

**Ongoing INTERNAL analyses, evaluations and possible publications based on ICP Forests data (as per 5 May 2013)**

No.	Exp - Pan.	shortName	Responsible persons	Title	STATUS	interested in participation (insert your name and potential contribution that you could give to this study)	web-group	End date	Hypothesis being tested, reserach question
		<b>Single suveys, descriptive</b>							
1	meteo	PhenoData	Ursa Vilhar (SI)	Pheno data verification and descriptive analysis		Comment: CH has additional data that is currently streamlined (contact: Anne Thimonier)			overview on data (which countries have sent the data, which years, what kind of data etc.)
2	foliage	LitterData	Liisa Ukonmaanaho (FI)	Litterfall data verification and descriptive analysis.	basic data work ongoing	Comment: CH has additional data that is currently streamlined (contact: Anne Thimonier, Peter Waldner), Flanders has send additional data in April13			overview on data (which countries have sent the data, which years, what kind of data etc.)
3	soil	SoilData	Nathalie Cools (BE)	Aggregated key soil parameters for Level II plots	aggregted soil data now availableon web. Presentation in Belgrade conference	Heike Fortmann, Germany: heike.fortmann@nw-fva.de, Lorenz Waltherth CH (expertise) and Stefan Zimmermann CH (expertise site Davos), Peter Waldner (finalize submission of CH soil data)			

4	depo	DepoTrends	Peter Waldner (CH)	Deposition trend analyses in Europe	work is done, published in ICP Forests reports, update for 2013 reports, base cations will follow, work on detection limits will follow, publications under preparation, dec 2012 and June 2013	Anne Thimonier, Maria Schmitt (ch), Aldo Marchetto, Michela Rogora (it), Karin Hansen (se), Daniel Zlindra (si), Oliver Granke (PCC), Daniel Zlindra (sl), Nicolas Clarke (no), Arne Verstraeten (be), Andis Lazdins (lv), Claus Schimming (de), Carmen Iacoban (ro), Antti-Jussi Lindroos (fi), Elena Vanguelova, Sue Benham (uk), Henning Meeseburg (de), Manuel Nicholas (fr), Anna Kowalska (pl), Vladislav Apuhtin, Ulle Nappa (ee), Zora Lachmanová (cz), Gunilla Pihl-Karlsson (se), Markus Neumann (at), Morten Ingerslev (dk), Juan Molina (es), Walter Seidling, Uwe Fischer (de), Richard Fischer, and Martin Lorenz.	Y	2013	1) Detection of deposition trends depends on the trend analyses techniques used in analysis; 2) For longer time series of continuous deposition measurements smaller trends can be detected than for short or non-continuous measurements; 3) Emission reduction measures have led to a decrease of throughfall deposition of sulphate and nitrogen
5	depo	Stemflow	Peter Waldner (CH)	The contribution of stemflow to total deposition	presentation in Belgrade Conference	Karin Hansen (se), Arne Verstraeten (be), Anne Thimonier (ch), Mitja Skudnik, Daniel Zlindra (si), Henning Meeseburg (de), Aldo Marchetto (it), Mathieu Jonard (be), Zora Lachmanova (cz), Miklos Manninger (hu), Richard Fischer (pcc),	Y	2013	The aim of the project is to gain knowledge on the relations between stemflow and throughfall and its relevance for the calculation of total deposition with the currently used canopy budget models.
6	depo	sample storage	Karin Hansen (SE)	Effects of storage in field and in laboratory on temperature, light and chemistry of forest water samples	presentation in Belgrade Conference		Y		

7	depo	HarmonDepo	Daniel Zlindra	Do throughfall sampler size and shape matter in deposition measurements – a comparison between harmonized and national samplers	presentation in Belgrade Conference, work finalized publication planned				
8	soil	SoilSolutionData	Tiina Nieminen (FI)	Soil Solution data verification and descriptive analysis with specific regard to DOC	work is done, published in ICP Forests reports, update for 2013 reports, base cations will follow, work on detection limits will follow, publications under preparation, dec 2012 and June 2013	Elisabeth Graf Pannatier (expertise) and Peter Waldner (data checking and evaluation techniques)			
9	soil	SoilSolutionTrends	Elisabeth Graf Pannatier (CH)	Soil solution trend analyses in Europe	Presentation in Belgrade Conference	Elena Vanguelova (UK), Peter Waldner (data checking techniques)	Y	??	see above "Deposition trend analyses in Europe" of Peter Waldner. Same approach
10	foliar	FoliarData	Pasi Rautio (FI)	Foliar data verification and descriptive analysis	spatio-temporal trends study in June 2012, quality problems in data	Anne Thimonier, Maria Schmitt, Peter Waldner CH (expertise)			

