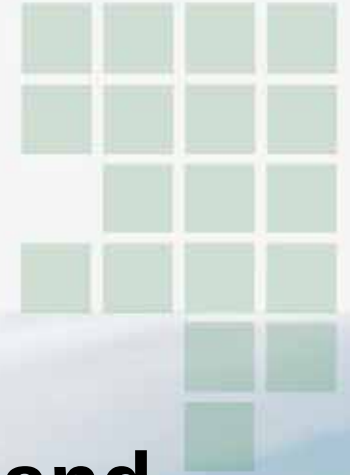




DATA INTEGRATION AND MANAGEMENT



**Steve Williams¹, Frank Toussaint², and
Toshio Koike³**

¹ NCAR Earth Observing Laboratory, Boulder, Colorado, USA

² Max Plank Institute for Meteorology, Hamburg Germany

³ University of Tokyo, Tokyo, Japan

3rd GEOSS Asia-Pacific Symposium

Kyoto, Japan

4-6 February 2009



EOL CEOP work supported by NOAA Climate Projects Office





GEWEX ORGANIZATION

RADIATION

GEWEX Radiation Panel (GRP) - W. Rossow, Chair

- **BSRN** Baseline Surface Radiation Network (E. Dutton)
- **CIRC** Continuous Intercomparison of Radiation Codes (L. Oreopoulos)
- **GACP** Global Aerosol Climatology Project (M. Mishchenko)
- **GPCP** Global Precipitation Climatology Project (R. Adler)
- **GVaP** Global Water Vapor Project
- **I3RC** Intercomparison of 3-D Radiation Codes (R. Cahalan)
- **ICRCCM** InterComparison of Radiation Codes in Climate Models (R. Ellingson)
- **ISCCP** International Satellite Cloud Climatology Project (W. Rossow)
- **LandFlux** Land Surface Fluxes
- **SRB** Surface Radiation Budget Project (P. Stackhouse)
- **SeaFlux** Sea Surface Fluxes (C. Clayson)
- **WGCAP** Working Group for Cloud and Aerosol Profiling (T. Ackerman)
- **WGDMA** Working Group on Data Management and Analysis (W. Rossow)
- **WGPRN** Working Group for Precipitation Radar Networks (V. Levizzani)

MODELLING AND PREDICTION

GEWEX Modelling and Prediction Panel (GMPP) - C. Jakob, Chair

- **GABLS** GEWEX Atmospheric Boundary Layer Study (B. Holtslag; G. Svensson)
- **GCSS** GEWEX Cloud System Study (P. Siebesma)
 - Boundary Layer Clouds (P. Siebesma)
 - Cirrus Cloud Systems (S. Dobbie)
 - Extra Tropical Layer Clouds (G. Tselioudis)
 - Precipitating Convective Cloud Systems (J. Petch)
 - Polar Clouds (J. Pinto)
 - GPCI - GCSS Pacific Cross-section Intercomparison (J. Teixeira)
- **GLASS** GEWEX Global Land/Atmosphere System Study (B. van den Hurk)
 - ALMA Assistance for Land-surface Modelling Activities (T. Oki)
 - GLACE-2 Global Land/Atmospheric Coupling Experiment (R. Koster)
 - GSWP-2 Global Soil Wetness Project (P. Dirmeyer)
 - LoCo Local land-atmospheric Coupling (B. van den Hurk)
 - PILPS Project for Intercomparison of Land Surface Parameterization Schemes (A. Pitman)

HYDROCLIMATE

Coordinated Energy and Water-Cycle Observations Project (CEOP) - T. Koike, J. Roads, Co-chairs

Regional Hydroclimate Projects (RHPs)

- **AMMA** African Monsoon Multidisciplinary Analysis Project (A. Gaye)
- **BALTEX** Baltic Sea Experiment (H.J. Isemer)
- **CPPA** Climate Prediction Program for the Americas (J. Huang)
- **LBA** Large-Scale Biosphere-Atmosphere Experiment in Amazonia (J. Maia)
- **LPB** La Plata Basin Project (H. Berbery)
- **MAHASRI** Monsoon Asian Hydro-Atmospheric Science Research and prediction Initiative (J. Matsumoto)
- **MDB** Murray-Darling Basin Water Budget Project (A. Seed)
- **NEESPI** Northern Eurasia Earth Science Partnership Initiative (P. Groisman)

Cross-Cutting Studies

- **Water and Energy Budget Studies** (J. Roads)
- **Extremes** (R. Stewart)
- **Stable Water Isotope Working Group** (D. Noone)
- **Aerosols** (W. Lau)

Modelling Studies

- **Global Models** (M. Bosilovich)
- **Regional Models**
 - Inter-Continental Transferability Study (B. Rockel)
 - Regional Modelling for Variability and Extremes (R. Arritt)
 - GEWEX Modelling and Prediction Panel (C. Jones)
- **Land Surface Models** (M. Rodell)
- **Hydrologic Applications Project** (E. Wood)

[Home](#)

[Data Access](#)

[Introduction/Organization](#)

[Strategic Implementation Plan](#)

[Publications/Documents](#)

[Meetings](#)

[Related Links](#)

[Contact](#)

[GEOSS \(DA-07-06\) \(tentative page\)](#)

News

Archive

05.12.08: The 3rd CEOP Annual Meeting will be held in Melbourne, 19 - 21 August 2009. ...[Full](#).

16.10.08: The 2nd CEOP Annual Meeting presentation material available. ...[Full](#).

12.09.08: Further updates of the 2nd CEOP Annual Meeting in Geneva Agenda and other documents. ...[Full](#).

10.09.08: Agenda of the 2nd CEOP Annual Meeting in Geneva updated. ...[Full](#).

