



## **Present extension of the debris-covered glaciers at the regional scale of the French Alps**

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As part of the EU-funded project GlaRiskAlp (Alcotra France-Italy), we realize a French Alps glaciers inventory. For the present glacier extension, it is based on 2006-2009 orthophotographs (50 cm resolution), and lists the French Alps glaciers, maps their limits, and implement a database (surface area, maximal and minimal elevation, aspect, exposition, slope, coordinates, etc.). Glacial outlines have been manually delimited for more details, and because debris-covered glaciers are not considered by automatic delineation. When glacial contour are difficult to determine accurately in debris covered area, field check has been achieved. For each glacier with a debris cover, present continuous and discontinuous supraglacial debris covers have been mapped, and data integrated in the database of the French Alps glaciers.

During the period 2006-2009, the overall glacier extension was about 275 km<sup>2</sup> in the French Alps. More than 17 % (48,8 km<sup>2</sup>) of this area was debris-covered; continuous and discontinuous debris covers represent 63 % (30.7 km<sup>2</sup>) and 37 % (18 km<sup>2</sup>) of the debris-covered area, respectively. Among the 593 identified glaciers, more than 34 % have a supraglacial debris cover extending for more than 10% of their area.

We studied spatial distribution and size classes of debris-covered glaciers. Topographical (aspect, slope, and elevation), geological, and geomorphological parameters were extracted from DEMs, maps and studies, in order to underline control factors on supraglacial debris cover development.

A study of the extension of supraglacial debris covers in the past (1900-1920s, and since 1940s) is in progress for the main French debris-covered glaciers.