

SPATIAL-TEMPORAL PATTERNS OF CHANGES IN PM 2.5 IN ATMOSPHERIC AIR OF IVANO-FRANKIVSK REGION

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ABSTRACT

PM is one of the main atmospheric air pollutants causing serious concern for public health. Spatio-temporal patterns of PM 2,5 change are a current topic in physics atmospheric and environmental sciences. An equally important aspect is the study of the relationship between PM 2,5 concentration and meteorological characteristics. Temperature, humidity, wind and atmospheric pressure can affect the concentration, distribution and transport of PM 2,5. The database for the study included measurements of PM 2,5 concentration, air temperature, atmospheric pressure, and relative humidity every hour, a total of 7,344 for each parameter from the Ecocity public monitoring station in the central part of Ivano-Frankivsk city. There are no significant stationary pollution sources and highways near the observation site. Certain regularities were found in the daily variation of PM 2,5 concentration: sharp increase in concentrations at night with a peak around midnight, decrease during the day (minimum around 17:00). The highest average monthly values of PM 2,5 are in March, the lowest are in July. When analyzing the relationship between PM 2,5 concentrations and air temperature, the regularity is observed both during the day and throughout the year (in cold periods, the concentration of particles is higher, which can be explained by lower air temperatures). Multivariate linear regression was used to find the mathematical relationship between the average monthly values of PM 2,5 concentration, humidity and air temperature. The model is acceptable for estimating and forecasting temporal patterns of the concentration of PM 2,5 particles in the atmospheric air of Ivano-Frankivsk, depending on the average monthly indicators of humidity and atmospheric air temperature.