

Sensitivity analysis and parameter estimation for a marine biogeochemical model.

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Results of parameter optimization and uncertainty analysis for a one dimensional marine biogeochemical model of NPZD type are presented. The model, developed by Schartau and Oschlies, simulates the distribution of nitrogen, phytoplankton, zooplankton and detritus in a water column and is driven by an ocean circulation model. It is tested against BATS (Bermuda Atlantic Time-Series Study) data. We study the model numerically, using sqp solvers with exact gradients provided by automatic differentiation. Contrary to published results, we find only little sensitivity of the optimal parameters to observational error alone. We compare the results for optimized initial values with those obtained by so called spinup. We assess the sensitivity of optimal parametersets to temperature, diffusivity etc. i.e. the forcing.