numerical model was created by combining both a hydrodynamic model and a particle tracking model. The particle tracking model used the Euler-lagrange method (Yanagi et al, 1989) combining the settling and resuspension process of the particles. The size of particles from rivers were divided into 12 categories. The settling rate of the particles was set up by Stokes equation. The resuspension process assumed that particles less than silt size (0.074 mm) which had accumulated on the bottom sediment were resuspended when the bottom friction force of the seawater flow was more than the critical shear stress.

As a result, the particles discharged from the rivers located at the head of Ariake Bay were moved in water columns and accumulated on the bottom sediment along the seawater flow towards the mouth of the Bay. Most of the particles which accumulated on the bottom sediment were supplied from the Kikuchi River, Sira River and Midori River which were all located in Kumamoto Prefecture. This model was able to quantitatively estimate the spatio-temporal behavior of particles during the process of accumulation on the sea bottom and subsequent resuspension in water columns. Hereafter, we will attempt to validate this model with a collection of real data from each of the locations that was simulated, while also estimating the contribution of particles from each source into the bay. Once validated, this simulation model could be useful for tracking the movement of plankton during red tides, as well as the journey of pelagic bivalve larvae.

Study on natural environmental characteristics of the Sone tidal flat in the Suo sea, Japan

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1. Introduction: The Sone tidal flat in Kitakyushu city has a dry flat of about 517ha during ebb tides, as shown in Fig. 1. It is one of the largest flat in the city and the nicest spots for the wild bird observation throughout four seasons. It is also famous as the breeding ground of Horseshoe crab (*Tachypleus tridentatus*). A construction of an artificial island for a new airport about 3 km offshore started in 1994, which was completed in 2006. A fishing port is under construction in the center of the tidal flat. There is therefore possibility that natural environments of the tidal flat may change. Although several large-scale landfills have been recently constructed surrounding the Sone tidal flat, number of Horseshoe crab breeding pairs laying eggs have been increasing. The aim of this study is to understand characteristics of the natural environments of the Sone tidal flat and to identify changes in wave environments due to the large-scale landfills through a numerical wave model.

