SUPPORTING INFORMATION AVAILABLE

Inferring the anthropogenic NO_x emission trend over the United States during 2003 - 2017 from satellite observations: Was there a flattening of the emission tend after the Great Recession?

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Figure Captions

Figure S1. Comparison between original EPA anthropogenic NO_x emissions and updated EPA anthropogenic NO_x emissions with the newest Continuous Emission Monitoring Systems (CEMS) measurements.

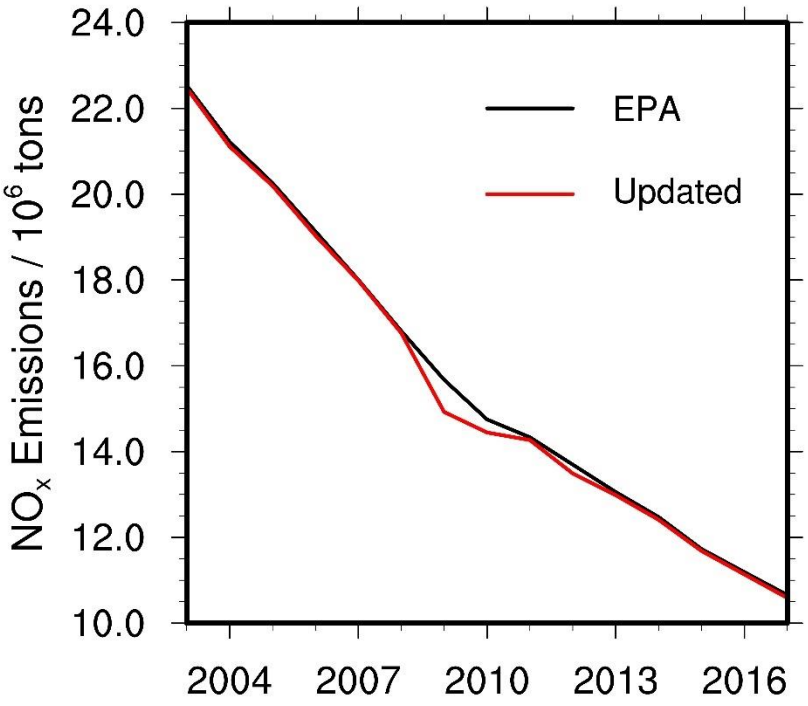
Figure S2. Daily OMI NO_2 TVCDs for July 2011 (a) and 2012 (b) in Atlanta (33.755° N, 84.39° W). Black circles are weekday values, and red circles are weekend values. We find significant daily variations of NO_2 TVCD from (a) and (b). The number of available measurements in July 2011 is much less than July 2012. We find clear larger NO_2 TVCD values on weekdays than on weekends in July 2011, but the difference between weekday and weekday TVCDs in July 2012 are not so obvious.

Figure S3. Hourly averaged ratios of FEM (a) and CAPS (b) to FRM NO_2 measurements in each season, respectively. The FEM/FRM ratios are computed from coincident FRM and FEM measurements from 2013 – 2015 at 4 sites. The CAPS/FRM ratios are calculated based on coincident CAPS and FRM data from 2015 – 2016 at 3 sites.

Figure S4. Annual variations of AQS NO_2 surface concentrations at different hours on weekdays in spring (a, b), summer (c, d), autumn (e, f), and winter (g, h). Left panels show absolute NO_2 concentrations, and right panels are their relative variations normalized to 2011. To conduct reliable and consistent comparisons, we only used monitoring sites satisfying the seasonal $RCI <$ 50% and continuity criteria on weekdays from 2003 – 2017.

Figure S5. Same as Figure 4, but for AQS NO_2 surface concentrations and coincident GOME-2A NO_2 TVCD data during 2008 – 2016.

Figure S6. Relative variations of OMI-QA4ECV NO_2 TVCD data for urban regions (black lines) and the whole CONUS (red lines) from 2005 – 2017 in 4 seasons.



