

Corona Bowl Avalanche Incident, December 6th, 2015

Report prepared by NWAC and Stevens Pass Pro Patrol

Incident snapshot

Time and Date: 11:48 AM, December 6th, 2015

Location: Corona Bowl, Chief Mountain, Stevens Pass Ski Area (closed portion), Chelan County, Mt Baker-Snoqualmie Forest, Washington State

Number in Party: 2 skiers

Number caught and completely buried: 1 skier

Depth to Face: 2 ft (0.6m)

Number injured: None

Number killed: None

Avalanche type: Soft Slab

Trigger: Skier, Unintentional

Size: R2-D2

Start Zone Aspect: SE

Start Zone Angle: 39 deg

Start Zone Elevation: 5000 ft (1524 m)

Sliding surface: In old snow

Height of Crown Face: 1.5 ft (0.45 m) avg to 2 ft (0.6 m) max

Width of Fracture: 100 ft (30 m)

Vertical Fall: 300 ft (90 m)

Weak Layer Grain Type: Facets

Weak Layer Grain Size: 2 mm

Terrain Trap: No

Party crossed start zone before avalanche: No

Location of subject relative to Start Zone: Low

Avalanche occurred during: Descent

Signs of Instability Noted by Group: Collapse or whumphing

Avalanche safety gear carried by party: Both victims carried transceiver, shovel and probe

Avalanche Training and Experience: Both victims had novice avalanche training but were expert skiers

NWAC Forecast Zone: Stevens Pass

NWAC Avalanche Danger Rating in effect for start zone (near treeline): Considerable

Rescue: The other skier in the party was able to rescue his buried partner after 15-20 minutes. The buried skier briefly loss consciousness but regained consciousness after being dug out.

Comments from NWAC Forecasters (Dennis D'Amico)

It was remarkable that the fully buried skier was uninjured given the rough terrain in the avalanche path and the decreasing chance for survival given the total amount of time buried. This incident is a good example of when unusual snowpack conditions for the PNW (persistent weak layers), human factors, and the calendar all collided to create an unnerving opportunity for serious skier triggered avalanches.

The first NWAC forecast of the season had been issued 2 days prior to this incident. A disappointingly warm and wet November throughout the PNW had locally concluded with about 24 inches of water at the Stevens Pass Schmidt Haus weather station and a Dec 1st snowdepth of only 4 inches. The Stevens Pass Brooks snowdepth at 4800' was not much better at 17". Clear and cold weather at the end of November had weakened the shallow early season snowpack, specifically in the Stevens and Snoqualmie Pass areas. The Stevens and Snoqualmie Pass zones were broken out in the NWAC avalanche forecast to identify the local persistent slab problem. The 5 days leading up to the incident in early December saw winter return with about 20" of new snow in the Stevens Pass area. Still not enough snow to fully open ski areas across the Pacific Northwest, but enough to get skiers and riders excited after a very poor 2014-15 winter and the aforementioned slow start to the 2015-16 season.

The skiers involved in this incident decided to ski unmitigated avalanche terrain on the backside of the ski area. They were not the only ones to trigger avalanches on the recently buried weak layers: At least one other group remotely triggered a slab avalanche on the same PWL that same day in the closed backside of Stevens Pass (Gemini run). Luckily no one was caught.

NWAC Professional observer Jeff Ward investigated the incident site the next day with the Stevens Pass Pro Patrol. Jeff's photos from the day after, Dec. 7th are attached as well as his informative YouTube video. Stevens Pass Patrol submitted a narrative of the incident and completed the USFS Avalanche Accident Short Form.

Corona Bowl (Large Bench Chute) Avalanche Incident, 12-06-15

Interview conducted by Dan Veenhuizen and Angela Seidling from Stevens Pass Ski Patrol

Persons 1 and 2 stated that they had been riding the Tyemill chair all morning and had decided to do some “hot laps” in Corona Bowl. They said they ducked the closure rope at the top of Corona Bowl, where the run sign is located by the main chute. They said they dug a pit at this location. They did not perform any standardized tests but dug as far down as the prevalent crust. They noted some settling. They said they felt like the main Corona Bowl was too hazardous and they began working down the rib/bench to the skiers left. They had not consulted an avalanche forecast. Person 1 said that she noticed some “whumpfing” as they skied down the low angle bench.

They reached the end of the bench where it opens into the path called “Large Bench Chute.” Person 1 entered the path very low in the start zone. Person 2 says snow was immediately coming down on her and he lost sight of her quickly. He traversed onto the bed surface/into the debris and took out his shovel and probe. He got his beacon out and turned it to search. He skied downhill, probing likely spots and looking for a signal. He did not pick up a signal on his initial pass. At this point he called a friend and told him what had happened and that he needed help. The friend contacted ski patrol.

