Supplement of

Insights into the significant increase in ozone during COVID-19 in a typical urban city of China

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### Table S1 \( R^2 \) of the deweathered model with different choices of \( n_{\text{tree}} \) and \( n_{\text{sample}} \).  

| \( n_{\text{tree}} \) | 100 | 200 | 300 | 400 | 500 |
|----------------------|-----|-----|-----|-----|-----|
| 100                  | 0.852 | 0.853 | 0.853 | 0.852 | 0.852 |
| 200                  | 0.855 | 0.855 | 0.856 | 0.855 | 0.855 |
| 300                  | 0.856 | 0.857 | 0.858 | 0.856 | 0.856 |
| 400                  | 0.857 | 0.857 | 0.857 | 0.857 | 0.857 |
| 500                  | 0.857 | 0.857 | 0.857 | 0.857 | 0.857 |

### Table S2 Influence of the choice of minimum node size on \( R^2 \) of the deweathered model.  

| minimal node size | 1 | 2 | 3 | 4 | 5 |
|-------------------|---|---|---|---|---|
| \( R^2 \)         | 0.860 | 0.857 | 0.858 | 0.858 | 0.859 |
| minimal node size | 6 | 7 | 8 | 9 | 10 |
| \( R^2 \)         | 0.855 | 0.853 | 0.852 | 0.851 | 0.849 |

### Table S3 Z value and Q values of each VOC  

| Compounds      | Z value | \( Q^* \times 10000 \) (ppbv h\(^{-1}\)) | Compounds      | Z value | \( Q^* \times 10000 \) (ppbv h\(^{-1}\)) |
|----------------|---------|---------------------------------|----------------|---------|---------------------------------|
| Formaldehyde   | 20.71   | 12.78                           | Heptanal       | -4.63   | -0.09                           |
| Methanol       | 14.09   | 6.35                            | Indene         | -8.51   | -0.34                           |
| Acetonitrile   | -8.95   | -0.61                           | Methyl styrene | -17.38  | -2.09                           |
| Acetaldehyde   | -10.31  | -3.95                           | Trimethyl benzene | -13.03  | -1.80                           |
| Ethanol        | -5.48   | -3.09                           | Trimethyl cyclohexene | 6.99   | 0.55                            |
| Methanethiol   | 15.15   | 0.14                            | Nitrobenzene   | -16.66  | -0.55                           |
| Propionitrile  | 26.68   | 0.17                            | Dihydronaphthalene | -24.02  | -0.37                           |
| 3-Buten-1-yne  | 1.03    | 0.08                            | Tetrahydonaphthalene | -9.65   | -0.16                           |
| Acrylonitrile  | 3.50    | 0.04                            | Cymene         | -10.44  | -0.34                           |
| Acrolein       | -15.48  | -2.76                           | \( \alpha/\beta \)-Pinene | -19.77  | -1.07                           |
| Acetone        | -1.07   | -0.68                           | Methyl iodide  | 7.40    | 0.03                            |
| Acetic acid    | -6.79   | -4.12                           | Methylphthalene | -17.60  | -0.20                           |
| Dimethyl sulfide | -23.25  | -1.51                           | Acenaphylene   | -4.09   | -0.02                           |
| Cyclopentadiene | -7.08   | -0.39                           | Acenaphene     | -14.83  | -0.05                           |
| Isoprene       | -6.13   | -0.78                           | Methyl caprylate | -20.48  | -0.09                           |
| MVK            | -14.07  | -0.83                           | Phenethyl acetate | -7.64   | -0.02                           |
| MEK            | -5.23   | -1.39                           | Fluorene       | -2.52   | -0.01                           |
| DMF            | -1.93   | -0.08                           | Phenanthrene   | -4.60   | -0.02                           |
| Butanol        | -10.42  | -2.83                           | Methyl decanoate | -3.86   | -0.02                           |
| Benzene        | -9.65   | -7.36                           | Ethyl caprate  | -1.69   | 0.00                            |
| Pyridine       | -4.82   | -0.80                           | Sesquiterpene  | -2.05   | 0.00                            |
| Pentanalnitrile | 5.44    | 0.06                            | \( \beta \)-Caryophyllene | 6.36    | 0.00                            |
| 1-Hexene       | -2.84   | -0.27                           | D4Siloxane     | 8.98    | 0.00                            |
| Vinyl acetate  | -26.32  | -2.76                           | D5Siloxane     | 9.04    | 0.00                            |
| Ethyl acetate  | -18.53  | -5.20                           | Styrene        | -9.42   | -0.95                           |
| Compound                | Mean | SE  | Compound        | Mean | SE  |
|-------------------------|------|-----|-----------------|------|-----|
| Diethyl sulfide         | -9.15| -3.16| m/p-Xylene     | -12.38| -7.20|
| Toluene                 | -14.02| -7.73| Cresol          | 25.73 | 3.67 |
| Phenol                  | -7.58 | -1.39| Methyl furfural | -1.91 | -0.04|
| Furfural                | 1.34 | 0.04 | Hexanol         | -8.77 | -0.36|
| Methyl pyrrolidinone    | 9.64 | 0.06 |                 |      |     |

Figure S1. The mean and standard error of predicted O₃ concentrations.

Figure S2. Sensitivity analysis of the influence of RH on simulated O₃
Figure S3. Time series of industrial-derived VOCs emissions, traffic volume, and key VOC tracers.

Figure S4. Average diurnal variations of key VOC species.
Figure S5. OFP of different VOCs species.
Figure S6. Reduction percentage and descent rate of O₃ as a function of reduction percentage of NOₓ.

Figure S7. Sensitivity analysis of the influence of C2-C5 alkenes
Figure S8. Sensitivity analysis of the influence of C2-C5 alkanes

Figure S9. MeanO₃ isopleth with (left) and without (right) hypothetical diurnal variation of C2~C5 alkenes and alkanes. The colored circles, triangles, and rectangles represent the daily average

Figure S10. Uncertainty analysis of J-value
Text S1 Calculation of industrial VOC emissions.

We summarized the electricity consumption of key industries in Changzhou during our observation, and calculated the corresponding VOC emissions using the following equation:

\[ E_o = \sum_{i=1}^{n} \frac{E_{pi}}{S_{pi}} \times S_{oi} \]

where \( E_o \) (unit: t) is the total daily VOC emission of from industrial sources during the observation; \( E_{pi} \) (unit: t) and \( S_{pi} \) is the daily VOC emissions and electricity consumption of the \( i \)th industry during the second national pollution census, respectively; \( S_{oi} \) is the daily electricity consumption during our observation; \( n \) is the number of industry types.