United Nations Economic Commission for Europe (UNECE)

Convention on Long-range Transboundary Air Pollution

Working Group on Effects (WGE)

International Cooperative Programme (ICP) on Integrated Monitoring of Air Pollution Effects on Ecosystems

Minutes of the twenty-eight Programme Task Force, held online

1. The meeting was organized online by Swedish University of Agricultural Sciences, SLU. The number of registered participants was 42 from the following Parties to the Convention on Long-range Transboundary Air Pollution (CLRTAP): Austria, Canada, Czech Republic, Estonia, Finland, Germany, Ireland, Italy, Latvia, Norway, Poland, Russian Federation, Spain, Sweden, and Switzerland. ICP programmes ICP Forests, ICP Waters and ICP Modelling and Mapping were represented. The Chair of Working Group on Effects (WGE) and members of the CLRTAP Secretariat also participated as well as a representative from EU Commission, DG Environment. The list of participants is attached as Annex II.

2. Mr. U. Grandin, Co-Chair of ICP IM welcomed all online participants and opened the Task Force meeting.

3. The Task Force adopted the agenda of the meeting (Annex I) including a full list of presentations.

4. The Task Force approved the Minutes from the 27th ICP IM Task Force meeting in Helsinki 2019.

5. Reports

a) Mr. K. Olendrzynski from the CLRTAP Secretariat presented the structure of the UNECE Convention on Long-Range Transboundary Air Pollution and an update on recent and planned activities. Mr. Olendrzynski presented the status of ratification of the recent protocols. He also presented the role of Working Group on Effects (WGE), and gave an update on priority areas of the LRTAP (link to presentation).

b) Mr M. Forsius, Programme manager of the ICP IM, presented information from the CLRTAP 40 year anniversary celebration (link to video). He also mentioned the paper by Grennfelt et al. 2019, highlighted at the anniversary.

c) Ms. A. Teller from EU Commission, DG Environment, presented the Post-2020 Global Biodiversity Framework (GBF) (on Wednesday 13th) and the potential synergies with UNECE CLRTAP and practical opportunities for increased cooperation (presentation).

d) Ms. A.-K. Prescher from ICP Forests, presented (on Wednesday 13th) latest activities of ICP Forests Programme including information about latest publications, revision of the manual in 2020 (every 5 years), and new ICP Forest Briefs. She mentioned HM work as possible cooperation with ICP IM. (full presentation will be available later).

e) Ms. H. de Wit, Chair of ICP Waters, presented (on Wednesday 13th) the current issues in ICP Waters Programme. She presented highlights from the TF meeting, recent publications and papers, recent results on particularly nitrogen and plans for the future (presentation). Work on nitrogen was proposed as possible cooperation between ICP IM and ICP Waters.

f) Mr. T. Scheuschner, Germany, presented the new organization of ICP Modelling & Mapping and recent activities. The creation of the new Centre for Dynamic Modelling (CDM) was especially mentioned. He

presented the recent and future work of Coordination Centre for Effects (CCE) and CDM and highlighted the potential collaboration with ICP IM on nitrogen effects and on revision of empirical critical loads (CL) (presentation).

g) Mr. Grandin presented the revised mandate for ICP IM decided by the Executive Body (Decision 2019/18).

h) Mr. Grandin presented the outline and most essential parts of the CLRTAP Long Term Strategy 2020-2030.

6. Mr. Grandin presented the activities during 2019/20
   - All activities are listed in chapter 1 of the 29th ICP IM Annual Report.