Person 2 reached the bottom of the path and started working his way back up, and then picked up a signal. Person 2 estimates 15-20 minutes had passed at this point. He pinpointed with his beacon and began probing. He got a probe strike and then started shoveling. He happened to expose Person 1’s head first. Person 2 says Person 1 showed signs of life right away but it took a few minutes for her to become coherent. Person 1 says she remembers coming to rest and then went into a “dream state.” Person 2 finished excavating Person 1 and helped her out of the hole. They estimate her head was under 2 feet of snow and her feet were under 6 feet of snow. She was buried supine, head downhill.

At this point ski patrol had been calling and texting Person 2, he finally responded to a text and said that everyone was out and they were making their way back to the top of Tyemill Chair. When they reached the top of Tyemill ski patrol gave Person 1 a courtesy ride down in a toboggan and brought the party to the aid room.

Neither member of the party had any formal avalanche education. They have been skiing at Stevens Pass their whole lives and are very familiar with Corona Bowl. They have been backcountry skiing less than 3 years.



Picture 1: Looking uphill at the crown face



Picture 2: Looking uphill at the crown face with skier for scale



Picture 3: Marking where Skier 1 was buried



Stevens Pass

Issued: 6:00 PM PST Saturday, December 5, 2015 by Garth Ferber

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: New slab layers are expected along the west slopes by Sunday. Extra caution is needed in the Stevens and Snoqualmie Pass areas due to an unusual and potentially dangerous persistent weak layer.

Issued: 6:00 PM PST Saturday, December 5, 2015 by Garth Ferber

Elevation

Sunday

Outlook for Monday



Above Treeline



Considerable

Dangerous avalanche conditions. Careful snowpack evaluation, cautious route-finding and conservative decision-making essential.



High



Near Treeline



Considerable

Dangerous avalanche conditions. Careful snowpack evaluation, cautious route-finding and conservative decision-making essential.



Considerable



Below Treeline



Moderate

Heightened avalanche conditions on specific terrain features. Evaluate snow and terrain carefully; identify problem features.



Moderate

Danger Scale

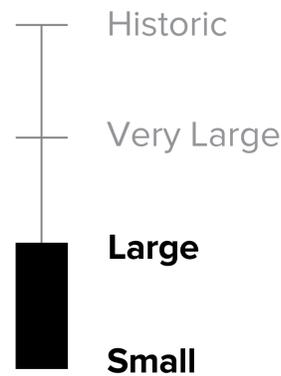
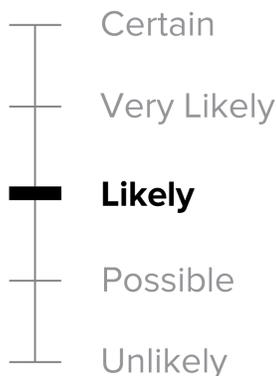
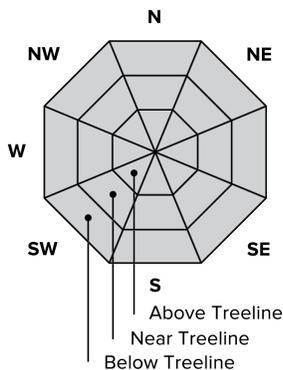
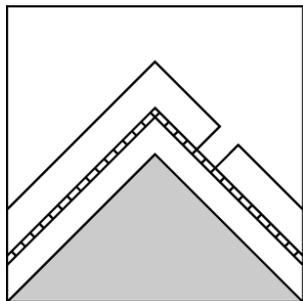


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Avalanche Problems for Sunday

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

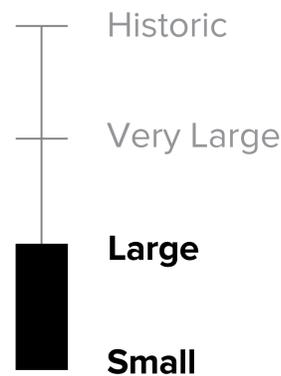
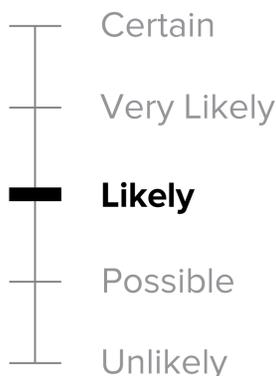
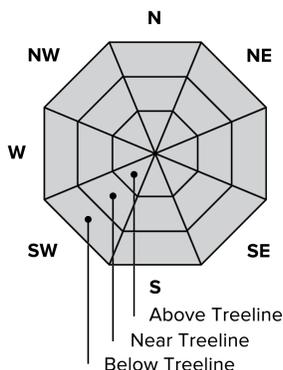
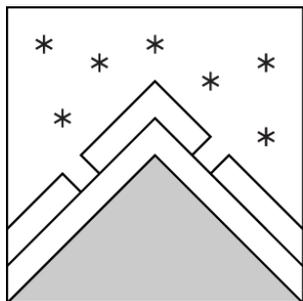
Aspect/Elevation

