

# East Slopes North - Canadian Border to Lake Chelan

Issued: 6:00 PM PST Sunday, December 25, 2016 by Dennis D'Amico

NWAC avalanche forecasts apply to backcountry avalanche terrain in the Olympics, Washington Cascades and Mt Hood area. These forecasts do not apply to developed ski areas, avalanche terrain affecting highways and higher terrain on the volcanic peaks above the Cascade crest level.

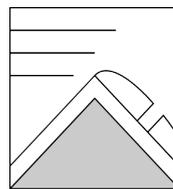
**The Bottom Line:** Pay attention to changing weather and avalanche conditions! New shallow wind and storm slab will develop Monday afternoon in the Washington Pass area. The avalanche danger will ramp up quickly late Monday afternoon and evening, so plan accordingly for deteriorating conditions.

Elevation	Monday		Outlook for Tuesday
 <b>Above Treeline</b>	 <b>Considerable</b>	Dangerous avalanche conditions. Careful snowpack evaluation, cautious route-finding and conservative decision-making essential.	 <b>High</b>
 <b>Near Treeline</b>	 <b>Moderate</b>	Heightened avalanche conditions on specific terrain features. Evaluate snow and terrain carefully; identify problem features.	 <b>High</b>
 <b>Below Treeline</b>	 <b>Moderate</b>	Heightened avalanche conditions on specific terrain features. Evaluate snow and terrain carefully; identify problem features.	 <b>Considerable</b>

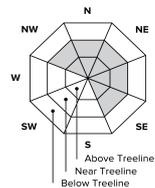
## Avalanche Problems for Monday

### Wind Slab

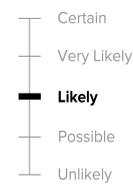
Wind slabs can take up to a week to stabilize. They are confined to lee and cross-loaded terrain features and can be avoided by sticking to sheltered or wind scoured areas.



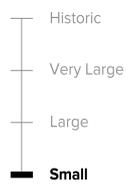
**Avalanche Problem**



**Aspect/Elevation**



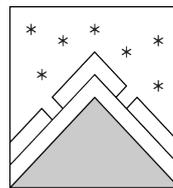
**Likelihood**



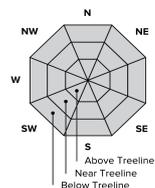
**Size**

### Storm Slabs

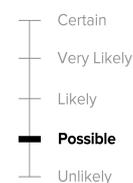
Storm slabs usually stabilize within a few days, and release at or below the trigger point. They exist throughout the terrain, and can be avoided by waiting for the storm snow to stabilize.



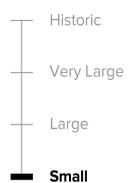
**Avalanche Problem**



**Aspect/Elevation**



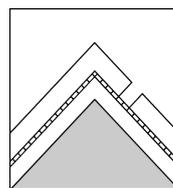
**Likelihood**



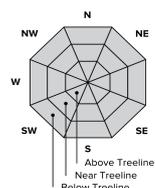
**Size**

### Persistent Slab

Persistent slabs can be triggered by light loads and weeks after the last storm. You can trigger them remotely and they often propagate across and beyond terrain features that would otherwise confine wind and storm slabs. Give yourself a wide safety buffer to handle the uncertainty.



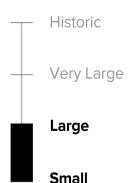
**Avalanche Problem**



**Aspect/Elevation**



**Likelihood**



**Size**

# Snowpack Analysis

## Weather and Snowpack

Strong westerly flow directed two Pacific frontal systems across the Northwest last Sunday night and again Monday night (12/18-12/19) with generally half to 1 inch of water accumulating along the east slopes through early Tuesday morning. Storm totals generally ranged from 6 - 12 inches along the east slopes during this cycle. Westerly winds were especially strong with the 2nd system late Monday night and into Tuesday with gusty winds mixing down into usually more wind sheltered terrain.

After a fair weather period midweek another front crossed the Northwest on Thursday followed by an upper trough on Friday with low snow levels. About 1-5 inches of snow accumulated along the east slopes.

Scattered snow showers were seen mainly near the crest with ample sunbreaks and generally light winds on Saturday with fair and cold weather seen on Christmas Day.

## Recent Observations

NWAC pro-observer Jeff Ward was in the Icicle Creek area up to about 6300 feet on Wednesday and saw evidence of a widespread natural wind slab avalanche cycle during the last storm, with one very large crown seen on a north aspect. The December 17th persistent weak layer (PWL) was found at 15-30 cm below the surface on W to N to E slopes. The layer was unreactive both in large column snowpack tests, ski tests and cornice drops.

The NCMG on Friday and Saturday at Washington Pass had some planar hand shears in wind affected snow but the only instability directly noted was small loose dry avalanches in steep rocky terrain. The 12/17 interface was found to be unreactive in several snowpack tests.

