1. Introduction & Objectives
The 30th September 1513 Monte Crenone rock avalanche (MCRA) was the first direct documented catastrophic event in the Swiss history. The huge mound of debris deposited just up of the village of Biasca, created a natural dam that led at the formation of a temporary lake named Lago di Malvaglia (~130 million cubic meter of water). The 20th May 1515 the huge mass of water broke the dam and destroyed the territory towards the Riviera Valley and Magadino Plain, going down in history as the well known “Bussa di Biasca”. With this study, we use historical, morphological and geotechnical evidences to recostruct volume and kinematics of the Monte Crenone rock avalanche.

2. Materials & Methods
The volume of the MCRA has been derived by: - in situ investigations (Fig. 1); - 2D photo-interpretation using SWISSIMAGE orthophotos and swissALTI3D hillshade, ©swisstopo (Fig. 2a); - drilling data from the geotechnical studies carried out for the Chiasso-San Gottardo highway works (Fig. 2b); All the previous data were used to validate a run out model reproducing the kinematics of this rock avalanche (Fig. 3). We applied the Ramms Debris Flow model, employed by the WSL Institute for Snow and Avalanche Research SLF and based on the Voellmy metod (1955).

3. Results
The numerical model (Fig. 4) shows a good fit with the current topography. Indeed, for the east side of the section the reproduced rock avalanche debris profile follows the current profile. In the central part instead, it is markedly visible the volume exported by the “Bussa di Biasca” of the 1515 and the following erosive Brenno river action. In this area, the height of the deposit reached 390 m a.s.l. corresponds at the highest point of the Malvaglia lake at the time of the overflowing (20th May 1515).

4. Conclusions
The Ramms model, allowed us to recreate an exhaustive historical reconstruction of the Monte Crenone rock avalanche occurred the 30th September 1513. The parametrization and validation of the Monte Crenone rock avalanche run out model will allow to study other potential rock avalanche affecting the right flank of the Bino valley.