

Reconstruction of SST and denitrification in the Arabian Sea during the last 25ka BP

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The oxygen minimum zone in the present Arabian Sea is maintained by the high productivity related to monsoonal upwelling at its western margins. Studies of sedimentary $\delta^{15}\text{N}$ values showed that the entire Holocene was characterized by a strong oxygen minimum zone with active denitrification while during glacial conditions denitrification took place only during the short, warm interstadials.

In order to better understand the mechanism and identify tipping points in the recent history of upwelling and denitrification we compiled all available SST and $\delta^{15}\text{N}$ records from the Arabian Sea of the last 25 ka and produced (a) SST and $\delta^{15}\text{N}$ maps for different time slices and (b) integrated SST and $\delta^{15}\text{N}$ curves for different parts of the basin. We can show that deglacial warming of the eastern Arabian Sea was almost parallel with the increase in solar insolation. Warming in the northern and western part of the basin seems to have lagged the insolation curve by a few thousand years. The onset of upwelling occurred at about 12 ka BP and was parallel with a strong increase of moisture transport to the Asian continent. The $\delta^{15}\text{N}$ curves suggest that denitrification was stronger in the western Arabian Sea during the early Holocene and the establishment of a strong OMZ in the northeastern Arabian Sea occurred only in the late Holocene.