



SEEDS
Sentinel EO-based Emission
and Deposition Service



Anthropogenic NO_x emissions

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CERFACS
CENTRE EUROPÉEN DE RECHERCHE ET DE FORMATION AVANCÉE EN CALCUL SCIENTIFIQUE



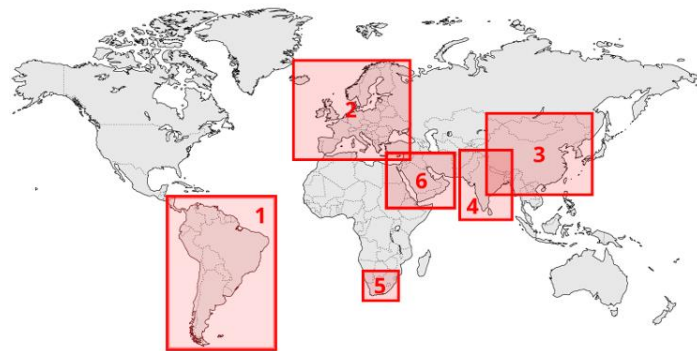
isardSAT[®]
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DECSO

Daily Estimates Constrained by Satellite Observations



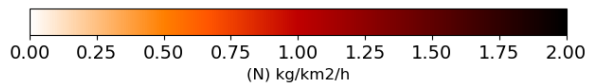
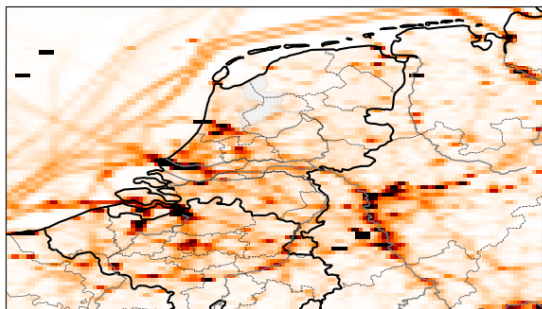
- Fast: one model run per assimilation step of 1 day
- No *a priori* information needed: unknown sources become visible
- Full error estimation
- Used for daily **NO_x** and **NH₃** emissions



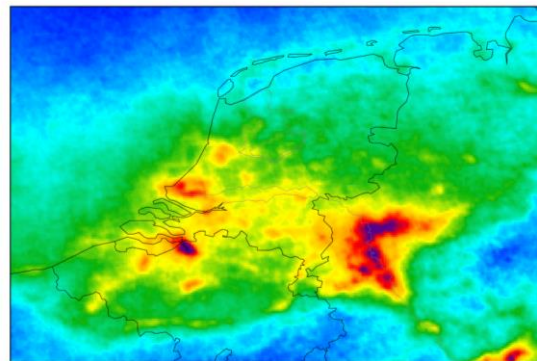
NO_x emissions

Bottom-up emissions

CAMS 2017

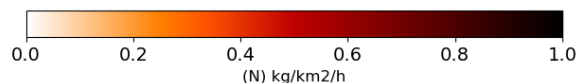
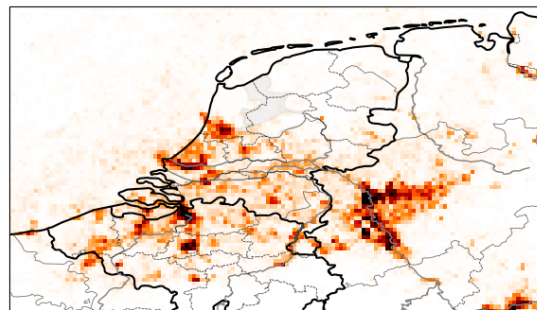


Sentinel-5P NO₂ tropospheric column, 2019 yearly mean



NO₂ tropospheric column ($\mu\text{mol}/\text{m}^2$)