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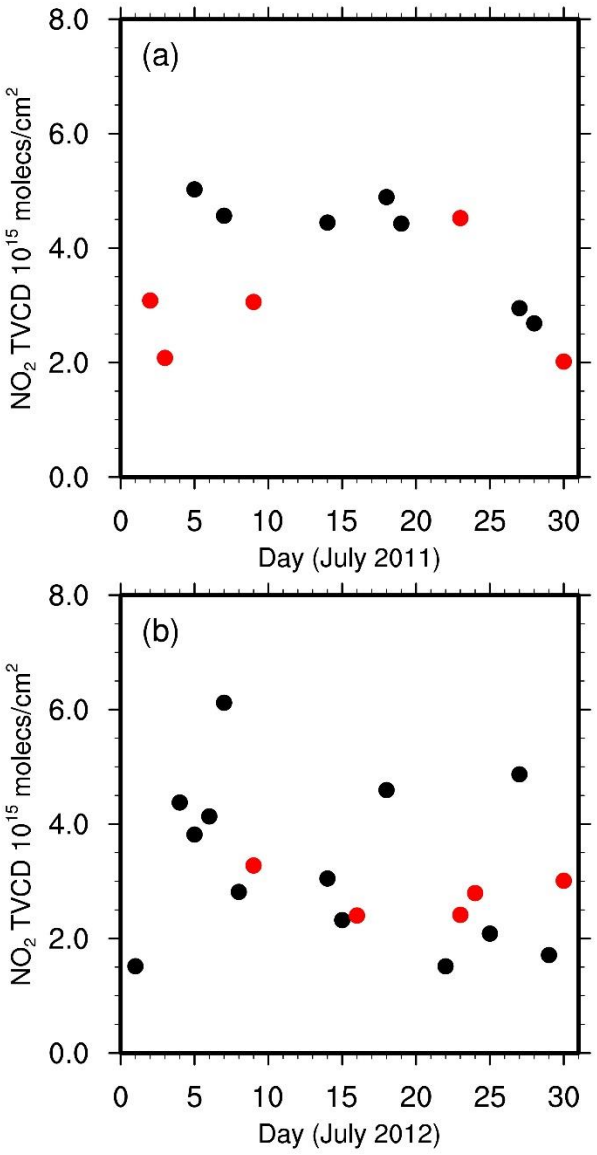

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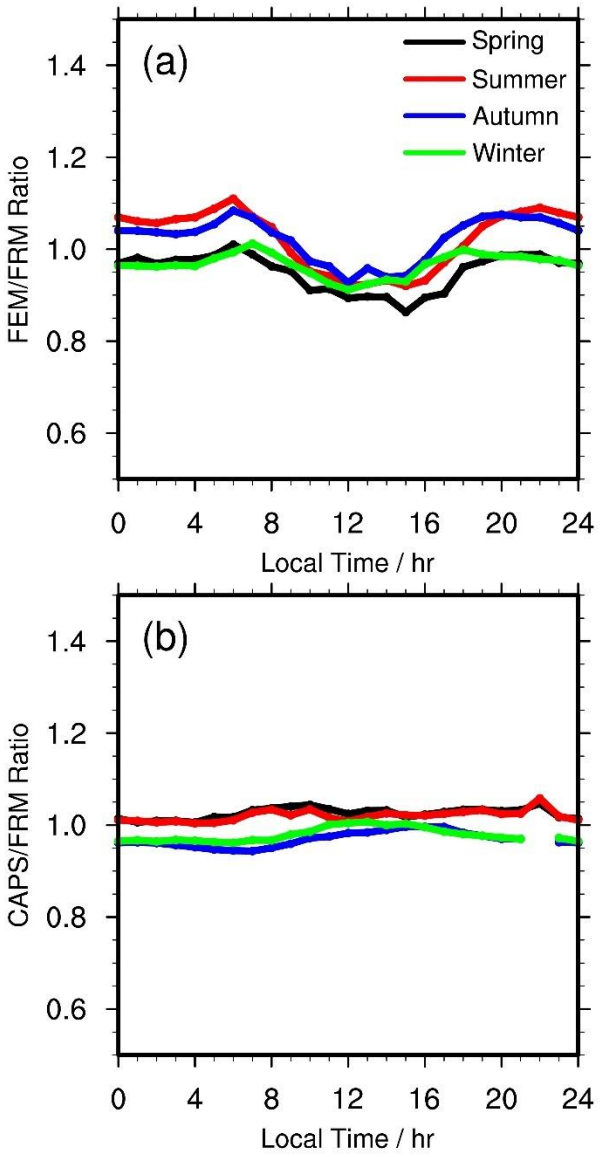

