

Main conclusions on assessment

- In Stockholm the Gaussian model can reproduce annual NO₂ and PM10 at background monitoring sites but for traffic sites in street canyons calculations with a street model is needed.
- The Delta tool is very useful so get an objective and comparable measure of uncertainties in the model calculations (and measurements).
- The composite mapping provides a simple and easy way to compare model calculations from different types of models, resolution, emission data...
- Air quality modelling at local scale requires high resolution and high quality emission data.

Methods

Models

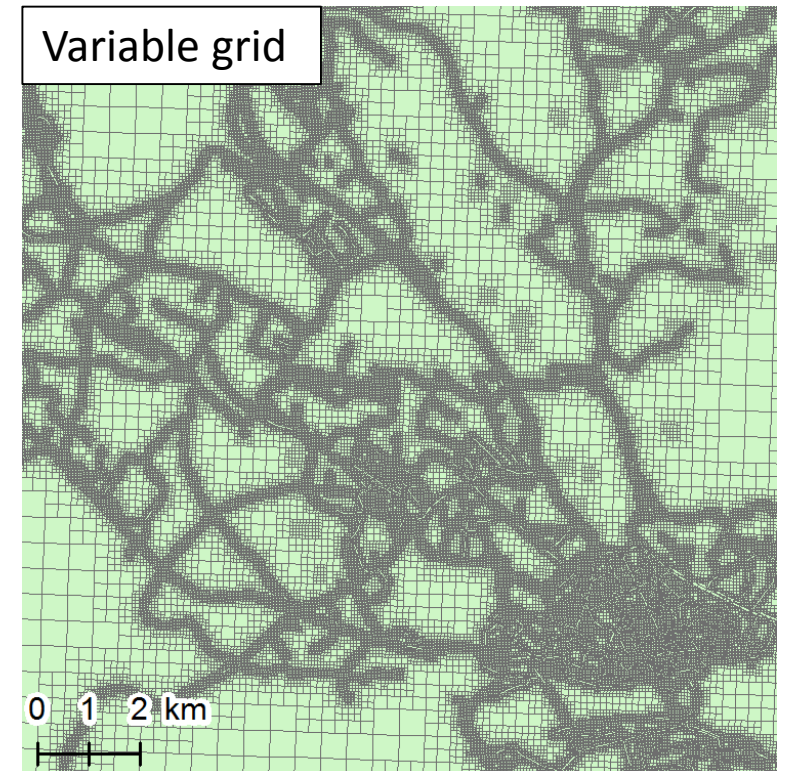
- Airviro Gaussian model with a variable grid (35-500 m)
- Airviro OSPM (Open Street Pollution Model)
NERI, Department of Atmospheric Environment in Denmark

Emission data

- Local emission data (mostly bottom-up data)

