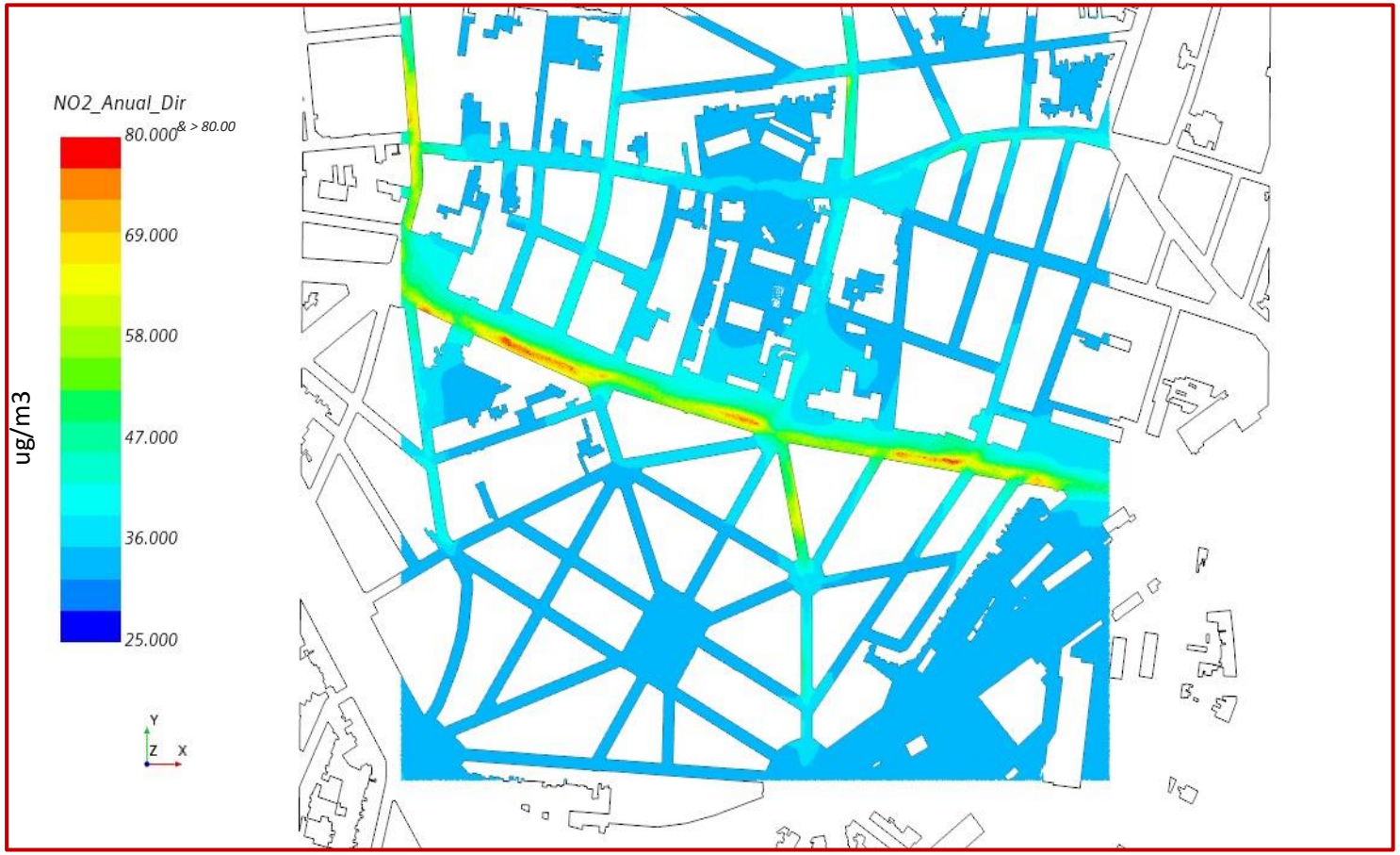
CT4 Intercomparison exercise. Step 3

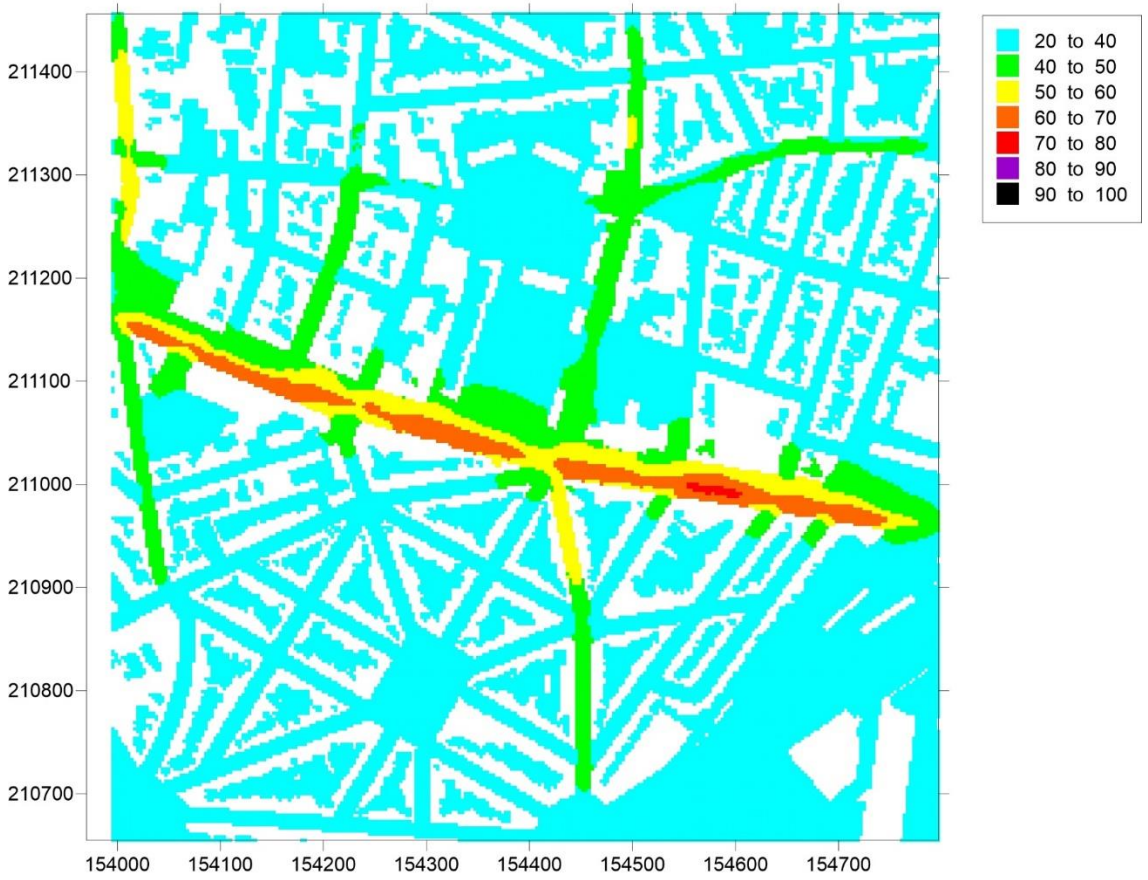
To compute averages (concentration maps) for 2016 year applying the methodologies of each group.

