



CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION (LRTAP)

WORKING GROUP ON EFFECTS (WGE)

INTERNATIONAL COOPERATIVE PROGRAMME ON EFFECTS OF AIR POLLUTION ON NATURAL VEGETATION AND CROPS (ICP VEGETATION)

Minutes of the 39th Task Force Meeting

The 39th meeting of the Programme Task Force was held 17-19 February 2026, in Rome, Italy, and hosted by the National Council of Research, Italy.

1. The meeting was attended by 48 participants from countries within the UNECE region, and representatives from countries within the EECCA region.
2. The meeting was opened by Ms. Felicity Hayes (UK), Chair of ICP Vegetation, and Ms. Cristina Leonardi (Italy), local host, welcoming the opportunity to meet in-person.
3. A welcome address was given by Ms. Cristina Leonardi (National Centre for Research), who gave a brief overview of the involvement of the Centre with various activities of the United Nations that relate to air quality and the environment.
4. Ms. Alessandra De Marco (Italy) gave an overview of the scientific contributions of Italy to the UNECE Air Convention. She highlighted recent work including a comparison of different metrics when assessing risk of ozone impacts in the northern hemisphere. This showed an increase in the ozone flux metric POD despite a decrease in ozone concentration, which was due to changes in phenology, temperature, and soil moisture that caused changes to the rate of ozone uptake. She also described mapping and assessment work to quantify the impact of urban and peri-urban vegetation in removing air pollution and improving air quality, demonstrating the benefits of trees and other vegetation particularly in urban settings.
5. Ms. Felicity Hayes gave an overview of the relevant policy framework for the ICP Vegetation, based on contributions from Ms. Anna Kaplina (UNECE). This included additional recommendations relating to investigations on nature restoration and air pollution; information on the E-learning course on the Convention and its Protocols; Ex-Post analysis to be completed to inform the revision of the Gothenburg Protocol, which includes analysis to be completed by ICP Vegetation on crops, trees and perennial grasslands. Ms. Hayes also presented some information received from Mr. Kai Schwärzel and Ms. Anne-Katrin Prescher (ICP Forests), and Mr. James Kuren Weldon (ICP-IM). Information from ICP Forests highlighted the recent report on forest condition in Europe, and the impact of tropospheric ozone on broadleaved forest vegetation. This showed widespread ozone injury symptoms on forest vegetation over recent years. Information from ICP-IM included an update on the current network of ICP-IM sites and relevant information on trends of measured metal deposition including efforts to quantify mercury deposition.

6. Ms. Felicity Hayes (UK), Chair of ICP Vegetation, gave an overview of the activities and achievements of the ICP Vegetation in 2025 and reported on progress with items included in the workplan of the LRTAP Convention. Important activities and deliverables included:
 - Contributions to the revision of the Gothenburg Protocol, which will continue to be important work for the ICP Vegetation over the coming year. Results were shown for wheat production, biomass increment of forest trees, and risk to flower number. These analyses showed increasing benefits with increasingly stringent scenarios, but also that there were still impacts of ozone pollution even in the most stringent scenario. To complement the Gothenburg Protocol work, ICP Vegetation has completed ex-post analysis of some scenario data from IIASA and MSC-W which has shown the importance of methane as an ozone-precursor and the potential benefit of global efforts addressing methane for wheat production within the region. An additional presentation relating to the Gothenburg Protocol revision work was given later in the meeting.
 - Results from a review of impacts of NO_x, which has revealed evidence of impacts on sensitive ecosystem components below the current critical levels. The sensitive ecosystem components include lichens, with several features of lichen health showing deleterious effects at low NO_x levels.
 - Progress with collection of samples from the current (2025-2026) moss survey, for content of selected metals, N and POPs,
 - The pilot study on mosses as biomonitors of microplastics as an indication of atmospheric deposition (MADAME). Analysis of samples is almost complete, with a wide range of microplastics found in samples from across the region. Additional presentations on microplastics, including results of the MADAME project, were given later in the meeting.
 - Outreach activities including deployment of ozone diffusion tubes in Ecuador, testing of tropical species for ozone sensitivity, and training in use and application of the DO3SE model.
 - Updates to the ICP Vegetation website (<https://icpvegetation.ceh.ac.uk>).
7. Mr. Richard Cross (Coordination Centre, UK) gave an update on progress with some analytical developments for identification of airborne microplastics in moss samples. He went on to provide information from further data and spatial analysis of the UK moss survey, which showed no clear spatial trend, suggesting widespread or long-range sources of microplastics rather than local hotspots.
8. Mr. Pierre Sicard (France) presented recent work to show the influence of tree canopy cover and the link to reductions in air-pollution related mortality in European cities due to reductions in air pollutants including ozone, PM_{2.5} and NO₂. This showed that even a modest increase in tree cover of 5% compared to current amounts could give improvements in air quality in European city centres, and that this would be sufficient to potentially decrease premature deaths.
9. Ms. Inga Zinicovskaia (Russian Federation) presented information from a study using moss bags to evaluate the impact of traffic-related emissions on deposition of potentially toxic elements. The content of elements in exposed moss samples was elevated compared to unexposed samples, with pronounced uptake near to the highways, particularly those with large volumes of traffic. Principle component analysis showed that the distance from the road edge was particularly important for elements including Al, Cu, Co, Cr, Fe, N and V.
10. Ms. Gana Gecheva (Bulgaria) presented work showing how moss walls could be used both to monitor air pollution, and as an educational resource for the public in built-up areas. Outdoor living moss walls were installed in urban spaces in Plovdiv, Bulgaria. In addition to

