

**WGE**

**CONVENTION ON LONG-RANGE  
TRANSBOUNDARY AIR POLLUTION**

***International Cooperative Programme on Modelling and Mapping  
of Critical Loads and Levels***

***and Air Pollution Effects, Risks and Trends***

***DRAFT CHAIR'S REPORT***

***of the***

***26<sup>th</sup> CCE Workshop and the 32<sup>nd</sup> meeting of the  
Programme Task Force***

***19<sup>th</sup> – 22<sup>nd</sup> April 2016 held at UBA, Dessau, Germany***

# TABLE OF CONTENTS

1. Introduction.....	3
2. Scientific sessions (CCE Workshop).....	4
2.1. Progress related to the Call for Data 2014 2015 .....	4
2.2. National contributions to effect-based work under the Convention (including the call for data).....	6
2.3. Experimental and modelling results of abiotic and biotic impacts of air pollution and climate change.....	7
2.4. Training session .....	8
3. Sessions related to the Convention Work plan .....	9
3.1. Integrated assessment and prospects of effects-based policy support .....	9
3.2. Update of the Mapping Manual.....	9
3.3. Collaboration in 2015-2016 under the LRTAP Convention .....	13
3.4. News from the Convention .....	14
3.5. 2016 – 2017 Work plan issues concerning WGE and ICP M&M.....	15
3.6. NFC tour de table.....	16
3.7. Meetings of interest to ICP M&M .....	16
4. Closure of the meeting.....	16
5. ICP M&M Task Force recommendations to the Working Group on Effects, discussed at the TF 32 <sup>nd</sup> meeting, Dessau, 20 <sup>th</sup> -23 <sup>rd</sup> April 2016.....	17
6. Annexes.....	19
6.1. Tour de table.....	19
6.2. List of participants to the meeting .....	21
6.3. Final agenda of the meeting .....	26

# 1. INTRODUCTION

63 delegates from the following 20 countries participated to the meeting: Austria, Belgium, Canada, Croatia, Czech Republic, Denmark, France, Germany, Iceland or Sweden, Italy, Norway, P.R. China, Poland, Russia, Serbia, Spain, Sweden, Switzerland, The Netherlands, United Kingdom, USA.

The ICP Vegetation, the ICP Waters, the ICP Forests, the Joint Expert Group on Dynamic Modelling, the Coordination Centre for Effects (CCE) were also represented. The list of participants is attached as Annex 1.

TF decisions were reviewed by the participants during the meeting. Presentations and posters were made available on the ICP M&M website ([www.icpmapping.org](http://www.icpmapping.org)).

Mr Markus Geupel (UBA) opened the meeting and provided organisational information, announcing the possibility of a visit of the UBA building including information on its energy and environmental efficiency and an option to join an excursion on Tuesday to SKW Stickstoffwerke Piesteritz GMBH. This facility accepted to offer an informative session and visit of the facility on research of methods that aim the fertilization of agricultural areas while limiting the leaching of nitrogen.

On behalf of Lilian Busse, director of Division II (*Environmental Health and Protection of Ecosystems*), Simone Richter, head of Department of the German Environment Agency (UBA), then welcomed the experts to the, in fact, 8<sup>th</sup> ICP M&M meeting ever organised in Germany, but the 1<sup>st</sup> meeting since UBA was moved to Dessau. She described the objectives and vision of UBA to protect human health and its environment as well as to detect environmental threats and assess them. Therefore, the role of UBA is closely linked to the ICP M&M activities. Nitrogen is an important issue, not only nationally in Germany, that is preparing a national policy to control this pollutant but also in Dessau and its location of nitrogen factories, both historically and presently. (close by, the 2<sup>nd</sup> nitrogen factory in the world was built in 1916 and the largest factory of ammonia in the world is 30 km away). Ms Busse stressed the importance of the work done to develop critical loads, to support the effect base policy of the LRTAP and of the EU. She acknowledged the importance of the ICP M&M work because critical loads remain exceeded in 67 % of the area and because critical loads are also of interest for Natura 2000 policy. She highlighted the importance of the work done by CCE and regretted that its funding was uncertain.

Mr Jean Paul Hettelingh, head of the CCE, and Ms Anne Christine Le Gall, the Chair of the Task Force, presented the objectives and structure of the workshop and of the task force meeting, addressing:

1. Latest findings in field- and laboratory experiments and through model assessments (VSD-PROPS; VEG; BERN,...) of (air pollution) impacts on plant species diversity
2. NFC-progress in response to the Call for Data 2015-2017 ([http://wge-cce.org/Activities/Call for Data](http://wge-cce.org/Activities/Call_for_Data))
3. Discussions (“training”) on practical issues regarding the modelling of plant species diversity in the context of the call for data.
4. Integrated assessment reports and studies on critical load exceedance or effects on biodiversity in natural areas caused by changes in (agriculture) emissions on specified spatial and temporal scales
5. Review of the Mapping Manual
6. ICP M&M - workplan 2016-2017 and other Task Force issues including reporting requirements to the second joint session of EMEP and the Working Group on Effects (September 2016).

They indicated that the discussion would focus on the results of the 2015-2016 call for data and on the development of effect-based work with particular attention for the modelling and monitoring of changes of biodiversity, for the review and revision of the Mapping manual and for the use of effect based information in integrated assessment, policy support and the upcoming publication of the Convention’s

Assessment Report. The last sessions of the meeting would be addressing network collaboration and organisational issues within the LRTAP Convention.

Jean Paul Hettelingh informed the meeting that the financial support for the CCE contribution to the LRTAP workplan for 2016-2017 was uncertain. Further information will be available later in 2016. Mr Hettelingh insisted that it was important that the tasks carried out by the ICP M&M network would be continued, in particular with respect to the adopted call for data 2015-2017. Ms Le Gall highlighted the essential role of the CCE as coordinator of that scientific network.

The TF adopted the minutes of the 31<sup>st</sup> Task Force M&M meeting (Zagreb, 20-23 April 2015) without modifications. Minor modifications were announced to the Agenda of the 2016 meeting (see annex II).

Markus Bernhardt-Römemann presented the relevance for ecosystem effects of nitrogen deposition, forest management and their interaction. He indicated that the difference between a history of low or high nitrogen preloading is that a change of biodiversity is driven by nitrogen deposition or management respectively.

## 2. SCIENTIFIC SESSIONS (CCE WORKSHOP)

### 2.1. PROGRESS RELATED TO THE CALL FOR DATA 2014-2015

Session chair: Jean-Paul Hettelingh.

Presentations were given by Jean-Paul Hettelingh, Max Posch, Hans-Dieter Nagel, Simon Rizetto, Dani Kurz, Jaap Slootweg.

#### **Summary of the discussion on the call for data**

Jean-Paul Hettelingh presented the objective of the call for data: derive nitrogen and sulphur critical load functions taking into account their impact on biodiversity as well as an opportunity for NFCs to update acidification and eutrophication critical loads. This session also included the presentation of preliminary results.

During the session, different model chains were presented, using different indicators leading to the Habitat Suitability Index. All converged towards the critical loads functions that were similarly built (with node points of CLSmax, CLNmin and CLNmax) as recommended by CCE.

The presentation of intermediate results highlighted progresses and a number of difficulties or uncertainties. Discussions were useful in the sense that knowledge and application experiences regarding (indicators for and modelling of) the change of biodiversity were shared and taken note of in lively debates. Altogether, the session enabled progress towards a common indicator in which confidence of the ICP M&M is likely to increase as methodological consensus further develops. This should provide NFCs with the information necessary to advise national policy on the quality of the biodiversity indicator that may become increasingly policy relevant on a European (Convention; EU) scale.

The following 16 countries indicated that they intended to respond to the call for data, either in updating their acidification and eutrophication database or/and in providing their contribution to the biodiversity critical load and the Habitat Suitability Index: Austria, Belgium (Wallonia), Croatia, Denmark, France, Germany, Ireland, Italy, the Netherlands, Norway, Poland, Russia, Serbia, Sweden, Switzerland, the United Kingdom.

Other parties were not yet in a position to inform whether to respond to the call (Canada, USA) while Flanders (Belgium) announced that it may consider to update its database in a few years.

France indicated that an unfortunate error had been made in its submission to the CCE of the French critical load database following the 2014-2015 call for data. France requested the possibility to remediate the error, and enable the CCE to implement the revision in the currently operational European critical loads database. This was agreed; the revised database will be implemented in the GAINS model in the course of 2016, as part of the collaboration between EMEP (IIASA-CIAM) and the WGE (RIVM-CCE).

**Different countries demonstrated that a variety of model chains, based on a similar logic, are available to assess N effects on biodiversity using suitable indicators (such as the Habitat Suitability Index, the Habitat Quality Index and the critical load (function) for biodiversity). The critical load function for biodiversity, was a common output of several of these model chains, potentially ensuring cross-border compatibility.**

---

*Summaries of presentations, as submitted by their authors to the ICP M&M chair.*

---

**Alternatives to relate indicator species to abiotic variables, Jaap Slootweg,**

The tentative application of generalised linear modelling with an aim to forecast the number of typical species from 'count data' (number of species) with known abiotic conditions did not yet yield a reliable 'number of species' indicator. The frequency of relevés in which specific 'typical species' occur turn out to be a function of pH and the C:N ratio that can support the use of the Habitat Suitability index.

**Progress in German response do the call for data 2015-2017 regarding biodiversity critical loads, Hans-Dieter Nagel, Angela Schlutow, Yolandi Bouwer**

With respect to the call for data 2015-17, the representative of the German NFC stated that critical loads of acidification and eutrophication will be renewed. He explained an approach to extend the critical load mass balance method to assess the impact on biodiversity. For this will be used specific vegetation depended limits (e.g. base saturation, C/N ratio, critical N concentration in soil solution) derived by the BERN model (see Schlutow et al. 2015).

