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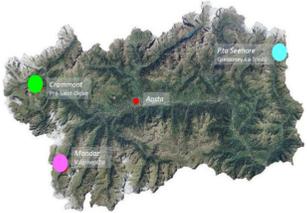
## Introduction

In Aosta Valley (NW Italian Alps) the avalanche census is the basis of the data collection to the continuous update of the Regional Avalanche Cadastre and avalanche hazard mapping.

## Test sites

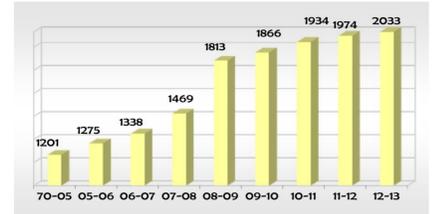
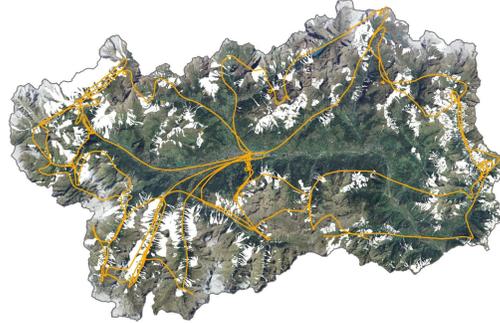
All the territory of Aosta Valley, but in particular three pilot avalanche sites have been chosen :

- Crammont in Pré-St-Didier both located in the NW sector of the Region and affected by N-NW perturbations
- Mandaz in Valgrisenche

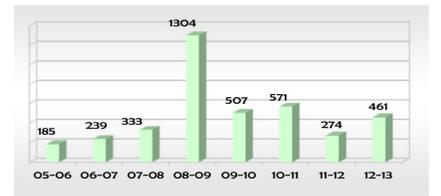


- P.ta Seehore test site in Gressoney-La-Trinité located in NE part of Aosta Valley and affected by S-SE snowfall

## Lots of information to manage: the numbers of the avalanche cadastre



Increase of the surveyed avalanches reported in Avalanche Cadastre of Aosta Valley from 1970 to 2013.



Number of events counted in the last eight winter seasons (2006-2013).

The map of Aosta Valley with the surveys of avalanche basins in Winter 2012/2013:

- in white: avalanche basin known by Regional Avalanche Cadastre;
- in orange: the GPS tracks made during (in situ and by helicopter) surveys.

To ease the work of the technicians for the update of the avalanche cartography and cadastre, a new procedure to quickly draw the boundary limits of avalanche events is developing:

## ADHOC4MAP<sup>3</sup> methodology

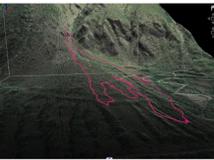
- image acquisition with a specific photogrammetric camera- from aircraft or ground



- use of a 3D model of the area that could be associated to each pixel of a 3D coordinate

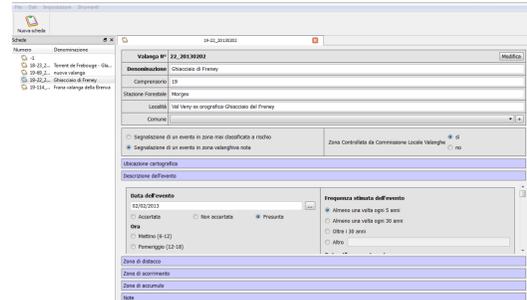
### IMPORTANT

- Distance of image acquisition
- camera characteristics

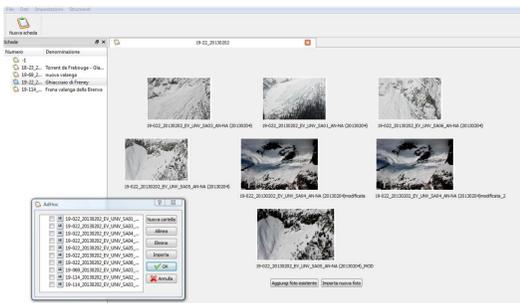


Example of perimeter with AdHoc4MAP<sup>3</sup> software

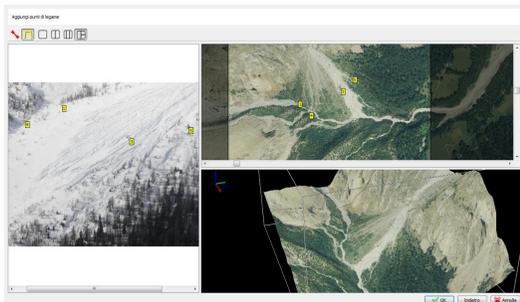
**Step1:** creation of avalanche event and association of alpha-numeric values to individual mappings



