



SEEDS
Sentinel EO-based Emission
and Deposition Service



Industrial NO_x emissions and validation

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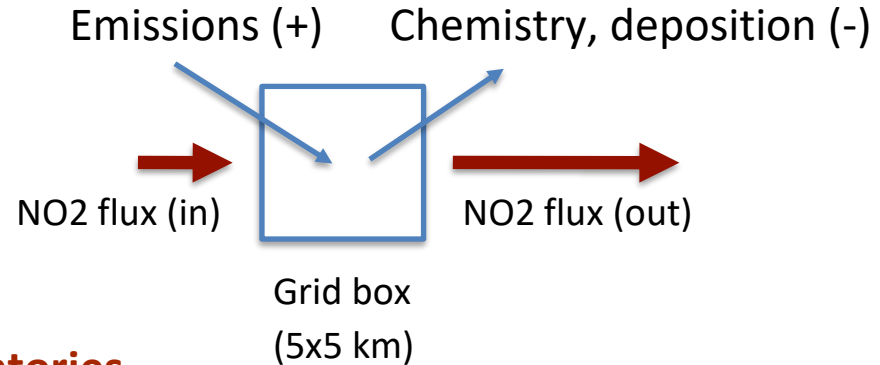
isardSAT
lobelia.

Validation of satellite-derived emissions



1. Alternative **mass balance approach** to estimate emissions

- Uses satellite columns + wind
- Highly independent to DECSO
- **Estimate of uncertainties**



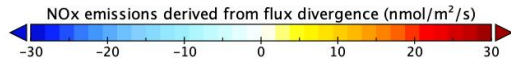
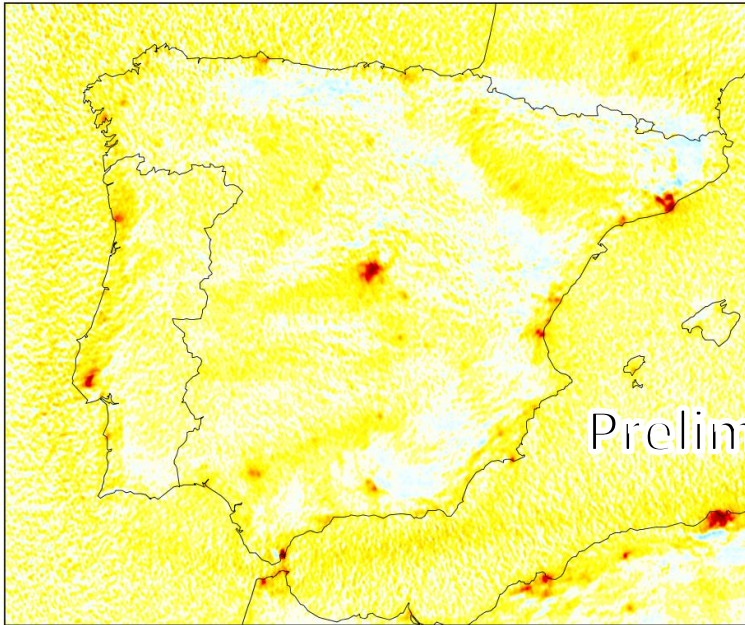
2. Comparisons with **bottom-up emission inventories**

- European scale, e.g. CAMS-TNO emissions, E-PRTR
- National, e.g. Netherlands "Emissieregistratie"
- Local, e.g. Catalonia, Spain

