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2017



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Keywords: Biogenic SOA, Source apportionment, Chemical tracers, Air mass surface exposure

## Introduction

Biogenic secondary organic aerosol (BSOA) is formed by photo-oxidation of biogenic volatile organic compounds (BVOCs). BSOA has been shown to dominate over combustion aerosol during summer in temperate regions (Genberg et al, 2011; Yttri et al, 2011). However, the connection between BVOC precursor emitting vegetation types and measured BSOA compounds are poorly explored. Coniferous forest, deciduous forest, arable land and pastures are all examples of potential BVOC sources. Information on specific land surface type BVOC and BSOA emissions is potentially crucial if an increased understanding should be reached on how land-use changes will affect organic aerosol levels and composition.

## Methods

Aerosols were collected on filters using a high volume sampler with 24 h time resolution at the Vavihill measurement station located in the rural areas of southern Sweden during June and July 2012. The filters were analysed for SOA compounds such as carboxylic acids, organosulfates (OS) and nitrooxy organosulfates (NOS) (see Nguyen et al, 2014).

Filter measurements were then connected to land surface types using the FLEXPART model. For each measurement a footprint was calculated, and convolved with the CORINE high-resolution map of land surface types in the European Union, in order to provide an estimation of the potential influence of each surface type on each measurement.

## Conclusions

A total of 9 carboxylic acids, 11 OS and 2 NOS of anthropogenic and biogenic origin were quantified in the samples. 9 surface types with the largest contributions to air mass surface exposure were selected for further analysis. A 10$^{th}$ category named "Other" was created to contain the reminder 34 surface types. Of these, the "Sea and Ocean" surface type dominated the overall exposure with an average of 56%. The second surface type exposure were from "Non-irrigated arable land" (19%).

A principal component (PC) analysis was performed in order to connect measured chemical compounds to surface types. The quantified compounds could be derived from four possible precursor sources: anthropogenic, fatty acids, isoprene and monoterpene. Hence, a 4 PC VARIMAX rotated solution was chosen. This solution explained 80% of the total variance.

PC1 accounted for 49% of the variance and had strong positive contributions from several monoterpene derived compounds. "Coniferous forest" was the strongest most contributing surface type to this PC, suggesting that monoterpenes are derived from conifer forest.

PC2 accounted for 15% of the variance and may be classified as surface categories with low contribution to measured BSOA compounds. Among these we found "Sea and ocean", "Non-irrigated arable land" and "Pastures". None of the measured compounds showed any contribution.

PC3 accounted for 9% and had strong contributions from three carboxylic acids. "Broad leaved forest" had the highest contribution suggesting that these three compounds may origin from this type of forest.

Finally, PC4 accounted for 7% but was harder to interpret than the other three PCs. This study demonstrates a methodology where it is possible to connect single chemical tracer compounds to surface categories. This application of the FLEXPART model allows investigations on how changes in land-use may affect organic aerosol composition.

This work was supported by The Swedish Research Council FORMAS (project 2011-743) and CRAICC Nordic Centre of Excellence.

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