

MONITORING OF RIVER MOUTH MORPHOLOGY CHANGE BY AERIAL PHOTOGRAPH ANALYSIS

PATCHANOK SRIVIHOK¹ AND HITOSHI TANAKA²

¹Environmental Hydrodynamics Laboratory, Department of Civil Engineering, Tohoku University, Aoba-06, Aoba-Ku, Sendai, JAPAN.

²Environmental Hydrodynamics Laboratory, Department of Civil Engineering, Tohoku University, Aoba-06, Aoba-Ku, Sendai, JAPAN.

The river mouth morphological change is the important information for coping with the coastal and estuarine problems such as flood control, navigation, and salinity intrusion into the river. Traditionally, the information can be obtained from continuous field observation. However, this method consumes lots of times and human works. Especially, it is not applicable to cover long-term period in the large area. In the present study, the image analysis is utilized to determine the river mouth feature based on color information in the aerial photograph. The land and water area would then be distinguished by the different color. After that the aerial photograph analysis method is applied to monitor the river mouth morphological change of the Nanakita River in Japan. This river has confronted the difficulty to maintain the position and sectional area at the river mouth. From the past history, the river mouth closure was observed many times in 1988-1989 as well as in 1994 according to considerably low river discharge, less than $10 \text{ m}^3/\text{s}$, during dry season. In the low river discharge period, tidal flow has the important role to flush sediment from river mouth. Additionally, the usual incoming wave direction from ESE and SE causes longshore current to transport sediment to the river mouth from right to left direction. However the study found that, in the recent period, the river mouth feature is rather stable and closure is not observed anymore. In this study, the changing behavior of river mouth during last decade is investigated and the factor affecting to river mouth morphological change is studied. Moreover, according to the location of the Nanakita River Mouth, the shoreline on the left side is affected by wave reflection from breakwater structure at Sendai Port far away for 2 km. The reflected wave induces the longshore current in the opposite direction to the usual incoming wave, left to right, and contributes the sediment supply to the river mouth. Thus, shoreline change in this vicinity area is considered that would influence on river mouth morphology change as well.