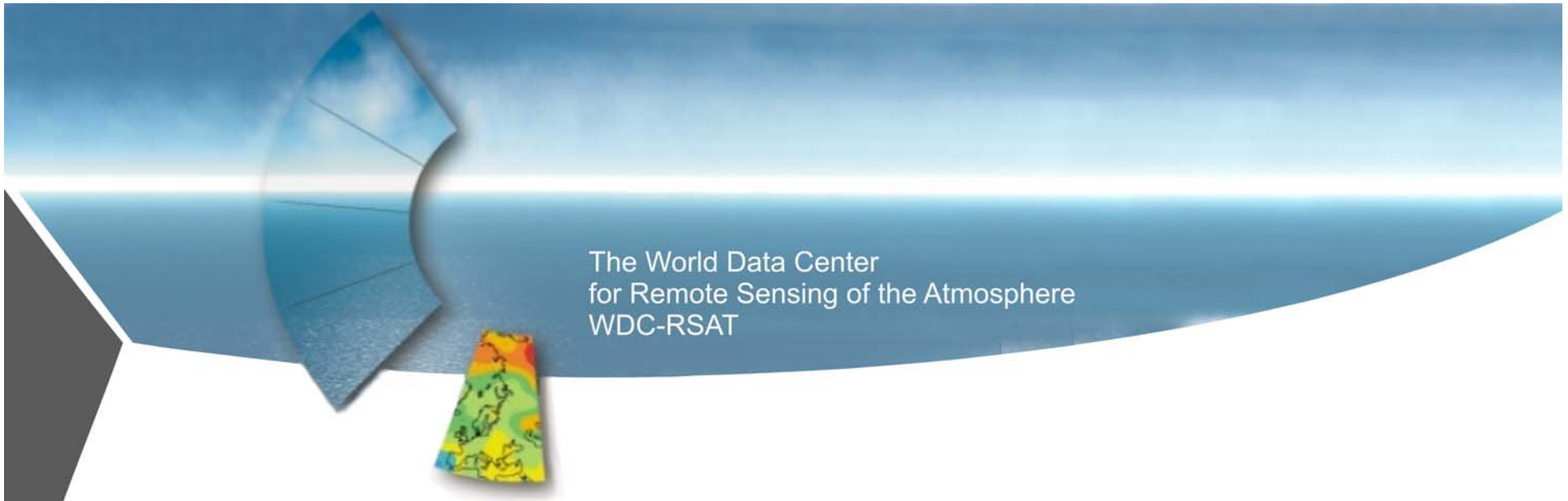


CEOS/ ICSU/ WMO World Data Center for Remote Sensing of the Atmosphere (WDC-RSAT)

Michael Bittner, Kathrin Höppner, Beate Hildenbrand,
Séverine Bernonville
German Aerospace Center (DLR)

WMO ET-WDC Meeting, Toronto, 12-14 May 2010

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

wdc
for remote sensing
of the atmosphere

http://wdc.dlr.de

WDC-RSAT:
Overview of achievements since last meeting (1)

- MoU between WMO and DLR
  - Joint signature 22 July 2009
- Letter of Agreement between NASA and DLR was signed
  - Joint development of CEOS Atmospheric Composition Portal (ACP)
- WDC-RSAT acts as Data Publication Agent
  - Assignment of Digital Object Identifiers (DOI) for data sets
- WDC-RSAT - activities for enhanced interoperability
  - WDC-RSAT metadata: ISO 19115 / 19139 metadata profile with Climate and Forecast convention (CF) for content information (http://cf-pcmdi.llnl.gov/documents/cf-standard-names/standard-name-table/11/standard-name-table)
  - WDC-RSAT services: ongoing establishment of standardized OGC services (WMS/WCS/WFS)
- Establishing WIS compatibility

WDC-RSAT:
Overview of achievements since last meeting (1)

- Data Analysis Center for the Environmental Research Station Schneefernerhaus UFS (UFS-DAZ)
  - Data Analysis Center provides data management and enhanced services for scientists
  - services will be available for UFS in 2-3 years
- Network for the Detection of Mesopause Change (NDMC)
  - 1st NDMC campaign (Sep-Oct 2009) successfully completed
  - 3rd NDMC meeting in Herrsching, Germany (10-14 May 2010)
    - Discussion regarding harmonization / interoperability of NDMC metadata and data formats
- Preparation of WDC-RSAT Symposium at DLR in early 2011

