6.156 Ozone responses to atmospheric modulations in Malaysia.

Early Career Scientist

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Abstract:

In the tropics, changes in ambient temperature and daylight hours are less pronounced compared to higher latitudes where the summer and winter seasons show large fluctuations in weather. However, ambient ozone (O_3) concentrations in the tropics can still be modulated by cyclical atmospheric processes such as the Asian monsoon and El Niño Southern Oscillation (ENSO) which influences cloud cover and rainfall patterns. This study attempts to determine the relative influence of atmospheric modulations on ambient O_3 concentrations in Malaysia, a country located within 7° North of the equator. Long term O_3 and meteorological parameters data (>10 years) from a network of ambient air quality monitoring sites made available by the Department of Environment Malaysia is analysed. Preliminary statistical analysis results on five selected stations (1997 – 2011) showed that daily maximum O_3 concentrations were not spatially consistent to ENSO and monsoonal modulation indicating stronger localised influence on O_3 concentrations. Spectral analysis results showed a shift from annual to semi-annual cycle moving from north to south of the Malaysian peninsula indicating sensitivity to the shift in Intertropical Convergence Zone. The current work is expected to provide more conclusive evidence on the relative influence of atmospheric modulations to ambient O_3 concentrations in the tropics.