

FAIRMODE

Forum for air quality modelling in Europe



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A beautiful friendship?

Leonor Tarrasón & Laurence Rouil

7th FAIRMODE Meeting - Baveno, Italy, 11th and 12th February 2014,

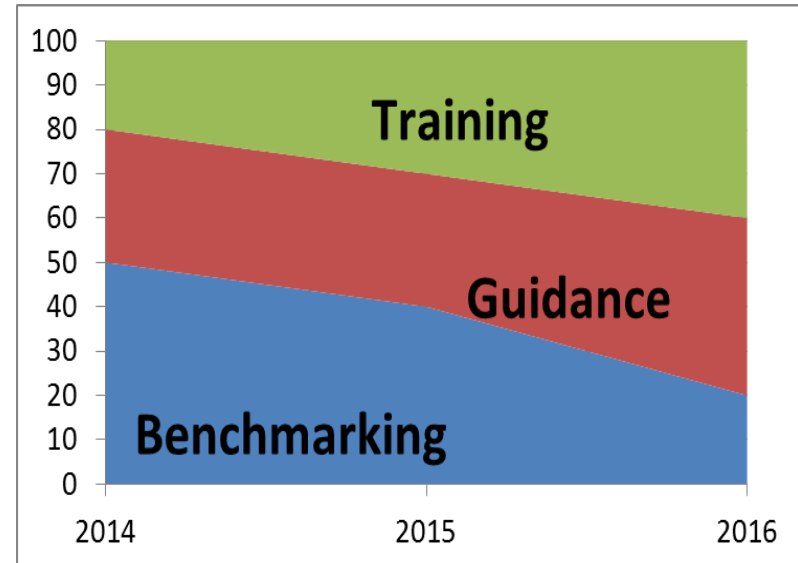
MACC potential links to FAIRMODE

1. MACC activities are cross-cutting (CC1, CC2, CC3)
2. Assessment products (WG1)
3. Regional Downscaled Emissions (WG2)
4. Source Allocation Information (WG3)
5. Planning Tools (WG4)

1. Cross-cutting activities

MACC teams currently share top- of- science - expertise concerning FAIRMODES cross-cutting activities

1. Forecasting - boundary conditions (CC1)
2. Spatial Representativeness (CC2)
3. Models and measurements - Data assimilation - (CC3)