- *Intercompare results from every methodology (annual 2D maps).*

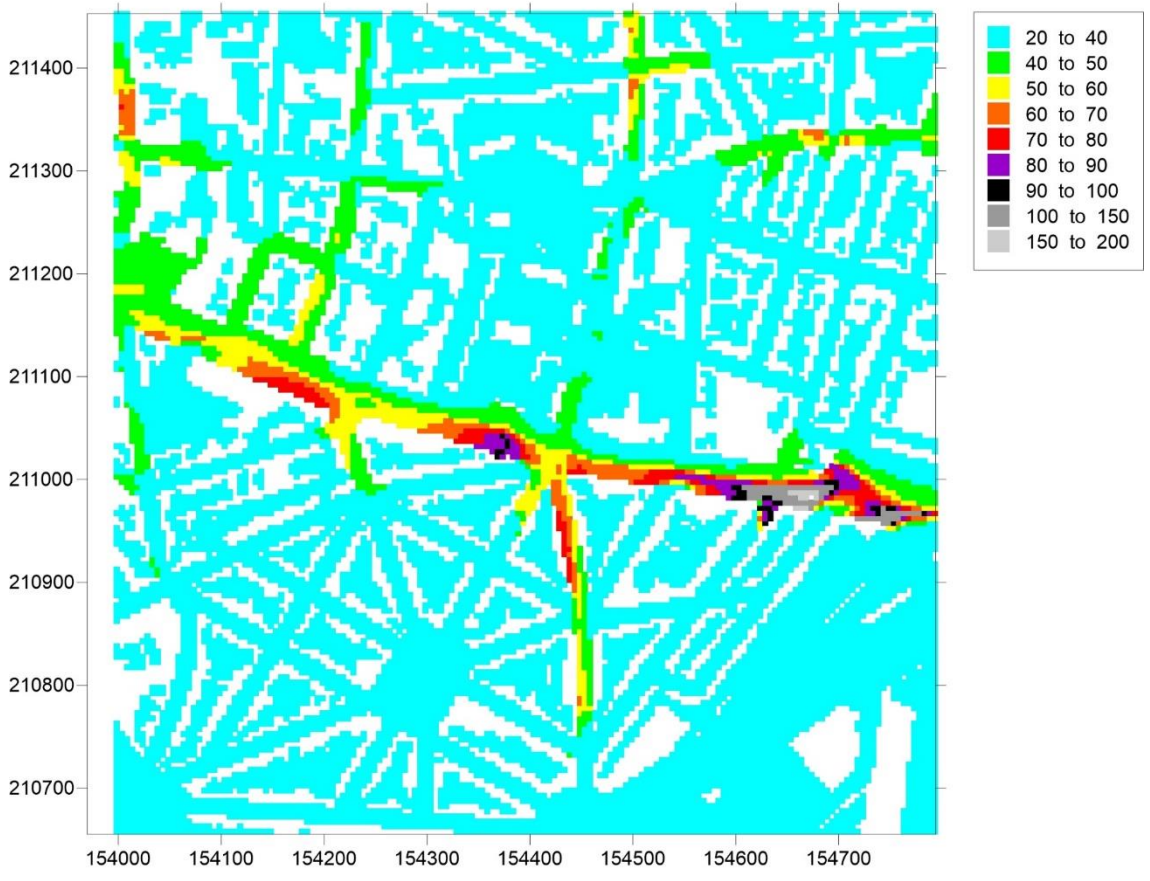


Step 3. Annual concentration maps

ENEA - STEP 3

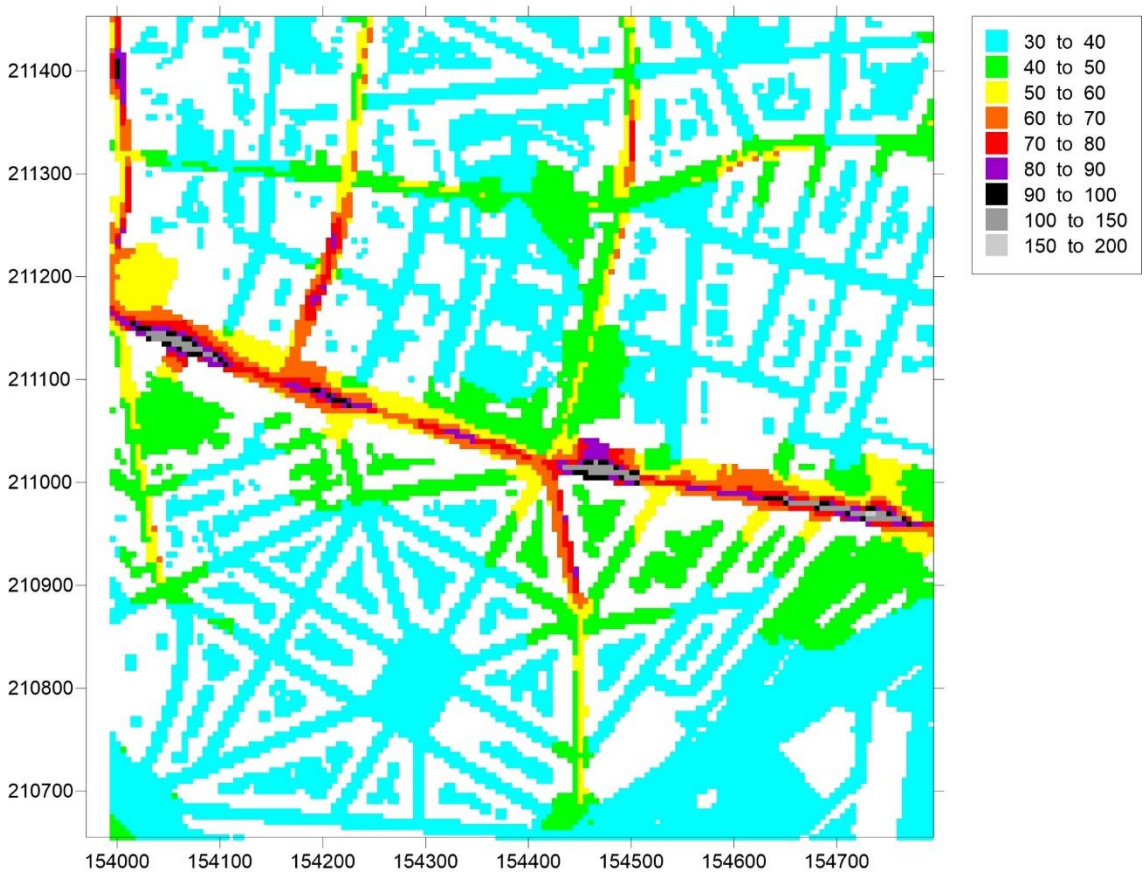


UOWM - STEP 3

