



Supplement of

Spaceborne tropospheric nitrogen dioxide (NO₂) observations from 2005–2020 over the Yangtze River Delta (YRD), China: variabilities, implications, and drivers

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Table S1. The number of cities, area of the region and population for each province (Zhejiang, Anhui and Jiangsu Province) of YRD region.

Province	Number of cities	Area (ten thousand square kilometers)	Population (million)
Zhejiang	11	10.55	65.40
Anhui	16	14.01	61.03
Jiangsu	13	10.72	84.75

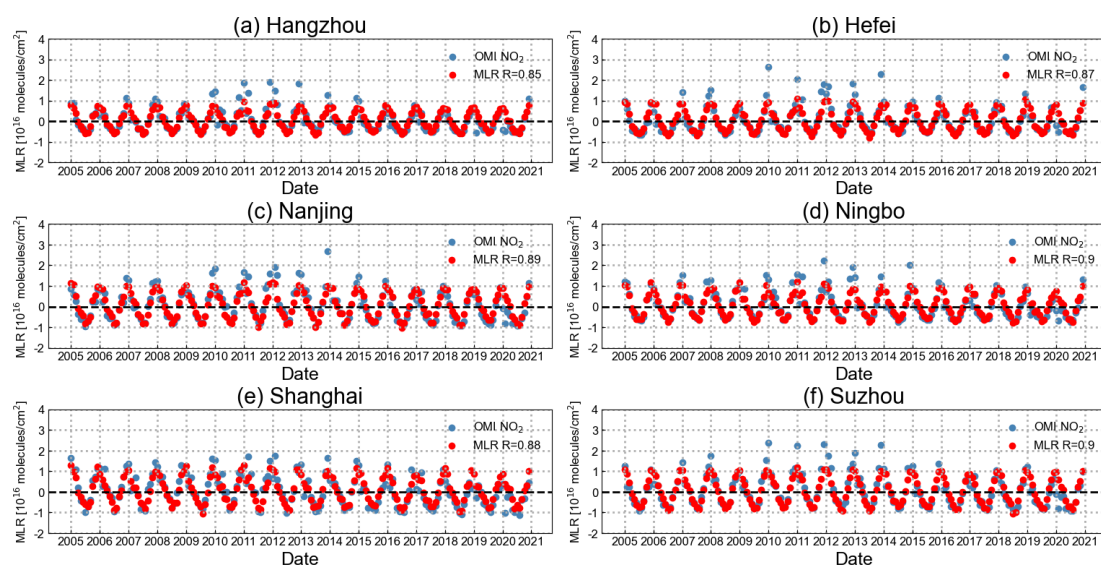


Figure S1. The comparisons of time series of monthly averaged OMI tropospheric NO_2 VCDs (blue dots) and the MLR model (red dots) from 2005 to 2020 over the 6 megacities within the YRD.

