



GROUP ON
EARTH OBSERVATIONS

Air Quality
Community of Practice



AQ

Community of Practice

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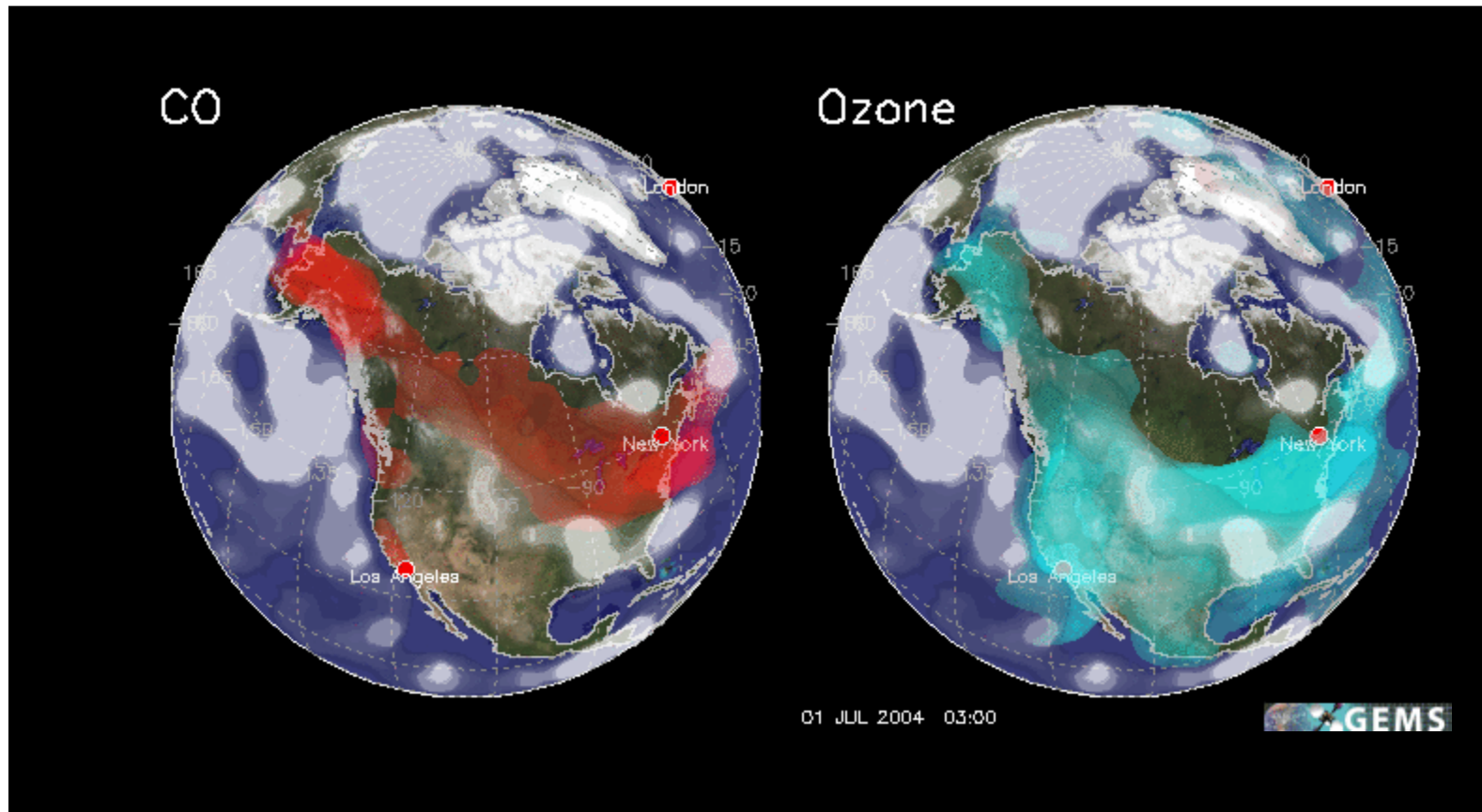


