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CT8 – SPATIAL REPRESENTATIVENESS, EXPOSURE & EXCEEDANCE INDICATORS AND NETWORK OPTIMIZATION

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E-reporting dataflow G

- Reporting of exceedance and exposure indicators relate to the AQ zone
- Need to know that the actual area of representativeness of the monitoring network used for reporting
- ***It is re-assuring that most of the experiments shown this morning conclude that the regional background network is representative for their AQ zones***

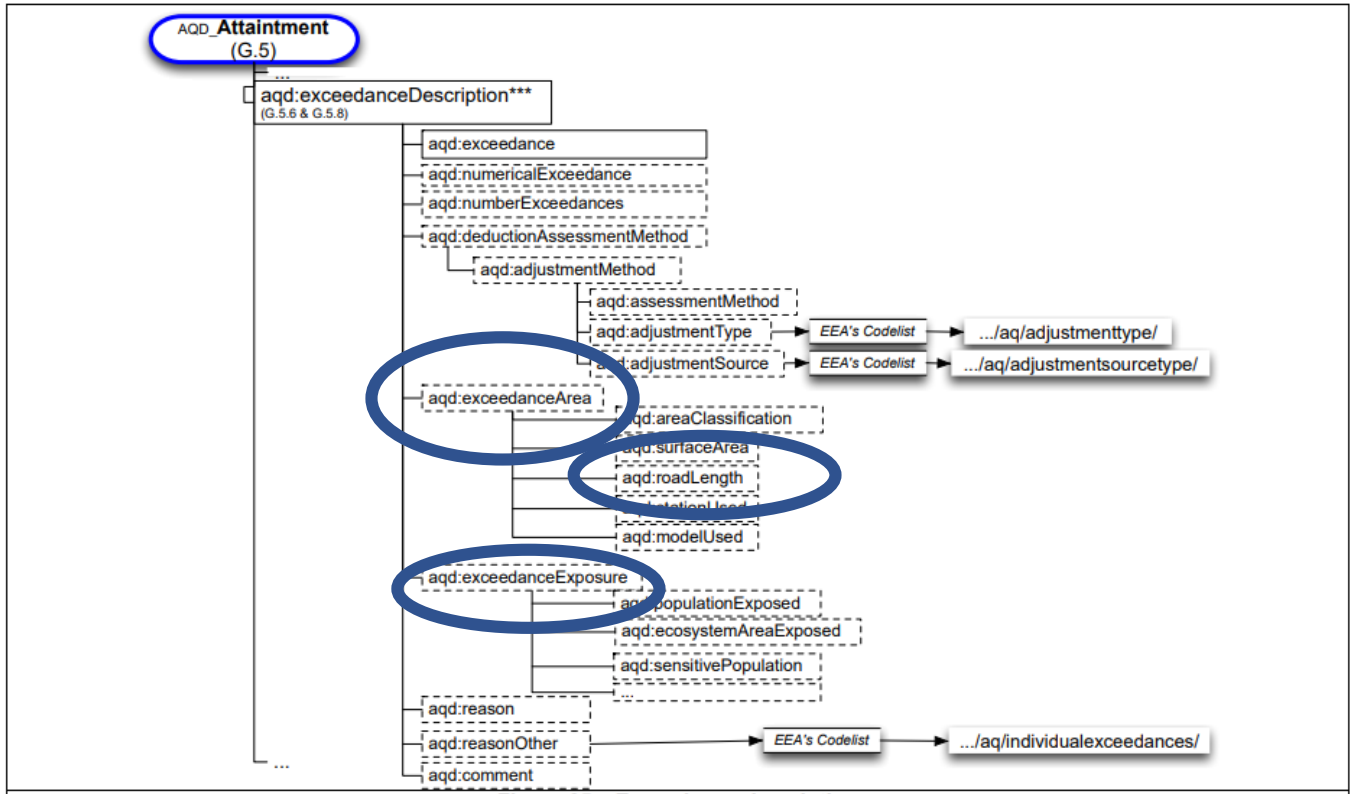
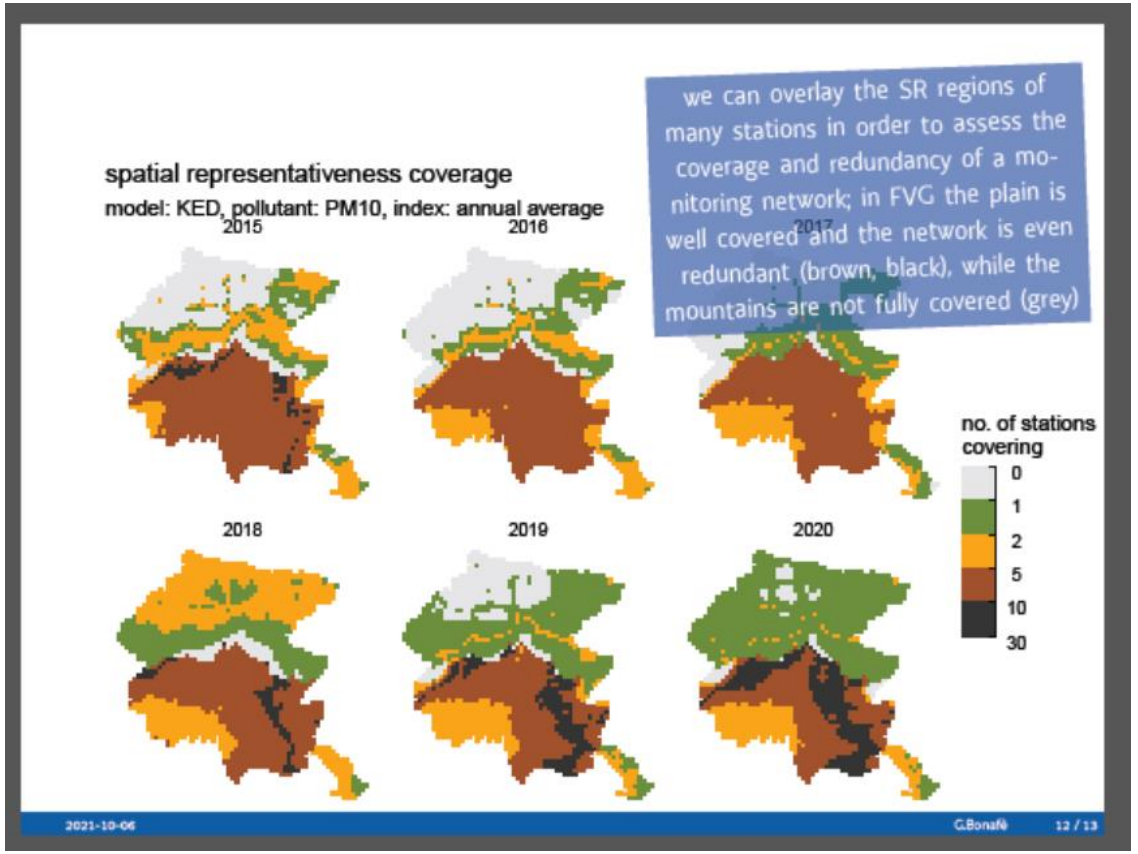


