Supplementary material: A management oriented 1-D ecosystem model: implementation in the Gulf of Trieste (Adriatic Sea)

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Abstract

In this paper a coupled physical-biogeochemical one-dimensional numerical model (BFM-POM 1D) was implemented in the Gulf of Trieste, (northern Adriatic Sea) and its structure was tested in order to evaluate its usability as a tool to support coastal management and planning. The evaluation concerned the ability of the model to reproduce the main trophic pathways, as well as their temporal variability, in terms of seasonal variations. The ecosystem structure comprised three phytoplankton groups, four zooplankton groups, one bacterial group, and a simple benthic return in order to parametrize benthic processes. The dynamics and interactions between groups were studied, as well as the model's sensitivity to different trophic web configurations. Results showed that the model was capable of replicating trends of seasonal vertical profiles of the major biogeochemical elements, and the prevalance of the microbial food web shaping the trophic chain in the Gulf of Trieste. The model also responded to strong forcings at the surface and different trophic arrangements, thus providing initial evidence of its potential as a scientific tool aimed at marine coastal management.

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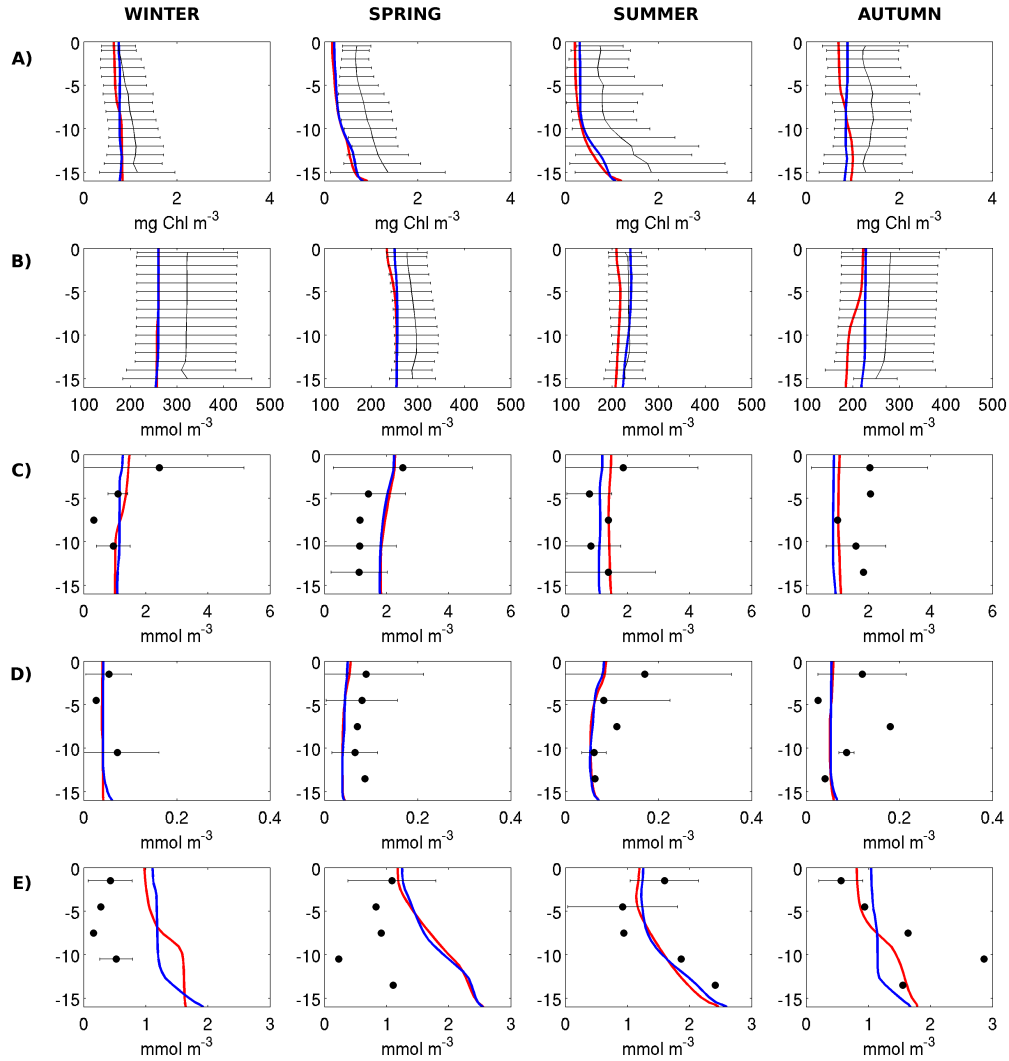
S 1. BASE (red) and sensitivity (blue) experiments compared to *in situ* data as climatological seasonal profiles for area MA21. The sensitivity experiment was forced with physical climatologies (temperature, salinity, wind stress and solar radiation) from the only period for which there is an overlap with biogeochemical data (2000 - 2001). Top to bottom: **A)** chlorophyll, **B)** oxygen, **C)** nitrates, **D)** phosphate and **E)** ammonia. Observations are plotted as seasonal means with standard deviation (where data allows it).