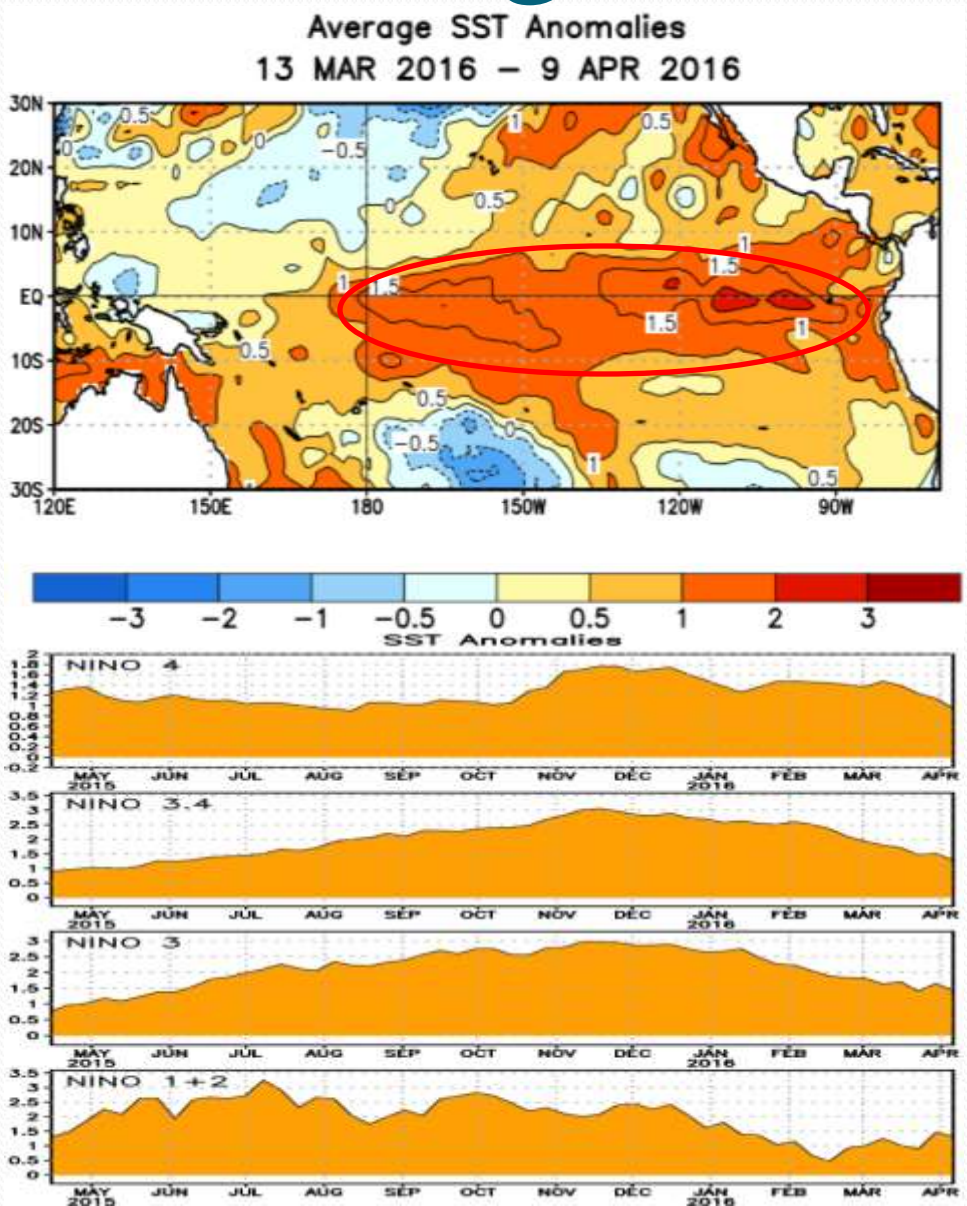
The latest drought monitor shows improvement across the Pacific Northwest, with only a small area of D1, or moderate drought lingering in southeastern Oregon. Some portions of northeast Oregon remain in the Do or abnormally dry category. Much of Washington, north-central Oregon and western Oregon are no longer being affected by drought conditions.

