



ICP MODELLING AND MAPPING PROGRESS IN ACTIVITIES IN 2022

Alice James Casas (Chair)
Markus Geupel, Christin Loran, Thomas Scheuschner (CCE)
Filip Moldan, Sara Jutterström (CDM)

8th Joint WGE / EMEP meeting
Geneva, 12 – 16th September 2022

Contacts



alice.james@ineris.fr



cce@uba.de



filip.moldan@ivl.se

ICP M&M Task Force news and ongoing activities

Communication with NFCs and ICP M&M community

- **Newsletter** since July 2019
- Condensed information to NFCs on main ICP M&M topics
 - Summarising main achievements
 - Announcing main M&M relevant events
 - Encouraging contribution to the on-going work
- Newsletters are available online:

<https://www.umweltbundesamt.de/en/news-0?parent=67248>

Directly in your email box ?

➤ ask alice.james@ineris.fr



ICP M&M Task Force news and ongoing activities

Communication with NFCs and ICP M&M community

38th Task Force and 29th CCE annual meeting 3 – 5 May 2022

- Online Teams meeting
- 2 days + 1 afternoon
- 69 participants
- 23 Parties to the Convention, 24 countries
- 17 National Focal Points
- Main topics on scientific work linked to Critical Loads
- Contributions to Gothenburg Protocol Review



➤ [ICP M&M 2021 Report available from CCE website – Meeting page](#)

ICP M&M – Contributions to/with other groups

➤ Other ICPs' meetings

- ICP Vegetation Annual Meeting (February 2022)
- EMEP/WGE Extended Bureaux Meeting (March 2022)
- ICP Waters and Integrated Monitoring Annual Meeting (May 2022)
- ICP Forests Annual Meeting (June 2022)

➤ Collaboration with other groups

- bilateral meeting : CCE with the Centre for Integrated Assessment Modelling (5 October 2021)
- Representative of CCE actively took part in meetings of the Ad-hoc group on Marine Protection (AMP)

ICP M&M – identification of NFCs

CCE initiated a process to complete NFCs list but this is not complete yet

Countries with unidentified NFCs	Contacted institution(s)	Email responses	Identified NFC contact
Azerbaijan	Ministry of Ecology and Natural Resources, Climate Change Center under the National Hydrometeorology Service	no	no
Lithuania	Center for Physical Sciences and Technology, Department of Environmental Research	yes	no
Iceland	Ministry of the Environment and Natural Resources, Department of Climate Action	yes	no
Republic of Moldova	Institute of Ecology and Geography, Laboratory of Natural and Anthropogenic Ecosystems	yes	yes
Romania	Forest Research and Management Institute of Romania Ministry of Environment	yes	yes
Slovenia	Republic of Slovenia Ministry of the Environment and Spatial Planning Ministry of the Environment and Spatial Planning, Environment division	yes	no

CCE ongoing activities for workplan 22/23

ECE/EB.AIR/148/Add.1

<i>Workplan item</i>	<i>Activity description/ objective</i>	<i>Expected outcome/ deliverable</i>	<i>Lead body(ies)</i>	<i>Resource requirements and/or funding source</i>
1.1.1.19	Steady-state Critical Loads: (a) Update of National Critical Loads by National Focal Centres; (b) Establishment of European Background Database by CCE	Database (2020/2021) for Critical Loads for acidification and eutrophication; Report (2022)	CCE and ICP Modelling and Mapping	National Focal Centres and recommended contributions
1.1.1.20	Empirical Critical Loads: Review and revision of the CLemp N published in 2011 (continued)	Report on empirical Critical Loads in Europe (2022)	CCE and ICP Modelling and Mapping	Covered by CCE, CCE National Focal Centres and by recommended contributions
1.1.1.21	Update of the harmonized Convention receptor map	Harmonized receptor map for Europe (2023)	ICP Modelling and Mapping/CCE	CCE and Germany
1.1.1.22	Critical Levels of ammonia: literature review and empirical data provision supporting a workshop	Organization of an international workshop (2022) and workshop report (2023)	ICP Modelling and Mapping/CCE	CCE and Germany

➤ [2022-2023 workplan for the implementation of the Convention](#)

CCE 2022 progress on activities (1/4)

Empirical Critical Loads for N – informal document agenda item 2

Workplan 2022: 1.1.1.20, Report on the review and revision of empirical Critical Loads

Scientific background: recommendations of the CLRTAP Empirical Critical Loads for nitrogen are more than 10 year old

Process coordinated by CCE during the year 2020 – 2022; scientific lead Roland Bobbink (B-WARE Research Center)

45 Authors/Experts including from ICP Forests, ICP Integrated Monitoring, ICP Modelling & Mapping, ICP Waters and ICP Vegetation

Funding: CCE and NFCs to ICP Modelling & Mapping

Oct 21: Expert workshop in Bern, Switzerland hosted by the Swiss NFC (Determination of revised CL)



CCE 2022 progress on activities (1/4)

Empirical Critical Loads for N – informal document agenda item 2

Concluding scientific remarks:

