The World Data Center
for Remote Sensing of the Atmosphere
WDC-RSAT

ICSU
WORLD DATA SYSTEM

The ICSU/WMO World Data Center for Remote Sensing of the Atmosphere: - Service for Science

Prof. Dr. Michael Bittner and Dr. Julian Meyer-Arnek

6 July, 2015
Paris

http://wdc.dlr.de

The World Data Center
for Remote Sensing of the Atmospheree

Deutsches Zentrum
für Luft- und Raumfahrt e.V.
in der Helmholtz-Gemeinschaft

Mission Statement

Provide free, simplified, standardized and sustainable access to atmosphere related satellite based data, information, value added products and services for science, administrative bodies, and industries

Portfolio

Data archive

- Atmospheric trace gases
- Aerosols, Radiation
- Temperatures
- Cloud physical parameters
- Surface parameters (SST, LST, NDVI)
- Spectroscopic data

Services

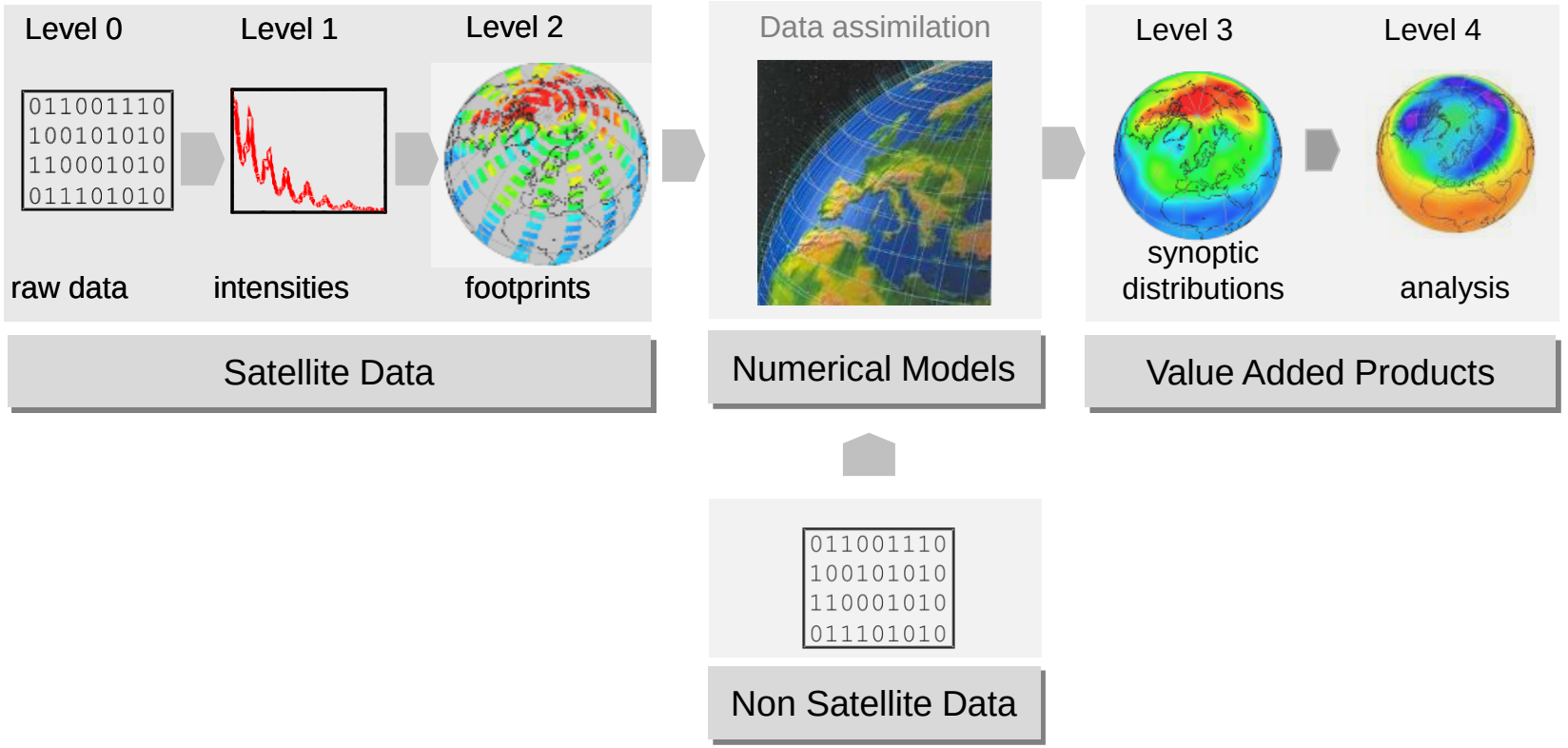
- Convention Monitoring
- Renewable Energies
- Air Quality & Health
- Hazard Early Detection
- Validation

R&D activities

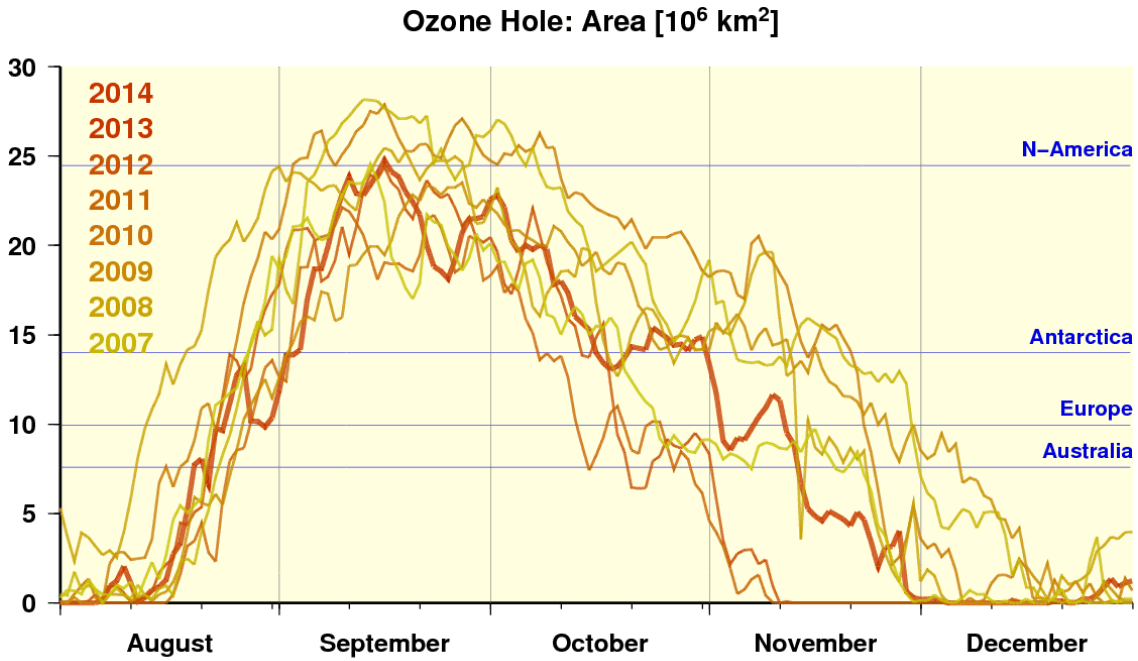
- Aerosols and Radiation
- Trace Gases
- Atmospheric Dynamics
- Infrasound

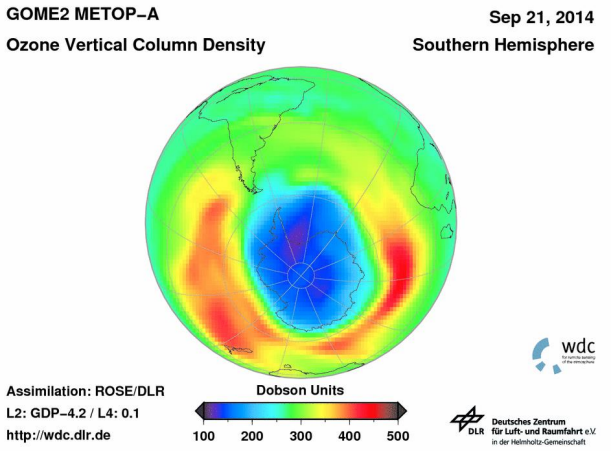
Activities of WDC-RSAT along the "Value Adding Chain"