pronounced long-term accumulation of heavy metals, soil dust tracers and industrial tracers over 24 months, biochemical changes in the moss material were also found that confirmed that prolonged exposure to metal deposition induced oxidative and physiological stress in the moss biomonitors.

11. Five sessions considered the ozone- and moss- sub-programmes. The topics of the oral presentations are provided in Annex III. For further details of the content of the oral presentations we refer to the book of abstracts and copies of the presentations available on the ICP Vegetation web site (<http://icpvegetation.ceh.ac.uk>). In addition, posters were presented during the meeting, covering similar topics as the oral presentations.

The ozone sessions included presentations on topics including:

- Ozone risk assessment for a range of forest species and climatic zones under different climate change scenarios, using phytotoxic ozone dose as the metric to indicate risk. This showed differential effects and different latitudes driven by physiological constraints on stomatal uptake (Mr. Guaita, Italy).
- Progress with estimating ozone impacts on changes to biomass increment and carbon sequestration for woodlands of the UK, which show a large interannual variability due, in part, to interannual changes in ozone concentration (Mr. Fincham, UK).
- Ozone injury monitoring in Italian forests, showing that for beech forests there has been an increase in the percentage of symptomatic species in recent years. The importance of annual reporting to the NEC network and ICP Forests to strengthen evidence for ecosystem risk assessment and policy support was highlighted (Ms. Moura, Italy).
- The importance of standardized flux estimates for Europe-wide ecosystem reporting such as the EU National Emissions Directive was highlighted. In particular, the importance of soil moisture modelling was shown. Results from estimations of soil moisture from models validated against field observations in Holm oak and pasture were shown for central Spain and discussed in the context of wider Mediterranean ecosystems (Mr González-Fernández, Spain).
- Results from the Spanish National Parks Network, where deposition of atmospheric pollutants to the 16 protected areas have been compared to air quality models to enable an initial risk analysis to be carried out for the Spanish National Parks. Indicators and methodologies for risk analysis to the vegetation of the parks is being reviewed and updated (Mr. Prieto-Benítez, Spain).
- Results of pilot studies using wood distillate as an ozone protectant using tobacco and wheat. These showed that for tobacco, spraying reduced leaf senescence and gave higher photosynthetic performance. However, for wheat although low concentrations were beneficial, higher concentrations were associated with increased mortality, highlighting the need to optimise the dose and application method. Further studies will occur in 2026 (Mr. Vannini, Italy).
- Ozone risk assessment at a global scale as part of the TOAR-II efforts, where the DO3SE model has been parameterised for additional species to allow application in understudied tropical regions in addition to temperate zones (Ms. Emberson, UK).
- Comparison of single layer and multilayer deposition schemes for estimating ozone uptake in Italian forests. Analysis for deciduous oak-hornbeam forests at Boso Fontana showed that although the multilayer schemes can enhance understanding of deposition processes within a forest, the single layer schemes appear sufficient for robust risk assessments and policy decisions. The importance of accurate calculation of soil moisture when calculating ozone uptake was also demonstrated (Mr. Gerosa, Italy).
- Experimental work using combined ozone and nitrogen addition to investigate impacts on plant-insect interactions, which showed that effects pollinators can include indirect effects

through the impacts on plants. These effects include impacts on leaf characteristics such as lignification and protein content, which affect herbivory (Ms. Bermejo-Bermejo, Spain).

