

The Month In Review

February 2020

National Weather Service
Pendleton, Oregon

February, 2020 Climate Summary

The month of February, 2020, was most significant for flooding that affected northeast Oregon and extreme southeast Washington. This was at the beginning of the month when an Atmospheric River (AR) set up in a northwest flow aloft and brought heavy rain on top of a deep and fresh snowpack over the northern Blue Mountains. This resulted in rapid runoff due to melting snow with heavy rain on top of it and mild temperatures. Several rivers reach all time record levels including the Umatilla River from Gibbon to Hermiston. This caused severe flooding in areas along the Blue Mountains and Foothills from Southeast Washington all the way to the Oregon Lower Columbia Basin (Hermiston and Echo). There was also flooding in the Grande Ronde Valley on the east side of the Blue Mountains from heavy snow, then heavy rain and snow melt. Pendleton and Hermiston, OR probably had the most devastating flooding. Flooding occurred over Interstate-84 and numerous other highways across the forecast area. Never before has flooding covered I-84 in Hermiston & Stanfield from flooding of the Umatilla River. Below are photos of the flooding, and the snowstorm which occurred during the event.



Flooding over I-84 in Stanfield, OR at the beginning of February.



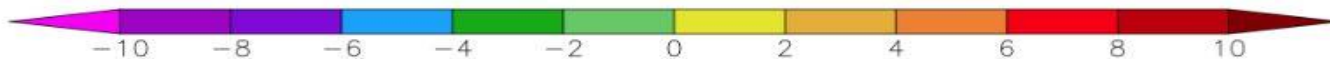
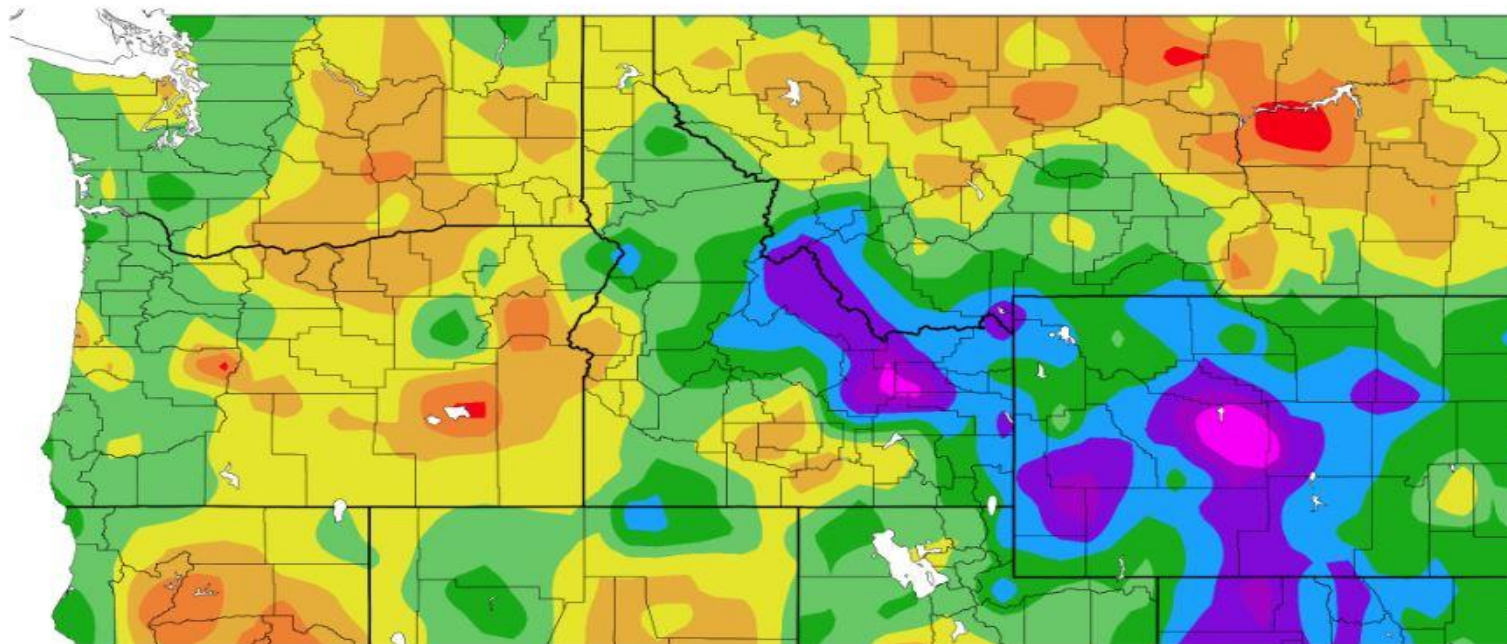
Severe flooding in the Riverside mobile home park in Pendleton, OR.



Winter storm which preceded the flooding event at the beginning of February. Photo in Pendleton, OR.