TROPOMI NO₂ emissions: DECSO versus Flux-divergence

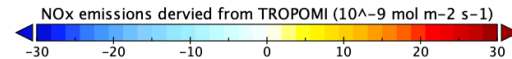
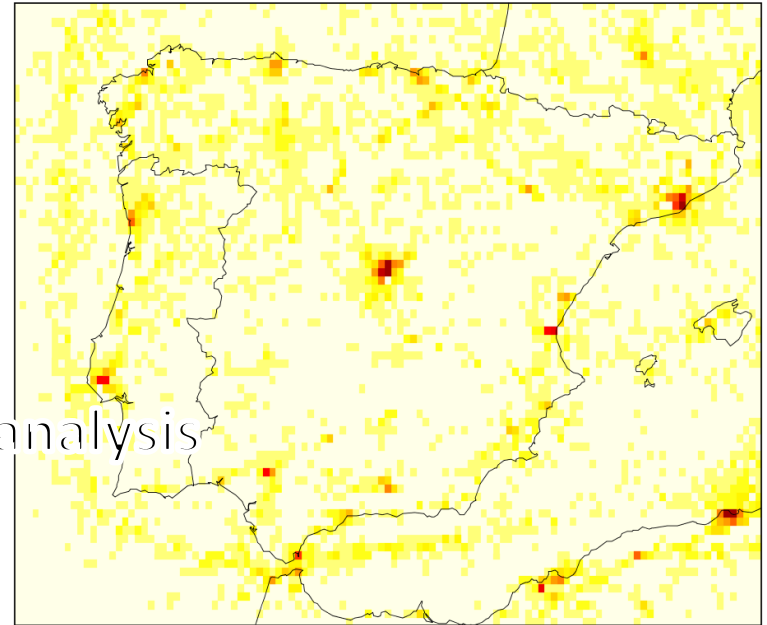
Flux-divergence

Sentinel-5P, JJA-2019, NO_x emissions derived from NO₂ flux divergence, tau=4h



DECSO

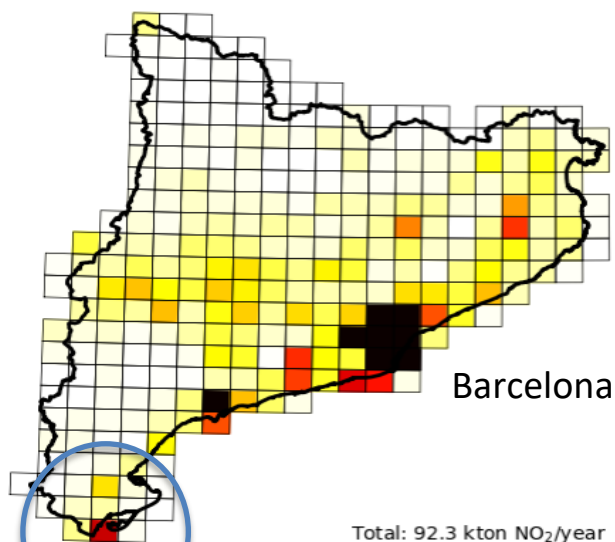
DECSO NO_x emissions derived from TROPOMI, July 2019



Preliminary analysis

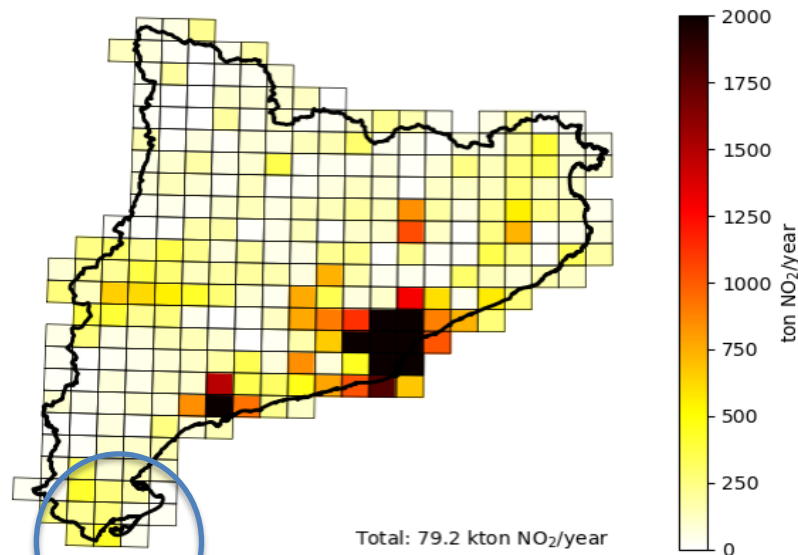
Comparison with regional bottom-up inventory HERMES (Catalonia, Spain)

