

TFMM: update and workplan

Joanna Struzewska¹, Lorenzo Labrador²

¹Institute of Environmental Protection - National Research Institute

²World Meteorological Organization

6/05/2024, 25th TFMM annual meeting

TFMM organization in 2024



- Email address: tfmm@ios.edu.pl
- Revision of the mailing list (please inform us if you do not get emails)
- On-line briefs:
 - 1st TFMM online brief on 20/12/2023 (work plan overview, update from WMO, update on the campaigns)
 - 2nd TFMM online brief on 6/02/2024 (FAIRMODE, CEN/TC WG44)
 - 3rd TFMM online brief on 4/04/2024 (Mike Holland – ARP, MSC-E update)
- **6/7 May 2024 - 25th TFMM annual meeting**
- June 2024 - 1st TFMM newsletter (based on the outcomes from the annual meeting)
- Planned briefs: end of June, September, December; thematic groups

TFMM – dissemination



Completed:

- Participation in TFICAP
- Presentation at FAIRMODE General Assembly on 27/02
- Presentation at EGU2024 on 19/04

To be decided in 2024:

- ITM Conference
- EPCAC

Please let us know if you publish/present the work done in the scope of TFMM to share/disseminate/cite



TFMM contribution to GP (26/03/2024)



TFMM will focus its contribution to the GP review on **evaluating the reliability of modelling tools for accurately representing ozone formation and aerosol processes.**

This analysis will identify knowledge gaps and model deficiencies, which are crucial for future scenario analysis and inform **recommendations for improved emission reporting**, such as explicit reporting of black carbon (BC), organic carbon (OC), condensables, and detailed VOC profiles.

Furthermore, TFMM will **couple modelling results with health assessment tools** to establish best practices for integrating the assessment process.

On the measurement side, TFMM will

1.1.1	Assess contribution of VOCs on high O ₃ pollution episodes using observations from intensive measurement period (summer 2022) and regular time series from EMEP network. Including model intercomparison exercise for intensive measurement week	EMEP reports (MSC-W) Peer-reviewed publication describing campaign and key results	2025
		Summary of model intercomparison exercise	2025
1.1.1.2	Investigate monitoring of chemicals of emerging concern. Follow up conclusions and guidelines from workshop in autumn 2023	Report from workshop	2024
1.1.1.3	Collect available information on aerosol chemical speciation from different models and how it can be matched with measurement to assess importance of different sources	Survey	2024
1.1.1.4	Consolidate representation of intermediate and semi-volatile condensable emissions in models and validation against existing observations of PM composition	Contribution to EMEP report (ad-hoc group?)	2025
1.1.1.8	Finalize Eurodelta-BaP model intercomparison. Assess BaP-related health effects	Peer-reviewed publication on Eurodelta BaP	2024/2025
		Summary report	2025



Inputs into the joint report by 10 May



This report (translated into the three official languages) will be the one in which **scientific activities and results will be gathered, summarized and presented in an understandable way** for the national representatives not familiar with all the scientific issues developed under the WGE and EMEP SB.





Work plan items lead by TFMM (6)

