# A short additional study of absolute and relative thresholds for station representativeness area using uEMEP

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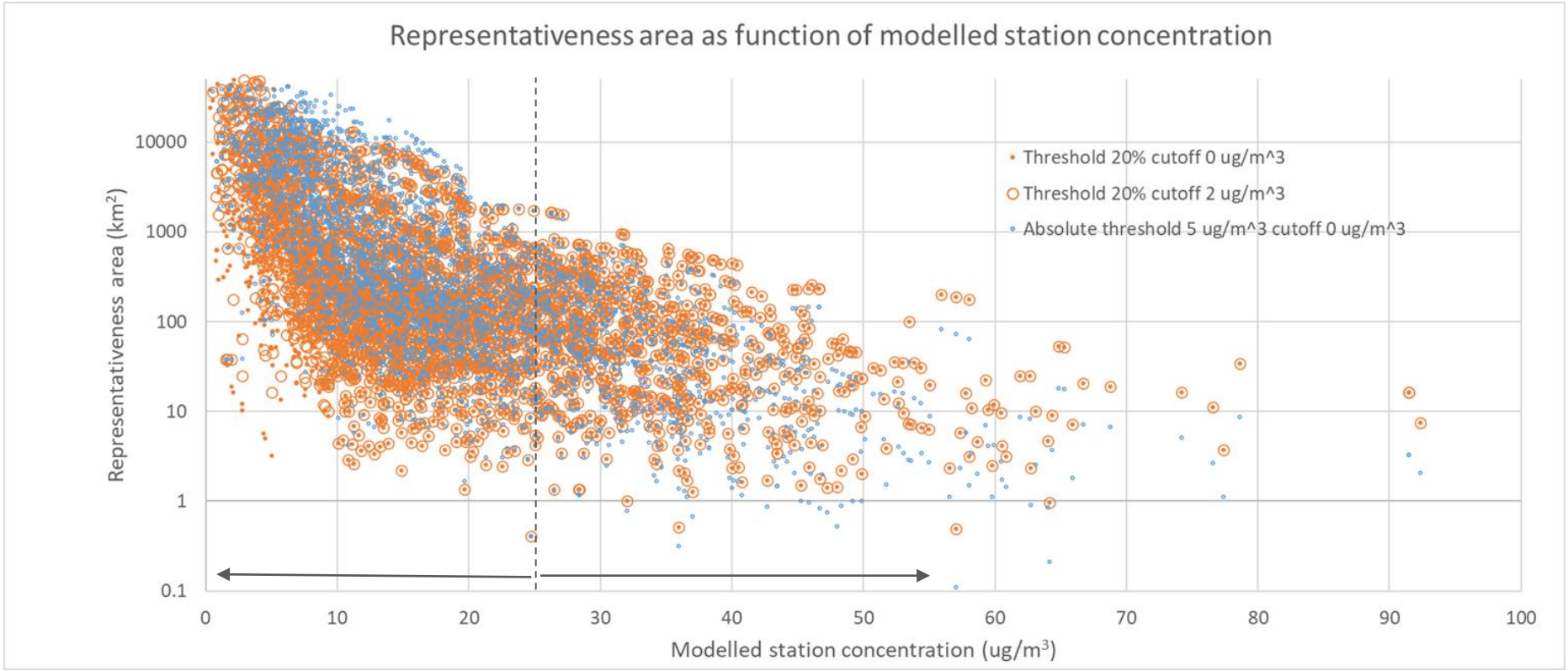
# Calculations

