

Gis based inventory of rock glaciers and their spatial characteristics in the Yarlung Tsangpo River Basin

LIU Shiyin^{1,2*}, GUO Zhiming^{1,2}, ZHU Yu^{1,2}, QIANG Xinxin^{1,2}

1. Institute of International Rivers and Eco-security, Yunnan University, Kunming, China
2. Yunnan Key Laboratory of International Rivers and Transboundary Eco-security, Yunnan University, Kunming, China

Corresponding author: shiyin.liu@ynu.edu.cn

Abstract. Rock glaciers are important periglacial phenomena in high mountain regions. The Yarlung Tsangpo River basin in the Tibet Autonomous Region of China, the distribution of rock glaciers and their hydrological and environmental effects are poorly understood in the basin. We have produced the first comprehensive inventory of rock glaciers in the Yarlung Tsangpo River basin through the fine spatial resolution satellite data that is freely available on Google Earth, we identified 372 rock glaciers based on their morphological features. We then generated attributes of these rock glaciers including the average length, width, slope, orientation, average elevations of the upper and lower limits, their average elevation and median elevation, as well as hypsometry of each glacier. Through statistical analysis, we show that rock glaciers are situated between 4307 and 5814m a.s.l, with the mean minimum elevation at the front estimated to be 4427 m a.s.l, and the mean maximum elevation at the front estimated to be 5731 m a.s.l. The majority (53%) were found to have a northerly aspect (NE, N, and NW). It provided an important basis for our further understanding of the rock glacier in the Yarlung Tsangpo River basin.

Keyword: The Yarlung Tsangpo River, Rock glacier, hypsometry, remote sensing