Unexpected slowdown of US pollutant emission reduction in the past decade

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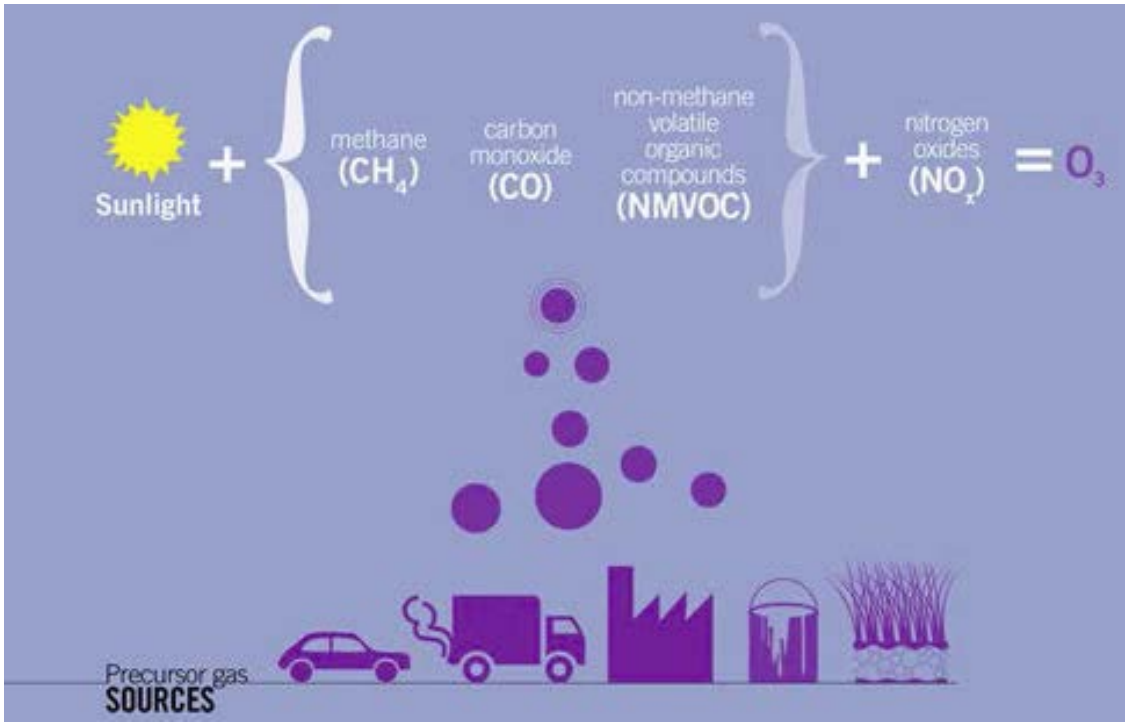
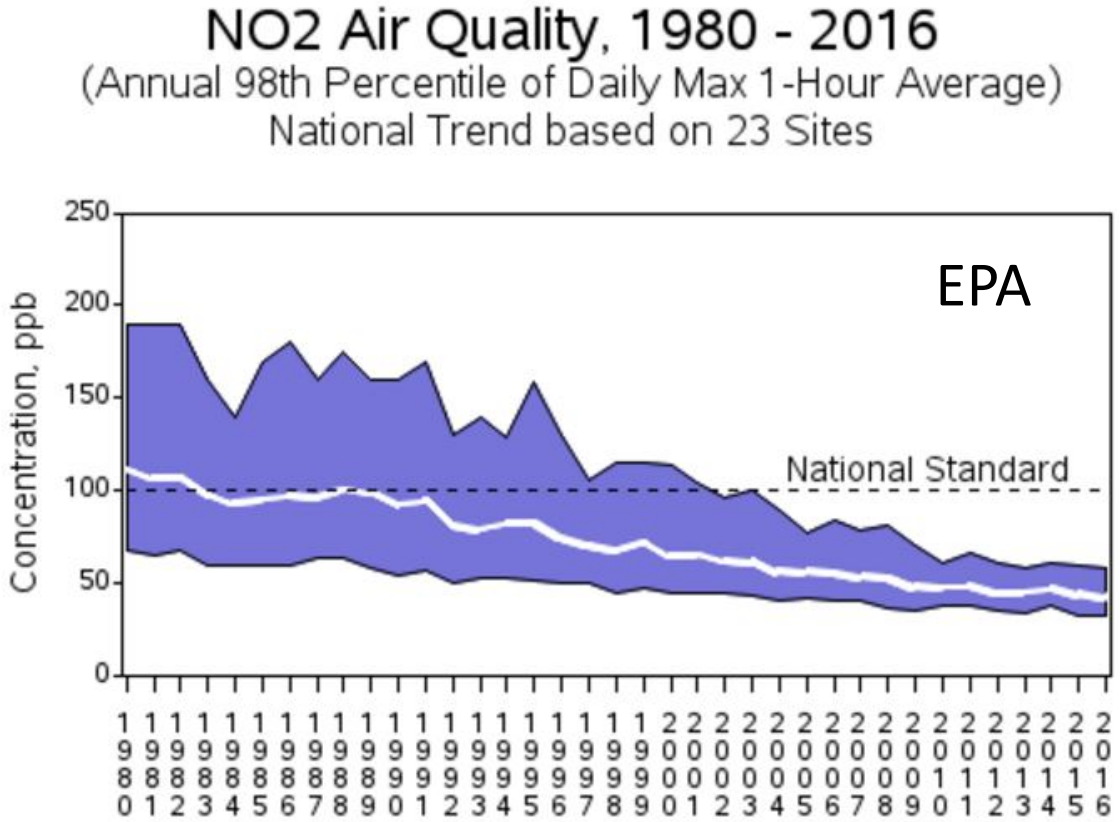
Tropospheric ozone and its precursors (NO_x and CO)

