



Atmosphere Monitoring

CAMS update

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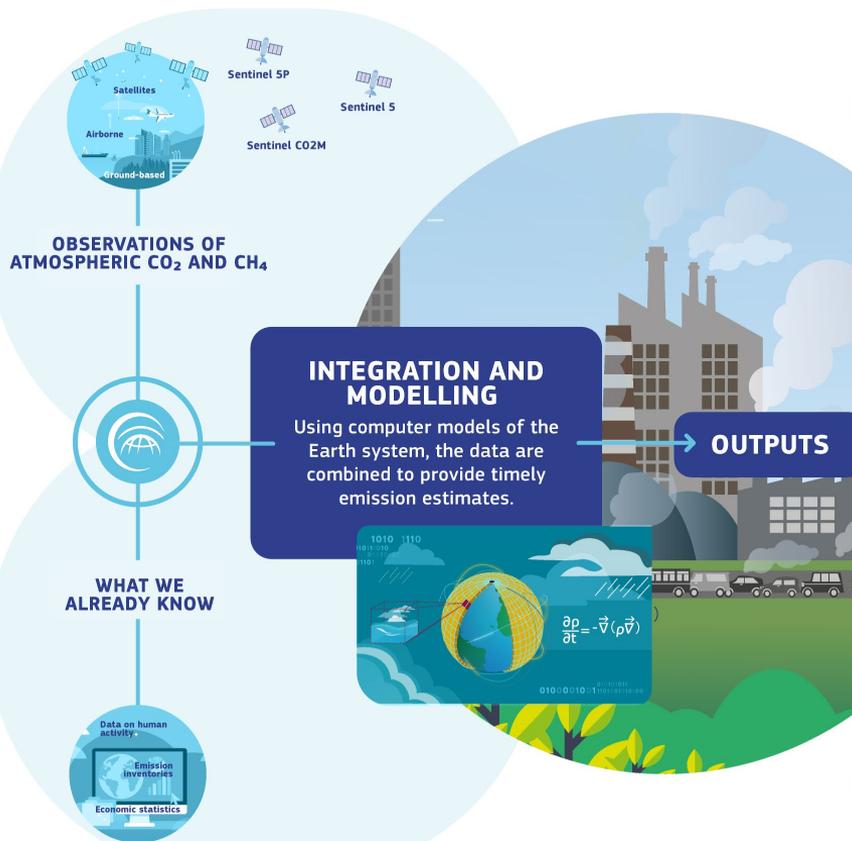
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ECMWF



Greenhouse gas emissions monitoring capacity





Atmosphere
Monitoring

Support for new challenges – emission monitoring



CLIMATE CHANGE National Inventory Report, Germany – 2022

**Submission
under the United Nations Framework Convention
on Climate Change and the Kyoto Protocol
2022**

National Inventory Report
for the German Greenhouse Gas Inventory
1990 – 2020
Federal Environment Agency

UNFCCC Submission
15 April 2022

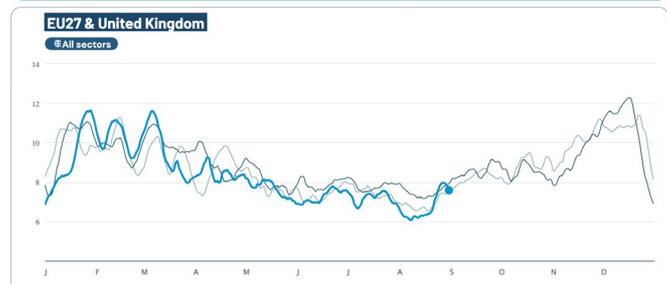





CAMS CURRENT OFFER ON GHG INFORMATION PRODUCTS

Atmosphere
Monitoring

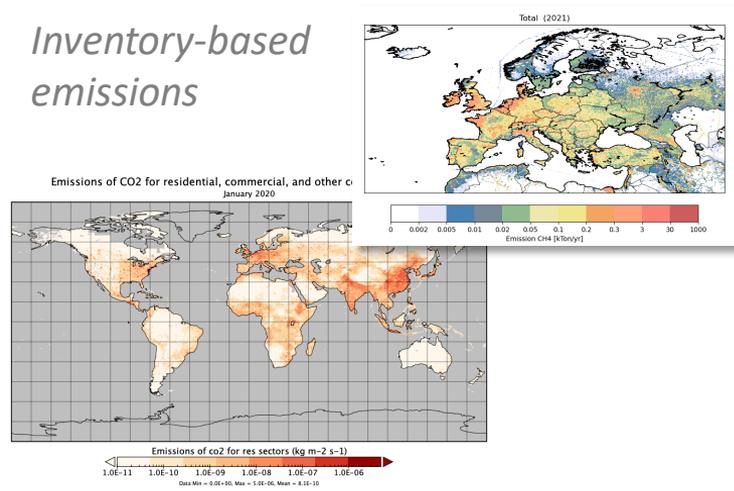
TOTAL CO₂ EMISSIONS PER YEAR (MtCO₂/day)