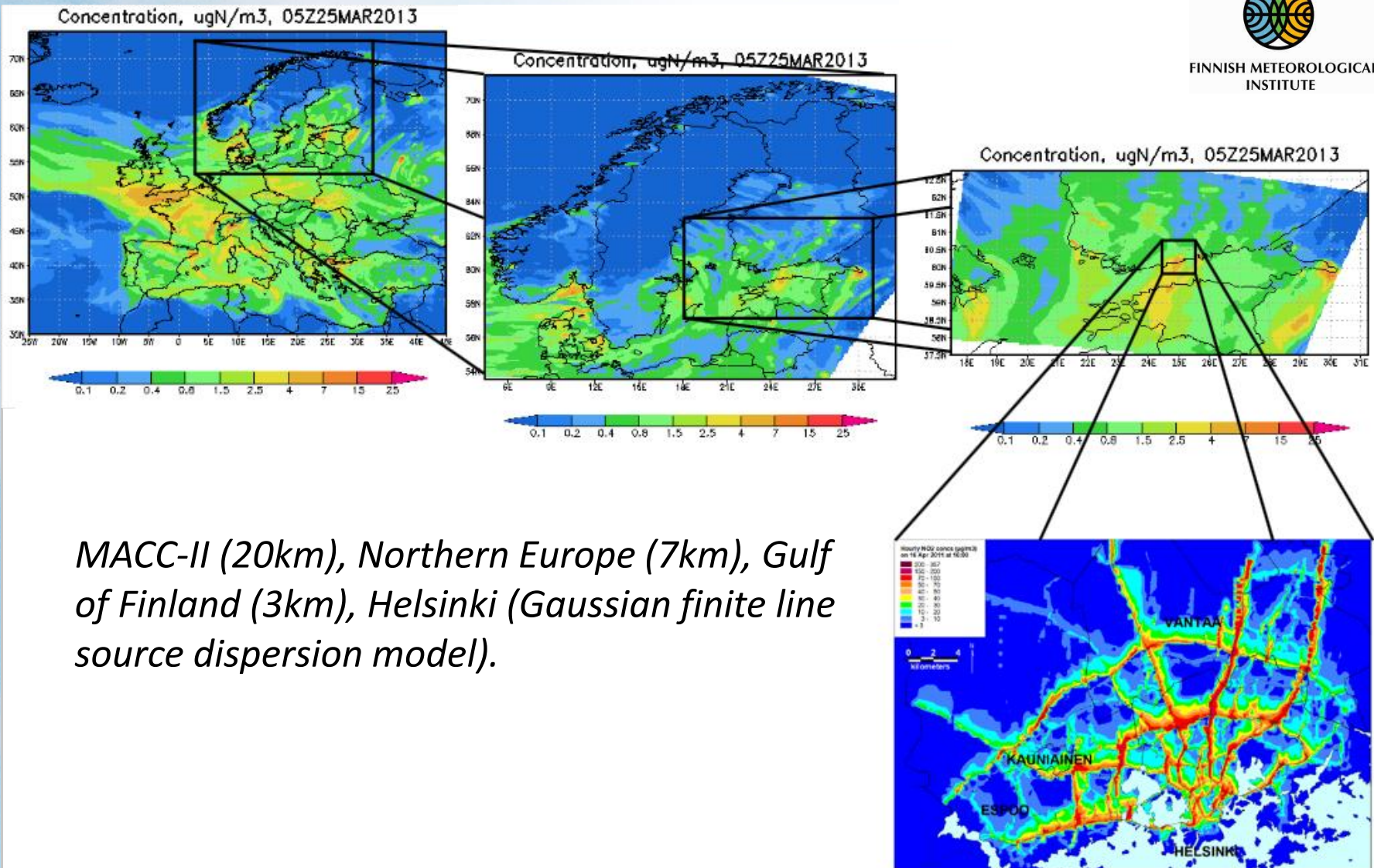
Active participation from MACC teams is meaningful for FAIRMODE benchmarking

