

Topic 4: Clean Air – Ecosystem and Climate

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Subtopics:

- Ozone effects and its links to food production and safety
- Links to forest production and forestry/climate interests
- Biodiversity effects and the link to the CBD and EU Directives
- The future of effect monitoring, including reporting under EU NEC Directive

Ozone effects and its links to food production and safety

RECOMMENDATIONS:

To improve evaluation of risks and impact of ozone, taking into account fluxes, climate and N (ICPs, EMEP)

To consider crops, forest and seminatural vegetation as distinct vegetation types for risk assessment for policy decisions (ICPs, EMEP, policy makers)

- To perform ozone risk assessment for different biogeographical regions and vegetation types based on flux uptake together with AOT40 (ICP Veg, ICP Forest, EMEP)
- To use flux based approach for climate change scenarios since it considers changes in the meteorological parameters and the profiles of ozone exposure (ICPs, EMEP, WGE)
- To use ozone flux modelling for ozone risk assessment on crops production, taking into account not only crop quantity but also crop quality (ICP-Veg, TFIAM)
- To support epidemiological studies on ozone impacts on forest trees (ICP Veg, ICP Forest)
- To improve the modelling of the influences of soil moisture on ozone fluxes and physiology (ICP-Veg, ICP Forest, EMEP)
- It is possible to map O₃ risk to biodiversity but only for grasslands based on flower/seeds output as proxy
- To improve monitoring air pollutants networks with better dry deposition data and mountain areas not present in current networks (EMEP, Air Quality networks)
- To explore interactions between ozone and nitrogen/climate change/ competition and ecological dynamics (for risk assessment)
- Explore other possible response parameters more related to ecosystem services

Links to forest production and
forestry climate interests

Evidence of large N leaching in some unmanaged forests

- increased risk for N saturation
- lower critical loads (CL) for unmanaged forests using mass-balance CL for N

RECOMMENDATION:

Need to better consider management in CL calculations for N (NFPs)

Evidence for N deposition effect on C sequestration in forested ecosystems

- clear evidence for aboveground biomass: 10-20 kg C per kg N added
- need to consider also other limiting nutrients (P, base cations, etc.)
- availability of water would affect relationships in arid areas → increasing importance in the future because of climate change

RECOMMENDATIONS:

Better data needed on N impacts on soil C sequestration (research)

Data needed for other ecosystems than forests (research)

There is an increasing interest in using forest biomass for bioenergy production as a climate change mitigation effort

- intensified forestry has an impact on soil quality and nutrient leaching due to increased nutrient removal
- decreasing acid deposition has decreased soil acidification and it should be ensured that intensified forestry does not affect this trend
- ash recycling needed in sensitive areas
- better data on base cation deposition and mineral weathering rates needed
- need to consider biomass production vs. nature protection efforts (e.g. deadwood needed for biodiversity)

RECOMMENDATION:

Important to harmonize air quality and climate policies to avoid negative effects of intensified forestry for biomass production on ecosystems (CLRTAP, EU, countries)

Biodiversity effects and the link to the CBD and EU Directives

Impacts of N one of the main reasons for decline of biodiversity in protected areas in Europe

RECOMMENDATIONS:

- *Air pollution effects remains in widespread areas of Europe one of the most important threats to the conservation status for habitats and species and the protection of biodiversity. Achievement of the goals of EU and national nature policies will in many cases only be possible with – or very costly without - substantial reductions in nitrogen load. Ecosystem effects and effect-based policies will therefore also be important in the future. (CLRTAP, EU)*
- *To improve the mitigation of threats to biodiversity and ecosystems there should be a strong linkage between air pollution, nature and agriculture policies (EU)*
- *Arrange scientific workshop to enhance/verify methodologies for assessing impacts of N on biodiversity (e.g. habitat suitability index) (WGE, ICPs)*
- *Continue long-term harmonized vegetation monitoring to assess ecosystem and biodiversity effects by air pollution and climate change (WGE, countries)*
- *Increase number of habitat types and sensitive species in N impacts assessment (WGE, ICPs, countries)*

The future of effect monitoring, including reporting under EU NEC Directive

RECOMMENDATIONS:

- *Cooperation with the Habitat Directive and WFD to ensure that the ecosystem monitoring to assess air pollution impacts includes the parameters and methodology in the NEC directive (annex 5), and future monitoring requirements are harmonized.*
- *Constitute a European working group for implementation of ecosystem monitoring under Article 9 in cooperation with the member states and the scientific support from the WGE. This WG should be managed by the Commission (EU)*
- *Harmonize efforts of the WGE and the Commission regarding impact assessment, as well as between the different directives (WGE, EU)*
- *Share the monitoring data reported to EEA also to ICPs and enhance ICP participation (countries)*
- *The WGE shall develop and present a common ecosystem monitoring platform to evaluate effects of air pollution in a coordinated manner (WGE)*
- *Establish cooperation with ESFRI Research Infrastructure (e.g. to enhance monitoring infrastructures and get experimental data) (WGE, ICPs, countries)*