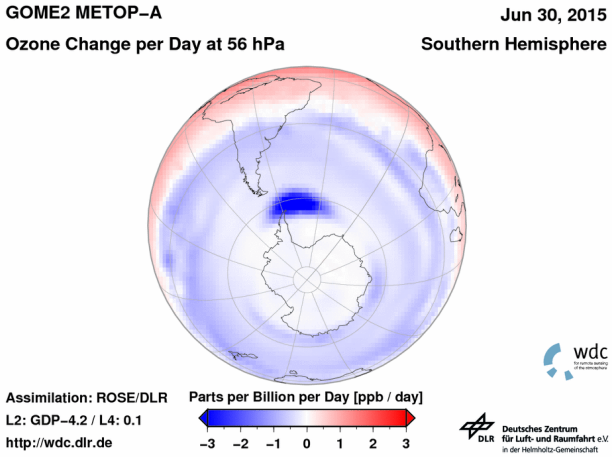
From data towards information



Service: Monitoring the Ozone Hole (Montreal Protocol)







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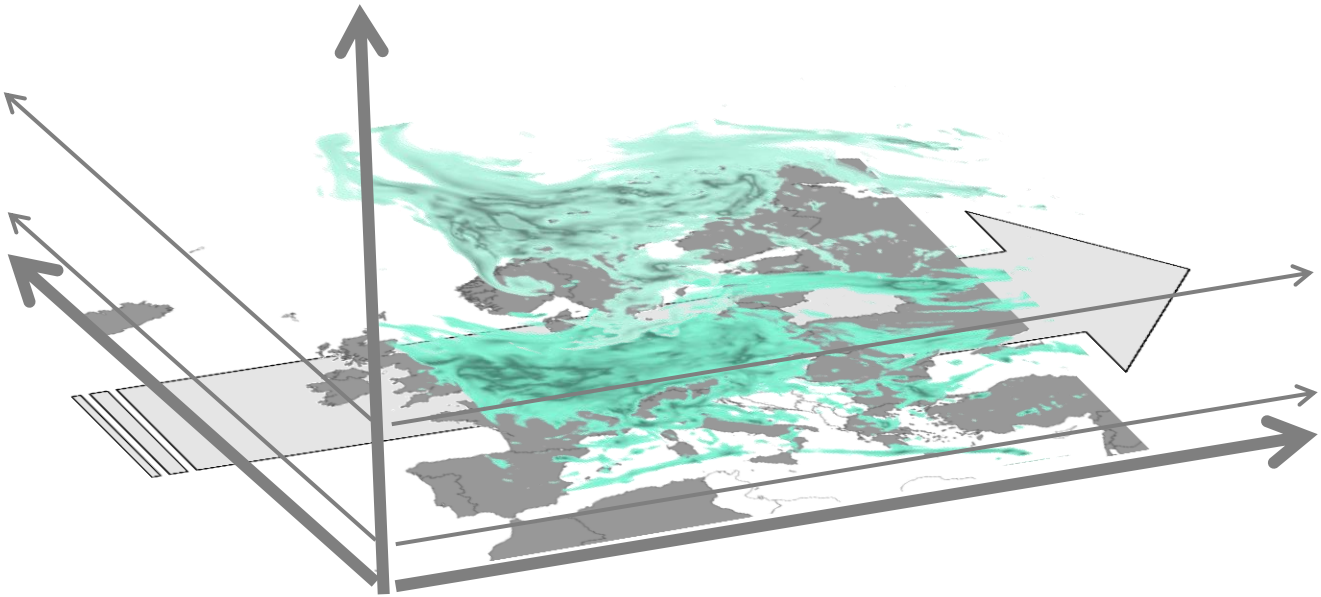
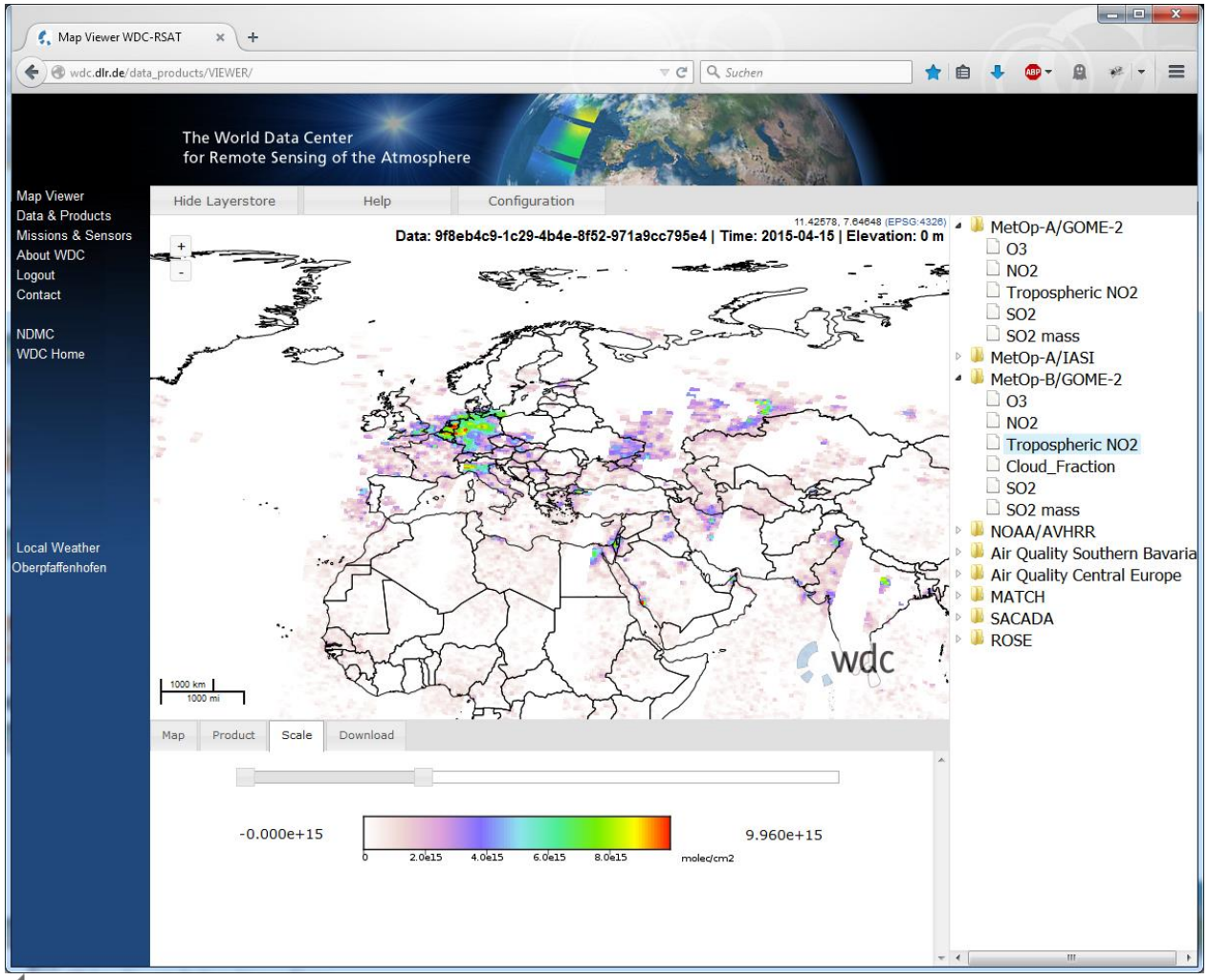
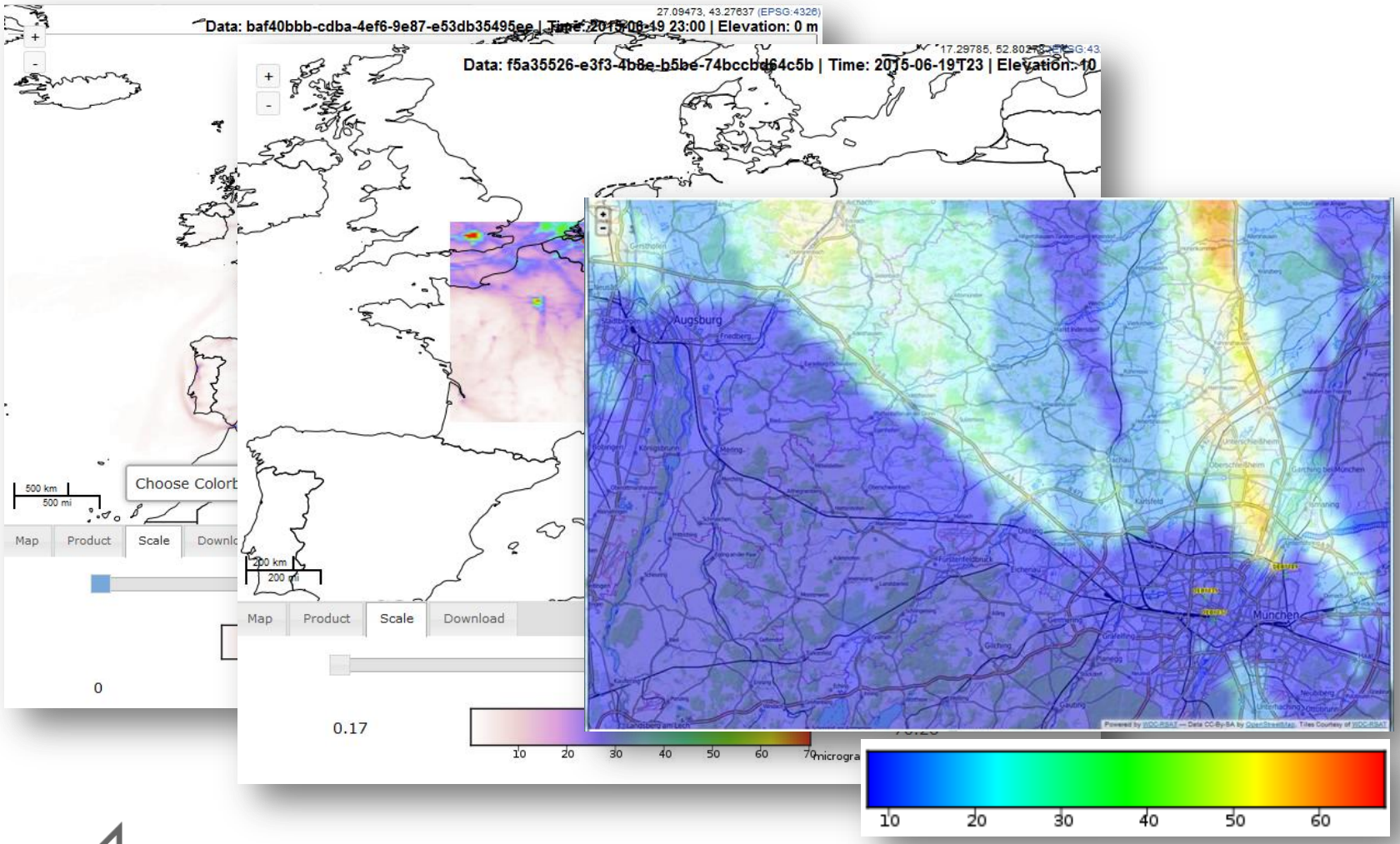
Interactive Product Exploration: Navigation in Time and Space