Air Quality

- Many different species are air pollutants (particles, ozone, SO₂, VOCs, POPs, mercury)
- Air pollution is generated locally
- Impacts of air pollution are diverse (health, crops, ecosystems, climate)
- Regulations on air quality are diverse (different thresholds, dose functions)
- Air pollution has global implications (long-range transport, long-lived species)



Example for long-range transport of air pollution





Community *(pl. communities)*

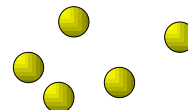




Practice

GEOSS is (should be) about:

- producing data
- distributing data
- enhancing data
- visualizing data
- using data



Which level of
coordination is
necessary/possible?



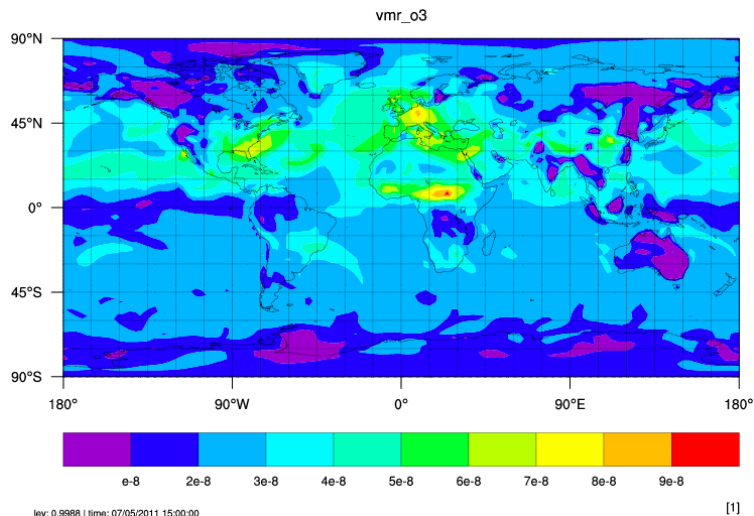
Air Quality Data Portals

- **ACTRIS** - Aerosols, Clouds, and Trace gases Research InfraStructure
 - EARLINET - European Aerosol Research Lidar Network
 - EUSAAR - European Supersites for Atmospheric Aerosol Research
 - CLOUDNET
- **AeroCom** - Aerosol Model Inter-comparison Project
- **CEOS ACP**: Atmospheric Composition Portal
- **CIERA**: Community Initiative for Emissions Research and Applications
- **DataFed** - Federated Data Systems for AQ Data Access and Analysis
- **EBAS** - Norwegian Institute of Air Research
- **GMES MACC**: Monitoring Atmospheric Composition and Climate
- **Jülich MACC and HTAP** boundary condition server
- **NASA GIOVANNI** - Data & Information Services Center
- **US EPA RSIG** - Remote Sensing Information Gateway
- **US EPA AQS** - Air Quality System
- **VIEWS** - Visibility Information Exchange Web System
- World Data Centers (WDCGG, WOUDC) ?

Notes: few „operational“ systems; little realtime data; poor links between systems; no data portal in Asia, Africa, South America, Australia

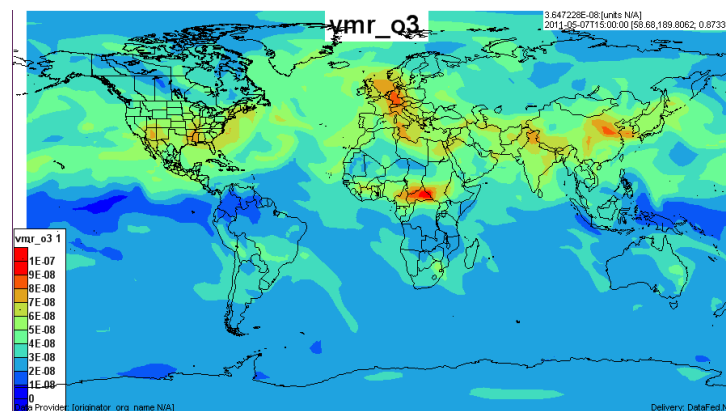
Ozone episode over western Europe: 07 May 2011

