



## Office of the Washington State Climatologist Newsletter

December 17, 2007

### December Flooding

December 1st marked the first in a series of 3 storms to move over the Pacific Northwest from December 1-3, 2007. With cold arctic air already in place over the region, the first storm produced heavy snow in the mountains and low-land snow throughout western Washington. Around Seattle, up-to 1" of snow fell while many areas away from Puget Sound received over 4" of snow.

On December 2, the snow changed over to rain as temperatures increased along with the wind. As a low pressure system moved over the Olympic Peninsula, wind gusts of over 80 mph were observed along much of the coast (Hoquiam 81, Destruction Island 93, Tatoosh Island 86) and 40 to 50+ mph inland (Olympia 44, Seattle 48, Bellingham 53).

The most significant of the three storms arrived the next day with near record high temperatures (59°F for Seattle) and moist tropical air which led to record rainfall and flooding around western Washington. Preliminary estimates indicate that 6-hour and 24-hour precipitation amounts were near 100-year rain frequency levels. The 24-hour maximum precipitation totals for Sea-Tac AP 4.16", the Seattle Weather Forecast Office 4.56", Olympia 3.80", Chehalis 5.38" and Shelton 6.42". For Bremerton, December 3, 2007 became the wettest day on record with 7.50" of rain, breaking the old record of 5.62" set

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*An aerial photo showing the flood waters over I-5 in Chehalis on December 4, 2007. Source: WSDOT*

December 10, 1921. It was the 2nd wettest day for Sea-Tac AP which received with 3.77" (first is 4.93" recorded on October 20, 2003).

According to the United States Geological Survey (USGS), the intense rainfall led to major flooding in southwest Washington and moderate flooding in central western Washington. About 10 sites reached new all-time record high river flows and set all-time record high flood stage levels, including the Chehalis which reached nearly 75 ft (10 feet over flood stage), breaking the previous record set in the floods of February 1996. The flooding of the Chehalis river led to widespread flooding throughout western Lewis county, including a stretch of I-5, forcing 20 miles of the interstate to be closed for 4 days. Despite advanced warning by the National Weather Service, the flooding caught most people off guard, keeping the coast guard occupied as they rescued more than 300 people from the flood areas. The flooding and mudslides have resulted in at least 5 deaths and have prompted the declaration of 6 counties as federal disaster areas by the President.

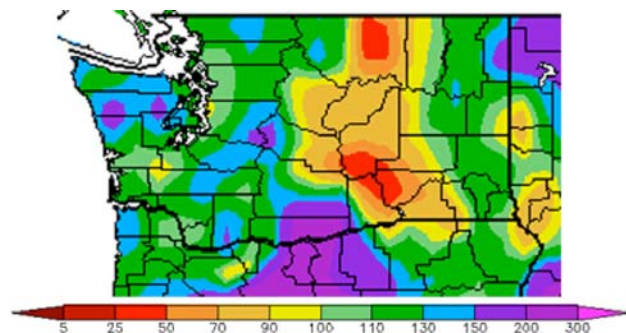
This article along with additional information on the December flooding is available at: <http://www.climate.washington.edu/events/dec2007floods/>

## Climate Summaries

### October

On October 17-18 strong winds knocked out power to more than 310,000 homes and businesses as an extratropical cyclone formed from the remnants of tropical storm Lingling. The low pressure system, which was difficult to pin-point via satellite due to the unusual absence of a well defined center, moved over Tatoosh Island producing wind gusts of 55-60 mph along the coast and 45-55 mph inland. Additional information: <http://www.climate.washington.edu/stormking/October2007.html>

Temperatures for October were the 9th warmest on record for the contiguous United States, with the warmest region in the Northeast where 5 states recorded their warmest October on record (since records began in 1895). While much of the country was unusually warm, statewide the average temperature for October was 46.9°F, 2.0°F cooler than the 1901-2000 average. With the exception of central Washington, precipitation was above normal throughout most of state. In Western Washington the percentage of normal precipitation ranged from 108% in the Olympics to 141% in the Cascades and for eastern Washington the range was 86% in the Okanogan region to 121% along the east slopes of the cascades.