**Using the phytoecological model and database EcoPlant to model the impact of climate change and atmospheric N deposition on French forest biodiversity, Simon Rizzetto, Salim Belyazid, Jean-Claude Gegout, Émilien Kuhn, Manuel Nicolas, Anne Probst**

Within the aims of the ongoing 2015 – 2017 Call for Data, the French NFC continues its work under the CLRTAP convention in the context of global change to regionalize the critical load of biodiversity and to calculate Habitat Suitability indices for French ecosystems. For that purpose, the dynamic models ForSAFE and Veg are linked to predict the vegetation and biodiversity evolution on a long time scale for French forest ecosystems under various global changes scenarios. As a first step, significant work of calibration and validation has been done at the site scale. The good correlations obtained between measured and modelled species covers, has given a strong result confidence that global changes and forest management are two main drivers of species evolution on long and short time scales, respectively. The upscaling of this modelling process from sites to ecosystems on the territory scale, needs to integrate new sites by the development of an automatic process. To spatialize the impacts of global changes on vegetation biodiversity on a large territory scale, we aim at coupling the ForSAFE model to a large dataset of relevés included in the phytoecological database *EcoPlant*. The species responses to various environmental

factors are predicted through Generalized Linear Model equations. First results show that species do not respond to the same driving factors depending on their own autecology. Simulating species responses on long time scale allows computing critical loads of biodiversity by using Habitat Suitability index. At the forest site scale, the results indicated that N atmospheric deposition rate influences site suitability over time but this trend is site dependant. This stresses that it is not possible to compare results between different sites; thus, HSi and critical loads of biodiversity will be performed at the habitat scale using typical vegetation species.

**An attempt to model biodiversity critical loads for forests in Switzerland with the VEG model Dani Kurz, Sabine Braun, Beat Achermann, Reto Meier**

The Swedish ground vegetation composition model Veg was re-parameterised using andolt's ecological indicator values as proxy for the plants' ecological niches and their quantification by means of essentially expert-knowledge-based assignment of value ranges of the underlying drivers. The revised version of Veg was applied in combination with VSD to 22 Swiss forest sites and produced reasonably coherent ground vegetation composition in response to changing drivers. On the other hand, current observed plant compositions could still not be reproduced on both, site level as well as regional level. Biodiversity critical loads were tentatively calculated with a combination of revised Veg and SMB. Their relevance, however, currently cannot be assessed due to the limited range of ecosystems tested and the lacking validation of the reliability of the Veg parameterisation.

## 2.2. NATIONAL CONTRIBUTIONS TO EFFECT-BASED WORK UNDER THE CONVENTION (INCLUDING THE CALL FOR DATA)

Session chair: Beat Achermann.

In the discussion it was noted that the term critical load for biodiversity may imply/suggest more ambition than it actually covers.

Presentations and discussions underlined that a number of modelling and data issues still remain to be addressed including interactions between N deposition, climate change and land use management.

Presentations were given by Ed Rowe, Tobias Roth, Jennifer Phelan, Ika Djukic, Kari Austnes.

---

*Summaries of presentations, as submitted by their authors to the ICP M&M chair.*

---

**Critical load functions: effects of uncertainties in biogeochemical and species responses and species choice, Ed Rowe, Simon Smart, Susan Jarvis, Pete Henrys, Chris Evans & Jane Hall**

The MADOC-MultiMOVE-HQI model chain has been used to calculate biodiversity-based critical load functions for ~400 Natura2000 sites in the UK, as a step towards calculating these functions for all UK 1km<sup>2</sup> gridcells with acid/nitrogen-sensitive habitats to respond to the Call for Data in 2017. Key uncertainties that need to be reduced are: whether and where nitrogen stimulates productivity; and which indicator-species should be included when calculating the overall habitat quality index.

**Estimating critical loads using change-point regression models, Tobias Roth**

In this work, we suggested that change-point models applied in a Bayesian context could overcome some of the difficulties when estimating empirical critical loads from gradient studies, such as accounting for confounding variables. We applied the methods to the national-scale plant species richness data from Switzerland. The estimated critical loads of nitrogen (N) deposition for alpine and subalpine scrubs were

similar to the approved empirical critical load assigned exclusively based on expert opinion, while for mountain hay meadows the estimated critical loads were at the lower range of the approved critical load range. Based on these results, we suggest to lower the upper range of the critical load of N deposition for mountain hay meadows.

**Critical Loads in the United States: Updates on NADP-CLAD and Biodiversity Critical Loads, Jennifer Phelan, Jason Lynch, Claire O’Dea, Tonnie Cummings, Chris Clark, Linda Geiser, Kevin Horn, Linda Pardo, and Sam Simkin**

The Critical Loads of Atmospheric Deposition (CLAD) Science Committee of the National Atmospheric Deposition Program (NADP) serves as the non-official United States (U.S.) National Focal Centre (NFC) for the ICP M&M. One of the products of CLAD is the U.S. National Critical Load Database (NCLD) which was the source of the critical load data submitted in response to the WGE-CCE call for data in 2011. Research conducted by CLAD members and other scientists in the U.S. contribute to the NCLD, and current critical load research that will be used to develop biodiversity critical loads for the U.S. includes empirical and modelled relationships between nitrogen (and sulphur) deposition and herbaceous, tree, and lichen responses. Critical loads of deposition have and will be developed from these relationships. Challenges encountered in these analyses have included: lack of sufficient data; confounding influences of unaccounted for variables; concerns regarding modelled processes and interactions between processes; and interactions between deposition and climate change.

**Interactive Impacts of climate change and nitrogen deposition on biodiversity in Austria, Ika Djukic, Thomas Dirnböck et al**

The aim of the study was to quantify the combined effect of the climate change and nitrogen deposition on the biodiversity in Austria by applying a twofold-approach (i) nitrogen and climate change risk maps in order to assess the single as well as combined climate and nitrogen risk to the habitats (ii) dynamic soil and plant modeling in order to shade more light on their interactive effects.

Our study shows that many habitats (especially alpine grasslands and Northern Alps) will experience combined pressure and that most of those sensitive habitats belongs to the EU’s Natura 2000 protection areas. We could show that the climate change can offset N deposition effects, albeit directly worsening that habitat quality. Moreover, the driest areas seem to be the most sensitive to N deposition.

However, the interactions between climate change and N deposition are complex and connect with high uncertainty so that further research and monitoring would be needed in order to be able to make more general conclusions.

**Present and future lake acidification status in Norway – nationwide MAGIC modelling update, Kari Austnes**

The MAGIC model has been re-calibrated and run with updated deposition scenarios for 990 lakes covering all of Norway. The objective was to get an update of current and future acidification level and to translate the results into acidification status according to the Water Framework Directive, to use in classification of unmonitored lakes. The results showed that there has been a marked recovery, and that lake acidification mainly occurs in the southwestern parts of Norway. However, it also showed that recovery is slow in the most acidified areas, where the lakes will still not have recovered by the end of the century.

## 2.3. EXPERIMENTAL AND MODELLING RESULTS OF ABIOTIC AND BIOTIC IMPACTS OF AIR POLLUTION AND CLIMATE CHANGE

Session chair: Maren Meyer-Grünefelt

Presentations were given by Werner Härdtle, Alexandra Bärhing, Seraina Basin, Vegar Bakkestuen, Christian Mulder, Todd McDonnell, Harald Sverdrup, Harry Harmens.

Professor W Härdtle gave a keynote presentation entitled: Global change impacts on ecosystems functions – the importance of interactive effects.

Presentations focused on field and lab experiments combining effects of climate change (changes of temperature and/or precipitation), and input ozone and nitrogen on long and short term horizons. Experiments addressed ways to disentangle synergetic and antagonistic causes of effects on biodiversity (fauna and flora).

---

*Summaries of presentations, as submitted by their authors to the ICP M&M chair.*

---

#### **Ecological Indicators for Increased Nitrogen Deposition in Coastal Heathlands, *Alexandra Bähring***

A four-year field experiment was conducted in a coastal dune heathland on the island of Fehmarn, Germany. Six different level of N fertilisation (0, 2.5, 5, 10, 20, and 50 kg N ha<sup>-1</sup> yr<sup>-1</sup>) were applied in addition to the total background deposition of 9 kg N ha<sup>-1</sup> yr<sup>-1</sup>, and the response of different ecosystem functions/variables was analysed with regard to their suitability as ecological indicator for increasing N availability. The current year's shoot increment of *Calluna vulgaris* and the C:N ratio of lichens of the genus *Cladonia* proved to be the best indicators for shifts in N availability, because these variables responded in the short term and to low-dose N additions (i.e. 5 kg N ha<sup>-1</sup> yr<sup>-1</sup>). Response variables also confirmed the current critical loads for N (10 - 20 kg N ha<sup>-1</sup> yr<sup>-1</sup>) for heathland ecosystems.

#### **Combined effects of low-level N deposition and climate change on subalpine pastures *Seraina Bassin, M. Volk, J. Fuhrer.***

Results were presented from a field experiment (2013-2017, Ardez, Switzerland), which enables to investigate in a subalpine grassland the interactive effects of N deposition (3 levels: 0, +3, +15 kg N ha<sup>-1</sup> yr<sup>-1</sup>), climate warming (6 levels: -1.2 up to +3.2°C, achieved by a transplantation along an elevation gradient) and two levels of water availability. At the highest deposition load (+15 kg N ha<sup>-1</sup> yr<sup>-1</sup>), but not yet at the lower load, N significantly altered the community composition, i.e. increased the proportion of sedges, but this effect was more pronounced at cooler sites irrespective of the irrigation treatment. This underlines the importance of considering climate change factors in the assessment and prediction of N impacts on ecosystems.

