Flash floods at the Black Sea coast of Russia: the challenges of hydrological characteristic assessment in data-sparse mountainous region

Tatyana Vinogradova (1), Olga Makarieva (1,2,3), Nataliia Nesterova (1), Irina Beldiman (2), and Aleksandra Kolupaeva (1)

(1) St. Petersburg State University, Russia, (2) Gidrotehproekt Ltd, Yakutsk, Russia, (3) Melnikov Permafrost Institute, Yakutsk, Russia

Flash floods are typical for the Black Sea coast of Russia. Densely populated areas in valleys of small mountainous watersheds suffer from catastrophic peak floods caused by intense rains in higher altitudes. This study aimed to assess flood characteristics for past and future at several small watersheds, located at the Black Sea coast in the piedmont area of the Caucasus Mountains. The task is complicated by the sparseness of meteorological and hydrological observational network in the region.

The hydrological model Hydrograph coupled with stochastic weather generator was applied.The results of deterministic-stochastic modelling are compared with the assessments made according to the Recommendations for engineering hydrological practice used in Russia. The results show that the Recommendations based on statistical analysis of historical data are not reliable in the conditions of changing climate and significant decrease of number of hydrological and rain gauges in the region. Hydrological modelling is proposed as the alternative approach.