Denitrification as a part of the calculation of critical loads

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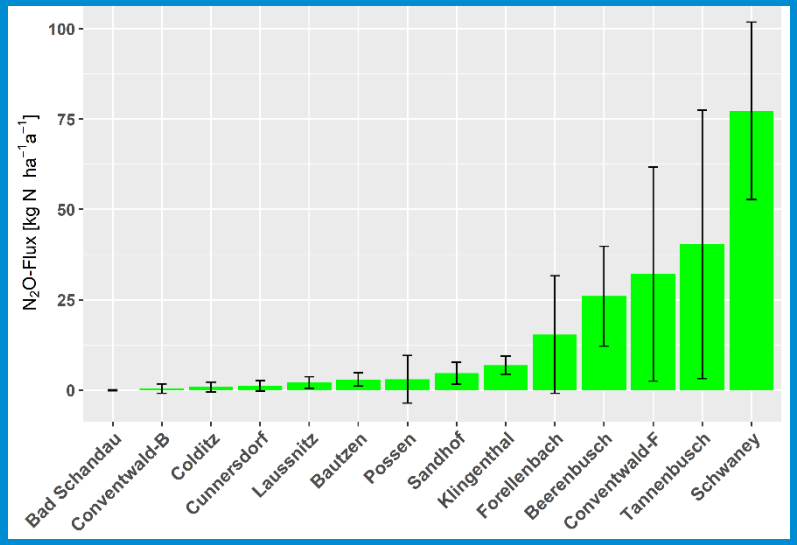


36th ICP M Task Force Meeting

21.04.2020

Comparison of calculations in Europe and Germany

- Revision of input parameter denitrification of the CL-calculation

$$CL_{nut}(N) = N_u + N_i + \mathbf{N_{de}} + N_{le}$$

$$CL_{nut}(N) = N_u + N_i + \frac{N_{le(acc)}}{1 - f_{de}}$$

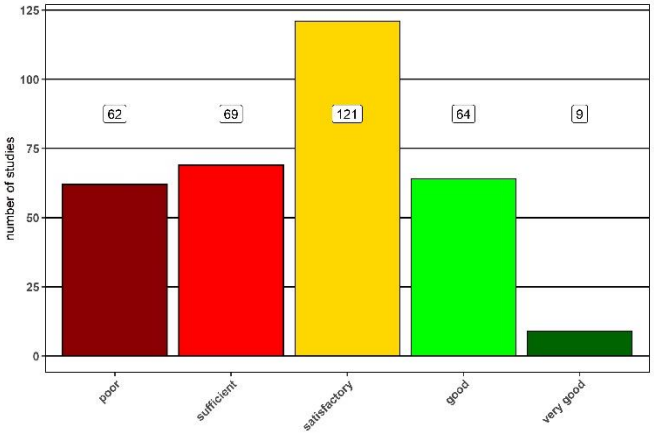
Drainage status	Excessive	Good	Moderate	Imperfect	Poor	Very poor
f_{de}	0	0.1	0.2	0.4	0.7	0.8

Europe (CLRTAP 2017)

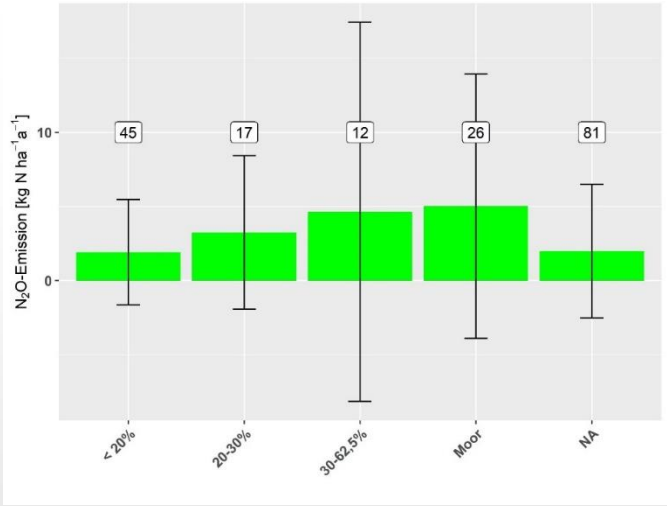
Clay content [%]	f_{de}
< 10,5	0,1
> 10,5 - < 20,0	0,1
> 20,0 - < 25,0	0,2
> 25,0 - < 30,0	0,2
> 30,0 - < 37,5	0,3
> 37,5 - < 45,0	0,3
> 45,0 - < 52,5	0,3
> 52,5 - < 57,5	0,3
> 57,5 - < 62,5	0,3
> 62,5 - < 70,0	0,5
> 70,0	0,5

Germany (Schlutow et al. 2019)