♦ *To understand and predict continental to local-scale hydroclimates for hydrologic applications.* ♦

→ [Objectives](#)

CEOP Elements

Regional Hydroclimate Projects

AMMA: African Monsoon Multidisciplinary Analyses

BALTEX: Baltic Sea Experiment

CPPA: Climate Prediction Program for the Americas

LBA: Large-Scale Biosphere-Atmosphere Experiment in Amazonia

LPB: La Plata Basin Project

MAHASRI: Monsoon Asian Hydro-Atmosphere Scientific Research and Prediction Initiative

MDB: Murray-Darling Basin Water Budget

NEESPI: Northern Eurasia Earth Science Partnership Initiative

Data Management

Reference Sites/Basins

Model Output

Satellite Data

Data Integration and Dissemination

Central Data Integration

Regional Studies

Cold Region Studies (CRS)

High Elevations (HE)

Monsoon (MONS)

Semi-Arid Studies (SAS)

Cross Cutting Studies

Water and Energy Budget Studies (WEBS)

Extremes

Aerosols

Isotope Cross Cut Study (ICCS)

Model Studies

Global Models

Regional Climate Models

Inter-Continental Transferability Study (ICTS)

Scale Interaction Evaluation Experiment (SIEVE)

Land Surface Models (LSM)

Hydrologic Applications Project (HAP)

Associated Global Data Centers: GPCC: Global Precipitation Climatology • GRDC: Global Runoff Data

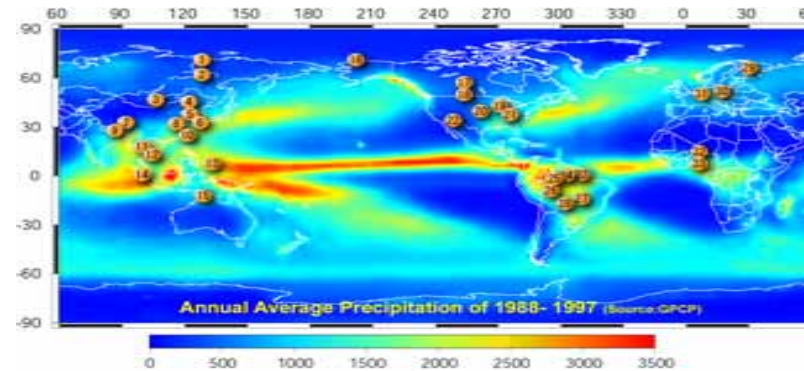
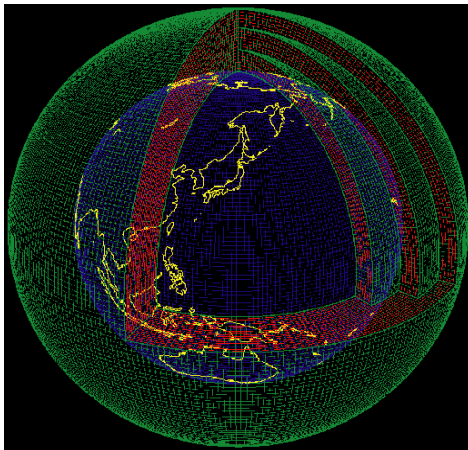
CEOP HOME PAGE: <http://www.ceop.net>



Coordinated Energy and water-cycle Observations Project

Unique Capabilities

A Well Organized Data Archive System



Model Output Data Archiving
Center at the World Data
Center for Climate, Max-Planck
Institute for Meteorology of
Germany

In-Situ Data Archiving
Center at NCAR (National
Center for Atmospheric
Research) of USA

Data
Integrating/Archiving
Center at University of
Tokyo and JAXA of
Japan



<http://www.eol.ucar.edu/projects/ceop/dm/>

**Coordinated Energy and Water
Cycle Observations Project
Data Management**



INTEGRATED



IN-SITU



SATELLITE



MODEL



Integrated Data Servers	
Distributed Data Integration System Centralized Data Integration System GCMD CEOP Portal	
Reference Site Data	
Reference Site Data Gateway CEOP Reference Site Data Policy Browse Imagery Data Format Documentation Reference Site Documentation Reference Site Virtual Tour CEOP EOP-1 Data Sets Hydrology Reference Sites	
Satellite Data	
CEOP Satellite Data Gateway CEOS satellite data exchange principles for research CEOS satellite data exchange principles for operations	
Model Output	
CEOP Model Data Gateway CEOP Model Center Documentation Table CEOP Model Supporting Documents Multi-model Analysis for CEOP (MAC)	
CEOP Contacts	
CEOP Contacts	
Acknowledgement	
 EOL Reference Site Data activities and coordination supported by NOAA Climate Program Office (CPO).  	