MoU between WMO and DLR

- Establishment of a one-stop-shop for satellite data regarding the chemical and physical composition of the atmosphere (phase 1: aerosol and ozone)
- Participation in SAGs Ozone and Aerosol

  Current activities:

  - Aerosol: one-stop shop regarding satellite aerosol products in development → will be available soon
  - Ozone: closer cooperation with WOUDC
    - a combined footprint search based on meta data information (ISO 19115)
    - cooperation on meta data, data formats and data exchange
    - joint inventory lists, joint/harmonized search functions
- Participation in WMO-GAW Expert Team on Near-Real-Time Chemical Data Transfer (ET-NRT-CDT)

Establishing WIS compatibility

- WDC-RSAT is nominated as DCPC (Data Collection or Production Center)
- Responsible for atmospheric satellite-based data
- German Weather Service (DWD) as GISC (Global Information System Center) for WDC-RSAT
- Questionnaire „WIS Center Nomination“ (WIS Demonstration Process) was submitted to WMO to act as a DCPC
- Participation in upcoming WIS Workshop on Information Access Enablers (17-18 May 2010 in Geneva)

WDC-RSAT operates the CEOS Atmospheric Composition Portal (ACP)

- The Atmospheric Composition Constellation (ACC) and the Workgroup for Information Systems and Services (WGISS) within the Committee on Earth Observation Satellites (CEOS) is developing

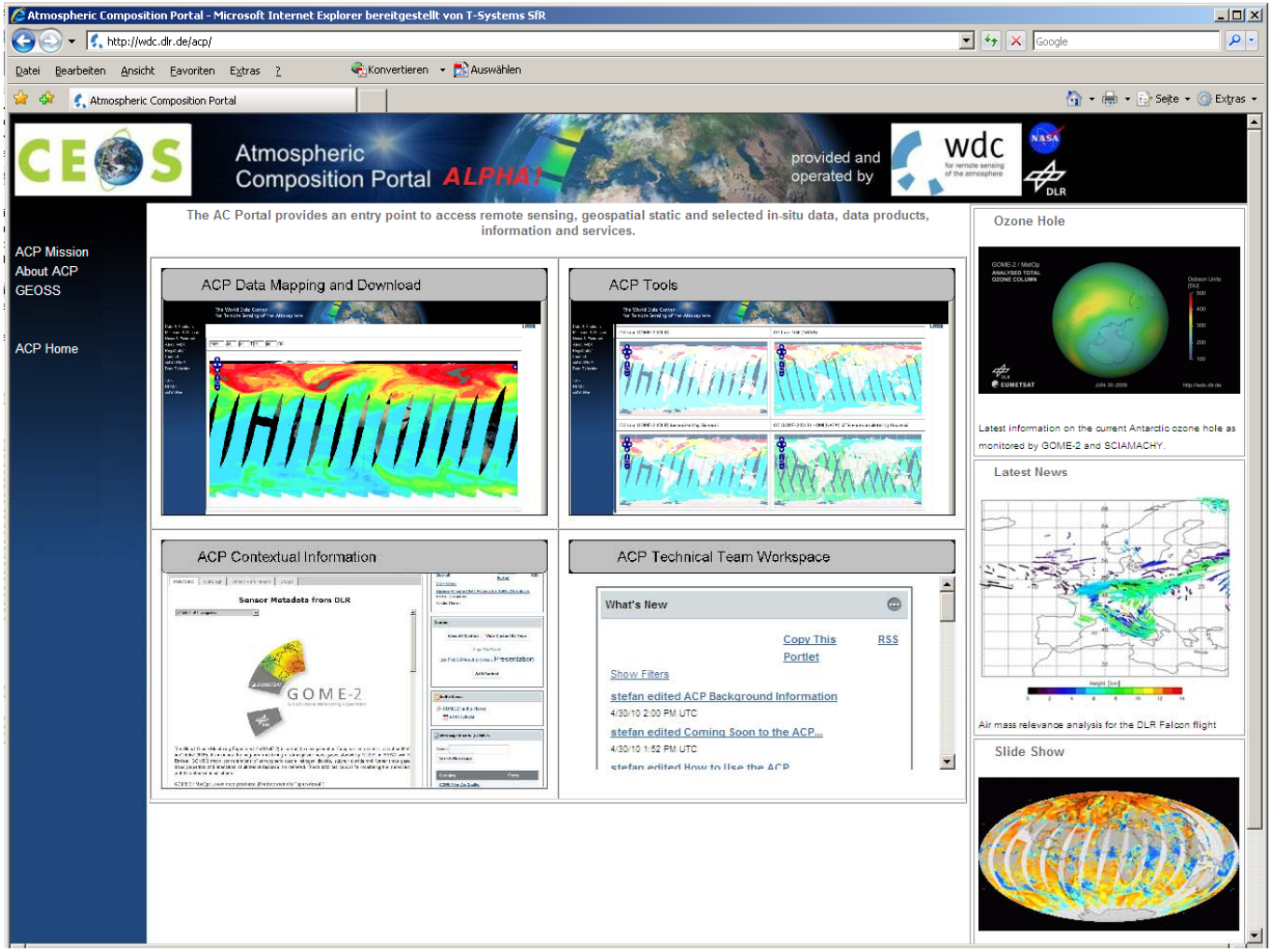
  a portal to support interoperability among the atmospheric composition research and applications communities

