



## **Climate events from the early Holocene to the Little Ice Age in North Iceland: Paleolimnological reconstructions from midges and other proxies**

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The Holocene climate history of Iceland is not well known, despite Iceland's strategic location at the intersection of major surface currents in the high-latitude North Atlantic. Sediments from Icelandic lakes provide high-resolution archives of climate and environmental change since the last deglaciation, and have been targeted by several recent studies. Here we present subfossil midge (Chironomidae) and other paleolimnological data from Stora Viðarvatn and nearby lakes in North Iceland.

We infer from midge assemblages that coastal North Iceland experienced surprisingly cool early Holocene summers (no warmer than present) and warmed through the Holocene until after 3 ka. This contrasts with other sites on Iceland and around the high-latitude Northern Hemisphere that experienced an early to mid-Holocene "thermal maximum" in response to enhanced summer insolation forcing.

High-resolution paleolimnological data for the past two millennia reveal details of late Holocene climate and environmental change. Much of the first millennium AD was relatively warm, with temperatures comparable to warm decades of the 20th century. Warm conditions also occurred during parts of the 10th and 11th centuries AD, coincident with rapid Norse expansion in the region. Between the 13th and 19th centuries AD, the site experienced declining summer temperatures, decreasing aquatic production, and/or increasing soil erosion. The most severe conditions of the last 2000 years

occurred in the 19th century.