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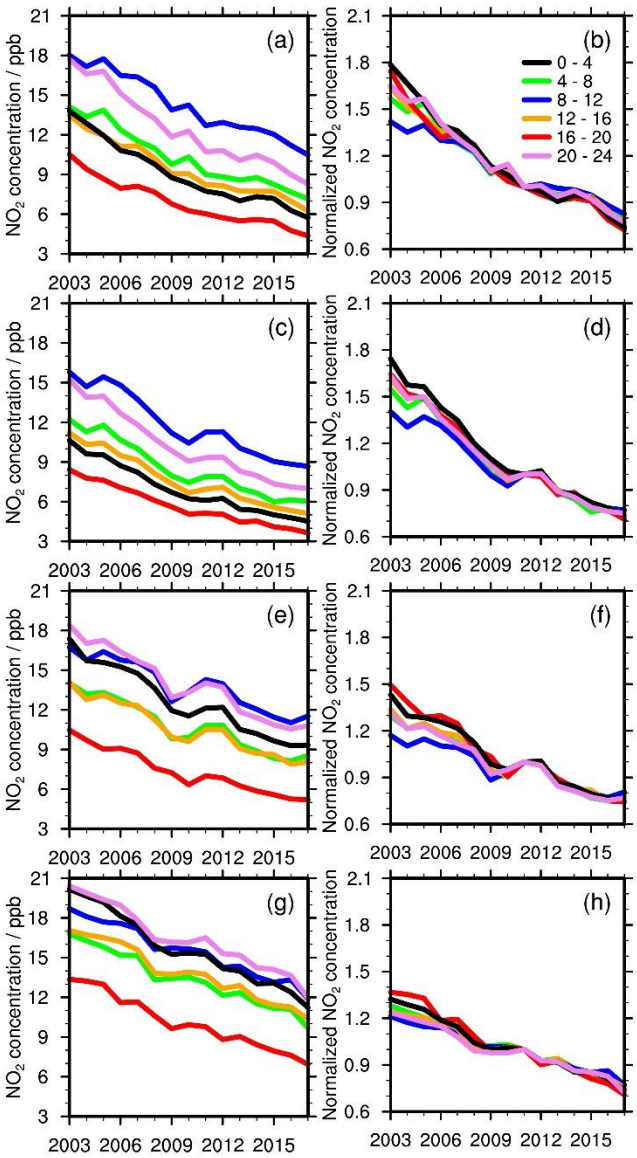

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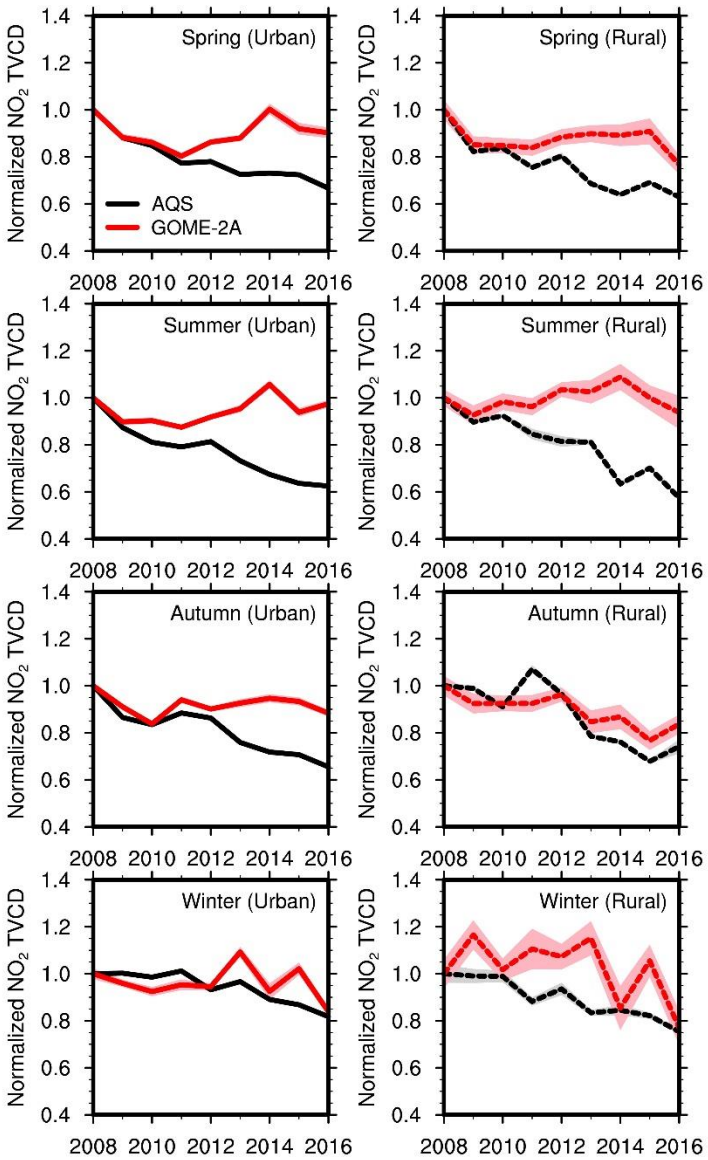

