



## **Lateglacial and early Holocene oceanography off North Iceland: foraminifera and stable isotopes**

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Sedimentary basins on the North Icelandic shelf provide important high-resolution palaeoceanographic and climatic archives for the last deglaciation and the Holocene. Benthic and planktonic foraminiferal distributions and stable isotope ratios are presented for the time interval 14,600-9000 cal. yr BP in four cores, two on the western side and two on the eastern side of the submarine Kolbeinsey Ridge, and substantial variability in the environmental conditions is documented. The chronology is primarily based on tephra markers, but a combined tephrochronological and radiocarbon-based age model is discussed as well. The following Icelandic tephra layers are included: the Borroból Tephra, the Vedde Ash, the Dyngjufjöll tephra, the Saksunarvatn ash, the Sudurøy tephra, the Hekla 3 tephra and the Hekla AD 1104 tephra.

The pre-Bølling (Greenland Stadial 2) and the Younger Dryas (Greenland Stadial 1) intervals are characterized by high surface and bottom water foraminiferal productivity, faunal indication of high influence of Atlantic water masses, and isotopic indication of brine formation on the North Icelandic shelf. The initiation of the Bølling-Allerød Interstadial Complex (Greenland Interstadial 1) and the initiation of the Pre-boreal are both marked by an abrupt change to very cold bottom waters and extensive seasonal sea-ice cover. The environmental proxy data show that the establishment of the modern oceanic circulation system in the area occurred at about 10,000 cal. yr BP and that the Kolbeinsey Ridge has acted as an oceanographic barrier not only during the deglaciation but also in the Holocene.

A comparison of environmental events in the marine record on the North Icelandic shelf with palaeo-records from the eastern North Atlantic and with the isotopic record of the Greenland ice cores indicates an anti-phase relationship in the water temperature between the North Icelandic shelf area and the eastern part of the Nordic Seas. The Greenland ice-core record appears to correlate with the eastern Atlantic, while it is out of phase with the lateglacial and earliest Holocene North Iceland shelf record.