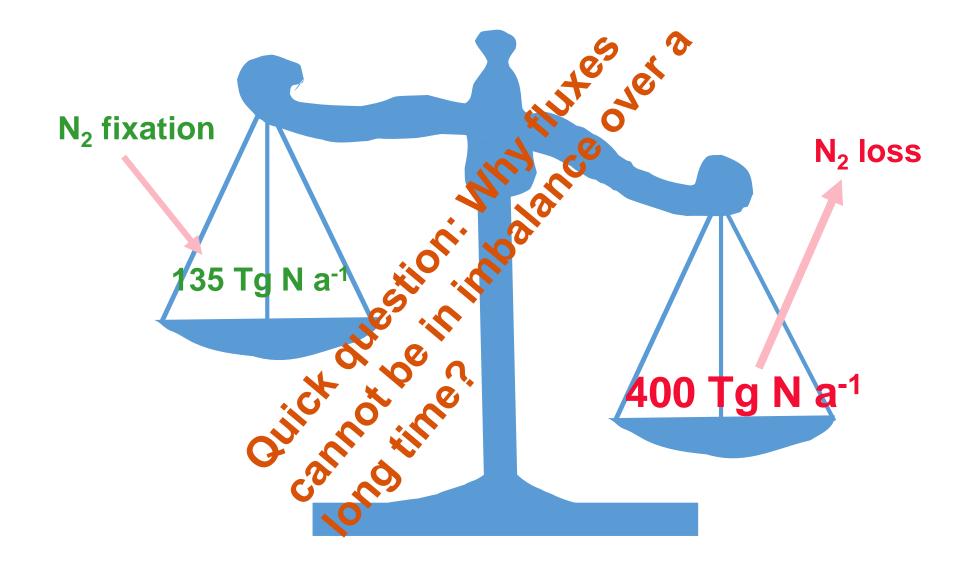
Low Dinitrogen Fixation Rates in the Bay of Bengal during Summer Monsoon

Arvind Singh, Himanshu Saxena, Deepika Sahoo, Atif Khan, Sanjeev Kumar, A K Sudheer

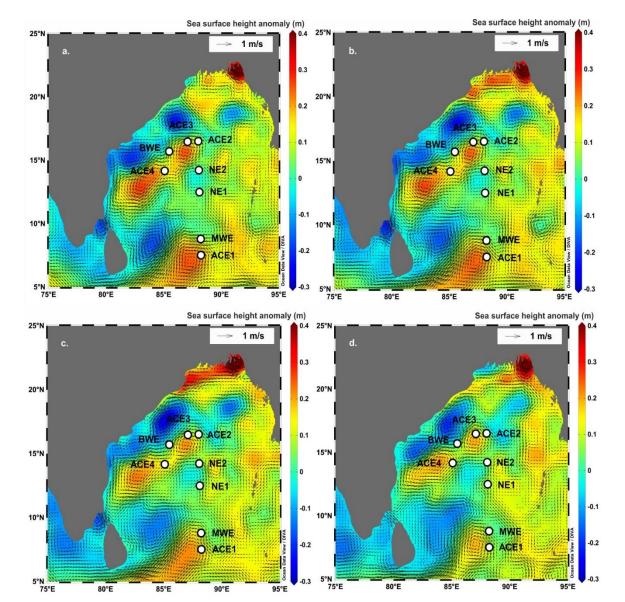
Physical Research Laboratory, Ahmedabad, India

