The Use of GIS for Air Pollution and Noise Assessment in Denmark

Jibran Khan, Assistant Professor, Department of Environmental Science, Aarhus University, Roskilde. E-mail: jibran@envs.au.dk.

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Content

- GIS – What and Why?
- Air Pollution and Noise – Why do we care?
- Air Pollution
- Noise Pollution
- GIS Showcase
- Takeaways

This Talk

Does not cover:

- Details of GIS
- RS/GIS tools and techniques

Covers:

- Use of GIS for
  - Air Pollution
  - Noise
  - Mapping/Exposure Assessment

Acknowledgements

- All the amazing colleagues – Section of Atmospheric Environment at AU-ENVS (Modelling, Emissions, Measurements)

GIS – What and Why?

“

GIS, GIS, on the map so high,

Pixel dancing in the digital sky.

With data magic, you're the star,

Mapping worlds, both near and far!

-

Anonymous

”

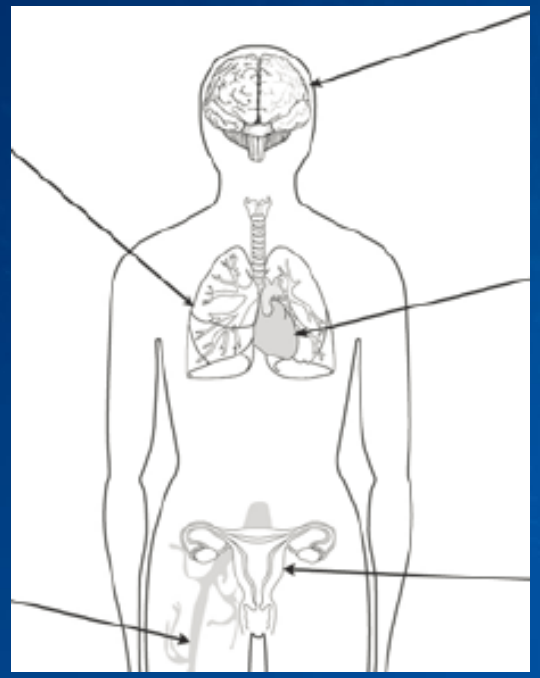
Image source: GIS Geography

Air Pollution and Noise

Air and Noise Pollution is a geographical phenomena!

Air Pollution and Noise

Health effects of air pollution and noise



Air pollution and noise – the first and second most harmful environmental risk factors!

GIS for Air Pollution

The DEHM-UBM-AirGIS System (Khan et al. 2019)

Standard system to estimate air pollution at any location of interest in Denmark

Direct street cont.

(OSPM: Streel-scale)

Urban background

(UBM: 1 km x 1 km)

Regional background

(DEHM: 5.6 km x 5.6 km)