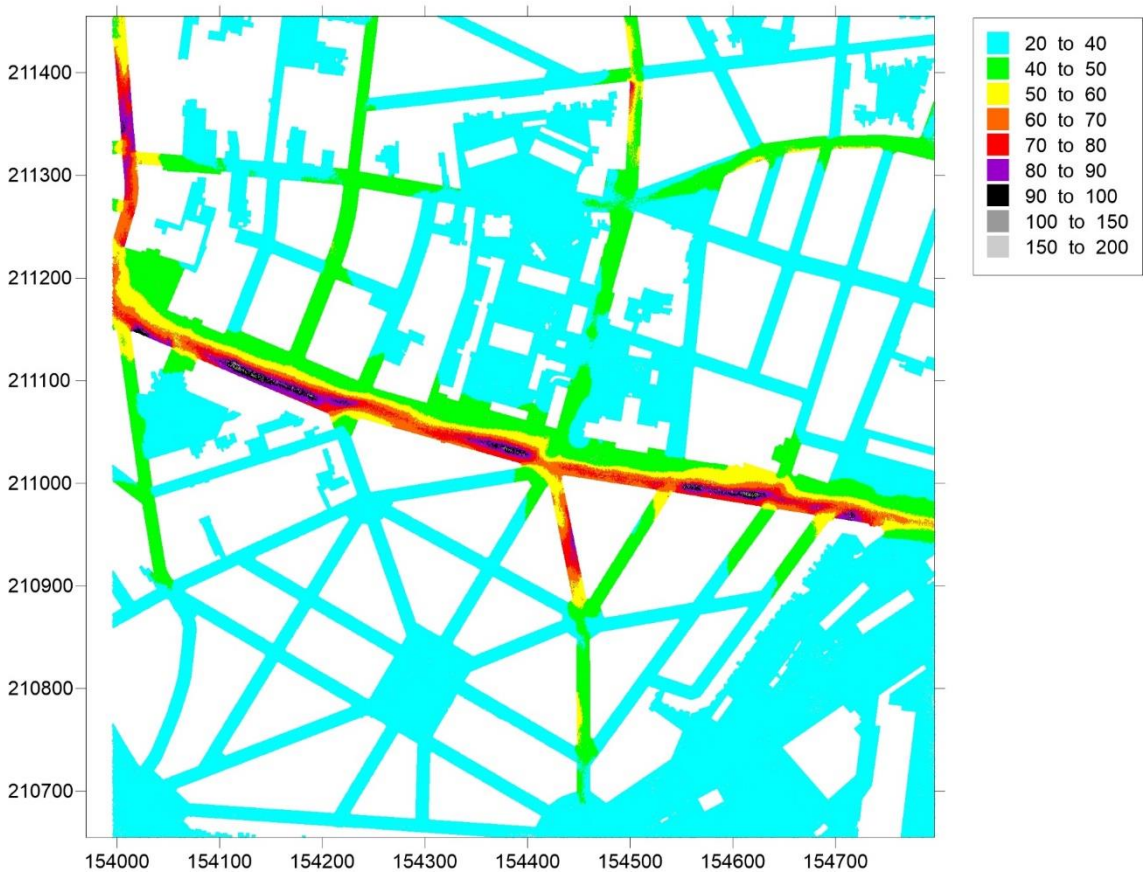


Step 3. Annual concentration maps

UPM - STEP 3

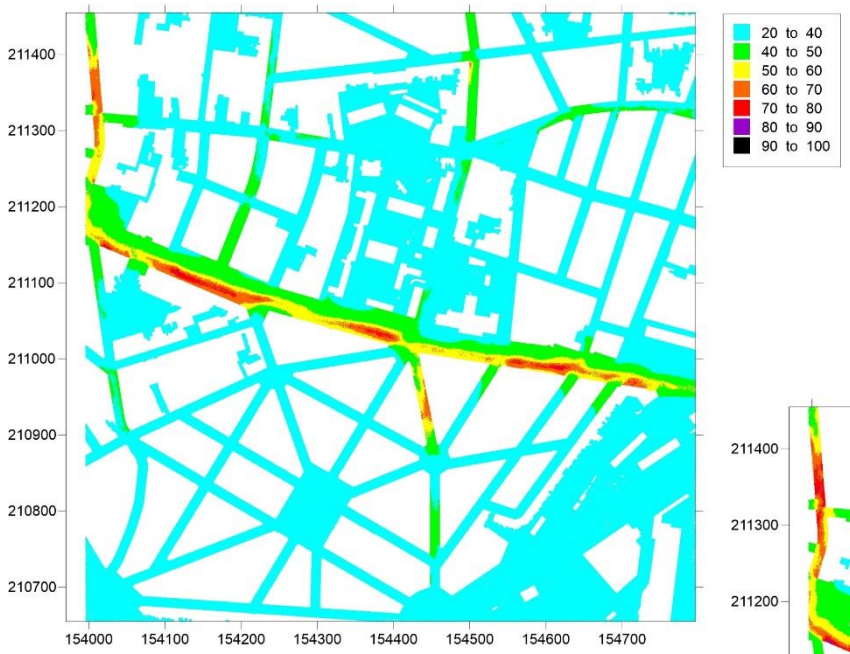


CERC-CIEMAT - STEP 3

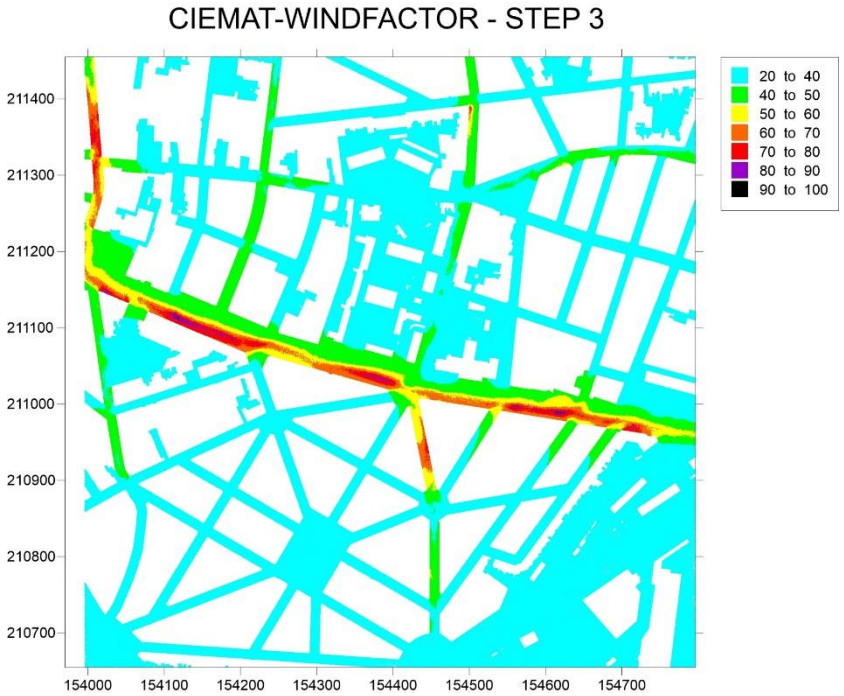


Step 3. Annual concentration maps