Meteorological Parameters for Tropospheric NO₂

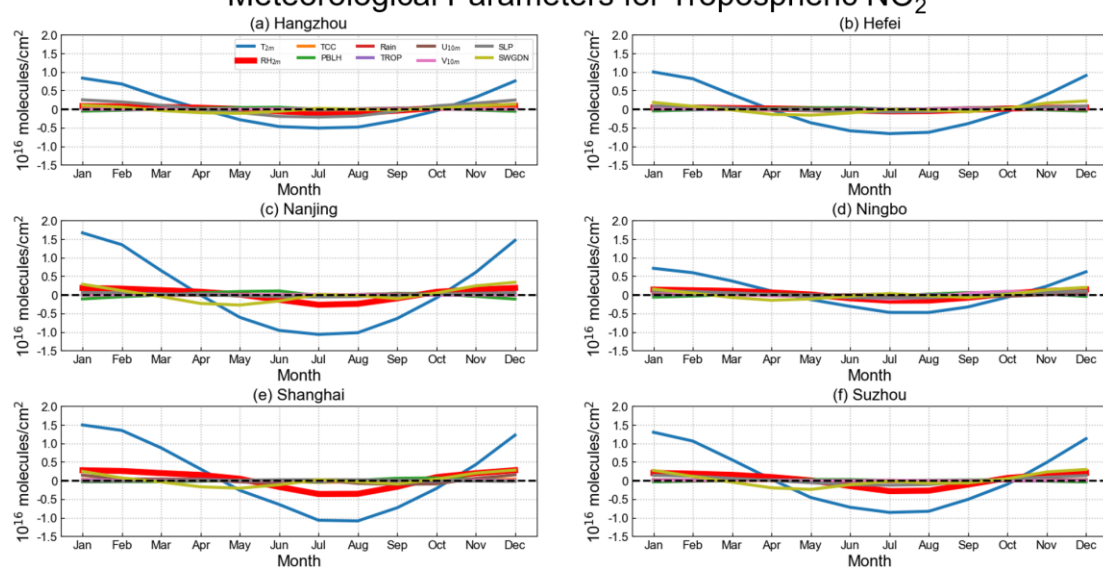


Figure S2. The contributions of each meteorological parameter to the month variations of tropospheric NO₂ VCDs over each YRD city.

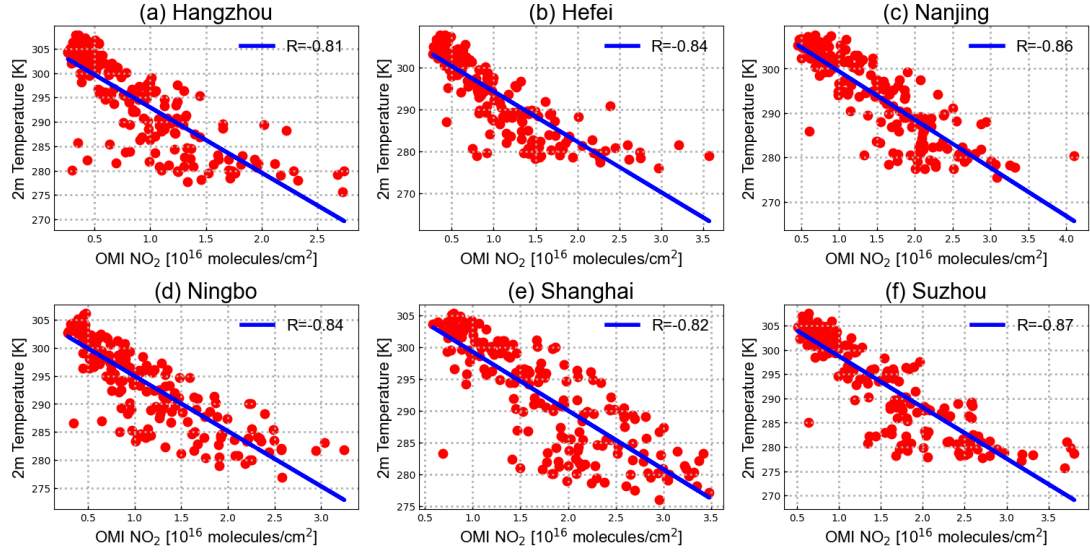


Figure S3. The correlations between monthly average of temperature and tropospheric NO₂ VCDs.