"DEHM-UBM-AirGIS" OR
The Danish AirGIS System

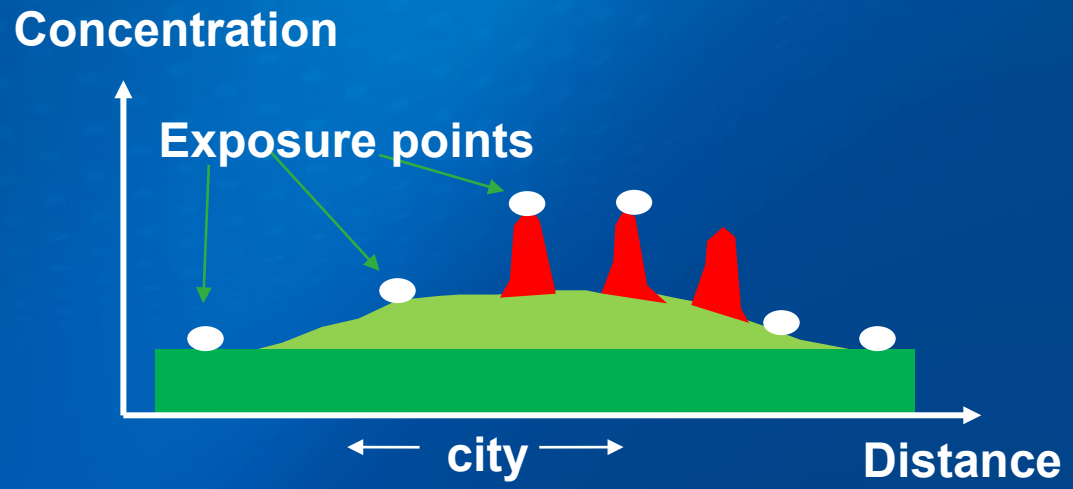
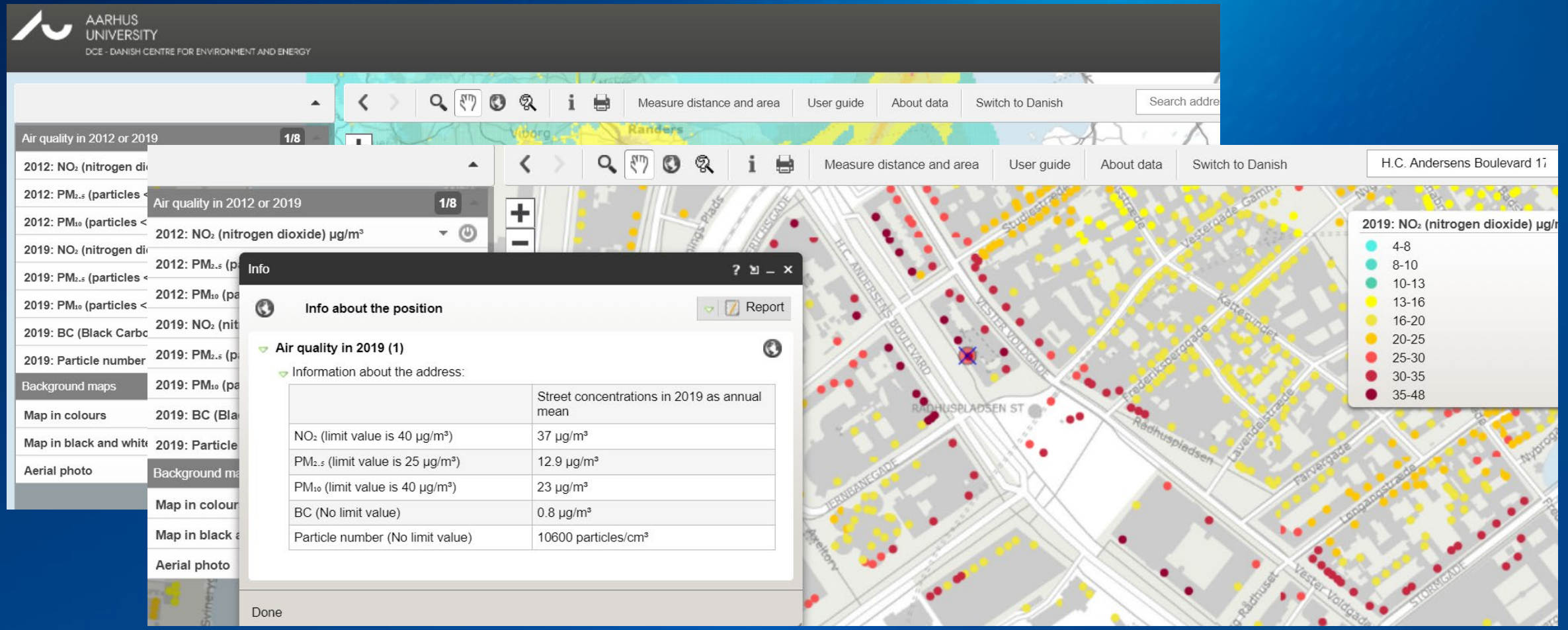