- Biologically significant outcomes of both field addition experiments and N gradient studies were used for revision
- The new EUNIS codes have been used
- CL ranges recommended for in total 51 ecosystems, 9 new receptors could be added
- For 36 ecosystems the 2010 ranges have been adapted (of which most became lower based upon new evidence)



CCE 2022 progress on activities (1/4)

Empirical Critical Loads for N – informal document agenda item 2

ICP M&M community at its 38th meeting in May 2022 (online):

- “agreed with the scientific content which led to the updated CLempN values”
- “asked WGE to take note of the report and the updated empirical critical loads of nitrogen and to recommend their use across the CLRTAP at the 8th joint WGE/EMEP session in September 2022”
- “recommended to plan a new Call for Data on national application of CLempN to be issued in 2023. The collected information will provide input needed to prepare a future item in the workplan 2024-2025 on applied risk assessment with CLempN “

→ WGE is asked to take note of and support this collaborative procedure, so that the new findings can be incorporated into the Mapping Manual



CCE 2022 progress on activities (2/4)

Workshop on NH₃ Critical levels – informal document agenda item 2

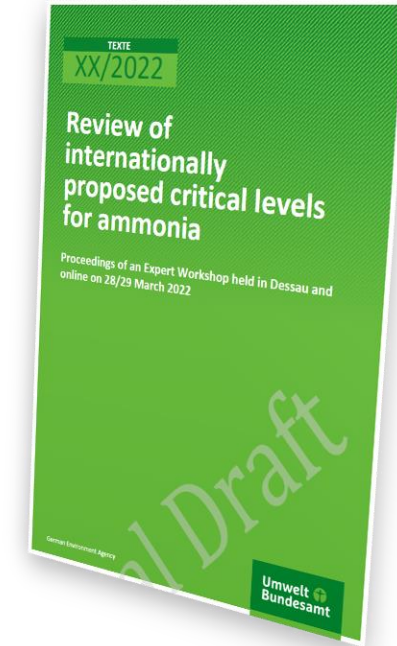
Workplan 2023: 1.1.1.22, Workshop and Workshop-Report on Atmospheric Ammonia (Informal Document Agenda Item 2)

Scientific background: recommendations of the CLRTAP critical levels for ammonia are more than 10 year old

28 – 29 March 2022, hosted by the Coordination Center for Effects ([CCE-homepage](#))

Initiation of a discussion on the new scientific findings on the effects of ammonia on vegetation

Information exchange on ammonia monitoring (networks)



CCE 2022 progress on activities (2/4)

Workshop on NH₃ Critical levels – informal document agenda item 2

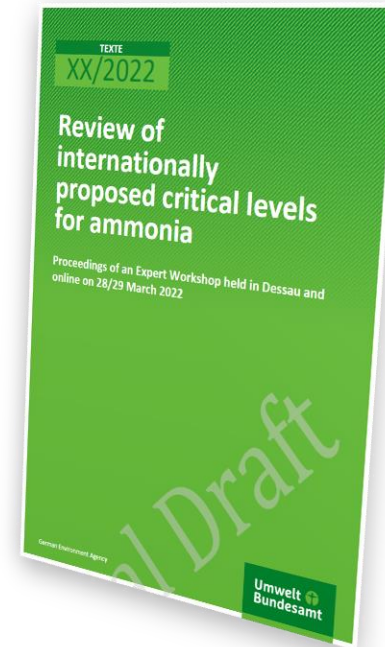
145 registered participants, 28 countries including UNECE Secretariat, WGE, ICP Vegetation, ICP Forest, CDM, CIAM, MSC-West, TFRN and representatives from several EU Environment Agencies

19 talks, existing studies (since the last 15 years) broadly support the ammonia critical levels from 2006

Monitoring findings:

- standardized low-cost method with passive sampling in place
- Nation wide networks
- Include in future legislation (e.g. EU Ambient Air Quality Directives).

→ **Update of Mapping Manual: CCE will coordinate a drafting group to incorporate the latest findings; discuss with ICP M&M (2023) and present update to WGE/EMEP (2023) for adoption**



CCE 2022 progress on activities (3/4)

CCE Status Report – informal document agenda item 2

Workplan 22: 1.1.1.19, Report on actual Critical Load Database

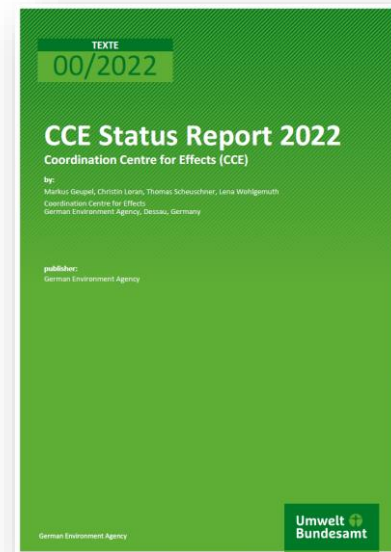
- National Critical Load data (Call for Data 2019-2021)
- Background database: Critical loads for eutrophication and acidification for European terrestrial ecosystems (Technical Documentation)

