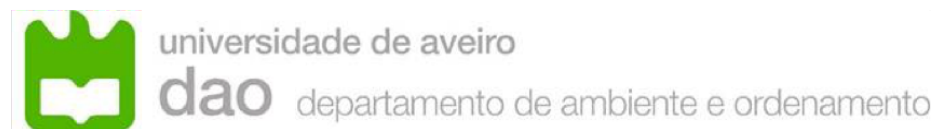


# CT6: Near real time assessment with low-cost sensors

Benchmarking

Vera Rodrigues

03/06/2021



# Data for PM2.5 benchmark

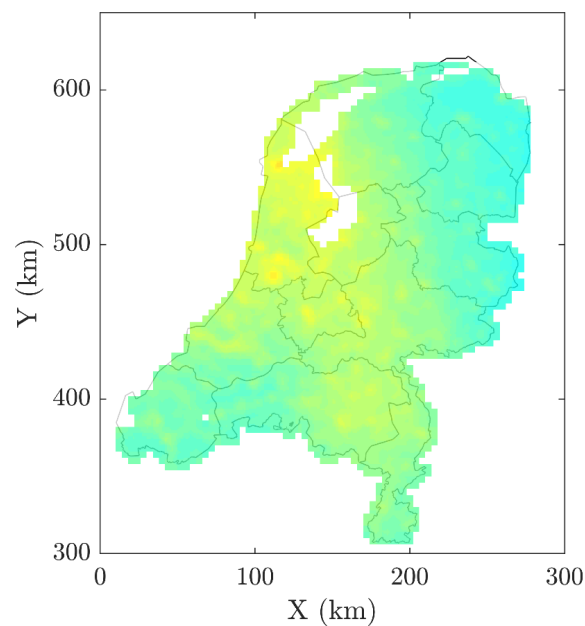
- Reference station measurements
- Fixed sensor data from 18/01/2021
  - Identified gap: 15/05 00:00 – 20/05 00:00
- RIO simulations of PM2.5 concentrations over the Netherlands on a 1 km x 1 km grid, together with the estimated uncertainty

# UAVR on-going work

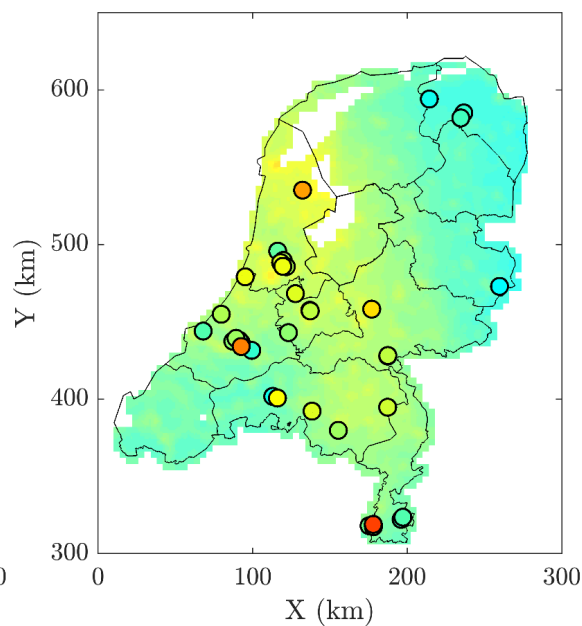
- **Sensors calibration applying the methodology proposed by RIVM**
- Calculation of a factor of correction based on reference stations and group of sensors located within **7.5 km** around the station
- Calibration performed every hour (**no consideration of the dataset as a whole**)
- Outliers detection: eliminate the highest and the smallest values
- $F = C_{Ref} / \text{mean}(C_i)$ 
  - $C_i$  – the concentration value for the  $i$ th closest sensor
- Bootstrapping to estimate factor uncertainty
- Where no sensor near a station: interpolation of the correction factor based on Inverse Distance Weighting

