

Grouse Ridge Avalanche Accident

Northern WA Cascades, March 4, 2011

Date: 3/4/2011, ~110 PM PST

Location: Northern WA Cascades near Grouse Ridge;

State: WA, USA—Skagit County, Mt Baker-Snoqualmie National Forest

Fatalities: 0; 1 seriously injured snowboarder

Summary: 1 snowboarder triggered 4-5 ft slab (1.2-1.5m) in steep N facing chute. Victim subsequently caught and swept into trees, seriously injured and totally buried about 2 feet under the snow surface. Victim located by beacon with airway uncovered within about 5-6 minutes by party members.

Slope/avalanche specifics: N aspect, 5400 feet / 1645 meters, 43 degree slope

Slab specifics: SS-AR-R5D3 -O (released on old facet/crust layer); Slab dimensions approx. 4-5 x 300 feet (1.2-1.5 m x 65 meters) with an average vertical fall of 500 feet (152 m)

Thanks to Jeff Hambelton (Mt Baker Pro Patrol) and Patrick Kennedy (witness) for providing the following accident and witness summaries.

Accident Summary:

Grouse Ridge Avalanche

Accident Date: March 4th, 2011

Rescue response report

Authored by: Jeff Hambelton, Member Mt. Baker Pro Patrol

Date of Report: March 16th, 2011

Part 1:

By sheer coincidence, I was at Chair 9 (Glacier, WA) when Tarek Husevold came out of the woods (2-2:30 pm or so) to report an avalanche accident on Grouse Ridge, and request aid for the 22 year old victim who had suffered multiple severe injuries including a fractured femur. Armed with the coordinates stored in his GPS unit, Tarek communicated the location of the survivors, and the injuries to 911 dispatch through the local Border Patrol unit. Before the conversation was over, we had confirmation that the Navy rescue helicopter from Whidbey was in the air.

At this point, I talked with Tarek a bit more about the accident, pressing for details, etc. He excitedly told me about the location, the accident itself, and about the rescue and recovery. By Tarek's account, the beacon search went quickly and predictably, and they were able to locate

and uncover the victim in very short order, even though he was initially reported to be buried over 5' deep. Tarek didn't stick around long, and headed back into the site of the accident.

I went home (Maple Falls) soon afterward to get my sled, and head up to the site myself, just to support the crew (I often ride with some of these guys), and take a few notes if I could. I heard the helicopter fly overhead, and assumed the patient/victim was on his way to the hospital.

By 4:20pm, I was at the Glacier Creek Trailhead, checked in with the Whatcom County Sherriff's Office Deputy, and met up with another local snowmobiler, Alex, who had heard about the accident. Together we drove the 13 miles into the scene of the accident. Just after crossing Clearwater Creek, (below Grouse Ridge) we ran into Pat Kennedy. He was on his way out to initiate a SAR response after an unsuccessful helicopter recovery, due to rapidly deteriorating weather. He informed me of the patient's condition, and after a short conference, continued down to relay the messages to the authorities.

We (Alex and I) continued to the location of the accident and the injured party, arriving around 4:50 pm. My patient assessment indicated the injuries included a fractured femur, suspected pelvis fracture, and dislocated or fractured elbow. Vital signs were stable, if slightly elevated, and patient had been in this state for over 2 hours. Upon that determination, it was suggested by myself, and agreed upon by the group that we wait for SAR response with the desirable medical equipment for evacuation.

Approaching dusk, two snowmobilers from the SAR detachment arrived, but without any extra rescue gear. They had a radio, but we were unsuccessful in reaching headquarters from our location. They left to report back, taking with them a second request for a traction splint, backboard, and toboggan.

After another 30 minutes or so, I dispatched two additional snowmobilers from our party to assist SAR in finding us as daylight waned. Still we waited for equipment.

Our patient was beginning to show signs of mild hypothermia, and the weather was deteriorating rapidly. It was turning into a mild blizzard, with gusting winds and driving snow. Now dark, we made the determination to initiate emergency transportation of the patient. With everybody's help, belts, and shoelaces, we improvised a traction splint with a camera tripod. With his leg at least stabilized and his arm in a sling, we loaded the patient onto a snowmobile turned into a rescue sled.

The sled was equipped with matching snowboard racks, and the space on the tunnel between them was filled with gear and backpacks, creating a very nearly flat and padded surface extending from the gas tank to a point nearly 1' past the tunnel on a 163cm track sled. Atop this "platform" we loaded the patient, head to the front, and secured him with tie-downs to the running boards. Finally, the driver stood on the rails, straddling the patient and began the drive down the mountain.