NWAC observer Tom Curtis was on DirtyFace Peak near Lake Wenatchee Saturday and found the 12/17 PWL 15-25 cm down but not propagating in snowpack tests on N-E-SE aspects between 4000-5500 feet. Tom also found shallow and stubborn wind slab in the near treeline band.

A different story continues to evolve in the Mission Ridge area. On Wednesday avalanche mitigation produced 1.5 -3 ft hard slab avalanches in 3 separate paths! These avalanches were releasing on basal facets about 15 cm from the ground. On Thursday, snowpits on W-N-E slopes at 6500 ft continued to show hard slab layers giving hard compression test results with moderate quality shears on facets about 15 cm from the ground with about 120 cm (4 ft) of total snow. On Saturday, a backcountry ski tourer in the Lake Clara area near Mission Ridge reported a huge whumping noise, likely indicating a collapse of the basal facets. While no avalanche occurred, the terrain where the collapse occurred connected to a large avalanche path that was NE facing near treeline. While deep persistent slabs in this area are unlikely to trigger, they warrant a high level of caution before venturing near or into avalanche terrain.

## Detailed Avalanche Forecast for Monday

After a benign start to Monday, an incoming frontal system will quickly spread light rain and snow over the Cascades with precipitation beginning around mid-day for the northeast Cascades and Monday afternoon for the south and central-east Cascades. Above treeline winds will quickly ramp up in the afternoon. Expect stormy conditions Monday night with increasing avalanche danger.

Fresh wind slab should begin to develop Monday afternoon near and especially above treeline on lee aspects.

Shallow storm slabs may develop in the Washington Pass area by late Monday afternoon as the storm intensifies.

The latest tests of the December 17th PWL in the Cascades don't seem to indicate a regionally reactive layer. However, since this layer is still showing the ability to propagate in snowpack tests throughout much of the range, we still advise observing the snowpack structure in your local area and skiing or riding on lower angled slopes until there is more certainty that this layer is no longer a problem. While triggering this layer seems unlikely, remember that persistent weak layers are generally involved in larger avalanches.

Of particular concern is the low-likelihood/high consequence threat of deep persistent slabs in the Mission Ridge area consisting of hard slabs failing on weak layers near the ground - a deadly combination. We recommend a very cautious approach with conservative terrain selection in the Mission Ridge area in light of this local problem.

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## Mountain Weather Synopsis for Monday & Tuesday

A quiet morning in the Pacific Northwest will soon change into an active next 36 hours as a very strong westerly jet stream in the eastern North Pacific begins to carry Pacific moisture inland later Monday. Winds should increase later Monday with precipitation initiating in the Olympics and NW Washington Cascades, by late morning, spreading to the remainder of the forecast region through the day. The first wave will bring heavy snowfall at low, but slightly rising freezing levels in all the west slope areas and volcanoes overnight Monday, with light to moderate precipitation along the east slopes. Strong and moist westerly flow Tuesday and Tuesday night will maintain moderate to heavy precipitation along the west slopes and volcanic peaks with significantly less precipitation expected along the east slopes, especially further east, away from the crest. Freezing levels should remain relatively low through this event, well below pass levels.

**24 Hour Quantitative Precipitation ending at 4 am**

Location	Tue	Wed
Hurricane Ridge	.50	.50 - .75
Mt Baker Ski Area	1.00 - 1.50	1.00
Washington Pass	.50 - .75	.50
Stevens Pass	.75 - 1.00	1.00
Snoqualmie Pass	1.00	1.00 - 1.50
Mission Ridge	.25 - .50	.25
Crystal Mt	.75	.50 - .75
Paradise	1.50	1.50
White Pass	.75 - 1.00	1.00
Mt Hood Meadows	1.00	1.50 - 2.00
Timberline	1.00 - 1.50	2.00

LT = less than; WE or Water equivalent is the liquid water equivalent of melted snow in hundredths of inches. As a rough approximation 1 inch of snow = about .10 inches WE, or 10 inches of snow = about 1 inch WE.

**Snow Level/Freezing Level in feet**

Day	Snow Level/Freezing Level in feet					Easterly Flow in Passes
	Olympics	Northwest Cascades	Northeast Cascades	Central Cascades	South Cascades	
Monday Morning	2000'	500'	500'	1000'	1500'	*
Monday Afternoon - Monday Evening	2500'	1500'	500'	1500'	2000'	*
Monday Night	3000'	2500'	1500'	2500'	3000'	*
Tuesday - Tuesday Night	2000'	2000'	1000'	2000'	2000'	

Cascade Snow / Freezing Levels noted above refer to the north (approximately Mt Baker and Washington Pass), central (approximately Stevens to White Pass) and south (near Mt Hood). Freezing Level is when no precipitation is forecast.

\* Note that surface snow levels are common near the passes during easterly pass flow and may result in multiple snow / freezing levels.