Influence of Meteorological Factors on Ecological Conditions of the Atmosphere (Georgia, Tbilsi)

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Since the second half of the 20th century, atmosphere, as one of the main components of the environment, has undergone significant changes as a result of the influence of anthropogenic factors, which in turn, contributed to climate change and it impacted humans and ecosystems. Along with climate change, extreme weather events have spiked and strengthened, some of which are linked to the global climate system changes.

The article reviews and analyzes the growth dynamics of aerosols and harmful substances and the ecological condition of Tbilisi city, which is mainly caused by geographical location specificities and meteorological factors (synoptic processes, inversion, isothermia) responsible for the accumulation of aerosols in the atmosphere and the changes in the city's microclimate.

For the assessment of climate change for Tbilisi city, air pollution monitoring materials are used from the National Environmental Agency where observation is carried out for the background air pollution and also concentrations of aerosols and harmful substances were measured in automatic mode. The results of four stages of indicator measurements are presented for Tbilisi. Statistical, climatic and graphical analysis are used for research.

Studies have shown, that throughout Tbilisi, basic pollutants: (carbon dioxide, sulfur dioxide, nitrogen oxides, ozone, PM₂₅ and PM₁₀ (monthly and annual concentrations) in most cases, are exceeding to maximum permissible concentrations MPC. Nitrogen oxides and ground ozone are particularly sensitive (especially crucial), average annual concentrations of which 1.4-1.8 times exceeds the MPC, which affects the health of the population. It is noteworthy, that in the last 5 years (2014-2018) in Tbilisi, the lead metal average annual concentration decrease trend is observed.

Climate change expressions often have a complex character, which especially complicates the determination of causal relationship between them and it requires right approach and proper definition of adaptation measures.