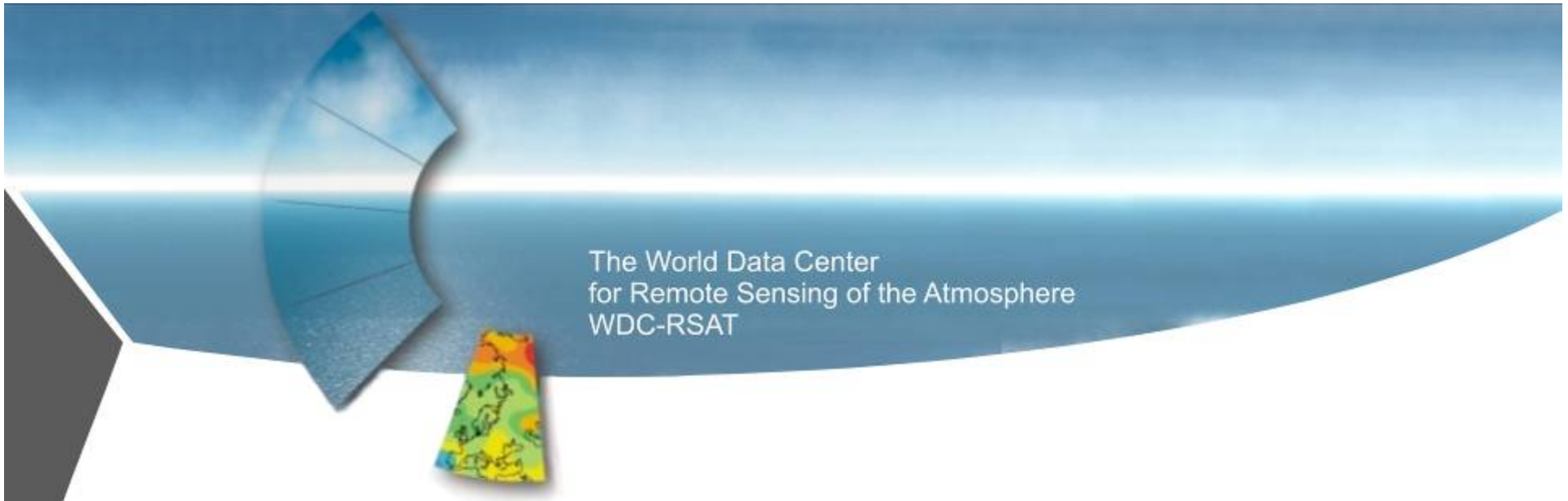



# World Data Center for Remote Sensing of the Atmosphere (WDC-RSAT)

M. Bittner, K. Höppner and the WDC-RSAT team
German Remote Sensing Data Center (DLR-DFD)

Meeting of the Expert Team on World Data Centres of the WMO
St. Petersburg, Russia, 02-03 October 2008

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

http://wdc.dlr.de

# Outline


- **Overview of the WDC for Remote Sensing of the Atmosphere (WDC-RSAT)**
- **Strategic Plan for implementing WDC-RSAT as a WMO-GAW World Data Center**

# Outline


- **Overview of the WDC for Remote Sensing of the Atmosphere (WDC-RSAT)**
- **Strategic Plan for implementing WDC-RSAT as a WMO-GAW World Data Center**

# WDC-RSAT overview

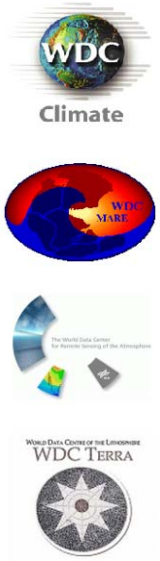
- WDC-RSAT is hosted by the Applied Remote Sensing Cluster of the DLR (DFD and IMF) and managed by the Department “Climate and Atmospheric Products (DFD-KA)”
- Since 2003 under the non-governmental auspices of the International Council for Science, ICSU
  - Main principles:
    - free and open access to data and data products
    - long-term preservation of data
- Part of a world-wide network of 52 ICSU-WDCs

# WDC-RSAT overview

- WDC-Cluster “Earth System Research”
  - WDC-Climate (WDC-C)
  - WDC for Marine Environmental Science (WDC-MARE)
  - WDC for Remote Sensing of the Atmosphere (WDC-RSAT)
  - WDC of the Lithosphere (WDC-Terra) (candidate)

