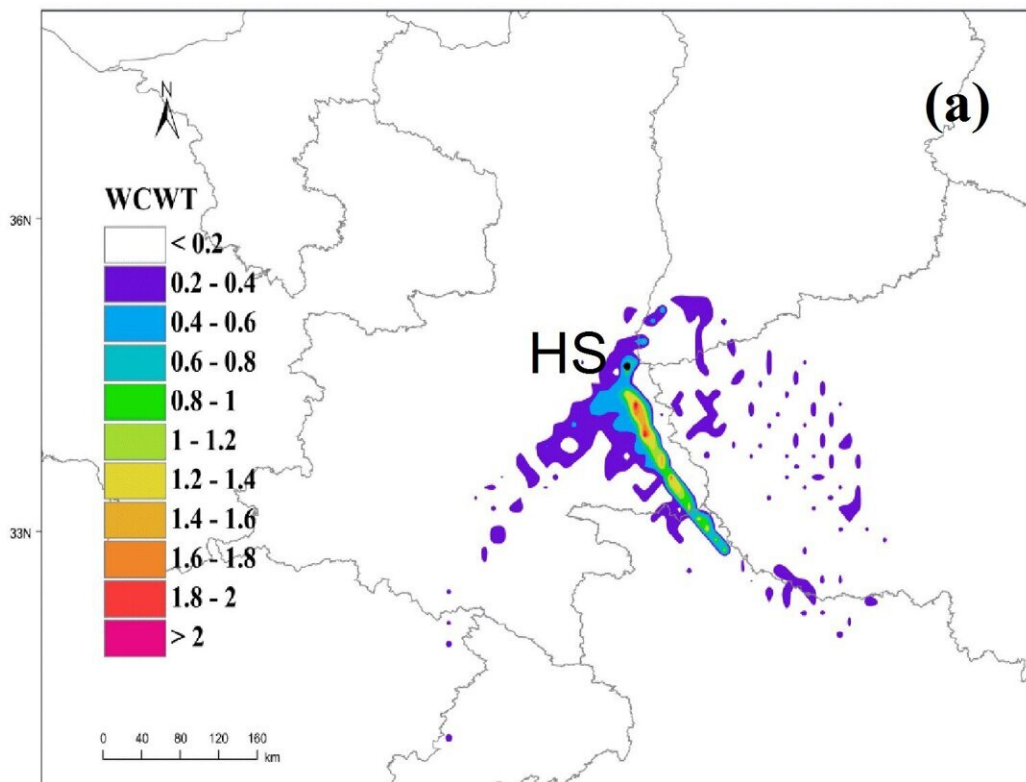


# Transport of volatile organic compounds found to cause worsening of regional ozone pollution

February 5 2024, by Zhang Nannan



Potential source distribution of formaldehyde (a), acetylene (b), and xylenes (c) at the Qinling Mountain in summer 2020. Credit: Xue Yonggang

The increasing concentration of ozone ( $O_3$ ) is a key factor contributing

to the deterioration of air quality in China. O<sub>3</sub> and its precursors, especially volatile organic compounds (VOCs), could be transported by air masses, leading to interactions of O<sub>3</sub> precursors from biogenic and anthropogenic sources.

Consequently, O<sub>3</sub> pollution mainly shows regional uniformity. Qinling Mountain, with a [high altitude](#), affects the climate and air quality in China, but its influence on VOC transport and regional O<sub>3</sub> pollution remains poorly understood.

Researchers from the Institute of Earth Environment of the Chinese Academy of Sciences conducted comprehensive observations on O<sub>3</sub> and its precursors to investigate the driving mechanism of the regional transport of O<sub>3</sub> and VOCs in the Qinling Mountain region and their impact on regional O<sub>3</sub> pollution.

This work was [published](#) in *Journal of Geophysical Research: Atmospheres* on Dec. 26.

The researchers found that the composition of VOCs at the foot of Qinling Mountain was significantly influenced by local sources, while the ambient VOCs near the top were influenced by the regional air mass, resulting in extremely high loading of O<sub>3</sub> and VOC loads at the top of Qinling Mountain during nighttime.

Furthermore, it was found that the East Asian summer monsoon and the local valley wind together drove the accumulation of O<sub>3</sub> (up to 152 ppbv) and VOCs (formaldehyde up to 5 ppbv) at the summit, exacerbating the O<sub>3</sub> pollution in the surrounding areas of Qinling Mountain.

This study improves the understanding of the transport of VOCs and its impact on the regional O<sub>3</sub> pollution, and the potential source distribution as well as transport pathways, which would be helpful in further regional

O<sub>3</sub> [quality control](#).

**More information:** Yonggang Xue et al, Asian Monsoon and Local Valley Wind Caused Transport of Volatile Organic Compounds Episode Across Qinling Mountain in China, *Journal of Geophysical Research: Atmospheres* (2023). [DOI: 10.1029/2022JD038256](https://doi.org/10.1029/2022JD038256)

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