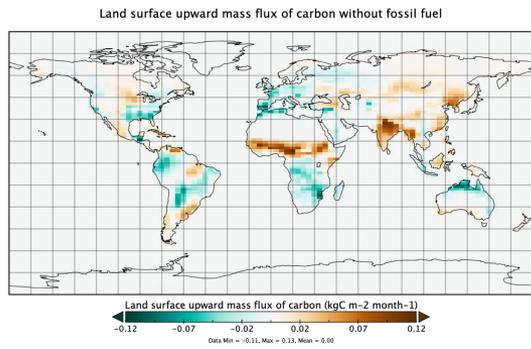
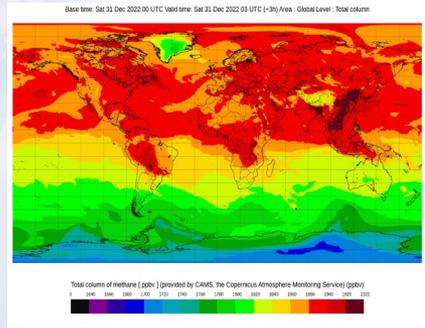
th
eu.carbonmonitor.org - October 10, 2023

Activity-based
emissions

Inventory-based
emissions



Daily global forecasts of atmospheric CO₂ and
CH₄ concentrations at high resolution



Annually updated
flux inversions
(monthly) for CO₂,
CH₄, and N₂O



Atmosphere
Monitoring

Research & Innovation to support implementation

Horizon 2020



Greenhouse gases



Atmospheric pollutants

Horizon Europe



Greenhouse gases



Atmospheric pollutants



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Atmosphere
Monitoring

CAMS new products

CAMS2_53a Development and provision of hot-spot observation-based emissions of methane

This ITT, entitled “Development and provision of hot-spot observation-based emissions of methane”, is for providing quantitative estimates of methane emissions from large point sources around the world based on satellite data.

DEADLINE 6th October 2023

And...

- Further IFS development
- Increased focus on bottom-up emissions
- Implementation of EQC framework
- More user engagement
- Continuation of existing products & services



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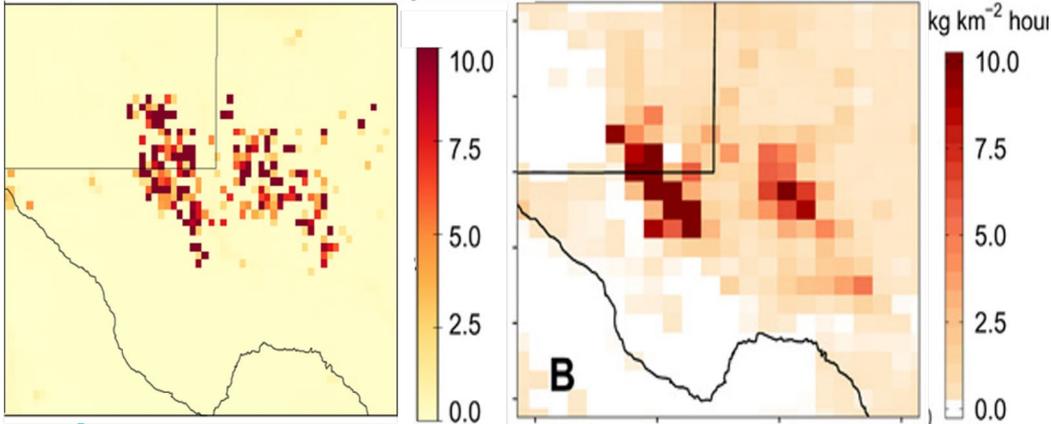


