Emission inventories in Malopolska/Krakow

FAIRMODE Technical Meeting, Athens XX.06.2017

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JRC Krakow integrated project 2005

- **From toxic emissions to health effects- an integrated emissions, air quality and health impacts case study in Krakow**
  - **Field campaign 2005**
  - **Modelling exercise**

Philippe Thunis and Kees Cuvelier could say more ☺

JRC Krakow integrated project 2005

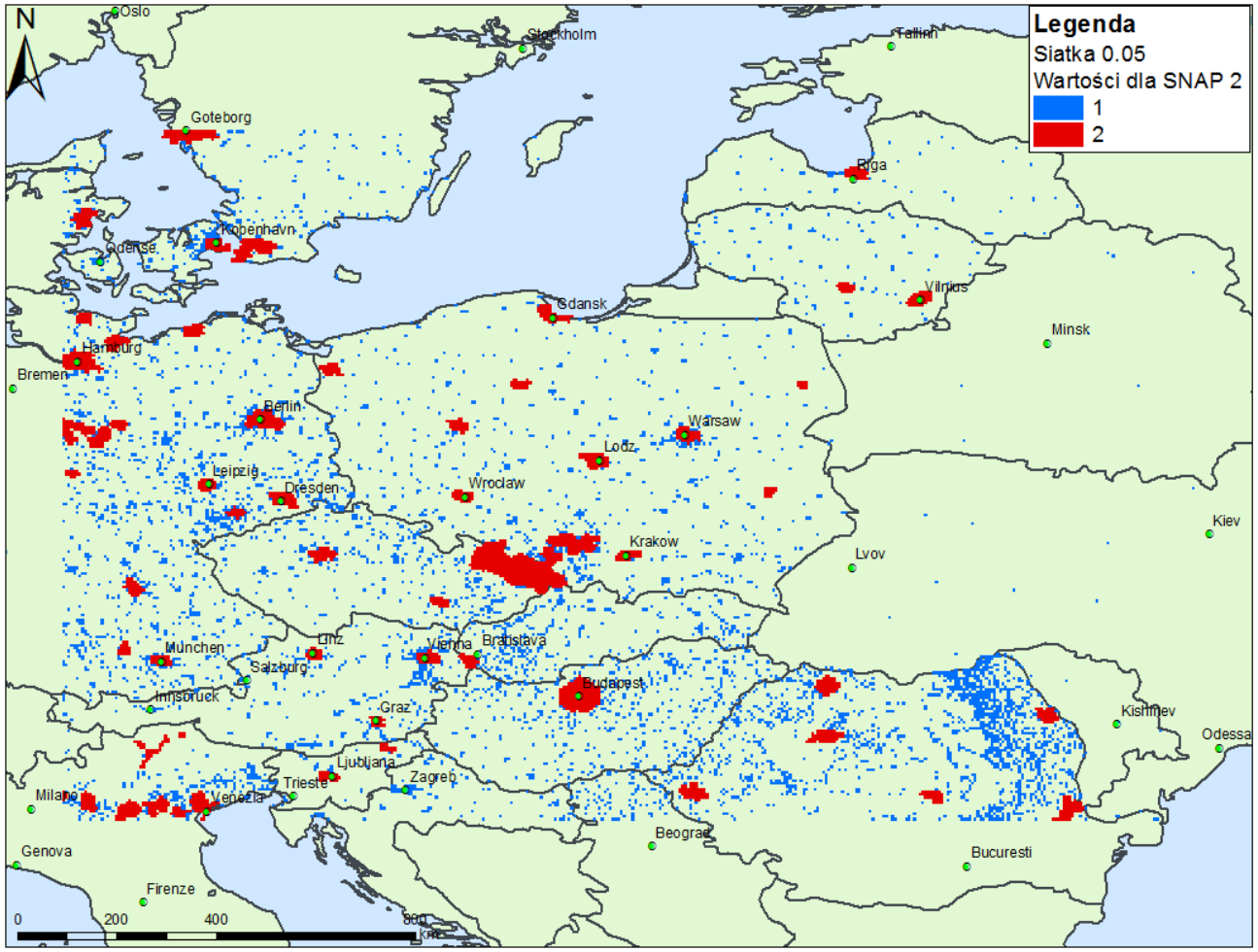
- WP 1 Emission Characterisation
- WP2 Emission inventories and synthetic emission reduction scenarios
- WP 3 PM outdoor/ indoor and human exposure monitoring campaign
- WP 4 Air Quality Modelling
- WP 5 Source apportionment
- WP 6 Health effects

