GEOPREVENT

AVALANCHE RADAR ZERMATT, SWITZERLAND

PART OF HEXAGON

The world's first avalanche radar system of its kind secures the access road to Zermatt.

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Title Page: Avalanche radar, Zermatt.

Figure 1: Webcam view: If the avalanche does not reach the road, the closure can be revoked immediately.

CHALLENGE

The only road that leads to Zermatt, one of Switzerland's most renowned resorts, home to about 6000 people and reaching 2 Mio. yearly overnight stays, is threatened by the two infamous avalanche gullies Lüegelti and Schusslobina. While most tourists reach Zermatt by train, locals and goods traffic depend heavily on the cantonal road that connects Zermatt and Täsch, the next village down valley. In good weather, avalanches in the two gullies are triggered artificially by helicopter blastings. For the past 30 years, trigger lines have been used to keep the road open during stretches of bad weather when flying is impossible, closing the road when an avalanche triggers one of the lines. This system, however, had its shortcomings: after every avalanche, it was inactive and the trigger lines needed to be replaced — a risky and costly job during winter. Furthermore, only avalanches that passed by the trigger lines were recorded.

SOLUTION

Since December 2015, a new system using radar technology has replaced the old trigger line system. In cooperation with Brig-based ForstIngPlus Geoprevent installed some brand new technology:
Two avalanche radars with a range of 2000 m and a horizontal opening angle of 90° survey an area of more than 2 km². They react within seconds, and immediately close the cantonal road by means of traffic lights and barriers. To prevent further traffic from entering the section between Täsch and Zermatt, a fifth traffic light is activated in Täsch. Local authorities receive prioritized SMS and calls (Swisscom eAlarm emergency), and live cameras installed along the road allow them to check on the situation immediately — even at night, as all cameras are equipped with infrared floodlights. If the avalanche has not reached the road, authorities can reopen it from their computers or smartphones within minutes.

This system is unique world-wide, combining the following technologies:

- Long range avalanche radars with wide opening angles (90°).
- Automatic road closure.
- Reopening per command issued from computer or smartphone.

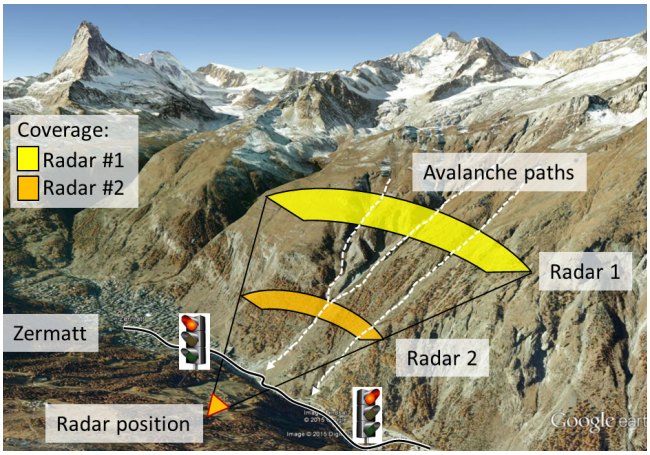

Figure 2: Overview of the alarm system in Zermatt. The radars are mounted on the opposite side of the valley.

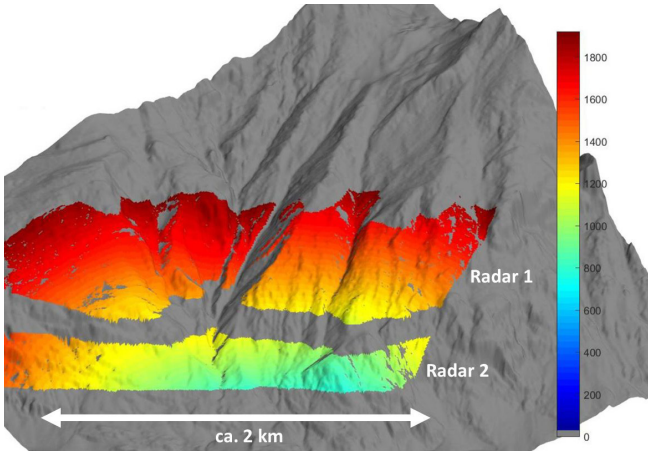

Figure 3: The radars monitor a total area of roughly two square km. The color in this graph indicates the distance to the radar in meters.