

Changes in North Sea macrofauna communities and species distribution between 1986 and 2000

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Abstract

The North Sea Benthos Project 2000 was initiated as a follow-up to the 1986 ICES North Sea Benthos Survey with the major aim to identify changes in the macrofauna species distribution and community structure in the North Sea and their likely causes.

The results showed that the large-scale spatial distribution of macrofauna communities in the North Sea hardly changed between 1986 and 2000, with the main divisions at the 50 m and 100 m depth contours. Water temperature and salinity as well as wave exposure, tidal stress and primary production were influential environmental factors on a large (North Sea-wide) spatial scale.

The increase in abundance and regional changes in distribution of various species with a southern distribution in the North Sea in 2000 were largely associated with an increase in sea surface temperature, primary production and, thus, food supply. This can be most likely related to the North Sea hydro-climate change in the late 1980s influenced by the variability in the North Atlantic Oscillation (NAO). Only one cold-temperate species decreased in abundance in 2000 at most of the stations. Indications for newly established populations of offshore non-native species were not found.

Differences in macrofauna community structure on localised spatial scales were predominantly found north of the 50 m depth contour off the British coast along the Flamborough Head Front towards the Dogger Bank, off the coast of Jutland and at the Frisian Front. These changes were most likely attributed to stronger frontal systems in 2000 caused by the increased inflow of Atlantic water masses in relation to the hydro-climate change in the late 1980s.