Geophysical Research Abstracts
Vol. 14, EGU2012-9474-1, 2012
EGU General Assembly 2012

Studying the Romanian Shelf benthic community in EU FP7 HYPOX Project: ecosystem recovery trends vs. fish kill events

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The main objective of the study was the assessment of marine ecosystem recovery post heavy eutrophication/pollution of 1970-1995, including hypoxia, under the conditions of increasing climate changes in the NW Black Sea sector. The paper aims are: 1. the understanding of the present ecological state of the ecosystem under the Danube River influence, 2. the highlight of emergent events and evidences of algal blooms and mass mortalities, 3. the knowledge of firm signs of recovery and 4. the establishing the certainties and uncertainties in benthic succession.
The authors present, on the basis of four main series of data (May 2009, May and September 2010 and April 2011) from 110 stations along three transects (SE-Sf. Gheorghe, in front of the Danube Delta, SE-Constanta and E-Mangalia) and in the sheltered area of Portita, the preliminary conclusions regarding the state variables of water masses, surface bottom sediments and biological communities of phytoplankton, zooplankton and benthos.
NW Black Sea ecosystem is under continuum complex stress of the Danube River discharges and human activities; these basic conditions generate oscillations in its structure and dynamics, being the origin of horizontal and vertical variability of all state parameters. Nowadays, under the climate change conditions, the situation has become more complex.
Compiling the existing and newly collected data the paper describes the regime shifts taking place in ecosystems in the last decades. Discussions focus on the results of the analyses obtained from the following samples: 10 sediments cores; 417 seawater samples; 336 phytoplankton samples; 214 zooplankton samples; 110 macrobenthos samples and 130 meiobenthos samples.
The paper brings new data on the following major aspects concerning the ecological state in NW Black Sea in 2009-2011.
- The pressure of the Danube River chemical discharges has decreased obviously, but water blooming events still occur, hypoxia is still present from time to time and there are mass mortalities of fish and other benthic organisms; the mass mortality of fishes in July 2010 is discussed in the paper.
- The authors consider signals of ecological recovery as being fragile and few, among them being mentioned the reappearance of species absent in the samples collected in the period 1970 -1990/95, which is a promising signal. Recurrence of species extinct in the last 20-30 years may be considered a good signal, but there are also questions which are discussed in the paper too.
- Recovery signs should be considered cautiously and the uncertainties could be solved only in a longer time by increasing the scientific efforts at the level of the whole basin. The occurrence of explosive events with a random character, sudden warming and cooling of water, sudden episodic freshening of water, large variations in gradients of state parameters, blooming, emergence of hypoxia, mass mortalities of fish and benthic organisms, raise many question marks.