



Supplement of

A machine learning approach to address air quality changes during the COVID-19 lockdown in Buenos Aires, Argentina

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S1. Supplementary Material

S1.1 Analysis of CNEA site during training period

S1.1.1 Temporal Variations

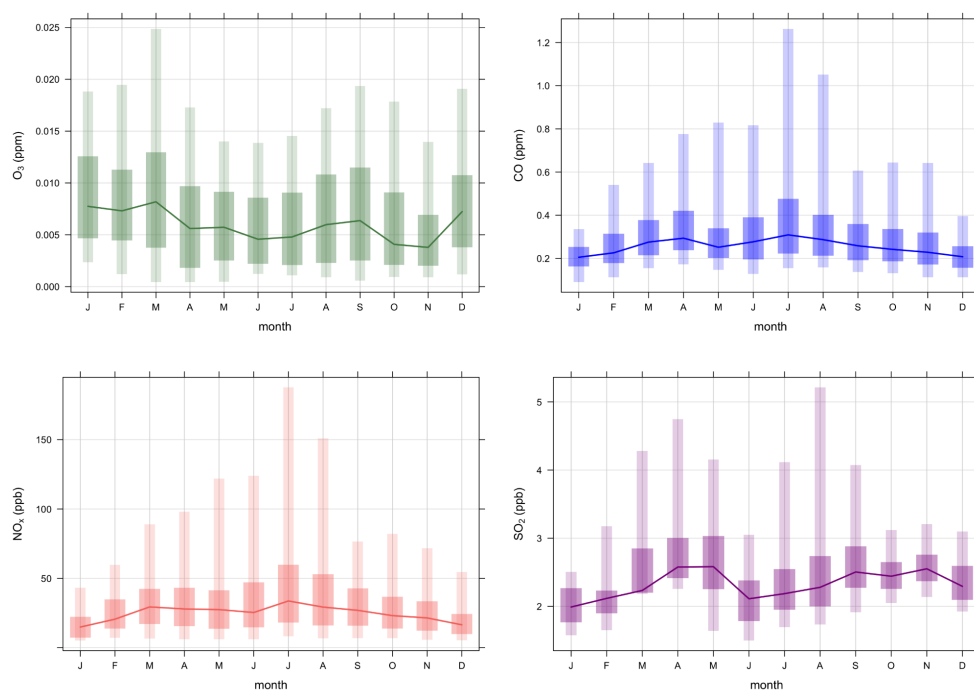


Fig. S1: Boxplot of training period ground-based observations for CNEA site.

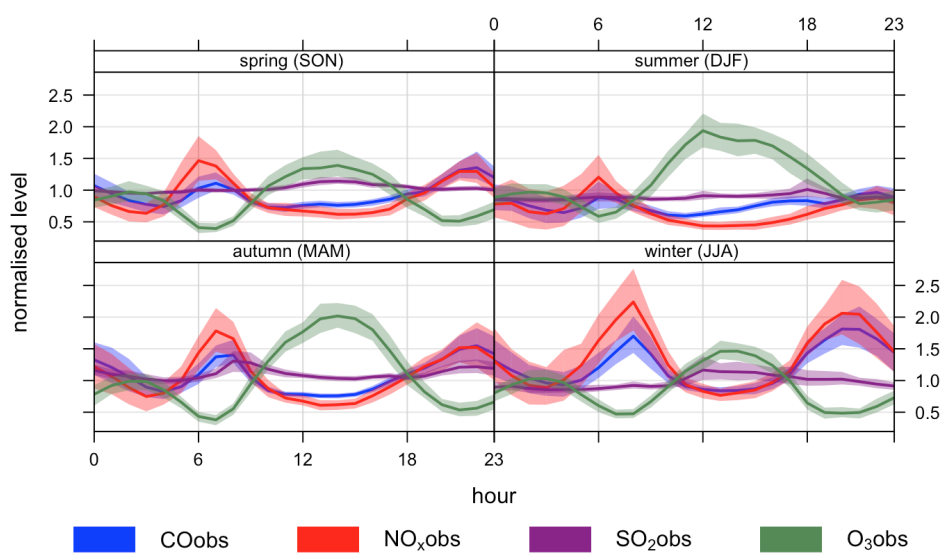


Fig S2: Seasonal diurnal cycles of training period ground-based observations for the CNEA site.

