

**Supplementary Material**  
*for*  
**Impact of SARS-CoV-2 on Ambient Air Quality in  
Northwest China (NWC)**

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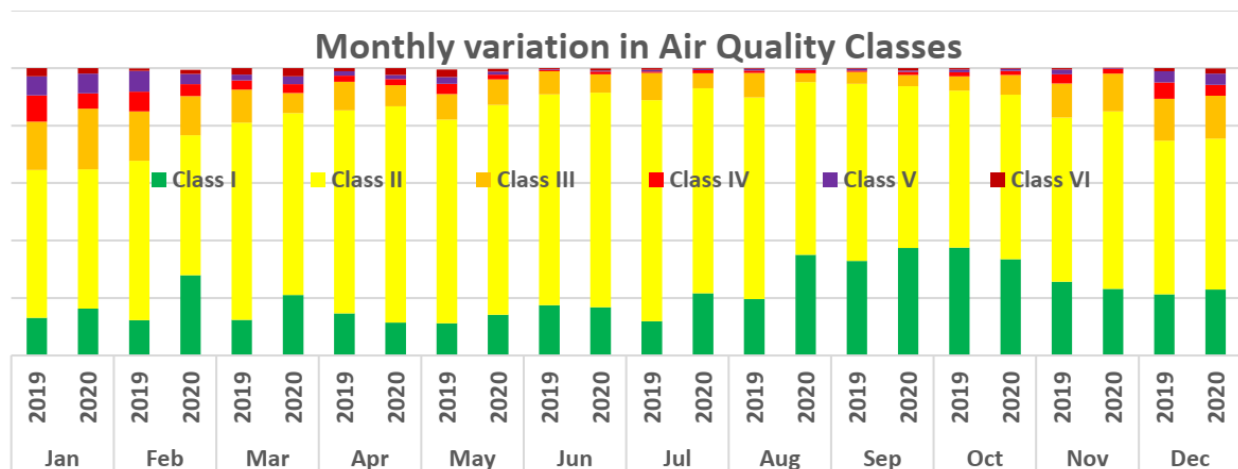
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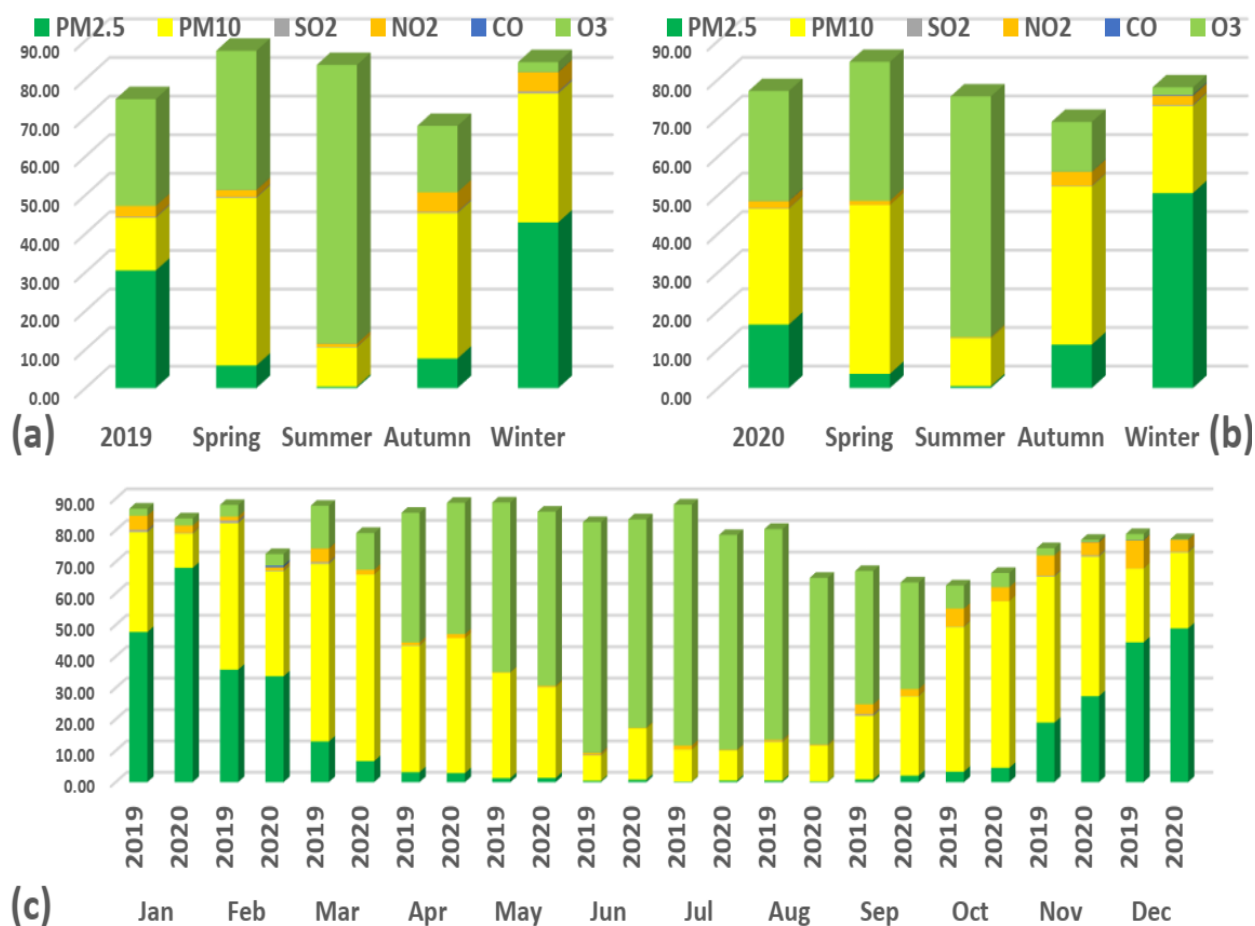