CC1: Forecasting

Core to downstream: National and local forecasting activities



FINNISH METEOROLOGICAL
INSTITUTE

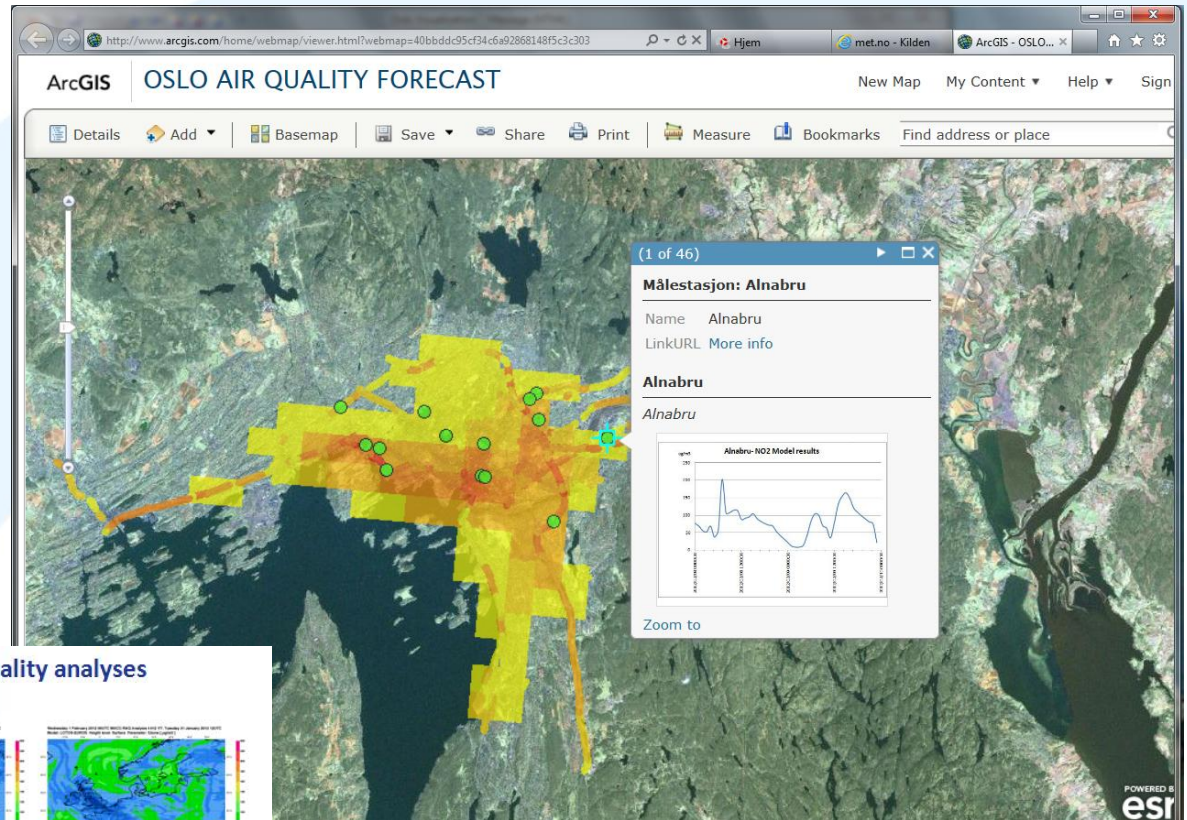


MACC-II (20km), Northern Europe (7km), Gulf of Finland (3km), Helsinki (Gaussian finite line source dispersion model).

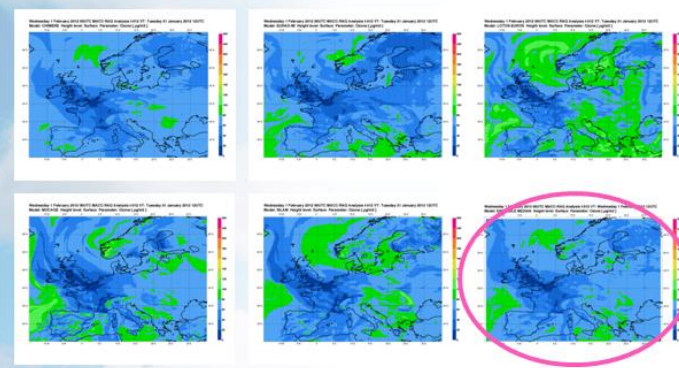
CC1- Forecasting BETTER CITY AIR forecasts in 9 Norwegian cities

Coupled systems:

The Norwegian city forecasts in 1x1km² use boundary conditions from the MACC ensemble



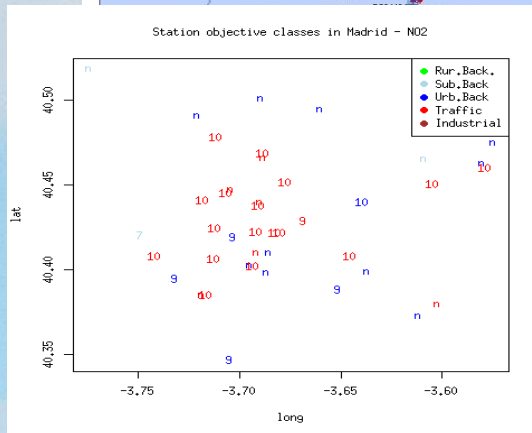
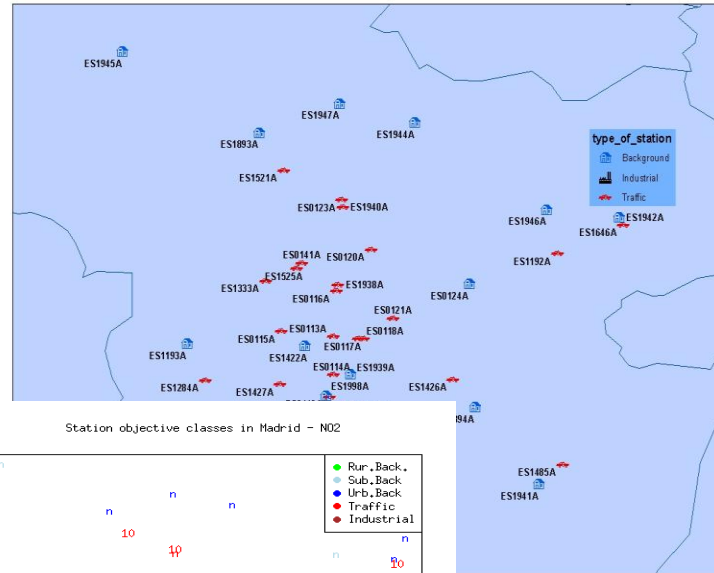
EDA/ENS: ensemble of European air quality analyses



👍 Are you the next one to use MACC BC?