   Summary:
   - ICP IM participated or was represented at 12 international meetings directly related to the IM core activities.
   - The Programme Centre received the 2018 data from most IM sites, data are now stored in the ICP IM database; further in item 10.
   - ICP IM has had continued cooperation with the European LTER community and their work to create a Pan-European Research Infrastructure for ecosystem monitoring.
   - The listed scientific outputs in the WGE 2020-2021 work plan are about to be completed:
     - Workplan item 1.1.1.15:
       Scientific paper on impacts of internal catchment related nitrogen parameters to total inorganic nutrient nitrogen (TIN) leaching. Scientific paper (2020)
       - MS submission planned after summer
     - Workplan item 1.1.1.16:
       Report on Hg and HM trends in concentrations and fluxes across ICP Integrated Monitoring sites in Europe. Report (2021)
       - Report in 29th IM Annual Report (see Chapter 2). Planned scientific article
     - Workplan item 1.1.1.17:
       Scientific paper on effects of nitrogen enrichment on forest vegetation. A co-operation between ICP Integrated Monitoring and ICP Forests. Scientific paper (2020)
       - MS submission planned to summer 2020

7. The Task Force broke up into groups and discussed and gave recommendations on the following points:

   I. Future scientific studies based on IM data - an important input to the next WGE work plan.
   II. In what ways can the cooperation with other ICPs (including the new Centre for Dynamic Modelling/ICP M&M) and EMEP be improved?
   III. Should there more formalised wider involvement in IM by the formation of task groups, expert panels etc. engaging more of the scientist connected to IM?
   IV. The EU 2030 biodiversity strategy, in what way can IM contribute?
   V. Is 'IM light' a good idea? Which other habitats than forests should be prioritised? What would a minimum set of variables be?

Recommendations from the groups are presented in Annex III

8. Work plan and future work priorities

   a) Reports and papers to be prepared/finalized in 2020/2021:
   - 2021: Scientific paper on Hg and HM trends in concentrations and fluxes across ICP Integrated Monitoring sites in Europe (WGE item 1.1.1.1.6).
   - 2020/21: Scientific paper on the relationship between critical load exceedances and empirical ecosystem impact indicators, manuscript (Forsius et al.) available.
   - 2020/21: Scientific paper on the recovery in the epiphytic lichen community in the IM catchments, after the decrease in S deposition.

   b) Suggested items for the 2022-2023 WGE Work Plan (science part):
   - The co-chairs and programme centre welcomed the suggestions from the break out group discussions

and will use this as a basis for the next work plan.

c) Co-operation with other ICPs, EMEP and organisations:

- The co-chairs and programme centre welcomed the suggestions from the break out group discussions and encourage the IM community to collaborate with other parties in the convention.

9. Mr. Grandin presented possible financing/external applications for ICP IM work.

Financial support for the international coordination of effects-oriented activities under the CLRTAP is available through voluntary contributions to the Trust Fund. Some key actions of the EU Horizon 2020 framework programme are open for research proposals. Such funding can be used for supporting research activities related to ICP IM, and the participating institutes are encouraged to look into the possibilities for joint applications. Information is available at: http://cordis.europa.eu/.

10. Ms. S. Kleemola from ICP IM Programme Centre described the status of data reporting to the Programme Centre. The following fifteen countries have continued data submission to the ICP IM data base during the period 2015–2019: Austria, Belarus, the Czech Republic, Estonia, Finland, Germany, Ireland, Italy, Lithuania, Norway, Poland, the Russian Federation, Spain, and Sweden. Presently the number of ICP IM sites with on-going data submission, data for at least part of the 'data period' 2014–2018, is forty-eight (presentation).

Due to expected personnel changes and new arrangements, NFPs are asked to report the 2019 data as early as possible. The TF meeting decided unanimously on a voluntary deadline for reporting of 2019 data to be 1st of November 2020.

11. The Task Force agreed unanimously that 2021 meeting should again be a Joint meeting with ICP Waters. Latvia has kindly volunteered to host the 2021 meeting.

12. The Task Force approved the draft Annual Report 2020 and invited NFPs to provide written comments by June 7th, 2019 and to submit additional contributions (short National Reports).

