Heavy metals in surface waters of Lower Silesia

Metale ciężkie w wodach powierzchniowych Dolnego Śląska

Monika Kowalska-Góralska, Ryszard Polechoński, Wojciech Dobicki, Magdalena Senze, Przemysław Pokorny

Department of Hydrobiology and Aquaculture, Wrocław University of Environmental and Life Sciences, Poland
e-mail: ryszard.polechonski@up.wroc.pl

The work of compilation has been created as a result of many years of research of the rivers and reservoirs located in the region of Lower Silesia. The investigation has been conducted by the employees of the Department of Hydrobiology and Aquaculture UP Wroclaw. The material consisting of information about the content of chosen trace elements: copper, nickel, zinc, cadmium, lead and mercury, has been selected from resourceful documentation of research described. The laboratory analysis of heavy metals contents in water samples was carried out with the use of the certified reference materials, and the method of Atomic Absorption Spectrometry (AAS). The aimed object of the research included: rivers, lakes, reservoirs, small water gardens and ponds, and it differed in the degree of the human pressure (from highly contaminated by the industry to slightly polluted or nearly free of contaminants).

In terms of the level of concentration on the rivers of Lower Silesia Zinc> Copper> Lead> Nickel> Mercury> Cadmium, while water reservoirs slightly different: Zinc> Copper> Lead> Cadmium> Nickel> Mercury.

Taking into account the average concentrations of heavy metals in the surface waters of Poland and the rest of the world, provided by other authors, the pollution with zinc, lead, nickel and cadmium of the surface waters of Lower Silesia can be considered average, and above average in terms of copper and mercury contamination. In several occasions the local exceed of set limits for maximum concentration has been noted, and it has been related to the activities of specific industries (Legnica, Głogów, Brzeg Dolny). Over time, within the last 20years the concentration of heavy metals in surface waters has been decreasing. This tendency is associated with introduction of new technology solutions; the closure of industries using outdated production technologies, and the construction of effectively working sewage treatment plants.