December 1-4 2007
Meteorological Analysis

By
Greg Sinnett
DNR Chief Meteorologist
December 2007 Storm Event

The December 1-3 storms offered nearly every winter season hazard ...

- Snow
- Strong Winds
- Heavy Rainfall
- Major Flooding
- Landslides
- Avalanches
- High Coastal Surf
- Coastal Flooding

Since Friday...

Very cold
Arctic Air Dam

Snow and or mixed
Snow and Rain ...

Variable
Snow Amounts
4 am Mon Dec 3
UW MM5–NAM 36km Domain

Init: 00 UTC Mon 03 Dec 07
Valid: 06 UTC Tue 04 Dec 07 (22 PST Mon 03 Dec 07)

Forecast: 30 h

- Temperature at 925 mb (°C)
- Sea Level Pressure (hPa)
- Wind at 10m (full barb = 10kts)

Model info: V3.6.3 Kain–Fritsch MRF PBL Simple ice 36 km, 37 levels, 108 sec
4 pm Sun Dec 2

Washington

Hawaii

Pineapple Express
10 pm Sun Dec 2
Washington

Hawaii
Pineapple Express
Hawaii

Pineapple Express

Washington

4 am Mon Dec 3
Hawaii

L

Pineapple Express

Washington

4 pm Mon Dec 3

24 Hr

Hawaii

Pineapple Express
4 am Tue Dec 4

Washington

Hawaii

Pineapple Express
Mauna Kea Weather Center

goeswest IR 10:00 am HST Sat 01 Dec 2007 (2000 UTC Sat 01 Dec 2007)
Katrina

Storm was an Extra-Tropical Cyclone NOT A Hurricane
Tropical Cyclone

Extratropical Cyclone

Merrill 1993
Seattle Radar
Estimated Precipitation

9pm Friday thru 2pm Tuesday

89 hours
Radar Blocked

Portland Radar Estimated Precipitation

11pm Friday thru 2pm Tuesday

87 hours
Figure 1. December 1-4 total precipitation. Stations with * have daily data back to at least 1948, and Weyerhaeuser gauges are marked (W).
4 pm Sun Dec 2

Surface Wind Speeds

60 mph
10 pm Sun Dec 2

Surface Wind Speeds

60 mph

UW MM5—NAM 12km Domain

Post: 6 h

10m Wind Speed (knots)

Wind at 10m (full barb = 10 kts)

Sea Level Pressure (hPa)

Init: 00 UTC Mon 03 Dec 07
Valid: 06 UTC Mon 03 Dec 07 (22 PST Sun 02 Dec 07)

Model info: V3.6.3 Kain–Fritsch MRF PBL  Simple ice 12 km, 37 levels, 36 sec
4 am Mon Dec 3

Surface Wind Speeds

60 mph
10 am Mon Dec 3

Winds Along the Beach…

70mph… Gusts to 84+ mph
4 pm Mon Dec 3
24 hours

HQM
51+ mph
Gusts to 84 mph

Power Lost...
Record Winds
7 pm Mon Dec 3

30+ hours

Constant Strong Winds...

60 mph
December 01-03, 2007: Peak Gusts, mph

Based on maximum wind gusts, the stretch of coast from about Newport, OR, to Hoquiam, WA, received the strongest gale since the great Columbus Day Storm of 1962. Factor in the extremely long duration of the coastal wind event, and the Dec 2007 windstorm becomes unprecedented. Add in extreme precipitation and major flooding in WA and OR, and this storm will likely go down in history as one of the great natural disasters in the Pacific Northwest.

This map lists the peak gusts for the entire duration of the storm event, covering the days December 1st through 3rd. The gale arrived in two surges, with the 1st triggered by the familiar scenario of a low moving into the Olympic Peninsula. The 2nd surge of wind arrived about 12 hrs later, and was stronger in some areas.

Sources: National Weather Service, raw METAR reports and Public Information Statements, and National Data Buoy Center, raw reports.

