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CLIMATE CHANGE IN THE **B**LACK **S**EA –  
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## Paper Abstracts



## LONG-TERM CHANGES OF BACTERIOPLANKTON AND OF CHLOROPHYLL "A" AS INDICATORS OF NORTH-WESTERN PART OF THE BLACK SEA ECOSYSTEM CHANGES IN THE LAST 30 YEARS

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The changes of biological processes intensity in the north-western part of the Black Sea (NWBS) are reflected in the dynamics of important indicators of the marine environment state such as bacterioplankton and chlorophyll "a".

The main goal of our investigations was the study of long-term changes of bacterioplankton and chlorophyll "a" in coastal and open parts of NWBS and in the marine area near Zmeiny Island. The task of investigations included detailed analysis of seasonal changes and processes of development of plankton community under current conditions as well.

Materials for analysis included authors data (last 30 years) from NWBS (coastal and open areas) and from Zmeiny Island coastal waters (last 5 years). Practically, in all investigated areas the pressure of rivers as Danube and Dniester was observed. Measurements of bacterioplankton parameters were made using microscopy methods with the aid of Olympus BH-2. Measurements of chlorophyll "a" concentration were carried out using standard spectrometric method with spectrophotometer JENWEY 630.

Data and analysis of changes of bacterial density and biomass during the last 30 years are presented. It is shown that the recently observed abundance of bacterioplankton (0.16-3.56) mln cells/ml in surface marine waters was 1.5 – 2.0 times lower than 30 years ago. This is the case for mesotrophic and eutrophic marine waters. Our conclusion is that current organic pollution of marine waters in NWBS is less than 30 years ago. The main patterns of seasonal changes 30 years ago observed were the same in the last 5 years too: with minimal activity and biomass of bacterioplankton in January-February and with maximal – in August. Current levels of bacterioplankton in waters near the Island of Zmeiny are the same as in open waters of the Black Sea 20-30 years ago. The explanation hypothesis can be based on the current decrease in river flows and improvement of marine and river waters quality.

It was shown that present levels of chlorophyll "a" (2003-2007) in surface waters near the Island of Zmeiny were from 0.13 to 28.04 mkg/litre.

Results of analysis of pigment's dynamics indicated that in spring-summer and in autumn two yearly maxima of chlorophyll "a" concentration were registered and usually in summer and in winter minima were found. Accordingly, for maxima time the quality class of water was – eutrophic, and for minima time - mesotrophic class. Seasonal patterns which were typical till 1980 for NWBS are the same currently. In 1980-1990 maximum of concentrations of chlorophyll "a" and maximum of eutrophication processes in NWBS were observed. Current (last 5 years) levels of chlorophyll "a" concentrations are 1.5-3.5 time lower than in 1980-1995.

In conclusion the authors propose such indicators like bacterioplankton and chlorophyll "a" jointly with nutrients compounds to be used as simple indicators of long-term changes of eutrophication's processes and of marine waters quality in all parts of the Black Sea.