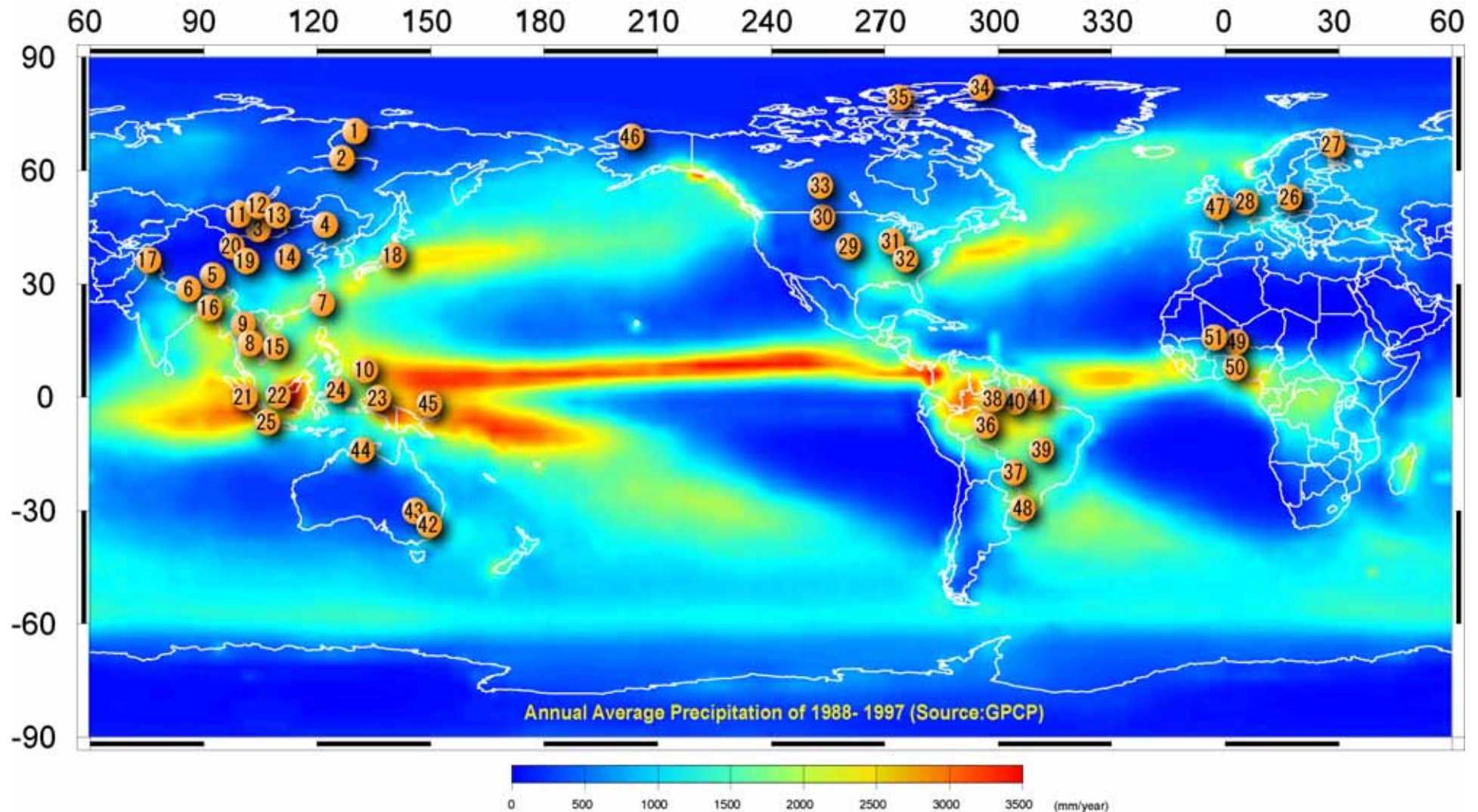
RHP Data and Policies		
AMMA	Data Access	Policy
BALTEX	Data Access	Policy
CPPA	Data Access	Policy
LBA	Data Access	Policy
LPB	Data Access	Policy
MAHASRI		
MDB		
NEESPI	Data Access	Policy
Global Data Centers		
GPCC	Data Access	Policy
GRDC	Data Access	Policy
Related CEOP Data Contributors		
ARM	Data Access	Policy
AWCI		
BSRN	Data Access	Policy
CAMP		
Cloudnet	Data Access	Policy
MAGS	Data Access	Policy
Documents		
CEOP Strategic Implementation Plan CF Metadata Convention Coordinated Enhanced Observing Period Documents Questionnaires		
Related Links		
CEOP Home Page Related Links		

Related Project Links





CEOP Reference Site Map





Lindenberg Reference Site



STATION NAME:

Falkenberg

CONTACT:

Name: Dr. Frank Beyrich

Affiliation:

Meteorologisches Observatorium Lindenberg
Deutscher Wetterdienst (DWD)

Address:

Am Observatorium 12
D - 15848 Tauche - OT Lindenberg
Germany

E-mail: frank.beyrich AT dwd DOT de

Telephone: +49 33677 60228

Fax: +49 33677 60280

WEB PAGES:

- ♦ [Lindenberg Meteorological Observatory Web Page](#)
- ♦ [BALTEX Home Page](#)

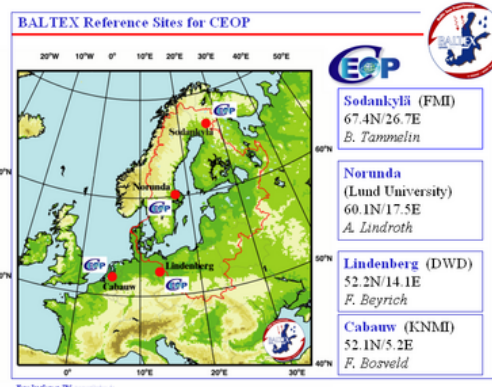
STATION LOCATION:

All meteorological, radiation, soil, tower and flux measurements have been performed at the Falkenberg Boundary Layer Field Site of the Meteorological Observatory Lindenberg (MOL).

The coordinates of the GM Falkenberg are given by:
52° 10' 01" N (52.17°N) and 14° 07' 27" E (14.12°E) at 73 m elevation.

The radiosondes are released at the site of the Meteorological Observatory Lindenberg (MOL) which is about 5 km to the North of the Falkenberg site.

The co-ordinates of the MOL are given by:
52° 12' 36" N (52.21°N) and 14° 07' 12" E (14.12°E) at 112 m elevation.



STATION DESCRIPTION:

Individual Site Metadata includes:

- Station (s)
- Contact (s)
- Links to relevant web pages
- Station location (e.g. maps, photos)
- Station description (e.g. vegetation characteristics, soil types, climate)
- Parameters and Instrumentation descriptions (SFC, TWR, STM, FLX, UA)
- Links to presentations
- Links to data sets and additional documentation

CEOP SFC Data Status and Quality

The colors represent the CEOP Data Quality Flags (see [definitions](#)) as follows: green=G, yellow=D, red=B, black=I, gray=U. Note that the time period covered varies from station to station. If a station does not measure any FLX parameters it is not included in this table.

For the Soil Temperature and Moisture Data Status and Quality summary click [here](#).

