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# Comparing OMI-based and EPA AQS in situ $NO_2$ trends: towards understanding surface $NO_x$ emission changes

**Ruixiong Zhang et al.**

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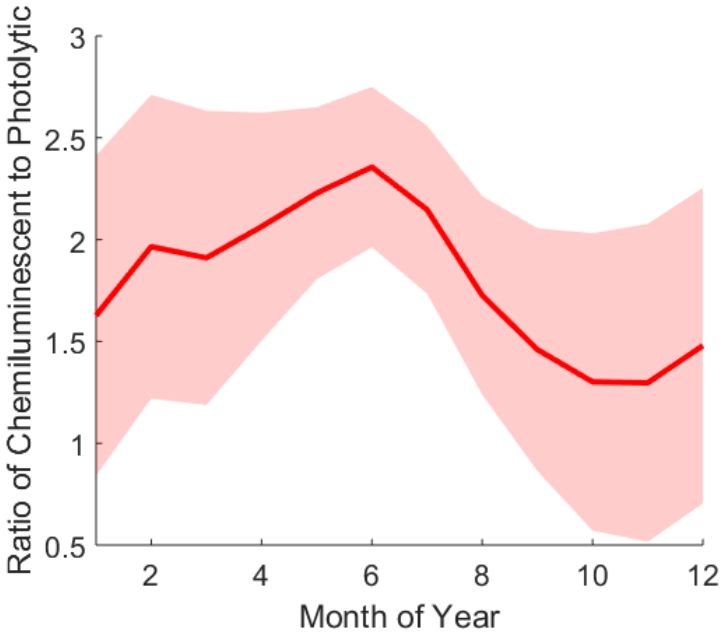


**Figure S1. The ratios between surface $NO_2$ concentrations of chemiluminescence to photolytic instruments. The ratios are calculated for each month from 7 sites with coincident photolytic measurements. The shaded area shows the 95$^{th}$ percentile confidence intervals.**

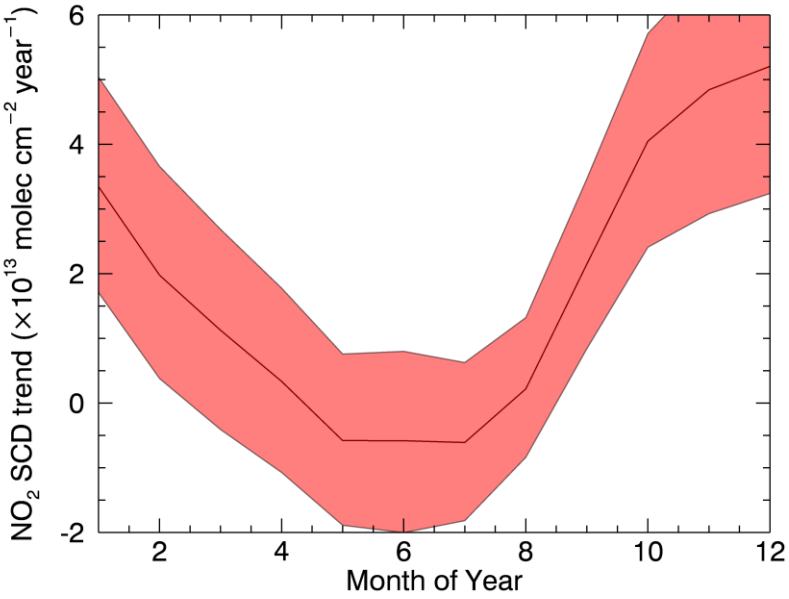


**Figure S2. The monthly OMI tropospheric $NO_2$ SCD trends averaged in the North Pacific region from 2005 to 2014. The red shade represents the 95$^{th}$ percentile confidence intervals.**

