Long-term trends in air quality in tropical megacities using Earth observations

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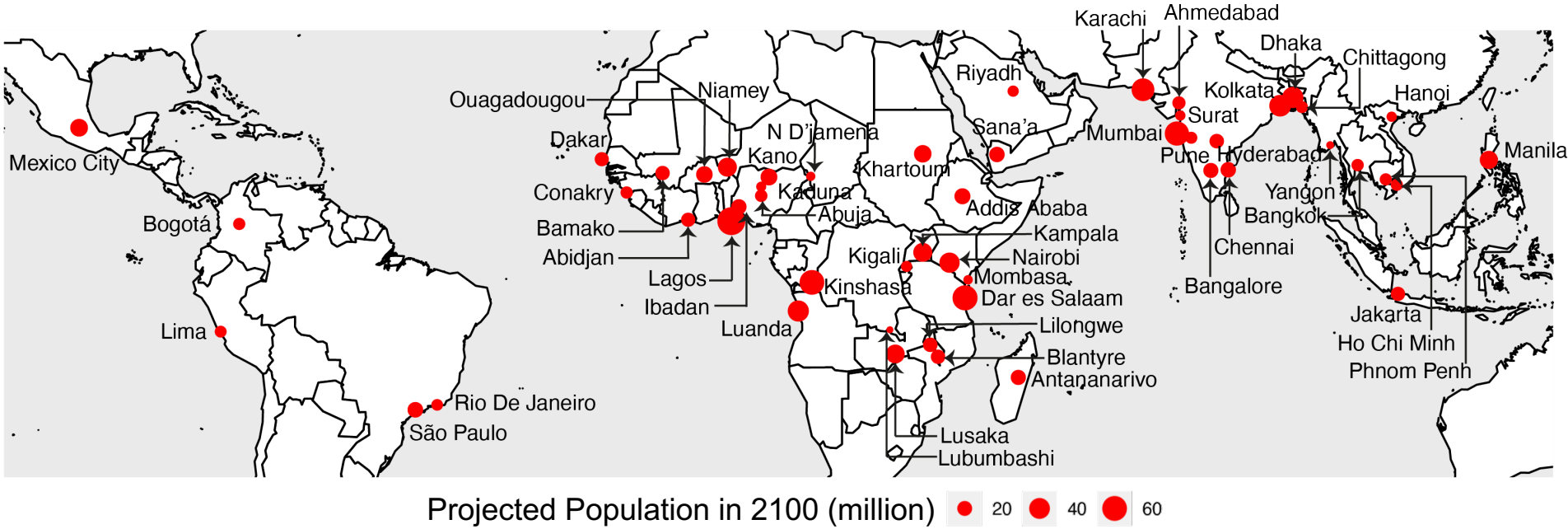
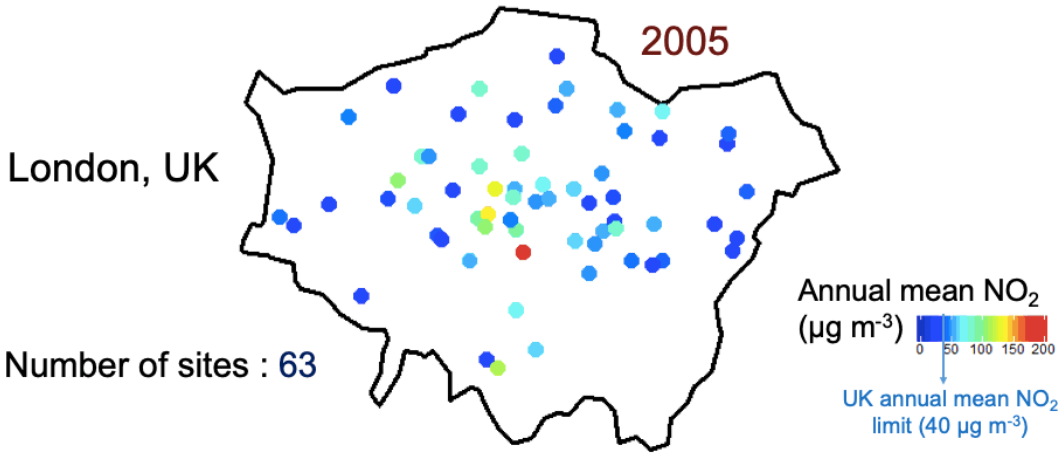
Tropics are the next frontier in air pollution