Figure 35 – Exceedance description

SPATIAL REPRESENTATIVENESS, EXCEEDANCE & EXPOSURE INDICATORS, MONITORING NETWORK DESIGN

Implications for monitoring network design

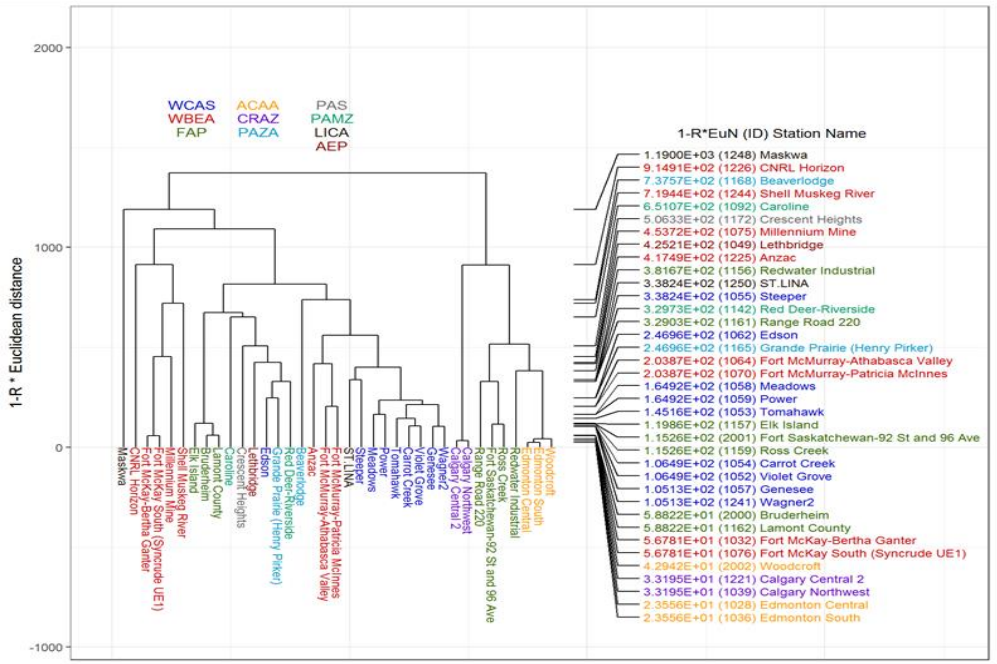
- Spatial representativeness evaluation can inform the design of the monitoring network
- Threshold choices based on station type can be useful also for monitoring design (regional background , urban , traffic, industrial)
- Further analysis necessary on how to deal with
  - ***Changes in SR from meteorological variability***
  - ***Changes in SR dur to model resolution***



Implications for monitoring network design – time averages

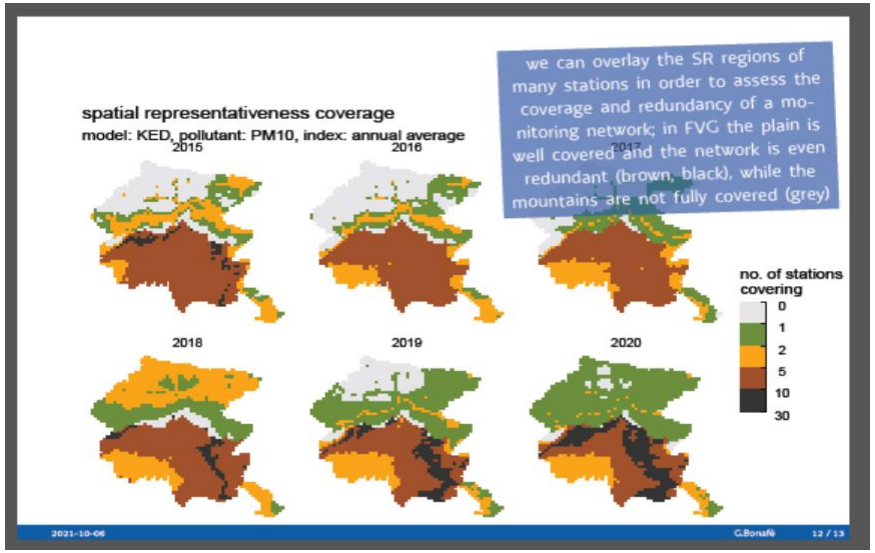
- Sampling point SR calculation based on similarity approaches for annual mean or other percentiles

