

Excursion Sheet

Eberle Rockfall and Talfer Slit Dam



Publication information

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1 Introduction

- Site 1 - Eberle Rockfall at the Eberle hotel (STOP N.2)
- Site 2 - Slit dam along the Talfebach at the Sill (STOP N.3)



Figure 1.1: Excursion route



Figure 1.2: Excursion Overview

2 Eberle Rockfall

On January 5th 2021 a large rockfall detached from the porphyry rock wall above the Eberle hotel in Bozen. Luckily the hotel was closed due to the pandemic (Covid19). The hotel is located beneath the walls of Hörtenberg, about 70 m above the town, along the Sant'Osvaldo panoramic walkway. The volume of the rockfall was approximately 3500 m³; it was 25m high and 20 m large. Figure 2.1 shows a comparison of the building before and after the rockfall.

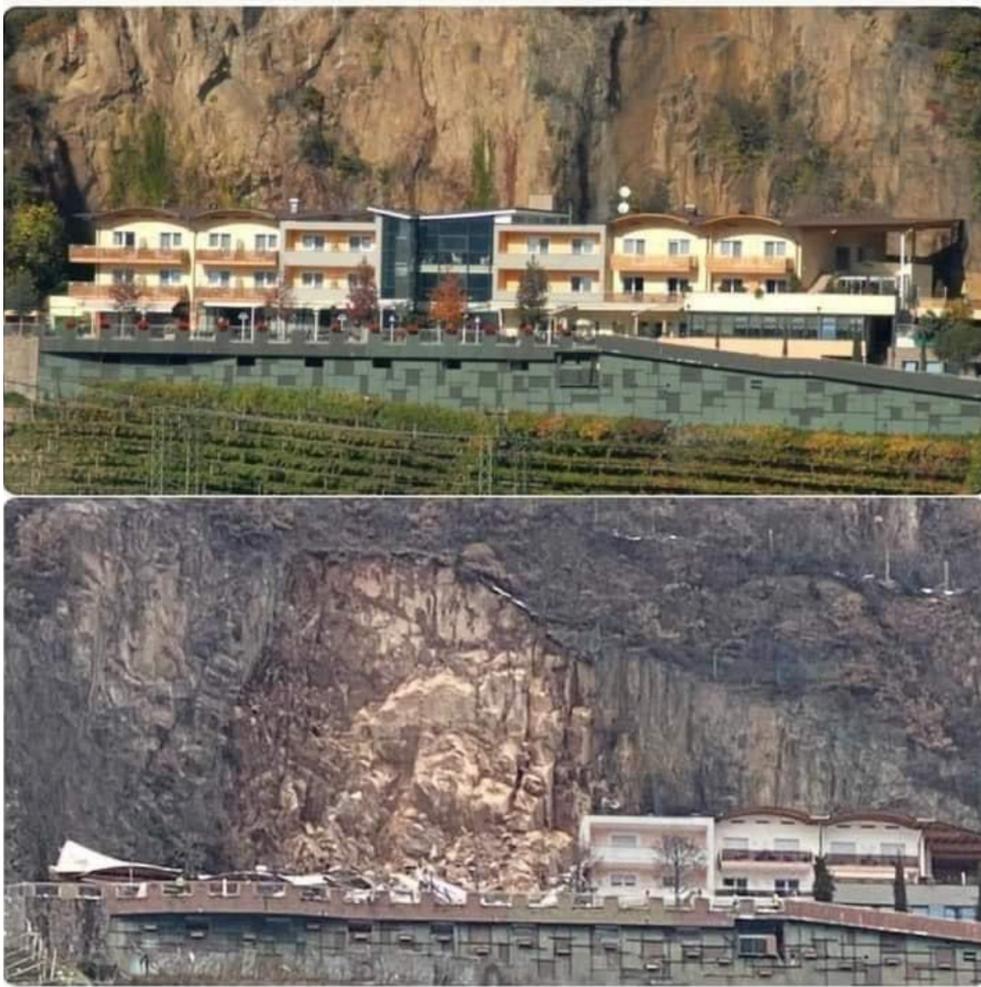


Figure 2.1: Eberle Rockfall occurred Jan 5th 2021

The site used to be an old porphyry quarry until the beginning of the 20th century, and the rock was mainly extracted by blasting. In the thirties the quarry was abandoned. The blasting probably caused part of the vertical cracks where water could infiltrate. Before the 5th-Jan-

21 event the area had experienced abundant precipitation, with cumulated values above the multi-year average and repeated freeze-thaw cycles.

