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Joint 56th Annual North-Central/ 71st Annual Southeastern Section Meeting - 2022

Paper No. 24-9

Presentation Time: 10:25 AM

RECENT PALEOLIMNOLOGICAL HISTORY OF JACKSON LAKE: GRAND TETON NATIONAL PARK, WYOMING

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This study utilizes a recently acquired, high-resolution CHIRP seismic reflection dataset and a deepwater sediment core to analyze the late Quaternary stratigraphy of Jackson Lake (Wyoming). The western shoreline of Jackson Lake is situated adjacent to the Teton fault, a down-to-the-east normal fault that produces the spectacular high topography of Grand Teton National Park. The sediments of Jackson Lake are underexplored and as a consequence, their value as indicators of environmental and tectonic changes is unknown. Here, we use the sedimentary fill of Jackson Lake as a natural archive of environmental change, specifically in reference to the influence of dam installation on the lake. We developed new bathymetric, acoustic basement, isopach, and facies maps that illustrate the distribution of available accommodation, sedimentary depocenters, and sublacustrine geomorphology. Faults were mapped by identifying offset reflectors, and acoustic facies were characterized on the basis on external geometry and internal characteristics of reflections. There is seismic evidence in the form of prograding clinoforms that capture dam-related lake level transgression, which resulted from the flooding of deltas. The northern axis of Jackson Lake displays high amplitude, parallel, semi-continuous lake floor reflections that we interpret as the flooded Snake River Plain. A short sediment core, dated with ²¹⁰Pb, ¹³⁷Cs, and ¹⁴C, serves as ground truth for the shallowest seismic reflectors and provides initial insights into deepwater sedimentation rates. The geochronological data indicate that the core encompasses ~365 years from 1654 to 2019 CE. This research will help to guide future long coring, which will be needed to establish the long-term depositional history of the basin.

Session No. 24

[T6. Limnogeology and Paleoclimate](#)

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