As we gained the first pitch of our climb out, we ran into the first wave of responders from the SAR detachment. Included in the party was one of the duty doctors at Mt. Baker, who quickly checked the patient's status, packaging, and encouraged us to continue with our evacuation. As we reached the roads below, we began to run into more members of the SAR detachment.

We all continued slowly out to the trailhead, where we were met by the paramedics from Whatcom Fire and an ambulance. The patient was successfully transferred to the ambulance by 9 pm, and then St. Josephs Hospital in Bellingham, and finally to Harborview in Seattle. He had multiple serious injuries to his femur, pelvis, and elbow. We are told he spent 7 days in the hospital, and was discharged and headed back to Colorado (??) to spend time convalescing with family.

Part 2:

The story of the accident itself is best told by the narrative authored by Pat Kennedy, one of the witnesses. Initially, Pat and Tarek were not part of this group, but through shared associations, shared terrain, and shared events, became a part of it.

The group that Pat and Tarek were not *initially* part of is a crew of snowboarders working on a film. This was their couple of weeks in the Baker area, before moving on. A couple of local snowboarders are working on the film project with them, and were showing them around a bit.

Following the accident, I was contacted by the producer of the film about teaching an avalanche course for him and his crew. He was out there that day, with the crew. As it goes, I run the Mountain Education Center at Mt. Baker, so this was a win-win situation. We scheduled the class for the middle of the next week.

Everyone who was involved in the accident, except the slide victim, was able to attend the course that day. We covered all the avalanche basics, and then spent a little time talking about the accident as a “case study” of sorts. This was a non-critical group exercise in breaking down the different facets of the day and the accident.

When we used the ALPTRUTH acronym, we found that all 7 culprits were evident that day. Likewise, when we looked at [Ian McCammon’s list of 6 common heuristics](#) evident in decision making situations (i.e., familiarity, consistency, acceptance, expert halo, social facilitation and scarcity), we observed that the group was victim to most of these as well. The ALPTRUTH analysis for that day on the slope in question is shown below:

A – avalanches in the past 48 hours; yes, day before in similar zone

L – loading in the past 48 hours; yes, 8-10” new overnight

P – path; yes, probably the most obvious path on the slope

T – terrain trap; yes, trees in the path

R – rating, considerable or greater; yes, considerable, trending up

U – unstable snow; yes, shooting cracks

Th – thaw instability; yes, temperature was rising at mid-day

The class concluded with avalanche beacon and companion rescue training, including a mock scenario. Overall, I would judge the course to be a success, but accidents aren't planned either. The group acknowledged their culpability and weaknesses that led up the accident. I think they are sufficiently scared from the experience to have a whole new respect for their decisions. They know they're lucky.

Part 3

The rescue was quite involved, multiple agencies and many people contributed. The SAR response, while initially delayed, came in force. Not less than 10, possibly more than 20 sleds came up to meet us as we descended. It was unfortunate that the helicopter pilots lost the ceiling just minutes before getting to the scene. It was fortunate that I decided to go in to "check things out," as it greatly impacted the speed of the rescue. I have WFR, OEC, and Ski Patrol rescue training, and am also familiar with the area's terrain.

The group members who had companion rescue training saved the patient's life in the moments following the avalanche. The group was strong, and focused on the patient's well-being over the next few hours. The patient was an asset too; I have never seen a tougher individual with so many painful injuries.

In conclusion, after reading the account provide by Pat Kennedy, and talking to all of the individuals involved, I feel the predominant response of the group is characterized by amazement. Each of these people has varying, but extensive experience in the mountains. Several of them have been in this specific terrain many times. However, for all of their collective experience, pressures, seen and unseen, had them pressing into terrain initially deemed "avoidable."

Witness Statement:

The following statement was prepared by a witness to this avalanche incident.

The Skinny Avalanche – Grouse Ridge; Mt Baker-Snoqualmie National Forest, WA.