#### **Chemical footprints of anthropogenic N deposition on soil eco-networks, *Christian Mulder***

Nitrogen affects the biodiversity of plants, animals and microbes and influences the relationships between biodiversity, ecosystem functioning and ecosystem services. Besides the aboveground consequences for human welfare and health, more attention has to be drawn to the responses to N of soil food webs driving belowground processes, as many supporting, provisioning and regulating ecosystem services have a belowground origin.

#### **Exploring Coupled Dynamic Biogeochemical and Vegetation Models in Temperate Forest Ecosystems of the Eastern United States, *Todd MacDonell, Salim Belyazid, Luc Bonten, Chris Clark, Gert Jan Reinds, Tim Sullivan***

The VSD+-PROPS and ForSAFE-Veg models are being/have been applied at three sites located in temperate forests of the Eastern United States. The primary goals of these applications are to evaluate model input data availability, model performance, and results comparison between the two model chains. The VSD+ model was calibrated to observed soil C pool, N pool, CN ratio, pH, and base saturation. A PROPS database derived from US input data for species presence/absence and abiotic drivers has been produced. VSD+-PROPS model results for a set of deposition and climate scenarios between 1850 and 2100 have also been generated. The relevant range of N deposition used to derive the US PROPS models for the modeled species was built from deposition rates primarily between 4 and 14 kg N/ha/yr, which results in consistently low occurrence probabilities for most species outside of this range. ForSAFE-Veg modeling remains in progress. Although, the Veg table has been built from expert input and the so-called 'niche alignment' biological response metric will be determined with ForSAFE-Veg for comparison with VSD+-PROPS output.

## 2.4. TRAINING SESSION

A training session/discussion was held by the CCE addressing (NFC-) specific modelling and mapping issues.

The session was well received. Upon request of the NFCs, the CCE and Alterra agreed to provide software to NFCs, in the summer of 2016, to enable them to compute critical load functions for biodiversity on a regional scale (i.e. multiple sites/habitats).

### 3. SESSIONS RELATED TO THE CONVENTION WORK PLAN

#### 3.1. INTEGRATED ASSESSMENT AND PROSPECTS OF EFFECTS-BASED POLICY SUPPORT

Session chair: Max Posch

Presentations were given by Jean-Paul Hettelingh, Rob Maas, Till Spranger

Jean-Paul Hettelingh presented the latest results obtained with the updated Critical loads database. As detailed in the 2015 CCE status report<sup>1</sup>, the exceedance of 2015 critical loads by total nitrogen deposition is higher than the exceedances of the 2012 critical loads. Overall, the 2015 data shows that the European ecosystem area at risk of excessive nitrogen deposition is 61 % compared to 55 % calculated with the 2012 critical loads data. For countries that did not submit data, the background database is used. This leads to lower critical loads (leading to a calculated greater sensibility).

The meeting recommended that future documentation of European scenario specific exceedances be completed with a table reflecting the national emissions related to these scenarios.

The persistent risk of air pollution on human health and the environment were summarised from the LRTAP Convention Assessment Report, presented by Rob Maas. The current support of European air policy is focusing on human health effects. It was noted that the need for the support of effect based policies remains, in particular with respect to (interactions between) changes of biodiversity, climate and air quality. It was regretted that European consensus is lacking for implementing a monitoring network to assess the efficiency and sufficiency of air pollution policies, in particular under the National Emission Reduction Commitment Directive. Concerns were expressed that the existing network of the ICP M&M, the CCE and other ICPs, as well as the technical solutions they had designed and proposed, had not been effectively considered.

The Assessment Report illustrates the successes and outstanding issues of the LRTAP approach to reduce pollution at a transnational level. It will be officially launched in Brussels on 31<sup>st</sup> May 2016.

#### 3.2. UPDATE OF THE MAPPING MANUAL

Session chair: Anne Christine Le Gall

---

<sup>1</sup> [http://www.wge-cce.org/Publications/CCE\\_Status\\_Reports/Status\\_Report\\_2015](http://www.wge-cce.org/Publications/CCE_Status_Reports/Status_Report_2015)

After an introduction by Anne Christine Le Gall, presentations were given by Reto Meier, Harald Sverdrup, Hans Dieter Nagel and Beat Rihm

An update of the Mapping Manual has been undertaken in 2014. At the 31<sup>st</sup> meeting of the TF of the ICP M&M (Zagreb, 20-23 April 2015) that all the chapters, except the Chapter 5, were agreed upon by NFCs. Subsequently, these chapters have been adopted by the first joint EMEP-WGE meeting in September 2015.

It was agreed at the 31<sup>st</sup> TF meeting, that experts who raised their concern about some sections in Chapter 5 would propose revisions at this year's (32<sup>nd</sup> TF M&M, Dessau) meeting. As a consequence, proposals for text revisions have been submitted to NFCs in advance of this year's meeting for their review and were presented to the Task Force according to the table below:

Topic	Experts from
Nitrogen immobilisation	Angela Schlutow
Acceptable leaching of nitrogen	Reto Meyer
Aluminium criteria	
Critical pH	
Critical base saturation	
Weathering	Harald Sverdrup

With the exception of the proposal on weathering, all texts have been reviewed by the TF. All modifications proposed by the experts have been accepted by the TF. The proposal on weathering will be circulated to the TF members. It will be considered accepted if no major modifications or remarks are sent to the ICP M&M chair by the 23<sup>rd</sup> May 2016. All accepted texts (see annex to these minutes) will be integrated in Chapter 5 of the Mapping Manual. The revised version of Chapter 5 will then be submitted to the WGE in September for formal approval.

The text on weathering of base cations will be circulated to the ICP M&M TF members for their review. Any eventual remarks should be sent to Ms Le Gall by email ([anne-christine.le-gall@ineris.fr](mailto:anne-christine.le-gall@ineris.fr)) by the 23<sup>rd</sup> May. If major remarks were formulated, the text on weathering would be considered as not accepted by the TF. It would nevertheless be included in the manual between square brackets. Further discussion will be organised in 2017 to reach a consensus. Although a consensus has been reached on the text describing nitrogen immobilisation, it was also agreed that the issue requires further expert discussion. Therefore a workshop might be organised in the coming 2 years so that recent research results be synthesised and new parameters or equations be prepared for inclusion in the Mapping Manual.

The procedure to update the Mapping Manual has therefore been completed compared the procedure adopted in 2015 with the following statement:

- *If no consensus is reached within the ICP M&M TF on a text proposed by an expert or an NFC as an update, two options shall be considered:*

1. *There is consensus that the Mapping Manual should remains unchanged (the proposal is rejected),*
2. *New text is added between [square brackets]*

*until new evidence is brought in and agreement is reached (if required, at dedicated workshops). Parties remain free to carry out the calculation as they feel suitable. They will document the specificities of their calculation when their report their results to the CCE.*

---

*Summaries of presentations, as submitted by their authors to the ICP M&M chair.*

---

## **Proposed updates of sections in Mapping Manual chapter V – Proposals of Swedish and Swiss Experts, *Reto Meier, Beat Achermann***

At a workshop in June 2016 Swiss and Swedish experts prepared proposals to update the following four sections of chapter 5 of the mapping manual:

Acceptable N leaching (chapter V.3.1.2): Critical concentrations for N in soil solution of table V.7 for calculating CLnutN are not meaningful in regions with high precipitations or in polar/sub polar regions. An approach solely based on critical N concentrations in soil solution in such regions can lead to very high N leaching amounts and consequently to unacceptable high critical loads for nitrogen (unacceptable high e.g. compared with empirical critical loads for nitrogen). Currently, the Mapping Manual contains no information about how to define acceptable N-leaching amounts in such regions. Therefore, it is proposed to include the ecosystem specific limits for annual N-leaching amounts (kg N ha<sup>-1</sup> y<sup>-1</sup>) as published in the 1996 version of the Mapping Manual.

Aluminium criteria (chapter V.3.2.2.1): In the current version of the mapping manual the Bc/Al criterion is based on one single critical Bc/Al = 1 without referring to the accepted quantified growth reductions for defining this value and without considering the plant species specificity of this ratio. Much more detailed information is available in Sverdrup and Warfvinge (1993) which will soon be available as a pdf on the CCE website. It is proposed to provide more detailed information to enable a more differentiated choice of Bc/Al since setting the critical Bc/Al ratio is crucial for protecting sensitive ecosystems from negative effects.

Critical base saturation (chapter V.3.2.2.3): In the current version of the mapping manual it is only stated that a critical base saturation could be chosen as a criterion for calculating critical loads of acidity - without elaborating on it. It is proposed to provide more information according to available data in the literature and mention as an example critical base saturation values based on published data from Swiss forests studies.

Hydrogen ion criteria (chapter V.3.2.2.2, subchapter (a)): The hydrogen ion criterion has a strong link to the aluminium problem. It is proposed to add this information with the link to the section on the aluminium criteria and to mention the relevant pH limit for forest soils.

## **Information on on-going work to assess the term “Nitrogen immobilisation”, *Angela Schlutow, Hans-Dieter Nagel***

In connection with the revision of the Mapping Manual, Germany presented information on ongoing work to assess the term “Nitrogen immobilisation”. Compared with similar work done in Switzerland it was concluded that more detailed evaluation of available data and research is needed and other countries should be invited to participate with data. Until then, the text should only slightly be changed as follows:

Proposed change (in bold letters) of the text Chapter V.3.1.3.1 Nitrogen Immobilisation

“Ni refers to the long-term net immobilization (accumulation) of N in the root zone, i.e., the continuous build-up of stable C-N compounds in (forest) soils. In other words, this immobilisation of N should not lead to significant changes in the prevailing C/N ratio. This has to be distinguished from the high amounts of N accumulated in the soils over many years (decades) due to the increased deposition of N, leading to a decrease in the C/N ratio in the topsoil.