  - Cooperation of NASA and DLR to advance the portal
  - New joint CEOS-WGISS activity under CEOS task (AR-09-02b “ACC Portal”) to respond to GEO 2009-2011 plan
  - Alpha Version launched in April 2010: **http://wdc.dlr.de/acp**

WDC-RSAT operates the CEOS Atmospheric Composition Portal (ACP)

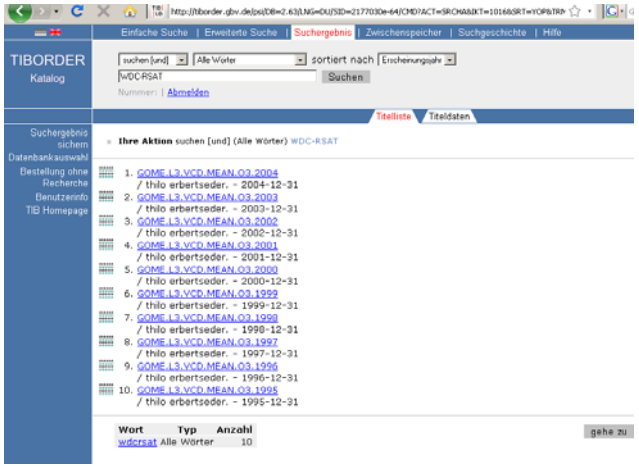
Alpha Version:
http://wdc.dlr.de/acp

ACP activities of WDC-RSAT in cooperation with NASA and University of Washington



Data Publication with Digital Object Identifiers (DOI)

- Having persistent identifiers is a basic requirement for publication and citation of scientific data
- DOIs (Digital Object Identifier) are persistent identifiers. The mechanism behind is the linkage of an URL to a data set (that might change) with a DOI (that is static).
- Global registration of scientific data using DOIs



- WDC-RSAT became a DOI Agent
  - Attractive for GAW related data sets

WDC-RSAT – activities for enhanced interoperability

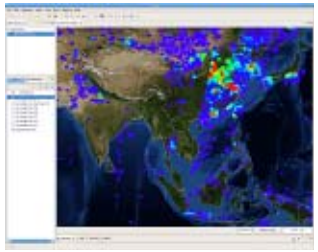
There is wide spectrum for defining “interoperability” - the ability to exchange and use information (usually in a large heterogeneous network) and required by GEOSS

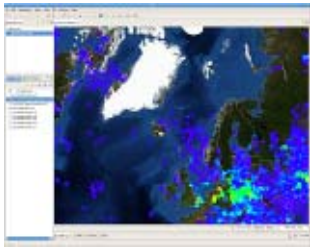
- developing tools for harmonization and correlation of heterogeneous data bases for customers initiating requests (flexible, generic, adaptable)
- Exploring (new) technologies for our needs (web map services, grid technologies)