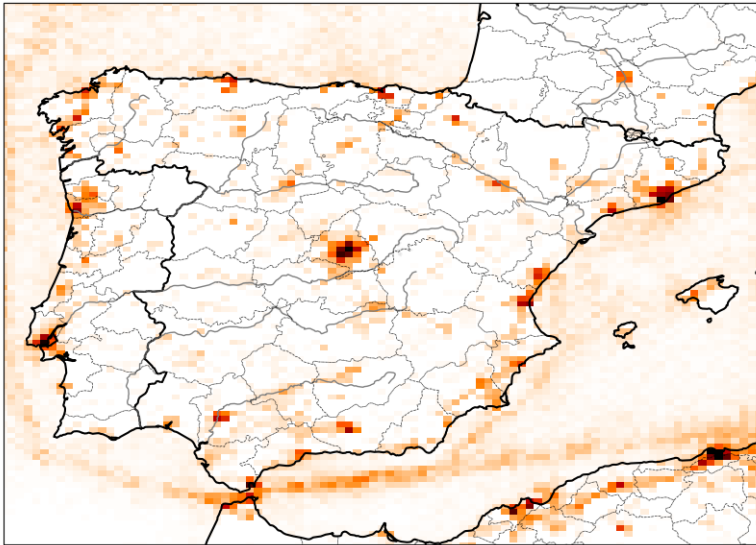
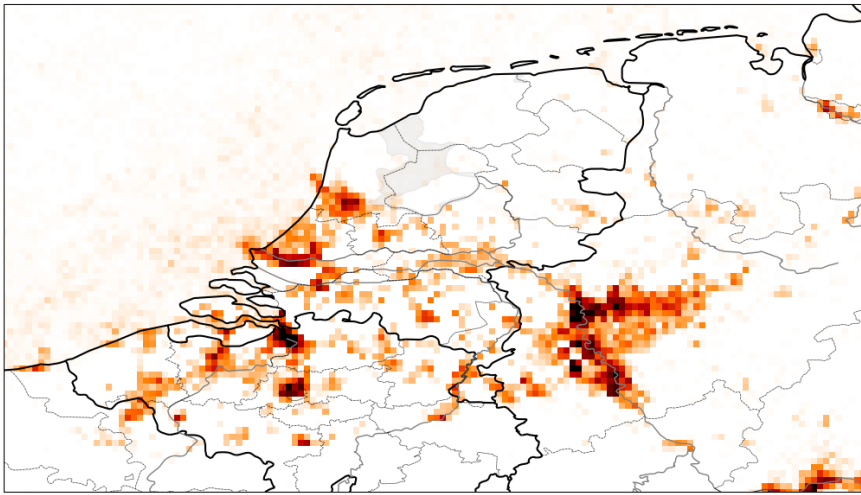
DECSO 2019



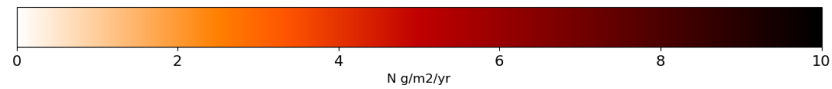
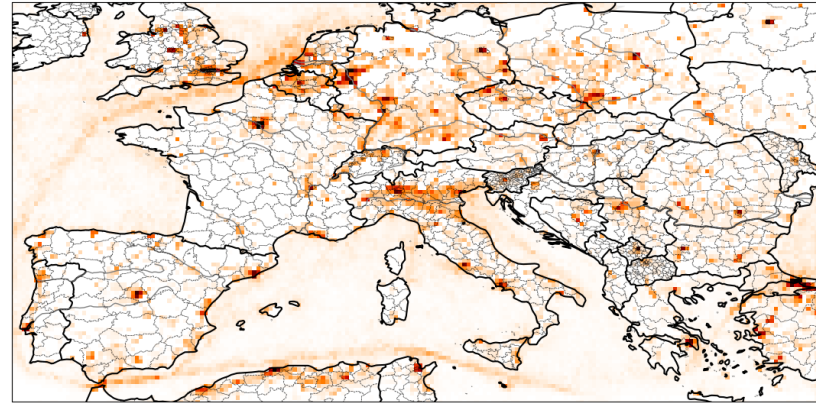
- Averaged TROPOMI NO₂ observations (3.5x5 km)
- Meteorology plays a role