51 cities within the tropics will be megacities by 2100 **[Hoornweg & Pope, 2016]**

Assessing Earth observations & trends

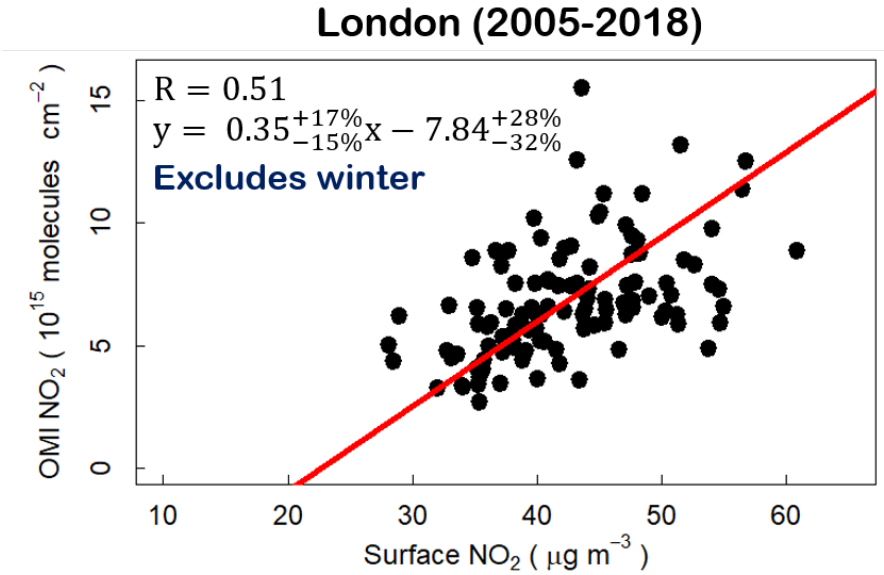
Coverage of surface NO_2 monitors



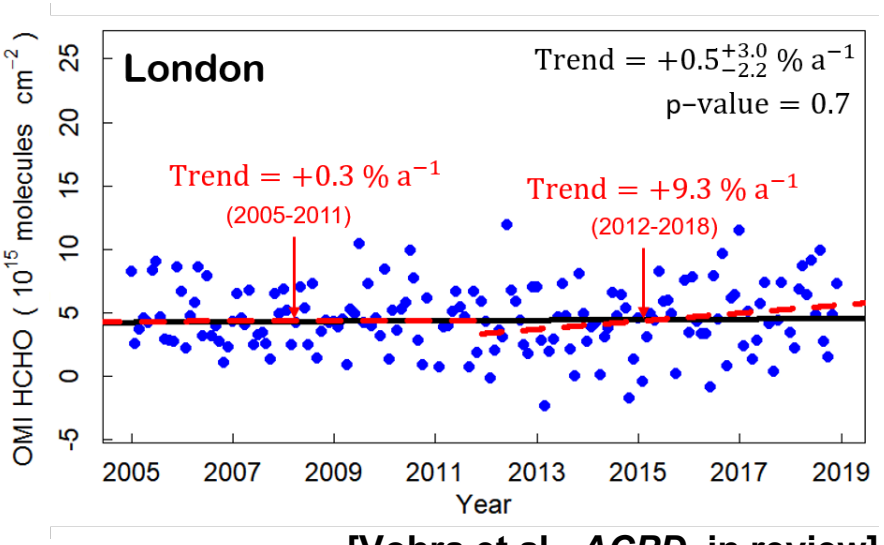
Data from *London Air Quality Network (LAQN)*

- Surface monitoring of air pollutants have limitations
- We assess Earth observations against available surface data
- We then analyse trends from the long-record of Earth observations