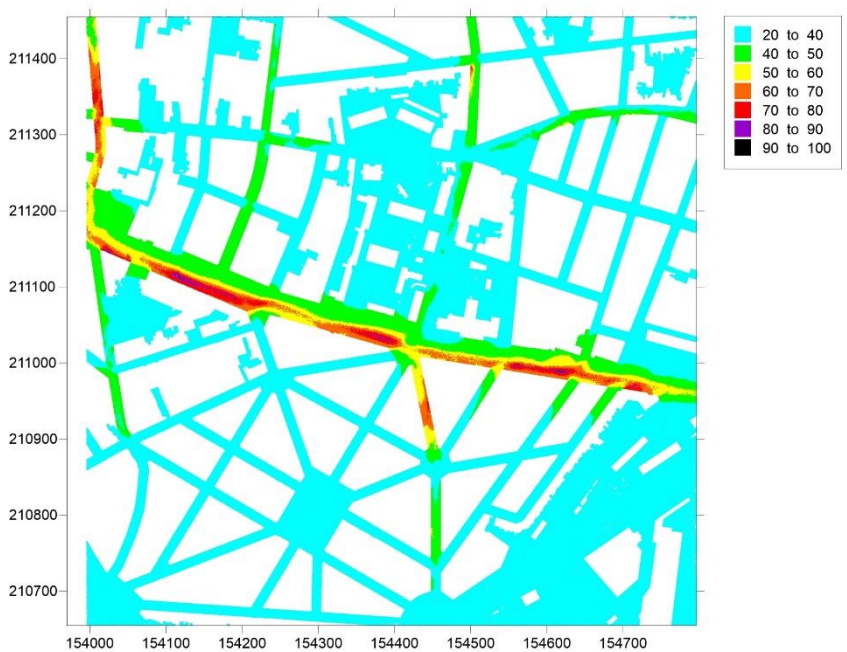
CIEMAT-SIMPLE - STEP 3



CIEMAT-WINDFACTOR - STEP 3

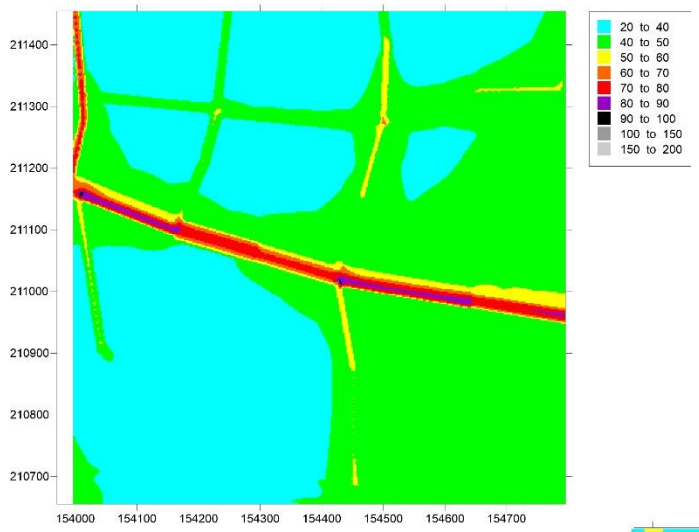


CIEMAT-DETAILED - STEP 3

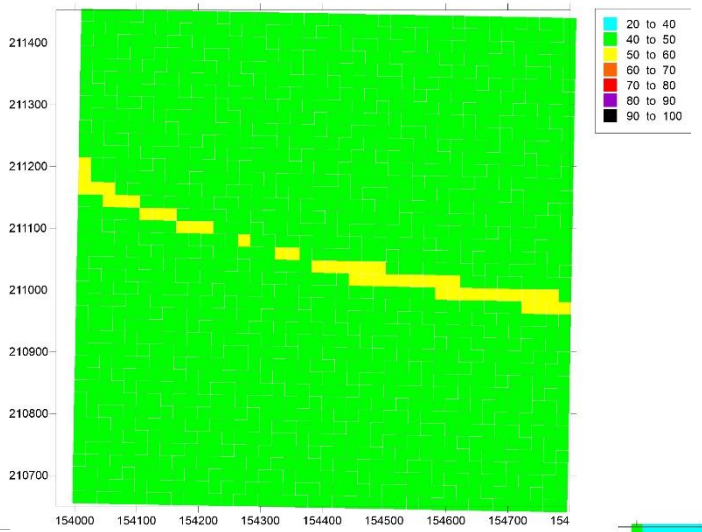


