

Application of an Innovative Method of Improving Water Quality on the Turawa Reservoir - Ventura Facility

Paweł Tomczyk^{1*}, Mirosław Wiatkowski¹, Bogna Buta¹, Łukasz Gruss¹, Witold Skorulski²

¹Wrocław University of Environmental and Life Sciences
25 Norwida St., 50-375 Wrocław, Poland

pawel.tomczyk@upwr.edu.pl (corresponding author); miroslaw.wiatkowski@upwr.edu.pl; bogna.but@upwr.edu.pl;
lukasz.gruss@upwr.edu.pl

² Art Strefa Witold Skorulski
ul. Śniadeckich 45/6, 51-604 Wrocław, Poland
witek.s@poczta.onet.pl

Extended Abstract

The purpose of water reservoirs has changed over the years. In times of intensified anthropopressure processes, dam reservoirs lose their original meaning only as an ecosystem that is a place of life for various aquatic organisms. Eutrophication also has a serious impact on the functioning of organisms living in the water, as well as on the health of people using the reservoir (the algae causing eutrophication are toxic).

The installation improving the quality (IIWQ) of water "Ventura" is located on the Turawa reservoir (50°43'25 "N 18°07'13" E), located in 18,900 km of the Mała Panew river in the Opolskie Voivodeship in Poland. The Ventura facility is located on the right bank of the Turawa reservoir, the area of operation of the installation includes the reservoir bay, where the adjacent area is used for tourism as a camping site. Due to the characteristics of the area, we observe large changes in nitrogen concentration during the study period. The Turawa reservoir was built in the years 1933-1939 for the purpose of water retention for the maintenance of the Odra flows for navigation purposes, and for recreation and relaxation. The tourist potential and the landscape and natural value of the site are drastically reduced during the growing season due to excessive eutrophication. Large amounts of nitrogen and phosphorus loads flowing into the waters of the Turawa reservoir significantly contribute to the gradual eutrophication, deteriorating the living conditions of aquatic organisms and limiting the possibilities of using the accumulated waters.

The aim of the work was to compare the water quality status before the installation is put into operation, during its operation and after the end of the 3-year period of operation. The paper presents the results of water quality tests. Based on the information on the volume of nutrient loads flowing in and out of the installation, the impact of the installation on the improvement of water quality in the reservoir was determined. In addition, control tests were carried out at checkpoints in the reservoir. It was found that increased eutrophication processes occur in the Turawa reservoir, which is mainly determined by nitrogen compounds. The research period covered measurements from June 2019 to May 2020, while from May 2020 to December 2021, the effectiveness of the operating installation was tested in the context of reducing the concentration of nitrates and phosphates.

Keywords: dam reservoir, water quality, nutrients, water management

This research was carried out as part of the National Center for Research and Development BIOSTRATEG3/343733/15/NCBR/2018 project entitled "An innovative method of improving water quality in multi-functional retention reservoirs".