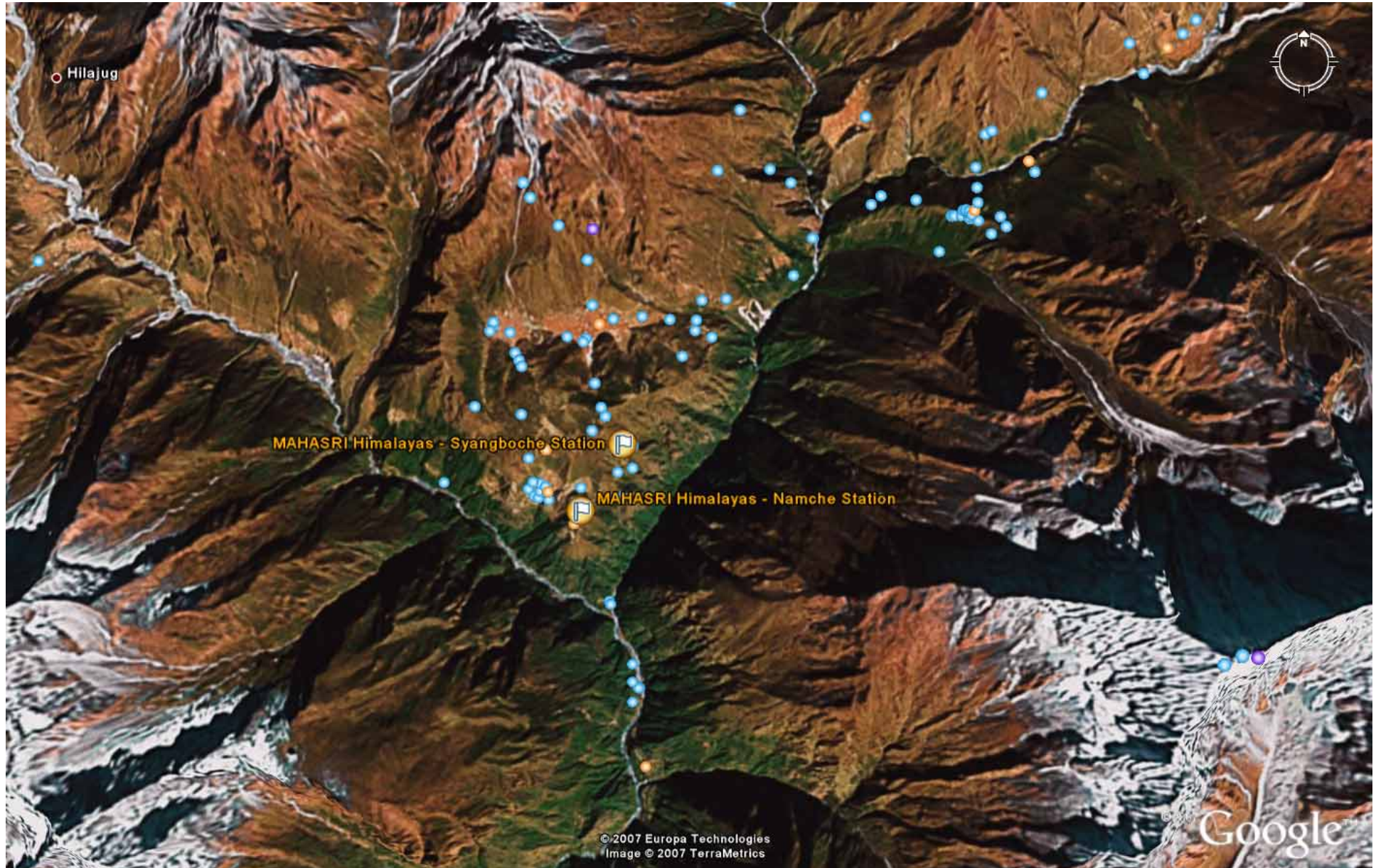
For the Meteorological Tower Data Status and Quality summary click [here](#).

For the Flux Data Status and Quality summary click [here](#).

