Anthropogenic NOx emissions
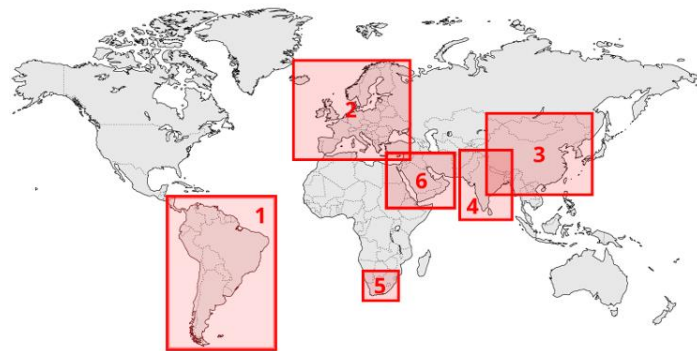
Ronald van der A, Jieying Ding, Henk Eskes, Bas Mijling (KNMI)

DECSO
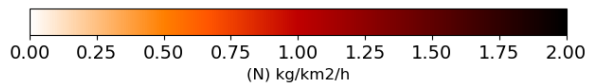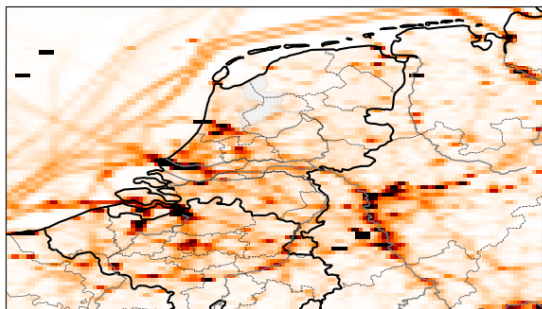## Daily Estimates Constrained by Satellite Observations

- Fast: one model run per assimilation step of 1 day
- No *a priori* information needed: unknown sources become visible
- Full error estimation
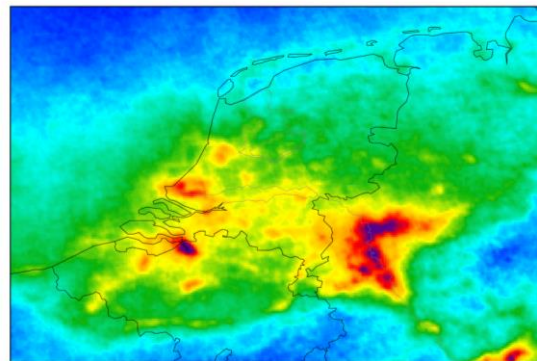- Used for daily **NO_x** and **NH_3** emissions
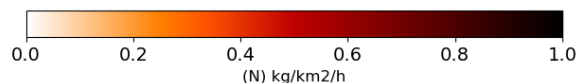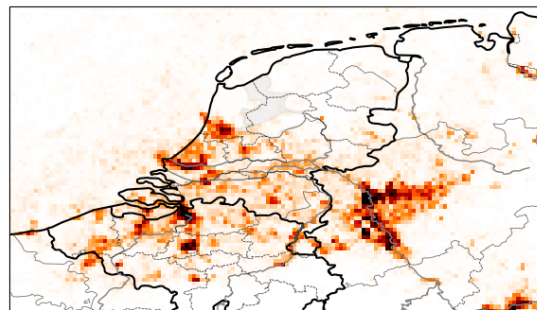
NOx emissions
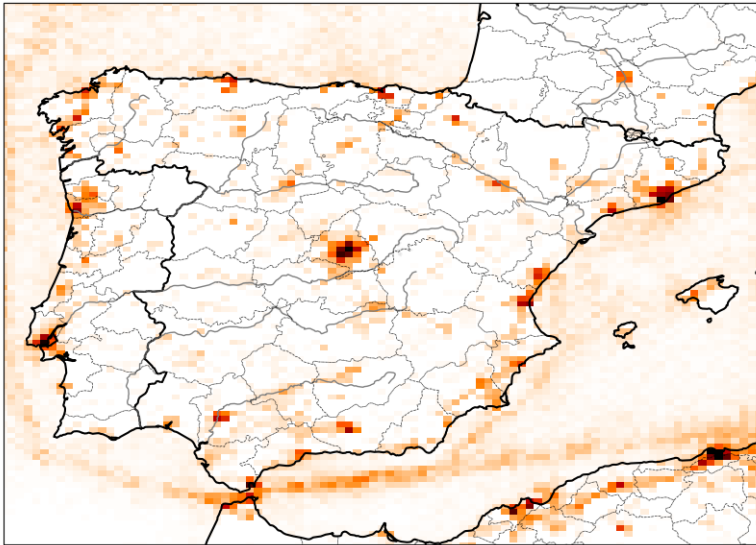
Bottom-up emissions
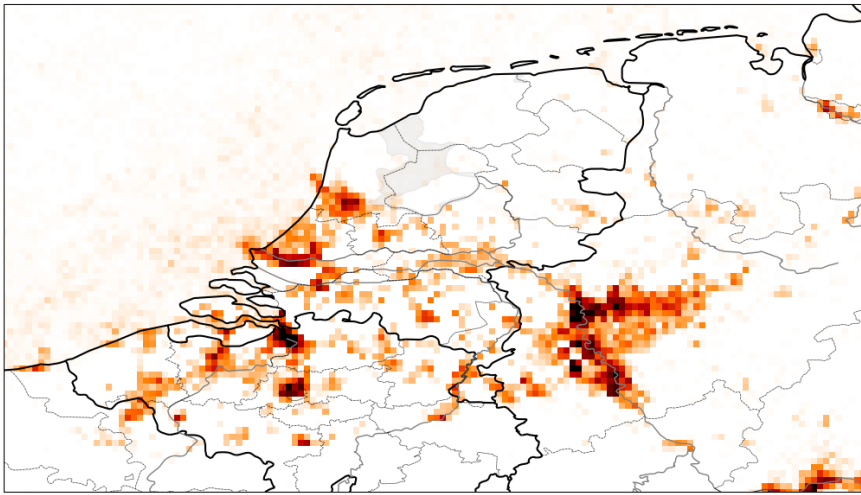
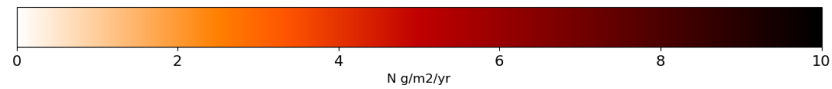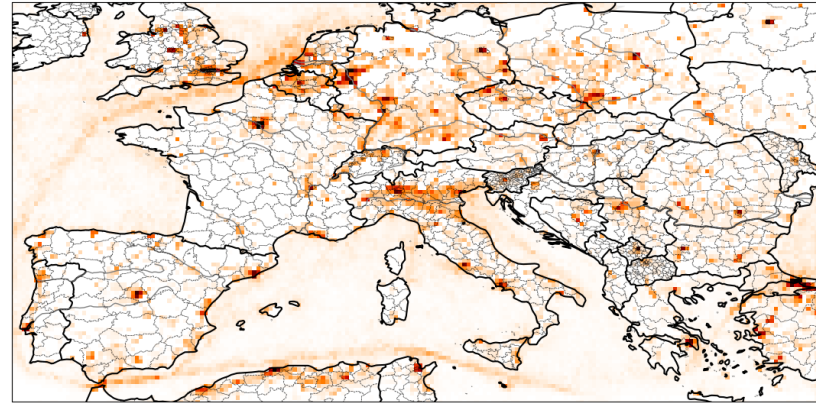Sentinel–5P NO₂ tropospheric column, 2019 yearly mean