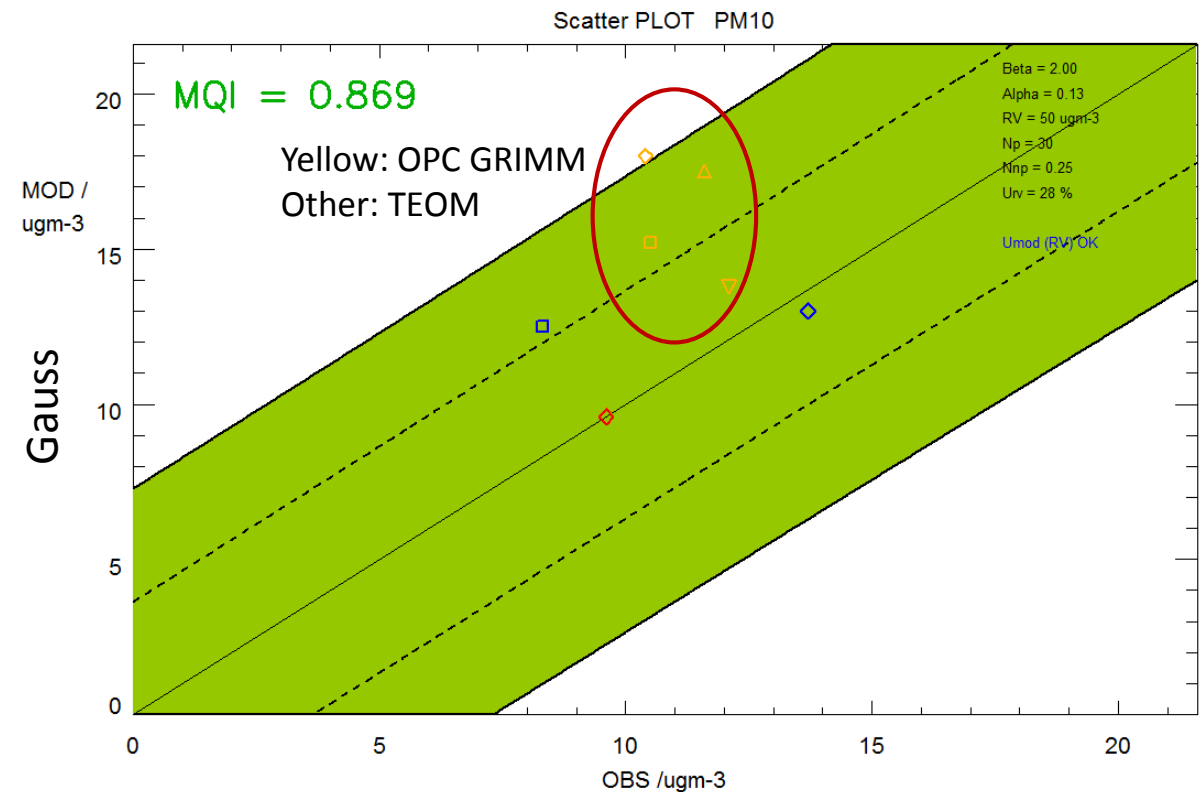
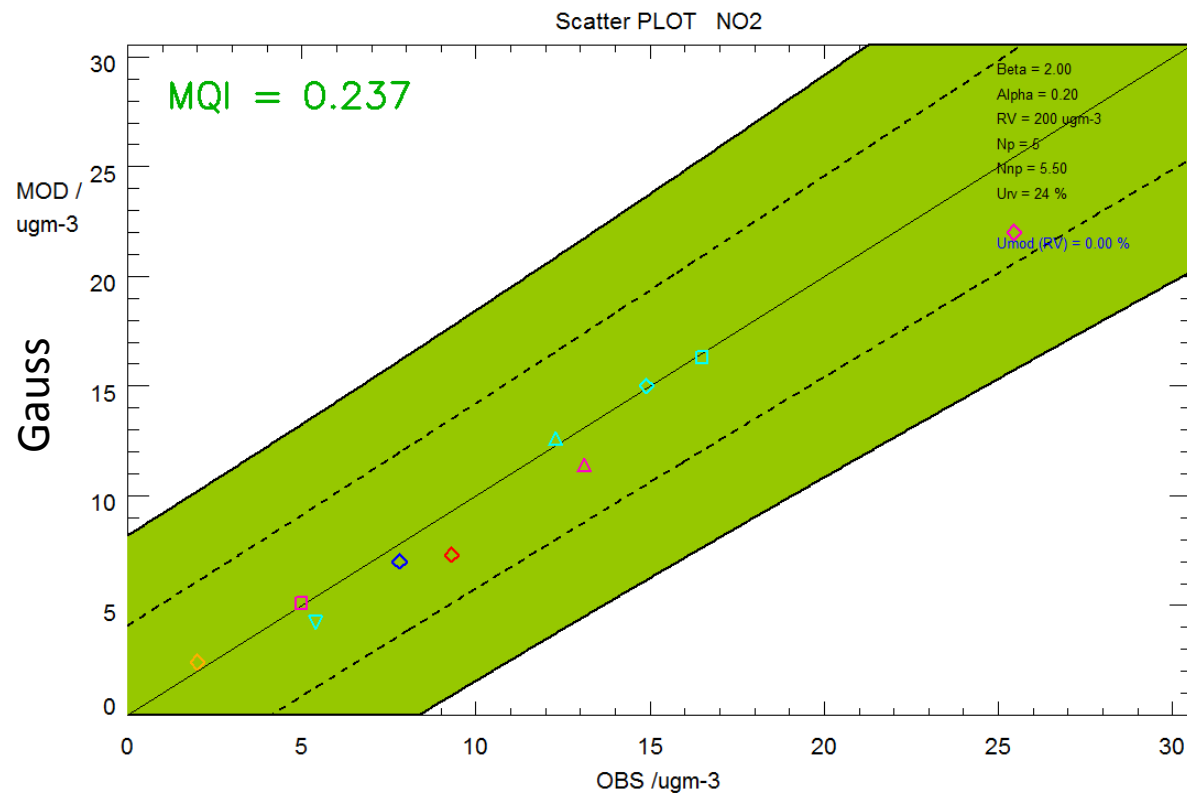
Measurement data

- Continuously measurements according to reference method or equivalent method
- NO₂: 5 UB with passive samplers (monthly or weekly)



“Delta tool” – Stockholm (1)

