Geophysical Research Abstracts, Vol. 8, 05471, 2006
SRef-ID: 1607-7962/gra/EGU06-A-05471

Natural hazards following a glacier disaster: forecast and mitigation measures (case study of the Central Caucasus)

K.N. Nosov (3), E.V. Zaporozchenko (3), S.S. Chernomorets (1), D.A. Petrakov (1), I.B. Seinova (2), O.V. Tutubalina (1)

(1) Faculty of Geography, Moscow State University, Russia, (2) University Centre for Engineering Geodynamics and Monitoring, Moscow, Russia, (3) North Caucasian Engineering and Design Institute for Water Industry and Land Reclamation (Sevkavgiprovodkhoz), Pyatigorsk, Russia (skgvh@skgvh.ru / Fax +7 8793-973862 / Phone +7 8793-393966)

20 September 2002 saw the biggest glacial disaster in the Russian history. The huge ice-rock-water flow from the Kolka glacier went down the Genaldon river valley. Having covered the distance of 18.5 km, it was stopped by the gorge of the Skalisty Range and filled the preceding Karmadon depression with 1.15 x 10^7 m^3 of deposits. The ice-rock-water mass has been pressed through 2 km of the narrow gorge and formed a debris flow for 10 km downstream devastating all the constructions in the riverbed. 125 people were lost. For two months before the disaster a series of frequent rock and ice collapses onto the glacier have been triggering the event. Eventually most of the glacier was knocked out and went down the valley. The 100-150 meter high water-ice-rock-and-air mass was moving down the 400-500 meters wide valley, cutting the frontal masses of three large ancient landslides on the way. The post-disaster hazards and risks are due to: the filling of the Karmadon depression by the ice-rock mix; the formation of a large dammed lake; the filling of the gorges by the deposits of the debris flow. The dammed lake discharges naturally. Residual water volume in 2005 was below 0.25 x 10^6 m^3. In 2002-2005 the debris flow deposits have not stabilized. They are easily erodible. The wave with the discharge rate of $\geq$20-30 m^3/sec or the storm flood of a 0.01 probability can trigger a debris flow with up to 4 x 10^6 m^3 deposits, adversely affecting the riverbed in the densely populated foothill areas and calling for dedicated mitigation measures. In the Kolka glacier cirque new ice and snow masses are accumulating, but the critical mass will not be reached before 2025.