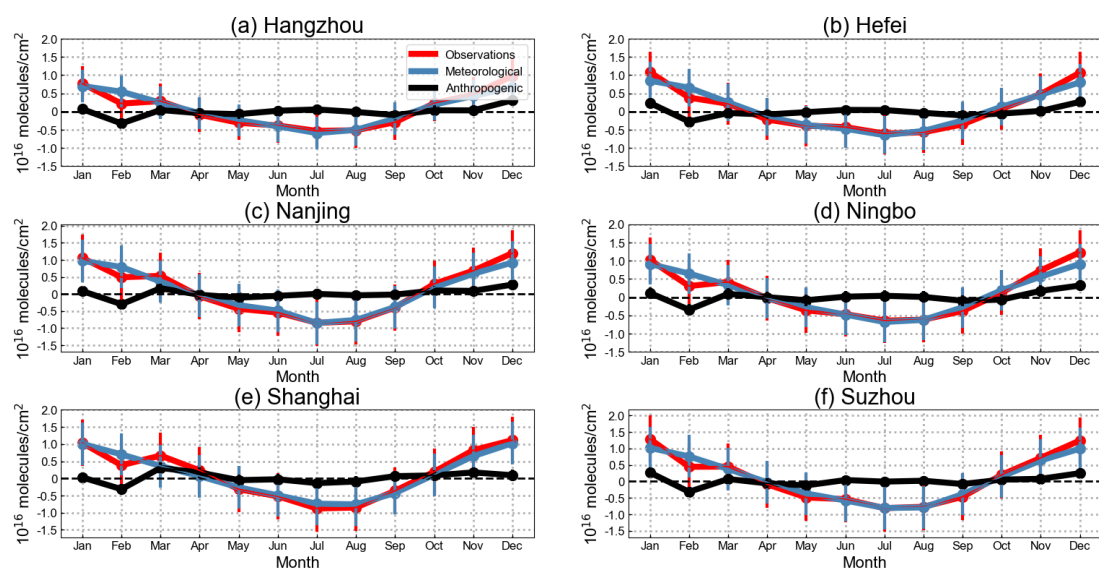


Figure S4. The monthly average of tropospheric NO₂ VCDs and its effect by only meteorological drivers and related anthropogenic drivers in main cities over YRD during 2005-2019.

