

Final Report

Workshop 16/11-18/11, 2010: Antwerp, Belgium

C cycling and GHG fluxes in forests as affected by N deposition

Organizers:

- Terrabites, COST ES0805 (Ivan Janssens, Kim Pilegaard)
- BurnOut, COST 639 (Robert Jandl)
- GHG Europe (Andreas Ibrom)
- NinE (Jan-Willem Erisman)

Aim:

The main aim of the workshop was to synthesize current knowledge on how nitrogen affects GHG budgets of European forests. For this purpose, a number of people were invited to give short keynote presentations on pre-defined topics, which would inspire subsequent discussions.

Results:

- 1) A synthesis review paper is currently being written by Kim Pilegaard (still in progress).
- 2) We discussed the possibilities for a joint project on this topic. It was decided to aim for a Eurocores project, but now this is no longer possible. An alternative would be to go for a Marie Curie ITN.

Workshop programme:

Time:

16/11 12:00 – 18/11 15:30

Programme:

16/11-----

Plenum

12:00 – 13:00: Arrival and sandwich lunch

13:00 – 13:15: Introduction to workshop (*Kim Pilegaard*)
13:15 – 13:45: Introduction to the topic (*Ivan Janssens*)
13:45 - 14:00: Discussion
14:00 – 14:20: N input (deposition) (*Camilla Geels*)
14:20 – 14:40: N accumulation in ecosystems (*Per Gundersen, Paul Jarvis*)
14:40 – 15:00: N effects on tree growth (*Sune Linder/Peter Högberg*)
15:00 – 15:30: Coffee/Tea
15:30 – 18:00: Group sessions 1 (1a, 1b, 1c)
18:30 - 19:30: Small dinner (paid by each participant)
19:30 – 20:00: Transport by tram;
20:00 - ??:??: Hands on workshop on aspects of applied microbiology (beer tasting)

17/11 -----

Plenum

09:00 – 09:20: N effects on GHG emissions from soils (*Sophie Zechmeister-Boltenstern*)
09:20 - 09:40: N effects on N and C accumulation in European forest soils (*Wim de Vries*)
09:40 – 10:00: N effects on NEE / NBP (*Federico Magnani/Sebastian Luysaert*)
10:00 – 10:30: Coffee/Tea
10:30 – 13:00: Group session 2 (2a, 2b)
13:00 – 14:00: Lunch break

Plenum

14:00 - 14:20: Modeling nitrogen effects on canopy photosynthesis (*Andreas Ibrom*)
14:20 - 14:40: Continental scale modeling (*Sönke Zaehle / Philippe Ciais*)
14:40 – 15:00: Overall implications (collection of important aspects, Lead *Paul Jarvis*)
15:00 – 15:30 coffee break
15:30 – 18:00 groups session 3 (3)
18:15: 30-min walk through city center to restaurant;

19:00: Sponsored dinner

18/11-----

Plenum

09:00 – 10:00: Groups deliver paragraphs for manuscript and potential display items

10:00 – 10:30: Coffee break

10:30 - 12:00: Group reports continued

12:00 – 13:00: Lunch

13:00 – 14:00: Manuscript structuring, tasks and deadlines

14:00 – 15:00: Joint proposals (EUROCORES, Marie Curie Training Networks) and overview of databases

15:00 – 15:30: Coffee and departure

Group discussions (Names underlined were rapporteurs)

1a N input

European N deposition estimates: temporal development and spatial variation:

Camilla Geels

Fertilization of forests and plantations:

Rossella Guerrieri, Peter Högberg, Robert Jandl, Sune Linder, Federico Magnani, Elena Vanguelova,

1b N output

Gaseous N emissions:

Mari Pihlatie, Kim Pilegaard, Sophie Zechmeister-Boltenstern, Donatella Zona,

Leaching of N:

Wim de Vries, Per Gundersen, Peter Högberg, Dries Huygens, Mari Pihlatie, Jeroen Staelens, Elena Vanguelova,

1c N accumulation

N saturation:

Per Gundersen, Peter Högberg, Elena Vanguelova,

Observations of N stock changes and variation in C/N ratio (feedback via higher quality litter):

Per Gundersen, Paul Jarvis, Michiel van der Molen, Elena Vanguelova,

Decomposition:

Per Gundersen, Dries Huygens, Paul Jarvis, Elena Vanguelova, Sophie Zechmeister-Boltenstern,

2a N effects on tree growth and ecosystem carbon budgets

N effects on C allocation and export to mycorrhizae:

Peter Högberg, Dries Huygens, Ivan Janssens, Janne F. J. Korhonen, Sune Linder, Elena Vanguelova, Sophie Zechmeister-Boltenstern,

N uptake by trees: canopy uptake vs root uptake:

Janne F. J. Korhonen, Federico Magnani, Mari Pihlatie, Jeroen Staelens, Elena Vanguelova,

N effects on photosynthesis and autotrophic respiration:

Katrin Fleischer, Rossella Guerrieri, Peter Högberg, Andreas Ibrom, Sune Linder, Michiel van der Molen

N effects on growth:

Wim de Vries, Per Gundersen, Janne F. J. Korhonen, Sune Linder, Federico Magnani, Elena Vanguelova

N effects on NEE / NBP:

Andreas Ibrom, Sebastiaan Luyssaert, Federico Magnani, Michiel van der Molen, Sönke Zaehle,

2b N effects on GHG emissions from soils and carbon sequestration

N₂O emission:

Wim de Vries, Daniela Kracher, Mari Pihlatie, Sönke Zaehle, Sophie Zechmeister-Boltenstern, Donatella Zona,

CO₂ emission:

Wim de Vries, Per Gundersen, Peter Högberg, Ivan Janssens, Sune Linder, Mari Pihlatie, Kim Pilegaard, Mirco Rodeghiero, Michiel van der Molen, Sönke Zaehle, Sophie Zechmeister-Boltenstern, Donatella Zona,

Soil C stock changes:

Peter Högberg, Sune Linder, Sebastiaan Luyssaert

Microbial community / soil biota changes in response to N deposition:

Per Gundersen, Peter Högberg, Dries Huygens, Jeroen Staelens, Sophie Zechmeister-Boltenstern,

3 Upscaling and implications

Modelling: process based:

Katrin Fleischer, Robert Jandl, Andreas Ibrom, Daniela Kracher, Federico Magnani, Michiel van der Molen, [Sönke Zaehle](#)

Modelling: continental scale:

Wim de Vries, Camilla Geels, Daniela Kracher, Sönke Zaehle,

Overall implications of additional N in forests on C cycling and GHG budgets:

[Wim de Vries](#), Katrin Fleischer, Per Gundersen, Andreas Ibrom, Ivan Janssens, Sune Linder, Federico Magnani, Kim Pilegaard, Elena Vanguelova, Sönke Zaehle, Sophie Zechmeister-Boltenstern, Donatella Zona,

List of participants

	NAME	AFFILIATION	E-MAIL
1	Ivan Janssens	University of Antwerp, Belgium	ivan.janssens@ua.ac.be
2	Kim Pilegaard	Risø DTU, Denmark	kipi@risoe.dtu.dk
3	Camilla Geels	NERI, Denmark	cag@dmu.dk
4	Saulius Marcinkonis	Lithuanian research centre for Agriculture and Forestry	saulius.marcinkonis@voke.lzi.lt
5	Andreas Ibrom	Risø DTU, Denmark	anib@risoe.dtu.dk
6	Sebastian Luysaert	LSCE, France	sebastiaan.luysaert@lsce.ipsl.fr
7	Per Gundersen	Forest & Landscape, Denmark	pгу@life.ku.dk
8	Peter Högberg	SLU, Sweden	Peter.Hogberg@sek.slu.se
9	Federico Magnani	University of Bologna	federico.magnani@unibo.it
10	Sune Linder	SLU, Sweden	sune.linder@ess.slu.se
11	Paul Jarvis	University of Edinburgh, UK	margaretsjarvis@aol.com
12	Michiel van der Molen	Wageningen University, The Netherlands	michiel.vandermolen@wur.nl
13	Sophie Zechmeister-Bolstenstern	BFW, Austria	sophie.zechmeister@bfw.gv.at
14	Daniela Kracher	MPI Meteorology, Germany	daniela.kracher@zmaw.de
15	Rosella Guerrieri	University of Edinburgh, UK	Rosella.Guerrieri@ed.ac.uk
16	Wim de Vries	Alterra, The Netherlands	Wim.devries@wur.nl
17	Katrin Fleischer	Vrije Universiteit, The Netherlands	katrin.fleischer@falw.vu.nl
18	Mari Pihlatie	KIT, Germany	mari.pihlatie@helsinki.fi

19	Jeroen Staelens	Ghent University, Belgium	Jeroen.Staelens@UGent.be
20	Dries Huygens	Ghent University, Belgium	Dries. Huygens@UGent.be
21	Janne Korhonen	University of Helsinki	janne.fj.korhonen@helsinki.fi
22	Sönke Zahle	MPI Biogeochemistry, Germany	szaehle@bgc-jena.mpg.de
23	Zona Donatella	University of Antwerp, Belgium	Donatella.Zona@ua.ac.be
24	Elena Vanguelova	Forest Research, UK	elena.vanguelova@forestry.gsi.gov.uk
25			
26			
27			
28			
29			