



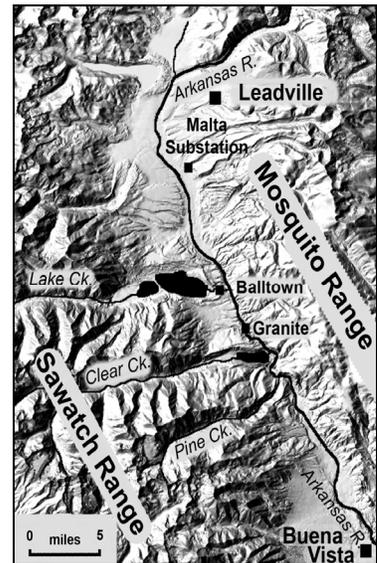
Catastrophic Glacial Outburst Floods on the Upper Arkansas River
A Field Trip from Leadville to Buena Vista - 29 September 2012

The Floods

During the Pleistocene, glaciers from the Sawatch Range flowed down three contiguous tributary valleys to the Arkansas River near Granite, Colorado. The Lake Creek glacier probably pushed the Arkansas River out of its channel, and the Clear Creek and Pine Creek glaciers crossed the river and rammed into granite walls on the far side of the valley. These glaciers formed an ice dam about 670 ft high that blocked the Arkansas River and created a large lake about 600 ft deep that extended 12 miles upstream below Leadville.

When the ice dam broke, the lake drained catastrophically. The outburst flood tore out the ends of the moraines and carried the detritus down the valley in a torrent of dirty water that deposited a sheet of flood boulders 60 ft thick in less than a day. Many flood boulders are tens of feet in diameter, and some can be found 150 ft up on the valley wall.

At least four catastrophic floods swept the Upper Arkansas Valley, together called the Three Glaciers Floods. Field evidence documents well the last two floods, but only patches of older flood boulders attest to two earlier floods. The most recent flood dates to the Last Glacial Maximum, or Pinedale age, with a cosmogenic age of 17-19 ka. The oldest flood is older than 760 ka, and the second flood is older than 640 ka. The age of the third, or penultimate, flood is currently under debate. Perhaps field trip participants can judge the field evidence and contribute to a solution.



The Field Trip

The trip will begin in Leadville and cover 50 miles with 10 stops, ending in Buena Vista. Stops will include overviews of the three glacial systems, a view of the glacial damsite from atop a lateral moraine, ice-rafted boulders at the shoreline of Three Glaciers Lake, flood boulder deposits, flood boulders 150 ft above the modern Arkansas River, remnants of the two oldest floods, and the granddaddy flood boulder 61 ft long.