The Geological office of the Province of Bozen carried out detailed analysis to investigate the current rockfall hazard to design appropriate mitigation measures. Details will be provided by the Director of the Geological office during the excursion.

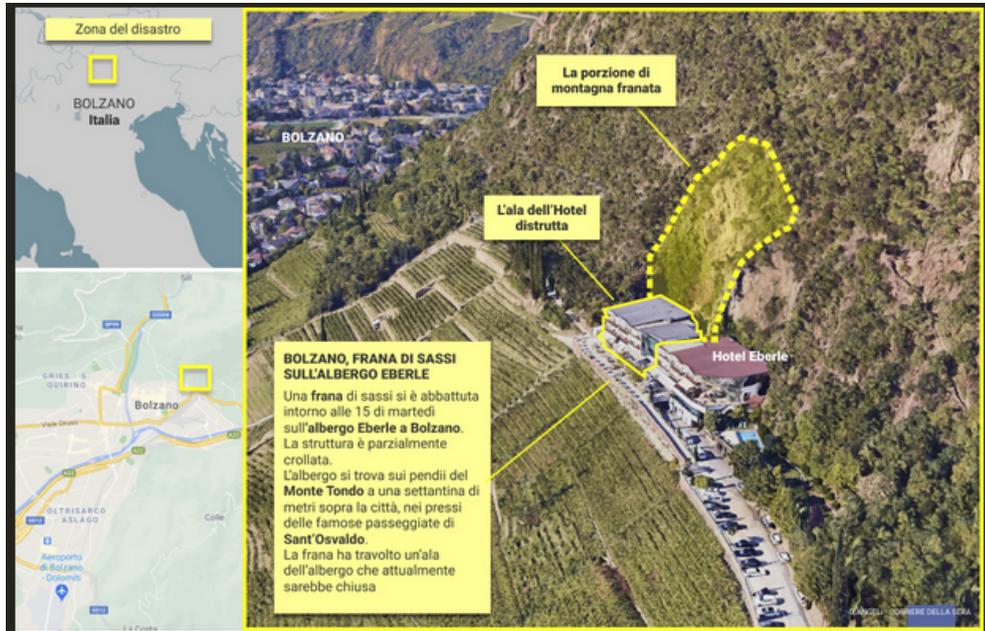


Figure 2.2: Eberle Rockfall: to the left the part of the hotel that was partially destroyed

