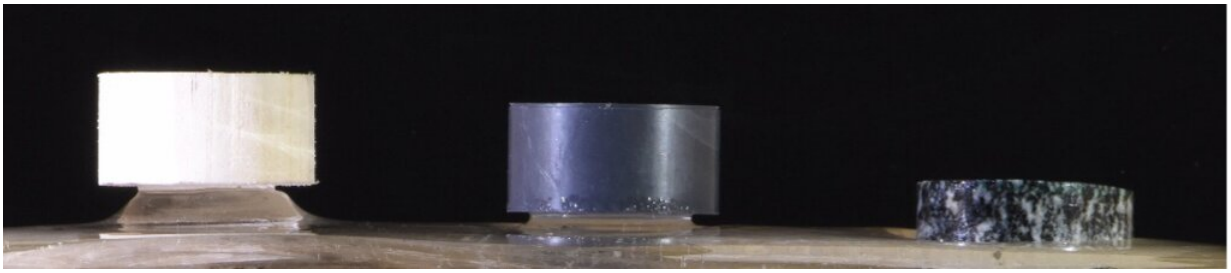
# How glacier tables are formed

September 16 2021, by Bob Yirka



Homemade glacier. To replicate glacier table formation, cylindrical stones made of polystyrene, PVC, and granite were placed on a plate made of ice. As the ice melted, the plastics (polystyrene and PVC) formed tables because they are relatively poor conductors of heat, whereas the granite—a stronger heat conductor—sunk into the ice. Credit: M. Hénot et al.

A trio of researchers at the University of Lyon, has learned via lab experimentation how glacier tables are formed. Marceau Hénot, Nicolas Plihon and Nicolas Taberlet have published their findings in *Physical Review Letters.*

Glacier tables are large boulders sitting atop columns of ice on glaciers. They are commonly seen around the bases of glaciers and do not occur at higher elevations. How they form has been a matter of opinion for many years. In this new effort, the researchers sought to answer the question.

Glacier tables appear at first sight as unnatural because they seem to balance atop a much thinner column of ice. They also raise the question

of why they do not just sink into the glacier as the ice below melts. To find out why they do not, the researchers set up multiple experiments in their lab.

The experiments began with the creation of 3-cm-thick slabs of ice that slant at angles similar to those of glaciers in nature. Each of the slabs was left to sit on a counter to melt, allowing the researchers to understand the factors contributing to their melting. They found it was both the warmth radiating from the lab walls and warmth in the air surrounding them. They noted that water runoff did not appear to have much of an impact on the time it took for their tiny glaciers to melt.

Next, the researchers placed small cylinders made of multiple materials with varying heat conductance atop the ice slabs and once again allowed them to melt. They found that some of the cylinders had formed glacier tables and some had not.

In studying the differences between those cylinders that formed tables and those that did not, the researchers found that heat conductance was the main factor—those that were poor heat conductors formed tables. Polystyrene cylinders, for example, were found to form a blanket of sorts, protecting the ice beneath the cylinder from melting, but only under the cylinder. The ice around it melted, leaving the cylinder sitting atop a column of ice. The researchers also found that shape played a role. Thinner cylinders were more likely to result in glacier tables than thicker cylinders. Thicker cylinders (or boulders), they noted, absorb more heat, which can find its way to the ice below.

**More information:** Marceau Hénot et al, Onset of Glacier Tables, *Physical Review Letters* (2021). DOI: 10.1103/PhysRevLett.127.108501 . On *Arxiv*: arXiv:2103.09760v3 [physics.flu-dyn], arxiv.org/abs/2103.09760

© 2021 Science X Network

Citation: How glacier tables are formed (2021, September 16) retrieved 13 March 2024 from https://phys.org/news/2021-09-glacier-tables.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.