Patrick Kennedy's perspective

Friday March, 4th 2011

5,400ft. Northern Aspect

10:30am – Group of two arrives at FR 39 to snowboard using snowmobiles as access and possibly film with another group of 7 if weather permits. Group of 7 had arrived 1 hour earlier. Snow conditions at FR 39 were low; parking at 1200 ft was required. Weather was partly cloudy, mild temperatures with evidence of the next weather system arriving. Group of two travels 13 miles into Grouse Ridge looking for party of 7. New snow and very few snowmobile tracks

enable tracking party of 7 over the distance. Both groups had members in the area the day prior sticking to low angle terrain due to many unstable indicators including a natural slab avalanche on Grouse Ridge.

11:30am – Group of two arrives at Grouse Ridge area: elevation 5,000ft NE aspect. 8-12 inches of new snow had fallen covering the natural release from the prior day. Party of 7 had found a location to build a jump and was currently filming. We all filmed the feature for another half hour until the next weather system caused the light to go flat. It began snowing, the wind picked up and temperatures were dropping. We put the cameras away and decided to switch gears to riding laps. Group of two splits away from party of 7 to ride an adjacent area frequently snowboarded. Group of two drop one snowmobile at the pick up zone and proceed on one snowmobile to drop zone at 5,400ft. Obvious wind loading was observed on due North Aspect at drop zone. A brief discussion of noticed hazards took place. We decided to ride a lower angle (35°), less loaded, consistently treed run spacing out and riding from one safe spot to another keeping in visual contact. Group of 2 finishes an amazing run and sets up for another lap. Second lap had similar characteristics to first lap and provided amazing turns. At this time group of 7 arrives and proceeds to lap similar lines with same results.

1:10pm – Many of the lower angle, naturally anchored lines had been ridden. The only untouched face remaining was a loaded 43° angle chute. The chute also had the best potential for wind loading due to recent weather patterns and had been avoided by all. The absence of trees around the chute made it the only run that could be filmed. Party of two (at this point could be considered party of 9) had recently finished a break from runs and was setting up for another lap down their first run made. At the drop zone one person was noticed strapped in looking at the 43° slope. Party of two voiced concern about the run.

Personal note: The concern noted was inadequate. I personally would not have placed myself on the run and should have expressed “I would not ride this and I'm very concerned with you riding it. Please do not ride this!” I'd been going into the back country with the rider for 5 years and we had developed a dysfunctional communication system. Simply put, “Too much respect for another could kill them when the respect hinders proper back country communication among a party.”

Party of two get in position to spot strapped in rider. Filmer and rider check in to communicate details of run. Rider drops into run and proceeds to lay down a risky, yet consequence free run. Party of two remain committed to repeating their first run. Unstrapping snowboards from the run, party of two notice another rider dropping into the 43° angle chute above. On the fourth turn the wind loaded chute cracked under the rider and propagated approximately 100 meters across the partially treed face with a crown varying from 4 to 5 feet. The rider made attempt to self arrest but was taken in the quick moving slab on a steep 43° angle slope. Run. We all ran.

Party of two were in the deposition zone scrambling for higher ground. Tons of snow, powder cloud and some tree debris filled the valley floor yet buried none but the missing rider. Before the cloud had fully settled 4 were on the way to the drop zone on snowmobiles. We knew the shit had hit the fan. Another group went for higher ground to make a successful 911 call at 1:20pm. Some started hiking up from the bottom of the slide path searching the deposition zone upwards. 3 arrive at drop zone, strap in and speak quickly about gear and plan of search. The 3 spread out and quickly ride the slide path towards the suspected location of the rider. The fourth searcher on snowmobile had taken a traverse path into the same suspected rider location. The four met again converging on the riders beacon signal in a section of trees bordering the right flank of the avalanche path 350ft from the valley floor. Rider was completely buried only two feet under and had the air way uncovered in 5-6 minutes. Rider was pinned against a tree, turning blue, initially unconscious with rough shallow breathing. Left side Elbow, Pelvis and Femur were suspected broken given the body position around the tree. Within a few minutes the rider started regaining consciousness and attempted movement. Space blankets were used, Lat/Long and injury summary was given to 911 at 2:00pm, then first aid was administered. Broken Femur was the main concern and was felt pushing against the upper vastus lateralis muscle, but not breaking through. Pelvis seemed broken and elbow was dislocated. Airlift out was the goal and the pickup was 350ft down to the valley floor. The riders broken snowboard was used as a make shift sled, was roped to it and slowly lowered down slope to valley floor. Communication with search and rescue pilot and party took place at 2:30pm. The search and rescue bird hovered above us shortly after reaching the valley floor with the avalanche victim; the timing seemed perfect. Unfortunately, the geography of the valley combined with a lack of visibility prevented any airlift evacuation attempt.

