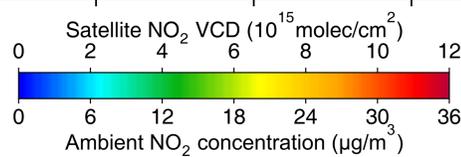
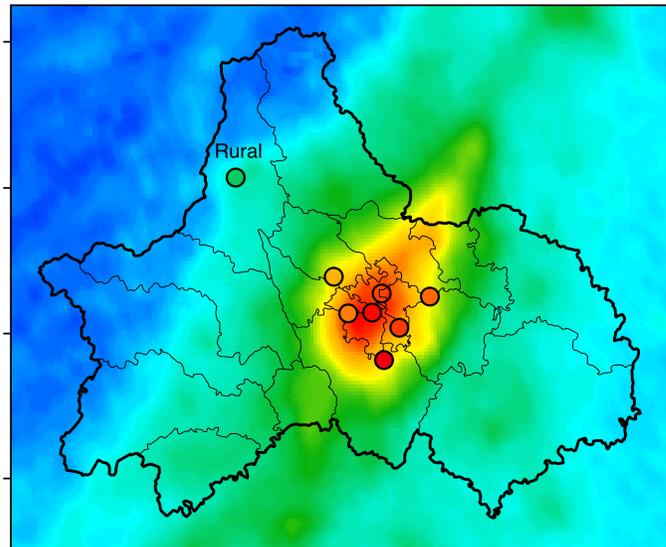




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Highlights



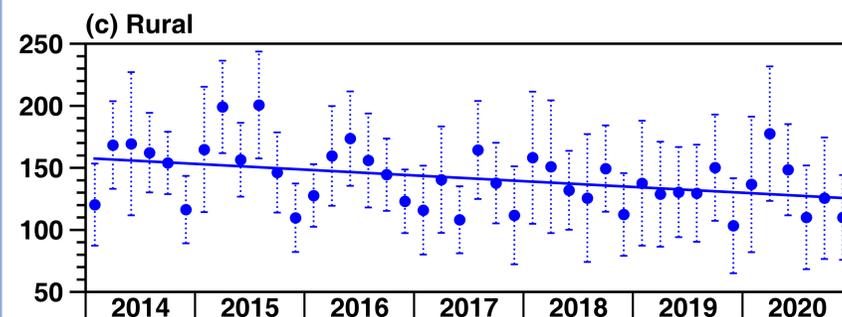
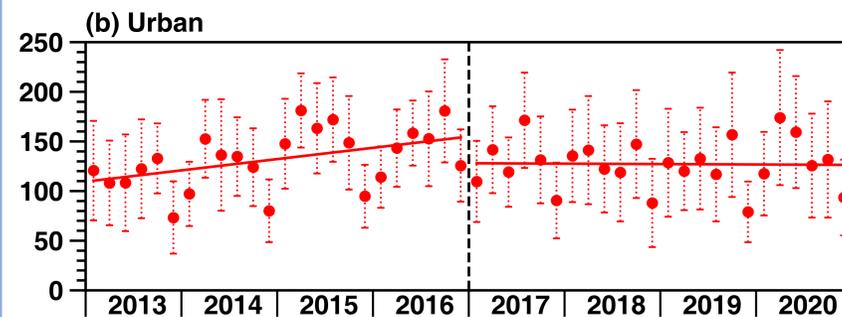
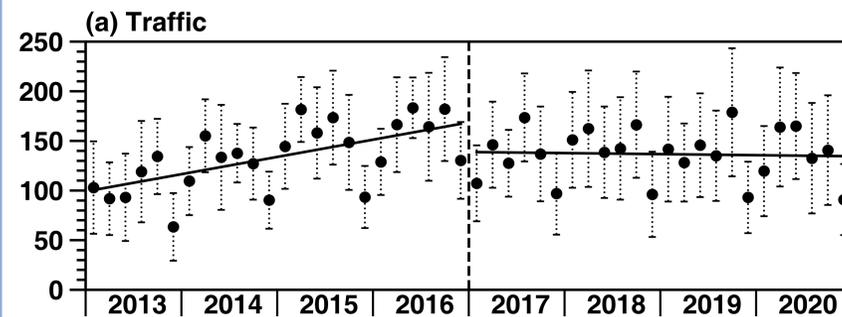
TROPOMI NO₂ columns and ambient NO₂ concentrations over Chengdu in 2020

- This work presents long-term ambient O₃ and precursor emissions trends in Chengdu.
- O₃-VOCs-NO_x sensitivity is inferred from OMI NO₂ and HCHO columns.
- The anthropogenic and natural effects on O₃ trends are identified.