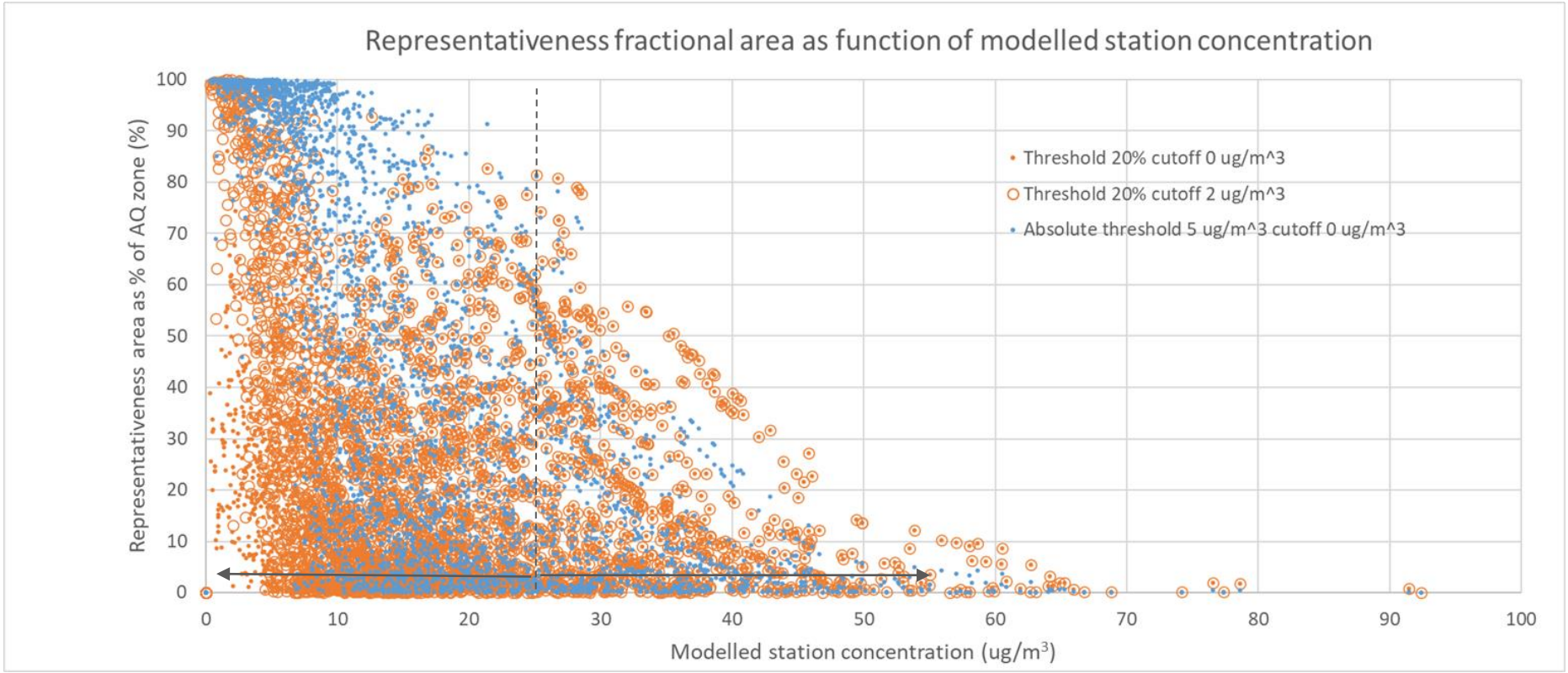
- uEMEP applied to all Europe at 100 m resolution
- Spatial representativeness (SR) area calculated for annual mean $NO_2$ and $PM_{2.5}$
- For $NO_2$ 3000 stations included
- For $NO_2$ ±10%, ±20% and with/without  an absolute cutoff of 2 µg/$m^3$ were calculated
- Results previously distributed in an excel sheet

- Previous results are compared to an $NO_2$ absolute threshold of ±5 µg/$m^3$
  - $NO_2$ concentration of 10 µg/$m^3$ this is equivalent to relative threshold ±50%
  - $NO_2$ concentration of 25 µg/$m^3$ this is equivalent to relative threshold ±20%
  - $NO_2$ concentration of 50 µg/$m^3$ this is equivalent to relative threshold ±10%

# Results: absolute area



# Results: relative to AQ zone area



# Results

- For the relative threshold calculations, with and without a cut off, the SR areas above 10 µg/$m^3$ (where ±20% = ±2 µg/$m^3$) are the same
- At 25 µg/$m^3$ the SR area for the ±20% relative threshold is the same as for the ±5 µg/$m^3$ absolute threshold. Below/above 25 µg/$m^3$ the SR area is larger/smaller. Up to a factor of 5 difference for high concentrations
- Below 10 µg/$m^3$ the ±5 µg/$m^3$ absolute threshold tends to cover the entire AQ zone
- Using an absolute threshold will accommodate the current concept of different relative thresholds for traffic and background stations but leads to very large SR areas for low concentrations
- If WHO guidelines are to be followed in the future then an absolute threshold of ±5 µg/$m^3$ will not be suitable