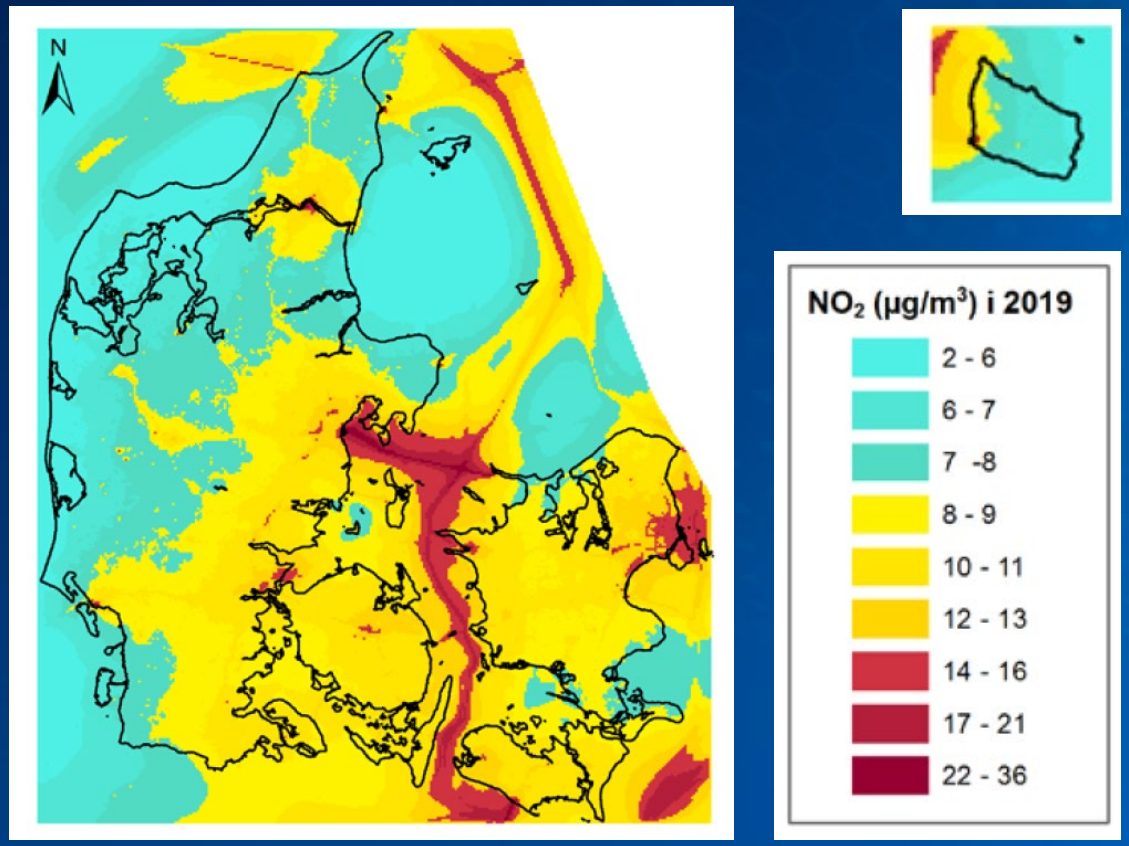
Image source : Khan et al. 2019

GIS for Air Pollution – Showcase

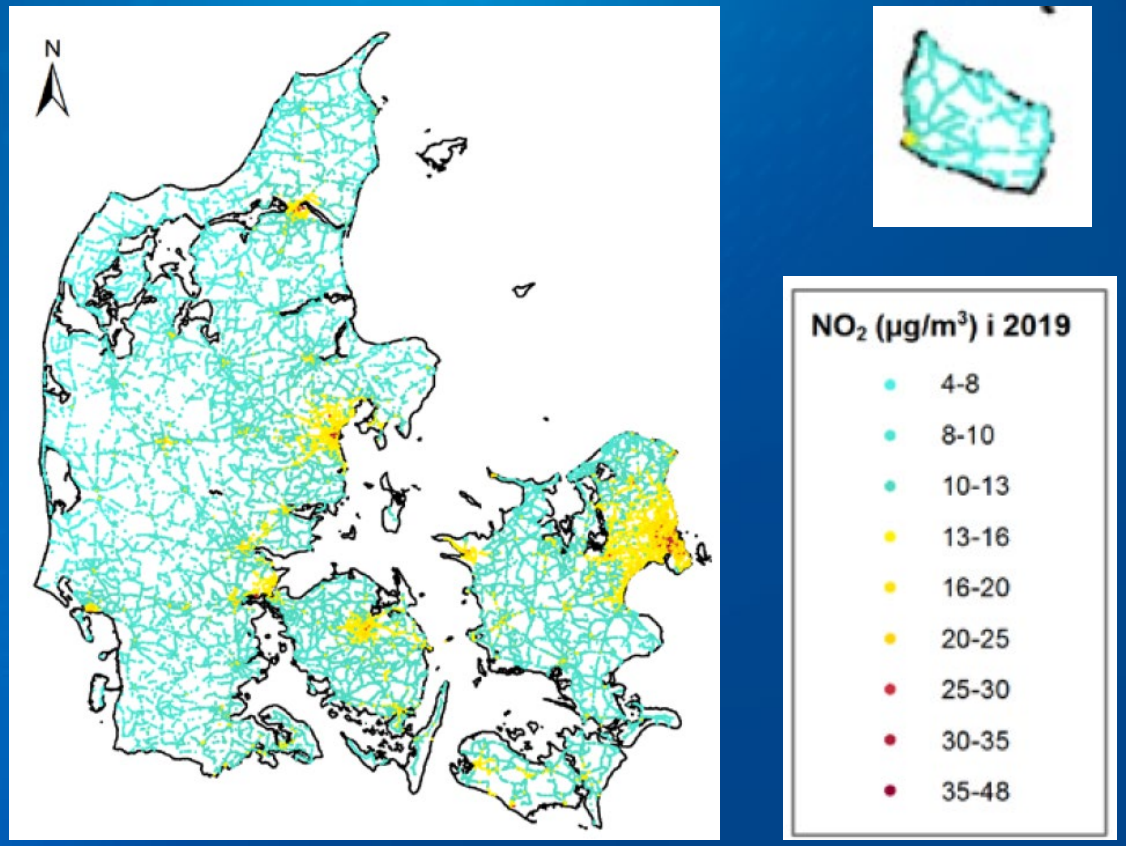


Source: http://lpdv-en.spatialsuite.dk/spatialmap

GIS for Air Pollution – Showcase



Background (1 km x 1 km)



Address-level (> 2.5 million)

