



Contribution: poster presentation

## **STRATEGIES TO REDUCE SNOW AND ICE ABLATION: INVESTIGATIONS AT THE DOSDÈ EAST GLACIER (LOMBARDY ALPS)**

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On Dosedè Est Glacier (Upper Valtellina, Italy) investigations to reduce snow and ice ablation were performed between May and October 2008 and between June and October 2009 in the framework of the “Water and Glaciers” Project funded by San Pellegrino-Levissima Spa.

In summer 2008 on this Alpine glacier (ca. 1 km<sup>2</sup> of area, North aspect) a cover of Ice protector® was spread on a glacier surface 150 m<sup>2</sup> wide at an elevation of about 2800 m a.s.l. The experiments were performed close to an Automatic Weather Station located at the glacier surface (AWS Dosedè Levissima). The AWS permits the collection of meteorological data and energy fluxes fundamental to calculate the glacier energy budget. The glacier covering was carried out on the 15th of May 2008 when the glacier surface was characterized by a snow depth of 2,50 m equal to 1,29 m water equivalent. The experiment ended on the 4th of October 2008.

At the end of the 2008 ablation season on the glacier area without artificial cover it resulted a snow ablation of 1,29 m water equivalent (w.e.) and an ice ablation of 1,05 m w.e.; the glacier surface protected with the cover, instead, resulted to be affected only by snow ablation and its magnitude resulted lower than in unprotected areas: there was a snow loss equal to 0,73 m w.e. and no ice ablation occurred. The positive result due to the artificial cover is thus equal to 1,61 m water equivalent (1,05 m w.e. from ice and 0,56 m w.e. from snow) and the snow survived was 43% of its initial value.

The second time (summer 2009) the glacier covering was performed on the 5th of June 2009 when the glacier surface was covered by a snow layer 2.5 m thick. The experiment ended on the 14th of October 2009. Moreover during summer 2009 we measured also the temperature of the artificial cover and the temperature of the covered snow pack. These data were sampled every 10 minutes through three thermistors probes equipped with three data loggers. This second test was aimed also at measuring the heat flux due to incoming solar radiation and to positive air temperature able to reach snow and ice covered by the Ice protector thus promoting their melting. This second experiment confirmed the ability of the artificial cover in reducing snow and ice ablation. Furthermore it resulted that the glacier area covered not only was protected from direct solar radiation (in particular the UV radiation) but it was also reduced the penetration of the heat flux and it was reduce its time length and its magnitude.