*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*

## *24th CCE Workshop and the 30th meeting of the Programme Task Force*

## *7th-10th April 2014 in Rome, Italy*

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# 1. INTRODUCTION

63 delegates from the following 20 countries registered to the meeting: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Italy, Ireland, Norway, P.R. China, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, The Netherlands, United Kingdom, USA.

The ICP Vegetation, the ICP Waters, the ICP Forests, the ICP Integrated Monitoring, the Joint Expert Group on Dynamic Modelling, the Coordination Centre for Effects (CCE) were represented. The list of registered 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 site (www.icpmapping.org).

Mr Giovani Vialletto welcomed the participants to the meeting on the behalf of ENEA, the institute hosting the meeting, and on the Ministry of Environment in Italy. He stressed that Italy would assure the next presidency of the European Union.

For the first time, in a joint ICP M&M task force meeting, the ozone and nitrogen impacts on forest, biodiversity, as well as on the ecosystems services and functions were discussed. Three contributions of the hosts were presented on this important topic:

- ***Ozone fluxes and epidemiology of ozone injury to forests (Silvano Fares - Elena Paoletti)***

  The quantification of ozone effects on real-world forests remains challenging. Different methods to derive large-scale stomatal ozone fluxes by modelling, micrometeorology or sap-flow measurements were presented together with preliminary results in Italian and French forests. Useful information to establish the best standards and thresholds for protecting plants from ozone were obtained from large-scale epidemiological investigations, where large-scale biological responses (e.g. growth, yield and their proxies, ozone visible injury, crown transparency, spectral indices) are compared with ambient data in the field. The use of phytotoxic ozone dose POD0, in the assessment of ozone risk for vegetation, is recommended because it has both biological significance and practicality in usage.

- ***Adapting Mediterranean forests to climate change and ozone (Pierre Sicard)***

  The European project FO3REST (LIFE10 ENV/FR/208) allowed:
  - ⇨ testing thanks to field surveys combined with modelling the current exposure-based critical levels (AOT40).
  - ⇨ suggesting new ozone flux-based critical levels for Mediterranean forest protection against ozone pollution.

  It was shown that PODY is well correlated with O3-induced symptoms whereas AOT40 is stronger correlated with discoloration and defoliation, i.e. typical specific indicators (multiple causes).

  FO3REST provided an evaluation of the DO3SE model parameterisation under Mediterranean conditions for Mediterranean tree species (Pinus halepensis, Quercus ilex and Pinus pinea) in 4 locations in Italy and France. Comparisons of measured and modelled stomatal conductance showed that modelled values underestimated the

stomatal conductance by about 10 %. A good agreement between the stomatal conductance estimated from DO3SE and canopy level measurements fromeddy-covariance was found. The DO3SE parameterization for Mediterranean species will be included in the new version of the UNECE mapping manual for ozone-risk assessment.

- ***Bridging modeled and measured data to evaluate forest health and vitality (Alessandra De Marco)***

  Defoliation is an indicator for forest health in response to several stressors including air pollutants and it is one of the most important parameters monitored in the International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests). The cause-effect relationship between air pollutants and meteorological variables versus crown defoliation is difficult to identify due to the multitude of interactions concurrently acting on the response variable. Thanks to the RFA and regression models, the most important predictors affecting crown defoliation were characterized.

  The crown defoliation was predicted by statistical models in 2030 for the most common European tree species, considering three climate change scenarios and one air pollution scenario. In the scenario analysis, the impacts of air pollution and climate change on crown defoliation were different for each of the twelve tree species, indicating species-dependent effects on health and vitality of forests. In some cases, vitality may increase for a combination of more favourable climate for growth (CO2 and temperature) and nitrogen fertilization. On the other hand, increasing drought and disturbance (e.g. growth of insect populations) could cause adverse effects. The methodological approach described seems to be highly suitable to provide concrete benefits in the form of necessary information for policy makers to support forest management.

Ms Le Gall presented the organisation of the workshop and task force meetings, primarily focused on the results of the 2012-2014 call for data on “no net loss of biodiversity”. The TF adopted the minutes of 2013 meeting without any modifications. Minor modifications were announced to the Agenda of the 2014 meeting (annex II).

Mr Jean Paul Hettelingh, head of the Coordination Centre for Effects, presented the goals of the CCE workshop.

# 2. Scientific sessions (CCE Workshop)

Work plan item 1.2.1

## 2.1. Organisation of the discussions

1) **Results of the Results of the Call for Data 2012-14 of contributions to dynamic modelling of vegetation changes and applications (“no net loss of biodiversity”).**

   Session chair: Mr Jean-Paul Hettelingh.

   Presentations were given by Jaap Slootweg and Max Posch.

2) **Call-results and Progress on identification and use of biodiversity endpoints (incl. ecosystem services) and indicators. Regional assessments of their changes (NFC + other presentations)**

   Session chair: Mr Max Posch.

   Presentations were given by Thomas Dirnböck, Ed Rowe, Simon Rizzetto, Thomas Scheuschner, Daniel Kurz, Gert Jan Reinds and Luc Bonten.

3) **New knowledge of (1) nitrogen impacts and trade-off between nitrogen and ozone impacts and (2) modelling of "biodiversity" endpoints indicators, e.g. for calls for data**

   Session chair: Mr Beat Achermann.

   Presentations were given by Arjen van Hinsberg, Seraina Bassin, Lukas Kohli, Walter Seidling and Harald Sverdrup.

4) **Results from international collaborations: Novel critical thresholds, status of ECLAIRE, other scientific progress and effect-oriented policy support**

   Session chair: Mr Jean Paul Hettelingh.

   Presentations were given by Wilfried Winiwarter, Rob Maas, Jesper Bak, Maria Holmberg, Chris Evans, Kari Austnes, Jane Hall and Tizziano Pignatelli.

