How to improve top-down approach for industry sector: a Portuguese experience

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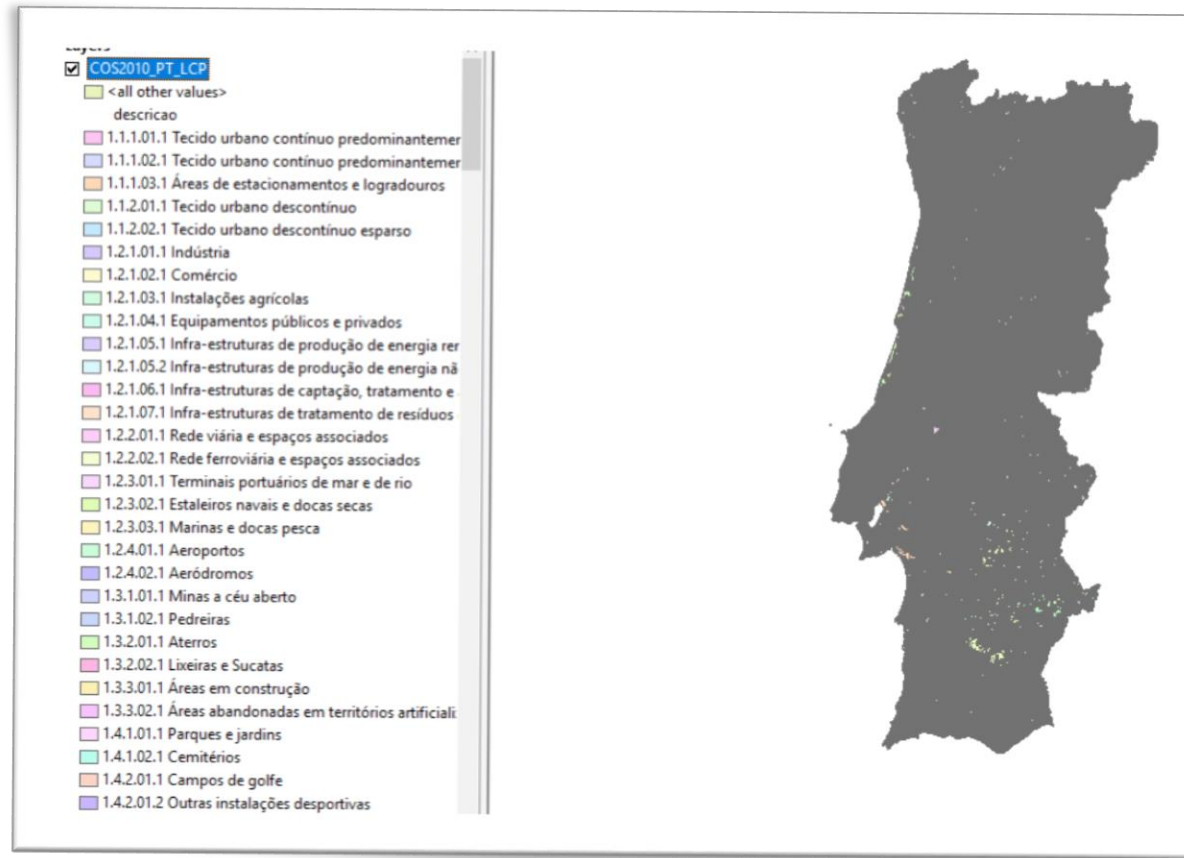universidade de aveiro

Objective

The main purpose of this work is to improve the spatial distribution of **industrial combustion and processes** emissions over Portugal.

Methodology

The location of industries was considered based on national land use data.

COS (Carta de Ocupação/Uso do Solo)

Top-down methodology

$$\text{Emission}_{\text{AQM,i km}} = \frac{\text{Emission}_{\text{EMEP, 10 km}} \times \text{Land use area}_{\text{AQM, i km}}}{\text{Land use area}_{\text{EMEP, 10 km}}}$$

$$\text{Emission}_{\text{AQM,i km}} = \frac{\text{Emission}_{\text{EMEP, 10 km}} \times \text{Area Grid}_{\text{AQM, i km}}}{\text{Area Grid}_{\text{EMEP, 10 km}}}$$

