



**American Avalanche Association
Forest Service National Avalanche Center
Avalanche Incident Report: Short Form**



Occurrence Date (YYYYMMDD): 20161227 **and Time (HHMM):** 1600 **Comments:**

Reporting Party Name and Address: Chris Talbot
White Pass Ski Patrol
48935 US Hwy 12 Naches WA 98937

Avalanche Characteristics:

Type: SS Aspect: 303
Trigger: ASu Slope Angle: 45-50
Size: R 2 \ D 2 Elevation: 4420 m / ft
Sliding surface (check one):
 In new New / old In old Ground

Location:

State: WA County: Lewis Forest: Gifford Pinchot
Peak, Mtn Pass, or Drainage: White Pass
Site Name: Grand Couloir
Lat/Lon or UTM: 46.6270, -121.4100

Group	Number of People	Time recovered	Duration of burial	Depth to Face <input type="checkbox"/> m / <input checked="" type="checkbox"/> ft
Caught	1			
Partially Buried— Not critical				
Partially Buried-- Critical				
Completely Buried	1	1753	2hr+	4
Number of people injured:		Number of people killed: 1		

Dimensions <input type="checkbox"/> m / <input checked="" type="checkbox"/> ft		Average	Maximum
Height of Crown Face		.75	.80
Width of Fracture		375	
Vertical Fall		325	
Snow	Hardness	Grain Type	Grain Size (mm)
Slab		PP or DF	
Weak Layer			
Bed Surface		IFrc	
Thickness of weak layer:		<input type="checkbox"/> mm / <input type="checkbox"/> cm / <input type="checkbox"/> in	

Burial involved a terrain trap? no yes → type: drainage

Number of people that crossed start zone before the avalanche: 0

Location of group in relation to start zone during avalanche:

high middle low

Avalanche occurred during ascent descent

Subject	Name	Age	Gender	Address	Phone	Activity
1	Adam Roberts	32	M	Randle, WA	unknown	skiing
2						
3						
4						
5						

Equipment Carried

1	2	3	4	5
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Transceiver
Shovel
Probe

Experience at Activity

1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Unknown
Novice
Intermediate
Advanced
Expert

Avalanche Training

1	2	3	4	5
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Unknown
None
Some
Advanced
Expert

Signs of Instability Noted by Group	Injuries Sustained						Extent of Injuries or Cause of Death					
	1	2	3	4	5		1	2	3	4	5	
<input type="checkbox"/> Unknown	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Asphyxiation
<input type="checkbox"/> None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	First Aid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Head Trauma
<input checked="" type="checkbox"/> Recent avalanches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Doctor's care	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Spinal Injury
<input type="checkbox"/> Shooting cracks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hospital Stay	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Chest Trauma
<input type="checkbox"/> Collapse or whumphing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fatal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Skeletal Fractures
<input type="checkbox"/> Low test scores							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Other:

Damage Number of Vehicles Caught:0 Number Structures Destroyed: 0 Estimated Loss: \$

Accident Summary Include: events leading to accident, group's familiarity with location, objectives, route, hazard evaluation, etc.

Rescue Summary Include: description of initial search, report of accident, organized rescue, etc.

	Rescue Method					
	1	2	3	4	5	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Self rescue
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Transceiver
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Spot probe				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Probe line
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Rescue dog
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Voice
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Object
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Digging				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Other:

White Pass Ski Patrol was notified at 1609 on 12/27/16 of a possible skier burial outside the ski area with a location of approximately one mile west of the White Pass Ski area.

Patrol was guided by the victim's friend (witness) to the top of slope in question at approximately 1700. The witness did not directly observe the accident but did find the avalanche debris after safely traveling around the slope in question (witness had separated from the victim as this point) and back up the drainage.

Patrollers observed an average crown face depth (slab thickness) of 9 inches with a slope angle of 45-50 degrees on a WNW aspect. The approximate slab dimensions were 375 feet wide with a vertical fall of 325 feet.

This area is part of a deep drainage known locally as the Grand Couloir. The slope in question terminates in a twenty foot wide creek bed with a timbered slope of similar angle on the other side, constituting an extreme terrain trap.

The patroller on-scene accessed the debris pile from the bottom of the drainage as well as from the top by skiing down on the bed surface. Patrollers and witness began probing the debris pile at 1706. A positive probe strike was made by the witness at 1750. Victim was buried down from the surface approximately 4 feet to the head and six feet to his feet. After the victim was extricated no CPR was performed as the victim had passed.