# Comments

- Agree with the concept of ‘as simple as possible’ = one criteria

**Relative thresholds**

- Small relative thresholds are too stringent for low concentrations (e.g. ±10% at 10 µg/$m^3$ )
- Inclusion of a minimum cutoff threshold addresses this but introduces an extra arbitrary number
- Large relative thresholds are possibly not stringent enough for high concentrations (e.g. ±20% at 40 µg/$m^3$ is ±8 µg/$m^3$ )
- Relative thresholds based on station type are no longer simple

**Absolute thresholds**

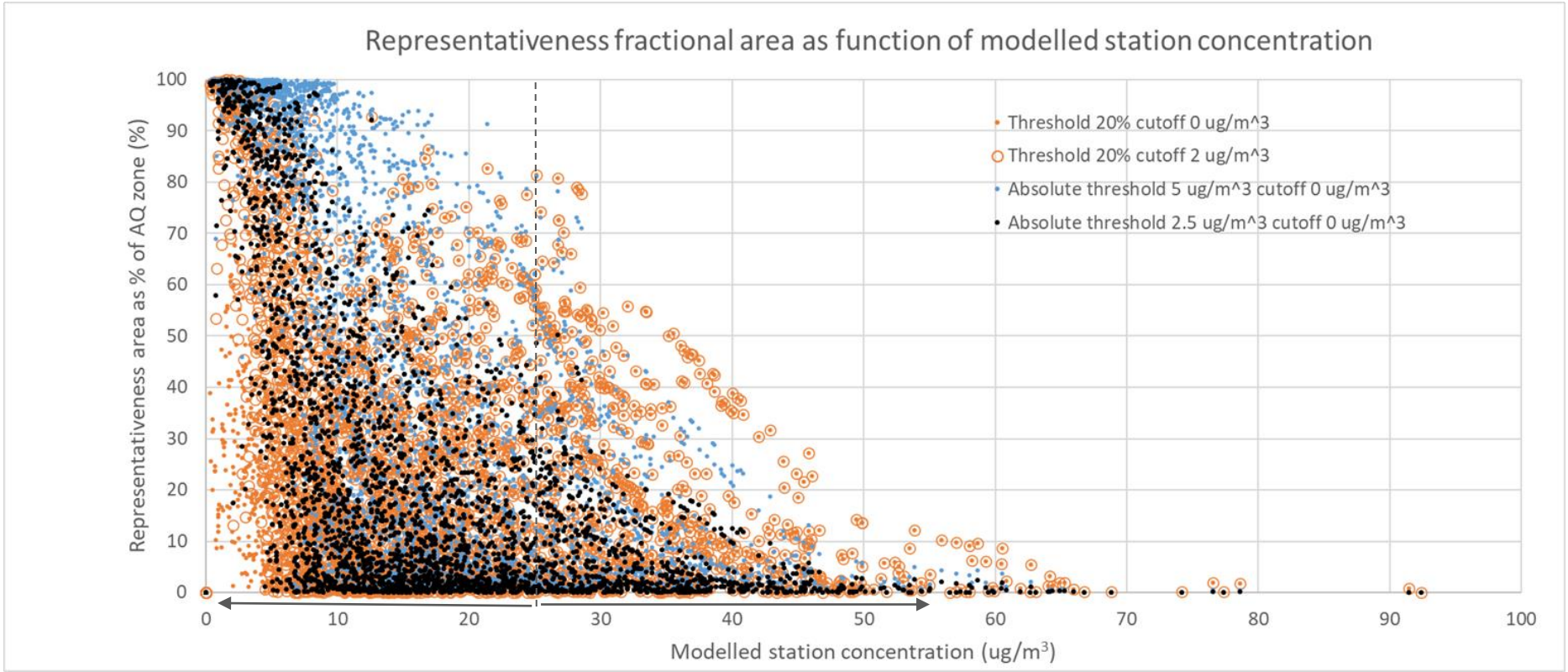
- High absolute thresholds are not stringent enough for low concentrations (e.g. ±5 µg/$m^3$ at 10 µg/$m^3$ )
- Low absolute thresholds are too stringent for high concentrations (e.g. ±2.5 µg/$m^3$ at 40 µg/$m^3$ )
- Any change in ‘important’ concentrations will require a new absolute threshold (e.g. from 40 µg/$m^3$ to 10 µg/$m^3$ )

