

## PRELIMINARY

### Scout Patrol Peak Avalanche Accident

January 1, 2012

**Time and Date:** approximately 1130 AM, 1-1-2012

**Submitted by:** Bryan Kraai, Craig Willis (and Mark Moore—NWAC)

**Place:** North flank of Scout Patrol Peak, about 6.5 miles WSW of Hyak near Snoqualmie Pass, west-central WA Cascades, King County

**Slope specifics:** 3,850 ft elevation, NNW aspect, approximately 30 deg slope angle below road cut

**State:** WA

**Country:** USA

**Fatalities:** 0

**Summary:** Two snowshoers were climbing up a road that cut across a steep NW facing slope when they encountered strong ESE winds. These winds had apparently loaded the short but steep slope with wind transported snow, deposited over a recent crust. The victims triggered a small (12-18 inch) wind slab from the road cut which expanded as it moved downhill, catching and carrying both snowshoers downslope about 250-300 feet. While being swept downhill by the slide, both victims encountered several stumps and rock outcrops that protruded through the overall relatively shallow snowpack. Fortunately, except for minor bruises sustained by contact with the terrain features, both victims ended up on the surface and were able to self rescue.

#### Accident Narrative by the victims:

**Narrative by Bryan Kraai**—*In the 7 years or so since I started hiking in Washington I've only ever had 1 serious brush with danger on the trails. I've managed to stay safe and the friends I've hiked with have had much success over the years too.*

*I've read trip reports of folks getting involved in avalanches and I've seen a few small ones tumble down mountainsides before too, but until today, I'd never been so close to one, or been involved in one.*

*With the avy danger below 5,000' at a moderate level we thought that a trip up to Scout Patrol Peak would be a good choice.*

*At about 3600' we ascended the slope with our sights set on a logging road ahead. The snow felt really stable as we headed up and we made decent time. Once at the road we made some minor gear adjustments as we knew when we headed east on the road and around the corner that we'd hit some very strong winds.*

*As I started to head to the east Craig said "Lead the way, it's your trip". No sooner had I said "This isn't my trip, this is our trip". I felt the ground beneath my feet move. I looked down just in time to see a crack open up and I yelled "SLIDE!!!" Not a second later I was sliding down the mountain amidst a lot of snow. A split second after I started down Craig was right there with me as he had only been 5 feet behind me on the road. Craig was quickly right next to me and as I tried to stay on the snow I hoped that my poles would not puncture him (the straps were still on my wrists). I said aloud: "We have to stay on*

*top of the snow!!" Craig of course already knew this. Soon he had passed me and was getting further away from me as we went down. Somehow in all of this my feet were leading the way and I credit my snowshoes with helping to keep me from getting buried as they helped keep me on the snow. Finally after about 300' the slope got flatter and we finally came to a stop. I yelled to Craig and he told me he was ok. On our way down we both hit some tree stumps and a rock or two. I didn't hit them as hard as Craig had. His lower leg took a hard hit and that gave him some pain the rest of the day.*

*We surveyed the terrain and I was surprised at how big the debris field had become. What started as something relatively small above (10-30' wide) had blossomed into a 100' wide swath of snow filled with slab chunks upwards of 6'x6' at the bottom. A little bit of debris had been pushed over and down an even steeper section of slope not 50' from where we had come to a stop.*

*We eventually made our way back up and I took some shots where the avalanche had started. I was amazed at what we had been through, especially when I looked down below and saw the size of the debris field.*

*I took some video and photos and they are below.*

*Also included are a few things that Craig put together this evening.*

*Never would I have figured the danger we were in just by standing near the edge of an old loggin road. Maybe I was just naïve 😞 I don't know.*

*The winds were very strong and from the east maybe between 50-60mph due to being compressed by the eastern side of the slope. As the winds came around the curve in the road they deposited a lot of snow on the road on the western side of the curve.*

*I am sharing this story in the hopes that it will help others be more aware of the dangers that we missed. We both take avalanche awareness very seriously and are proud that we've had so many years of safe winter traveling between us.*

