



Supplement of

How is avalanche danger described in textual descriptions in avalanche forecasts in Switzerland? Consistency between forecasters and avalanche danger

Veronika Hutter et al.

Correspondence to: Frank Techel (techel@slf.ch)

The copyright of individual parts of the supplement might differ from the article licence.

Norway, example Ofoten, 5 Mar 2021 - <https://www.varsom.no/snoskredvarsling/varsel/Ofoten/2021-03-05>

Snøskredvarsel for Ofoten fredag 05.03.2021

Varsom - Forsida > Snøskredvarsling > Snøskredvarsel for Ofoten fredag 05.03.2021

2
Moderat

Publisert: 04.03.2021 kl. 15:40

Ustabile fokksnøflak i leområder. Vedvarende svake lag kan påvirkes der snødekket er tynt.

Høyeste faregrad per dag:



Råd

Unngå terreng brattere enn 30 grader og utløpsområder der skredproblemet er til stede.

NB, det er svært vanskelig å vite hvor skredproblemet er.

Unngå terrengfeller.

Skredproblem

Fokksnø (flakskred)
Nedføyket svakt lag med nysnø
[Les mer om skredproblemet](#)

Vedvarende svakt lag (flakskred)
Nedsnødd eller nedføyket kantkornet snø
[Les mer om skredproblemet](#)

Skredstørrelse:
Utløsningsårsak:
Utbredelse:
Sannsynlighet:

2 - Middels
Liten tilleggsbelastning
Noen bratte heng
Mulig

3 - Store
Liten tilleggsbelastning
Få bratte heng
Mulig

[Usikker på hvordan du skal forstå innholdet i et snøskredvarsel?](#)

Skredfarevurdering

Fortsatt snøbyger og perioder med vind opprettholder problemet med fokksnø i leområder. Dreining i vindretning gjør at flere himmelretninger vil få pålagring. Noen steder kan disse flakene være lette å påvirke for en skiløper. Det finnes også områder med vedvarende svake lag i fjellet. Disse er antagelig mest utbredt i indre strøk og høyt til fjells der forrige ukes mildvær ikke ødela lagene. Vær særlig oppmerksom i overganger mellom tynt og tykt snødekke. Skredfaren ventes å øke i takt med vindøkningen utover dagen.

Avalanche forecast for Ofoten Friday 2021-03-05

Norwegian avalanche, flood and landslide hazard warnings > Avalanche bulletins > Avalanche forecast for Ofoten Friday 2021-03-05

Highest danger level per day:



2
Moderate

Published: 2021-03-04 03:40 PM

Unstable conditions due to wind slabs in lee areas. Persistent weak layers may also be triggered where the snow cover is thin.

Advice

Avoid terrain steeper than 30 degrees and runout zones where the avalanche problem is present. Remote triggering is possible.

NB: Identifying the avalanche problem is very difficult.

Avoid terrain traps.

Avalanche problems

Wind drifted snow (slab avalanches)
Buried weak layer of new snow
[Read more about the avalanche problem](#)

Persistent weak layer (slab avalanches)
Buried weak layer of faceted snow near surface
[Read more about the avalanche problem](#)

Avalanche size:
Trigger/release:
Distribution:
Probability:

2 - Medium
Low additional load
Specific steep slopes
Possible

3 - Large
Low additional load
Isolated steep slopes
Possible

Canada: example Glacier National Park, 15 Jan 2021 - [https://avalanche.pc.gc.ca/bulletin-](https://avalanche.pc.gc.ca/bulletin-eng.aspx?r=3&d=2021-01-15)

[eng.aspx?r=3&d=2021-01-15](https://avalanche.pc.gc.ca/bulletin-eng.aspx?r=3&d=2021-01-15)

Avalanche Bulletin - Glacier National Park - Fri Jan 15, 2021

Issued: Fri Jan 15, 2021 08:00

Valid Until: Sat Jan 16, 2021 08:00

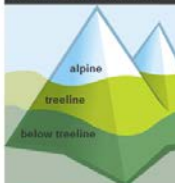
Large Areas of Glacier National Park Are CLOSED For Avalanche Control Using EXPLOSIVES. For access information visit pc.gc.ca/skirogers or call (250) 837-7500

“Jan 10th surface hoar and thin temp crusts reside under the recent storm snow. Take time to dig for weak layer distribution under the recent storm snow. Expect thin sun crust on steep solar terrain.”

