

Strong El Niño events could increase near-surface ozone in China

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Urban air pollution. Credit: Jiangtao Zhu

With the implementation of a series of air pollution reduction policies, aerosol pollution in China has been effectively controlled. However, in recent years, ozone (O_3) is gradually becoming the most critical air pollutant in China. High O_3 concentrations damage ecosystems, reduce crop yields, and harm human health. Therefore, it is great significance to reveal the factors that influence the variation in O_3 concentrations in China and understand the reasons behind it. El Niño–Southern Oscillation is the strongest signal of interannual variation in the ocean, and has significant impacts on global weather conditions and atmospheric circulation. Previous studies have focused on the influence of El Niño on aerosol concentrations in China. However, the effect on summertime near-surface O_3 in China has been insufficiently investigated.

To understand the influences of El Niño on O_3 concentrations in China, Prof. Yang Yang's team from Nanjing University of Information Science and Technology researched the impact of strong El Niño events (1997/98 and 2015/16) on summertime near-surface O_3 concentrations in

China by applying the GEOS-Chem model. Their paper has recently been published in *Atmospheric and Oceanic Science Letters*.

The study reveals that O_3 concentrations over southern China increased during the two El Niño events, which was related to the accumulation caused by the weakening prevailing monsoon winds. Meanwhile, O_3 increased in northeastern China during the summer of the developing phase of the 1997/98 El Niño, mainly due to the increased chemical production related to the increases in temperature and decreases in relative humidity. However, this anomaly did not occur in the 2015/16 event, which could be related to the different sea surface temperature anomaly patterns of the two strong El Niño events. Furthermore, O_3 concentrations decreased during the summer of the decaying phase of the El Niño events, which may be due to the change in the sea surface temperature condition to La Niña.

"This work reveals that strong El Niño events play an important role in regulating near-surface ozone concentrations in China, which can provide important data to support future air pollution predictions and [control measures](#)," says Prof. Yang, the corresponding author of the study.

More information: Mengyun Li et al, Impacts of strong El Niño on summertime near-surface ozone over China, *Atmospheric and Oceanic Science Letters* (2022). [DOI: 10.1016/j.aosl.2022.100193](https://doi.org/10.1016/j.aosl.2022.100193)

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