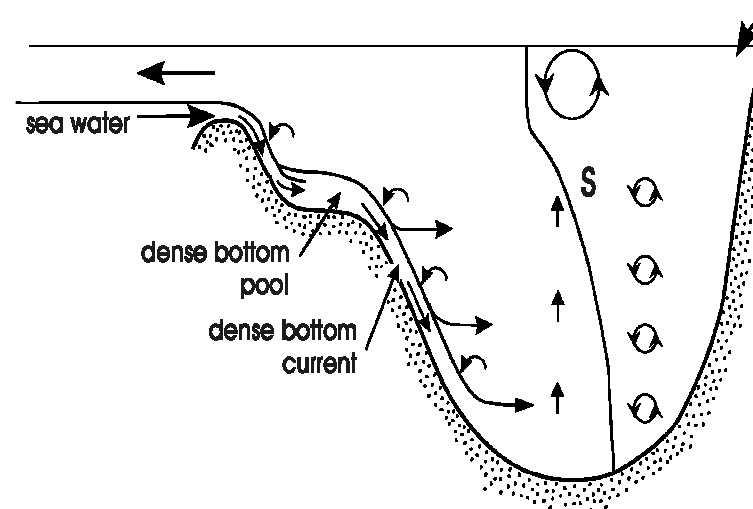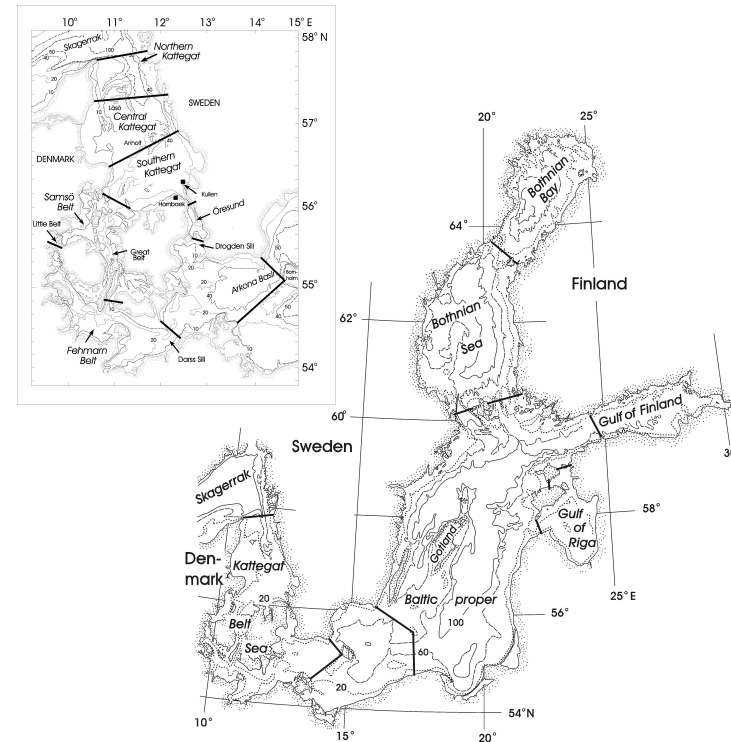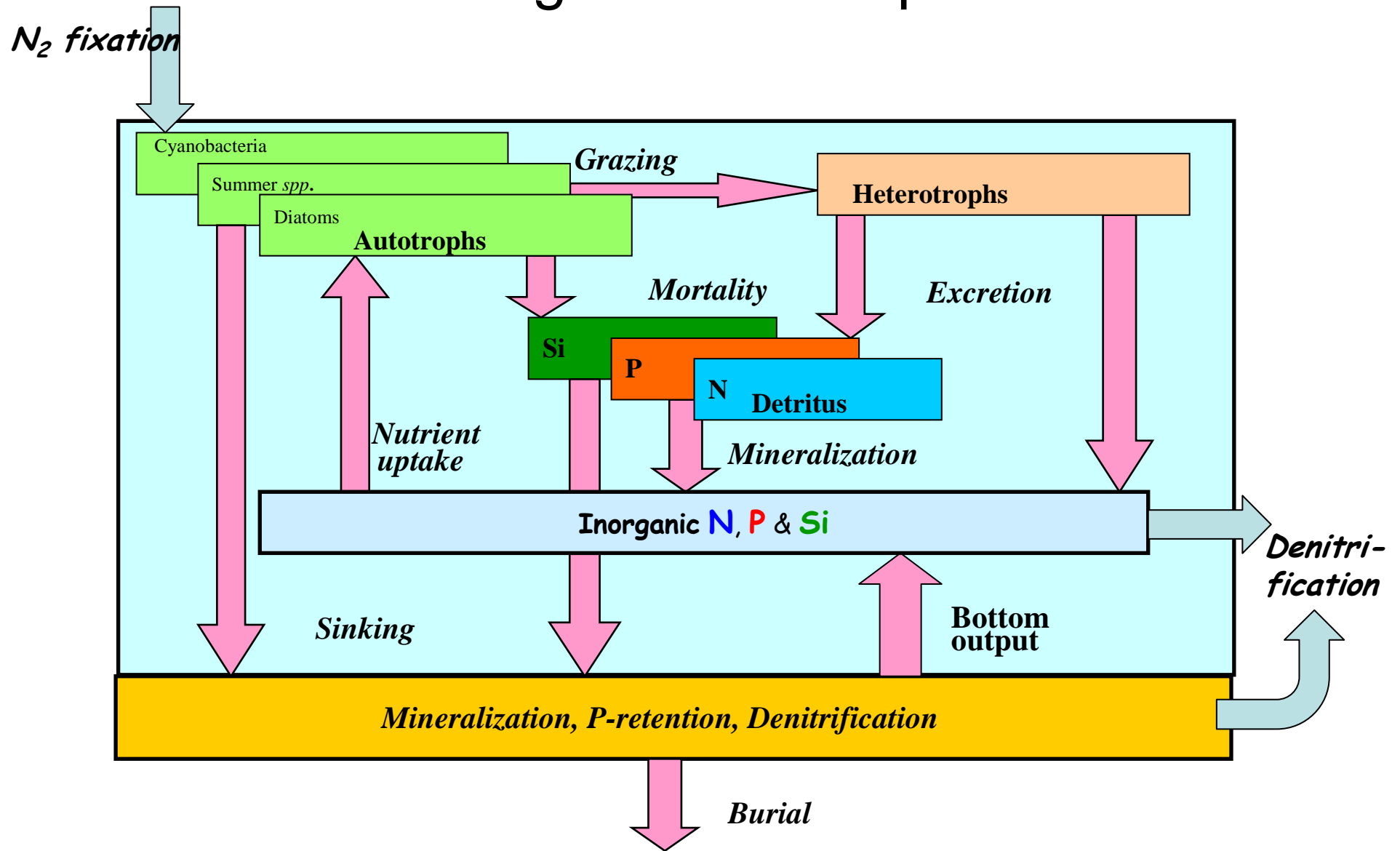# BAltic sea Long-Term large-Scale Eutrophication Model