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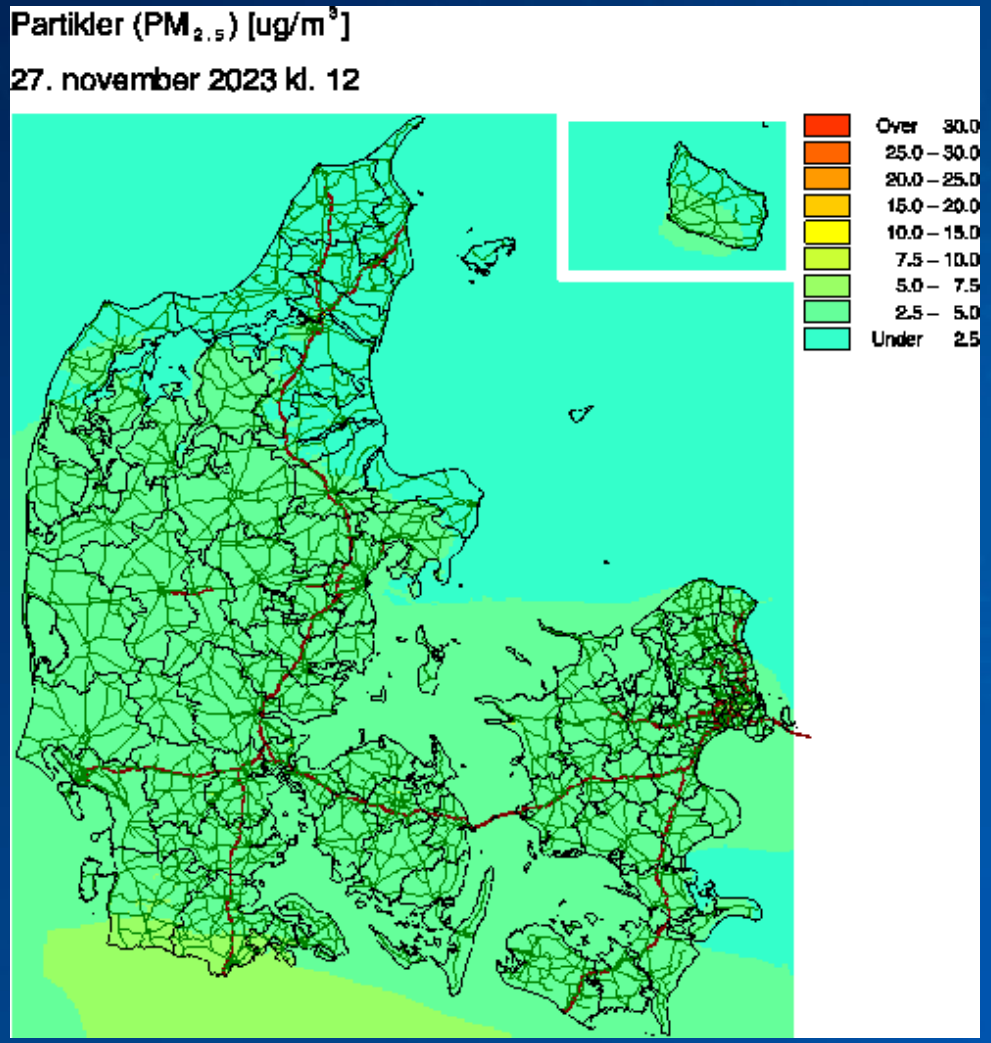
