

Monitoring on Ice-dammed Lake and Related Surging Glaciers in Yarkant River, Karakorum in 2009

NIU Jingfei^{1,2}, LIU Jingshi¹, WANG Di¹, Kenneth Hewitt³

(1. Institute of Tibetan Plateau Research, Chinese Academy of Sciences, Beijing 100085, China;

2. Graduate University, Chinese Academy of Sciences, Beijing 100049, China;

3. Cold Regions Research Centre, Wilfrid Laurier University, Waterloo, Ontario N2L 3C5, Canada)

Abstract: Under the influence of climate and glacier changes, Glacier Lake Outburst Floods (GLOFs) occurred frequently in Yarkant River, Karakorum, China, in recent years. Using China Environment and Natural Disaster Monitoring Satellite images (HJ-1A/1B), source of floods in upstream Yarkant River was under dynamic monitoring from May to September in 2009. During this period, an expanding ice-dammed lake was found in the glacier terminus of KYagar. However, in early August the ice-dammed lake suddenly disappeared, leaving a large number of ices in the river valley. This phenomenon is significantly different from previous years. Related hydrological records and analysis of historical data show a sudden advancing of glacier terminus damaged the ice dam, leading to the break out of ice-dammed lake. The results suggested that infrequent glacier surging occurred in KYagar glacier, and further monitoring will be conducted near future.

Key words: Karakorum, ice-dammed lake, glacier surging, HJ-1A/1B, SPOT

封面照片说明: 四川绵竹清平泥石流灾害

四川省绵竹市清平乡地处绵远河上游, 位于龙门山腹心地带, 属 2008—05—12汶川 8 级地震的极重灾区, 地震烈度达 X 度, 由地震引起的次生山地灾害极为发育。受地震激发, 在绵远河左侧支流文家沟内形成了一个巨型滑坡——文家沟滑坡, 其堆积物体积约达 $5 \times 10^7 \text{ m}^3$, 成为形成泥石流的松散固体物质来源。此后, 在 2008—2010 年的汛期, 受暴雨作用, 文家沟先后暴发了 5 次大规模和特大规模的泥石流灾害, 其中以 2010—08—13 的泥石流规模最大, 泥石流堆积量方量大于 $300 \times 10^4 \text{ m}^3$ 。

2010—08—13 在暴雨作用下, 清平乡及其附近的绵远河支流几乎沟沟都暴发了泥石流, 并且普遍规模巨大, 把大量的泥沙石块倾泻至绵远河中, 这当中文家沟和走马岭沟泥石流规模最大, 对清平乡及绵远河的危害也最大。泥石流淤埋房屋、堵断主河、毁坏公路, 清平乡地震后恢复重建起的居民住房、学校、桥梁等等, 普遍遭受淤埋, 导致 14 人死亡 (含失踪); 泥石流在绵远河河谷地带形成的巨大堆积扇相互重叠, 将清平乡一带河道完全淤满, 形成一个长约 3 km 宽 150~500 m 的堆积区, 堆积厚度达 5~15 m, 总方量约 $7 \times 10^6 \text{ m}^3$ 。严重的泥石流灾害, 再一次为受强烈地震破坏的山区安全选址重建, 提出了警示!

照片为文家沟沟口 2010—08—13 泥石流堆积状况。

(嘉 益)