



Impacts of the c. 3,400 BP Aniakchak II eruption on a distal peatland

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The caldera-forming eruption of Aniakchak, dated to approximately 3,400 BP, is known to be one of the largest of the Holocene period, with a significant trace in Greenland ice cores, distal tephra and thick proximal deposits. In this paper we review the dates for the eruption and present new palaeoecological evidence for the impacts of the tephra on a tundra wetland, 1100km from the eruption.

Initial results suggest a hiatus in peat deposition, followed by a return of peat formation in a landscape dominated by Poaceae (grasses) and Ericaceae (heaths), before returning to a sedge (Cyperaceae) dominated wetland. During the earlier phases post-deposition, tree pollen increase in frequency, perhaps due to the underproduction of ground flora. Mites (oribatids) show a pattern of recolonisation by *Ceratozetes parvulus* and then *Hydrozetes*, demonstrating first a phase of thin organic soil and then a phase of increasingly wet and peaty conditions. Statistical analyses of the pollen and oribatid data using RDA show that the impacts of the AK tephra deposit are statistically significant, based on a model of immediate impact at the depth of tephra deposition and then continued but exponentially-diminishing impact above this.

Implications of these results are that a large proportion (perhaps 20%) of the wetlands of Alaska may have been affected by the eruption and ash deposition for a long period of time and that local ecological changes were significant enough to affect carbon balance and the ecology of the region. The tephra layer may have left the ground surface

bare, or prevented preservation, preventing peat growth for a period of 100-200 years. However, these data relate only to a single site, and for the period immediately following the tephra deposition no evidence is available due to the lack of peat accumulation.