Dear referee,

Thank you very much for the valuable comments to our paper and suggestions for article improvements. The manuscript has been modified accordingly.

Below are the answers and modification on the manuscript. In the following: "RefC" is the comment from Referee, "AuthR" is the author's response and "AuthCM" represents the author's changes to the manuscript.

RefC: "The revised manuscript demonstrates substantial improvements in methodological clarity, contextualization, and presentation, addressing the majority of concerns raised during initial review. The authors have successfully strengthened the introduction, expanded methodological justifications, and enhanced the discussion of practical implications for policymakers. While the bulk of the revisions is now complete, minor technical corrections are required to ensure consistency, precision, and reproducibility. Specifically, attention should be given to: clarifying the spatial extent depicted in Figure 1; ensuring consistent map delineation with the described study area; resolving the discrepancy in R2 values between lines 160-163 and 247- 252; and incorporating details about the in-situ instrument(s) at the MARS facility in relation to lines 279-280.

Technical comments

Figure 1.

The spatial extent of Bucharest considered in the land use regression requires clarification (e.g., whether it aligns with the map boundary or a narrower study area). A precise delineation of this extent would enhance methodological transparency and allow readers to evaluate the land use classes integrated into the model. Additionally, the absence of standard cartographic elements—such as a scale, orientation, or geographic coordinates (e.g., latitude/longitude, as provided in Figure 2)—limits the interpretability of the spatial data. "

AuthR: The recommended corrections were done.

AuthCM: Figure 1 was replaced, added the geographic coordinates, orientation, scale and a rectangular for area used in the model.

RefC: "Lines 133 – 135 …. *window on 3 data points window…. values higher and lower than 1.5 times the window mean*.

The clarity of the text can be improved: A moving average filter with a 3-data-point window was used to remove data points with values exceeding 1.5 times the window mean, above or below."

AuthR: The recommended corrections were done in the text.

AuthCM: "A moving average filter with a 3-data-point window was used to remove data points with values exceeding 1.5 times the window mean, above or below."

RefC: "Line 199 – 200 ... over an area of approximately 240 km2 (the entire area of the city of Bucharest). Going back to the discussion on figure 1. This area should be clearly delineated on the map."

AuthR: The recommended corrections were done.

AuthCM: Figure 1 was replaced, added a rectangular pin pointing the area used in the model. Also it was added in the figure caption "dotted rectangular represent the modelled area"

RefC: "Lines 160 – 163: The performance of the model has been evaluated in three steps. First, a subset containing 15% of data collected through mobile measurements (and not used to tune the model) was used for cross-validation. This percentage represents the optimal value for which the models developed in this study can recognize the relationship between the attributes of the input data and the output variable with R^2 score greater than 0.75.

Lines 247 – 252: The performance of each model (one for each type of pollutant) was tested in three steps. First, the outputs of the model have been cross-validated against mobile measurements on the route (the 15% randomly selected mobile datasets not used for training). The percentage of 15% kept for testing represents the optimal value for which the models developed in this study can recognize the relationship between the attributes of the input data and the output variable with R^2 score greater than 0.5.

Is it greater than 0.5 or greater than 0.75? To ensure clarity and eliminate redundancy, please remove one of the duplicated paragraphs and clarifying the R2 score."

AuthR: Thank you for pointing out the redundancy and typo in the second paragraph.

AuthCM: We deleted most of the second appearance (lines 247-252) in the text and rephrased as follows: "The performance of each model (one for each type of pollutant) was tested following three steps described in details in section 2.3. Moreover, in the first step, the 15% of data kept for testing covers all possible situations ………"

*RefC: "*Line 279 – 280. *More information about what type of variables are measured by NAQMN is given in (Ilie et al, 2023).*

An additional sentence should be added regarding the in-situ instrument(s) at the Magurele Center for Atmosphere and Radiation Studies (MARS)."

AuthR: A sentence related to MARS site and measurements was added.

AuthCM: It was added the sentence "Detailed description of MARS site is given in (Pirloaga et al., 2023), where continuous PM concentrations are performed using optical particle counters (Marmureanu et al.,2019) and gases analysers (Castell et al., 2018)."

and added the following to the reference section:

"Mărmureanu, L.; Marin, C.A.; Andrei, S.; Antonescu, B.; Ene, D.; Boldeanu, M.; Vasilescu, J.; Viţelaru, C.; Cadar, O.; Levei, E. Orange Snow—A Saharan Dust Intrusion over Romania During Winter Conditions. Remote Sens. 2019, 11, 2466. https://doi.org/10.3390/rs11212466"

"Pîrloagă, R.; Adam, M.; Antonescu, B.; Andrei, S.; Ştefan, S. Ground-Based Measurements of Wind and Turbulence at Bucharest–Măgurele: First Results. Remote Sens. 2023, 15, 1514. https://doi.org/10.3390/rs15061514"

"Castell, N.; Schneider, P.; Grossberndt, S.; Fredriksen, M.F.; Sousa-Santos, G.; Vogt, M.; Bartonova, A. Localized real-time information on outdoor air quality at kindergartens in Oslo, Norway using low-cost sensor nodes, Environmental Research, Volume 165, 2018, Pages 410-419, ISSN 0013-9351, https://doi.org/10.1016/j.envres.2017.10.019"