ABSTRACT

TITLE:	OSL Dating of Fluvial and Lacustrine Sediment North of Durango, Colorado: A Record of an Asynchronous Glacial Advance at 55 Ka?
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ABSTRACT: New optically stimulated luminescence (OSL) ages were obtained from fine-grained fluvial sediment exposed in a well-preserved outcrop at the southern end of the San Juan Mountains, Durango, Colorado (Z13, 249144mE, 4132617mN; 2098 m). The sedimentary sequence exposed in the ~4 meter high outcrop consists of multiple and repetitive sets of mm-size rhythmite couplets, climbing ripples, planar laminae, and minor, small-scale water escape structures, overlain by a diamicton; the outcrop was previously interpreted as a remnant of the glacial landscape formed during a Bull Lake glacial advance (MIS 5d - 6). Three samples collected along a vertical transect (~0.8 meters apart) yielded preliminary ages of ~5010ka, 51.61 8.07 ka, and ~65 13ka (MIS 4, early Wisconsin Glaciation, ~55ka). The OSL ages are asynchronous with northern hemisphere glacial maximums. No previous studies have reported significant asynchronous glacial advances as far south as the study area (~3717' N latitude). Alternative explanations were sought to explain the seemingly anomalous ages, including: (1) OSL bleaching; (2) abandoned meander sequences in the adjacent glacial valley (Animas River); and, (3) deposition from a stream that presently occupies an incised channel and flows ~parallel to the outcrop (Spring Creek). Sediment deposited in glacial environments is often inadequately bleached, but OSL has been successfully used on glaciofluvial deposits. Insufficient bleaching would yield older ages, which suggests that the sedimentary sequence in this study is not correlative with older Bull Lake glacial deposits. Similarly, a lack of trough cross-bedded sands, mud drapes, lateral accretion surfaces, and fining upward sequences argue against a meander sequence. It is also difficult to explain the process linkage that would yield the change of stream flow direction required for sediment to have been deposited by an entrenched stream that, at present, drains away from the outcrop. Field evidence from the isolated outcrop was insufficient to definitely determine sediment provenance and glacial origin. Consequently, we remain open to the prospect that this outcrop may represent the first quantitative ages of a significant asynchronous glacial advance in the southern San Juan Mountains.