Two WPs dedicated to emission inventory issues in Malopolska

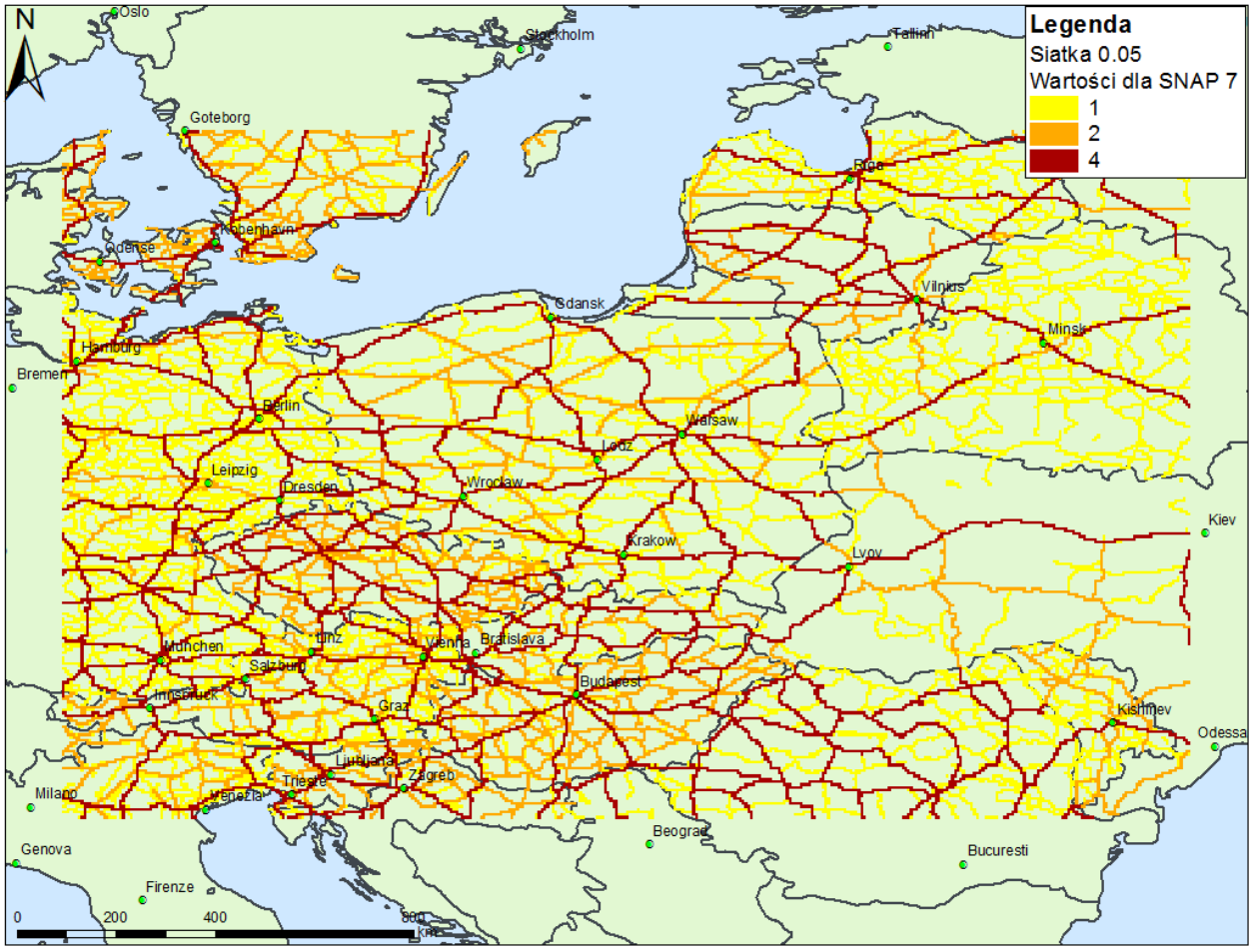
Emissions used for AQ forecast

- Top-down (relocated EMEP to 5km based on GIS database) → verified
  - SNAP sectors
  - 0.05deg
  - Pollutants – NOx, SOx, CO, NMVOC, PMs