Likelihood

Size

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

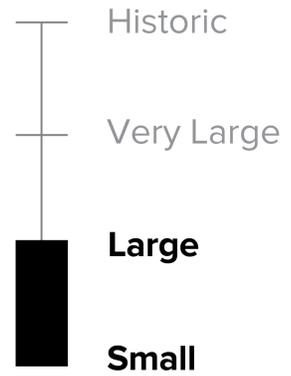
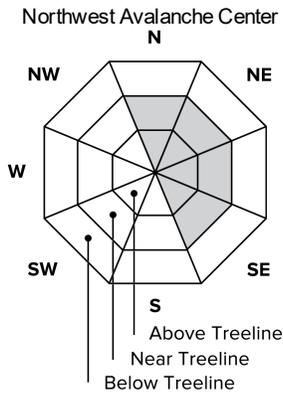
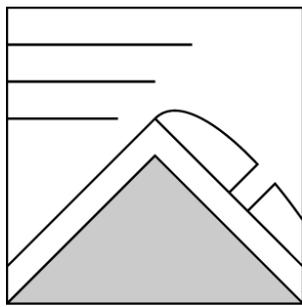
Aspect/Elevation

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

Snowpack Analysis:

Note: The snowpack discussion is for the entire west slopes of the Cascades but the avalanche danger forecast varies by zone.

We had a wild and wet month of November, with 12- 25 inches of *water* at west side NWAC stations only amounting to about a 1 meter or 3 foot snowpack in the north Cascades above 4000 feet and above 6000 feet elsewhere. Then strong high pressure led to strong temperature inversions and brought very cold air through the Cascade Passes over Thanksgiving weekend. The weather pattern has become more active for the first few days of December with a few inches of new snow over the west slopes paired with moderating temperatures in the Passes.

Snowpack and Avalanche Observations: Recent activity along the west slopes away from the Cascade Passes has been confined to new storm snow. New NWAC pro-observer Lee Lazzara noted a natural cycle of loose wet avalanches on Wednesday as temperatures warmed. This natural cycle likely extended to higher elevations in the north Cascades on Thursday as rain pushed above 5000'. The Mt. Baker and Crystal patrols reported minor avalanches involving new storm snow during control work Friday morning.

The west slopes do not have a uniform maritime snowpack! Due to the cold temperatures and clear skies near the end of November, buried surface hoar can be found in the Stevens Pass area. NWAC pro-observer Dallas Glass found this layer at 4-5000 feet at Skyline on E-NE aspects around 45 cm down. Faceting may also be found at a similar depth on solar aspects around a buried sun crust. Stevens pass pro patrol reported a 12-14 inch (30-35 cm) natural persistent slab avalanche in *closed* Corona Bowl of the ski area Friday on a N-NW aspect. Professionals also reported shooting cracks and whumping in the area as temperatures warmed and the slab above the PWL became cohesive.

Detailed Forecast for Sunday:

Strong alpine winds and moderate to heavy rain and snow will accompany a cold front across the Northwest Saturday afternoon to Sunday morning. This should bring 1-2 feet of new snow near and above treeline with the most expected in the Mt Baker area. Temperatures may not change much over the west slopes Sunday following the front.

New potentially large storm and wind slab should be likely on Sunday along the entire west slopes.

Recent observations have identified a persistent weak layers in the Stevens Pass area. We don't know anything about this layer yet in the Snoqualmie Pass area. We don't deal with PWL layers very often near and west of the crest so we need to use extra caution in the Stevens and Snoqualmie Pass areas until more information is obtained. Stay on low angle slopes and watch and listen for clues like cracking and whomping.

A short minor break between weather systems should be seen Sunday afternoon. This may slightly decrease the avalanche danger.

The next strong system should begin to move into the Olympics and Cascades Sunday night. But be prepared to curtail your plans later Sunday if conditions deteriorate sooner than expected.