otherwise

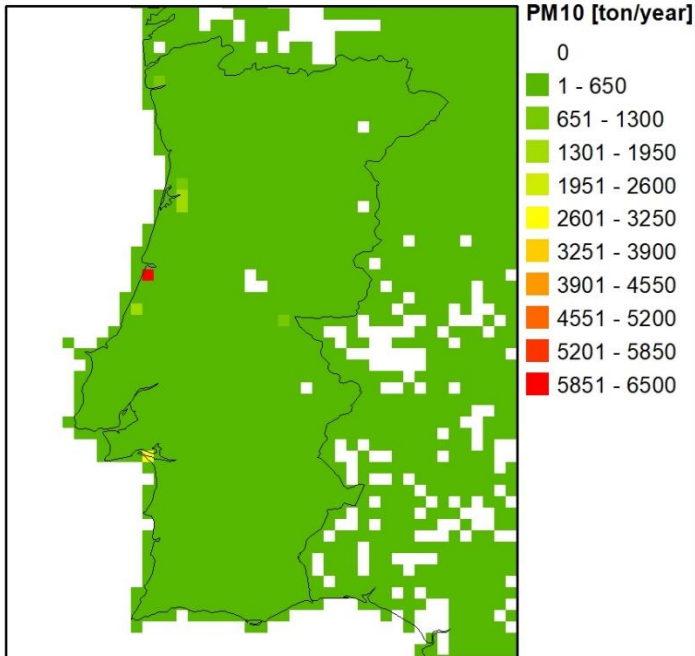$$\text{Emission}_{\text{AQM,i km}} = \frac{\text{Emission}_{\text{EMEP, 10 km}} \times \text{Land use area}_{\text{AQM, i km}}}{\text{Land use area}_{\text{EMEP, 10 km}}} = \frac{110 * 0}{0} = 0$$

EMEP disaggregation

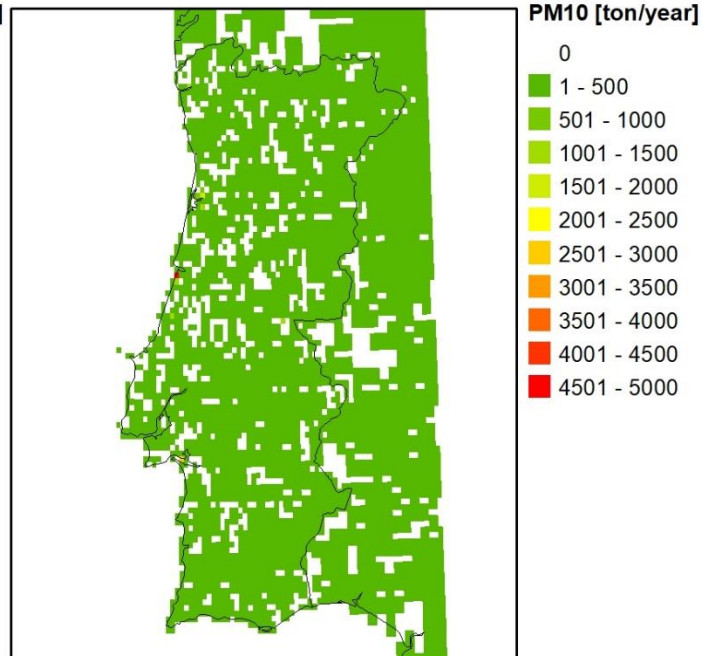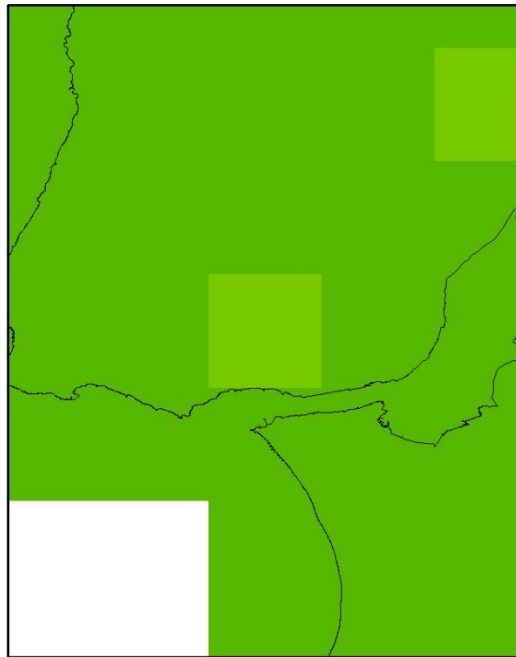**Portugal 5x5 km^2**
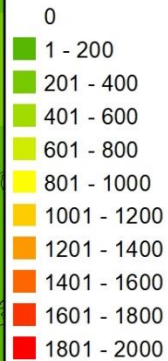