No detailed avalanche observations were made during the time of the rescue due to the ongoing storm and rising avalanche hazard. It is assumed that the bed surface was the 12/20 rain crust, also referred to as the Solstice crust in the NWAC forecast.

Attach additional pages as needed. Include weather history, snow profiles, reports from other agencies, diagram of site, photographs, and any other supporting information

Please send to: CAIC; 325 Broadway WS1; Boulder CO 80305; caic@state.co.us and to the nearest Avalanche Center.



Start Zone

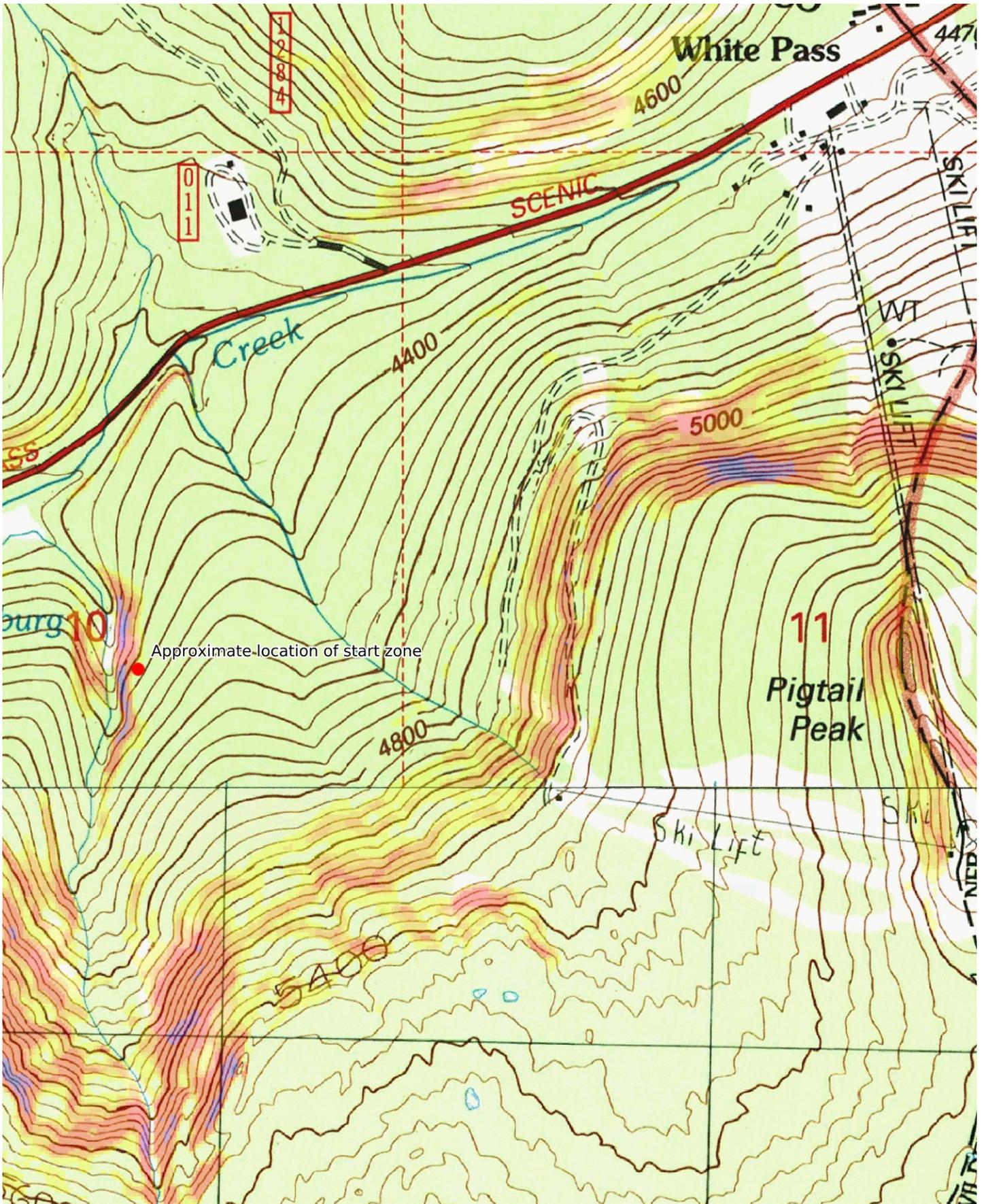
Burial Location

© 2016 Google

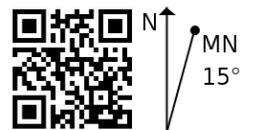
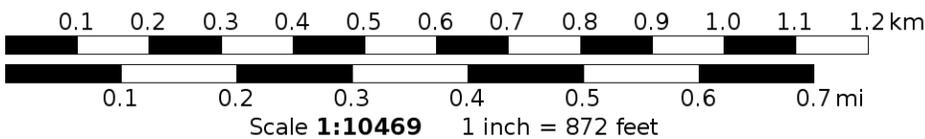
Google Earth

