

Damage to Biodiversity – a powerful argument to limit air pollution

- Centre for Dynamic Modelling, ICP Modelling & Mapping

EB decisions 2023, revision of Gothenburg protocol

New:

- Biodiversity loss recognised as one of the three major crisis (the other two: climate change and pollution)
- Multi-pollutant/multi-effect approach to reduce air pollution needs to include biodiversity loss

Already in place:

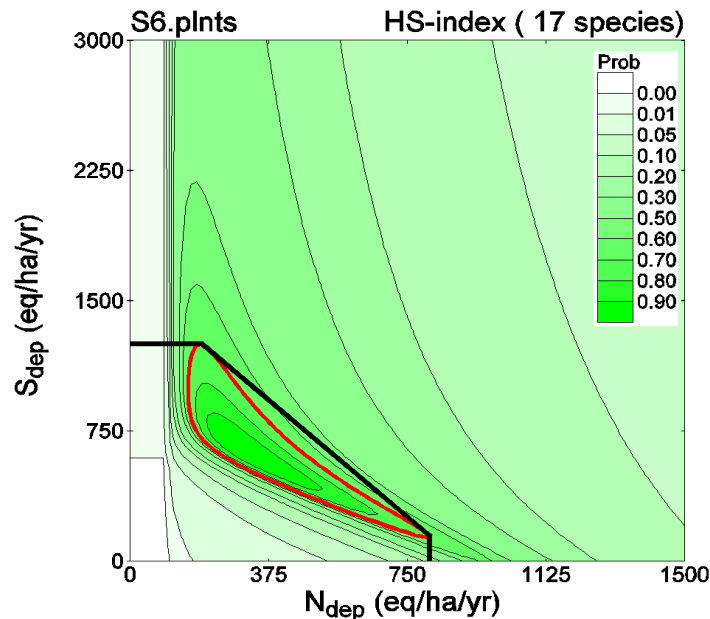
- Cl_{emp} are specifically designed to address preserving plant communities
- Plus outcomes from a number of previous CfDs

Biodiversity in CfDs 2006 - 2017

- 2006/2007 call for data “of nitrogen-related parameters” including the possibility for dynamic modelling of eutrophication using e.g. for the Very Simple Dynamic model (VSD)
- 2009 (a) focusing on new vegetation relevant data requirements, in addition to soil-chemical data as in past calls, and (b) familiarizing with a more sophisticated VSD+ model. In total 11 countries tested
- 2010/2011 To continue work on VSD+ and vegetation modelling, including the assessment of interactions between effects of air pollution and climate change. Nine countries submitted VSD+ model runs, of which 6 have also carried out vegetation modelling
- 2011/2012 Call for Contributions focus on the use and testing of the dynamic modelling of changes in plant species diversity. Specifically included an overview of endpoints considered by the NFCs and application of biodiversity indices. Twelve countries replied.

Biodiversity in CfDs 2006 -2017 cont.

- 2012/2014 Adverse effects to biodiversity caused by air pollution, including interactions with climate change for every EUNIS class within the country (preferably in Natura2000 or other protected areas). Ten countries responded. The NFCs had used different metrics to assess biodiversity: habitat suitability, red list species, species cover, species abundance, functional diversity, and ecosystem services. Conclusion: a common biodiversity indicator such as habitat suitability would be useful in addition to indicators that meet specific parties' requirements.

