

Coastal Eutrophication in Southeast Asia: Importance of Atmospheric Deposition of Nutrients

SUNDARAMBAL PALANI¹, RAJASEKHAR BALASUBRAMANIA², SATHRUGNAN KARTHIKEYAN², PAVEL TKALICH¹

> ¹Tropical Marine Science Institute, National University of Singapore, 14 Kent Ridge Road, Singapore 119223

²Division of Environmental Science & Engineering, National University of Singapore, Singapore 117576

The sources of nutrients for eutrophication include both point and nonpoint sources. Point sources are effluents that reach a body of water by pipes, discharge channels or similar structures. On the other hand, nonpoint sources do not enter the aquatic system by a single site, but across a widespread boundary or interphase zone. Among the non-point sources, atmospheric deposition of nutrients in the coastal zone is the least understood process. The knowledge is limited by the paucity of comprehensive data sets. However, the available data suggest that atmospheric deposition may be an important contributor to nutrient loading of coastal zones in Southeast Asia because of the abundant rainfall in this region and the recurring forest fires on a large scale. The uncontrolled forest fires that took place during the 1997-98 El Nino were of particular concern to the international scientific community since the air pollution problem was severe and persisted for several months. In order to assess the environmental impacts of the emissions from the forest fires, we studied the chemical composition of both rainwater and airborne particles during this smoke haze episode. The wet and dry deposition fluxes of atmospheric nutrients were also estimated to gain further insights into this environmental problem. This is the first attempt to quantify atmospheric fluxes of macro-nutrients to the Singapore coastal area. The results obtained from this comprehensive study will be presented and discussed. Keywords: Singapore seawater; atmospheric deposition, nutrient input, marine environment, eutrophication. Corresponding author: 2*Prof. Rajasekhar Balasubramanian, Email:eserbala@nus. edu. sg; Tel: (65) 65165135