1995

Imagery Date: 6/9/2015 46°37'38.35" N 121°24'38.02" W elev 4306 ft eye alt 5497 ft



Mercator Projection
 WGS84
 USNG Zone 10TFS
 CalTopo.com



White Pass Ski Patroller standing in the debris where the victim was buried.





West slopes South - South of I-90 to Columbia River (Includes White Pass)

Issued: 6:02 PM PST Monday, December 26, 2016 by Kenny Kramer

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.

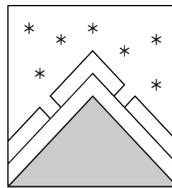
The Bottom Line: Very dangerous avalanche conditions are expected in much of the terrain Tuesday. Storm or persistent slabs will be sensitive Tuesday. The safest plan is to avoid avalanche terrain of consequence until storm, wind slab or persistent slabs stabilize.

Elevation	Tuesday		Outlook for Wednesday
Above Treeline	High	Very dangerous avalanche conditions. Travel in avalanche terrain not recommended.	High
Near Treeline	High	Very dangerous avalanche conditions. Travel in avalanche terrain not recommended.	High
Below Treeline	Considerable	Dangerous avalanche conditions. Careful snowpack evaluation, cautious route-finding and conservative decision-making essential.	Considerable

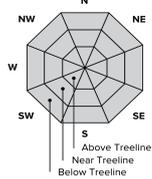
Avalanche Problems for Tuesday

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.



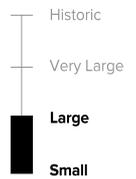
Avalanche Problem



Aspect/Elevation



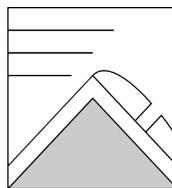
Likelihood



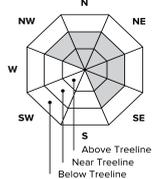
Size

Wind Slab

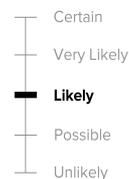
Wind slabs can take up to a week to stabilize. They are confined to lee and cross-loaded terrain features and can be avoided by sticking to sheltered or wind scoured areas.



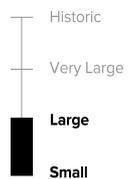
Avalanche Problem



Aspect/Elevation



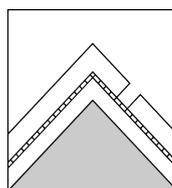
Likelihood



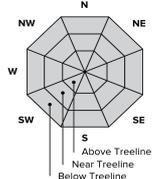
Size

Persistent Slab

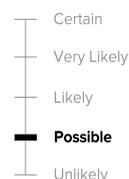
Persistent slabs can be triggered by light loads and weeks after the last storm. You can trigger them remotely and they often propagate across and beyond terrain features that would otherwise confine wind and storm slabs. Give yourself a wide safety buffer to handle the uncertainty.



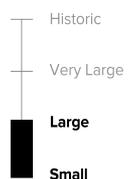
Avalanche Problem



Aspect/Elevation



Likelihood



Size

Snowpack Analysis

Weather and Snowpack

Strong storms a week ago Sunday and Monday deposited generally 1 to 2 inches of water equivalent along the west slopes through early Tuesday morning. A period of rain or freezing rain (Snoqualmie) during this storm cycle allowed crust layers to form in the Baker area from 4000-4500 feet, the Passes up to around 5000 feet (Stevens) to 6000 feet (Snoqualmie) and 6000-7000 feet in the Paradise area. In most areas the crust is strong enough to support a skier's weight. The crust is very thin or non-existent in the Crystal backcountry.

A front Thursday and upper trough on Friday with low snow levels deposited about 20 inches of snow at Mt. Baker over this period with about 2-8 inches accumulating elsewhere along the west slopes including the Passes.

Scattered snow showers, sunbreaks and generally light winds summed up the weather on Saturday with fair and cold weather seen on Christmas Day and early Monday, before a strong front moved into the region Monday afternoon.

