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GSA Connects 2022 meeting in Denver, Colorado

Paper No. 95-1

Presentation Time: 9:00 AM-1:00 PM

SEDIMENT TRANSPORT AND DEPOSITION IN REDROCK AND FISHERCAP LAKES IN SWIFTCURRENT VALLEY, GLACIER NATIONAL PARK, MONTANA, USA

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Multiple sediment sources and sinks exist in alpine basins, including glacially-derived sediment from subglacial and supraglacial sources, hillslope processes, vegetation, fluvial transport and storage, upvalley paternoster lakes, and human activity. Analysis of lake sediment cores can provide information on both changing environmental conditions and the complexities of spatial sediment transport and deposition in glacier-fed alpine valleys. Glacier National Park, Montana has experienced dramatic geomorphic and environmental change since the end of the Last Glacial Maximum, as well as documented change prior to the founding of the Park in 1910. To better understand sediment transport and records of environmental change in Glacier National Park from the late Holocene to the present, we collected a downlake transect of cores from Redrock and Fishercap Lakes in the Swiftcurrent Valley. In addition, we used ground penetrating radar to explore subsurface sedimentary structures of Fishercap Lake, which is significantly shallower than surrounding lakes, at only 1 m depth. Approximately 65 cm below the sediment/water interface there is a dense gravel layer that extends across the lake floor and which may represent a mid-Holocene desiccation surface. The fine-grained sediment above the gravel is thickest at the upvalley end of the lake (85 cm) and grades to about 40 cm at the downvalley end of the lake, reflecting almost 5000 years of sediment delivery. Redrock Lake, the next lake upvalley of Fishercap Lake, is about 6 m deep. Preliminary results suggest higher sedimentation rates in Redrock Lake, similar to those in Swiftcurrent Lake and Lake Josephine in the adjacent Grinnell Valley. Changes in sediment sources and transport vary between lakes and over time, with the size of alpine glaciers, lake bathymetry, and runoff variability driving sediment transport and storage dynamics on centennial to millennial timescales.

Session No. 95--Booth# 43

[T144. Lakes Past, Present, and Future—Archives of Climate Variability, Paleoenvironment, Geohazards, and Economic Resources \(Posters\)](#)

Monday, 10 October 2022: 9:00 AM-1:00 PM

Exhibit Hall F (Colorado Convention Center)

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