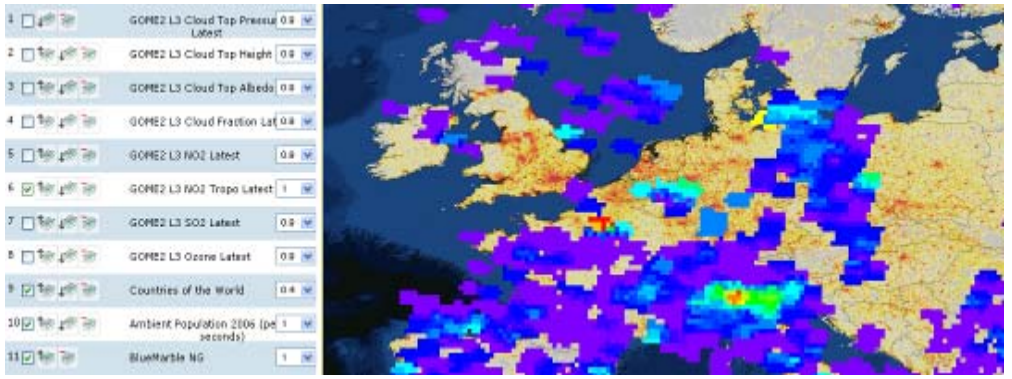
Interacting with Web Map Services

- Define and display your own
  - Area of interest
  - Projection
  - Time

http://...wms?
REQUEST=GetMap
LAYERS=**gome2.no2**
BBOX**=-180.0,-90.0,**
180.0,90.0
TIME=**2008-08-28**

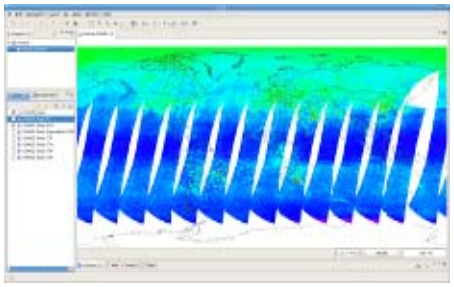


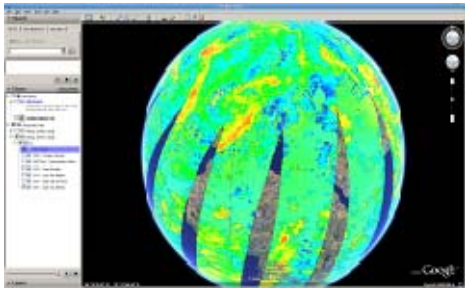




- Combine datasets from multiple sources…

- ..in multiple clients





WDC-RSAT – activities for enhanced interoperability

There is wide spectrum for defining “interoperability” - the ability to exchange and use information (usually in a large heterogeneous network) and required by GEOSS

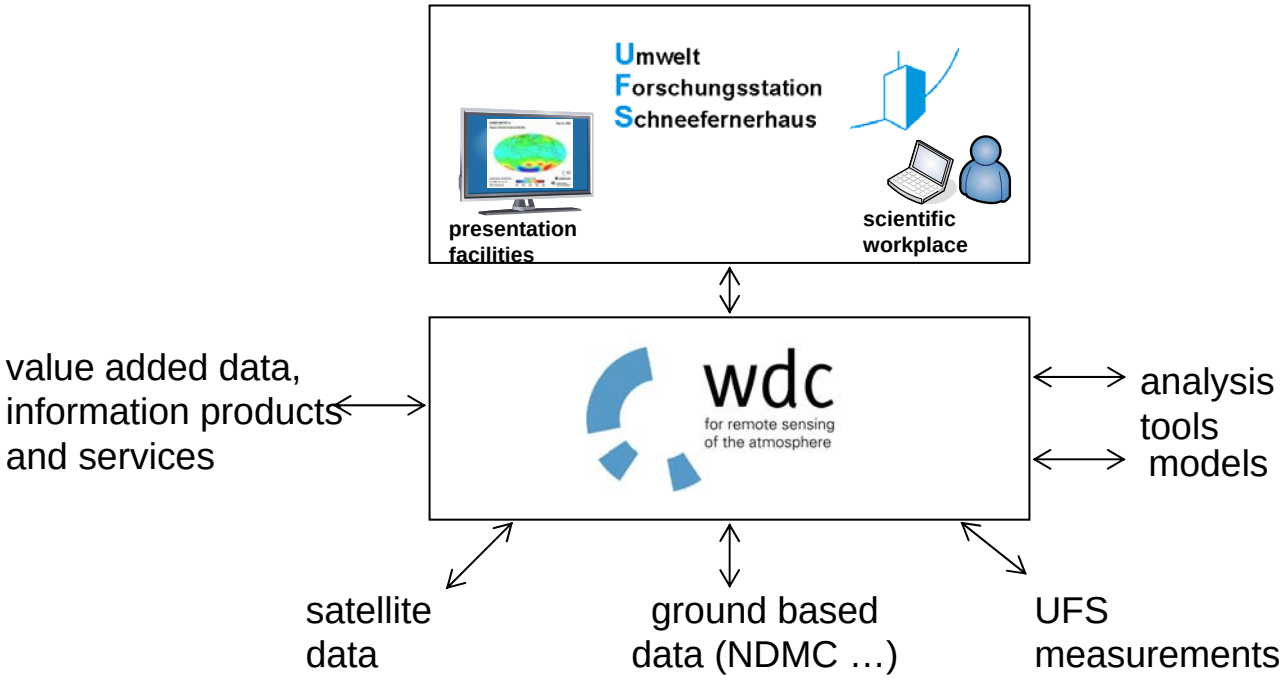
- Developing tools for harmonization and correlation of heterogeneous data bases for customers initiating requests (flexible, generic, adaptable)
- Exploring (new) technologies for our needs (web map services, grid technologies)
- Enhance international cooperation, data sharing and services
- Implementing and using of international standards for data, metadata and interfaces (OGC, CF-netCDF, ISO, …) and maybe extend them if needed, ideally folding them back into the overall standards
- Developing services for integrated validation of satellite based data and verification of models and information products