CC2: Spatial Representativeness Madrid

All stations in the city (classified as urban background or urban traffic in AirBase) show similar behaviour according to the new classification.

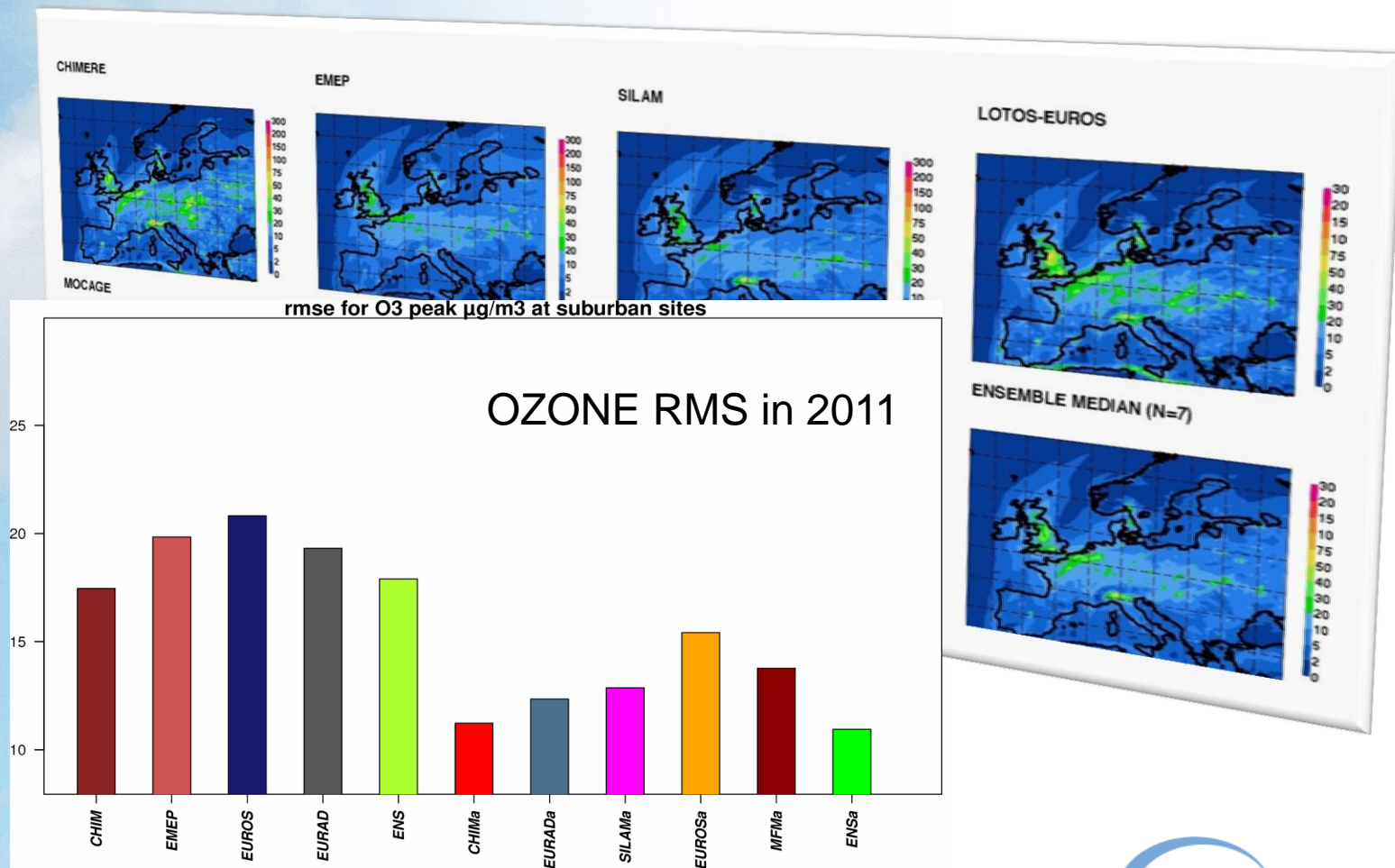


Guidance contribution at FAIRMODE?



