

# 東京湾の水質のモデル解析

## Water Quality Analysis of Tokyo Bay using Mathematical Model

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### Abstract

In order to analyze the water quality, especially COD, T-P and T-N of Tokyo Bay in summer, the hydrodynamical and ecosystem coupled model we have developed was applied. The stationary state results could be obtained over 100 days time integration. For the phytoplankton abundance, COD, T-P, T-N, and inorganic nitrogen concentrations, the model could reproduce the realistic values except an inorganic phosphorous concentration when we adopted phytoplankton cell composition ratio (N/P ratio by weight in the model) to be 14 in place of 8. The discrepancy could not be improved, even if we gave 10 times larger phosphorous release rate from the sea bottom than standard rate. It may be improved if we consider the cell quota mechanism or different decomposition rate of organic matter for nitrogen and phosphorous.

The DOC concentrations in the model showed lower values than the ones in the observations. It was implied that when the lower decomposition rates of DOC and POC, and changing the POC/DOC ratio in the loading from land were considered, the discrepancy could be reduced.

The zooplankton biomass distribution showed the influence of fresh water distribution, that is, the influence of zero value at the river boundary. The dominance of physical processes such as diffusion and advection compared to biological processes such as zooplankton growth rate could be plausible reason. In phytoplankton case, such problem does not occur because of biological processes dominance (high turnover rate).