

Vertical flux of organic matter in heavily eutrophic embayment, Dokai Bay, Japan

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Dokai Bay is an enclosed small bay, located in western part of the Seto Inland Sea, Japan. It is well known as the most eutrophicated coastal bay in Japan, due to serious water pollution by effluents from industry along coast of this bay. Since the 1970's, various measures for the purification of the bay have been undertaken. As a result, the properties of the water have been improved. However, Dokai Bay is still highly eutrophicated and red tides often occurred in summer.

The vertical flux of organic matter and its chemical characteristics were investigated to assess the material circulation in Dokai Bay. Sediment trap experiments were conducted 6 times from August 1995 to February 1998.

Total settling mass flux varied from 8.2g/m²/day to 307g/m²/day. The organic carbon and nitrogen contents in sinking particles were varied from 27.3 mgC/g to 107 mgC/g and 1.45 mgN/g to 11.7 mgN/g, respectively. The estimated carbon fluxes varied from 0.66 gC/m²/day to 25.6 gC/m²/day.

The mean carbon flux was estimated 6.23 gC/m²/day in August, although primary productivity was

estimated 2.44 gC/m²/day from July to September. Thus the carbon flux level was approximately 2.5 times higher than that of primary productivity. Moreover C/N ratio of sinking particles were estimated from 7.7 to 22.3 (C/N ratio of phytoplankton : 6.6) and C/Chla ratio varied from 121 to 4390 (C/Chla ratio of phytoplankton : 30 to 60). These results indicated that the sinking material was not mainly originated from phytoplankton products but the allochthonous products from the land.