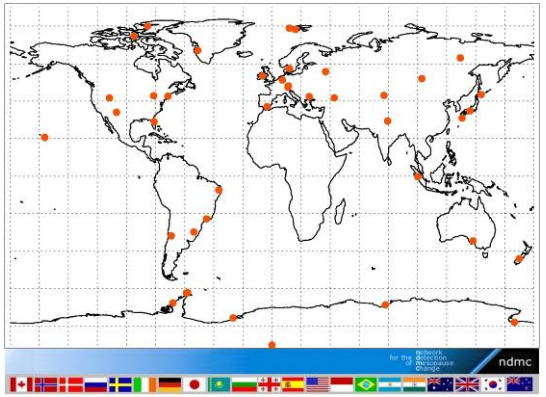
- Focus is on establishing and making use of modern information technologies in order to promote networking.
  - C3-Grid (Collaborative Climate Community Data and Processing Grid) project
  - WDC-RSAT implemented as data publication agent for data related to remote sensing of the atmosphere
    → authorized to assign ‘Digital Object Identifiers’ (DOI)

WDC-Cluster
Earth System Research

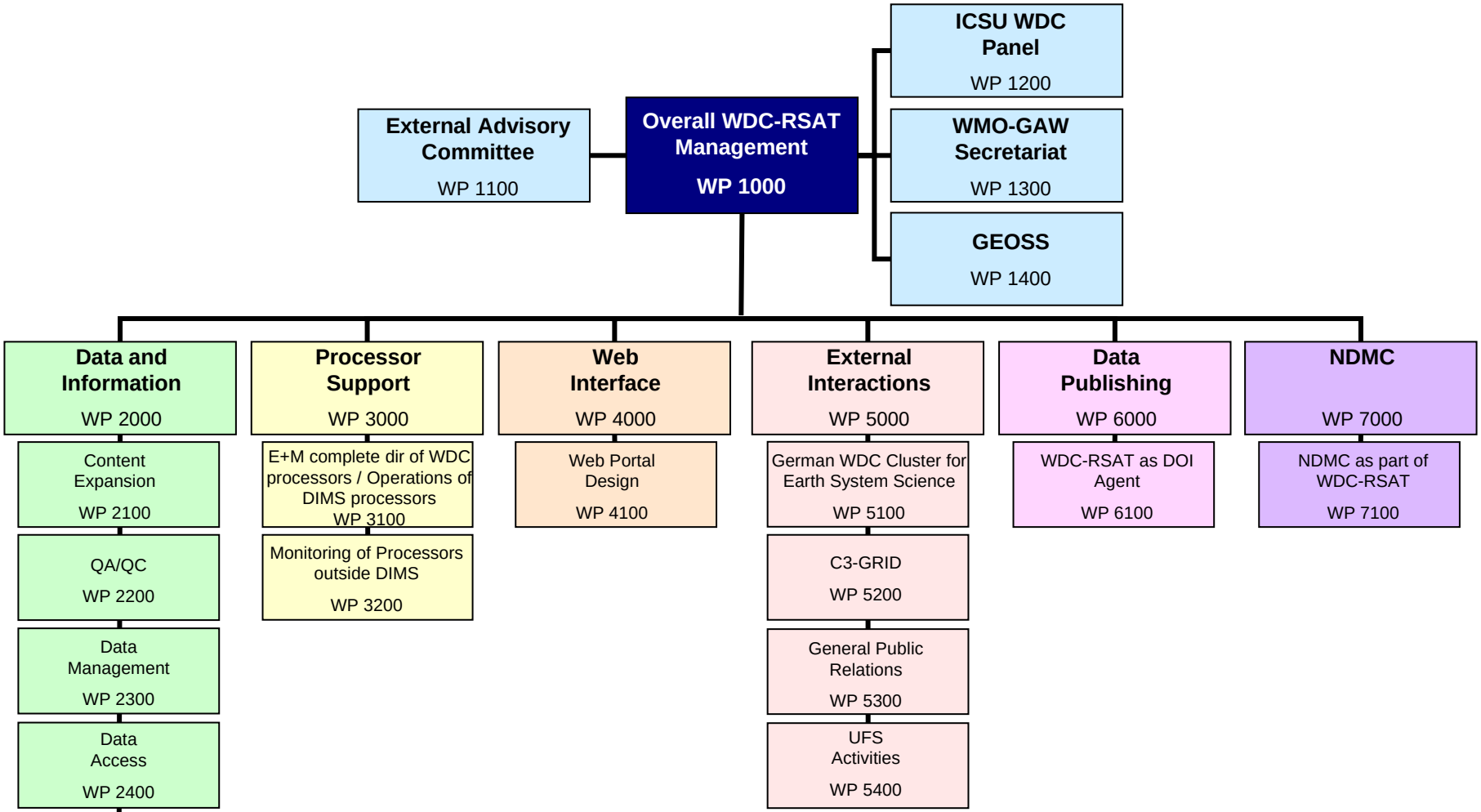


# WDC-RSAT overview

- WDC-RSAT serves as a communication and data management platform for the **Network for the Detection of Mesopause Change (NDMC)** (http://wdc.dlr.de → ndmc)

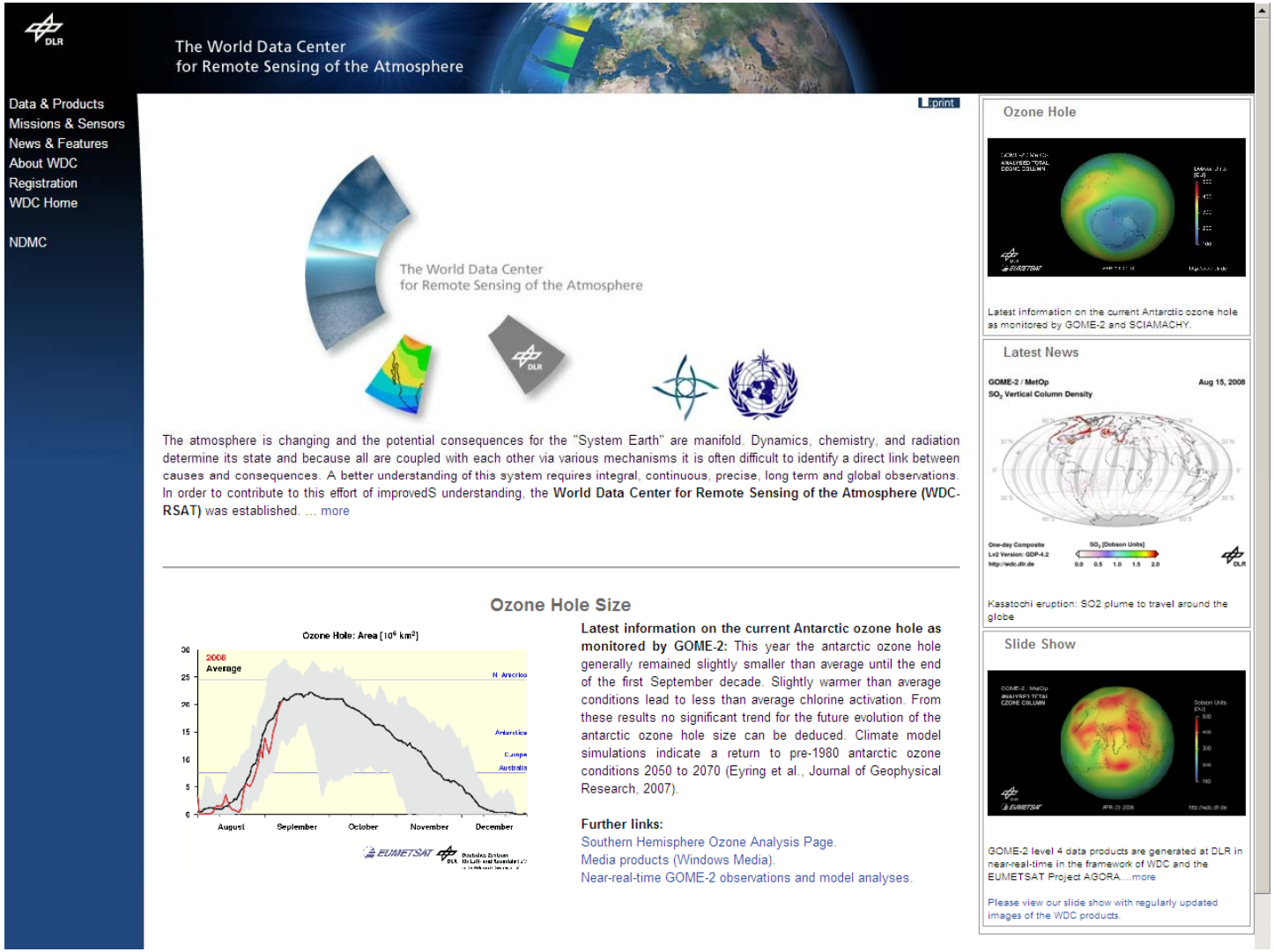



- WDC-RSAT serves the **Bavarian Environmental Research Station "Schneefernerhaus" (UFS)** (GAW Global Station) on the mountain Zugspitze with all aspects related to data management.




