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### Abstract

We have developed an ecological risk assessment model and used it to estimate the ecological risk of specific harmful chemicals in seawater. We calculated the concentration of chemicals, such as TBT, in a high-resolution gradient of an estuary and with high accuracy using a database of the results from a 3-D hydrodynamic model and ecosystem model.

Generally, the ecosystem risk assessment model has been used with a mainframe and a workstation. Further, only some researchers and experts were able to operate the model since they needed to set the many complex parameters. To make this model more user-friendly, we rewrote the program in C++ language so that it runs Windows® with a Graphical User Interface (GUI).

The calculation domains were set as Tokyo Bay (AIST-RAMTB), Ise Bay (AIST-RAMIB) and Seto- Inland Sea (AIST-RAMSIS). These domains have the following functions: 1) allowing the manual setting of chemical loading fluxes from user-defined points such as, major rivers, commercial harbors, navigation routes, and the atmosphere, 2) calculating chemical concentrations in their dissolved and adsorbed phases in seawater, 3) setting the NOEC (No Observed Effect Concentration) and the UF (Uncertainty Factor) for user-defined biota in the estuary, 4) estimating the ecological risk to aquatic organisms, 5) plotting the calculation results as a horizontal distribution, vertical cross section, and a time-series graph, 6) storing the calculation data in the CSV format and images of the display data in WMF, BMP, and JPEG formats.

This software is freely available to the public on the Advanced Industrial Science and Technology (AIST) website: <http://www.aist-riss.jp/projects/RAM/>. It is already widely used by over 230 groups at universities, technical colleges, institutes, local governments, and companies. These groups use the model to assess ecological risks in sea areas, and for environmental education, research, and policy-making.