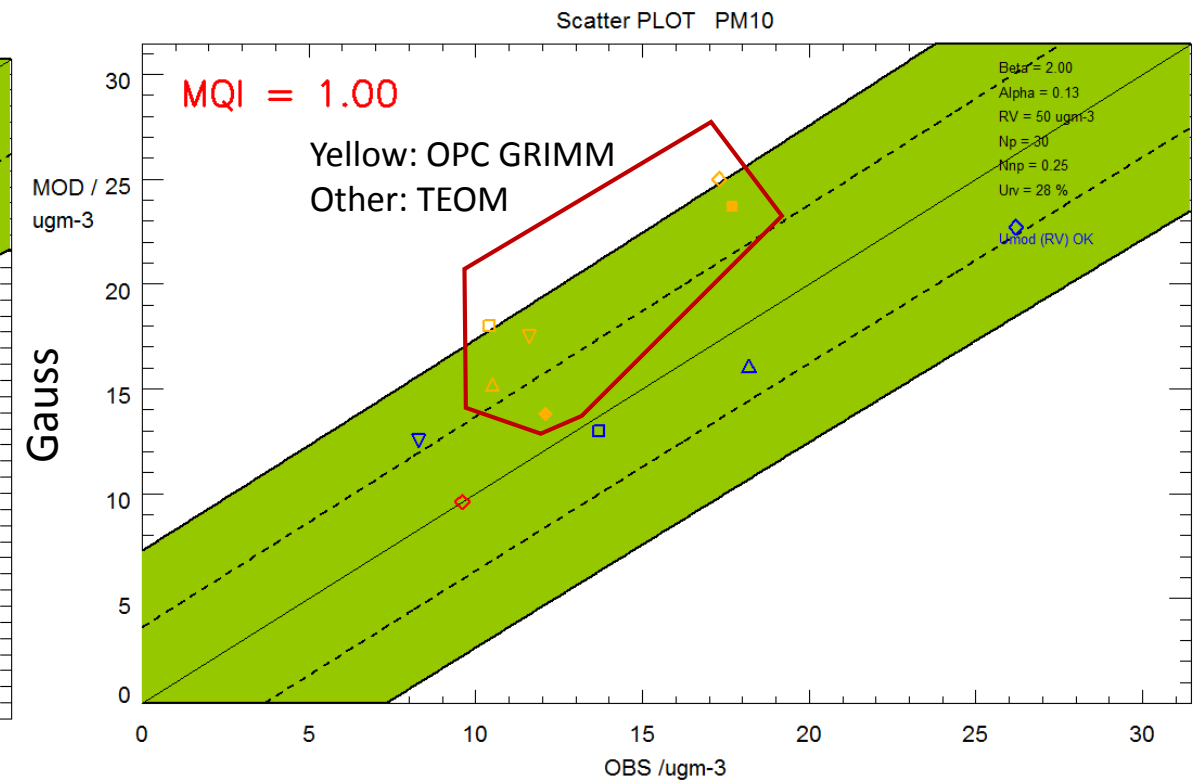
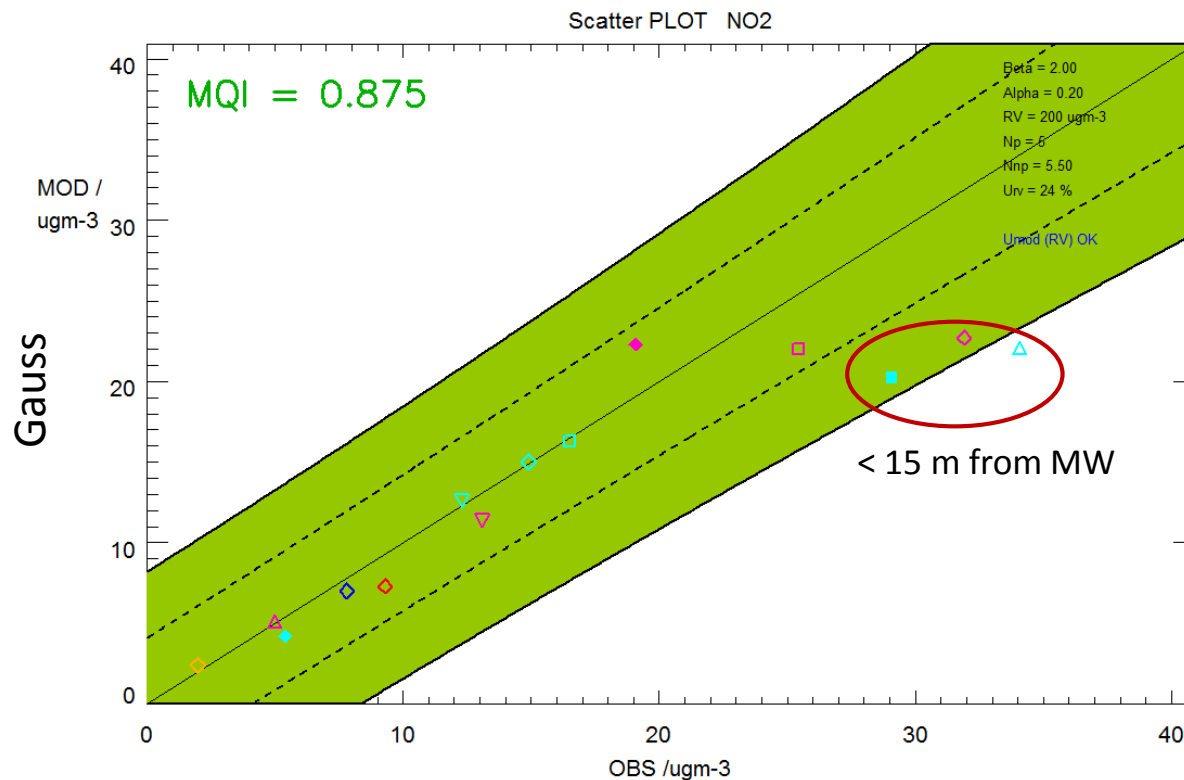
- The Gaussian model can reproduce annual NO_2 and PM_{10} at background monitoring sites.