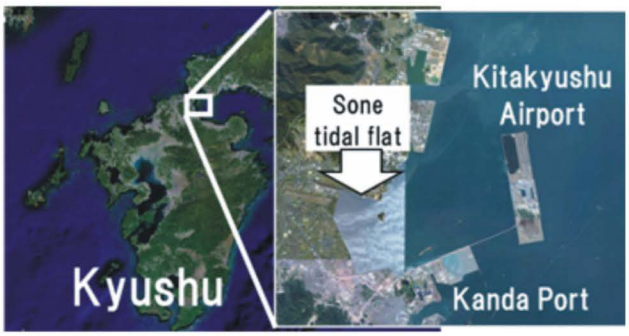

Fig.1 Location of the study site

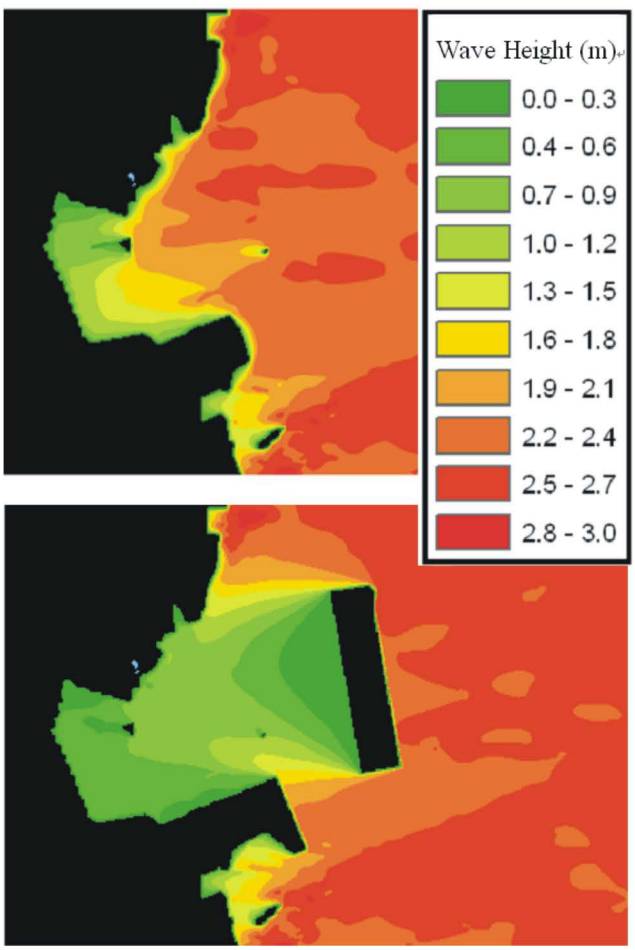

Fig.2 Computed wave height

2. Techniques used: An extensive field study has been carried out to collect pertinent data to ground elevation, water quality, bottom sediment quality and benthos in the recent three years starting 2005. Also, to understand basic physical environmental characteristics of Horseshoe crab larva's habitat, individual larvae have been observed on the flat. These investigation results are compared with the past findings. A numerical computation of wave height distribution and bottom Sheilds numbers through the energy balance equation method has been conducted to study any changes in wave environments due to the landfill constructions.
3. Results and conclusions: A drastic decrease in the wave intensity due to the large-scale landfills is confirmed, as indicated in Fig. 2 and may be one of the reasons for increase in number of the breeding pairs. The results of the field study indicate, however, that natural environments of the flat and its neighboring sea such as water and sediment qualities have not significantly changed at the present time. Also, basic physical characteristics of Horseshoe crab larva's habitat environments are identified and discussed, as shown in Fig. 3, where individual larvae are plotted with bars over the topographic map (left figure) and the horizontal distribution of ignition loss of the bottom sediment (right figure).

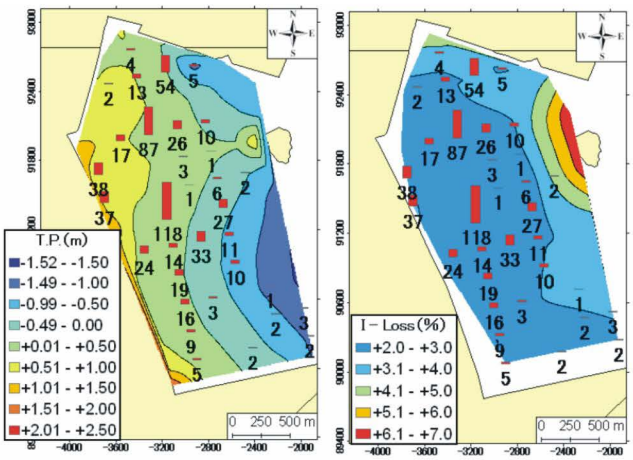

Fig.3 Individual larvae observed on the flat

Design and application of artificial neural network predicting model of assessment index in coastal marine ecosystem

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Due to the overexploitation of marine ecological resources and the worsening of environmental pollution, our typical marine ecosystem has been seriously damaged, with local (regional) water ecosystems imbalance and biodiversity sharp decline. So the development of marine ecosystem assessment will provide an important basis for decision-making for the effective protection of marine ecological environment and sustainable exploitation and utilization of marine ecological resources. Ecosystem health assessment is not only a focus but also a difficult point in ecology studied at present; with promising development and application, it has a great deal of questions existing at the same time(for instance, the concept and definition of health, evaluation criterion, etc). According to the assessment index system that has already been set up, by using MATLAB7.0 neural network toolbox, set up artificial neural network (ANN) with mapping predicting model to various kinds of physical and chemical, ecological factor and chlorophyll a density of coastal sea water. At the same time, the statistical software SPSS was used to make further optimization analysis to the correlation of marine ecosystem structure, function and environmental indicators. On this basis, perfect the method of ecosystem assessment, guarantee the accuracy and scientificity of assessment method, which promote the comprehensive understanding of ecosystem healthy.

Occurrence levels and distribution of organochlorine pesticides (OCPs) in surface sediments of the Bohai Sea, China

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The Bohai Sea located in North China is a shallow marginal sea enclosed by Liaodong and Shandong Peninsulas. Several large rivers, including Huanghe (Yellow River - the second largest sediment-load river in the world) drain into the Bohai Sea. The surrounding area of the Bohai Sea is a highly urbanized and industrialized region. The rapid industrialization and urbanization around the coastal regions has resulted in a severe environmental stress.
Organochlorine pesticides (OCPs), as one of the