**Abstract:**

Holocene sediment infill from glacier-fed Cariboo Lake was examined using 10 khz acoustic sub-bottom profiling and sediment cores. Sediment influx into Cariboo Lake is dominated by annually laminated silt and clay sediments delivered primarily by overflow currents of suspended clastic sediments produced in the glaciated headwaters. The sediment infill is estimated to be ~ 18 m thick and can be broken into two main sediment facies. The lower facies (facies A) is poorly laminated and indicates reduced headwater flow and sediment infill. The upper facies (facies B) is acoustically laminated suggesting increased inflow to Cariboo Lake and the occurrence of turbidity deposits. Sediment cores were retrieved from the upper portion of facies A and provided evidence that inflow of clastic sediment to Cariboo Lake remained high enough to produce annual varves over the past two millennia. An average sediment accumulation rate of 2 mm/yr was calculated from two of the dated sediment cores. Based on this sediment accumulation rate the ~ 18 m sediment package is estimated to be representative of 9000 yr BP.

The lower layer coincides with the Northgrippian period (8300 – 4200 BP) which consisted of high temperatures and reduced glacier cover.

**Introduction:**

Studies of specific sediment yield, the amount of sediment that leaves a catchment over a given time period and is expressed as a mass per unit area per unit time {need Onstad citation} (Heideman, Menounos, & Clague, 2017) has been a useful tool in indicating past changes in sediment sources, transport and storage. These variations in specific sediment yield have been useful in providing records of glacial change (Menounos, Koch, Osborn, Clague, & Mazzucchi, 2004), geomorphic and hydrologic events (Desloges & Gilbert, 1994a, 1994b; Heideman, Menounos, & Clague, 2015), trends in temperature and precipitation (Desloges, 1999; Glur, Stalder, Wirth, Gilli, & Anselmetti, 2015), and changes in the connectivity of between sediment sources and downvalley environments (Wohl, Magilligan, & Rathburn, 2017) {check menounos 2017 for more citations}.

Typically, sediment delivery to glacier-fed lakes is connected to changes in temperature and precipitation and thus these records have potential to reveal changes in various sediment characteristics such as sediment yield, grain size, percent organics that coincide with Holocene climate fluctuations (Shakesby et al., 2007; Heideman et al., 2017). Several studies have looked at glaciolacustrine sediment records across the globe and extensively across British Columbia. However, the majority of studies completed in British Columbia have focused on glacier-fed lakes in the Coastal and Rocky Mountains with fewer studies focused in the Interior Mountains. More research on proglacial lakes in the Interior Mountains would be beneficial as this region has a different climate. Studying how sediment transport rates differ between these different regions is critical for understanding how downvalley population centres will be affected and will better equip communities to prepare water treatment plants, energy, infrastructure (bridges), and hhydroelectric power.

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