HOLOCENE PALEOCEANOGRAPHY OF THE BARENTS SEA AND VARIATIONS OF THE NORTHWARD FLUX OF ATLANTIC WATER

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Holocene variations of the flux of Atlantic waters penetrating the Barents Sea have been estimated using three cores located at key positions in the Barents Sea. Core ASV 880 from the Franz Victoria Trough is on the path of the northern branch of Atlantic water inflowing from the Arctic Ocean. Core ASV 1157 from the southern margin of Novaya Zemlya is located in a major area of brine formation, which recycles the modified Atlantic water carried by the North Cape and Novaya Zemlya currents. Core ASV 1200 from the Central Barents Sea lies in the bottom water. The three cores have been dated by AMS C-14 on mollusks. Oxygen and carbon isotope measurements were performed on the planktonic species N. pachyderma (left coiling) and the benthic species Elphidium clavatum and Nonion labradoricum. The comparison of the isotope records shows a short temperature optimum, which developed between 7.8 and 6.8 ka BP. During this optimum, the northern and southern inputs of Atlantic water to the Barents Sea reached their maximum. In the north, the Atlantic water mass invaded the whole Franz Victoria Trough and was present from sub-surface to the bottom. In the south, brine water was mainly formed by Atlantic water. The penetration of Atlantic water decreased suddenly by 6.8 ka BP and the Barents Sea deep water was formed by a mixture of Atlantic and Arctic waters. This water mass expanded in the whole deep Barents Sea. The percentage of Arctic water varied during the last seven millenia but tended to increase with time. It suddenly decreased between 0.2 and 0.7 ka BP. These variations are probably related to those of the inflow of Atlantic water to
the Barents Sea.