



Kick-off meeting for the FAIRMODE mapping exercise

Joint WG2 & WG7 activity

12th May 2023

Agenda

- Introduction to the exercise
- Plans for the CM on concentrations
- Plans for the CM on emissions
- Interface and technical aspects - upload and processing of data
- Q & A



FAIRMODE MPI mapping exercise

WG2 activity (with links to WG7)

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12th May 2023

Content

- Purpose of the exercise
- Available new tools at the Composite Mapping platform
- How to proceed with the exercise – data to be compiled
- How to proceed with the exercise – analysis to be carried out
- Time plan

WG2 Roadmap 2023-2025

WG2 roadmap for the next 3 years to identify good modelling quality assessment practices

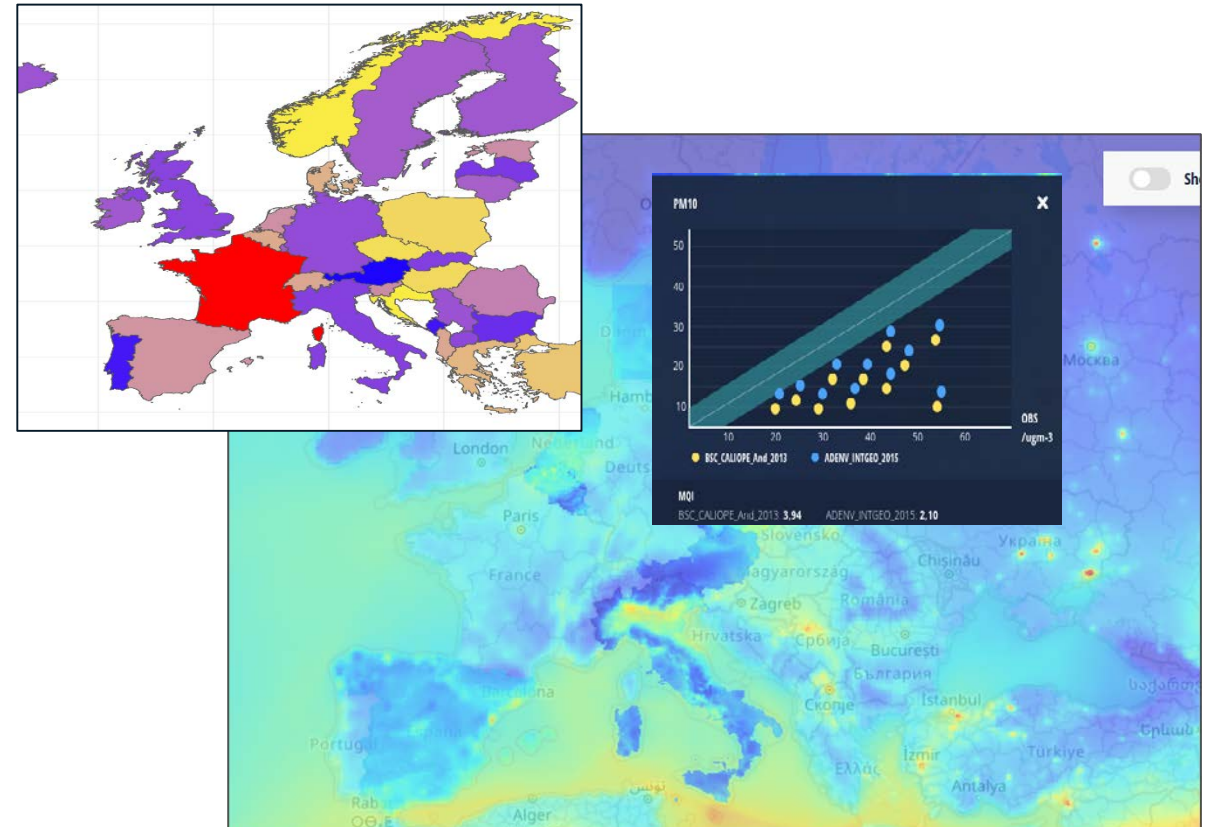
Proposed further development of the composite mapping platform by adding

- An **on-the fly MQI/MQO** aligned with the AAQD
- A **benchmark EU map** linked to ensemble **emission benchmark**
- Structured and regular **inter-comparisons**