3:45pm – Evacuation becomes a concern due to waning daylight. Communication with Search and Rescue had ceased after 2:30pm. One with enough fuel leaves to make the 13 mile route out to the trail head. Two friends of party who knew of the incident are met in route to trail head 3 miles from avalanche scene. One had extensive first aid and rescue experience on Mt Baker Ski Patrol for the past 8 years. Information is exchanged and both continue on to destinations.

5:00pm – Arrive at trail head and check in with coordinating Sheriff on scene. Injury and location details are again provided. Urgency of airlift is pressed given nature of injuries. Weather worsens and continues to prevent air evacuation. Search and Rescue prepare for snowmobile evacuation and wait for doctor and additional medical gear to arrive on scene.

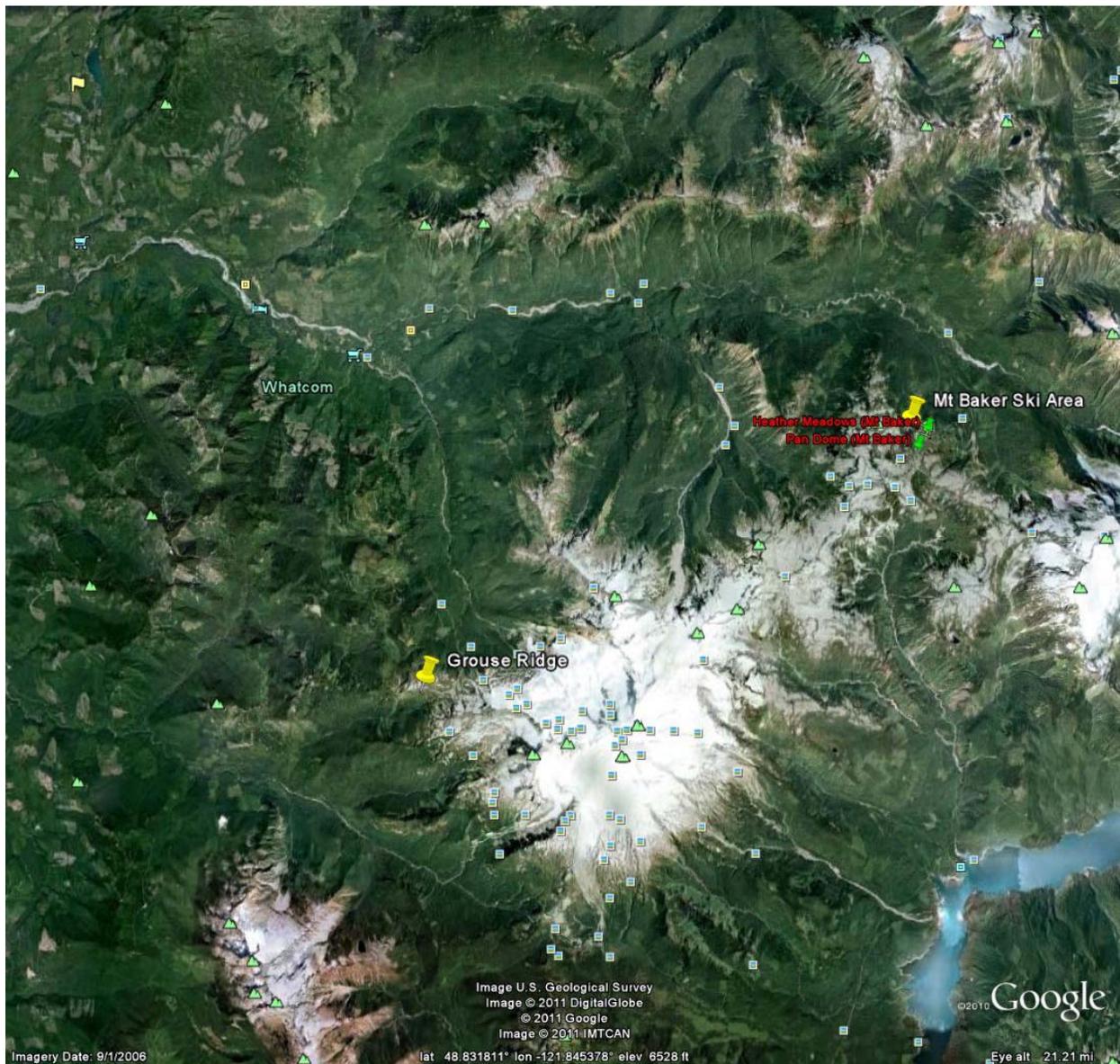
7:00pm – Team one of ground Search and Rescue operations depart from trail head in route to incident scene with doctor and medical gear. Upon arriving at the incident scene the party

members on scene had given up on Search and Rescue, placed the broken leg in traction and created a flat platform on a snowmobile tunnel/seat with the victim strapped to the contraption, packaged and ready to move. The contraption proved the most efficient, smoothest way to transport and was used the entire 13 miles out.