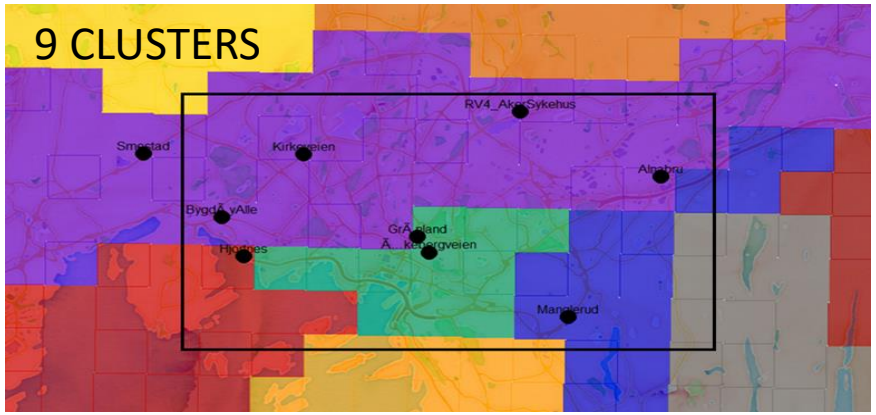
- Clustering approach for hourly data – *information on different beharviour at site level based on topography, emission sources and air quality regime*



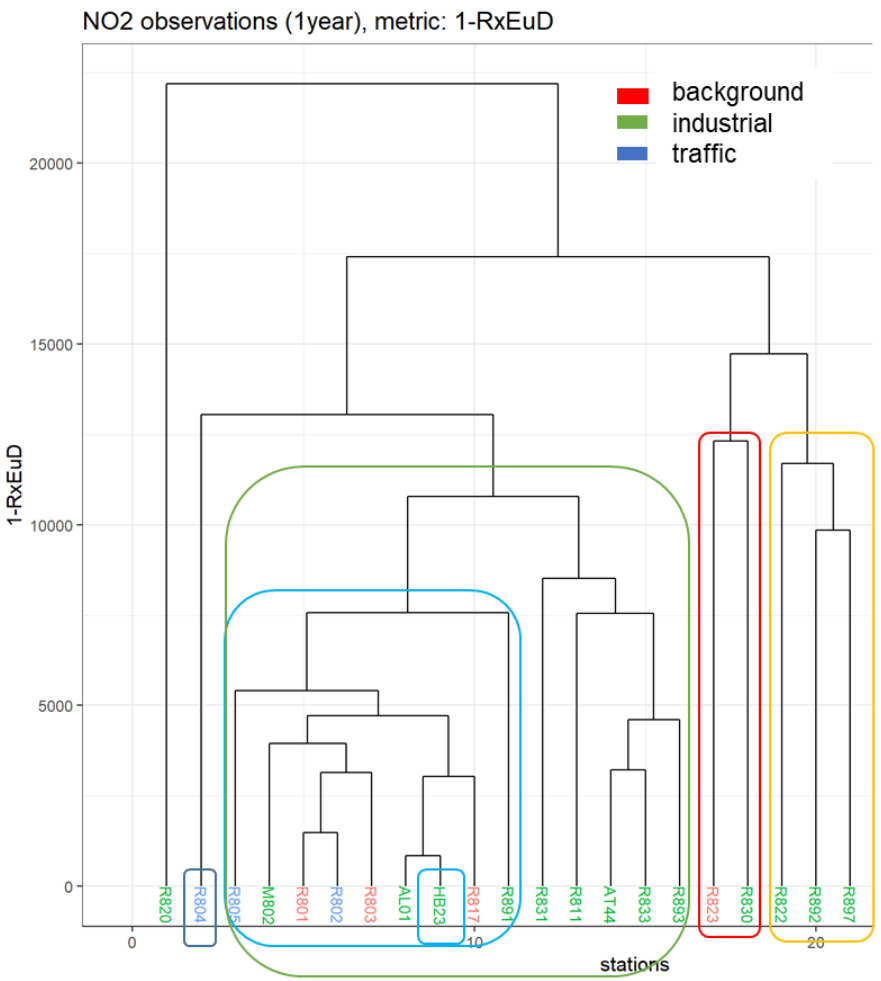
Implications for monitoring network design – choices of thresholds/clusters

