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A DIATOM RECORD OF ENVIRONMENTAL CHANGE OVER THE LAST 48 KYR IN LAKE FRYXELL, TAYLOR VALLEY, ANTARCTICA

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The extraordinary sensitivity of Taylor Valley, Antarctica, to climate and environmental change has been documented as part of a Long-Term Ecological Research (LTER) project. Regional geologic evidence of Pleistocene development and environmental change has been largely restricted to scattered perched delta deposits formed in pro-Glacial Lake Washburn (GLW) during the last glacial maximum (LGM), and a few short cores from the lake that represent post LGM time.

We report results of analysis of a 9.14 m long sediment core from Lake Fryxell, Lz1021, recovered to obtain a continuous paleoenvironmental record that can be compared with present day conditions, and document the development prior to and during the existence of GLW. Analysis includes diatom abundance and assemblages, magnetic susceptibility, texture, bulk chemistry, mineralogy, 14-C dating methods.

The preliminary diatom data reveal distinct shifts in diatom assemblage throughout the record spanning the last ca 48 kyr (e.g. Marine Isotope Stages 1 through 3). Several shifts in diatom assemblage take place during the Holocene. Modern flora are distinguished by the presence of *Navicula shackletoni*, *Nitzschia westii*, *Diadesmis contenta* var. *parallela* as well as an unknown *Navicula* species. Prior to the LGM, assemblages are characterized by *Diadesmis contenta*, *Muelleria peraustralis*, and various *Luticola* species. The abrupt appearance of *Mayamaea atomus* var. *permitis* marks a distinct zone characterized by fine laminations. The diatom record is primarily interpreted as reflecting shifts in water depth and conductivity, and is together with the variable lithology, including laminated facies, and physical and chemical properties used to infer past environmental change. The Lake Fryxell paleoenvironmental data is tentatively correlated to Taylor Dome ice core records and high southern latitude orbital insolation.