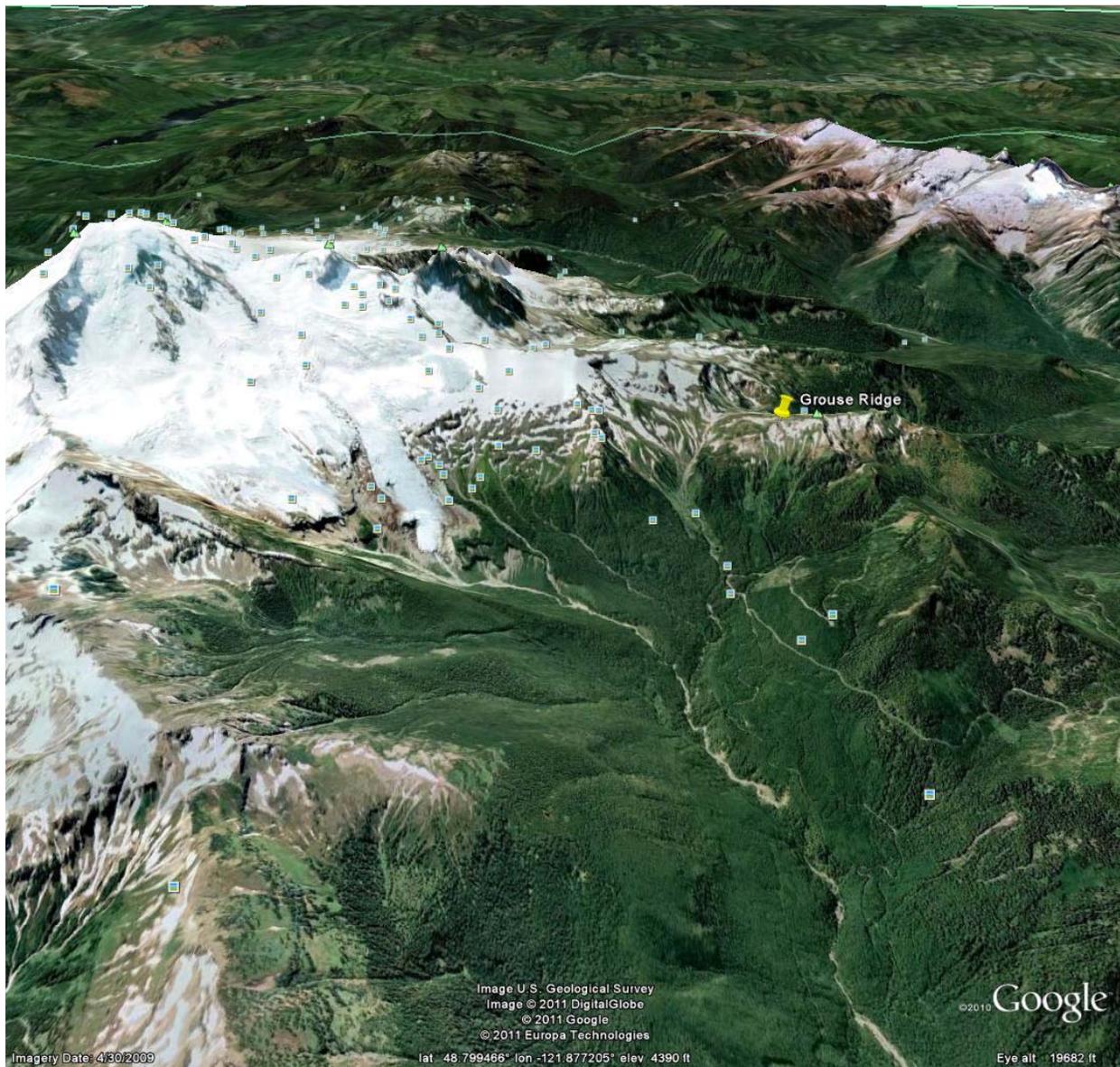
8:45pm – Avalanche victim arrives at Search and Rescue base of operations on FR 39.

