

## Chapter 25

# Features of the Hydrological Regime of Shatsk Water Bodies of the Volyn Region

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### ABSTRACT

*This is an analysis of the state of natural waters of the Shatsk lake in the conditions of climate change. Analyzed are hydrological regime of water bodies and hydrogeological state of areas of formation and feeding. It is noted that there is a slight increase in the levels of ground and pressure aquifers, and, accordingly, surface aquifers, which is mainly due to atmospheric factors. It is noted that the chemical composition of the water of the lakes of the Shatsk group has remained stable enough for decades and the formation of its composition is determined not only by the peculiarity of the water supply of the lakes, but also by the level of anthropogenic load on the water area. It was established that in order to improve the condition and water supply of the Shatsk lake, it is necessary to develop and implement measures to prevent and minimize the possible impact of harmful effects of water, develop integrated approaches and measures to optimize water use, improve water quality, conserve and restore water resources, ensure sustainable use, and development of natural reserve fund objects.*

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## **BACKGROUND**

Preservation of unique natural complexes and water bodies for the future encourages the relevance of the study of nature conservation areas – as reserves of untouched and slightly disturbed nature. At the same time, the key role belongs to the study of the current state, features of functioning, and the degree of anthropogenic transformation of water bodies of the Shatsk lakes area, as well as the development of principles of integrated water management of the studied territory.

The first network of observation wells for studying the regime and balance of ground and pressure water was created after the construction of the Kopayiv drainage system by the Lviv Hydrogeological and Reclamation Expedition in 1969. The network consisted of three observation wells (between Svityaz Lake and Pripyat River valley; Svityaz Lake – Pulemetske Lake and Svityaz Lake – Krymno Lake), a water-balance site on the northern shore of Svityaz Lake, and gauging stations on canals and lakes, where routine observations were carried out (Formation of the regime of natural waters of the Shatsk lakes area in modern conditions, 2004).

To protect rare natural complexes in the area of Shatsk Lakes, Shatsk National Nature Park (32.500 hectares) was established in 1983. The nature of the lake complex, located on the Main European watershed, the territory of the park has no analogs in Ukraine.

Shatsk National Natural Park (SNNP) is included in the international biosphere reserve «Western Polesie», as well as in the European Bug Eco Corridor, which unites the park-reserve territories of Ukraine, Poland, and Belarus with an area of about 120 thousand hectares. Therefore, environmental monitoring in the territory of the Shatsk NNP and the valley of the Prypyat River (not only in its upper reaches) becomes especially relevant. This enables control of the changes in the components of the natural environment and makes timely management decisions. At the same time, it becomes possible to determine the patterns of changes in natural complexes under various anthropogenic loads, assess their consequences, and determine measures to neutralize negative processes.

The most important component of the Shatsk NNP is water resources, which include surface (lakes, rivers, artificial reservoirs) and underground (soil and pressure) waters. Their main users in the park are agriculture, the communal economy, and the population of the district, which directly takes water from lakes, rivers, and aquifers, using it for economic needs (Khomik N.V., 2013).

The natural waters of the Shatsk Lake District are a unique object of conservation that requires constant scientific attention to assess and forecast their level regimes and hydrochemical characteristics, the changes of which depend both on natural factors and anthropogenic activity in the basin of the

Western Bug River, to which the Shatsk Lake District belongs to. Its territory is located in the watershed area of the Western Bug and Pripyat rivers, which practically coincides with the boundaries of the Shatsk National Nature Park (SNNP). Within these boundaries, there are 23 lakes with a total area of 6338.9 hectares (13% of the area of the Shatsk NNP), among which Svityaz Lake is the deepest in Ukraine (58,8 m) and the largest in the area among the Shatsk Lakes.

The main water arteries of the Volyn Polesie are the Western Bug and Prypyat Rivers, as well as the tributaries of the Western Bug River – Kopaivka and Ryta. But only the Kopaivka (2.0 km) and Ryta (about 1,0 km) Rivers are included in the territory of the Shatsk National Nature Park.

The Prypyat River, the right tributary of the Dnieper River, belongs to the Black Sea basin, and the Western Bug River is the right tributary of the Vistula River and belongs to the Baltic Sea basin. The line of the Main European watershed between these rivers, due to the flatness of the territory, passes through the elevations along the chalk ridge. From the watershed line, the sloping plain extends further

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