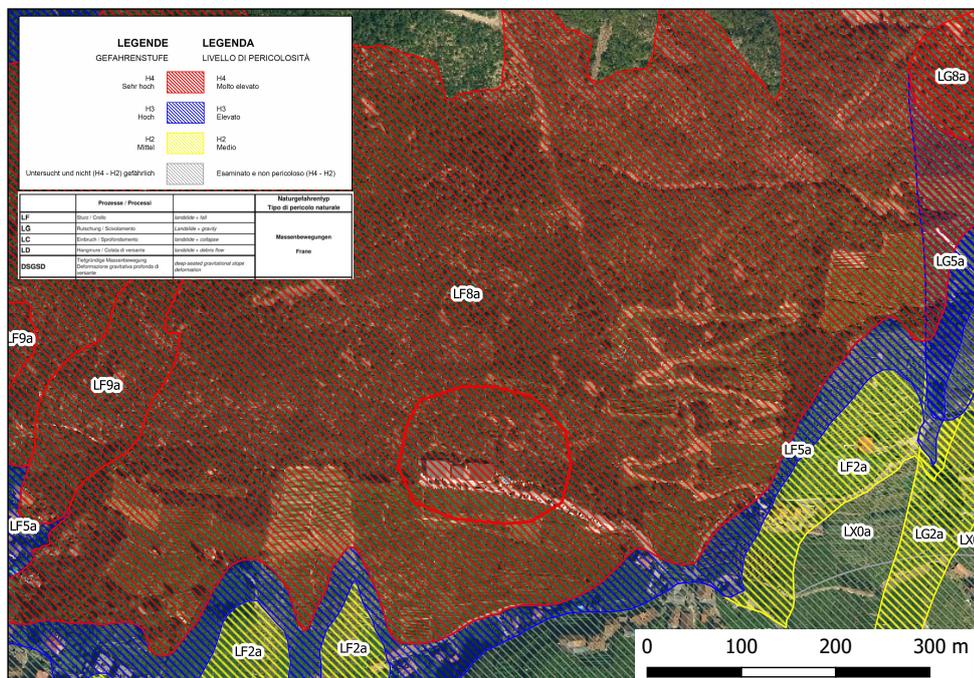


Figure 2.3: Eberle Rockfall: hazard map

3 Slit dam along the Talferbach

The Talferbach had threatened Bozen for a long time until a large retention dam was built North of town (Figure 1.2). This dam trapped sediments and large amounts of wood; in addition it was an obstacle for the fish. Downstream the retention dam 45 check dams and lateral walls confined the river to an artificial morphology to protect Bozen from flooding. Lately a change in culture and mentality has enhanced the values of river ecology and its related ecosystem services. Starting from 2015 a series of river restoration measures has been implemented by the civil Protection Agency of the Province of Bozen. Some of the 45 check dams have been opened in order to promote fish and sediment continuity. An analysis carried out by comparing Lidar surveys taken in 2013 and 2016 proved the effectiveness of the check dam opening. Figure 3.7 shows pattern of scour (red) along the alternate flow direction and aggradation (blue) elsewhere. In 2018 the old retention dam (Figure 3.1) was substituted with a new one, which is more permeable to sediments and wood in case of small and frequent flood events. This dam is characterized by a filter, made of a series of steel beams (Figures 3.2 and 3.3), which is able to capture a large amount of wood and sediments during high flood events.



Figure 3.1: The old retention dam North of Bolzano



Figure 3.2: The new slit dam built in 2018 - view toward North



Figure 3.3: The new slit dam built in 2018 - the steel filter



Figure 3.4: The new slit dam during the event of June 2021



Figure 3.5: The new slit dam during the August 2021 event



Figure 3.6: The new slit dam during the August 2021 event

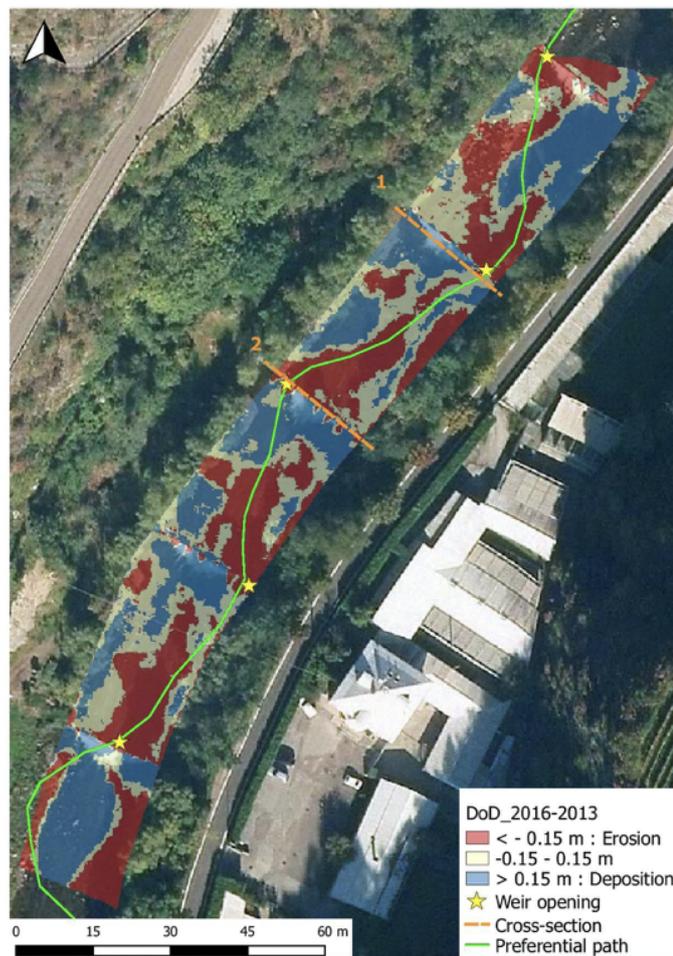


Figure 3.7: DEM of Difference: Lidar2016 - Lidar2013

With the purpose of optimising the selectivity of the slit dam with respect to its ability to retain sediments and wood, a physical model has been implemented by the University of Bozen in its hydraulic Lab (Figures 3.8 and 3.9). Experiments show that the time distribution of wood within the flow has an impact on the retention capability of the slit dam; indeed, the more lumped the wood amount, the larger the volume of wood trapped behind the dam. Observations show that sediments have an impact on the wood dynamics only if they anticipate the wood wave, and form deposits that can interfere with the wood dynamics, either by filling the space behind the dam or by deviating the logs.

