Preface

Exchanges across marine interfaces are important in global material cycles and in the modification of atmospheric composition. Climate change caused by natural processes or anthropogenic interference has the potential to alter the net exchange of materials. A special Ocean-Atmosphere Session-18 (OA 18) on **Material exchanges at marine boundaries and surface ocean processes: Forcings and feedbacks** was held during the 2nd Annual Meeting of the Asia–Oceania Geosciences Society (AOGS) in Singapore during 20–24 June 2005. The following Special section contains some of the papers presented at that session.

The first article by Sarma addresses the biogeochemical response of the Arabian Sea to the Indian Ocean Dipole (IOD) of 1997–98, and finds significant decreases in surface primary production and sea-to-air fluxes during the IOD period than at other times. Conspicuous intra-basin differences in these responses within the Arabian Sea reflect the importance of regional climate shift (i.e., IOD) to the biogeochemistry of the region. In a future study it will be interesting to see how the biogeochemical processes in the Bay of Bengal respond to changes in rainfall and land discharges caused by the IOD.

In the second article, Shalini *et al* show that bubbling process ejects ~ 5 times more methane than is possible by diffusional flux in the Pulicat lake, which exhibits shallow estuarine characteristics. Diffusional flux is generally used to quantify air–sea flux of a gas and the bubbling process is generally ignored. This study highlights therefore the significance of bubbles in loading the atmosphere with methane from shallow water systems. What happens in other shallow ecosystems along the Indian coast is also of considerable interest.

In the third article, Nair reports changes in the chemical composition of sinking fluxes in the Arabian Sea in relation to atmospheric dust transport. He finds higher export fluxes of dolomite in the western Arabian Sea associated with dust loads transported by northwesterlies. Trace metal exports show peaks during the monsoon months facilitated by enhanced biological production. The connection between dust/particles (transported by air and rivers) and export fluxes is yet to be probed in detail.

In the fourth article, Mandal *et al* studied aerosols and trace gases during the monsoon transition period of 2004. They found lower ozone and higher greenhouse gases over the equatorial Indian Ocean.

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Guest Editor

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