April Drought Outlook



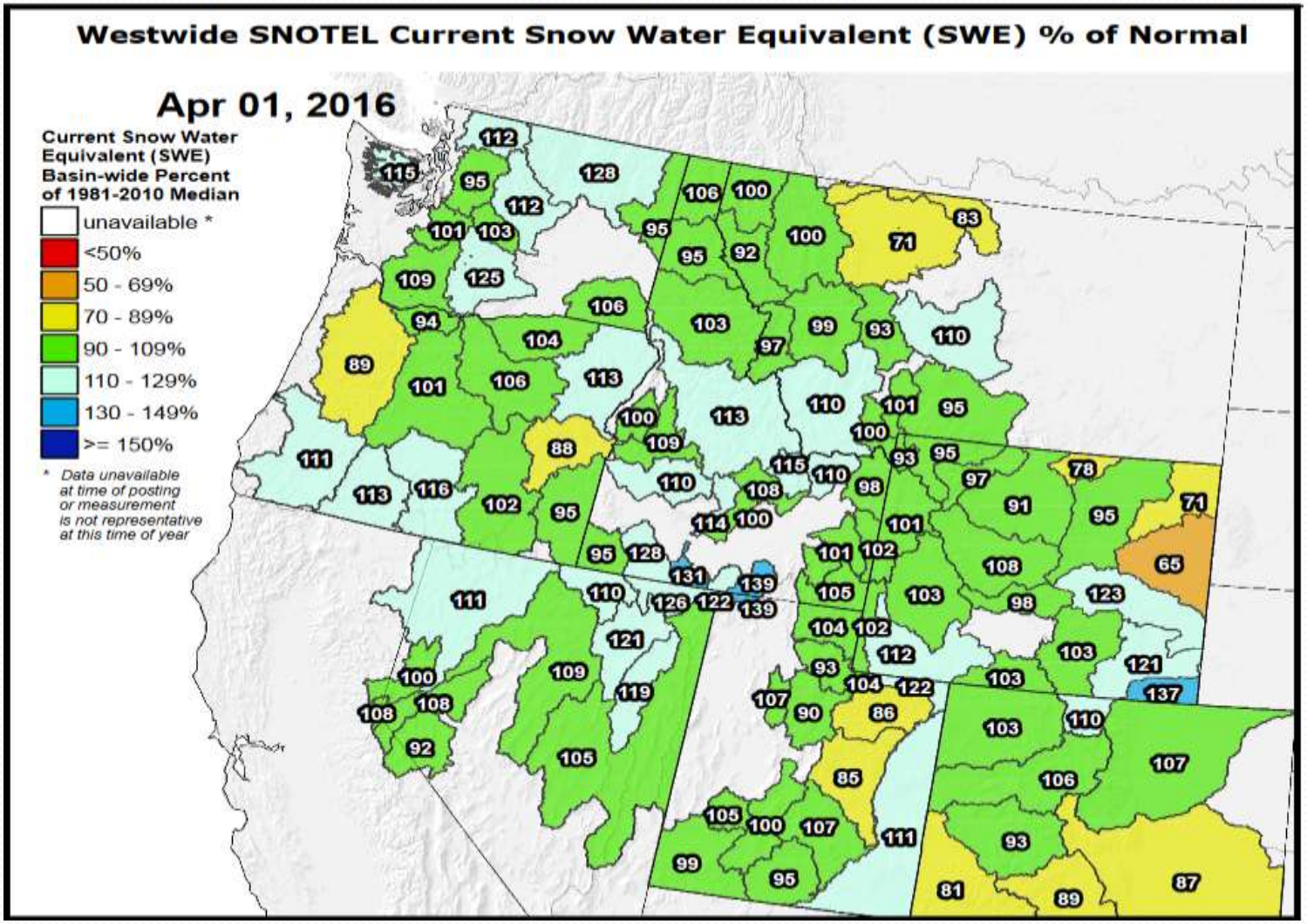
The monthly drought outlook from CPC indicates drought removal likely over much of eastern Oregon, with drought remaining but improving along the immediate Nevada, California and Oregon border area. This outlook is valid for April 2016.

