

The strong reduction phase of the Calderone Glacier during the last two centuries: Reconstruction of the variation and of the possible scenarios with GIS technologies

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Abstract

The paper presents the state of the art of the works in progress; in particular Prof. L. D'Alessandro co-ordinates geomorphologic topics, Dr. Massimo Pecci field activities and data elaboration in GIS environment and Prof. C. Smiraglia glaciological themes.

The Calderone glacier is now confined into a deep central mountain valley of the Gran Sasso d'Italia, with steep walls, and does not show movements along the borders and along the front. The little apparatus is characterised by a reduction phase since the end of the "Little Ice Age" Auct., particularly strong since the end of the last decade. During the nineties a set of multidisciplinary researches started to evaluate the role of the Glacier like an indicator of the effects of human activities and finally of regional and global climatic change. In this paper the authors present the analysis performed to evaluate the variations, particularly in surface area and volume, since the end of the Little Ice Age up to now. The use of a Geographic Information System (GIS), modeling available data, regarding both the morphology of the ice surface (georeferenced from recent topographic maps and reconstructed from historic documents and old topographic maps) and the morphology of the bed rock (from Ground Penetrating Radar surveys), allows the 3D-reconstruction of the volumetric variation during time. The "time sample points" in the modeling processes include the end of the LIA, the end of the past century and the

present century for a total of six 3D- reconstruction. The resulting values, reconstructed and/or calculated since the end of the LIA, of about 50.000 squared metres of ice surface area and of about 4.000.000 cubic metres in volume represent the loss up to now (1990). The obtained results are finally discussed also in order to apply and to generalise the presented methodology in calculating the mass balance of particular type of glaciers and in order to evaluate the probable living (surviving) times of the glacier.

Notes to readers

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