



BALTEX Survey on

Biogeochemical Modelling Activities in the Baltic Sea Basin

Model Name	PROBE (Program for Boundary Layers in the Environment)
Model Description	PROBE can be classified as a general equation solver for one-dimensional transient, or two dimensional steady, boundary layers. Typical examples of such boundary layers are the Ekman Layer and the developing channel flow. The hydrodynamic part involves turbulence models, equation for momentum and density. Biogeochemical variables can easily be directly coupled to the hydrodynamic part. A special feature of PROBE is that it can be used for coupled model systems, such as coupled boundary layers or sub-basins
State Variables	Default variables are: momentum, heat, salinity, turbulent kinetic energy, dissipation and 30 concentration equations. PROBE is used in a number of Baltic Sea process studies calculating oxygen, planktons, nutrients, dissolved inorganic carbon, alkalinity etc
On a scale between 1 and 10, please classify your model	1 Biogeochemical cycling, matter fluxes 2 X 3 4 5 6 7 8 9 10 Ecosystem functioning
Dimension (0D, 1D, 2D, 3D)	1.5 dimensional
Modeled Area (Marine, terrestrial, combined)	Baltic Sea and several different lakes
Coupled to hydrological component	Prescribed or observed data
Suited for climate change sensitivity studies	yes
Publications	Omstedt, A., and D., Hansson, (2006). The Baltic Sea ocean climate system memory and response to changes in the water and heat balance components. <i>Continental Shelf Research</i> , 26, 236-251. Omstedt, A. and L., Axell (2003). Modeling the variations of salinity and temperature in the large Gulfs of the Baltic Sea. <i>Continental Shelf Research</i> , 23, 265-294 Svensson, U., Axell, L., Sahlberg, J. and A., Omstedt (2002). PROBE Program for Boundary Layers in the Environment. System description and Manual. Updated Version available from Anders Omstedt (Anders.Omstedt@gvc.gu.se) and Jørgen Sahlberg (Jorgen.Sahlberg@smhi.se).
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