## 2.2. SUMMARY OF THE SCIENTIFIC DISCUSSIONS

**The 2012-2014 call for data** aimed at deriving a harmonized metric from submitted variables and indicators with the objective to quantify "no net loss of biodiversity" on a regional scale. It was proposed to upscale the proposed approach (and indicators) from individual sites, using the EUNIS classification. Emphasis should be put on Natura 2000 sites.

Ten countries responded to the 2012-2014 call for data on biodiversity indicators and calculations. Seven of them applied dynamic modelling. Respondents to the call suggested that further technical and conceptual work was needed to come to a harmonised indicator of no net loss of biodiversity. The analysis of metrics used to characterise no net loss of biodiversity by parties did not yet lead to any overall relationship with nitrogen deposition or critical loads at regional level. This was partly due to the fact that the metrics chosen were not homogenous in their response to nitrogen deposition.

During the meeting, several countries indicated their wish to complete their response to the call for data. The TF agreed to set a new deadline for a completed response to the end of May 2014.

There are however some potential consequences of this delay:

- The CCE status report may be delayed until the beginning of 2015, as this report compiles the NFCs responses and reports;

- The TF and CCE written report to the WGE (Work plan item 1.1.12, cf below) may need to be completed verbally at the WGE meeting in September, since this report is requested by the secretariat by the end of May.

**Follow up call for data**

A new call for data was proposed with the aim to:

- adapt the critical load database to the new longitude - latitude 0.5° x 0.25 ° EMEP grid;
- offer the possibility to NFCs to update their national data with a novel approach to calculate sulphur and nitrogen critical load function taking into account their impact on biodiversity, proposed by the CCE.
- Respond to the policy demand of special emphasis on biodiversity.

The call will be organised so that three levels of responses may be possible:

- 1- Basic: Convert existing critical load to **$0.10^0 \times 0.05^0$ Lon-Lat-grid** and the critical load for acidity and the critical loads for nutrient to a 4-point N & S critical load function
- 2- Intermediate: Update critical loads, considering including biodiversity indicator before performing 1.
- 3- Advanced: Use (steady-state or dynamic) biodiversity model to derive N & S critical load functions before performing 1.

It was emphasized that this ICP M&M task responds to the requirements of the LRTAP Long term strategy (ECE/EB.AIR/WG.5/2010/17) and of the workplan 2014-2015 as adopted by the Executive Body in December 2013 (work plan item 1.2.1). The biodiversity indicators designed here are developed so that they can be used in integrated assessment modelling.

The presentations on the 2012-2014 call for data and the ensuing discussions highlighted that NFCs had used several different metrics to assess biodiversity:

  - Habitat suitability
  - red list species
  - species cover
  - species abundance
  - functional diversity
  - ecosystem services

As a result of the different (NFC) presentations addressing the issues of the call for data, the TF came to the conclusion that a common biodiversity indicator such as habitat suitability indicator would be useful in addition to indicators that meet specific parties' requirements. These indicators will be calculated using lists of species characteristic of EUNIS habitats

It was highlighted that the European Environmental Agency has started a project to revise and evaluate the floristic composition of the EUNIS habitats at level 3. In 2013, the floristic composition of the EUNIS forest habitat types has been determined on the basis of the floristic composition of corresponding phytosociological alliances, according to a revised crosswalk between EUNIS and syntaxa. A draft report on the floristic composition of European forests in now available. This year the focus is on heathlands. As a basis for the analysis, a database of vegetation relevés has been compiled, containing datasets from a wide range of data providers throughout Europe (the European Vegetation Archive; http://euroveg.org/eva-database). The current vegetation database, set up for the BioScore project (http://www.bioscore.eu/), was mentioned in the CCE workshop as a basis for deriving dose-response functions. The species lists could be used as a starting point to define high habitat quality indicator species.

In addition, the necessity was noted to define a reference situation in order to assess the evolution of the biodiversity index towards a target to be selected, for use in e.g. integrated assessment. The definition of the reference situation was not agreed upon. It was suggested that it may refer to a favourable ecological status, under other drivers (such as climate change or land use change). To associate the reference status to a date is problematic:

- A recent date (such as 1990 for instance) would be convenient because physico-chemical and biological (flora, fauna) data may be known for a number of conditions or sites. However, such a reference would not, in most case, be associated to the undisturbed, unpolluted, resilient, sustainable equilibrium that may help to define a target for the future.
- A date in the far gone past (pre-industrial state) or a date in the future may represent an "unpolluted" system, but data to characterise it are lacking.

Future discussions may help to better define what the reference state is to be used for (starting or end point of modelling?). Input from all stakeholders would be valuable to continue this discussion.

**Training session**

A half day training session was held by the CCE addressing (NFC-) specific issues on dynamic soil-vegetation modelling and call for data 2012-2014. It allowed exchanges between NFCs and the CCE to provide technical assistance on the tools suggested for use in the call for data. It was also the opportunity to present updated versions of those tools.

The objective of the training session

- Develop on a common biodiversity indicator.
- Issues related to abiotic and biotic modelling by NFCs in response to the call for data.

Ed Rowe gave an overview on the previous discussions about biodiversity indices in preparation to the discussions on a common indicator. Arjen van Hinsberg presented how similar the Dutch, Swiss and Danish approaches are to the habitat suitability as applied in the UK. He

demonstrated how the calculations are defined. Max Posch related the suitability index to the probability isolines as calculated with PROPS in a presentation. Luc Bonten presented PROPS and VSD+ in the latest Studio-version. After the presentations and a discussion on the common indicator, there was a hands-on training-session where many issues were addressed and mostly solved.