*Let this be a reminder to us all of the hidden dangers that we face in the mountains on a daily basis.*



Profile of where avalanche started



The light blue line angling to the northwest was the path of the avalanche



Before the avalanche came down (Photo courtesy and © Bryan Kraai)



Figure 1. Debris field below avalanche (fracture line visible in foreground) (Photo courtesy and © Bryan Kraai)



Figure 2. Avalanche debris and some harder wind slab remnants. (Photo courtesy and © Bryan Kraai)



Figure 3. View up avalanche path from near runout (Photo courtesy and © Bryan Kraai)

Youtube video of the accident site:

[http://www.youtube.com/watch?feature=player\\_embedded&v=vd1dSGvPqow](http://www.youtube.com/watch?feature=player_embedded&v=vd1dSGvPqow)

**Statement by friend Craig**— *The first thing that Bryan wanted to do when we got back to civilization was notify NWAC. That is why he was so quick to make that video, and why I was so quick to create some pictorials and help determine our location at the time.*

*We had opted to walk near the road-edge, thinking that was best idea because it was not covered with much snow and was not at a typical avalanche-prone angle. I guess the combination of sustained 50-60 MPH winds and our steps helped crush down our snow path, and the weight of the wind-loaded snow against that spot reactively began to totally slab off. It was a freak event..*

*We both stayed on top of the snow during the slide. Bryan said to keep on top of the snow, and I said for us to swim to remain that way. We were very fortunate to have been near the upper part of the slide when it started, so we did not get buried, and we were also fortunate that neither of us fell head-first. I lost a blue-colored Nalgene bottle during the slide, but we were lucky that none of our gear items hit each other. Hitting the stump/rock was painful enough. Things could have been a lot worse for us, and if we had any other people with us the outcome might have been different (i.e. worse).*

*It happened very quickly, but one thing seemed to be slow in my memory... When I heard Bryan say*



*"Slide!" and then a brief profanity, I looked down at the ground he was standing on. A nearly full circle of snow broke off around the place he was standing, looking almost like a circular surfboard. As soon as that slab finished breaking there, it quickly did the same with me.*

*I take pride in having safely avoided avalanches at this point, and have taken a couple of courses for them. I had regularly probed/examined the slopes we had just ascended, and there were no signs of danger on them. I did not probe the roadway we were walking on, because the snow depth was minimal where we walked and the snow next to it was a low angle. This was definitely not something taught in avalanche awareness courses I have attended, but in that regard this firsthand experience should ultimately make Bryan and I become more aware in the future. I do not think either of us will soon forget what happened, and later figuring out how/why it happened.*

#### **BY THE NUMBERS:**

*The road was at ~3850' elevation.*

*We slid down approximately 250'-300".*

*The length of roadway covered with wind-loaded snow was approximately 10' distance, with Bryan and I separated by approximately 5' between us.*

*However, what started as 10' across Bryan estimated became approximately 30' across due to a ripple-effect the slide/snow-breaks had on the snow adjacent/above the road. Kind of like a funnel effect.*

*Bryan started 5' ahead of me, but his slide path apparently smoothed out the slope just prior to my sliding. This caused my snowslide to get a little faster than Bryan's. I was behind Bryan when the event started, then above him (because he started sliding first), then right next to him on his other side, and then approximately 15' away from him horizontally and 10' lower vertically. We basically criss-crossed. Totally bizarre feeling.*

*Fortunately neither of us panicked; we were both focused on the problem-at-hand and it helped get us through the event mostly unscathed. We were also lucky. We wanted to share this experience with people so they knew that even when danger is not apparent and if you are on seemingly safe terrain (such as a road with little snow), stuff can still happen. Mountaineering has its share of risks. The key is to keep them calculated risks rather than unnecessary risks. We did not do anything unnecessarily stupid, but I guess we miscalculated. Sometimes it takes an experience like this to re-jolt personal awareness for situations/locations otherwise usually taken for granted.*

#### **The Location**

This Google Earth Map shows the approximate avalanche accident starting point, with I-90 in the background and Denny Creek in the upper right of map.



