



## **Risk Assessment of Glacier-lake Outburst from Ranwu to Tongmai in Southeast Tibet Based on Remote Sensing**

Jianrong Fan, Xuan Li, Yong You, and Jinfeng Liu

Institute of Mountain Hazards and Environment, Chinese Academy of Sciences, Chengdu, China(fjrong@imde.ac.cn)

**Abstract:** There are more than half of maritime glaciers in china concentratedly distributed in Southeast Tibet. At the same time, it is also a region suffering serious hazards of glacier-lake outburst. So, the Southeast Tibet region from Ranwu to Tongmai was selected as the study area in this paper. In order to assess the risk of glacier-lake outburst from five characteristics including glacier features, the scale of glacier-lakes, meteorological conditions, moraine dam parameters and downstream channel characteristics, nine factors which are accessible and convenient for quantification were selected. At first, we used MODIS (Moderate Resolution Imaging Spectroradiometer) land surface temperature product and TRMM (Tropical Rainfall Measuring Mission) precipitation data to calculate monthly mean surface temperature, surface temperature change rate, and annual rainfall factors. Then, glacier area, downstream channel slope, distance from tip of ice tongue to glacial-lake, area of supply glaciers, average slope gradient of glacier snow cover, and terminal moraine dam crest width factors were obtained based on Landsat TM images and DEM (Digital elevation model) data. Finally, fuzzy comprehensive evaluation method was used for assessing the glacier-lake outburst hazards in the study area. According to the results, there are 130 glacier-lakes in total, 10 of them are high hazardous, 8 glacier-lakes are medium hazardous, 2 glacier-lakes are low hazardous, and 110 glacier-lakes are extremely low hazardous. The evaluation results reflect the risk of the glacier-lakes in Southeast Tibet, which can provide guidance and reference for hazards prevention in this area.

**Key words:** Southeast Tibet; glacier-lake outburst; fuzzy comprehensive evaluation; remote sensing