# WDC-RSAT Project Work Packages

# WDC-RSAT Homepage: http://wdc.dlr.de




GEOportal: Homepage - Microsoft Internet Explorer bereitgestellt von T-Systems SfR
GEOportal: View Resource - Microsoft Internet Explorer bereitgestellt von T-Systems SfR
Datei Bearbeiten Ansicht Favoriten Extras ?
Zurück Suchen Favoriten
Adresse http://www.geoportal.org/resource_summary.cfm?rid=771
Wechseln zu Links
GEO Portal
Under Construction (Click to provide Feedback)
Home - About GEOportal - How to use GEOportal - Contacts
News
GO
- Advanced Search
Download GEOportal - MyGEO
Select a Country/Continent
Select a Region
CLEAR
Societal Benefit Areas
DISASTERS
HEALTH
ENERGY
CLIMATE
Understanding
Assessing
Predicting
Adapting to
Mitigating
WATER
WEATHER
Browsing for: Climate
Return to Results
INFORMATION SERVICES
- DATA PROVISION
Summary - Full Metadata
World Data Center for Remote Sensing of the Atmosphere
The World Data Center for Remote Sensing of the Atmosphere is maintained by the German Aerospace Center, DLR. The WDC for Remote Sensing of the Atmosphere, Oberpfaffenhofen, is operated by, and collocated with, the German Remote Sensing Data Center (DFD) and the Remote Sensing Technology Institute (IMF) (http://www.caf.dlr.de)
Summary of Data Held: Atmospheric trace gas concentrations, cloud physical and meteorological parameters from various satellite based sensors (see http://wdc.dlr.de for details):
ATMOS (Atmospheric Trace Molecules Observed by Spectroscopy)
ATOVS (Advanced Tiros Operational Vertical Sounder)
AVHRR (Advanced Very High Resolution Radiometer)
CRISTA (Cryogenic Infrared Spectrometers and Telescopes for the Atmosphere)
GOME (Global Ozone Monitoring Experiment)
HALOE (Halogen Occulation Experiment)
MAS (Millimeter-wave Atmospheric Sounds)
MIPAS (Michelson Interferometer for Passive Atmospheric Sounding)
MODIS (Moderate Resolution Imaging Spectroradiometer)
SAGE II (Stratospheric Aerosol and Gas Experiment II)
SCIAMACHY (Scanning Imaging Abborption Spectrometer for Atmospheric Cartography)
Contact Details
WDC for Remote Sensing of the Atmosphere
DLR-DFD
Oberpfaffenhofen
D-82234 Wessling
GERMANY
World Data Center for Remote Sensing of the Atmosphere Website
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12:20

# WDC-RSAT Portfolio


- Thematic areas covered by WDC-RSAT products
  - International environmental conventions
  - Air quality / chemical weather
  - Renewable energies (biomass, solar)
  - Early detection of climate signals

- Categories of data archived in WDC-RSAT
  - atmospheric trace gases, aerosols, and temperatures
  - cloud physical parameters
  - solar radiation
  - land and sea surface parameters
  - spectroscopic data

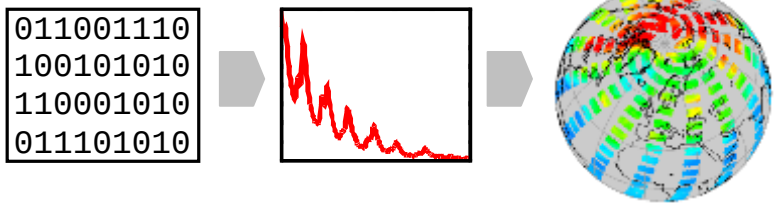
# User Driven Data- and Information Products

Climate & Atmosphere

| Science | Administration | Industry |
|---|---|---|
| Services for Climate and Atmosphere Research | National<br>UBA, LUA, DWD, BGR etc.<br><br>Europe<br>DG XII, EEA, ESA, EUMETSAT<br><br>Global<br>UN, WMO, WHO, IEA | Technology-Transfer (TT)<br>Kayser-Threde GmbH, EnBW, EDF, Meteocontrol, GAF, ASK, L'Oreal etc.<br><br>Public Private Partnership (PPP) |