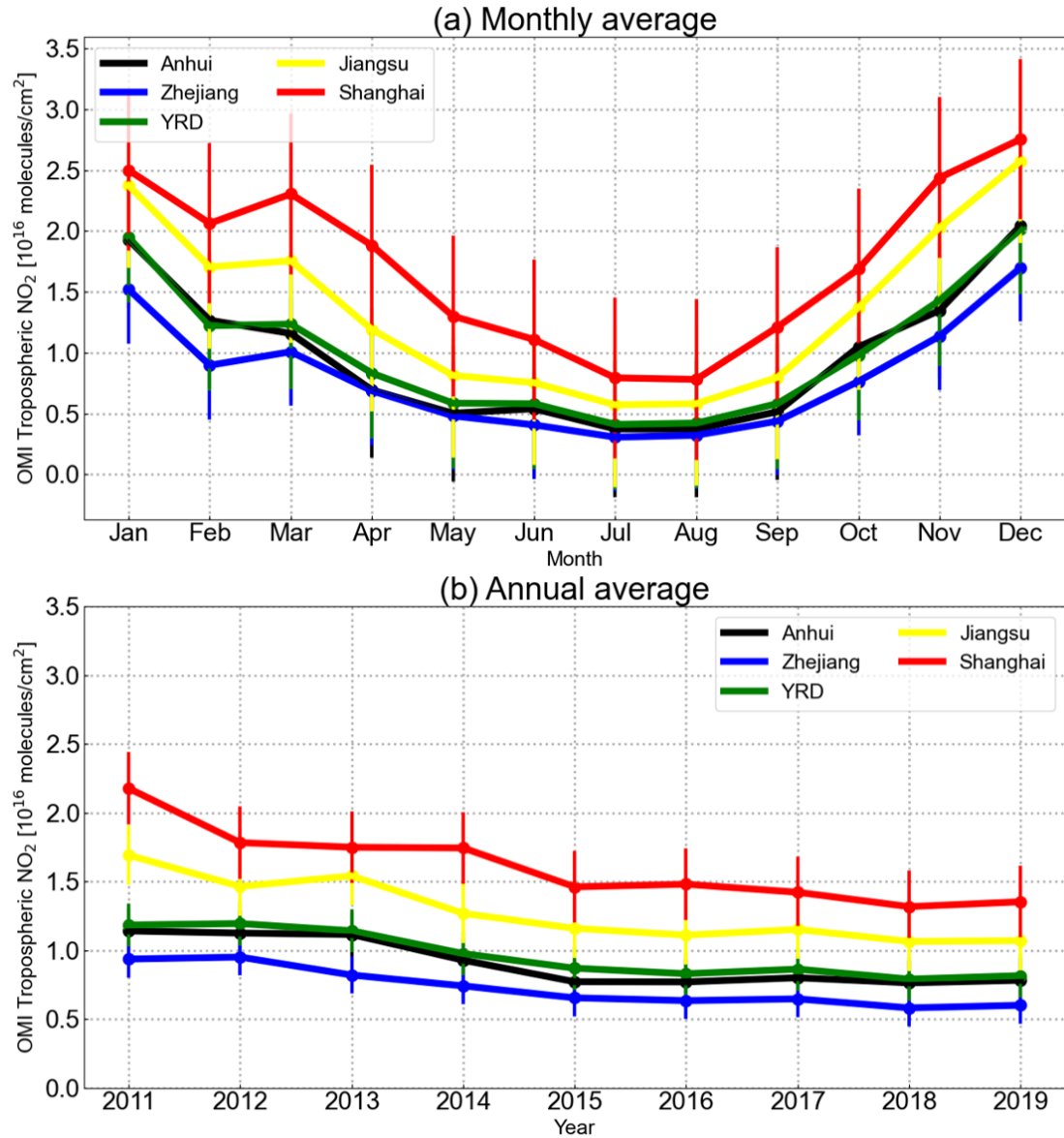


Figure S5. (a) Monthly averaged tropospheric NO₂ VCDs over the whole YRD region (green dots and lines), Anhui Province (black dots and lines), Zhejiang Province (blue dots and lines), and Jiangsu Province (yellow dots and lines) during 2011 to 2019. (b) Same as (a) but for annual average. The vertical error bar is 1σ standard variation (STD) within that month or year.

