

Avalanche Accident Report for April 11, 2001

—near Mt Baker, Washington

One snowmobiler caught, buried and killed

South side of Mt. Baker, Snowmobile Avalanche-Fatality Report

Report prepared by Brandon Weathermon; Bellingham Mountain Rescue 04/13/01

A. General Information

1. Date: April 11, 2001
2. Time: approx. 10:00 am
3. Exact Location: 48°44.50N, 121°49.46W ; 6390 feet; just East of the Metcalfe Moraine on the North Cascade Volcano, Mt. Baker in Washington State
4. Accident: 1 person caught; 1 completely buried; 1 killed
5. Victim: 31-yr. old male, Everett, Washington
6. Witnesses: 3 other snowmobilers travelling with the victim witnessed the event
7. Damage: No damage occurred to buildings or lifts

B. Accident Summary

Winter seemed to finally arrive in Washington during the spring of 2001. With snowpack levels in the Mt. Baker region some 70% below normal for the year, the Governor of Washington State declared a state of drought for Washington State by the middle of March.

A series of winter storms blanketed the northwest beginning March 25th. This first storm system on the 25th may have also contributed to the death of two climbers on Mt. Baker, one of which was recovered the same day of this avalanche incident.

The morning of April 11th, sunny skies and strong northwesterly winds were evident in the Bellingham area, but winds were reported to be calm on the mountain during the time of the incident.

A group of four snowmobilers from the Seattle area annually visit the slopes on the South side of Mt. Baker in the spring. Around 10:00 the group had reached the 6400' level. The victim reportedly headed up a large bowl-like slope reaching approx. 6800' then made a turn down slope. Witnesses indicated that the slope fractured "out in front of him" and that he ran into the slide on his way downslope. The point last scene was approximately 10 feet below the crown, mid-slope. Witnesses did not see the subject run into the avalanche and become entrapped as they were moving out of the slide path to avoid being caught.

C. Search

The party quickly scuff searched the debris field; no one in the party carried avalanche transceivers, probes or shovels. Other snowmobiles began to arrive, many with transceivers, probes and shovels. Around 10:30 a 911 cell phone call was made, and by 11:00 am Bellingham Mountain Rescue team members and the Whatcom County Snowmobile club had been paged out. The Whidbey Island Naval Air Station was contacted and provided helicopter support for the incident.

Whidbey helicopter Firewood 6 was able land below the incident, dropping off one Mountain Rescue team member who was then transported to the scene by snowmobile around 13:30.

Arrival on scene showed approximately 25 other snowmobilers searching the scene, some with probes randomly spot probing areas. The victim's snowmobile had been located and dug out. The tip of one of the skis had been found above the snow surface. Subsequent probing around the snowmobile revealed the victim's helmet.

Rescuers organized coarse probe lines utilizing snowmobilers equipped with transceivers, posted avalanche guards and identified escape routes. Four other Mountain Rescue team members arrived on scene around 15:00 with armloads of probes for the many snowmobilers willing to help. Around 17:00 two Mountain Rescue dogs and handlers arrived on scene and began searching.

Around 17:30 the subject was probed utilizing a closed order, course probe. The victim was buried approx. 3.5 feet deep in a prone position, head down slope, and one arm reaching forward. Victim was pulse-less, apneic and cyanotic. Subject was approx. 150' up-slope from where the snowmobile and helmet had been recovered, roughly in line of travel from point last scene. The subject was airlifted to St. Joseph's hospital in Bellingham, WA and pronounced dead some 45 minutes later. Subject's core temp was noted to be around 80° F.

D. Weather and Snowpack Data (Also see additional weather data below)

1. Weather: A strong system had moved through the area on the morning and afternoon of the 10th. The evening of the 10th and morning of the 11th skies were clear. The Mt. Baker Ski Area, 9 miles away on the North side of Mt. Baker at 4200', reported 6 inches of new snow by 13:00 on the 10th. On the morning of the 11th no new snow was reported at the ski area since late on the previous morning, temperature was 26° at 0700, 36° at 1300

2. Snowpack: The snow surface around and above the accident scene showed evidence of high winds and heavy snow transport. An ice layer was probed at most locations to be approx. 3' deep.

3. Danger Rating: The Northwest Weather and Avalanche Center had rated the danger Considerable above 4000', Moderate below, except for locally high danger on steep sun exposed slopes (see Ancillary Section below for further weather and avalanche information).

