MACC-II

Using Earth observation systems to provide the Copernicus Atmosphere Service

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- MACC-II is a component of Europe's Copernicus programme, focusing on atmospheric composition
- As for the other thematic areas, the atmospheric programme comprises
 - developing operational spacebased observation of constituents (Sentinels 5P, 4 and 5)
 - strengthening the provision of *in* situ observations (GISC)
 - developing and operating associated data and information services (MACC, MACC-II)
 - downstream (PASODOBLE, ENDORSE, OBSAIRVE...) and supporting projects (NORS....)





Project structure and main products



36 partners from 13 countries



Map data @2012 Google - Terms of

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http://www.copernicus-atmosphere.eu



Long-range transport of air pollution:

Seattle haze July 2012



CALIPSO backscatter



Model aerosol and cloud



Model backscatter 60 100 🗏 200 300 400 1.5x10 1.2x10 9x10-4 6x10-4 3x10 600 1000 10:55 10:50 10:45 10:40 Lon -129 -127 -125 -122 -118 -113 -106 137 -133 -131 -135 16 36 40 44 48 52 56 64 68 -4 02468 12 20 24 32 60



Forecasting of air quality episodes





MACC-II provides daily 4-day forecasts of European air quality that can support decision making in smog episodes.

Thursday 24 January 2013 00UTC MACC-RAQ Forecast D+0 VT: Thursday 24 January 2013 Model: CHIMERE Height level: Surface Parameter: PM10 Aerosol Daily Mean [µg/m3]









Forecasting dust storms that affect air quality.

Climate monitoring

MACC-II is a regular contributor to BAMS State of the Climate for the aerosol and biomass burning sections.





Global Carbon Cycle (CO₂ & CH₄)



Flux inversions

Based on in-situ and satellite observations



High-resolution modelling

CTESSEL carbon model as part of ECMWF IFS



esday 9 April 2013 00UTC MACC-II Forecast t+036 VT: Wednesday 10 April 2013 12UTC

nn CO2 dry molar fraction [ppm]

Using and supporting in-situ observations

ICOS



Use of MACC-II in WMO Antarctic Ozone Bulletin





One, three and five day forecasts of the ozone mole fraction at 54.6 hPa from the atmospheric chemistry model used in the MACC-II project. The images show how the ozone hole will move over the southern tip of the South American continent at midnight on 4 October. More information on the MACC-II project and model products can be found on page 58.



Impact of GMES atmosphere aerosol product to assess direct normal irradiance (2003-2009)



GEMS AOD daily values

AOD monthly climatology

Direct normal irradiance [W/m2]

Climatology databases do not allow correct representation of direct normal irradiance distribution



SME, Bratislava, SK

MACC-II contribution to GEO

- MACC-II is accessible through GEO data portal
- Health: HE-01 Tools and Information for Health Decision-Making
- Climate: CL-01 Climate Information for Adaptation
- Climate: CL-02 Global Carbon Observation and Analysis
- Energy: EN-01 Energy and Geo-Resources Management

Thank you!

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