UFS – Data Analysis Center (UFS-DAZ) (ongoing project)

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

- UFS-DAZ
  - Provides UFS scientists a quick, comfortable, tailored and secured access to UFS measurements
  - offers comfortable access to
    - atmosphere-related satellite based and non-satellite based data (e.g. from ground-based networks such as NDMC etc.),
    - value added data and information (e.g. atmospheric dynamics activity or global ozone distribution),
    - services (e.g. air quality forecasts), atmospheric models (e.g. trajectory models or 3D-Chemistry Transport Models) and
    - user specific data analysis tools (e.g. Web Mapping Tools).

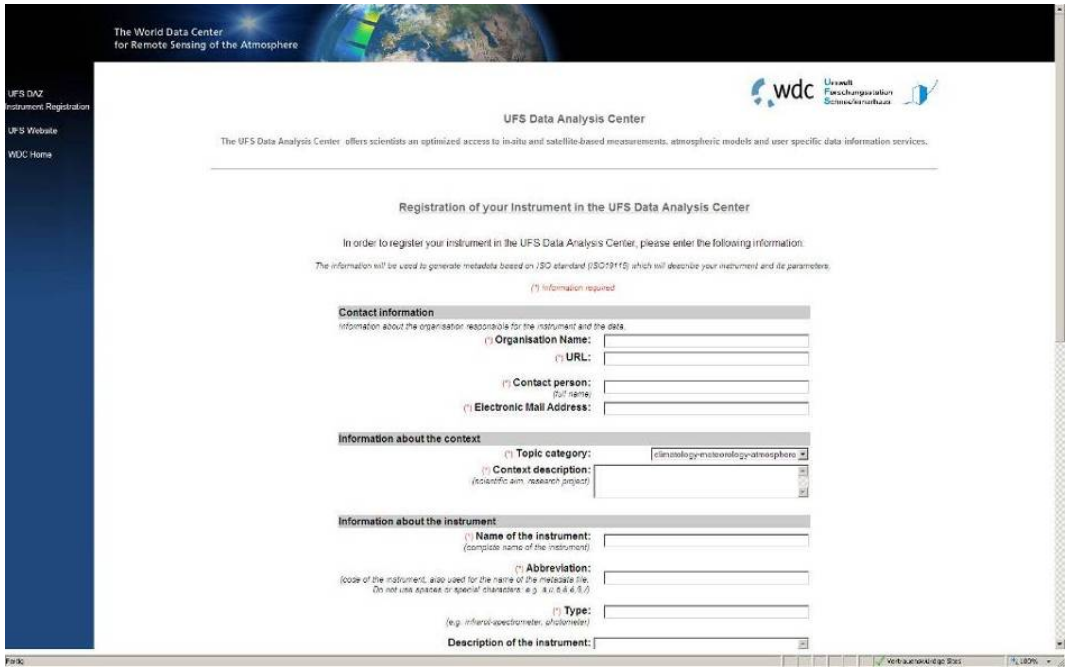
UFS – Data Analysis Center (UFS-DAZ)