Jülich BC web interface



<http://maccc.icg.fz-juelich.de:58080>

Datafed



<http://webapps.datafed.net>

Data server



triggered
by user
request

Data producer



automatic
script



http://macc.icg.kfa-juelich.de:50080/comparison

☆ ↻ 🌐 krake

uchte Seiten DB Bahn RETRO MACC EGU2009 IPCC RCPDB ICG-2 Intern HAMMOZ Wik HTAP Wik Jülich OGC HAMMOZ Redmine

Home > Services > MACC global boundaries for regional air quality models

Start

Data services

About this service

Contact

Imprint

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Data comparison (under construction)

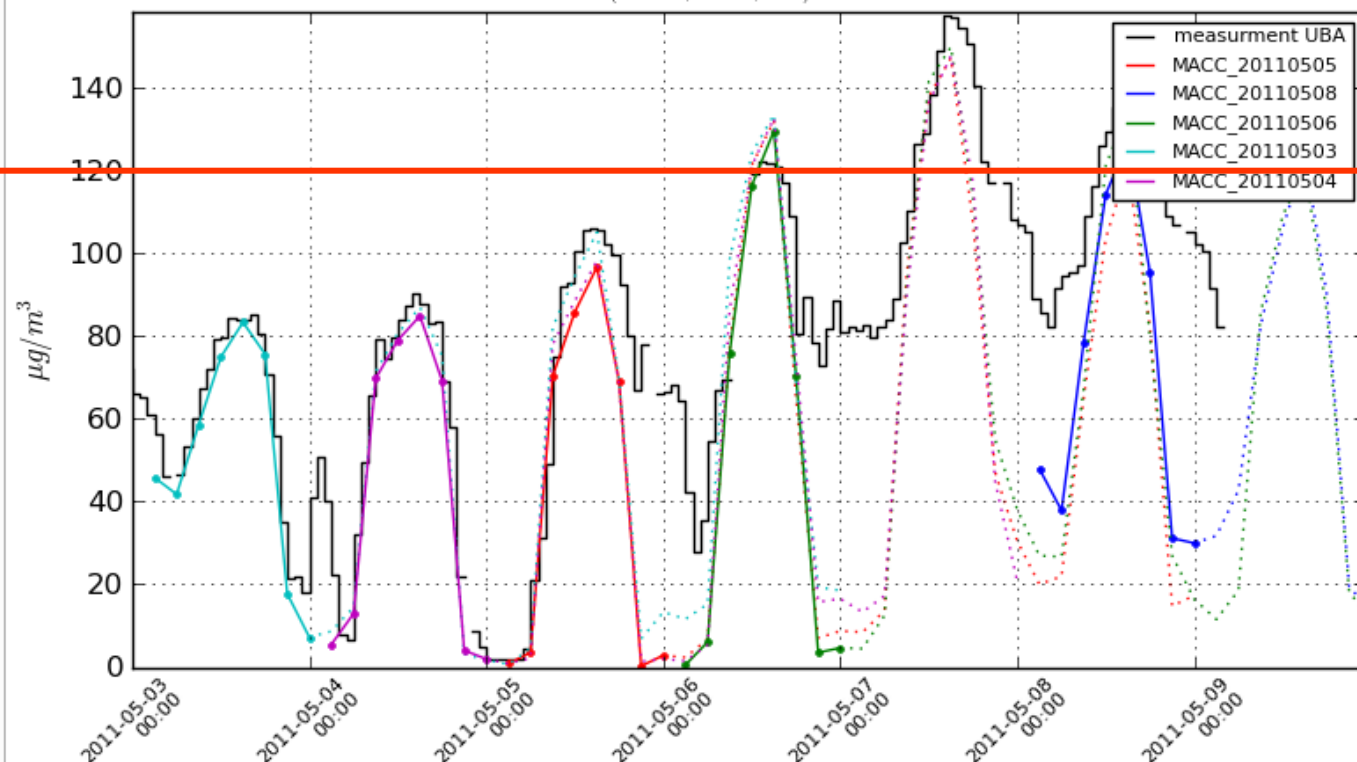
Station: Köln-Chorweiler (DENW053)