[Weather Stations](#) [map of region](#) [Print](#) [CAAML Data Source](#) [disclaimer](#)

Public Avalanche Forecast **Forecast Details**

Danger Ratings: Friday



3 - Considerable Dangerous avalanche conditions. Careful snowpack evaluation, cautious route-finding and conservative decision-making essential. Natural avalanches possible. Human-triggered avalanches likely.
3 - Considerable Dangerous avalanche conditions. Careful snowpack evaluation, cautious route-finding and conservative decision-making essential.
2 - Moderate Heightened avalanche conditions on specific terrain features. Evaluate snow and terrain carefully; identify features of concern.

Forecast	Saturday	Sunday
alpine	3 - Considerable	3 - Considerable
treeline	2 - Moderate	3 - Considerable
below treeline	2 - Moderate	2 - Moderate

Confidence: Moderate - Due to the number of field observations

[Weather Observations](#)

[learn more about danger ratings](#)

Problem 1: Storm Slabs

Which Elevation?	Which Slopes?	Chance of Avalanches?	Expected Size?
			

Recent heavy snowfall accompanied by strong S-W winds have formed widespread storm slab. The Jan 10 surface hoar layer underlies the storm slab in protected locations. We are still gathering info on the distribution of this weak layer.

Travel and Terrain Advice

Dig down to find and test weak layers before committing to a line. Watch for whumpfung, hollow sounds, and shooting cracks.

Avalanche Bulletin - Glacier National Park - Fri Jan 15, 2021

Issued: Fri Jan 15, 2021 08:00

Valid Until: Sat Jan 16, 2021 08:00

Large Areas of Glacier National Park Are CLOSED For Avalanche Control Using EXPLOSIVES. For access information visit pc.gc.ca/skirogers or call (250) 837-7500

“Jan 10th surface hoar and thin temp crusts reside under the recent storm snow. Take time to dig for weak layer distribution under the recent storm snow. Expect thin sun crust on steep solar terrain.”

[Weather Stations](#) [map of region](#) [Print](#) [CAAML Data Source](#) [disclaimer](#)

Public Avalanche Forecast **Forecast Details**

Weather Forecast

Cloudy with sunny periods and isolated flurries producing a trace of precipitation.
An alpine temperature of -7 C accompanied by moderate SW ridge top winds.
Freezing level: 1100 metres.
Saturday calls for similar weather with freezing level dropping to 800m.

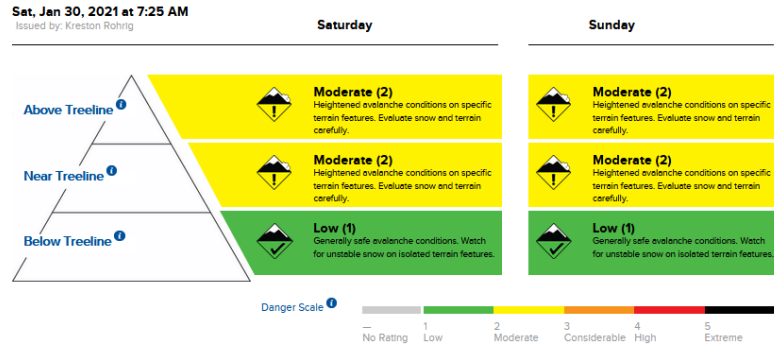
Snowpack Discussion

The recent storm dropped 40cm snow burying a thin crust from sun and/or rime in exposed terrain. Jan 10 surface hoar resides under the storm snow in sheltered terrain at and below treeline. The spotty Dec 26 surface hoar is down 70-90cm. The Dec 7th surface hoar/crust/facet layer is down 1.5m. Crusts with facets persist at the base of the snowpack.

Avalanche Activity Discussion

Field team members remotely triggered a size 1 slab on Jan 10 surface hoar at 1900m in the west end of the park. The Lone Pine path glide crack on Mt Tupper released to ground size 3 yesterday. Wednesday's natural avalanche cycle and avalanche control produced numerous size 3 slides and even a couple size 4.

