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ANALYSIS OF WILDFIRES IN LVIV REGION

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Wildfires include forest fires, peat fires, steppe fires (vegetation and grass fires), agricultural fieldfires, fires in solid waste landfills and others. The combustion of plants, peats and especially solid waste, is accompanied by the formation of toxic combustion products that settle in soil and water. Moreover, toxic combustion products can cause respiratory diseases and cancer in humans. To investigate the causes of the wildfires it is necessary to analyze the distribution of their time occurrence and dependence of different factors. For the analysis we have selected statistics for the last 3 years. The diagrams show the distribution of the occurrence of steppe fires, peat fires, forest fires and fires in landfills in Lviv region.

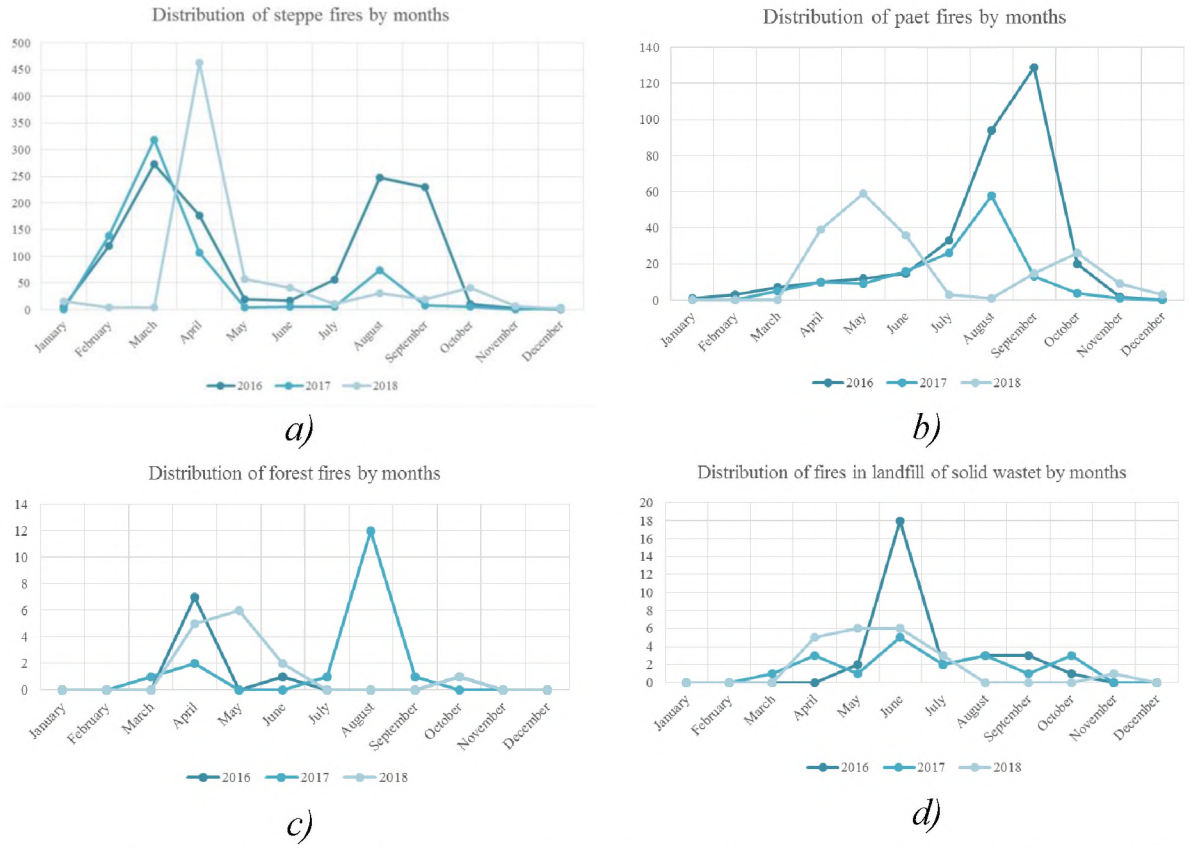
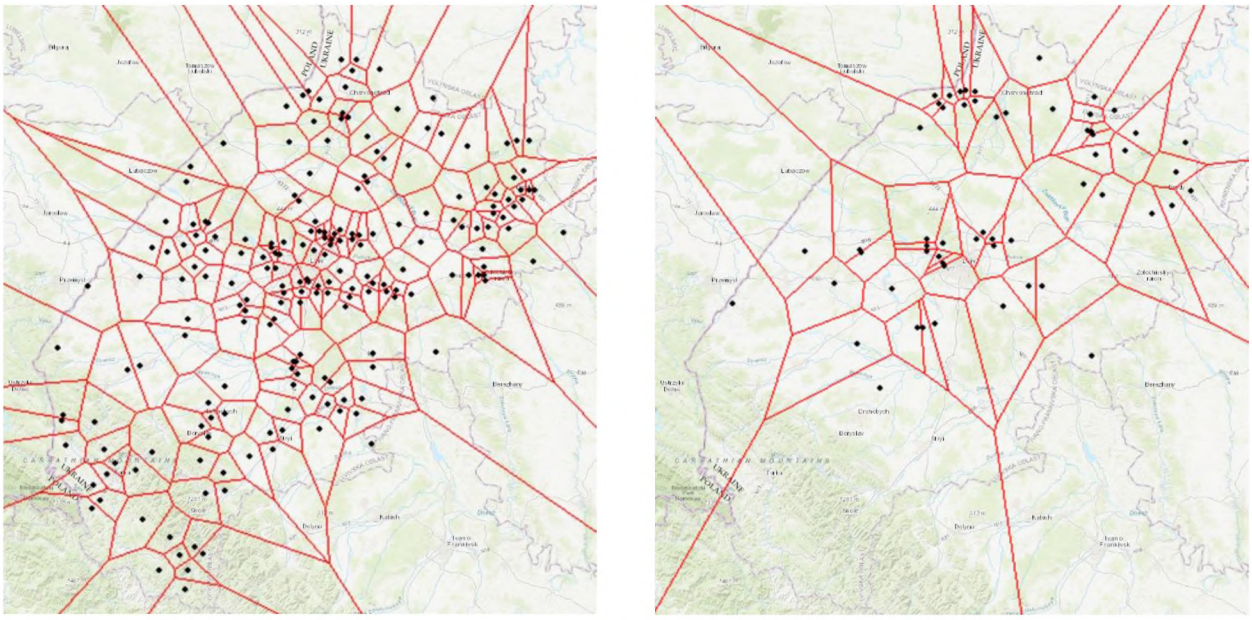


