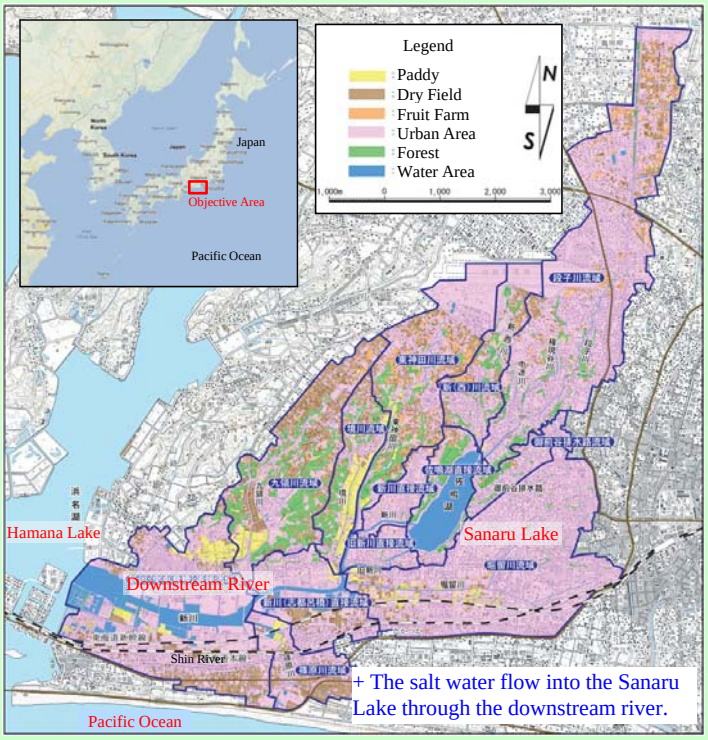
The Approach for Improving the Water Quality in the Sanaru Lake

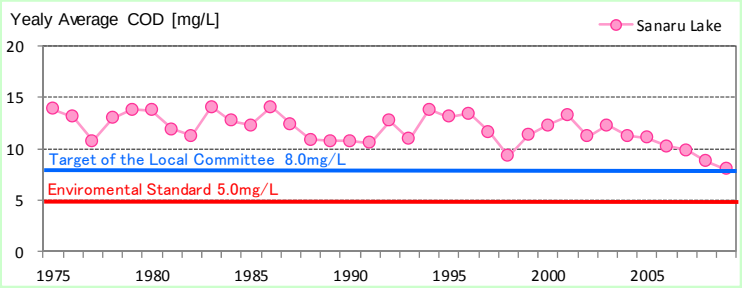
○Tatsuya Tobe, Toshinari Morikawa, Toshiharu Okada, Kouji Fukunaga, Taku Watanabe, Yoshiki Wada

Nihon Suido Consultants Co., Ltd.
Water and Environmental Consultants

1. Introduction & Water Quality in the Sanaru Lake



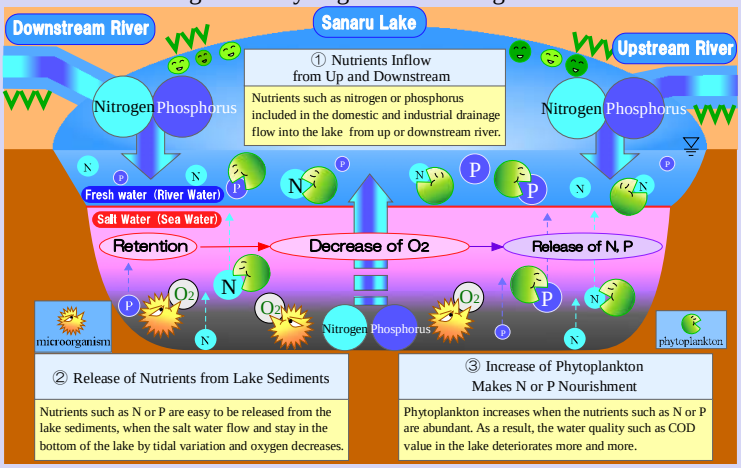
+ The water quality had deteriorated from the 1960s, because of the rapid urbanization and industrialization in the watershed.