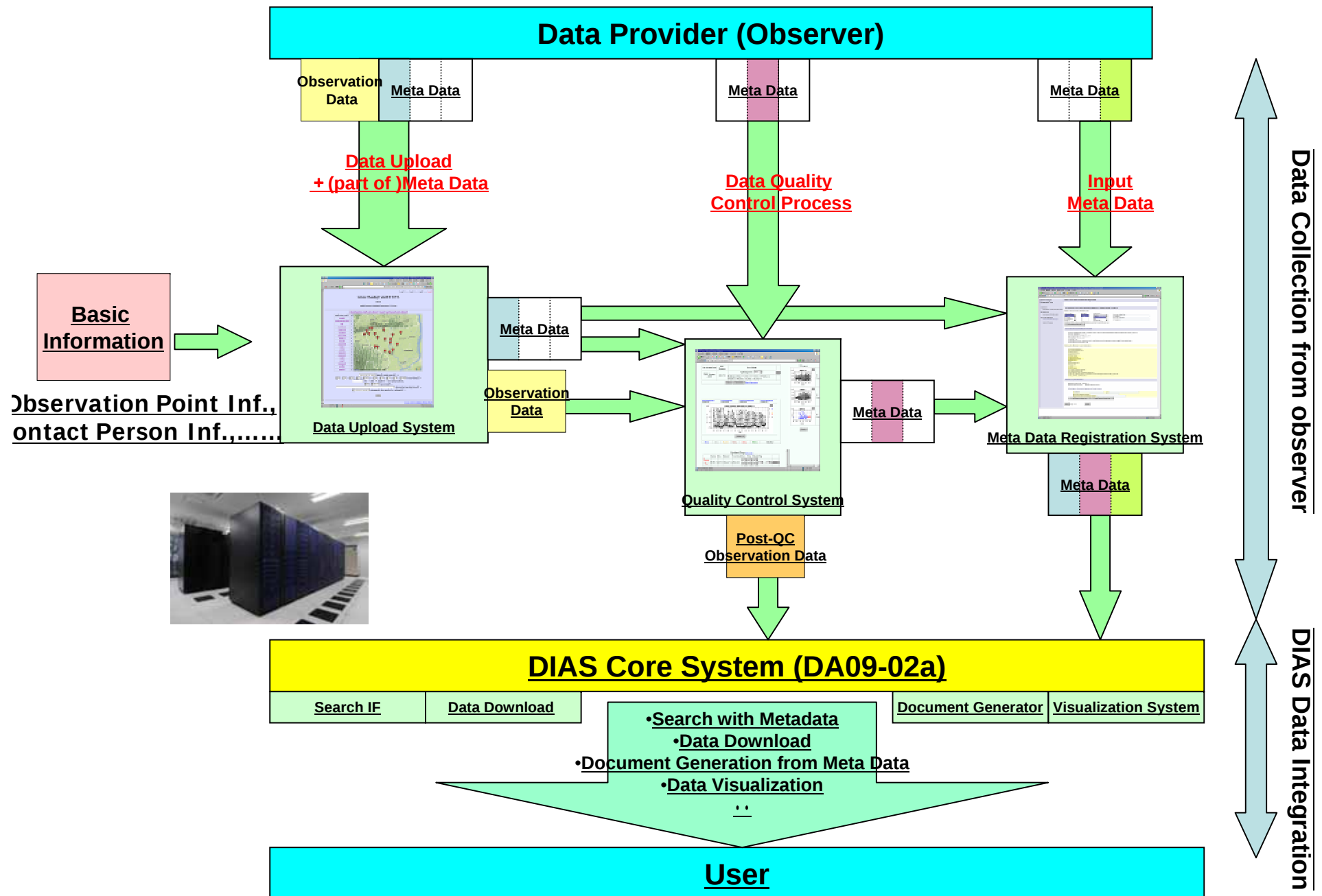
RHP	Reference Site	Station	Station Pressure	Air Temp	Dew Point	Relative Humidity	Specific Humidity	Wind Speed	Wind Dir	U Wind	V Wind	Precip	Snow Depth	In Short	Out Short	In Long	Out Long	Net Rad	Skin Temp	In PAR	Out PAR
BALTEX	Cabauw	Cabauw											None							None	None
BALTEX	Lindenberg	Falkenberg																			
BALTEX	Lindenberg	Forest						None	None	None	None		None							None	None
BALTEX	Norunda	Norunda											None						None		
BALTEX	Sodankyla	Oberseratory Site A														None	None	None	None	None	None
RHP	Reference Site	Station	Station Pressure	Air Temp	Dew Point	Relative Humidity	Specific Humidity	Wind Speed	Wind Dir	U Wind	V Wind	Precip	Snow Depth	In Short	Out Short	In Long	Out Long	Net Rad	Skin Temp	In PAR	Out PAR
CLIC (MAGS)	BERMS		No data available yet.																		
RHP	Reference Site	Station	Station Pressure	Air Temp	Dew Point	Relative Humidity	Specific Humidity	Wind Speed	Wind Dir	U Wind	V Wind	Precip	Snow Depth	In Short	Out Short	In Long	Out Long	Net Rad	Skin Temp	In PAR	Out PAR
CPPA (GAPP)	Bondville	Bondville											None								
CPPA (GAPP)	Pt. Peck	Pt. Peck											None								
CPPA (GAPP)	Mt. Bigelow	Mt. Bigelow	No data available yet.																		
CPPA (GAPP)	Oak Ridge	Oak Ridge											None								
RHP	Reference Site	Station	Station Pressure	Air Temp	Dew Point	Relative Humidity	Specific Humidity	Wind Speed	Wind Dir	U Wind	V Wind	Precip	Snow Depth	In Short	Out Short	In Long	Out Long	Net Rad	Skin Temp	In PAR	Out PAR
CPPA (GAPP)	SGP (ARM)	C1 Lamont	None	None	None	None	None	None	None	None	None	None	None							None	None
CPPA (GAPP)	SGP (ARM)	E1 Lamed											None						None	None	None
CPPA (GAPP)	SGP (ARM)	E2 Hillsboro	None	None	None	None	None	None	None	None	None	None	None						None	None	None
CPPA (GAPP)	SGP (ARM)	E3 Le Roy											None						None	None	None
CPPA (GAPP)	SGP (ARM)	E4 Plevna											None						None	None	None
CPPA (GAPP)	SGP (ARM)	E5 Halstead											None						None	None	None
CPPA (GAPP)	SGP (ARM)	E6 Towanda											None						None	None	None
CPPA (GAPP)	SGP (ARM)	E7 Bk Falls											None						None	None	None