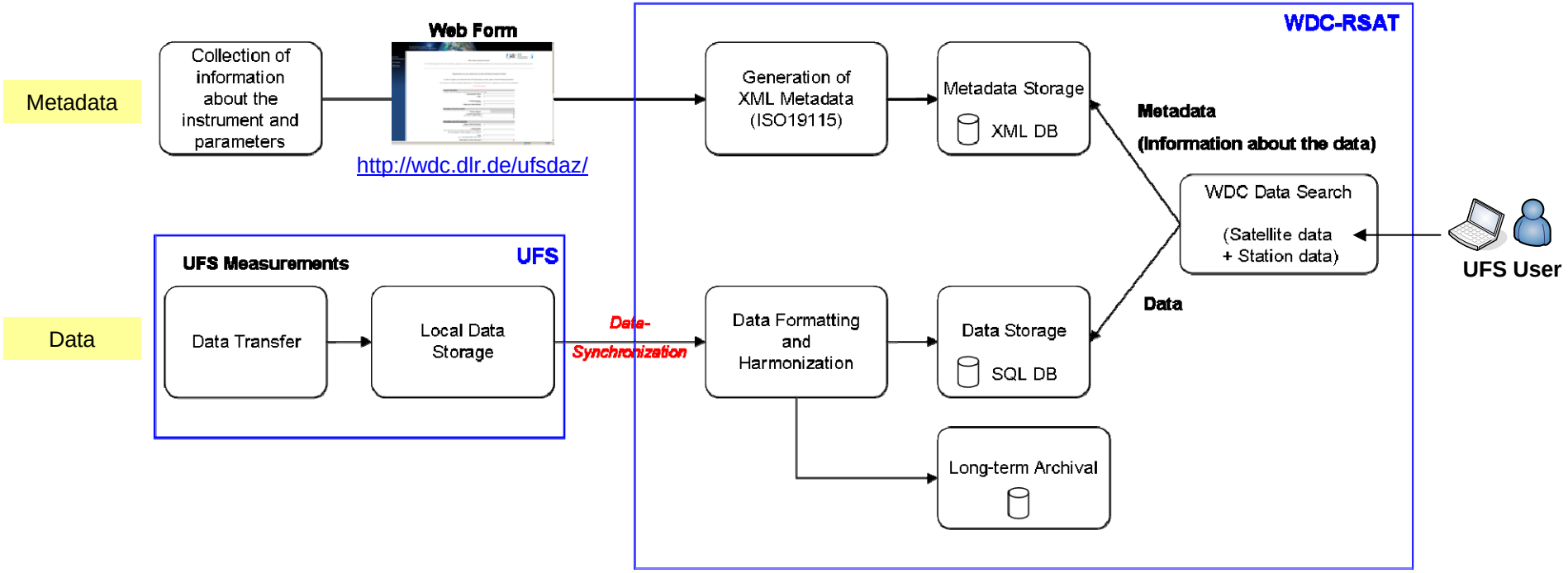
This concept is expandable in future to include more observatories and types of observations in the sense of the Global Earth Observation System of Systems (GEOSS)

UFS-DAZ Data Management: Web form (Metadata)

- Data collection:
  - Information about the UFS instruments and measurements
- Aim: Generation of ISO Metadata (ISO 19115)
  - Uniform und standardized description of the measurements
- Web form is online available:
  - http://wdc.dlr.de/ufsdaz/



