GEOPREVENT

AVALANCHE RADAR ROGERS PASS

PART OF HEXAGON

Avalanche detection system with autonomous power supply for automatic detection of avalanches at Rogers Pass, Canada.

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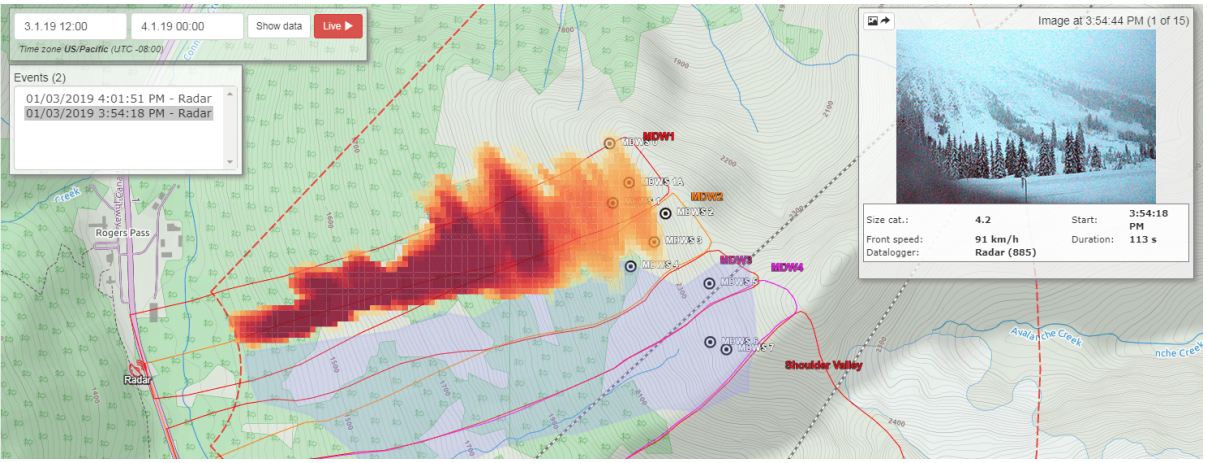

Title Page: The first avalanche radar system is installed below the summit of Rogers Pass and monitors the avalanche chutes across the valley at a distance of up to 3.5 km.

Figure 1: When the radar detects an avalanche, it is plotted on a map. A webcam, which automatically takes images, enables visual verification of the avalanche.

CHALLENGE

Connecting Canada's east and west coasts, the Trans-Canada Highway (TCH) is one of Canada's most important transportation routes. Around Rogers Pass, one of the highest points on the TCH, more than 140 avalanche chutes threaten the highway. As part of the world's largest Avalanche Control Program, Parks Canada and Canada's armed forces regularly trigger avalanches artificially during planned road closures, before large amounts of new snow can accumulate. Before the road can be reopened, authorities need to confirm that the avalanche release was successful – a tricky task at night or during a blizzard!

SOLUTION

Automatic avalanche detection systems can help to evaluate the success of an artificial release, even when visibility is low. Such a system also provides valuable information about snow stability and avalanche activity in the area. As part of a multi-year project supervised by Wyssen Avalanche Control, a comprehensive avalanche detection system consisting of radar and infrasound technology has been established. Geopraevent provided the radar part for this project with five avalanche radar stations of totally seven radars units. By merging of stations, we were able to use synergies in station design, e.g. in power supply and data transmission.

All stations include an avalanche radar, a camera, communication devices, a control cabinet and autonomous power supply provided by a combination of solar panels and a fuel cell. A camera immediately acquires time-lapse images, while the radar tracks the avalanche until it comes to a halt or disappears from view. The mapped avalanche track and important avalanche characteristics such as avalanche velocity and duration, are immediately visible on our online data portal. Authorized users can easily access the portal from their PC, tablet or smartphone to see when and where avalanches were released. In addition, the avalanche detection system instantly alerts selected individuals by text message of the avalanche release. Thanks to this system, employees of the Avalanche Control Program can continuously monitor avalanche activity – regardless of the weather or time of day.

Figure 2: The Trans-Canada Highway runs through the Glacier National Park, one of the snowiest areas in the world.

Figure 3: The avalanche radar reliably detects avalanches regardless of visibility and weather conditions: Day and night, in fog, snow or rain.