REFERENCE SITE GOOGLE EARTH (.KMZ) FILE

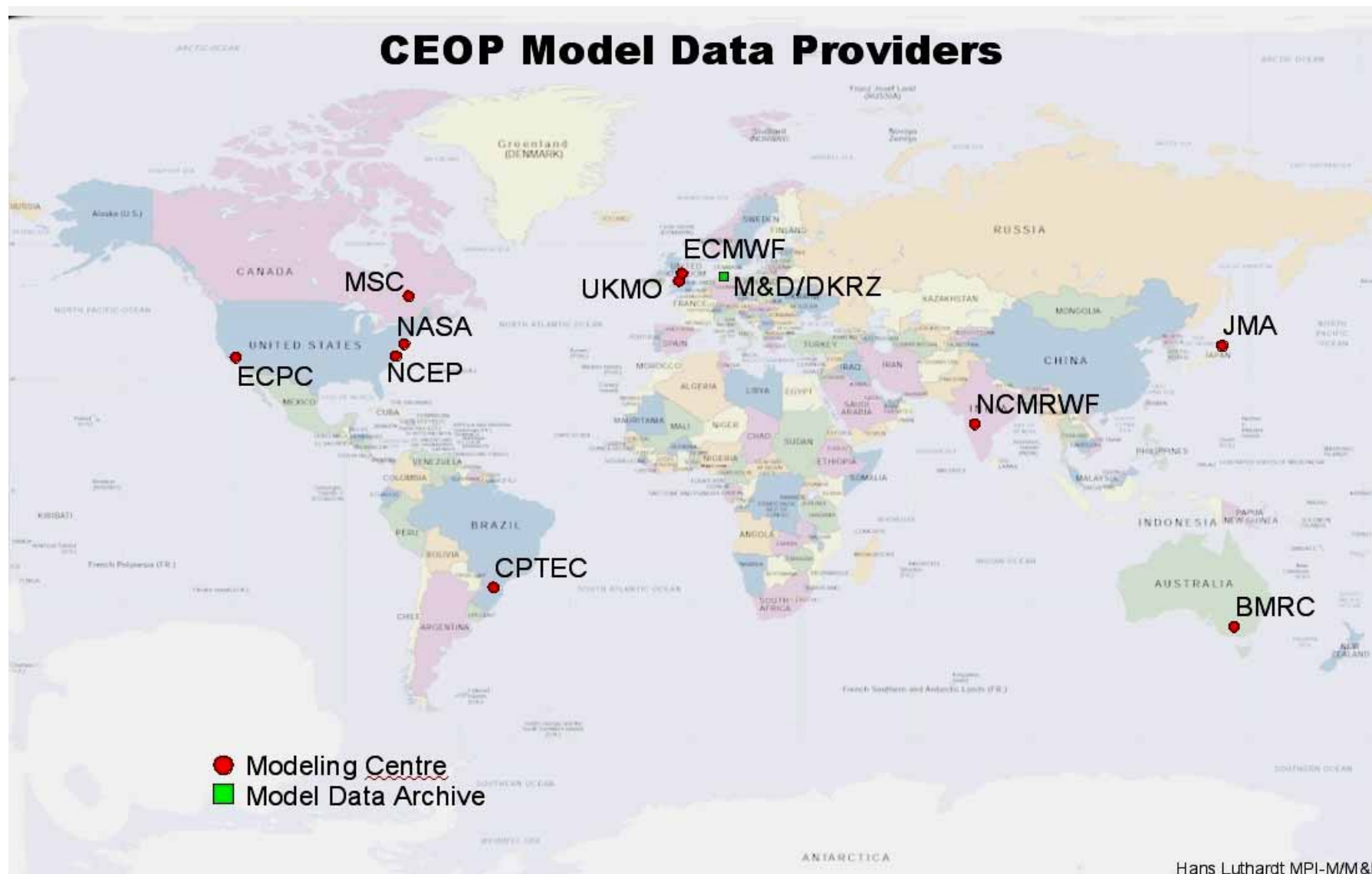


Framework on DIAS Core System





CEOP Model Data Providers





Gateway to CEOP model data



Access by internet (web browser) to the CERA Gateway

<http://ceop.wdc-climate.de>

<http://www.mad.zmaw.de/wdc-for-climate/ceop/>

or

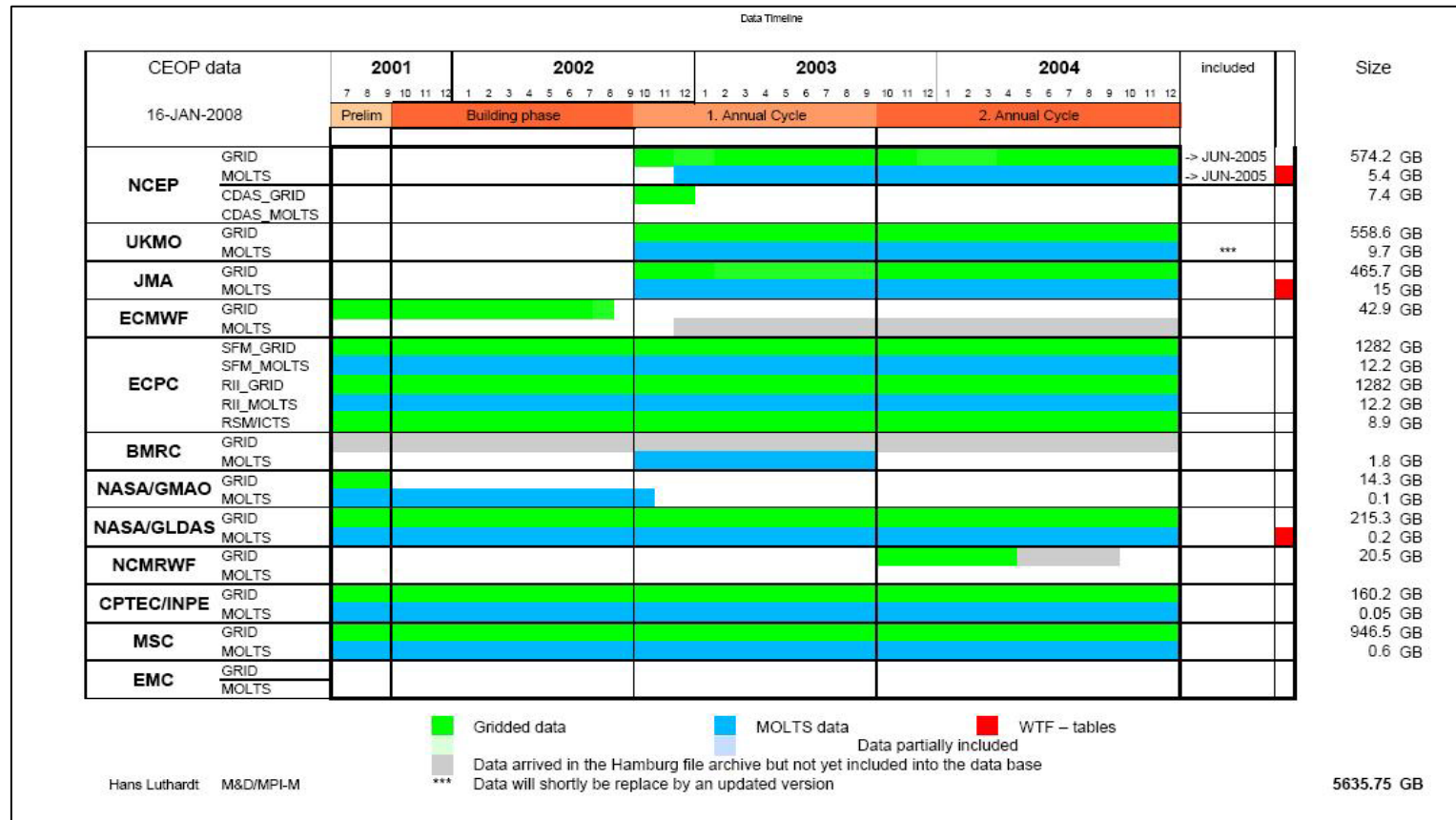
by java command line tool ('jblob')

CERA Gateway page for CEOP also provides summary information (e. g. time line representation of available data) on the data base content and data descriptions



Model Output Content

(as of 1 November 2008)



The most recent version of the data status (time line) can be found from:

<http://www.mad.zmaw.de/wdc-for-climate/ceop/>

CEOP Model Center Documentation

This table summarizes some basic characteristics of models providing MOLTS output for CEOP. **DRAFT** (as of 1 November 2004, to be completed by all Centre representatives. Further columns may have to be added, if required.)

