

Geomorphological factors of flash floods

Yulia Kuznetsova

Laboratory of Soil Erosion and Channel Processes, Faculty of Geography, Lomonosov Moscow State University, Moscow, Russian Federation (kuzyulia@gmail.com)

Growing anthropogenic load, rise of extreme meteorological events frequency and total precipitation depth often lead to increasing danger of catastrophic fluvial processes worldwide. Flash floods are one of the most dangerous and less understood types of them. Difficulties of their study are mainly related to short duration of single events, remoteness and hard access to origin areas. Most detailed researches of flash floods focus on hydrological parameters of the flow itself and its meteorological factors. At the same time, importance of the basin geological and geomorphological structure for flash floods generation and the role they play in global sediment redistribution is yet poorly understood. However, understanding and quantitative assessment of these features is a real basis for a complete concept of factors, characteristics and dynamics of flash floods.

This work is a review of published data on flash floods, and focuses on the geomorphological factors of the phenomenon. We consider both individual roles and interactions between different geomorphological features (the whole basin parameters, characteristics of the single slopes and valley bottom). Special attention is paid to critical values of certain factors. This approach also highlights the gaps or less studied factors of flash floods. Finally, all data is organized into a complex diagram that may be used for flash floods modeling. This also may help to reach a new level of flash flood predictions and risk assessment.