Strong El Niño Weakening



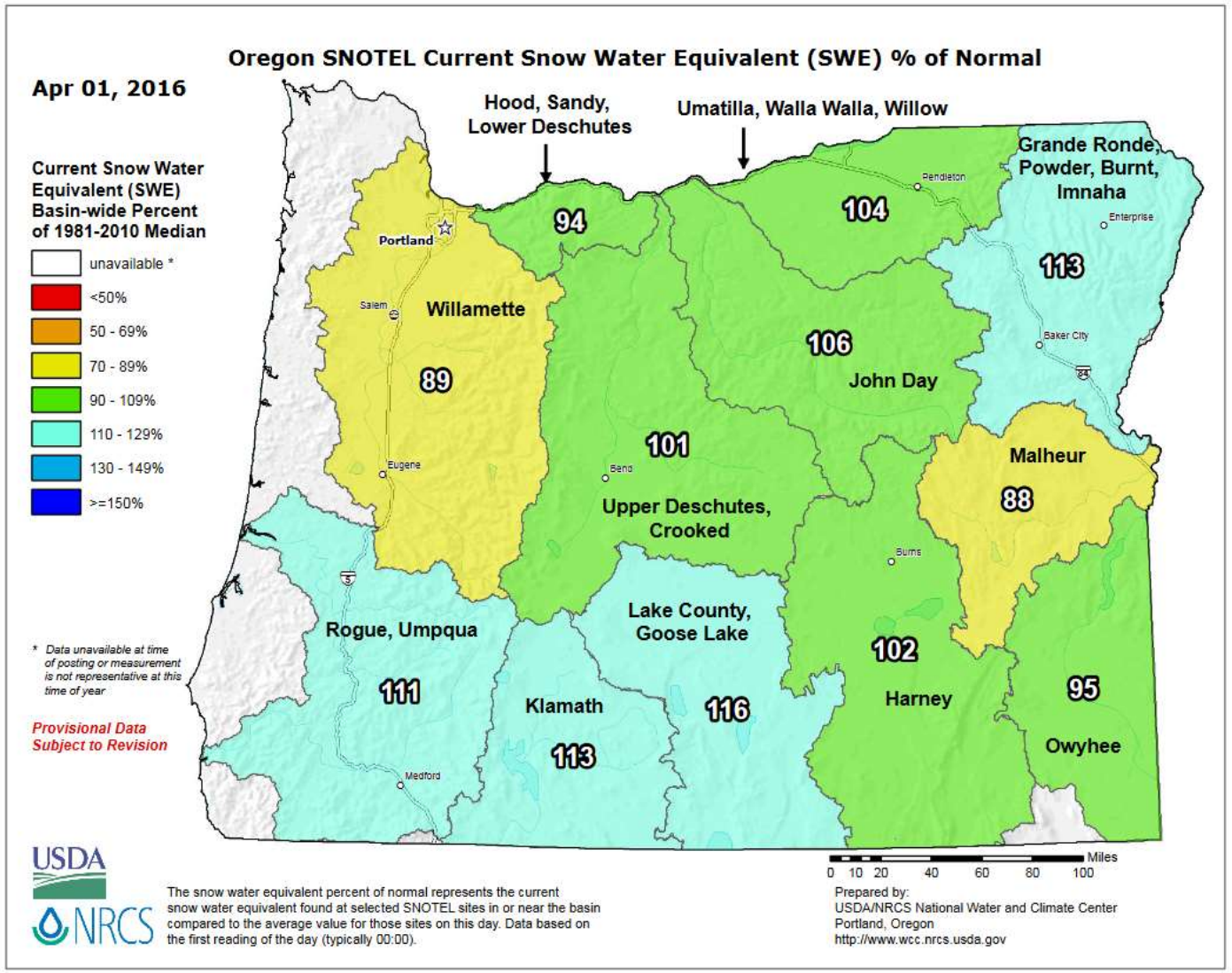
- An El Niño Advisory continues from the Climate Prediction Center. Sea Surface Temperature (SST) anomalies are decreasing in the tropical Pacific. However, and area of +1 to +1.5°C anomalies are still present.
- The Climate Prediction Center has stated that A transition to ENSO neutral is likely during late Northern Hemisphere spring or early summer 2016, <u>with close to a 50% chance for La Niña conditions to develop by the fall.</u>

