the location of the onset of trace level oxygen concentrations as they control the lower limit of the nitrification and the onset of the denitrification in the water column. The model successfully simulates the observed seasonal and vertical variations of the dissolved oxygen in response to its atmospheric and photosynthetic productions, and losses during the particulate matter decomposition and nitrogen transformations.

The simulations support the presence of an oxygen deficient zone (the so-called the Suboxic Layer) below the 15.6 sigma-t level within the interior Black Sea. The upper boundary of the suboxic layer varies depending on the two opposing mechanisms; the oxygen consumption in the remineralization and nitrification and the ventilation associated with the vertical diffusive transport from the oxycline. Its lower boundary always coincides with the vanishing H2S concentrations near the 16.2 sigma-t level.

In the case of complete oxygenation of this zone, the SOL disappears all together as the positions of vanishing oxygen and H2S concentrations converge to a common point, implying that their overlapping is not possible under the realistic oxidation rates.

1P20

Modeling trophic interrelations in the Black Sea

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It is known that the Black Sea has been subject to severe ecological changes with the last few decades. The river induced nutrient enrichment and eutrophication caused significant changes in the species composition. Some of species have disappeared while some others were newly introduced and dominate the ecosystem. Among those, gelatinous organisms suddenly reached a high level of biomass during late 1980's (estimated as several hundred million tons). This period also coincides with the major decline in several fish stocs. A set of four balanced steady state models, corresponding to periods of 1960's, before and after outburst of the gelatinous organism and the present state of the ecosystem, is is used to study this long term ecosystem changes. The model considers trophic interactions among the six compartmens of the ecosystem involving phytoplankton, macrozooplankton, gelatinous carnivores, demarsal fishes, small and large pelagics. Using these models, a series of experiments are performed in order to explore the role of each group at different stages of the Black Sea ecosystem within the last 30 years. The experiments suggest a minimal role of gelatinous species on the decline of the fish stocks, on the contrary to the general blief. More interestingly, the model results indicate that decline in the fish stocks as a result of overfishing, and ever increasing plankton productivity associated with the eutrophocation during 1980's led to outburst of the jellies.

3N

The BENEFIT programme: a regional initiative for co-operative marine science in the Benguela Current region

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The Benguela Current is situated off the west coast of Southern Africa and is one of the four eastern boundary upwelling regions of the world. The ecosystem is characterised by high levels of primary production in coastal waters and an abundance of fish with diverse populations of seabirds and marine mammals. It supports major commercial fisheries which contribute to the food security and economics of coastal states in Africa.

The Benguela exhibits considerable environmental variability which is reflected in regime shifts, species flips and fluctuations in the distribution and abundance of it's marine resources. In addition, the commercially important fish stocks are periodically subject to heavy fishing pressure which contributes to further fluctuations in biomass. The interactions between these environmental and anthropogenic factors on the marine resources are poorly understood and new strategies need to be formulated to take these factors into account in fisheries management.