EMEP – 10 km

EMEP – 5 km
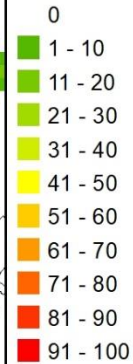
Land use

EMEP disaggregation

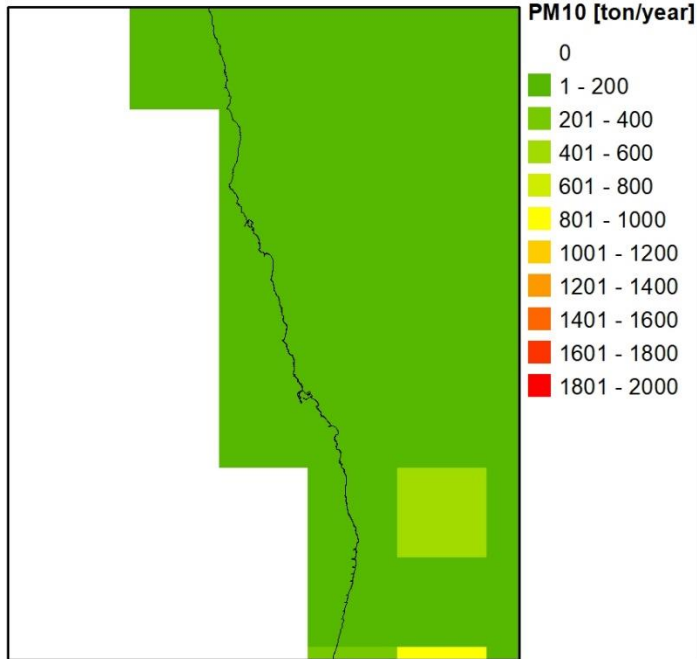**Lisbon 1x1 km²**

EMEP – 10 km
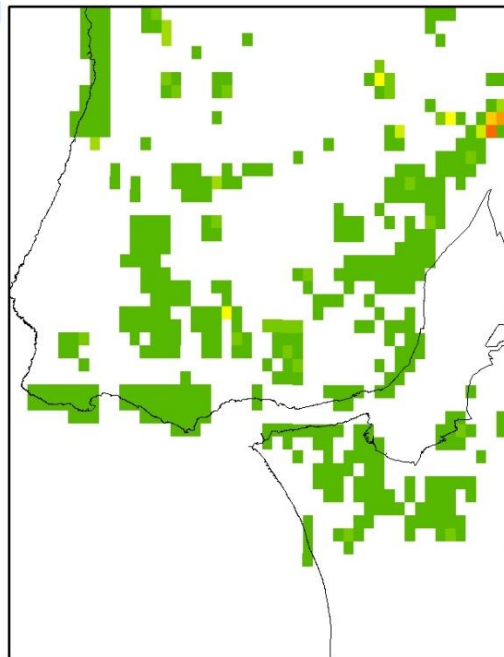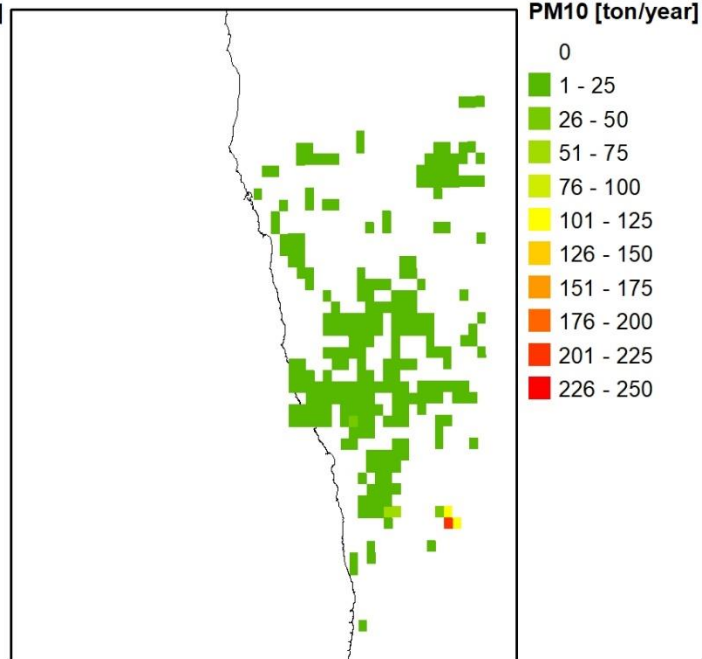
EMEP – 1 km

