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Local teacher explores Antarctic glaciers

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Sumbitted by Timothy Dwyer

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I touched a glacier for the first time the other day. The river of ice flowing down the slopes of Mount Erebus and out into McMurdo Sound near Cape Barne is known as the Barne Glacier. Where it runs into the ocean, it's close to 100 feet tall and towers in a craggy, fissure-filled wall over our dive hut near Cape Barne. Below the sea ice, it slides down into the black, much farther than I can swim or see, or would even want to. Next to the underwater boulder field deposited by the freeze/thaw cycle of the basaltic cliffs above, the subtidal Barne Glacier forms an unbroken wall of white, curling up overhead and creating a dark and cavernous chamber at the edge of the deep.

Sea ice and glacial ice are formed by two entirely different processes. The fast ice under which we dive is frozen seawater, cooled to the point of freezing and expelling much of its salt in the process. In McMurdo Sound, the ice held fast in place against the land creates a flat, unbroken horizon of white that will eventually begin to melt, splitting up at the height of the austral summer and blowing north as an ice floe, out into the Ross Sea. The fast ice in McMurdo Sound thickens to about 8 feet, but can reach thicknesses of 15 feet under the right conditions. Despite the hazards of cracks and territorial seals, fast sea ice serves as highway for both penguin and research team, creating an open terrain that allows for easy travel, during part of the year at least.

Glacial ice is the product of hundreds of thousands of years of snowfall, compacting and freezing solid, rising to great heights over the land, slowly flowing into the sea and even weighing down the Earth's crust at the same time. Glacial ice is formed from fresh water and preserves a long-term record of the conditions under which it formed. The large glaciers that sit on land are known as ice sheets; ice shelves are the edges of glaciers that flow into the oceans and float upon them. They can be hundreds, or even thousands of feet thick and by breaking off, or calving, into the sea, give birth to giant icebergs. In the Ross Sea, slightly warmer water from deep down melts the base of these shelves where they contact the bedrock underwater – the grounding line. In swimming up to the grounding line of the Barne Glacier, I had the profound experience of putting my gloved hand on half a million years of the planet's story before it eventually breaks free and drifts into the Ross Sea.



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