FAIRMODE WG2 MQI Mapping Exercise
Contribution from Belgium

First interpretation webinar - 3rd June 2024

Q1 + Q2+ Q3 evaluation of on-the-fly MQI

WG2 Data Used in the exercise

Model used: ATMO-Street (RIO = statistical + IFDM = Gaussian)

Main uses of the modelling system under the AAQD: assessment and planning

Monitoring Stations data used: data downloaded for 2019 from IRCEL in November 2022

Emissions: traffic (road/shipping) and industrial point sources for Gaussian model

Pollutant: NO_2, PM_{10}, $PM_{2.5}$

Area used for the MQI evaluation: Belgium

Meteorological year used: 2019

Selected MQI/Stringency level: Fairmode / stringency = 1.0

WG2 Data Used in the exercise

Which measurement data is used?

1. ***Our data set for NO_2 82 stations***

2. ***Alternative data set for NO_2 with 54 stations by Elke, only 13 in common with dataset 1***
   reason? Stations not used in RIO!
   for the common stations the yearly averages are slightly different

3. ***Dataset in the Fairmode application: 119 stations for NO_2 of which 11 not in data set 1***
   for the common stations slight difference in modeled and observed values (some stations differ up to 20)

Not clear where these differences come from => needs to be looked at in more detail

WG2 Evaluation of the FAIRMODE MQI

Comparison of the MQO from FAIRMODE and at home – building trust and understanding differences *- Analysis for the non-data assimilated data* ***is not possible as RIO is a statistical model with the data in the JRC webtool***

MQI Results from home calculation for Belgium (MQI 90th %) calculated in XLS

NO_2: ***0.45***

PM_{10}: ***0.67***

$PM_{2.5}$: ***0.19***

MQI Results from FAIRMODE platform

NO_2: ***0.83 (my data: 0.45)***

PM_{10}: ***0.65 (my data: 0.67)***

$PM_{2.5}$: ***0.20 (my data: 0.19)***

Same MQI results for same data set
=> so calculation is correct (or we are making the same mistakes)

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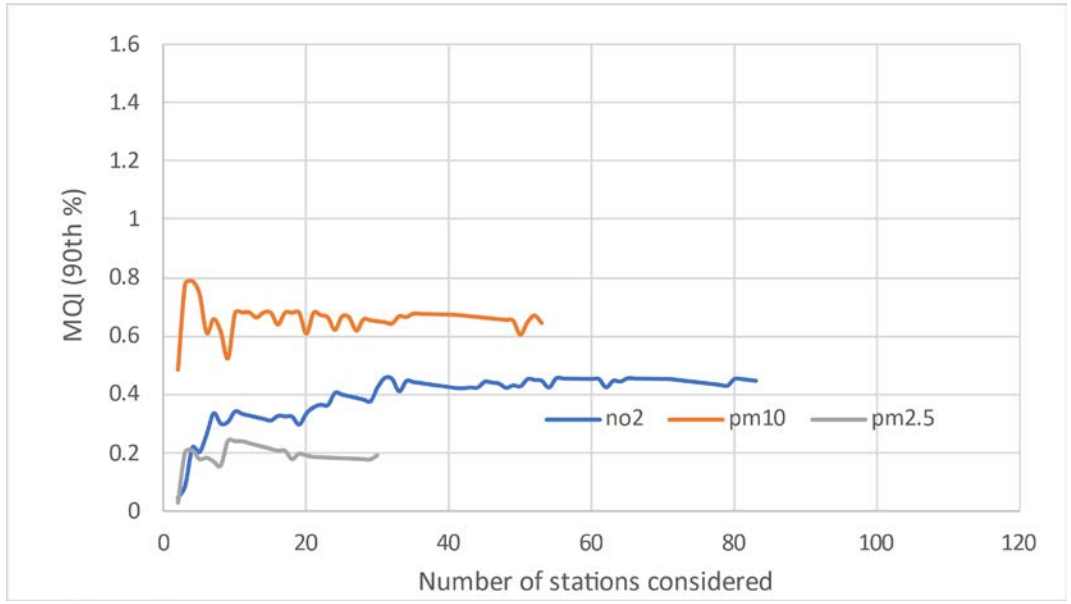
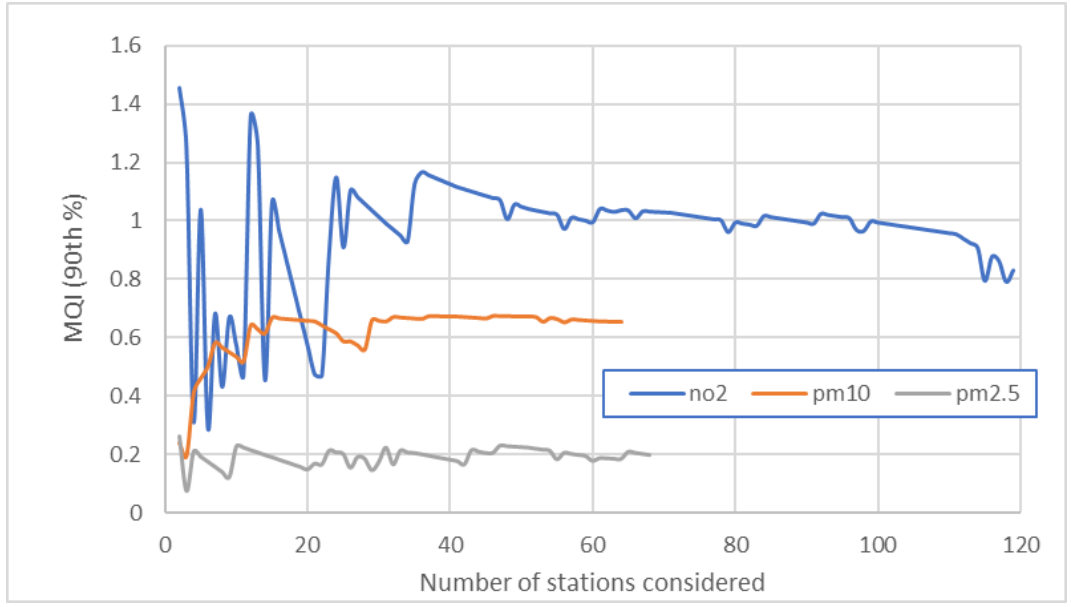
WG2 Evaluation of the MQI robustness - Results

Robustness test – Check robustness of your MQI with respect to the number of stations

Results from home calculation



Results from FAIRMODE platform



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WG2 MQI robustness – Analysis

Robustness test: Check robustness of your MQI with respect to the number of stations

- Especially NO_2 is different when considering the two datasets, VITO and JRC
  Difference in MQI 90% could be because of differences in types of stations included in the data sets where the one in the JRC platform contains more traffic stations?
  => further analysis based on stations actually included in both datasets could help here.
- PM is similar between the two data sets
- MQI remains quite constant for PM less for NO_2

WG2 MQI robustness – Questions & suggestions

- Question/suggestion
  add metadata to observations in the platform. Where/how were these obtained?
- Suggestion to improve the FAIMODE MQI platform
  - Functionality to select and remove stations could be improved eg by clicking on a station and allow disabling it
  - Selection of stations not used in data assimilation/ statistical model
  - Stringency setting is difficult

Thank-you

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