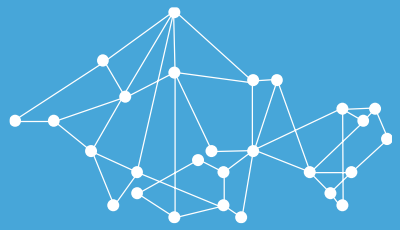
FAIRMODE
Forum for air quality modelling in Europe



EXCEEDANCE MODELLING & FIT FOR PURPOSE

STIJN JANSSEN & JOOST WESSELING

EXCEEDANCE ESTIMATES & THE AQD

- Reporting of an exceedance situation according to implementing decision 2011/850/EC
  - *6. Estimate of the **surface area** where the level was above the environmental objective*
  - *7. Estimate of the **length of road** where the level was above the environmental objective*
  - *10. Estimate of the total resident **population** in the exceedence area*

FITNESS FOR PURPOSE

» No guidance exist on how to estimate these quantities

» Models have a role to play in this process → but… which are “fit for purpose”?

» FAIRMODE should come up with an answer

FITNESS FOR PURPOSE

- Criteria to assess fitness-for-purpose:
  - FAIRMODE's **MQO**
    → min. quality objective
  - **Spatial variability** of the environmental objective
    → min. spatial scale
  - **Temporal scale** of the environmental objective
    → min. temporal scale

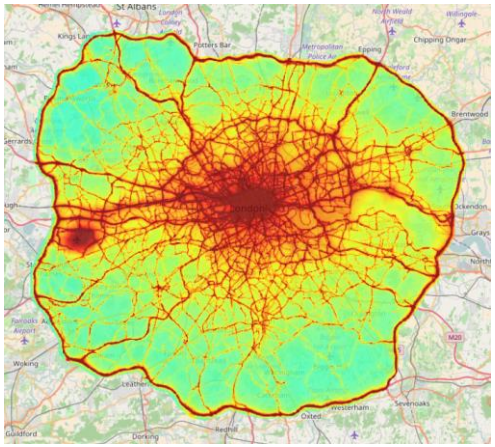
- Additional considerations:
  - Model type
  - Data assimilation / data fusion
  - Output frequency