The main points raised by the NFCs during the training session were:

- The habitat suitability index is proposed as a common biodiversity indicator for all countries to use, possibly next to country-specific indicators.
- Step one in this approach is listing the 'typical' or 'positive indicator species' for a site or a EUNIS/habitat type.
- Such a step can be part of the next call for data in order to test its properties and compare to other indices.
- Many technical issues of the VDS+PROPS model are related to different versions of Windows and user permissions.
- There is an increasing demand on the transparency and educational functions of VSD+ and PROPS
- New relevé data from parties will be made available to improve and extend the PROPS model.

**Use of biodiversity indicators in IAM**

The potential use of biodiversity indicators in IAM was reviewed in the context of the FP7 project ECLAIRE, a large research project operating under the EU's 7th framework programme. This project develops and at the same time uses information on effects of ecosystem inflicted by air pollution (ozone and nitrogen). In consequence policy responses, also considering the impacts of climate change, should be re-evaluated. Integrated assessment modelling with GAINS which forms the backbone of evaluation cannot handle opposing directions of effects (high ozone pollution causes problems, high nitrogen pollution based on the same sources at least in part repairs them) – quantification of these effects and the resulting trade-offs is needed beforehand. Economic valuation can serve to resolve this. Approaches to quantify economic values of ecosystems services are still under development, but start to become available and can be used. This includes estimates for the economic value of maintaining biodiversity, which has been estimated at a similar level of 8 billions EUR annually for the total of EU using three largely independent methods. Implementation of biodiversity into the framework needs simple indicators that can both easily assessed and communicated.

Different valuations approaches were tentatively used to evaluate biodiversity in a cost benefit analysis, in a presentation that focused on Natura 2000 areas. It was (tentatively) concluded that benefits of air pollution reduction on Natura 2000 ecosystems were similar to costs to be engaged to reduce pollution.

Furthermore, the use of biodiversity indicators and their application to integrated assessment were shown to be suitable to address different policy agendas (Water Framework Directive, Habitat Directive) at national level.

# 3. Sessions related to the Convention Work plan

## 3.1. Update of the Mapping Manual

An update of the Mapping Manual has been undertaken. It is coordinated by Ms AC Le Gall, partly funded by Germany (in kind contribution of France, the Netherlands, UK, Sweden, Norway). Several chapters have been updated so far and are under review. This update includes:

- ⇨ Introduction
- ⇨ Guidance on mapping concentrations levels and deposition levels
- ⇨ New section about modeling critical loads for biodiversity
- ⇨ Update of the empirical critical loads
- ⇨ Dynamic modelling for waters reviewed by ICP Waters
- ⇨ General mapping issues.

Updates related to empirical critical loads and levels were based on knowledge that has been validated and reviewed in scientific literature and/or technical LRTAP workshops.

Chapter 3 “Mapping critical loads for vegetation” has been updated and reviewed by ICP vegetation and its NFCs. Chapter 4 “Mapping effects on materials” is in the process of updating under a similar process. Both chapters will have been discussed by the respective task forces. Comments by ICP M&M NFCs are not expected on these chapters.

A new layout for the chapters has been designed and will be applied to all chapters once they are validated. The design will allow updating chapters independently in the future.

The following plan for the work remaining to be done was proposed:

- The draft update of the Mapping manual is to be completed preferably before 15 July 2014, but no later than by the 33rd session of the Working Group on Effects . Draft chapters will be posted on ICP M&M web sites before the 33rd session of the WGE as appropriate so that they may be commented by NFCs and then finalised by the 2015 ICP M&M Task Force
- Initial review by ICP M&M NFCs until 15th August,
- Presentation to WGE in September,
- Further review of the document if shown necessary by discussions at the WGE meeting,

- Final review of the revised Mapping Manual at the 2015 ICP M&M Task force meeting,
- Translation into Russian once validated (with Secretariat funding).

If major comments are suggested by NFCs during their review, a discussion could be organised at the ICP M&M meeting in 2015.

At the end of the process, the updated Manual will be translated in Russian, thanks to a contribution from the Secretariat.

The Task Force appreciated the progress on the update of the Mapping Manual and its new layout.

## 3.2. Capacity building in EECCA countries

Several EECCA countries traditionally participate to the CCE workshop and its training session, during which it is fruitful to have all NFCs (including EECCA) collaborate. It is also for them the opportunity to get familiar with modelling and mapping methods and data used at national and regional scales. The CCE workshop is integrated and held back to back with the Task Force of the ICP M&M meeting in order to optimize exchanges of information. In 2014, lack of funding from lead countries prevented a number of EECCA country representatives to travel to Rome. A request to the Secretariat to contribute to their travelling costs with reference to funds allocated to ICP M&M work in the 2013-2014 workplan were not honoured.

According to the work plan (item 4.8), ICP M&M is to organize a meeting in 2015 aimed at increasing EECCA countries competencies for the implementation of the Convention Protocols. Discussions on its organization have just been initiated with the Secretariat in order to help EECCA countries to participate to ICP M&M activities.

## 3.3. Collaboration in 2014-2015 under the LRTAP Convention

Traditionally at the ICP M&M meetings, this session forms an annual opportunity for other ICPs to present their work that is relevant to the ICP M&M community so that exchange of data and of information is facilitated.

Presentations were given by Christopher Clark (US), Kari Austnes (on behalf of Heleen de Wit, ICP Waters), Maria Holmberg (ICP IM) and Harry Harmens (ICP V).

These presentations underlined that collaborations occur regularly between ICPs. These may be at “Chair” level, with exchange of information at WGE meetings, or through the participation of ICP and Programme Centres Chairs at Task Force meetings. Collaborations also occur at NFCs or scientific levels. Most participants to the ICP M&M activities are either directly participating to on of the other ICPs (ICP Vegetation, ICP Waters, ICP Forests or ICP Integrated Monitoring activities), or are collaborating actively with colleagues who participate to these groups. Collaboration with US colleagues is still very active. Even though US have not (yet) responded to CCE calls for data, work done to calculate critical load and to implement dynamic models has considerably progressed. The Task Force appreciated that a response to a future call for data has now become a realistic target for the US.