“Delta tool” – Stockholm (2)

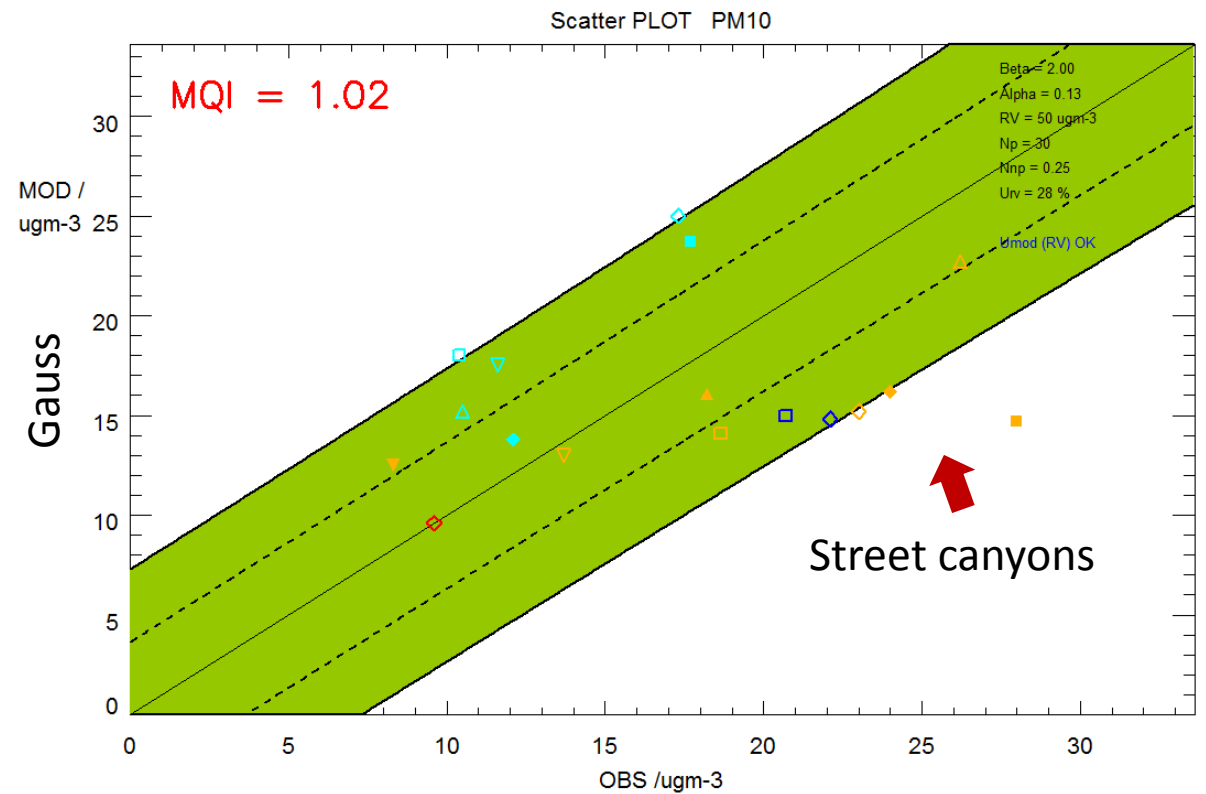
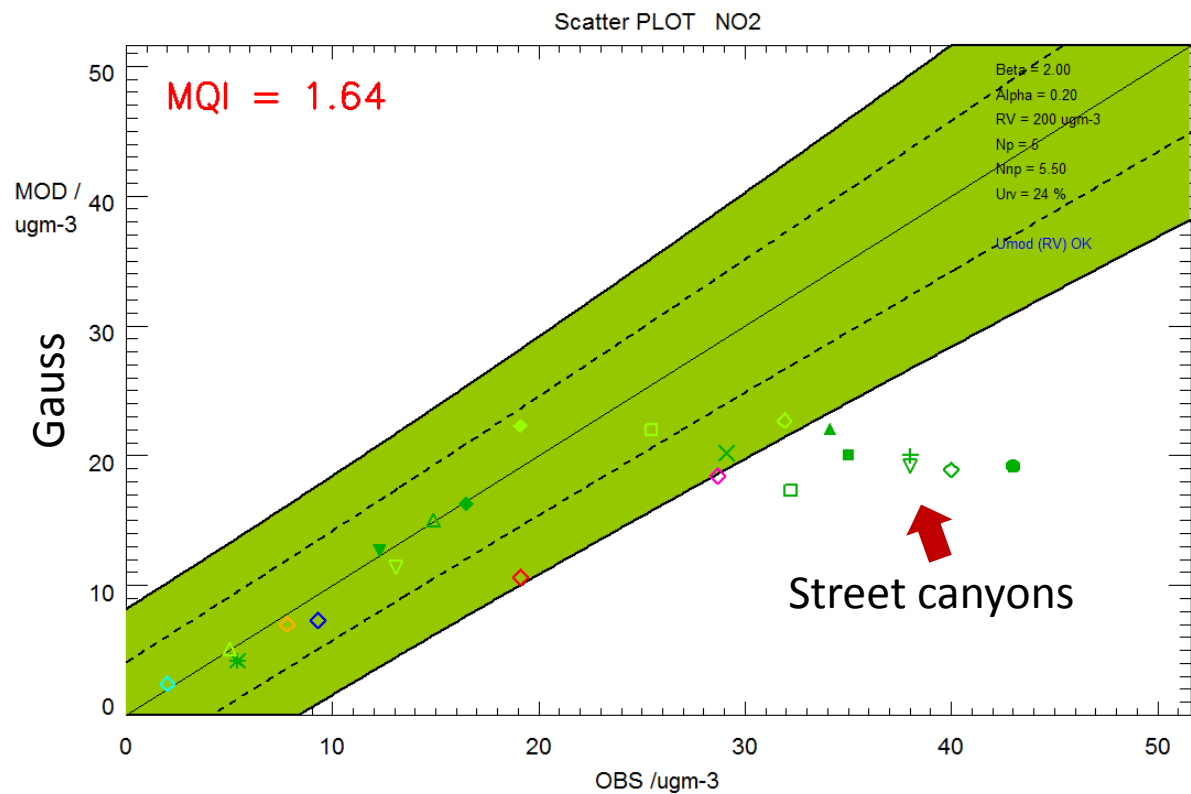