E. Avalanche Data

1. Class: HS-AO-2-0
2. Dimensions: approx. 150 yards across; 1000 feet of run
3. Crown Face: 1.5-2.5 feet deep for most of crown; estimated
4. Depth of Debris: 1-8 feet
5. Other: Bowl like wind loaded slope.

F. Terrain Data

1. Crown Line elevation: approx. 6850 feet
2. Toe elevation: approx. 6200 feet
3. Starting Zone angle: estimated at 32-34 degrees
4. Vegetative cover: open
5. Shape of avalanche path: open-gully
6. Slope Aspect: South

G. Conclusions:

Several snowmobilers volunteering in probe lines at the accident scene were very vocal about how the victim's lack of wearing an avalanche transceiver was extremely frustrating. Of the group of snowmobilers on scene 50% appeared to be equipped with transceivers.

Effective probing of an avalanche area usually requires substantial resources. In this case, the participation of other snowmobilers was a key factor in the successful location of the subject. Without them, the subject would not have been located the same day.

Ancillary Weather and Avalanche Information:

Discussion, data and forecasts provided by Mark Moore, NWAC

Remote Weather Data—

Unfortunately, NWAC does not maintain any remote weather stations near the accident site that have both wind speed and direction. The closest and probably most representative sites for this high elevation ridgeline are at Mission Ridge (about 90 miles to the south-southeast), Hurricane Ridge (about 70 miles to the west-southwest and Alpentel (about 75 miles to the south). All three sites indicated similar trends in significant increases in wind speeds (mostly from the north-northeast) and precipitation from Tuesday afternoon, the 10th, through Wednesday morning of the 11th. Additionally, radiosonde data from Forks, WA, indicated moderate to strong north-northeasterly winds on the afternoon of the 10th and the morning of the 11th between the 850mb and 700 mb levels (about 5000-10,000 ft).

The data below for Mission Ridge ski area shows this dramatically upward trend in north-northeasterly winds accompanying the upper level trough and associated front that moved over the region in a generally northerly flow aloft. As is evident from the data shown, substantial wind transport would have been expected onto southeast through northeast exposures at the 6000 ft level and above.

Mission Ridge, Wash. 04/11/01 0400 PST

| DATE | TIME | TEMP | TEMP | TEMP | REL. | WIND | SPEED | WDIR | PREC | PREC | SNOW | |
|-------|-------|------|------|------|------|------|-------|------|-------|-------|------|------|
| MmDd | (PST) | DegF | DegF | DegF | Hum. | AVG | MAX | AVG | (1HR) | ACCUM | 24hr | TOT. |
| 2001 | Hour | 6740 | 5300 | 4600 | 5300 | 6740 | 6740 | 5300 | 5300 | 5300 | | |
| | | | | | | | | | | | | |
| 04/11 | 0400 | 17 | 23 | 24 | 100 | 25 | 36 | 56 | 0.06 | 0.98 | 12 | 54 |
| 04/11 | 0300 | 17 | 23 | 25 | 100 | 27 | 40 | 60 | 0.06 | 0.92 | 10 | 54 |
| 04/11 | 0200 | 17 | 23 | 25 | 100 | 32 | 47 | 62 | 0.07 | 0.86 | 12 | 54 |
| 04/11 | 0100 | 18 | 24 | 26 | 100 | 36 | 52 | 64 | 0.08 | 0.79 | 12 | 53 |
| 04/11 | 0000 | 18 | 24 | 26 | 100 | 38 | 61 | 64 | 0.12 | 0.71 | 10 | 52 |
| 04/10 | 2300 | 18 | 24 | 26 | 100 | 31 | 51 | 63 | 0.08 | 0.59 | 7 | 50 |
| 04/10 | 2200 | 18 | 24 | 26 | 100 | 26 | 40 | 66 | 0.08 | 0.51 | 5 | 48 |
| 04/10 | 2100 | 18 | 25 | 26 | 100 | 24 | 26 | 57 | 0.10 | 0.43 | 4 | 47 |
| 04/10 | 2000 | 19 | 26 | 27 | 100 | 13 | 19 | 71 | 0.11 | 0.33 | 3 | 46 |
| 04/10 | 1900 | 20 | 27 | 28 | 100 | 10 | 11 | 59 | 0.03 | 0.22 | 3 | 45 |
| 04/10 | 1800 | 22 | 27 | 30 | 100 | 4 | 14 | 295 | 0.03 | 0.19 | 3 | 45 |
| 04/10 | 1700 | 22 | 28 | 31 | 100 | 10 | 18 | 273 | 0.03 | 0.16 | 3 | 45 |
| 04/10 | 1600 | 22 | 30 | 32 | 93 | 12 | 13 | 264 | 0.03 | 0.13 | 2 | 45 |
| 04/10 | 1500 | 23 | 31 | 31 | 92 | 13 | 27 | 270 | 0.06 | 0.10 | 1 | 43 |
| 04/10 | 1400 | 23 | 30 | 31 | 92 | 13 | 13 | 266 | 0.02 | 0.04 | 0 | 42 |
| 04/10 | 1300 | 21 | 30 | 31 | 89 | 23 | 26 | 248 | 0.02 | 0.02 | 0 | 42 |
| 04/10 | 1200 | 22 | 31 | 33 | 81 | 13 | 21 | 261 | 0.00 | 0.00 | 0 | 42 |
| 04/10 | 1100 | 21 | 31 | 32 | 78 | 16 | 24 | 257 | 0.00 | 0.00 | 0 | 42 |
| 04/10 | 1000 | 20 | 28 | 33 | 76 | 10 | 19 | 256 | 0.00 | 0.00 | 0 | 42 |