Using data from Swedish forest soil plots, Rosén et al. (1992) estimated the annual N immobilisation since the last glaciation at 0.2–0.5 kgN/ha/yr (14.286–35.714 eq/ha/yr). While **immobilisation of N is probably higher in temperate climates (increasing biomass productivity), this rate is limited at even higher temperatures as well due to increasing mineralisation.** Values of up to 1 kg N/ha/yr could be used for Ni, without causing unsustainable accumulation of N in the soil. It should be pointed out, however, that even higher values (closer to present-day immobilisation rates) have been used in critical load calculations. Although studies on the capacity of forests to absorb nitrogen have been carried out (see, e.g., Sogn et al. 1999), there is no consensus yet on long-term sustainable immobilization rates.”

## Nitrogen immobilisation and nitrogen pools in Swiss forest soils, *Beat Rihm*

N-pools in 307 Swiss forest soil profiles (0-100 cm depth) are between 0.3 and 31.5 t N/ha (mean 9.0 t N/ha). The average N-pools in 1 °C temperature-classes can be approximated by a quadratic regression function showing the maximum pools between 4 and 7 °C, a clear decrease of N-pools below 4 °C and a small decrease above 7 °C (insufficient data above 10 °C). Assuming a period of 8'000 years since glaciation, the average net N immobilisation rates are 0.4-1.4 kg N/ha/year. A first test with a Swiss soil map (1:500'000) showed that the measured N-pools were quite homogenous within the 21 soil types and that soil maps could also be useful for mapping N-pools. However, it remains unclear how to determine a long-term sustainable immobilisation rate.

### 3.3. COLLABORATION IN 2015-2016 UNDER THE LRTAP CONVENTION

Traditionally at ICP M&M meetings, this session gives an opportunity for other ICPs to present their work that is relevant to the ICP M&M community so that exchange of data and information between ICPs and with the joint EMEP-WGE sessions is facilitated.

In the last two years, collaborative work between all scientific groups of the LRTAP Convention has led to the compilation of the "WGE Trends Report" (De Wit *et al.*, 2015 available on the ICP-Waters site <http://hdl.handle.net/11250/2372486>) and the Convention's Scientific Assessment Report:

(<http://www.unece.org/environmentalpolicy/conventions/envlrtapwelcome/publications.htm>)

These two reports are completed with the EMEP Trends Report (*in prep*), to be presented and finalised at the coming TF MM meeting. The Task Force on Measurements and Modelling (TF MM) Chair is looking to invite a small expert group (5 to 7 persons) to work on measurement and modelling methods implemented by EMEP or WGE. If interested, ICP M&M experts may contact him ([augustin.colette@ineris.fr](mailto:augustin.colette@ineris.fr))<sup>2</sup>.

Presentations on ICPs activities were given by Salar Valinia for ICP Waters, by Tanja Sanders for ICP Forests, & the Joint Expert Group on Dynamic modelling) and by Harry Harmens for ICP Vegetation.

Mr. Harry Harmens (Chair ICP Vegetation, UK) reported on recent achievements of the ICP Vegetation and the future workplan for 2017 – 2019. ICP Vegetation had produced a glossy brochure on 'Field evidence of ozone impacts on vegetation in ambient air (2007 – 2015)' and one on 'Impacts of ozone pollution on biodiversity', including mapping Natura 2000 habitats at risk from ozone impacts. In addition, ICP Vegetation had produced the first flux-based global maps of ozone impacts on wheat yield, showing an average yield loss of 9.4% due to ambient ozone, representing an economic loss of \$24.3 billion. Almost 40 countries take part in the 2015/16 European moss survey on heavy metals, nitrogen and persistent organic pollutants (POPs), including many countries from Southern-Eastern Europe, Eastern Europe, Caucasus and

---

<sup>2</sup> This would be a contribution to the workplan item 1.1.1.7: Setup a contact group between EMEP and WGE to compare WGE exposure measurements and modelled and monitored exposures by EMEP.

Central Asia (EECCA region), and other parts of Asia. The 30th ICP Vegetation Task Force meeting will be held from 14 – 17 February 2017 in Poznam, Poland.

It was recommended that ICP forests reports on the relationships between air pollution and tree damages would benefit from making an informed distinction between direct and indirect effects.

### 3.4. NEWS FROM THE CONVENTION

The ICP M&M chair informed the Task Force participants of a number of issues related to the LRTAP Convention.

WGE and EMEP meetings are now merged in practice, with a first joint EMEP-WGE session held in 2015. This is aimed at optimising country representative time in Geneva and at improving communication between the science groups.

This year, the EMEP and WGE chairs have requested the groups to present their results in an integrated form according to the (some of the) following themes:

- Ozone impact assessments, in particular in Mediterranean zones
- Nitrogen and biodiversity
- Mercury and hemispheric transport
- Indicators trends
- BaP and wood combustions
- Quality of emission inventories
- PM, health and condensables.

The aim is to make scientific results even further accessible to policy makers and stakeholders.

Also, the Long term strategy is subject to its mid-term review. It may answer questions such as: What has been achieved? What is still to be done? Any new topics to be taken care of?. The EB is to set up a small group to tackle this issue.

At the 2015 ICP M&M Task Force meeting, Filip Moldan and Jesper Bak presented the audit they were carrying out to assess the availability of ICPs data. One option to facilitate the diffusion of these data is to set up a WGE web portal. Its feasibility is being discussed. Germany has offered its help to set it up.

### 3.5.2016 – 2017 WORK PLAN ISSUES CONCERNING WGE AND ICP M&M

The 2016-2017 work plan has been adopted by EB. This work plan is presented in two documents<sup>3</sup>. Prioritisation of workplan items is necessary due to the financial constraints of the CCE.

- **ECE/EB.AIR/2015/1-ECE/EB.AIR/WG.5/2015/1:**

<b>Workplan item</b>	<b>Activity description/objective</b>	<b>ICP M&amp;M contribution</b>
1.1.1.15	Call for data on biodiversity critical loads with interim results in 2016, final results in 2017	Present and analyse results from the call for data
1.1.1.16	Update of chapter 5 of mapping manual	Discussion at ICP M&M TF
1.5.1	Assess the long-term trends in air pollution and its adverse effects	
1.5.2	Assess scientific and policy outcomes over the past few decades within the Convention, including Scientific Assessment and Trends.	Round up of CCE contributions to Assessment report

- Informal document **Basic and multi-year activities in the 2016-2017 period of the work-plan:**

<b>Work plan item</b>	<b>Activity description/objective</b>
1.2.1	Foster collaboration between National Focal Centres, CCE and habitat experts on the effects of air pollution, with an emphasis on nitrogen deposition on protected areas
1.2.2	Update the Mapping Manual (Manual on Methodologies and Criteria for Modelling and Mapping Critical Loads and Levels and Air Pollution Effects, Risks and Trends) including latest relevant scientific knowledge

The Task force expressed its concern over the financial situation of several NFCs as well as of the CCE. The realisation of the workplan items above is strongly dependant on the funding situation of the CCE. They may not be completed if CCE financing situation (funding by Parties and from the trustfund) is not consolidated in the coming months. The RIVM has proposed to prioritise CCE activities on the 2015-2017 call for data.

At its up-coming meeting in May, the Executive Body is due to prioritise actions of the whole working plan. It has been informed on the priorities proposed by the CCE.

<sup>3</sup> ECE/EB.AIR/2015/1-ECE/EB.AIR/WG.5/2015/1: To be found under “official” and “informal” documents of the December 2015 EB meeting at <http://www.unece.org/index.php?id=38060#/>

### 3.6. NFC TOUR DE TABLE

NFCs were requested (kindly) to provide the chair of the ICP M&M with a short description (10-15 lines) of their activities in writing, addressing the following points (as appropriate):

- Their progress, and if any difficulties, in relation to the 2015-2017 call for data, and whether they plan to answer this call by a deadline provisionally set of January 2017,
- Their outreach activities (collaborations with EECCA countries, outside UNECE and with other organisations such as OECD, CBD, IPCC...)

Contributions are expected by 23<sup>rd</sup> May 2016 and should be sent to [Anne-christine.legall@ineris.fr](mailto:Anne-christine.legall@ineris.fr). They will thereafter be compiled into an annex to the present report.

The tour de table was found useful by the NFCs, as it is an opportunity to learn of others activity and progress. It will therefore be repeated in the coming year.

### 3.7. MEETINGS OF INTEREST TO ICP M&M

The chairwoman presented a list of upcoming meetings of relevance to ICP M&M. They included:

- ICP, TF Health, JEG DM meetings
- EB Meetings: 2-4 May 2016, Geneva
- EMEP and WGE meetings: 14 – 18 September 2016, Geneva
- Ozone Critical Levels Workshop, Madrid, Spain 7<sup>th</sup> November 2016.
- WGSR / EB Meetings: 13-14/15-18 December 2016, Geneva

Detailed information about these LRTAP meetings is found on <http://www.unece.org/environmental-policy/conventions/envlrtapwelcome/meetings-and-events.html#/0/0/0/28088/10034>

## 4. CLOSURE OF THE MEETING

The decisions listed in the minutes were presented to the participants, discussed and modified accordingly.

