

# Falling lake an omen of change in global permafrost landscape

N.W.T. lake's collapse in July is expected to become a natural process occurring in Canada's Arctic and across the world's permafrost region.

Thaw slump and lake drainage near Fort McPherson, NWT, Canada



By **MICHAEL ROBINSON** Staff Reporter  
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Like Humpty Dumpty on top of a wall, a [clifftop lake just had a great fall.](#)

The dramatic drainage event was video-recorded by Northwest Territories Geological Survey (NTGS), which used remote cameras to catch the gushing action on July 15.

The recently released footage shows the equivalent of an icy mudslide in which half of the lake's volume — estimated to be about 30,000 cubic metres of water, comparable to a dozen Olympic-sized swimming pools — was drained in about two hours by way of a 10- to 15-metre-high temporary waterfall.

Things took a turn for the worst on the Peel Plateau when a thawing embankment surrounding the 1.5-hectare lake gave way, causing it to pour into a valley below. This thaw slump — a result of ice-rich permafrost thawing — had been growing for about a decade by the time it collapsed.

Scientists are calling the high-magnitude event just another example of Canada's Arctic grappling with the effects of climate change.

**Article Continued Below**

William Quinton, co-director of the Cold Regions Research Centre at Wilfrid Laurier University, called the lake drainage a “really dramatic example” of what happens when a “permafrost-like dam” is thawed.



This small unnamed lake in the Northwest Territories burst through a rapidly shrinking rampart and plunged 200 metres into the Mackenzie Valley in July. (SCOTT ZOLKOS / THE CANADIAN PRESS)

“If you remove the dam by thawing it, it can no longer hold back water and it will flood away rather quickly,” he said.

“In this case, it’s not just a leaky dam ... it’s a full-on, catastrophic failure.”

Carleton University geography professor Chris Burn cited an increase in the number of rainstorms in the region as a culprit behind the hillside collapse.

The frozen ground expert said the rainfall creates “little landslides that uncover glacier ice that was buried 12,000 years ago.”

“For many years, we thought of the permafrost environment as a static because permafrost — permanently frozen — suggests that the land is completely locked up,” Burn said. “But what we are seeing now is things like increased rainfall make the environment dynamic.”

Robin McKillop, a geomorphologist with Palmer Environmental Consulting Group Inc., said the summertime event could have also had an impact on separate aquatic ecosystems situated downstream.

When the water flowed over and through the melting ice wall, it brought along pieces of slump debris with it.

Once mixed in with other water sources, stirred-up sediment in the form of silt, clay and stones can become trapped in a fish’s gills, making it harder for them to breathe. The displaced debris can also cover up the bottom-dwelling bugs that fish prey on for food.

The event overall reinforces the longtime risk of developing infrastructure, such as pipelines, roads and runways, across Canada’s Arctic landscape. Quinton suggests these types of high-magnitude events place pressure on the N.W.T. government to manage the availability of water resources.

The lake’s collapse is not considered to be a one-time event, either. According to McKillop, the natural process is expected to occur not just in Canada’s Arctic but across the world’s permafrost region.

“This is an example of what is to come,” he said of the geohazard event turned YouTube spectacle. “The continued thawing of ice-rich permafrost will have an impact on the land as we know it today.”

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