ABSTRACT

TITLE:	An 18-KA Glacial Lake Outburst Flood From Glacial Lake Durango: Southern San Juan Mountains, Colorado
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Cosmogenic nuclide (^{10}Be) surface exposure ages were obtained on granite and sandstone boulders from a boulder field south of Durango, Colorado. The rounded boulders in the boulder field: (1) measure 2-4 meters in diameter; (2) occur at elevations between 2006 and 2028 meters; (3) are in a remote location approximately 96 meters above the modern Animas River; (4) are located approximately 9.4 km down-gradient from the southernmost, Last Glacial Maximum (LGM) terminal moraine; and, 5) are located approximately 22 km down-gradient from the closest granite outcrop. The boulder field was thought to have been emplaced by a glacial lake outburst based on the size of the boulders, elevation, location, local geology and geomorphology. Two boulders from the boulder field, a granite and a sandstone, yielded exposure ages of 18.2 ± 2.5 and 18.1 ± 2.2 ka, respectively. The exposure age dates indicate that the glacial lake outburst flood occurred close to the LGM for this area (19.4 ± 1.5 ka; Guido, et. al, 2007).

Another granite boulder, resting at an elevation of 2012 meters, from a different boulder field, was also exposure age dated and yielded an anomalously young exposure age of 2.5 ± 0.4 ka. The second boulder field: (1) is located approximately 4.5 km down-gradient from the LGM terminal moraine; and, (2) contains a cluster of boulders that form a linear array in a gully along the north face of Smelter Mountain (in Durango). The exposure age date of the second granite boulder likely represents the age of the last downslope movement of the boulder in the north-facing gully. It is reasonable to suggest that the downslope movement of 2-4 meter diameter boulders occurred as a result of a significant (regional or local) precipitation event. Remarkably, the 2.5 ± 0.4 ka exposure age on the granite boulder correlates well with the onset of regional climate change recorded in the nearby La Plata Mountains. A palynology study by Petersen and Mehringer (1976) indicates that an upward advance in the La Plata Mountain timberline position began around 2.55 ± 0.075 ka, and peaked at a mean of about 2.0 ka.

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