

Western U.S. Winter Storm

7-10 February, 2014

By: M. Sean Ryan, WPC Meteorologist

Meteorological Overview:

From 7-10 February, a series of Pacific storm systems impacted the western U.S. with heavy snow, rain and strong winds. When the event was complete, more than 3 feet of snow was measured at some locations, with high winds nearing or even surpassing hurricane force at some higher elevation locations. A unique component to this event was the incursion of Arctic air into Washington and Oregon, which led to significant snow and freezing rain accumulations in lower elevation areas, even near the coast.

By 12 UTC on 7 February, an Arctic frontal boundary had already pushed southward into most of Washington and Oregon, with temperatures in the teens and 20s Fahrenheit at many locations. Areas near the coast were even subject to the cold air mass, where temperatures dropped into the 20s at many locations along the coast from central Oregon northward. The first Pacific storm system began to approach the Northwest during the day on 7 February, with precipitation increasing in coverage and intensity later in the day. The atmosphere was cold enough for snow at most locations north of the Arctic front, which extended in a generally west-east orientation from southern Oregon to northern Nevada and Utah to Wyoming at 00 UTC on 8 February. Additionally, freezing rain fell in areas close to and just north of the Arctic front, in the shallow cold air layer across Oregon. There was a brief lull in the precipitation during the morning hours of 8 February, before another Pacific storm began to spread precipitation across the region late on 8 February into early 9 February. Again, snow fell at many relatively low elevations, with freezing rain across the valleys in Oregon close to the Arctic front. In the wake of this system, the Arctic front remained in place for an additional 12 to 24 hours, with many locations across Oregon and Washington remaining at or below freezing well after the precipitation had ended. Finally, early on 10 February, the Arctic front began to erode as warm air advection caused temperatures at the surface to gradually rise.

When the event was concluded, up to 3 feet of snow had fallen in the Cascades of Oregon, with 3 to 6 inches of snow measured at lower elevation locations such as Portland and Oregon City, OR. In addition to the snow, areas around Portland also received more than a quarter inch of freezing rain ice accumulation. Olympia, WA also received 4 inches of snowfall. Additionally, 2 to 3 feet of snow fell in the Sierras and at many higher elevation locations in the Intermountain West.

Impacts:

The winter storm closed schools in areas affected by snow and freezing rain across the Pacific Northwest. Vehicle pileups were reported on major highways in at least two instances, one involving at

least 25 vehicles and another involving several tractor-trailers. A number of flights were cancelled at major airports around the region, however airports did not completely shut down during the event. Additionally, avalanche concerns prompted the closing of some roads in the Cascades.

Figures:

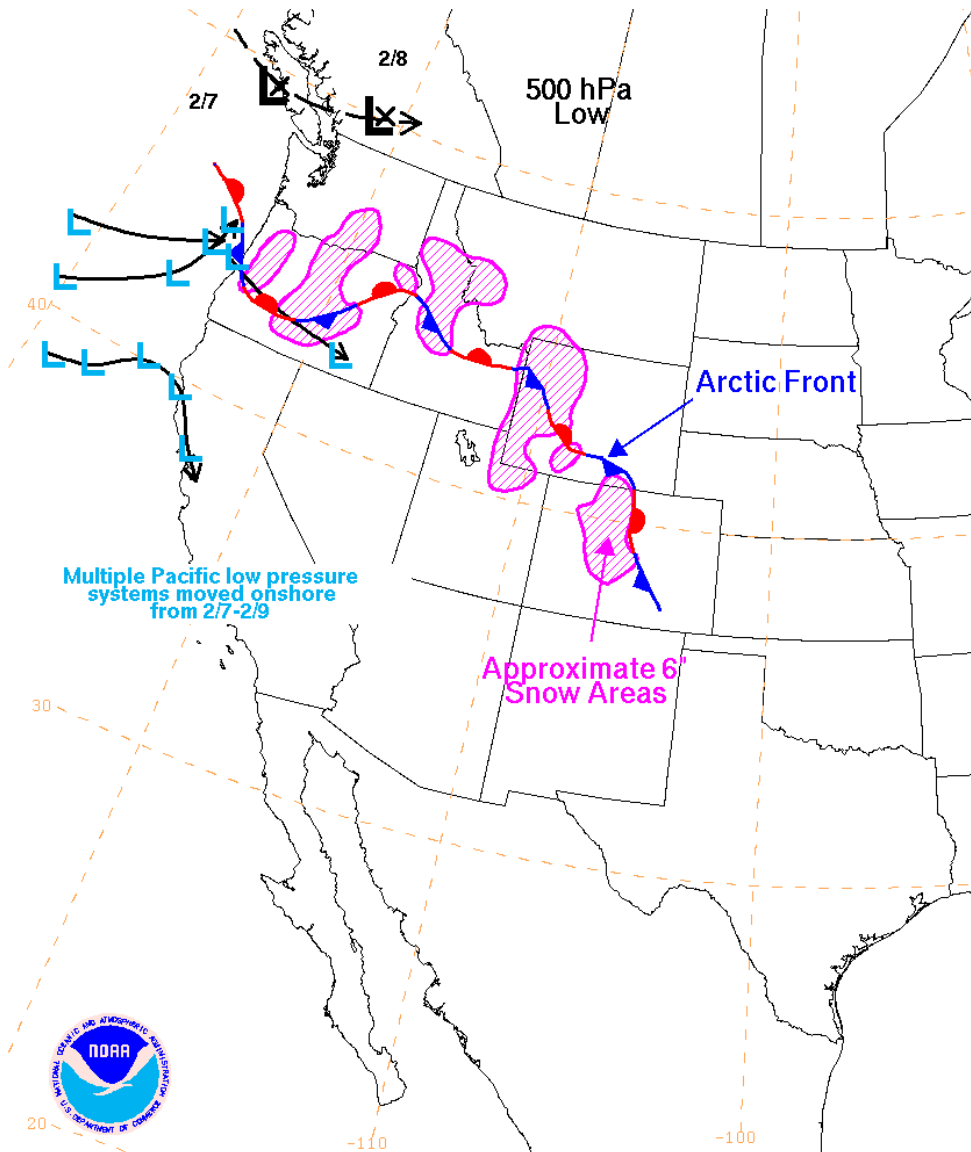


Figure 1: 500 hPa low track (black), surface low tracks (light blue), surface analyses indicating the position of the Arctic surface front, approximate areas receiving greater than 6 inches of snow (magenta). Positions at 00z of 500 hPa lows (black) are indicated by dates.

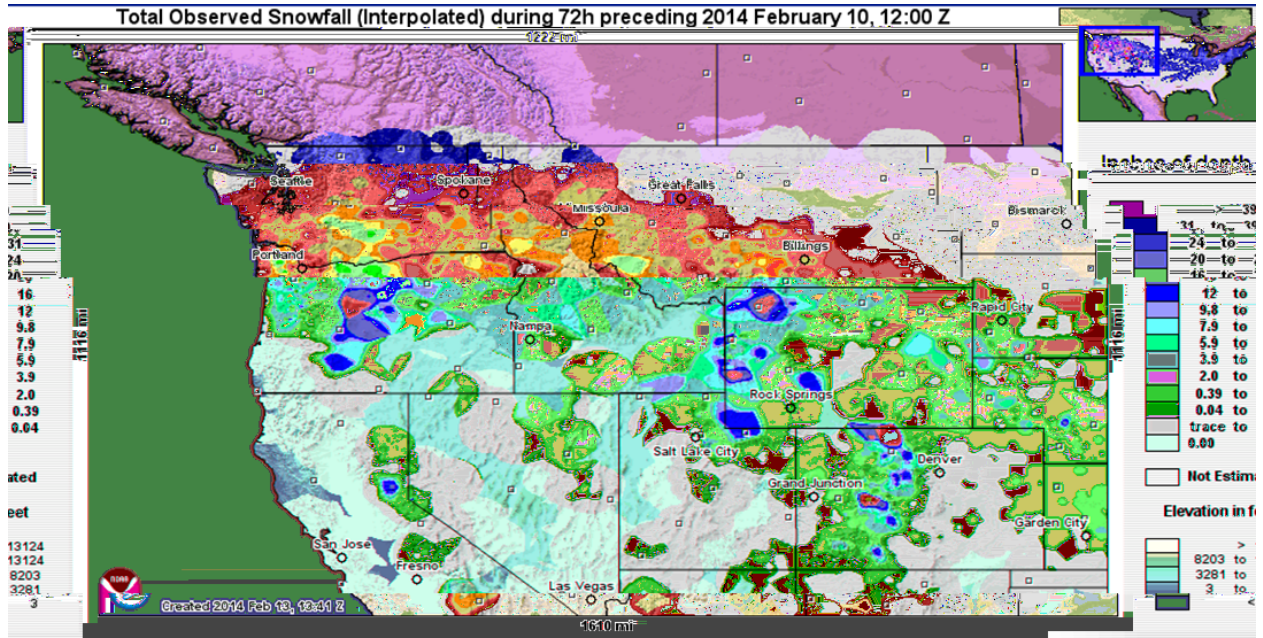


Figure 2: Snowfall analysis for 72 hours ending at 12 UTC 10 February, 2014 (NOHRSC).