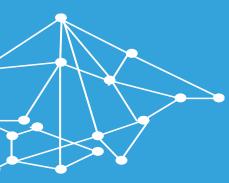
WG8 update Spatial Representativeness, Exceedance Situation Indicators & Monitoring Network Design

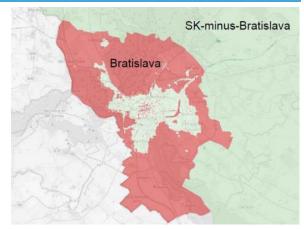
FAIRMODE Plenary Meeting 5th March 2025



WG8 UPDATE - SPATIAL REPRESENTATIVENESS

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"





WG8 UPDATE - SPATIAL REPRESENTATIVENESS

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:

Commission	English			
Joint Research Centre		FAIRMODE WG8 – Guidance Document on	List of app	pendicies
		FAIRWODE WG8 – Guidance Document on		
FAIRMODE		the estimation of spatial representativeness	Appendix 1:	FAIRMODE WG8 - RECOMMENDATIONS ON SPATIAL REPRESENTATIVENESS ESTIMATION - ITALY
Home Activities v Meetings v About v Guidance v Tools v Join FAIRMCDE >				Appendix A: Examples of good practices by ARPAE
Nome > > About the European Commission > FAIRIMODE		Authors: Matthew Ross-Jones, Leonor Tarrason and Stijn Janssen on behalf of the WG8 community		Appendix B- Examples of good practices by ARPA LOMBARDIA
		With contributions from: Andreas Kerschbaumer, Antonio Piersanti, Bart Degraeuwe, Bianca Patrizia Andreini, Caterina Busillo, Chiara Collaveri, Fernando Martín (on behalf of the FAIRMODE WG4		Appendix C- Examples of good practices by LaMMA-ARPAT
WG8 – Monitoring design, spatial representativeness and associated exceedance situation indicators	About FAIRMODE	community), Francesca Guarnieri, Gesuina Dirodi, Giovanni Bondy, Guido Lanzani, Jenny Lindvall, Lina Vitati, Laris Colomba, Michele Stortini, Mihoela Mircas, Aberta Amorati, Stefan Feigenspan, Stefano Bande, Stephan Nordmann, Susan Kessinger, Wolfgang Spangl.		Appendix D- Examples of good practices by ARPA FVG
Leddes M.Ross-Jones (Naturatory effect) Contact us ES Jon E	Steering committee >	Version 4, 03/03/2025 This Guidance Document summarizes the work carried out so far within the FAIRMODE WG8	Appendix 2:	Feedback and results from FAIRMODE WG4-Microscal Modelling based on the FAIRMODE WG8 checklist for further testing of spatial representativeness of measurement stations
Guidances and proposals	National Experts > Roadmap >	community in relation to the issue of spatial representativeness of air quality sampling points. It builds on and replaces the previous <u>WGB guidance document</u> on this issue and provides a range of recommendations for the estimation of spatial representativeness of sampling points. The document	Appendix 3:	Testing Spatial Representativeness of Monitoring Stations in Four Cities wit East Sweden Air Quality Management Association
Image: An and a state of the estimation of Spatial Representativeness du de transmission (and spatial Representativeness du de transmission) Version 3 - Fab 2021 Contains a de transmission (and spatial Representativeness and of spatial Representativeness	Strategy >	also includes a number of annexes with contributions and examples from different monitoring networks and organisations following extensive testing of the spatial representativeness methodology during the last few years. The revised EU Ambient Air Quality Directive (EU) 2024/2881 (AAQD) includes a number of key criteria	Appendix 4:	Feedback and results from Environment Agency Austria (Umweltbundesam GmbH) based on the FAIRMODE WG8 checklist for further testing of spatial representativeness of measurement stations
	Guidance	The Terminal Committee in community measures are of sampling on the CARO, Annex V Point RS, which for determining spatial representatives are of sampling points (AAO), Annex V Point RS, which are largely based on the methodology and recommendations that have been developed within FARMODE for estimating spatial representativeness. This document is intended to give more details	Appendix 5:	Feedback from Environment Agency Austria (Umweltbundesamt GmbH) on additional criteria for spatial representativeness of air quality monitoring st
	Assessment >	and important background information on the methodology and recommendations, as well as examples on the application of these criteria.		Testing Spatial Representativeness of Monitoring Stations in Germany
Description	Planning >	In its current version, this guidance does not identify the best ways of reporting representativeness	Appendix 7:	Spatial Representativeness study for Belgium, Croatia, Ireland and Slovakia.
The AAGD offers the opportunity for MS to use model applications (alone or as supplementary	Tools	area of sampling points under the Implementing Provisions on Reporting (IPR), but the recommendations and experiences gained within FAIRMODE WG8 can provide an important input to		
information of measurements) to assess the air quality. The Implementing Provision on Reporting (PR) and related e-Reporting process have defined how to report these model applications. As a	Δ - Delta Benchmarking >	the upcoming review of the IPR.		
esult, an increasing number of MS are reporting modelling data and model based indicators equested by the IPR However, there is still a clear lack of guidance on the use of model results for	SHERPA >			
assessment and planning purposes and, therefore, in the formal reporting cycle (e.g. estimation of				
exceedances, exposure in given areas or spatial representativeness of the monitoring station). Based on the work carried out in the past years, future WG8 activities will focus on:	EC Map (2024) >			
Best practice identification - Fine-tuning and further testing spatial representativeness methods	EC MAP (2017) >			
2 Best practice identification - Fit-for-purpose modelling approaches to assess Exceedance Situation Indicator	ECMap - Database >			
Benchmarking - Better describing the details of implementation of the Exceedance laceting indicator			L	