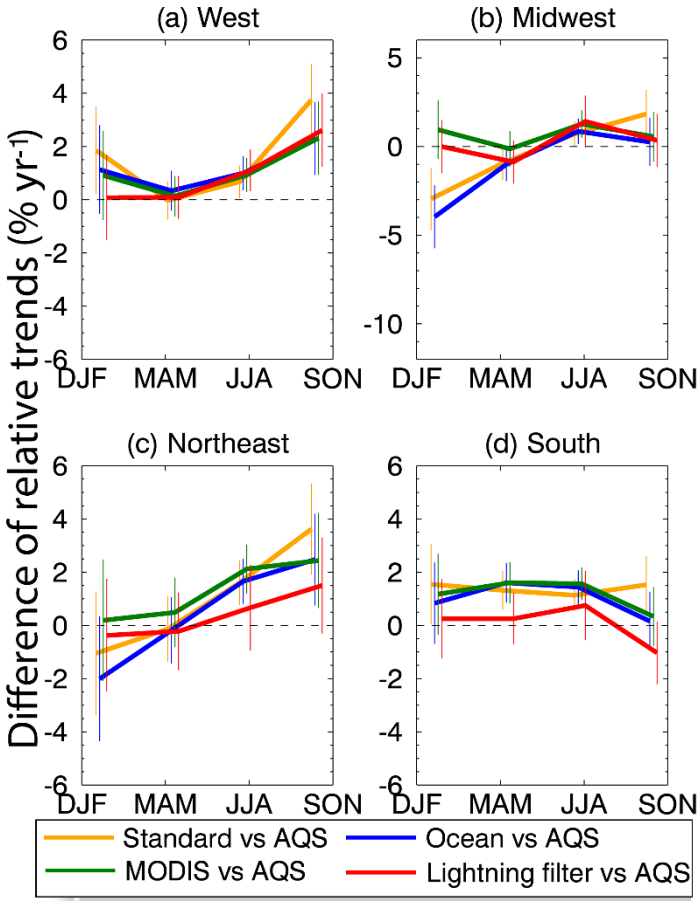


**Figure S3. Seasonal differences of OMI-based relative trends from those computed from AQS in situ data. The error bars represent 95$^{th}$ percentile confidence intervals. Same as Figure 7 in the main text but using monthly correction for ocean trend removal.**

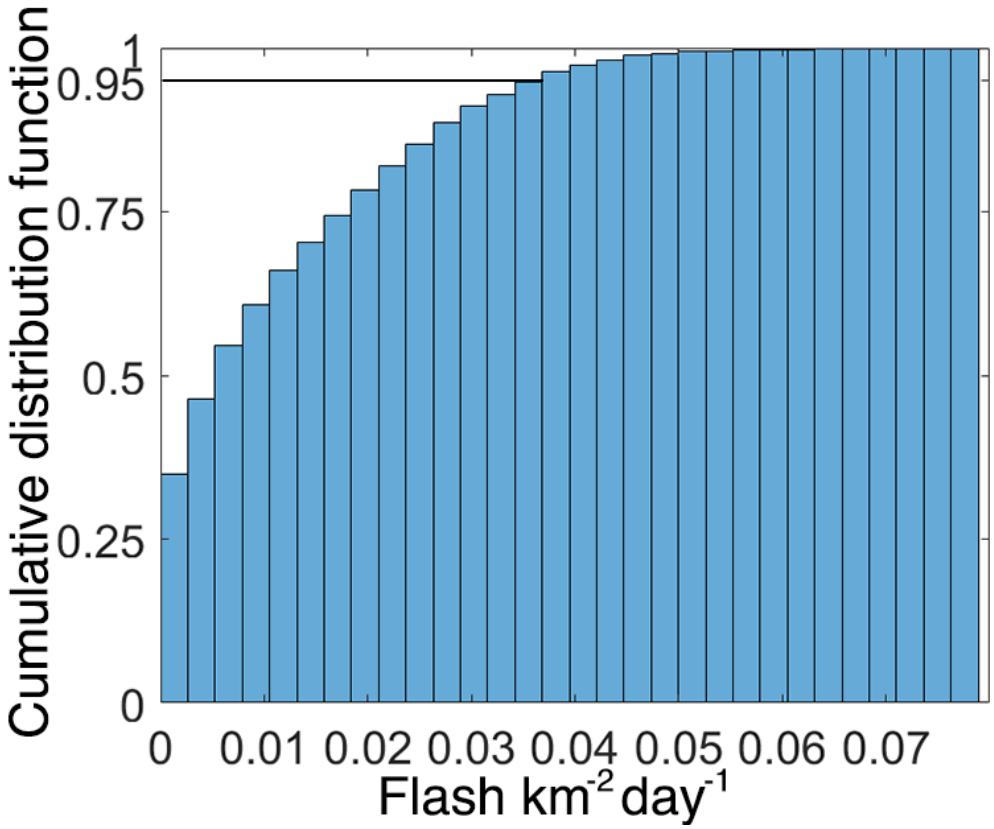


**Figure S4. The cumulative distribution function of NLDN detected CG lightning density in the South.**