



EUROPEAN CONFERENCE

Conference Proceedings



**III International Science Conference
“Using the latest technologies”**

**February 26 – 27, 2021
Groningen, Netherlands**

USING THE LATEST TECHNOLOGIES

Abstracts of III-rd International Scientific and Practical Conference

Groningen, Netherlands
February 26 – 27, 2021

UDC 01.1

ISBN – 978-9-40361-459-5

The III-rd International Science Conference «Using the latest technologies», February 26 – 27, 2021, Groningen, Netherlands. 120p.

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The recommended citation for this publication is: Chudovska V.

Legislative support for the allotment of a land plot for the placement of facilities of power generating enterprises // Using the latest technologies. Abstracts of III-rd International Scientific and Practical Conference. Groningen, Netherlands 2021. Pp. 22-24.

URL: <https://eu-conf.com>.

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SYSTEM OF MONITORING AND ECOLOGICAL ASSESSMENT OF WATER RESOURCES OF UKRAINE

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Monitoring of land surface water pollution is a system of observations, assessment and forecasting of land surface waters to obtain information about their quality necessary for the rational use of water resources and the implementation of measures to protect them from pollution and depletion [1].

The National Environmental Pollution Monitoring System includes monitoring of: marine pollution, sources of pollution; land surface water pollution; atmospheric air pollution; soil pollution; background observations.

The most dangerous consequence of man-made impact on the environment is the pollution of environmental components - air, surface waters, seas and soils. The organization of a system for monitoring environmental pollution is an important component of a modern strategy for regulating the quality of this environment and its management.

The number of monitoring points in the most general way should provide a reliable assessment of the state of all surface waters of the state within each basin and sub-basin [2]. It is clear that it is inexpedient to organize a network of observations in an extensive way. A balance must be struck between the quality of the information received from the network and its cost indicators. In pools with uniform characteristics of a water body or man-made impact, the number of observation points may be smaller compared to those pools that have more diverse conditions. In this case, the grouping of water bodies made according to the principles of typology or characteristics of anthropogenic activity is allowed.

Depending on the goals and objectives of the state water monitoring, the following procedures are established:

- procedure for diagnostic monitoring of surface and underground water bodies;
- procedure of operational monitoring of surface and underground water massifs;
- procedure of research monitoring of surface water massifs;
- sea water monitoring procedure.

Diagnostic, operational and research monitoring is carried out on a basin basis.

The new water monitoring system provides for a six-year monitoring cycle and classification of water status according to 5 classes of ecological status and 2 classes of chemical status.

Appropriate state water monitoring programs are being prepared for state water monitoring.

Today in Ukraine there are two monitoring systems for the quality of surface water bodies:

1. Interactive map "Clean water" of river pollution in Ukraine (<https://texty.org.ua/water/>).

2. System of monitoring and ecological assessment of water resources of Ukraine (<http://monitoring.davr.gov.ua/EcoWaterMon/MapEcoWaterMon/Index>).

Thus, the interactive map "Clean Water", based on data from the State Agency of Water Resources, displays more than 400 control points for river water for 16 pollution parameters, as well as changes in their level over five years (Fig. 1).

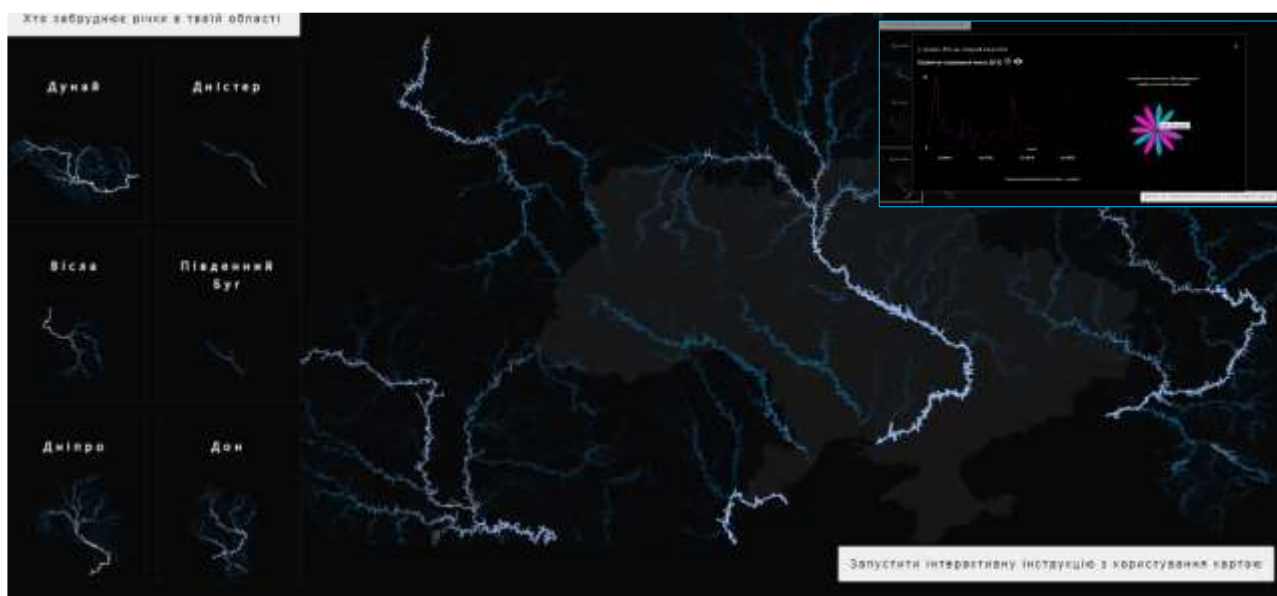


Figure 1. Interface of the interactive map of pollution of river basins of Ukraine "Clean water"