S.1.1.2 Bivariate polar plots for training period

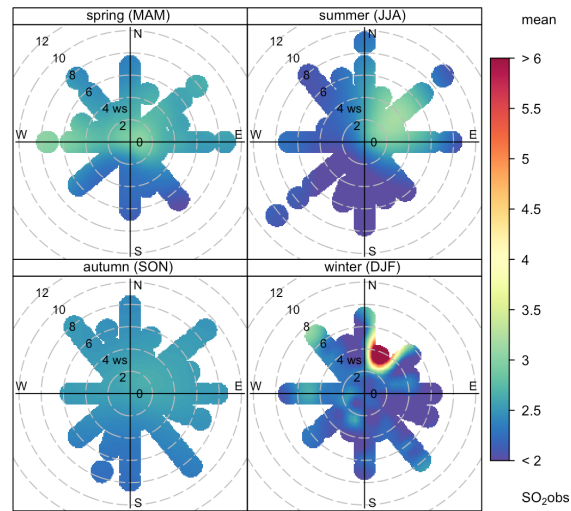


Figure S3: SO₂ seasonal bivariate polar plots for training period (CNEA site).

S1.2 Analysis of CNEA site during evaluation period

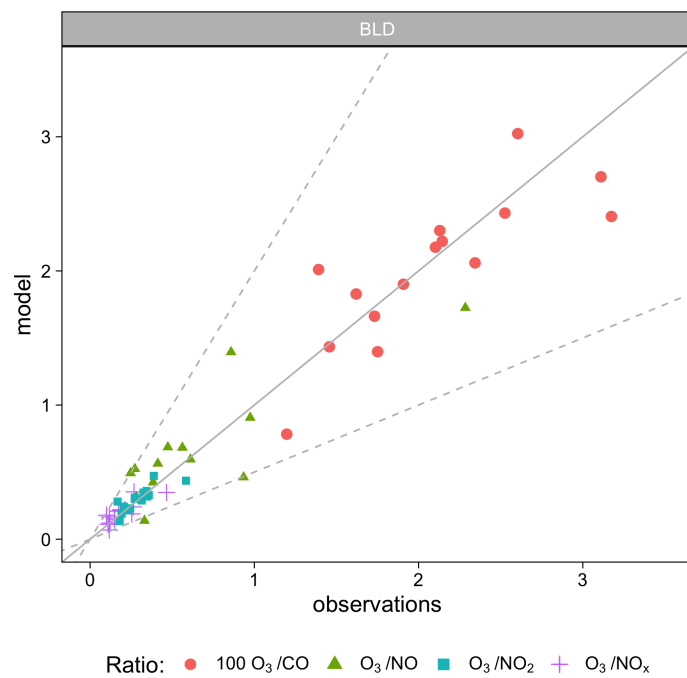


Figure S4. Scatter plot for O₃ ratios during evaluation period (BLD) in CNEA site. For better visualization O₃-CO ratio was multiplied by 100. The 1:1 line is solid and the 1:0.5 and 1:2 lines are dashed. Values within the dashed lines represent the fraction of values that are within a factor of 2 of the observations. Pearson correlation coefficients: $r_{\text{O}_3\text{-CO}} = 0.79$, $r_{\text{O}_3\text{-NO}} = 0.85$, $r_{\text{O}_3\text{-NO}_2} = 0.87$, $r_{\text{O}_3\text{-CO}_x} = 0.89$.

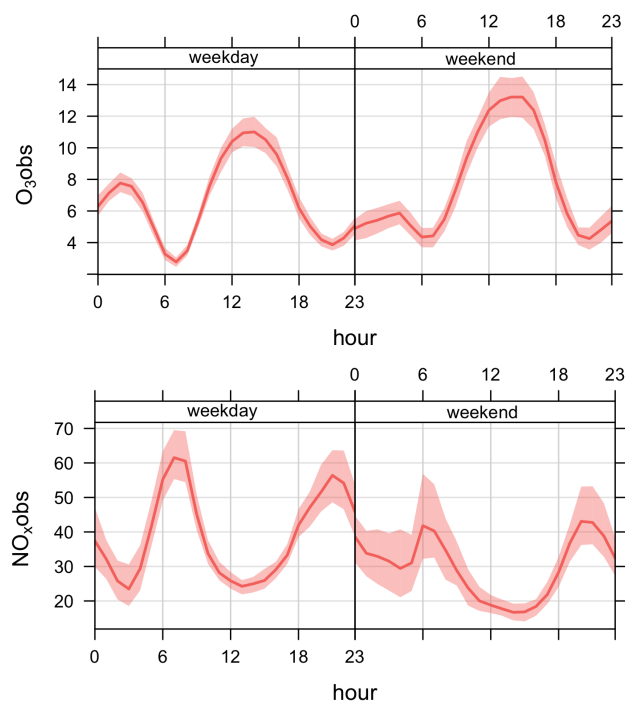


Figure S5. Mean diurnal cycle for weekends and weekdays for O_3 [ppb] and NO_x [ppb] during the training period (February 2019 to February 2020) at CNEA site.