February 2020, Departure from Normal of Average Temperatures

Departure from Normal Temperature (F)
2/1/2020 – 2/29/2020



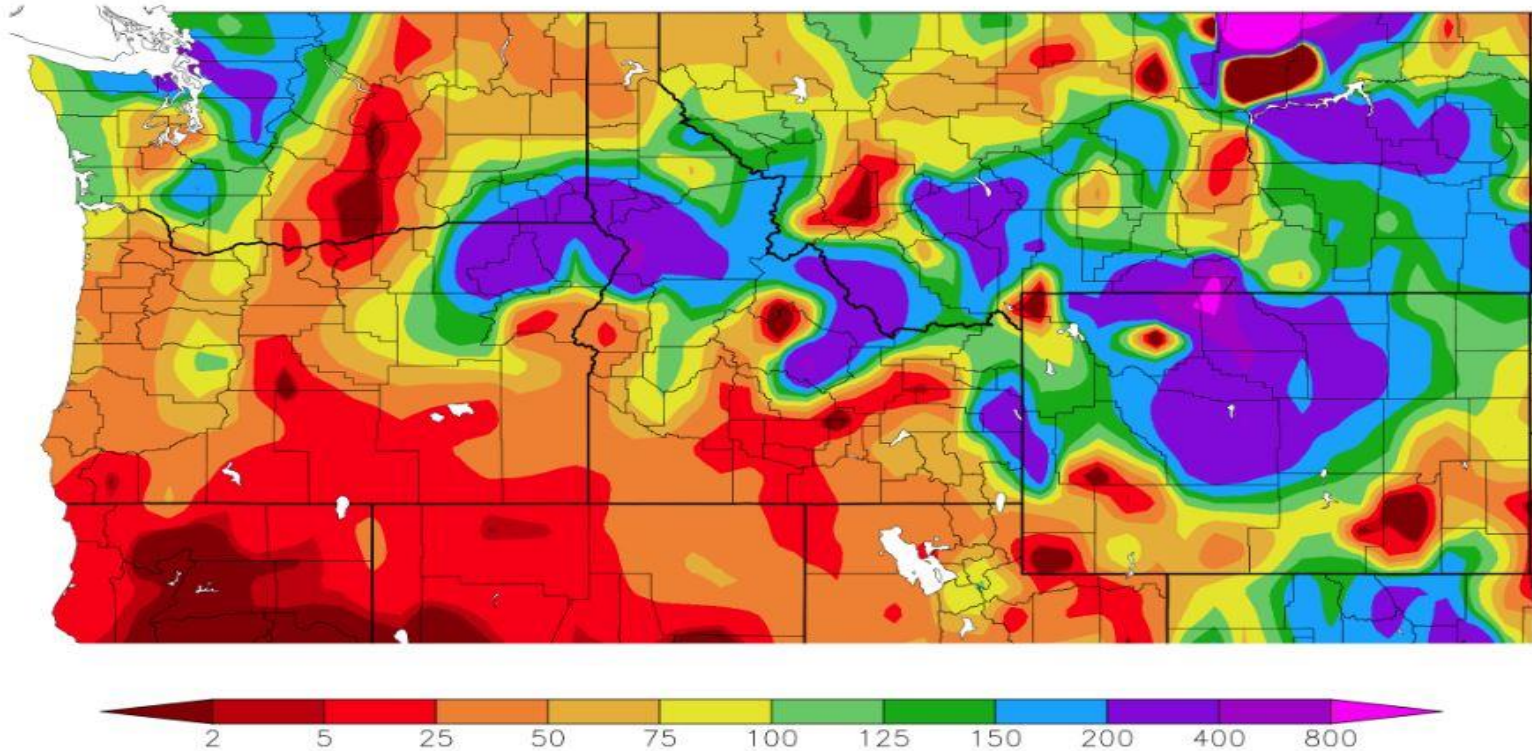
Generated 3/1/2020 at HPRCC using provisional data.

NOAA Regional Climate Centers

The image above shows that most of the forecast area, except for a small portion over the east central Oregon area had average temperatures above normal. This was likely due to a persistent progressive flow off of the Pacific which is typically warmer than the drier land mass of North America, which will often breed deep, cold, arctic air.

February 2020, Percent of Normal of the Average Precipitation

Percent of Normal Precipitation (%)
2/1/2020 – 2/29/2020



Generated 3/1/2020 at HPRCC using provisional data.

NOAA Regional Climate Centers

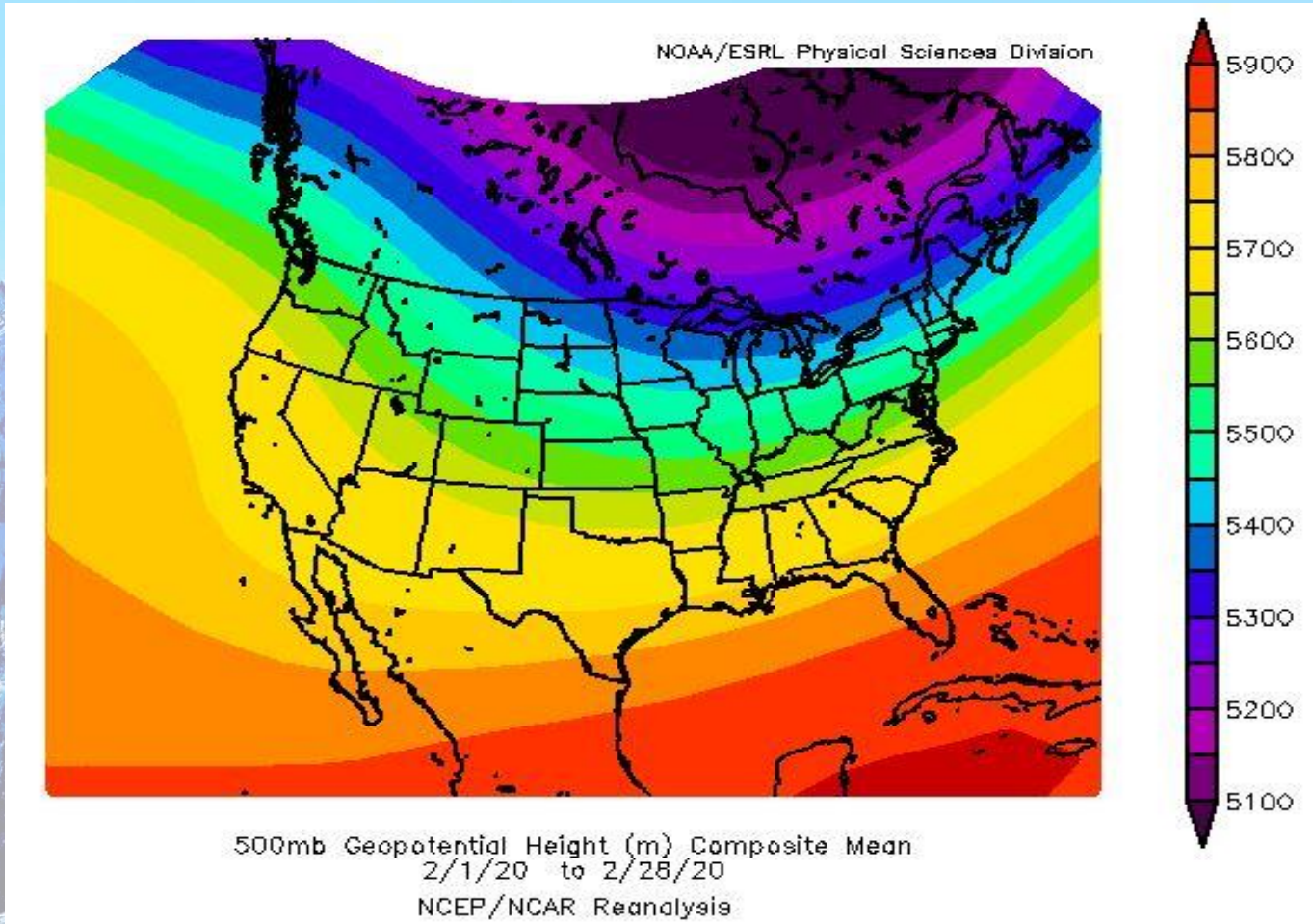
At first glance, you can immediately notice the area of much above normal precipitation over extreme northeast Oregon and Southeast Washington. This area was the result of heavy rain over a heavy fresh snowpack at the beginning of the month which led to severe flooding over the northern Blue Mountains and Foothills areas.