Reference

- Wang, Y., Yang, X., Wu, K., et al., 2022. Long-term trends of ozone and precursors from 2013 to 2020 in a megacity (Chengdu), China: Evidence of changing emissions and chemistry. *Atmospheric Research*, 278, 106309.
- Zheng, B., Tong, D., Li, M., et al., 2018. Trends in China's anthropogenic emissions since 2010 as the consequence of clean air actions. *Atmos. Chem. Phys.* 18, 14095–14111.
- Deng, Y., Li, J., Li, Y., et al., 2019. Characteristics of volatile organic compounds, NO₂, and effects on ozone formation at a site with high ozone level in Chengdu. *J. Environ. Sci.* 75, 334–345.
- Tan, Z., Lu, K., Jiang, M., et al., 2018. Exploring ozone pollution in Chengdu, southwestern China: a case study from radical chemistry to O₃-VOC-NO_x sensitivity. *Sci. Total Environ.* 636, 775–786.

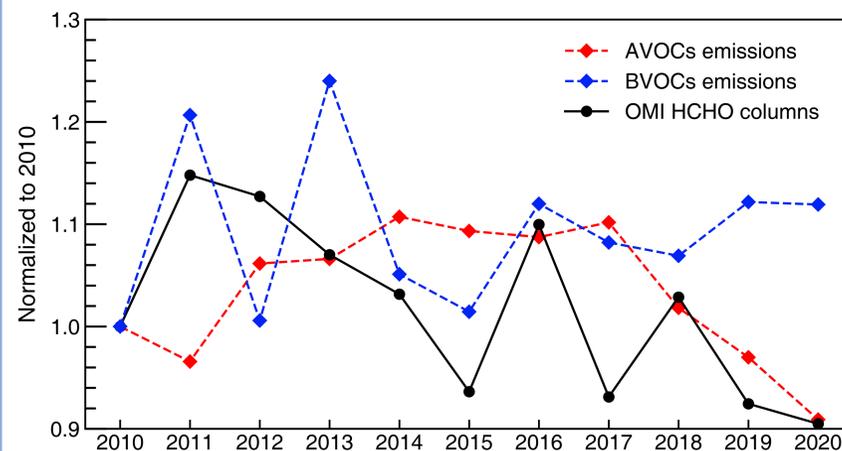
Long-term ozone trends



Long-term ambient O₃ trends over Chengdu (unit: µg/m³)

- Urban ↑ (2013-2016) Traffic ↑ (2013-2016) Rural ↓ (2014-2020)
- Urban ■ (2017-2020) Traffic ■ (2017-2020)

