WG8 update
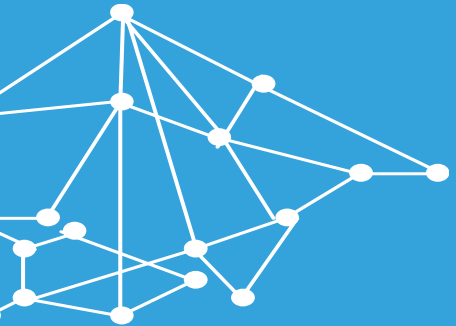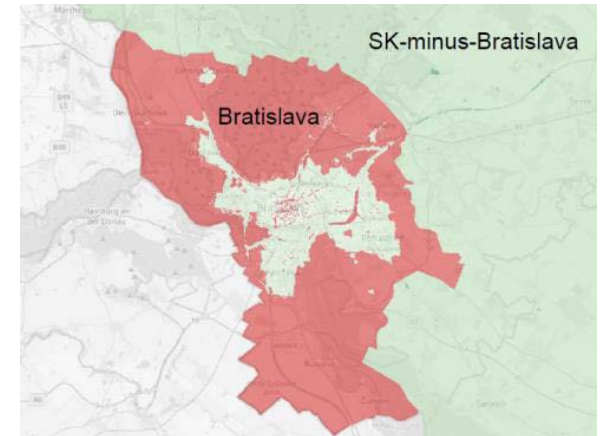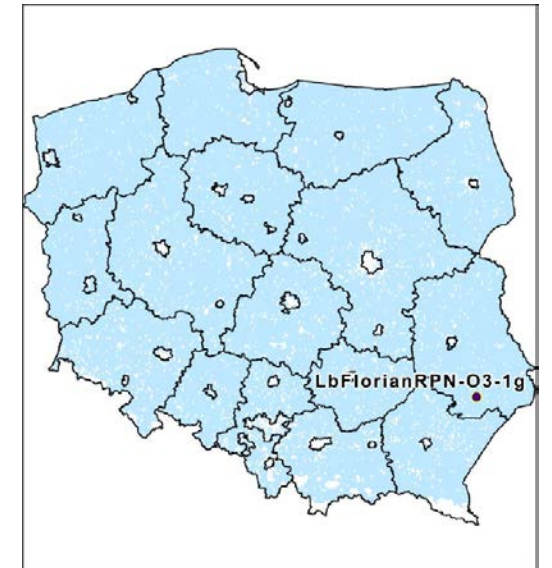# Spatial Representativeness, Exceedance Situation Indicators & Monitoring Network Design

FAIRMODE Plenary Meeting
5th March 2025

Activities since the 2024 plenary meeting

- Focus on key remaining open issues, in particular:
  » Criteria for limiting SRAs of rural / regional background stations
  » Use of source-related criteria

- In-depth discussion at the technical meeting Oct 2024

- Two WG8 webinars 24th Jan & 11th Feb
  » Contributions from DE, PL, AT, TECNALIA (ES), VITO (BE)

Examples of the rural background "challenge"

Activities since the 2024 plenary meeting

- Written contributions from testing received from IT, WG4, SE, AT, DE, VITO (IE, BE, HR, SK)
- Updated WG8 guidance document on spatial representativeness:

https://fairmode.jrc.ec.europa.eu/document/fairmode/WG8/
WG8_Guidance_Document_Spatial_Representativeness_VS4.pdf

Activities since the 2024 plenary meeting

- **Guidance document on how to use MoNET for monitoring network**
  - » Evaluation of the representativity of the air quality network to assess:
    - Pollution regimes
    - Flagging of potential outliers and redundancies
    - Identification of inconsistencies in sampling point classification
    - Assessing spatial gaps
    - Evaluation of Air Quality Zones
  - » Eight contributions from the AQUILA- FAIRMODE workshop were revised
  - » The description of how to interpret the tool's output has been improved

- **MoNET has undergone significant improvements, enhancing its capabilities and performance**

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Priorities for 2025 and finalising this work period (2023 - 2025)

- Finalise guidebook on the use of MoNET (August)

- Finalise summary document on CAMS – FAIRMODE Natural dust excercise 2023-24

- Continue testing SR methodology and remaining open issues? E.g.
    » Further testing on use of source-related criteria
    » Use of other metrics than annual means, e.g. percentiles
    » Sensitivity tests on interannual variability of SRAs
    » Template for documentation & reporting of SRAs

- Develop priorities & potential activities for the next roadmap (2026 - 2028)
    » E.g. Strengthen link between network design, SR and AQ zones?

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How did the Working Group contribute to better modelling for assessment and/or planning?