February 2020, Departures from Normal of Averages for Select Cites

	Max T	Max T D	Min T	Min T D	Ave T	Ave T D	PCPN	PCPN D
Yakima	53.0	6.7	24.7	-1.2	38.8	2.7	0.11	-0.67
Kennewick	55.6	7.6	31.7	1.0	43.6	4.3	0.34	-0.44
Walla Walla	50.0	4.0	32.8	0.6	41.4	2.3	2.93	1.17
The Dalles	52.6	4.0	32.5	0.7	42.5	2.6	0.31	-1.46
Redmond	52.1	5.3	21.9	-1.8	37.0	1.8	0.18	-0.47
Pendleton Airport	52.2	5.4	31.3	1.0	41.8	3.3	2.04	0.93
La Grande	45.9	3.0	26.1	0.2	36.0	1.6	4.79	3.65
John Day	51.4	4.0	28.9	4.1	40.1	4.0	1.00	0.26

The data above shows that every single average maximum temperature was significantly above normal, with the greatest being at Yakima with the average high being 6.7 degrees above normal. Most of the average minimums were also above normal, but only slightly, with the greatest departure being at John Day with 4.1 degrees above normal. Two stations has average minimums below normal by less than 2 degrees. All of the average temperatures of both highs and lows combined were above normal. There was an even split for the total precipitation with half being above normal and half being below normal. The greatest departure was at La Grande with precipitation being 3.65 inches above normal.

February 2020 Average 500 MB Weather Pattern



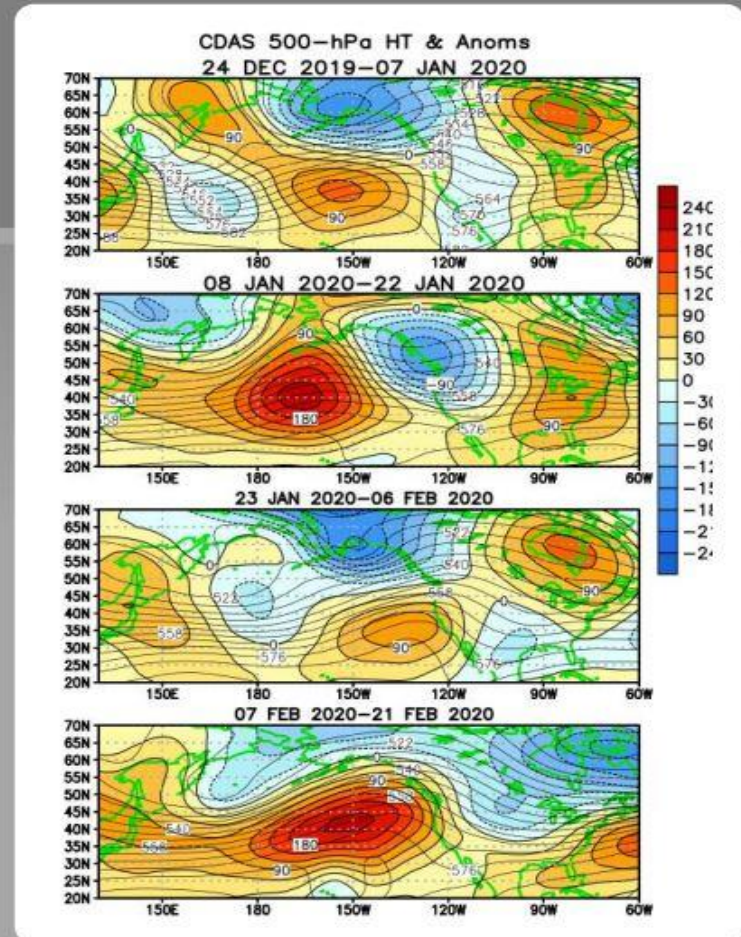
The average 500 mb pattern over the Pacific Northwest was mostly a ridge pattern with a mean northwest flow over the forecast area (NE Oregon/SE Washington) during the month. This resulted in a warmer than normal month which will be shown later in tabular data as well as the previous slide of the average temperature departure. This pattern was also responsible for the Atmospheric River (AR) which caused the flooding at the beginning of the month over northeast Oregon and southeast Washington.

More Detailed 500 MB Plots for February, 2020

Atmospheric anomalies over the North Pacific and North America During the Last 60 Days

From late December 2019 through February 2020, above-average heights and temperatures were evident over the eastern US.

While more variable, heights over the western or central US were predominantly below-average, resulting in periods of near or below-average temperatures.



For the Pacific Northwest there was a mean average high pressure ridge over the eastern Pacific which nosed into the CWA to keep conditions warmer than normal through the month.

