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SCREENING THE WEEKDAYS/WEEKEND PATTERNS OF AIR POLLUTANT CONCENTRATIONS RECORDED IN SOUTHEASTERN ROMANIA

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Abstract

Some of the major stressors of air quality in the urban areas are nitrogen oxides, ozone and suspended particles. The effect of air pollution on respiratory diseases can increase considerably at high levels of pollution and might trigger asthma symptoms. Long-term exposure can increase the rate of respiratory infections and symptoms at population level, but particularly in children. The goal was to analyze with statistical techniques the pollutant concentrations (NO, NO₂, and SO₂) recorded by 15 automated monitoring stations, to establish weekdays-weekend trends in various towns of the South Muntenia Region during cold months when residential heating contributes to the overall emissions. Raw data of the monitored parameters were acquired from 7 stations for NO and NO₂, and 14 stations for SO₂. Data acquisition and processing were performed between November 15, 2013 and February 28, 2014 and hourly-recorded time series were characterized for central tendency, dispersion and distribution. The statistical analysis determined the degree of differentiation between different sites and time intervals of the monitored pollutants using the screening of air quality trends based on hourly concentrations of each weekday using a specific grouping of data. The results support the characterization of weekday/weekend patterns in air pollutant concentrations in several urban areas of Southern Romania, where air pollution data were available: 4 cities (NO, NO₂) i.e., Ploiesti, Slobozia, Turnu Magurele, and Giurgiu, respectively 6 cities (SO₂), i.e., Ploiesti, Pitesti, Cimpulung, Giurgiu, Alexandria and Turnu Magurele.

Key words: automated monitoring station, nitrogen oxides, sulfur dioxide, time series analysis

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