USA – example Colorado Avalanche Information Center (Region 2), 30 Jan 2021 - https://avalanche.state.co.us/caic/pub_bc_avo.php?zone_id=2



Summary

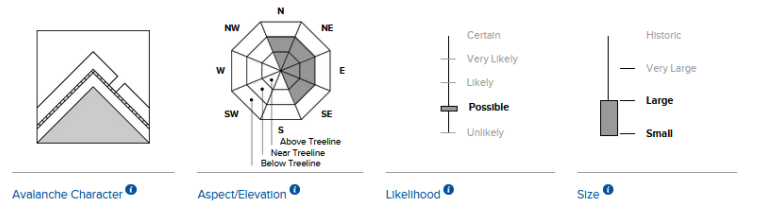
A few inches of new snow and westerly winds will stack another fresh slab on north to east to southeast-facing slopes near and above treeline. Treat wind-deposited snow below ridges, underneath cornices, or in cross-loaded gullies with a good deal of caution. Any steep wind-drifted slope has the potential to break many feet deep and entrain enough snow to bury you. The snowpack is full of weak snow layers that have struggled to handle any new load this year and continues to fall in surprising ways. With fresh slabs spanning across terrain on wind-drifted slopes, you can trigger an avalanche that breaks wider or deeper than you might expect.

Sticking to lower angle slopes in wind-sheltered areas will help reduce your risk.

.....

Please remember to recreate responsibly, including following state and local public health orders and social distancing recommendations.

Avalanche Problem **Persistent Slab** ①



What You Need to Know About These Avalanches

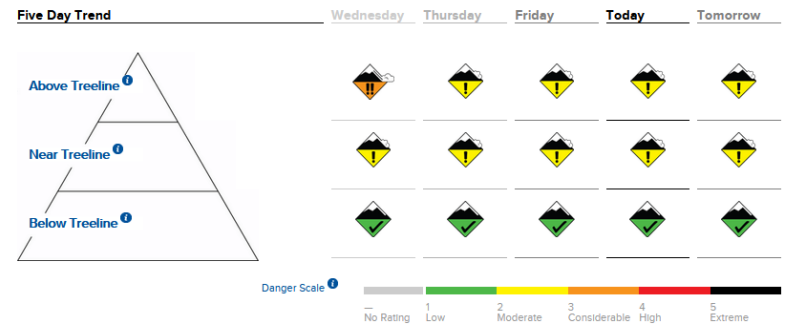
Persistent Slab avalanches can be triggered days to weeks after the last storm. They often propagate across and beyond terrain features that would otherwise confine Wind and Storm Slab avalanches. In some cases they can be triggered remotely, from low-angle terrain or adjacent slopes. Give yourself a wide safety buffer to address the uncertainty.

Snow totals are below our threshold for raising the danger, but you should still use a good dose of caution around any steep terrain. The snowpack is still thin and weak in many places and has not reacted well to even modest loads this season. Wind-transported snow can stack up fast and makes slopes unstable. Even with 4 inches of new snow, westerly winds can easily make that into a 1 to 2-foot slab on easterly-facing slopes.

To put it into basic terms, steep wind-loaded slopes are the most dangerous now, and almost always. Here's why:

To create dangerous avalanche conditions, you need three ingredients: a slab (most often created by wind-transported snow), a weak layer (they form all the time in Colorado between storms), and a steep slope (yes, steep terrain is more dangerous). With a continental snowpack (generally characterized as thin and weak, cold temperatures, lots of wind, etc.), we almost always have some spectrum of avalanche danger throughout the winter until things change in the spring. Because of this, we forecasters stay pretty much clear of avalanche terrain throughout winter. It's really a simple management tool if you're willing to be patient. Sking steep terrain is always going to be a roll of the dice during the winter in Colorado. Persistent Slab avalanches (the ones with slabs and weak layers that hangout and live in the snowpack for long periods of time) are our common enemy, and they don't play nice. They lurk around all season and can be very hard to predict.

When we say, "stick to lower angle slopes," we actually mean it because that's what we do to stay alive. Trying to outsmart avalanches is not the long-game play, and I, for one, want to be an old avalanche forecaster someday.