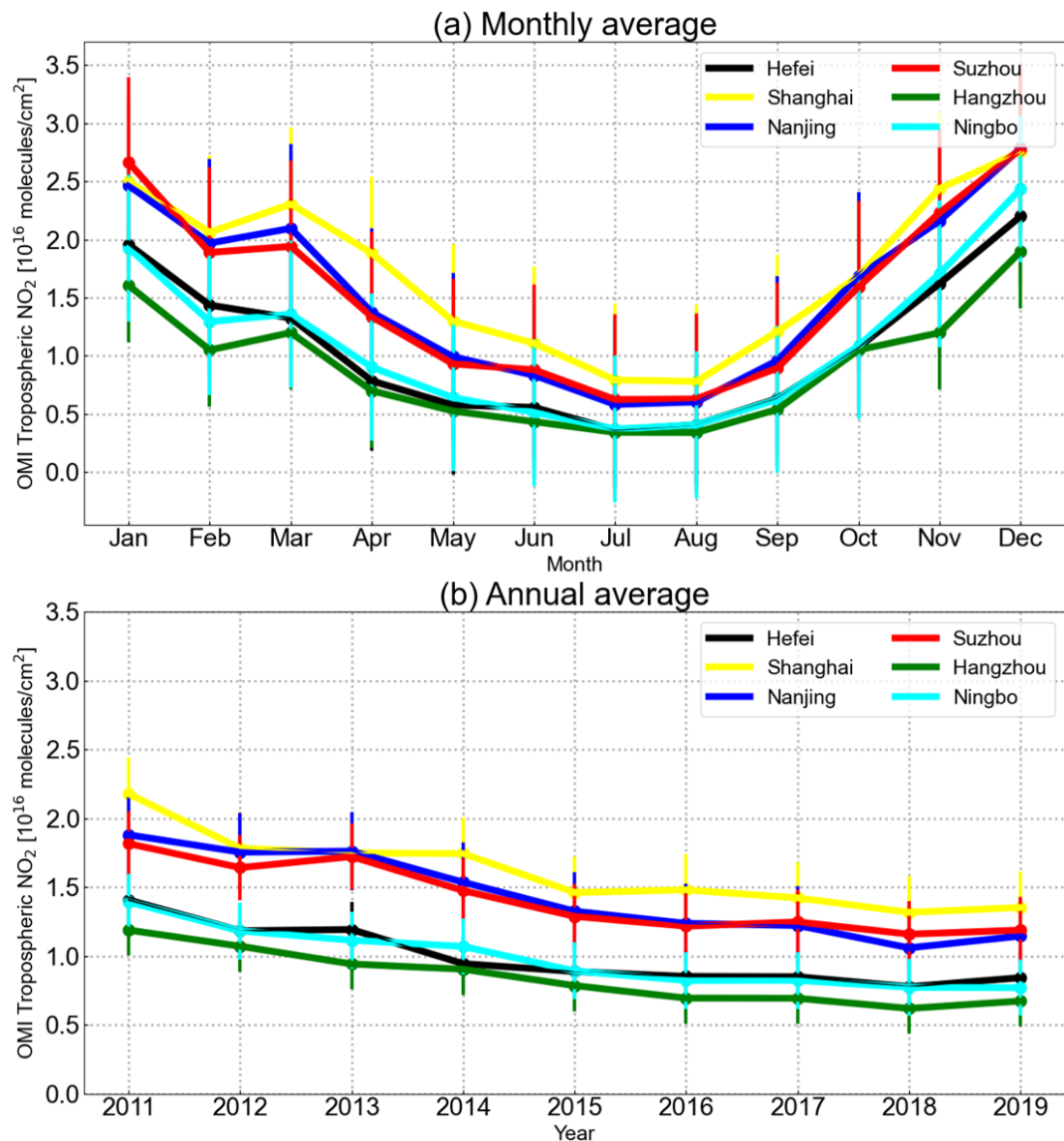


Figure S6. (a) Annual averaged tropospheric NO₂ VCDs over the whole YRD region (green dots and lines), Anhui Province (black dots and lines), Zhejiang Province (blue dots and lines), and Jiangsu Province (yellow dots and lines) during 2011 to 2019. (b) Same as (a) but for annual average. The vertical error bar is 1 σ standard variation (STD) within that month or year.

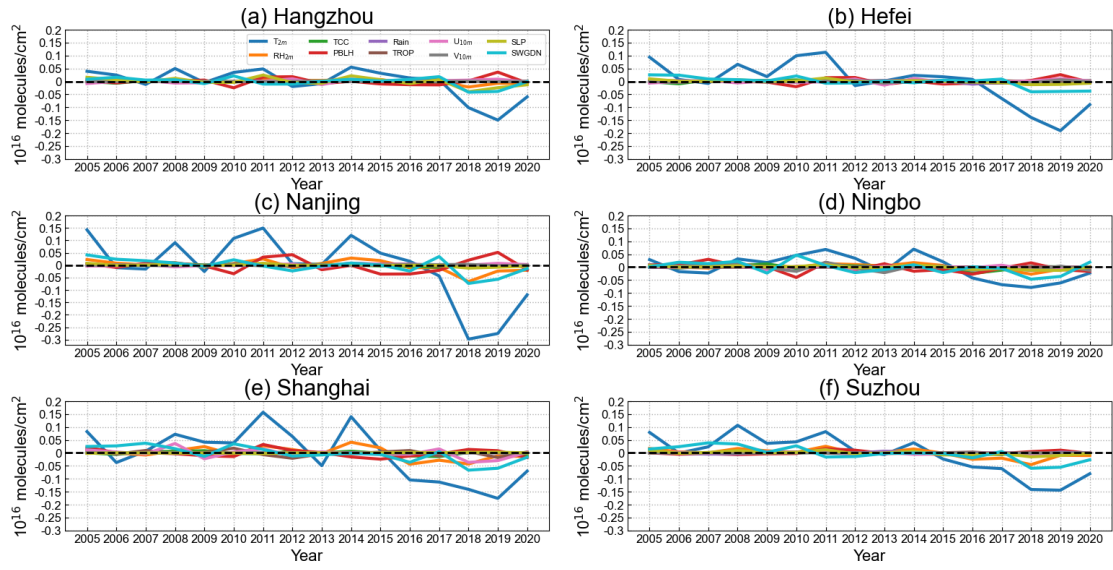


Figure S7. The contributions of each meteorological parameter to the annual variations of tropospheric NO₂ VCDs over each YRD city.