1.1.1.1 Contribution of VOCs during high ozone pollution episodes

1.1.1.3 Aerosol chemical speciation in different models

1.1.1.4 Representation of intermediate and semi-volatile condensable emissions

1.1.1.8a Finalise the Eurodelta-BaP model intercomparison

1.1.1.8b Assessment of the BaP-related health effects

1.3.5 Low-Cost Sensor review of WMO report

1.1.1.2 Chemicals of emerging concern





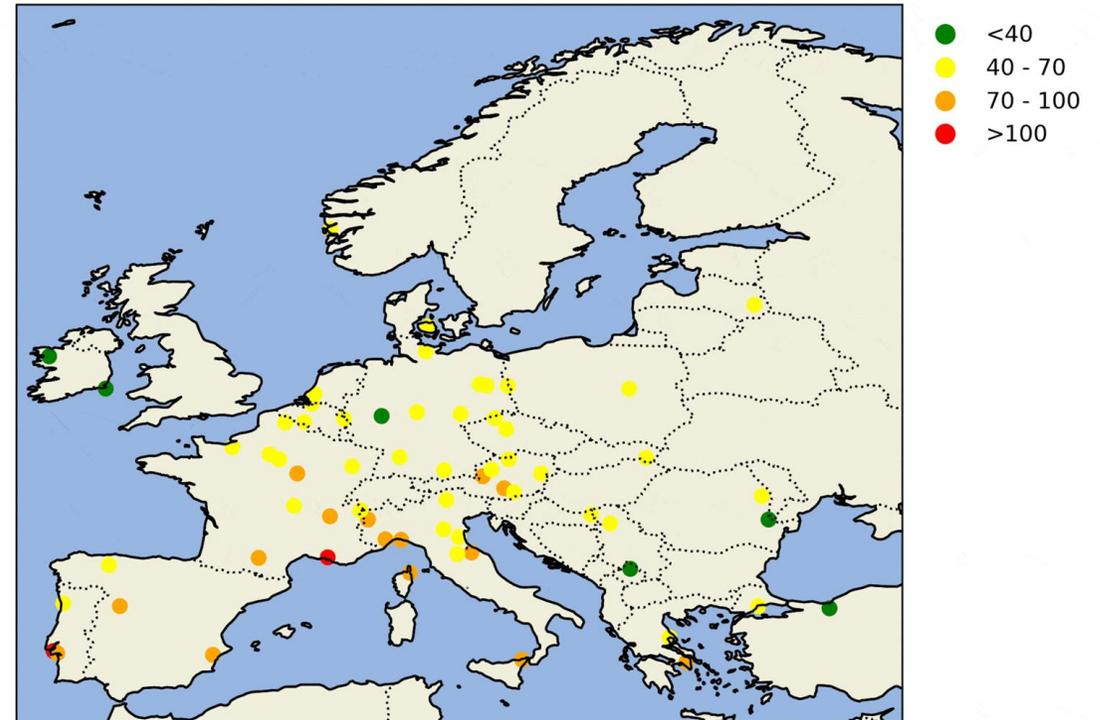
1.1.1.1 Contribution of VOCs during high ozone pollution episodes

1. Ozone modelling exercise in July 2022 focused on the sensitivity to VOCs, based on observations from the 12-19 July 2022 campaign (heatwave episode) - lead IEP-NRI

Will be discussed at 3pm today - Preparation to modelling exercise + preliminary results

2. Measurement campaign oriented towards VOCs in urban regions in 2024 – lead CCC/NILU

O3 daily average concentrations [$\mu\text{g}/\text{m}^3$] on 10 July, 2022



A new VOCs intensive measurement campaign planned for 2024

Wenche Aas NILU/CCC

- The scope should still be on ozone formation.
- **The most critical aspect to address is the knowledge gap on speciated VOC emissions, which is of utmost importance for our research.**

Setup:

- Measurements closer to emission sources, thus focusing more on industrial and urban sites, combined with regional sites in the vicinity. **Close cooperation with activities in RI-URBANS and ACTRIS**
- Try to have more **high-resolution instrumentation**, complemented with manual measurements, to get the full range of species.
- **one month measurement**
- July and/or September 2024
- ESIG kindly offered to sponsor the campaign

Science questions for the 2024-2025 period (1)



- 1) How do biogenic and anthropogenic VOCs contribute to ozone formation episodes across Europe?
 - a) How well do models reproduce ozone variability and levels?
 - b) How well do models reproduce VOC variability and levels?
 - c) How can we compare modelled and observed VOC species?
 - d) How can we deal with VOC emissions in the models?
 - e) A common approach for ozone regime analysis

Feedback to decision-makers:

How much can VOC mitigation impact the reduction of ozone episodes and background ozone levels

1.1.1.3 Aerosol chemical speciation in different models

1.1.1.4 Representation of intermediate and semi-volatile condensable emissions



1. Modelled PM composition (preparation for a 2025 or 2026 modelling exercise)

- a) Aerosol chemical speciation in different models
- b) Representation of intermediate and semi-volatile condensables emissions
- c) SIA and SOA formation
- d) Impact of biogenic VOC emissions on SOA formation

- Similar outcome from other European research projects – important to analyze "lessons learned" to build and added value to TFMM