- Experimental work on ozone and trees using a free-air enrichment facility, where a wide range of studies have shown effects of ozone on plant physiology and growth (Mr. Hoshika, Italy).
- Further discussions included progress with additional chapters to Scientific Background Document B; progress with ex-post analysis for revision of the Gothenburg Protocol; improving ozone uptake parameterisations; biomonitoring strategy, outreach within and beyond the UNECE region.

The moss sessions covered topics including:

- Species-specific differences between mosses in moss transplants used to monitor atmospheric microplastic accumulation in urban areas, which showed elevated microplastic deposition including at sizes below the visual detection limit that were identified using fluorescence microscopy (Ms. Jafarova, Canada).
- A comparison of methods to extract plastic microfibrils from lichens, showing comparable performance in terms of microfibre recovery from 36 lichen samples from rural Italy (Mr. Legnaro Diamanti and Ms. Gaglione, Italy).
- Effectiveness of transplants of the lichen *Evernia prunastri* to monitor pollutants from traffic emissions including tyre wear particles, potentially toxic elements, and metals. These showed an exponential decrease with distance from the highway, with a sharp decline at within 25 m to 150 m from the highway, depending on the pollutant (Ms. Grifoni, Italy).
- Results from biomonitoring for metals in Georgia and Moldova, which showed strong interelement concentrations. Altitude, land-cover, climate and landscape were identified as principle factors controlling element variability in this heterogeneous region (Mr. Chaligava, Georgia).
- Results from a national vs local measurement network in Switzerland, which showed the importance of sampling over larger areas to draw national conclusions compared to a dense network over a smaller area to investigate local pollution levels and sources (Ms. Ehrenmann, Switzerland).
- Use of the moss survey data to provide robust validation datasets for chemical transport model source attribution for PAH, showing the value of continued cooperation between EMEP and ICP Vegetation (Ms. Arevalo, Slovenia).
- Results from the Russian-Norwegian border, where the results for nickel content of moss clearly show a sudden and abrupt decline in pollution levels following the closure of nearby nickel smelter at Nikel (Mr. Flatlandsmo Berglen, Norway).
- Use of a contamination factor to provide an alternative perspective to elemental concentration gradients to facilitate comparison of pollution levels in long-range studies where a variety of moss species are used (Ms. Lazo, Albania).
- Spatial distribution of potentially toxic elements within Kosovo, based on collection of moss samples. These showed highest levels of pollution in the Mitrovica region, where the Trepça mining complex and lead–zinc tailing landfills are located. In the Prishtina region elevated levels of nickel, chromium and cobalt were attributed to the regional geological background and nearby ferro-nickel open-pit mines (Mr. Paçarizi, Kosovo).
- Spatial distribution of potentially toxic elements within a national study in Albania and the link to substrate soil, which suggested negligible interactions between the moss species used (*Hypnum cupressiforme*) and substrate soils. The effects of local mineral-enriched dust in certain regions was also shown (Ms. Qarri, Albania).

