

Early warning method of Glacial Lake Outburst Floods based on temperature and rainfall

Jingjing Liu (1,2), Pengcheng Su (1), and Zunlan Cheng (1)

(1) Institute of Mountain Hazards and Environment, Chinese Academy of Sciences, China (liujingjing@imde.ac.cn), (2) State Key Laboratory of Hydrology-Water Resources and Hydraulic Engineering, Hohai University, China

Glacial lake outburst floods (GLOFs) are serious disasters in glacial areas. At present, glaciers are retreating while glacial lake area and the outburst risk increases due to the global warming. Therefore, the research of early warning method of GLOFs is important to prevent and reduce the disasters. This paper provides an early warning method using the temperature and rainfall as indices. The daily growth rate of positive antecedent accumulative temperature and the antecedent thirty days accumulative precipitation are calculated for 21 events of GLOF before 2010, based on data from the 21 meteorological stations nearby. The result shows that all the events are above the curve, $T_V = -0.0193R_{DC} + 3.0018$, which can be taken as the early warning threshold curve. This has been verified by the GLOF events in the Ranzeaco glacial lake on 2013-07-05.