The map shows the largest river basins in Ukraine. The user needs to click on one of the pools in the menu to start working with the map. After clicking, the card leaves the selected pool and icons (in the form of a "flower") on it. They mark on the map the places where the DAVR takes water for analysis. If the "flower" petals turn pink, then the pollution exceeds the MPC [3]. The graph shows how the concentration of CL has changed in the past and what it is now. As for the "flower", each of its petals indicates a certain parameter by which to assess the quality of water. You can click on the petals to see the graph for the selected indicator. The blue color of the graph line means that the indicator is within normal limits. The pink part of the line can have different shades, depending on how much the figure exceeds the norm. The brighter the line, the greater the excess.

The map shows a list of enterprises that, according to official data of the State Water Agency, pollute rivers in each region of Ukraine. There is no data on the exact coordinates of the places where they dump pollutants.

On December 11, 2017, during the meeting of the sections on economics and water resources management of the Scientific and Technical Council of DAVR, its participants were presented a new software system "Monitoring and environmental assessment of water resources of Ukraine", developed by leading Ukrainian experts information systems".

With the help of modern information technologies, the new program will automatically process water monitoring data. As a result, we can see conclusions about the state of water resources of Ukraine and transboundary water bodies (Fig. 2).

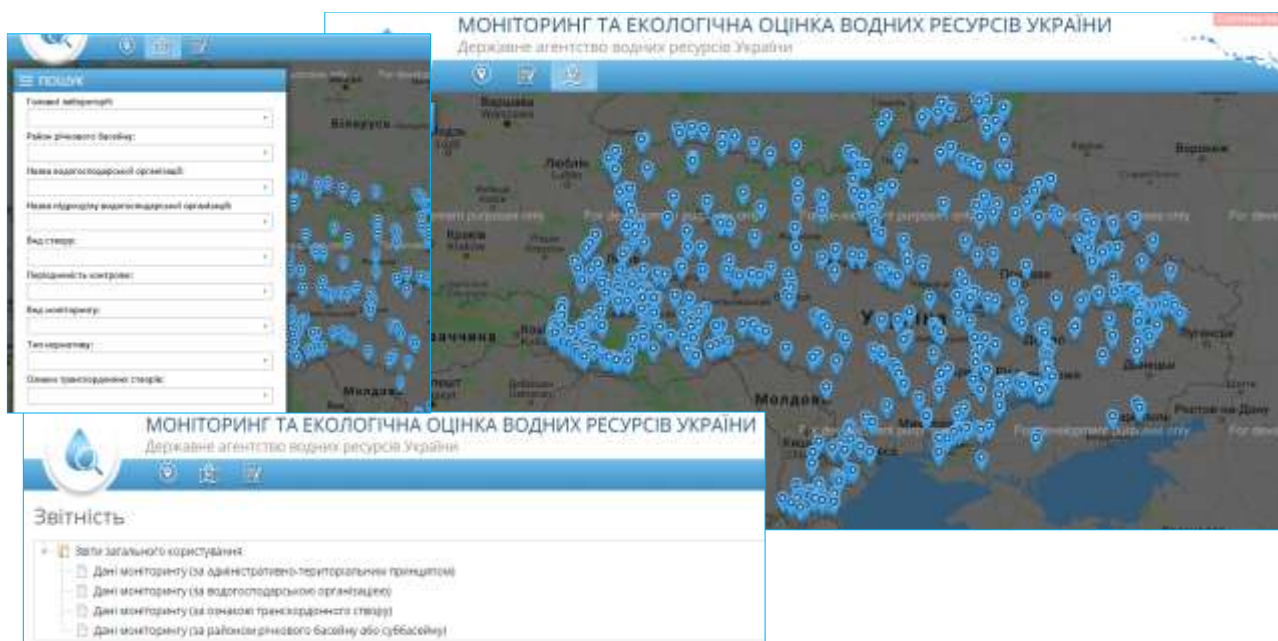


Figure 2. Interface of the system of monitoring and ecological assessment of water resources of Ukraine

The system is designed taking into account the requirements of legislation adopted in the framework of approximation of EU standards. It provides for the division into river basins and sub-basins. The system provides opportunities to build analytical reports in terms of both hydrographic units and the administrative principle, as well as the main rivers. The basis for maintaining databases in accordance with the new water monitoring system that meets the requirements of the WFD [4].

In Ukraine, the State Water Monitoring is carried out to collect, process, store, summarize and analyze information on the status of water bodies, forecast its changes and develop scientifically sound recommendations for decision-making in the field of water use, protection and reproduction. Since 2019, Ukraine has introduced European approaches to water monitoring in accordance with the requirements of the Water Framework Directive. The Post of the Cabinet of Ministers of Ukraine of September 19, 2018 № 758 approved a new Procedure for state water monitoring. The procedure defines a clear division of responsibilities between the subjects of monitoring without

duplication of powers, introduces new indicators of monitoring, which have not been measured in Ukraine so far - priority, hydro-morphological and biological.

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Scientific publications

MATERIALS

The III-rd International Science Conference «Using the latest technologies»,
Groningen, Netherlands. 120 p.

(February 26 – 27, 2021)