Including detailed description of methods, modelling framework in R

Risk assessment for the review of the Gothenburg Protocol (historic & scenario assessment)

→ CCE asks WGE to formally take note of the current CL database 2021 and recommend its application in policy support

→ Formal notice is of high importance for policy support e.g. EEA headline indicator CL Exceedances for EU Biodiversity strategy



CCE 2022 progress on activities (4/4)

Ongoing activities

- Workplan 2023: 1.1.1.21, Update the database for landuse/ landcover for UNECE region (focus on Europe)
 - CCE will contact MSC-West with preliminary results, who else?
- Continuation of cooperation in the ad-hoc group on marine protection (AMP)
- Extension of the Critical Load background database to EECCA countries
- Complete list of NFC contacts – start more intensive bilateral exchange with new NFC on CL modelling → capacity building



CDM ongoing activities for workplan 22/23

ECE/EB.AIR/148/Add.1

<i>Workplan item</i>	<i>Activity description/ objective</i>	<i>Expected outcome/ deliverable</i>	<i>Lead body(ies)</i>	<i>Resource requirements and/or funding source</i>
1.1.1.23	Modelling interaction between air pollution and climate change: N and C	Expert workshop (2022)	ICP Modelling and Mapping/CDM	CDM and National Focal Centres experts
1.1.1.24	Modelling biodiversity change to set critical loads for N	Report on methodology development and proposal for call for data (2023)	ICP Modelling and Mapping/CDM/CE	CDM, CCE, and National Focal Centres experts

➤ [2022-2023 workplan for the implementation of the Convention](#)

CDM progress on activities

Expert workshop planned: Modelling interaction between air pollution and climate change: N and C

- Goal: to model effects of N on ecosystems including biodiversity is an old problem which is, however, not fully resolved and it is further complicated by climate change. Interaction between C and N is crucial but not well-enough captured by the models.
- Who: communities from modelling, monitoring & data collection, both air pollution and climate change
- Potential: new data, new model developments and much more focus on C from the CC community. More expertise available.
- When: spring 2023, suggestion back-to-back with either a TF-meeting or with related project such as e.g. CatchC&N

CDM progress on activities

Dynamic modelling activities in the ICPs

Interviews conducted with five ICPs based on the following questions:

- How are dynamic models used today in the ICP and what are the policy-relevant environmental problems being addressed by using dynamic models?
- What is the future potential of dynamic modelling work undertaken by the ICP to provide policy-relevant outputs?
- Hindrances for advancement with dynamic modelling work (lack of process understanding, data availability etc.)
- Areas of common interest and potential collaboration.

CDM progress on activities

Dynamic modelling activities in the ICPs

Themes/highlights/points that came up during the interviews:

- Investigating the links between air pollution, land use and climate change is important, and this will also likely include carbon flux in one way or another.
- DM useful for predicting timing of recovery e.g. in surface waters.
- Models need further development; data need to be collected and indicators of biodiversity change needs to be developed and agreed. Science underpinning models must be robust.
- One hindrance for advancement of dynamic modelling work is access to forecasts of the driving variables
- Analyses and publication of the latest data and scientific advances are, as ever, a necessary basis for political decisions and are also crucial steps for model development.
- Conducting modelling work with the Programmes would raise the priority to the modelling work and ideally lead to a larger resource allocation for these efforts

CDM progress on activities

Report on methodology development and proposal for CFD

- Report aims at using modelled biodiversity change to set CL for N
- Based on model development & applications, on work done by or associated with ICPs
- Indicators & response functions: discussion/suggestion on what indicators and response functions are the most suitable
- Models: which models that are in use/data demand/complexity/ease of use
- Data: from within and from outside WGE, new initiatives such as IM extended to expand list of habitats with data
- Hindrances, difficulties and potential benefits

CDM progress on activities

New version of common WGE portal available, further development needs consensus on how

- Webpage centered around three themes: **Monitoring, Modelling, Impact Indicators**
- Gives information on whole WGE clustered around those themes
- Does not duplicate data, links to ICPS
- Further steps needs to be discussed

ICP M&M 2022 – Main take-home messages

Main messages you are invited to take back home or proposals to discuss now



- Review and Revision of Empirical CL work is achieved !
 - ICP M&M TF and CCE asks WGE to recommend the use of the new values
 - Final draft report is available (cf. informal document of this meeting) from [here](#)
 - Final report will soon be available
- Steady-state CL: the CCE status report 2022 is available (cf. informal document of this meeting)
- NH₃ critical levels : ammonia critical levels from 2006 are supported by the 2022 review
- Updating the harmonized CLRTAP receptor map: work is ongoing
- Dynamic Modelling experts have met in person for the first time since CDM was created (Sitges, April 2022)
- DM activities undertaken at ICPs were screened, report is forthcoming
- There is an interest in DM at all ICPs, with different focus and priorities, ca. 30 models used
- WGE representatives of countries (AZ, LH, ICE, SLO) are encouraged to send information on NFC contacts