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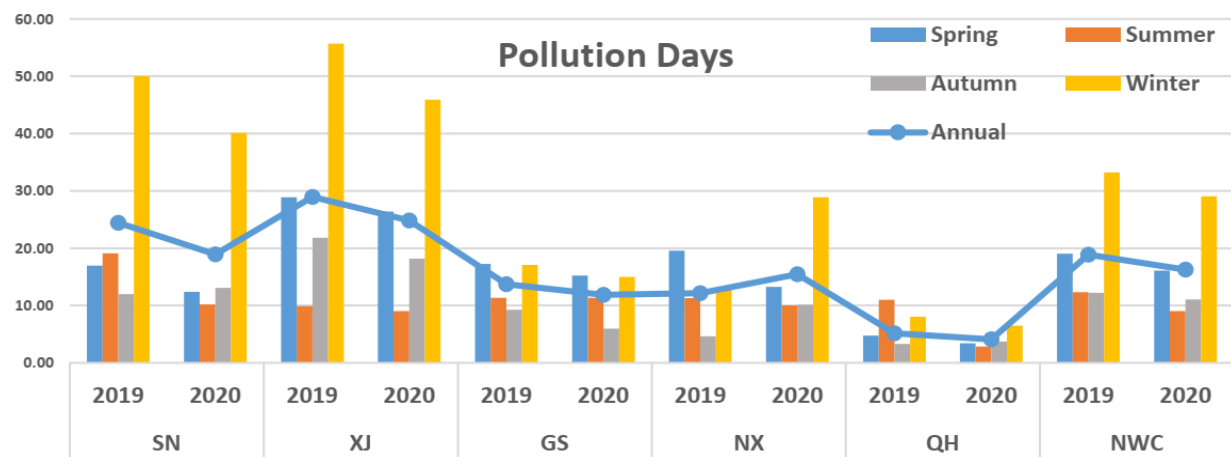
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**Fig. S1.** Monthly variation in distribution of AQ class during 2019 and 2020



