



## **Geomorphologic mapping in the Ny Ålesund area (Svalbard Island, Norway) for the analysis of geomorphologic effects on rock slopes induced by glacier retreat in climate sensitive High Arctic regions**

Enrico Miccadei (1), Tommaso Piacentini (1), Ruggero Casacchia (2), and Roberto Sparapani (2)

(1) Department of Engineering and Geology, Università degli Studi "G. d'Annunzio" di Chieti-Pescara, Chieti, Italy, (2) Department of Earth System Sciences and Technologies for the Environment, CNR National Research Council, Rome, Italy

The geomorphological effects of glacial retreat, rapidly changing Arctic environments and consequent local temporary permafrost melting are several types of glacial and periglacial landforms (pingos, solifluction, drumlins, etc.) but also debris and rock falls, alluvial fan and glacial outwash development and scarp/slopes retreat and evolution.

In this work we have realized a geomorphologic map of rockfalls, landslides, alluvial fans and the slopes and scarps of steep mountainsides in the Ny Ålesund area (Svalbard Island, Norway) focused on the analysis of rock falls as geomorphological effects of glacier retreat, permafrost degradation and higher temperatures on slope processes. The investigation is based on geological and geomorphological field survey, and remote sensing and aerial photo interpretation,

The Ny Ålesund area landscape is characterized by rugged non-vegetated mountains only partially covered by glaciers, with steep flanks and rock scarps; the scarps are formed by different types of rocks (intrusive and effusive igneous rocks, marine sedimentary rocks); this landscape is highly affected by debris and rock falls (from scarps and slopes) forming wide talus slopes and by alluvial fan and fluvial outwash (from glaciers), which make the surface sedimentary cover of the island together with rock glaciers and moraine deposits and locally fluvial deposits. The work is focused on the comprehension of the role of different factors in inducing rock falls, alluvial fans, slope/scarps evolution in high geomorphological sensitivity environments (i.e. glacial, periglacial or mountain) including: orography, lithology, rock fracturation, morphostructural setting, meteorological context. The conclusions focus on the possible geomorphological hazards affecting the Ny Ålesund area.