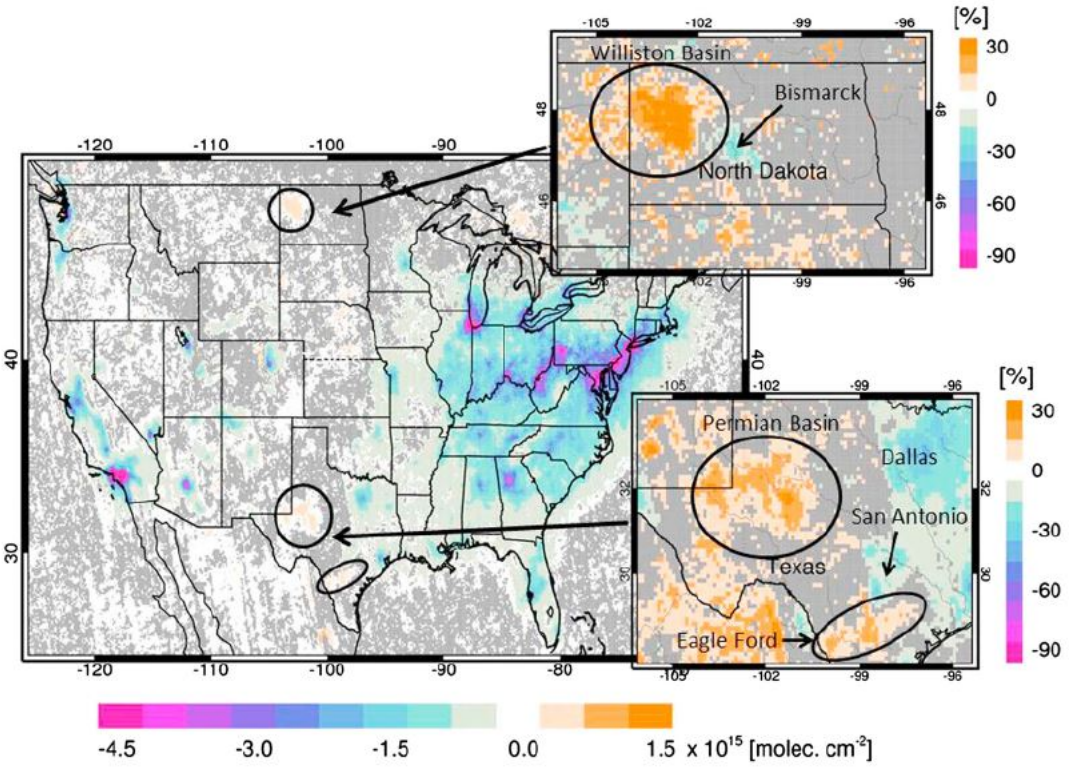


Decrease of US NO_x emissions (surface sites)