CC3: Measurement and Modelling

MACC teams expertise in data assimilation



Guidance at FAIRMODE?

2. Assessment products (WG1)

European wide AQ Yearly Reports

- Ensemble products
- Satellite observations
- Data assimilated
- Focus on episodes

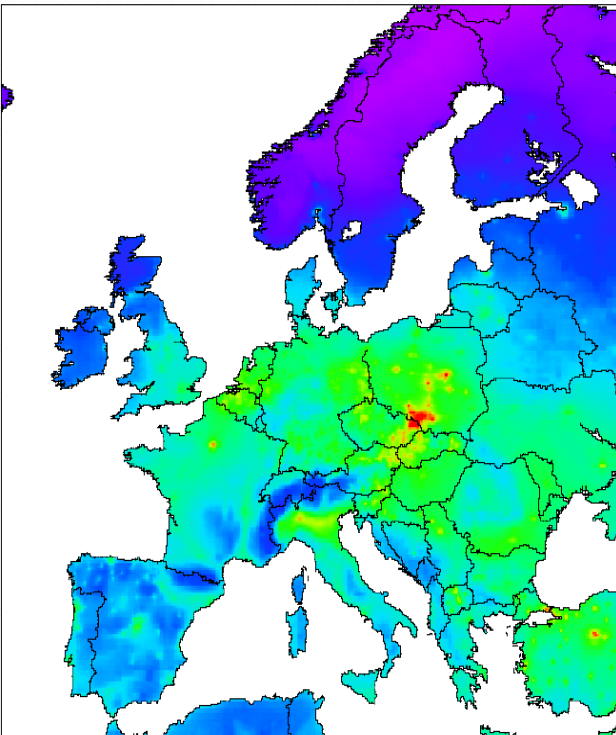
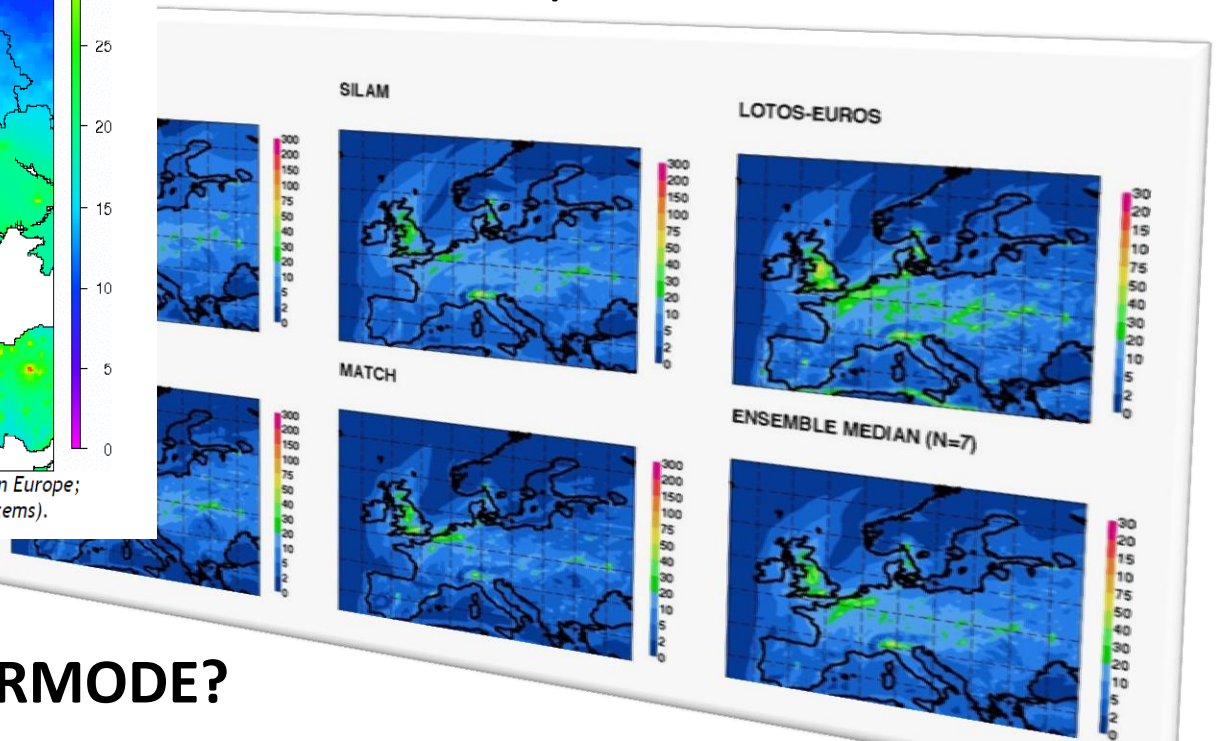