October Percent of Normal Precipitation.  
Source: High Plains Regional Climate Center  
<http://www.hprcc.unl.edu>

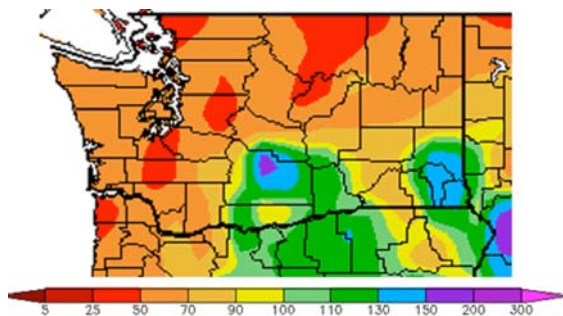
### October Climate Summary for Various Locations

City	Temperature (°F)			Precipitation (inches)		
	Average	Normal	Departure from Normal	Total	Normal	% of Normal
<b>Coast</b>						
Hoquiam	52.9	53.1	-0.2	5.53	5.91	94%
Long Beach	N/A	51.7	-	N/A	6.76	-
Quillayute	49.1	50.1	-1.0	12.71	9.81	130%
<b>Western WA</b>						
Bellingham	49.1	50.2	-1.1	3.44	3.02	114%
Everett	50.7	51.1	-0.4	3.81	3.34	114%
Olympia	48.6	50.0	-1.4	4.88	4.19	116%
Seattle	50.5	52.7	-2.2	3.32	3.19	104%
Vancouver	52.7	52.4	0.3	2.95	3.28	90%
<b>Cascades</b>						
Mt. Rainier (Paradise)	37.6	39.5	-1.9	9.27	8.63	107%
Ross Dam	47.3	49.5	-2.2	6.41	5.23	123%
Stampede Pass	40.1	42.7	-2.6	9.62	5.81	166%
<b>Eastern WA</b>						
Lind	47.3	49.6	-2.3	0.00	0.79	0%
Republic	42.4	43.6	-1.2	0.91	0.87	105%
Spokane	46.8	47.1	-0.3	1.18	1.06	111%
Walla Walla	52.4	54.3	-1.9	1.25	1.61	78%
Wenatchee	49.4	50.9	-1.5	0.39	0.45	87%
Yakima	47.1	49.3	-2.2	0.56	0.53	106%

Normal is defined as the 1971-2000 average.

### November

The second windstorm of the season made its way through Washington November 12, as a strong low pressure system moved over the northern tip of Vancouver Island. The storm brought heavy rain and the strongest winds since the Hanukkah Eve Wind Storm of 2006, for the coast and northwest interior. Wind gusts were in excess 70 mph throughout these areas (Hoquiam 71, Destruction Island 75, Tatoosh Island 78, Whidbey Island 70, Anacortes 73, Bellingham AP 74) and gusts of 92 mph and 97 mph were recorded by 2 trained spotters in Sekiu and 5 miles east of I-5 on the Mt. Baker Highway, respectively. Wind gusts around the Puget Sound area from Tacoma to Everett ranged from 40 to 50 mph and would have been much stronger had the center of the storm been farther south.



November Percent of Normal Precipitation.

Source: High Plains Regional Climate Center

Temperatures for the month were near normal throughout the state. The statewide average temperature was 38.5°F, 0.1°F cooler than the 1901-2000 average. In a normally wet month, strong ridging over the state during most of November led to below normal precipitation throughout much of the state, with the exception of the Yakima Valley, Palouse, and the Blue Mountains which received above

normal precipitation. The percent of normal precipitation ranged from 49% along the coast to 63% for the southwest interior and in eastern Washington precipitation ranged from 57% in the Okanogan region to 110% for the Palouse and Blue Mountains. For Hoquiam and Bellingham, it was the 5th and 6th driest Novembers on record, respectively.