- SR methodology developed by WG8 has provided a sound basis for:
  - Strengthened assessment provisions in the revised AAQD
  - Technical support document on modelling
  - →Improved harmonisation of SRA assessment across Europe
  - →Also provides a pragmatic approach for a first estimation of ESIs
- MoNET evaluation of monitoring network & optimisation
  - Valuable tool to aid the revision and optimisation of MS monitoring network under the revised AAQD
  - Useful for the evaluation of air quality zones
- Natural Dust Exercise illustrated strengths and limitations of use of CAMS for assessment of natural dust contributions
  - Important input in efforts to include CAMS modelling in the revision of the guidance to discount natural source contributions to exceedances
  - A viewer for natural dust contributions now included in the work plan of CAMS for the next phase (2025-2028) to make these data better avaiable for use by Member States

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Thank you!
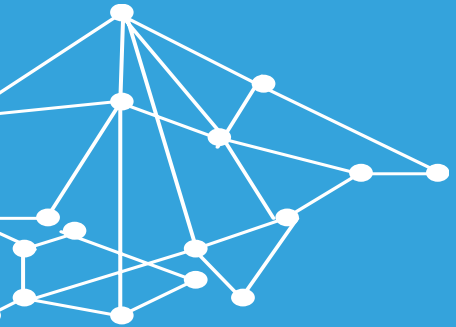
Leonor Tarrason lta@nilu.no
Matt Ross-Jones
matthew.ross-jones@naturvardsverket.se

Structure of the chapter/sub-chapter on **monitoring network design**

- Relevant AAQD requirements
- Methodology for using modelling to aid network design:
  - » Identification of hotspot locations
  - » Identification of background locations
  - » Supplementary methods for reducing min number of fixed measurements
- Regular review of monitoring network design
- QA/QC process and fitness for purpose

Feedback received and planned changes

- **Clear request for a separate guidance on siting criteria and monitoring design (joint work with the AQUILA community)**
- Planned changes / additions:
  - » Make clear that this current guidance only covers how to use models to support network design
  - » Link to **MoNET guidance** once published
  - » **Hot spots** – defined by high concentrations in areas with high impact on exposure
  - » "Redundancies" a term to be carefully explained and considered in terms of "completeness" of networks – Identification of possible monitoring network **gaps** more relevant

European Commission

Technical Guidance in the field of Air Quality Modelling

Technical guidance document on the use of modelling for various application domains under the Ambient Air Quality Directive

SECOND DRAFT

June 2024

LOGO

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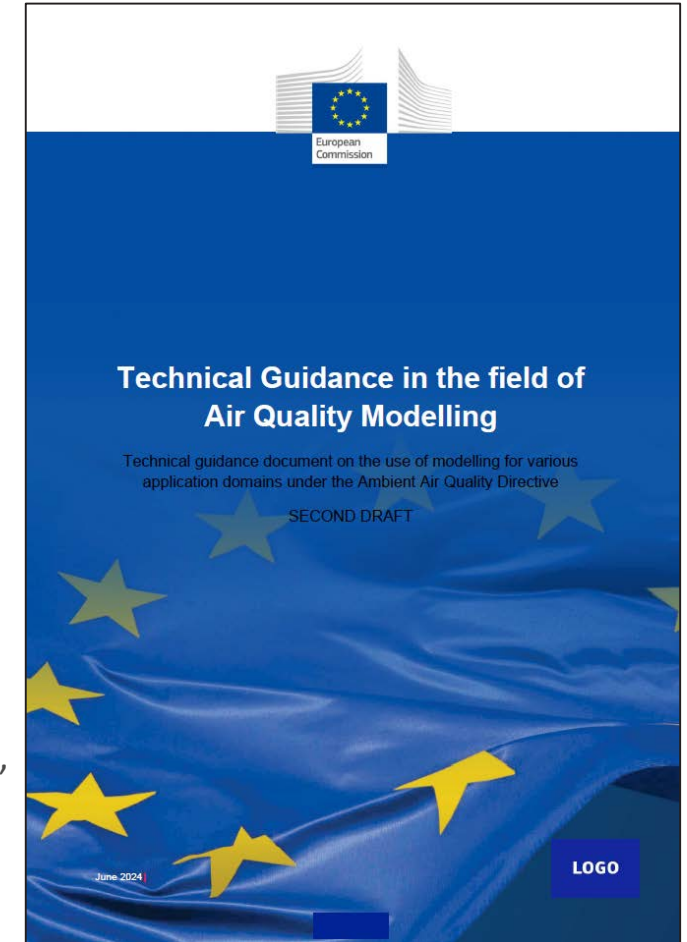
FAIRMODE MoNET GUIDANCE