Current Snow Water Equivalent



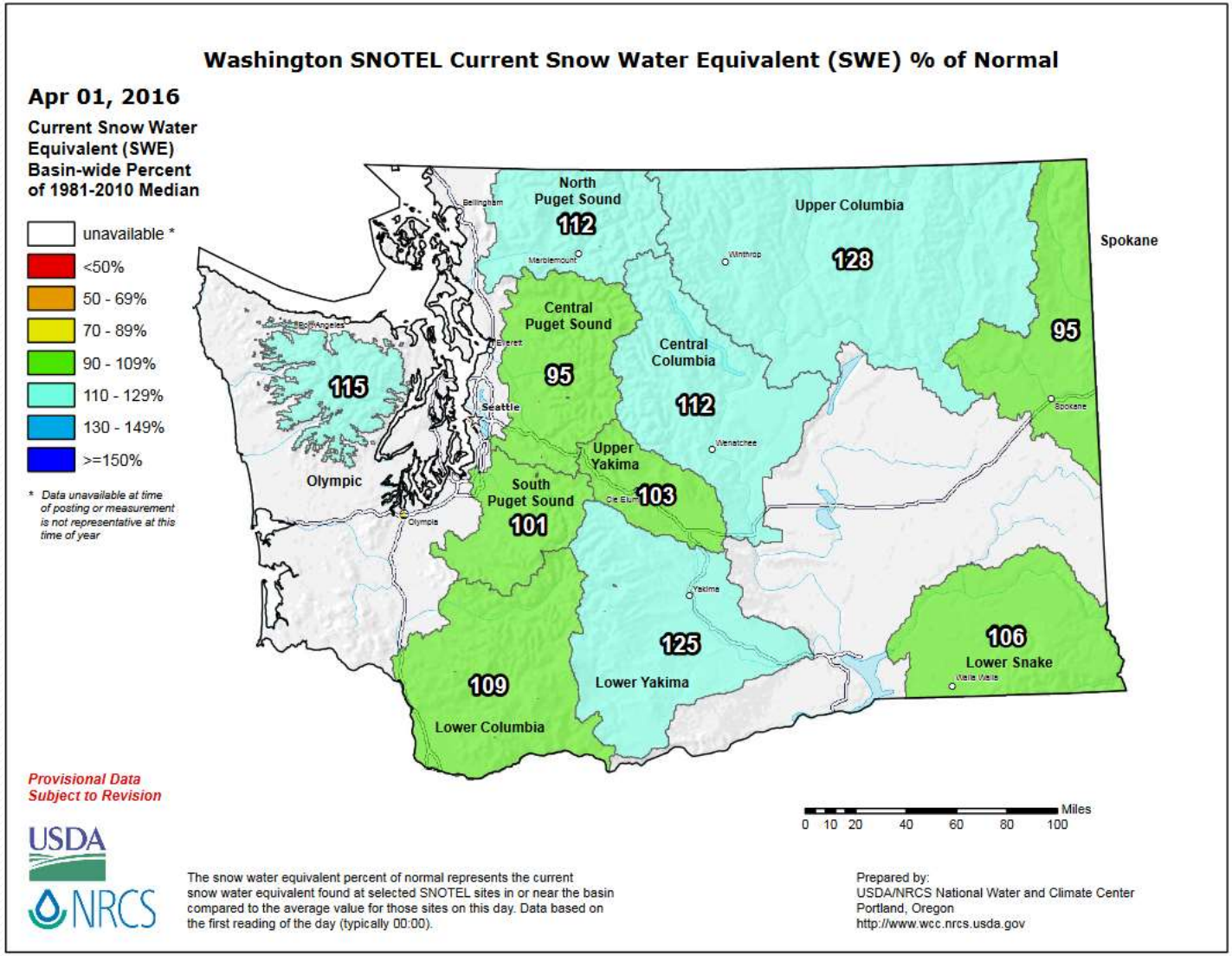
Current snow water equivalent (SWE) is running mainly near to above average across the Pacific Northwest. Just about all of Washington and Oregon now has SWE values between 88 and 130 percent of normal for April 1st. This should provide a source of much needed water through the spring and summer months ahead. We are in much better shape compared to last year at this time.