Change

Time series

Correlation

Köln-Chorweiler - O_3
(51.02° N, 6.88° E, 45m)



Models:

MACC_20110505
MACC_20110508
MACC_20110506
MACC_20110503
MACC_20110504

+ Add models

Species:

☐ SO_2
☒ O_3
☐ NO_2

[Data source and use conditions](#)

EU
threshold
(8 hours)



Data formats (examples)

WDCGG, Japan

```
C01 TITLE: hourly meteorological data
C02 FILE NAME: ryo239n00.jma.xx.xx.met.nl.hr2010.dat
C03 DATA FORMAT: Version 1.0
C04 TOTAL LINES: 6584
C05 HEADER LINES: 32
C06 DATA VERSION: 201008
C07 STATION NAME: Ryori
C08 STATION CATEGORY: Regional
C09
C10 COUNTRY/TERRITORY: Japan
C11 CONTRIBUTOR: JMA
C12 LATITUDE: 39.03
C13 LONGITUDE: 141.82
C14 ALTITUDE: 260
C15
C16
C17
C18 PARAMETER: WD WS RH AT
C19 COVERING PERIOD: 2010-01-01 2010-09-30
C20 TIME INTERVAL: hourly
C21
C22
C23
C24 TIME ZONE: Local time UTC+9
C25
C26 CREDIT FOR USE: This is a formal notification for
C27 and provided without charge. By their use you acce
C28 with the data providers or owners whenever substan
C29 must be made to the data providers or owners and t
C30 COMMENT:
C31
C32 DATE TIME WD WS RH AT
2010-01-01 01:00 270.0 12.4 84.0 -4.0
2010-01-01 02:00 270.0 8.2 79.0 -3.9
2010-01-01 03:00 270.0 15.5 65.0 -3.6
2010-01-01 04:00 270.0 14.6 67.0 -3.7
2010-01-01 05:00 270.0 14.0 72.0 -4.1
2010-01-01 06:00 270.0 17.5 67.0 -3.9
2010-01-01 07:00 270.0 19.5 68.0 -4.1
2010-01-01 08:00 270.0 20.1 65.0 -3.6
2010-01-01 09:00 270.0 19.2 66.0 -3.2
2010-01-01 10:00 270.0 17.0 59.0 -2.0
2010-01-01 11:00 270.0 15.2 58.0 -1.7
```

EMEP, NILU

```
Ozone data from GB06 2009
Local time: GMT + 0

Date      Hour      Value
01.01.2009 00:00      -999.0
01.01.2009 01:00       24.0
01.01.2009 02:00       28.0
01.01.2009 03:00       32.0
01.01.2009 04:00       34.0
01.01.2009 05:00       36.0
01.01.2009 06:00       38.0
01.01.2009 07:00       36.0
01.01.2009 08:00       38.0
01.01.2009 09:00       34.0
01.01.2009 10:00       32.0
01.01.2009 11:00       36.0
01.01.2009 12:00       34.0
01.01.2009 13:00       38.0
01.01.2009 14:00       36.0
01.01.2009 15:00       38.0
01.01.2009 16:00       36.0
01.01.2009 17:00       34.0
01.01.2009 18:00       30.0
01.01.2009 19:00       30.0
01.01.2009 20:00       28.0
01.01.2009 21:00       32.0
01.01.2009 22:00       30.0
01.01.2009 23:00       28.0
02.01.2009 00:00       30.0
02.01.2009 01:00       32.0
02.01.2009 02:00       32.0
02.01.2009 03:00       34.0
02.01.2009 04:00       34.0
02.01.2009 05:00       34.0
02.01.2009 06:00       36.0
02.01.2009 07:00       38.0
02.01.2009 08:00       38.0
02.01.2009 09:00       36.0
```