Land use

EMEP disaggregation
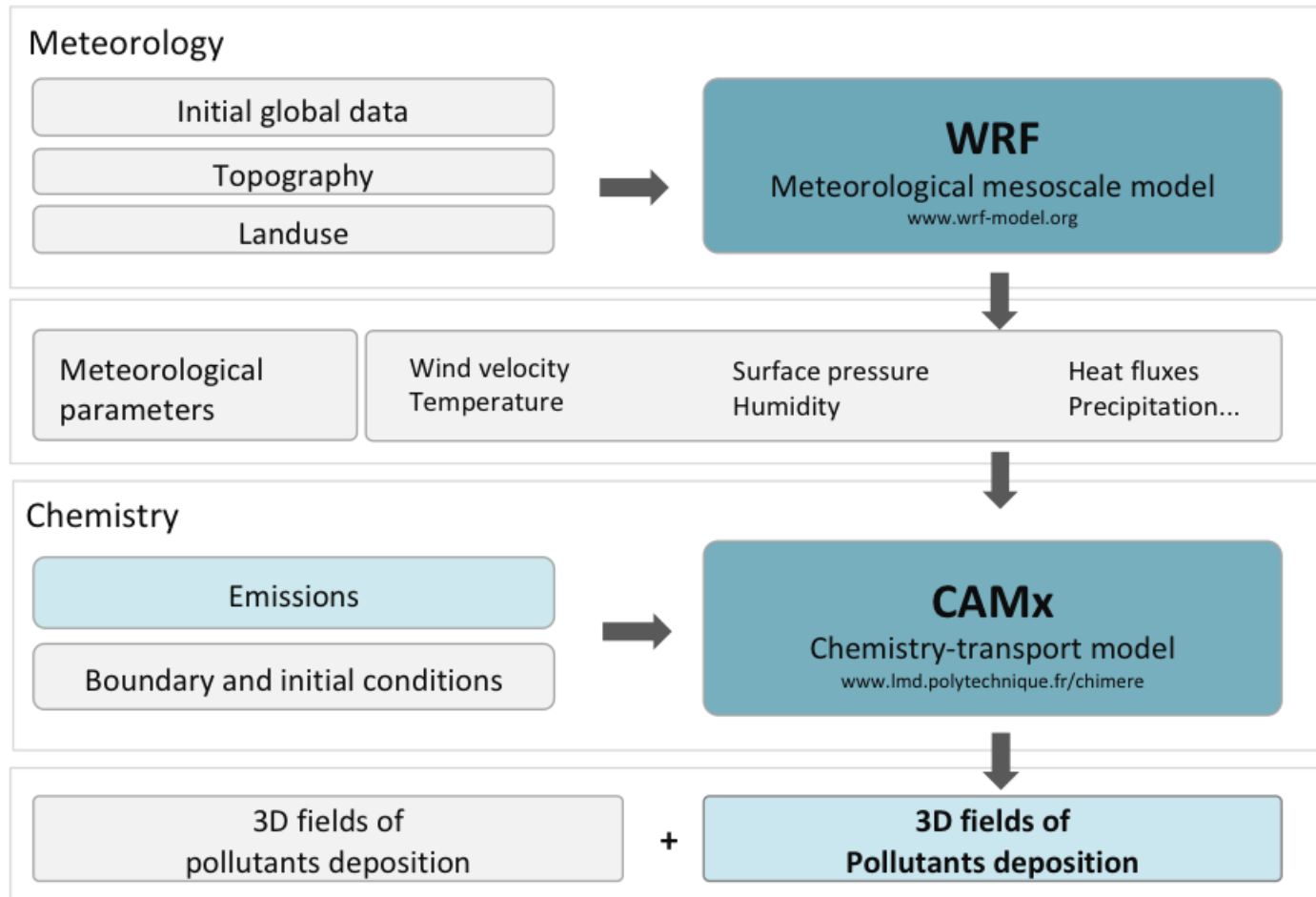