Step 3. Annual concentration maps

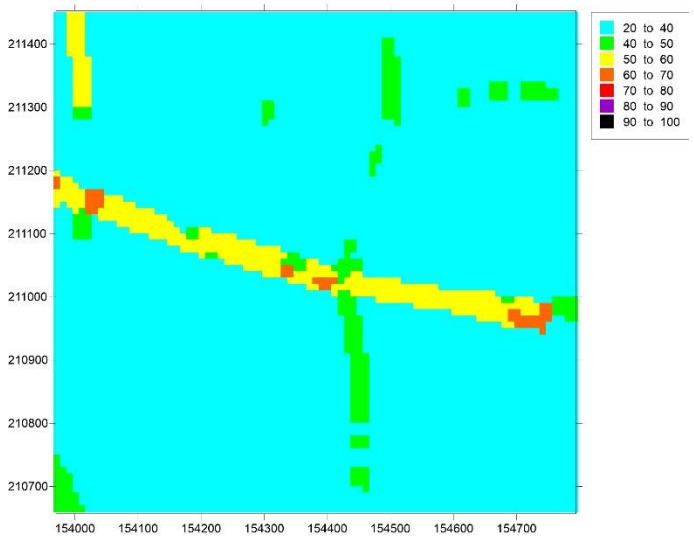
CERC-ADMS - STEP 3



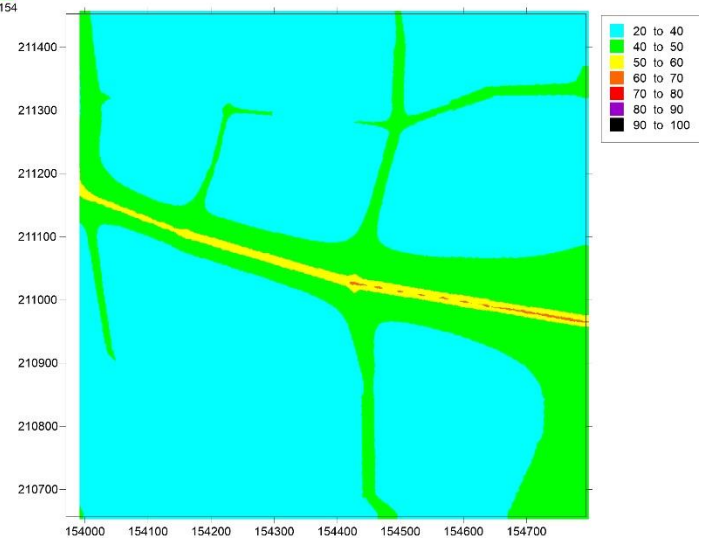
NILU - STEP 3



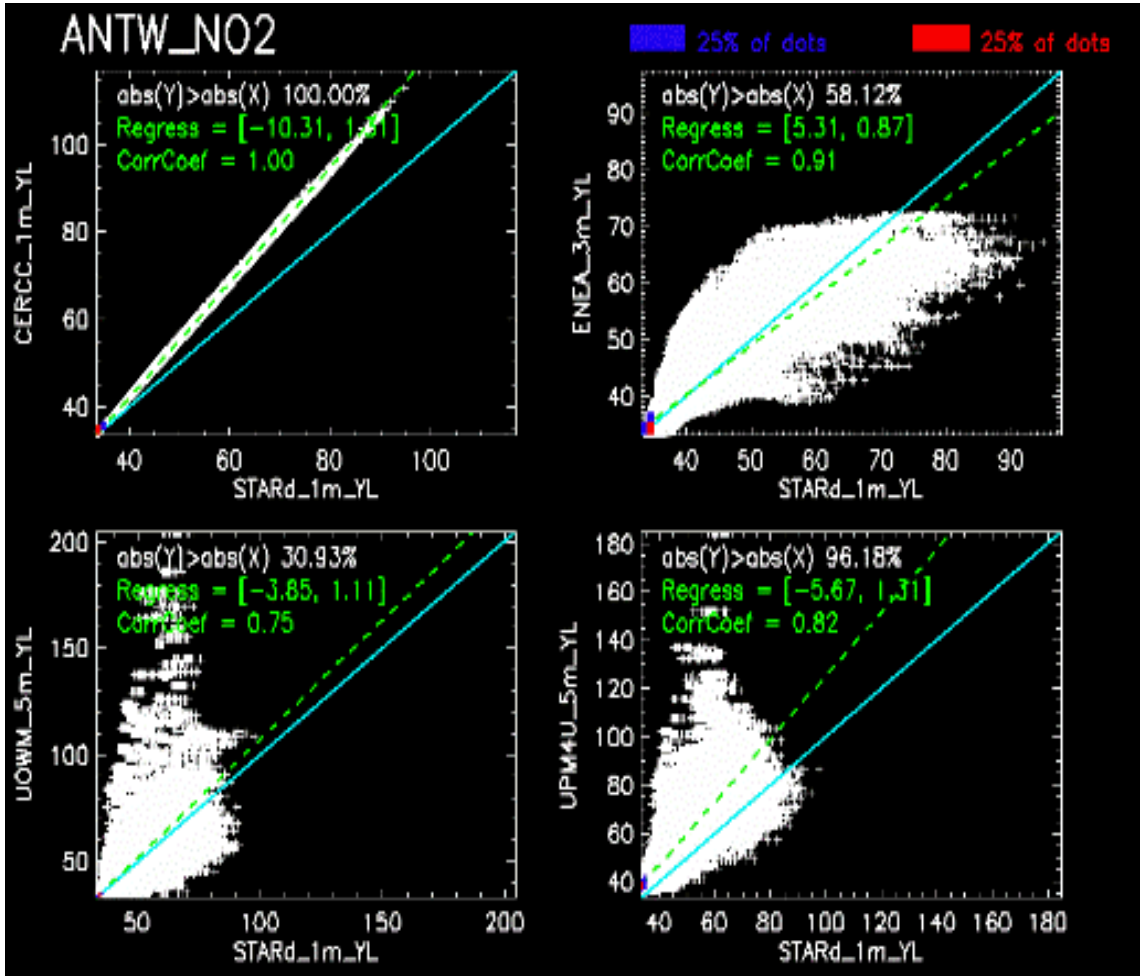
VITO-ATMOSTREET - STEP 3