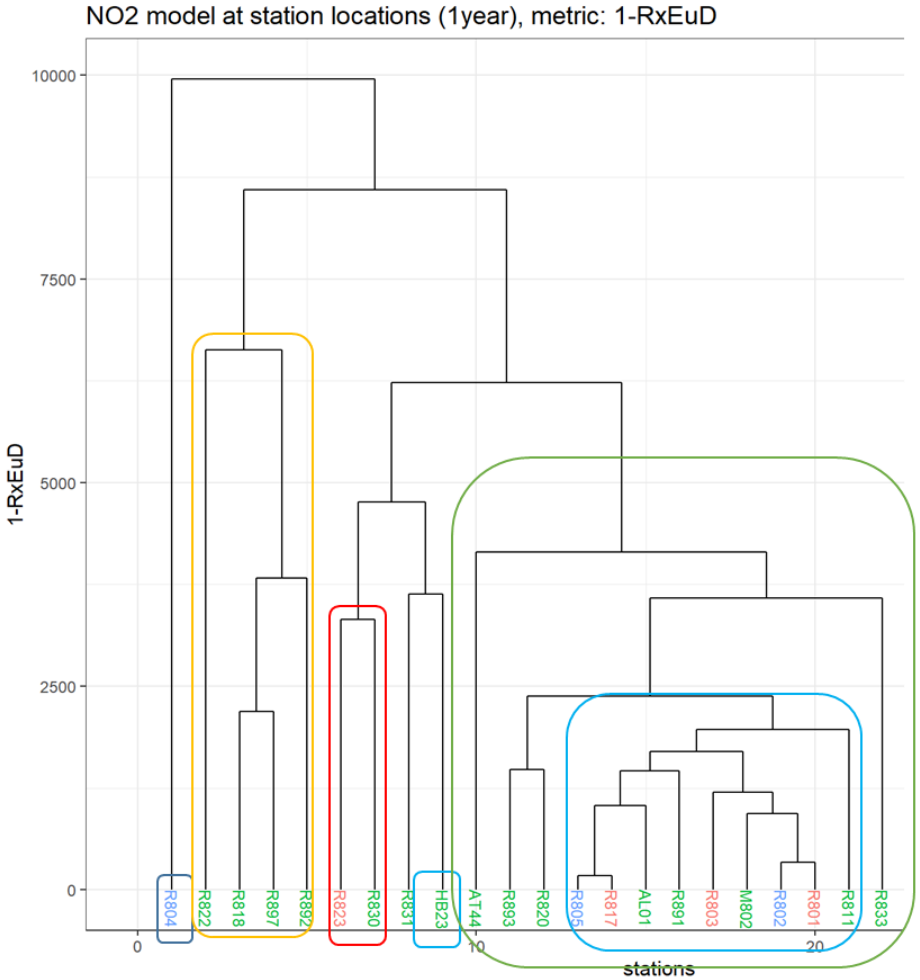
- Sampling point SR calculation based on similarity approaches for annual mean - **thresholds**
- Clustering approach for hourly data – **number of clusters**