Modelling Performance Indicators – role of FAIRMODE

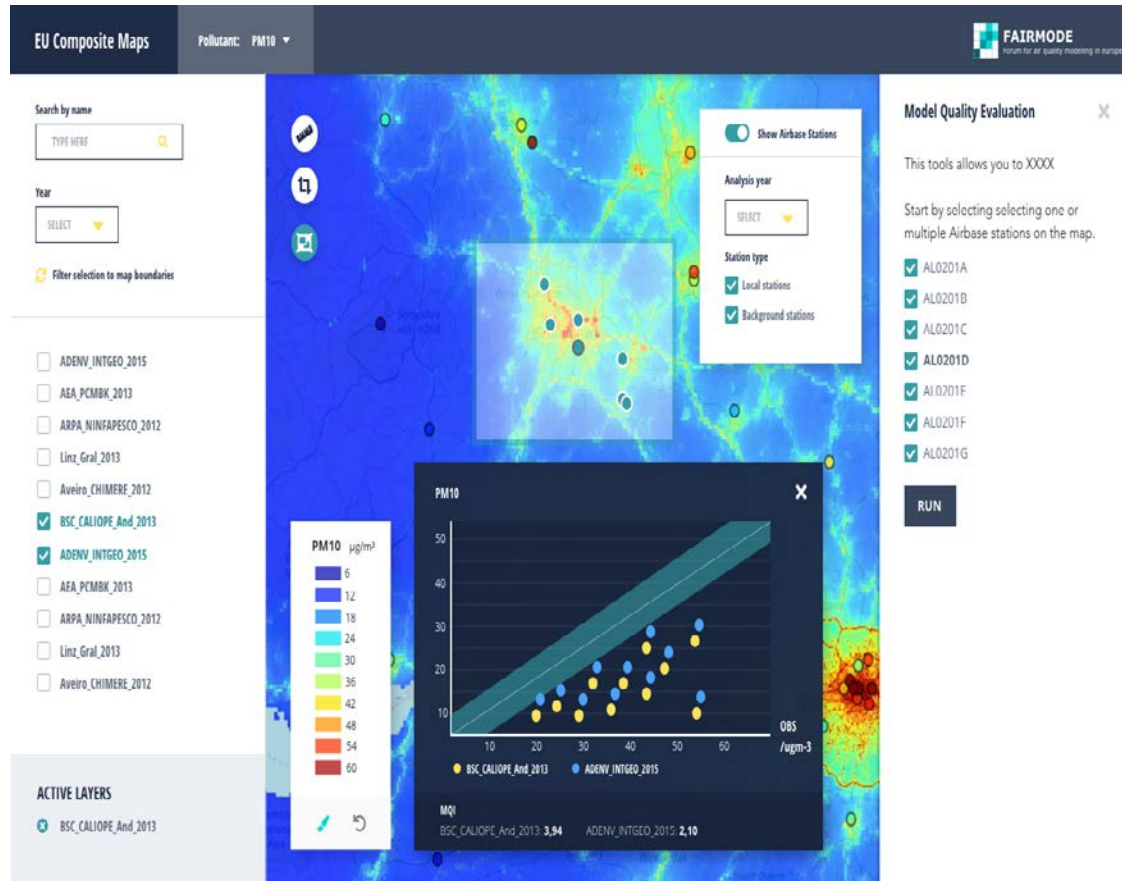
Two main new interfaces in the MPI exercise

1. On-the-fly MQI evaluation - Flexible interface to test MQI/MPI robustness
2. Composite mapping with MQI - Fixed interface to visualize overview MQI (and associated) maps



Further development of the FAIRMODE Composite mapping (M) platform that needs to be tested

