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The 3-D forward sedimentation model SEDLOB (SEDimentation in Large Ocean Basins) is used to simulate the climatically driven Quaternary sedimentation history of the northern North Atlantic (NNA). This model is driven by the thermohaline oceanic circulation and coupled to an ocean general circulation model.

Sedimentation processes including erosion, transport and deposition in large ocean basins depend strongly on sediment input from various sources and on ocean circulation patterns. Sedimentation and ocean thermohaline circulation are controlled to a large extent by the morphology of a basin and by climate, and are subject to long term tectonic and short term climatic changes.

Process-oriented 3-D modeling of sedimentation in the NNA should be performed on the basis of (a) an adequate geologic/oceanographic data base; (b) efficient algorithms and parameterization for the simulation of sedimentation processes; (c) accurate model initialization with respect to the external forcing of sedimentation and (d) reproducible model validation in comparison to the modern state of the investigated system.

In view of numerical experiments in stratigraphy, an efficient model is aimed of simulation of sediment distribution patterns on the sea floor, especially accumulation and erosion of sediments integrated over time intervals long enough to represent the stratigraphic architecture. Based on the stratigraphic record, this architecture is composed of succeeding sequences in a chronostratigraphic time frame.

SEDLOB is used to generate basin-wide glacial and interglacial sedimentation patterns of the NNA. North Atlantic site DSDP 607 was used for high-resolution stratigraphic calibration of glacial and interglacial stages, covering the last 262 ka. Cold and warm periods were based on the oxygen isotope curve. A continuous time sequence of 33 cold and 34 warm periods was elaborated taking into account shifts in the time dependent mean of oxygen isotope values and a minimum duration of 15000 years per period to contribute noticeably to the build-up of the sediment column. Synthetic stratigraphic sections are obtained from this climatically forced basin fill. Examples with maps and synthetic cross sections are presented for the NNA.

Different pathways of particles, sediment, and synthetic seismograms from cross sections can be shown in several video presentations.

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