Significant Weather Events for February, 2020

Significant Weather Events				
Event	Date	Report	Where	Source
Snow	February 5, 2020	E 4.5 inches	Mt Vernon, OR	Public
Heavy Snow	February 5, 2020	M 9.5 inches	5 NNE La Grande, OR	Trained Spotter
Heavy Snow	February 5, 2020	M 13.0 inches	Meacham, OR	Media
Heavy Snow	February 5, 2020	M 7.0 inches	Ukiah, OR	Public
Heavy Snow	February 5, 2020	M 7.5 inches	6 E John Day, OR	Trained Spotter
Heavy Snow	February 5, 2020	M 7.0 inches	Mt Vernon, OR	Public
Heavy Snow	February 5, 2020	M 9.5 inches	La Grande, OR	Public
Heavy Snow	February 5, 2020	M 6.0 inches	Elgin, OR	Public
Heavy Snow	February 5, 2020	M 12.5 inches	1 WSW Ski Bluewood, WA	Trained Spotter
Heavy Snow	February 5, 2020	M 12.0 inches	4 N Ukiah, OR	Public
Heavy Snow	February 5, 2020	M 12.0 inches	SSE Granite, OR	Trained Spotter
Heavy Snow	February 5, 2020	M 11.5 inches	6 W North Powder, OR	Trained Spotter
Heavy Snow	February 5, 2020	M 8.0 inches	Wallowa, OR	Co-op Observer
Heavy Snow	February 5, 2020	M 6.0 inches	3 N Joseph, OR	Trained Spotter
Heavy Snow	February 5, 2020	M 11.0 inches	5 N Ski Bluewood, WA	Meso-net SnoTel
Heavy Snow	February 5, 2020	M 10.0 inches	6 E John Day, OR	Trained Spotter
Heavy Snow	February 5, 2020	M 17.5 inches	5 NNE La Grande, OR	Trained Spotter
Heavy Snow	February 5, 2020	M 12.0 inches	SSE Granite, OR	Trained Spotter
Flood	February 6, 2020	M 0.6 inches rain	5 NNE La Grande, OR	Trained Spotter
Flood	February 6, 2020	Pine Creek	Weston, OR	Emergency Mgr.
Flood	February 6, 2020	Wildhorse Creek	Athens, OR	Emergency Mgr.
Heavy Snow	February 5, 2020	M 10.0 inches	Summerville, OR	Public
Heavy Snow	February 5, 2020	M 16.0 inches	9 SW Ski Bluewood, WA	Meso-net SnoTel
Heavy Snow	February 5, 2020	M 13.0 inches	4 NNW Meacham, OR	Meso-net SnoTel
Heavy Snow	February 5, 2020	M 12.5 inches	1 WSW Ski Bluewood, WA	Trained Spotter
Snow	February 5, 2020	E 6.0 inches	6 SSE Tollgate, AR	Public
Flood	February 6, 2020	Blue Creek	11 E Walla Walla, WA	Emergency Mgr.
Heavy Rain	February 6, 2020	M 1.2 inches	5 NNE La Grande, OR	Trained Spotter
Heavy Rain	February 6, 2020	M 1.86 inches	4 N Bingham Springs, OR	Trained Spotter
Heavy Snow	February 6, 2020	E 32 inches	19 W N. Powder (Anthony Lakes)	USFS
Flood	February 6, 2020	Pine Creek	Weston, OR	NWS Employee
Flood	February 6, 2020	Highway 125	Walla Walla, WA	NWS Employee
Flood	February 6, 2020	Umatilla, River	1 E Pendleton, OR	NWS Employee
Flood	February 6, 2020	Umatilla, River	5 E Cayuse, OR (Gibbon)	Law Enforcement
Flood	February 6, 2020	Levee Failure	Pendleton, OR (East Oregonian)	Media
Flood	February 6, 2020	Umatilla, River - Tree	Pendleton, OR	Media
Flood	February 6, 2020	Touchet River	Waitsburg, WA	Emergency Mgr.
Flood	February 6, 2020	3 bridges under water	Dayton, WA	Emergency Mgr.

The table above show that most of the events were either moderate to heavy snow, and flooding events.

Significant Weather Events for February, 2020 continued

Significant Weather Events				
Event	Date	Report	Where	Source
Flood	February 7, 2020	Highway 12 closed	Dayton to Waitsburg, WA	EM Manager
Flood	February 7, 2020	Evacuations in Hermiston ...water over I-84, Hwy 207	Stanfield-Hermiston area, OR	EM Manager
Heavy Rain	February 7, 2020	M 1.80 inches	5 NNE La Grande, OR	Trained Spotter
Flood	February 7, 2020	I-84, Hwy 237 & 204	Pendleton to Hermiston, OR	Dept of Highways
Flood	February 7, 2020	Hwy 244, 11 & 207	Standfield to Baker City	Dept of Highways
Flood	February 7, 2020	Hwy 12, WA	Dayton, WA	Dept of Highways
Heavy Rain	February 7, 2020	M 3.35 inches	10 N Elgin, OR	CoCoRaHS
Flood	February 7, 2020	Naches River, WA	10 NW Tieton, WA	EM Manager
Flood	February 7, 2020	Mill Creek, WA	2 WSW Garrett, WA	Trained Spotter
Flood	February 7, 2020	Couse Creek Bridge washed out, Levee breach	2 SSE Milton-Freewater, OR	Media
Flood	February 6, 2020	Bridge Thorn Hollow washed out	8 SE Adams, OR	Media
Flood	February 6, 2020	People stranded on roof	Thorn Hollow, OR	Media (E.O.)
Flood	February 7, 2020	Oasis Road washed out	11 SE Burbank, WA	Trained Spotter
Heavy Snow	February 8, 2020	M 8.0 inches	5 SW Spout Springs, OR	Meso-net - Snotel
Heavy Snow	February 8, 2020	E 10.0 inches	Tollgate, OR	Public
Heavy Snow	February 8, 2020	M 8.0 inches	9 SW Ski Bluewood	Meso-net - Snotel
Heavy Snow	February 9, 2020	M 11.0 inches	1 WSW Ski Bluewood	Trained Spotter
Heavy Snow	February 5, 2020	M 26.0 inches	1 NNW La Grande, OR	Trained Spotter
Heavy Snow	February 16, 2020	M 11.0 inches	1 WSW Ski Bluewood	Public
Heavy Snow	February 16, 2020	E 10.0 inches	9 SW Ski Bluewood	Meso-net - Snotel
Snow	February 16, 2020	M 7.0 inches	4 NW Meacham, OR	Trained Spotter
Heavy Snow	February 16, 2020	M 8.0 inches	2 NNW Ski Bluewood	Meso-net - Snotel
Heavy Snow	February 16, 2020	M 10.0 inches	5 SSW Spout Springs, OR	Meso-net - Snotel
Snow	February 16, 2020	E 6.0 inches	WSW Tollgate, OR	Trained Spotter
Snow	February 16, 2020	E 4.0 inches	3 N Bingham Springs, OR	Trained Spotter
Heavy Snow	February 16, 2020	U 7.5 inches very wet snow	3 NNE Bingham Springs, OR	Trained Spotter
Heavy Snow	February 16, 2020	M 11.0 inches	6 SSW Kamela, OR	Meso-net - Snotel
Heavy Snow	February 17, 2020	E 6.5 inches	5 NNW Ellensburg, WA	Trained Spotter
Heavy Snow	February 17, 2020	E 4.6 inches	4 ENE Thorp, WA	Trained Spotter
Non tstm Wind Gust	February 23, 2020	M 74 mph	3 N Helix	Meso-net
Non tstm Wind Gust	February 23, 2020	M 73 mph	8 NW W. Richland, WA	Meso-net
Non tstm Wind Gust	February 23, 2020	M 67 mph	8 WSW Grass Valley, OR	Meso-net
Non tstm Wind Gust	February 23, 2020	M 66 mph	4 SSW Fossil, OR	Meso-net
Non tstm Wind Gust	February 23, 2020	M 65 mph	17 NNW W. Richland, WA	Meso-net
Non tstm Wind Gust	February 23, 2020	M 64 mph	4 ENE Mission, OR	Meso-net