Figure 21. 2010 Reanalysis of the PM10 winter average in Europe; (Ensemble data assimilated chain of the MACC-II/EVA systems).



Benchmarking at FAIRMODE?

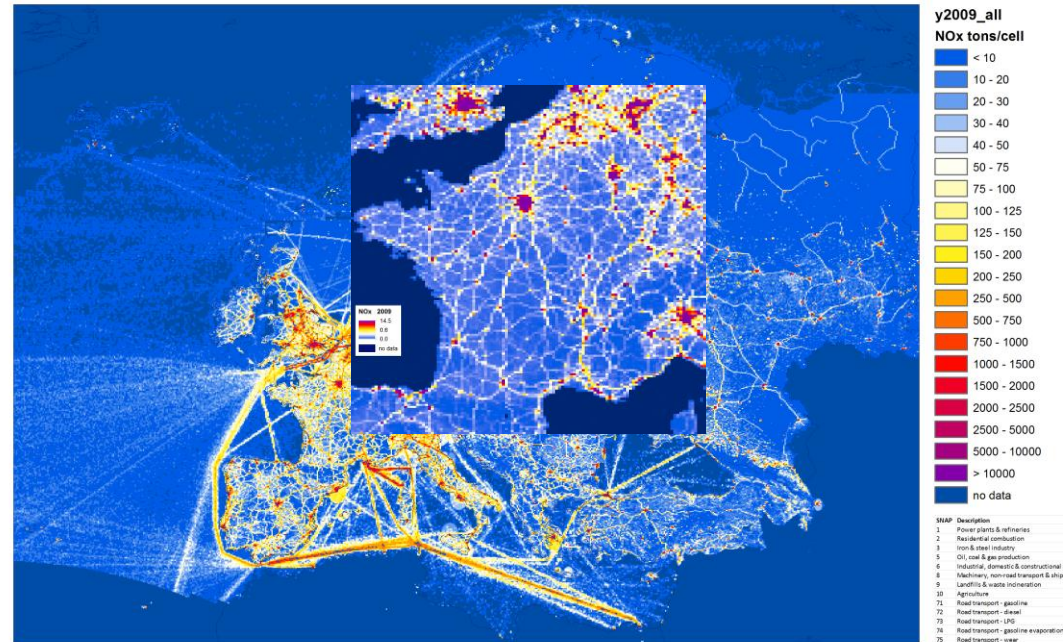
3. Regional Downscaled Emissions (WG2)

«An unexpected success!»

Most AQ modelling groups in Europe use the **TNO MACC-II** emission inventory

THIS INVENTORY CAN BE USED FOR BENCHMARKING IN FAIRMODE WG2

- a) GMES Emission Workshop, October 2011
- b) GEIA workshop, June 2012
- c) New GEIA workshop, June 2014



THE ECCAD - THE GEIA DATABASE

LOGIN [Not yet registered?](#)

Emissions of atmospheric Compounds & Compilation of Ancillary Data

Data Catalogue | Data Visualization | Emission Calculation

Emissions Inventories

GLOBAL INVENTORIES

- MACCcity ACCMIP RCPs EDGARv4.2 PEGASOS_PBL
- EDGARv3.2FT2000 RETRO
- ECLIPSE_GAINS_4a Junker-Liousse HYDE1.3 Andres_CO2_2013
- AIMAP_Mercury
- GFASt1.0 GFED3 GFED2 GICC AMMABB
- MEGAN2 MEGAN-MACC MEGAN2-CH3OH
- GEIAv1 POET

