



Detection of Slope Instabilities Along the National Road 7, Mendoza Province, Argentina, Using Multi-Temporal InSAR

Clément Michoud (1), Marc-Henri Derron (1), Valérie Baumann (2), Michel Jaboyedoff (1), and Tom Rune Lauknes (3)

(1) Center of Research on Terrestrial Environment (former IGAR), University of Lausanne, Switzerland (clement.michoud@unil.ch), (2) Geological Survey of Argentina (SEGEMAR), Buenos Aires, Argentina, (3) Norut, Tromsø, Norway

About 2'230 vehicles per day pass through the National Road 7 that link Buenos Aires to Santiago de Chile, crossing Andes Cordillera. This extremely important corridor, being the most important land pass between Argentina and Chile, is exposed to numerous natural hazards, such as snow avalanches, rockfalls and debris flows and remains closed by natural hazards several days per year.

This goal of this study is to perform a regional mapping of geohazard susceptibilities along the Road 7 corridor, as started by Baumann et al. (2005), using modern remote sensing and numerical approaches with field checking. The area of interest is located in the Mendoza Province, between the villages Potrerillos and Las Cuevas near the Chilean border. The diversity of soil and rock conditions, the active geomorphological processes associated to post-glacial decompression, seasonal freeze and thaw and severe storms along the road corridor, increase the risk to natural hazard.

With the support of the European Space Agency (ESA Category-1 Project 7154), we have in this study processed a large number of ERS and Envisat ASAR scenes, covering the period from 1995 to 2000. We applied both the small-baseline (SB) and the persistent scatterer (PSI) multi-temporal interferometric SAR (InSAR) techniques. The study area contains sparse vegetation, and the SB InSAR method is therefore well suited to map the area containing mainly distributed scatterers. Furthermore, PSI algorithms are also used for comparison for selected landslides in the inventory.

Both approaches show a relatively good coherence within mountain areas, which is a good point for the landslide detections along the road. Indeed, the authors identified several large slope instabilities even active scree deposits. This inventory is finally compared with field observations and with existing susceptibility maps regarding snow avalanches, debris-flows and rockfalls.

The final objective of this project is to develop a risk strategy that will help local authorities to manage the risk along this highway and also to provide guidelines.