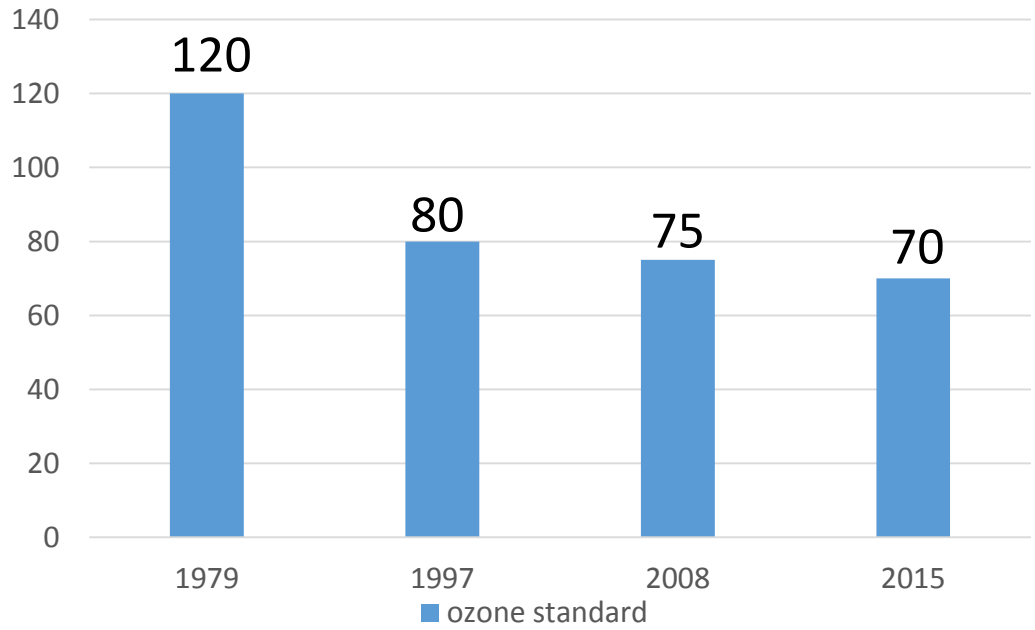
Decrease of US NO_x emissions (satellite)

