

Models Show Variability in Background Ozone Levels

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The total amount of ground-level ozone pollution that affects human health can vary widely depending on geography, seasonality and meteorological conditions.

Variability in background ozone concentrations are driven by the transport of precursor emissions from foreign countries and natural sources, including influxes of ozone from the upper atmosphere, according to work led by Meiyun Lin. Lin's work was highlighted last week during the NASA Air Quality Applied Sciences Team's (AQAST) sixth biannual meeting at Rice University in Houston.

As emissions in China, India and other developing nations in Asia continue to rise, larger amounts of ozone causing pollutants can be carried across the Pacific Ocean and cause problems for air quality managers in the western US. Studies have shown that missions from Asia can cross the Pacific in as little as ten days.

Background ozone levels can also rise unexpectedly when "good" ozone is forced from the stratosphere into the troposphere, an event known as a stratospheric intrusion. Air quality models suggest that Nevada is particularly susceptible to these events. Lin and colleagues are analyzing observations at a newly established network of six research sites under the Nevada Rural Ozone Initiative led by Professor Mae Gustin at University of Nevada-Reno,.

Much of the variability in springtime ozone levels across the western US is likely caused by stratospheric intrusions, which in conjunction with emissions transported from Asia, can push some areas above federal air quality standards.

AQAST members are working to develop new techniques to measure these highly variable sources of background ozone to help air quality managers identify ways to control pollution. Existing models are adept at predicting certain types of air quality events, but they must be improved to accurately account for transnational emissions and stratospheric intrusions.

Lin's work was presented on January 16th at AQAST's 6th biannual meeting at Rice University in Houston, Texas. The meeting agenda can be found at this [website](#). Link's to Lin's published articles on background ozone can be found below.

References

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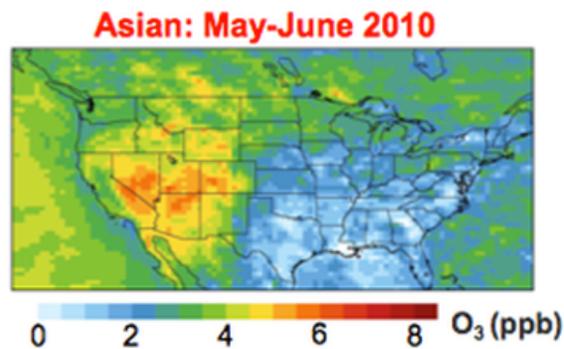
Lin, M., et al. (2012a): Transport of Asian ozone pollution into surface air over the western United States in spring, *Journal of Geophysical Research*, 117, D00V07, doi:10.1029/2011JD016961 ([PDF](#))

Sources and media coverage

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The map above shows the effect of Asian emissions on US background ozone levels, while the map below displays the effect of stratospheric ozone intrusions (Source: Lin et al., 2012a; Lin et al., 2012b, J. Geophys. Res.)