## satellite data

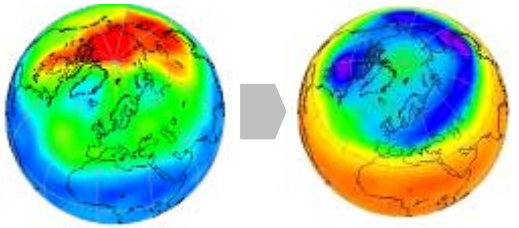
level 0 | level 1 | level 2




raw data | radiances | footprints

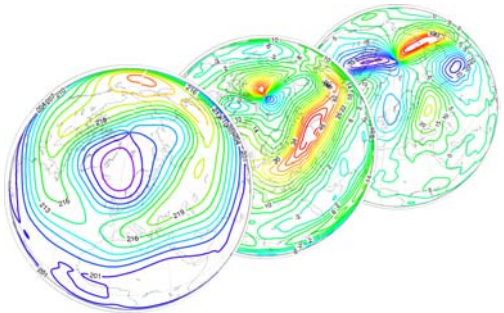
## value added products

level 3 | level 4+

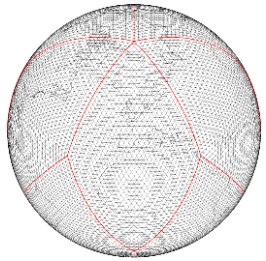


maps ($O_3$ distribution) | analyses ($O_3$ loss)

## meteorology



## models

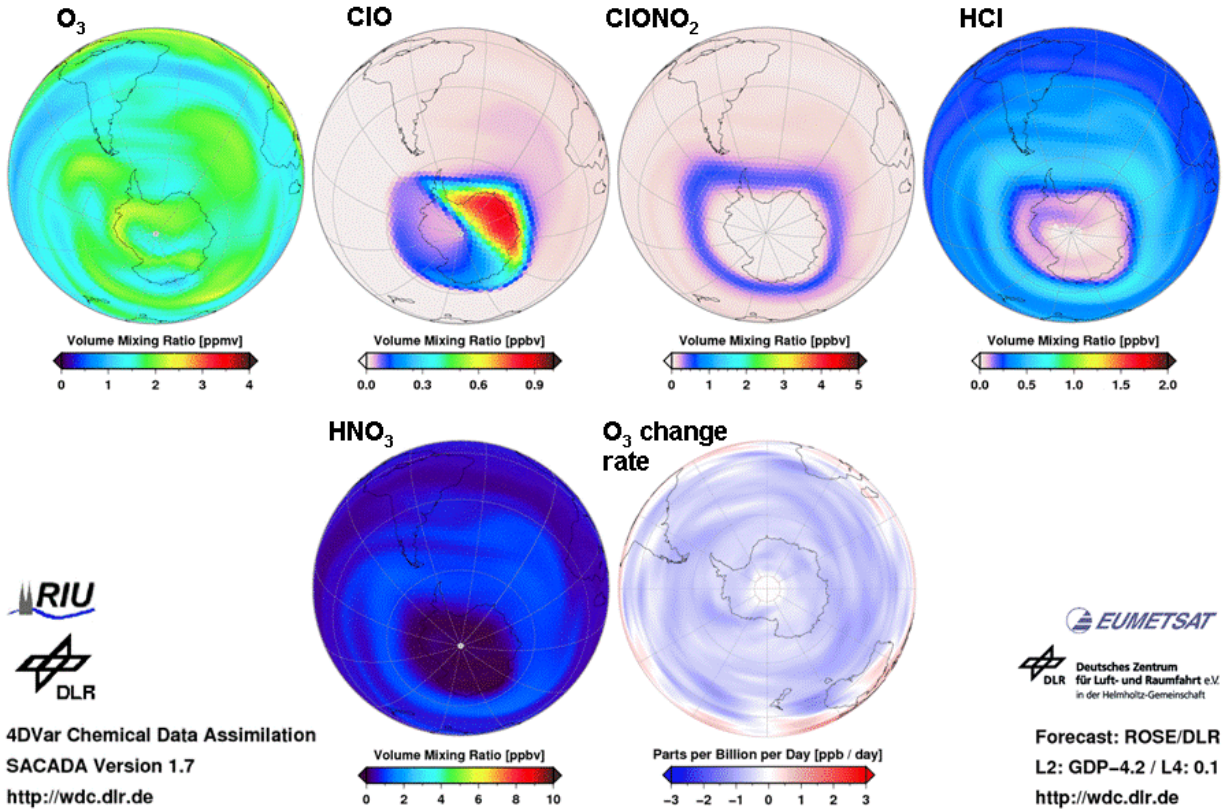


data assimilation
(SACADA / ROSE/DLR)

