

THE STUDY ON OVERLAPPING BETWEEN FLOOD AND STORM SURGE IN RIVER AND ESTUARY REGION

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The water disaster due to seawater behavior, e.g., storm surge and tsunami, causes serious hazard. The measures on storm surge are especially important because typhoon frequently strike over JAPAN. On the other hand, the measures on river flood are also important subject at typhoon striking. However, the influence of storm surge at mouth of river has not been considered to deal with the river flood. In this study, the feature of overlapping between flood and storm surge is evaluated by numerical simulation. Synthetic analysis model, which consists of 1D river flood model and H2D storm surge model, is developed in this study. To examine validity of this analysis model, storm surge analyses for 8 typhoons passed over the Ise Bay in JAPAN are investigated. Fig. 1 shows the analysis regions of river and sea. The major river for evaluation is Shounai river. While, as the storm surge analysis is needed large-scale analysis region without influence of topography, the large-scale analysis region is prepared. By comparison between calculated water level and observed one, the analysis results show good agreement with observed data.

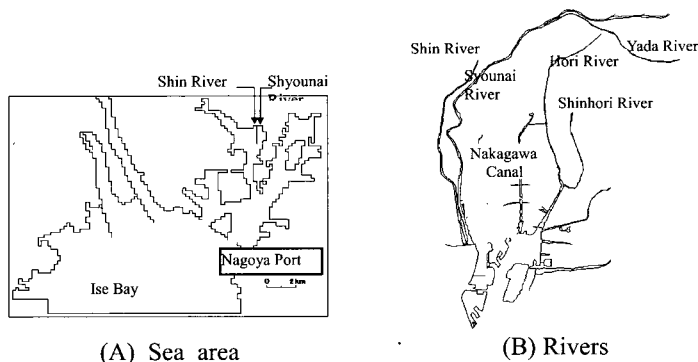


Fig. 1 Analysis region

Table 1. Analysis conditions

	Upstream condition in river	Open boundary condition of sea area	Atmospheric pressure and wind
Case A	Water level during Tokai heavy rain	Predicted tidal level during Tokai heavy rain	No consideration
Case B	Water level during normal states	Predicted tidal level during Tokai heavy rain and sea-level departure due to typhoon 5915	Atmospheric pressure and wind due to typhoon 5915
Case C	Water level during Tokai heavy rain	Predicted tidal level during Tokai heavy rain and sea-level departure due to typhoon 5915	Atmospheric pressure and wind due to typhoon 5915

Moreover, the validity of analysis model on river flood is shown through the realization of hydraulic conditions in Shounai river due to Tokai heavy rain occurred in 2000. Finally, overlapping between flood and storm surge is analyzed and the feature of flood behavior with dangerous property is discussed with analysis condition explained in Table 1. Fig. 2 shows the temporal change of water level at Touchi which is located at 2.9 km upstream from mouth of river. It is found that in the case of overlapping between flood and storm surge rising of water level in downstream area is investigated. Moreover, by comparison between water level and river dikes almost dikes are effective against overlapping between flood due to Tokai heavy rain and storm surge due to Typhoon 5915, only the danger of dike near Isshiki oohashi is shown in Fig. 8.

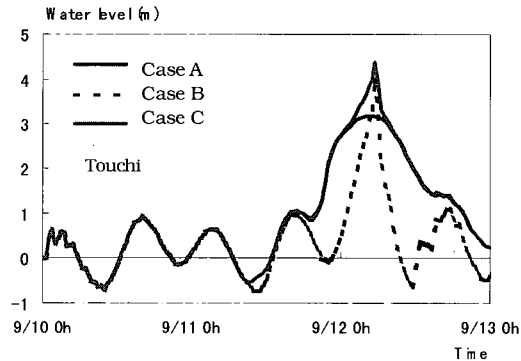


Fig. 2 temporal change of water level

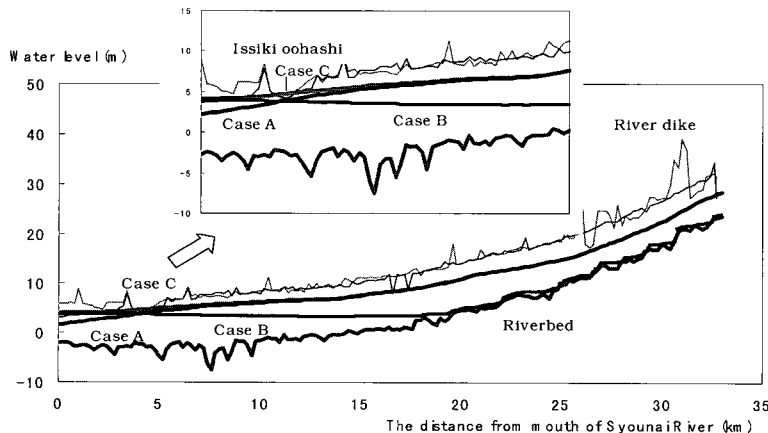


Fig. 8 The longitudinal distribution of water level in Shounai river