Styrian Avalanche Service – danger scale 5 – more than 200 avalanches

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ABSTRACT: In Styria there are 35 avalanche commissions for 47 parishes. They are divided into 11 different political areas. The local avalanche commission has the function to advise the public authorities of the emergency service. The avalanche commission can also advise other decision makers and if necessary suggest arrangements to reduce avalanche danger. Within the avalanche service there were 20 meteorological weather stations equipped. The total number of voluntary local members of avalanche commissions is 298 at the moment. Of these are 3 members of the federal state Carinthia, 8 members of Upper Austria and 287 members of Styria.

In the final organisation plan of the Styrian avalanche service you find the members of the avalanche commissions, their education and their function. Their sphere of action can be found in the rules and regulations of the avalanche commissions. The temporally limited number of arrangements concern the organized skiing area, transport routes and settlement areas. The assessment of avalanche danger in the free skiing area is not the job of the avalanche commission. The members of the avalanche commission work voluntarily and unsalaried but are provided with the best insurance coverage of “Land Steiermark”. The avalanche report is a service for all end-users.

In 2005 Styria was affected by catastrophic avalanches like no other federal state in Austria. Between February 2nd and February 5th, 2005 there were more than 200 avalanches registered in Styria. All end-users got a good information about the avalanche situation on the homepage from the avalanche service Styria (www.lawine-steiermark.at).

KEYWORDS: Avalanche, Avalanche Warning Service Styria, danger scale 5,

1 INTRODUCTION

In 2005 Styria was affected by catastrophic avalanches like no other federal state in Austria. It began with the passage of a cold front from January 18th to January 19th, 2005. This cold front started a phase of adverse weather including partly heavy snowfall. From February 2nd to February 4th, 2005 precipitation intensified.

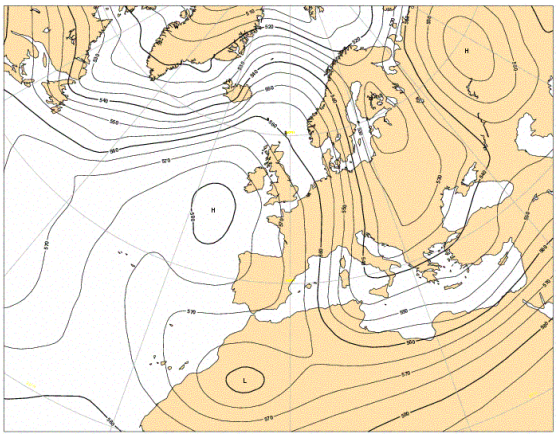

Fig.1 Map presenting the meteorological situation in Styria on February 2nd, 2005

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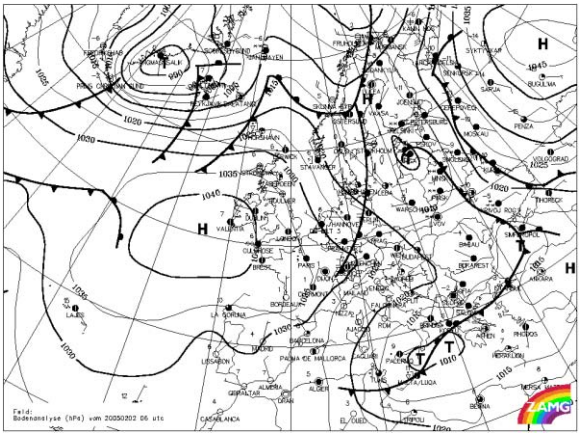

Fig.2 Map presenting the meteorological situation in Styria on February 2nd, 2005

There was a new snow depth of 120 cm in 24h and a snow depth increase of 300 cm in four days in the range of the Northern Alps. These amounts of new snow combined with the continuous Northern current (warm front) led to the highest possible level on the International Avalanche Danger Scale (stage 5 – see fig. 3).

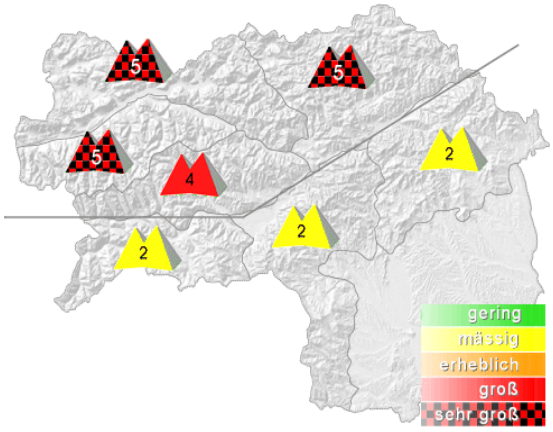

Fig.3 Map presenting the avalanche danger levels in Styria on February 2nd, 2005, 5 pm

