

Multitechnique monitoring of the Pont Bourquin landslide (les Diablerets)

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The Pont Bourquin landslide has been active since the early 1990's. Up to 5m thick, it is situated in a mountainous area. It is developing in a low density housing area, but threatening the road linking the resorts of les Diablerets and Gstaad. It has experienced two major events since it has been monitored. A big slide that went over the road in 2007 and a smaller one in 2009, caused by the failure of the toe. Although stabilizing measures have been implemented, it is still moving. Furthermore, there is a lack of information on the toe (supporting the whole landslide), due to vegetation hindering some monitoring methods from measuring accurately what is happening in it.

The aim of this project is to monitor the landslide and especially its toe using different methods including dGPS, Lidar, total station and UAV. All of them are expected to give information about the kinematics and the behaviour of the landslide. The second aim is to provide redundancy of the measurements to make the monitoring more accurate and to compare the strengths and the weakness of these techniques. Some of the measurement will be compared with another method such as the inclinometer, already installed. It is also planned to draw a geomorphologic map and to calculate the potential sliding volume using the SLBL method to determine the risk that is posed by the landslide. More thoroughly, the Lidar captures the area (figure 1).



Figure 1 : Lidar measuring the main part of the landslide

The dGPS and total stations measure the movement at ground points spread along the slope. The UAV offsets the issue of vegetation that impedes the Lidar to reach completely the ground by taking aerial pictures. Image correlation is then used to track the movements by analysing differences between the current pictures with the one of the previous year.