Bavaria (Germany) – example 12 March 2021 - https://www.lawinenwarndienst-bayern.de/res/archiv/lageberichte/lagebericht_neu.php?id=3673&lb_zur=1615417200

[bayern.de/res/archiv/lageberichte/lagebericht_neu.php?id=3673&lb_zur=1615417200](https://www.lawinenwarndienst-bayern.de/res/archiv/lageberichte/lagebericht_neu.php?id=3673&lb_zur=1615417200)

Lawinenlagebericht

für den bayerischen Alpenraum

Freitag, 12.03.2021

ausgegeben am Donnerstag, 11.03.2021, 17:30
Uhr



Lawinenwarnzentrale
im Bayer. Landesamt für
Umwelt

In höheren Lagen bei starkem Westwind frische, störanfällige Tribschneeanisammlungen beachten.



Beurteilung der Lawinengefahr:

In den Allgäuer Alpen ist die Lawinengefahr über der Waldgrenze als erheblich, im übrigen bayerischen Alpenraum als mäßig einzustufen.

Das Hauptproblem sind frische, kleinräumige Tribschneeanisammlungen. Gefahrenstellen befinden sich über der Waldgrenze im kammnahen Steilgelände der Hangrichtungen Nordwest über Nord bis Ost sowie in frisch eingewehten Rinnen und Mulden. Kleine bis mittelgroße Schneebrettlawinen können bereits bei geringer Zusatzbelastung, z.B. durch einen einzelnen Skifahrer, ausgelöst werden. Anzahl und Größe der Gefahrenstellen nehmen mit der Höhe zu.

Bei Sonneneinstrahlung ist aus felsdurchsetztem, neuschneebedadenem Steilgelände die Selbstauslösung kleinerer Lockerschnee- und Schneebrettlawinen möglich.

Schneedecke:

In der Nacht zum Freitag regnet es im bayerische Alpenraum zuerst bis in mittlere Lagen, dann fallen bei sinkender Schneefallgrenze verbreitet 10 cm, im Westen auch 20 cm Neuschnee. Starker Wind aus westlichen Richtungen verfrachtet den Neuschnee über der Waldgrenze und bildet neue, kleine Verfrachtungen. In schattseitigen Steilhängen höherer Lagen sind in den Tribschneeanisammlungen der letzten Tage schwache Zwischenschichten eingelagert, die den Schneedeckenaufbau störanfällig machen. In mittleren Lagen verbindet sich der wenige Neuschnee gut mit der durchfeuchteten, oberflächennahen Altschneedecke. Im Innern ist die Altschneedecke kompakt und stabil. Der wenige Neuschnee liegt unterhalb 1600m meist direkt auf ausgeapertem Boden.

Hinweise und Tendenz:

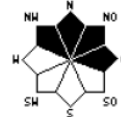
Am Samstag beruhigt sich das stürmische Wetter unter Zwischenhocheinfluss nur kurz. Die Lawinensituation wird sich in den nächsten Tagen nicht wesentlich ändern. Hinweis: Skipisten werden momentan nicht überwacht und vor Lawinengefahren gesichert.

Hauptproblem



Tribschnee

Gefahrenstellen vorwiegend
in den Hangrichtungen ...



Europäische Gefahrenstufen



Lawinenprobleme



France – exemple Massif de Mont Blanc, 19 March 2021 -

https://donneespubliques.meteofrance.fr/?fond=produit&id_produit=265&id_rubrique=50



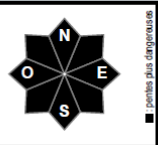
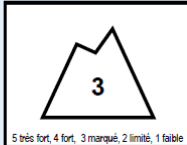
BULLETIN D'ESTIMATION DU RISQUE D'AVALANCHE MASSIF DU MONT-BLANC

(Valable en dehors des pistes balisées et ouvertes)



ESTIMATION DU RISQUE JUSQU'AU SAMEDI 20 MARS 2021 AU SOIR

Risque marqué.



Départs spontanés : Coulées pentes raides. Rares plaques de fond

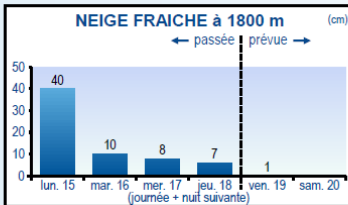
Déclenchements skieurs : Plaques formées par la bise.