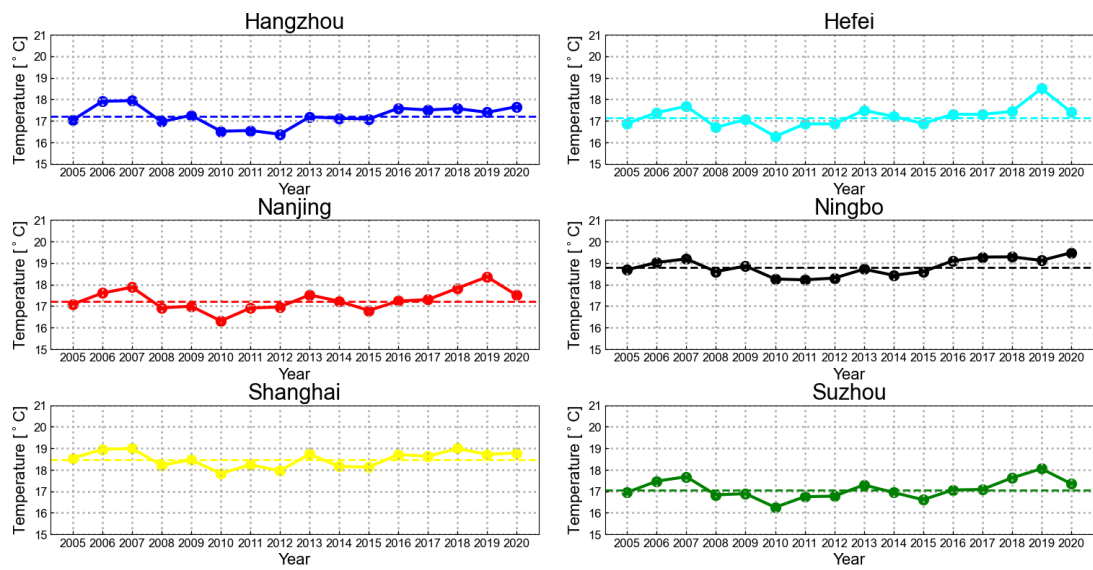


Figure S8. The annual average of surface temperature in main cities over YRD during 2005-2020.