- Trends in metal concentrations in moss in Sweden, which show a good agreement with emissions reductions reported for Sweden since 1990. The data also shows a clear south-north gradient with higher concentrations in the south, reflecting atmospheric deposition relating to population density and industrial activities as well as long-range transport (Ms. Segura Roux, Sweden).
 - Use of satellite data to provide landcover, meteorological and anthropogenic indicators to explain variability in heavy metal concentrations in moss samples. Advanced machine learning algorithms revealed forest cover to be a stable and positive predictor, possibly due to a canopy scavenging mechanisms where trees capture pollutants and concentrate them in the underlying moss layer (Mr. Rusňák, Slovakia).
 - Results from a study in Armenia where concentration of lanthanum and cerium in 61 moss and soil samples were also analysed. This showed that soils were the primary source of REE content of mosses in Armenia (Mr. Tepanosyan, Armenia).
 - A historical review of the development of the moss biomonitoring survey including results for the UNECE region, where many (but not all) of the metals have shown a decline in concentration within the moss tissue since 1990. Information was also given on efforts to extend the program to Asia and the Pacific region, with 14 countries indicating a willingness to participate (Ms. Frontasyeva, Russian Federation).
 - The importance of factors influencing adsorption, binding and transport of toxic elements by chitin. Electrochemical studies reveal different timescales of loss of different analytes from chitin, which may explain why there can be large discrepancies between metal concentration in moss and lichen at the same site (Mr. Fränzle, Germany).
 - Metal accumulation by urban plants, which accumulated heavy metals in an experimental study. Physiological responses to the stress were also observed, including enhanced antioxidant enzyme activity. Species-specific responses were observed (Ms. Cakaj, Kosovo).
 - Further discussions included potential future activities relating to airborne microplastics; potential additional chemicals of importance/relevance; outreach opportunities relating to biomonitoring for metals and microplastics.
12. At the end of the ozone and moss survey specific sessions, conclusions and recommendations were presented, discussed and adopted by the Task Force as described in Annex I. In particular,
 - Encouraging participants to contribute to biomonitoring of ozone impacts using wood distillate as an ozone protectant, using a newly established biomonitoring protocol
 - Preparation of a position paper on assessing the impacts of ambient ozone on vegetation.
 - Welcoming the new initiative on biomonitoring microplastics using moss bags (MADAME³)
 - Recommending outreach activities for the moss survey
 13. The medium-term workplan was reviewed and agreed and adopted by the Task Force (see Annex II). Ms. Hayes (UK) drew attention to various workshops and conferences in 2026.
 14. On behalf of the Task Force, Ms. Hayes (UK) closed the meeting by thanking Ms. Cristina Leonardi, Ms. Alessandra De Marco, and their colleagues for hosting the meeting. Ms. Hayes thanked colleagues at the PCC. Ms. Hayes acknowledged the UK Department for Environment, Food and Rural Affairs (Defra) and the United Nations Economic Commission for Europe (UNECE) for their continuous financial support of the ICP Vegetation Coordination Centre. Ms. Hayes thanked the participants of the ICP Vegetation for their valuable contributions to the programme.

Annex I. Decisions and recommendations by the Task Force of the ICP Vegetation at its 39th meeting, 17-19 February 2026, Rome, Italy. Workplan items are included in Annex II.

OZONE RELATED ACTIVITIES:

- The TF took note of progress with the development of new chapters for Scientific Background Document B (SBD-B), associated with Chapter 3 of the Modelling and Mapping Manual of the LRTAP Convention. The table below provides an overview of the topics proposed for inclusion, who is taking the lead and who will contribute (subject to available funding).

Topic	Lead	Contributions
<i>Biomonitoring ozone impacts by using wood distillate as an ozone-protectant</i>	Andrea Vannini	Participants willing to test effectiveness under different climate and ozone levels using exposure facilities. Including Ignacio González-Fernández (Spain), Victoria Bermejo-Bermejo (Spain), Felicity Hayes (UK)
<i>Guidelines for assessing ozone-induced foliar damage and yield loss of horticultural crops</i>	Ignacio González Fernández and Victoria Bermejo (Spain)	Vicent Calatayud (Spain), Giacomo Gerosa and Riccardo Marzuoli (Italy)
<i>Impacts of ozone on pasture quality</i>	Felicity Hayes (Coordination Centre, UK), Ignacio González Fernández (Spain)	
<i>Ozone flux-effect relationships and methodology for net annual increment (NAI) of trees</i>	Lisa Emberson (UK)	Sabine Braun (Switzerland), Per Erik Karlsson (Sweden)
<i>Ozone removal by vegetation in urban areas</i>	Lina Fusaro and Fausto Manes (Italy)	Rocio Alonso (Spain), Pierre Sicard (France), Giacomo Gerosa (Italy)
<i>Ozone-induced injury guidance for educational and awareness raising purposes</i>	Klaudia Borowiak (Poland)	Felicity Hayes (UK), Felix Leung (Hong Kong, China), Vicent Calatayud and Victoria Bermejo (Spain), Pierre Vollenweider (Switzerland)
<i>Critical levels for ozone-sensitive clones of poplar</i>	Yasutomo Hoshika (Italy)	Vicent Calatayud (Spain), Riccardo Marzuoli (Italy), Pierre Sicard (France)
<i>Ozone impacts on insects</i>	Valda Araminiene (Lithuania).	Coordination Centre (UK), contacts of Stefan Wallek (Germany)
<i>Interactive impacts of ozone and nitrogen on (semi-)natural vegetation</i>	Felicity Hayes (Coordination Centre, UK), Ignacio González Fernández (Spain)	
<i>Harmonization of the ozone damage indicators in the framework of the NEC Directive</i>	Ignacio. González-Fernández (CIEMAT, Spain), Yasutomo Hoshika (CNR, Italy)	Stefan Wallek (Germany)
<i>Validation of soil moisture index for natural vegetation and rain fed crops</i>		Ignacio González Fernández, Yasutomo Hoshika (Italy)
<i>Opportunities for using external data in data poor situations, including suitability for use in OTC experiments</i>		Pierluigi Guaita (Italy)
<i>Opportunities for exploring and using data from ozone flux towers</i>	Giacomo Gerosa (Italy)	Pierluigi Guaita (Italy)

