



City scale pollen concentration variability

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Pollen are emitted in the atmosphere both in the country-side and in cities. Yet the majority of the population is exposed to pollen in cities. Allergic reactions may be induced by short-term exposure to pollen. This raises the question how variable pollen concentration in cities are in temporally and spatially, and how much of the pollen in cities are actually produced in the urban region itself.

We built a high resolution (1×1 km) pollen dispersion model based on WRF-Chem to study a city's pollen budget and the spatial and temporal variability in concentration. It shows that the concentrations are highly variable, as a result of source distribution, wind direction and boundary layer mixing, as well as the release rate as a function of temperature, turbulence intensity and humidity.

Hay Fever Forecasts based on such high resolution emission and physical dispersion modelling surpass traditional hay fever warning methods based on temperature sum methods. The model gives new insights in concentration variability, personal and community level exposure and prevention. The model will be developed into a new forecast tool to serve allergic people to minimize their exposure and reduce nuisance, cost of medication and sick leave. This is an innovative approach in hay fever warning systems.