In a tentative effort to meet work plan items 1.8.1 and 1.8.3, the ICP Vegetation and ICP M&M are exploring ways to organise, perhaps already in 2015, joint sessions on the combined interactions

of nitrogen and ozone on ecosystems and their functions. Details of their organisation are in discussion. Beyond looking to improve scientific knowledge, one objective is to give scientists from both groups opportunities to meet.

Further, following discussions initiated in 2012 with ICP Forests, the comparison between ICP Forests critical load calculations and those of the CCE confirmed the need for harmonisation of calculations methods and modelling parameterization. Changes in ICP forests organisation have postponed a planned exchange of data, which is now to be carried out within weeks. It was agreed that ICP Forests would provide their critical load and background data to the ICP M&M NFCs, who are expected to include ICP Forests data into their databases. Thus, ICP Forests data will be included in the European Critical Load database, through an updated submission of NFCs. The ICP M&M Task Force appreciated ICP Forests willingness to exchange information and data.

It was drawn to the TF attention that meetings of scientists, national representatives and policy makers participating to the LRTAP Convention activities are useful at country level. This process is now well set up in Germany and other countries (plan to) coordinate their activities at national levels. This contributes to scientific collaborations and to integrate and optimise work done within the Convention. Such actions were encouraged by the ICP M&M Chair.

The discussion also focused on some observed modifications of critical loads exceedances maps when input data (especially EMEP) change. It was agreed that to explain such changes, information was required from EMEP as these were not connected to any amendments to the critical loads calculation methods. The Task force agreed that such a point was relevant for a discussion at the next EMEP-WGE joint meeting.

In 2013, an audit of the ICPs organisation and functioning has been carried out. A report has been submitted to the EB in December 2013 (ECE/EB.AIR/2013/2). The EB concluded that a merge between EMEP and WGE was not necessary. However EB seems to continue to aim for another way of organizing the activities of the Convention subsidiary bodies. The discussion about the ICP implementation of EB objectives will continue at the September 2014 WGE meeting.

The ICP M&M chair informed the Task Force participants of a number of changes in the Convention:

- The head of PCC of ICP Forests is now Walter Seidling, who replaces Martin Lorenz.
- ICP Materials have a new co-chair Pasquale Spezzano, who replaces Stephan Doytchinov.
- The Joint Expert Group on Dynamic Modelling will meet in October 2014, in Sitges. The shape and form of JEG DM activities after 2014 will be subject to further review.
- In WGSR, the Expert Group on Techno-Economic Instruments (EGTEI) is expected to become a Task Force (TF TEI) and to integrate the TF POP and TF HM by the end of 2014.
- The Task Force on Reactive nitrogen has now a new co chair from Denmark (information on his name?), who replaces Oene Oenema (?).

- The organisation of LRTAP meetings will change in 2015, with in particular a joint EMEP-WGE meeting in September (work plan item 1.1.12 and 1.1.13).

## 3.4. WORK PLAN ISSUES CONCERNING WGE AND ICP M&M

### *3.4.1. COMMON WGE ITEMS*

Via the work plan (document **ECE/EB.AIR/122/Add.2)**, EB requests WGE[1]:

**WGE Reports:**

- To prepare an annual joint report with clear policy-relevant messages and recommendations (work plan item 1.1.11).
- To "assess scientific and policy outcomes within the Convention over the past few decades, including scientific understanding, trends and achievements under the Gothenburg Protocol, and outline future" (Work plan item 1.9).
- To report scientific findings of policy relevance according to a template prepared by EB (Work plan item 1.1.12[2]) and on annual scientific activities (for ICP M&M Work plan item 1.2.1).

**Organisation of work (discussed at the WGE in March 2014):**

- "To improve integrated working and reporting. To foster integrated/thematic assessments, combining the work and output of different subsidiary bodies" (Work plan item 1.8.1).
- "To set priorities for monitoring and other collection of data by Parties in view of policy needs" (work plan 1.1.1).
- "To explore ways to combine/merge the activities of some of the ICPs" (e.g., ICP Integrated Monitoring, ICP Forests, ICP Waters) (Work plan item 1.8.3).
- To develop "common standards for all ICPs and a portal approach to enable integrated assessments and to assist the Parties in their implementation of air pollution strategies" (Work plan item 1.8.2).

**Outreach:**

- To enhance the involvement of countries in Eastern Europe, the Caucasus and Central Asia (workplan item 1.1.10).
- To cooperate with programmes and activities outside the ECE region and provide information on them to the Executive Body (Work plan item 1.1.10).

[1] The list below is a selection of items common to several ICPs/TF. Actions specific to ICPs and not involving ICP M&M are not mentioned here.

[2] http://www.unece.org/fileadmin/DAM/env/documents/2013/air/eb/Informal_document_n__18_Proposed_Template_for_reporting_by_Task_Forces_and_Expert_Groups_to_CLRTAP_subsidiary_bodies.pdf

WGE, including ICP M&M, is therefore responding on these common items by:

- Continuing production of the annual "Joint Report" (Coordination: P. Grennfelt, WGE Chair, September 2014). This document summarizes the main updates of the work done under the WGE (Work plan item 1.8.1).

- Collaborating to the "Assessment report": A draft outline is being discussed between WGE and EMEP. It was hoped that funding would become available for the chairman of the TFIAM (Rob Maas) to take up a central coordinating task. Considering the current review of the outline by both EMEP and WGE, and the lack of funding, its publication planned for 2015 (Work plan item 1.9) is likely to be delayed until 2016.

