



Anthropogenic nitrogen as a driver of interannual variability of primary production in the marginal seas of the northwestern Pacific Ocean

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The impacts of anthropogenic nitrogen (N) deposition on the marine N cycle are only now being revealed, but the magnitudes of those impacts are largely unknown in time and space. The marginal seas of the northwestern Pacific Ocean (e.g., East China and Yellow seas) are particularly subject to high anthropogenic N input because the adjacent Chinese continent is highly populated and has rapidly growing economy. Such excess N input has even switched some parts of the study area from being N-limited to P-limited. Analysis of datasets for atmospheric N deposition, satellite chlorophyll-a (Chl-a), and air mass back trajectories reveal that transport of N originating from China, and its deposition to the ocean, has been responsible for approximately 40–60% of interannual variations in Chl-a in the East China and Yellow seas. The airborne contribution of N to Chl-a in these basins is expected to grow in the coming decades.