**Simple threshold**

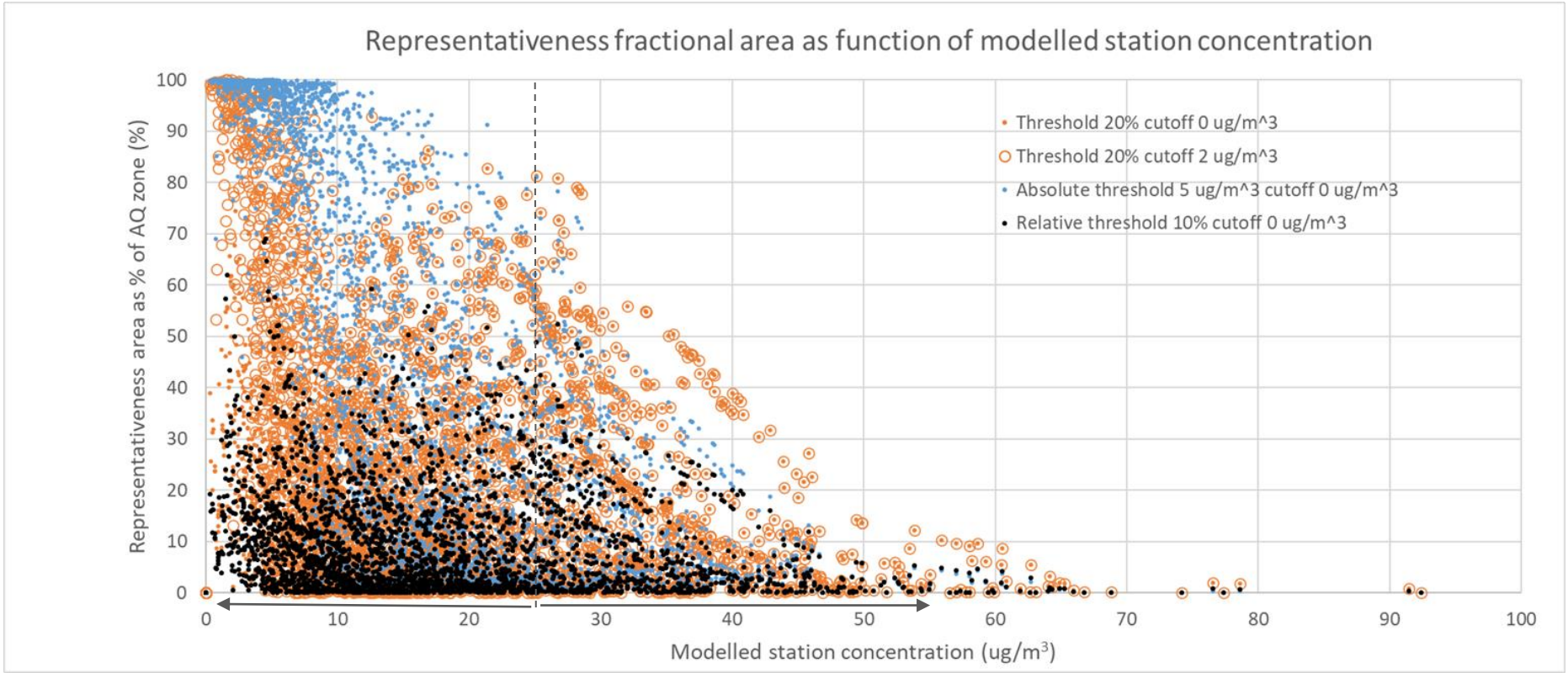
- Higher concentrations are more important than low but lower concentrations may be important in the future as well
- The middle way: relative threshold = ±15%, no cut off

# Additional variants

# Results: relative to AQ zone area, absolute threshold 2.5



# Results: relative to AQ zone area, relative threshold 10%



# Results: relative to AQ zone area, relative threshold 15%