Service: Interactive Product Exploration



Service: Interactive Product Exploration (assimilated products → NO2 [µg/m³], forecast)



R&D:
Dissemination of information via App on the mobile phone

Presentation of service at CeBit, Hannover, 03/2012

http://www.lab.dtrd.de/Obsairve

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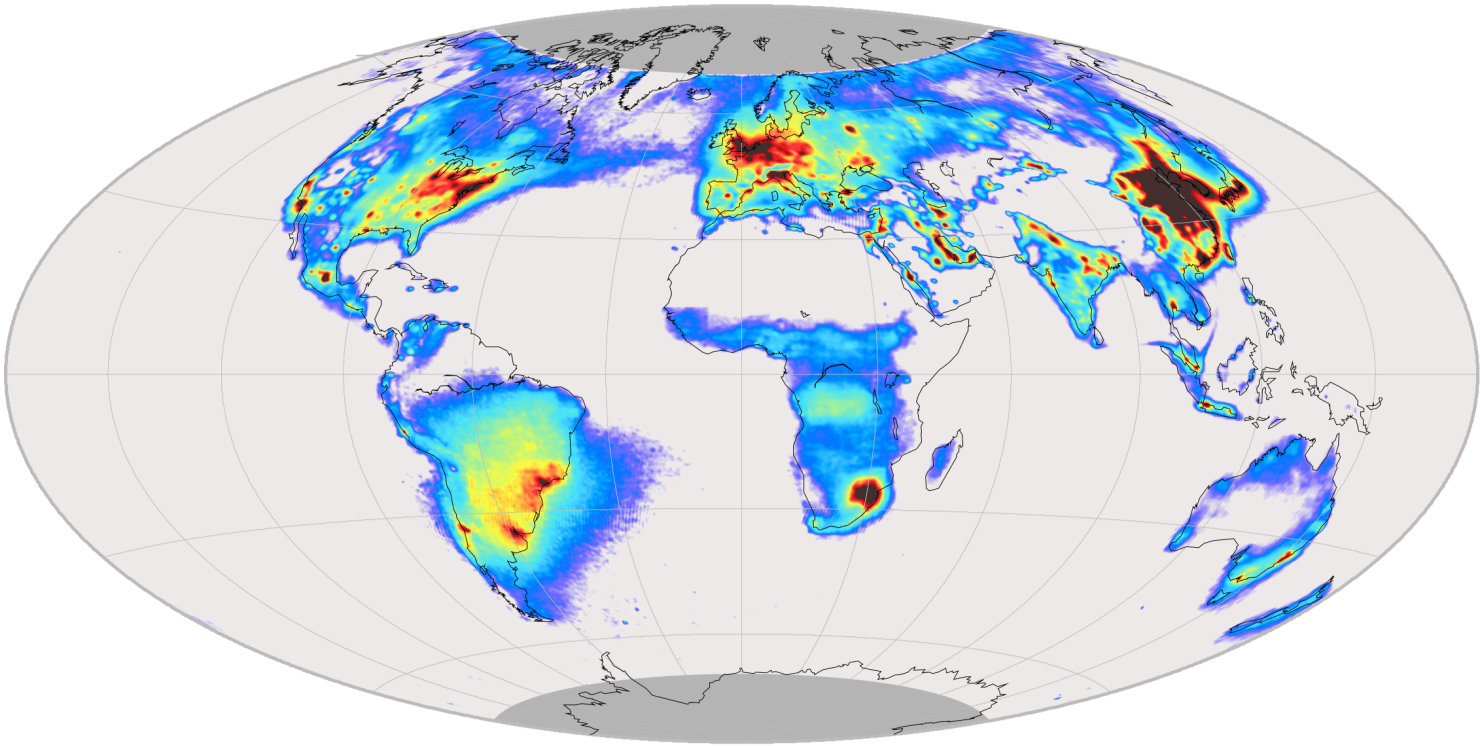
Fax: +49 (0) 89 12 15 28-79
E-Mail: info@gaf.de
Webpage: www.gaf.de

Consortial partners:
DLR Deutsches Zentrum für Luft- und Raumfahrt e.V. Germany
umweltbundesamt Austria
T-Systems Germany

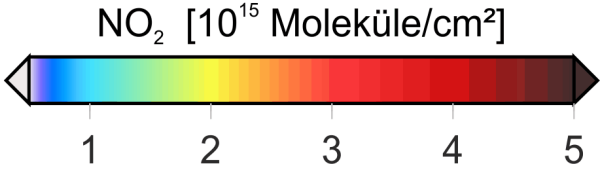
Project members:
France Netherlands Bulgaria Italy Spain
Europe Europe Germany Greece Germany France

R&D: Trend analysis of air pollutants

(Mean total NO_2concentration over a 7-years period – 2007-2013)



