Biogenic aerosol formation in the boreal forest

Fact Sheet

Project information

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FP4-ENV 2C

Coordinated by:
UNIVERSITY OF HELSINKI
Finland

Objective

The main objectives in BIOFOR project are:
1. To determine formation mechanisms of aerosol particles in the boreal forest site
2. To verify emissions of secondary organic aerosols from the boreal forest site, and to quantify the amount of condensable vapours produced in photochemical reactions of 'biogenic volatile organic compounds' (BVOC) leading to aerosol formation.

To fulfil the objectives following tasks will be carried out:

In task 1 continuous long-term measurements of submicron and ultrafine aerosol particle size distributions, their vertical net flux and relevant background data are performed in the SMEAR II station (southern Finland; Scots pine stand). Size distributions are measured by two differential mobility particle sizers and the flux by eddy covariance technique. Background data consists of meteorological quantities (including radiation) and vertical profiles of several inorganic gases. In addition, the states of vegetation (level of photosynthesis) and soil (temperature, water content and bacterial and mycorrhizal activity) are determined. In SMEAR II station the formation and growth of natural, biogenic aerosols can be measured and be connected to the function of trees and soil. The local formation rate of particles and the fate of newly formed particles will be identified. Task 1 includes also data evaluation and data delivery.

In task 2 three intensive field campaigns will be arranged in order to determine the concentrations and vertical profiles of organic and inorganic gases possibly acting as precursors of aerosol particles. Also the vertical profiles of aerosol size distribution, hygroscopicity of aerosol particles and nucleation potential of aerosol particles will be measured. Radio soundings to evaluate meteorological conditions in the planetary
boundary layer will be carried out. Task 2 also includes the preparation of measurements, calibration of instruments, data evaluation and data delivery. The comparison of evaluated data and models will be an essential part of Task 3. In this task the overall view of gas phase chemistry and aerosol formation and dynamics as well as the linkage to biological activity (level of photosynthesis and emissions from trees and soil) is formed. Lagrangian models combined with long-range trajectory analysis will be used.

Programme(s)

**FP4-ENV 2C - Specific programme of research and technological development in the field of environment and climate, 1994-1998**

Topic(s)

**01020102 - Tropospheric physics and chemistry**

Funding Scheme

CSC - Cost-sharing contracts

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