Scout Patrol Peak

Avalanche Accident Starting Zone

Benny Creek

© 2011 Europa Technologies  
Image U.S. Geological Survey  
© 2011 Google

Google earth

Imagery Date: 4/30/2009

47°20'54.31" N 121°29'18.95" W elev: 4538 ft

Eye Alt: 21643 ft

## Ancillary Avalanche Information: NWAC Forecasts

The forecasts shown below were those issued over the weekend, Saturday and Sunday, December 31 and January 1. The snowpack analysis for the forecast issued on Saturday indicated a significant concern for wind effects on the snowpack...the same concern the victims expressed as they rounded the road cut corner. The following statement is extracted from the analysis:

*In general, the dominant recent winds should have loaded anything from northerly facing to southeast facing terrain. However, cross loading and local wind channeling may have loaded other aspects as well. It will be most prudent to perform many quick pits and stability checks when changing aspects and elevations.*

The complete forecast for this zone is given below:

### Forecast Issued Saturday, December 31, 2011

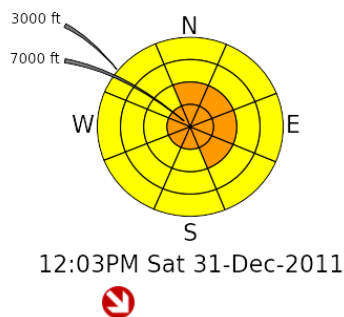
#### 1203 PM PST Sat Dec 31 2011

This forecast applies to back country avalanche terrain below 7000 feet and does not apply to developed ski areas or highways.

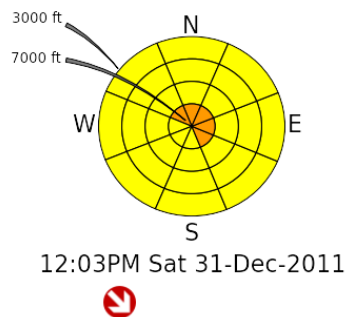
### Zone Avalanche Forecasts

**Snoqualmie Pass, WA Cascades near and west of crest - between Stevens and Snoqualmie Pass, WA Cascades near and west of crest - between Snoqualmie and White Pass**

Danger Rose for Saturday



Danger Rose for Sunday



Click [here](#) for complete definitions of the avalanche danger scale.

### Forecast

**Saturday:** Considerable avalanche danger above 4000 feet and moderate below, slowly decreasing. Danger further gradually decreasing Saturday night.

**Sunday:** Considerable avalanche danger above 5000 feet on lee slopes and moderate elsewhere. Danger further gradually decreasing Sunday night.

### *Snowpack Analysis*

Beginning Tuesday a series of warm and wet frontal passages deposited heavy rains or periods of heavy wet snow across the region. Cooling and a gradual change from rain to wet snow then further cooling with more significant snowfall down to low elevations has characterized the last few days. In general along the west slope areas about 15 to 30 inches has been deposited with cooling temperatures but some periods of very strong southwest to northwest crest level winds.

The prior concerns of the old December crust/facet layers should have mostly been dealt with given the amount of rain most areas received to high elevations earlier in the week and the subsequent newly formed crust layer. In addition rain runnels had become well established in many areas and have refrozen by now also helping to consolidate any older weak layers.

The main avalanche concern presently has shifted to newly formed wind slab layers on lee slopes, mainly at higher elevations affected by recent strong winds. The overall gradual cooling temperature trend the past two days may be helping to create a right side up snowpack structure, however local wind affects should be monitored closely. In general, the dominant recent winds should have loaded anything from northerly facing to southeast facing terrain. However, cross loading and local wind channeling may have loaded other aspects as well. It will be most prudent to perform many quick pits and stability checks when changing aspects and elevations. Always avoid steeper slopes of questionable stability. This may be the best time to avoid large open terrain near ridges and opt for shallower angled terrain in more wind protected areas such as glades or well treed slopes. Besides, that is type of terrain holding the best quality snow as well as lowest probability of triggering a slide!

