is recorded by a drastic decrease in pelagic carbonate fluxes and by a moderate IRD input in the eastern sector of the basin.

Various glacial circulation patterns are dicussed. Based on the sedimentological evidence, the authors favor a modified anti-estuarine circulation model. The major driving force would be strong catabatic winds at the boundaries of stable high pressures over the Scandinavian and the Greenland ice domes, which would be deflected by Coriolis force to the north on the eastern and to the south on the western side of the basin, resulting in a northward-bound Eastern Ice Drift Current and a southward-bound Western Ice Drift Current. In the center of the basin cyclonic gyres would connect the marginal ice-drift streams. Seasonal variations in sea-ice coverage and salt injection by a weak underflow of Atlantic waters in the southeastern-most areas could contribute to deep water formation. In detail, a more variable pattern is observed: very strong glaciations with peak supplies in IRD and almost basin-wide extension of glaciomarine diamictons (stages 12, 10 and 6); strong glaciations with high IRD input and diamictons restricted to the eastern and western basin sectors (stages 8, 4, 3, and 2); weak intrusions of Atlantic waters (events 8.6 - 8.5, 6.5 and 3.1).

LATE CRETACEOUS CALCAREOUS NANNOFOSSIL BIOCHRONOLOGY FROM THE ATLANTIC OCEAN.

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The rapidity of their evolution, wide geographic distribution and great abundance have made calcareous nannofossils one of the most used fossil groups for stratigraphic correlation of Mesozoic and Cenozoic marine sediments.

A quantitative study of calcareous nannofossils from four Deep Sea Drilling Project (DSDP) sites that span the late Cretaceous Atlantic Ocean from 37° N to 36° S has resulted in a dated subdivision for the latest approximately three million years of the Cretaceous. Six nannofossil events, three based on traditional markers and three new previously unused events have been calibrated to magnetostratigraphy. The ages of the stratigraphic markers are: First Occurrence (FO) of *Micula praemurus* 69.0 ± 0.2 Ma, FO of *Lithraphidites quadratus* 68.6 ± 0.1 Ma, Last Occurrence of *M. praemurus* 68.2 ± 0.3 Ma, FO of *Ceratolithoides kamptneri* 67.6 ± 0.2 Ma, and FO of *Micula murus* 67.2 ± 0.1 Ma. The use of *Nephrolithus frequens* as a marker was found here to be unreliable since its FO was diachronous. A refined uppermost Cretaceous calcareous nannofossil zonation from the middle Maastrichtian (upper part of *Arkhangelskiella cymbiformis* Zone) to the Cretaceous-Tertiary boundary is as follows: *Micula praemurus* Subzone, *Lithraphidites* quadratus Zone, *Cribrosphaerella ehrenbergii* Subzone, *Ceratolithoides kamptneri* Subzone, *Micula murus* Zone, and the *Micula prinsii* Zone.

^{230}THORIUM AND ^{10}BERYLLIUM STRATIGRAPHY OF TWO SEDIMENT CORES FROM THE ARCTIC SEA

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Two sediment cores from the Arctic Sea (core 21533 SL: 82°01.9'N 15°10.7'E, 2030 m water depth, 485 cm length, Yermak Plateau and core 21521 KAL: 82°56.5'N 32°5.2'E, 3752 m water depth, 467 cm length, Nansen Basin) were analyzed at high resolution for concentrations of the radionuclides ^{230}Th and ^{10}Be and for N, Fe and Al .

The cores were dated by ^{230}Th- and ^{10}Be-stratigraphy. For core 21533 the results were compared with a $\delta^{18}O$-profile.

The average sedimentation rate of core 21533 deduced from the ^{230}Th- and ^{10}Be-stratigraphies amounts to 3.1 cm/ky, which results in a bottom age of 147 ky correlating well with the oxygen isotope stratigraphy. The average sedimentation rate of core 21521, achieved only by ^{230}Th- and ^{10}Be-stratigraphy, is 3.4 cm/ky yielding a bottom age of 108 ky.

From the comparison of the ^{230}Th-, ^{10}Be- and $\delta^{18}O$-stratigraphies of core 21533 it can be shown that ^{230}Th- and ^{10}Be-stratigraphy can replace the $\delta^{18}O$-dating method in high latitudes.

We also can confirm that Fe- and Mn-oxihydroxides are the main carriers in the scavenging processes affecting ^{230}Th, and that aluminosilicates are the main carriers for ^{10}Be.

Together with the data of the cores 23235 (Fram Strait) and 364 (86°N) (Eisenhauer et al. 1990,91), our data yield a transect from North to South through the Arctic Ocean. It shows that climatic changes, current regime and oscillations of the southern boundary of the Arctic ice shield influence the fluxes of the elements in the sediments.

GLACIAL TO POST-GLACIAL CHANGES IN THE TROPICAL PLANKTONIC FORAMINIFERAL $\delta^{13}C$ RECORD: A PALEOPRODUCTIVITY RECONSTRUCTION

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We offer a new hypothesis on the succession of events that made last glacial $\delta^{13}C$ tropical planktonic values appear similar to the late Holocene ones, and led to the puzzling minimum during the last transition.

For the reconstruction of the equatorial surface $\delta^{13}C$ ecord, we chose four cores from the western equatorial Pacific ERDC core set, and located all of them well above the regional lysocline to avoid dissolution-related problems. We used the planktonic foraminifera *Globigerinoides sacculifer* because it is known to thrive best in surface, nutrient-depleted, warm waters, and because it seems to be the best recorder of warm, nutrient-depleted, surface mixed-layer, isotopic composition.

The reconstruction of an average Pacific Ocean $\delta^{13}C$ record, measured from shells of the benthic foraminifer *P. wüllerstorfi*, was derived from the average of two cores shallower than 2 km, thought to represent the mid-depth ^{12}C-depleted water masses, and two cores deeper than 2 km, thought to represent the ^{12}C-enriched glacial abyssal water masses.

We have already reported (Herguera, 1992; Herguera and Berger, 1991) how the primary productivity of the surface ocean is strongly correlated with the benthic foraminifera accumulation rates (BFAR) in the modern ocean. Here we apply this paleoproductivity reconstruction method to five cores, from western equatorial Pacific deep-sea sediment, spanning the last 18 ka.

The results offer some revealing insights into the surface water $\delta^{13}C$ record. Our evidence shows how a decrease in productivity during the late Glacial, coupled with the ocean's degassing to the biosphere during the transition,