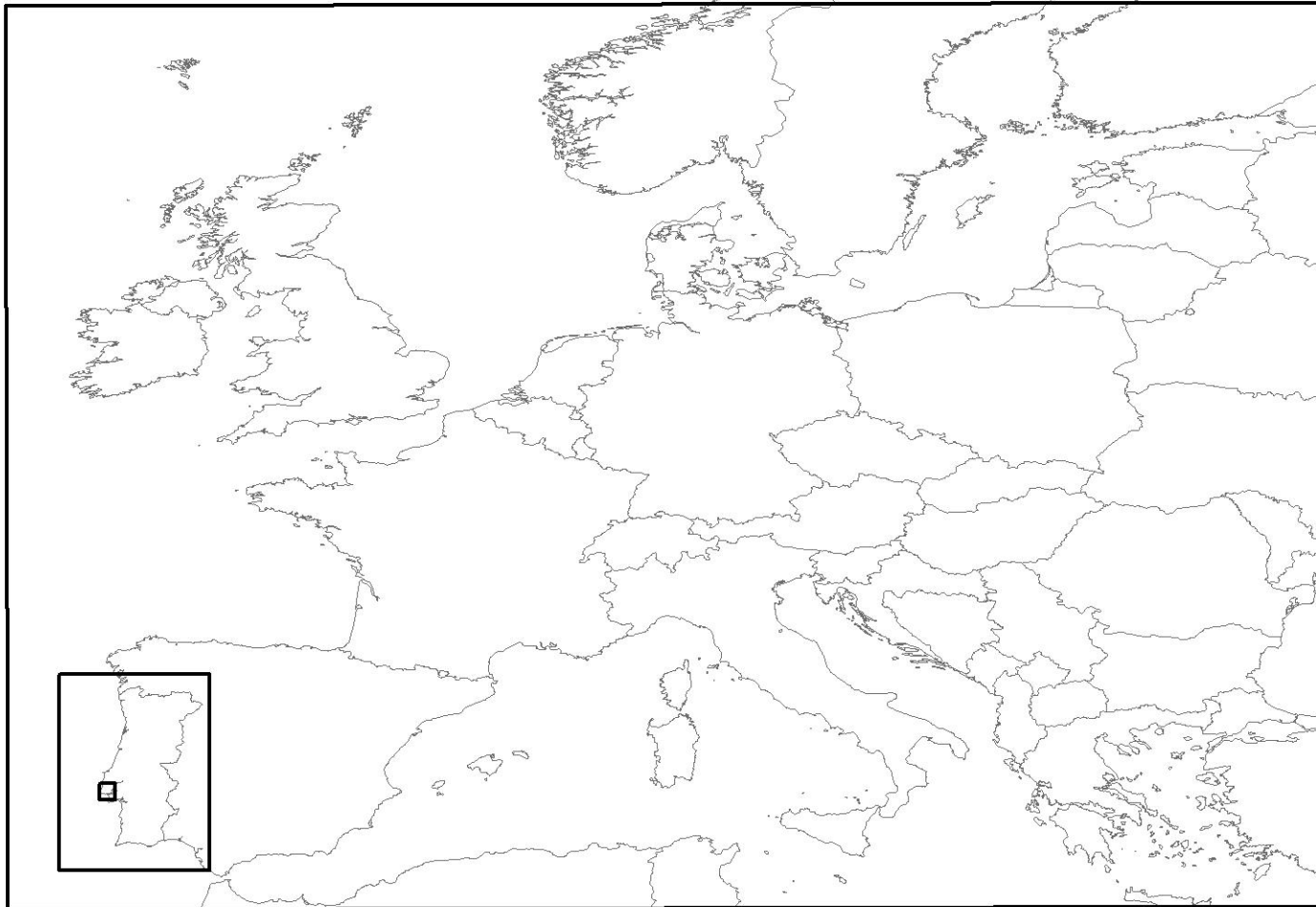
Porto 1x1 km²