- ...but including traffic monitoring sites adjacent to motorways the results is worse.



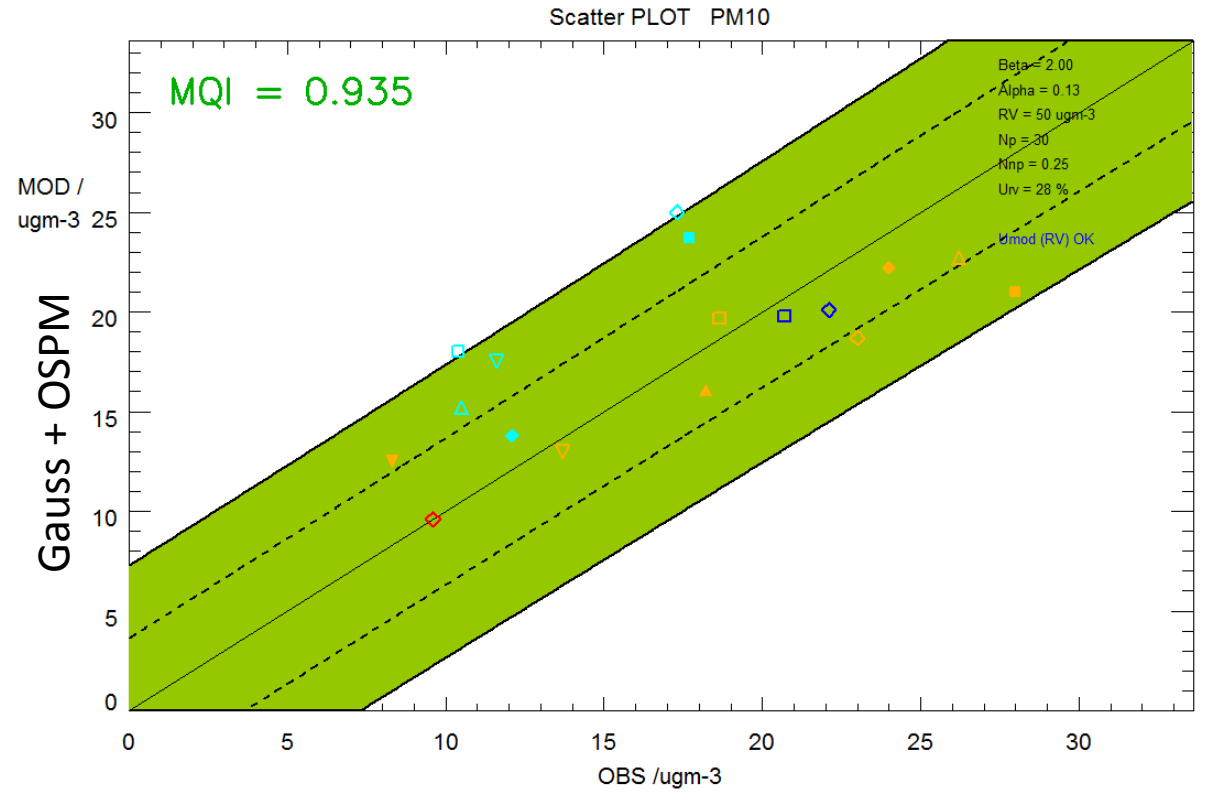
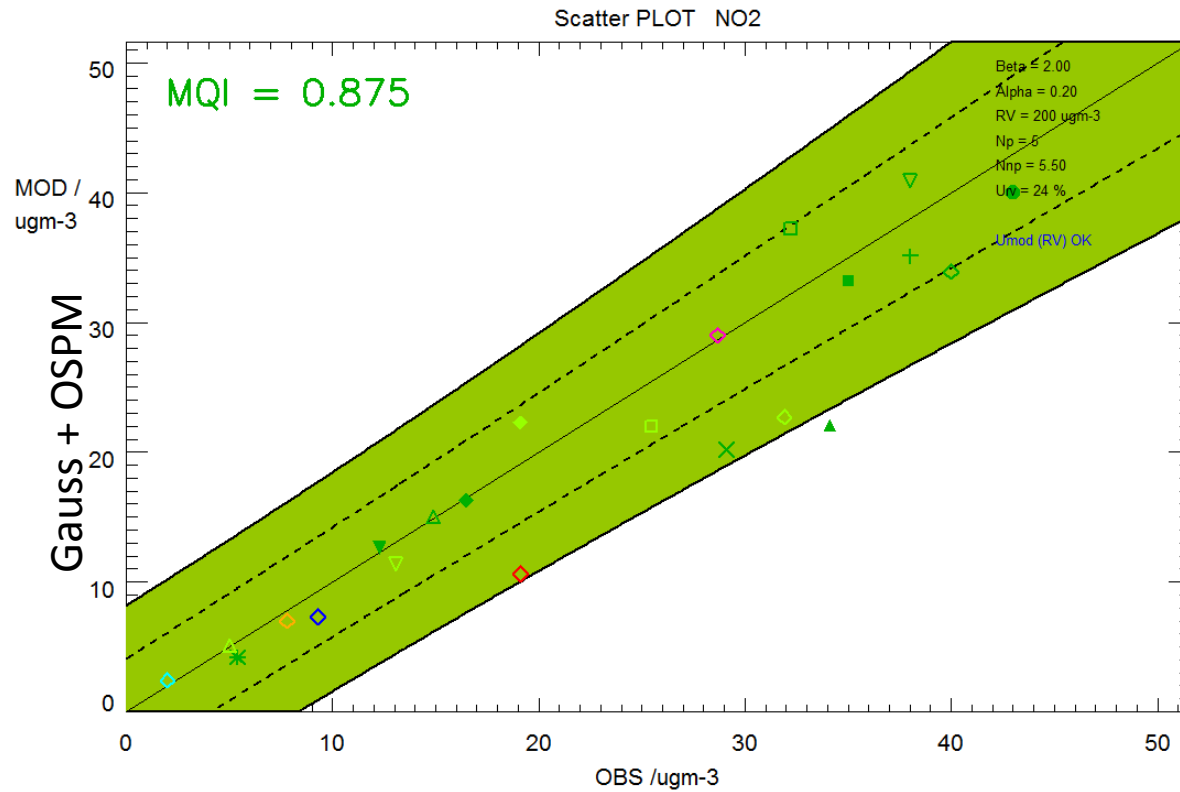
“Delta tool” – Stockholm (3)

