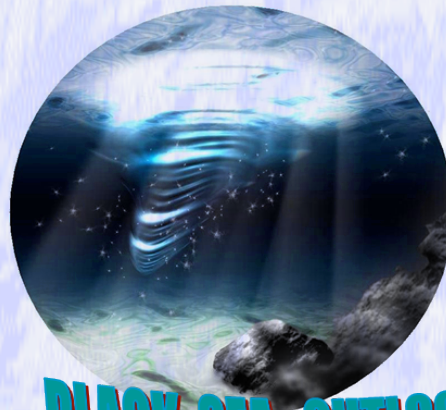# 3rd Bi-annual BS Scientific Conference and UP-GRADE BS-SCENE Project Joint Conference

Odessa, Ukraine, 1 - 4 November 2011

BLACK SEA OUTLOOK

Drivers, pressures, state, impacts, response and recovery indications towards better governance of Black Sea environmental protection.

JOINTLY ORGANIZED BY

THE COMMISSION ON THE PROTECTION OF THE BLACK SEA AGAINST POLLUTION (Black Sea Commission)
&
MINISTRY OF ENVIRONMENT AND NATURAL RESOURCES OF UKRAINE
&
UP-GRADE BLACK SEA SCIENTIFIC NETWORK - EC FP7 PROJECT

With the support of
EUROPEAN COMMISSION
UKRAINIAN SCIENTIFIC CENTER OF ECOLOGY OF THE SEA

ABSTRACTS

Table of Contents

6

or the Azov Sea are suggested, as there the highest frequency of the PTM development has been observed in the recent years.

References : 1. Ryabushko L.I. Potentially Dangerous Micro-Algae of Azov-Black Seas Basin. – Institute of Biology of Southern Seas Named After A.O.Kovalevskiy, National Academy of Sciences of Ukraine. – Sevastopol: EKOSI–Hydrophysics, 2003. – 288 p. (In Russian)

On Interconnections between Principal Natural Factors and Trophic State of Sea Water in the Zmiinyi Island Area

V.Medinets[a], N. Kovalova[b], S. Medinets[c]

Odessa National Mechnikov University. 7, Mayakovskogo lane, Odessa, 65082, Ukraine
[a]medinets@te.net.ua, [b]n.kovaleva@onu.edu.ua [c]s.medinets@gmail.com

Key words: Black Sea, trophic state, transparency, salinity, TRIX; chlorophyll "a", bacterioplankton

Our studies of 2003-2007 [1] have shown that the properties of sea water near the Zmiinyi Island were mainly determined by interconnections between high-seas water and the Danube River flow. Assessment of water quality long-term changes carried out by the authors [2] on TRIX index evidences that in the last decade water quality in the Zmiinyi Island area was significantly higher than in the other Black Sea areas. However, the reasons of this phenomenon are not finally clarified yet.

The aim of this work is to reveal the main natural factors that determine trophic state of marine water in the Zmiinyi Island area, assessed using the TRIX index.

As the source materials sets of the principal natural marine water parameters' observations carried out by the Research Station "Island Zmiinyi" of Odessa National I.I. Mechnikov University in 2004-2010 were used, as well as results of our last study of long-term changes in TRIX index [2]. Methods of observation and results' analyses are briefly described.

Results of temporal distribution analyses of the sets of hydrological & hydrochemical and hydrobiological parameters studied and characteristics of correlation analysis of their interrelations with the TRIX index are presented.

It was revealed that the values of all the studies hydrological and hydrobiological parameters varied within broad limits, for example salinity varied between 6.5 and 18.5 ‰, transparency - between 0.8 and 10.0 m, TRIX between 2.9 and 6.9, chlorophyll «a» between 0.12 and 28.03 mkg/l, bacterioplankton number between 0.16 and 3.65 million C/ml.

Results of statistical analysis of studied parameters' sets are described. Significant positive correlation connection between salinity and transparency is revealed, which will enable us to use salinity and transparency variations for assessment of the stage of marine and river waters' transformation, and to assess indirectly influence of the Danube flow.