RICARDO - STEP 3

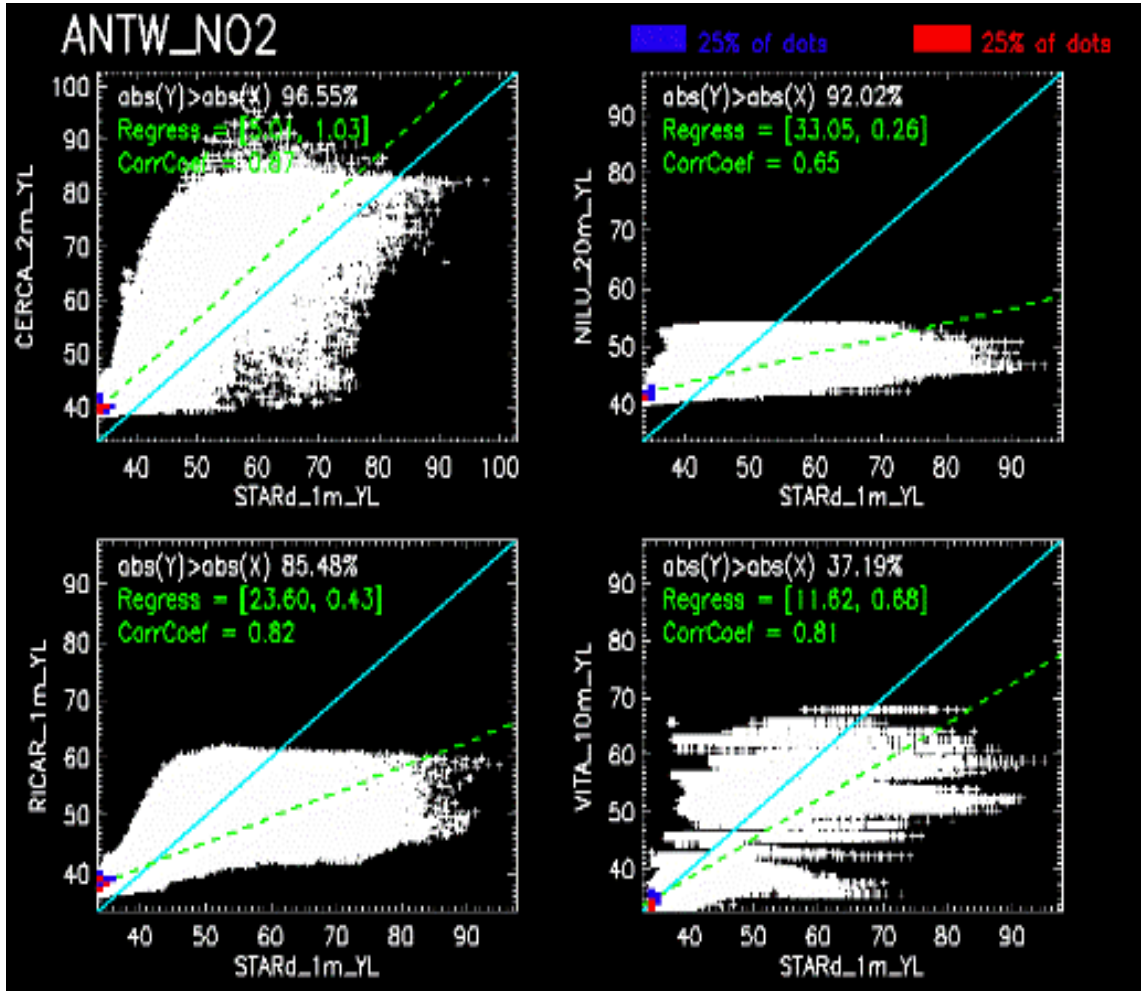


Step 3. Annual concentration scatter plots



- High correlation CERC-CIEMAT and ENEA with CIEMAT-DETAILED
- Slope close to 1 for CERC-CIEMAT and ENEA.

