



Diatom based reconstruction of palaeoceanographic changes on the North Icelandic shelf during the last millennium

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Palaeoceanographic changes on the North Icelandic shelf (NIS) during the last millennium are revealed by a diatom record of high temporal resolution (5-15 years). Despite relatively low variability, diatom-based summer sea surface temperature (SSTs) reconstruction of the multi-core B05-MC04A record indicates a clear warming trend since the start of twentieth century and is comparable with neighboring instrumental SSTs records, suggesting that diatoms are reliable to quantitatively reconstruct palaeoceanographic changes in the studied area. A generally warm and stable period on the NIS is recognized by the diatom record from the tenth to the thirteenth century, corresponding to the Medieval Warm Period (MWP). The warmest interval prevailed during the late twelfth and early thirteenth centuries. A steep cooling at around AD 1320 introduced the Little Ice Age (LIA) that lasted until the beginning of the twentieth century warming. This cooling interval is marked by century-scale oscillations instead of a broad trend, with several extremely cold periods revealed at AD 1480s-1520s, AD 1610s-1640s and AD 1830s-1840s. On a long-term scale, the North Icelandic diatom-based oceanographic record shows consistency with historical, instrumental and other marine proxy records. However, discrepancies exist, particularly for the short-term fluctuations, during the LIA. The results show that the diatom-based SSTs reconstruction is on average 1-2°C lower than alkenone-based SSTs in the same core.