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		integrated							
14	depo	NExceedanceEffects	Peter Waldner / Anne Thimonier (CH), WPs: Aldo Marchetto, Marco Ferretti, Elisabeth Graf Pannatier	Biological effects of critical load exceedances of N in European forests (Based on paper by Thimonier et al., 2010 and an analyse of Italian Crown Conditioni data)	work done, published in Forest Condition Reports, publication planned, perhaps repetition with new and soil data	A. Thimonier, E. Graf Pannatier, A. Marchetto, M. Ferretti, M. Calderisi, P. Rautio, K. Derome, T. Nieminen, S. Nevalainen, A.-J. Lindroos, P. Merilä, G. Kindermann, M. Dobbartin, M. Neumann, N. Cools, B. de Vos, P. Roskams, K. Hansen, H.-P. Dietrich, R. Fischer, O. Granke, S. Iost, M. Lorenz, S. Meining, H.-D. Nagel, P. Simoncic, K. v. Wilpert, H. Meesenburg, A. Verstraeten, S. Nevalainen, T. Scheuschner, M. Ingerslev, S. Raspe	Y	2013	1) Trees will respond to high deposition of N and CL exceedances; higher growth, higher defoliation, higher N foliar contents and higher N leaching.
15	depo	Na/ClRatios	Karin Hansen (SE) /Anne Thimonier (CH)	The Na/Cl in throughfall in forests throughout Europe (based on paper by Thimonier et al, 2008)	Karin started work based on Waldner data, finish in 2013	Endla Asi, Ylle Napa, Peter Waldner (data preparation)	Y	End 2013	1) A portion of Na/Cl ratios in throughfall in Europe fall outside the recommended range of 0.5-1.5. 2) Leaching of Na and Cl from forest canopies do occur in the autumn or spring. 3) Leaching is highest from deciduous tree species.
16	depo	NRetention	Karin Hansen (SE) / Stephan Raspe (DE)	Do indicators of N retention and leaching differ between coniferous and deciduous tree species in Europe (Based on a paper by Gundersen et al., 2009)	waiting for water budgets ...	Peter Waldner CH (comparision to study of about 40 sites in Switzerland. Comment: I suggest to also invite Sabine Braun, ICP Vegetation CH, to participate), Anne Thimonier CH (expertise for explaining factors). Elisabeth Graf Pannatier (soil solution and water balance modelling)		2013	1) Lower N deposition in broadleaved stands compared to coniferous stands is reflected as a similar difference in nitrate leaching; 2) differences in the input-output response between broadleaves and conifers are an effect of soil differences rather than differences in forest type; and 3) C/N-min is a better predictor of nitrate leaching than C/N-org, especially in broadleaved stands.

17	depo	CanopyBudget Models	Bernd Ahrends (DE), Henning Meeseburg	Impact of canopy structure on deposition	presentation at Belgrade Conference. Finalizing model development and starting with evaluation of model performance and article writing.	Anne Thimonier (CH) [we have measurements of effective LAI measured with a Licor LAI-2000 directly above our precipitation collectors - might be relevant for this study][study on spatial variability of deposition within the forest]		Dez 13	1) tree species effect on deposition, 2) impact of stand/canopy structure on deposition, 3) suitability of stand information for regionalization of deposition
18	depo	SBudgets	Elisabeth Graf Pannatier	Temporal trends of sulfur budget	waiting for water budgets ...	Peter Waldner - CH; J. Capuliak - Slovakia		? Dec 2015 ?	1) The decrease in sulfate deposition has led to a decrease in sulfate concentrations and fluxes in the soil solution from the topsoil. 2) Depending on the soil properties, there is a net loss of SO4 on an annual basis (output > input). 3) A decrease in element concentrations favours the desorption of SO4 4) the mobilization of SO4 from internal S sources leads to the mobilization of base cations and toxic Al.
19	depo	NandCbudgets	Elena Vanguelova (UK)		waiting for aggregated data	Inge Stupak, ism@life.ku.dk, Denmark (interested in contributing with knowledge on nutrient balances and additional biomass extraction, if useful). Anne Thimonier, Elisabeth Graf Pannatier, Peter Waldner, Lorenz Walthert, Matthias Dobbartin			evaluating the long term sustainability in our forest ecosystems, the N deposition or pollution recovery they could sustain (so very relevant to evaluate CL of N and acidity) and also in relevance to the sustainability for additional biomass extraction from our forest (e.g forest residue for biofuels).