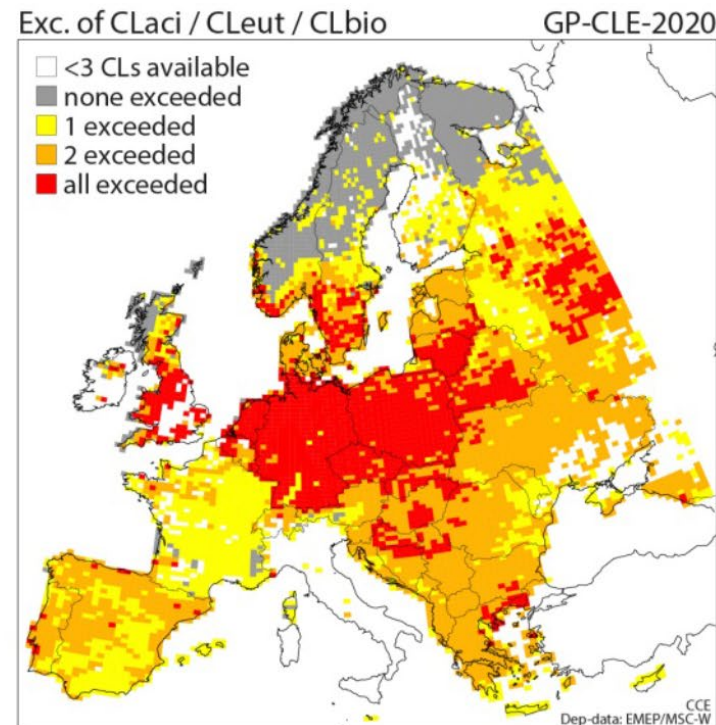
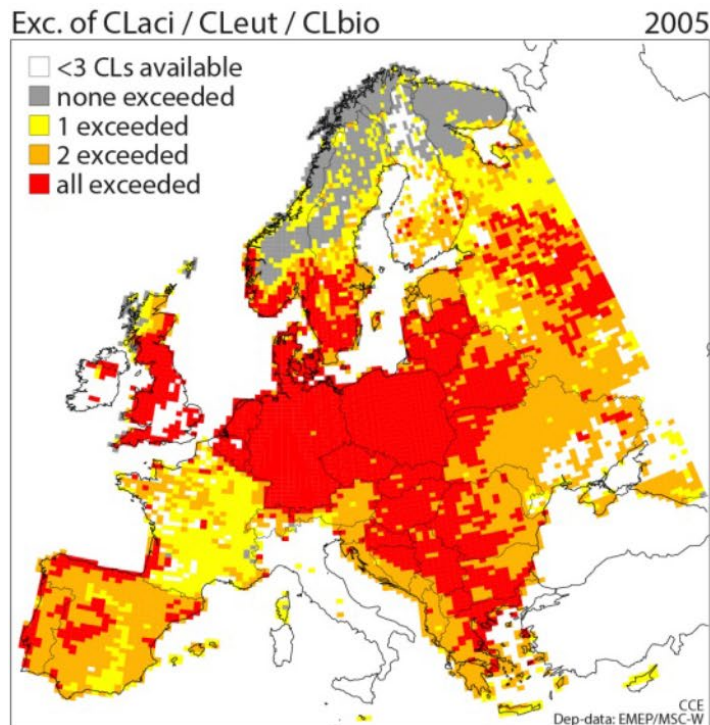


Modelled response of Habitat Suitability Index could be transformed into the CL function which is mathematically compatible with any other way to calculate CL

Results from the PROPS model. Source: Max Posch, CCE, 2014

Biodiversity in CfDs 2006 -2017 cont.

- 2015/2017 To derive nitrogen and sulphur critical load functions taking into account their impact on biodiversity (critical loads for biodiversity). Seven Parties submitted critical loads for biodiversity. (But not for political purposes.) CCE also provided conceptual framework of combining all available critical loads into “one map”



Hettelingh J-P, Posch M, Slootweg J (eds.)
(2017) European critical loads: database,
biodiversity and ecosystems at risk, CCE
Final Report 2017, Coordination Centre
for Effects, RIVM Report 2017-0155,
Bilthoven, Netherlands

Current status of using biodiversity as an argument to reduce air pollution (WGE)

- Empirical critical loads are directly linked to protecting biodiversity, CL_{emp} were recently revised by CCE + group of experts. Results from the current Call for Data will be available later in 2024.
- Six previous CfDs (2006 – 2017) included modelling of biodiversity, models have been developed, there are plans to include biodiversity modelling again in planned CfD 2024/25. More work is needed. End points, metrics, models, data, (to name a few)
- Several ICPs presented results relating AP and biodiversity, more is coming.
- Potential of modeling is not only in setting CL (again: CL_{emp} exists). Ex post analysis or other types of scenario analysis, additional ways to demonstrate damage to biodiversity and benefits of air pollution abatement. Dialogue with IAM is important to ensure relevance of model outcomes.
- Addressing the issue of nature restoration might require other tools than CL. Also shift in focus, e.g. from ecosystems to regions.

Work plan 2024/25

1.1.1.20 Define Dynamic Modelling indicators for protection of biodiversity and Dynamic Modelling outputs

1.1.1.21 Launch 24/25 CfD to: (a) update SMB CL; and (b) include dynamic modelling of biodiversity

Thematic session on Biodiversity (Sept 2023)

Progress and further work summarized into 8 conclusions and 6 recommendations (See September meeting report [ECE/EB.AIR/GE.1/2023/2–ECE/EB.AIR/WG.1/2023/2](#))

CDM's particular interest in following up:

- Need for more targeted data collection (within relevant ICPs and/or elsewhere)
- Representatives from ICPs tasked to co-ordinate biodiversity work are needed.

Two possibilities to review progress and discuss further:

- ICP M&M + CCE meeting in May (Oslo)
- Separate CDM workshop specifically on modelling biodiversity in Call for Data 2024/25 (in Aarhus or in Copenhagen, to be specified, June or end of August, to be specified)

Thank you for your
attention.