Developed for ongoing projects

- IS4FIRES
- GUESS-ES GUESS-ES-Scenario
- CCMI

REGIONAL INVENTORIES

- TNO-MACC-II (Europe) TNO-MACC (Europe)
- EMEP (Europe) Assamoi-Liousse (Africa)
- India_NOx (India) SAFAR-India (India)
- REAS (Asia)

Developed for ongoing projects

- ChArMEx (Mediterranean)

Ancillary Datasets

| | | | |
|---------------------|-------------------------------------|-------------------|---------------------------------|
| LAND COVER | FIRES | POPULATION | GEOGRAPHICAL INFORMATION |
| UMD CLM3 GLC2000 | WFA GBA2000 Geoland2_BAv1_Africa | GPW3_Population | GPW3 Region_IMAGE2.4 Pixel_Area |

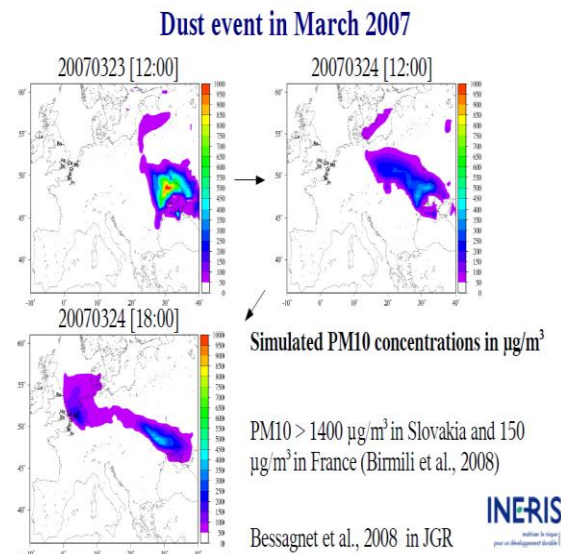
Partners: imacc, gmes, eccad, geia, ileaps, ethz, cnrs

ECCAD v6.6.3 ©2009-2015 CNRS-LEOD

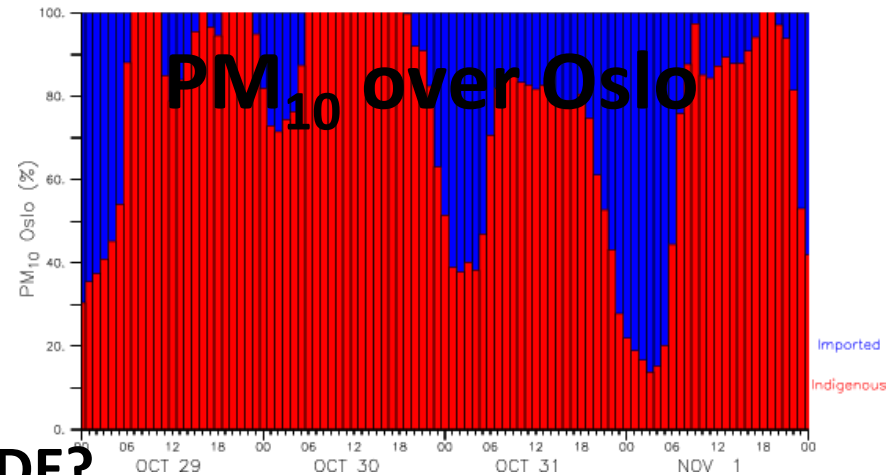
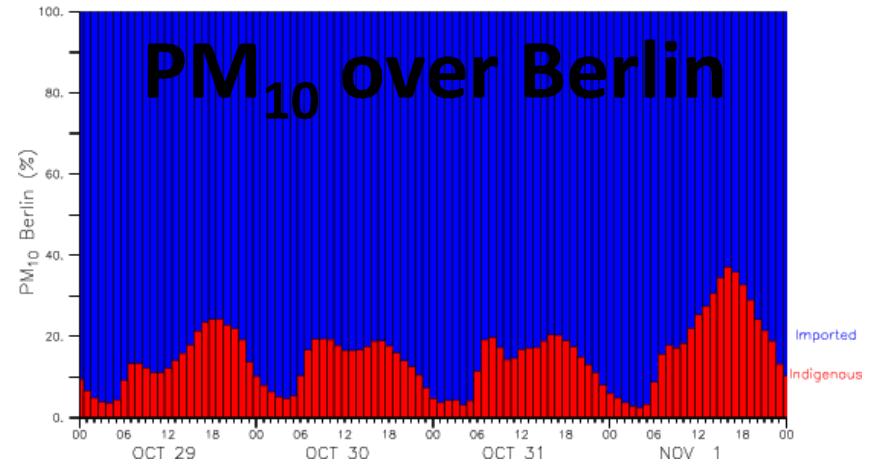
4. Source-Allocation Information (WG3)

