periods of Wet-Dry and Dry-Wet seasons has increased the DIN and TOM accumulation in the water column, and it stimulated phytoplankton bloom at Hurun Bay. This situation has caused the DO concentration decrease due to high decomposition of the organic matter. The results recommend that in both transition periods, the aquaculture activity should be limited at minimum level to reduce the risk of fish mass mortality caused by the DO depletion, diseases appearance, and particularly harmful algae bloom such as *Noctiluca sp* that appeared during these periods. DIN was a main factor of the environmental pollution at Hurun Bay due to the intervention of the anthropogenic activity through aquaculture. The DIN/DIP ratio within this area was less than 16.

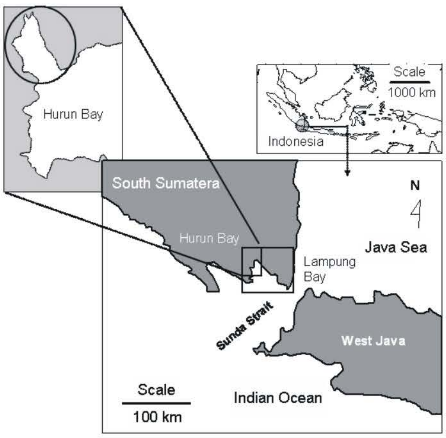

Fig. 1 The situation of Hurun Bay in the southern coastal area of Sumatera

Influence of water pollution control measures on sediment quality in Japanese Lakes

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Lake sediment qualities in three lakes (Lake A, B and C) , which differ in the levels of water pollution control and therefore pollutant load, were measured and compared.

Lake conditions: Lake A had suffered from heavy blue-green algae blooming caused by pollutant load from houses and livestock since 1970's, however, because of the progress of sewerage system installation and dredging of lake sediment in heavily polluted area, blue-green algae blooming has stopped for recent five years. On the contrary, Lake B, where sewerage installation is at low level and livestock load is large, has been experiencing algae blooming recently. Lake C, which is a small brackish lake and receives large pollutant load from cities and agriculture, has a water pollution problem for over several decades.

Sewerage installation levels expressed as a population ratio served by sewerage system are 55%, 8% and 50% for Lake basins of A, B and C, respectively. And the levels of domestic pollution load to the lakes expressed as the ratios of population without sewerage system to the lake surface area are 2,600, 1,800 and 73,000 capita/km^2 for Lake A, B and C, respectively.

Methods: Lake sediments were collected in the center of the lakes using core samplers, and the concentration profiles of nitrogen, phosphorus and organic carbon in solid phase and liquid phase along the depth were measured. Also, release rates of nitrogen, phosphorus and organic carbon from the sediment core samples were measured at 20C□ under aerobic and anaerobic condition. Additionally, some sediment layers were subjected to oxygen consumption tests.

Results: Nutrient concentrations in the liquid phase of the sediments were the smallest in Lake A, then in Lake B, and by far the highest in Lake C, which reflects the pollution loads to the lakes as the consequence of the development stage of countermeasures such as sewerage system and sediment dredging. Nutrients release rates showed the same tendency as the liquid phase concentration of the sediments (Fig. 1), and the comparison between the release rates in Lake A and Lake B indicates the effectiveness of taking polluted sediments out of the lake even though the phosphorus concentration of surface water does not show much difference.

Oxygen consumption rates of the sediments are shown in Fig. 2 for several sediment layers. The rates of the surface layers are not so different among the lakes, which might be caused by the aerobic conditions of the bottom water when sediment samples were taken, however, the rate of 2cm-depth layer of Lake C was double of those of other lakes, which indicates the tendency of low DO concentration in bottom water in Lake C.

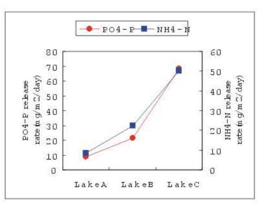

Fig. 1 Nutrients release rate from sediment under anaerobic condition

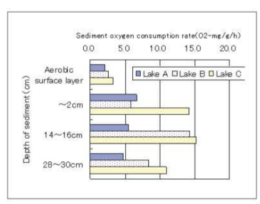

Fig. 2 Comparison of sediment oxygen consumption rate for several