



## **Effect of N-deposition on long term soil acidification simulations of forest ecosystems in Germany**

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Acidification of forest soils has been a big issue in the mid 70s of the last century due to an immense output of sulphur by the industry and of course also by nitrogen, leading to forest decline and a shift in biodiversity. The deposition peaked during the 1980s and a number of conventions (e.g. Gothenburg Protocol) have been signed, agreeing to reduce industrial emissions.

Today, the sulphate deposition has been reduced significantly due to the use of filter systems by the industry, whereas nitrogen depositions ( $\text{NH}_4$ ,  $\text{NO}_3$ ) are still on a high level (ca.  $40 \text{ kg N ha}^{-1} \text{ yr}^{-1}$ ).

In this study, a soil acidification submodule based on SAFE (Soil Acidification of Forest Ecosystems) has been implemented into the Modular Biosphere Simulation Environment (MoBiLE). MoBiLE is a model framework already capable to simulate N and C turnover in forest ecosystems and associated nutrient losses e.g. N leaching and trace gas emissions ( $\text{CO}_2$ ,  $\text{N}_2\text{O}$ ,  $\text{NO}$ ,  $\text{N}_2$ ,  $\text{CH}_4$ ). The aim of the study is to investigate the impact of elevated atmospheric N deposition on forest acidification and eutrophication.

This will be done retrospectively for the years 1920-2000 and by application of future deposition and climate scenarios (A1B, B1) for the years 2000-2030, the latter especially with respect to the evaluation of the recovery potential of forest ecosystems.

Long term soil acidification simulation results of German Level II sites are shown as well as model sensitivity studies. Furthermore, first results of the linkage between MoBiLE, the BERN model and a stochastic ecosystem type model to address N-deposition effects on biodiversity will be demonstrated.