S2.1 Variable Importance Plots

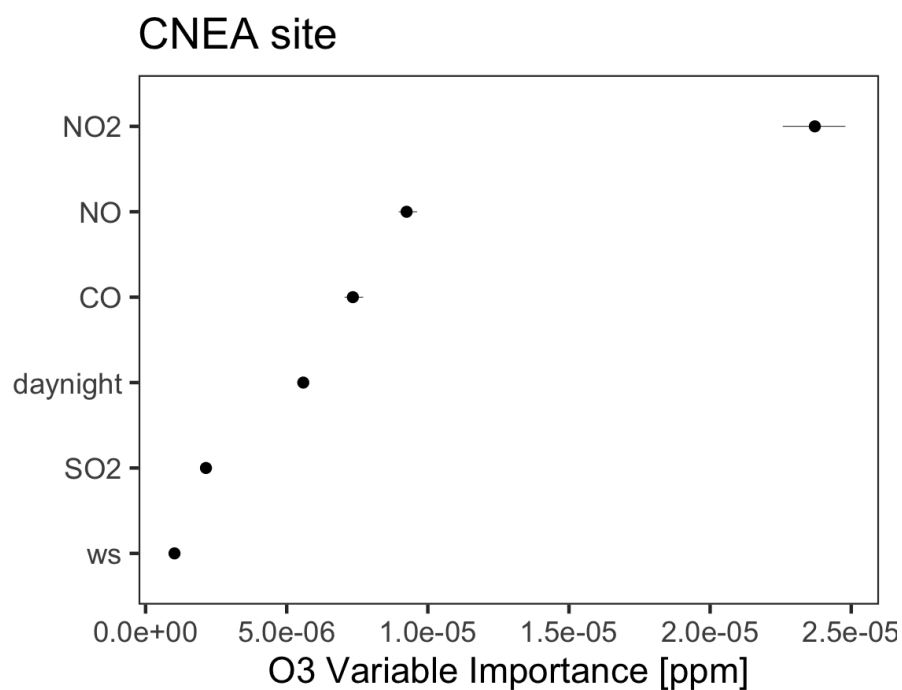


Figure S6. O_3 Variable Importance Plot (permutation difference) for RF for CNEA site (ppm). The dot represents the mean value and the line is the variable importance from 25th and the 75th percentile estimated with the 50 simulations run.

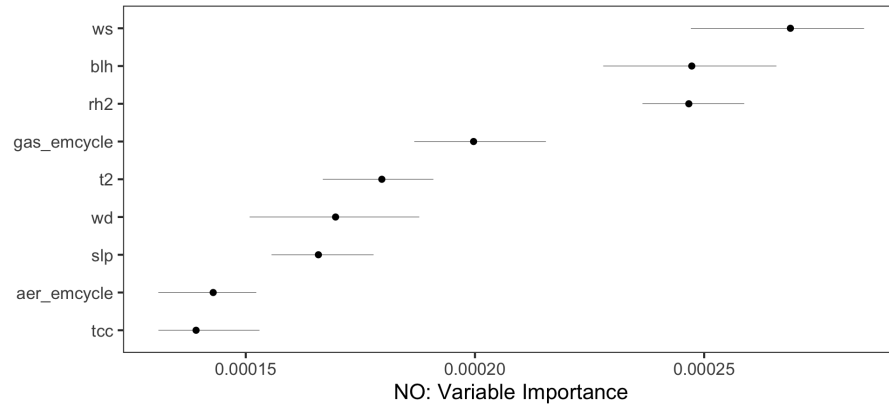


Figure S7. NO Variable Importance Plot (permutation difference) for RF for CNEA site (ppm). The dot represents the mean value and the line is the variable importance from 25th and the 75th percentile estimated with the 50 simulations run.

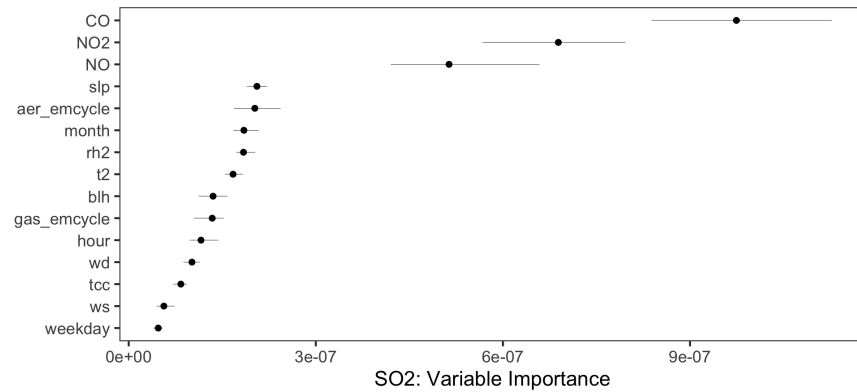


Figure S8. SO₂ Variable Importance Plot (permutation difference) for RF for CNEA site (ppm). The dot represents the mean value and the line is the variable importance from 25th and the 75th percentile estimated with the 50 simulations run.