- Including traffic monitoring sites both adjacent to motorways and in street canyons the results is even worse.



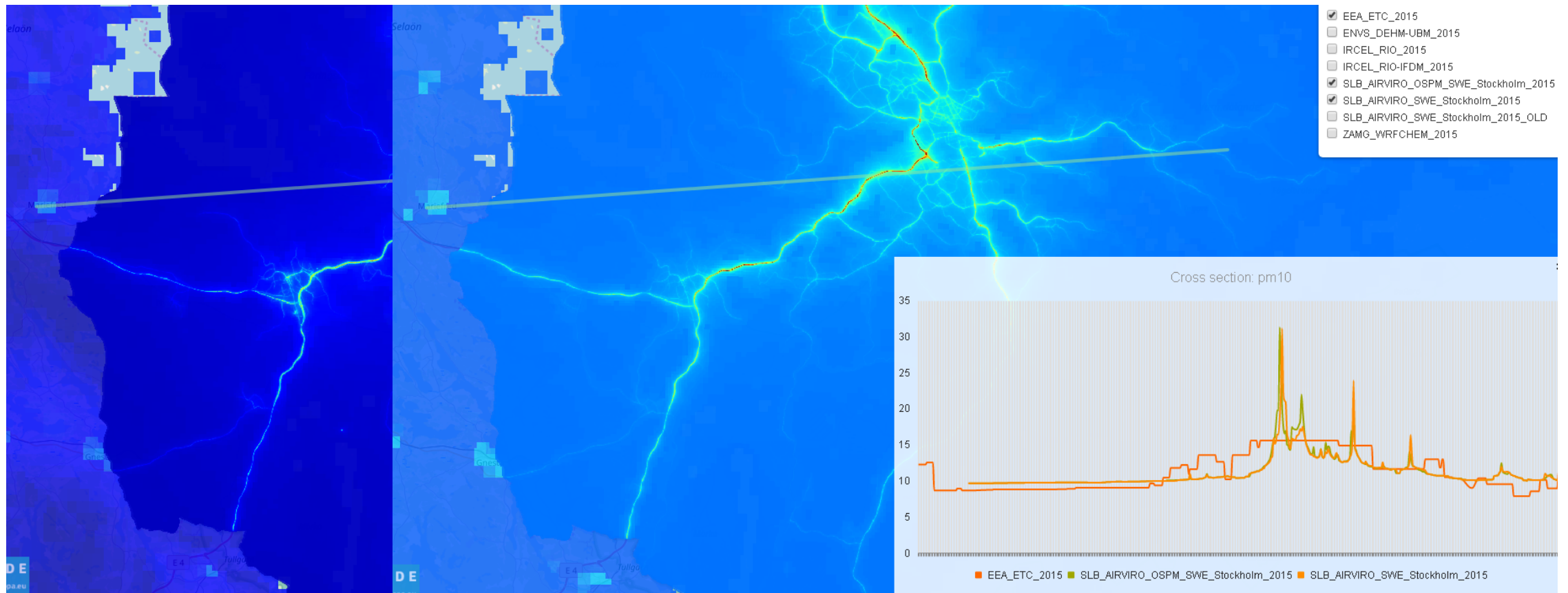
“Delta tool” – Stockholm (4)

