

Northeastern Section - 43rd Annual Meeting (27-29 March 2008)

Paper No. 24-3

Presentation Time: 8:00 AM-12:00 PM

A MULTI-PROXY INVESTIGATION OF LAKE SEDIMENT FROM THE UINTA MOUNTAINS, UTAH

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Reader Lake and Elbow Lake, two high altitude (~3300 m asl) lakes in the Uinta Mountains of Utah, are located about 2 km apart in the same drainage basin. Despite their proximity, however, climate reconstructions from sediment cores suggest that the lakes have responded to post-glacial climate changes in surprisingly different ways. The goal of this study is to clarify how each lake responded to climate changes and to understand why the two lakes have behaved so differently over time.

Loss on ignition (LOI), biogenic silica (BSi), carbon to nitrogen ratios (C:N), and grain size distribution were analyzed at 1-cm intervals throughout both cores. AMS ¹⁴C dating of terrestrial macrofossils indicates that the cores contain sediment from ca. 14 ka BP through ca. 2 ka BP. Overall, the Reader Lake record features high variability in LOI, BSi, and grain size, while the Elbow Lake record features a prolonged interval of elevated LOI, C:N ratios, and grain size between 10 and 4 ka BP. Both lakes exhibit a pronounced shift in climate centered on 4 ka BP. In Reader Lake, this shift is characterized by unusually high LOI and low BSi, suggesting a profound change in the character of sediment accumulating in the lake at this time. In Elbow Lake, this event marks the end of a 6,000-year period of heightened C:N ratios.

Differences between the two records may reflect the geomorphology of the lake basins themselves. Reader Lake lacks an inflowing stream and likely operated as a closed basin for most of its history. Elbow Lake, on the other hand, has an active inflow linked to a large delta. Past changes in the amount or intensity of precipitation over this watershed may, therefore, have impacted the two lakes in different ways, underscoring the need to consider geomorphic setting when evaluating the suitability of a specific lake for a paleolimnological study.

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[General Information for this Meeting](#)

Session No. 24--Booth# 11

[Lakes, Climate, and Environmental Change: Paleolimnological Studies of the Holocene and "Anthropocene" \(Posters\)](#)

Hyatt Regency Buffalo: Grand Ballroom C
8:00 AM-12:00 PM, Friday, 28 March 2008

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