| 04/10 | 0900 | 20 | 25 | 33 | 78 | 10 | 10 | 256 | 0.00 | 0.00 | 0 | 42 |
|-------|-------|------|------|------|------|------|-------|------|-------|-------|------|------|
| 04/10 | 0800 | 18 | 25 | 29 | 78 | 15 | 24 | 271 | 0.00 | 0.00 | 0 | 42 |
| 04/10 | 0700 | 17 | 25 | 29 | 78 | 13 | 25 | 274 | 0.00 | 0.00 | 0 | 42 |
| 04/10 | 0600 | 17 | 25 | 28 | 80 | 12 | 13 | 283 | 0.00 | 0.00 | 0 | 42 |
| 04/10 | 0500 | 17 | 25 | 28 | 86 | 14 | 15 | 272 | 0.00 | 0.00 | 0 | 42 |
| | | | | | | | | | | | | |
| DATE | TIME | TEMP | TEMP | TEMP | REL. | WIND | SPEED | WDIR | PREC | PREC | SNOW | |
| MmDd | (PST) | DegF | DegF | DegF | Hum. | AVG | MAX | AVG | (1HR) | ACCUM | 24hr | TOT. |

Mission Ridge, Wash. 04/12/01 0400 PST

| DATE | TIME | TEMP | TEMP | TEMP | REL. | WIND | SPEED | WDIR | PREC | PREC | SNOW | |
|-------|-------|------|------|------|------|------|-------|------|-------|-------|------|------|
| MmDd | (PST) | DegF | DegF | DegF | Hum. | AVG | MAX | AVG | (1HR) | ACCUM | 24hr | TOT. |
| 2001 | Hour | 6740 | 5300 | 4600 | 5300 | 6740 | 6740 | 5300 | 5300 | 5300 | | |
| | | | | | | | | | | | | |
| 04/12 | 0400 | 17 | 20 | 24 | 100 | 0 | 0 | 297 | 0.00 | 0.08 | 0 | 55 |
| 04/12 | 0300 | 17 | 21 | 25 | 100 | 0 | 0 | 351 | 0.00 | 0.08 | 0 | 55 |
| 04/12 | 0200 | 18 | 23 | 26 | 100 | 0 | 0 | 356 | 0.00 | 0.08 | 0 | 55 |
| 04/12 | 0100 | 18 | 24 | 26 | 100 | 0 | 0 | 322 | 0.00 | 0.08 | 0 | 55 |
| 04/12 | 0000 | 19 | 24 | 26 | 100 | 0 | 3 | 331 | 0.00 | 0.08 | 0 | 55 |
| 04/11 | 2300 | 20 | 25 | 27 | 100 | 6 | 10 | 336 | 0.00 | 0.08 | 0 | 55 |
| 04/11 | 2200 | 19 | 25 | 28 | 100 | 8 | 14 | 360 | 0.00 | 0.08 | 0 | 55 |
| 04/11 | 2100 | 19 | 25 | 28 | 100 | 6 | 12 | 17 | 0.00 | 0.08 | 0 | 55 |
| 04/11 | 2000 | 21 | 27 | 30 | 100 | 8 | 14 | 333 | 0.00 | 0.08 | 0 | 55 |
| 04/11 | 1900 | 22 | 29 | 31 | 100 | 2 | 8 | 342 | 0.00 | 0.08 | 0 | 55 |
| 04/11 | 1800 | 23 | 29 | 34 | 100 | 1 | 2 | 356 | 0.00 | 0.08 | 0 | 55 |
| 04/11 | 1700 | 23 | 29 | 36 | 100 | 7 | 14 | 44 | 0.00 | 0.08 | 0 | 55 |
| 04/11 | 1600 | 24 | 31 | 36 | 100 | 10 | 17 | 28 | 0.00 | 0.08 | 0 | 55 |
| 04/11 | 1500 | 24 | 32 | 33 | 100 | 14 | 25 | 33 | 0.00 | 0.08 | 0 | 55 |
| 04/11 | 1400 | 23 | 30 | 32 | 100 | 21 | 37 | 51 | 0.00 | 0.08 | 0 | 56 |
| 04/11 | 1300 | 20 | 28 | 31 | 100 | 30 | 41 | 62 | 0.00 | 0.08 | 0 | 56 |
| 04/11 | 1200 | 19 | 25 | 29 | 100 | 33 | 43 | 63 | 0.00 | 0.08 | 0 | 56 |
| 04/11 | 1100 | 17 | 24 | 27 | 100 | 21 | 44 | 60 | 0.00 | 0.08 | 0 | 56 |
| 04/11 | 1000 | 17 | 23 | 26 | 100 | 18 | 29 | 65 | 0.00 | 0.08 | 0 | 56 |
| 04/11 | 0900 | 16 | 23 | 25 | 100 | 19 | 26 | 63 | 0.00 | 0.08 | 44 | 56 |