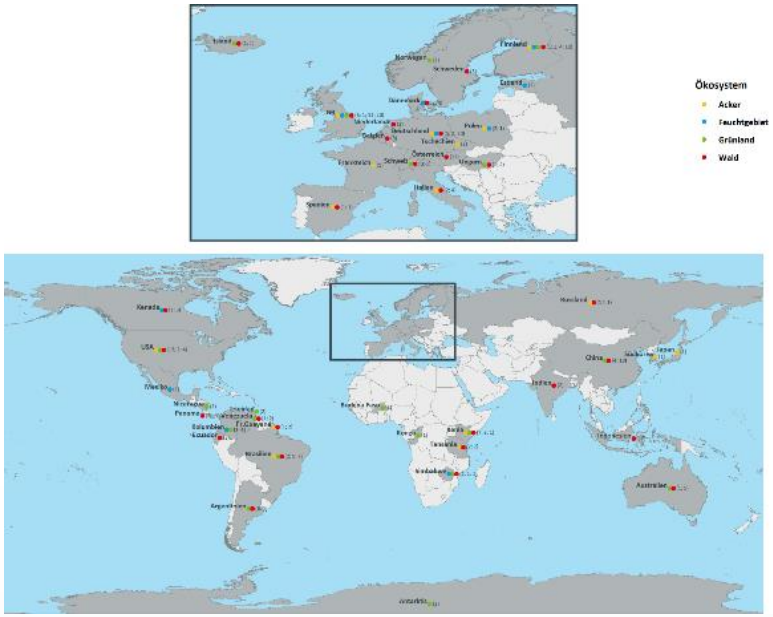
Literature study
Quality of studies and correlations with clay content



Quality of used studies



N_2O emissions from forest soils in temperature climate for different clay contents



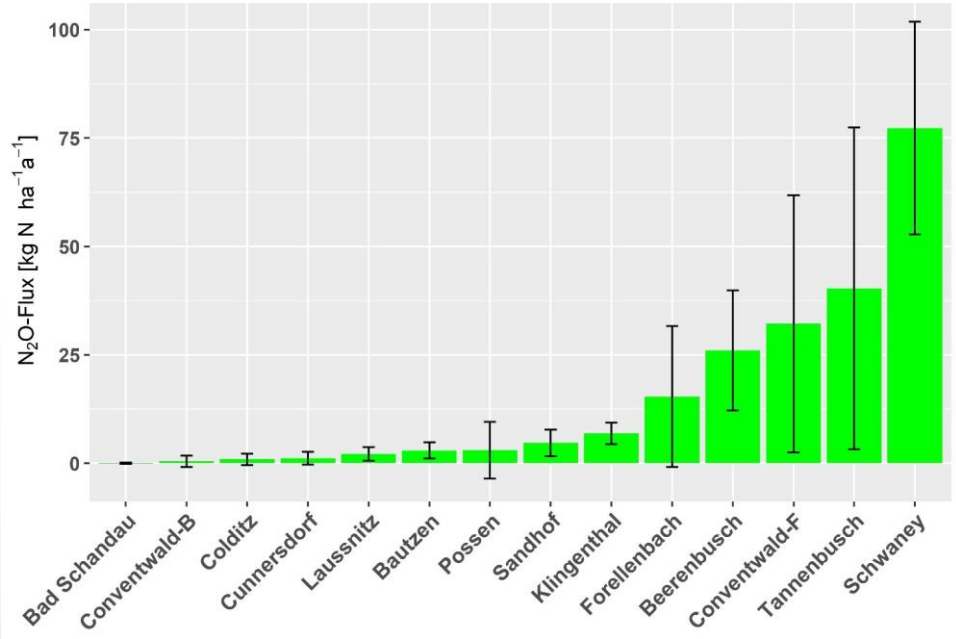
Global distribution of N_2O studies

Laboratory study
Measurement techniques

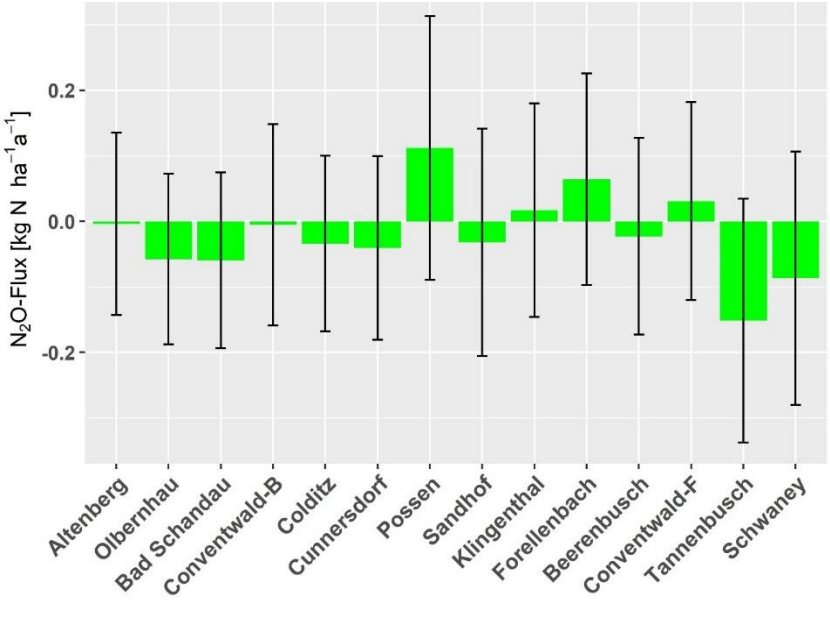
- **N_2O**, CH_4, CO_2
  - Different temperature and moisture levels
  - Disturbed and undisturbed soil cores
  - Ambient air as carrier gas

Laboratory study
Results

N_2O emissions of **disturbed** samples from German forest sites at 20°C and 90 % WFPS



N_2O emissions of **undisturbed** samples from German forest sites at 20°C and 90 % WFPS



Open questions

- Are different denitrification factors required for forest mineral soils depending on clay content?

or

- Is drainage status sufficient?