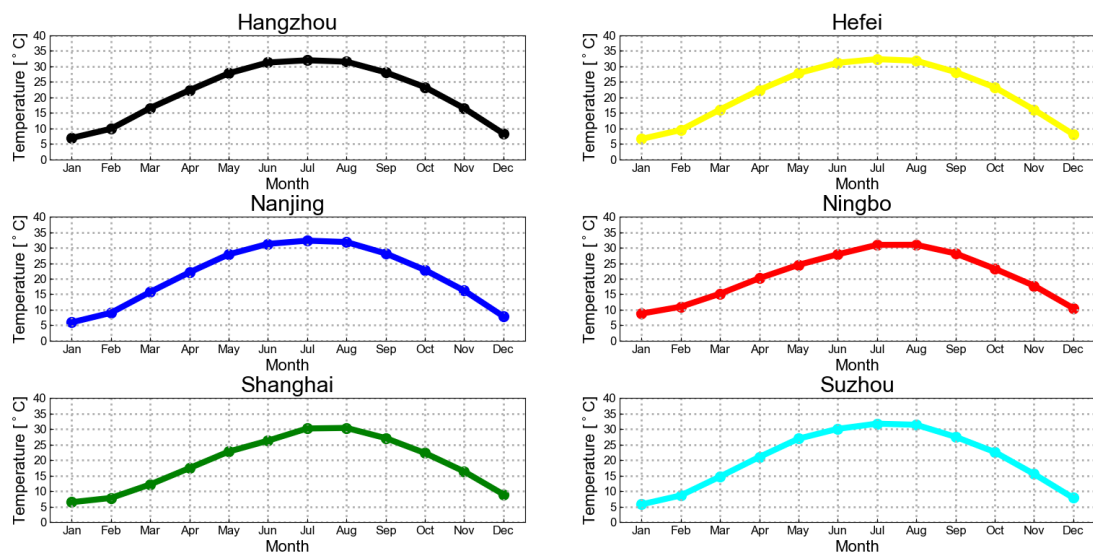


Figure S9. The monthly average of surface temperature in main cities over YRD during 2005-2020.

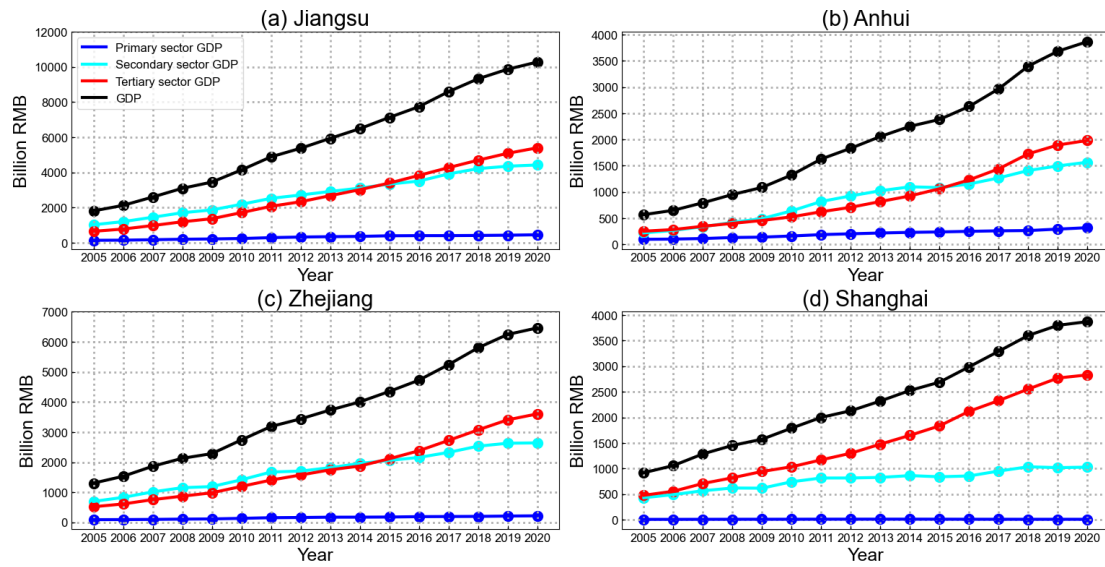


Figure S10. The value of GDP for total (black dots and lines), primary sector (blue dots and lines), secondary sector (cyan dots and lines) and tertiary sector (red dots and lines), in Jiangsu Province from 2006 to 2020, Anhui Province, Zhejiang Province and Shanghai city, respectively.