<i>Investigating and representing uncertainty relating to flux-effect modelling</i>		Felicity Hayes (Coordination Centre, UK), Katrina Sharps (Coordination Centre, UK), Pierluigi Guaita (Italy)
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- The TF took note of the ongoing collaboration between ICP Vegetation and EMEP Task Forces and Centres and encouraged to continue such collaboration as described in further detail of the workplan of the ICP Vegetation (Annex II).
- The TF took note of a chapter update of the Scientific Background Document B, associated with Chapter 3 of the Modelling and Mapping Manual of the LRTAP Convention, on “Handling of soil moisture effect on ozone flux for large-scale modelling using the soil moisture index”. The updated chapter includes new species-specific fSMI parametrizations for flux-based ozone risk assessment in water-limited areas. This update is the result of the activity on validation of soil moisture index used in EMEP model coordinated by CIEMAT (Spain), with contributions from CEAM (Spain), Unicatt (Brescia, Italy) and EMEP MSC-West.
- The TF took note of a chapter update of the Scientific Background Document B, associated with Chapter 3 of the Modelling and Mapping Manual of the LRTAP Convention, on the parameterization of the ozone flux-effect relationship for poplar, with comparisons between native poplar and hybrid clones.
- The TF took note of the need to incorporate a greater number of participants and research groups also by expanding the TF topics, for example to include N effects on vegetation and interactions of ozone or nitrogen impacts with climate change and/or crop management, to encourage scientific exchange of relevant information. It was suggested that this could be encouraged by online meetings with other ICPs, side meetings involving international research forums on air pollution, and bringing together ICP-Vegetation participants for joint participation in European level research projects.
- The TF took note of the outreach activities of the ICP Vegetation and encouraged to continue such activities, especially in developing regions. The TF encouraged further collaboration with international scientific networks at the global scale.
- The TF agreed to the continued inclusion in the future meetings of a session focused on nitrogen impacts on vegetation and its interactions with other pollutants and climate change, to discuss methodologies and exchange results.
- The TF took note that the progress in the application of flux-based ozone critical levels and other ozone damage indicators in the framework of the European directive on national emission reductions, as well as other national-level initiatives, are considered as relevant policy initiatives for the ICP-Vegetation. The TF recommended that these initiatives continue to be discussed in future Task Force meetings, with the aim to facilitate the harmonization of methodologies between CLRTAP and the EU and other regions in terms of monitoring and risk assessment of ozone impacts in vegetation.

MOSS SURVEY RELATED ACTIVITIES:

- The TF recommended that important information and new developments of relevance to the moss survey should be documented into a scientific background document that can be updated with new chapters as required – similar to SBD-B of the ozone group. The table below provides an overview of the topics proposed for inclusion, who is taking the lead and who will contribute (subject to available funding).

Topic	Lead	Contributions
<i>Canopy Drip Effect on Element Concentrations in Mosses</i>	<i>Winfried Schroder</i>	<i>Sebastien Leblond</i>
<i>The use of mosses as bioindicators of PAH and other organic pollutants (e.g. are mosses suitable as bioindicators for all PAH, or only some?)</i>	<i>Zaida Ehrenmann</i>	
<i>impact of deposition on plant/moss growth and physiology (with a focus on air deposition rather than soil contamination).</i>	<i>Sebastien Leblond</i>	
<i>ecosystem links and impacts, e.g. N influencing uptake of metals?</i>	<i>Stefan Franzle</i>	
<i>Nitrogen influence on metal uptake</i>		
<i>How to robustly use moss monitoring for monitoring 'at the edges and beyond the core region'</i>		
<i>Review metals and pollutants of focus. Check methods are suitable e.g. for Rare Earth Elements</i>		
<i>Methods for microplastics – depending on purpose – guidelines to be written</i>		
<i>Update sampling protocols for some metals, particularly 'new' additions to the Protocol</i>		

