



10Be exposure dating of Holocene moraines in the Sierra Nevada, California

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Constraint on the extent and timing of Holocene glaciations is critical to addressing standing hypotheses that ascribe climatic fluctuations to changes in atmospheric and oceanic circulation patterns, or anthropogenic forcing. In the terrestrial record, such constraint typically relies on chronologies obtained from ^{10}Be exposure dating of moraine deposits. However, the short exposure time of Holocene moraines, particularly those formed during the Little Ice Age (LIA), makes obtaining precise chronologies extremely challenging. To date, only a handful of LIA deposits in two locations (New Zealand and the Swiss Alps) have been successfully dated with ^{10}Be .

Here, we report new ^{10}Be exposure ages from LIA and Neoglacial moraines from multiple sites in the Sierra Nevada (Lyell, Maclure, and Palisade glaciers). The Sierran LIA record will be compared to those from New Zealand and the Swiss Alps to test whether LIA deglaciation was globally synchronous. This result would support the contention that the LIA was terminated by anthropogenically-driven warming. Chronology from the neoglacial deposits will be used to test whether the timing of the return to glacial conditions in the Sierras correlates to a southward shift in the Intertropical Convergence Zone, which has been hypothesized to increase El Nino-like conditions in the Pacific Ocean. This record should be ideal for testing this hypothesis since precipitation in the Sierras is highly sensitive to El Nino conditions.