

TIDAL CURRENT SIMULATION USING THE FORECASTED WEATHER DATA

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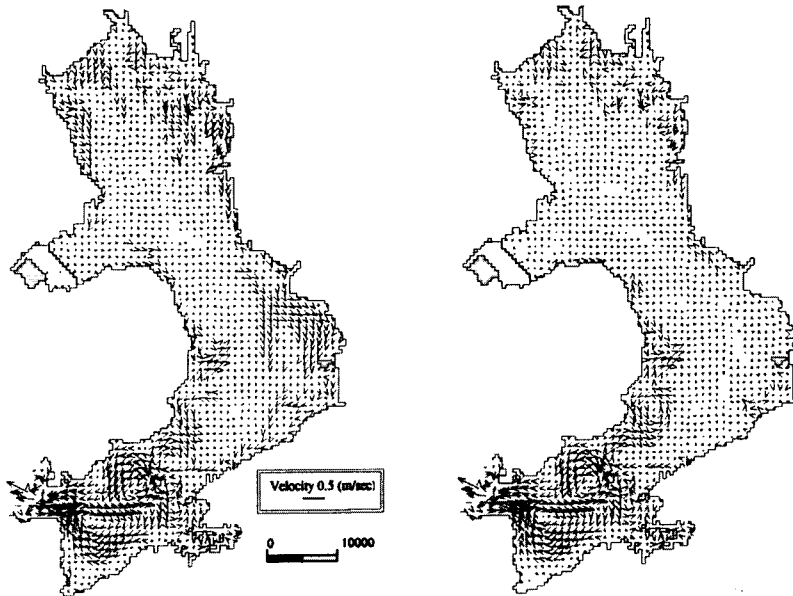
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For the tidal current simulation, the proper estimation of meteorological conditions, such as spatial variation of wind, atmospheric pressure and so on, are necessary. The meteorological simulation is recently carried out in many countries as well as Japan for the daily and long-term weather forecast, and meteorological conditions at sea area are also available as predicted results in real time.

This paper presents the outline of tidal current simulation using forecasted weather data. Sea level departure caused due to the meteorological variation at open boundary is estimated by artificial neural network (ANN). Tidal current simulation is carried out for Shimabara Bay, Japan, and the effects of wind blowing on the water surface on tidal motion of this bay are shown.

As one of the calculated results using simulation model developed in this study, predicted residual current of Shimabara Bay are depicted in Figure 1. In this figure, results obtained under computational condition which effects of meteorological variation were excluded are also shown in order to investigate the degree of influences of wind and atmospheric pressure.

Although the velocities of residual current except around open boundary are relatively small, notable differences in velocity are seen around eastern and northern sea area. As shown in Figure 1 (a), water tends to be transported to southward along the shoreline. Because MSM was predicting that wind on this day blew from northeast at Shimabara Bay, these changes were caused by the computational condition on wind distribution. From these figures, spatial distribution of tidal current, especially coastal area, are seems to be strongly affected by wind blowing on water surface, thus, adequate estimation of wind is needed in order to make clear the spatial and temporal distribution of pollutants from this watershed.



(a) MSM data is considered (b) weather data is not considered
 Fig. 6 Calculated results of residual current at the surface layer in Shimabara Bay.

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