

Change of Water Quality in Osaka Bay During Past 70 Years

**Keiji Nakatsuji⁽¹⁾, Kohji Muraoka⁽¹⁾ and Nobuyuki
Yamane⁽²⁾**

*⁽¹⁾ Department of Civil Engineering, Osaka University, Osaka 565-0871, Japan Tel
+81-6-6879-7613 Fax +81-6-6879-7616*

e-mail: nakatsuj@civil.eng.osaka-u.ac.jp

⁽²⁾ CTI-Engineering Co., Osaka Branch, 1-2-15 Otemae, Osaka 540-0008, Japan

Tel+81-6-944-7747 Fax +81-6-944-7761

e-mail: n-yamane@osaka.ctie.co.jp

Abstract

The rapid industrialisation and urbanisation in Osaka Bay Area have produced many serious water pollution problems since the 1960s. A symbolic phenomenon is the increase in the occurrences of red tide. The present study collected and analyzed water quality data in Osaka Bay for the past 70 years, and also social and economic information such as population, livestock, fertilizer, industrial product and so on. A comparison of time changes of observed water qualities with estimated pollution loads discharged from land is examined. The cut-off reduction of pollution loads produced immediate results for the recovery of water quality in Osaka Bay. The time changes of COD and phosphorus between observed data and estimated loads demonstrate similar tendency after 1970s; however, there are delays of four or five years. This shows that the circulation system of each substance may play important roles on the long-term fluctuations in water qualities. Finally, numerical experiments using ecosystem model are conducted under the conditions of estimated pollutant loads and the different lay of reclaimed land in the past 70 years, in order to quantitatively evaluate the impacts of past coastal development on the time change of water qualities. This attempt can be considered as 'post-environmental assessment', in contrast to well known environmental impact assessments which are performed beforehand.