

## Assessment of MEIS for Marine Spatial Planning in the Nakdong River Estuary, Busan Metropolitan City, South Korea

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The Nakdong River has a length of nearly 510 km, with a drainage basin of around 23,400 km<sup>2</sup> in South Korea. The Nakdong River Estuary (NRE) in Busan city is a typical example of an estuary in which the throughput is manipulated artificially. The Noksan barrage, built in 1934, blocks the flow of the West Nakdong River, and the NRE barrage was completed between 1983 and 1987 to regulate the flow of the East Nakdong River. With the construction of several huge industrial complexes on reclaimed land near the NRE barrage in the last 65 years, the hydraulic circulation in the NRE has undergone dramatic changes in river discharge and geomorphic configuration, such as the formation of a series of barrier islands. In this study, marine environmental information system (MEIS) data collected after May 2015 were applied to support marine spatial planning (MSP) in the brackish water zone of NRE. The MEIS data in NRE consists of landscape classification of sub-environments, surface sediment distributions, characteristics of suspended sediment, short-term sedimentation, stratification index analysis in channels, closed circuit television (CCTV) using 4G long term evolution (LTE), automatic weather stations (AWS) in real time, calculated residual flow ( $R_r$ ), net suspended sediment loads ( $Q_s$ ), and net suspended sediment flux ( $F_s$ ) in main stream inlet using mooring station, etc. The NRE could be divided into areas continuously managed by government, marine protected areas, areas for the development of marine attractions, areas conserved for research education, and coastal areas subject to safety management, etc. For MSP, it was possible to use comparative data of the characteristics of environmental changes in the estuarine watershed to prepare the NRE for the partial opening or drainage extension in 2019 to 2021. This study aims to discuss how to predict environmental change after partial or full opening in NRE barrage and use ecological-based environmental maps in the process of MSP. The development of marine spatial planning mapping in NRE is much necessary for the nation at a time when the diversity of marine use and the demand for policies regarding marine space rapidly increase.

Keywords: Barrage, Busan, Estuary, Marine Environmental Information System, Marine Spatial Planning, Nakdong River Estuary

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