



## WINTER METEOROLOGY

*A. Leichtfried*

Looking at weather forecasts can be sufficient to fill with joy all winter sport lovers.

The passage of a cold front makes the heart beat stronger for all those who, like freeriders, anticipate eagerly the emotion of riding their board down slopes covered with plenty fresh and powder snow... and the same weather forecast instead arouses a totally different feeling among ice climbing lovers, who instead hope for scarce snowfalls, associated with fronts of polar air that make temperature plunge. Albert illustrates to us the ideal meteorological conditions that make the several winter sport lovers happy.

## SELF-RESCUE WITHIN A GROUP

*M. Genswein*

Is it paradoxical or reasonable to assume that an alpine guide may be buried by an avalanche and be rescued by those same people he is accompanying on a hike? This issue was exhaustively addressed by Manuel Genswein, who last winter tried to teach his "standard clients", i.e. truly

beginners, the main self-rescue techniques to help their fellow hikers. All that in only 15 minutes. And results were really surprising.

## SNOWCOVER MONITORING THROUGH WEBCAM

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Snow cover extension is one of the most important parameters for the study of climate variations, of hydrological balance and also for the management of tourist activities in mountain areas. Lately, webcam images collected at daily or even hourly intervals are used as tools to observe the snow covered areas; those images, properly processed, can be considered a very important environmental data source. This paper presents the Snow-noSnow software specifically designed to automatically detect the extension of snow cover from webcam images. The software was tested on images collected in the Alps (ARPAV webcam network) and the Apennines in a pilot station properly equipped for this project by CNR-IIA.

## LAVANCHERS 2010 New avalanche management issues in Valle d'Aosta

*V. Segor, E. Borney, A. Debernardi, S. Roveyaz*

Little more than 10 years after the tragic event that in February 1999 caused huge damage and a victim at the Dailley hamlet, near Morgex, last winter the Lavanchers avalanche once again proposed itself as an exemplary case. The 1st March 2010 event shows in fact some peculiarities that arouse new questions about the management of avalanche sites that put at risk settlements and infrastructures. Faced with such challenges, in the next years scientific research, technological innovation and land management strategies will have to evolve towards innovative solutions and choices.

## CIVIL DEFENCE PLAN FOR AVALANCHE EMERGENCY AT VENAUS

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During heavy snowfalls taking place between 14 and 17 December 2008 (Cordola et al., 2009) the western alpine range was affected by major avalanche events that resulted in high damage to infrastructures and settlements, even involving areas that had not been hit by avalanches for decades. In the Venaus area, on 15 December 2008 an average size avalanche destroyed a vast forest area, interrupting a stretch of the state road 25 of Moncenisio and coming to a halt in its runout zones at only some 200 m from some settlements below; the main damage was caused to a broad-leaved tree wood, which was entirely destroyed by the avalanche (more than 20 hectares). The avalanche events affecting the slope above Venaus show twenty-year historic frequency; the most serious documented event was the one taking place on 15 January 1885, which affected some small villages and resulted in the destruction of several dwellings and the burial of 23 people, 6 of whom were found dead. Following the December 2008 event, which has determined more favourable conditions for the avalanche runout down the slope, therefore putting some villages at higher risk, in November 2009 the municipal administration decided to adopt an Avalanche Emergency Plan (PEV), drawn up by the Civil Defence

Service of the Turin province, in collaboration with the forestry authority of Oulx and the Forecasting system department of ARPA Piemonte.

The PEV was included in the Civil Defence Plan and aims at safeguarding the safety of people living in some hamlets of the area and granting safety in some stretches of the state road 25 of Moncenisio.

## STANDARDIZED SNOW BARRIERS

*R. Castaldini*

The purpose of the snow supporting structures, as it is known, is to prevent the detachment of avalanches. In fact, they are not designed to stop an avalanche fully developed, but they are opposed to the sliding and creeping slow movements of the snow layer creating a so called "back pressure barring zone" upstream, characterized by compressive stresses, which normally extends over a distance of at least 3 times the vertical snow height, measured in the line of slope. The effects of snow pressure on snow supporting structures are very complex to determine because they are function of several parameters which vary in time and space; often natural phenomena occur that are not well understood and difficult to predict despite careful observations and measurements and the designer must take some way account. The installation of such structures is mostly in high altitude sites often steep and inaccessible slopes with a variety of different ground characteristics. Types simple, durable, safe, inexpensive and possibly homologated are therefore essential prerequisites for successful, effective and long lasting implementation. The Swiss Directive issued by Swiss Federal Institute for Snow and Avalanche Research in Davos are worldwide the point of reference for the calculation of the snow supporting structures in the starting zone of the avalanches. The article explains in detail the procedure to obtain the snow supporting structures certification by Swiss Federal Institute for Snow and Avalanche Research in Davos (WSL) and the homologation by Federal Office of Environment Forests and Landscape in Berne (BAFU), to confirm the reliability and validity of these performance requirements and makes some practical considerations on this kind of structures in the light of new Italian technical standards (NTC2008).