- The TF reiterated the importance to participants of the 2025-26 moss survey to:
 - Sample mosses in agreement with the monitoring manual and recommended sampling in areas with a defined humus layer (where possible);
 - Conduct quality checks of data before submitting the final data, including data on moss reference material;
 - Remember that the focus of the LRTAP Convention is at rural sites, rather than at local point sources, although noting that local issues may be of importance to ancillary studies using mosses.
- The TF reiterated that quality checks of submitted data are the responsibility of the data provider. Subsequently, the Moss Survey Coordination Centre is tasked to check data for outliers, discuss

any country border effects with respective data providers and agree with the data providers on the final data to be included.

- The TF took note of the importance of avoiding collection of moss where there would be ‘canopy drip’ from trees and shrubs. In addition the TF took note that often managed grassland can be unsuitable for sampling mosses due to sparse occurrence of moss and that shoots may be less than three years old.
- The TF recommended the formation of a sub-group to review and update the Protocol for the Moss Survey, including consideration of the metals and pollutants of focus for future surveys, bearing in mind potential emerging pollutants. The TF noted the following recommendations:
 - Heavy metals accumulation in mosses should continue to be measured, even though they have been decreasing since 1990. The decreases are not continuous for all elements, it is important to report stagnations and renewed increase, and even low accumulation can cause critical concentrations in ecosystems to be reached or exceeded.
 - Nitrogen must also continue to be measured, because in many countries, nitrogen emission and related accumulation in mosses has been monitored at unchanged high levels since 2005, exceeding critical effect thresholds.
 - POP measurements started since 2010 should be continued and could be part of the standard measurement program.
 - Microplastics should be measured where possible, to build the evidence base for the occurrence of airborne microplastic deposition, and to allow validation of models when such models are developed.

Annex II. Medium-term workplan (2026 – 2027) of the ICP Vegetation

Workplan items in *italics* are not specifically included in the biannual workplan of the LRTAP Convention for 2026 and 2027 but remain important ongoing activities.

- Call for data for the moss survey 2025-2026 on heavy metals, nitrogen, POPs and microplastics.
- Investigation of potential for active biomonitoring of microplastics in moss using moss bags
- Additional work investigating importance of methane as an ozone precursor, using scenario data from EMEP-MS-C-W
- Position paper on assessing impacts of ambient ozone on vegetation.
- Work relating to the LOW methane scenario from EMEP-MS-C-W (details to be confirmed), and other work as required relating to the review / revision of the Gothenburg Protocol, including ozone impacts on biodiversity, including effects on different ecosystem components and ecosystem processes important for biodiversity conservation such as pollination.
- Investigation of ambient ozone impacts on biomonitor species using wood-distillate as an ozone-protectant
- Use of metals in moss data to inform models of deposition, and comparison of trends in emissions with trends in moss data (Collaboration with MS-C-E)

Selected ongoing annual activities:

- *Review and update Scientific Background Document B for Chapter 3 of Modelling and Mapping Manual of LRTAP Convention*
- *Further development and applications of ozone modified photosynthesis-based flux-response models (with EMEP/MS-C-West)*
- *Outreach and networking activities in developing regions, linking with other international networks*

Annex III. Programme of the 39th Task Force Meeting of the ICP Vegetation

Tuesday 17th February, 2026

09:00 Registration and putting up posters

Session 1: 9:00 – 10:30 Plenary Chair: Cristina Leonardi

09:15 Opening of meeting

09:20 *Cristina Leonardi* - Welcome address:

09:30 *Alessandra De Marco* – Italian involvement in the UNECE Air Convention

09:50 *Felicity Hayes* – Current policy developments and other activities of UNECE.

10:05 *Felicity Hayes* – An overview of the ICP Vegetation's work.

10:30 – 11:00 Coffee/tea and viewing posters

Session 2: 11:00 – 12:30 Plenary Chair: Alessandra De Marco

11:00 *Richard Cross* – Microplastics, MADAME and methods.

11:20 *Pierre Sicard* – Effect of tree canopy cover on air pollution-related mortality: an integrated approach in European cities.

