Project Database of ICP Forests
PROJECT DESCRIPTION

PROJECT INFORMATION

Project title: Atmospheric Deposition: EMEP - ICP Forests comparisons of level, trend and canopy exchange

Project ID: 76

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This data request includes three studies that aim on comparing ICP Forests and EMEP deposition estimates with slightly different purposes.
The objectives of the three studies are:

a. Comparison of measured ICP Forests bulk and throughfall deposition with modelled EMEP (50 x 50 km grid model and if agreed also the 7 x 7 km grid) for the years 2010-11 (Lead: Aldo Marchetto)
b. Comparison of temporal trend of EMEP model, EMEP measurements and ICP Forests bulk and throughfall deposition measurements (Lead: Hilde Fagerli).
c. Comparison total deposition estimates calculated with canopy budget models based on ICP Forests level II bulk, throughfall and stemflow measurements (Lead: Peter Waldner).

Deposition of acidifying compounds, nitrogen as a nutrient and base cations to forests in Europe is a major driver for many processes in forests. Level and temporal trend of deposition is often used as a driver variable in analyses of cause effect relationships within the measurement data from ICP Forests Level I and Level II plots. Comparison of levels and trends for measured (ICP Forests) and modelled (EMEP) data are relevant for assurance of quality as well as for extrapolation and mapping purposes.

The methods used in this study will be:

1. Comparison of ICP Forests deposition measurements with deposition derived from EMEP models
   - Mean annual or monthly values of the years 2010-2011 of bulk deposition and throughfall+stemflow measurements will be compared to EMEP estimates for wet and total deposition of the EMEP model using inverse distance weighting to smoothen grid boarder effects.
   - Using of information from QA/QC forms and Laboratory Intercalibration Working Ring Tests (WRT) to classify the dataset in order to repeat the analyses for all and selected high quality datasets only.

2. Comparison of temporal trends of EMEP measurements, models and ICP Forests Measurements.
   - Temporal trends will be calculated using the Seasonal Mann-Kendall (Hirsch et al. 1982) and Partial Mann-Kendall (Libiseller & Grimvall, 2002) trend analyses techniques and Sen's (1968) slope. Regional patterns of trend estimates will be compared using adequate aggregation and visualization methods.

3. Comparison of Canopy budget models
   - Calculation of the total deposition based on various canopy budget models suggested in literature (e.g. de Vries et al. 2001, de Vries et al. 2003, Daaijers 1995, Johnson and Lindberg 1992, Lovett and Lindberg 1993, Ulrich 1983, van der Maas & Pape 1991) will be performed and compared.

ICP Forests data

The investigations will be carried out using the Aggregated Deposition Dataset of ICP Forests or a draft version of this aggregated set.

Publications of results

It is the intention to write three joint publications with the experts that were responsible for the deposition measurements in the countries (in accordance with the ICP-Forests Intellectual Property Policy).

References

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