Along the Northern Alps as well as on the Northern declivity of the *Niederen Tauern* avalanches were triggered which can be categorised as once-in-a-hundred-years-events. Particularly affected were the *Planneralm* (leading to evacuation of people by military helicopters), the Styrian *Salzkammergut* (*Bad Aussee*, *Grundlsee*, *Bad Mitterndorf* and the *Tauplitz* were cut off from the outside world), the *Gesäuse* as well as the *Hochschwabmassiv* in the area of the *Wildalpen*. Between February 2nd and February 5th, 2005 there were more than 200 avalanches registered in Styria. Large areas of protection forest were destroyed which led to the formation of new avalanche tracks.

Already on January 31st, 2005 danger level 4 was issued. The Avalanche Committee was contacted by the ZAMG-Graz (operating company of the Avalanche Warning Service in Styria) to discuss the immediate development of the avalanche risk. On February 2nd, 2005 in the afternoon danger level 5 was finally issued.

The Avalanche Committee hereupon closed important exposed transportation routes. Before this action was taken houses were evacuated. In reconsidering the events this kind of prevention proved to be very effective because damage to people was prevented.

2 EXAMPLES

Fig. 4 Avalanche “Niederstuttern”

Fig. 5 Avalanche “Gesäuse”

Fig. 6 Birkgraben avalanche - Planneralm

3 IMPACTS

Impacts of avalanches in February 2005:

- Larger avalanche prone locations
- Degradation of humus layers
- Increasing erosion in avalanche tracks
- New avalanche lines

Challenges for the future avalanche prognosis: the damaging avalanches destroyed a considerable amount of forest area. This means that a notable higher amount of snow can be deposited in certain areas. This is a risk potential that has to be re-evaluated.

The critical amounts of new snow for the events in February 2005 were known. Because of the large-scale changes in the terrain we have to ask ourselves the following essential question regarding avalanche prognosis: How high will the critical sum of new snow be in future to cause damaging avalanches in avalanche prone locations? Another crucial point that has to be taken into consideration is the question about how the snow cover behaves on erosion-damaged soil.

It is a future goal of the Avalanche Warning Service to raise avalanche awareness and provide relevant information to the population. This action will mostly affect people doing winter sports as well as huntsmen, forest rangers and professional road workers who spend a lot of working time outdoors in winterly weather conditions.

The described example clearly points to the practicable usefulness and value of the Avalanche Warning Service. It also highlights the required know-how that is essential for avalanche forecasting and the questions that have to be re-evaluated in future when it comes to avalanche prognosis.

All in all this report presents how the Styrian Avalanche Warning Service works, how avalanche danger level 5 came about, which effects the precipitations had, and which endeavours have to be made to improve the forecasting of avalanches.

4 OUTLOCK

Blowing and drifting snow in various ways affect human civilization. The influence on avalanche formation in Alpine regions has to be emphasized. The snow depth at mountainsides and the dead load of snow slabs are important factors that determine whether avalanches occur. In addition to fresh fallen snow, snowdrift contributes a lot to the amount of snow at mountainsides. Mainly leeward the snow depth is determined by the strength of drifting snow. At mountainsides even with a slope angle of about nearly 30 avalanches may be released due to very high snow depths. Finally, drifting snow forms big snow cornices at mountain ridges. That is why snow cornices are a second important factor when it comes to the triggering of avalanches. Wind deposited snow forms can cause an avalanche release.

Avalanche formation is only one consequence of blowing and drifting snow. Less hazardous but a still important economic aspect is the influence of snowdrift on everyday life. Snowdrift causes additional snow loads on structures.

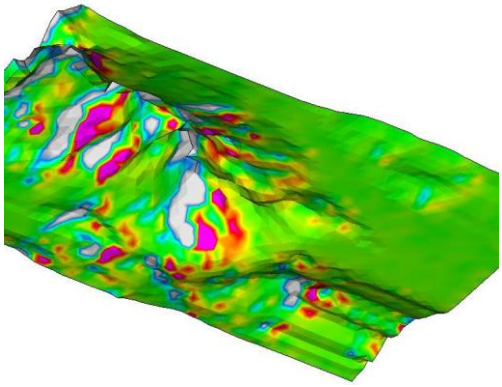

Fig. 7: Snow drift (vgl. Simon Schneiderbauer 2007)

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Photos: Avalanche Service Styria