Change of OMI NO2
（2005-2014）

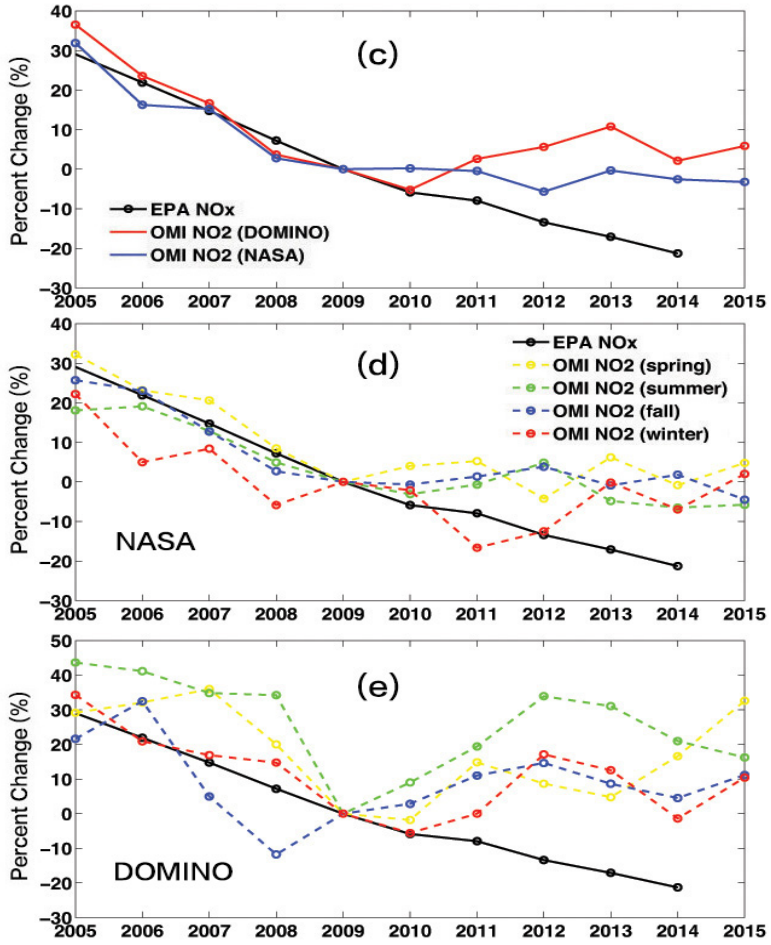


[Duncan et al. 2016 JGR]

Change of US O_3 standard levels



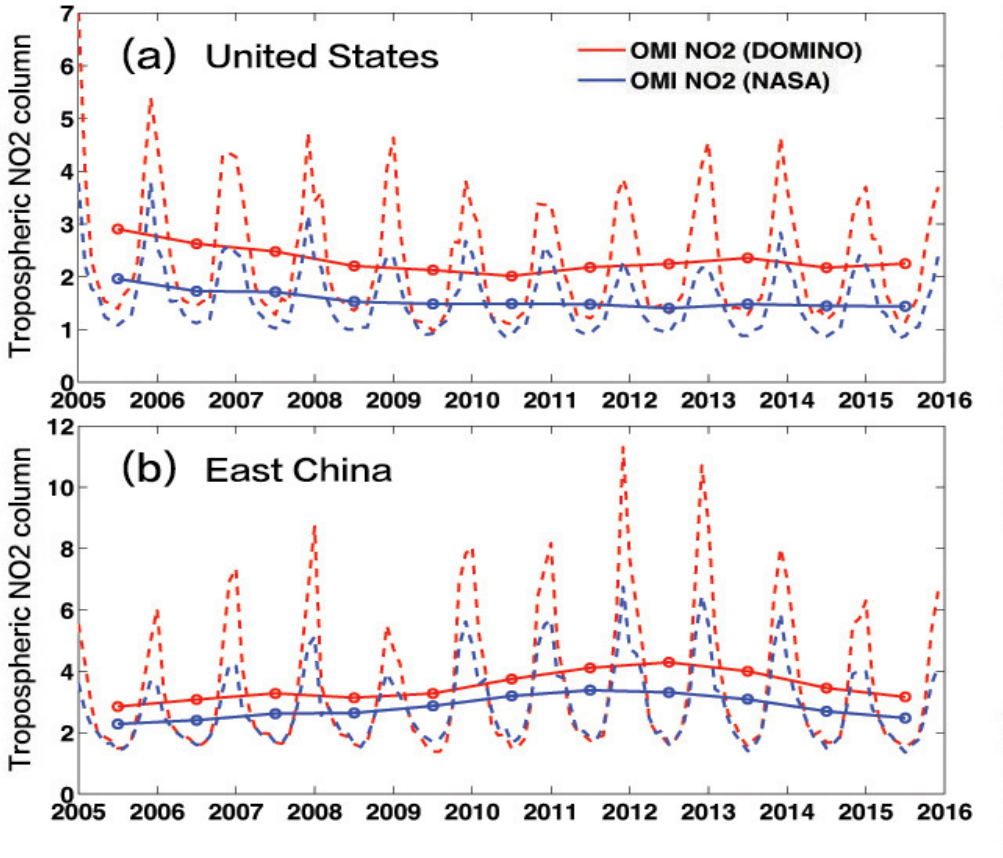
Discrepancy between OMI NO_2 and EPA's inventory



