

Mexico and Caribbean, followed by 2) a cooling and strong climatic instability probably responsible for the discrepancies in distributions of some taxa, in Zone N4 (across the Oligocene/Miocene boundary) and 3) a new warming from the upper part of Zone N4b and Zone N5 (lower Miocene).

The abundance of the upwelling indices, *Paragloborotalia kugleri*, *Globorotaloides hexagonus*, *Globorotaloides stainforthi* group and protentellids, corroborated by the presence of radiolarians, diatoms, and sponge spicules, also allowed one to identify the major upwelling pulses in subzone N4a.

MAPPING THE ARCTIC OCEAN LOW-SALINITY SURFACE LAYER BY MEANS OF STABLE ISOTOPES IN PLANKTIC FORAMINIFERS FROM SURFACE SAMPLES AND SHORT SEDIMENT CORES

R.F. Spielhagen (GEOMAR, Kiel, Germany), S.E.I. Köhler, R. Stein, H.W. Hubberten, and the POLARSTERN ARCTIC' 91 Shipboard Scientific Party

Planktic foraminifers (*Neogloboquadrina pachyderma* sin.) from Arctic surface sediment samples and short sediment cores have been analyzed for stable oxygen and carbon isotopes ( $\delta^{18}\text{O}$ ,  $\delta^{13}\text{C}$ ). Samples were obtained during various RV POLARSTERN expeditions, including ARK IV/3 (1987) and ARCTIC '91 to the eastern and central Arctic Ocean. The data base was extended using previously published data sets.

Oxygen isotopic values show a well-expressed trend towards lighter values between the southern Nansen Basin (>3.5‰) and the North Pole (<1.6‰). This reflects the changing salinity in *N. pachyderma*'s habitat, decreasing from >33‰ in Atlantic waters north of the Barents Shelf to <31‰ of the Arctic Ocean low-salinity layer in the Amundsen Basin. Water temperatures are generally just above freezing point (c. -1.8°C in high Arctic waters). Carbon isotope values in *N. pachyderma* sin. from surface samples are in the range of 0.7-1.0‰ north of 84°N, with only a few exceptions. In sediment cores from the Yermak Plateau and the Gakkel and Lomonosov Ridges, oxygen isotope values of *N. pachyderma* sin. from the uppermost layer are on the level of the surface samples and represent the Holocene. The glacial-interglacial difference is 1-1.5‰ to underlying sediments.

Relatively heavy oxygen isotope values (c. 3‰) in surface samples from the vicinity of the Morris Jesup Plateau (MJP) are not in accordance with today's water-mass properties in this area. The oxygen isotope profile in a short core from the MJP shows only little variations and suggests non-deposition or erosion during the at least parts of the Holocene or even a longer interval.

ACOUSTIC STRATIGRAPHY OF MAUD RISE SEDIMENTS - A DIGITAL PARASOUND ECHOSOUNDER SURVEY AT ODP DRILL SITES 689 AND 690

V. Spieß (Univ. of Bremen, Germany)

During the RV POLARSTERN cruise ANT VIII/6 in April/ May 1990 digital seismic data were collected on a routine basis with the Parasound echosounder and the new digital data acquisition system PARADIGMA. The source frequency can be varied between 2.5 and 5.5 kHz and signal length from 0.27 to 4.8 ms. The sound energy is restricted to a narrow 4° cone providing a superior vertical resolution on the order of 10 cm as well as high lateral resolution due to