Very long-term forecast: Northwest winters will be even wetter

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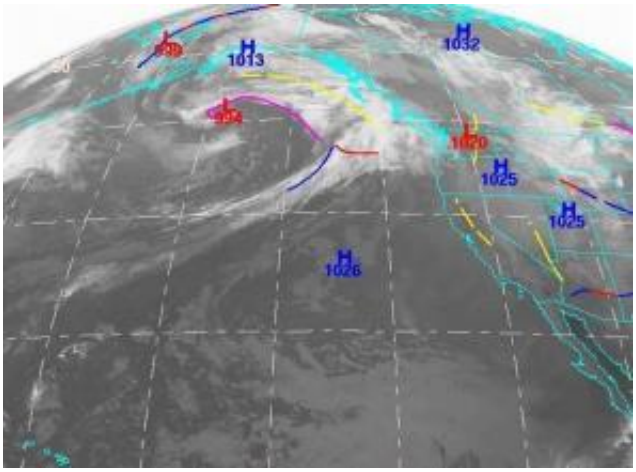

A late-September satellite image shows the swirling cloud mass of a low-pressure center near Alaska's Aleutian Islands. The Aleutian Low appears to be moving north and east. Credit: National Weather Service

If you think Pacific Northwest winters are gray and rainy now, just wait. By the end of this century winter storms are likely to be much more pronounced, particularly west of the Cascade Range, according to new University of Washington research.

The reason is that the Aleutian Low, a low-pressure system near the Aleutian Islands that is most pronounced during winter months, is moving farther to the north and east, and the general track of storms coming from the Pacific is moving farther north. Not only that, but

because of climate change the storms themselves are becoming more intense.

By moving the storm track farther north, one might expect less rainfall in areas such as western Washington and Oregon. However, because the storms also will be more intense and will hit more directly, they will deliver a more potent rainfall punch than they do now, said Eric Salathé, a UW research scientist with the Joint Institute for the Study of the Atmosphere and Oceans, based at the UW.

While western Washington and Oregon will be soggier than they are now, "Alaska will really get it -- Alaska and the British Columbia coast," said Salathé, author of a paper describing the research, which was published Oct. 13 in the online edition of the journal *Geophysical Research Letters*.

His work indicates that western Washington and Oregon can expect 10 percent more rainfall in November, December and January by the end of the century, and coastal Alaska and British Columbia will get 15 percent more precipitation.

The altered storm track means storms that now typically approach land from the southwest instead will hit more directly from the west, with the mountainous terrain wringing even more moisture from the clouds before they cross the Cascades.

For his research, Salathé collected data from 10 commonly used climate models for the period of 2050 to 2100, giving the most weight to two models that most accurately portray existing conditions based on current data. He added information reflecting the movement of the Aleutian Low, one of the main centers of atmospheric circulation in the Northern Hemisphere, and the Pacific storm track. He also added data on expected changes caused by global warming and detailed topographical

information for the Pacific Northwest. He then compared the model results with the actual rainfall from 1950 to 2000.

Leaving a 50-year gap between the measurement periods, he said, made long-term changes easier to discern and prevented the findings from being skewed by short-term fluctuations that could occur naturally.

The result is a marked increase in winter precipitation over the coastal regions of the Pacific Northwest in the last half of the 21st century compared with the last half of the 20th century.

"The atmosphere becomes more energetic because of climate change," Salathé said. "It's not just the temperature increase, but the increased temperature drives a more vigorous circulation."

He did not examine the most extreme events -- that's his next research effort -- but he expects that if the winter storms pack more wallop generally, then the most extreme storms will be more powerful too.

"The seasonal mean is made up of four or five big storms and then mostly drizzle. It's the big storms that are important for flooding or the scouring of fish habitat," Salathé said. "If the mean is shifting, then you would expect that the extremes are shifting too."

Source: University of Washington