气候变化研究进展 2007 03 (03): 132-137 ISSN: 1673-1719 CN: 11-5368/P

研究论文

天山乌鲁木齐河源 1 号冰川消融对气候变化的响应

李忠勤 沈永平 王飞腾 李慧林 董志文 王文彬 王林

中国科学院寒区旱区环境与工程研究所 中国科学院 寒区旱区环境与工程研究所

收稿日期 2007-5-8 修回日期 网络版发布日期: 2007-5-30

摘要 目前气候变暖导致的冰川退缩，引起了全世界的广泛关注。 以新疆天山乌鲁木齐河源1号冰川为例，根据1958年以来的观测资料，研究了冰川消融对气候变化的响应。结果表明，近50 a来冰川在表面粒雪特征、成冰带、冰川温度、面积、厚度及末端位置等方面发生了显著变化，而这些变化均与气温的升高有着密切的联系；20世纪80年代以来的快速升温，使冰川的退缩出现了加速趋势，冰川融水径流量也呈加速增大趋势。

关键词 冰川消融 气候变暖 天山 乌鲁木齐河源1号冰川

分类号

Response of Melting Ice to Climate Change in the Glacier No. 1 at the Headwaters of Urumqi River, Tianshan Mountain

Abstract Current glacier recession under climate warming has drawn widely attention around the world. Initiated from 1958, the observations of Urumqi Glacier No. 1 at the headwaters of Urumqi River in eastern Tianshan promise the best datasets of glacier and climate changes in China. Taking Urumqi Glacier No. 1 as an example, this paper has analyzed the response of the glacier to the climate change. The results show that during the past 50 years, remarkable changes occurred on the glacier, including snow-firn stratigraphy, glacial zone, glacial temperature (borehole temperature), glacier area, and glacier terminus position etc. These changes are found to be closely related to temperature rise in this area. The glacier retreat appeared throughout the entire observed time period and has shown an accelerated tendency during the last 20 years, particularly after 1995. In addition to summer temperature increase, other two reasons may also be responsible for the acceleration of glacier melting: one is the glacial temperature rise, which reduced the cold reserve in the glacier and thus increased the sensitivity of the glacier to air temperature rise; the other is the decrease of albedo on the glacier surface, which evidently enhanced absorption of radiation.

Key words glacier melting climate warming Tanshan Mountain Urumqi Glacier No. 1

DOI

通讯作者 李忠勤 lizq@lzb.ac.cn