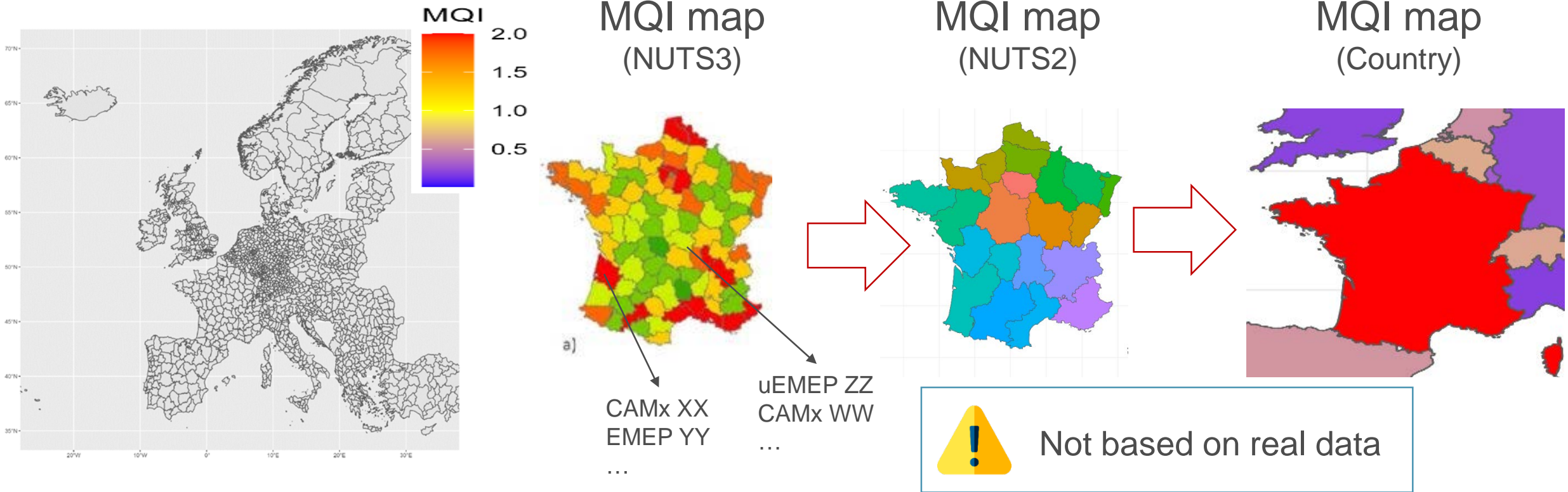
1. On-the-fly MQI - Flexible interface



- ❖ Available for NO_2 , PM_{10} , $\text{PM}_{2.5}$ and O_3
- ❖ Only possible for the annual MQI, based on hourly, daily and 8h daily maximum values for NO_2 , PM_{10} , $\text{PM}_{2.5}$ and O_3 , respectively.
- ❖ Calculates FAIRMODE's MQI values based on user-defined:
 - Set of AIRBASE stations by classification
- ❖ Geographical area (from NUTS3, AQ zone, to country)
 - Optional number of stations – it is possible to remove specific stations
 - CEN/FAIRMODE vs AAQD formulations

2. CM - Fixed interface – What does it deliver?

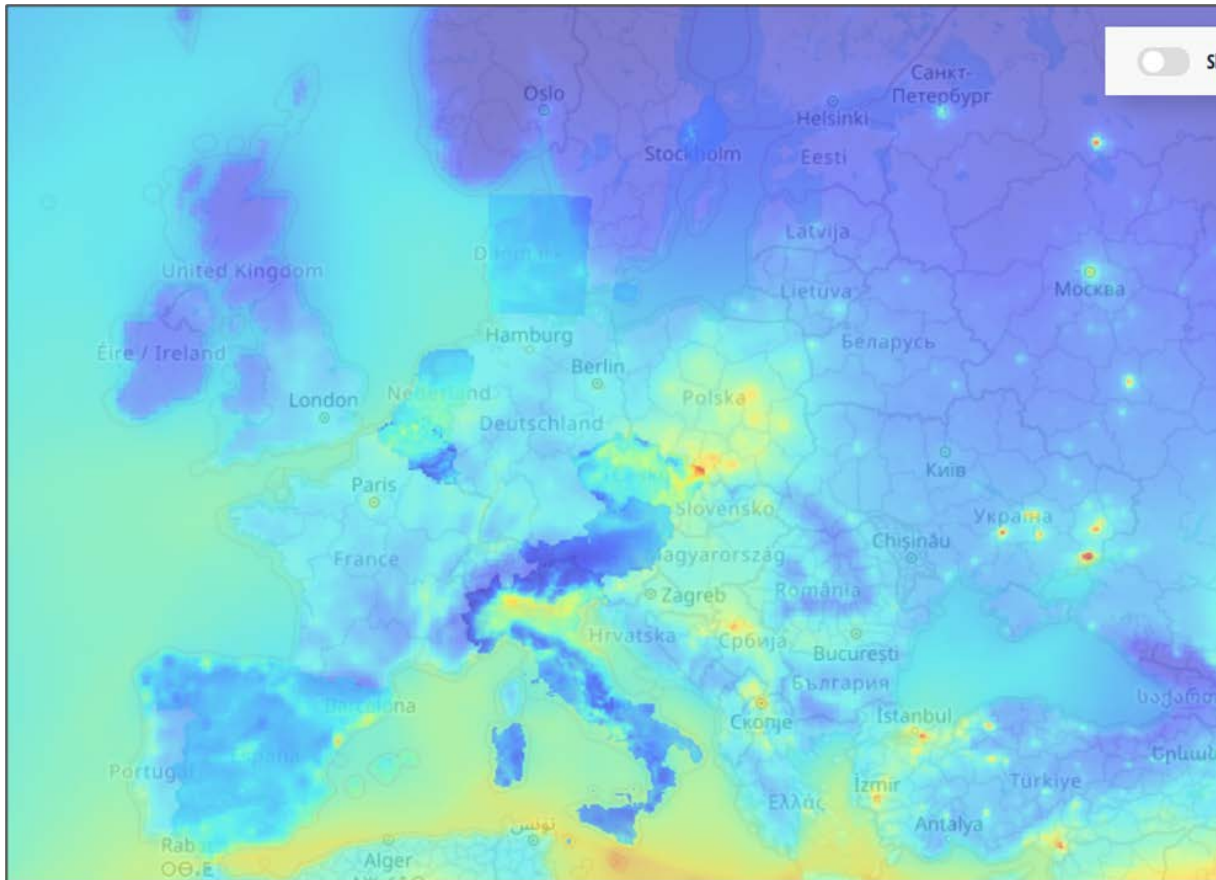
MQI maps



- Look at MQI results aggregated to regional or country scale based on aggregation of best performing models
- Option to select or not models based on data-assimilation

2. CM- Fixed interface – What does it deliver?

Air concentration maps



- Based on best performing results at NUTS3/2 level
- Keep analysis tools as in previous CM (transects, measurements...)

