

Purification of Marine Water Environment in the Outside Waters by an Effect of the “Utsuro”

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We are facing the very age of earth environment in which nature and human should symbiotically live together by necessarily making use of natural energy and vital energies of ecology.

An area of the sea aimed for purification can be systematically cleaned up by natural energies (including tides and ocean waves, sunlight, lunar and terrestrial gravitation, vital energies of ecology, etc.) with an enclosure of wave breaking embankment having many voids provided. Such a system is called the “Utsuro”, which has been proposed as a technology to create the oceanic environment in 1981.

In the meantime, it became apparent that such a phenomenon served as a means for restoration of an oceanic environment like marine pollution by improving the water quality of polluted areas in the outside waters. It is therefore our attempt to make verification of the effects of the “Utsuro” through the studies of the “Utsuro” located at the estuary of Kinokawa and that located at the airport-neighboring park in Osaka Bay conducted by Sawai, Kihara, et al. in Setsunan University.

Among them, the estuary of Kinokawa (called the Aogishi area) is a specific water area having contaminated brackish water into which polluted exhaust discharged from a region of the former city in Wakayama prefecture flows, where the “Utsuro” is formed in the water area surrounded by seashore rock fill embankments and miscellaneous stones in all directions.

This “Utsuro” is about 30,000m² in area (A) having a difference in tidal height of about 1.5m in the outside waters, which constantly maintains a level of clean water with the contaminated water being purified in the outside waters at high tide by the action of catalytic oxidation taken through permeable rubble and then flowed into the “Utsuro”.

When the tide is on the ebb in due course of time, the volume of water that flowed in at full time alone will flow out to the outside waters after being purified by purification through permeable rubble and finally purifies the outside waters.

Therefore, the volume of water flowed out after being purified corresponds to the accumulation of product of area (A) in the Utsuro and tidal level (h) in the area of the Utsuro, with the purified water being continuously purified in the outside waters of about 90,000 ton per day (nearly 1 ton/sec).

Under the circumstances, this study was made as a proposition of the recovery and restoration technology to cope with the marine pollution allowing the measurement of water quality in those outside waters.

Therefore, despite the continuous purification of a vast amount of water in the outside waters, there is almost no consumption of running cost required for running the purification process owing to the use of natural energy. In addition, since this system is processed in the ecological cycle, its great advantage lies in the non-existence of polluted sludge, thereby making it possible to eliminate the environmental problem in land filling or incineration that will result in generation of polluted sludge associated with water treatment.