EMEP – 10 km

EMEP – 1 km

Land use

The AQ modelling system

Simulation domains

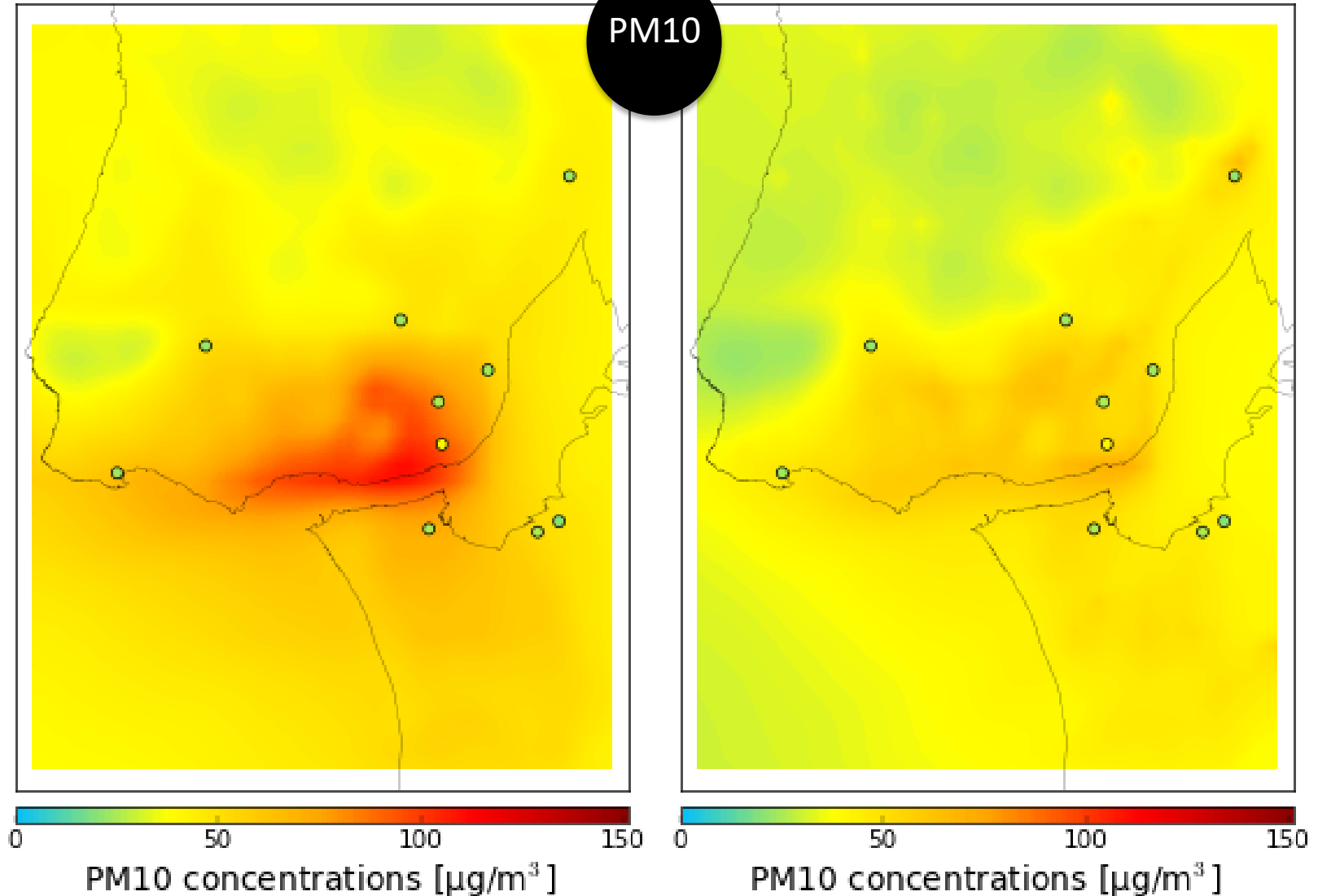**D1 (25 km) - D2 (5 km) - D3 (1km)**
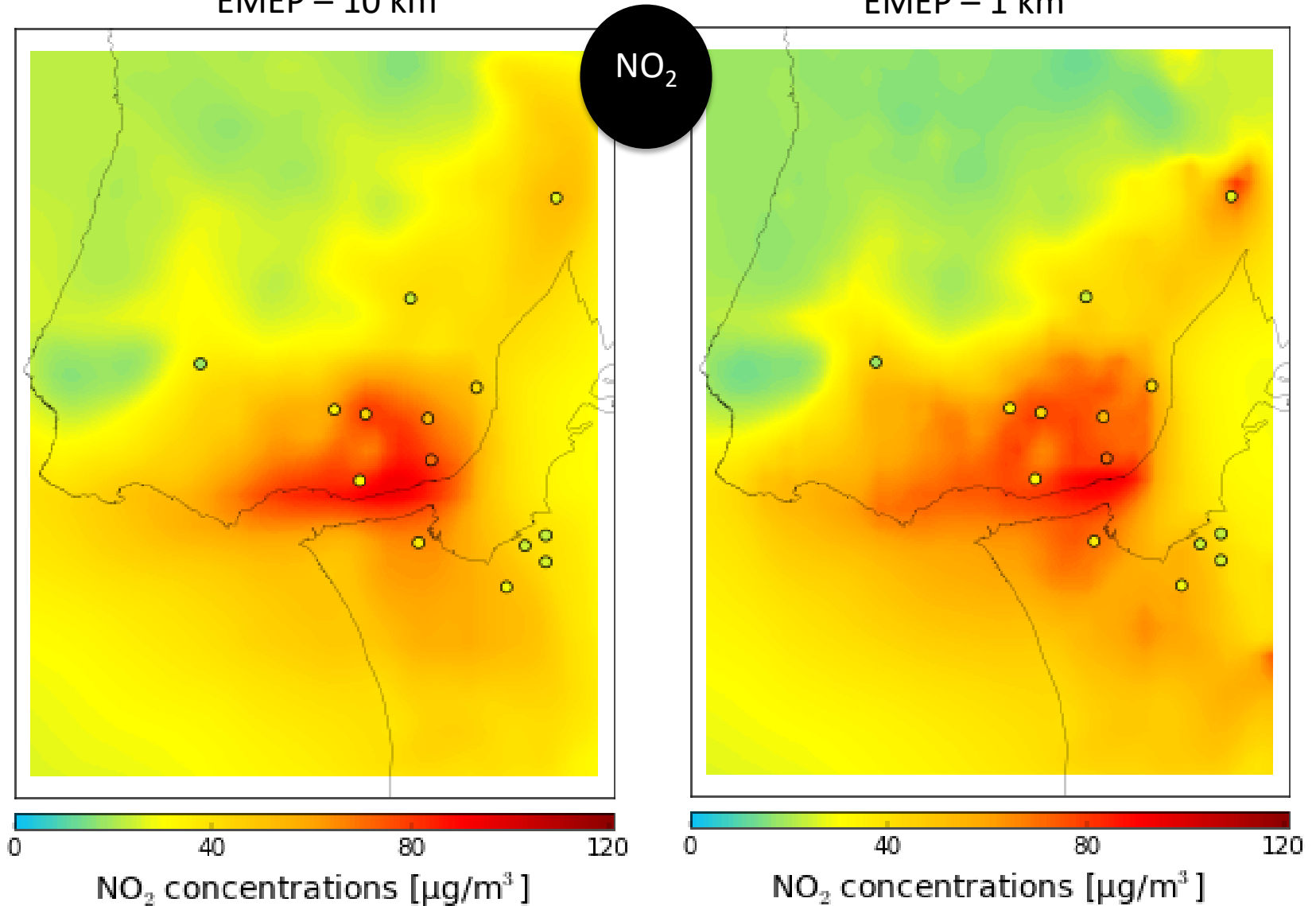
Air quality results