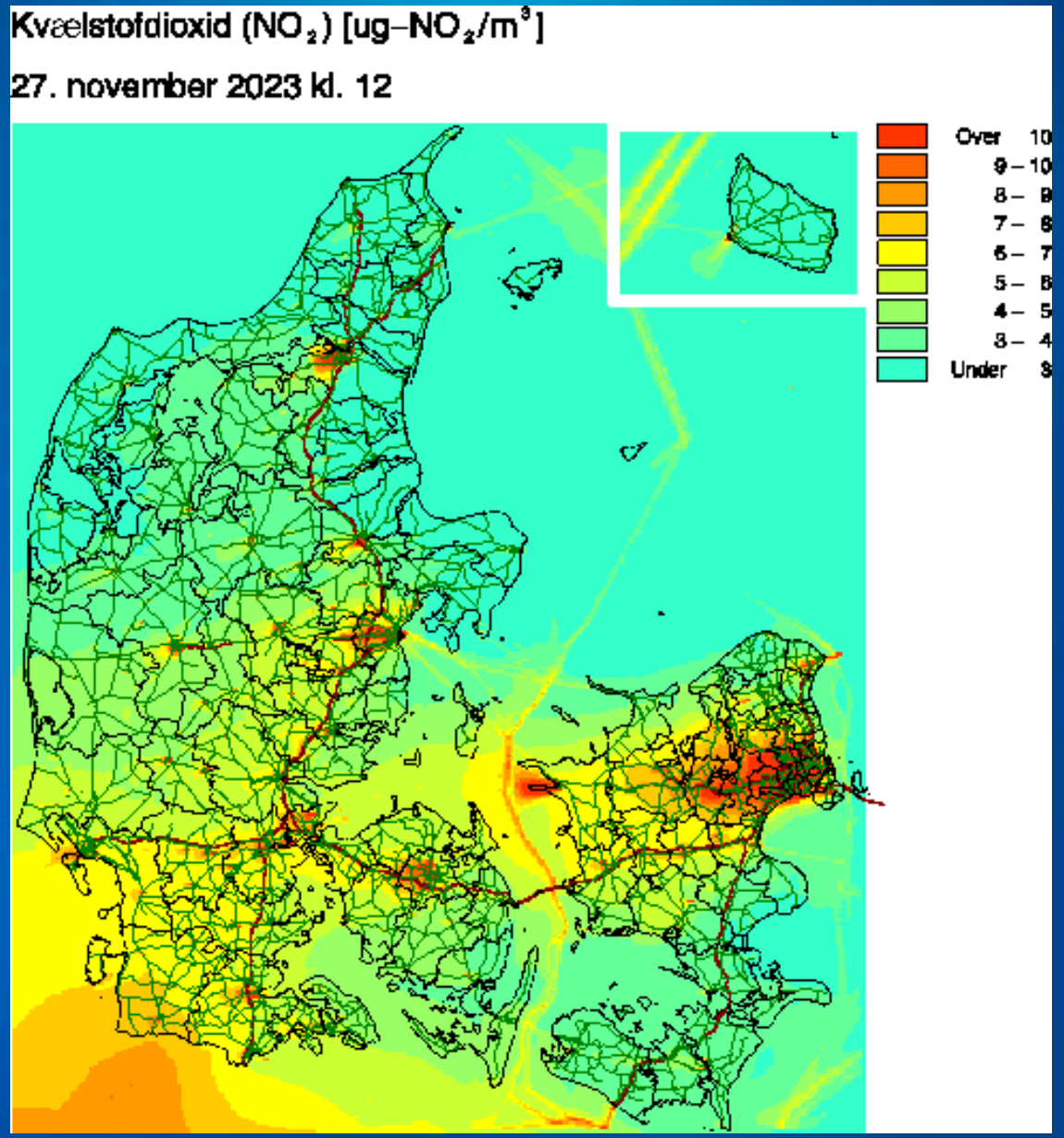
Real-time Air Pollution Forecast via the THOR System