FAIRMODE Forum for air quality modelling in Europe

https://fairmode.jrc.ec.europa.eu/document/fairmode/WG8/ WG8 Guidance Document Spatial Representativeness VS4.pdf

WG8 UPDATE – MONITORING NETWORK DESIGN

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

FAIRMODE

• Evaluation of Air Quality Zones

Forum for air quality modelling in Europe

- » 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



WG8 NEXT STEPS

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?



WG8 CONTRIBUTION TO AQ ASSESSMENT & PLANNING

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
 - \rightarrow 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



Thank you!

Leonor Tarrason <u>Ita@nilu.no</u> Matt Ross-Jones <u>matthew.ross-jones@naturvardsverket.se</u>

MONITORING NETWORK DESIGN - DRAFT TECHNICAL GUIDANCE DOCUMENT

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



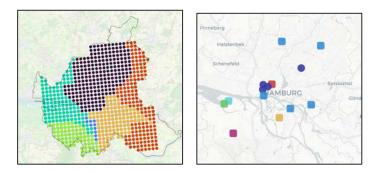
FAIRMODE MONET GUIDANCE

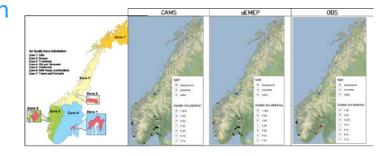
• To be completed by the next plenary 2025

Planned next exercises

Can clustering of model data support the SRA in a city ?
 Comparison of AQ Mon+ AQ model + SRA calculations in a city
 Can clustering of model data serve to define the AQzones?

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







EXCEEDANCE INDICATORS - DRAFT TECHNICAL GUIDANCE DOCUMENT

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:

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

Forum for air quality modelling in Europe





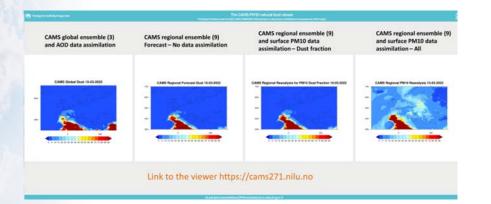
CAMS - FAIRMODE Natural dust excercise - Document 2

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)
 - Laly Tuscany (Guglielmo Tanganelli and Francesca Guarneri, ARPAT)
 - Let **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)

AIRMODE

Spain (Noemi Perez, CSIC)



orum for air quality modelling in Europe

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

WG8 – NEXT STEPS

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