Early season hazards exist for much of the below treeline band throughout the Northwest, so ski and ride with caution.

Weather Data from NWAC/DOT Stevens Pass Schimdt Haus Station

Date/Time (PST)	Temperature (deg F)	RH (%)	Precipitation (")	Snow Depth (")	24 hour snowfall (")
12/6/2015 12:00	33	94	0.08	23	3
12/6/2015 11:00	32	93	0.06	21	2
12/6/2015 10:00	31	93	0.02	23	2
12/6/2015 9:00	30	94	0.03	23	2
12/6/2015 8:00	30	94	0.04	22	1
12/6/2015 7:00	30	93	0.01	22	1
12/6/2015 6:00	30	92	0.01	21	0
12/6/2015 5:00	30	92	0.02	22	11
12/6/2015 4:00	30	93	0.02	21	10
12/6/2015 3:00	30	92	0	21	10
12/6/2015 2:00	30	92	0.01	21	10
12/6/2015 1:00	30	92	0.02	22	10
12/6/2015 0:00	30	92	0.02	21	10
12/5/2015 23:00	29	92	0.02	21	10
12/5/2015 22:00	29	93	0.07	20	9
12/5/2015 21:00	29	93	0.08	20	7
12/5/2015 20:00	29	93	0.07	19	8
12/5/2015 19:00	29	93	0.07	18	7
12/5/2015 18:00	29	93	0.08	17	6
12/5/2015 17:00	29	93	0.07	17	5
12/5/2015 16:00	29	94	0.04	16	4
12/5/2015 15:00	29	94	0.05	16	4
12/5/2015 14:00	29	94	0.1	15	3
12/5/2015 13:00	29	94	0.07	14	2

* 24 hr Snowbard was cleared at before 6 am



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



Occurrence Date (YYYYMMDD): 20151206 and Time (HHMM): 1148 Comments:

Reporting Party Name and Address: Mac Lyon

Avalanche Characteristics:

Type: SS Aspect: SE
 Trigger: AS Slope Angle: 39
 Size: R 2 \ D 2 Elevation: 5000 m / ft
 Sliding surface (check one):
 In new New/old In old Ground

Location:

State: WA County: Chelan Forest: Mt Baker-Snoqualmie
 Peak, Mtn Pass, or Drainage: Chief Mountain
 Site Name: Corona Bowl
 Lat/Lon or UTM:

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			2
Number of people injured: 0		Number of people killed: 0		

Dimensions <input type="checkbox"/> m / <input checked="" type="checkbox"/> ft			
	Average	Maximum	
Height of Crown Face	1.5	2	
Width of Fracture	100		
Vertical Fall		300	
Snow	Hardness	Grain Type	Grain Size (mm)
Slab			
Weak Layer		FC	2
Bed Surface			
Thickness of weak layer: <input checked="" type="checkbox"/> mm / <input type="checkbox"/> cm / <input type="checkbox"/> in			

Burial involved a terrain trap? no yes → type:

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

Location of group in relation to start zone during avalanche: high middle low below all unknown

Avalanche occurred during ascent descent

Subject	Name	Age	Gender	Address	Phone	Activity
1	Sam Merrick	25	F	512 Wellington Ave, Seattle, WA 98122	206-755-6064	SKI
2	Dylan Bibbins	24	M	720 213TH ST Se Bothell, WA 98021	425-275-1940	SKI
3						
4						
5						

Equipment Carried

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

Experience at Activity

1	2	3	4	5	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unknown
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Novice
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Intermediate
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Advanced
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Expert

Avalanche Training

1	2	3	4	5	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unknown
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Some
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Advanced
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Expert

Signs of Instability Noted by Group

Unknown
 None
 Recent avalanches
 Shooting cracks
 Collapse or whumphing
 Low test scores

Injuries Sustained

1	2	3	4	5	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<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"/>	Doctor's care
<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"/>	Fatal

Extent of Injuries or Cause of Death

1	2	3	4	5	
<input type="checkbox"/>	Asphyxiation				
<input type="checkbox"/>	Head Trauma				
<input type="checkbox"/>	Spinal Injury				
<input type="checkbox"/>	Chest Trauma				
<input type="checkbox"/>	Skeletal Fractures				
<input type="checkbox"/>	Other:				

Damage Number of Vehicles Caught:0 Number Structures Destroyed: 0 Estimated Loss: \$1000

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

Rescue Summary Include: description of initial search, report of accident, organized rescue, etc.
See Attached Narrative. Stevens Pass Pro Patrol staged a rescue response at the top of Tye Mill, and stood down when we received information that the party had self rescued.

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

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.