Figure 1 —Distributions of fires by months in Lviv region: a) steppe fires; b) peat fires; c) forest fires; d) landfill fires

As we can see from the diagrams, there is no close correlation for the last 3 years between the number of fires and months. The peak of fires in Lviv region usually occurs at the beginning of the fire danger period and after the harvest. The largest correlation is observed between the number of fires in landfills and months.

In order to investigate the distribution of fires in Lviv region, we have constructed Voronoi diagrams for the wildfires to identify the most dangerous and

safe areas. Figure 2 shows the diagram of Voronoi by the place of steppe and peat fires.



a) b)

Figure 2 —Voronoi diagram by place of wildfires: a) steppe fires; b) peat fires

We have also analyzed the influence of climatic conditions on wildfires depending on, namely: average monthly temperature, maximum monthly temperature, average monthly humidity and minimum monthly humidity. According to the results of the analysis, it is established that the largest correlation is observed between climatic indicators and the occurrence of fires in landfills.

The impact of wildfires on the environment is being studied globally. According to the article [1], wildfires and increase of the daily wildfire-specific lead to increased risk of respiratory diseases in humans. In the work [2] the influence of pollutants on the risk of respiratory illness and asthma in children is established. The scientists went even further into their research [3] as they have found the impact of wildfires on increase the weight of newborn male children.

The investigation of peat fires is also often practiced around the world. In the paper [4] the results of mathematical modeling of peat fires are presented. As per article [5] scientists have investigated the temperature regimes during peat fire at different depths and spread of fire around the area.

The effects of landfill fires on the environment and human health is less studied in the literature. Scientists from Nigeria have established the composition of waste in landfills and the composition of combustion products released into the atmosphere by burning [6]. The composition of combustion products is also considered by observations of their concentration during the fire, during extinction and after extinction of landfill fire in northern Canada [7]. Studies in the United States have focus on the study of tire fires in the landfill.

Conclusion. The composition of garbage in landfills and the composition of garbage combustion products in different countries is different. It is caused by environmental legislation, climate, etc. Therefore, the study of landfill fires is a perspective area of research.

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