The weak seasonality implies anthropogenic sources:：

1：OMI retrieval error
2：local sources
3：non-local sources

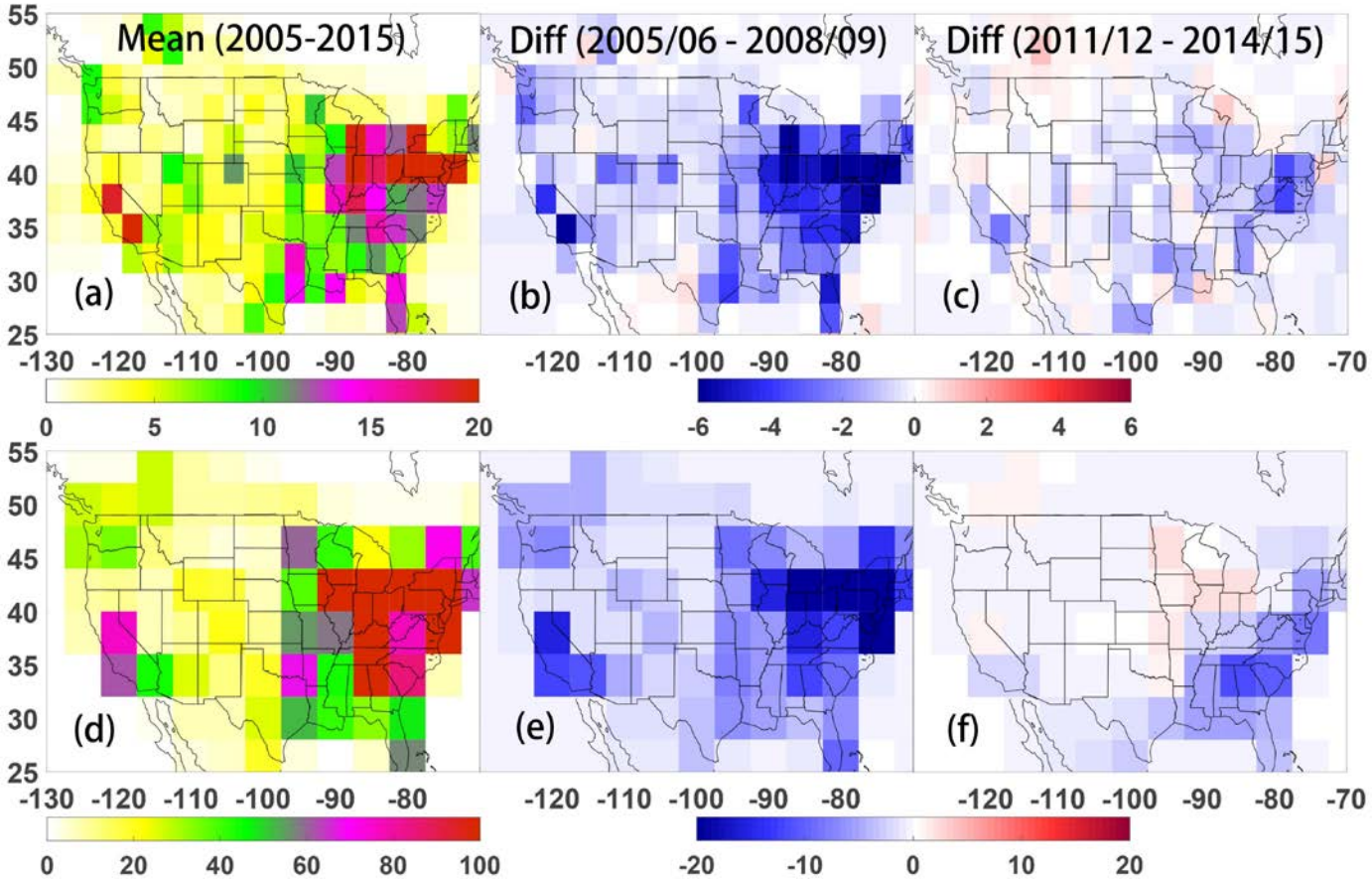
Inconsistency between trends of US and China emissions