11:40 *Inga Zinicovskaia* – Impact of traffic-related emissions on air quality assessed via moss bags technique

12:00 *Gana Gecheva* - Moss walls as active biomonitoring systems: moving beyond green infrastructure.

12:20 General discussion

12:30 – 14:00 Lunch

Session 3: 14:00 – 15:30 (Two parallel sessions: Ozone and Moss survey)

Session 3a: Ozone Chair: Victoria Bermejo

14:00 *Pierluigi Guaita* – Future ozone risk assessment for forest ecosystems under different climate change scenarios.

14:20 *William Fincham* – Ozone exposure, biomass loss, and carbon sequestration: A UK-scale woodland assessment.

14:40 *Barbara Moura* - The Italian Forest Ozone Injury Monitoring Network (2018 to 2024).

15:00 Discussion on “Ozone impacts on forests - what next for ICP Vegetation?”

Session 3b: Moss survey Chair: Richard Cross

14:00 *Mehriban Jafarova* – Biomonitoring of Atmospheric Microplastics: Does Moss Species Matter?

14:20 *Mirko Legnaro Diamanti* and *Anna Gaglione* – A time-efficient method for the extraction of plastic microfibers from lichen samples.

14:40 *Lisa Grifoni* – Cryptogams as biomonitors of tire wear particles and traffic tracers from Canada's busiest highway.

15:00 Discussion on “Airborne microplastics – what is next for ICP Vegetation?”

15:30 – 16:00 Coffee and view posters

Session 4: 16:00 – 17:00 (Two parallel sessions: Ozone and Moss survey)

- Session 4a: Ozone** **Chair: Pierluigi Guaita**
- 16:00 *Ignacio González-Fernández* – Soil moisture modelling for phytotoxic ozone dose estimation in the Spanish air pollution effects monitoring network under EU National Emissions Directive.
- 16:20 *Samuel Prieto-Benítez* – Preliminary results of air pollution monitoring and its effects in the Spanish National Parks network.
- 16:40 *Andrea Vannini* – Wood distillate as a mitigator of ozone phytotoxicity: a recap of experiments involving ozone-sensitive tobacco and spring wheat plants.
- Session 4b: Moss survey** **Chair: Jana Borovská**
- 16:00 *Omari Chaligava* - Geogenic and climatic influences on moss biomonitoring: elemental patterns across the heterogeneous landscapes of Georgia and Moldova.
- 16:20 *Zaida Ehrenmann* – Moss monitoring in Switzerland: condensed measurement network vs. Nationwide survey.
- 16:40 *Isabel Garcia Arevalo* – Bridging Modelling and Moss Biomonitoring: Species-Specific Source Attribution of PAHs Across European Countries.

Wednesday 18th February, 2026

Session 5: 09:00 – 10:30 (Two parallel sessions: Ozone and Moss survey)

- Session 5a: Ozone** **Chair: Vicent Calatayud**
- 09:00 *Lisa Emberson* – Modelling ozone uptake to vegetation.
- 09:20 *Giacomo Gerosa* – Do multi-layer deposition schemes perform better than single-layer schemes in estimating phytotoxic ozone dose (POD1)? A multiannual comparison for an Italian deciduous forest.
- 09:40 *Discussion on “What is needed next for improving ozone uptake parameterisations?”*
- Session 5b: Moss survey** **Chair: Lisa Grifoni**
- 09:00 *Musaj Paçarizi* – Mosses as biomonitors of atmospheric deposition of chemical elements in Kosovo: Moss survey 2025.
- 09:20 *Tore Flatlandsmo Berglen* – Moss sampling in the Russian-Norwegian border areas 2008 – 2025.
- 09:40 *Pranvera Lazo* - An attempt for the standardization of comparison large-scale air quality performed under interspecies moss biomonitoring and various analytical techniques.
- 10:00 *Flora Qarri* – Moss biomonitoring studying Co, Cr and Ni contamination in the atmospheric deposition in Albania and the effects from the substrate soils
- 10:20 *General Discussion*

10:30 – 11:00 Coffee/tea and poster viewing

Session 6: 11:00 – 12:30 (Two parallel sessions: Ozone and Moss survey)

