General overview on existing regional climate change scenarios and the existing output available for AMBER

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References:

- Meier, H.E.M., 2006: Baltic Sea climate in the late twenty-first century: a dynamical downscaling approach using two global models and two emission scenarios. Clim. Dyn., 27(1), 39-68

- Eilola, K., H.E.M. Meier, and E. Almroth, 2009: On the dynamics of oxygen, phosphorus and cyanobacteria in the Baltic Sea; a model study. J. Marine Systems., 75, 163-184

- Meier, H.E.M., K. Eilola, and E. Almroth, 2009: Climate-related changes in marine ecosystems simulated with a three-dimensional coupled biogeochemical-physical model of the Baltic Sea. In preparation.

To estimate uncertainties an ensemble of four scenarios are available

forced with two emission scenarios (A2, B2) and two GCMs:

1) ECHAM4/A2: SST +3.7ºC, SSS -3.2 psu, increased mixing

2) ECHAM4/B2: SST +2.9ºC, SSS -3.0 psu, increased mixing

3) HADAM3H/A2: SST +3.2ºC

4) HADAM3H/B2: SST +2.1ºC

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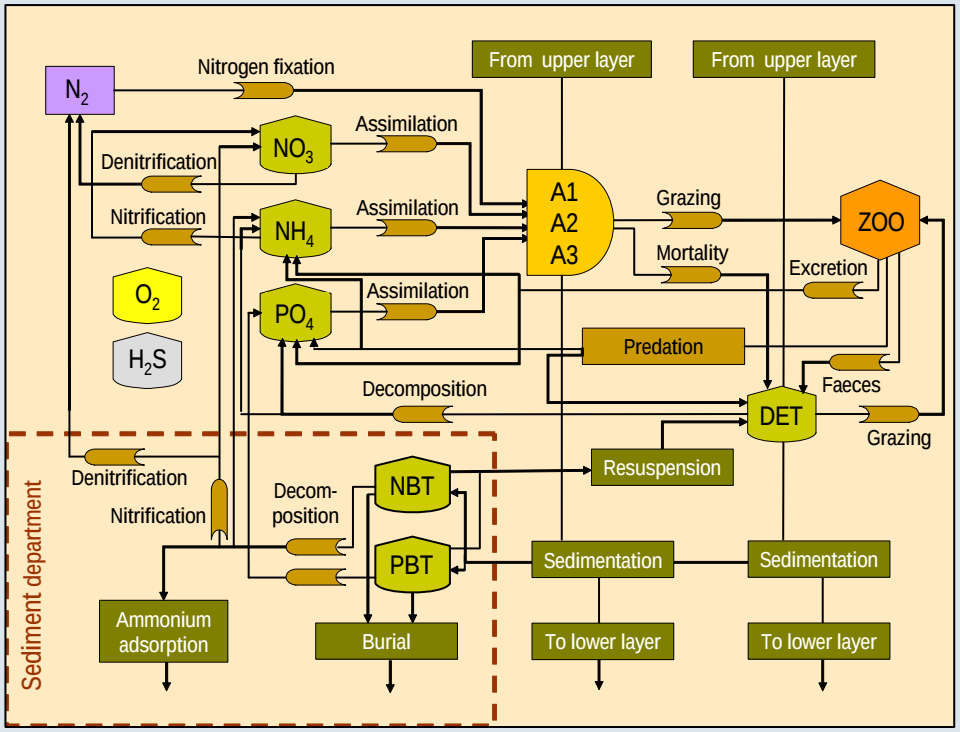
Output variables:

- Baltic Sea including Kattegat (but without Skagerrak)
- 6 nautical miles, 41 levels with thicknesses between 3 and 12 m, 2 – daily
- Arakawa B-grid
- Time slices 1969-1998, 2071-2100
- Physical variables: temperature, salinity, velocity, sea level, sea ice

RCO-SCOBI

High-resolution 3-D coupled physical-biogeochemical model for climate and process studies



Pelagic variables:

- ***nitrate*** ***(NO3)***
- ***ammonium*** ***(NH4)***
- ***phosphate*** ***(PO4)***
- ***autotrophs*** ***(A1,A2,A3)***

(diatoms, flagellates, cyanobacteria)

- ***zooplankton*** ***(ZOO)***
- ***detritus*** ***(DET)***
- ***oxygen*** ***(O2)***
- ***Hydrogen sulfide*** ***(H2S) is included as negative oxygen.***

- **The sediment contains nutrients in the form of benthic nitrogen (NBT) and phosphorus (PBT).**
- **Aggregated process descriptions for oxygen dependent nutrient regeneration, denitrification and adsorption of ammonium to sediment particles as well as re-suspension and permanent burial of organic matter.**

SMHI deliverables in AMBER

- Maps of the influence of climate change on ecological patterns in graphical form in the internet for all potential end users WPA.4 (month 24)
- Quantification of mean integrated ecological quality indicators suggested by HELCOM for 1961-1990 and 2071-2100, WPC.6 (month 18)

Work in AMBER

- 4 new scenarios of the Baltic biogeochemistry with …
- better process descriptions,
- updated nutrient load scenarios,
- ….