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ABSTRACT

It is necessary to develop a numerical model that can be used to assess the toxic impact of decomposition products of chemicals in the marine environment. To this end, we developed a chemical fate model for the decomposition products of Tributyltin (TBT) that has been used primarily as an antifouling agent incorporated into antifouling paints for vessel hulls. We used the model to calculate the concentrations of decomposition products of TBT in Tokyo Bay.

The model is based on an existing chemical fate model, which we modified to predict the fate of TBT, Dibutyltin (DBT) and Monobutyltin (MBT). Degradation of each butyltin accumulated in the sediment was a function of temperature of the bottom water. The process of release from sediment was modeled using a partition coefficient for each butyltin.

The model was run to reproduce the seasonal variation of TBT, DBT and MBT during the period from January 1971 to December 2004. The model results compared well with field measurements collected in 2004. But, there was a significant discrepancy in the DBT concentration.