| 04/11 | 0800 | 16 | 23 | 25 | 100 | 20 | 22 | 80 | 0.00 | 0.08 | 44 | 57 |
| 04/11 | 0700 | 16 | 22 | 24 | 100 | 19 | 19 | 54 | 0.01 | 0.08 | 44 | 56 |
| 04/11 | 0600 | 16 | 22 | 24 | 100 | 24 | 37 | 56 | 0.03 | 0.07 | 44 | 56 |
| 04/11 | 0500 | 16 | 23 | 24 | 100 | 25 | 35 | 56 | 0.04 | 0.04 | 44 | 55 |
| | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|------|-------|------|------|------|------|------|-------|------|-------|-------|------|------|
| | | | | | | | | | | | | |
| DATE | TIME | TEMP | TEMP | TEMP | REL. | WIND | SPEED | WDIR | PREC | PREC | SNOW | |
| MmDd | (PST) | DegF | DegF | DegF | Hum. | AVG | MAX | AVG | (1HR) | ACCUM | 24hr | TOT. |

Forecast information—

As early as the avalanche forecast issued on Monday, the 9th, increasing avalanche danger was discussed for Tuesday night regarding expected wind slab deposition on southeast through southwest exposures—"with further wind slabs likely forming on southeast through southwest facing slopes near higher ridgelines". This theme of unstable wind slabs continued into the forecast issued on Tuesday, the 10th (see below) and on to the forecast issued on the morning of the accident (the 11th), when a considerable danger was forecast for avalanche terrain above 4000 feet (see excerpted Zone Forecast for the 11th following the 10th forecast.

NWAC Avalanche forecast issued Tuesday morning, April 10th—

ZCZC SEASABSEA

TTAA00 KSEA DDHMM

WAZ012-017-018-019-025-042-ORZ011-111600-

NORTHWEST WEATHER AND AVALANCHE CENTER

NWAC Program administered by USDA-Forest Service with cooperative funding and support from Washington State Department of Transportation, National Weather Service, National Park Service, Washington State Parks and Recreation Commission, Pacific Northwest Ski Area Association, and other private organizations

BACKCOUNTRY AVALANCHE FORECAST FOR THE OLYMPICS, WASHINGTON CASCADES AND MT HOOD AREA

These forecasts apply to back country avalanche terrain below 7000 feet. They do not apply to highways or operating ski areas.

0830 AM PDT Tuesday, April 10, 2001

ZONE AVALANCHE FORECASTS.....

OLYMPICS. . .WASHINGTON CASCADES. . .MT HOOD AREA. . .

Moderate avalanche danger below 7000 feet Tuesday, gradually increasing later Tuesday becoming considerable above 6000 feet and moderate below. Avalanche danger remaining considerable above about 6000 feet and moderate below on Wednesday. Note that a locally considerable danger should develop Wednesday on sun-exposed slopes, especially in areas that have accumulated significant recent snowfall, mainly above 5000 feet. In these areas triggered slides are likely and natural slides possible.

