



BALTEX Survey on

Biogeochemical Modelling Activities in the Baltic Sea Basin

Model Name	Neva Bay Wastewaters Model
Model Description	The model is based on 3-D hydrodynamic, σ - coordinate model of Princeton University (POM), version pom2k, released 01.08.2004, and adapted to the Neva Bay of the Gulf of Finland. The Neva Bay is separated from the easternmost part of the Gulf of Finland by an incomplete flood protection barrier (FPB). To better describe the complex configuration of Neva river delta and rather narrow waterway gates of the FPB, a curvilinear grid having variable horizontal steps from 61 to 990m and 7 σ - levels is used. The wind waves model SWAN is coupled to the circulation model. The most important components of wastewater, such as the total dissolved phosphorus <i>P_{tot}</i> characterizing the eutrophication, are included in the model as passive tracers. The model is driven by atmospheric forcing given on a re-analysis data, river water discharge of Neva, and sea level, temperature and salinity prescribed at open sea boundary. The discharges of wastewater and <i>P_{tot}</i> concentrations are given in points where wastewaters from wastewater treatment plants of St.Petersburg are released.
State Variables	Component of current velocity, temperature, salinity, density, sea level, passive tracers such as <i>P_{tot}</i> .
On a scale between 1 and 10, please classify your model	1 Biogeochemical cycling, matter fluxes
Dimension (0D, 1D, 2D, 3D)	3D
Modeled Area (Marine, terrestrial, combined)	Marine: the Neva Bay and the easternmost part of the Gulf of Finland
Coupled to hydrological component	No. River discharge and precipitation are prescribed, evaporation is calculated
Suited for climate change sensitivity studies	Could be used in studies of local effects of climate change given in forcing functions.
Publications	Ryabchenko V., Konoplev V., Rumyancev V., Kondratyev S., 2005. Spreading of wastewaters in the Neva Bay: simulation with a 3-D hydrodynamic model. - Proceedings of 3rd Symposium "Quality and measurement of water resources", St.Petersburg, Russia, 2005, p. 488-498. Ryabchenko V.A., Konoplev V.N., Kondratyev S.A., Pozdniakov S.R., Liskova U.S. 2006. Estimation of water quality changes in the Neva

	Bay after the implementation of South-Western Wastewater Treatment Plant of Saint-Petersburg using results of mathematical modeling. Izvestiya Russkogo Geographicheskogo Obtschestva, vol.138, issue 5, p.48-57 (in Russian).
Institute	St.Petersburg Branch P.P.Shirshov Institute of Oceanology Academy of Sciences of Russia 30, Pervaya Liniya, 199053 St.Petersburg, Russian Federation
Developer, E-Mail	Vladimir Ryabchenko vladimir_ryabchenko@VR5841.spb.edu
Web Site	

Remarks