

Regional Trend Analysis of Surface Ozone Observations from Monitoring Networks in Eastern North America, Europe and East Asia

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Surface ozone is a greenhouse gas and pollutant detrimental to human health as well as crop and ecosystem productivity. The Tropospheric Ozone Assessment Report (TOAR) is designed to provide the research community with an up-to-date observation based overview of tropospheric ozone's global distribution and trends. We conducted a spatial and temporal trend analysis using the TOAR database of global surface ozone observations for different regions and for several metrics in summertime (April-September) over 2000-2014. The generalized additive mixed model (GAMM) analysis of several ozone metrics indicates that East Asia has the greatest human and plant exposure to ozone pollution under current monitoring coverage, with increasing ozone levels through 2014. The results also show that ozone mixing ratios continue to decline significantly over eastern North America and Europe, however, there is less evidence for decreases of daytime average ozone at urban sites.

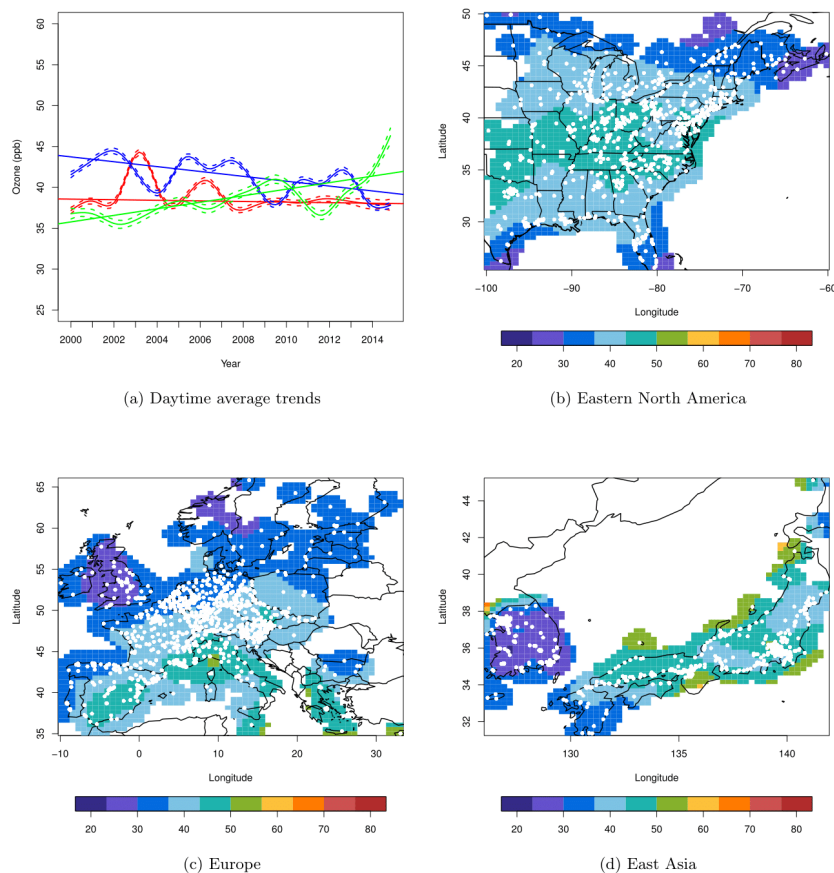


Figure 1. Spatial and temporal trends for summertime mean of daytime average in different regions: estimated long-term changes (ppb) in eastern North America (blue), Europe (red) and East Asia (green), and their spatial distributions. The white points indicate the locations of stations.