- Averaged TROPOMI NO2 observations (3.5x5 km)

- Meteorology plays a role
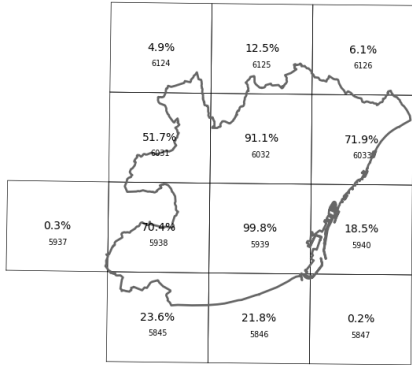
- Calculated NOx emissions

- Resolution is 0.05˚ (4-5 km)

REGIONS

DECSO 2019

N g/m2/yr

Timeseries NO$_X$ emissions Barcelona

Barcelona and DECSO grid

Total emissions
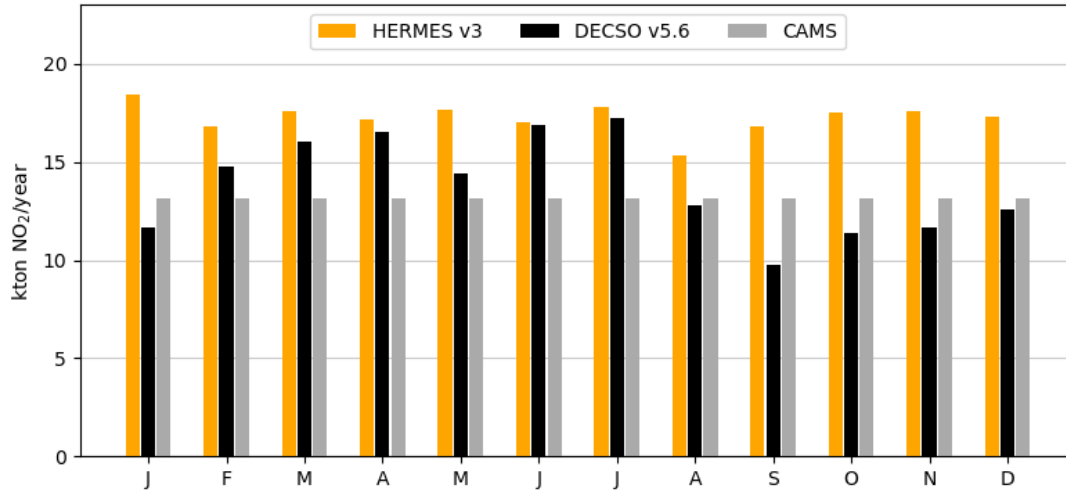
HERMES v3 (2019):   17.3 kton NO$_2$

DECSO v5.5.9 (2019): 13.8 kton NO$_2$

CAMS (2017):   13.2 kton NO$_2$

2019

NOx emissions Barcelona

Barcelona — 2020

Start COVID regulations
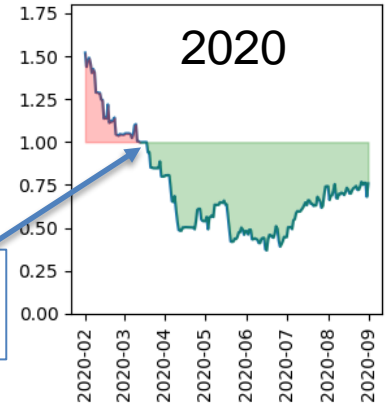
Anthropogenic NOx emissions

Regional Emission Maps from satellite

Timeseries (up to the present)

Observation-based data