

Supplementary Material: Implications of COVID-19 Restriction Measures in Urban Air Quality of Thessaloniki, Greece: A Machine Learning approach

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Table S1. Descriptive statistics (mean, 10th percentile, 25th percentile, median, 75th percentile, 90th percentile, and standard deviation) for NO₂ (µg/m³) and O₃ (µg/m³) at AGSOFIA station, and NO₂ (µg/m³) at EGNATIA station, for the time period from 1 January, 2018 to 31 December, 2019.

	AGSOFIA NO ₂	AGSOFIA O ₃	EGNATIA NO ₂
mean	24	44	72
10th	10	6	45
25th	15	15	57
median	22	44	71
75th	31	67	85
90th	40	84	99
std	12	29	22

Table S2. XGBoost hyperparameters used for the BAU models.

	AGSOFIA NO ₂	AGSOFIA O ₃	EGNATIA NO ₂
eta	0.11	0.11	0.13
gamma	1.51	1.23	1.63
max_depth	7	7	7
min_child_weight	1.5	3.0	2.5
n_estimators	255	275	215
reg_alpha	0.8	0.4	0.7
reg_lambda	1.0	0.2	0.6
subsample	0.7	0.6	0.7

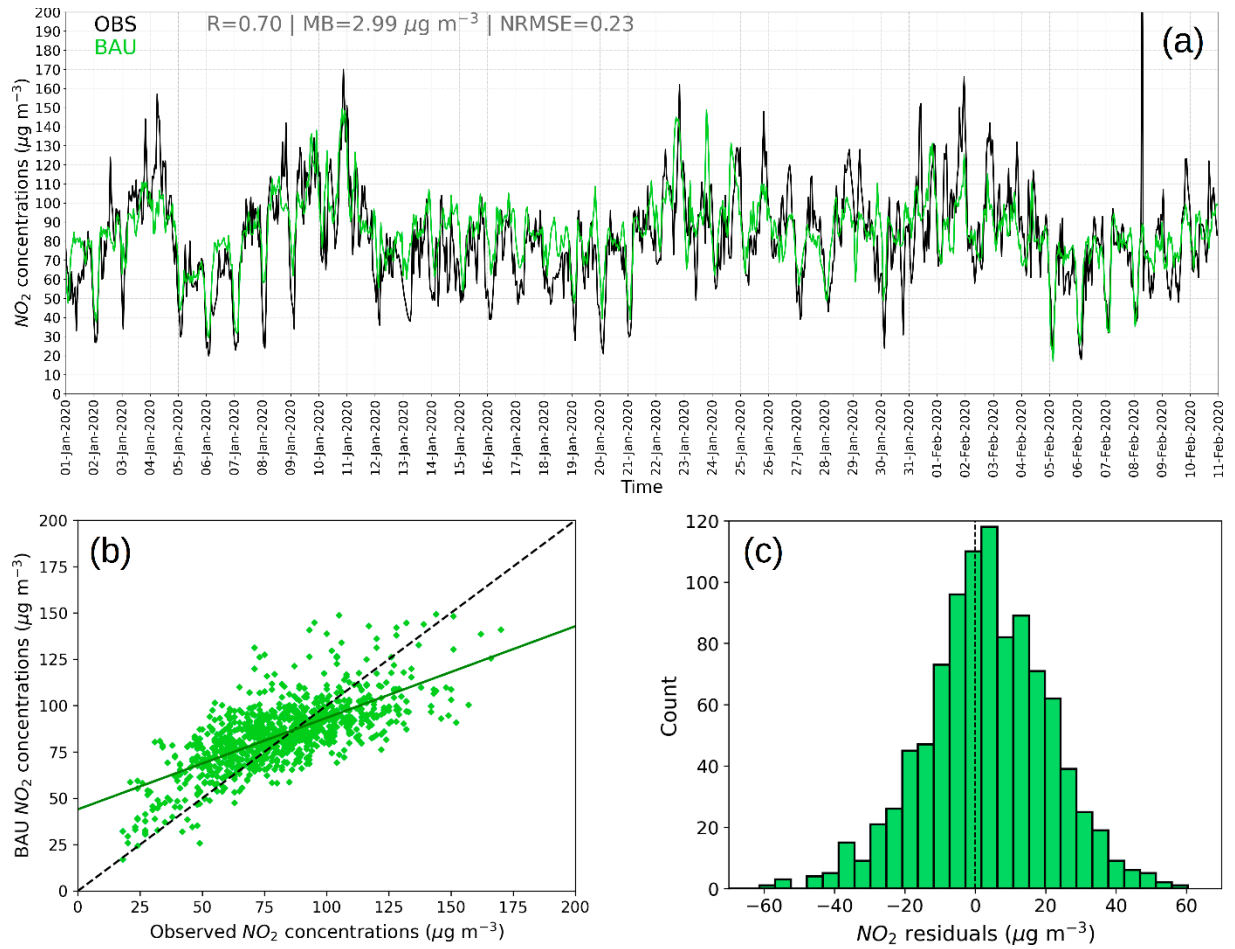


Figure S1. a) Observed (black) and BAU (green) timeseries of NO_2 hourly concentrations at EGNATIA station during the time period from 1 January to 10 February, 2020. b) Scatter plot of observed and BAU NO_2 hourly concentrations at EGNATIA station during the time period from 1 January to 10 February, 2020. The solid green line represents the regression line of the observed and BAU NO_2 concentrations, while the dashed black line is the 1:1 line. c) Histogram of NO_2 residual concentrations (BAU-observation) at EGNATIA station during the time period from 1 January to 10 February, 2020.

