

# **Assessment of the status of Ukrainian transboundary water bodies in the Danube River Basin**

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## **Introduction**

Recently the system to assess the status of water bodies basing on physical-chemical, biological and hydromorphological parameters actively applied in the countries of the European Union. The response of ecosystems of different river types is recognized as the best indicator of “good ecological status”. The Directive 2000/60/EC of the European Parliament and Council of 23 October 2000 includes these assessment tools and provides the framework for basin wide action in the field of water policy (EU WFD, 2000). In this document the main assignments concerning protection of surface, coastal, ground and sea waters are formulated. As the majority of large European river basins cover territories of several countries, some beyond the EU borders, transboundary river basin management should be coordinated with the non EU-countries. Thus, the main principles formulated in the Directive should promote implementation of liabilities of international nature protection normative documents. In particular, the «Convention on the Protection and Use of Transboundary Watercourses and International Lakes» should be taken into account.

According to the Ukrainian euro-integration course and geopolitical position - with the main transboundary river basins Dnipro, Dniester, Danube, Western Bug, Severski Donets - the Directive 2000/60/EC is an important document. It should help to create and harmonize the national legal normative-methodical basis of water protection measures. The countries (including Ukraine) which have signed the Convention on cooperation for the protection and sustainable use of the Danube River (Danube River Protection Convention, 1998) are obliged to use the Directive as the basic document.

Recently the appreciable successes concerning the development of a methodical basis of an ecological assessment of the status of water bodies were achieved in Ukraine. In particular, “Guidance of ecological estimation of surface waters quality on appropriate criteria» (1998), «Guidance of mapping of ecological status of surface waters of Ukraine based on water quality” (1998), and «Guidance of determination and usage of ecological normatives of surface waters quality of a land and estuaries» (2001) were developed. At the same time there is full absence of ecological status assessment of water bodies of Ukraine with application of biotic components (ROMANENKO & ZHUKINSKIJ, 2003).

## **Ecological quality assessment of water bodies in Ukraine**

Scientific investigations concerning introduction of methodological approaches to assess the ecological status of water bodies on a basis of biotic components (as it is stipulated in the Directive 2000/60/EC) are actively carried out in the Institute of Hydrobiology of the National Academy of Sciences of Ukraine. In particular, usage of characteristics of hydro-morphological

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structure and qualitative indices of microphytobenthos for ecological assessment of water ecosystems status is proved. Methods to determine reference communities and parameters for the estimate of an ecological status of the water bodies under anthropogenic influence are proposed (OKSIJUK & DAVYDOV, 2006).

Methods of ecological risks assessment based on “hot spot” pollution with application of indicative benthic invertebrate species and the Trent Biotic Index are developed (AFANASYEV & GRODZINSKI, 2004)

On the territory of Ukraine the Danube River Basin includes the transboundary Carpathian tributaries (Tisza, Prut etc.) and Delta water bodies (Kilian Delta and Lower reaches Lakes). Each of these regions has a special complex of hydroecological problems.

Within the framework of fulfillment of the Convention on the protection of the Black Sea against pollution, the Ukrainian scientists investigate characteristics of Danube River flow with the purpose to reduce the load of polluting substances and to improve the Black Sea ecosystem status.

To unify the methods of water quality assessment the joint Ukrainian - Romanian project «Comparative assessment of environmental impact upon aquatic ecosystems from Danube Delta (Romanian and Ukrainian parts)» started in 2005 within the framework of bilateral agreement concerning scientific and technical cooperation between the National Academy of Sciences of Ukraine and the Romanian Academy.

Investigations of the water quality of Danube tributaries which originate in Carpathian region (Tisza, Prut and some others rivers) are carried out. For the first time full-scale hydrobiological research of the Trans-Carpathian rivers, including rivers suffered from peak pollution discharge of dangerous substances was performed (Tisza, Latorytsya and some others rivers). The disturbance of biota and biodiversity during flood is studied. A conceptual approach to practical application of biological parameters of "ecological normative" (target status), as one of the basic standard in the field of use and protection of waters and restoration of water resources, is developed. Assessment of water environment quality with application of biotic parameters (Trent Biotic Index) was carried out. In the absence of significant pollution the structure of benthic communities changes due to sediment transportation and altered granulometric structures (AFANASYEV, 2002).

During realization of the international research programs in Ukraine (UNDP-GEF, TACIS) biological assessment of water quality of transboundary rivers based on index-mark approaches is applied, methodological approaches and practical recommendations concerning to determination of ecological normative of surface waters quality are developed.

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