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Subglacial lake exploration in Antarctica: A new frontier in the cryosphere

Mark Skidmore, Earth Sciences, Montana State University, Bozeman, MT, USA.

Subglacial lakes are part of the extensive hydrologic systems that lie beneath ice caps and ice sheets. They vary in size from 0.02 km³ to 5000 km³ (the size of Lake Ontario). Their existence has been known for decades, but only recently have these lakes been accessed using clean drilling techniques to reveal ecosystems powered by energy derived from geologic sources beneath the ice masses. The presentation will provide an overview of subglacial lake exploration in Antarctica, but focusing on the recent successful drilling project at Subglacial Lake Whillans in West Antarctica. The drilling process including the clean access technologies will be described and the results on the physical, chemical and biological characteristics of Subglacial Lake Whillans will be presented. Future plans for an upcoming subglacial lake drilling project at Subglacial Lake Mercer, West Antarctica in 2018/19 will also be highlighted.