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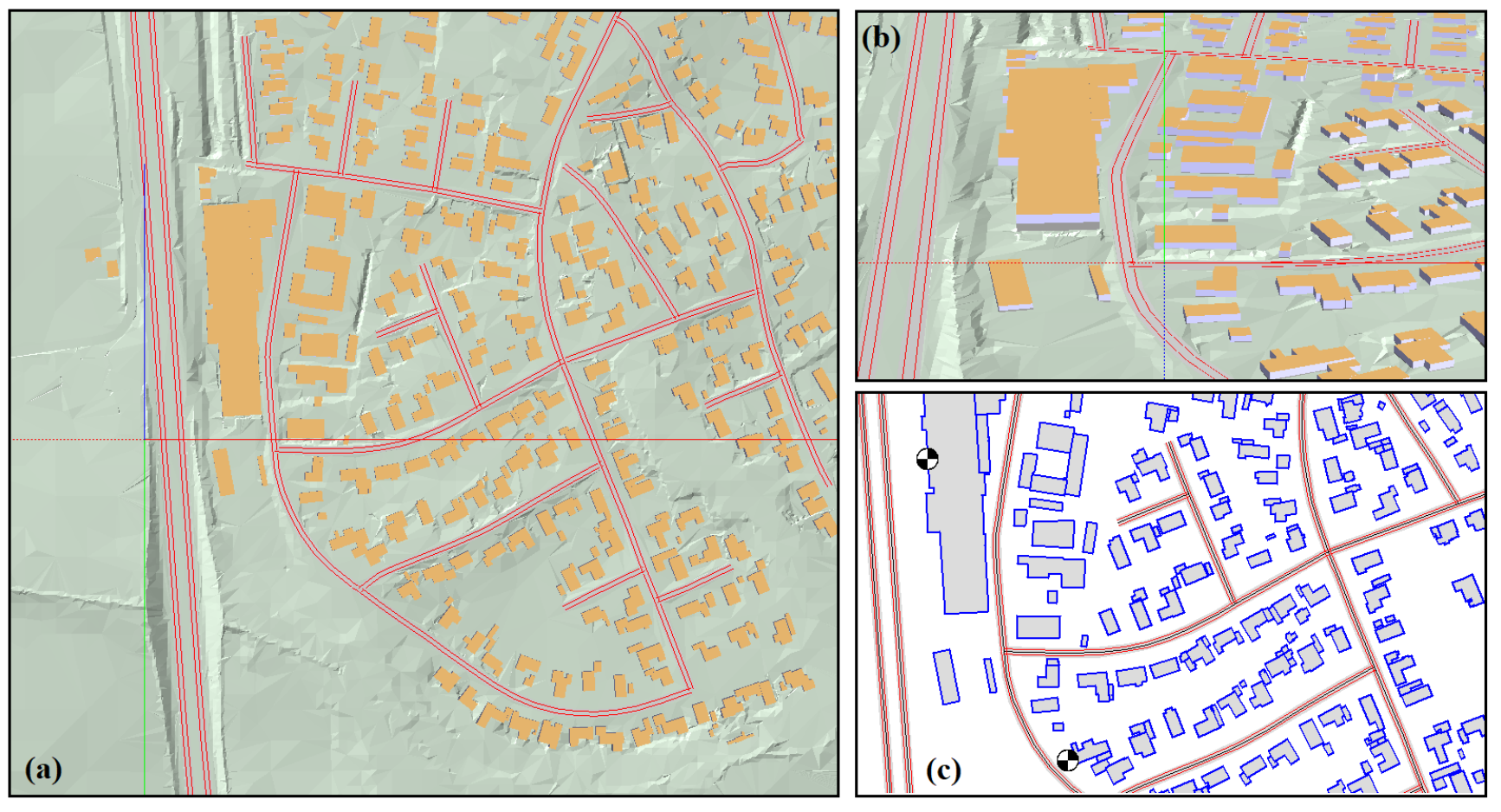
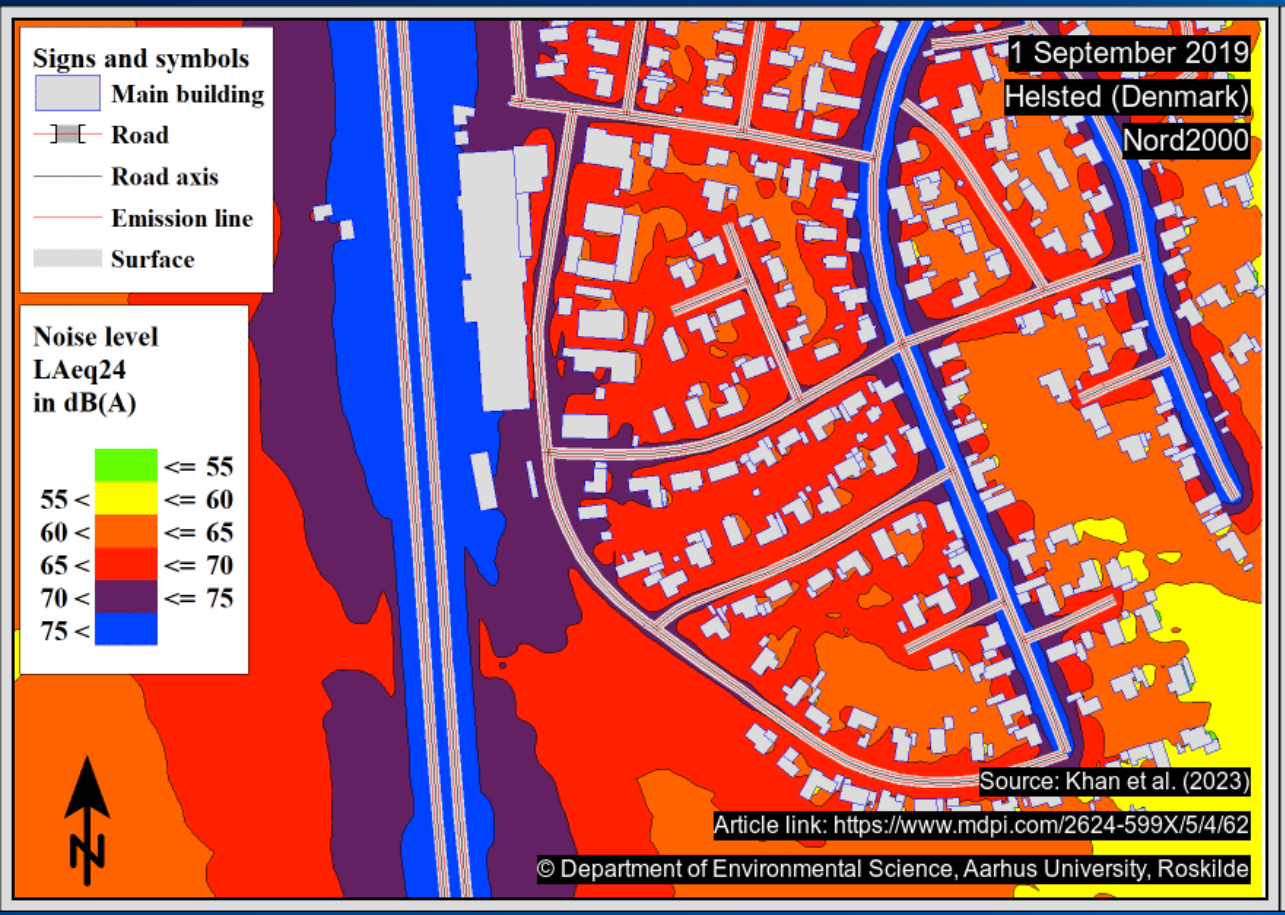
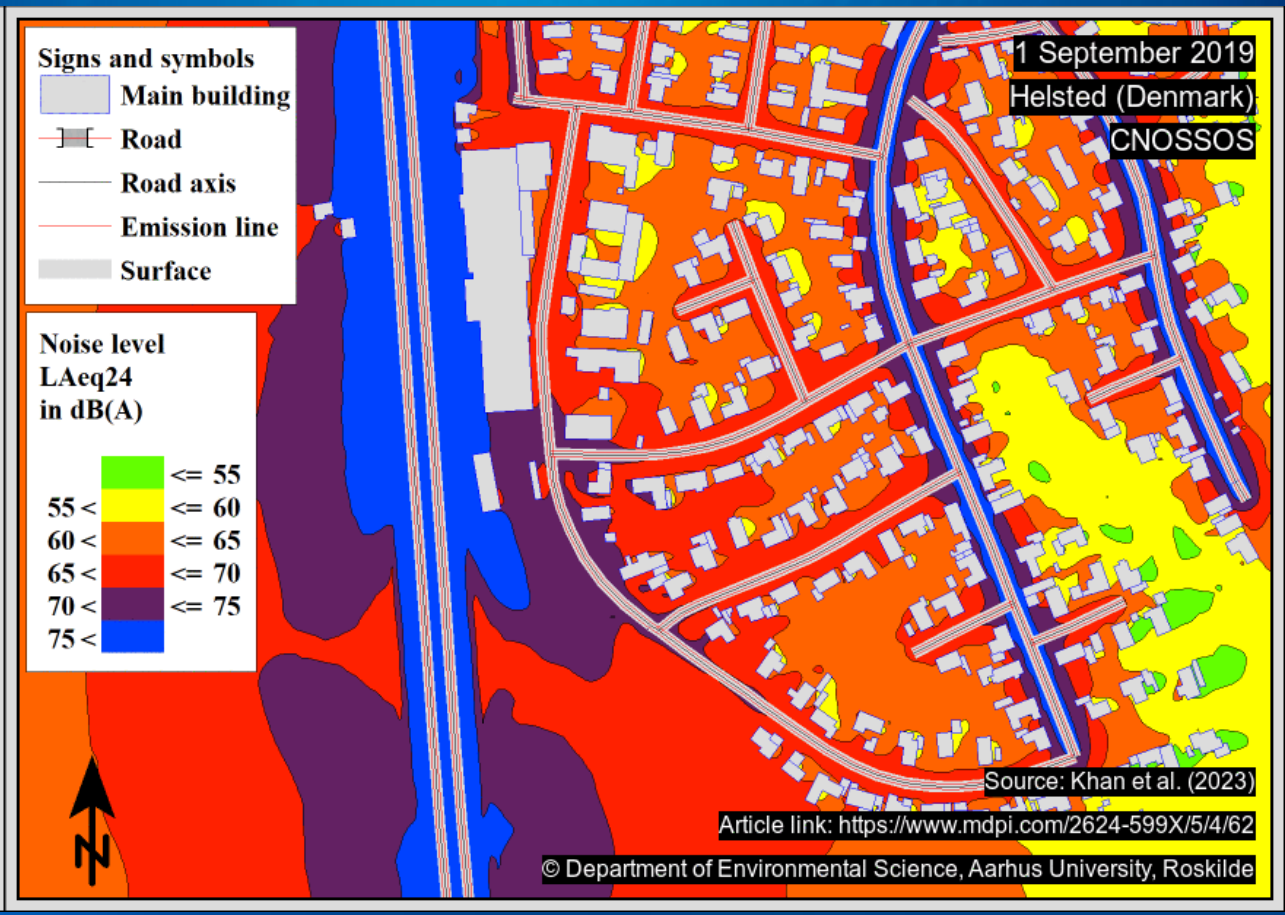
GIS for Noise



3D (or 2.5D) building polygons in noise simulations

GIS for Noise – Showcase





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GIS for Exposure Assessment

Exposure modelling + Linked National Registers

Takeaways

- GIS is crucial for
  - Air Pollution Prediction and Mapping
  - Noise Prediction and Mapping
  - Exposure Assessment

- Public Awareness
- City Planning
- Health Assessments