Recent Observations

Observations received over the last several days from across the west slopes of the Cascades regarding the 12/17 persistent weak layer (PWL) showed no avalanches or direct signs of deeper instability. However, the 12/17 PWL still shows some propensity for propagation in snowpack tests.

The Alpentel pro-patrol on Friday and Saturday reported shallow wind slabs in exposed areas were poorly bonded to the crust formed last week. Elsewhere, the new snow was not cohesive and was sluffing on the crust. Sensitive and shallow wind slab were also reported in the Silver Basin area of Crystal Friday.

Pro-observer Ian Nicholson was at Mt. Snoqualmie Saturday morning. Ian identified shallow wind slab as his greatest potential concern on steeper wind loaded slopes where it had bonded poorly to a graupel layer overlying the uppermost crust. The 12/17 PWL was showing signs of propagation in snowpit tests, but was requiring more load and showed signs of rounding versus earlier in the week.

Dallas Glass was in the below tree-line band of the Snoqualmie Pass area on Christmas Day and observed 6" (15 cm) of weak snow poorly bonded to the crust, setting up a weak surface snow and slick bed surface combination heading into the upcoming storm cycle, now arriving late Monday. These weak surface snow conditions, and poorly bonded old snow to a smooth underlying crust also exist in the Paradise area, as reported over the past few days by NPS rangers.

Dallas Glass was back in the Crystal area backcountry Monday 12/26 and reports the 12/17 persistent layer is very much in play in that region, buried about 1 foot below the surface. Large column tests continued to show propensity to propagate in multiple tests.

Detailed Avalanche Forecast for Tuesday

Stormy conditions Monday night into Tuesday will cause an increasing avalanche danger through Tuesday.

Storm slabs will continue to build over a variety of weak surface snow conditions, or to exposed crusts with increased load. Natural or triggered storm slabs may break down to deeper persistent layers where present, making larger and more dangerous avalanches possible Tuesday, especially the Crystal Mountain and Stevens Pass areas.

Fresh wind slabs should continue to build Monday night and Tuesday near and above treeline. Wind slabs will likely be the most sensitive in areas where it poorly bonds to an underlying crust.

The persistent slab problem still warrants attention in the Cascades, especially in areas void of a stout recent crust layer, most notably outside the Paradise, Snoqualmie and Mt Baker area. Significant loading by Tuesday will make this layer more sensitive to trigger where present. Remember that persistent weak layers are generally involved in larger avalanches and cautious route-finding and conservative decision making will be essential for safe travel Tuesday. Err on the side of caution Tuesday by avoiding avalanche terrain of consequence.

Mountain Weather Synopsis for Tuesday & Wednesday

A strong front moved across the Olympic range overnight and the Cascades early Tuesday morning. Moist post frontal flow is being carried into the Pacific Northwest by a very strong westerly jet stream directed precisely at us! The jet is in excess of 150 kts and will provide the punch to maintain moderate to at times heavy orographic precipitation along the west slopes and over the volcanoes through the day and overnight. A short wave disturbance rapidly approaching the coast should enhance precipitation near midday through the afternoon. Showers slowly taper Tuesday night into early Wednesday as brief high pressure rebuilds over the region midday Wednesday. This should cause showers to diminish or end by late morning, Wednesday with a brief break Wednesday night. Not much change in freezing levels is expected with snow levels generally between 1-2000 feet most areas into Wednesday. The next frontal system to affect the region should arrive late night Wednesday and early Thursday to renew the precipitation once again.

24 Hour Quantitative Precipitation ending at 4 am

Location	Wed	Thu
Hurricane Ridge	.25 - .50	.25 - .50
Mt Baker Ski Area	1.00	.25 - .50
Washington Pass	.25 - .50	.25 - .50
Stevens Pass	1.00	.25 - .50
Snoqualmie Pass	1.00	.25 - .50
Mission Ridge	lt .25	lt .10
Crystal Mt	.50	lt .25
Paradise	1.00 - 1.50	.25
White Pass	.75 - 1.00	lt .25
Mt Hood Meadows	1.50	lt .25
Timberline	1.50 - 2.00	lt .25

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	Northwest Northeast Central South					Easterly Flow in Passes
	Olympics	Cascades	Cascades	Cascades	Cascades	
Tuesday	2000'	2000'	1000'	2000'	2000'	
Tuesday Night	1500'	1500'	500'	1500'	2000'	
Wednesday	2000'	2000'	1000'	2000'	2000'	
Wednesday Night	2500'	2000'	1500'	2000'	2500'	*

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.