CASTNET, US

```
SITE_ID,DATE_TIME,TEMPERATURE,TEMPERATURE_F,TEMPERATURE_DELTA,
ION,SOLAR_RADIATION_F,OZONE,OZONE_F,PRECIPITATION,PRECIPITATION
SIGMA_THETA_F,FLOW_RATE,FLOW_RATE_F,WINDSPEED_SCALAR,WINDSPEED
QA_CODE,UPDATE_DATE
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Ensuring data quality

2002-03-21	07:00	9999-99-99	99:99	-99999999.9	-9999	-9999.9	-9999	1
2002-03-21	08:00	9999-99-99	99:99	-99999999.9	-9999	-9999.9	-9999	1
2002-03-21	09:00	9999-99-99	99:99	0.0	1	-9999.9	-9999	1
2002-03-21	10:00	9999-99-99	99:99	-99999999.9	-9999	-9999.9	-9999	1
2002-03-21	11:00	9999-99-99	99:99	-99999999.9	-9999	-9999.9	-9999	1
2002-03-21	12:00	9999-99-99	99:99	-99999999.9	-9999	-9999.9	-9999	1
2002-03-21	13:00	9999-99-99	99:99	0.0	2	0.0	-9999	1
2002-03-21	14:00	9999-99-99	99:99	-99999999.9	-9999	-9999.9	-9999	1
2002-03-21	15:00	9999-99-99	99:99	-99999999.9	-9999	-9999.9	-9999	1
2002-03-21	16:00	9999-99-99	99:99	-99999999.9	-9999	-9999.9	-9999	1
2002-03-21	17:00	9999-99-99	99:99	-99999999.9	-9999	-9999.9	-9999	1
2002-03-21	18:00	9999-99-99	99:99	-99999999.9	-9999	-9999.9	-9999	1
2002-03-21	19:00	9999-99-99	99:99	-99999999.9	-9999	-9999.9	-9999	1
2002-03-21	20:00	9999-99-99	99:99	-99999999.9	-9999	-9999.9	-9999	1
2002-03-21	21:00	9999-99-99	99:99	0.0	3	0.0	-9999	1
2002-03-21	22:00	9999-99-99	99:99	-99999999.9	-9999	-9999.9	-9999	1
2002-03-21	23:00	9999-99-99	99:99	0.0	2	0.0	-9999	1
2002-03-21	24:00	9999-99-99	99:99	0.0	2	0.0	-9999	1
2002-03-26	14:00	9999-99-99	99:99	-99999999.9	-9999	-9999.9	-9999	1
2002-03-26	15:00	9999-99-99	99:99	0.0	1	-9999.9	-9999	1
2002-09-01	01:00	9999-99-99	99:99	164.5	6	12.3	-9999	1
2002-09-01	02:00	9999-99-99	99:99	160.9	6	15.4	-9999	1
2002-09-01	03:00	9999-99-99	99:99	145.8	6	14.2	-9999	1
2002-09-01	04:00	9999-99-99	99:99	125.5	6	21.4	-9999	1
2002-09-01	05:00	9999-99-99	99:99	164.3	6	13.6	-9999	1
2002-09-01	06:00	9999-99-99	99:99	191.2	6	2.4	-9999	1
2002-09-01	07:00	9999-99-99	99:99	205.8	6	5.0	-9999	1

Mean value at this station is ~30 (ppb), valid range = 1 – 40 ppb



Ensuring data quality

- requires (common?) data quality objectives
- requires knowledge about data generation
- must be standardized
 - across compounds
 - across measurement networks
 - across measurement techniques/instruments
 - across communities

Can it be automated?



Forming a community & Establishing practices



Workshop on **Networking Air Quality Observations and Models:**

Motivation:

"From Observations to Decision Support"
at session 34-3, ISRSE 33, May 2009, Stresa, IT

Day 1: State of AQ Interoperability

Day 2: Technical Discussion

Day 3: Consensus? What Next?

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Šolta, Croatia, August 24-26, 2011



link = ST-09-02, DA-02-08,
OGC, network, outreach,
stakeholders, ...



www.techtoons.com

link = In -s foo bar