Prediction of glacial hazards and disasters in the Central Caucasus, Russia

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Glacial hazards (including debris flows, rockfalls, glacier avalanches, rock avalanches, glacial-lake outbursts), are an important threat to security worldwide. These processes act in response to the inherent instability of glacial environments and the rapid change these environments are undergoing due to global climatic change. Natural disasters resulting from glacial hazards were some of the most destructive in the last 100 years, and in which over 50,000 people have lost their lives. Moreover, glacial hazards have impacted on infrastructure downstream from glaciers.

We focus on the analysis of glacial hazards in the Caucasus Mountains of the Russian Federation, typified by the 2002 Kolka Glacier disaster. Enhanced risk management of glacial hazards will help saving of lives in this region.

This research project is sponsored by NATO’s Public Diplomacy Division in the framework of “Science for Peace".

In the project we develop and utilise state-of-the-art science and technology in the fields of remote sensing, glaciology, geomorphology, geotechnical engineering, geohazard assessment and risk management. We strive to integrate the existing methodology in these separate subjects into a novel multi-disciplinary approach to the assessment of glacial hazards for enhanced risk management. In this endeavour we will use existing tools and

software, as well as extensive field data already gathered in the Caucasus. We will also further improve tools and methodologies currently under development by project participants. Briefly these are GIS, satellite image analysis, dynamic modelling of catastrophic events, database development, field geomorphological, glaciological, hydrological, geological and meteorological methods.