SNOWPACK ANALYSIS....

Most areas received some 2 to 4 inches of new snow as of Tuesday morning. Moderate west to northwest ridge crest winds early Tuesday have likely built some shallow new wind slabs on mainly east through south facing slopes at higher elevations. Early control results from Stevens Pass Tuesday indicate ski released soft slabs of 6 to 8 inches along leeward slopes. Since last Friday, most west slope areas have accumulated some 1 to 2 feet or more of new snow at relatively low freezing levels. Somewhat less new snow was received along the east slopes. The greatest amounts of recent snow have likely accumulated along the central Washington Cascade west slopes as a result of the persistent convergence zone over the past five days. Field reports from Sunday in backcountry terrain near Cascade Pass indicated some 4 feet of recent snow over the strong crust from late March. Excellent low-density powder was found on north facing slopes up to 6800 feet with no avalanche activity. A relatively good bond has been reported to the crust in most areas. A backcountry trip to Jim Hill near Stevens Pass Monday also confirmed the relatively strong bond of recent snow to old crust. Good powder snow was found on north aspects generally between 6500 to about 5000 feet. A snowpit in the same area revealed a moderate shear about 4 inches down on a density change and a moderate shear about 20 inches above the old crust. Slopes of 30 to 35 degrees were skied with no avalanche incidents. There have been some reports of triggered slab releases over the past few days however. An 18 inch ski triggered slab release was reported near Snowy Lakes in the north Washington Cascades on a north facing slopes near 7000 feet, fortunately no one was caught. A cornice triggered climax avalanche was seen near Kangaroo Pass, also near Washington Pass on Monday. Limited daytime warming and some breaks in precipitation have allowed for some snowpack settlement of the recent snow and this is maintaining a generally moderate danger. At lower elevations and along the east slopes, less recent snowfall accumulations and a strong near surface crust is

maintaining a somewhat lesser but moderate danger.

TUESDAY. . .TUESDAY NIGHT. . .

Increasing light to occasionally moderate snow and moderate ridgetop winds should cause a gradually increasing danger later Tuesday, mainly at higher elevations where new unstable wind slabs should form. The greatest danger increase is expected on mainly east through south facing slopes were a considerable danger is expected. At lower elevations, lighter winds and less accumulations of new snow should cause only a slightly increasing

danger.

WEDNESDAY. . .WEDNESDAY NIGHT. . .

Decreasing snow showers in the south and clearing in the north early Wednesday with continued cool temperatures should not appreciably change the avalanche danger. Becoming mostly sunny with gradually rising freezing levels later Wednesday. This should lead to an increasing avalanche danger, especially on steeper slopes

receiving sunshine during the warmest part of the day. In areas with significant recent snow, some large natural or triggered slides are possible, with some slides entraining large volumes of snow as they descend. Backcountry travelers should use extreme caution in avalanche terrain later Wednesday.

Backcountry travelers should be aware that elevation and geographic distinctions are approximate and a transition zone between dangers exists. Remember there are avalanche safe areas in the mountains during all levels of avalanche danger. Contact local authorities in your area of interest for further information. NWAC Mountain Weather Forecasts and mountain weather data are also available by visiting our Web site at www.nwac.noaa.gov.

Kramer/Forest Service Northwest Weather and Avalanche Center

Excerpted NWAC Avalanche Forecast Zones for Wednesday morning, April 11th

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BACKCOUNTRY AVALANCHE FORECAST FOR THE OLYMPICS, WASHINGTON CASCADES AND MT HOOD AREA

These forecasts apply to back country avalanche terrain below 7000 feet. They do not apply to highways or operating ski areas.

0830 AM PDT Wednesday, April 11, 2001

ZONE AVALANCHE FORECASTS.....

OLYMPICS. . .WASHINGTON CASCADES. . .MT HOOD AREA. . .

Considerable avalanche danger above 4000 feet and moderate below Wednesday, except for a locally high danger on steep sun exposed slopes late morning and afternoon hours Wednesday, especially in areas that have accumulated significant recent snowfall. Avalanche danger gradually decreasing Wednesday night and Thursday becoming considerable above 5 to 6000 feet and moderate below. Avalanche danger increasing Thursday night becoming considerable above 4 to 5000 feet and moderate below.