- Discussing the set up of a common portal. The need for a meta-database has been identified, as well as a need for human resources and funding. Other communications tools were suggested (such as ICP Vegetation application for reporting ozone injuries, twitter…).

- Proposing the preparation of reports in the coming years on the following themes (Work plan item 1.8.1):

    - Trends of effects indicators over the long term.
    - Ozone – nitrogen interactions on ecosystems.
    - Heavy metals and POP.
    - Integration of ICP Forests data in ICP M&M database following a transfer of information to the NFCs.
    - Development of knowledge on coastal ecosystems, sensitive to nitrogen depositions.

  These themes have been discussed at the last WGE bureau meeting but no decision was then taken.

- Encouraging Parties to establish collaborations between their NFCs (as done in Germany for instance[3]) (one way to respond to Work plan 1.8.3).

### *3.4.2. ICP M&M REPORTS*

ICP M&M and CCE will have prepared two main reports in 2014. They will form the basis of the presentations to the WGE in September.

A. Technical official report to the WGE: (ICP M&M and CCE Chairs, September 2014). This document is to be prepared to describe scientific and organisational advances under the ICP M&M. Presented according to a very strict template designed by the secretariat as requested by EB (Work plan items 1.1.12, 1.1.10, 1.1.11). This document will not be translated in the official languages.

[3] Resulting in the report available at http://www.umweltbundesamt.de/publikationen/genug-getan-fuer-mensch-umwelt

*B.* Annual report on response to the call for data (work plan item 1.2.1). This will be the 2014 CCE status report.

### 3.5. NFC TOUR DE TABLE

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

- ⇨ their progress in relation to the 2012-2014 call for data,
- ⇨ their envisaged capacity for 2014-2015,
- ⇨ their collaboration with habitat experts,
- ⇨ their collaborations with EECCA colleagues.

Contributions are expected by 30th may and should be sent to Anne-christine.le-gall@ineris.fr. They will thereafter be compiled into an annex to the present report.

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

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

- WGSR meeting (Geneva, 30 June – 3 July)
- International Conference 'Ozone and Plants' 18-21 May in Beijing, China
- WGE meeting (Geneva, 17-19 September 2013).
- EB meeting, 8-12 December, Geneva
- JEG on Dynamic Modelling, October 2014, Sitges, Spain.
- ICP Waters, 14-16 October 2014, Grimstad, Norway.
- Workshop related to biomass burning and effects of ammonium and ozone deposition in Northern Fennoscandia and North-West Russia, St. Petersburg, Russia, 1-3 October 2014

## 4. CLOSURE OF THE MEETING

The chairwoman indicated that the location and the time of the next ICP M&M TF/CCE workshop meetings will probably be Zagreb, in Croatia, at about the same dates as in 2014 (2nd week of April).

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

**Finally the chairwoman and the head of the CCE thanked the hosts of the meeting for the excellent organisation of the meeting, the quality of the venue and the instructive and pleasant excursion.**

**The chairs of the sessions, their speakers and the meeting participants were acknowledged and thanked for providing opportunities for discussions and for grappling with ideas and options of novel endpoints and indicators to further improve the assessment of ecosystem effects of air pollution. And the meeting was ended.**

# 5. ICP M&M Task Force recommendations discussed at its 30th meeting, Rome, 7-10 April 2014 to the Working Group of Effects

The following recommendations have been agreed upon during the meeting and may not be modified, except, if requested, at the next ICP M&M TF meeting.

The ICP M&M Task force recommends that:

- ✓ NFCs may complete their response to the 2012-2014 call for data until the end of May 2014.
- ✓ There might be a delay in the finalisation of the 2014 CCE status report, so this report may take into account all NFCs reports related to their response to the 2012-2014 call for data.
- ✓ The ICP M&M and CCE written report to the WGE is to be completed verbally at the WGE meeting in September, if needed.
- ✓ It will be proposed that the WGE requests a new call for data that will:
    - address the need to adapt the critical loads database to the new longitude - latitude - 0.50° x 0.25 ° EMEP deposition grid;
    - offer the possibility to NFCs to update their national data with a novel approach to calculate sulphur and nitrogen critical load functions taking into account their impact on biodiversity, as proposed by the CCE,
    - NFCs to be enable to submit a list of typical and relevant species for the ecosystems/habitats/… considered.
- ✓ A common indicator, preliminarily named "habitat suitability indicator", should be used by all NFCs, in addition to indicators that meet specific national requirements;
- ✓ A reference situation, or threshold, needs to be further discussed;
- ✓ The draft update of the Mapping manual is to be completed preferably before 15th July 2014 but no later than by the 33rd session of the Working Group on Effects. Draft chapters will be posted

on ICP M&M web site before the 33rd session of the WGE as appropriate so that they may be commented by NFCs and then finalised by the 2015 ICP M&M Task Force. Chapters 3 and 4 have been discussed by ICP Vegetation and ICP Materials and are not expected to be commented on by ICP M&M NFCs.

- ✓ The WGE-EMEP meeting should discuss causes of significant differences in computed critical load exceedances (especially when some updated depositiondata are made available).
- ✓ A request will be made to EMEP to make land use specific deposition data available on its web site so that NFCs may carry out national assessments;
- ✓ NFCs and their collaborative institutions were requested to check whether their names and addresses were fully and correctly listed on the updated ICP M&M site (http://icpmapping.org/NFCs).