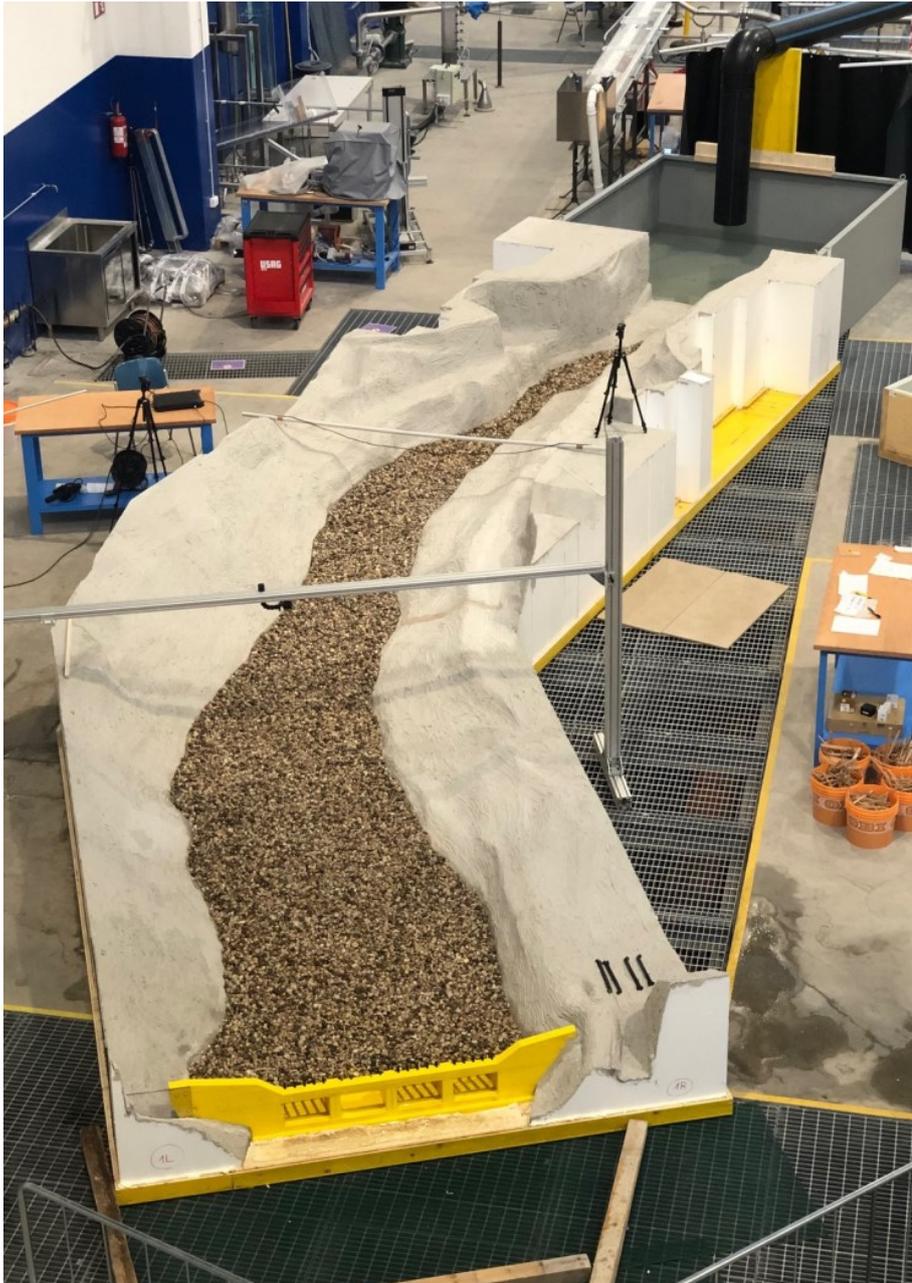


Figure 3.8: Physical model constructed by the University of Bozen (Prof. M. Righetti)



Figure 3.9: Physical model constructed by the University of Bozen (Prof. M. Righetti)