UFS-DAZ Data Management: Overview

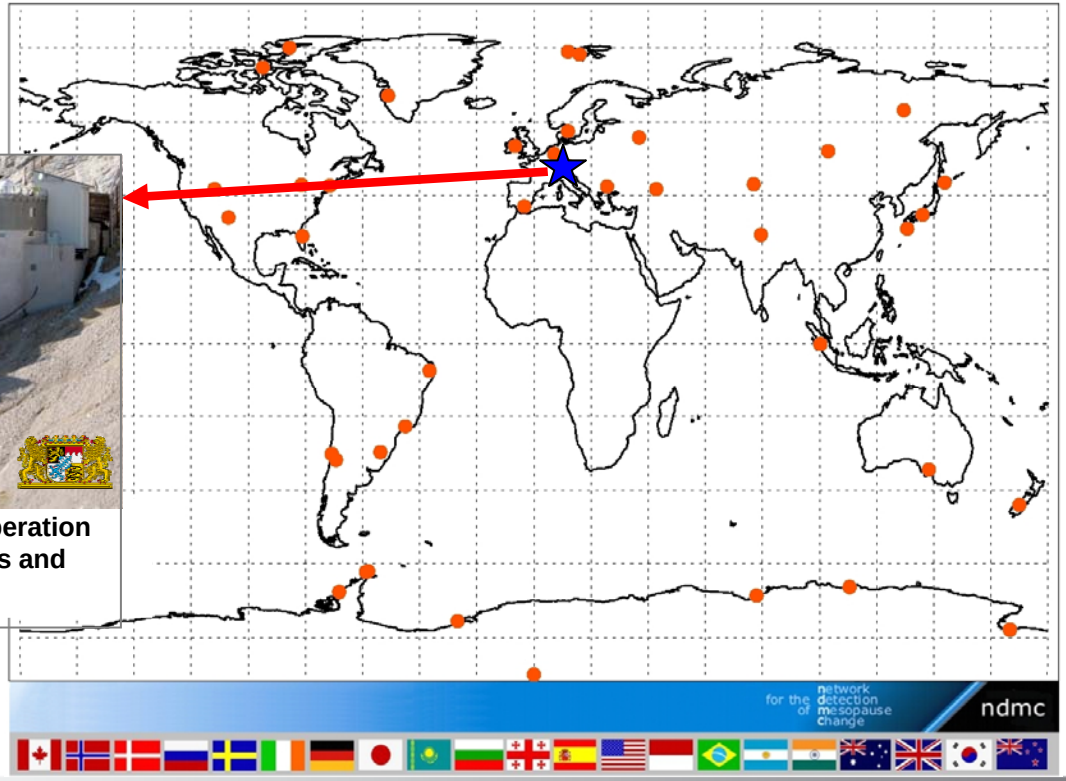


Network for the Detection of Mesopause Change (NDMC)

network for the detection of mesopause change

- Global network including currently 48 ground-based measurement sites worldwide
- monitoring the airglow emission layer in 80-100 km height

Coordination:DLR, in Cooperation with UFS Schneefernerhaus and CONICET, Argentina



Network for the Detection of Mesopause Change (NDMC)

ndmc
network
for the detection
of mesopause
change

- 1st NDMC campaign (Sep-Oct 2009) successfully completed

- 3rd NDMC meeting in Herrsching, Germany (10-14 May 2010)
  - Presentation of campaign results
  - Discussion regarding harmonization / interoperability of NDMC metadata and data formats

- Management: DLR-DFD / CONICET; Coordination center: UFS
- WDC-RSAT serves as data and communication platform
- NDMC is affiliated with GAW and NDACC

wdc
for remote sensing
of the atmosphere

- http://wdc.dlr.de/ndmc

Announcement of CEOS-ICSU-WMO WDC-RSAT Symposium

- The symposium will bring together the **data providers** and **users** with the objective of
  - (1) visualising **available resources** (data, information, data processing services etc.),
  - (2) increasing their exposure to potential users and soliciting feedback for **improvements and increased cooperation**, and
  - (3) developing the WDC-RSAT into a “one-stop shop” with the ultimate goal of becoming a fully operational “community node” in the GEOSS architecture.

- The symposium responds to the contemporary challenges that all World Data Centers face through the **participation of major stake holders**,
  - Data Providers, Data Centers, Data Archives, as well as
  - Service Providers and the User Community at large.

CEOS-ICSU-WMO WDC-RSAT Symposium, early 2011

- The **two day symposium** will be structured in
  - **plenary sessions** with invited overview presentations and submitted topical talks allowing amble time for discussions and
  - **individual workshops** with moderators and rapporteurs.

- A list of potential **joint activities** for consideration by the workshop will be prepared during the symposium.
  - where appropriate, the workshop participants will evaluate how each task contributes to overall GEOSS objectives.

- Proposed time windows:

  Time window 1: February 22-23, 2011

  Time window 2: February 23-24, 2011

  Time window 3: February 28 – March 01, 2011

  Time window 4: March 01 – March 02, 2011

  Time window 5: March 10-11, 2011

→ The official date will be announced soon.