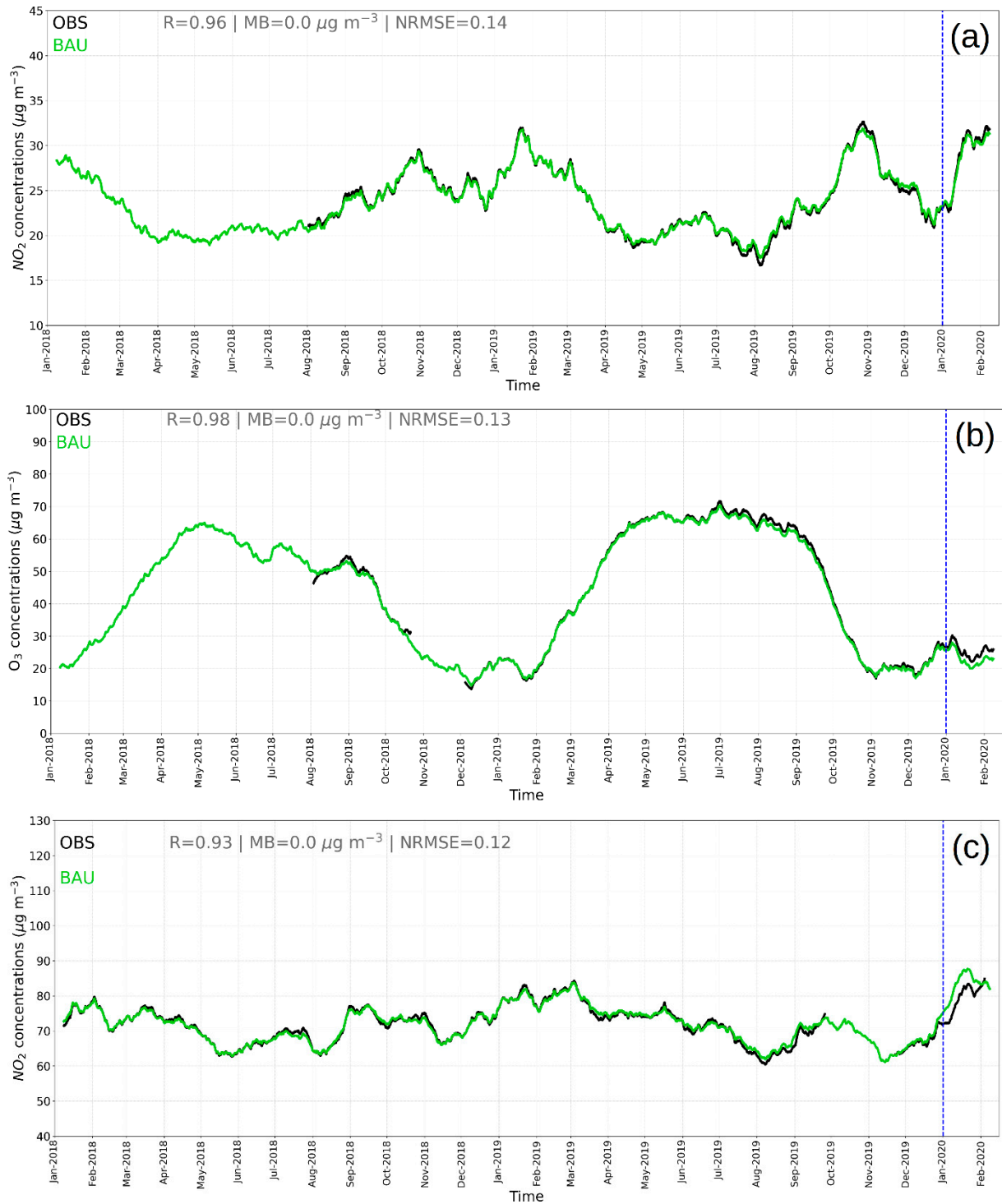


Figure S2. Observed (black) and BAU (green) 1-month moving average concentrations during the train (left of the blue dashed line) and test (right of the blue dashed line) periods, along with the correlation coefficient (R), mean bias (MB), and normalized root mean square error (NRMSE) for the train period for AGSOFIA NO₂ (a), AGSOFIA O₃ (b), and EGNATIA NO₂ (c).