Finally the chairwoman and the representative of the CCE thanked UBA in general and Lilian Busse (director division II), Simone Richter, Markus Geupel and Maren Meyer-Grünefeldt in particular for hosting the meeting, for the excellent organisation of, and facilities for, the meeting, for the quality of the venue, the excursion and for the 2 guided tours to a nitrogen facility and on Bauhaus respectively

The chairs of the sessions, their speakers and the meeting participants were acknowledged and thanked for providing opportunities for discussions and for improving the community modelling capacity, little by little, step by step, so that tools for policy makers are made available to support air as well as nature conservation policies.

The TF was informed that several options were being considered for the 2017 TF meeting. It was planned that the time will be mid April and further information will be sent as soon as possible.

## 5. ICP M&M TASK FORCE RECOMMENDATIONS TO THE WORKING GROUP ON EFFECTS, DISCUSSED AT THE TF 32<sup>ND</sup> MEETING, DESSAU, 20<sup>TH</sup> -23<sup>RD</sup> APRIL 2016

The ICP M&M Task force concludes that:

- In response to the call for data, all NFCs should submit their national data even if these have not changed since the last submission. For countries that do not submit data, CCE will use critical loads from the European background database for future European maps and scenario analysis.
- Future documentation of European scenario specific exceedances is to be completed with a table reflecting the national emissions related to these scenarios.
- In future, the chapters of CCE reports using national data is to be circulated for review to the NFCs.
- For issues related to the update of the Mapping Manual:
  - The text related to the weathering of base cations (V.3.2.3.3), will be reviewed by NFCs until the 23<sup>rd</sup> May. Afterwards, it will be integrated in the Mapping Manual as new text if accepted by all experts, in square brackets if not.
  - The revised texts on acceptable leaching of nitrogen (V.3.1.2), nitrogen immobilisation (V.3.1.3.1), aluminium criteria (V.3.2.2.1), critical pH (V.3.2.2.2.a) and critical base saturation (V.3.2.2.3) were adopted by the TF and will be included in chapter 5 of the Mapping Manual that will be thus presented for approval to the WGE.
  - In the future, the procedure for changes in the manual will be as described below:
    - *Text to be changed is proposed by experts to the ICP M&M Chair.*
    - *If a consensus on the change is obtained at the following ICP M&M Task Force, the agreed change is submitted to WGE and, once agreed upon, included in the official Mapping Manual version available at the ICP M&M web site.*
    - *If no consensus is reached within the ICP M&M TF on a text proposed by an expert or an NFC as an update, two options shall be considered:*
      1. *There is consensus that the Mapping Manual should remain unchanged (the proposal is rejected),*
      2. *New text is added between [square brackets]*

*until new evidence is brought in and agreement is reached (if required, at dedicated workshops). Parties remain free to carry out*

***calculations as they feel suitable. They will document the specificities of their calculations when their report their results to the CCE.***

- *New translations to Russian are to be carried out when/if updates are major or numerous.*
  - The meaning of the square brackets will be explained in the Manual.
- A workshop may be organised between experts to update the Mapping Manual on the calculation or the parameterisation of nitrogen immobilisation in soils within 2 years.
- Upon request of the NFCs, the CCE and Alterra agreed to provide software to NFCs, in the summer of 2016, to enable them to compute critical load functions for biodiversity on a regional scale (i.e. multiple sites/habitats).
- The deadline for the answer to the call for data is (provisionally) set to the end of January 2017.

The TF took note:

- of the EB intention to prioritize the work plan items at its coming session in May 2016;
- that the following countries were preparing to answer the 2015-2017 call for data: Austria, Belgium (Wallonia), Ireland, Croatia, Czech republic, Denmark, France, Germany, Sweden, Italy, the Netherlands, Norway, Switzerland, the United Kingdom, Poland, Russia. Potentially, there might be contribution from Canada and the United States.

Concerns were expressed about the financial support of the CCE and thus its role in the Workplan 2016-2017.

## 6. ANNEXES

### 6.1. TOUR DE TABLE

Austria
Czech Republic
<p>In relation to the Call for Data (2014/2015) the Czech NFC submitted the data on critical loads of S and N (CLmaxS, CLmaxN, CLminN, CLnutN, CLempN) for forest ecosystems based on ca 1200 localities of soil properties measurements in 2000-2005. The database of critical loads calculated with use of SMB method should be enlarged by the critical loads based on biodiversity observed in the period of 1995-2014 from 163 forest localities (Forsoil programme) including 16 intensively monitored forest plots incorporated in the International Cooperative Program for Forests. The data set is related to the composition of tree and shrub layers and ground vegetation species on the forest herbal floor. The Czech NFC expects to continue in the preparation of the data from phytocenological observations and to derive critical loads for biodiversity. The data set will be involved in the last Call for Data 2015/2017.</p> <p>Concerning biodiversity and habitat characteristics the Czech NFC expects to cooperate closely to the Forestry and Game Management Research Institute (involved in the ICP Forests) and the Agency of Nature and Landscape Protection. In the field of mapping activities the Czech NFC goes on the mutual cooperation to the Czech experts in the ICP Materials from the SVUOM Ltd.</p>
France
<p>The French NFC continues to prepare the response to the 2017 call for data. To reach this objective, work is in progress. In april 2016, by now, we have updated the CL data for CLmaxS, CLminN, CLmaxN, CLnutN using the new 0.1° x 0.05° EMEP grid and evidenced some potential bias depending on the method chosen when passing from former data (with 50kmx50km grid) to new maps. A particular effort has been done to produce new drainage calculations for French forest sites, indicating an overestimation for a majority of former values, leading to SMB CL overestimation for corresponding sites. CLbdiv are not yet calculated since we first proceed in a great effort to calibrate and validate the coupled biogeochemical-ecological model at the forest site scale (ForSAFE-Veg) for various ecological factors using the french ICP forest sites (n=102). For upscaling at the French territory, we work in coupling ForSAFE with EcoPlant database (14000 phytocological relevés), which allows to use a large set of calibration data and a different set of validation data. HSi was already calculated for some forest sites as well as the prediction of the index trends under various scenarios of nitrogen and temperature changes using ForSAFE modelling. An upscaling to habitat protection using typical species will be considered as well as ecological functional groups. The simulations will take into account various combinations of nitrogen deposition and climate change scenarios by 2100 applied on common and protected ecosystems (N2K and national protection status). Predictions at the site scale have already successfully performed (Gaudio et al., 2015; Rizzetto et al., 2016). Other objectives are planned to be achieved by next year for the running call deadline.</p>
Germany
<p>In addition to the given presentations at the meeting, Germany reported on current activities: In January 2016, the National Focal Centre (NFC) invited neighbouring countries for a “Cross Border Comparison Meeting”. Together with NFC of Poland and Switzerland and under the consultancy of the CCE differences in SMB Critical Load calculation had been evaluated. In June 2016, the NFC will take part in the annual meeting of all German effects related NFCs at the Integrated Monitoring site of Forellenbach, to exchange views and knowledge on effects based research under the Convention. Currently under discussion is the inclusion of Critical Load Exceedance as an indicator to the National Sustainability Strategy. The inclusion would substantially strengthen the political application of NFC work. Currently ongoing is a research project on national deposition modelling, in which comparisons with ICP Forest Level II data is undertaken and comparisons with data from the Convention Trend Report is anticipated.</p>
Norway

<p>1. Norway has so far not submitted critical loads for biodiversity, only the empirical critical loads for eutrophication. In 2015 work was initiated to be able to respond at some level to the 2015-17 Call for data. To get more experience with the methodology and compare our results with others, one of our Integrated Monitoring sites was included in the joint ICP IM exercise on VSD+/PROPS and critical loads. The VSD+ model was calibrated, and the PROPS model is currently being tested. The plan for 2016 is to test PROPS for more sites from the Norwegian terrestrial Monitoring program for sub-alpine forests (TOV), calculate critical loads for these sites and compare these with the empirical critical loads. This will be Norway's response to the Call for data. We do not foresee that we will deliver biodiversity critical loads for the country as a whole. The exploration of biodiversity critical loads can be done in time for a deadline in the end of January 2017, but a later deadline, as originally planned, would allow us to use some of the 2017 budget on this task as well.</p> <p>2. Based on the comparison of critical loads for acidification methodology between Norway and Sweden in 2015, plans exist to explore the methodology further, in particular the critical limit. However, given limited resources and the choice to prioritise biodiversity critical loads, it is not clear whether there will be any update of the critical loads for acidification for the 2015-17 Call for data.</p> <p>3. The Focal Centre capacity has been more or less unchanged over the last few years. In 2015 this meant that we had capacity to follow up on the tasks mentioned above and to participate in the task force meeting. We also follow up on the development of MAGIC and collaboration with other ICPs etc. The Norwegian EPA initiates joint meetings for the Focal Centres under the different ICPs, where we get the opportunity to present work done. The methodology comparison was presented here in 2016. This was also presented at the Norwegian-Swedish conference on acidification and liming held in November.</p>
Poland
Sweden
<p>Swedish NFC for ICP M&amp;M will respond to the Call for data 2015/17 by updating CL for acidification. NFC continues to acidification-related work on lakes. The work is co-ordinated with national efforts in connection to Swedish Environmental Objective "Natural Acidification Only" where further specifications define non-exceedance of critical loads as one of the criteria for the objective achievement. With respect to nitrogen as a nutrient, Swedish NFC continues to focus on Swedish Natura 2000 areas. Previously submitted CL N(emp) represent current view and will not be updated. In 2016 Swedish NFC also received support to organise 16th meeting of JEG DM. The meeting will be held at Sitges Spain October 26 – 28, 2016.</p>
Switzerland
<p>In Switzerland work for deriving biodiversity critical loads based on the habitat suitability index is ongoing and the NFC plans to respond to the CCE data call 2015-2017. The intention is to calculate Biodiversity CL with the VSD/VEG model using soil and vegetation data of 32 forest plots combined with ground vegetation response parametrizations based on expert knowledge. Comparisons with results from VSD/PROPS applications will be evaluated. Response to the data call by end of January 2017 may be possible.</p> <p>In addition to the activities presented during the TF meeting (Bassin, Roth) the Swiss NFC also continues its support for a N-addition experiment in the alpine Furka region evaluating N-eutrophication effects on vegetation cover on different soil types. The NFC also coordinated a reevaluation of POPs concentrations in lichens after a first evaluation in 1994. Measured POPs include those regulated in the POPs protocol and the Stockholm Convention and reflect emission reductions during the past 20 years. In addition, Switzerland supports the monitoring of the alpine catchment of lago nero which has been included into the program of ICP on Integrated Monitoring. Switzerland plans to respond to the data call 2015-2017 of ICP Materials regarding air pollution effects on UNESCO world heritage sites and also continues its participation in ICP Vegetation, ICP Forests, ICP Waters and the Task Force on Health.</p>
United Kingdom
<p>The UK has been continuing its critical loads work and developing biodiversity based critical loads for selected sensitive habitats of Special Areas of Conservation (SACs; part of the Natura 2000 network). The current contract for UK critical loads work runs until the end of May 2016, and a tender has been submitted for continued funding for a further three years (contract award pending). Under the new contract the UK is planning to submit data in January 2017 in response to the Call for Data.</p>