Purpose of Study ： To figure out the feature of water pollution, and evaluate the effect of the purification measures by developing and applying the simulation model based on the feature in the Sanaru lake.

2. Feature of Water Pollution by Monitoring

+ The mechanism of water pollution was figured out by carrying out various monitoring and analyzing the monitoring data.



3. Water Quality Simulation Model

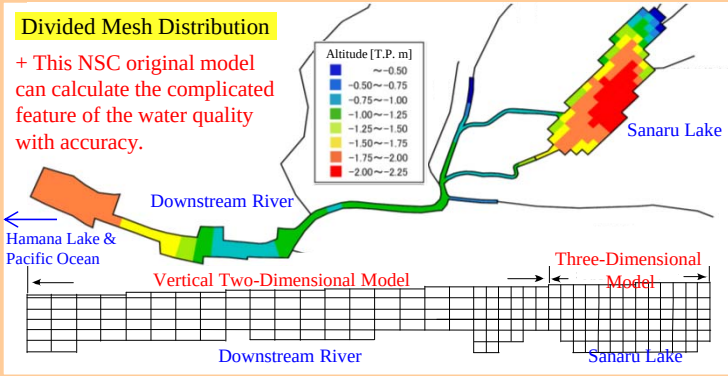
Water Quality Simulation Model

Hydraulic Model
- Equation for Continuity
- Equation for the Conservation of Momentum
- Equation for Shear Stress at the bottom layer and the water surface by wind

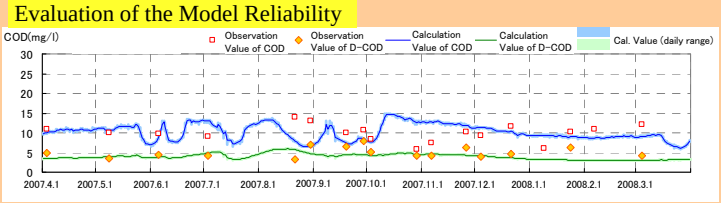
Water Quality Model
- Equation for Salinity Balance
- Equation for Tempreture Balance
- Equation for Ecological Model (Chl-a, COD, DO, Dissolved or Particulate N, P)

Divided Mesh Distribution

+ This NSC original model can calculate the complicated feature of the water quality with accuracy.



Evaluation of the Model Reliability



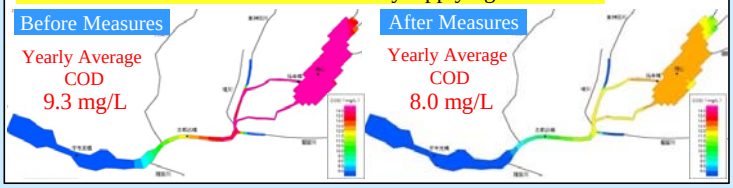
4. Evaluation of the Effect of Water Purification

Purification Measures

In the River or Lake
- Dredging in the Downstream River
- Facility for the Water Purification Directly in the Lake
- Facility for the Nitrogen Removal in the Upper Stream of the Lake

In the Watershed
- Improvement of the Sewage System
- Connection to the Sewer regarding Domestic and Industrial Drainage
- Installation of the Joint Wastewater Treatment Tank

Effect of the all Purification Measures by Applying the Model



Conclusion :

+ Yearly average COD value in the Sanaru lake became under 8.0mg/L in 2009 by carrying out the all purification measures.
+ The approach of Monitoring-Modeling-Evaluation is important to carry out the water purification effectively.

Acknowledgement : Special thanks to Shizuoka Prefecture, Hamamatsu City, and Local Committee of Water Renaissance in the Snaru Lake.