ABSTRACT

CISA IKAR 2006

S. Pivot

The annual conference of CISA IKAR, the international alpine rescue commission, took place last October at Kranjska Gora, in the magnificent ring of Triglav National Park.

CISA IKAR is in fact an international open platform for know-how exchange among the various mountain rescue services within CISA IKAR; rescue workers have the possibility of meeting people experienced in air, snow and avalanche rescue, first aid doctors and rescue materials suppliers.

This international meeting is very important for those organisations coming from quite isolated countries (for example: New Zealand) because is one of the few possibility to share information and experiences to improve the degree of efficiency and safety in rescue operations.

The suppliers of rescue avalanche materials presented 3 new digital beepers, some statistics about the utility of ABS backpack and a new prototype using air bag technology: the Snowpulse.

THE SNOW AVALANCHE RISK MANAGEMENT DURING THE BACKCOUNTRY SKI RACE DÉFI DES FAVERGES 2006

R. Bolognesi

The Défi des Faverges is a backcountry ski race along an alpine environment, across steep slopes at any aspects between 1500 and 3000 m of altitude.

Along the route of the race the snow pack can have large variations of stability, changing in time and space, and so the hazard avalanche management is quite complicated and require an important preliminary work and then, during the race, a continous survey and analysis of weather and snow conditions.

These two steps of the security measure plan for the race are widely examined in this report.

SNOW WATER EQUIVALENT DETERMINATION AN EXPERIMENT CARRIED OUT IN SOME STATIONS OF VENETO MOUNTAINS USING THE SNOWPACK MODEL

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The water resources resulting from snow melting in spring (SWE) are often limited following not too snowy winters.

Calculation of the snow water equivalent (SWE) is usually carried out on the occasion of survey campaigns, where the snowcover SWE is determined by carrying out vertical samplings. These campaigns, which take place from January to late June, involve a lot of personnel and the use of appropriate instruments.

SWE estimate can also be carried out using the SNOWPACK model which, making the most of processed data provided by automatic snow and weather stations, determines the snowpack mass balance in the course of the winter season.

In the Piave basin (Dolomiti and Veneto Prealps) 5 snow and weather stations are operated by the Centro Valanghe of Arabba (ARPA Veneto), for which the SLF Institute of Davos provides data calculated according to the SNOWPACK model.

Stations installed at Monti Alti di Ornella (2,200 m), Col dei Baldi (1,900 m) and Monte Lisser (1,428 m) are particularly suitable for estimating the SWE value of the area where they are placed. For these stations, operators have verified, with good results, the data provided by the snow cover model SNOWPACK with the SWE values resulting from the traditional vertical sampling operations and with the data from the snow profiles carried out for the local avalanche warning service.

SNOW AVALANCHES AND SOIL EROSION: PRELIMINARY RESULTS OF TWO EXPERIMENTAL SITES IN THE AOSTA VALLEY

Freppaz Michele, Lunardi S.,Maggioni Margherita, Valfrè di Bonzo F., Bizzocchi T., Zanini E.

Snow avalanches exert considerable erosive forces on soils, which may be torn open and scraped away, especially in the transition zone, as a result of the ground shear stress. Soil material mixes up with the avalanche body and is normally deposited at the bottom of the valley, originating specific forms of erosion and accumulative topography. The quantity of soil material eroded and accumulated depends on avalanche characteristics (e.g. dimension, full depth dry or wet avalanches) and on morphological features

(e.g. channelled or unconfined avalanches, slope angle), but also on soil properties and vegetation cover.

The monitoring of two channelled avalanche cones in the Aosta Valley (NW-Italy) was realized in order to assess the erosive impact of avalanches on soil. Sediment concentration estimates and measurements of the avalanche deposit volumes were used to calculate the total sediment load. The sediments collected were separated into the fine earth (<2mm) and large (>2mm) organic and mineral fractions. Preliminary results obtained from the winter season 2003-2004 showed that the amount of upwards eroded material deposited on the pre-existent soil at the foot of the avalanche paths was constituted mainly by the fine earth fraction. The organic carbon and total nitrogen content in the fine earth fraction was respectively equal to 8-9% and 0.39-0.42%. The total sediment load was estimated equal to 31 and 25 t/ha, with the greatest value recorded in the smallest avalanche cone. The considerable avalanche sediment deposits together with the great amount of water released during the snowmelt may influence the soil development in the deposition zone, contributing to determine specific pedo-environmental conditions

SNOW: OBSERVATION AND ANALYSIS IN CHINESE PAMIR

Dellavedova Paola, Filippa G., Freppaz Michele, Cheney T.

The idea of a trip in Chinese Pamir and the curiosity to make a comparison with our Alps has been the opportunity to take snow samples up to 7.494 meters of elevation, to analyze pH and electrical conductivity in the field and to do snowpack stratigraphy. The determination of the chemical properties of the snow cover represents an useful way for the evaluation of air mass qualities that can cause precipitation. Moreover the determination of the chemical properties of the snowpack represents an important element of evaluation of principal meteorological conditions that can strongly influence the transformation processes.

A particular attention was given to the variations of chemical properties of snow with relation to the height and meteorological conditions.

The determination of pH and electrical conductivity was done in the field with the combinate tester HI 98129. The stratigraphic profiles were done at an elevation of 5.312 meters, close to a snow precipitation and repeated after 4 days, and at higher elevation, (6.121 and 7494 meters).

The preliminary observations have pointed out a pH generally lower in the surface layers, with values between 5,7 and 6,2. Whereas, the electrical conductivity was generally higher in the surface layer, with values between 2,0 and 7,0 µScm-1. At 6.648 and 7494 meters of elevation in the surface snow layers the electrical conductivity was equal to1,0 µScm-1. In the snow profile at 6.121 meters, the electrical conductivity was relatively homogeneous in all the snowpack and greater at greater depth. Moreover a reduction of pH and electrical conductivity was recorded as a consequence of snow melting. The crystallographic analysis of stagional snow in the glacial surface at 6.121 meters has show the presence of snow crystals with angular form type 4, but without live corners.

The solar radiation at 6.121 at the end of the day in the considered period (July) has influenced the firsts 20 – 25 cm of the snowpack. The temperature at the interface ice/snow at 5.312 m with 30 cm of snow, was -5,7° C.

The desire to observe and analyze snow in a different environment derives form a strong curiosity, only partially satisfied because a lot of new questions raised from this preliminary contact with a so beautiful landscape. The sensation remained, is that of a snow with the same behaviour of our Alps but with quickly changes due to the particular intensity of solar radiation. We cannot predict the prosecution of this activity, conscious that with this article we can't be completely exhaustive but these data may represents the starting point of a more complete characterization of this environment.

MASS GLACIER ON THE ALPE SUD (MONTE SOBRETTA, ALTA VALTELLINA) NEW TECHNIQUE BASED ON GPS MEASUREMENTS.

Marco Belò, Luigi Bonetti,Stefano Urbani, Giovanni Peretti e Valerio Paneri

Since 1997 on the Alpe Sud Glacier (Monte Sobretta, Alta Valtellina), snow measurement campaigns are performed to evaluate snow amounts and collect data for glacier mass balance. A new technique based on GPS measurements has been applied in summer 2006. Result of this new method is the computation of a 3D model (DTM) of the glacier. From the comparison among this model with the ones wich will be realized in the following years detailed mass balances will be computed. From a first analysis between 2006 data and the information obtained from the Carta Tecnica Regionale (1981) 1:10000 about Alpe Sud Glacier, tit was possible to evaluate an average lost of thickness in ice of about 25 meters.