**Fig. S2.** Annual, seasonal (a, b), and monthly (c) proportion of various primary pollutants during 2019 and 2020 in NWC



**Fig. S3.** Annual and seasonal proportion of pollution days during 2019 and 2020 in NWC

**Table. S1.** Annual average concentration of PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>2</sub>, CO, O<sub>3</sub>, and PM<sub>2.5</sub>/PM<sub>10</sub> in northwest China (NWC) during 2019-2020

|                                     | PM <sub>2.5</sub><br>( $\mu\text{g}/\text{m}^3$ ) | PM <sub>10</sub><br>( $\mu\text{g}/\text{m}^3$ ) | SO <sub>2</sub><br>( $\mu\text{g}/\text{m}^3$ ) | NO <sub>2</sub><br>( $\mu\text{g}/\text{m}^3$ ) | CO<br>( $\text{mg}/\text{m}^3$ ) | O <sub>3</sub><br>( $\mu\text{g}/\text{m}^3$ ) |
|-------------------------------------|---|--|---|---|----------------------------------|--|
| <b>2019</b>                         |   |  |   |   |                                  |  |
| <i>Shanxi</i>                       | 43.14 $\pm$ 32.59                                 | 81.12 $\pm$ 46.05                                | 11.15 $\pm$ 4.64                                | 34.84 $\pm$ 11.49                               | 0.85 $\pm$ 0.34                  | 89.06 $\pm$ 37.51                              |
| <i>Xinjiang</i>                     | 48.79 $\pm$ 31.42                                 | 123.24 $\pm$ 72.32                               | 9.14 $\pm$ 3.47                                 | 28.06 $\pm$ 10.16                               | 0.92 $\pm$ 0.48                  | 86.60 $\pm$ 27.02                              |
| <i>Gansu</i>                        | 28.25 $\pm$ 16.80                                 | 67.86 $\pm$ 51.82                                | 14.08 $\pm$ 6.36                                | 25.38 $\pm$ 8.20                                | 0.67 $\pm$ 0.25                  | 95.18 $\pm$ 24.03                              |
| <i>Ningxia</i>                      | 32.03 $\pm$ 18.28                                 | 79.74 $\pm$ 60.98                                | 16.94 $\pm$ 7.95                                | 29.59 $\pm$ 10.51                               | 0.78 $\pm$ 0.26                  | 98.72 $\pm$ 30.75                              |
| <i>Qinghai</i>                      | 24.69 $\pm$ 8.22                                  | 49.21 $\pm$ 25.03                                | 12.79 $\pm$ 3.39                                | 21.35 $\pm$ 5.52                                | 0.73 $\pm$ 0.16                  | 103.36 $\pm$ 21.01                             |
| NWC                                 | 37.65 $\pm$ 19.36                                 | 85.39 $\pm$ 41.38                                | 12.11 $\pm$ 4.36                                | 27.76 $\pm$ 8.30                                | 0.80 $\pm$ 0.31                  | 93.0 $\pm$ 26.09                               |
| <b>2020</b>                         |   |  |   |   |                                  |  |
| <i>Shaanxi</i>                      | 41.3 $\pm$ 26.19                                  | 71.09 $\pm$ 32.69                                | 10.07 $\pm$ 3.44                                | 30.86 $\pm$ 11.04                               | 0.75 $\pm$ 0.28                  | 88.94 $\pm$ 33.59                              |
| <i>Xinjiang</i>                     | 48.46 $\pm$ 31.27                                 | 117.75 $\pm$ 74.9                                | 8.53 $\pm$ 2.67                                 | 24.79 $\pm$ 11.51                               | 0.84 $\pm$ 0.46                  | 85.18 $\pm$ 24.73                              |