# 6. ANNEXES

## 6.1. TOUR DE TABLE

**Austria**

**Belgium**

**Czech Republic**

**Denmark**

**Finland**

In response to the call for data, Finland submitted no data but a summary of national activities that are related to identifying the impacts of nitrogen on biodiversity and to developing indicators of biodiversity. The report was written in collaboration with our national habitats experts. No national metric on "no net loss of biodiversity" has yet been identified in Finland. The Finnish NFC participates in the work on indicator development through the exercise led by ICP Integrated Monitoring to apply VSD+ and PROPS to selected IM sites in Europe. With respect to the Finnish critical loads database, our next tasks are to convert the CL values to a grid suitable for use for with the new longitude latitude grid of EMEP and to update the $CLN_{emp}$ values using more detailed information on the location and habitats of the Natura 2000 network in Finland. It is not yet clear if we will be able to complete these tasks before the end of 2015. We have been advised by our national habitats experts to postpone the update of the $CLN_{emp}$ database until they have completed their ongoing work to refine the information in the Finnish Natura 2000 database.

**France**

**Germany**

**Ireland**

**Italy**

**Netherlands**

**Norway**

**Romania**

**Russia**

**Slovakia**

**Spain**

**Sweden**

**Switzerland**

**United Kingdom**

(1) NFC progress in relation to the call for data

The UK NFC has developed biodiversity metrics that summarise the outputs of soil-vegetation models. The use of these metrics has been illustrated by application to 18 designated nature conservation sites, including representative sites of EUNIS classes D (Mires, bog and fen habitats), E (Grassland and tall forb habitats) and F (Heathland, scrub and tundra). The results of this study have been submitted to the CCE in response to the 2012-14 Call for Data and are described in a UK contribution to the CCE 2014 Status Report.

(2) Envisaged capacity for 2014-2015

The UK NFC currently has funding from Defra until 31/05/15; future funding beyond that date is not yet known. The biodiversity modelling activities reported in (1) above have also been funded by Defra, but under two short-term contracts; future funding by Defra is not

yet known, however a small amount of additional funding has been obtained from NERC until 31/03/15.

(3) NFC collaboration with habitat experts
The UK NFC collaborates with the Statutory Nature Conservation Bodies (SNCBs) in developing and applying (a) site relevant critical loads for feature habitats of UK designated sites, including Natura 2000 sites; (b) biodiversity models and metrics.

(4) NFC collaboration with EECA countries: none at present.

**USA**

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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

# 24th CCE Workshop and 30th Task Force Meeting

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

***Monday 7 – Thursday 10 April 2014***

## Rome, Italy

**ENEA**

**Lungotevere Thaon di Revel 76**

**Rome**

**Sponsored by:**
**National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), Italy**
**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**

# Monday, 7 April 2014

| **Opening of the 24th CCE workshop and 30th TF and Key Note Session**<br>Chair: Alessandra De Marco | | |
|---|---|---|
| 8:00 - 8:30 | Registration, coffee and mounting of posters | |
| 8:30 - 8:45 | Welcome | P.M. |
| 8:45 - 10:15 | Keynote Session | |
| 8:45 - 9:15 | Ozone fluxes and epidemiology of forest injury | Elena Paoletti et al. |
| 9:15 - 9:45 | $FO_3REST$: Adapting Mediterranean forests to climate change and air pollution | Pierre Sicard et al. |
| 9:45 - 10:15 | Bridging modelled and measured data to evaluate forest health and vitality | Alessandra De Marco et al. |
| 10:15 - 10:30 | Objectives of the workshop and Task Force | Anne-Christine Le Gall/ Jean-Paul Hettelingh |

| **Topic 1: Results of the Call for Data 2012-14 of contributions to dynamic modelling of vegetation changes and applications ("no net loss of biodiversity")**<br>CHAIR: JEAN-PAUL HETTELINGH | | |
|---|---|---|
| 10:30 - 10:45 | Coffee break and Poster session in the presence of poster authors | |
| 10:45 - 11:30 | 2012-14 Call for Data results | Jaap Slootweg & Max Posch |
| 11.30 - 12.00 | Objectives of proposed WGE-ICP M&M Call for Data 2014-15 | Max Posch & Jaap Slootweg |
| 12:00 - 12:30 | Discussion | |
| | TF Conclusions and recommendations for<br>on Topic 1 | Anne-Christine Le Gall |
| 12:30 - 14:00 | Lunch | |

| **Topic 2: Call-results and Progress on identification and use of biodiversity endpoints (incl. ecosystem services) and indicators. Regional assessments of their changes (NFC + other presentations)**<br>CHAIR: MAX POSCH | | |
|---|---|---|
| 14:10 – 14:20 | Modelling N driven biodiversity changes in Austrian forest and grassland habitats | Thomas Dirnböck |
| 14:20 – 14:40 | Selecting a biodiversity metric for the UK response to the CCE Call for Data by comparison | Ed Rowe |

| | | |
|---|---|---|
| | with specialist judgement. | |
| 14:40 – 15:00 | Modelling plant response to nitrogen atmospheric deposition in some French ecosystems: progress and limits. | Simon Rizzetto et al. |
| 15:00 – 15:20 | Biodiversity in a changing environment – call for data results in Germany | Thomas Scheuschner |
| 15:20 – 15:45 | Coffee break and Poster session | |
| 15:45 – 16:15 | Issues addressed in Switzerland in responding to the CCE Call for Data 2012-2014 | Daniel Kurz , Beat Achermann (2 parts) |
| 16:15 – 16:40 | Modelling biodiversity indicators using the CCE background database | Gert Jan Reinds |
| 16:40 - 17:00 | Recent developments on the VSD+PROPS model | Luc Bonten |
| 17:00 - 17:30 | Discussion & interim Task Force conclusions on Topic 2 | |

# Tuesday, 8 April 2014

**Topic 2…Contd: New knowledge of (1) nitrogen impacts and trade-off between nitrogen and ozone impacts and (2) modelling of "biodiversity" endpoints indicators, e.g. for calls for data**