MetOp/GOME-2: 2007-2013



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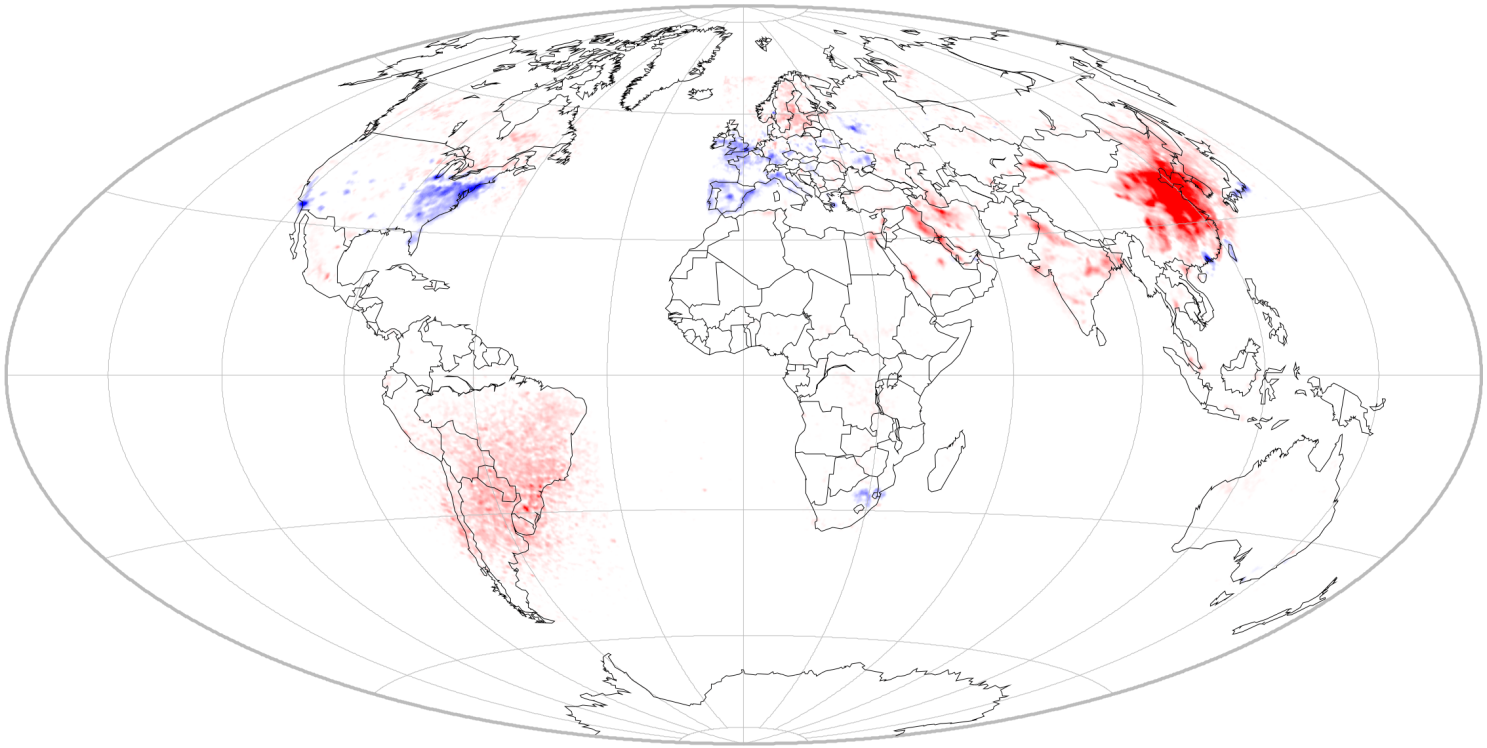
R&D: Trend analysis of air pollutants

(Linear trend in total NO_2 concentration over a 7-years period – 2007-2013)

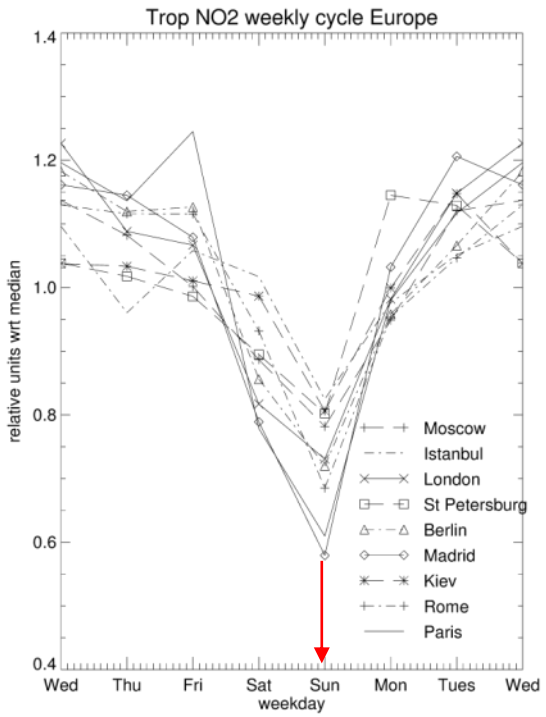


MetOp/GOME-2: 2007-2013

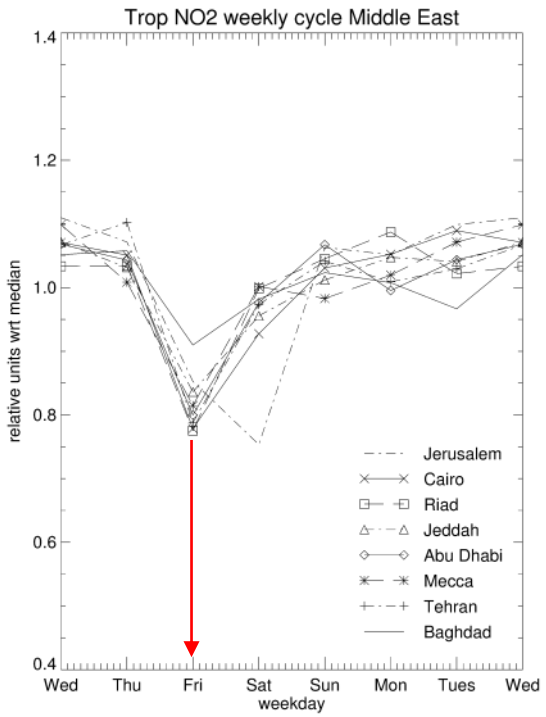
Absoluter NO_2 Trend [10^{15} Moleküle/cm² Jahr]

R&D: Weekly cycle of air pollutants for larger cities

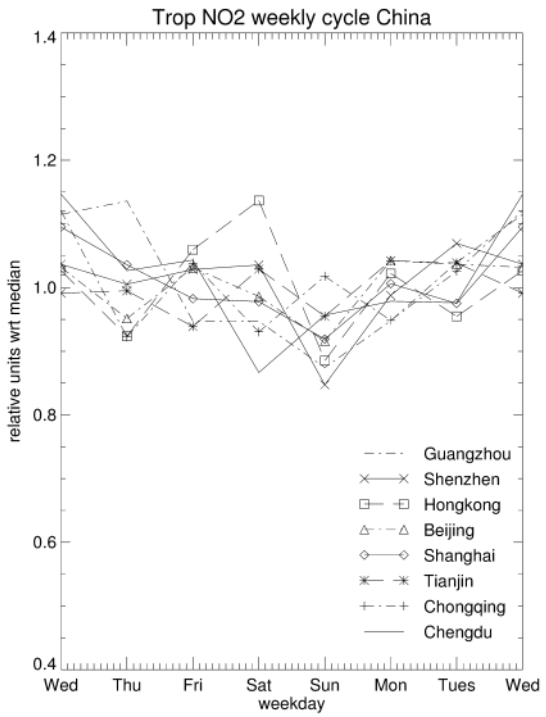
(Linear trend of total NO_2 concentration over a 7-years period – 2007-2013)