EMEP – 10 km

EMEP – 1 km

PM10

PM10 concentrations [µg/m³]

PM10 concentrations [µg/m³]

Air quality results

EMEP – 10 km

EMEP – 1 km

NO$_2$

NO$_2$ concentrations [µg/m^3]

NO$_2$ concentrations [µg/m^3]

Air quality results

EMEP – 10 km

EMEP – 1 km

O$_3$
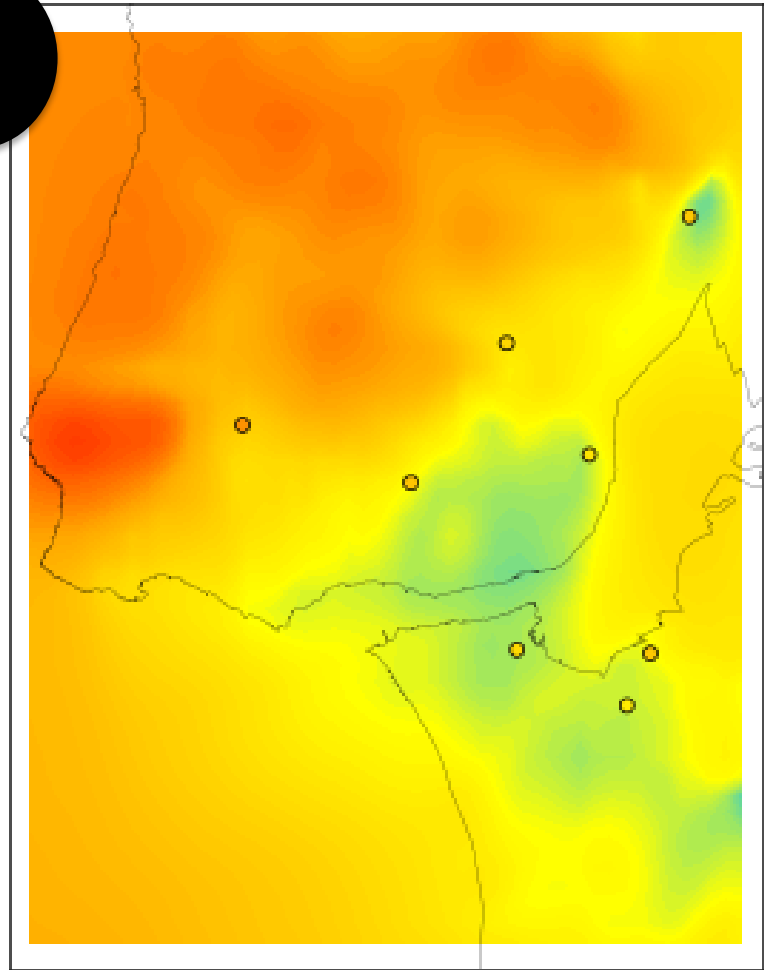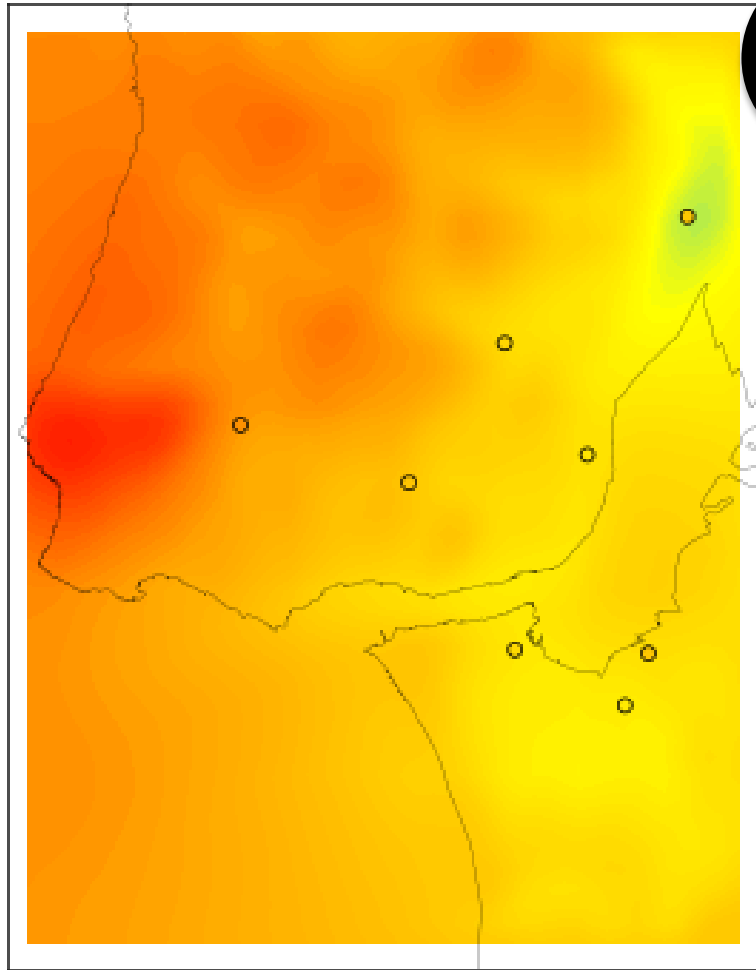
O_3 concentrations [μg/m^3]

O_3 concentrations [μg/m^3]

On-going work

Specific methodologies are being developed and applied for each SNAP sector in order to improve spatially and temporaly disagregated inventory:

- Agriculture
- Traffic
✓ - Shipping
✓ - Residential combustion