With up to 3 feet or more of recent snowfall and strong crest level winds, there may be some rather large wind slab features on lee slopes, likely 4 to 6 feet or possibly more. With an overall good cooling trend during the past few days and likely good bonding to the newly forming crust, ski triggers may be difficult in these deep slab layers, but the consequences very great indeed. Another reason to stick to more conservative terrain until these new layers settle further.

### *Detailed Forecasts*

#### Saturday

Diminishing winds and cool temperatures with mainly high clouds are expected Saturday. This should allow for recent wind slab layers to continue slowly settling and stabilizing, as there has already been 4 to 8 inches of snowpack settlement as of Saturday morning. However, some rather large and potentially unstable wind slab layers should persist on lee slopes, mainly higher terrain, where conservative decision-making is essential.

A weak front should pass the area late Saturday night and early Sunday to deposit some light amounts of new snow with shallow new wind layers being deposited on some higher elevation lee slopes, mainly north to northeast facing.

#### Sunday

A weak front should lift northward early Sunday with light showers ending and leaving mainly high clouds with warming temperatures. High pressure should cause rapid warming later Sunday. The warming should allow for more significant snowpack settlement and stabilization of most recent storm layers.



While an overall decreasing danger trend is expected Sunday, continued careful snowpack evaluations and cautious routefinding should be practiced, especially in steeper terrain at higher elevations.

---

### Forecast Issued Sunday, January 1, 2012

The NWAC forecast issued around 10 AM on Sunday indicated a moderate danger overall below about 5000 feet, but also cautioned about wind affected terrain, stating that *“increased caution is advised on wind affected terrain...especially with warming conditions likely in higher elevation terrain on Sunday.”* From the incident above, the winds did indeed create some shallow but somewhat sensitive slab conditions over a recent crust on lee slopes. The complete text for this zone is shown below:

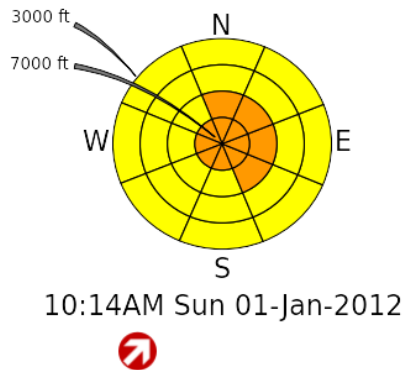
#### 1014 AM PST Sun Jan 01 2012

This forecast applies to back country avalanche terrain below 7000 feet and does not apply to developed ski areas or highways.

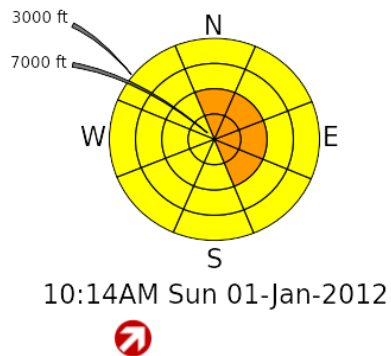
### Zone Avalanche Forecasts

#### WA Cascades near and west of crest - between Snoqualmie and White Pass

##### Danger Rose for Sunday



##### Danger Rose for Monday



Click [here](#) for complete definitions of the avalanche danger scale.

### Forecast

**Sunday and Sunday night:** Considerable avalanche danger above 6000 feet and on lee slopes above 5000 feet and moderate elsewhere slightly increasing Sunday. Danger gradually decreasing overnight.

**Monday and Monday night:** Considerable avalanche danger above 6000 feet and moderate below early Monday. Danger gradually increasing mid-day through Monday night, becoming considerable on lee slopes above 5000 feet and moderate elsewhere.