13. The Co-Chair U. Grandin ended the 28th ICP IM Task Force meeting.

Annex I

UNECE CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION

International Cooperative Programme on Integrated Monitoring of Air Pollution Effects on Ecosystems

28th ICP IM Task Force Meeting, 13-14 May 2020

Wednesday May 13 – Scientific presentations and messages from other ICPs

Time (CEST)	Topic	Presenter
13:00-13:10	Welcoming and opening of the 28th ICP IM Task Force meeting	Ulf Grandin
13:10-13:35	EU 2030 biodiversity strategy	Anne Teller
13:35-13:45	Current and emerging activities in ICP Forests	Anne-Katrin Prescher
13:45-14:05	Weak recovery of epiphytic lichen communities in Sweden over 20 years of rapid air pollution decline	James Weldon
14:05-14:15	Break, 10 minutes	
14:15-14:25	Current and emerging activities in ICP Waters	Heleen de Wit
14:25-14:45	Long-term records of Hg in archived samples suggest pivotal role S deposition to explain long-term decline of Hg in fish'	Heleen de Wit
14:45-15:05	Heavy metals in deposition, soil and runoff in ICP IM sites	Karin Eklöf
15:05-15:25	The Lago Nero Observatory: Report of the five-years activities as contribution to ICP-IM	Luca Colombo
15:25-15:45	Break, 20 minutes	
15:45-16:05	Impacts of catchment characteristics, climate and hydrology on N processes and leaching at ICP IM sites	Jussi Vuorenmaa
16:05-16:20	Arginin in spruce needles at the Swedish IM sites	Ulf Grandin
16:20-16:30	Current and emerging activities in ICP Modelling & Mapping	Thomas Scheuschner or Markus Geupel

16:30-16:50	Assessing critical load exceedances and ecosystem impacts of N and S deposition at ICP IM sites	Martin Forsius
16:50	Adjourn	Ulf Grandin

Thursday May 14 – Task Force meeting
13:00 – ca. 17:00 (CEST)

Suggested agenda for the formal 28th ICP IM Task Force meeting, with annotations

1. Opening of the TF meeting

2. Approval of the agenda

3. Approval of the minutes from the 27th ICP IM Task Force meeting, Helsinki 2019.

The minutes were distributed my mail to all participants, and are available on the ICP IM web site at the programme centre: https://www.syke.fi/download/noname/%7BBF595595-CA904506-9928-F61958F26B3A%7D/147596

4. Reports from

a) the CLRTAP secretariat (Krzysztof Olendrzynski)

b) the CLRTAP 40 year anniversary celebration (Martin Forsius)

See the video: https://www.youtube.com/watch?v=UNka_IZDNE0.

c) other items (reports from other ICPs and EU 2030 biodiversity strategy presented on Wednesday, May 13)

- A revised mandate for ICP IM was decided by the Executive Body (Decision 2019/18), available at https://www.unece.org/fileadmin/DAM/env/documents/2019/AIR/EB_Decisions/Decision_2019_18.pdf.

5. Activities during 2019/20 - Information

All activities are listed in the 29th Annual Report from IM, soon available from the ICP IM web site: https://www.syke.fi/nature/icpim. Below a summary.

- ICP IM participated or was represented at 12 international meetings directly related to the IM core activities.
- The Programme Centre received the 2018 data from most IM sites, data are now stored in the ICP IM database; further in agenda item 10.
- The listed scientific outputs in the WGE 2020-2021 work plan are about to be completed (see table below).
- ICP IM have had continued cooperation with the European LTER community and their work to create a Pan-European Research Infrastructure for ecosystem monitoring.

From the WGE 2020-2021 work plan:

Work plan item	*Activity description/objective*	*Expected outcome/ deliverable*	*Outcome*
1.1.1.15	Scientific paper on impacts of internal catchmentrelated nitrogen parameters to total inorganic nutrient nitrogen (TIN) leaching.	Scientific paper (2020)	MS submission planned after summer
1.1.1.16	Report on Hg and HM trends in concentrations and fluxes across ICP Integrated Monitoring sites in Europe.	Report (2021)	Report in 29th IM Annual Report. Planned scientific article.
1.1.1.17	Scientific paper on effects of nitrogen enrichment on forest vegetation. A co-operation between ICP Integrated Monitoring and ICP Forests.	Scientific paper (2020)	MS submission planned to summer 2020.