S2.2 Partial Dependence plots (ppm)

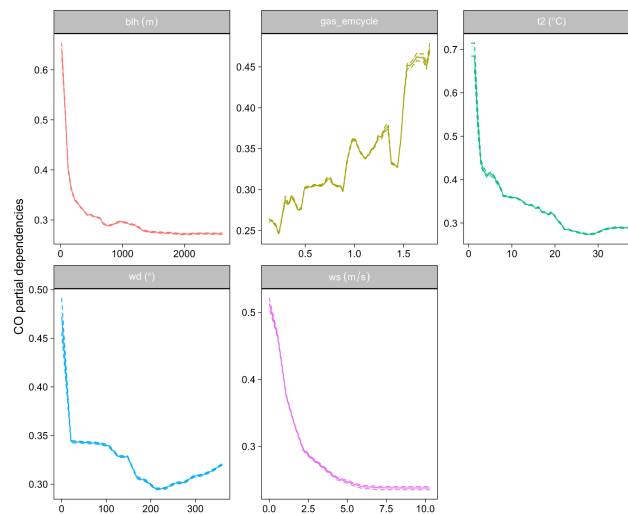


Figure S9. CO Partial dependencies plot (ppm) for RF for CNEA site . The shaded Area represents the variable importance between 25th and 75th percentile estimated from the 50 simulations.

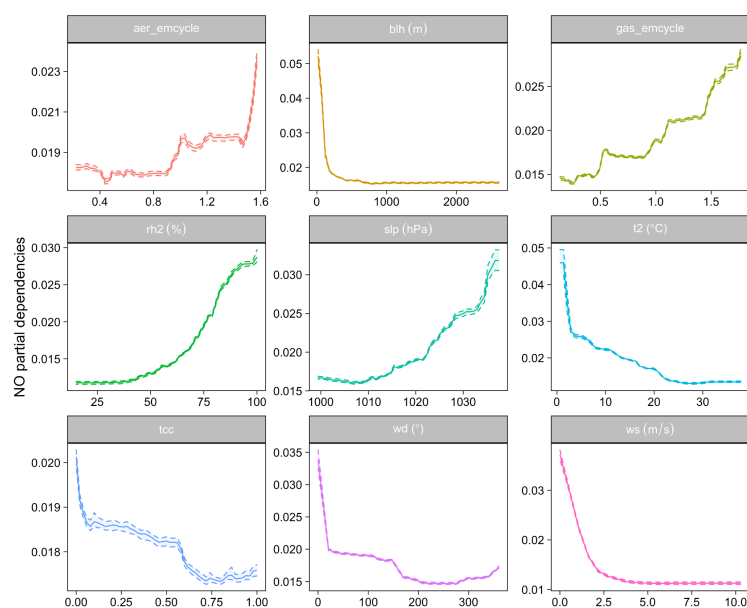


Figure S10. NO Partial dependencies plot (ppm) for RF for CNEA site. The shaded Area represents the variable importance between 25th and 75th percentile estimated from the 50 simulations.

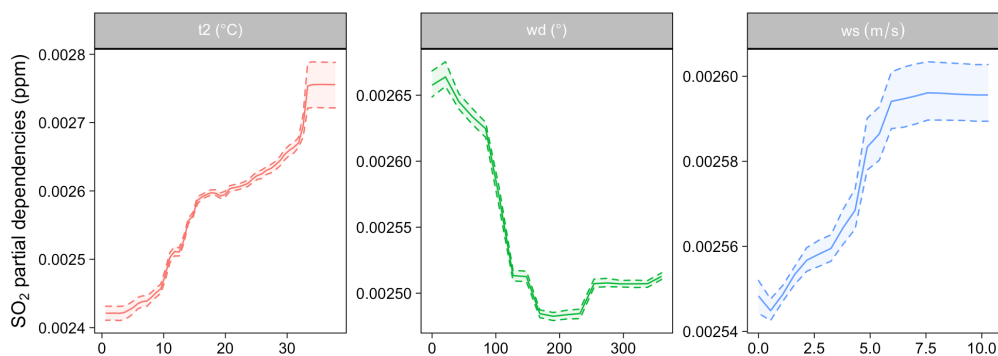


Figure S11. SO₂ Partial dependencies plot (ppm) for RF for CNEA site for temperature and winds. The shaded Area represents the variable importance between 25th and 75th percentile estimated from the 50 simulations.