-Need for the restart of the ad-hoc condensable group

1.1.2.3 Develop guidance on estimating and Party's reporting of emissions of condensable component of PM (CEIP and TFEIP with MSC-W and TFMM)

1.1.2.4 Develop guidance on estimating and Party's reporting of emissions of BC (TFEIP and CEIP with TFMM)

Science questions for the 2024-2025 period and beyond (2)



- 2) What is the contribution of secondary aerosol production as compared to primary;
- To what extent does primary aerosol reproduce variability and pattern of the observed PM₁₀/PM_{2.5}?
 - What is the natural component in the background?
 - How does secondary aerosol production differ between the models?
 - Are available emission data sufficient to reproduce aerosol chemical composition?
 - How to compare observed and modelled chemical components (magic factors applied to BC and OC)

Feedback to decision-makers:

Assessment of the contribution from the natural sources (no control) and secondary production (potentially nonlinear relation to the emission reduction)



1.1.1.8a Finalise the Eurodelta-BaP model intercomparison

1.1.1.8b Assessment of BaP-related health effects

1. Ciemat (Marta Garcia Vivianco) led the EurodeltaBAP publication, which was conducted in cooperation with FMI, ENEA, and INERIS.
2. Health effects will be calculated using the AlphaRiskPoll Tool, which Mike Holland shared.
3. Initial analysis was undertaken based on Eurodelta-BAP, but we would like to extend the exercise to include country case studies (Balkan countries – MSC-E) or national modelling.
4. Foreseen cooperation with TFIAM and TFHealth

Further discussion, call to action, and next steps will be on Tuesday.

1.1.1.32 Consolidate existing evidence on health outcomes of exposure to air pollution TF-Health with other groups (TFIAM, TFMM)

Publication on BaP Modelling *and impacts on health*

Contents:

- Air concentration intercomparison and evaluation: GLEMOS, CHIMERE, MINNI, SILAM
 - Gas/particle ratios: GLEMOS, CHIMERE, MINNI (almost all particle), SILAM (only gas)
 - Deposition intercomparison: total, dry , wet: GLEMOS, CHIMERE
 - Precipitation intercomparison: GLEMOS, CHIMERE
- **Impacts on health**

Science questions for the 2024-2025 period



3) Feedback from EurodeltaBAP

- a) BaP as a tracer vs. chemically active
- b) similarities as differences between models' results
- c) feedback on emission data (sources and its temporal variability)
- d) are the model estimations reliable? Evaluation

4) BaP-related health effects

- a) How different are the health effects estimations among EurodeltaBAP models
- b) How different are the health effects estimations among national estimates and EurodeltaBAP models
- c) How different are model-based estimates as compared to observation-based approaches?
- d) How significant is the spatial variability of BaP in health estimations – is "country average" a reliable approach?

Feedback to decision-makers: ???

1.1.1.2 Chemicals of emerging concern

Towards a harmonized approach for atmospheric monitoring of Chemicals of Emerging Concern (CECs)

Workshop 8-10 November 2023 at NILU, Kjeller, Norway.

Thematic sessions:

- Siloxane and Chloro-paraffins
- PFAS
- Flame retardant
- Microplastic and plastic additives

Presentations available at

https://projects.nilu.no/ccc/tfmm/kjeller_2023/index.html

Report or possible a peer reviewed paper with recommendations are being written





Work items in collaboration

WMO

1.3.5 Review of WMO Report on Low-Cost Sensors

7/05 Tuesday - **Low-cost sensors** session

TFHTAP

1.1.1.7 Long-term O₃ projections in relation to CH₄ mitigation

1.1.3.2 O₃ modelling of future scenarios

1.1.4.2 Global and regional model simulations of historical trends and future scenarios with assessment of human health and vegetation impacts

MSC-W

1.1.1.5 Review source-receptor methodologies: brute force and sensibilities (local fractions) and their applicability

Slido.com



Join us at **slido.com** with **#8245607**

- 1) I'm willing to join (list of TFMM activities)
- 2) Ideas to consider for the next work plan 2025-2026
- 3) Venue for the 2026 annual meeting?





Thank you