Reliably substantiated is that changes of the TRIX trophic index are mainly connected with changes of salinity and transparency (indices of linear correlation are 0.37 and 0.51 respectively). Regression analysis of TRIX index and bacterioplankton content dependence on water transparency and salinity, carried out for averaged groups of data on transparency and salinity with intervals 1 m and 1‰ respectively has shown that correlation between these parameters is best described by logarithmic functions with determination indices R^2=0,90-0,94. Peculiarities of use of each of these regression dependencies for preliminary assessment of marine water trophicity in the Zmiinyi Island area are discussed.

Proposals on use of chlorophyll «а», bacterioplankton and transparency as direct local indicators of marine water eutrophication are substantiated. Elaborated scale of these indicators is presented, which corresponds to different trophic statuses of marine water.

References: 1. Zmiinyi Island. Ecosystem of Coastal Waters: Monograph / Exec. Ed. Medinets V.I.; Odessa National Mechnikov University. Odessa: Asroprint, 2008.- 228 p.

2. Kovalova N., Medinets V. Comprehensive Assessment of Long-Term Changes of the Black Sea Water Quality in the Zmiinyi Island Area. (see proceedings of current Conference).

State of the Problem of Determination of Microtraces of Semivolatile Organic Compounds in Water Systems of Ukraine by Chromatographic and Chromato-Mass Spectrometric Methods

M.V. Milyukin

A.V. Dumanskii Institute of Colloid Chemistry and Water Chemistry, National Academy of Sciences of Ukraine, 03680, Kiev-142, blvd. Vernadskii, 42, Ukraine,

m_milyukin@mail.ru

Keywords: organochlorine pesticides, polychlorinated biphenyls, polynuclear aromatic hydrocarbons, gas chromatography/mass spectrometry, determination, water, sediments, biota

Last years for an evaluation of ecological risks from receipt in surface waters of toxic persistent organic pollutants (POPs) results of studying of their prevalence, ways of moving, degree of accumulation and bioavailability in objects of the water environment are used. In Ukraine regular works in this direction are not carried out, mainly, in the absence of the corresponding methodology of research including the chemical analysis, – uniform for all objects of water system – water, sediments, biota, allowing to receive authentic and reproduced results.

For the aim of an evaluation of an ecological state of water systems the analytical methodology of research – isolation, concentration, identification and determination of the semivolatile organic compounds including POPs is developed: organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs), polynuclear aromatic hydrocarbons (PAHs), in these objects with application of adequate methods sample preparation both modern chromatographic and chromato-mass spectrometric methods of the analysis – gas chromatography with electron capture detection (GC/ECD), high performance liquid chromatography (HPLC) with UV/Vis/Flu/Ref detection, chromato-mass spectrometry (gas chromatography/mass spectrometry) (GC/MS) with mass selective detection in SCAN and SIM modes, allowing to receive authentic and reproduced results. For the decision of problems of monitoring OCPs, PCBs and PAHs schemes of the analysis natural and drinking waters, sediments and biota of Dnieper river basin, sediments and biota of Black sea and sediments of the rivers of Crimea (Belbek, Chernaja) are developed, approved and applied. Samples of natural and drinking waters are selected at waterworks of cities of Dnieper river basin and biotas (muscle tissue of fish) also are taken from Dnieper river basin. Samples for the analysis of sediments and biota (benthos) are selected in Dnieper and Bug mouths and Danube delta, Balaklava and Sevastopol bays (2006–2009). Levels of content of OCPs, PCBs and PAHs in natural, drinking waters, sediments and biota of Dnieper, Bug, Danube rivers basin and sediments and biota of Black sea are determined. For an estimation of reliability and accuracy of the developed schemes of the analysis, techniques sample preparation and determination of OCPs and PCBs in water, sediments and biota by methods GC/MS and GC/ECD and PAHs by methods GC/MS and HPLC used results of the analysis of samples of comporative rounds and