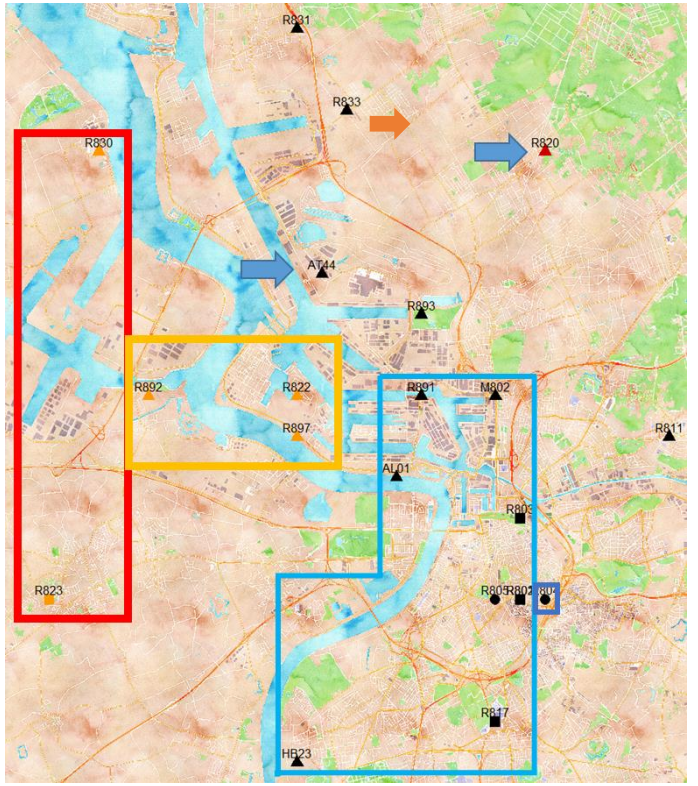




MONITORING NETWORK EVALUATION TOOL: MODEL VALIDATION (ANTWERP, NO2)







FIT FOR PURPOSE!

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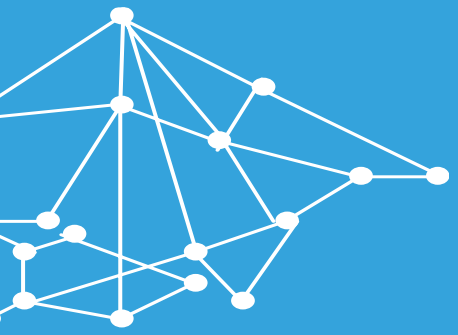
PROPOSED CT8 EXERCISE - III

Test the suitability of the current monitoring network - Common FAIRMODE & EEA & AQUILA exercise

- The Composite Mapping Platform could be extended for monitoring design purposes and add a useful instrument to foster interaction between experts, increase transparency and support the QA/QC processes of reporting
- Add monitoring station information to the Composite Mapping Platform

- Use the proposed clustering method to test model validation and support network design in a selected group of cities
    - Make use of your existing modelling results
    - Use the clusetring approach – dendrograms