Accident Location Information:

The Google Earth skyview map below gives the approximate location of the Grouse Ridge incident, just WNW of the summit of Mt Baker (lower middle) and approximately 11.5 miles (18.45 km) WSW of the Mt Baker ski area (upper right).



Google Earth tilted view of the Grouse Ridge area from the north:



Ancillary Information:

NWAC Avalanche Forecasts:

The forecasts issued for the area in question on both March 3rd and 4th are reproduced below...as they both discuss the snowpack and danger which the party encountered. The forecast issued on the 3rd discussed “a continuing (though slowly decreasing) potential for larger avalanches involving more deeply buried weak layers”...and this sort of snowpack structure and stability may be similar to what was

encountered in the Grouse Ridge area. As of the publication of this report, it is not known if any of the affected parties had accessed the avalanche forecasts shown below.

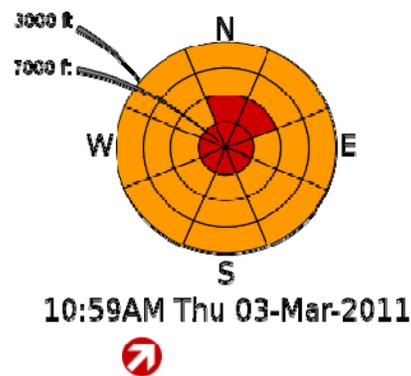
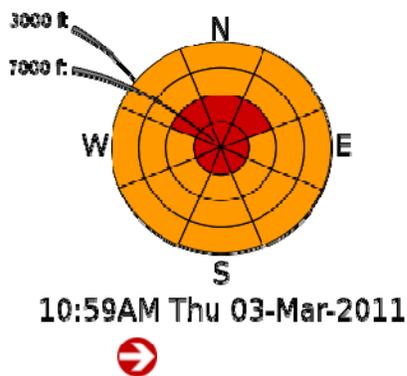
March 3 Forecast for the 3rd and 4th (selected sections):

Issued 1059 AM PST Thu Mar 03 2011

WA Cascades near and west of crest - north of Stevens Pass

Danger Rose for Thursday

Danger Rose for Friday



Forecast

Thursday through Friday morning: High avalanche danger above 6000 feet and on lee slopes above 5000 feet, otherwise considerable danger Thursday. Danger slightly and temporarily decreasing Thursday night and Friday morning and becoming considerable below 7000 feet.

Friday afternoon through Saturday morning: Danger slowly increasing and becoming high above 6000 feet and considerable below.

Saturday afternoon and night: Slowly decreasing avalanche danger becoming considerable below 7000 feet.

Snowpack Analysis

Most NW mountain locations in the Olympics and Cascades near and west of the crest have now received from 30 to over 50 inches of new snow since the most recent series of strong storms began to buffet the region last weekend, with up to 4 to 9 feet of snow (more on lee slopes) now deposited over the crust region that dominated the NW snowpack from late January to about

mid-February. While recent increasing settlement and some weak surface crust formation during warming at lower elevations Wednesday has helped reduce the danger somewhat below 4 to 5000 feet and may be helping to reduce but not eliminate the potential for larger slabs involving more deeply buried weak layers, very strong ridge top winds on Wednesday combined with the warming to create stiffening 1 to 3 ft wind slabs overlying numerous weak layers on higher elevation lee slopes...most notably on northwest through northeast exposures. These buried weaknesses include multiple surface hoar layers, faceted snow near several minor sun or melt-freeze crusts, very low density layers, several graupel layers and more significant faceting near the old MLK crust region.

While the recent settlement may be gradually reducing the likelihood or frequency of deeper slide releases triggered by recently developing and stiffening wind slabs, the potential for more isolated but relatively deep slides is by no means gone. Even though recently limited visibility into most avalanche terrain has restricted avalanche observations of late, some natural and controlled avalanche fractures ranging from 2 to over 5 feet on Wednesday indicate a continuing (though slowly decreasing) potential for larger avalanches involving more deeply buried weak layers. As a result of both new winds stiff wind slabs developed Wednesday and the multitude of buried weak layers, a high danger continues above 6000 feet and on lee slopes above 5000 feet with considerable danger elsewhere.

