



## **Nitrous oxide emissions from the Northern Indian Ocean: the roles of atmospheric and riverine inputs**

Lauren Zamora (1,2), Parv Suntharalingam (3), Arvind Singh (1), Manmohan Sarin (4), Srinivas Bikkina (5), Sybil Seitzinger (6), and Sunke Schmidt (1)

(1) GEOMAR Helmholtz Institute for Ocean Research Kiel, Germany, (2) NASA Goddard Space Flight Center, Greenbelt, MD, USA, (3) University of East Anglia, Norwich, UK, (4) Physical Research Laboratory, Ahmedabad, India, (5) Institute of Low Temperature Science, Hokkaido University, Sapporo, Japan, (6) International Geosphere-Biosphere Program, Stockholm, Sweden

The North Indian Ocean accounts for ~20-30% of oceanic emissions of the greenhouse gas, nitrous oxide. These regional nitrous oxide emissions are sensitive to relatively small shifts in oxygen levels, which in turn depend upon regional nutrient inputs. Model and observational data indicate a twofold increase in nutrient loading in this region in recent decades from atmospheric deposition and river runoff. These enhanced nutrient inputs could have large, nonlinear effects on regional marine oxygen levels and nitrous oxide emissions in both the Arabian Sea and Bay of Bengal.