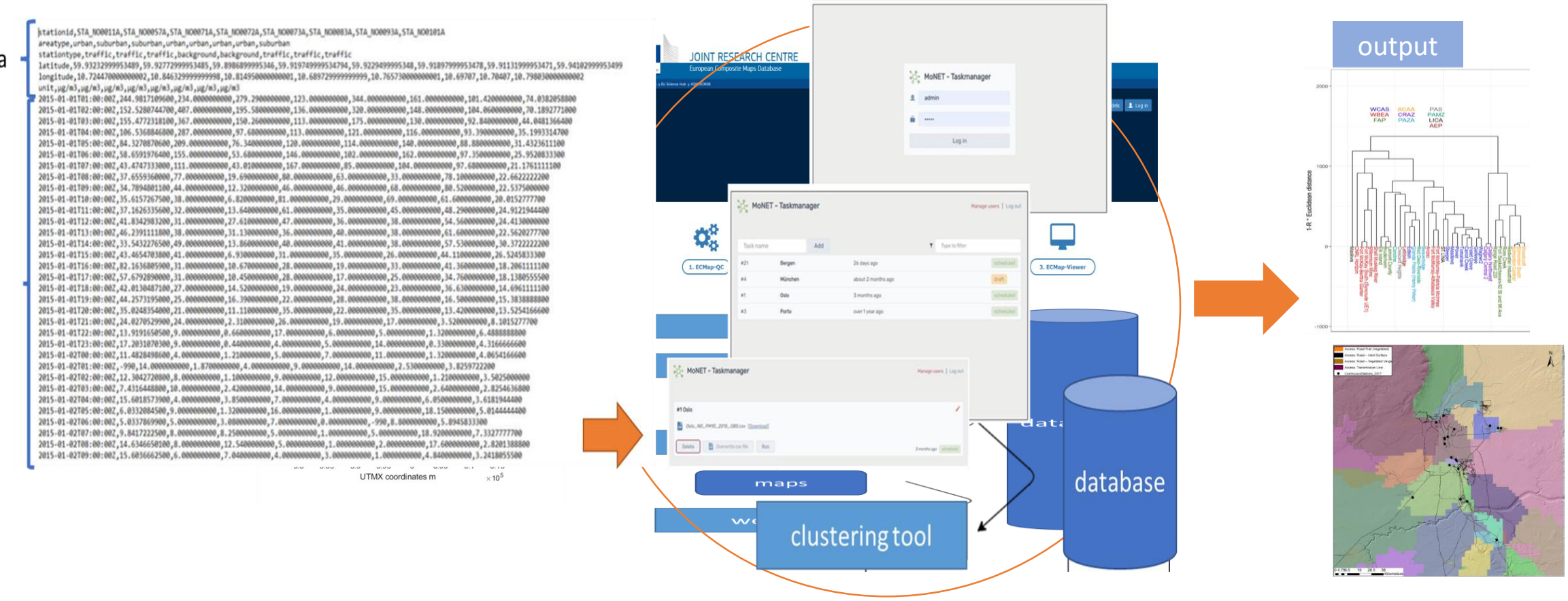
Monitoring design - clustering tool

Joana Soares, Christoffer Stoll

MONITORING NETWORK EVALUATION TOOL – CLUSTERING TOOL

A web-based system to aide assessments for monitoring design and model validation applications.

The tool will initiate a task when the input data is uploaded to a database, run the clustering tool on the input data, and produce a dendrogram (2D representation of the hierarchical clustering). The user will then be able to request a set of maps (spatial distribution of clusters) based on the dendrogram.



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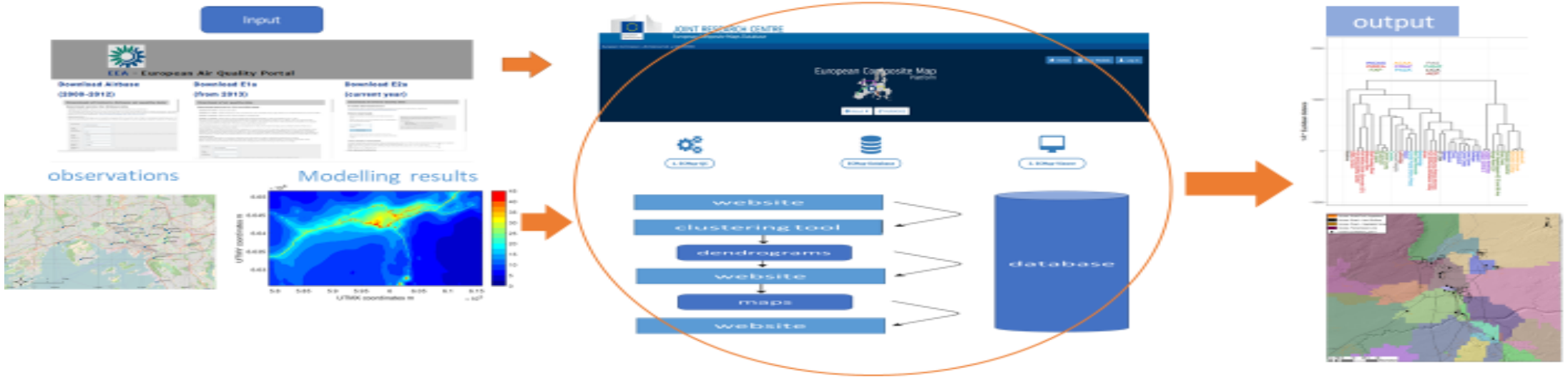
MONITORING NETWORK EVALUATION TOOL – CLUSTERING TOOL



Caveats:

- *Outcome depends on the quality of the data: error in measurements, data accuracy different sampling technologies, outliers, temporal coverage*
- *Computationally demanding for large number of observations (> 1e4 hourly time series)*
- *Requires temporal and spatial (modelling) continuity*

PROPOSED CT8 EXERCISE - III

- Finalization of the clustering tool –accessible via FAIRMODE CM
- Development of the set of questions for monitoring design exercise based on today's discussions – **Hackathon November 2021**
- Inter-comparison exercise on monitoring design with AQUILA and EEA – in January 2022

Thank you!