

# Bioecological evaluation of the quality of the surface runoff from urban territories (case study of the city of Brest)

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## 1. Aim and scope

The aim of the work was to estimate the pollution of the surface runoff from urban territories (SRUT) in the city of Brest, Belarus and its impact on the receiving river ecosystem (the Mukhavets river, Baltic sea basin).

## 2. Materials and methods

Standard methods for wastewater analysis – AAS, photometry and titration methods were used for SRUT analysis. Bioassay and the study of the macrophyte communities were conducted to estimate influence on living organisms and ecosystem.

## 3. Results

SRUT was characterized by seasonal dynamics: the degree of contamination in winter was significantly higher than in summer period, primarily due to the use of sand and salt deicing composites (see Fig. 1.).

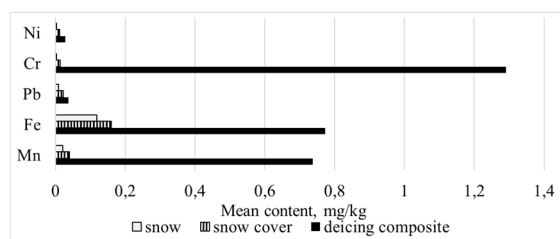


Figure 1. Results of analysis of snow, snow cover and deicing composites in the city of Brest.

Among other identified sources of pollution there were atmospheric precipitation and wash-off from the rooftops and road surfaces. Chloride and phosphate ions, dissolved zinc and copper were recognized as environmentally significant pollutants, because their content had significantly exceeded the regulation levels (maximum permissible concentrations).

The impact of SRUT on water plants was assessed using biotest with duckweed (*Lemna minor* L.) and the study of the macrophyte communities of the receiving river. Significant impact of SRUT on the biochemical parameters of *L. minor* was proved (See Fig. 2.). The presence of strong anthropogenic pressure, primarily due to pollution from surface runoff was identified in the study of macrophyte communities. Results showed significant impact of SRUT on the ecosystem of the receiving river.

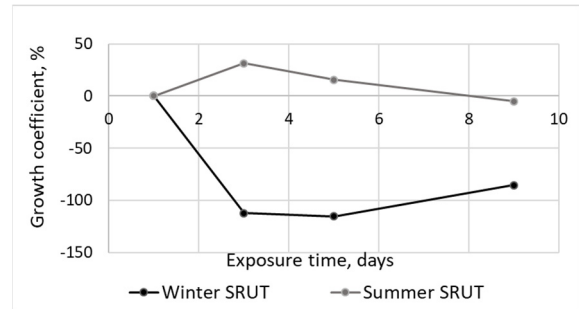


Figure 2. Relative growth of duckweed in samples of winter and summer SRUT.

## References

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