6. Discussions – break out groups, about 1.5 hr (including coffee break).

Background: In line with the priorities set out in the long-term strategy for the Convention, science-based decision-making and an effects-oriented approach will remain an essential component of the Convention and the links between science and policy development will be retained and strengthened. User-friendly effect indicators and cost-benefit assessments are important to policymakers, politicians and the public and will be further developed. The science-related work in the period 2019–2022 will aim to make additional progress on the remaining and emerging challenges identified in the long-term strategy (e.g., particulate matter, tropospheric ozone, critical load exceedances and linkages between air pollution, climate change and biodiversity).

The 2020-2021 Convention Work Plan stress a further integration of the various elements covered by EMEP and the effects-oriented activities under the Working Group on Effects. This integration may be demonstrated through common or joint outcomes and deliverables, such as e.g. assessment reports, country reports and joint websites.

ICP IM is currently restricted to forested catchments. There has been suggestions to include more habitat types for better understanding of biogeochemical processes and fluxes at a larger landscape levels. “IM light” is a conceptual thought to engage other monitoring programmes in other kind of habitats in IM. However, it is so far only an idea to be discussed and developed.

Finally, IM activities are currently to a large extent governed in a top-down structure. We would like to hear the opinions regarding a wider bottom-up involvement through the formation of formal or informal task groups or expert panels, as other ICPs have.

Discussion topics: Each break out group should discuss each of the following points, or as many as time allows. Start by prioritise the points. The chair of each group should report back, and provide a short written summary.

- Future scientific studies based on IM data - an important input to the next WGE work plan.
- ln what ways can the cooperation with other ICPs (including the new Centre for Dynamic Modelling/ICP M&M) and EMEP be improved?

- Should there more formalised wider involvement in IM by the formation of task groups, expert panels etc. engaging more of the scientist connected to IM?
- The EU 2030 biodiversity strategy, in what way can IM contribute?
- Is IM light a good idea? Which other habitats than forests should be prioritised? What would a minimum set of variables be?

7. Report back from the BOG

8. Work plan and future work priorities

a) Reports and papers to be prepared/finalized in 2020/21

- 2021: Scientific paper on Hg and HM trends in concentrations and fluxes across ICP Integrated Monitoring sites in Europe (WGE item 1.1.1.1.6).
- 2020: Scientific paper on the relationship between critical load exceedances and empirical ecosystem impact indicators, manuscript (Forsius et al.) available.
- 2020: Scientific paper on the recovery in the epiphytic lichen community in the IM catchments, after the decrease in S deposition.

b) Suggested items for the 2022-2023 WGE Work Plan (science part)

- Suggestions from the break out discussion groups
- No decisions at this year's meeting

c) Co-operation with other ICPs, EMEP and organisations

- Suggestions from the break out discussion groups.

9. Financing/external applications

Financial support for the international coordination of effects-oriented activities under the CLRTAP is available through voluntary contributions to the Trust Fund.

Some key actions of the EU Horizon 2020 framework programme are open for research proposals. Such funding can be used for supporting research activities related to ICP IM, and the participating institutes are encouraged to look into the possibilities for joint applications. Information is available at: http://cordis.europa.eu/.

The NFPs may report on any progress in this field.

10. Data submission and database status

Due to expected personnel changes and new arrangements, NFPs are asked to report the 2019 data as early as possible. The TF meeting is asked to decide on a voluntary deadline for reporting of 2019 data to 1st of November 2020.

The Programme Centre will present the current status of the database. A detailed description is given in the 29th Annual Report 2020.

11. Next Task Force meeting

Decision: Main issue for ICP IM Task Force is if we want to continue to have joint TF meetings with ICP waters.

12. Other business

13. End of meeting

Annex II

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ANNEX III

Result of break out group discussions at the 28th ICP IM Task Force meeting, May 2020

During the Task force meeting the attendants were randomly divided into four break out groups to discuss five questions related to future priorities and structure of the IM Task Force. Below a summary of the outcome of the group discussions.

Future scientific studies based on IM data - an important input to the next WGE work plan.

