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THE SPATIAL AND TEMPORAL DISTRIBUTION OF ZINC IN SNOW: CASE STUDY OF JELGAVA CITY

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Abstract
The harmful effects of various air pollutants on human health, living in a polluted air environment, are relatively well proven: the morbidity of the population is increasing, life expectancy is decreasing. Suspended particulates are one of the generally recognized air pollutants. The most dangerous solid particles are released during primary combustion processes, they contain heavy metals (zinc, copper, iron, lead). Heavy metals are known to be persistent in the human body and remain for decades. Heavy metals can enter the human body by inhaling dust particles, coming in contact with contaminated soil and water.

According to the National Atmospheric Emissions Inventory, the main causes of zinc suspended particulate matter pollution are emissions from industrial areas, fuel and diesel combustion processes. Even suspended particles from car tires and brake disc wear can account for up to 20% of zinc air pollution. As a result of all these activities, zinc enters the urban environment, where it accumulates as the snow melts.

In environmental monitoring snow is a valuable resource for information on air pollution sources and air pollution levels. Snow serves as an efficient accumulator for car exhaust gases, as well as an accumulator of other pollutants. It has a large surface area that can store as much pollutants as possible.

The aim of the work is to look at the zinc pollution in the snow cover in the city of Jelgava by using descriptive statistics, and to draw conclusions about the changes in air quality over the years. The results of 240 measurements obtained from 60 measurement sites in Jelgava in the period from 2018 to 2021 were used in the data processing. The compacted infrastructure and high-rise buildings in the city center form corridors where zinc pollution can accumulate. Preliminary results indicate high levels of zinc pollution at key traffic points.

Keywords: pollution, heavy metals, environment, ArcGIS, Inverse distance weighted (IDW)

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