### *Snowpack Analysis*

Relatively heavy snowfall at lowering freezing levels and strong winds last Thursday night and Friday experienced some slow stabilization Saturday through early Sunday as some large wind slabs on lee slopes have started to settle. While a relatively good bond of new snow to the old, wet and slowly refreezing snow surface (resulting from the 6-10 inches of rain earlier in the week) developed below 5000 feet, a weaker bond developed above about 5000 feet where temperatures had already lowered below freezing prior to the onset of heavy snowfall. As a result, considerable danger and some stubborn wind slabs ranging from a few feet up to 4 feet deep remain on steeper, higher elevation lee slopes, mainly north through east exposures above about 5000 feet. These slabs may be difficult for single skiers, snowboarders or other recreationists to release, but could be released by snowmobilers and the consequences for such a release could be quite severe. At lower elevations more settlement and a better bond of new snow are helping to produce a lower danger overall...however heightened avalanche conditions may still exist on steeper wind loaded terrain. As a result, increased caution is advised on wind affected terrain...especially with warming conditions likely in higher elevation terrain on Sunday.

### *Detailed Forecasts*

#### Sunday and Sunday night

Occasional light snow should decrease Sunday morning as weak warm frontal remnants lift mostly north of the area. However, moderate ridgetop winds should combine with significant warming and some sun breaks later Sunday morning through Sunday afternoon to maintain or slightly increase existing avalanche danger. As a result, the potential for snow rollers or small wet loose avalanches should increase during the mid-day and afternoon hours, and these small releases could trigger some isolated larger slabs. Also a warming, weakening and softening snow surface may put more stress on buried weak layers as well as allow for more penetration into the slab and any buried weak layers by skiers, snowboarders or other recreationalists. These developments should increase the potential for at least some avalanche activity involving the most recent snowfall from late last week. Meanwhile, further slow snowpack settlement should help to further limit activity involving any older and weaker layers that had faceted in early to mid December. Such potential for deeper slide releases involving older facets should be primarily confined to higher elevation terrain on the volcanoes...mostly above 7 to 8000 ft...where the effects of recent warming have been more limited.

Variable mid or high clouds Sunday night should allow for further settlement of recent snow and weak surface crust formation to slightly decrease the danger. However, in some wind sheltered terrain some surface hoar development is possible and this should be monitored on Monday prior to potential burial by anticipated snowfall.

#### Monday and Monday night

Relatively high freezing levels, increasing clouds and moderate winds Monday morning should be followed by increasing light rain or snow later Monday morning and mid-day and increasing light to moderate rain or snow Monday afternoon along with slow cooling and moderate ridgetop winds. This should allow for gradually and slightly increasing avalanche danger as generally minor new snow accumulations are deposited over mostly older wind slabs or weak surface crusts. For the most part a good bond of new snow is expected to the old snow surface below about 5000 feet in the north and 6000 feet in the south, with a weaker bond of mostly shallow slabs expected above about 6000 feet. However, any surface hoar that develops overnight and survives some light rain to about 5000 feet during the morning may be sporadically buried by new snowfall and help form some isolated

but relatively sensitive, shallow new slabs..mainly on north through east facing slopes at higher elevations. Decreasing light snow or snow showers Monday night should combine with decreasing winds and further slight cooling to allow for slowly decreasing danger as small new wind slabs settle, and the older wet and weak snowpack beneath the most recent heavy snowfall continues to slowly settle and strengthen.

#### Danger Scale Legend

<b>5</b>	= Extreme avalanche danger
<b>4</b>	= High avalanche danger
<b>3</b>	= Considerable avalanche danger
<b>2</b>	= Moderate avalanche danger
<b>1</b>	= Low avalanche danger

Warning = Extreme or high avalanche danger occurring or expected to occur within 12 hours: at or below 4000 feet in the Olympics and/or WA Cascades; at or below 5000 feet in the Mt. Hood Area.

Watch = Warning conditions expected within 12-48 hours.

Special Conditions = Unusual conditions meriting special attention that do not meet Watch or Warning criteria.

Click [here](#) for complete definitions of the avalanche danger scale.

Moore/Northwest Weather and Avalanche Center Seattle Washington