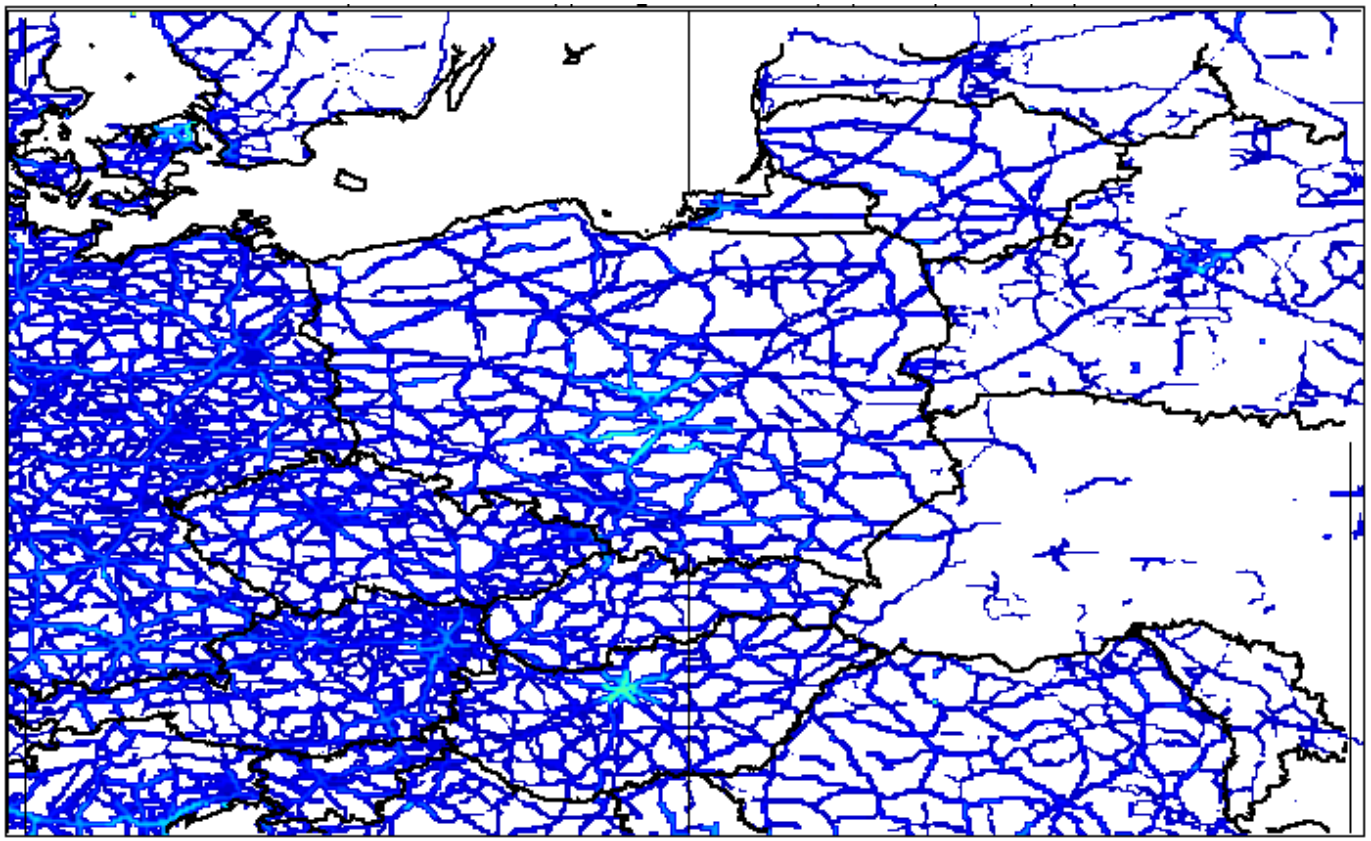
Relocation mask – SNAP02



Relocation mask – SNAP 07



EMEP relocated – SNAP7



NO2 – SNAP07

New bottom-up inventory

- Prepared in LIFE IP
  - Types (point/area/line sources; other)
  - Resolution: 0.1km for Krakow,
    0.25km for other urban areas
  - Pollutants (NOx, SOx, CO, NMVOC, PMs + more)
  - Excel files and shp (per sector, per pollutant)
- Used for improvement plans