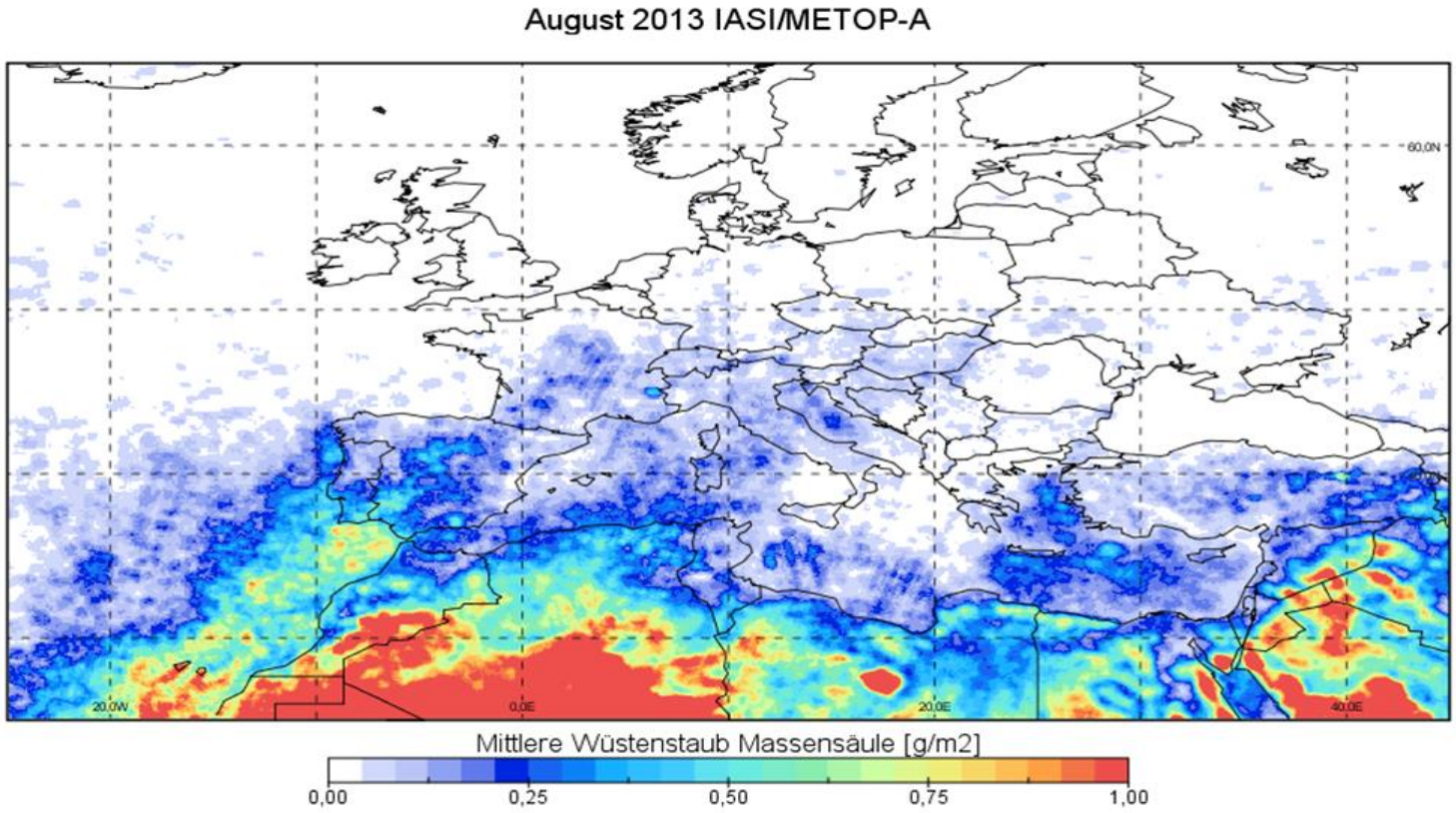
Sunday



Friday



Service: Monitoring desert dust loads in the atmosphere



August, 2013 - derived from IASI on MetOp

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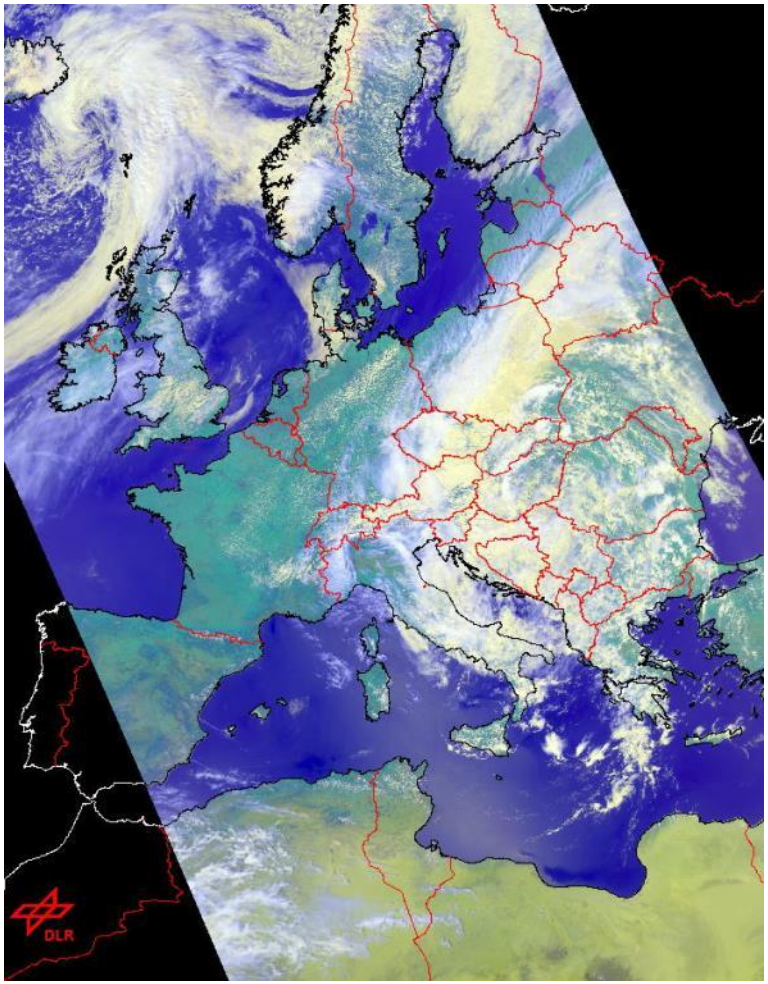
Service: Monitoring cloud cover & cloud physical parameters over Europe



16 May, 2014 -
derived from AVHRR on NOAA-19

30 Years of AVHRR @ DLR

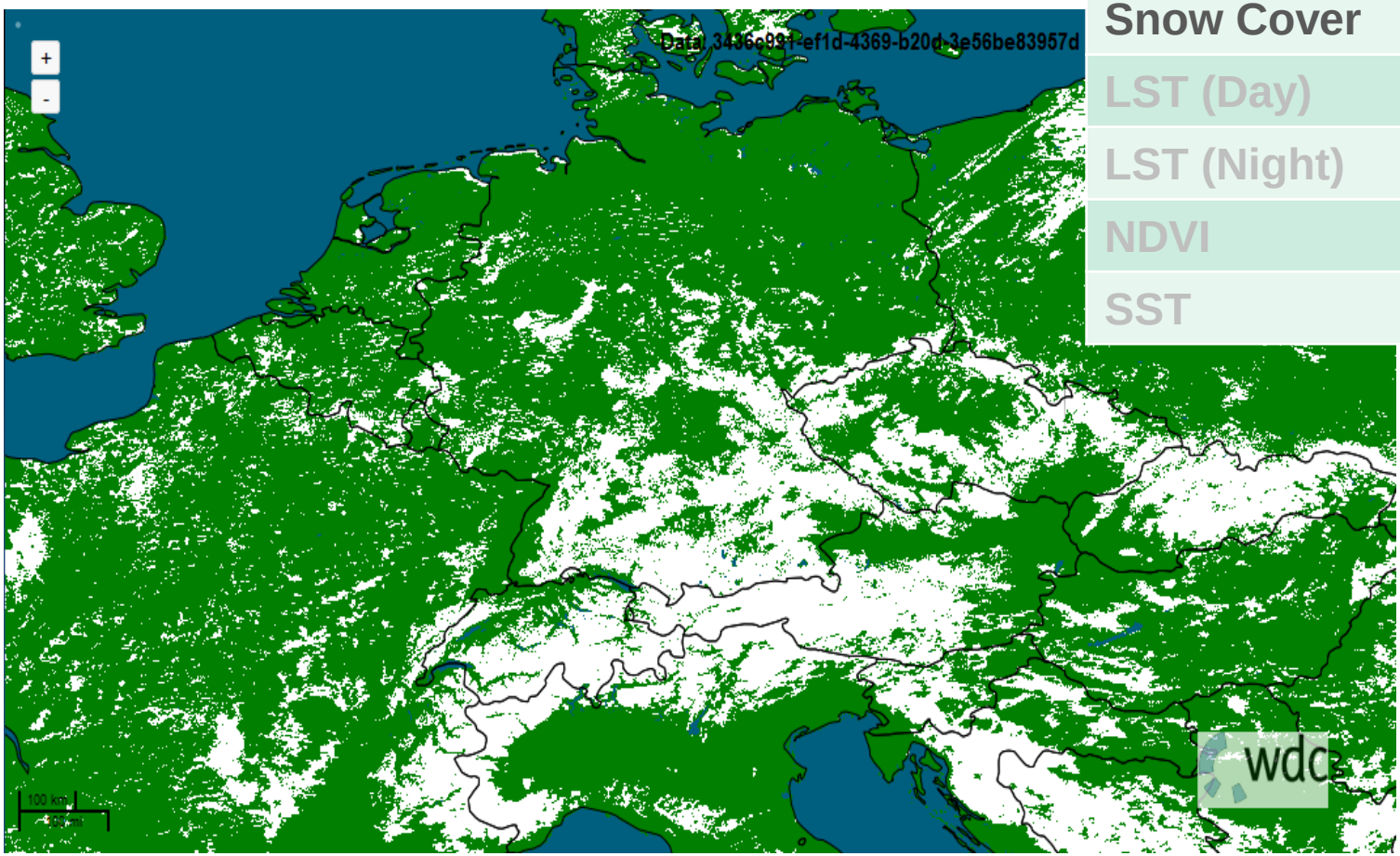
- Cloud phys. Param.
- Snow Cover
- LST (Day)
- LST (Night)
- NDVI
- SST

DLR

Service: Monitoring snow cover over Europe

30 Years of AVHRR @ DLR

- Cloud phys. Param.
- Snow Cover
- LST (Day)
- LST (Night)
- NDVI
- SST



19 February, 2015 - derived from AVHRR on NOAA-19

Years of AVHRR
DLR

oud phys. Param.

