Geophysical Research Abstracts
Vol. 20, EGU2018-176, 2018
EGU General Assembly 2018

Mudflows in small river basins in southern Sakhalin Island and their negative impact on water objects

Evgenii Nemchinov (1) and Valeria Rasputina (2)

(1) Saint-Petersburg State University, Earth sciences, Hydrology, Russian Federation (evgeny.nemchinov@gmail.com), (2) Saint-Petersburg State University, Earth sciences, Hydrology, Russian Federation (rasputina.valera@mail.ru)

The Sakhalin Island is characterized by regular natural disasters including mudflows.

Studies of mudflow processes on small rivers in lowlands of Southern Sakhalin carried out by the Sakhalin Branch of the Far East Geological Institute of the Russian Academy of Sciences in 1998-2017 demonstrated some problems resulting from calculation inaccuracies of mudflow characteristics and assessment biases of the impact on objects and constructions because peculiarities of rainfall distribution in mountainous area were not considered. The aim of our study was to analyze small mountain streams/rivers of the Susunay ridge and their mudflow potential.

In is traditionally accepted that mudflow torrents are typical for large river drainage areas. However mudflow torrents can take place in small river basins when combinations of several factors occur: heavy rainfalls, deep gorges and high picks, unfavorable lithological structure. Rivers and streams near settlements are especially dangerous. Southern Sakhalinsk is a typical example of such dangerous situation.

The greatest threat to the city is posed by the mudflow torrents that are formed on left-bank inflows of the river Susuy. The study was performed in the drainage area of the Rogatka River because the main fresh water intake of the city is located here. It is necessary to assess the risk of intake of torrential material into water reservoir located near the city as well as an indirect impact on it. Mud and stone torrents are characteristic for the area of Susunay ridge. Left inflows of the Rogatka River have been chosen for the inspection of torrential processes.

The Rogatka River drainage area has high mudflow potential. The volume of recorded mud flows exceeds 100 thousand cubic meters.

Data collected during field expeditions in June 2017 were used to estimate characteristics of the mudflow basins and to assess dynamic parameters of mudflows. Assessment of mudflow risk was carried out according Ragozin's method adapted for water reservoirs.

Our calculations demonstrated that small mountain streams of the Susunay Ridge are potential source of mudflows that can have negative impacts on infrastructure objects of human settlements.