A general comment was that we should follow the WGSR priorities for the revision of the Gothenburg Protocol. There was also a concern that we need to strengthen the link between science and policy and investigate the need of new or improved indicators.
In addition to that, suggestions on future studies included the following:

- Climate change and its effects in combination with air pollution, and also linkages with other pressures.
- Continued work on critical loads and biodiversity impacts and empirical indicators of biodiversity e.g. vegetation (PROBS database). Co-operations with EMEP, CDM and ICP M&M.
- Evaluating needle chemistry, litter fall etc. in relation to critical loads, mal-nutrition and drought. Cooperation with EMEP and ICP Forests.
- Continued work on mercury and other heavy metals
- Nitrogen impacts in forest ecosystems. Cooperation with EMEP, ICP Waters and ICP Forests.
- Ground level ozone impacts in cooperation with ICP Vegetation.

There were also suggestions for extended monitoring:

- add grazing pressure, which has shown to hide effects of nitrogen deposition on ground vegetation.
- follow the development in new molecular techniques, e.g. eDNA, and possibly add this in the manual.

In what ways can the cooperation with other ICPs (including the new Centre for Dynamic Modelling/ICP M&M) and EMEP be improved?

Several suggestions for cooperation are already mentioned in the previous section. The groups noted that it is important to keep the contacts between the ICPs by e.g. attending each other's TF meetings, more frequent video meetings, etc.
In addition, the groups suggested:

- More joint data assessments, like the joint assessment a few years ago, could be about e.g. climate or drought.
- Important to have continued cooperation with CCE.
- CDM is a good example of cooperation but could be improved: ICP IM always had a big role in dynamic modelling. IM has for example found that recovery of lichens is very slow and we can now use this knowledge in the CL work we are pursuing. Dynamic modelling is always site specific because it is so data intensive, which is one on the strengths of ICP IM.
- We could investigate possibilities for co-location of different ICPs to further improve the ecosystem effect monitoring, and possibly cooperate more with the European eLTER Research

Infrastructure for co-location at the national level – EU member states may use this mechanism for the streamlining of their ICP monitoring network.

- The cooperation between NCFs of different ICPs could be improved within some counties, e.g. like what was achieved for the NEC Directive reporting. May be accomplished through a call for improved national joint reports.

Should there be more formalised wider involvement in IM by the formation of task groups, expert panels etc. engaging more of the scientist connected to IM?

Most comments said that the ICP IM community at present is too small to divide into formal sub groups, but welcomed ad hoc groups for specific tasks, e.g. around manuscript writing. Some argued that it could be better to create topic wise sub groups across the different ICPs. However, there were also voices saying that formalised sub groups could be important to let people have sense of a more formalised role in ICP IM.

The EU 2030 biodiversity strategy, in what way can IM contribute?

This topic was new to most participants, and a common feeling was that this is above the level of ICP IM alone. It was rather seen as a question for the WGE level of the air convention. It was anyway acknowledged that:

- Changes in biodiversity caused by air pollution impacts is an important issue.
- Critical loads seems relevant also for the 2030 biodiversity strategy. The same holds for the habitat suitable index, which is a good concept but has not been embraced outside ICP M&M community.
- One group raised the issue of risk of duplication of several seemingly parallel biodiversity initiatives, e.g. Global Biodiversity Framework, Green Deal and the 2030 EU Biodiversity Strategy.

Is "IM light" a good idea? Which other habitats than forests should be prioritised? What would a minimum set of variables be?

It was noted that IM sites already today are not measuring all parameters, so "IM light" is to some extent already a reality. Several groups pointed out that we need to revise the IM manual if IM light is realised. It was also noted that this relates to the NEC Directive monitoring and reporting, which may be an advantage to get national funding.
The main points raised were:

- IM light may help new countries to enter the programme.
- IM light relates to the different levels of site categories in the eLTER Research Infrastructure, ranging from very low to extremely high instrumentation, which may be a model for an extension IM.
- Germany is already looking for such sites – could be an entry point for ICP IM

Key variables in IM light could be:

- deposition
- biodiversity indicator (e.g. vegetation)
- soil water
- limited set of analyses with focus on N.