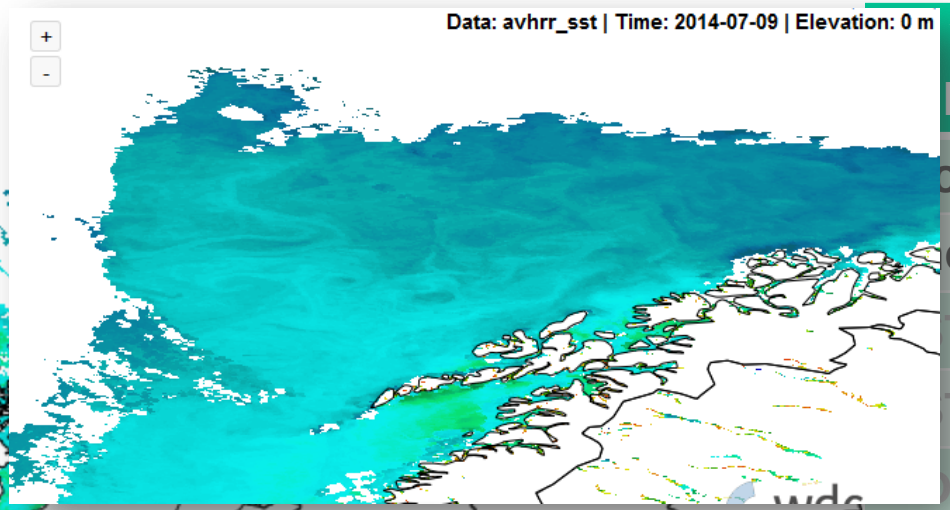
ow Cover

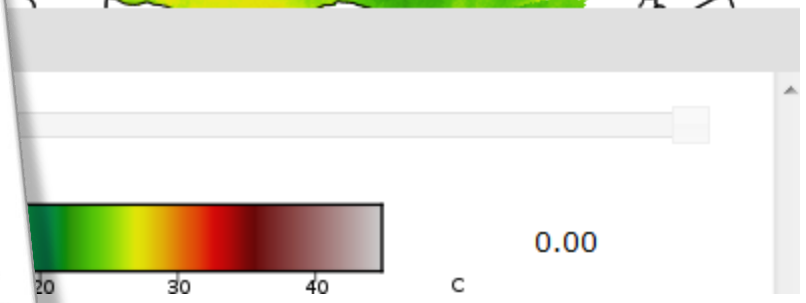
T (Day)

T (Night)

VI

SST





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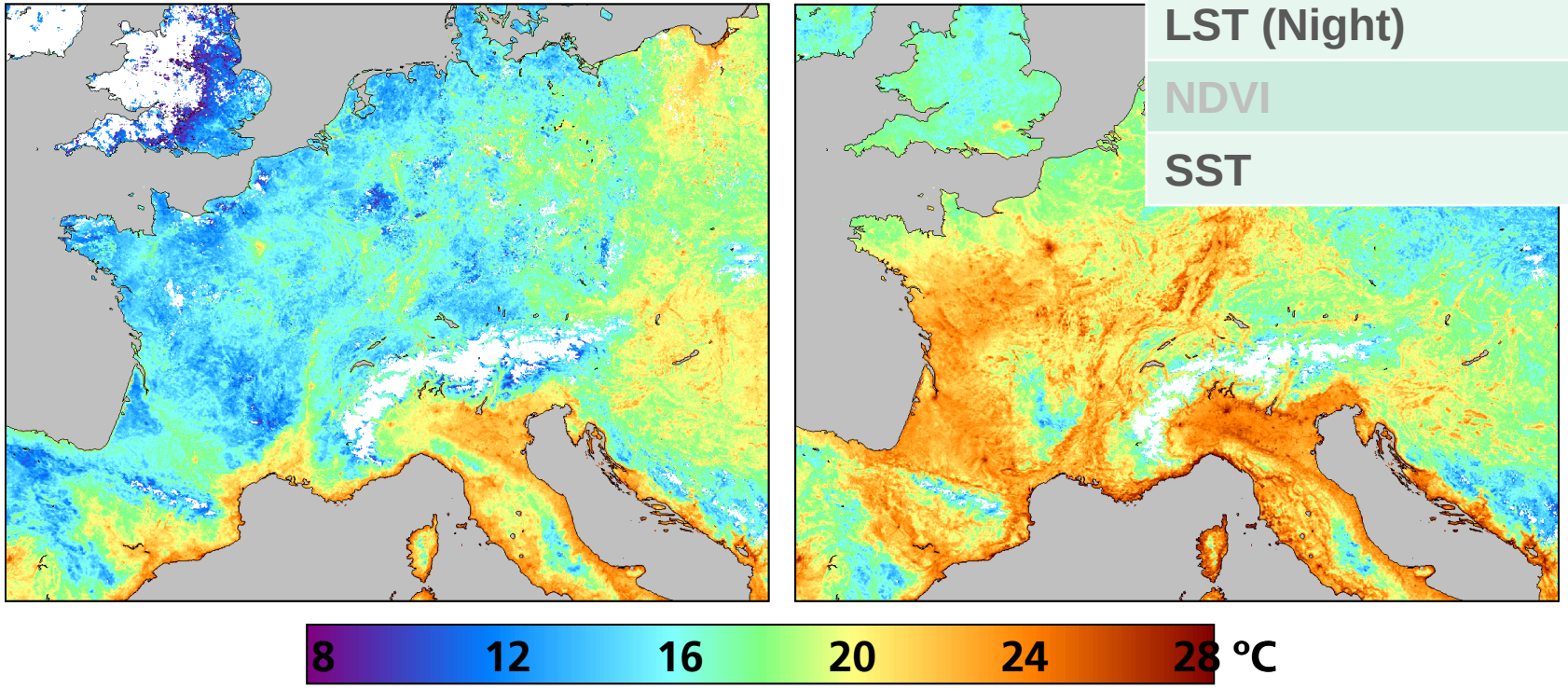
R&D: Analysing special events

Heat wave in Europe 28 July (left) – 10 August (right), 2003



30 Years of AVHRR @ DLR

- Cloud phys. Param.
- Snow Cover
- LST (Day)
- LST (Night)
- NDVI
- SST

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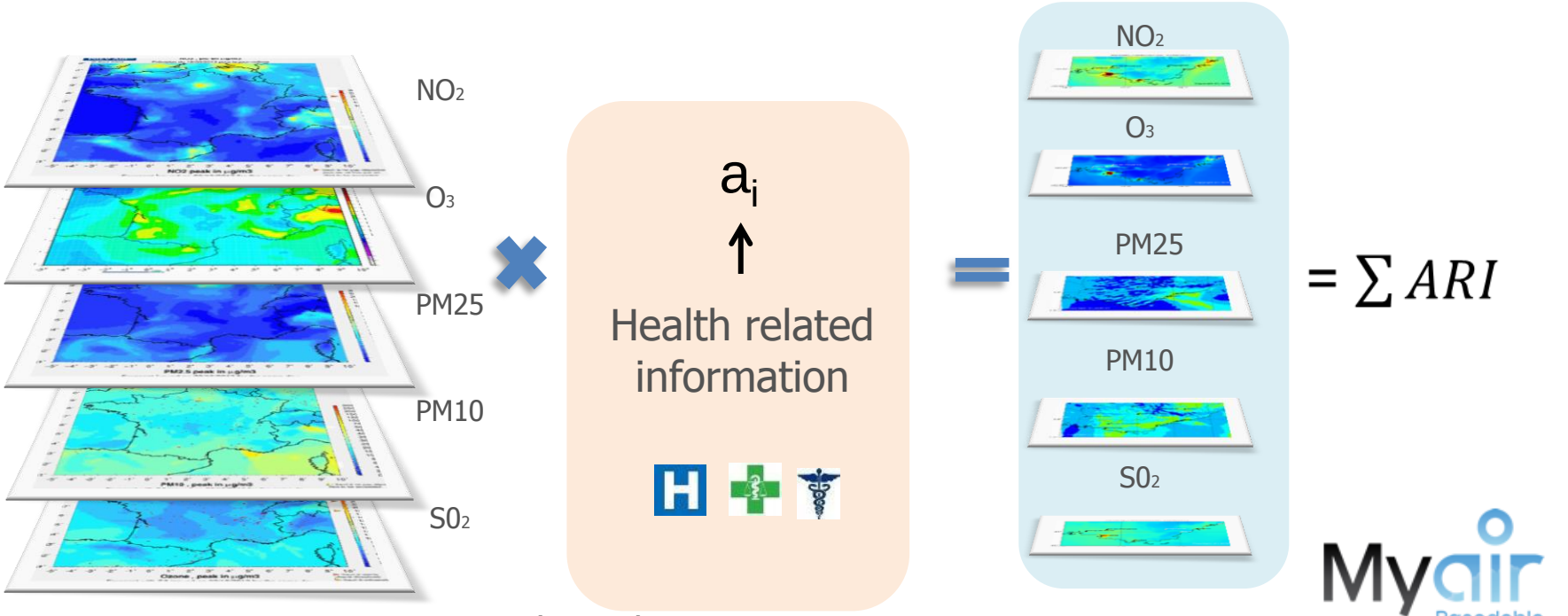
R&D: Developing measures for health impact of pollutants

