

Relationship between anthropogenic pollution and spatiotemporal change in element composition contained in the bottom sediments from Tokyo Bay, Japan.

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Elucidating temporal variations using sediment records from the hydrosphere is an effective method to evaluate the historical trends of environmental loads and the resulting effect to aqueous ecosystems.

The watershed of Tokyo Bay is widespread in Kanto Plain including large cities in capital district such as Tokyo and Yokohama, where approximately 30 million people live (1/4 of that of Japan). Especially, industrial and residential districts with urban infrastructures are located along the coasts, and 25,000 ha of water area are reclaimed. Therefore, history of the effects of such anthropogenic modifications are considered to be recorded in the bottom sediments in Tokyo bay as a temporal variations of element components.

Matsumoto (1983) investigated the elemental composition for the last 100 years up to 1981 in Tokyo Bay, and evaluated the manifestation and peak of artificial alteration. However, the spatiotemporal distribution after the peak, especially trace metal elements such as rare metals are not enough clarified. Therefore, we investigated the temporal distribution of each elements for the last 70 years in two surface cores TB12B-38 (c.l. 82 cm) and TB15-68 (c.l. 58.5 cm) recently drilled in Tokyo Bay by using ICP-MS. We also investigated surface sediments collected at 14 sites in Tokyo Bay to evaluate the horizontal distribution of each elements and the factor of the concentration to the bottom sediment.

Temporal distributions of many elements, including Cu, Pb, Zn which are the general indicators for industries, rapidly increased from 1950' s to 1970' s, then decreased to core surface (2010' s). These trends are considered to be the effects of the historical change of anthropogenic loads, such as the high economic growth after the World War II and later effluent control for the severe environmental problem. More specific trends in each element due to their emission source and sedimentation trend will be discussed on the presentation.

Reference: Matsumoto. E. (1983), Sediment environment in Tokyo Bay (review)

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