Preliminary results: IFS-based CH₄ and NO_x emissions

CH₄ inversion over Permian Basin

IFS posterior

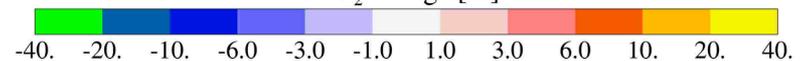
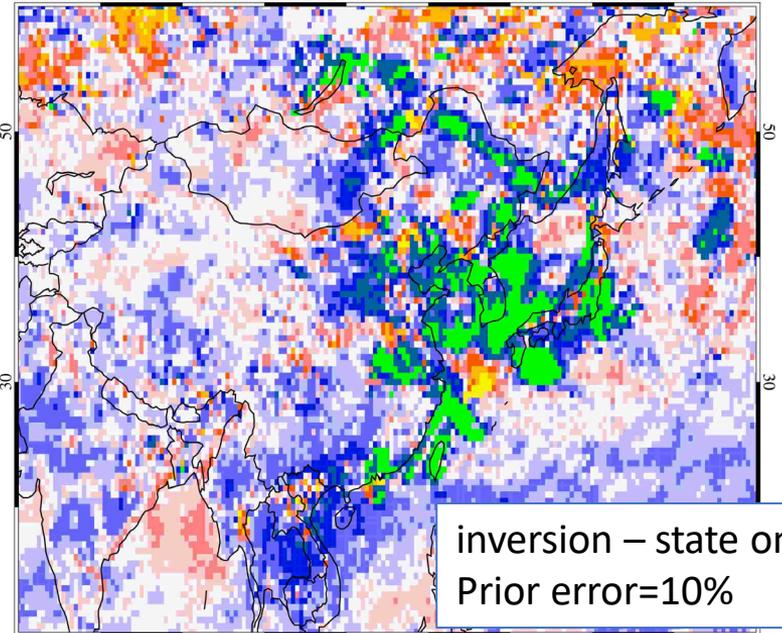
Zhang et al.



- CH₄ inversion results in agreement with previous studies.
- NO_x inversion results show small improvements over Southeast Asia (ongoing prior errors sensitivity tests).

NO_x inversion (04/2020)

% rms change for i1fb (sttd=0.1) vs hyl8 (ctrl)



Evaluation of 24h forecasts (0-24h) of IFS against TROPOMI NO₂ (PAL)



Last year of CoCO2, but the work continues



[CoCO2 Final Meeting and CORSO GA Meeting](#)

The CoCO2 project, in collaboration with the CORSO project, will hold its final General Assembly from Monday 20 to Wednesday 22 November 2023.

[Learn more](#)



Atmosphere
Monitoring Service

atmosphere.copernicus.eu



CORSO
CO2MVS Research on
Supplementary
Observations



CATRINE
Carbon Atmospheric Tracer
Research to Improve
Numerics and Evaluation



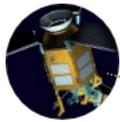
PARIS
DATA
MODELS
INVENTORIES



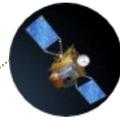


Atmosphere Monitoring

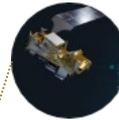
Towards operational CAMS Emission Services



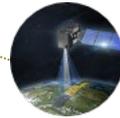
Sentinel 5p



Sentinel 4



Sentinel 5



CO₂ Mission

SATELLITE MISSIONS

CO₂ TASK FORCE GUIDANCE DOCUMENTS



2015



2017



2019

2018



2017



RESEARCH AND PREPARATORY PROJECTS



2021



2022

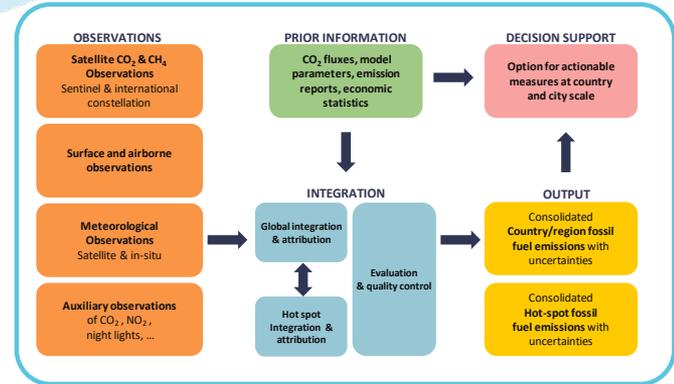
Operational ramp-up in CAMS

Air Quality emissions 2025

2026

CO₂ Monitoring & Verification Support (CO₂MVS)

SERVICE COMPONENTS



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Thank you

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