Air pollution:
Most significant individual environmental health risk (WHO)
→ 3,2 Million premature deaths per year (2010)

$$ARI = a_{O3}*C_{O3} + a_{NO2}*C_{NO2} + a_{SO2}*C_{SO2} + a_{PM2.5}*C_{PM2.5} + a_{PM10}*C_{PM10}$$



Sicard et al., 2011, 2012

Myair Pasodoble

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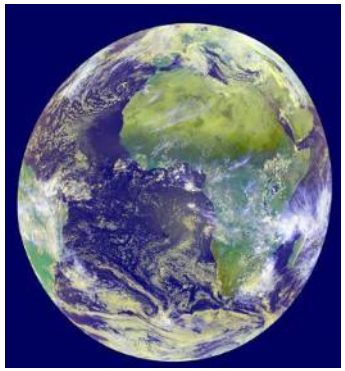
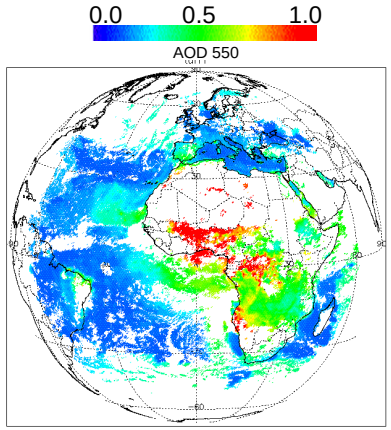
Renewable Energy - Solar

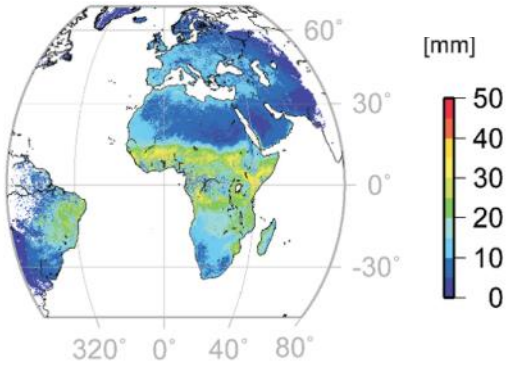
Providing information about the state of the atmosphere in order to serve forecasts on potential energy yield, monitoring power plant efficiency and planning of new power plants



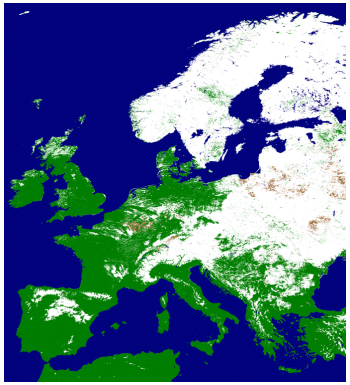
Cloud parameters



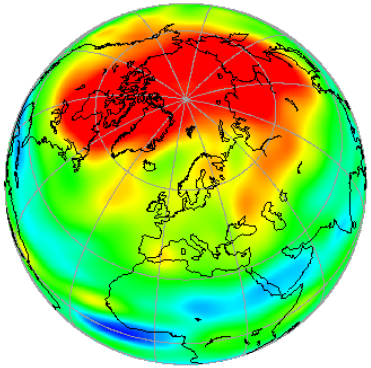
Aerosols



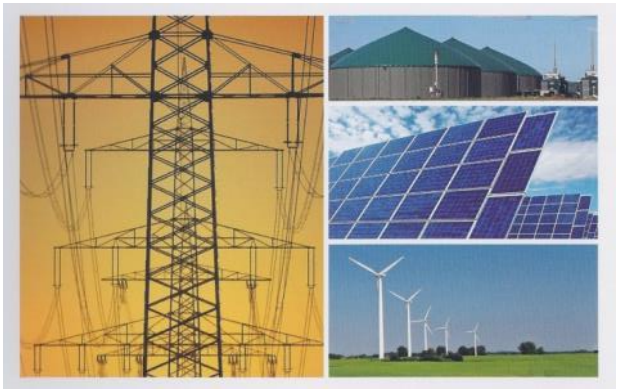
Water vapor



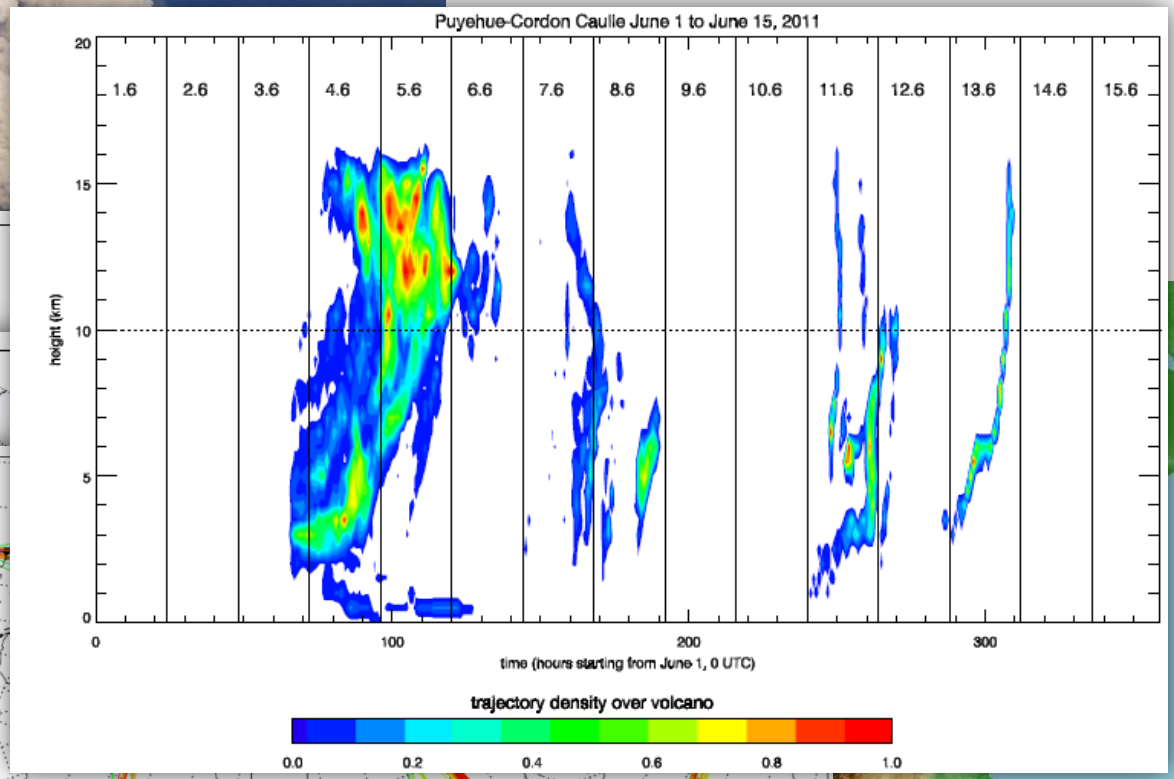
Snow cover

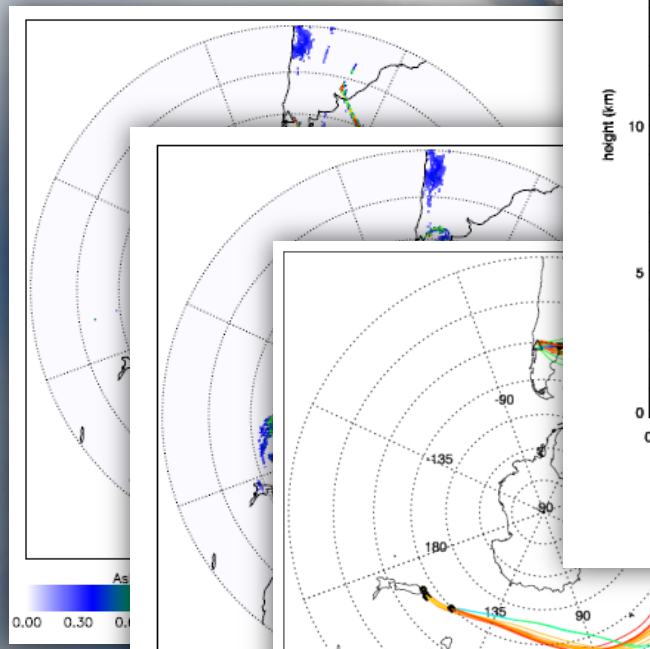


Ozone



R&D: Monitoring plumes of volcanic emission (ash, SO_2)





(CLAUDIO SANTANA/AFP/Getty Images)

Service:
Monitoring the atmospheric airglow layer (~90km altitude)