# UAVR on-going work

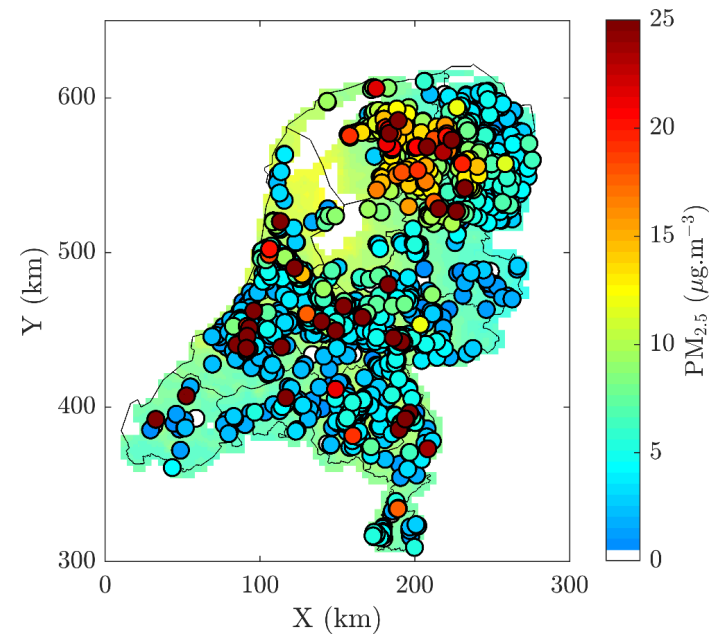
29/04/2021 at 4 pm



RIO outputs



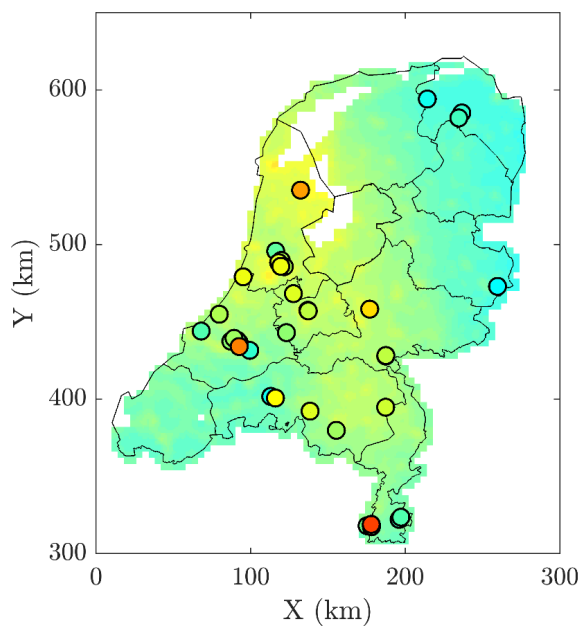
RIO + reference data



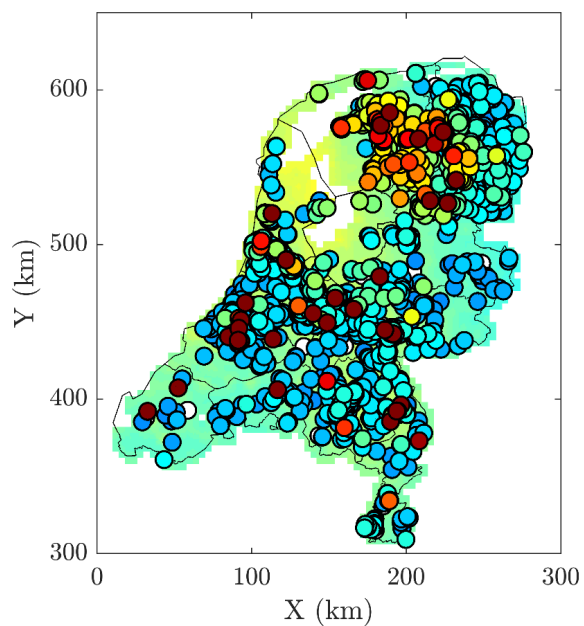
RIO + sensor raw data

# UAVR on-going work

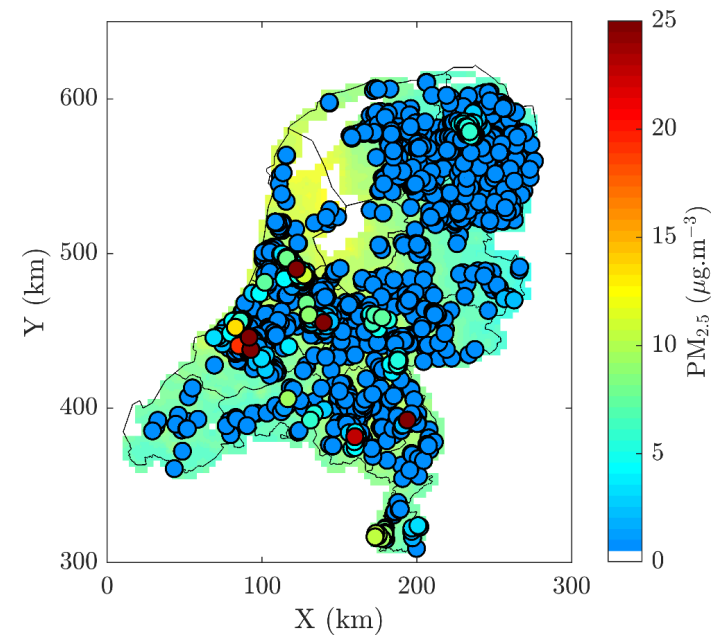
29/04/2021 at 4 pm



RIO + reference data



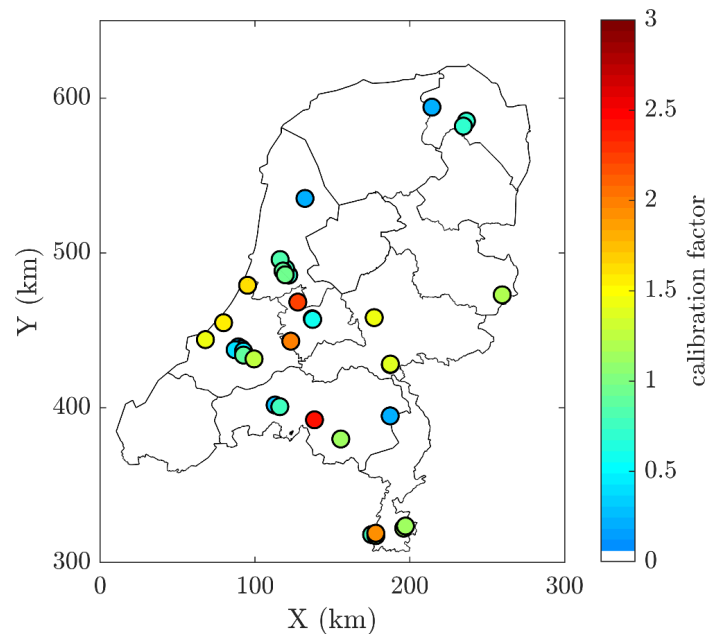
RIO + sensor raw data



RIO + sensor calibrated data

# UAVR on-going work

29/04/2021 at 4 pm



Calibration factor

- Calibration factor calculated at each reference station applied to all sensors in the vicinity of the station
- RIVM calibration

# UAVR future work

- **Sensor data calibration**

- Assess the temporal profile of the calibration factor of each sensor
- How to relate fixed sensors with reference station measurements considering the classification of the sensor (type of influence)
  - Can we have access to traffic counting data to support the classification of the surroundings?
  - Should we use land-use data to support the classification of the surroundings?
- AI/ ANN as tools to support future methodologies (do we have enough data?)
- Should we focus on the influence of the type of equipment of the sensor?
- Should we focus on the influence of the meteorological conditions?

- **Data fusion**