Greenland ice sheet meltwater can flow in winter, too
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Greenland to see if any of this meltwater was also leaving the ice sheet during winter. In February 2015, he and his colleague Colin Gleason of the University of Massachusetts at Amherst dragged a ground-penetrating radar across frozen rivers downstream of the edge of the ice sheet and drilled boreholes to see if any water was leaving the ice sheet and flowing beneath river ice. They surveyed rivers draining five Greenland Ice Sheet outlet glaciers and discovered meltwater flowing at just one site, the Isortoq River. In summertime, the Isotoq drains meltwater from the terminus of the Isunguata Sermia outlet glacier. In winter, the river appears frozen, but Pitcher and Gleason found slowly flowing liquid water there.

It was "a trickle, not a torrent," Pitcher said, and the water was flowing below half a meter of ice while temperatures were well below zero. Pitcher and Gleason collected water samples and geochemical analysis indicated that it had come from under the ice sheet itself.

The team concluded that it is possible the bed of the Greenland Ice Sheet can stay wet and drain small amounts of water year-round. This finding is important for understanding how meltwater from the ice surface moves through the ice sheet, is retained, refreezes and/or ultimately drains into rivers and/or the global ocean.

It is often assumed that Greenland's drainage system lies dormant during winter. Pitcher's team's findings highlight a growing need for year-round Arctic hydrologic investigations, not just in summer.


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