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The effects of trees on air pollutant levels in peri-urban near-road environments

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Highlights

- NO₂ levels were higher and levels of coarse particles lower in the forests than open areas.
- PM_{2.5} mean levels were unaffected by forests.
- Attenuation of NO₂ and mean values of PM by distance from the road did not differ between habitats.
- Forest vegetation properties explained little of the variation in pollutant levels.
- Forest affected the magnitude of PM_{2.5} and Coarse PM peak events.

Abstract

It is often stated that plants remove air pollutants from the urban atmosphere with their large leaf area, thus providing benefits – i.e. ecosystem services – for citizens. However, empirical evidence showing that local-scale air quality is uniformly improved by urban forests is scarce. We studied the influence of conifer-dominated peri-urban forests on the springtime levels of NO₂ and particle pollution at different distances from roads, using passive samplers and high time resolution particle counters in a northern climate in Finland. Passive samplers provided average values over a one month period, while active particle counters provided real time measurements of air pollution to mimic human inhalation frequency. NO₂ concentrations were slightly higher in forests than in adjacent open areas, while passive particle measurements showed the opposite

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