

ENVIRONMENTAL DYNAMICS MONITORING BASED ON SATELLITE EXPLORATION IN LUBLIN CITY

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Abstract. This study focuses on utilizing remote sensing technologies for a comprehensive analysis of dynamic environmental changes in Lublin. The research encompasses the assessment of air quality, vegetation dynamics and urban expansion from 2019 to 2023. Air quality analysis relies on satellite imagery from the Sentinel-5p satellite from the online platform "EO Browser", emphasizing concentrations of CO, HCHO, SO₂ and NO₂. The findings reveal changes in the concentrations of these substances in the air over the specified period, highlighting potential threats to human health. Additionally, the study investigates vegetation dynamics in Lublin using NDVI (Normalized Difference Vegetation Index) analysis based on Sentinel-2 satellite images. The assessment includes the application of spectral band combinations and the QGIS program to monitor the decrease in vegetation levels in Lublin. Urban expansion in the city is examined using the "Urban Classified Script" applied to Sentinel-2 satellite images. The research observes the rapid pace of Lublin's urban growth from 1986 to 2023, indicating a substantial increase in built-up areas. The integration and advancement of remote sensing technologies prove crucial for monitoring Earth's surface and contribute significantly to scientific research, environmental protection and understanding global changes.