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Distribution of nitrogen and phosphorus, both dissolved and particulate forms, were investigated in the Bang Pakong river during wet (August, 1989) and dry (Febuary, 1990) seasons. Both nutrient elements were found to be present mostly in the dissolved form, being 99.8 % for total nitrogen and 84.1 % for total phosphorus. In the wet season, dissolved nitrogen (nitrite+nitrate and total nitrogen) showed to be increasing in concentration form the head of the estuary towards the sea. However, decreasing trend was observed in the dry season. Ammonia and phosphorus exhibited variable trends for both wet and dry seasons. In general, nutrient concentration were found to be higher during the dry season as compared to the wet season, especially those of nitrite+nitrate, orthophosphate, total nitrogen and total phosphorus. The average N:P ratio was found to be 28:1, indicating that phosphorus is the limiting factor for phytoplankton growth in the Bang Pakong river.

Behaviour of dissolved nitrite+nitrate and total nitrogen in the dry season were found to be conservative, whereas those of ammonia, organic nitrogen, orthophosphate, organic phosphorus and total phosphorus were non-conservative. Particulate nitrogen and phosphorus also exhibited non-conservative behaviour in the Bang Pakong river.

Nutrient fluxes to the Upper Gulf of Thailand were found to be higher in the wet season as compared to the dry season. The annual mean net fluxes of ammonia, nitrite+nitrate, organic nitrogen, total nitrogen, orthophosphate, organic phosphorus and total phosphorus were calculated to be 229 x 10^3, 965 x 10^3, 445 x 10^3, 1,641 x 10^3, 24 x 10^3, 8 x 10^3 and 32 x 10^3 kg/year respectively. The annual mean salt flux was 171 x 10^8 kg/year.