PROJECT AIMED AT PACKAGING OPTIMAL ENVIRONMENTAL RESTORATION TECHNOLOGIES FOR ENCLOSED COASTAL SEAS

INTERNATIONAL EMECS CENTER SECRETARIAT
International EMECS Center, 5-1 Wakinohama-kaigandori 1-chome, Chuo-ku, Kobe, 651-0073 Japan

In enclosed coastal zones where surroundings are highly utilized by industry or densely populated, eutrophication has progressed, leading to problems such as "red tides" and oxygen-deficient water masses that still have not been resolved. Research into element technologies such as artificial tidal flats and seaweed beds as one facet of the techniques for environmental restoration in coastal zones is underway on many fronts. However, to apply these to actual coastal zones where the problems have been caused by various environmental factors and complex mechanisms and to produce effective results, it is necessary to resolve the question of how these techniques which have different functions should be combined. For this reason, a research has been conducted to determine the optimal combination of environmental restoration techniques to restore material circulation and ecosystems to a favorable status through on-site experiments in the Port of Amagasaki (located at the farthest interior portion of Osaka Bay, in which reclamation has formed an extremely enclosed sea area), and to "package" the technologies so the knowledge obtained through the study could be applied to other areas. In 2001, the project started as a joint research project supported by the Japanese Ministry of the Environment, with Dr. Hideki Ueshima, of the National Institute of Advanced Industrial Science and Technology, as research representative and the International EMECS Center as secretariat. Members of the project are Kobe University, The University of Tokushima, Osaka Prefecture University, the National Institute of Advanced Industrial Science and Technology, the National Institute for Environmental Studies, the Port and Airport Research Institute, the Hyogo Prefectural Institute of Public Health and Environmental Sciences, Ohbayashi Corporation, Kobe Steel, Ltd. and Sohgoh Kagaku Inc. The on-site experiments have been conducted for artificial tidal flat, closed-type artificial tidal flat, inhabitable quaywall and floating seaweed bed since their construction in March 2002. In addition, flow control experiments using a hydraulic model is being conducted in order to determine the method to improve sea water exchange between the interior and the exterior of the port and the experiments for seaweed biomass utilization technologies to recycle the seaweed harvest which grew on nutrients in the sea are also being carried out. Investigations are being performed to accumulate data to evaluate the effects of the combination of technologies. Achievements of the project so far include the effects of these applied technologies such as closed-type artificial tidal flat, the maturation of bivalves (clams) cultivated in the artificial tidal flat and some practical application techniques to improve water quality by cultivating seaweeds, which are to be presented separately. In the same time, an environmental education program for local inhabitants and children is held at the on-site experimental facilities in order to introduce the present status of the environment of the coastal zone and how the degradation has been brought about and to promote their awareness for environmental restoration.