The table above show that most of the events were either moderate to heavy snow, flooding and/or high winds.

Significant Weather Events / Records for February, 2020

Significant Weather Events				
Event	Date	Report	Where	Source
Non tstm Wind Gust	February 23, 2020	M 63 mph	2 NNW Pendleton, OR	ASOS - PDT airport
Non tstm Wind Gust	February 23, 2020	M 62 mph	4 NW Richland, WA	Meso-net
Non tstm Wind Gust	February 23, 2020	M 60 mph	4 W Adams, OR	Meso-net
Non tstm Wind Gust	February 23, 2020	M 60 mph	19 N West Richland, WA	Meso-net
Non tstm Wind Gust	February 23, 2020	M 59 mph	5 N Richland, WA	Meso-net
Non tstm Wind Gust	February 23, 2020	M 59 mph	9 E Dufer, OR	Meso-net
Non tstm Wind Gust	February 23, 2020	M 58 mph	11 W Deschutes River, OR	Meso-net
Non tstm Wind Gust	February 23, 2020	M 58 mph	5 N W. Richland, WA	Meso-net
Non tstm Wind Gust	February 23, 2020	M 58 mph	1 NNE Sisters, OR	ASOS
Non tstm Wind Dmg	February 23, 2020	Electric transformer exploded ...M 50 mph winds	1 SE Bend, OR	Media
Non tstm Wind Dmg	February 23, 2020	Trees & Power Lines down	Bend, OR	Media
Non tstm Wind Dmg	February 23, 2020	I-84 Closed due to high winds	17 WSW La Grande to Meacham	Dept of Highways
Non tstm Wind Dmg	February 23, 2020	Hwy 11, 204 closed ...truck overturned	1 N Weston, OR	Public
Dust Storm	February 23, 2020	I-82 Accidents	9 SW Richland, WA	Law Enforcement
Non tstm Wind Gust	February 28, 2020	M 61 mph	4 NW Richland, WA	Meso-net

The table above shows that all of these events during the last week of February were high wind events.

Record Weather Reports					
Event	Date	Where	Previous Record	New Record	Records Began
Low Temp	February 3, 2020	Meacham, OR	2 / 1950	-4	1929
High Temp	February 27, 2020	Redmond, OR	63 / 1967	67	1941
High Temp	February 28, 2020	Redmond, OR	65 / 1959	68	1941
High Temp	February 28, 2020	Walla Walla, WA	63 / 1972	64	1930
High Temp	February 28, 2020	Yakima, WA	65 / 1988	66	1909

The table above show that all of the record events were either record low or record high temperature events.

February, 2020 Observed Monthly Max & Min Temperatures

Location	Highest Maximum Temperature	Lowest Minimum Temperature
Pendleton, OR	63	23
Redmond, OR	68	9
Pasco, WA	65	17
Yakima, WA	66	15
Walla Walla, WA	64	25
Bend, OR	64	12
Ellensburg, WA	57	15
Hermiston, OR	64	17
John Day, OR	69	17
La Grande, OR	58	13
The Dalles, OR	63	22
MT Adams RS, WA	60	19

The highest maximum temperatures were mostly in the 60s, with the warmest being at John Day, OR with a maximum high of 69 degrees. These are not unusual for the Pacific Northwest for February. Minimum low temperatures could be much colder in February, but the month overall was warmer than normal. Most minimum lows were in the teens to mid 20s, with only 1 station below 10.

February 2020, Monthly Precipitation and Snowfall Totals

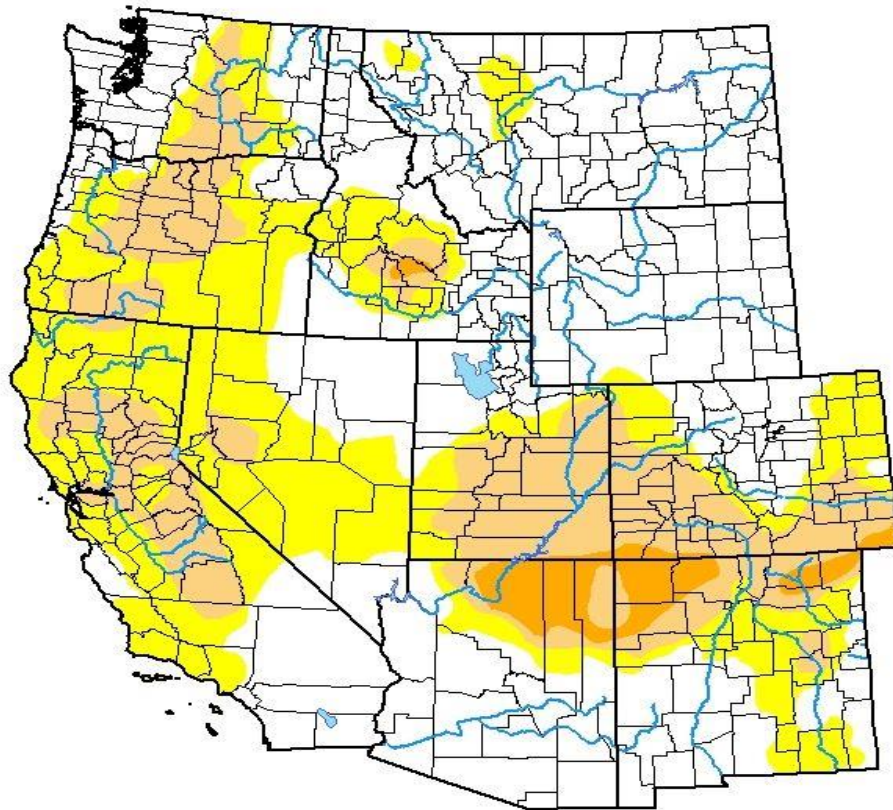
Location	Total Monthly Precip (inches)	Total Snowfall (inches)
Pendleton, OR	2.04	3.8
Redmond, OR	0.18	0.0
Pasco, WA	0.32	0.0
Yakima, WA	1.34	0.5
Walla Walla, WA	2.93	0.0
Bend, OR	0.04	Missing
Ellensburg, WA	0.55	Missing
Hermiston, OR	Missing	Missing
John Day, OR	1.00	Missing
La Grande, OR	4.79	10.0
The Dalles, OR	0.31	Missing
Mt Adams RS, WA	0.91	Trace