Satellite versus surface NO_2



Trend in London NMVOCs

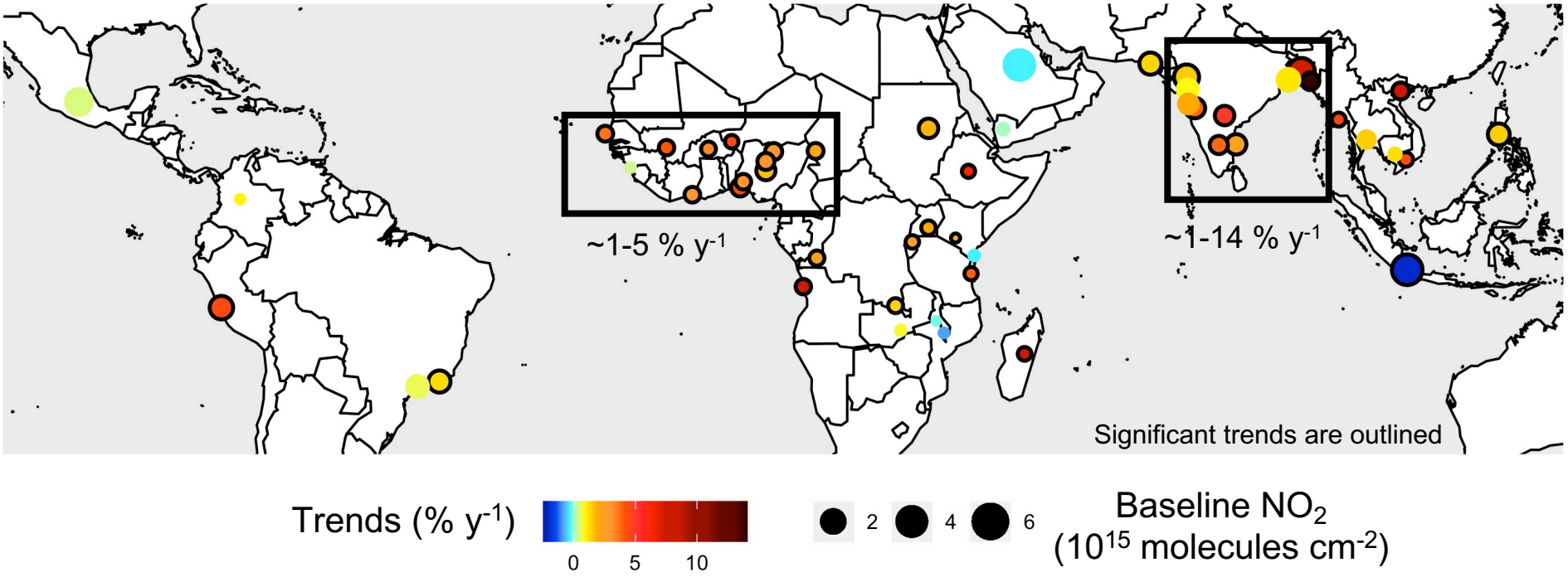


[Vohra et al., *ACPD*, in review]

Long-term trends in air quality in tropical megacities

Trends in NO_2 (2005-2018)

NASA OMI Level-2 Tropospheric column NO_2 version 3.0



NO_2 has increased in 46 out of 51 cities

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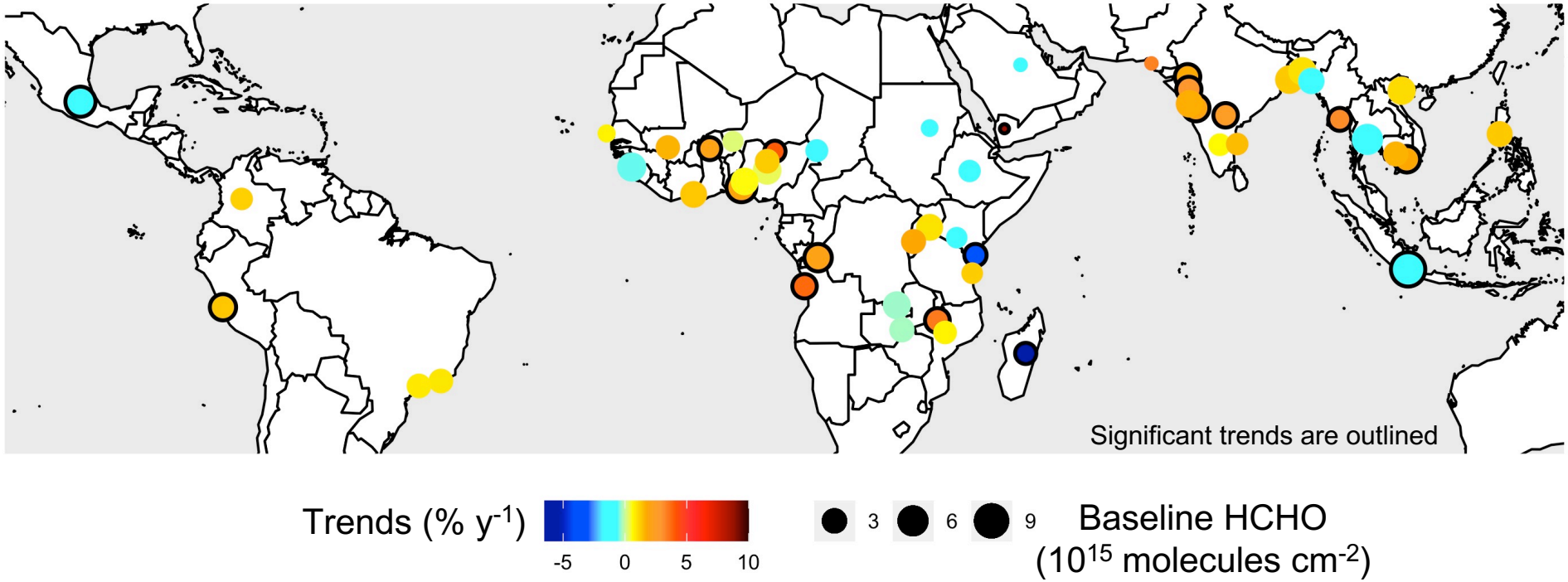
Trends in reactive NMVOCs (2005-2018)