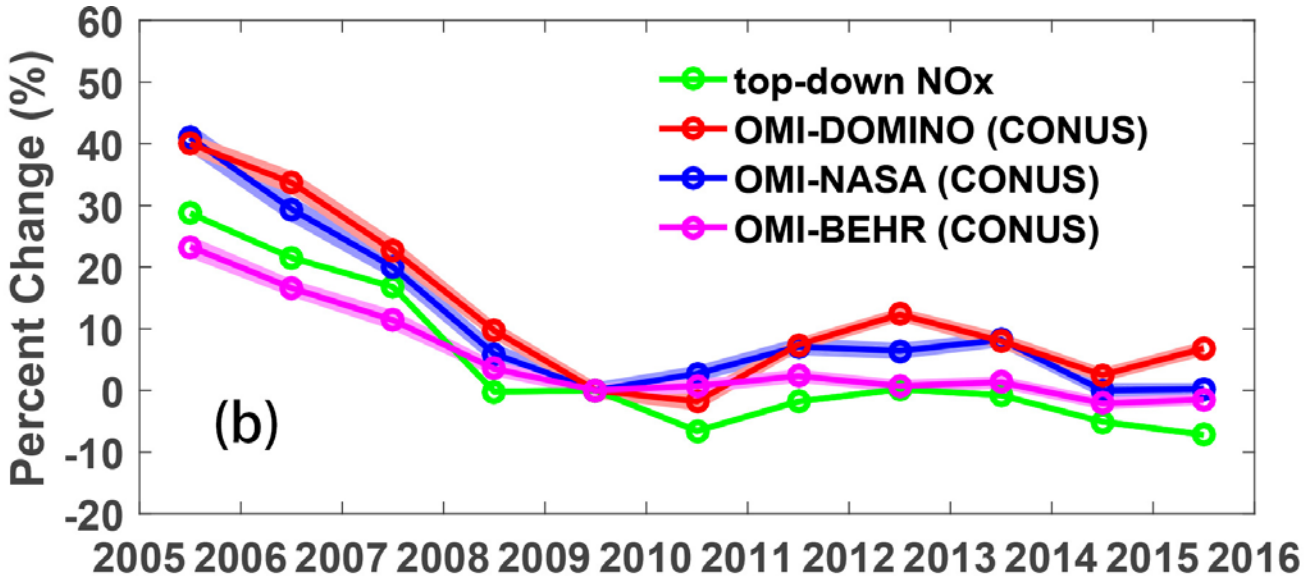
US anthropogenic NO_x and CO emissions

NO_x (Miyazaki et al. 2017 ACP)