Most stations reported below normal rain and snowfall in February. The exception is in the extreme northeast portions of the forecast area where above normal precipitation was reported (E.G. 2.04" at Pendleton, 4.79" at La Grande). This was due to the heavy rain from an Atmospheric River (AR) at the beginning of the month. Most of the forecast area had below normal snowfall. Even Mt. Adams R.S. only had a Trace of snow.

February, 2020 - Drought Monitor

U.S. Drought Monitor West

February 25, 2020
(Released Thursday, Feb. 27, 2020)
Valid 7 a.m. EST



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	53.17	46.83	20.48	3.02	0.00	0.00
Last Week <i>02-18-2020</i>	54.96	45.04	17.80	3.00	0.00	0.00
3 Months Ago <i>11-26-2019</i>	44.19	55.81	23.84	11.57	0.24	0.00
Start of Calendar Year <i>12-31-2019</i>	59.17	40.83	18.17	7.12	0.00	0.00
Start of Water Year <i>10-01-2019</i>	68.40	31.60	16.32	3.16	0.00	0.00
One Year Ago <i>02-26-2019</i>	47.01	52.99	26.50	9.76	1.40	0.09

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

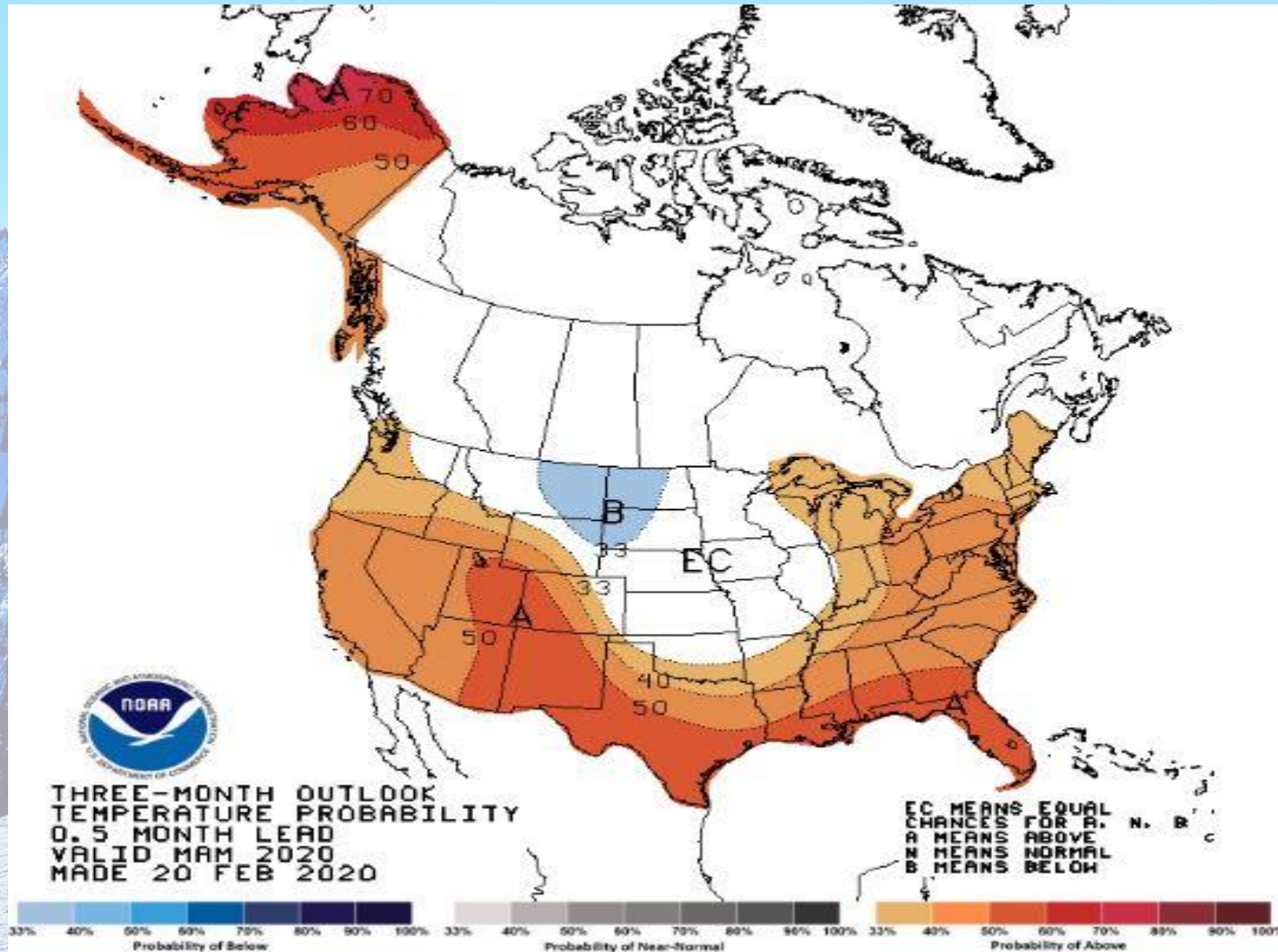
David Miskus
NOAA/NWS/NCEP/CPC



droughtmonitor.unl.edu

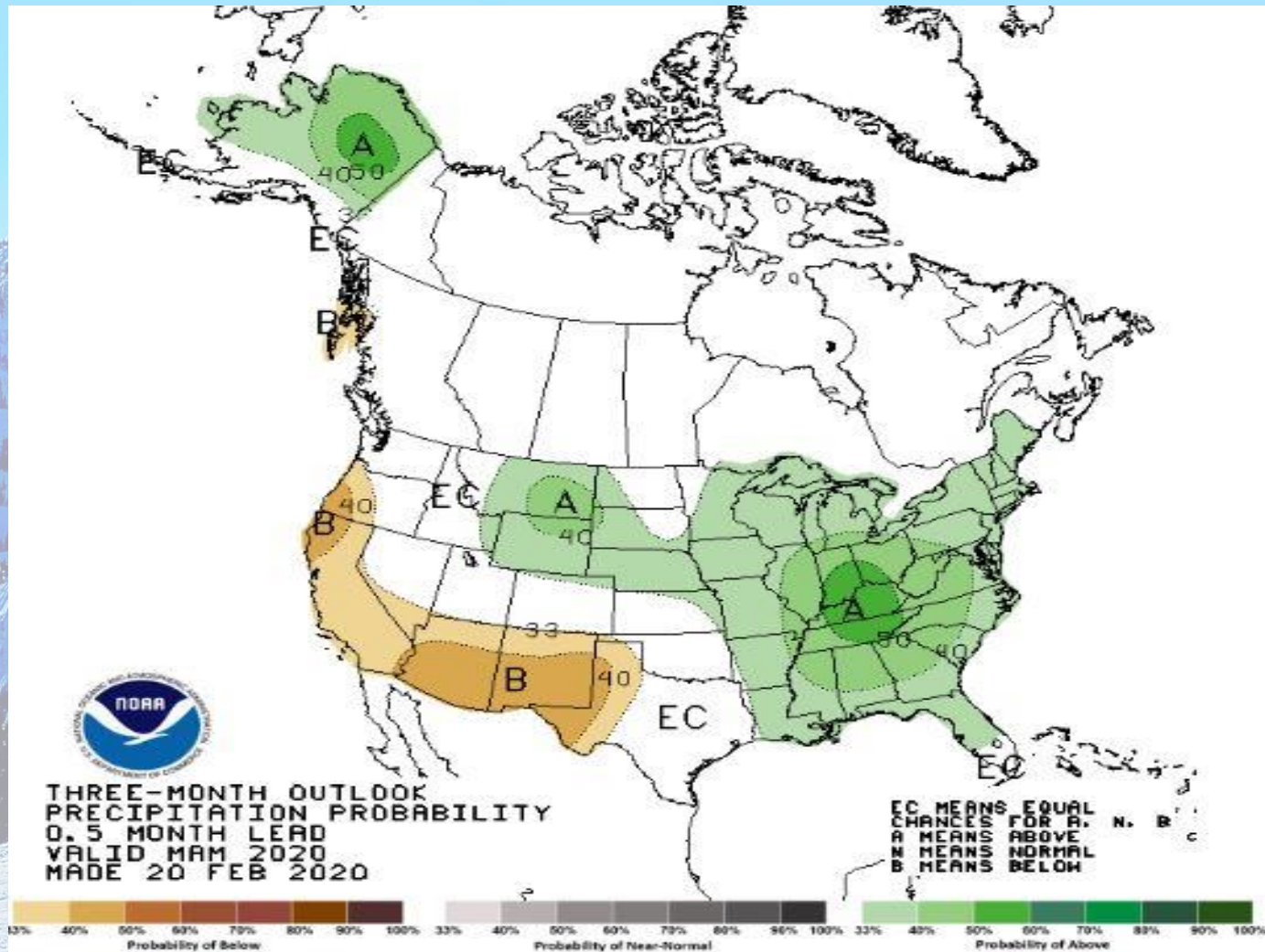
As of late February (the 25th) most of the forecast area was in a drought classification of “Abnormally Dry” (D0) to “Moderate Drought” (D1). The exception is the northeast corner of Oregon where there was abundant precipitation, which caused the floods.

USA Three Month Temperature Outlook



The temperature outlook for the next three months (March, April & May) shows about a 33% to 40% chance for above normal temperatures for most of the forecast area. The exception is extreme southeast Washington which has equal chances.

