Unexpected slowdown of US pollutant emission reduction in the past decade

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Tropospheric ozone and its precursors
\((\text{NO}_x \text{ and CO})\)
Decrease of US NO\textsubscript{x} emissions (surface sites)
Decrease of US NO\textsubscript{x} emissions (satellite)

Change of OMI NO\textsubscript{2} (2005-2014)

[Duncan et al. 2016 JGR]
Change of US O$_3$ standard levels

- 1979: 120
- 1997: 80
- 2008: 75
- 2015: 70
Discrepancy between OMI NO₂ and EPA’s inventory

The weak seasonality implies anthropogenic sources:

1: OMI retrieval error
2: local sources
3: non-local sources
Inconsistency between trends of US and China emissions
US anthropogenic NO$_x$ and CO emissions

NO$_x$ (Miyazaki et al. 2017 ACP)

CO (Jiang et al. 2017 ACP)
Good consistency between top-down NOx and satellite measurements
OMI NO$_2$ and MOPITT CO
Good consistency between satellite and surface (AQS) measurements
Explanations based on fuel-based bottom-up method

1. growing relative contributions of industrial, area, and off-road sources
2. decreasing relative contributions of on-road gasoline
3. slower than expected decreases in on-road diesel emissions.
Press release

Los Angeles Times

Slowdown in emissions reductions could explain stalled progress on smog, study finds

The Washington Post

America’s air isn’t getting cleaner as fast as it used to

The Guardian

America's huge success in cutting smog at risk of being eroded, experts warn

Daily Mail

America's air quality crisis: Study warns pollution gains are slowing dramatically