CHARACTERISTICS OF VERTICAL PROFILE OF NUTRIENTS IN TOKYO BAY, JAPAN

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Tokyo Bay is one of the main enclosed coastal seas in Japan. About 26 million people live in the watershed, accounting for 22% of Japan's total population. It includes the Tokyo metropolitan area, which is the political, economical and industrial center of Japan. A system of Area-wide Total Pollutant Load Control (ATPLC) has been established to restrict the quantity of COD, nitrogen(N) and phosphorus(P) flowing into Tokyo Bay. As a result, the quantity of those pollutants produced in the coastal zones of Tokyo Bay was estimated to be greatly reduced. However, the water quality of Tokyo Bay has not improved considerably yet. It is due to the eutrophication and the primary production.

Our study aims to estimate the total amount of nutrients in Tokyo Bay in order to evaluate the effect of water pollution controll measures. For the accurate estimation, vertical profile data of nutrients are needed, but sufficient such data haven't been reported so far. Therefor, we have started vertical profile observation of N and P in Tokyo Bay using a new multi-depth watersampler. The following results have been obtained by analyzing the behavior characteristics of the nutrients.

- NO_x concentration is highest in the surface layer, and gradually decreases to the bottom layer. The vertical profile is opposite to the salinity's. It indicates that NO_x is mainly flowing into the bay by river water.
- Vertical profile of PO_4 concentration changes seasonally, except in the surface layer near river mouth where the concentration is usually high. In summer, especially when the bottom layer is in anoxic condition, the concentration in the bottom water increases. So these facts indicates PO_4 has two sources; river water and bottom sediment.
- Using multi-depth sampling data, the mean concentrations of two layers (surface and bottom) and of multi layers (each 1m depth) were calculated and compared. In many cases, the ratio of two layer mean concentration to multi layer mean's was greater than 1.0. It follows from this result that the total amount of nutrient calculated by the two layer mean value (i.e. the concentrations lineally change from the surface to the bottom layer.) likely overestimates the real quantity.