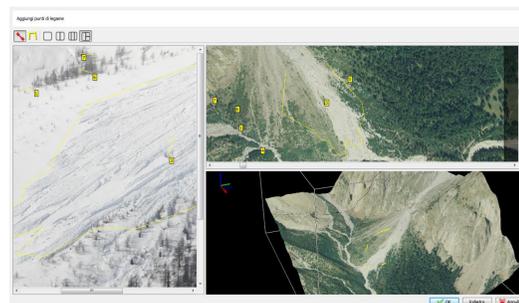
**Step2:** association with one or more images



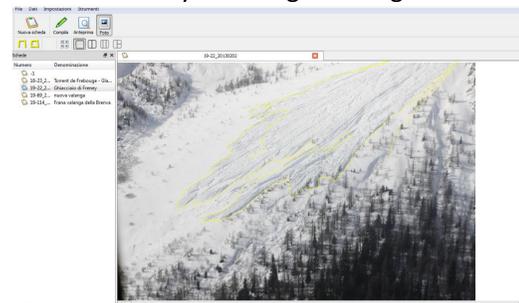
**Step3:** geo-referencing of images



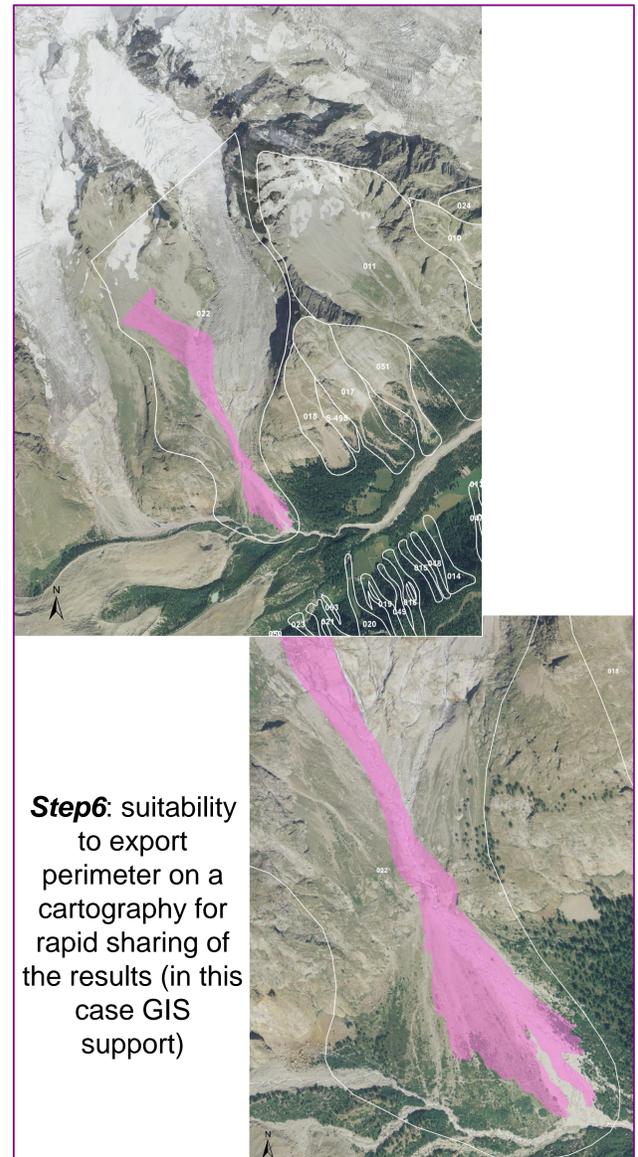
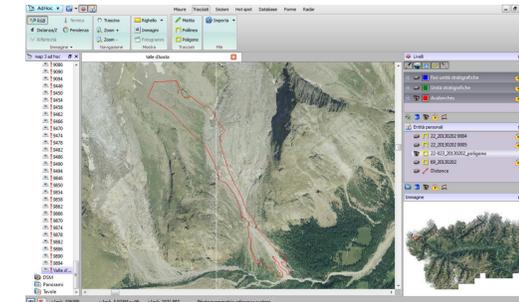
**Step3\_bis:** geo-referencing of images



**Step4:** draw the perimeter of the avalanche event directly on a original image



**Step5:** see the result directly in a 3D map



**Step6:** suitability to export perimeter on a cartography for rapid sharing of the results (in this case GIS support)