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Preliminary results from the first ice core drilled in the Cordillera Darwin Icefield, Chile

Content

In recent decades, glaciers have been shrinking worldwide in response to increasing surface temperatures, contributing significantly to sea-level rise. The impact of climate change on glaciers has been widely observed along the entire South American Andes, but particularly in the icefields of Patagonia and the Cordillera Darwin. Glacier volume changes in these regions account for 10% of the non-polar contribution to sea-level rise, the largest contribution to sea-level per unit glacier area in the world. Despite their relevance, only the icefields from Patagonia have been widely studied. The Cordillera Darwin icefield has remained mostly uncharted.

The Cordillera Darwin icefield is located in an isolated region in the southernmost mountain range in the South American Andes. In 2020, as part of a National Geographic funded expedition, we drilled the first ice core in this icefield. This shallow depth ice core provides unprecedented records from this region. Here we present our preliminary results applying several analytical methods, including continuous flow analysis (CFA), laser ablation inductively-coupled plasma mass spectrometry (LA-ICPMS), scanning Electron Microscopy (SEM), High-resolution ion chromatography (IC), cavity-ring down spectroscopy (δD and $\delta 18O$), line scanning, and microfocus X-ray computer tomography. These preliminary results allow us to assess the potential of the ice from this icefield to hold a record of past environmental variability. In addition, we outline our plans for a future drilling campaign in late 2022/2023.

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