

Variations of surface and volume changes of the glaciers in Ticino between 1947 and 2012

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Glaciers in Ticino are not studied often, except for the Basodino glacier and the Vadrecc di Bresciana. This is despite the fact that in 1947 in the Canton of Ticino there were 44 glaciers, covering $22,61\text{km}^2 \pm 1,43\text{km}^2$, the 0.8% of the total area of the Canton.

Considering their importance for hydroelectric power production, for water resource, for the tourism, etc. it is important to determine what evolution the glaciers in Ticino have gone through in the past decades. This will help to understand the actual conditions of the glacier's lifecycle better.

About all this 44 glaciers a detailed study is created using topographical maps offered by Swisstopo (Federal Office of Topography), based on surface evolution for the large part of the glaciers and also on the volume changes for the six largest glaciers.

As well as many glaciers worldwide and other glaciers situated in the Alps, also those in Ticino have had to face climate changes in the last decades. In 65 years glaciers in Ticino have lost 71,3% of their initial area and 11 glaciers completely vanished in this period. This means that the glacierized area in Ticino has decreased and a similar phenomena occurred in other Swiss glaciers.

The changes in mass balance are calculated using the geodetic method and the six glaciers that were measured showed a change in volume of about -357.3 million of m^3 in 65 years.

Some of the glaciers in Ticino have also shown a period of stagnation or even re-advance of their area between 1965 and 1980. The analysis of these changes in volume on six selected glaciers confirms the trend of a continuous decrease, also showing a positive mass balance in the favourable period.

Glaciers in Ticino are also characterized by higher air temperature, more precipitation, and a lower elevation compared to the majority of the others glaciers in Switzerland; their behaviour was compared with that of other Swiss Alps glaciers: usually the glaciers in Ticino have lost less surface (in percentage) and they have a more negative mass balance.

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