Oregon Current Snow Water Equivalent



April 1st 2016: 88 to 116 percent of average SWE

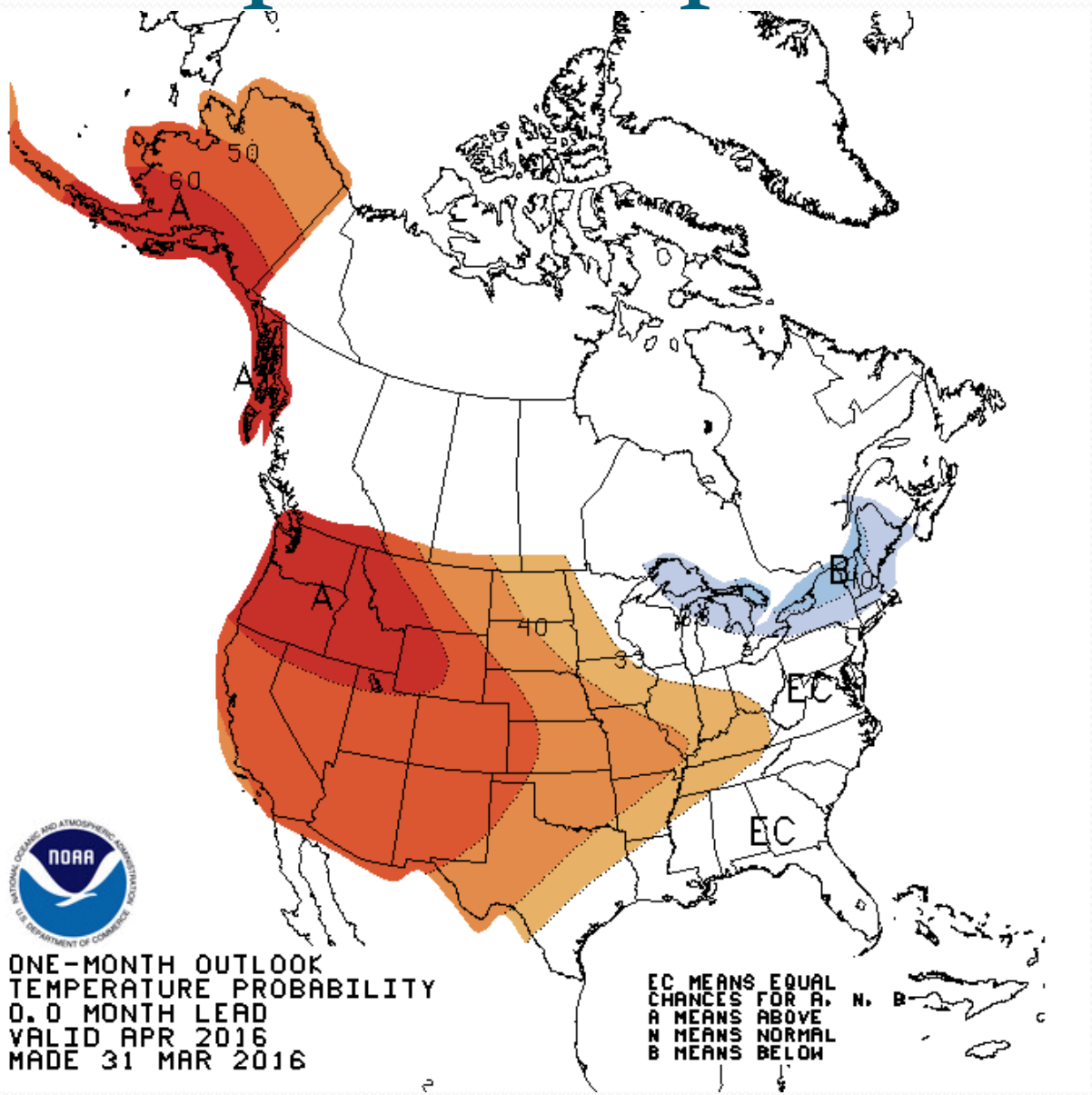
Washington Current Snow Water Equivalent