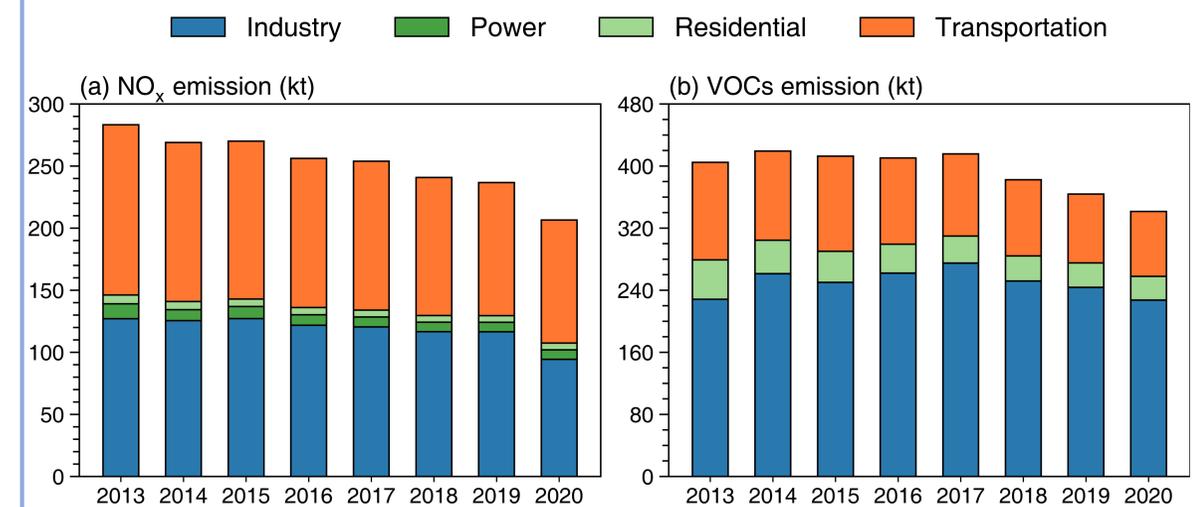
Natural effects



Trends of anthropogenic and biogenic VOCs emissions, and OMI HCHO columns

- Both biogenic and anthropogenic VOC emissions contribute to the changes in HCHO levels.

Anthropogenic effects



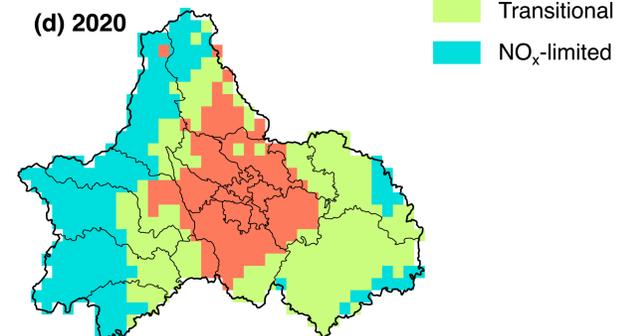
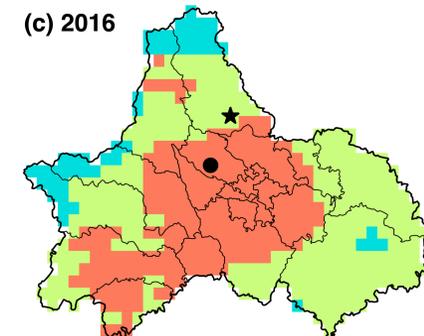
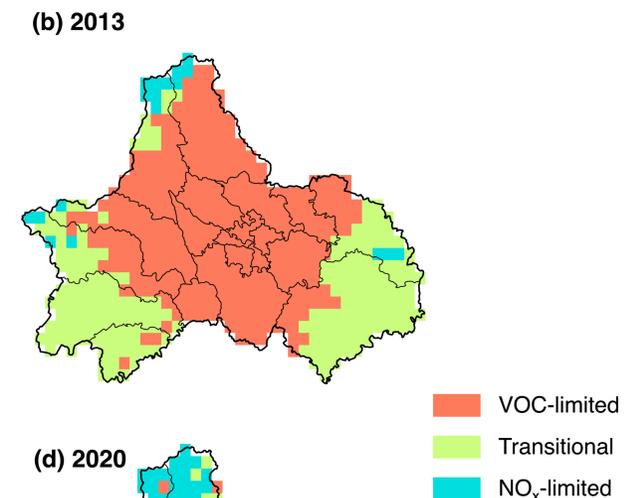
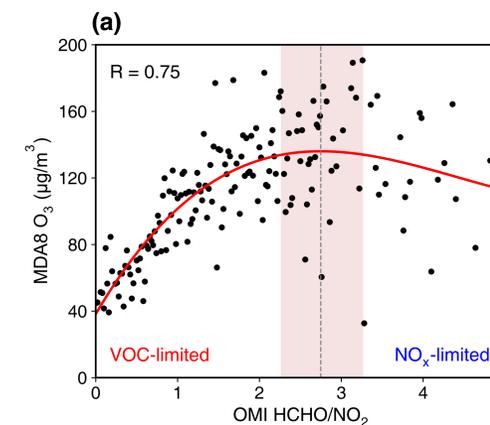
Anthropogenic NO_x and VOCs emissions in Chengdu from MEIC (Zheng et al., 2018)

NO_x ↓ (2013-2020)

VOCs ↑ (2013-2017)

VOCs ↓ (2017-2020)

O₃-VOCs-NO_x sensitivity



(a) O₃ concentrations vs OMI HCHO/NO₂ (b-d) O₃-VOCs-NO_x sensitivity over Chengdu

- The extent of the VOC-limited regime gradually shrinks in Chengdu.
- In 2016, the black circle site is reported in VOC-limited regime (Deng et al., 2019), while the pentagram is in transitional regime (Tan et al., 2018).