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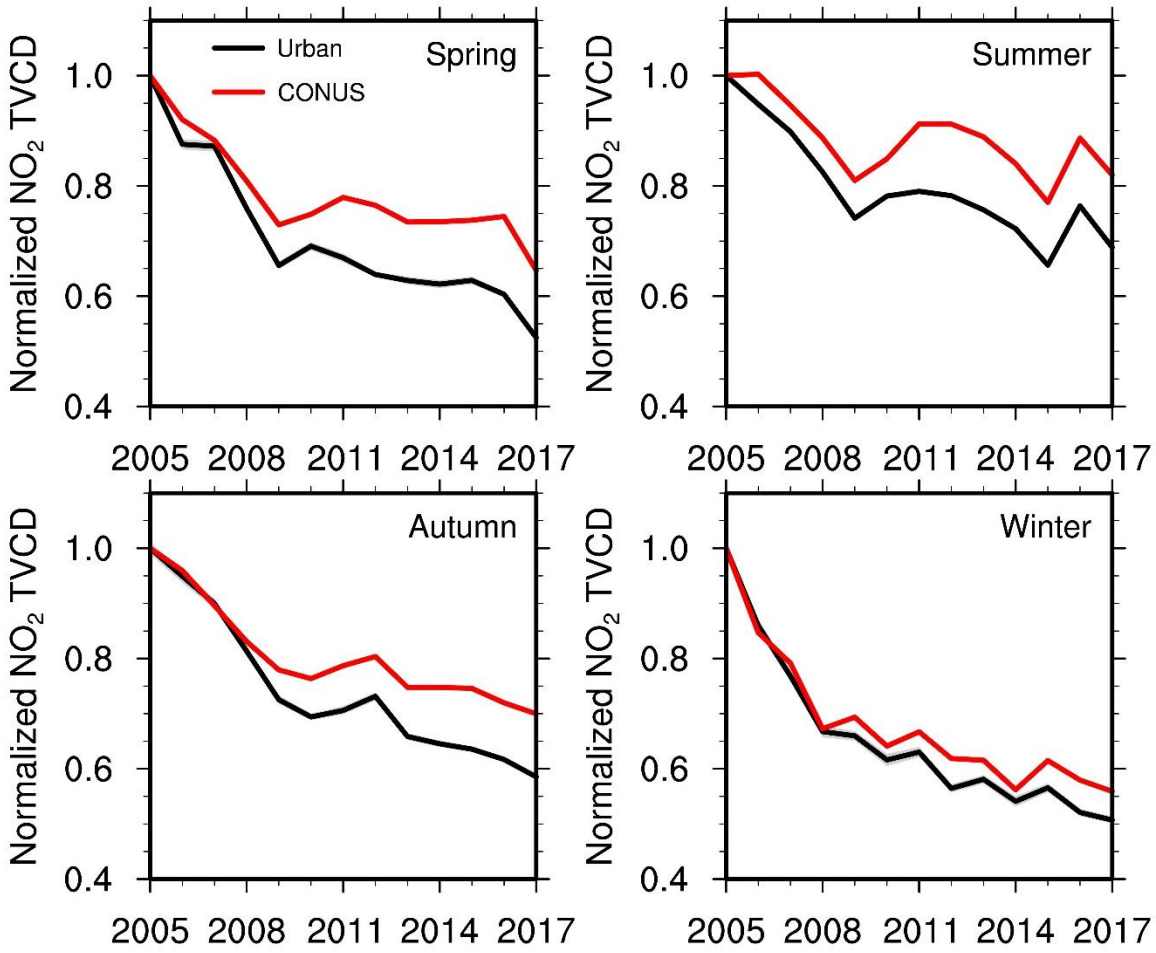

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