

96-8 - PALEOFIRE AND PALEOENVIRONMENTAL DYNAMICS REVEALED IN JACKSON LAKE SEDIMENTS (GRAND TETON NATIONAL PARK, WYOMING, USA)



Monday, 16 October 2023



8:00 AM - 5:30 PM



Hall B (2, David L Lawrence Convention Center)

Booth No. 45

Abstract

Jackson Lake, located in the Grand Teton National Park (Wyoming), is characterized by an alpine climate that is influenced by the Teton range, which receives heavy winter precipitation annually. The lake is surrounded by coniferous forest and shrublands, and seasonal wildfires are common. Despite its unique geological setting, which includes earthquakes, hydrothermal activity, and a history of extensive late Quaternary glaciation, much remains unknown about environmental changes in Grand Teton National Park, including the paleofire history. This study analyzes a 13.83 m sediment core from Jackson Lake in order to reconstruct the fire history using fossil charcoal, as well as signals of limnological change using bulk organic geochemistry. The core, dated using radiocarbon, covers the Early Holocene (~10.4 cal ka BP) to the present, with an average sedimentation rate of 0.14 cm/yr. Samples of known volume were collected every 5 cm along the length of the core, yielding ~300 samples for analysis. Given the age-depth model, this sampling provides decadal temporal resolution for the charcoal and geochemical proxies. The samples were pretreated using standard techniques and washed through a 106 μm sieve to separate charcoal fragments. The residues were examined under a stereomicroscope in gridded petri dishes, counted, and statistically enumerated. Charcoal morphological characteristics, such as size and shape, were also documented. These parameters provide insights on the intensity and scale of paleofire events, and the identification of the plant types involved (e.g., grasses versus trees). In addition, samples underwent geochemical analyses, focusing on TOC, TN, $\delta^{13}\text{C}$, and $\delta^{15}\text{N}$. Preliminary results indicate TOC variability over time, with lower concentrations near the bottom of the core (~2 wt. %), and higher concentrations at the top (3.6 wt. %). Research is ongoing, and the outcomes of this study seek to significantly contribute to our understanding of the history of fire dynamics in Grand Teton National Park. This knowledge will have implications for broader ecological studies and management strategies related to fire in this alpine environment.

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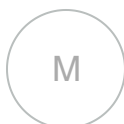
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