### November Climate Summary for Various Locations

City	Temperature (°F)			Precipitation (inches)		
	Average	Normal	Departure from Normal	Total	Normal	% of Normal
<b>Coast</b>						
Hoquiam	46.9	46.2	0.7	5.17	10.30	50%
Long Beach	N/A	46.3	-	N/A	11.82	-
Quillayute	43.0	44.0	-1.0	9.89	14.82	67%
<b>Western WA</b>						
Bellingham	41.4	43.2	-1.8	2.18	5.36	41%
Everett	42.6	43.9	-1.3	3.39	5.04	67%
Olympia	42.2	42.7	-0.5	4.04	8.13	50%
Seattle	44.3	45.2	-0.9	3.71	5.90	63%
Vancouver	44.6	44.7	-0.1	4.31	6.29	69%
<b>Cascades</b>						
Mt. Rainier (Paradise)	34.3	29.5	4.8	8.74	18.99	46%
Ross Dam	39.4	39.2	0.2	6.07	10.48	58%
Stampede Pass	32.9	30.3	2.6	7.40	12.21	61%
<b>Eastern WA</b>						
Lind	38.2	37.5	0.7	0.41	1.31	31%
Republic	N/A	31.2	-	N/A	1.72	-
Spokane	35.0	34.8	0.2	1.58	2.24	71%
Walla Walla	42.2	42.0	0.2	2.09	2.70	77%
Wenatchee	37.7	37.1	0.6	0.55	1.19	46%
Yakima	37.2	37.7	-0.5	1.50	1.05	143%

Normal is defined as the 1971-2000 average.

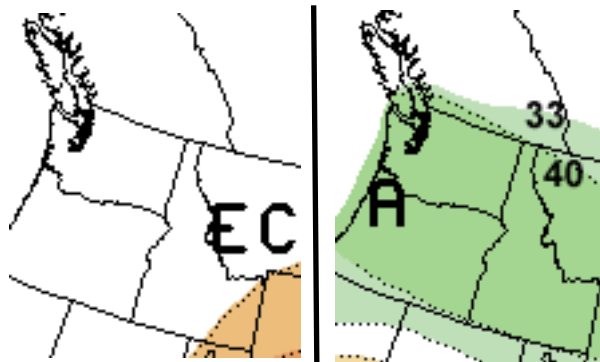
## Outlook

The Climate Prediction Center's (CPC) 3-month outlook for December-January-February is for equal chances of above, below, or normal temperatures for Washington with a increased probability for above normal precipitation.

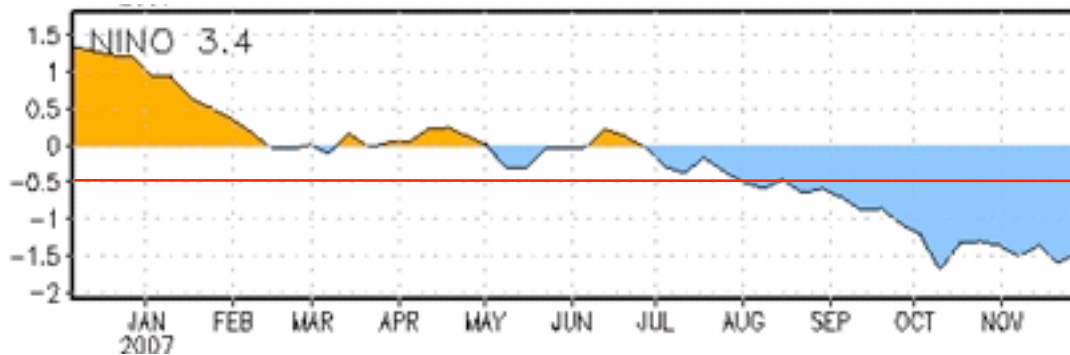
Sea-surface temperatures (SSTs) in the tropical Pacific continue to be below average as La Niña reached moderate strength in November. Current model forecasts indicate the continuation of La Niña into spring 2008 with over half the models suggesting moderate to strong La Niña conditions through February.

Historically, La Niña conditions favor above normal precipitation for the state with cooler than average winter temperatures around western Washington. However, with the current long-term warming trend La Niña merely offsets the trend and yields near normal temperatures.

### Dec-Jan-Feb Outlook Temperature - Precipitation



### SST Anomalies



*La Niña conditions are characterized by negative monthly SST anomalies less than or equal to  $-0.5^{\circ}\text{C}$ .*