Step 3. Annual concentration scatter plots



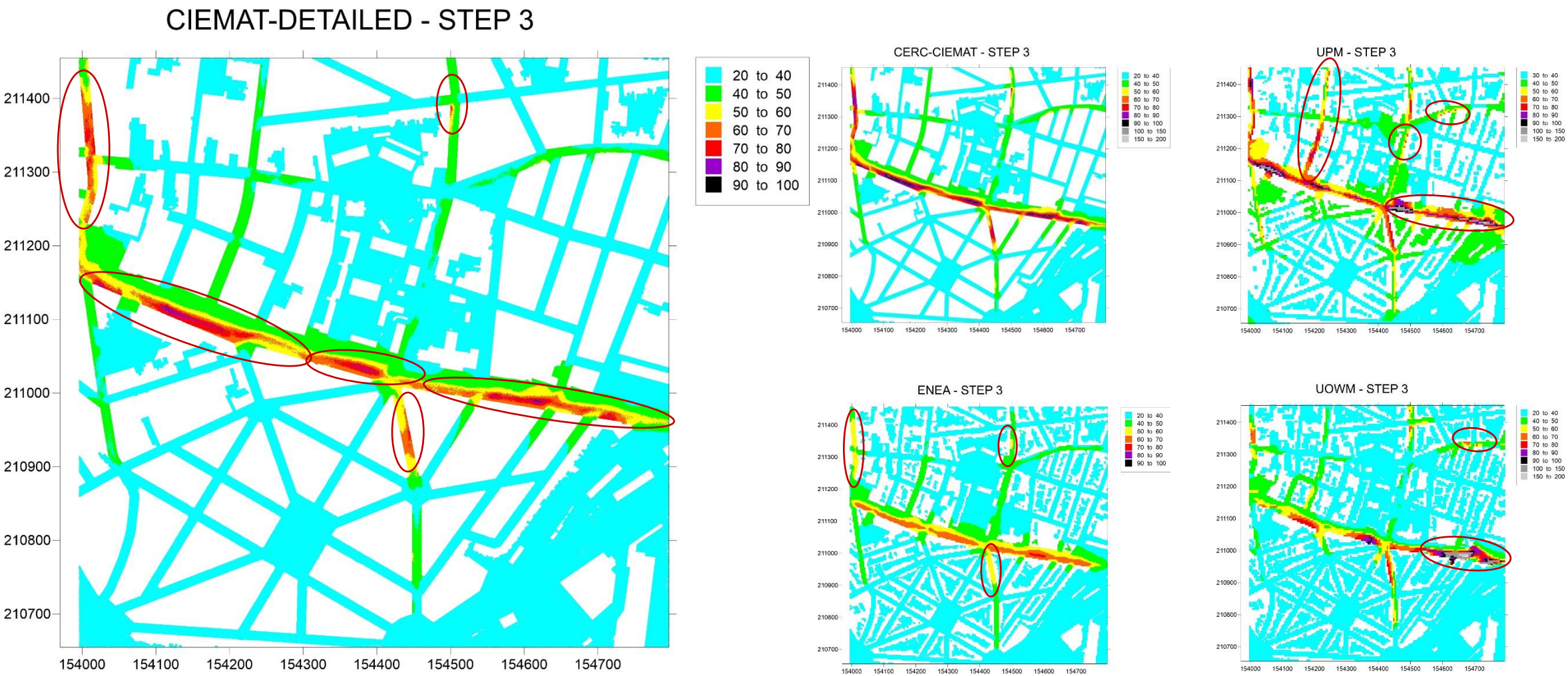
Only high correlation with slope close to 1 for CERC-ADMS with CIEMAT-DETAILED

Step 3. Annual concentration maps

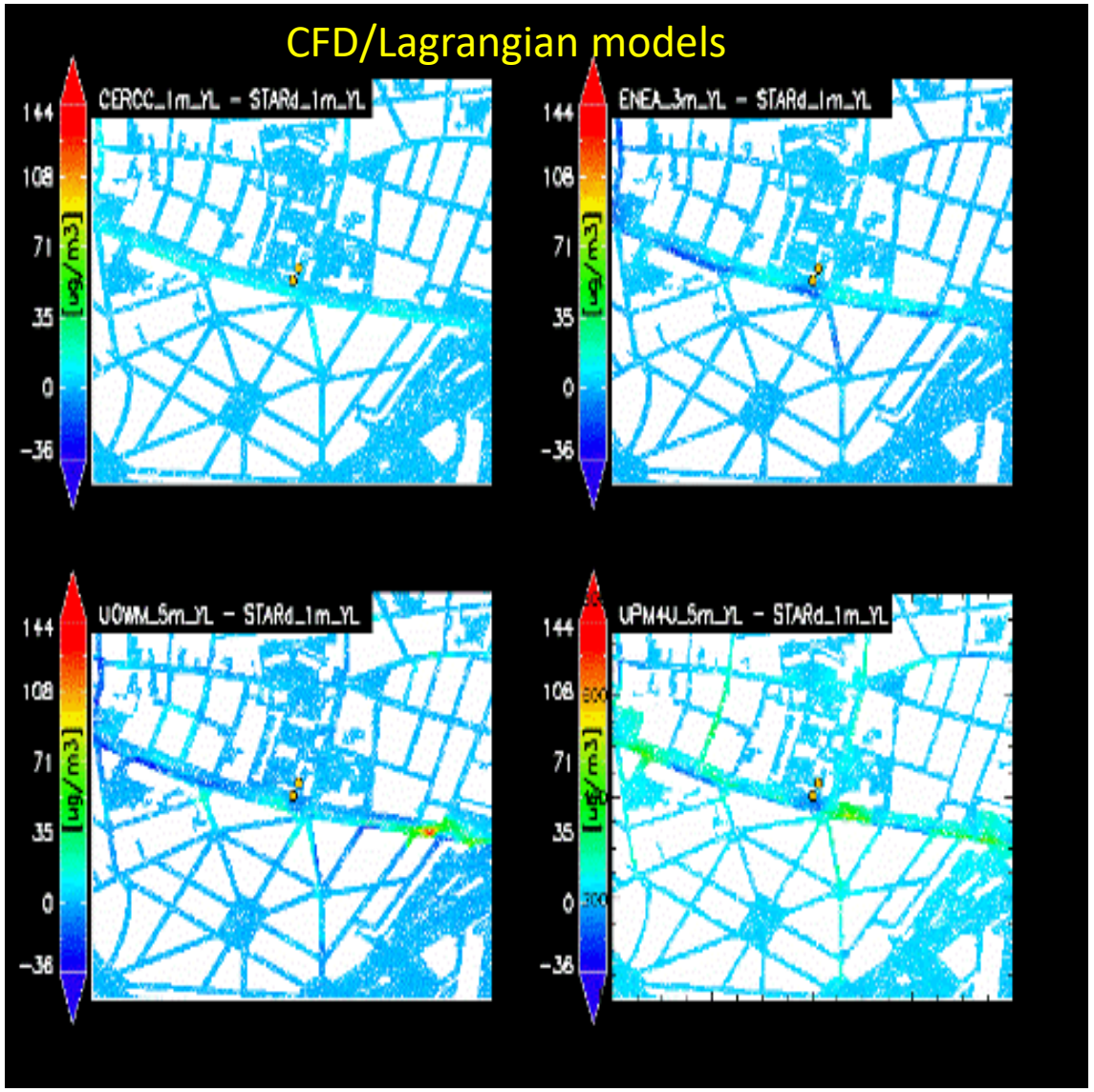
The main conclusions raised from the STEP 2.2 (monthly concentration maps) seem to be valid for the STEP 3 (annual ones)