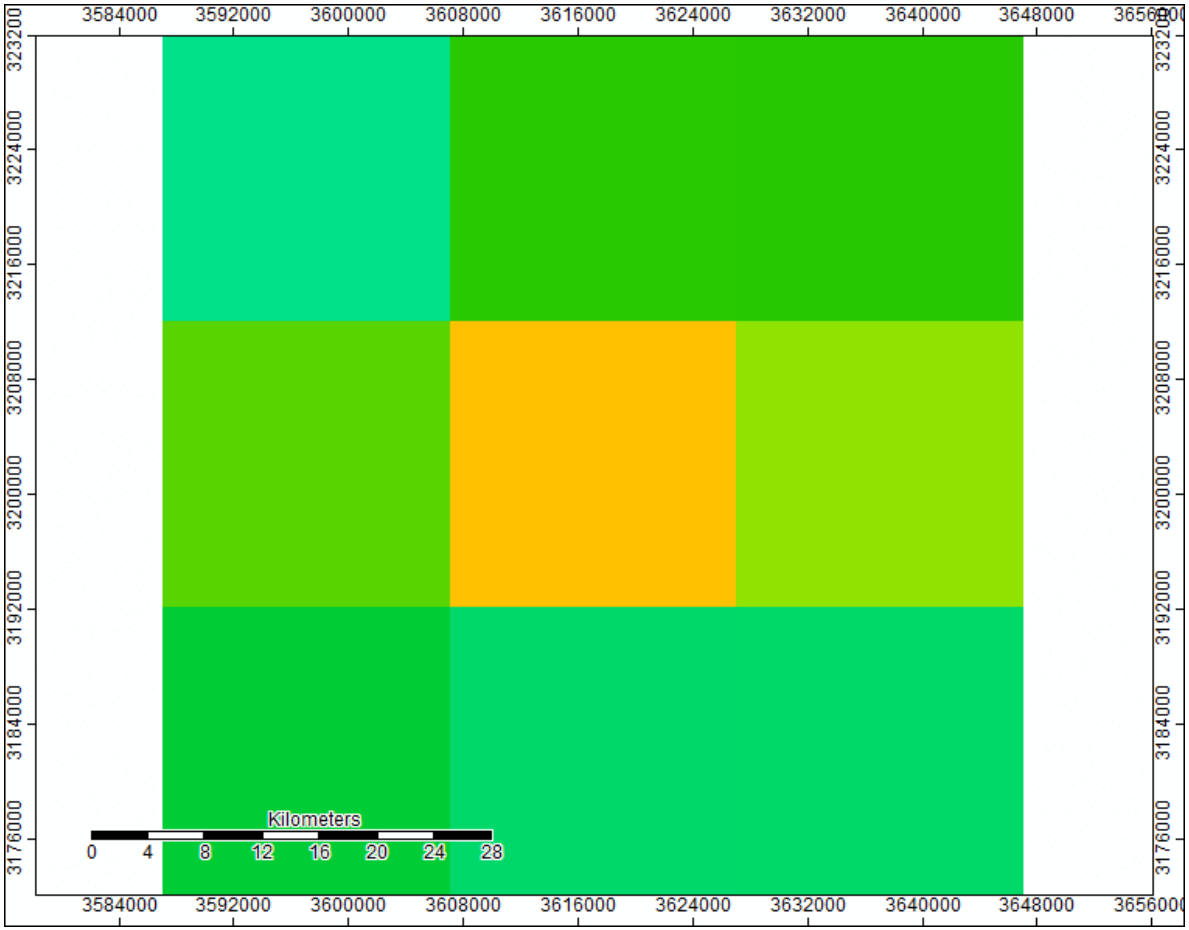
FITNESS FOR PURPOSE – ALREADY COVERED WITHIN FAIRMODE

- Criteria to assess fitness-for-purpose:
  - FAIRMODE's MQO
    → min. quality objective
  - Spatial variability of the environmental objective
    → min. spatial scale
  - Temporal scale of the environmental objective
    → min. temporal scale

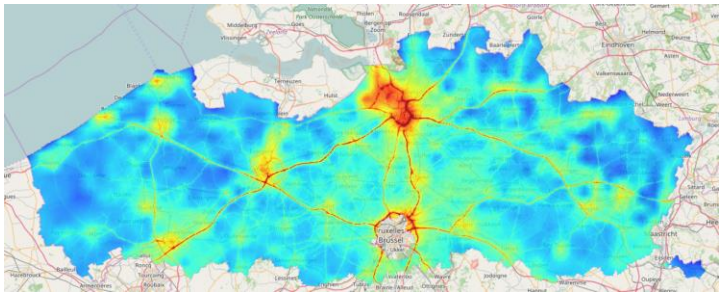
- Additional considerations:
  - Model type
  - Data assimilation / data fusion
  - Output frequency