HERMES



HERMES predicts a major point source:
Alcanar Cement production plant

DECOSO

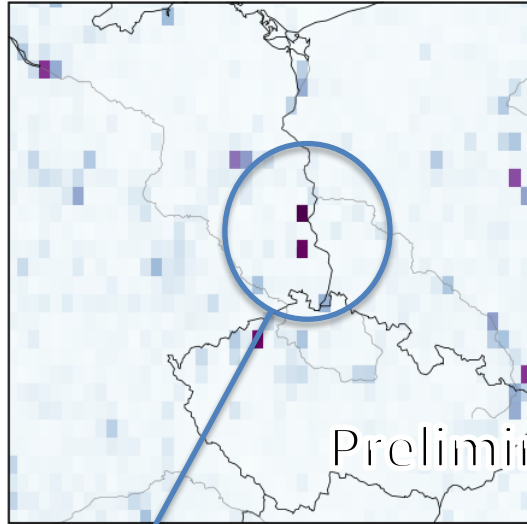


But TROPOMI observes no, or only a
small NO₂ enhancement
over the background

Coal mining and power plants in East Germany

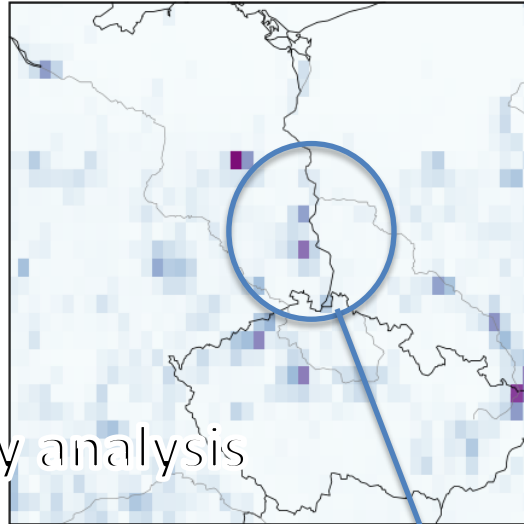


CAMS-TNO emissions 2017



The CAMS-TNO power plant emissions

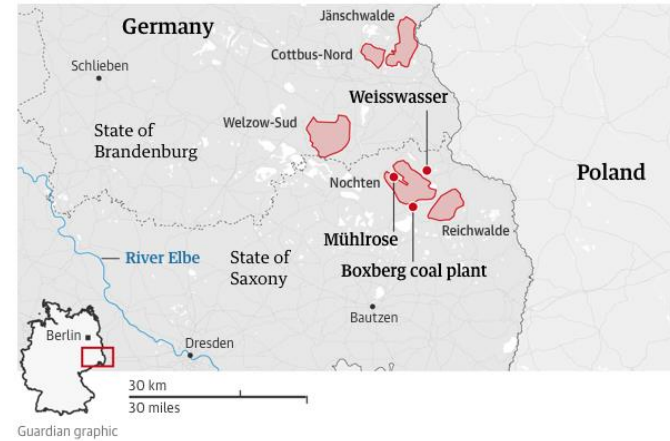
DECSO 2019



DECSO derived emissions based on TROPOMI NO2

Preliminary analysis

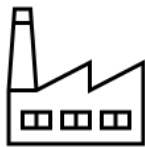
Europe's largest lignite mines





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Industrial NO_x emissions

- Rich database of TROPOMI satellite-derived point-source emissions, to be compared with bottom-up (E-PRTR) and local emission measurements
- Two independent satellite emission estimates to better quantify uncertainties



Funded by
the European Union