MACC-II Products on Source apportionment of episodes

- a) LRT components
- b) Sea salt contribution
- c) Fire events
- d) Dust episodes



Imported
indigenous



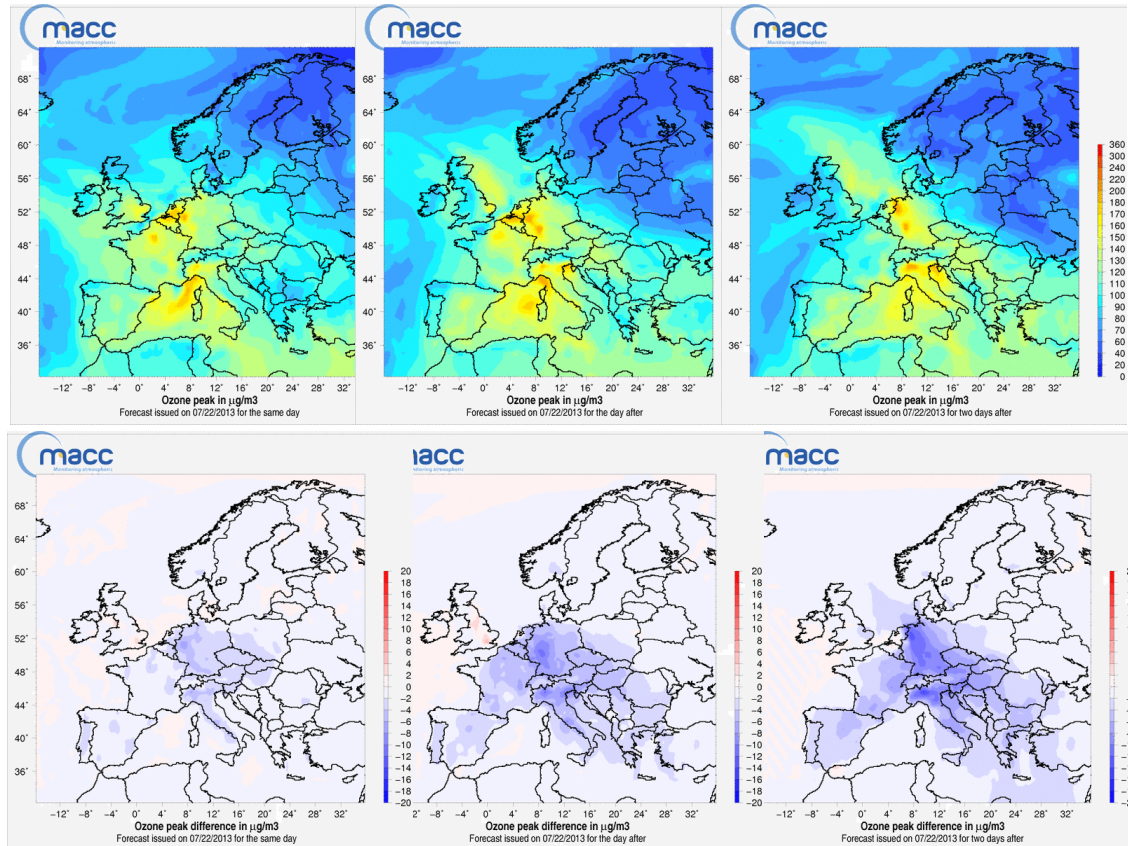
Guidance contribution at FAIRMODE?

5. Planning Tools (WG4)

MACC POLICY SCENARIOS

Example of what can be expected to reduce ozone episode with the control scenarios:

O3 episode from 21 to 25 July 2013



STRA scenario decreases the ozone concentration by $12 \mu\text{g}/\text{m}^3$ in the plume (maximum impact on D+2).

Guidance and training contribution at FAIRMODE?



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