Detailed Forecasts

Thursday through Friday morning

Several moderate weather systems expected Thursday into Thursday evening should maintain periods of increased light to moderate snow in most areas at relatively low freezing levels and slightly decreasing ridge top winds. However, further weak layers are likely during breaks or brief decreases in winds or snowfall, and along with additional slow loading of these and other buried weak layers, considerable to high danger should continue in most steeper terrain...with greatest danger on wind loaded northwest, north, northeast and east facing terrain at all elevations.

Decreasing showers and winds later Thursday night thru Friday morning should allow for another slow and temporary decrease in the danger as new wind slabs start to settle, loading rates diminish and slow bonding begins to develop in the upper part of the snowpack. This temporary danger decrease should persist into Friday morning before the next strong storm moves across the area mid-late Friday and increases the danger once again.

Friday afternoon through Saturday morning

Light snow should develop in the Olympics and northern Cascades during the afternoon, increasing and spreading southeastward overnight. Along with strengthening winds and slow warming, this weather should lead to generally increasing avalanche danger as new and more dense slabs develop over lighter snow layers received during relatively light winds and colder temperatures on Thursday. Although moderate to occasionally heavy snow overnight should become more showery Saturday morning along with slow cooling, moderate winds and moderate

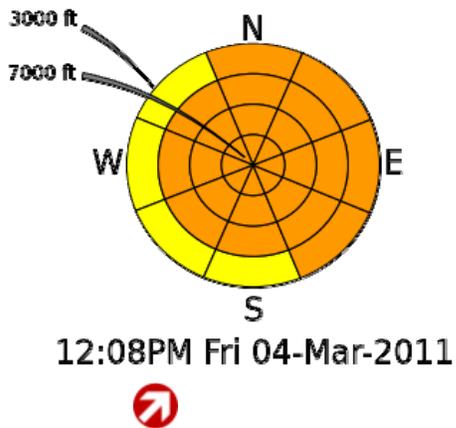
snowfall from the showers should help maintain considerable to high danger. Near higher ridgetops, the greatest danger should gradually shift from north and northeast facing slopes Friday afternoon to more easterly aspects Saturday morning. Meanwhile near the passes, a pass wind shift overnight should allow the greatest danger to transition from westerly exposures late Friday to more easterly aspects Saturday morning.

March 4 Forecast (selected sections):

WA Cascades near and west of crest - north of Stevens Pass

Issued 1208 PM PST Fri Mar 04 2011

Danger Rose for Friday



Forecast

Friday: Considerable avalanche danger above 4000 feet and moderate below. Danger significantly increasing by Friday night.

Saturday: High avalanche danger above 5000 feet and considerable below gradually decreasing. Danger further gradually decreasing Saturday night.

Sunday: Considerable avalanche danger above 4000 feet and moderate below further gradually decreasing. Danger further gradually decreasing Sunday night.

Snowpack Analysis

The latest weather and avalanche cycle began last weekend. Strong southwest winds and warmer denser snowfall were seen Sunday-Monday. Strong southeast to southwest winds and warmer denser snowfall were seen again on Wednesday. Total snowfall since last weekend is in the 4-5 foot range at Hurricane and sites near and west of the Cascade crest.

The winds and the periods of warmer denser snowfall helped build wind and soft slab layers and cause many natural and triggered avalanches during this period. Periods of lower density snowfall and graupel showers between the storms provided temporary weak layers.

Generally decreasing winds, decreasing snow and cooler temperatures were seen Thursday. This should have begun to allow recent layers to partly stabilize. Some explosively triggered avalanches were still reported on Thursday by snow safety crews such as at Stevens, Snoqualmie and Crystal but much less or no natural avalanches were reported.

Detailed Forecasts

Friday

A front should approach the Northwest on Friday. This should cause increasing southwest winds, increasing clouds, and warmer temperatures. Some light snow should be seen by the afternoon. But this should not cause great change in snow conditions. Previous soft or wind slab layers are most likely to linger on lee slopes. This should be north to southeast slopes at higher elevations.

The front should cross the Olympics and Cascades on Friday night. This should cause further increasing southwest winds and heavier snowfall with warmer temperatures. Several inches of snow should be common by Saturday morning with deeper wind transported accumulations on lee slopes. This should build significant new soft or wind slab layers on lee slopes by Saturday morning. This should also be mainly north to southeast slopes at higher elevations.