- Session 6a: Ozone** **Chair: Elisa Pellegrini**

- 11:00 *Vicent Calatayud* – Air pollution removal by urban trees in Valencia (Spain): implications for species selection and urban greening.
- 11:20 *Victoria Bermejo Bermejo* – New lines of research into the effects of combining ozone and atmospheric nitrogen deposition on the Plant-Insect interaction.
- 11:40 *Yasutomo Hoshika* - Ozone FACE Experiments (FO3X) - Challenges in Mediterranean Europe.
- 12:00 *Felicity Hayes* – Ozone impacts on vegetation
- 12:20 *General Discussion*

Session 6b: Moss survey **Chair: Musaj Paçarizi**

- 11:00 *Marina Frontasyeva* – The Past, Present and Future of the UNECE ICP Vegetation.
- 11:20 *Gevorg Tepanosyan*– Prospective study on lanthanum (La) and cerium (Ce) contents in mosses and soils of Armenia.
- 11:40 *Stefan Fraenzle* – Chitin – a covering biopolymer determines both biomonitoring results (lichens, arthropods) and element distributions, withholding, but can we understand how (much)?
- 12:00 *Arlinda Cakaj* - Assessing heavy metal bioindicator potential of common urban plants: environmental exposure and heavy metal irrigation.
- 12:20 *General Discussion*

12:30 – 14.00 Lunch

Session 7: 14:00 – 15:30 (Two parallel sessions: Ozone and Moss survey)

Session 7a: Ozone **Chair: Lisa Emberson**

- 14:00 Ozone discussion session – including outreach, paper writing, potential funding, biomonitoring strategy, skills/expertise needed for “new” opportunities.

Session 7b: Moss survey **Chair: Zaida Ehrenmann**

- 14:00 *Tomáš Rusňák* - Can mosses and satellites talk? What big data reveals about heavy metal deposition.
- 14:20 *Marta Segura Roux* - Trends of Fe, Al, Cu, V and Zn moss up to 2020: Lessons learned from the 2025 sampling campaign.
- 14:40 Moss discussion session – including outreach, potential additional metals/chemicals to include, background documents for manual, paper writing,

15:30 – 16:00 Coffee and take down posters

Session 8: 16:00 – 17:00 Final plenary session **Chair: Felicity Hayes**

- 16:00 *Ignacio González-Fernández* - Report back of main ozone decisions / discussions.
- 16:10 *Mehriban Jafarova* - Report back of main moss decisions/discussions.
- 16:20 Final discussions: workplan, decisions, AOB.
- 17:00 Close of meeting.

19:30 Conference Dinner at 19.30 in **L'Apulia Osteria Pugliese**. Via degli Umbri, 10 - 00185

Thursday 19th February, 2026

Excursion Castelporziano

Posters

Authors	Title
<u>Majlinda Ramadani</u> ^{1,2} , Sonja Lepitkova ² , Visar Ismaili ³ , Arlinda Cakaj ⁴ , Valbon Bytyqi ⁵ , Musaj Paçarizi ^{3*}	MOSSES AND LICHENS AS BIOINDICATORS FOR ATMOSPHERIC DEPOSITION OF HEAVY METALS AND MICROPLASTICS
Arlinda Cakaj ^{*(1)} , Maria Drapikowska ⁽²⁾ Marta Lisiak-Zielińska ⁽²⁾ , Kinga Drzewiecka ⁽³⁾ , Blerona Cakaj ⁽⁴⁾ Arbnore Cakaj	MICROPLASTICS IN ATMOSPHERIC DEPOSITION AND SURFACE WATERS IN PRISHTINA (KOSOVO)
<i>Qëndresa Berisha</i> ⁽¹⁾ , <u>Arlinda Cakaj</u> ^{*(1)} , Musaj Paçarizi ⁽²⁾ , Hana Shehu ⁽¹⁾ , Blerona Cakaj ⁽³⁾	SPATIAL AND TEMPORAL ASSESSMENT OF URBAN HEAVY METALS IN PRISTINA USING A PLANT BIOINDICATOR
<i>Magdalena Widmann and Renate Alber</i>	FROM 1995 TO 2021: HEAVY METAL AND NITROGEN DYNAMICS IN <i>HYLOCOMIUM SPLENDENS</i>
<i>Borovská Jana, Rusňák Tomáš</i>	THE MOSS SURVEYS IN SLOVAKIA
<i>Pierre Sicard</i>	REMOTE SENSING FOR URBAN PLANNING - THE 3-30-300 RULE