Title:	Assessment and Modeling of Glacier Lake Outburst Floods in the Chandra Basin, Himachal Pradesh, India.
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Abstract:	As the global temperature is on the rise and climate change is accelerating, glaciers all around the world are melting and retreating at an alarming rate, resulting in the rapid expansion of glacial lakes and ultimately posing a significant risk of catastrophic events like Glacier Lake outburst floods (GLOFs). This present study focuses on assessing the temporal growth and potential GLOF hazards of two major proglacial lakes, Ghepan Gath and Samudra Tapu, in the Chandra Basin Himachal Pradesh, India. The study utilizes a combination of Remote sensing and GIS techniques along with hydrodynamic modeling to analyze changes in lake parameters, followed by hydrodynamic modeling to compute various hydraulic GLOF characteristics and their impact downstream. The results show a notable increase in both glacial lake parameters, indicating a growing risk of GLOFs in the region. GLOF modeling was conducted using HEC-RAS software to simulate various breach scenarios and assess their potential impact on downstream areas. The findings reveal that the worst-case scenarios could lead to peak discharges of 8090.21 m 3 /s for Ghepan Gath Lake and 12,233.46 m 3 /s for Samudra Tapu Lake, reaching downstream settlements of Sissu and Batal within minutes to hours after the dam breach initiation. Risk assessment and infrastructure mapping were done to identify high-risk zones, and the results revealed that many settlements, infrastructure, and agricultural land near the riverside are exposed to potential future GLOFs. The study underscores the urgent need for proactive GLOF risk management strategies, including improved early warning systems, sustainable land-use practices, and infrastructure resilience. Overall, This study provides valuable insights into the changing dynamics of glacier lakes in the Himalayas and emphasizes the importance of monitoring and mitigating the impacts of potential future GLOFs in the region.
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