QA4ECV OMI Level-2 Total column HCHO version 1.2

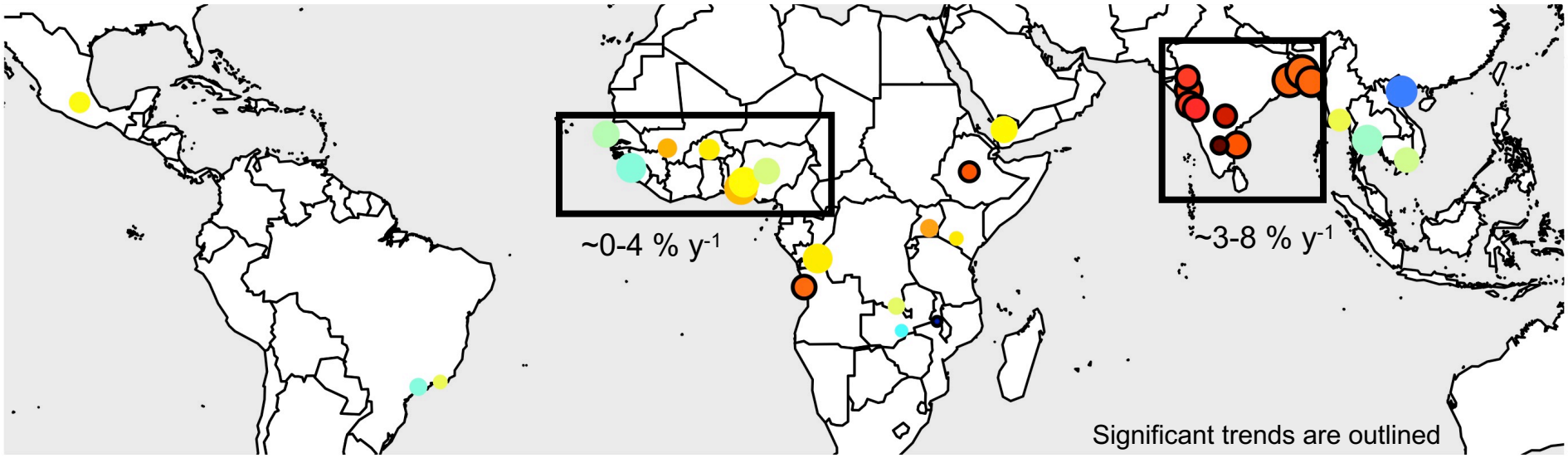


HCHO (reactive NMVOCs) has increased in 37 out of 51 cities

Long-term trends in air quality in tropical megacities

Trends in $PM_{2.5}$ (2005-2018)

NASA MODIS Level-2 Dark Target AOD Collection 6.1



AOD has increased in 25 out of 33 cities

Next steps

- Interpret the drivers of these trends
- Compare trends to widely used global emission inventories