United States of America

As the non-official U.S. NFC, NADP-CLAD is communicating with the U.S. representatives within LRTAP EMEP to determine if and how to respond to the ICP M&M WGE-CCE 2017 call for data. The decisions resulting from these communications will be shared with the WGE-CCE.

## 6.2. LIST OF PARTICIPANTS TO THE MEETING

### Austria

Ika Djukic  
Ecosystem Research & Environmental  
Information  
Management  
Spittelauer Lände 5, 1090, Vienna  
+43-1-31304-3432  
ika.djukic@umweltbundesamt.at

### Belgium

Johan Neiryndck  
Research Institute for Nature and Forest  
Gaverstraat 4, 9500 Geraardsbergen  
+ 32478282136  
johan.neiryndck@inbo.be

Vincent Vanderheyden  
SITEREM  
Cour de la Taillette 4, 1348 Louvain la-Neuve  
+ 3210457119  
vanderheyden@siterem.be

### Canada (Ireland)

Julian Aherne  
ERS, Trent University  
1600 West Bank Drive  
Peterborough, Ontario K9J 7B8  
+1 705-748-1011 e 7887  
jaherne@trentu.ca

### Croatia

Vladimir Jelavić  
EKONERG Institute for Energy and  
Environmental  
Protection  
Koranska 5, 10000 Zagreb  
+38598 280 346  
vladimir.jelavic@ekonerg.hr

Sandra Krmpotic  
Ministry of Environment and Nature Protection  
Radnicka cesta 80, 10000, Zagreb  
+385 13717237  
[sandra.krmpotic@mzoip.hr](mailto:sandra.krmpotic@mzoip.hr)

Dragana Pejakovic  
Croatian Agency for the Environment and Nature  
Radnicka cesta 80/7 10000, Zagreb  
+385 14886869  
dragana.pejakovic@azo.hr

Delfa Rados  
EKONERG Institute for Energy and Environmental  
Protection  
Koranska 5, 10000 Zagreb  
+38516000111  
delfa.rados@ekonerg.hr

Sonja Vidic  
Meteorological and Hydrological Service  
Gric 3, 10 000 Zagreb  
+385 1 4565719  
sonja.vidic@cirus.dhz.hr

### Czech Republic

~4677104

Irene Skořepová  
Czech Geological Institute  
Klarov 3,118 21, Praha 1  
+ 420-251085349  
irena.skorepova@geology.cz

#### Denmark

Jesper Bak  
Aarhus university  
Vejlsovej 25, 8600 Silkeborg  
+45 8715 8808  
jlb@dmu.dk

#### France

Sebastien Haunold  
CNRS-Ecolab - Laboratoire Ecologie  
Fonctionnelle  
et Environnement,  
ENSAT Avenue de l'Agrobiopole  
BP 32607, Auzeville-Tolosan  
31326 Castanet-Tolosan Cedex  
+33 5 34 32 60 46  
sebastien.haunold@ensat.fr  
Anne Probst  
CNRS-Ecolab - Laboratoire Ecologie  
Fonctionnelle  
et Environnement,  
ENSAT Avenue de l'Agrobiopole  
BP 32607, Auzeville-Tolosan  
31326 Castanet-Tolosan Cedex  
+33 6 81231443  
anne.probst@ensat.fr

Anne-Christine Le Gall  
INERIS  
DRC/DECI/INDO  
Parc technologique Alata, BP2  
60550 Vernueil en Halatte  
+33 3 44 55 65 93  
Anne-christine.le-gall@ineris.fr

Simon Rizetto  
CNRS-Ecolab - Laboratoire Ecologie  
Fonctionnelle et Environnement,  
ENSAT Avenue de l'Agrobiopole  
BP 32607, Auzeville-Tolosan  
31326 Castanet-Tolosan Cedex  
+33 5 34 32 39 46  
simon.rizetto@ensat.fr

#### Germany

Alexandra Bähring  
Leuphana University Lüneburg, Institute of  
Ecology  
Scharnhorststraße 1, 21335 Lüneburg  
+49 4131 6772962  
baehring@leuphana.de

Yolandi Bouwer  
OEKO-DATA  
Hegermuehlenstrasse 58, 15344 Strausberg  
+49 3341 390 1922  
yolandi.bouwer@oekodata.com

Heinz Gregor  
Freie Universität Berlin  
Marinesteig 42, 14129 Berlin  
gregor.berlin@t-online.de

Maren Meyer-Grünefeldt  
Umweltbundesamt  
Wörlitzer Platz 1, 06844 Dessau  
+4934021033564  
[maren.meyer-gruenefeldt@uba.de](mailto:maren.meyer-gruenefeldt@uba.de)

Markus Bernhardt-Römermann  
Institute of Ecology, Friedrich Schiller  
University Jena  
Dornburger Str. 159, DE-07743 Jena  
+49/+3641/9-49435  
[markus.bernhardt@uni-jena.de](mailto:markus.bernhardt@uni-jena.de)

Markus Geupel  
Umweltbundesamt  
Wörlitzer Platz 1, 06844 Dessau  
+4934021032839  
markus.geupel@uba.de

Werner Härdtle  
Institute of Ecology, Univ. of Lueneburg  
Scharnhorststr. 1, 21335 Lueneburg  
+49 4131 6772841  
haerdtle@uni-lueneburg.de

Hans-Dieter Nagel  
OEKO-DATA  
Hegermuehlenstrasse 58, 15344 Strausberg  
+49 3341 390 1921  
[hans.dieter.nagel@oekodata.com](mailto:hans.dieter.nagel@oekodata.com)  
Tanja Sanders  
Thünen Institute of Forest Ecosystems

Simone Richter  
Umweltbundesamt  
Wörlitzer Platz 1, 06844 Dessau  
+4934021032725  
[simone.richter@uba.de](mailto:simone.richter@uba.de)

Alfred-Möller-Str.1, Haus 41/42,  
16225 Eberswalde  
+49 2334 3820339  
[tanja.sanders@ti.bund.de](mailto:tanja.sanders@ti.bund.de)

Andreas Schmitz  
Thünen Institute of Forest Ecosystems  
Alfred-Möller-Str.1, Haus 41/42,  
16225 Eberswalde  
+49 2334 3820343  
[andreas.schmitz@ti.bund.de](mailto:andreas.schmitz@ti.bund.de)  
Angela Schutlow  
OEKO-DATA  
Hegermuehlenstrasse 58, 15344 Strausberg  
+49 3341 390 1923  
[angela.schutlow@oekodata.com](mailto:angela.schutlow@oekodata.com)

Gudrun Schuetze  
Umweltbundesamt  
Wörlitzer Platz 1, 06844 Dessau  
+4934021033199  
[gudrun.schuetze@uba.de](mailto:gudrun.schuetze@uba.de)

Till Spranger  
German Environment Ministry  
Krausenstr. 16-18, 10117 Berlin  
+4930 305 2437  
[till.spranger@bmub.bund.de](mailto:till.spranger@bmub.bund.de)

#### **Iceland (Sweden)**

Harald Sverdrup  
University of Iceland  
Hjardarhagi 2-6, IS-107, Reykjavik  
+46 708 855 683  
[hus@hi.is](mailto:hus@hi.is)

#### **Italy**

Alessandra De Marco  
ENEA  
Via Anguillarese 301, Santa Maria di Galeria,  
00123 Rome  
+39 06 3048 3910  
[alessandra.demarco@enea.it](mailto:alessandra.demarco@enea.it)

Maria Francesca Fornasier  
ISPRA  
Via Vitaliano Brancati 48, 00 144 Rome  
+39 6 500 72504  
[mariafrancesca.fornasier@isprambiente.it](mailto:mariafrancesca.fornasier@isprambiente.it)

#### **Netherlands**

Jean-Paul Hettelingh  
National Institute for Public Health and the  
Environment (RIVM)  
Coordination Centre for Effects (CCE)  
P.O. Box 1, 3720 BA Bilthoven  
+31 30 274 3048  
[jean-paul.hettelingh@rivm.nl](mailto:jean-paul.hettelingh@rivm.nl)

Onno Knol  
Netherlands Environmental Assessment  
Agency (PBL)  
P.O. Box 303, 3720 AH Bilthoven  
+31 646964658  
[onno.knol@pbl.nl](mailto:onno.knol@pbl.nl)