Center (Linked to further documentation)	Model Name and Type (operational, re-analysis, forecast, ...)	Model Horizontal Resolution (Both spectral and long/lat or km information)	Time Resolution	Number of Vertical Levels	Vegetation Description Scheme Used (name and number of types, details in a separate table)	Soil Description Scheme Used (name and number of types, details in a separate table)	MOLTS Location Characteristics Table	MOLTS Format
BMRC	Operational Global Medium Range Prediction Model	T239L29	1 hour	29	bucket hydrology	3 layers		netCDF
CPTEC	CPTEC/COLA	T126 gaussian grid ~1.125 degrees on pressure surfaces	6 hours	28	SSiB scheme 13 vegetation types	13 types related to the vegetation		IEEE binary read from GRADS
ECMWF	ERA-40 (and continuation)	T159 Reduced gaussian grid (125 km)	1 hour	60	TESSEL BATS classification	1 soil type	Table ERA-40	ASCII
	Operations	T511 Reduced gaussian grid	1 hour	60	TESSEL BATS classification	1 soil type	Table Operations	ASCII



CEOP Satellite Data Gateway

Home/Data Access

[Overview of available data](#)

[Registration](#)

[Data Policy](#)

[Forgot your password?](#)

[Contact](#)

[CEOP Home Page](#)

[CEOP Data Management](#)

Welcome to the CEOP Satellite Data Gateway

CEOP satellite data is open to public but **registration** is required for receiving an access to data. Prior to registration, a user is prompted to the **CEOP Satellite Data Release Guidelines** page, where an **agreement** with the specified terms and conditions is required.

The agreement with the CEOP Satellite Data Release Guidelines is also required prior to each accessing the Data Download page.

Please go to the [Registration page](#) to open your account.

If you forget your password, ask [here](#) for it to be sent to you again.

Data Download (registered users only)

Coordinated Enhanced Observing Period ('CEOP') Data:

► [Enhanced Observing Period \(EOP\) 3 and 4:](#) [Select and Download Data](#)
[Available Data Overview](#)

(EOP-3: 01/10/2002 - 30/09/2003 and EOP-4: 01/10/2003 - 31/12/2004)

► [Enhanced Observing Period \(EOP\) 1:](#) [Select and Download Data](#) [Available Data Overview](#)

(EOP-1: 01/07/2001 - 30/09/2001)

Data scale types and data format

Three scale-types of satellite datasets are available:

- Global coverage datasets
- Monsoon region subsets covering areas of the five world monsoon regions including Asian, Australian, North American, South American, and NorthWest African monsoon ([see the map of the monsoon regions](#))
- Reference site subsets covering 250km x 250km square areas around CEOP reference sites with a reference site located in the center of this area ([see the map and list of the Coordinated Enhanced Observing Period \('CEOP'\) reference sites](#))

A dataset consist of raster (Grid) data file in band sequential format (BSQ) and metadata file in XML ([see the scheme of the dataset format](#)).

Note

Please note that in case of the Coordinated Enhanced Observing Period ('CEOP') data (2001 – 2004), it is not possible to select and download a dataset(s) for a particular site(s) or monsoon region(s). By requesting the monsoon or reference site data, you will download a whole package containing datasets for all monsoon regions or all reference sites respectively.

Access to the satellite data through the CEOP Centralized Data Integration System

CEOP satellite as well as in-situ and model output data are also accessible through the CEOP Centralized Data Integration System that offers multiple tools for **data visualization and analysis**. Please go to the [CEOP Centralized Data Integration System home page](#) to learn more about its use and available capabilities.

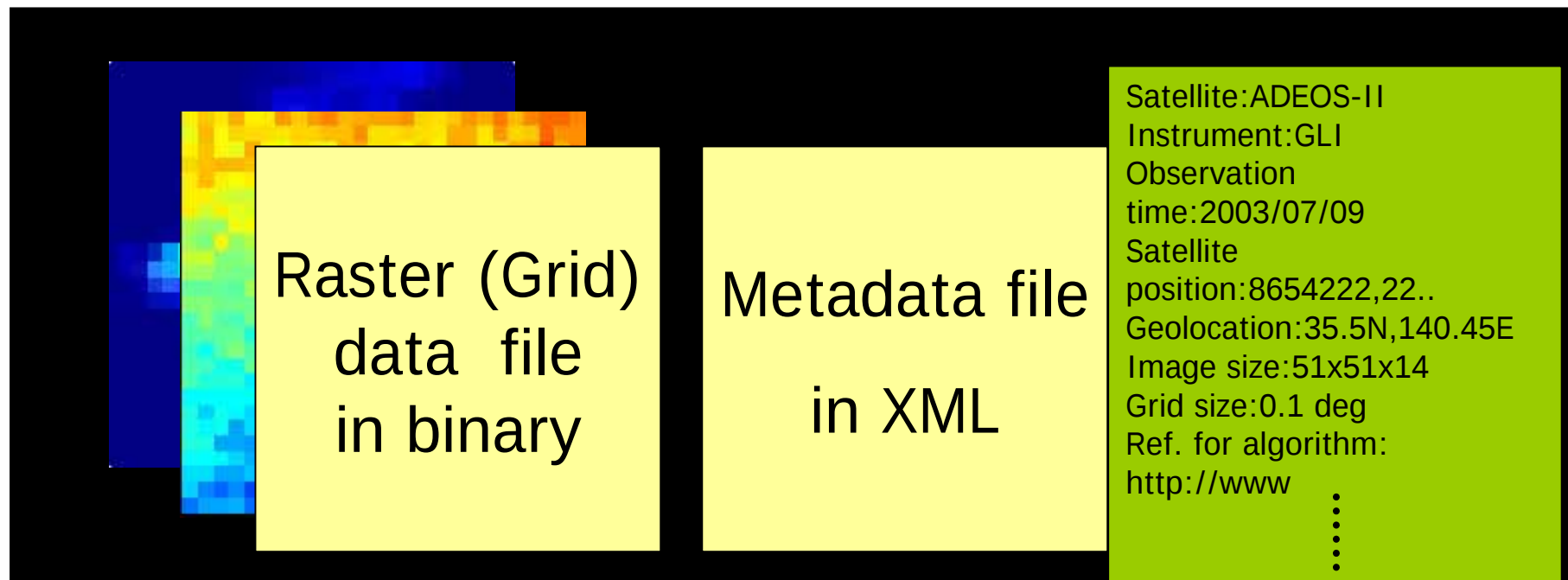
GATEWAY PROVIDES:

