BALTEX Survey on

Biogeochemical Modelling Activities in the Baltic Sea Basin

Model Name	SANBALTS (**S**imple **A**s **N**ecessary **BA**ltic **L**ong **T**erm large **S**cale eutrophication model)
Model Description	SANBaLTS simulates the interplay between nutrient sources and sinks within the major seven basins of the Baltic Sea Each basin is treated as a homogeneous box except of the Baltic Proper basin, which is split along the halocline into surface (BPs, 0-60 m) and deep (BPd, below 60 m) boxes. The model describes interactions between annual integrals of external inputs (from land, atmosphere and Skagerrak), inter-boxes transports (due to advection and mixing), and internal biogeochemical fluxes (primary production and nitrogen fixation, pelagic recycling, sedimentation, outputs from the sediments, denitrification, and sediment burial).
State Variables	Each box contains eight state variables representing annual averages of: dissolved inorganic nitrogen **DIN** and phosphorus **DIP**, labile organic nitrogen **ONL** and phosphorus **OPL**, refractory organic nitrogen **ONS** and phosphorus **OPS,** benthic nitrogen **BEN** and phosphorus **BEP**. Additionally, BPd contains an average oxygen concentration **OX**.
On a scale between 1 and 10, please classify your model	1 Biogeochemical cycling, matter fluxes 2 3 4 5 6 7 8 9 10 Ecosystem functioning
Dimension (0D, 1D, 2D, 3D)	8x0D, i.e. eight homogeneous boxes covering the entire Baltic Sea
Modeled Area (Marine, terrestial, combined)	The Baltic Sea marine area comprising the Kattegat
Coupled to hydrological component	No, atmospheric and hydrologic components are considered just as given boundary conditions
Suited for climate change sensitivity studies	In a way… through scenario boundary conditions and prescribed water flows between the Baltic Sea basins
Publications	1. Pitkänen, H., Kiirikki, M., Savchuk, O.P., Räike, A and Wulff, F. 2007. Searching efficient protection strategies for the eutrophied Gulf of Finland: The combined use of 1 D and 3 D modelling in assessing long-term state scenarios with high spatial resolution. *Ambio 36.* (in print). 2. Savchuk, O.P. 2006. SANBaLTS - Simple As Necessary Long-Term large-Scale simulation model of the nitrogen and phosphorus biogeochemical cycles in the Baltic Sea. (Techn. Rep., 23 pp). http://www.mare.su.se/nest/docs/SANBalTS_QAv3.pdf) 3. Savchuk, O.P. and Wulff, F. 2007a. Long-term modelling of large-scale nutrient cycles in the entire Baltic Sea. *Hydrobiologia.* (submitted).

	4. Savchuk, O. and Wulff, F. 2007b. Modeling of the nutrient biogeochemical cycles in the Baltic Sea as "working horse" of the MARE's NEST. *Ambio 36*, (in print). 5. Savchuk O.P., Wulff, F., Hille, S., Humborg, C. and Pollehne,F. 2007. The Baltic Sea a century ago – a reconstruction from model simulations, verified by observations. (in prep.) 6. Wulff, F., Savchuk, O.P., Sokolov, A.V., Humborg, C. and Mörth, M. 2007. Assessing the past and the possible future of the Baltic. *Ambio 36*. (in print).
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Remarks