Main characteristics:

- 13 sub-basins
- High vertical resolution
- Full air-sea exchange including sea ice
- Water exchange from well-founded steady state dynamics
- Wind and buoyancy forced mixed-layer dynamics and wind-forced deep-water mixing
- Dense gravity current mixing sub-models
- Forced by meteorology, river runoff, sea level in Kattegat and stratification in Skagerrak
- Typical simulation times on 8 core MacPro:
    - physics only 1.6 sec/year
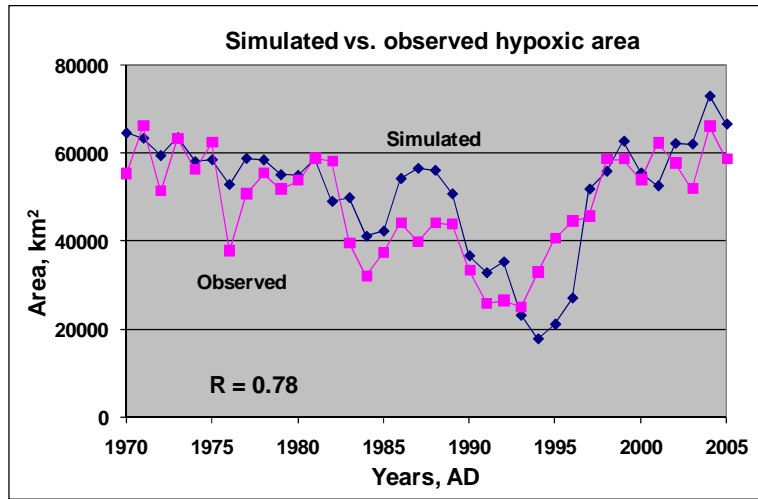   - with BGC 14 sec/year

Sub-basin boundaries

Baltsem biogeochemical processes

N_2 fixation

Cyanobacteria

Summer spp.

Diatoms

Autotrophs

Grazing

Heterotrophs

Mortality

Excretion

Si

P

N **Detritus**

Nutrient uptake

Mineralization

Inorganic N, P & Si

Denitri-fication

Sinking

Bottom output

Mineralization, P-retention, Denitrification

Burial

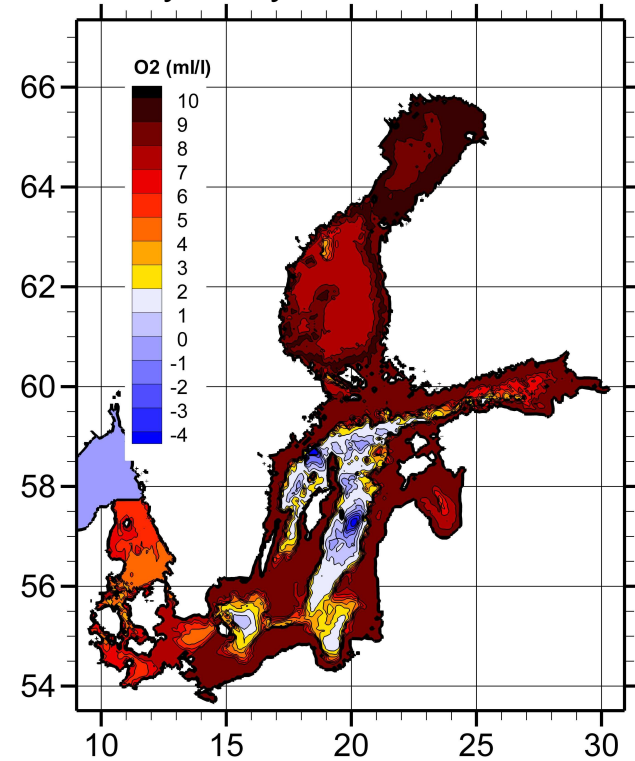# Examples of results from BALTSEM

Average O2 conc. Projected on the bathymetry

Average concentrations in Baltic proper