- Combination of Gauss and OSPM compared to all types of stations



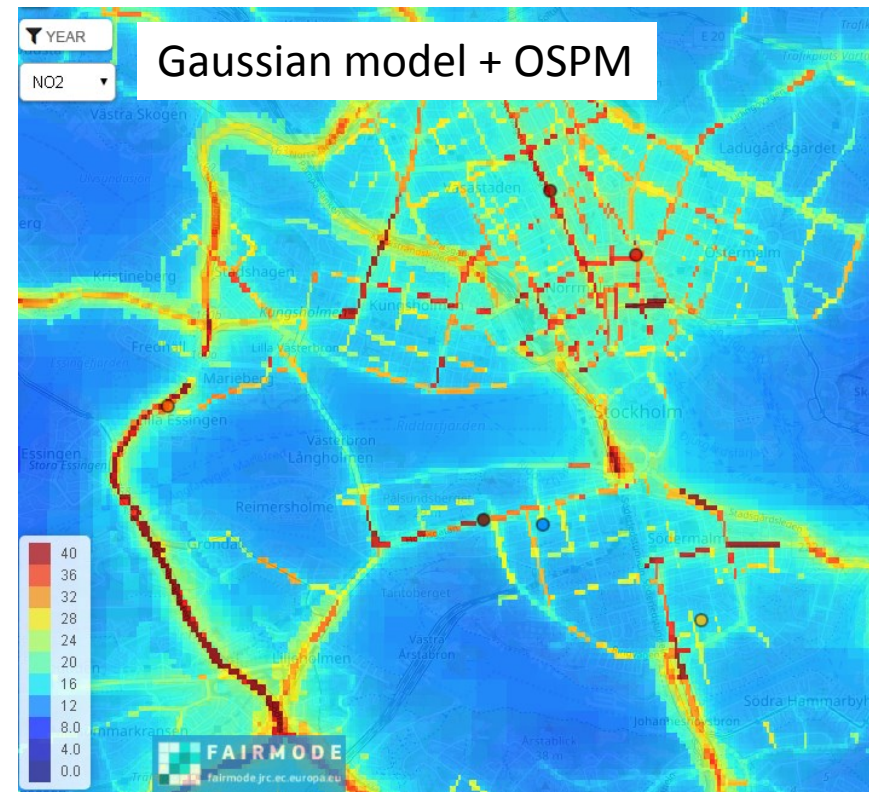
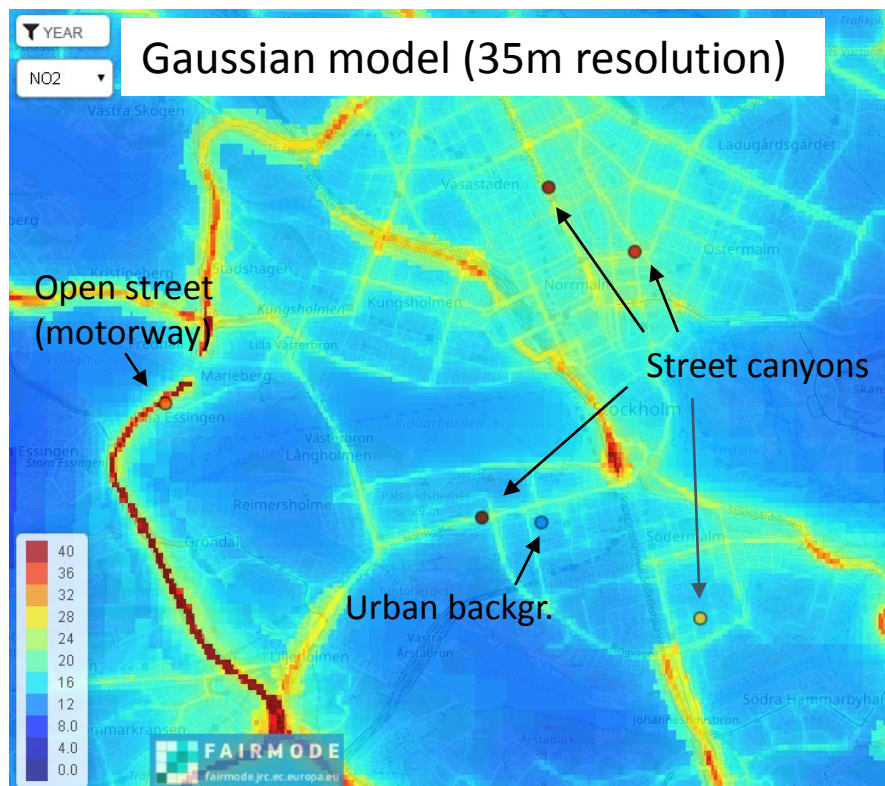
“Composite mapping concentrations” – Stockholm (1)

