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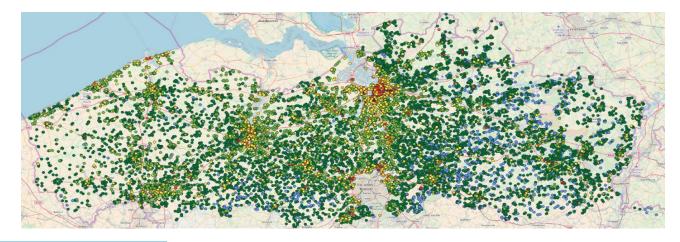
VALIDATION OF THE ATMO-STREET MODEL WITH THE CURIEUZENEUZEN CAMPAIGN DATA

W. Lefebvre, H. Hooyberghs, S. de Craemer, S. Janssen, F. Fierens, E. Trimpeneers, F. Meysman



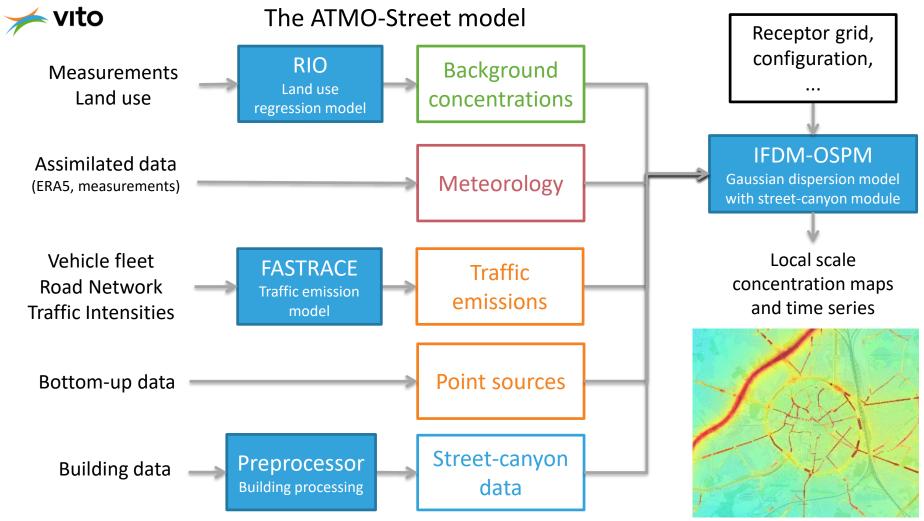
THE CURIEUZENEUZEN MEASUREMENT CAMPAIGN

- See previous talk (S. de Craemer)
- A large dataset of 4-weeks average NO₂-concentrations
- Stringent data quality checks: 17886 measurements for validation











THE ATMO-STREET MODEL

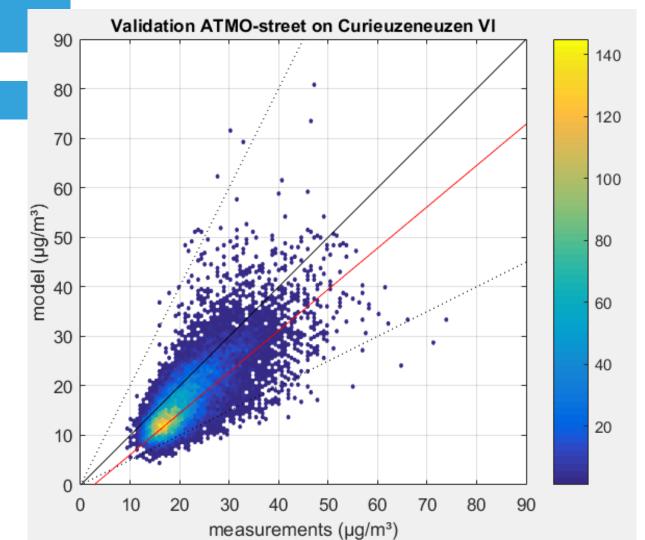
- Previously validated on smaller dataset (e.g. Lefebvre et al., 2013)
- Never been validated on such a representative and large dataset

🧡 vito

VALIDATION

Bias: -4.07 μg/m³ RMSE: 6.12 μg/m³ BCRMSE: 4.57 μg/m³ R² : 0.58 MQI: 0.956

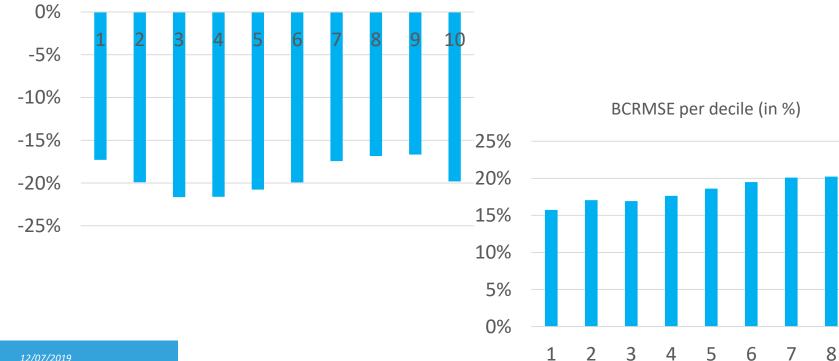






VALIDATION

Bias per decile (in %)