- To be completed by the next plenary 2025

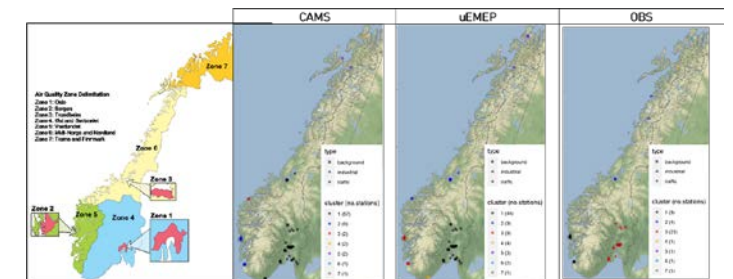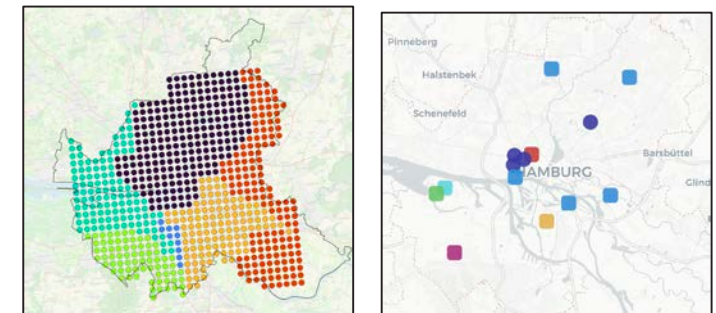**Planned next exercises**

1) Can clustering of model data support the SRA in a city ?

Comparison of AQ Mon+ AQ model + SRA calculations in a city

2) Can clustering of model data serve to define the AQzones?

Comparison of AQ Mon+ AQ model + the countries AQ zone definition

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Structure of the chapter/sub-chapter on exceedance situation indicators

- Relevant AAQD requirements
- Overview of the ESI's
- Step-by-step methodology for estimating ESIs
- Population exposure modelling
- Recommendations for natural source contribution estimation

Feedback received and planned changes

» **Spatial extent of exceedances**:
   » Use of SRAs for the ESI – calculated with a fit-for-purpose models (even if in the specific situation the model does not catch the exceedance)

- **Exposed population**:
   » Keep it simple / pragmatic! - population data resolution and model resolution must be balanced (constrained by their fitness for purpose and MQO)
   » Suggestion to change the recommended minimum resolution for urban population data (<0.5 km)

- **Road length in exceedance**:
   » Keep it simple ! Keep to one road length independently of the lanes.
   » Relevance of this indicator still in question (link to review of IPR)

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June 2024

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Atmosphere Monitoring

- ❑ **Austria** (Wolfgang Spangl, UBA-Viena)
- ❑ **Cyprus**   (Jonilda Kusta, CYI)
- ❑ **Bulgaria** (Emilia Georgieva and Hristina Kirova, National Institute of Meteorology and Hydrology- Bulgaria)
- ❑ **France** (Laure Malherbe and Laurent Latenois, INERIS)
- ❑ **Hungary** (Anita Tóth, Hungarian Meteorological Service)
- ❑ **Italy - Tuscany** (Guglielmo Tanganelli and Francesca Guarneri, ARPAT)
- ❑ **Italy** - Diapason (Francesca Barnaba, Cnr-isac, Andrea Bolignano, Enea, and Giorgio Cattani, Ispra).
- ❑ **Malta** (Ariana Schembri and Ruth Borg, ERA)
- ❑ **Poland** (Joanna Strużewska, IOS, Poland)
- ❑ **Portugal** (Carla Gama, University of Aveiro)
- ❑ **Portugal** (Joana Monjardino, FCT NOVA, Portugal)
- ❑ **Spain** (Noemi Perez, CSIC)

- • Measured exceedance at sampling point
- **Evidence of dust intrusion – CAMS + additional measurement data**
- • Check CAMS service for ocurrence of dust intrusion episode (IRA maps)
- • Check CAMS modelled values for the episode at sampling point
- • Review additional sampling evidence in nearby sampling points
- **Evaluation of contribution of natural dust to the exceedance (possible method)**
- • Apply bias correction to measured data from CAMS modelling
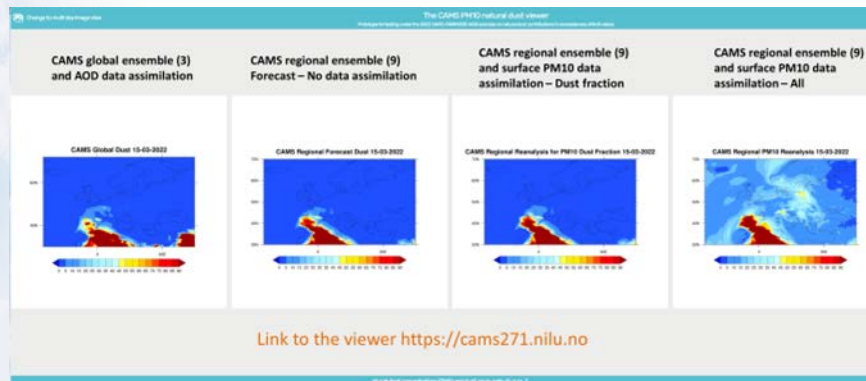
- • **FAIRMODE Summary document (april 25)**
- • **Peer review publication ?**

- • *Link to on-going revision of the guidance to discount natural source contributions to exceedances*

Link to the viewer https://cams271.nilu.no

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3 documents in the making

- FAIRMODE technical guidance on evaluation of SRA
- Use of models in natural dust exceedance situation
- Guidance on the use of models for Monitoring Design – MONET guidance

*Further tests to link monitoring design testing to SRA
analysis with focus on air quality zones / geographical area*