20	foliar	Seed-C	Peter Waldner (CH)	Carbon allocation to fruits and seeds in European forests as a function of climate, atmospheric deposition and nutrient supply	Study idea presented at EP meeting Slovenia		Y	End 2014	(1) Climate change, such as increasing temperatures or drought stress might lead trees to changes fruiting years frequency (2) Allocation of biomass production, i.e. carbon, to stem increment, foliage production, root production, fruit/seeds production (3) These may have an effect on residence carbon in the trees and the c-sequestration of forests (not yet included in climate change models)
21	foliar	BaliticFoliage	Arta Bardule (LV)	Chemical foliar and litterfall contents as reference for chemical changes of charcoal and torrefied wood, after torrefaction in different temperatures	under development - maternity leave				
22	meteo	LAIRelations	Stefan Fleck (DE), Henning Meessenburg	LAI estimations with allometry, leaf litter collections, and optical measurements	work ongoing	Anne Thimonier (CH), Patrick Schleppi CH (LAI field protocol), Lorenz Walthert (comparison to CH study)		Jul 05	1) Allometric relationships for the main Broadleaf forest tree species in Europe are not constant. The variability is dependent on soil properties like field capacity or nutrient availability.

23	meteo	GreenHouseGases	Konstantin Olschofsky (DE), Volker Mues	Supporting green house gas inventories by modelling forest development with respect to management and climate change scenarios	delayed	Anne Thimonier, Elisabeth Graf Pannatier, Peter Waldner, Lorenz Walthert, Matthias Dobbertin (expertise in model validation)		End 2013	Climate sensitive forest growth models can be calibrated regionally on basis of long term monitoring data.
24	meteo	SoilWaterRetention	Stefan Fleck (DE), Henning Meesenburg, Bernd Ahrends, Markus Wagner	soil water retention curve evaluation	Soil Water data checked, solid soil data available, work ongoing	Jozef Capuliak, Slovakia, (in collaboration with Stephan and Bruno: pedotransferfunctions?), Lorenz Walthert CH (expertise of swiss soil data and water budget modelling)		Feb 13	1) To falsify: The Mualem-vanGenuchten functions is always sufficient to characterize soil water retention curves. 2) Regionally applicable pedotransfer functions for forest soils are (are not) suitable for a representative set of forest soils on the European scale. 3) To falsify: The impact of small scale spatial variability of water retention characteristics on the derivation of the Mualem-van Genuchten function is generally negligible
25	soil	NitLeach	Peter Waldner (CH)	Explore the mapping of nitrate leaching risk for Forests	Study idea presented at the EP meeting	Elisabeth Graf Pannatier, Sabine Braun, Lorenz Walthert, etc (CH), Stephan Raspe (DE)	Y	End 2015	Which of the nitrogen saturation indicators can be used to assess the risk of nitrate leaching, how can they be related to mapped data.
26	soil	SoilC/N	Nathalie Cools (BE), Bruno De Vos (BE)	Major factors explaining C:N ratios in European forest soils	progressing a publication submission end of Nov one of the Warsaw spec. Issue	Heike Fortmann, Germany: heike.fortmann@nw-fva.de. Lars Vesterdal (have already contributed to paper. Will continue to contribute to paper, particularly based on my knowledge of tree species effects on soil C and N.) Lorenz Walthert CH (expertise of CH soil data and C/N ratios), Elisabeth Graf Pannatier CH (only if soil solution is considered), Peter Waldner (ideas on how to consider tree species effects)		2012	1) Tree species are the dominant factor explaining C:N ratio both in forest floor and mineral soil (2) the impact of deposition on C:N ratio is marginal and (3) how valid is C:N index as an indicator for N imbalances in forest soils?



27	biodiv	CCN-Adapt	Markus Neumann, Thomas Dirnböck (Umweltbundesamt, Vienna)	Adaptation to Interactive Impacts of Climate Change and Nitrogen Deposition on Biodiversity	work started 2013			2016	Climate change and airborne nitrogen deposition exert strongly interacting effects. However, we do not know if adaptation measures which focus on climate change may be insufficient or even worsening.
28	soil	Soil solution and depo	Arne Verstraeten (BE)	impact of DOC deposition on soil solution DOC	Presentation in Slovenia 2013. project proposal is being worked out	Tiina Nieminen, Elisabeth Graf-Pannatier (soil solution data), Peter Waldner (deposition data), Johan Neiryneck, Maarten Hens, Peter Roskams, Bruno De Vos		End 2015?	DOC delivered by atmospheric deposition influences soil solution DOC trends and seasonal patterns
29	crown	IntegratedTree Vitality	Peter Roskams	effects of different climatic and soil related drivers on forest tree defoliation	some basic data work, delayed	Peter Waldner (temporal LAI evolution during an oak insect event)			
30	crown	ClimateEffects Growth	Tanja Sanders (DE)	drought stress effects, nutrition, management...effects on forest growth and carbon sequestration	pre-results send to co-authors, waiting for climatedata input	Lorenz Walthert CH, Anne Thimonier CH (DP, LF), Peter Waldner (DP, LF), Elisabeth Graf Pannatier CH (SS, water budget modelling).			1) Climate-growth (and general stress) reactions vary with nutrition status; 1) Biotic and abiotic disturbances modify nutrient cycling (e.g. Pitman et al. 2010); 2) Tree vitality can be expressed by growth and defoliation;
31	crown	predisposing factors of defoliation	Tanja Sanders (DE)	effect of AWC and dbh	paper in review	Peter Roskams, Peter Waldner, Rona Pitman, Pascale Weber, Walter Seidling			

