

ON-SITE EXPERIMENTS OF OPEN- AND CLOSED-TYPE ARTIFICIAL TIDAL FLATS AT INNER PART OF OSAKA BAY

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Water and sediment qualities in an enclosed sea area, like Osaka Bay, are chronically bad since pollution loads from big cities are much higher than the natural purification capacities. A closed-type artificial tidal flat, which is a shallow water area surrounded by rubble-mound breakwater, was proposed as one of the ecotechnologies applicable to the enclosed seas. Water purification effects of the closed-type artificial tidal flat are mainly sustained by tidal energy, and include not only physical filtration effect but also carbon and nutrient fixation effects by an ecological material circulation. The aim of this study is to clarify differences of water purification functions between the closed-type artificial tidal flat and a conventional open-type artificial tidal flat. On-site experimental facilities of both open- and closed-type artificial tidal flats were constructed at inner part of Osaka Bay in March 2002. Investigations of water and sediment qualities and benthic organisms have been performed since one month after the constructions. From the investigations, it is found that the rubble-mound breakwater can filtrate suspended solid and particulate organic matter, and reduce sedimentary turbulence and ingression of benthic animals. These results suggest that primary production and accumulation of organic matter in the closed-type artificial tidal flat are higher than those in the open-type artificial tidal flat.