Some readings left off this map due to space constraints include 47 mph at Fort Lewis, WA, 52 mph at the Tacoma Narrows Airport, 37 mph at Renton, 39 mph at Boeing Field, 52 mph at West Point in Seattle, 39 mph at Mt Vernon, 137 mph at Holy Cross in Pacific County, 88 mph at the Yaquina Bridge in Newport, OR, 82 mph at NWPO3 C-MAN station, Newport, 54 mph at TMKO3 Tillamook, 76 mph at the TPUD office in downtown Tillamook, 129 mph at Bay City (suspect), 71 mph sustained wind at Clatsop Spit, 91 mph gust at Mt. Hebo, 72 mph at Rockhouse RAWS (Central Coast Range), 49 mph at McMinnville, 44 mph at Aurora.
October 12, 1962: Peak Gusts, mph

The 60 and 80-mph isotachs delineate a broad area of damaging winds that struck the Pacific Northwest in this “mother of all windstorms.” Stations with 80+ peaks are the majority on this map.


Some readings left off the map due to space constraints include a gust to 63 mph at San Francisco, CA, 63 mph at Santa Rosa, 40 mph at Oakland, and 66 mph at Sacramento. Also, a fastest mile of 88 mph at the Portland International Airport, OR, with estimated gusts to 104 by weather bureau personnel. Studio personnel at KGW radio in downtown Portland witnessed a gust to 93 mph before the anemometer was destroyed. Also, the Weather Bureau Office in downtown Seattle, WA, had a peak fastest mile of 65 mph, both the Seattle Naval Air Station and Boeing Field had peak gusts of 66, and West Point had a gust to 83. Winds of 75 mph were reported at Anacortes, and 87 mph at Vancouver, BC. The Cape Blanco reading listed on the map was achieved with a damaged anemometer, and was probably higher! According to Dave Willson and Ira Kosovitz of the NWS, Portland, in a web article on the storm, winds at Cape Blanco reached 150 mph with gusts to 179.

Finally, according to the study by Lynott, Robert E., and Cramer, Owen P., "Detailed Analysis of the 1962 Columbus Day Windstorm in Oregon and Washington," *Monthly Weather Review*, Feb 1966, many of these measurements were probably low.
<table>
<thead>
<tr>
<th>Storm Event</th>
<th>Peak Gust at Astoria, OR (mph)</th>
<th>Other Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-Oct-62</td>
<td>96</td>
<td>Columbus Day Storm</td>
</tr>
<tr>
<td>03-Dec-07</td>
<td>85</td>
<td>&quot;Great Coastal Gale&quot;?</td>
</tr>
<tr>
<td>14-Dec-06</td>
<td>82</td>
<td>Hanukkah Eve Storm</td>
</tr>
<tr>
<td>15-Jan-51</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>16-Jan-00</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>03-Mar-99</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>13-Feb-79</td>
<td>76</td>
<td>Kitsap Blowdown</td>
</tr>
<tr>
<td>17-Dec-61</td>
<td>76</td>
<td></td>
</tr>
<tr>
<td>20-Dec-61</td>
<td>76</td>
<td></td>
</tr>
<tr>
<td>16-Jan-86</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>03-Nov-58</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>15-Dec-95</td>
<td>74</td>
<td>Big Blast</td>
</tr>
<tr>
<td>15-Dec-97</td>
<td>74</td>
<td></td>
</tr>
<tr>
<td>20-Jan-93</td>
<td>72</td>
<td>Inauguration Day Storm</td>
</tr>
<tr>
<td>27-Apr-62</td>
<td>71</td>
<td></td>
</tr>
<tr>
<td>27-Dec-02</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>26-Mar-71</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>09-Jan-53</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>14-Nov-81</td>
<td>68</td>
<td>Friday-the-13th Storm</td>
</tr>
<tr>
<td>07-Jan-53</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>27-Oct-50</td>
<td>65</td>
<td></td>
</tr>
</tbody>
</table>

Note: Peak gusts from 1995-2006 are adjusted upward to account for a 5-second averaging period. Source Oregon Climate Service