How to proceed with the exercise – data to be compiled

Required input

- Best gridded concentration map at EU, country, regional or urban scale for NO₂, PM₁₀, PM_{2.5} or/and O₃. Same format as previous exercises.
- For non-gridded model output (e.g. traffic locations), possibility to either:
 - Post-process data to a regular mesh with free resolution (complete or incomplete grid)
 - Send results at station (long-lat) – (in this case, no mapping produced, only MQI)
- Sector/pollutants emission totals aggregated over NUTS3 (**mandatory**) and largest functional administrative area (optional). Preprocessor provided by JRC.
- Concentration maps should be for 2019 for comparison with 2019 observations

Required data and Metadata for air concentrations

Pollutants considered	NO ₂ , PM10, PM2.5 and/or O ₃
Temporal	Annual averaged concentrations
Year considered	Y-4 (i.e. 2019 for data delivered in 2023)
Data format	Gridded. See current composite mapping platform instructions & templates (https://aqm.jrc.ec.europa.eu/ecmaps/)

Basic information	Model code (visualisation name)
	Model name (e.g. EMEP, CAMx...)
	Model version
	Reference Year
	Model type
	Country covered
	Area covered (optional)
	EPSG map projection
Other information	Contact information
	Model domain/ spatial coverage
	Temporal resolution
	Spatial resolution
	Underlying emissions (inventory name and reference year)
	Input meteorology
	Initial & boundary conditions
	Data assimilation / fusion
Model documentation	

The FAIRMODE MQI - CM platform

What can we learn from it?

1. Overview analysis of MQIs across countries and regions
2. Monitoring progress and trends on MQIs as the platform is populated (how much does the MQI assessment improves from one to the other exercise?)
3. Support guidance on MQI formulation and methodology for the AAQD – lessons learnt on modelling QA/QC and model use
4. Testing usability and usefulness of modelling metadata
5. Platform maps can be useful for testing other parameters than MQI
 - ❖ exposure, station representativeness, design of monitoring networks, evaluation of data-assimilation...
 - ❖ Test of spatial MPIs
 - ❖ Links to emission benchmarking

On-the-fly MQI - What can we learn? How to use it in the exercise?

A first purpose of the exercise is to understand the robustness of the MQI results

1. Compare FAIRMODES on-the-fly MQI with own home calculation
2. Check minimum number of stations needed for a robust MQI estimate
3. Check robustness of the MQI with respect to aggregation area (NUTS3 vs. NUTS2 vs. country)
4. Check whether MQI is able to assess specific modelling purpose (e.g. MQI of coarse resolution modelling against background stations only)
5. Check robustness of the MQI across pollutants
6. Understand cause of poor/good MQI as compared to other results (both for modelling? And emissions (see next presentation)?...)

How to proceed with the exercise – analysis to be carried out

In this initial stage – the purpose of the exercise is to understand the robustness of the MQI results

1. Choose and document the data and stations you want to use for the MQI analysis
2. Compare FAIRMODEs on-the-fly MQI with own home calculation
3. Carry out ONE analysis of your choice
 - Check robustness of your MQI with respect to the number of stations
 - Check robustness of your MQI with respect to aggregation area (NUTS3 vs. NUTS2 vs. country)
 - Check robustness of your MQI across pollutants
 - Compare your MQI with others MQI
 - Check MQI ability to assess specific modelling purpose
4. Report back to us at the FAIRMODE Technical meeting

Time schedule for activities in 2023

- On the fly MQI/MQO
- Benchmark assessment map
- QA/QC aggregated emissions



Summer 2023

- Delivery of results for inter-comparisons

August 31st 2023

- Presentation of results and discussion

October 4-6th (tech. Meeting)

Intentions for participating...so far

- Kristina Eneroth (SE)
- John Bartzis (GR)
- Alexandra Monteiro (PT)
- Matthias Ketzel (DK)
- Luka Matavz (SI)
- Flandorfer Claudia (AT)
- Bruce Denby (NO)
- Rafael Borge (SP)
- Ari Karppinen (FI)
- Stephan Nordmann (GE)
- Helen Alpfjord (SE)
- Pawel Durka (PL)
- CAMS
- EMEP
- EEA