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# Analysis of Ground Based Site Representativeness for European Scale Trend Analysis

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Long term and recent trends of surface $O_3$ within Europe vary substantially depending on the location and surroundings of a measurement site. Within the framework of the EU project GEOmon an effort is undertaken to harmonize and validate datasets of the trace species $O_3$, $NO_2$ and CO originating from different regional, national and European air quality networks (e.g. EMEP, GAW). While a focus is given on the provision of quality assurance and quality control metadata, calibration scale problems will also be identified and corrected, to derive a dataset for which observations and their trends are readily inter-comparable between different sites throughout Europe.
Observations also greatly depend on the representativeness of a site (e.g. background vs. urban site). However, different air quality networks use different definitions for categorizing measurement sites and often an objective criterion does not exist at all. Therefore, it is one aim of GEOmon to develop criteria on which sites can be categorized and to apply these to a selected subset of regional, national and European air quality ob-servation sites. Besides the local environment of a site also the larger scale 'catchment area' (defined here as geographical areas with predefined air mass residence time) influences observations of species with life-times larger than a few hours. Both need to be characterized to yield useful information for inter-comparing data and trends between sites, but also for inter-comparison with remote sensing data and for data assimilation in air quality models.
In this study we analyzed 30 ground based sites covering the European continent. We used backward Lagrangian Particle Dispersion Modelling to identify 'catchment ar-

eas' for individual sites. Representativeness was then analysed using high resolution source and sink proxy data within each catchment area. Furthermore, trace gas concentrations were calculated from the LPDM results and available emission inventories and compared to the measurements, again with a focus on site characterization. Sites were classified as belonging to different categories of representativeness based upon threshold values. These present a harmonized and comprehensive site categorization approach that facilitates the understanding of diverse trace species trends as observed at the selected sites.