Motivation - Nitrogen Imbalance

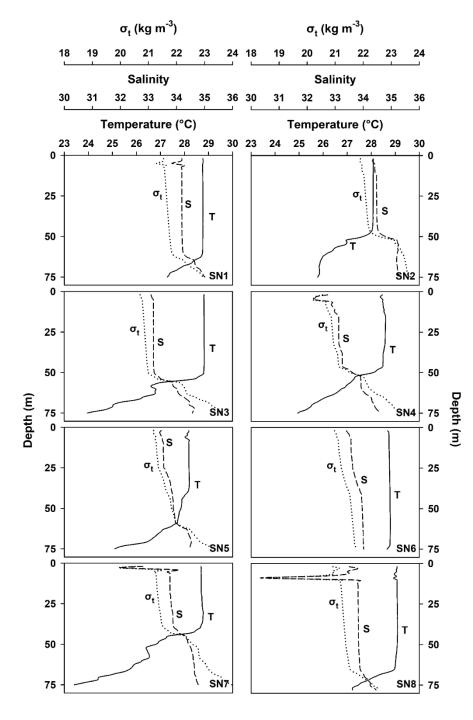


Data source: Codispoti, 2007

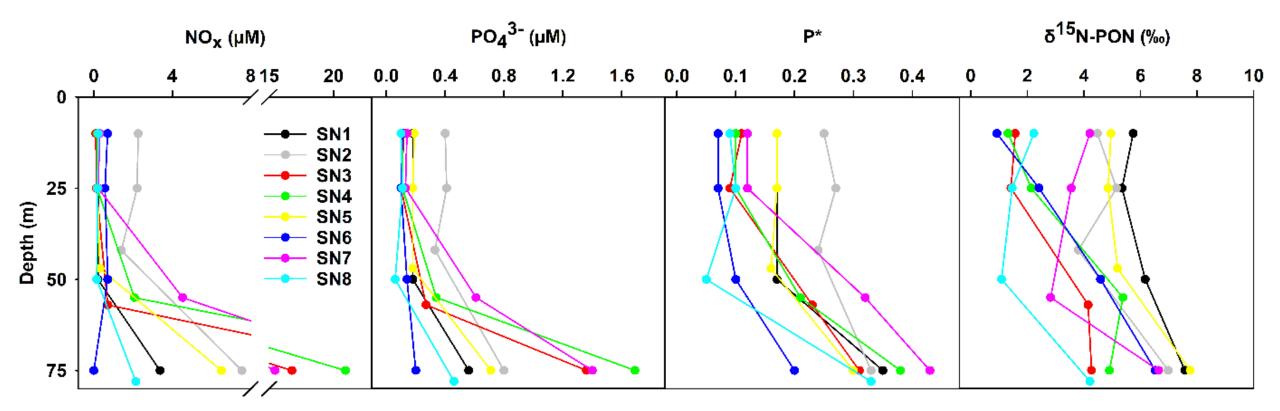
Sampling Locations (July 2018)



Physical Properties



Chemical Properties

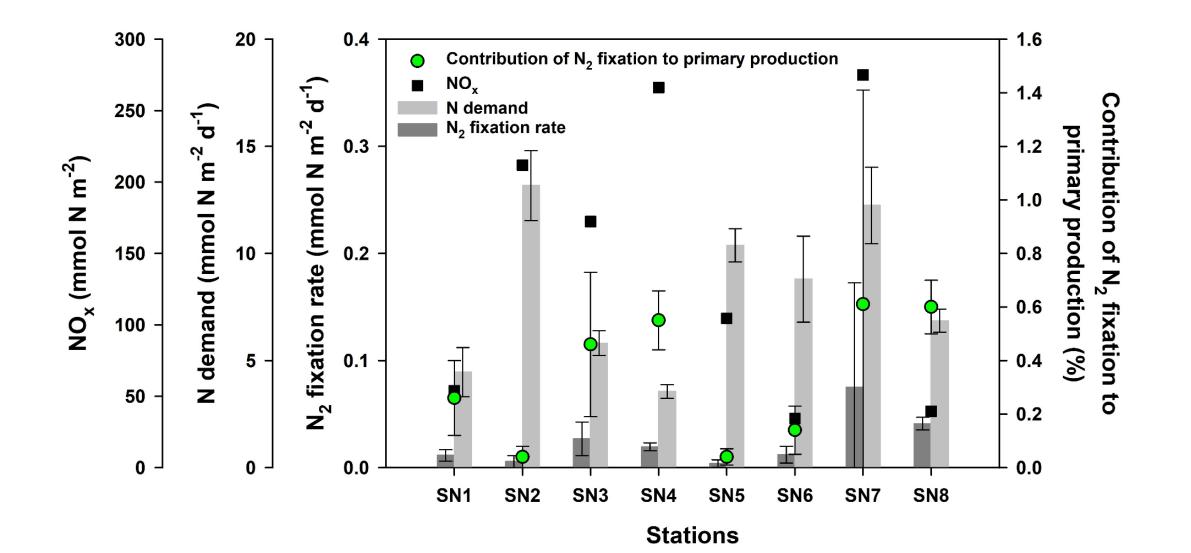


Volumetric Rates

Carbon uptake rate (nM C hr⁻¹) 75 150 225 300 75 150 225 300 n - 0 SN2 SN1 25 - 25 50 50 O N₂ fixation rate Carbon uptake rate 75 - 75 0.00 0.03 0.06 0.09 0.12 0.15 0.00 0.03 0.06 0.09 0.12 0.15 150 75 150 225 300 0 75 225 300 n 0 - 0 SN4 SN3 - 25 25 50 50 75 75 Depth Depth (m) 0.00 0.03 0.06 0.09 0.12 0.15 0.00 0.03 0.06 0.09 0.12 0.15 225 225 0 75 150 300 75 150 300 E 0 SN6 SN5 - 25 25 50 50 75 75 0.00 0.03 0.06 0.09 0.12 0.15 0.00 0.03 0.06 0.09 0.12 0.15 150 225 300 75 150 225 300 75 0 0 - 0 SN8 SN7 25 - 25 50 50 75 - 75 1.4 0.00 0.03 0.06 0.09 0.12 0.15 0.6 1.2 0.0 0.2 0.4

N₂ fixation rate (nM N hr⁻¹)

Integrated Rates



Summary

- First N_2 fixation study within the sunlit layer of the Bay of Bengal.
- Bay encounters warm water, excess PO_4^{3-} and Fe prerequisites for diazotrophs, thus we hypothesized high N₂ fixation in the Bay.
- Our findings were contrary to our hypothesis.
- Contribution of N_2 fixation to primary production was negligible.
- Turbidity due to copious riverine discharge and cloud cover over Bay might have contributed towards the low rates of N_2 fixation.
- A detailed study (covering all seasons) is needed to estimate the N_2 fixation rates in the Bay.