- All CEOP Satellite Data Access
- Inventory of Available Data
- Description of Data Products
- Standard XML Metadata
- Data Policy
- Registration Instructions
- Information on Scale and Format
- Ability to Browse Data
- Relevant Links and Documentation

<http://monsoon.t.u-tokyo.ac.jp/ceop2/satellite/>

CEOP Dataset Format

A dataset consist of raster(Grid) data file in band sequential format (BSQ) and metadata file in XML.

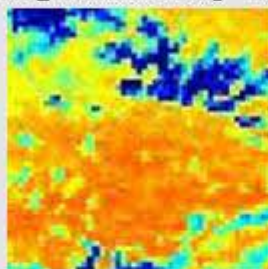


Sample Images (AMSR-E:RS, Monsoon)

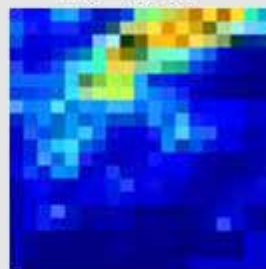


Reference site

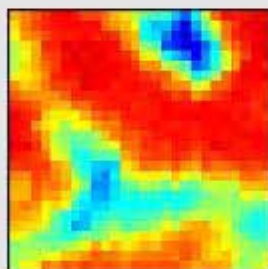
Brightness temp Ch.1



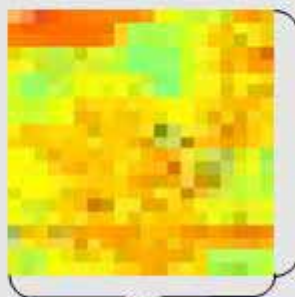
Rain rate



Brightness temp. Ch2



Soil moist.

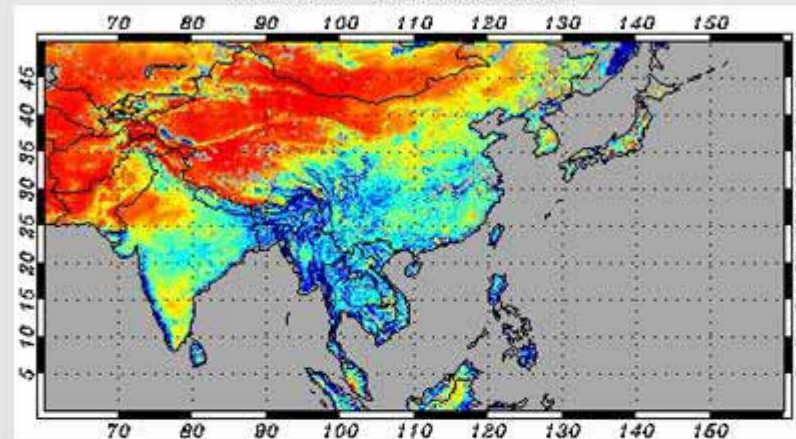


2.5deg

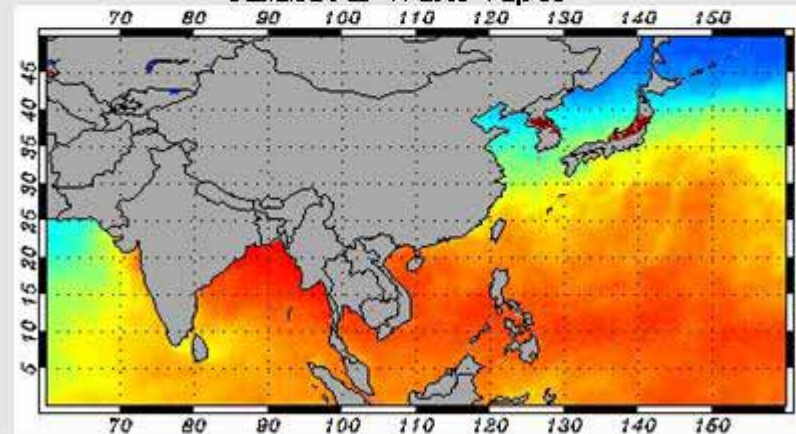
2.5deg

Asia monsoon

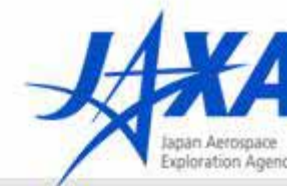
AMSR-E Soil moisture



AMSR-E Water vapor



Number of Processed Scenes



S/C	Sensor	EOP-3	EOP-4	2007	Total
DMSP	SSMI	53,780	66,885	44,217	164,882
ADEOS-II	AMSR	103,590	-	-	103,590
	GLI	114,550	-	-	114,550
TRMM	PR	22,291	27,851	18,685	68,827
	TMI	49,793	62,385	49,503	161,681
Aqua	AMSR-E	230,607	282,784	172,348	685,739
ALOS	PRISM	-	-	504	504
	AVNIR-2	-	-	276	276
	PALSAR	-	-	698	698

EOP-3: 2002/10/1 – 2003/9/30

EOP-4: 2003/10/1 – 2004/12/31

Total 1,300,747



Coordinated Energy and water-cycle Observations Project

Data Management

Distributed- and Centralized- Data Integration Functions

