CEOS Water Portal Status Update

WGISS-34
Hyderabad, India – September 24-28, 2012

JAXA/Mission Operations System Office
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Update since WGISS-33

- New Data Partners
  - Adding 2 data centers (On-going)
    - In-situ data (GEMS/Water) : WFS I/F
    - In-situ data (Deltares*1) :OPeNDAP I/F
  - Soliciting new partners (candidates include IGWCO*2 meeting participants)
- Enhancement
  - Use-case Registration Service
- Outreach
  - Introduced into GEWEX*3 News Letter (May 2012)

*1 Deltares : Deltares is an independent, institute for applied research in the field of water, subsurface and infrastructure in Netherlands. Member of GLOWASIS.

*2 IGWCO : Integrated Global Water Cycle Observation, Community of Practice (COP) for GEO water cycle strategy

*3 GEWEX : Global Energy and Water Exchanges

CEOS Water Portal

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The Committee on Earth Observation Satellites (CEOS) Water Portal (*http://waterportal.ceos.org/*) provides access to a variety of hydrological and water relevant data including satellite, in situ, and model output data. The Water Portal is being developed by a project under the CEOS Working Group on Information Systems and Services (WGISS) led by the Japan Aerospace Exploration Agency (JAXA). It began as a prototype system that was collaboratively developed within WGISS as a Test Facility (WTF) project to support the science community of the Coordinated Energy and Water Cycle Observations Project (CEOP), providing user-friendly access to CEOP data. The CEOS Water Portal expands these functions, available data, and target users.

Water Portal system data are archived in globally distributed centers, including the National Center for Atmospheric Research (NCAR) Earth Observing Laboratory in Boulder, Colorado, USA. Numerical Weather Prediction (NWP) station time series and global gridded model output data are archived at the Max Planck Institute for Meteorology (MPIM) in cooperation with the World Data Center for Climate in Hamburg, Germany. Some of the satellite data are archived at the Data Integration and Analysis System (DIAS) at the University of Tokyo, Japan. The Portal processes user requests and retrieves the data, including rendered images and plots, from the distributed data centers using the OPeNDAP protocol.

Data Partners

In order to become an "attractive" portal system for users, one of the most important features is to offer a variety of data to meet user needs. Table 1 shows the current data partners and available data lists. There are plans to collaborate with eight or more data centers over the course of the next four years. New data partners, especially those that have the OPeNDAP interface, are encouraged to participate.

Features

The portal system aims to provide one-stop-service and access to a variety of hydrological and water relevant data and also supports data integration. By aggregating multiple types of data (in situ, satellite, and model output), the data will have more value than they had individually. This portal has several features that can support data integration, including:

- Single user interface to get the various type of data (satellite, in situ, and model output)
- Selecting data by time range, variable, and station
- Viewing data in image format
- Downloading data [available formats: NetCDF, ASCII, and GRIB (only for model output)]

In the search feature, the portal provides two kinds of searches to facilitate easy access, category search, and map search (see Figure 1). Users can either start from a category list (such as

Table 1. Data Partner List (as of April 2012)

Data Partner	Data Types	Variables	Server Locations
CEOP	Satellite*	PR, TMI, AMSR, AMSR-E, MODIS, GLI, SSMI, VISSR	University Of Tokyo (Japan)
	Model (Time Series)	Surface pressure, skin temperature, hourly precipitation amount, surface brightness temperature, specific humidity, and u- and v-components of wind	MPI (Germany)
	Model (Gridded)	Air pressure, surface air pressure, air temperature, precipitation rate, and snowfall amount.	MPI (Germany)
	In situ**	Surface meteorological and radiation data set, flux data set, soil temperature and soil moisture data set, and meteorological tower data set	UCAR (USA)
AWCI	Model (Time Series)	Surface pressure, skin temperature, hourly precipitation amount, surface brightness temperature, specific humidity, and u- and v-components of wind	MPI (Germany)
	In situ	Precipitation amount, river discharge, and river water level	University of Tokyo (Japan)
NASA	Satellite	AIRS Level 3 data (daily, 8-day, or monthly averaged, global data)	NASA GSFC (USA)
NOAA (GPCC)	In situ	Precipitation data	NOAA (USA)
NASA	Satellite	GRACE Level 3 (Monthly averaged, global data)	NASA/JPL (PO.DACC)
NASA (FLUXNET)	In situ	FLUX data (fluxes of carbon dioxide, water vapor, and energy exchange)	NASA ORNL DAAC (USA)