STABILITE DU MANTEAU NEIGEUX

Situation typique : neige ventée.

Départs spontanés : Dans les adrets, quelques coulées sont probables dans les barres rocheuses et pentes très raides. De même, dans ces versants, en dessous de 2000 m, rares ruptures de plaques de fond (reptation) dans les pentes raides (avalanches de taille moyenne). Dans les ubacs, éventuellement, une rupture d'une plaque en cours de formation par la bise.

Déclenchements par skieurs : Essentiellement lié aux plaques qui vont se former sous l'action de la bise. Ces plaques nouvellement formées ou en cours de formation, seront sans doute facile à rompre. On se méfiera, en particulier, de tous les secteurs où la neige sera travaillée par le vent (zone sensible à la bise, et plus généralement en haute montagne). Dans les adrets très raides de moyenne montagne, possibilité de provoquer une coulée de neige récente humide, sous les ski, voire, plus rarement, un départ linéaire.



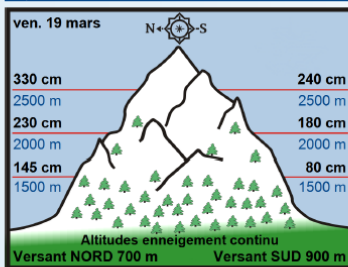
APERCU METEO



pluie-neige

iso 0°C	600 m	600 m	1000 m
vent 2000 m	10 km/h	40 km/h	50 km/h
vent 3000 m	10 km/h	50 km/h	50 km/h

EPAISSEUR DE NEIGE HORS-PISTE



QUALITE DE LA NEIGE

Bonne condition d'enneigement. On peut chausser les ski dès 1000/1200 m.

Dans les ubacs, neige poudreuse, mâte en dessous de 1500 m, souvent travaillés par la bise ce samedi (accumulation, neige cartonnée), encore légère uniquement dans les combes abritées. Dans les adrets un peu raides, neige souvent croûtée le matin, s'humidifiant lentement dans les pentes protégées du vent.

TENDANCE ULTERIEURE DU RISQUE

dimanche 21 → lundi 22 →

BULLETIN NEIGE ET AVALANCHES

08 92 68 10 20 Service 0,35€/min + prix appel

Elaboré le 19-03-2021 à 16h leg.

Bulletin rédigé par Météo-France avec la contribution des observateurs du réseau nivo-météorologique. Partenariat : ANMSM (Maires de Stations de Montagne), DSF (Domaines Skiabiles de France), ADSP (Directeurs de Pistes et de la Sécurité des Stations de Sports d'Hiver) et autres acteurs de la montagne.

CENTRE MÉTÉOROLOGIQUE DES ALPES DU NORD



Courriel : alpes-du-nord@meteo.fr / Tel : / Fax :

http://www.meteofrance.com

Euregio – example, 15 March 2021 - <https://avalanche.report/more/archive>

Avalanche.report

Monday 15.03.2021

Published 14 03 2021, 17:00



Avalanche.report

Danger Level 3 - Considerable



Tendency: Increasing avalanche danger
on Tuesday 16 03 2021



Wind-drifted
snow



Treeline

Fresh wind slabs represent the main danger.

The sometimes storm force wind will transport the new snow and, in some cases, old snow as well. The fresh and somewhat older wind slabs can be released by a single winter sport participant. Caution is to be exercised on steep slopes above the tree line in all aspects. Mostly avalanches are medium-sized. Very isolated large avalanches are possible, in the regions exposed to a lot of new snow in particular. The number and size of avalanche prone locations will increase with altitude.

Small and medium-sized natural avalanches are possible in the regions exposed to heavier precipitation, in particular on very steep shady slopes, and on wind-loaded slopes.

Snowpack

Danger patterns

dp.6: cold, loose snow and wind

Over a wide area 10 to 30 cm of snow, and even more in some localities, will fall. As a consequence of a sometimes storm force wind from northwesterly directions, avalanche prone wind slabs will form. The wind slabs are lying on soft layers in all aspects above the tree line.

The old snowpack will be stable over a wide area.

Tendency

The avalanche danger will increase but remain within the current danger level.