Temporal and Spatial Variation on Water Environment and Fishery Resources in Osaka Bay

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ABSTRACT
Osaka bay located in western Japan is one of the famous semi-closed water areas in Japan. Around this bay, the natural beach almost completely disappeared due to the development of the seafront zone. On the other hand, former Osaka bay has rich fishery resource; it was called “Chinu-no-Umi” which means “sanctuary for black sea bream”. The environmental rehabilitation of Osaka bay is citizen’s longtime hope. In this study, first, we divided Osaka bay into 5 sea areas and examined temporal and spatial change (1973-2005) on water quality, such as COD (Chemical Oxygen Demand) and DO (Dissolved Oxygen). Second, we also examined temporal and spatial change on the amount of catches of Japanese blue crab and black sea bream. Japanese blue crab and black sea bream are the symbol of wide-ranging and benthic animal in Osaka bay, respectively. Finally, using the statistical approach, the relationship between water quality improvement and the recovery of fishery resources was clarified.

KEY WORDS: Osaka bay; water quality; mud property; fishery resources; black sea bream; Japanese blue crab.

INTRODUCTION
The Osaka bay (Fig. 1) is well known as one of the semi-closed water area in JAPAN. In this area, water quality improvement has been permanent problem. Former Osaka bay was called “Chinu-no-Umi”, “Chinu” means black sea bream, “Umi” means sea in Japanese, respectively. Therefore, “Chinu-no-Umi” was the word expressing the rich fishery resources in former Osaka Bay. However, after the World War II, with the aim of reducing the storm surge damage and the functional enhancement of distribution productivity, many shore protection facilities were well maintained along the coast line in the bay. As a result, aggravation of water quality has been progressed and fishery resources have been reduced.

In recent years, some countermeasures with the environmental improvement techniques for degraded Osaka bay have been conducted by the governments and the water quality shows some signs of improvement. However, Osaka bay has been on way to the rehabilitation.

In this study, using some results of environmental investigations in Osaka Bay, first, the time series of water quality and sediment property was presented. Next, the time series of fishery resources in Osaka bay was grasped by statistical data in Osaka prefectural fisheries experiment station. Finally, using noticed above data, the relationship between the effect of water quality improvement and the recovery of the fishery resources in Osaka bay was examined.