32	crown	biotic occurrences	Tanja Sanders (DE)	biotic factors recorded with the survey and effects on defoliation as well as differences in distribution	Presentation in Warsaw; paper in prep.	Rona Pitman, Walter Seidling			
33	crown	Level_II_defoliation	Ferretti (IT)	Defoliation and nitrogen deposition in Europe: a study on four tree species within the ICP-Forests network	Presentation at Belgrade Conference	Marcho Calderisi, Aldo Marchetto (it), Peter Waldner (ch), and Anne Thimonier, Elisabeth Graf Pannatier (ch) and others (involved in Study on Ecological Effects and show(ed) interest to participate in this part emerging from that study)			investigate whether N deposition have some role in explaining the defoliation of four main tree species in Europe
34	crown	Level_I_defoliation	Fischer (DE)	What are the most important parameters affecting crown defoliation in European forests	Presentation at Belgrade Conference	Alessandra De Marco (IT) lead author, Marcello Vitale (IT)		End 2013	
35	growth	ECLAIRE	Spohia Etzold (CH)	Empirical assessment of the impacts of ozone, nitrogen and sulphur deposition on terrestrial carbon and greenhouse gas balances	Presentation at Belgrade Conference	Antti-Jussi Lindroos, Tiina Nieminen, Päivi Merilä, Pekka Nöjd (FI), A. Marchetto, Fabbio, A. Constantini, T. Sorgi (IT), Anne Thimonier, Elisabeth Graf Pannatier, Lorenz Walthert, Marcus Schaub, Maria Schmitt, Peter Waldner (CH)		2014	The aim of this project is to undertake an integrated analysis of existing datasets, augmented by additional measurements at experimental sites where required, to derive widely applicable quantitative relationships between N, S and O3 exposure and ecosystem carbon balance, accounting for differences in climatic data

36	biodiv	Level I related biodiversity evaluations based on new Level I data will be discussed at EP meeting in Freising June 2013	Roberto Canullo (IT)						
37	biodiv	Bioindicator Mosses	Mitja Skudnik (SLO)	Use of mosses as biomonitors for nitrogen and sulfur depositions in the forest environment	Presentation Belgrade conference	Note Anne Thimonier (CH): Collaboration with ICP Vegetation? Swiss ICP Forests LWF II plots are included in the European study by Harmens et al. 2011, Environmental Pollution 159: 2852-2860		2012	(i) with mosses as biomonitors it is possible to estimate the amount of N and S deposited into forest ecosystem, (ii) bioindication with mosses is comparable to some other bioindication methods as foliar analysis
38	biodiv	Bioindicator Lichens	Giordani (IT), Calatayud, Stofer, Seidling	Detecting the nitrogen Critical Loads (Levels?) on European Forests by means of epiphytic lichens. A signal-to-noise evaluation	publication accepted	Anne Thimonier CH (deposition measurements)		2012	It is possible to establish nitrogen Critical Levels and Critical Loads for European Forests, based on the relative diversity of functional groups of epiphytic lichens. Moreover, it is possible to quantify the independent effect of nitrogen pollutants against the background noise of other environmental predictors (mainly climatic variables).
39	biodiv	Bioindicators Lichens (II)	Giordani (IT)	Phylogenetic lichendiversity based on ForestBIOTa data	planning stage	lead: Sergio Pérez Ortega, CSIC Madrid			

40	biodiv	BioindicatorVascPlants	Maija Salemaa (FI), Raisa Mäkipää (FI)	Responses of plant species to climatic gradient in boreal and temperate forests in Europe	see EP Biodiv meeting	F. Malis, Slovakia		2013	Geographical distribution of plant species infers species' environmental requirements. Climate change likely acts as an important driving force to plant species distributions and community structure. Species that have narrow ecological niche along climatic gradient can be used as indicators of climate change in boreal (and temperate) forests.
41	AAQ	Ozoneflux	Marcus Schaub (CH) and Vicent Calatayud (ES)	Can data from ozone passive samplers and daily meteorological means be used for calculating ozone fluxes?	Presentation at Belgrade Conference	Martine Rebetez CH (Meteo data), Elisabeth Graf Pannatier (tensiometer, soil water content, expertise of water budget modelling), Peter Waldner (automatic soil water content)			It is possible to calculate ozone fluxes from passive samplers