

Winter excursion of the Swiss Young Geomorphologists (SGmS)

Brig – Simplon Pass, 15-16 February 2019



The Saltina is a small river crossing Brig in a channel of 15 m width before flowing into the Rhone river. In 1993, following abundant rainfall, the river overflowed because the main bridge was obstructed by transported materials. Water, mud, debris and wood flooded the Brig center until 3 m of height in some points and two people died (Fig. 1 and 2). The damage costs amounted to 500 million Swiss Francs. After this event, in the Grindji area upstream of Brig, 100 000 m³ of material were carried away to create two deposit areas and the Saltina channel walls were raised. Then a new mobile bridge (Fig. 3) was built instead of the old one: it can lift itself off by 3 m in case of flood, avoiding an overflow. When the river reaches a certain height, the water goes through a small lateral channel to a steel basin. This reservoir of 50 m³, when full, sinks into the constructed well for this purpose. Thanks to a system of cables and pulleys, it raises the 152 tons of the bridge in 6 minutes. In other words, the river itself maintains its freedom of flow and, if the automatic device does not work, the tank manually can be full manually. In 2000, the Saltina level increased due to high rainfall but the new bridge, which lifted itself, avoided city flood (Fig. 4).

In 2011, the University of Fribourg carried out geophysics investigations for a potential construction of a third deposit area in the Grindji area. Geoelectric profiles, seismic refraction and ground-penetrating radar were achieved to estimate the thickness of deposits above bedrocks. The fieldwork was complicated because of the narrow shape of the valley, turbulent flow of the river, presence of underground and superficial water and irregular surface. The seismic refraction and the geoelectric survey gave the best results; instead, the ground-penetrating radar was not able to produce good results because of surface irregularities. The results had showed that the sediment thickness was between 0 and 15 m in the studied section. Under the actual river bed, the sediment thickness was 7

m. Furthermore, an old and deeper river bed was detected. In conclusion the bedrock was too near to the surface to build a deposit zone and the project was stopped.

With the excursion group, on Friday afternoon we walked along the Saltina river from Brig center (Fig. 5) to the Grindji area (Fig. 6), explaining the hydrological hazard, the protection measurements and the geophysical investigations. We spent the night in the Garni Europe hotel in Brig and the next morning we took the bus to the Simplon Pass, where we did a small snowshoes hike up to the Staldhorn pick (Fig. 7-11). We had a pic-nic in the summit and then came back to Brig by bus.

Many thanks to all participants for their active attendance. We also would like to thank the Swiss Geomorphological Society for its financial support.



Fig. 1. Damages in the Brig center during the flood in 1993.



Fig. 2. Damages at the Brig train station (flood 1993).



Fig. 3. The new mobile bridge built after the flood in 1993.



Fig. 4. Lifted bridge during the flood in 2000.



Fig. 5. Explanation about Saltina river, Brig center.



Fig. 6. Explanation about geophysics measurements in the Grindji area.



Fig. 7. Hopsche houses in Simplon Pass area.



Fig. 8. Snowshoeing on action.



Fig. 9. Simplon Pass and Schiltorn peak.



Fig. 10. View on Brig and Valais mountains.