Martijn de Langen  
National Institute for Public Health and the  
Environment (RIVM)  
Coordination Centre for Effects (CCE)  
P.O. Box 1, 3720 BA Bilthoven  
+31 30 274 2639  
[martijn.de.langen@rivm.nl](mailto:martijn.de.langen@rivm.nl)

Rob Maas  
National Institute for Public Health and the  
Environment (RIVM)  
P.O. Box 1, 3720 BA Bilthoven  
+31 30 274 3527  
[rob.maas@rivm.nl](mailto:rob.maas@rivm.nl)

Christian Mulder  
National Institute for Public Health and the  
Environment (RIVM)  
Coordination Centre for Effects (CCE)  
P.O. Box 1, 3720 BA Bilthoven  
+31 30 274 3148  
[christian.mulder@rivm.nl](mailto:christian.mulder@rivm.nl)

Max Posch  
National Institute for Public Health and the  
Environment (RIVM)  
Coordination Centre for Effects (CCE)  
P.O. Box 1, 3720 BA Bilthoven  
+31 30 274 2573  
[max.posch@rivm.nl](mailto:max.posch@rivm.nl)

Gert Jan Reinds  
Alterra, Wageningen UR

Jaap Slootweg  
National Institute for Public Health and the

P.O. Box 47, 6700 AA, Wageningen  
+31 317 486508  
gertjan.reinds@wur.nl

Environment (RIVM)  
Coordination Centre for Effects (CCE)  
P.O. Box 1, 3720 BA Bilthoven  
+31 30 274 3072  
[jaap.slootweg@rivm.nl](mailto:jaap.slootweg@rivm.nl)

#### **Norway**

Kari Austnes  
Norwegian Institute for Water Research  
(NIVA)  
Gaustadalleen 21, 0349 Oslo  
+4792238696  
kari.austnes@niva.no

Vegar Bakkestuen  
Norwegian Institute for Nature Research  
Gaustadalléen 21  
0349 Oslo  
[vegar.bakkestuen@nina.no](mailto:vegar.bakkestuen@nina.no)

Salar Valinia  
Norwegian Institute for Water Research  
(NIVA)  
Gaustadalleen 21, 0349 Oslo  
+ 47982215461  
[salar.valinia@niva.no](mailto:salar.valinia@niva.no)

#### **P.R. China**

Lei Duan  
Tsinghua University, School of Environment  
Haidian District, Beijing 100084  
+86-13911020737  
[lduan@tsinghua.edu.cn](mailto:lduan@tsinghua.edu.cn)

#### **Poland**

Tomasz Pecka  
Institute of Environmental Protection,  
National Research Institute (IOS-PIB)  
ul. Kolektorska 4, 01-692 Warszaw  
+48 506104243  
tomasz.pecka@ios.edu.pl

#### **Russia**

Elena Evstafyeva  
Medical Academy of Crimea federal University  
blvd Lenine 5/7 Simferpol, Republic Crimea,  
295 006  
+36 652 554 850  
e.evstafeva@mail.ru

Sergey Gromov  
Institute of Global Climate and Ecology  
Roshydromet & RAS (IGCE)  
IGCE, Glebovskaya street, 20-B, Moscow 107258  
+7 499 160 5836  
sergey.gromov@igce.ru, maria.igce@gmail.com

#### **Serbia**

Jelena Beloica  
University of Belgrade, Faculty of Forestry,  
Departement for Ecological engineering in the  
protection of soil and water resources  
Kneza Višeslava 1, 11000 Beograd  
+381643953754  
jelena.beloica@sfb.bg.ac.rs

#### **Sweden**

Filip Moldan  
IVL Swedish Environmental Research  
Institute  
Box 530231 SE-400 14 Göteborg

+46 10 788 6781  
filip.moldan@ivl.se

### Switzerland

Beat Achermann  
Federal Office for the Environment  
CH-3003 Bern, Switzerland  
+41 584629978  
beat.achermann@bafu.admin.ch  
Seraina Bassin  
Agroscope Research Station  
Reckenholzstr. 191, CH-8046 Zurich  
+41 58 468 75 08  
seraina.bassin@agroscope.admin.ch  
Daniel Kurz  
EKG Geo-Science  
Maulbeerstrasse 14, CH-3011 BERN  
+41 313026867  
geo-science@bluwin.ch  
Beat Rihm  
Meteotest  
Fabrikstrasse 14, CH-3012 Berlin  
+41 31 307 26 26  
beat.rihm@meteotest.ch

Sabine Augustin  
Federal Office for the Environment  
CH-3003 Bern, Switzerland  
+41 584620518  
sabine.augustin@bafu.admin.ch  
Lukas Kohli  
Hintermann & Weber AG  
Aarberggasse 61, CH-3011 Bern  
+41 31 310 13 02  
kohli@hintermannweber.ch  
Reto Meier  
Federal Office for the Environment  
CH-3003 Bern, Switzerland  
+41 58 46 307 99  
reto.meier@bafu.admin.ch  
Tobias Roth  
Hintermann & Weber AG  
Austrasse 2a, CH-4153 Reinach  
+41 61 717 88 62  
roth@hintermannweber.ch

### United Kingdom

John George Cooper  
Aerius Europe Ltd  
Strouds, Church Lane, Horsted Keyned, West  
Sussex, RH17 7AY  
+44 (0) 1825 791696  
john-george.cooper@aeriseurope.com

Jane Hall  
Centre for Ecology and Hydrology  
Environment Centre Wales, Deniol Road,  
Bangor, Gwynedd LL57 2UW  
+44 (0) 1248 374511  
jrha@ceh.ac.uk

Harry Harmens  
Centre for Ecology & Hydrology  
Environment Centre Wales, Deiniol Road,  
Bangor, Gwynedd LL57 2UW  
+44 1248374500  
hh@ceh.ac.uk

Ed Rowe  
Centre for Ecology and Hydrology  
Environment Centre Wales, Deiniol Road,  
Bangor, Gwynedd LL 57 2UW  
+44 7774580247  
ecro@ceh.ac.uk

### USA

Todd McDonnell  
E&S Environmental Chemistry  
2161 NW Fillmore Avenue, Corvallis,  
OR97330  
+1- 541-231-9072  
todd.mcdonnell@esenvironmental.com

Jennifer Phelan  
National Atmospheric Deposition Program –  
Critical Loads of Atmospheric Deposition  
Science Committee (NADP-CLAD)  
304 N. Bloodworth St., Raleigh, NC 27601  
+1-919-791-6026  
phelan@illinois.edu

6.3.FINAL AGENDA OF THE MEETING

*UNECE Convention on Long-range Transboundary Air Pollution*

***Working Group on Effects***

**International Cooperative Programme  
on Modelling and Mapping  
of Critical Levels & Loads and Air Pollution Effects,  
Risks and Trends (ICP M&M)**

**Final Agenda**

(13 April 2016)

**26<sup>TH</sup> CCE WORKSHOP AND 32<sup>ND</sup> TASK FORCE MEETING**

**on assessments of impacts of air pollution, and interactions with  
climate change, biodiversity and ecosystem services**

***Tuesday 19 – Friday 22 April 2016***

**Dessau, Germany**

**Sponsored by:**

**German Environment Agency (UBA)  
French National Institute for Industrial Environment and Risks (INERIS)  
Dutch Ministry of Infrastructure and the Environment  
Coordination Centre for Effects (CCE) at RIVM, The Netherlands**

## Tuesday 19 April 2016

<b>Opening of the 26th CCE workshop and 32nd TF and Key Note Session</b>		
<i>Chair: Markus Geupel</i>		
8:00 - 8:30	<b>Registration and mounting of posters</b>	
8:30 - 8:45	<i>Welcome</i>	<i>Simone RICHTER, on behalf of Lilian BUSSE (Head of Division II, Environmental Health and Protection of Ecosystems, UBA)</i>
8:45 - 9:00	<i>Objectives of the workshop and Task Force</i>	<i>Anne-Christine LE GALL/ Jean-Paul HETTELINGH</i>
9:00 - 9:30	<b>KEYNOTE:</b>  <i>The relevance of nitrogen depositions in relation to forest management, game browsing and climate change</i>	<i>Markus BERNHARDT-RÖMERMANN, University of Jena</i>

<b>Topic 1: Progress related to the Call for Data 2015-2017</b>		
<i>CHAIR: JEAN-PAUL HETTELINGH</i>		
9:30 - 9:35	<i>Short introduction</i>	<i>Jean-Paul HETTELINGH</i>
9:35 - 10:00	<i>The PROPS Vegetation model: status</i>	<i>Gert Jan REINDS</i>
10:00 - 10:20	<i>PROPS-computed critical loads and the assessment of exceedances on number of plant species</i>	<i>Max POSCH</i>
10:20 - 10:40	<b>Discussion</b>	
10:40 - 11:00	<b>Coffee break and Poster session in the presence of poster authors</b>	
11:00 - 11:20	<i>Progress in German Response to the Call for Data 2015-2017 regarding biodiversity critical loads</i>	<i>Hans-Dieter NAGEL, Angela SCHLUTOW &amp; Yolandi BOUWER</i>
11:20 - 11:40	<i>Using the phytoecological model and database EcoPlant to model the impact of climate change and atmospheric N deposition on French forest biodiversity</i>	<i>Simon RIZZETTO, Salim BELYAZID, Jean-Claude GEGOUT, Émilien KUHN, Manuel NICOLAS, Anne PROBST</i>
11:40 - 12:00	<i>An attempt to model biodiversity critical loads for forests in Switzerland with the VEG model</i>	<i>Dani KURZ, Sabine BRAUN, Beat ACHERMANN, Reto MEIER</i>
12:00 - 12:20	<i>Alternatives to relate indicator species to abiotic variables</i>	<i>Jaap SLOOTWEG</i>
12:20 - 12:45	<b>Discussion</b>	
13:00 - 14:00	<b>Lunch*</b>	

\* The M&M-quarter (derived from the Dutch "Academic quarter-of-an-hour") is to help avoid people being late. It is hidden in the agenda before- and after lunch to allow our participants to leisurely walk between the meeting room and the UBA restaurant, while making it back in time (!) for the next session.