## Covering all Elements of the Value Adding Chain

Illustrated for the operational ozone processor operated at DLR on behalf of ESA and EUMETSAT, using ERS-2/GOME, Metop/GOME2, ENVISAT/SCIAMACHY, ENVISAT/MIPAS.

# 4D variational data assimilation analysis using 3D-Chemistry Transport Models (SACADA/DLR) based on MetOp GOME-2 measurements




Shown is the volume mixing ratio on September 07, 2008, 12:00 GMT, at 56hPa for O3, ClO, ClONO2, HCl, HNO3. Also shown is the O3 change rate forecast at 56hPa for September 10, 2008, using the 3D-CTM ROSE/DLR and sequentially assimilating earlier MetOp-GOME-2 data.

# Outline


- Overview of the WDC for Remote Sensing of the Atmosphere (WDC-RSAT)
- **Strategic Plan for implementing WDC-RSAT as a WMO-GAW World Data Center**

# WDC-RSAT as WMO-GAW WDC

- Visit of OPAG EPAC in Oberpfaffenhofen in November 2006
- DLR and WMO have agreed in a Memorandum of Understanding to establish and operate the WDC-RSAT as a WMO-GAW World Data Centre.
  → Implementing WDC-RSAT as a WMO-GAW World Data Center
- WDC-RSAT is involved in
  - Expert Team on World Data Centres of the WMO
  - Aerosol SAG
  - Ozone SAG

# Implementation of WDC-RSAT as a WMO-GAW WDC

General objectives as defined in the WMO / DLR MoU:

(a) Develop and publish a strategy plan for the WMO-GAW World Data Centre for Remote Sensing of the Atmosphere (WDC-RSAT) by December 2008 in cooperation with WMO and partners

(b) Manage implementation of the WMO WDC-RSAT

(c) Develop and maintain by August 2009 a portal with overview of satellite-based products for atmospheric composition, including products available directly at WDC-RSAT and with links to products outside of WDC-RSAT ('one-stop shop')

(d) Join the Expert Team on GAW World Data Centres (ET-GAW WDCs) which in turn ensures linkage to the WMO Information System (WIS)

(e) Communicate WMO-GAW WDC-RSAT activities (current state of satellite observational systems, brochures, web portal etc.)

(f) Publicize GAW data availability within the satellite community and help promote their use for satellite data validation

(g) Assist WMO in identifying satellite products which are suited to be utilized in WMO Ozone Bulletins and other WMO publications

(h) Participate in the work of the WMO-GAW Scientific Advisory Groups (SAG) for ozone and for aerosols.

## The WDC-RSAT Strategic Plan for WMO

The main **long-term objectives** of WDC-RSAT will be in line with the WMO Strategic Plan 2008-2015 and with those expressed in the IGACO report [IGACO, 2004].

# The WDC-RSAT Strategic Plan for WMO

- Phased implementation approach

  → comprehensive set of satellite derived data, data products and mandatory metadata **for selected substances** available through the WDC-RSAT

**Phase 1 (Oct 2008 – Dec 2011):**

- Focusing on a limited number of parameters to satisfy IGACO recommendations and to meet GAW's and GEOSS needs
  1) **ozone** (profile and column)
  2) **aerosol** (aerosol optical depth, Angstrom coefficient, fine / coarse fraction, chemical composition, fraction of non-spherical particles and extinction profiles)

  including associated metadata, derived data products and WIS compatibility
- Establishing an 'one-stop-shop' for all satellite-based ozone and aerosol products

# The WDC-RSAT Strategic Plan for WMO – Phase 1 (2008–2011)

## Next steps

- Signing the Memorandum of Understanding between DLR and WMO
- WMO agreed to assign a scientific officer of the WMO to lead the WMO contribution to the implementation of WMO-GAW WDC-RSAT and be a member of the WDC-RSAT Advisory Committee
- Implementation of the WDC-RSAT Strategic Plan for WMO in the following three years
- WDC-RSAT Symposium
- Pilot Project: Establishing a close link between WDC-RSAT and GAW stations