



Water column versus sedimentary N-loss in the Arabian Sea off Pakistan

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The Arabian Sea exhibits one of the largest and most stable Oxygen Minimum Zones (OMZ) in the global Ocean. Reported N-deficits and elevated N₂O concentrations in the suboxic waters suggest heavy loss of fixed nitrogen that, so far, is attributed to pelagic denitrification.

N-loss from the sediment is thought to be less relevant than from the water column of the Arabian Sea. However, for sediments with impinging OMZ it is not known to what extent sedimentary N-loss contributes to the N-deficit in the water column. In the Arabian Sea, measurements of sedimentary N-loss are scarce and the contribution of anammox to the total sedimentary N-loss is unknown.

We present data from a cruise to the Pakistan continental margin, conducted during the inter-monsoon season in October 2007. At sites across the Pakistan Margin OMZ we determined N-loss rates in the water column and in the sediment using ¹⁵N-labelled substrates. N-loss in the water column was at the detection limit. Integrated N-loss in the water column was <200 μmol m⁻²d⁻¹ whereas the average sedimentary N-loss in the OMZ was around 450 μmol m⁻²d⁻¹. Denitrification was identified as the main process responsible for sedimentary N-loss but the contribution of anammox increased with depth from 5% at 360m to 45% at 1430m. Based on these results sedimentary N-loss seems to be the main nitrogen sink in this region of the Arabian Sea.