

12-9 - THE CASE FOR A LONG SCIENTIFIC BOREHOLE IN JACKSON LAKE, GRAND TETON NATIONAL PARK (WYOMING, USA)



Sunday, 15 October 2023



10:25 AM - 10:40 AM



324 (3, David L Lawrence Convention Center)

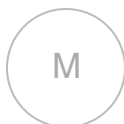
Abstract

Few basins in the western USA hold as much promise as Jackson Lake for recovering an expanded sedimentary record of environmental change through deep coring. Located in western Wyoming, Jackson Lake sits adjacent to the Teton fault, a range-bounding Cenozoic normal fault that produces the spectacular mountain relief of Grand Teton National Park. The Teton fault is a major seismic hazard; trenches located to the north and south of Jackson Lake have provided evidence for several significant Holocene-aged earthquakes, and turbidites studied in nearby Jenny Lake suggest the possibility of a more complex history of seismicity. Jackson Lake's intermediate position between Jenny Lake and the various trenches is ideal for capturing sedimentary evidence of earthquakes that ruptured the entire length of the Teton fault, as well as more localized events. High-resolution CHIRP seismic profiling shows that Jackson Lake contains nearly 100 m of acoustically variable strata organized in a deepwater (125-140 m deep) depocenter, and dekameter-scale mass transport deposits provide compelling evidence of ancient tectonic processes that altered slope stability. Existing short core studies suggest that Jackson Lake sediments are amenable to radiocarbon dating. A long and well-dated core from the Jackson Lake depocenter therefore holds great promise for resolving the earthquake history of the Teton fault, especially when paired with an extensive grid of seismic reflection profiles. In addition, short sediment cores exhibit variability in geochemical and microfossil proxies over the past several centuries, demonstrating Jackson Lake's sensitivity to hydroclimate change. Jackson Lake's water balance is controlled by the Snake River, and the history of this important fluvial system remains poorly known. The postglacial evolution of alpine climate, ecosystems, and hydrology in Grand Teton National Park may likewise be revealed with a long sediment record from Jackson Lake.

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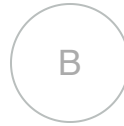
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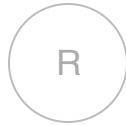
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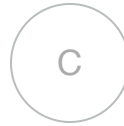
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