

Glacier song

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Mountain glaciers represent one of the largest repositories of fresh water in alpine regions. However, little is known about the processes by which water moves through these systems. In this study published in *Geology* on 24 Oct. 2014, David S. Heeszel and colleagues use seismic recordings collected near Lake Gornersee in the Swiss Alps to look for signs of water moving through fractures near the glacier bed. Analysis of these recordings reveals, for the first time, that harmonic tremor occurs within mountain glaciers and that individual icequakes at the glacier base can exhibit harmonic properties.

These observations suggest that there is a complex network of fluid-induced fracture processes at the glacier base. Because glacial lake drainage events can occur with little or no warning, there is the potential for damaging floods in valleys below the glacier. Unfortunately, because the water moves under and through the glacier, surface observations alone cannot predict lake drainage events.

Modeling changes in the observed harmonic frequencies indicates that the spectral characteristics of seismic data can provide important information about hydraulic fracture geometry and fluid pressure at depth, leading to important insights into subglacial hydrologic processes. Future modeling of these processes may lead to improved glacial outburst flood hazard predictions.

More information: Humming glaciers, David S. Heeszel et al., Published online ahead of print on 24 Oct. 2014; [dx.doi.org/10.1130/G35994.1](https://doi.org/10.1130/G35994.1)

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