| <i>Gansu</i>                        | 27.97 $\pm$ 15.62                                 | 66.57 $\pm$ 43.16                                | 12.2 $\pm$ 4.62                                 | 24.19 $\pm$ 7.52                                | 0.61 $\pm$ 0.22                  | 93.50 $\pm$ 22.27                              |
| <i>Ningxia</i>                      | 35.13 $\pm$ 23.74                                 | 77.70 $\pm$ 49.18                                | 15.16 $\pm$ 6.12                                | 27.99 $\pm$ 10.78                               | 0.71 $\pm$ 0.31                  | 96.81 $\pm$ 27.60                              |
| <i>Qinghai</i>                      | 23.17 $\pm$ 7.33                                  | 46.25 $\pm$ 17.79                                | 13.42 $\pm$ 3.39                                | 20.51 $\pm$ 5.78                                | 0.72 $\pm$ 0.15                  | 97.27 $\pm$ 17.97                              |
| NWC                                 | 36.62 $\pm$ 18.32                                 | 80.85 $\pm$ 35.12                                | 11.15 $\pm$ 3.26                                | 25.43 $\pm$ 8.47                                | 0.73 $\pm$ 0.28                  | 91.01 $\pm$ 23.14                              |
| <b>Two Year Average (2019-2020)</b> |   |  |   |   |                                  |  |
| <i>Shaanxi</i>                      | 43.72 $\pm$ 29.64                                 | 76.10 $\pm$ 40.21                                | 10.61 $\pm$ 4.12                                | 32.85 $\pm$ 11.44                               | 0.80 $\pm$ 0.31                  | 89 $\pm$ 35.58                                 |
| <i>Xinjiang</i>                     | 48.63 $\pm$ 31.32                                 | 120.49 $\pm$ 73.62                               | 8.84 $\pm$ 3.11                                 | 26.43 $\pm$ 10.97                               | 0.88 $\pm$ 0.47                  | 85.89 $\pm$ 25.89                              |
| <i>Gansu</i>                        | 28.11 $\pm$ 16.21                                 | 67.22 $\pm$ 47.65                                | 13.14 $\pm$ 5.63                                | 24.78 $\pm$ 7.89                                | 0.64 $\pm$ 0.24                  | 94.34 $\pm$ 23.17                              |
| <i>Ningxia</i>                      | 33.58 $\pm$ 21.23                                 | 78.72 $\pm$ 55.36                                | 16.05 $\pm$ 7.14                                | 28.79 $\pm$ 10.67                               | 0.75 $\pm$ 0.29                  | 97.76 $\pm$ 29.21                              |
| <i>Qinghai</i>                      | 23.93 $\pm$ 7.82                                  | 47.73 $\pm$ 21.75                                | 13.11 $\pm$ 3.40                                | 20.93 $\pm$ 5.67                                | 0.73 $\pm$ 0.16                  | 100.31 $\pm$ 19.77                             |
| NWC                                 | 37.13 $\pm$ 18.84                                 | 83.11 $\pm$ 38.41                                | 11.63 $\pm$ 3.88                                | 26.6 $\pm$ 8.46                                 | 0.77 $\pm$ 0.30                  | 92.0 $\pm$ 24.66                               |