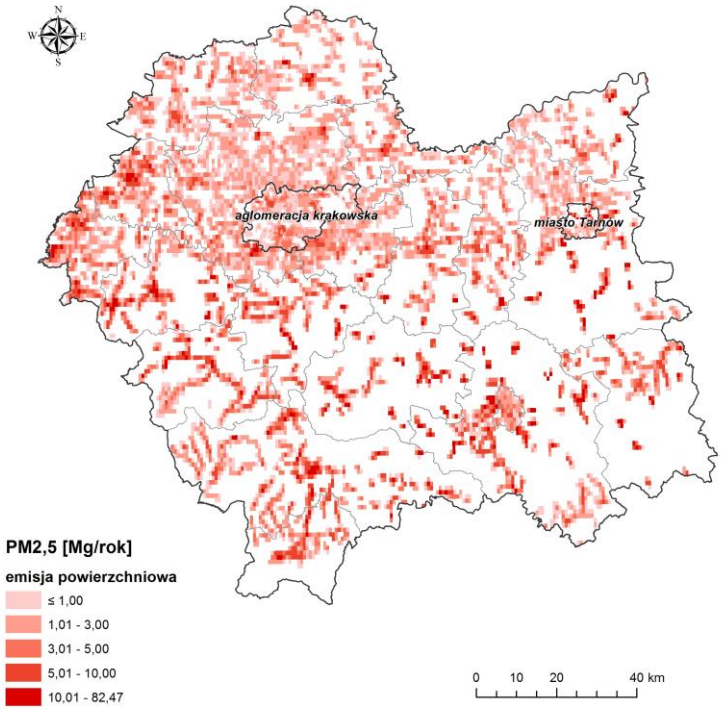
BUT

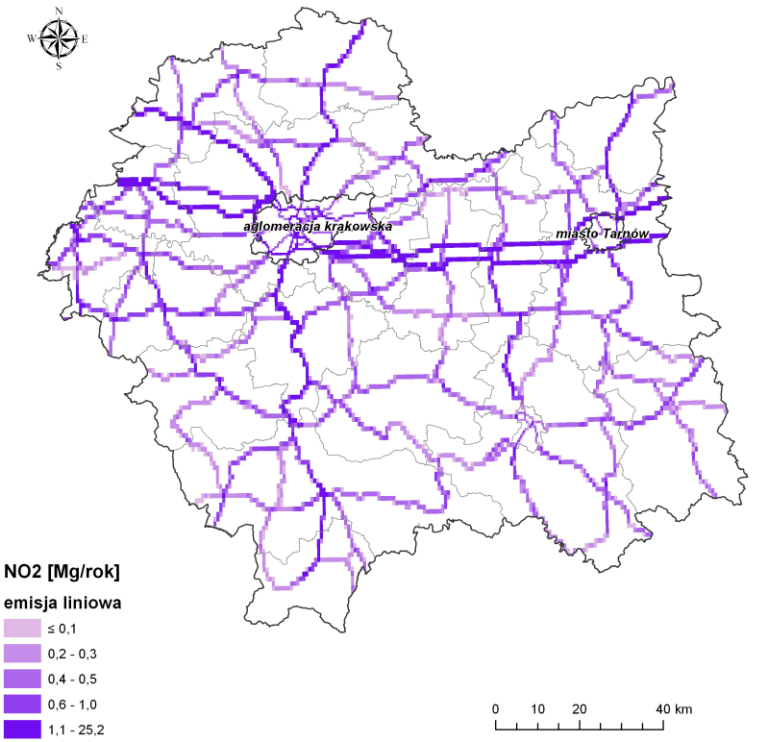
- Verification – ongoing

(modelling shown inconsistencies on the boarders and general overestimation)

Will be made available after correction

Examples


aglomeracja krakowska
miasto Tarnów
PM2,5 [Mg/rok]
emisja powierzchniowa
≤ 1,00
1,01 - 3,00
3,01 - 5,00
5,01 - 10,00
10,01 - 82,47
0 10 20 40 km


aglomeracja krakowska
miasto Tarnów
NO2 [Mg/rok]
emisja liniowa
≤ 0,1
0,2 - 0,3
0,4 - 0,5
0,6 - 1,0
1,1 - 25,2
0 10 20 40 km

Summary

- Issues:
  - Bottom up highly inconsistent with top-down
  - “real emission” changes every year due to changes in household heating technology (forced by recent regulations)
  - Part of bottom-up estimates based on “declared emission level” and population density
  - Unknown fraction of emission flux due to waste burning (especially during winter period) → monitoring of waste load shows annual pattern with minimum in wintertime