- Calculated NO_x emissions
- Resolution is 0.05° (4-5 km)

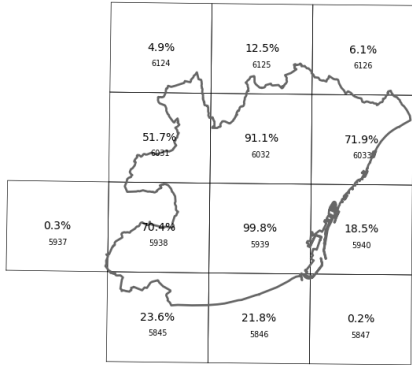
REGIONS



DECSO 2019



Barcelona and DECSO grid



Timeseries NO_x emissions Barcelona

Total emissions

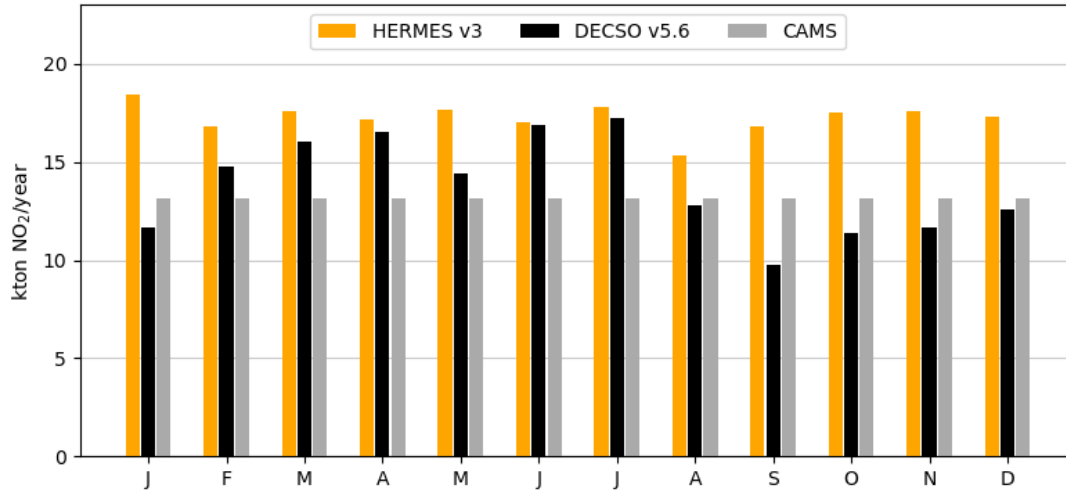
HERMES v3 (2019): 17.3 kton NO₂

DECSO v5.5.9 (2019): 13.8 kton NO₂

CAMS (2017): 13.2 kton NO₂

2019

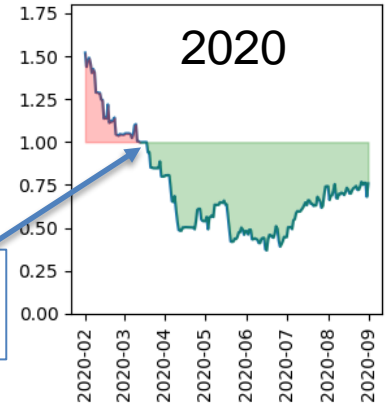
NO_x emissions Barcelona



Barcelona

2020

Start COVID regulations





SEEDS

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Anthropogenic NO_x emissions

Regional Emission Maps from satellite

Timeseries (up to the present)

Observation-based data



Funded by
the European Union