



Analyzing Ecosystem State Changes on the North-Western Black Sea Shelf with Conceptual Models

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The broad and shallow western shelf of the Black Sea suffered from pollution, eutrophication and overfishing from the 1960's to the end of 1980's and experienced severe changes in the ecosystem structure and functioning as a result. After the collapse of the centrally planned industries and agriculture in the eastern European countries in the early 1990's, the ecosystem now starts to respond to the decrease in anthropogenic pressures. It is not known however, how resistant the benthic and pelagic ecosystems are to further stress and what the thresholds are. Climate changes are likely to introduce further stress to the shelf ecosystems by temperature rise and by changes in the freshwater supply from the rivers in the future.

Nutrient budgets of the shelf area for the different states of the system are crucial for understanding the changes that had happened. We present a tentative nutrient budget for the North-Western shelf of the Black Sea for the late 1990's (contemporary) and give an outlook on how to arrive at budgets for the pristine and eutrophication periods.

Historical and recent data on the interaction of the benthic and pelagic systems of the North-Western Shelf are then interpreted in a conceptual eutrophication model on the drivers, pressures and state indicators of the system for its pristine state (before 1960), the eutrophication period (1960's to 1990's) and the contemporary state. Such a causative analysis shall help to identify key moments in the development of the eutrophication problem and reveal what the thresholds for further decline/recovery

would be. The causative analysis is part of the DPSIR assessment framework applied in the FP6 project “European Lifestyles and Marine Ecosystems”. The outcome of this work will provide valuable information to control eutrophication through adaptive management.