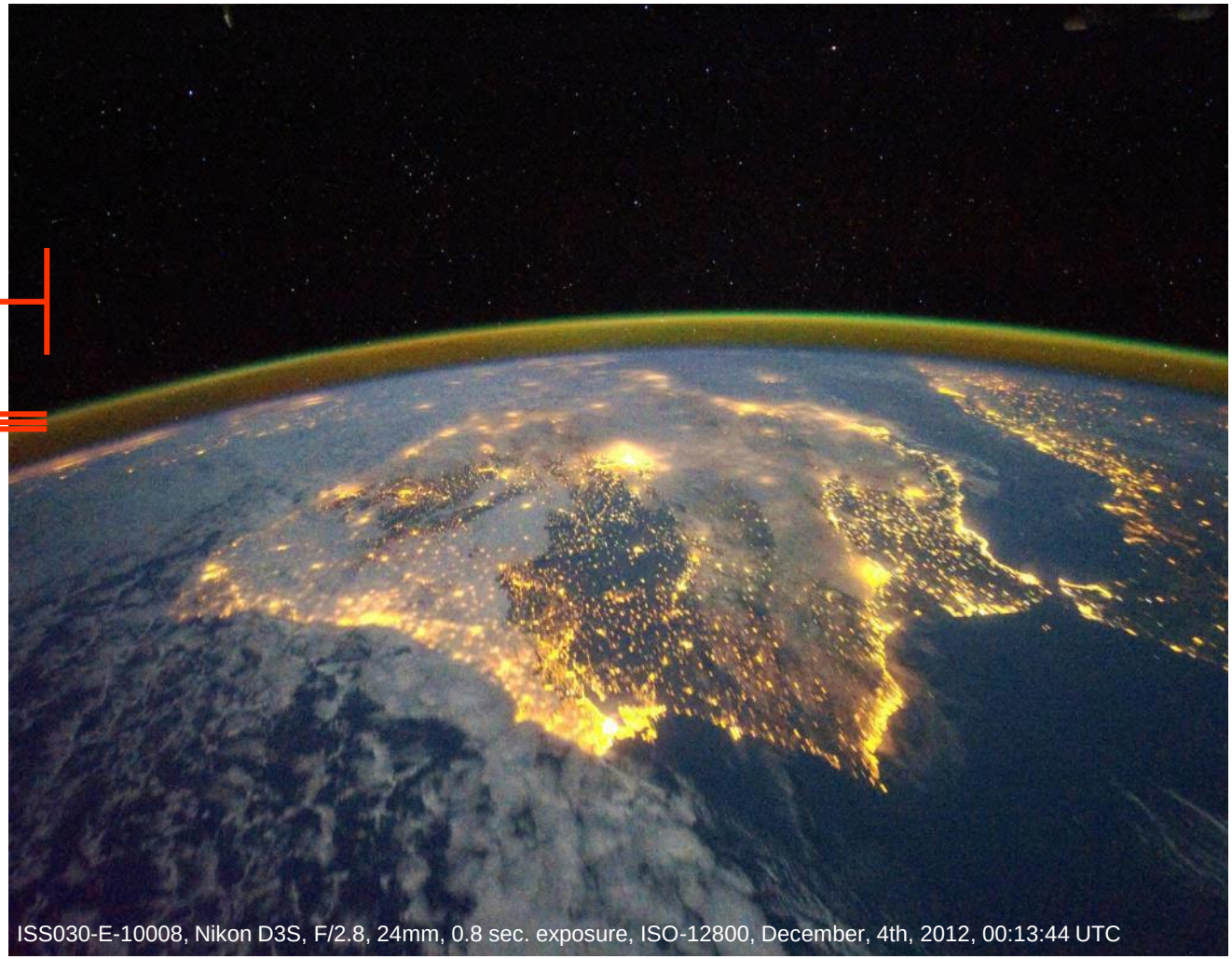
OI - 630 nm

OI - 577.7 nm

O_2 ~ 865 nm

Na - 589 nm

OH (87 km):
~ 500 - 4500 nm



ISS030-E-10008, Nikon D3S, F/2.8, 24mm, 0.8 sec. exposure, ISO-12800, December, 4th, 2012, 00:13:44 UTC

DLR

Service: Hosting the data of the international Network for the Detection of Mesospheric Change, NDMC

wdc

http://wdc.dlr.de/ndmc

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ARISE

ARISE

- ARISE Data Center
- Thematic approach
- Geographic approach
- Value-added products
- arise-project.eu
- Final Meeting - Grainau

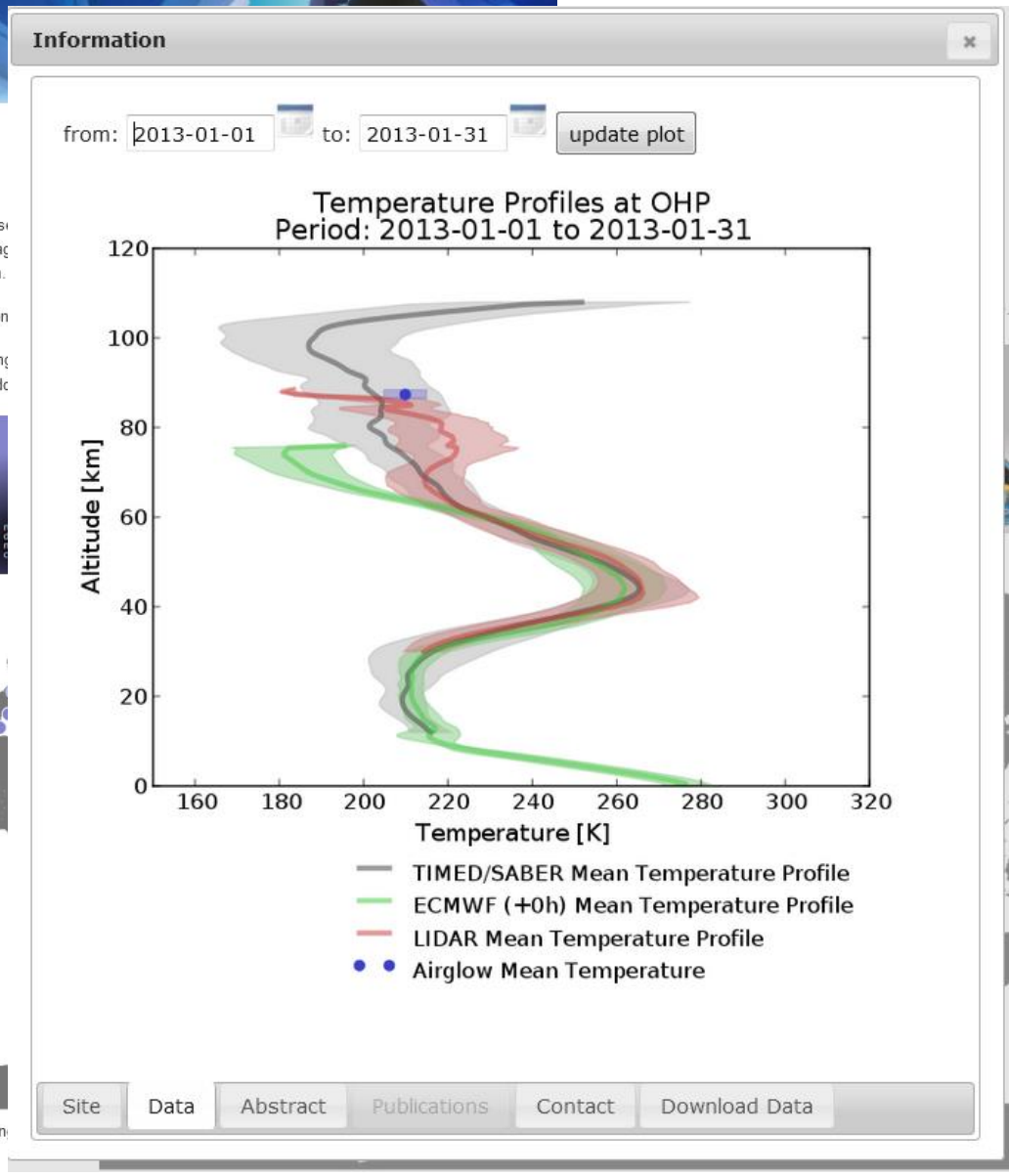
Geographic approach

The FP7 project ARISE (http://www.arise-project.eu) propos
different station networks in order to provide a new "3D" imag
mesosphere with unprecedented spatio-temporal resolution.

Three existing networks are involved providing information on

The Geographic Approach offers the opportunity for selecting
through the data products (observations as well as value-adc

Figure: Observation network of the ARISE partners includin



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International Users:

Users from 120 Countries (01/2015)