April 1st 2016: 95 to 128 percent of average SWE

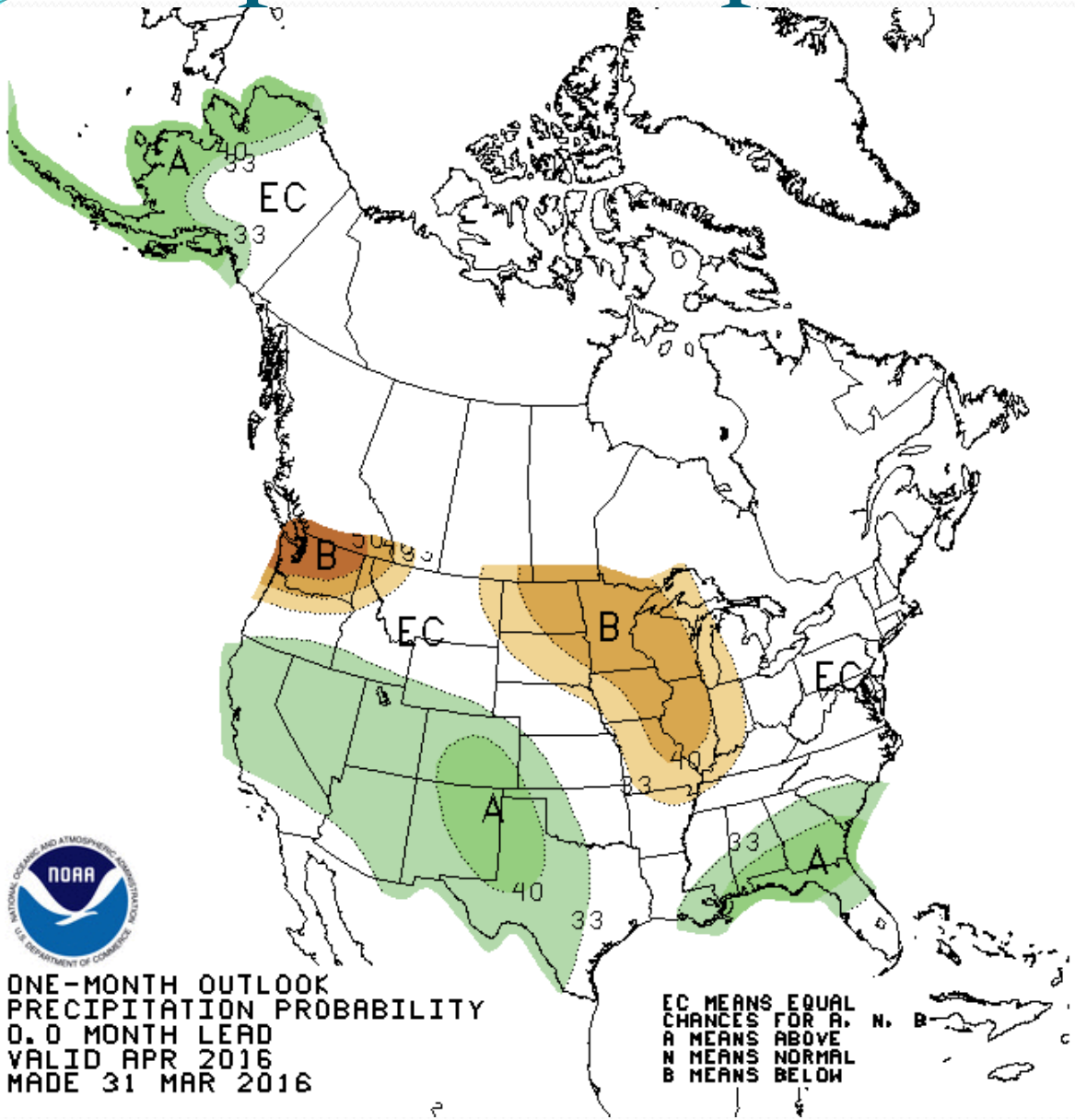
April Outlook

April Temperature Outlook



This graphic is issued by the Climate Prediction Center or CPC and is the Temperature Outlook for the month of April. The cool colors indicate a greater chance of below normal temperatures and the warm colors represent a greater chance of above normal temperatures. The time period for the normals runs from 1981-2010. Most of the Inland Pacific Northwest has a 60+ percent chance for above average temperatures in the month of April. This higher probability for warmth extends down the entire West Coast into California, north to most of Alaska, and across the entire western half of the US. There are higher probabilities for below average temperatures for the month of April in the Northeast & Great Lakes.

April Precipitation Outlook



This graphic is CPC's Precipitation Outlook for the month of April. The green colors represent a greater chance of above normal precipitation, and the brown colors represent a greater chance of below normal precipitation. Much of Washington and northern Oregon has higher probabilities for below average precipitation during the month of April. Across central Oregon there are equal chances for above, below or near average precipitation amounts in April. Meanwhile, across the southern tier of Oregon the odds are slightly tilted toward above average precipitation amounts in April. Please remember that these are probabilities of averages, and that the day-to-day weather will still vary for the month .

Thank You!