Washington and Oregon 2022-2023 Winter Snowpack Outlook

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The mountain winter snowpack is critically important not only to the general public, but also to special interest groups, as it determines irrigation water for agriculture, river flow for power generation, and winter and summer recreation. The winter snowpack is also a significant factor in the severity of summer fire seasons because it affects drought and thus both live and large dead fuel moisture.

Weather Research and Consulting Services, LLC has developed a set of algorithms based upon correlations between the mid-winter El Niño Southern Oscillation (ENSO) 3.4 region sea surface temperature (SST) anomaly, the average winter (November–March) 500hPa height over Washington and Oregon, and the April 1 Snow Water Equivalent (SWE) percentage compared to the median. Forty years of data (1981-2020) were used to develop these algorithms. The source of both the ENSO 3.4 region SST anomaly and 500 hPa data is from the National Oceanic and Atmospheric Administration (NOAA). The April 1 SWE data is from the Natural Resources Conservation Service (NRCS) SNOTEL station network.

The primary predictor for this early outlook is the three-month DJF (Dec Jan Feb) forecast ENSO 3.4 region SST anomaly. We use a composite of twenty-four international dynamic and statistical ENSO models as displayed at the International Research Institute for Climate and Society (IRI) website. The forecast ENSO 3.4 region SST anomaly is then used to predict both the average wintertime 500 hPa height over Washington and Oregon and the April 1 SWE percentages for both states. The forecast winter-time 500 hPa height value is also used to calculate a second value for the April 1 SWE. These two April 1 SWE values are then averaged to produce our final forecast value. This method uses five algorithms to predict the Washington and Oregon April 1 SWE compared to the climatological median.

The Climate Prediction Center (CPC) is predicting a moderate La Niña again this winter. The projected IRI/CPC ENSO 3.4 region SST anomaly for the mid-winter months of DJF is -0.77 degrees Celsius. The predicted La Nina this winter is very similar in strength to 2008, 2012 and 2022. Using this value as input for our set of algorithms, the following is our prediction for the 2023 Washington and Oregon snowpack.

Washington: 115% (+/- 20%) of median

Oregon: 110% (+/- 20%) of median

Figures 1 and 2 display these forecasts in relation to the 1981-2022 historical values for both states.

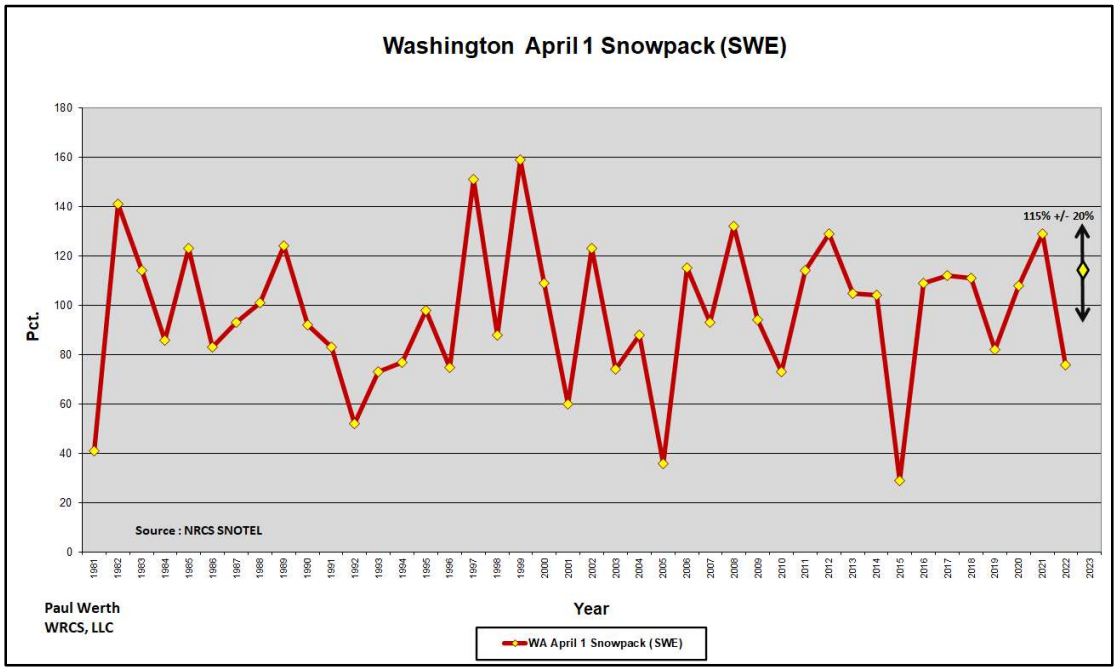

Figure 1. Washington April 1 SWE 1981-2022 and predicted 2023.

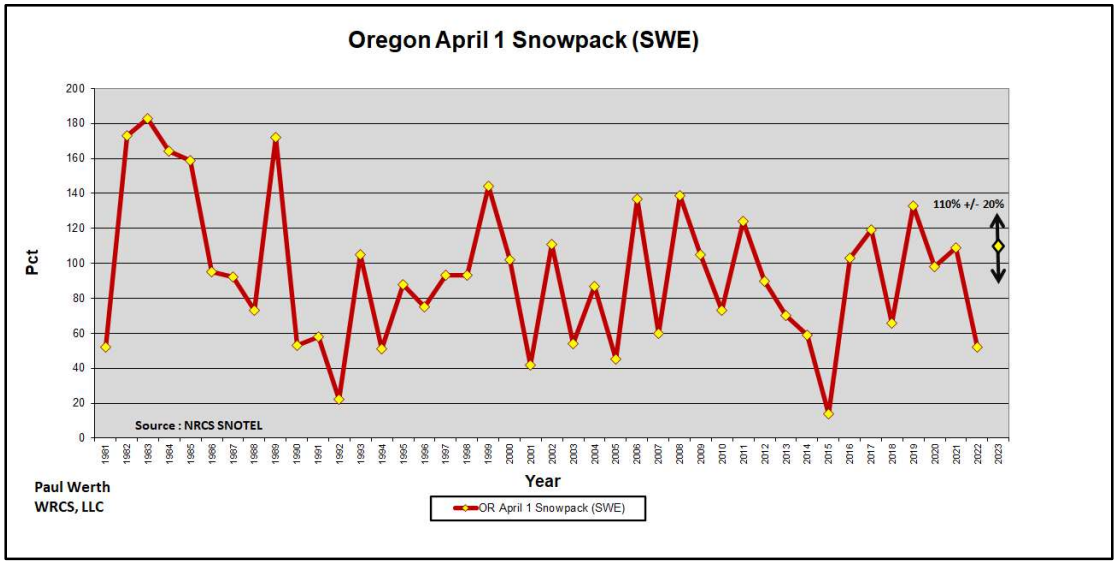

Figure 2. Oregon April 1 SWE 1981-2022 and predicted 2023.

A moderate La Niña is predicted for this winter. Based upon this forecast, our research indicates there is a high probably that Washington and Oregon will experience a colder and wetter than normal winter. The 2022-2023 snowpack in both states will likely be near or above the median. This means there should be ample snow for winter recreation. Many ski resorts could open as early as the Thanksgiving holiday. There will likely be plenty of water for summer irrigation and electric power generation. If Washington and Oregon experience the usual spring snowmelt rate, the 2023 summer fire season should again be near average.

Our Snowpack Tracker Report will be issued every two weeks beginning January 1, 2023.

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