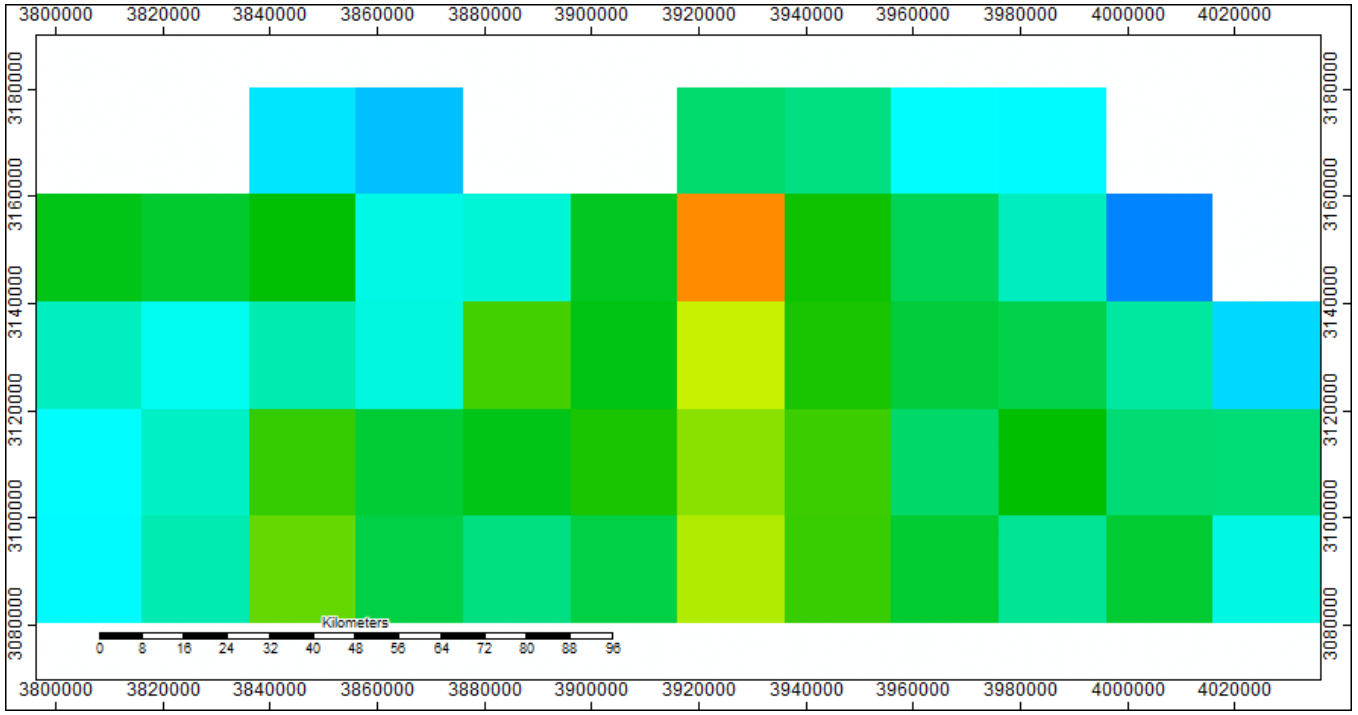
NO2 MAP OF LONDON AT VARIOUS RESOLUTION



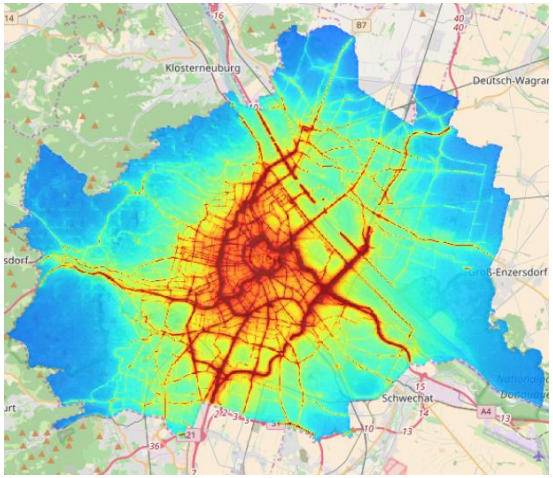


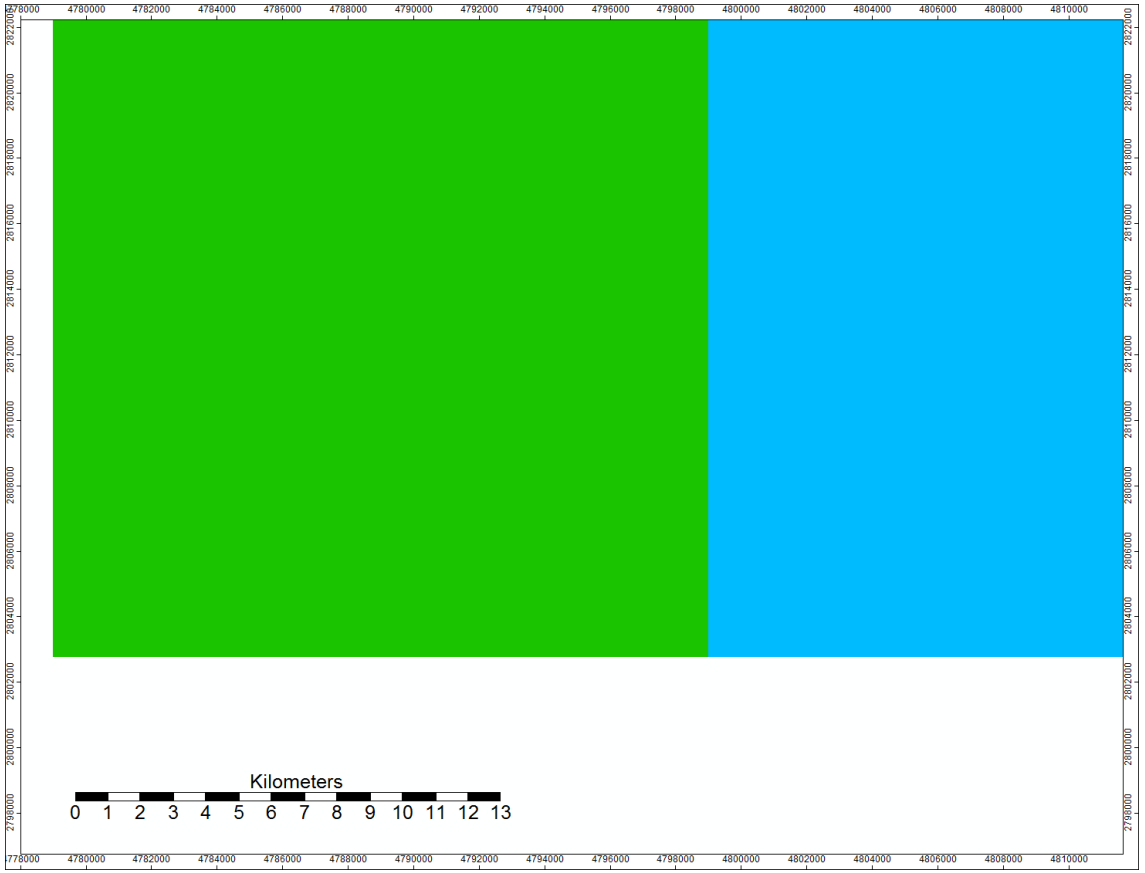
NO2 MAP OF FLANDERS REGION AT VARIOUS RESOLUTION





NO2 MAP OF VIENNA AT VARIOUS RESOLUTION





SPATIAL VARIABILITY

- How to define the spatial variability of an environmental objective?
  - Dedicated measurement campaigns
  - Modeling exercises
  - Expert opinion & literature review
  - …
- Spatial variability of the “real world” should eventually define the spatial resolution of the modelling application
- Focus on NO_2 and $PM_{2.5}$ (PM_{10}) in a first stage

QUESTIONS TO THE WORKING GROUP

1. Do you see **other elements** that define the extent of a model's **fitness-for-purpose** with regard to exposure assessment ?

2. Do you agree that assessment/definition of the typical **spatial variability** is one of the **main missing criteria** to define fitness-for-purpose within the present FAIRMODE concepts?

3. Do you have any preferences or suggestions on **how to define** the typical **spatial variability** for the yearly average environmental criteria for NO_2 and $PM_{2.5}$ (first focus)?

4. Can you come up with a **proposal for** the required **spatial resolution** for annual averaged NO_2 and $PM_{2.5}$ simulations? What kind of information do you base your proposal on?

FEEDBACK FROM MATTHEW ROSS-JONES (SE)

- *I agree that the three elements **quality**, **spatial** and **temporal scale** are the key elements that should be considered.*

- *With regard to spatial scale I wonder if it might be best to split this into two separate elements, spatial resolution and **spatial extent**? It is possible to have an appropriate spatial resolution but a spatial extent which is far too limited, or vice-versa.*

- *Whereas the appropriateness of a model's spatial resolution may vary for different pollutants and averaging times, I think that any **criteria for spatial extent could be more general**.*