ABSTRACT

Late Quaternary Glacier Fluctuations and Vegetation Change in the Northwestern Ahklun Mountains, Southwestern Alaska

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This research examines moraine and lacustrine records of glacier fluctuations, in combination with palynological records of vegetation change, from the previously unstudied northwestern Ahklun Mountains in southwestern Alaska.

Moraine mapping reveals that ice-cap outlet glaciers in the study area extended ca. 60 km from the center of the Ahklun Mountains ice dome during the early Wisconsin (*sensu lato*), and ca. 40 km during the late Wisconsin. Correlations with well-studied moraines in the southern Ahklun Mountains indicate an asymmetry of glaciation over the range, with ice-cap outlet glaciers more extensive to the south. This asymmetry was more striking during the early Wisconsin (*s.l.*) than during the late Wisconsin.

Alpine glaciers have repeatedly advanced from cirques within the study area. Because these alpine glaciers were confluent or sub-confluent with outlet glaciers during the late Wisconsin maximum, the alpine-glacier moraine record is relatively young. Lacustrine sedimentology from Little Swift Lake records significant retreat of alpine glaciers ca. 12.8 ka (coeval with the onset of the North Atlantic Younger Dryas). Moraines upvalley of the lake suggest a minor glacier (or rock glacier) advance occurred ca. 5.5 ka.

Lacustrine records of vegetation from Little Swift Lake extend back to ca. 13.4 ka. Most vegetation changes resulted from the post-glacial spread of trees and shrubs, including *Betula*, *Alnus*, and *Picea*, to their modern ranges. However, pollen assemblages and other paleoclimate proxies suggest some major changes in late-glacial and Holocene climate. Major vegetation change, most notably the dramatic expansion of Poaceae, occurred ca. 100 yr after the 12.8-ka glacier retreat and persisted for more than 2 ka. The inferred reversal to dry (and possibly cool) climate was followed by a period of exceptionally productive mesic conditions during the early Holocene, ca. 11 to 9 ka.

The pattern of latest-Quaternary climate changes documented in this study may be evidence that, as previous workers have concluded regarding the Pleistocene glaciations, the late-glacial and early Holocene climate of the Ahklun Mountains region was strongly modulated by changes in the proximity and temperature of the Bering Sea.