Geophysical Research Abstracts
Vol. 21, EGU2019-1218, 2019
EGU General Assembly 2019
© Author(s) 2018. CC Attribution 4.0 license.

Modelling of the high density debris flows in the Transbaikal region

Daria Sokolova (1) and Tatyana Vinogradova (2)

(1) Institute of earth Sciences, St. Petersburg state University, Saint-Petersburg,Russian Federation, (dafna2895@mail.ru), (2) Institute of earth Sciences, St. Petersburg state University, Saint-Petersburg, Russian Federation, (vinograd1950@mail.ru)

Debris flows are one of the most dangerous hydrological phenomena in mountainous regions. Such events as debris flows can cause massive human losses, destruction of cities and towns, bridges and transport routes. Such hazard must be carefully studied for prevention actions. However, the problem of calculation the debris flows still remains unsolved. The calculation methods developed by various researches give certain errors. Unfortunately. empirical formulas are used to calculate debris flows.
The aim of the study is assessment of the debris flow characteristics with the use of the transport- shift process model using the example of the Trans-Baikal region. The most important parameters are the discharges of the debris flow, debris flow density and velocities. Currently the settlements in mountainous areas are rapidly increasing
The object for modeling debris flows is the region of Transbaikalia, the mountains of the Stanovoi highland. These mountains stretch for seven hundred kilometers from the northern tip of Lake Baikal to the middle reaches of the Olekma River. The high ruggedness of the terrain, large slopes, easily destructible rocks and a monsoon climate create excellent conditions for the descent of debris flows in the area. For the calculation, more than ten debris flow streams in this region were selected, along which debris flows descend about every five years.
To calculate the characteristics of the debris flow, a model of the transport- shift process was developed, developed in Russia by Professor Vinogradov Yu.B (Vinogradov Yu.B., 2010). High-density debris flows occur as a result of the development of the transport- shift process are the most frequent and dangerous ones. The model is based on the equations of the coefficient of instability of the potential debris flow array, the elementary potential power of the flow and the mobility index of the debris flow mass. The verification of the model was carried out using measured data on experimental (in natural conditions) debris flows (Vinogradova T.A., Vinogradov A.Y., 2017). Artificial debris flow experiments were conducted in 1972-76 years in the Chemolgan river, organized by the Kazakh research hydro-meteorological Institute.
The results modeling and assessment of the results will be provided in presentation.