



Tephra horizons in the north Atlantic region contemporary with early Holocene climate events

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The climate of the North Atlantic region was relatively unstable after the last Termination. Three cold events superimposed upon the general warming took place during the earliest part of the Holocene: the Preboreal oscillation (ca. 11,300-11,100 cal. yr BP), the Erdalen event (ca. 10,300-10,200 cal. yr BP) and the 9.3 ka BP event. Dating and correlations of short climate fluctuations between marine, ice core, and terrestrial records can be difficult using radiocarbon and lithostratigraphy; however, tephrochronology could offer new potentials to solve issues of chronology. A well defined tephrochronological framework for the North Atlantic region could facilitate the creation of high resolution chronologies but also give the opportunity to test hypothesis regarding synchronous or non-synchronous response to climate.

Tephra horizons identified in palaeolake cores on the Faroe Islands and western Norway span the period 11,900-9500 cal. yr BP. The rhyolitic Håsseldalen tephra dated to ca. 11,300 cal. yr BP has been found at several locations in NW Europe and occurs in close vicinity to the Preboreal oscillation. A tephra from the Askja volcanic system dated to ca. 10,400 cal. yr BP is tentatively correlated with the Askja-S/10 ka tephra and has previously been found in large parts of the North Atlantic region and now also on the Faroe Islands. Another rhyolitic tephra which correlates with the SSn/Sn-3 tephra have been identified both on the Faroe Islands and in western Norway. This layer is approximately hundred years younger than the basaltic Saksunarvatn ash (ca. 10.300 cal yr BP). Both horizons occur in close time to the Erdalen event. The youngest horizon is a so far unidentified tephra with an estimated age of 9500 cal. yr BP.

These tephra horizons provide a unique potential to link not only the records from NW Europe but also possibilities to correlate them and associated climate events to ice-core records from Greenland.