USA Three Month Precipitation Outlook

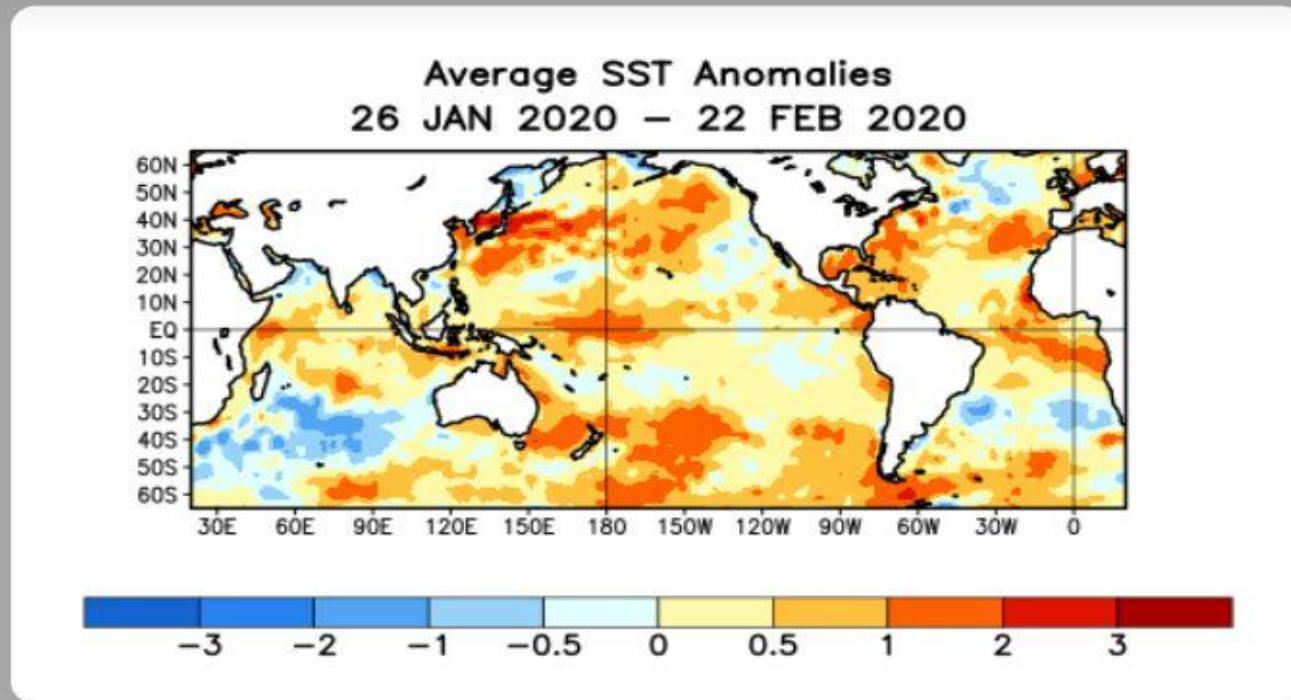


The percent of normal precipitation outlook for the next three months (March, April & May) shows equal chances that the forecast area will have either a higher or lower percent of normal precipitation for the entire forecast area.

Sea Surface Temperature (SST) analysis for February, 2020

Global SST Departures (°C) During the Last Four Weeks

During the last four weeks, equatorial SSTs were above average across the western and central Pacific, the Atlantic Ocean, and the Indian Ocean.



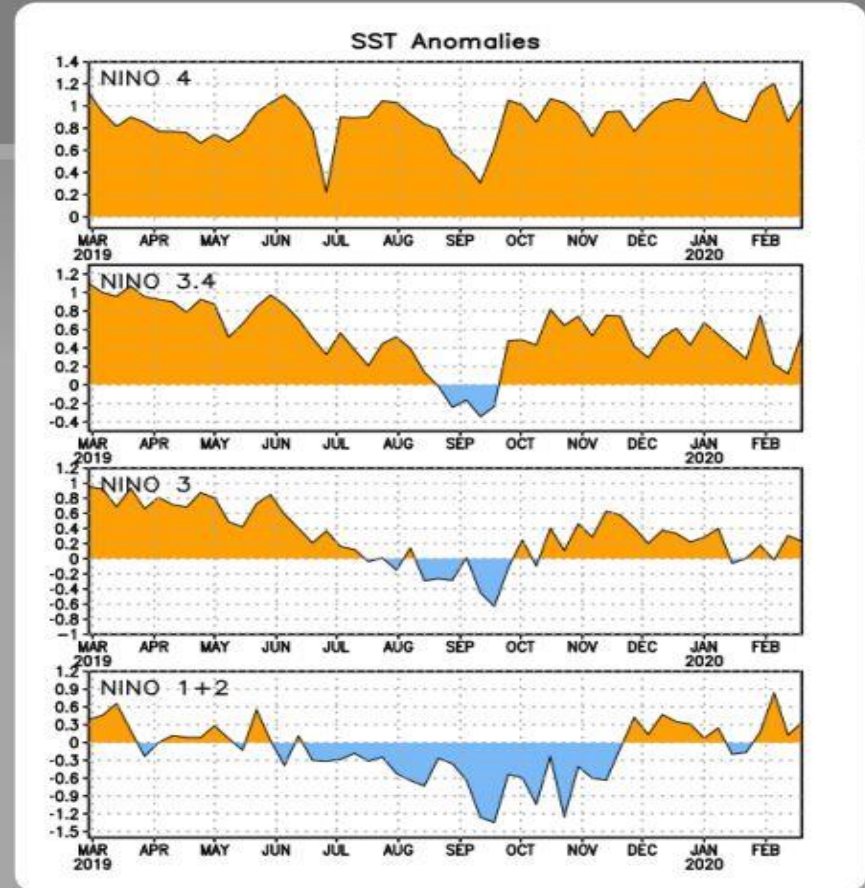
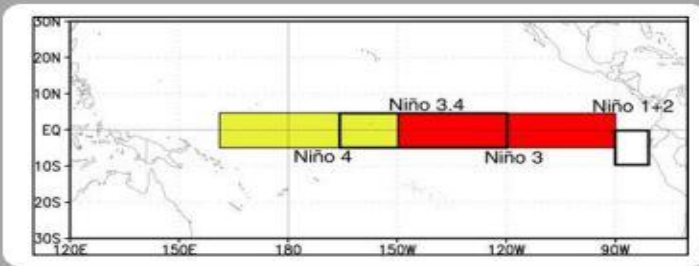
These above normal SSTs may indicate more frequent and greater intensity ocean storms on both the east and west coasts of the USA. However, it does not show a conclusive indication of the ENSO status (I.E. an El-Nino or a La-Nina). As continental cold fronts interact with the warm ocean temperatures, storms will form more frequently, with greater intensity.

El Nino/ La Nina Regions, Showing SST Anomalies for Each Nino Region

Niño Region SST Departures (°C) Recent Evolution

The latest weekly SST departures are:

Niño 4	1.1°C
Niño 3.4	0.6°C
Niño 3	0.2°C
Niño 1+2	0.3°C



The above images show that all four Niño regions are now indicating warming tropical Pacific SST temperatures for the past several months. While this also does not show conclusive indications of the ENSO status, it does show that the oceans are becoming warmer, which would indicate a better chance of more frequent and greater intensity ocean storms, including tropical storm systems (Hurricanes, Typhoons, Cyclones etc.).

Current ENSO (El Nino Southern Oscillation) Alert System Status

ENSO Alert System Status: Not Active

ENSO-neutral conditions are present.*

Equatorial sea surface temperatures (SSTs) are near-to-above average across the Pacific Ocean.

The tropical atmospheric circulation is generally consistent with ENSO-neutral.

ENSO-neutral is favored through Northern Hemisphere spring 2020 (~60% chance), continuing through summer 2020 (~50% chance).*

In the previous two slides, both showed warmer than normal SSTs. However, the ENSO Alert System Status is still shown as “Not Active” for the third month in a row, meaning that we are not in either an El-Nino or a La-Nina status, but in a “Neutral” ENSO status. These neutral conditions are forecast to continue through the spring and summer of 2020 (about a 50 - 60 percent chance). Despite the above normal SSTs, the atmospheric circulation is more consistent with neutral ENSO conditions.



Thank You!