

MEASUREMENT OF SNOW ACCUMULATION SINCE AUGUST 1992 ON COLUMBIA GLACIER, ALASKA

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The depth of snow accumulated for the past five years was measured at nine sites on the main branch of Columbia Glacier above 884 m altitude. The measurements were made from the surface down to a prominent volcanic ash layer that was deposited on August 18 and 19, 1992, by an eruption of Crater Peak. Crater Peak is a vent on the south flank of Mt. Spurr Volcano. The raw snow-depth measurements are not corrected for the effects of glacier flow including both horizontal and vertical strain and differential altitude displacement of the annual layers.

Snow-accumulation measurements were made on August 3, 1997, in crevasses that seemed safe to approach and showed good stratigraphy with minimal deformation. The horizontal and vertical position of each measurement site was determined with a single GPS receiver. The 1992 ash layer was always easy to identify as were most of the more recent summer surfaces. No measurements were made between 1,200 and 1,600 m altitude, because the ash layer and more recent summer surfaces were contorted and therefore judged to be unreliable indicators of accumulation.

Total snow accumulation since August 1992 generally increases with altitude but varies considerably from year to year. The greatest snow depths were measured at the highest sites, at 2,409 and 2,438 m altitude, where the accumulation for the five years was 28.0 and 25.6 m, respectively. Below 870 m altitude, no snow had accumulated above the 1992 ash. Annual accumulation increments were measured at six sites. The average of the annual increments was largest for the winter of 1993-94 (6.0 m). In order of decreasing thickness, the average of the annual accumulation measured between successive summer surfaces were: 1994-95 (5.3 m), 1992-93 (4.1 m), 1995-96 (3.4 m), and 1996-97 (0.7 m).



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