

Distribution of Dissolved Organic Carbon (DOC) in the Bay of Bengal: Influence of sediment discharge, fresh water flux and productivity.

RAVI BHUSHAN¹, CHINMAY S SHAH¹ AND
A. K. SUDHEER¹

¹Physical Research Laboratory, Ahmedabad, India,
bhushan@prl.res.in, chinmays@prl.res.in,
sudheer@prl.res.in

The Bay of Bengal in the northern Indian Ocean is a unique oceanic basin with significant influence of discharge of fresh water and sediment from various rivers and productivity associated with seasonally reversing southwest and the northwest monsoon. The DOC concentrations were determined in the vertical profiles of seawater samples collected from the Bay of Bengal and the Indian Ocean. The highest DOC concentration were observed in the northern Bay of Bengal in the surface waters due to the influence of fresh water with higher DOC. The surface DOC concentration in the Bay of Bengal varies from 75-100 μM , whereas in the Indian Ocean it varies from 70-90 μM . In the northern Bay of Bengal, the sub-surface DOC concentrations show enhanced DOC concentrations upto $\sim 700\text{m}$ when compared to the other southern stations. This can be attributed to the release of DOC from the enormous flux of ($0.5 \times 10^{12} \text{ mol.C.yr}^{-1}$) particulate organic carbon (POC) from the Ganga-Brahmaputra river system. Lower concentration of dissolved oxygen in similar depths indicates oxygen consumption due to degradation of the enhanced flux of POC. Thus, in addition to productivity, the distribution of DOC in the Bay of Bengal appears to be significantly controlled by fresh water and sediment discharge and has strong implications to the regional carbon budget.