CHAIR: BEAT ACHERMANN

| | | |
|---|---|---|
| 8:30 – 9:00 | Dynamic modelling of impacts in Natura 2000 habitats in the Dutch response to the call for data | Arjen van Hinsberg |
| 9:00 – 9:20 | Effects of 7 years of combined O3 and N deposition on the species composition and soil C and N pools in a subalpine grassland | Seraina Bassin |
| 9:20 – 9:40 | Scale-dependent effects of nitrogen deposition on plant diversity | Lukas Kohli |
| 9:40 – 10:00 | Measuring or modelling: complementing or contradicting | Walter Seidling |
| 10:00 – 10:20 | Reporting on new progress with the ForSAFE-VEG model towards good accuracy on vegetation modelling. The result of calibrating a database across North America and Europe on output | Harald Sverdrup / Salim Belyazid |
| 10:20 – 10:40 | Discussion & Task Force Conclusions and recommendations on Topic 2 | Anne-Christine Le Gall |
| 10:40 – 11:00 | Coffee break and Poster session | |

| **Topic 3: ICP M&M 2014-2015 work plan: Mapping Manual and collaboration with other ICPs**<br><br>CHAIR: ANNE CHRISTINE LE-GALL | | |
|---|---|---|
| 11:00 – 11:20 | Updates on U.S. activity related to the WGE Call for Data | Christopher Clark |
| 11:20 – 11:40 | First communication on a dynamic vegetation modelling study at selected ICP IM sites with contributions from ICP M&M and ICP Forest | Maria Holmberg |
| 11:40 - 12:10 | ICP-Vegetation - Updates to chapter 3 of the Modelling and Mapping Manual. | Harry Harmens |
| 12:10 – 12:30 | Presentation of the updated Mapping Manual | Anne-Christine Le Gall |
| 12:30 – 13:00 | Task Force Conclusions and recommendations on Topic 3 | Anne-Christine Le Gall |
| 13:00 – 14:00 | Lunch | |
| 14:00 - 19:00 | Excursion (PM.) | |
| 20:30 (PM.) | Conference dinner (PM.) | |

# Wednesday, 9 April 2014

| **Topic 4: Results from international collaborations: Novel critical thresholds, status of ECLAIRE, other scientific progress and effect-oriented policy support**<br><br>CHAIR: ANNE-CHRISTINE LE GALL | | |
|---|---|---|
| 8:45 – 9:15 | Challenges in using biodiversity indicators to quantify ecosystems services for a cost-benefit analysis in the framework of ECLAIRE | Wilfried Winiwarter |
| 9:15 – 9:35 | The valuation of damage to ecosystem services due to air pollution…follow up of TFIAM-NEBEI workshop, Zagreb, 24-25 October 2013 | Rob Maas |
| 9:35 – 9:55 | ICP Waters - report from current activities: trends, biodiversity and ecosystem services. | Heleen de Wit |
| 9:55 – 10:15 | Indicator choice in quantifying the threat of atmospheric N to the Natura 2000 network | Jesper Bak |
| 10:15– 10:45 | Discussion | |
| 10:45 – 11:05 | Coffee break | |
| 11:05 – 11:25 | The development of a new acidity critical load method for UK peats | Chris Evans |

| | | |
|---|---|---|
| 11:25 – 11:50 | Critical limits for acidification of surface waters vs boundary values in the Water Framework Directive – a Norwegian case study | Kari Austnes |
| 10:50 – 11:10 | The ammonia deposition reductions required post 2025 to protect Annex I habitats in the UK | Jane Hall |
| 11:10 – 11.30 | The use of the GAINS_Italy Model for Impact Assessment | T.Pignatelli, G. Vialetto |
| 11:30 – 12.30 | Discussion<br>Task Force Conclusions and recommendations on Topic 4 (and if necessary on topics 2 and 3) | Chair : Anne-Christine Le Gall |
| 12:30 – 14:00 | Lunch | |

| **Topic 5: Training session + issues for possible call 2014-2015**<br>MODERATOR: JAAP SLOOTWEG ET AL. (CCE AND ALTERRA) | | |
|---|---|---|
| 14:00 – 14:15 | Introduction | PM. |
| 14:15 - 18:00<br>**Coffee break @ 15:30** | Interactive discussions with NFCs on call for data software (incl. VSD-PROPS) and CCE/NFC data base issues | |

# Thursday 10th April 2014

| **Topic 6: ICP M&M workplan …continued […Including: Inventory of (national) effect-oriented research and policy support 2014-2020…]** | | |
|---|---|---|
| 9:00 – 9:20 | Summary of training session findings | Jaap Slootweg & Max Posch |
| 9:20 – 9:30 | Task Force Conclusions and recommendations on Topic 5 | Chair : Anne-Christine Le Gall |
| 9:30 – 10:30 | Discussion on capacity building in EECCA Countries Common EMEP – WGE Reports<br>Collaboration with other groups under the LRTAP Convention<br>[The traditional Tour the Table is replaced by your contribution in writing, e.g. addressing (1) NFC progress in relation to the call for data, (2) envisaged capacity for 2014-2015, (3) NFC collaboration with habitat experts] | |
| 10:30 - 10:50 | Coffee break | |

| | | |
|---|---|---|
| 10:50 - 12:30 | Draft ICP M&M contributions to WGE meeting<br>Technical document(s) for 33rd WGE session (Geneva, 18-19 Sept. 2014)<br>Future meetings<br>Adoption of the draft minutes of the meeting.<br>Closure of the CCE WS and ICP M&M Task Force meeting | |
| 12:30 - 14:00 | Lunch | |

| **Posters**<br>(Poster sessions are combined with coffee breaks) | |
|---|---|
| *Modeling stomatal ozone deposition in mediterranean forests: validation using field observations from two coastal test sites* | *Silvano Fares and Flavia Savi* |
| *Results for VSD+ Modelling for the Level II Plots in Romania* | *Carmen Iacoban* |
| *Empirical Critical Loads for N as a nutrient at Natura 2000 sites – Swedish contribution to the call for data 2012/2014* | *Filip Moldan* |
| *Antagonism of temporal trends in atmospheric deposition influences the determination of sensitive ecosystem in France* | *Pascaud et al.; Anne Probst* |
| *Dynamics of understory plant communities in pine forest sites under long-term impact of increased nitrogen depositions: analysis of indicators and drivers* | *Irina Priputina* |
| *Changes in the ground vegetation composition of forest ecosystems observed in the Czech Republic in relation to atmospheric depositions, soil properties, temperatures and precipitation amounts* | *Irena Skořepová* |
| *Ozone impact on forest, grassland and crop in the ORCHIDEE model: results from dose/response concepts* | *Thomas Verbeke* |
| *[Setting critical loads of nutrient nitrogen for Irish oak woodlands]* | *Kayla Wilkins and Julian Aherne* |