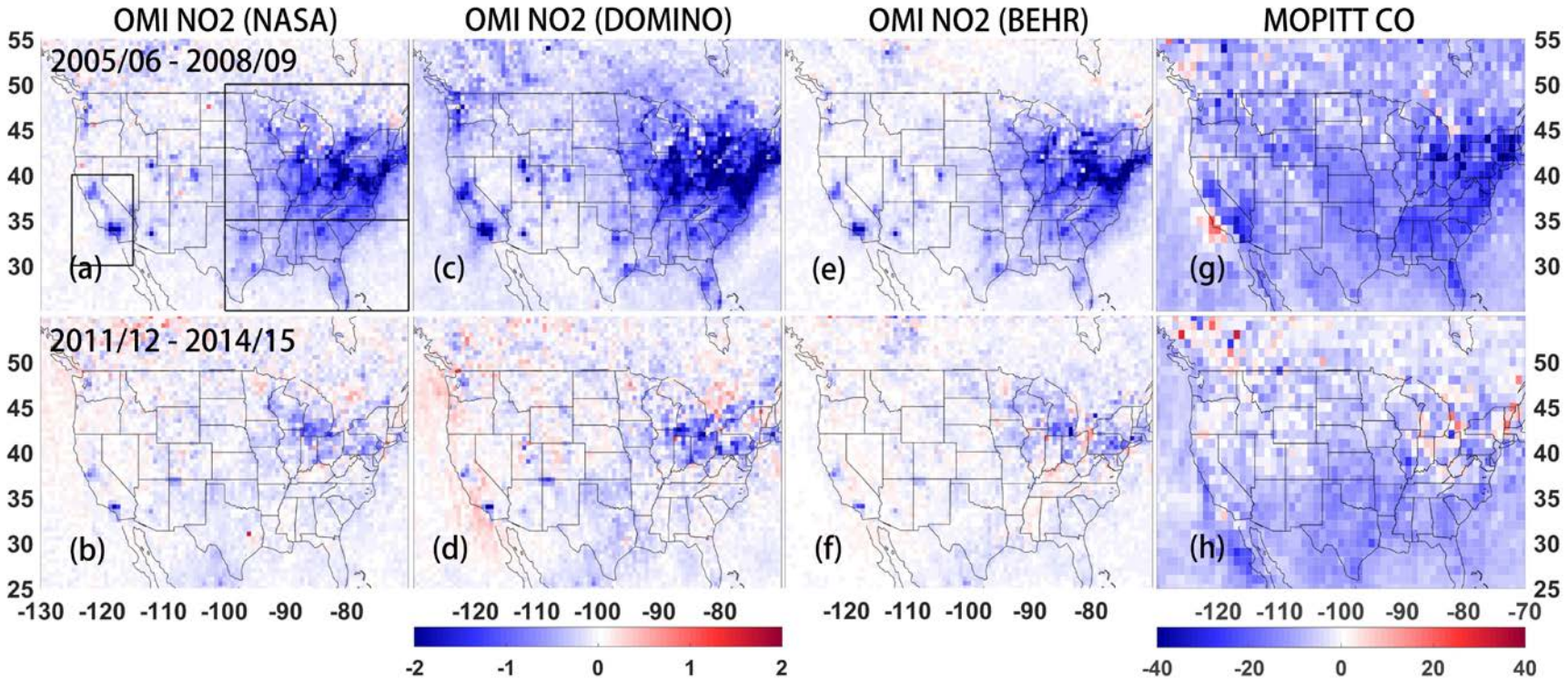
CO (Jiang et al. 2017 ACP)



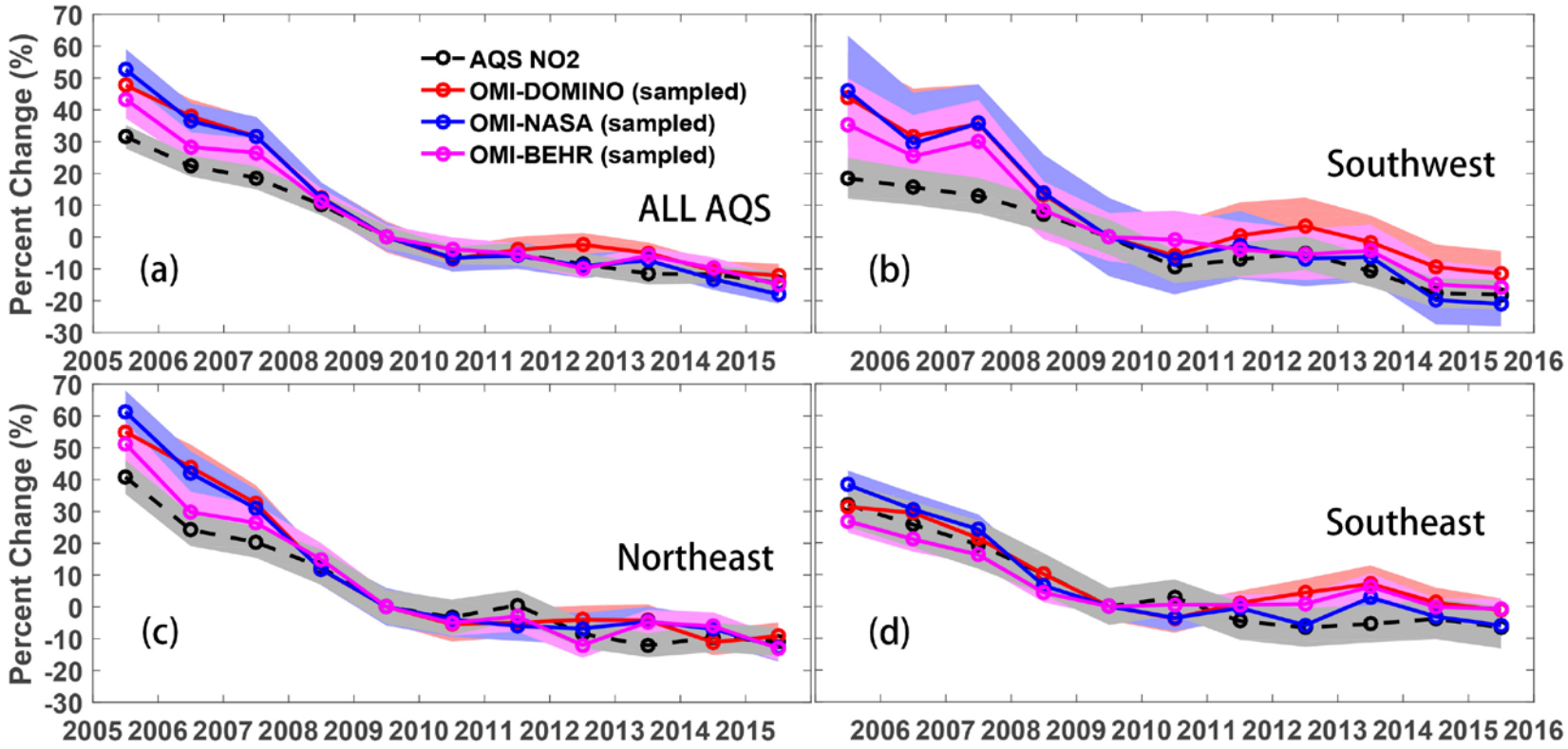
Good consistency between top-down NO_x and satellite measurements



