Geophysical Research Abstracts
Vol. 21, EGU2019-13527, 2019
EGU General Assembly 2019

Englacial and Subglacial Seismic Structure of the Crary Ice Rise

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Ice rises that form within the interior of ice shelves provide significant buttressing to grounded ice. The Crary Ice Rise is located just downstream of the Whillans Ice Stream's grounding line. Previous work has demonstrated that the evolution of the Crary Ice Rise and the Whillans Ice Stream are linked. Thus, we conducted a geophysical experiment to understand the origin and evolution of the Crary Ice Rise. Seismic data reveal a complex sedimentary structure is present beneath the Crary Ice Rise. This indicates that the topographic high responsible for the ice rise is not due to an elevated region of exposed bedrock. Instead, it appears that the topographic high has been formed as the result of both the regions tectonic history and interactions with the overriding ice sheet. We are continuing to explore geodynamic implications for the observed geologic structures and their potential influence on ice sheet behavior. Analysis of ICESat altimetry indicates that the ice rise is slowly migrating. Understanding the interaction between a stagnating ice stream and an ice rise will improve interpretations of ice stream behavior over centennial time-scales.