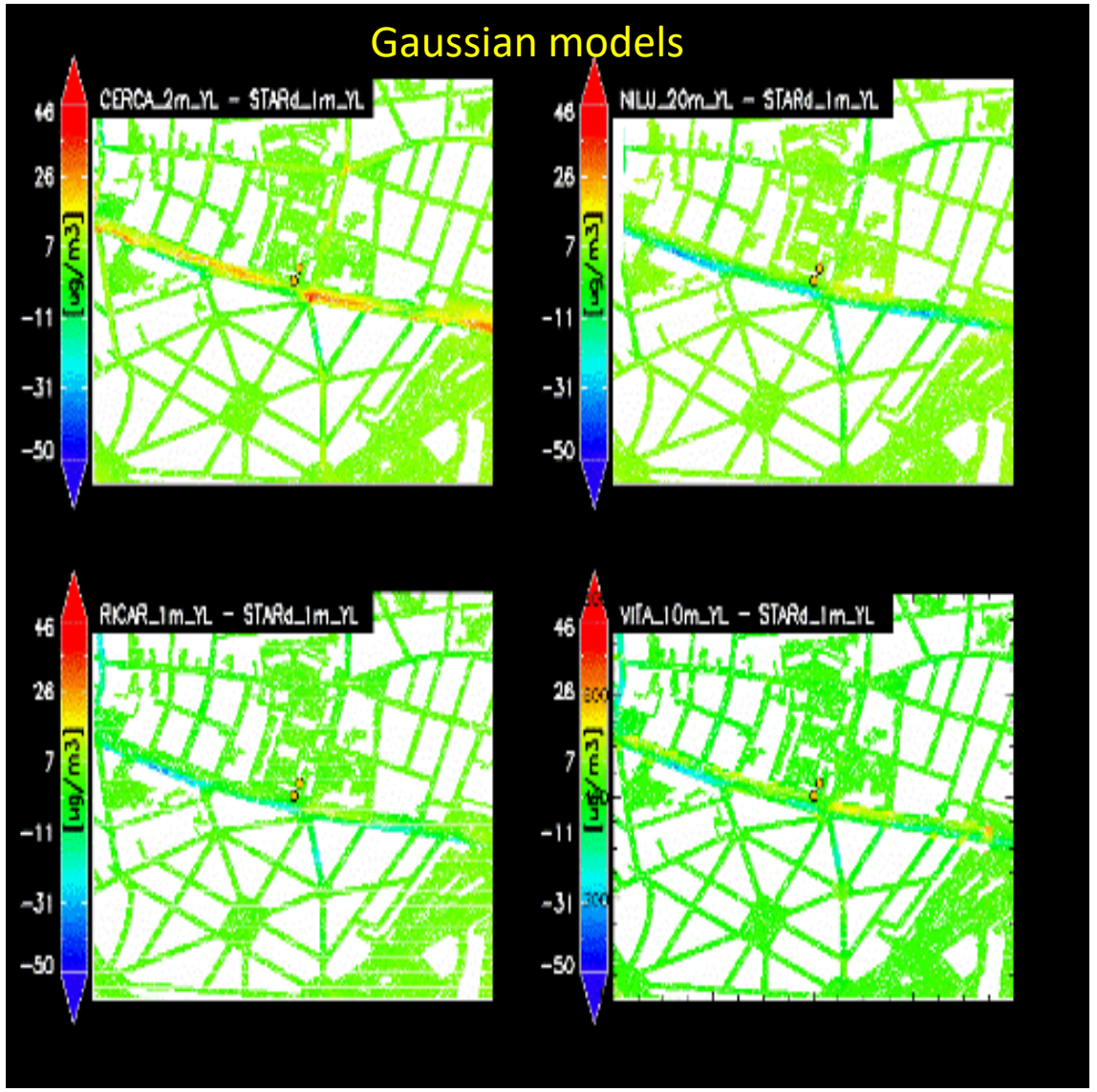
- Results seems to be quite coherent among most of the models
- There are notable differences in the magnitude of the predicted concentrations.
- More detailed maps for CFD or Lagrangian model techniques seem to simulate better the Street-Canyon effects as maximum concentrations areas are shifted to a sidewalk but emissions are also shifted.
- Parametric or Gaussian models provide simpler concentration maps (especially NILU) with weak gradients and/or maximum concentrations areas centered in the street axis.
- VITO-ATMOSTREET and CERC-ADMS predict maxima at the street crossings, while CFD models many times have no maxima due to the higher ventilation at them.

Maximum annual concentration areas STEP 3



Step 3. Differences of annual concentration. Models – CIEMAT-DETAILED





Step 3. Annual concentration maps

- There are also significant differences in the magnitude of the maxima in the CFD results. The higher ones are UOWM, UPM and CERC-CIEMAT, whereas ENEA predicts lower magnitude for the maxima than CIEMAT. It could be due to:
  - some particular features or parameter configuration of the CFD models?
  - the way how the emission data were processed to input the models?
  - the numerical methodology for post-processing the monthly average concentrations?
- Most of the areas with maxima concentration are common to the CFD models, but there are some areas, which appear in some models but not in others. It could be due to:
  - how the emission data were processed to input the models?
  - the numerical methodology for post-processing the monthly average concentrations?
- Gaussian models (except CERC-ADMS) predict lower maxima than CFD models