

# Simulations show thousands of lakes in Himalaya Mountains at risk of flooding due to global warming

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The north face of Mount Everest seen from the path to the base camp in Tibet Autonomous Region, China. Credit: Luca Galuzzi/Wikipedia.

Three researchers with the University of Potsdam report that thousands of natural lakes in the Himalayas are at risk of bursting their moraines due to global warming and causing flooding downriver. In their paper published in *Proceedings of the National Academy of Sciences*, Georg

Veh, Oliver Korup and Ariane Walz describe simulations they ran on lake models and what they showed.

As [climate change](#) continues unabated, scientists are trying to predict what might happen around the world. The region of the Himalayas has already seen some dramatic changes—as [glaciers](#) melt, natural lakes have formed—85 of them in the Sikkim Himalaya between 2003 and 2010. Such lakes form naturally as water makes its way down the mountains, pooling in crevasses—they can present a danger to those living downstream when one of their borders is a natural levee called a moraine. These barriers are made of loose rock and dirt held together by ice. If the ice melts, the moraine gives way, resulting in what the researchers describe as glacial lake outburst floods (GLOFs), several of which have already occurred in recent decades. In this new effort, the researchers sought to learn more about what might happen in coming decades as the glaciers continue to melt, putting ever more pressure on moraines.

To see what might happen as higher temperatures melt Himalaya glaciers, the researchers carried out 5.4 billion simulations based on [lake](#) models developed with topographic and satellite data. After running the simulations, they report that they found approximately 5,000 lakes in the Himalayas are likely unstable due to moraine weaknesses. They also noted that those lakes with the highest risk of a GLOF were the ones with the largest volume of water. And they found that risks from flooding due to GLOFs in the near future were three times higher in the eastern parts of the Himalayas. They note that prior research has shown that up to two-thirds of Himalayan glaciers are going to disappear in the next decade, indicating that a lot of water buildup in lakes is going to pose a serious threat to those living downstream.

**More information:** Georg Veh et al. Hazard from Himalayan glacier lake outburst floods, *Proceedings of the National Academy of Sciences*

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