

# Benthic Habitat Restoration along Seawall under Co-Benefit Strategy with Disaster Prevention: Pilot Work and its Restoration Monitoring in Tokyo Bay

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Habitat restoration in enclosed bays should often be said that it needs enough magnitude in space and proper choices of the location for water quality environment and larvae recruitment. These requirements cost high for regional governments or citizens, and sometimes result in unhappy abundant of local efforts. A co-benefit strategy is necessary for producing local Win-Win situation. This paper presents a concept of the multi-objective type restoration along seawall and an experience of its pilot-scale implementation with restoration monitoring in Tokyo Bay.

In February, 2008, Yokohama Port and Airport Technology Investigation Office, Ministry of Land, Infrastructure, Transport and Tourism, completed its construction of a small "stair-type" tidal flat along its existing seawall for ship mooring. The length of the flat along the wall is 50m and the width is 20m. The flat has 3 stage-steps and each depth of step surface is CDL+0m, +0.5m and +1.0m. Fine sand as flat material was accumulated over the existing anaerobic bottom bed. Accumulated sand in front of the exiting seawall was expected as the counter weight for preventing seawall failure at an earthquake occasion. The stair-type flat was also expected as a new habitat for the benthic system in coastal shallow water and a tidal flat. Also, its proper configuration was expected to provide enough depth and fewer obstructions for ship mooring.

After its completion, recruitment of benthos was monitored. New partnership was organized for monitoring with the owner (Government Office), research institutes, universities, NGO's, and high school students. This demonstration site also provided elementary school students opportunities



of good experience of observing tidal-flat ecosystem. One year's monitoring results show rapid recovery of the sound tidal flat ecosystem. Morphological stability was also confirmed. PPP (Public-Private Partnership) was functioned well for the adaptive management at the initial stage of its maintenance. Mass-media show interest after get to know these activities.

In Tokyo Bay, most of its coastal line is covered by the artificial seawall and the total length of the seawall is long. Various bodies, such as coastal industries and port authorities, occupy and manage the seawalls. The "stair-type" tidal flat along seawall will provide its owners larger safety and better habitat. Accordingly, this type of flat could make industries, governments and port authorities attractive to create. We have good reason to expect that combinations or series of such small scale efforts will create some large scale new benthic habitat along the coast, after all.