

## Changes in the Water Environment of Dokai Bay and Issues for Future Resolution

Masaharu Inoue

The Seto Inland Sea of Japan has developed as not only a place of unparalleled beauty but as a treasure-trove of fishing resources. With economic development, however, industrial regions were formed along the waterfront, and water pollution progressed to the point where the Seto Inland Sea was called a "dying sea." In 1971, the 11 prefectures and 3 municipalities in the coastal regions of the Seto Inland Sea established the Governors and Mayors' Conference on the Environmental Management of the Seto Inland Sea, and as a result of calls for the national government to establish a special law, the Law for Temporary Measures for the Conservation of the Environment of the Seto Inland Sea was enacted in 1973 and specific countermeasures were promoted, including measures to reduce the load from industrial waste water and measures to curb reclamation.

Based on these events, and as a specific example of improvements to water quality in the Seto Inland Sea region, I would like to discuss water pollution measures in Dokai Bay in the city of Kitakyushu.

Since the early years of the 20th century, heavy and chemical industries have grown up around the Dokai Bay of Kitakyushu. As a result, water pollution increased dramatically in the bay starting in the 1950s, to the point where marine organisms could find no habitats and the area was referred to as a "dead sea." However, strict legislation-based regulation on factory wastewater were implemented and sewer systems were constructed in the surrounding region. In addition, a total of 350,000 cubic meters of sludge containing mercury concentrations of 30 mg/kg or greater were dredged between 1973 and 1976. These policies resulted in a dramatic improvement in the quality of water in Dokai Bay, to the point where in 1993 it was confirmed that a total of 527 species ranging from plankton to fish and birds (including 115 species of fish and shellfish) had returned to the Bay.

However, one problem that still remains is the problem of eutrofication. Red tides occur in Dokai Bay on a daily basis, and the Bay is also beset by other problems specific to enclosed coastal seas, such as the appearance of anoxic water. For this reason, companies in the surrounding area are being requested to reduce quantities of nitrogen, and new experiments such as the use of a mussel, *Mytilus galloprovincialis* and biotopes to reduce nutrients are also being conducted. In addition to these efforts, the effect of the total load restrictions on

nitrogen and phosphorous that are soon to be implemented will be studied and efforts to reduce the amount of nitrogen in the Dokai Bay will be promoted.