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SEMINAR

Oceanic nitrogen cycling: new results based on isotopic tracers

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Nitrogen is abundant in the Earth's atmosphere, but much of it is not directly useful for life. Reactive nitrogen is needed for life processes and a small amount of reactive nitrogen is controlling life processes and hence the global carbon cycle. Over the last decade, we have investigated various aspects on the marine nitrogen cycle in the Indian Ocean. Using 15N and 13C tracers we have quantified, besides the biological productivity in the ocean (rate at which carbon is fixed by photosynthesis by marine planktons, measured in units of g C m–2day–1) and its temporal and spatial variability, the 'new production', the fraction of the carbon that is dispatched to the deep ocean to stay for longer time scales. We have developed experimental methodologies to measure the direct fixation of atmospheric nitrogen by marine diazatrophs such as Trichodesmium in the water column and also sediments. Further we have quantified the nitrification process, which compensates for the loss of reactive nitrogen to the atmosphere by denitrification. For the latter, we have modified the traditional Rayleigh isotopic fractionation model. We have also evaluated the nitrogen transport to the ocean through rivers and atmospheric transport. In this talk, while highlighting some important new results, we also propose to discuss current and future research in this area.

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Venue: USO Seminar Hall