## Tuesday 19 April 2016...Cont<sup>d</sup>

### **Topic 2: National contributions to effect-based work (under the Convention including the call for data)**

Chair: Beat Achermann

14:15 - 14:35	<i>Critical load functions: effects of uncertainties in biogeochemical and species responses and species choice</i>	Ed ROWE
14:35 - 14:55	<i>Estimating critical loads using change-point regression models.</i>	Tobias ROTH
14:55 - 15:25	(1) Update on CLAD activities and accomplishments in the U.S.] (2) Update on progress in response to the Call for Data 2015-2017 regarding biodiversity critical loads]	Jennifer PHELAN
15:25 - 15:45	<b>Discussion</b>	
15:45 - 16:10	<b>Coffee break and poster session</b>	
16:10 - 16:30	<i>Assessing combined climate change and N deposition impacts in Austrian terrestrial ecosystems</i>	Ika DJUKIC
16:30 - 16:50	<i>Present and future lake acidification status in Norway – nationwide MAGIC modelling update</i>	Kari AUSTNES
16:50 - 17:30	<b>Discussion and Task Force conclusions and recommendations on Topic 1 and 2</b>	Anne Christine LE GALL

## Wednesday 20 April 2016

### **Topic 3: Experimental and modelling results of abiotic and biotic impacts of air pollution and climate change**

Chair: Maren Meyer-Grünefeldt

8:30 - 9:00	<b>KEYNOTE:</b> <b>Global change impacts on ecosystem functions – the importance of interactive effects</b>	Werner HÄRDTLE, University of Lüneburg
9:00 - 9:20	<i>Ecological indicators for increased nitrogen deposition in coastal heathlands</i>	Alexandra BÄHRING
9:20 - 9:40	<i>Combined effects of low-level N deposition and climate change on subalpine pastures</i>	Seraina BASSIN
9:40 – 10:00	<i>The Norwegian monitoring program for sub-alpine birch forests; Effects of air pollution and climate change on ground vegetation.</i>	Vegar BAKKESTUEN
10:00 - 10:20	<i>Chemical footprints of anthropogenic N deposition on soil eco-networks</i>	Christian MULDER
10:20 - 10:40	<b>Discussion</b>	

Please note: Lunches are to be paid by the participants, directly to the UBA-restaurant cashiers

10:40 - 11:00	<b>Coffee break</b>	
11:00 - 11:20	<i>Exploring Coupled Dynamic Biogeochemical and Vegetation Models in Temperate Forest Ecosystems of the Eastern United States</i>	Todd McDONNELL
11:20 - 11:40	<i>New developments with PROFILE and ForSAFE; Calculating soil weathering rates along hill-slopes and estimating weathering in whole catchments relevant for streams. Dynamic modeling of weathering rates and long term average weathering values for critical loads</i>	Harald SVERDRUP, Salim BELYAZID and Martin ERLANDSSON
11:40 - 12:00	<i>Recent achievements of the ICP Vegetation</i>	Harry HARMENS
12:00 - 12:45	<b>Discussion and Task Force conclusions and recommendations on Topic 3</b>	Anne-Christine LE GALL
13:00 - 14:00	<b>Lunch<sup>1</sup></b>	
<b>Afternoon &amp; evening</b>		
<b>Social Event &amp; Dinner</b>		

### Thursday 21 April 2016

#### **Topic 4: Integrated assessment and Prospects of Effects-based policy support**

Chair: Max Posch

9:00 - 9:20	<i>Exceedance assessments using the 2015 database</i>	Jean-Paul HETTELINGH
9:20 - 9:50	<i>The LRTAP Convention Assessment Report 2016 and prospects of effects-based policy support</i>	Rob MAAS
9:50 - 10:10	<i>Integrated assessment and prospects of effects-based policy support</i>	Till SPRANGER
10:10 - 10:30	<b>Discussion</b>	
10:30 - 10:45	<b>Task Force conclusions and recommendations on Topic 4</b>	Anne-Christine LE GALL
10:45 - 11:00	<b>Coffee break and poster session</b>	

#### **Topic 5: Mapping Manual**

Chair: Anne-Christine Le Gall

11:00 - 11:20	<i>Status of the revised Mapping Manual and NFCs proposals for changes</i>	Anne Christine LE GALL
11:20 - 11:40	<i>Proposed updates of sections in Mapping Manual chapter V - Proposals of Swedish and Swiss Experts</i>	Reto MEIER and Beat ACHERMAN
11:40 - 12:00	<i>Proposal for updates for the weathering chapter in the Mapping Manual. Results and recommendations from a workshop in Ystad, Sweden</i>	Harald SVERDRUP and Salim BELYAZID
12:00 - 12:45	<b>Discussion</b>	

13:00 - 14:00	<b>Lunch<sup>1</sup></b>	
14:15 - 14:35	Information on ongoing work to assess the term Nitrogen immobilization,	Angela SCHUTLOW and Hans-Dieter NAGEL
14:35 - 14:55	Nitrogen immobilization and nitrogen stocks in Swiss soils"	Beat RIHM
14:55 - 15:30	<b>Discussion on Mapping Manual</b>	
15:30 - 15:45	<b>Task Force Conclusions and recommendations on Topic 5</b>	Anne-Christine LE GALL
15:45 - 16:15	<b>Coffee break and poster session</b>	
<b>Topic 6: Discussions ("training") on practical issues of the call for data.</b>		
Moderators: Jaap Slootweg, Max Posch, Gert Jan Reinds		
16:15 - 16:30	Status	Jaap SLOOTWEG, Max POSCH, Gert Jan REINDS
16:30 - 17:30	Discussion / Interventions	

## FRIDAY 22 APRIL 2016

<b>Topic 7: ICP Progress under the LRTAP Convention and ICP M&amp;M work plan</b>		
Chair: Anne-Christine Le Gall		
9:00 - 9:20	<b>Task Force conclusions and recommendations on Topic 6</b>  Outstanding issues of other sessions	Anne Christine LE GALL
9:20 - 9:40	Representation of ICP-Waters future plans	Salar VALINIA
9:40 - 10:00	ICP-Forests reporting and highlights	Tanja SANDERS
10:00-10:20	Swedish NFC-progress in response to the Call for Data 2015-2017	Filip MOLDAN
10:20 - 10:30	Tour de Table on national progress in the field of effects-based policy support in general and ICP M&M workplan issues in particular	All NFCs or country representatives
10:30 - 11:00	<b>Coffee break and poster session</b>	
11:00 - 11:30	Tour de Table ...continued	All NFCs or country representatives
11:30 - 11:45	M&M 2016-2017 workplan issues and Proposed contributions to 2 <sup>nd</sup> joint session of EMEP and WGE (Geneva, Sept. 2016)	Anne-Christine LE GALL and Jean-Paul HETTELINGH
11:45 - 12:00	<b>Discussion</b>	
12:00 - 12:30	<b>Task Force Conclusions on topic 7;</b> <b>Draft ICP M&amp;M minutes of the 32<sup>nd</sup> TF M&amp;M;</b>	Anne- Christine LE GALL
12:30	<b>Adoption of the draft minutes and closure of the 26<sup>th</sup> CCE WS and 32<sup>nd</sup> ICP M&amp;M Task Force meeting</b>	Anne-Christine LE GALL

<b>Posters</b>	
<b>(Poster sessions are combined with coffee breaks)</b>	
<i>Biodiversity related critical loads in Denmark</i>	<i>Jesper BAK</i>
<i>Emissions of amines from CO<sub>2</sub> capture plants. A study of long-term effects of amine (nitrogen) deposition on the Norwegian Atlantic bog ecosystem.</i>	<i>Vegar BAKKESTUEN</i>
<i>Advancement forward to implementation the approaches of LRTAP Convention in the Republic Crimea</i>	<i>Elena EVSTAFYEVA</i>
<i>Updates on mapping critical loads and model biodiversity indices on French forest ecosystems</i>	<i>Sebastian HAUNOLD, Simon RIZZETTO, Arnaud MANSAT, Anne PROBST</i>
<i>Bioscore 2 :A tool to assess the impacts of climate, land use and pressure factors on European biodiversity</i>	<i>Onno KNOL</i>
<i>Advancements in Critical Loads in the United States</i>	<i>Jennifer PHELAN (NADP-CLAD)</i>
<i>A New Tool for Presenting Critical Loads and Exceedance Information for US National Parks</i>	<i>US National Park Service c/o Jennifer PHELAN</i>
<i>USDA Forest Service Air Quality Portal for Land Management Planning: The application and use of critical loads for management and policy decisions</i>	<i>US Forest Service c/o Jennifer PHELAN</i>
<i>Exceedances of Critical Loads for S and N in relation to forest soil chemistry and biodiversity changes</i>	<i>Irena SKOŘEPOVÁ</i>
<i>Vegetation community change points suggest that critical loads for nutrient nitrogen deposition are too high.</i>	<i>Kayla WILKINS and Julian AHERNE</i>
<b>ALSO WELCOME:</b>	
<ul style="list-style-type: none"> <li>- <b>Non-registered last-minute Posters, e.g. addressing ecosystem effects of air pollution including interactions with other policies</b></li> <li>- <b>Posters to backup oral presentation</b></li> </ul>	