

German Cluster of WDCs for Earth System Research

- Entwurf -

Michael Lautenschlager¹, Michael Diepenbroek², Hannes Grobe², Michael Bittner³, Jens Klump⁴

¹World Data Centre Climate, M&D at Max-Planck-Institut für Meteorologie, DKRZ
(www.wdc-climate.de)

²World Data Centre for Marine Environmental Sciences (WDC-MARE),
MARUM at Bremen University, AWI,
(www.pangaea.de)

³World Data Centre for Remote Sensing of the Atmosphere, DLR-DFD, DLR-IMF
(wdc.dlr.de)

⁴GeoForschungsZentrum Potsdam, GFZ
(isdc.gfz-potsdam.de)

Recognition of and concern regarding the changes being experienced by "System Earth" has lead to a marked increase in the amount and variety of data being collected from experiments designed to study various aspects of the Earth's major systems.

Studies of the atmosphere, the oceans, and land all rely on the collection and analysis of such data and has lead to valuable discoveries related to indications or impacts of climate change. Similarly, efforts discovered to modeling past and future climate changes rely heavily on large data sets and also produce them, serving as a source of valuable information for a wide variety of scientific disciplines.

In Germany, many of the data sets described above are archived in data centers, such as the three current World Data Centers (WDCs) of the International Council for Science (ICSU) as well as in another data center that is a candidate ICSU WDC.

In 2003 these data centers founded the German WDC Cluster Earth System Research.

In addition to data archiving, the German cluster of WDCs is actively working together on issues related to data publication and availability in several national projects.

One of these joint projects is called **C3-GRID (Collaborative Climate Community Data Processing Grid)** and is funded by the German Federal Ministry for Education and Research (BMBF). This project, started in September 2005, aims to develop a highly productive grid-based environment for the German earth system science community in order to foster effective scientific analysis of the vast amounts of data resulting from modelling and observation programmes. This environment will be built on available Grid technology but will require within the project the development of a new generation system. The system will be composed of a meta-directory structure for the consistent description of data leading to effective access and use of data archived in data centres such as ICSU WDCs, as well as to efficient use of distributed processing capability. C3-GRID is funded by the German Federal Ministry for Education of Research (BMBF).

eScience Platform for the Earth and Environmental Sciences (eGEOS) is a framework to build a generic eScience platform for the Earth and Environmental Sciences, linking together geodata sources, geosciences libraries, and compute services. The platform will supply a new generation of tools for the exploration and visualization of available information. It will help create added value by interdisciplinary integration in fundamental research and development, as well as supporting technology transfer into application. eGEOS is also funded by BMBF.

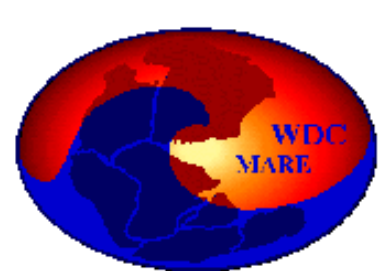
Another notable joint project is called **STD-DOI (Publication and Citation of Scientific Primary Data)** and is funded by the German Research Foundation (DFG). This ongoing project, started in 2004, has focused several separate efforts in Germany to make possible the most direct steps towards a system for registration and publication of scientific data [6]. As a result of this project the German National Library of Science and Technology (TIB) is now established as a registration agency for scientific primary data as a member of the International DOI Foundation. STD-DOI is being funded by the German Research Foundation and was undertaken to support an initiative from a working group of the ICSU Committee on Data for Science and Technology (CODATA).



WDC-Climate (WDC-C)

by Model and Data (M&D) group hosted at the Max-Planck-Institute for Meteorology and is realized in cooperation with the German Climate Computing Center (DKRZ)

The mission of the WDC-Climate corresponds with the basic tasks of M&D. Data for climate research are collected, stored and disseminated in order to serve the scientific community. M&D has experience in running international data centers. The WDC-Climate is restricted to climate data products. Emphasis is spent on climate modeling and related data products. In May 2006 approximately 220 TB of climate data are archived in the CERA database system and split up into 6 Billion individual table entries for direct web data access.



WDC for Marine Environmental Science (WDC-MARE)

by Center for Marine Environmental Sciences (MARUM) at Bremen University and Institute for Polar and Marine Research of the Foundation Alfred Wegener (AWI)

WDC-MARE aims to collect, scrutinize, and disseminate data related to global change in the fields of environmental oceanography, marine geology, paleoceanography, and marine biology. It focuses on georeferenced data using the information system PANGAEA.



WDC for Remote Sensing of the Atmosphere (WDC_RSAT)

by Cluster of Applied Remote Sensing (CAF) hosted by the German Remote Sensing Data Centre (DFD) of the German Aerospace Centre (DLR)

WDC-RSATS aims at the provision of data and information on atmospheric trace gases, clouds, and the Earth's surface which are primarily gathered from satellite-based sensors. Higher level data and information products are also generated from the data through assimilation into numerical models of the atmosphere and of its interaction with the biosphere.



WDC of the Lithosphere (WDC-Terra)

(candidate WDC)
by GeoForschungsZentrum Potsdam (GFZ)

The scope of WDC-TERRA will be Earth's gravity field and gravity field models, geomagnetism, atmospheric sounding by GPS radio occultation, superconducting gravimetry, seismology (GEOFON and other sources), aerogravimetry, lithosphere soundings/seismics, magnetotellurics, and scientific continental drilling. The WDC facilities will be integrated into the local framework of lithosphere observation and modelling.

The Infrastructure of the World Data Center Cluster „Earth System Research“

