

**Carson, E.C., 2005, Fluvial geomorphology and hydrology of the sub-alpine streams in the Uinta Mountains: In *Uinta Mountain Geology*, C.M. Dehler, J.L. Pederson, D.A. Sprinkel and B.J. Kowallis, eds., Utah Geological Association Guidebook 33, p. 171-187.**

#### **ABSTRACT**

The physiography of stream systems on the north and south slopes of the Uinta Mountains reflects broad differences in physical conditions on the two sides of the range. Variations in bedrock geology, stream gradients, and the extent and style of Late Pleistocene glaciations, have produced a significantly different collection of stream planforms and alluvial landforms on the opposite slopes. However, both slopes of the range experience similar hydrometeorological conditions, producing broadly similar stream hydrology across the range. The entire range receives the majority of its annual precipitation from winter frontal storms from the North Pacific Ocean. Accordingly, the magnitude of modern floods is closely correlated to the depth of snowpack that accumulates in winter and the rate at which it melts in spring. Alluvial sediments in select sites on the north slope of the range record the effects of logging during the 19<sup>th</sup> and 20<sup>th</sup> Centuries. Tree-ring data have been used to reconstruct streamflow in the southern Uintas for the past ~350 years, and the reconstruction suggests that annual streamflow during this period experienced significant variability over decadal and centennial timescales. Interestingly, the sub-alpine Uintas apparently experienced prolonged drought conditions through the peak of the Little Ice Age in the western United States. A paleoflood chronology has been constructed that also shows systematic, non-random variations in flood magnitudes over millennial timescales. Bankfull floods in the northern Uintas were apparently larger than modern prior to about 4600 cal yr BP and again from 2800 to 1000 cal yr BP; bankfull floods were smaller than modern from 4600 to 2800 cal yr BP and from 1000 cal yr BP to near modern. These results compare favorably to independent proxy climate data from the Uintas and surrounding ranges in the western United States.