1. Tour de Table: highlights by NFCs (To be finalised in May 2014).
2. Assessment reports questions

## 6.4.CLTRAP ASSESSMENT REPORT (AS OF 10/04/2014). –

The questions below are organized as a first draft of the CLRTAP assessment report requested by the EB to the Convention Subsidiary bodies. Discussions are on going about this report and additional questions may occur, other may be deleted.

### 6.4.1. *Executive summary: How can air pollution abatement contribute to our health and the sustainability of ecosystems and society?*

a. How important is air pollution abatement for our health?
b. To what extent is air pollution affecting biodiversity and ecosystem services?
c. How can air pollution abatement improve human wellbeing and the economy?
d. Which pollutants and sources need to get priority?
e. What are the costs and benefits of further reductions?
f. What synergies are possible between air pollution control and other policy strategies, e.g. on climate change, promoting healthy lifestyles or sustainable city design?

### 6.4.2. *Looking back: To what extent is the air pollution problem solved?*

a. Which improvements in emissions, air quality and effects have occurred over the last decades due to international air pollution agreements?
b. What have been the main driving forces in reducing emissions? To what extent is this due to international cooperation? What would emissions (and impacts) be without emission reduction and international cooperation?
c. Which abatement measures contributed mainly to improved health and ecosystems protection?
d. Why did the forest in Europe not die?
e. Have we solved the acid rain problem? Are there still acid lakes and soils in Europe?
f. What are the impacts of nitrogen to ecosystem services and biodiversity?
g. How serious is ozone abatement for food security?
h. How important are natural emission sources?
i. Were emissions reductions within the UN ECE region in line with international commitments?
j. Are there large differences in Europe with respect to air pollution threats?
k. To what extent is air pollution still an international problem? Is air pollution becoming mainly a local problem?
l. Who are currently the net exporters of air pollution? Who are net receivers?

### 6.4.3. *What is the role of science in air pollution policy?*

a. What scientific questions have been answered in the past decades?
b. Have concentrations and deposition of atmospheric pollutants gone down in line with what is expected from model outputs?
c. Do we have appropriate methods and monitoring systems for verifying agreed emission reductions and support further measures?
d. How well can models represent reality?
e. What is the optimal spatial scale to take measures given the residence time of the various pollutants in the atmosphere?
f. What is to be gained with a multi-pollutant approach?
g. What can be learned from the effectiveness of energy policy and international coordination?
h. What is the role of atmospheric pollutants in climate change?

### 6.4.4. *FUTURE OPTIONS: WHERE TO GO FROM HERE?*

a. Will emissions continue to decline, even with continuous growth in human activities, (such as traffic, energy use and food production)?
b. What is needed to significantly reduce health risks and to protect ecosystems? What happens to ecosystems and their services if air pollution continues?
c. What is the contribution from climate change policies for achieving the long term air pollution objectives?
d. What are the economic impacts of future air pollution control? Will jobs get lost?
e. What are the costs and benefits (for health, ecosystems, agriculture and materials)? Will additional measures increase economic growth or welfare?
f. Who has to pay? And who will benefit?
g. What are the conditions for "green growth". Will technology be able to compensate for further growth in production and consumption. To what extent is more innovation needed? SULEVs? New transport systems?
h. What could be gained by a biobased economy or a circular economy?

### 6.4.5. *DO WE NEED A GLOBAL APPROACH?*

a. What could be gained in terms of health and ecosystems benefits by technology transfer to Asia and EECCA countries?
b. What would Europe and America gain from measures in Asia and EECCA countries?
c. What institutional arrangements would be effective and feasible? What could be the role of CLRTAP?
d. Are there issues within the UN ECE region that are important?
e. Does air pollution action buy us time from climate change impacts?
f. Could air pollution mitigation have a cooling effect?
g. Will climate change decrease the resilience of ecosystems to air pollution?
h. How cost-effective is a combined international approach to mitigating air pollution, climate change and protection of ecosystems?
i. What would be the impact of global 'game changers' such as shale gas, CCS, geoengineering?
j. How can air pollution policy be integrated in biodiversity and ecosystem policy?
k. Are international air pollution policies of importance for controlling climate change in the the Arctic?

### 6.4.6. *WHAT IS THE ROLE OF LOCAL AIR POLLUTION POLICY IN AIMING AT HEALTHY, SAFE AND SUSTAINABLE CITIES?*

a. What local synergies are possible between mitigating air pollution and climate change? What would be the health impact of low carbon and pollution free neighbourhoods?
b. What could be the role of air pollution policies in increasing the resilience of cities against fast climate change and extreme events?
c. How could healthy diets, reduction of food waste and increased efficiency of the use of nutrients in food production contribute to reduction of air pollution and the protection of ecosystems?
d. How universal are the remaining challenges? Is a common cost-effective solution possible? Could economic instruments be effective?

e. What is the cost-effectiveness of additional air pollution measures compared to other measures to protect health (e.g. smoking bans, preventive screening of diseases)?