- No border effects between EEA maps and local Stockholm maps



“Composite mapping concentrations” – Stockholm (2)

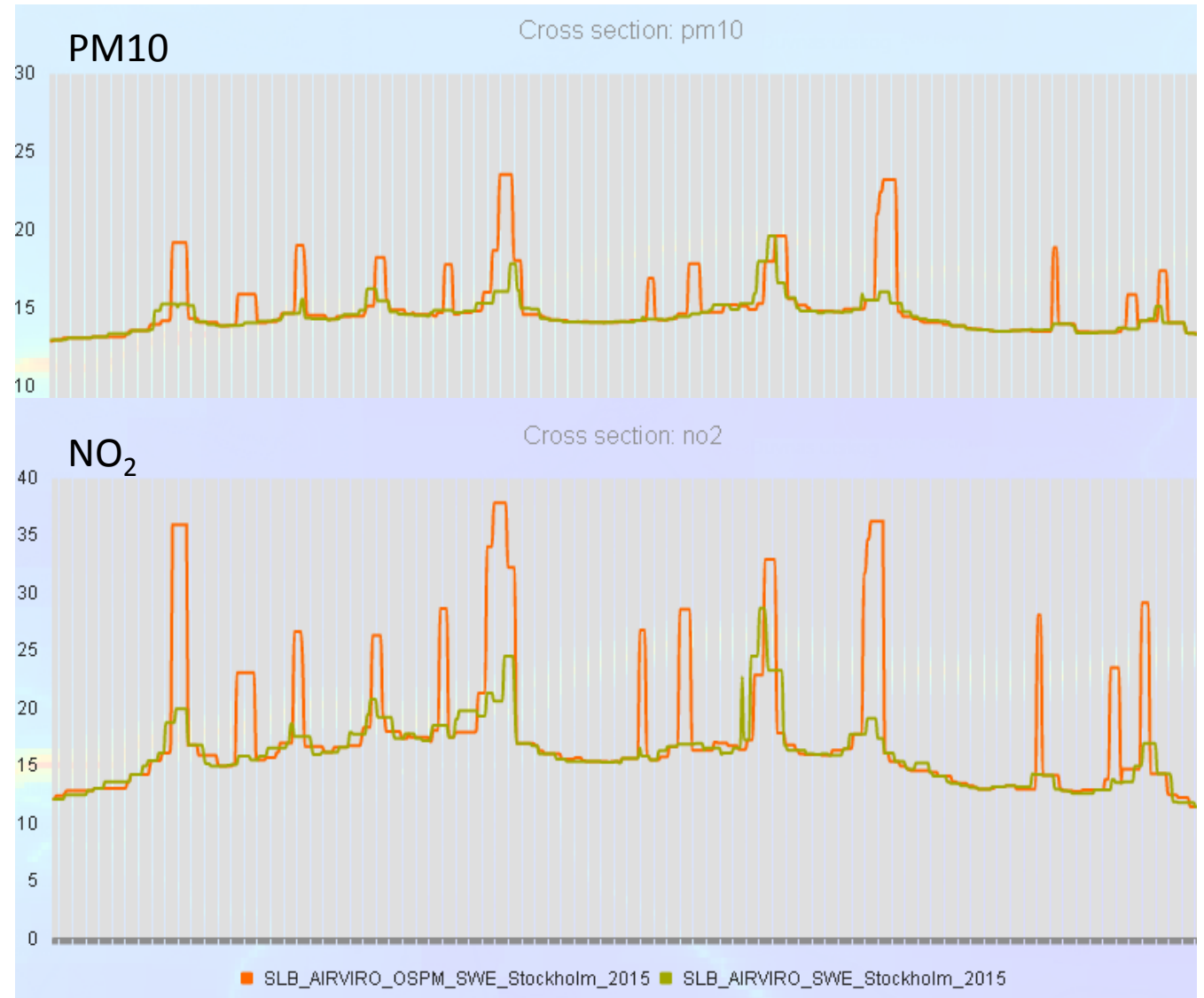
- Good agreement between model and background stations and traffic stations (open street)
- ...but the Gaussian model can not reproduce the inner city street canyons’ high concentrations.



“Composite mapping concentrations” – Stockholm (3)

- In some streets OSPM gives rise to double concentrations compared to the Gaussian model

Yearly mean	PM10	NO ₂
Regional background	9 µg/m ³	2 µg/m ³
Urban background	13 µg/m ³	12 µg/m ³



Additional comments - Stockholm

- It is very difficult to model sharp gradient close to busy roads, which means that it is harder to “pass the test” if you have a lot of traffic stations compared if you only compared you model with background stations.
 - Can this be in some way be accounted for in the Delta tool? For example, background stations could have a greater impact while traffic stations become less important.
- Sometimes it is difficult to classify which type of station, e.g. traffic or urban background.
- How should you do with measurements that is not done with according to reference methods (e.g passive samplers) or do not cover the whole year?