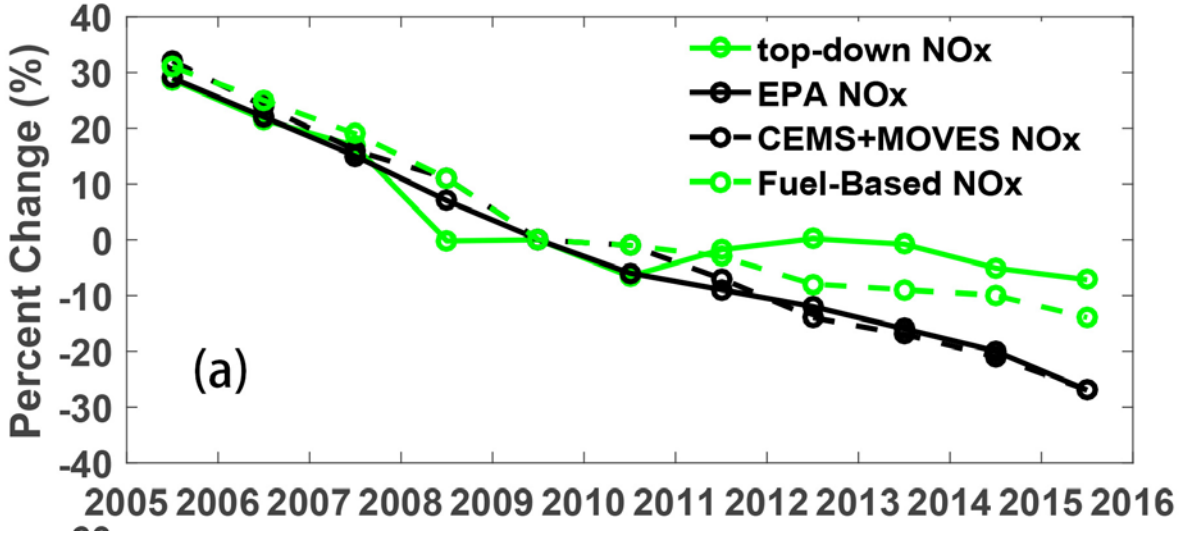
OMI NO_2 and MOPITT CO



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