©VITO – Not for distribution

10

9

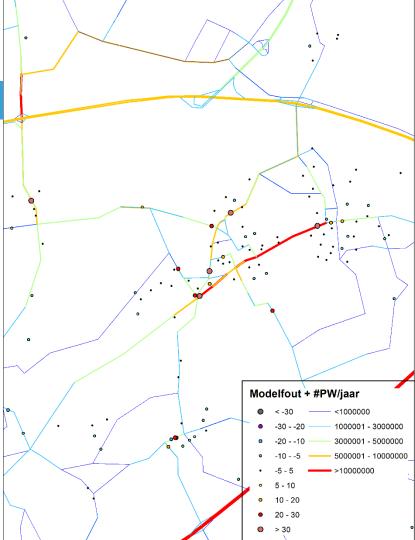


DETAILED INVESTIGATION OF ORIGIN OF ERRORS

- Traffic data!
 - At several locations, the traffic data is unrealistic. (Strong clustering of most important errors)









DETAILED INVESTIGATION OF ORIGIN OF ERRORS

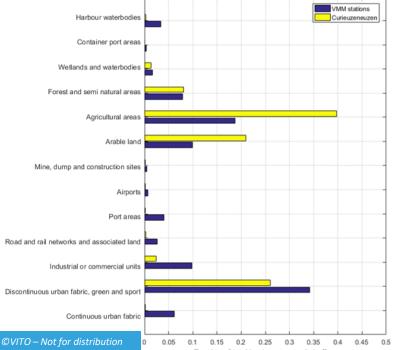
- Street canyon or not?
 - Ribbon development
 - Wide street canyons
 - Half-open canyons





DETAILED INVESTIGATION OF ORIGIN OF ERRORS

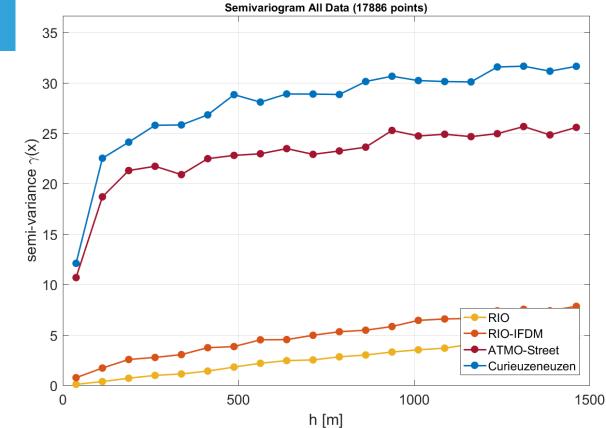
- Strong underestimations at the coast, close to the borders
- Underestimation in rural background locations



=> RIO adaptations

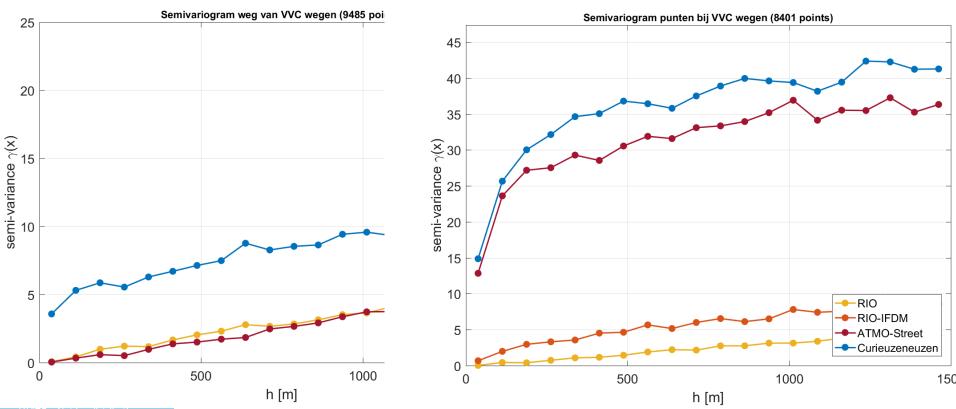


LOCAL SPATIAL VARIABILITY: SEMIVARIOGRAM $\gamma(h) = \frac{1}{2N(h)} \sum_{N(h)} (c_i - c_j)^2$ 30





LOCAL SPATIAL VARIABILITY: SEMIVARIOGRAM





CONCLUSIONS

- The model validates well, although there is an important negative bias
- The measured spatial variation is well represented by the model
- Main improvements:
 - Traffic data
 - Edge street canyon cases
 - RIO-contribution