**Table. S2.** Annual and seasonal correlation between different pollutants in 2019-2020

|                   | 2019                   |                       |                       |           |                      | 2020                   |                       |                       |           |                      |
|-------------------|------------------------|-----------------------|-----------------------|-----------|----------------------|------------------------|-----------------------|-----------------------|-----------|----------------------|
| <b>Annual</b>     | <b>PM<sub>10</sub></b> | <b>SO<sub>2</sub></b> | <b>NO<sub>2</sub></b> | <b>CO</b> | <b>O<sub>3</sub></b> | <b>PM<sub>10</sub></b> | <b>SO<sub>2</sub></b> | <b>NO<sub>2</sub></b> | <b>CO</b> | <b>O<sub>3</sub></b> |
| PM <sub>2.5</sub> | .799**                 | .810**                | .681**                | .841**    | -.649**              | .654**                 | .822**                | .681**                | .856**    | -.647**              |
| PM <sub>10</sub>  |                        | .445**                | .330**                | .403**    | -.341**              |                        | .363**                | .299**                | .260**    | -.239**              |
| SO <sub>2</sub>   |                        |                       | .822**                | .931**    | -.722**              |                        |                       | .798**                | .919**    | -.686**              |
| NO <sub>2</sub>   |                        |                       |                       | .840**    | -.747**              |                        |                       |                       | .745**    | -.687**              |
| CO                |                        |                       |                       |           | -.777**              |                        |                       |                       |           | -.744**              |
| <b>Spring</b>     |                        |                       |                       |           |                      |                        |                       |                       |           |                      |
|                   | <b>PM<sub>10</sub></b> | <b>SO<sub>2</sub></b> | <b>NO<sub>2</sub></b> | <b>CO</b> | <b>O<sub>3</sub></b> | <b>PM<sub>10</sub></b> | <b>SO<sub>2</sub></b> | <b>NO<sub>2</sub></b> | <b>CO</b> | <b>O<sub>3</sub></b> |
| PM <sub>2.5</sub> | .908**                 | .210*                 | .246*                 | .296**    | -.332**              | .946**                 | .341**                | .167                  | .355**    | -.413**              |
| PM <sub>10</sub>  |                        | .001                  | .029                  | -.045     | -.179                |                        | .245*                 | .068                  | .216*     | -.364**              |
| SO <sub>2</sub>   |                        |                       | .895**                | .771**    | -.353**              |                        |                       | .656**                | .751**    | -.129                |
| NO <sub>2</sub>   |                        |                       |                       | .812**    | -.368**              |                        |                       |                       | .389**    | .334**               |
| CO                |                        |                       |                       |           | -.567**              |                        |                       |                       |           | -.418**              |
| <b>Summer</b>     |                        |                       |                       |           |                      |                        |                       |                       |           |                      |
|                   | <b>PM<sub>10</sub></b> | <b>SO<sub>2</sub></b> | <b>NO<sub>2</sub></b> | <b>CO</b> | <b>O<sub>3</sub></b> | <b>PM<sub>10</sub></b> | <b>SO<sub>2</sub></b> | <b>NO<sub>2</sub></b> | <b>CO</b> | <b>O<sub>3</sub></b> |
| PM <sub>2.5</sub> | .967**                 | .101                  | -.013                 | .075      | .174                 | .973**                 | .210*                 | .262*                 | -.295**   | .227*                |
| PM <sub>10</sub>  |                        | .142                  | .105                  | -.060     | .258*                |                        | .312**                | .373**                | -.329**   | .325**               |
| SO <sub>2</sub>   |                        |                       | .353**                | -.127     | .456**               |                        |                       | .506**                | -.066     | .364**               |
| NO <sub>2</sub>   |                        |                       |                       | .067      | .327**               |                        |                       |                       | -.227*    | .725**               |
| CO                |                        |                       |                       |           | -.432**              |                        |                       |                       |           | -.241*               |
| <b>Autumn</b>     |                        |                       |                       |           |                      |                        |                       |                       |           |                      |
|                   | <b>PM<sub>10</sub></b> | <b>SO<sub>2</sub></b> | <b>NO<sub>2</sub></b> | <b>CO</b> | <b>O<sub>3</sub></b> | <b>PM<sub>10</sub></b> | <b>SO<sub>2</sub></b> | <b>NO<sub>2</sub></b> | <b>CO</b> | <b>O<sub>3</sub></b> |
| PM <sub>2.5</sub> | .865**                 | .811**                | .692**                | .891**    | -.694**              | .787**                 | .772**                | .744**                | .902**    | -.622**              |
| PM <sub>10</sub>  |                        | .704**                | .635**                | .700**    | -.567**              |                        | .540**                | .674**                | .633**    | -.397**              |
| SO <sub>2</sub>   |                        |                       | .838**                | .903**    | -.627**              |                        |                       | .886**                | .927**    | -.606**              |
| NO <sub>2</sub>   |                        |                       |                       | .830**    | -.546**              |                        |                       |                       | .873**    | -.438**              |
| CO                |                        |                       |                       |           | -.712**              |                        |                       |                       |           | -.666**              |
| <b>Winter</b>     |                        |                       |                       |           |                      |                        |                       |                       |           |                      |
|                   | <b>PM<sub>10</sub></b> | <b>SO<sub>2</sub></b> | <b>NO<sub>2</sub></b> | <b>CO</b> | <b>O<sub>3</sub></b> | <b>PM<sub>10</sub></b> | <b>SO<sub>2</sub></b> | <b>NO<sub>2</sub></b> | <b>CO</b> | <b>O<sub>3</sub></b> |
| PM <sub>2.5</sub> | .688**                 | .655**                | .547**                | .858**    | -.275**              | .255*                  | .644**                | .735**                | .875**    | -.472**              |
| PM <sub>10</sub>  |                        | .358**                | -.060                 | .427**    | .091                 |                        | .153                  | .158                  | .045      | -.103                |
| SO <sub>2</sub>   |                        |                       | .589**                | .799**    | -.417**              |                        |                       | .698**                | .801**    | -.381**              |
| NO <sub>2</sub>   |                        |                       |                       | .806**    | -.645**              |                        |                       |                       | .752**    | -.846**              |
| CO                |                        |                       |                       |           | -.538**              |                        |                       |                       |           | -.400**              |

Note: The correlations are expressed as Pearson's correlation coefficient, where \*, and \*\* denote significant correlations at  $p < 0.01$ , and  $p < 0.05$  (two-tailed) respectively.