

Ice avalanche culprit? Too early

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London: The deadly flooding in Nepal on Wednesday was likely set off at least in part by an enormous chunk of ice snapping off a glacier and cascading thousands of feet to the valley below, according to an initial assessment by a group of geologists and glaciologists. The phenomenon is known as an ice avalanche.

"It looks like a glacier in the area basically snapped off in a clean break, allowing it to fall just over a vertical kilometre to the valley bottom," said Daniel Shugar, a geologist at the University of Calgary in Canada who studied satellite imagery to analyse what happened. "The bottom looks like a bomb exploded — it's just deposits from the broken-up glacier," he said. But he said that it was too early to rule out other possible factors behind the flash flooding.

A chunk of ice with a width of about 2,000 feet snapped cleanly off the glacier, Shugar said, sending a mixture of ice and water to the valley floor. By his assessment, the chunk of ice fell from an altitude of around 17,000 feet, dropping almost 4,000 feet.

"This is a big chunk of ice that is stored at high elevation



The debris-choked banks of the Trishuli river in Nepal's Nuwakot district after the flash flood on Wednesday. (AP)

in the mountain, with a huge amount of potential energy," said Simon Cook, a glaciologist at the University of Dundee in Scotland who also worked on the satellite analysis. When it breaks off, he added, the sheer force of the drop pounds the ice into a dangerous, fast-moving mix. "That ice just gets pulverised into water," he said.

According to the group's analysis, the flow of ice moved northwest along the valley toward the Bhotekoshi River, at the border between Nepal and the Chinese territory of Tibet.

Cook said the ice avalanche recalled a similar event in India in 2021, when a Himalayan glacier broke and caused

major flooding in Uttarakhand, killing more than 100 people.

Kristen Cook, a geomorphologist at the University of Grenoble in France, said that local seismic readers indicated that a large mass had suddenly moved downhill in the area at around 8.40am local time. That was followed immediately by a "flow signal", which indicates flooding.

"I see a signal that is quite large at the start of the event, but it does not look like an earthquake," she said. "When we combine this with what we know about the area and satellite imagery, we come to a preliminary interpretation that

this was most likely a rock-ice avalanche that transitioned into a flow as it moved downstream."

At around that time, the United States Geological Survey recorded 4.4-magnitude tremors in the area. The scientists said they were still analysing data to determine whether the force of the avalanche above ground could have set off the tremors.

Though complete weather data is not yet available, Shugar said satellite images show a vanishing snow cover over the previous day, indicating warmer temperatures that may have melted the glacier and contributed to the ice avalanche.

Shugar added that overcast conditions meant that up-to-date satellite imagery remained incomplete, and that scientists' understanding of the cause of the flooding would become clearer in the coming days. He said it was too early to rule out other contributing factors.

"The amount of water in the videos is astounding, an order of magnitude bigger than other recent glacial disasters like this," he said. "It's very possible that there's another culprit here."

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