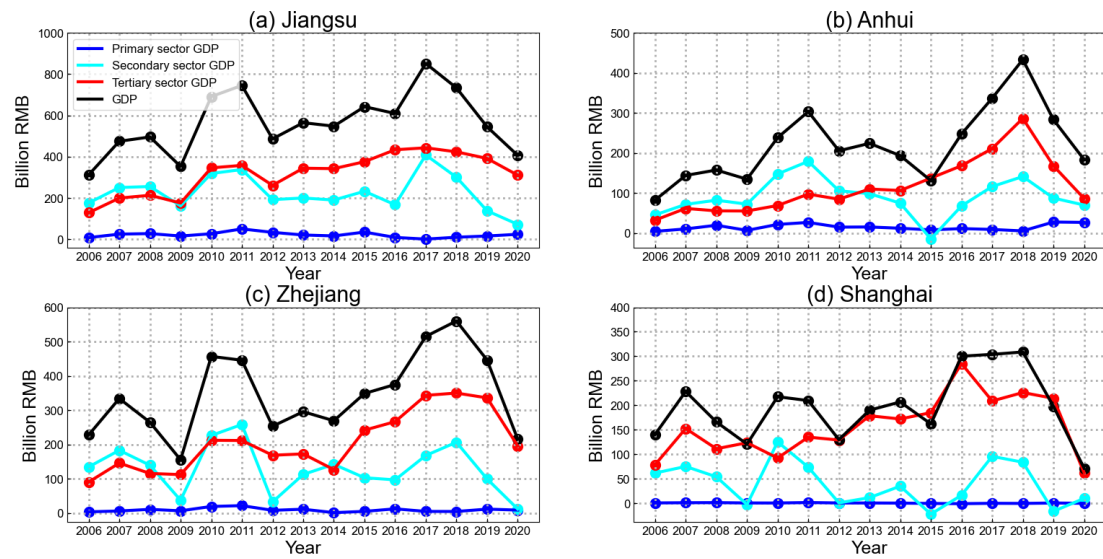


Figure S11. Time series of year-to-year increment in GDP, i.e., the increase in GDP at a given year relative to its previous year, over Jiangsu Province, Anhui Province, Zhejiang Province, and Shanghai within the YRD from 2006 to 2020. GDP for total, primary sector, secondary sector, and tertiary sector are marked with black, blue, cyan, and red dots/lines, respectively.

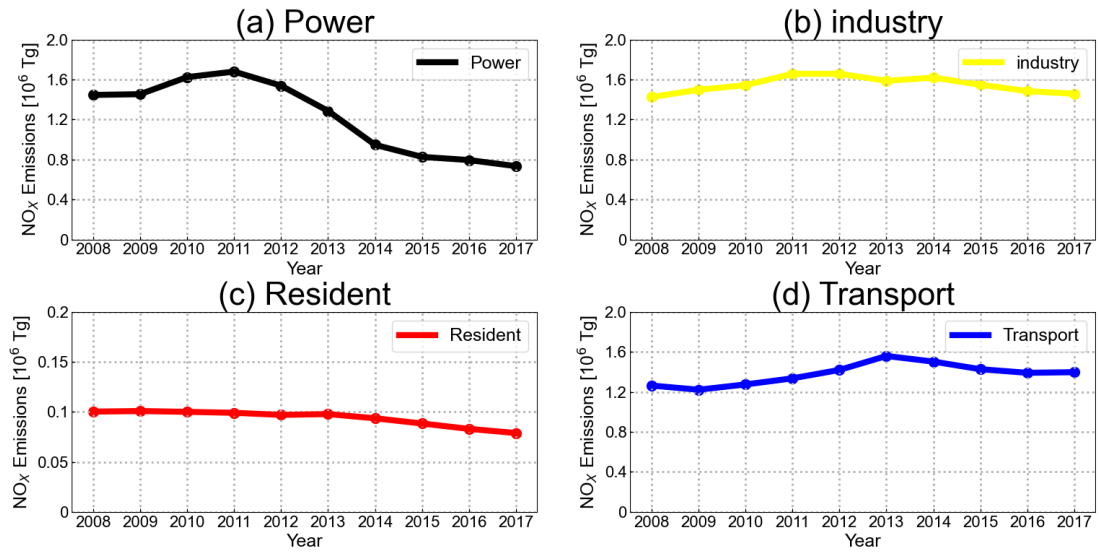


Figure S12. Each categories NO_x emissions including motor vehicle emissions, major industrial emissions, resident emissions and power emissions from 2008 to 2017 which are extracted by MEIC inventory (<http://meicmodel.org>, last accessed: February 25, 2022) over YRD region.