**Data available as 250 km x 250 km subset scenes regridded to Latitude/Longitude grid and centered over more than 50 in situ data sites, as well as monsoon area regions. Users can select bands and time period, and download multiple scenes.*

***Four types of CEOP in situ data from over 50 Reference Sites are available. Nineteen surface variables are available and nine variables from Towers are also available. In addition to these, soil and flux data (sensible heat, latent heat, CO_2, soil heat flux) are also available. Quality check flags can be downloaded embedded in the data.*

Figure 1: CEOS Water Portal search interface (left: category search; right: map search)

surface, upper air, or oceanic) or a world map to get to their data of interest. Users may specify time range, a variable name, and an observation station to refine the search results. Data can be viewed (as gif image) and downloaded [by NetCDF format, ASCII format, or GRIB (only model output)], as described above.

Target Users and Feedback Loop

Target users of the original WTF-CEOP prototype system were mainly scientists. The CEOS Water Portal plans to extend its user community to include decision makers and officials such as river administrators by facilitating a feedback loop as shown in Figure 2.

Figure 2 shows one example of data and information flow centered on the CEOS Water Portal.

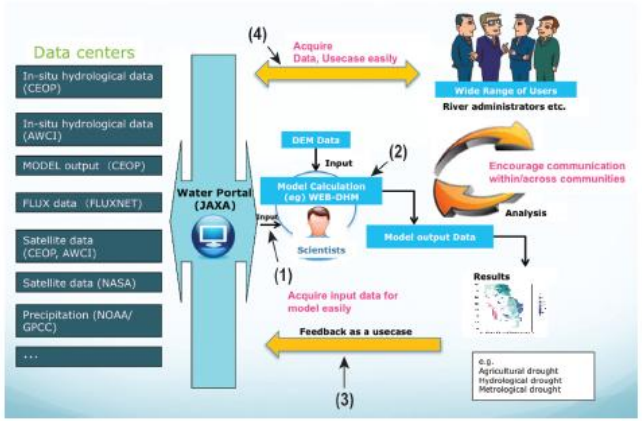


Figure 2: Data and information flow related to the CEOS Water Portal

1. Scientists get various data needed for model calculation (WEB-DHM, for example) via the portal.
2. Scientists use model output data and complete their analyses.
3. Scientists register their use cases into the portal.
4. Decision makers and officials can refer to and acquire use cases and data easily.

This feedback loop will encourage communication within and across communities. In order to realize this feedback loop, the portal has a function that enables users to register use cases. Users can register the results of their research obtained by using data via the portal as a use case, which then becomes available for other users to reference in their data search on the portal.

Future Work

CEOS Water Portal development started in 2010 and will continue until 2016. During the next four years, the following features will be implemented:

- User authentication function (in order to respect each data partners' data policy)
- Statistical analysis function
- Use case registration and search function enhancement
- Free text search function

Other enhancements will be implemented, depending on user and data partners' requests.

Please visit and use the portal. Any comments and requests are highly appreciated.

Goal of CEOS Water Portal

Data centers

- In-situ hydrological data (CEOP)
- In-situ hydrological data (AWCI)
- MODEL output （CEOP)
- FLUX data （FLUXNET)
- Satellite data (CEOP, AWCI)
- Satellite data (NASA)
- Precipitation (NOAA/GPCC)
- In-situ hydrological data (GEMS/Water)
- In-situ hydrological data (Deltares)

Adding new two data centers

Water Portal (JAXA)

Acquire
Data, Use case easily

Wide Range of Users

River administrators etc.

DEM Data

Input

Model Calculation (eg) WEB-DHM

Input

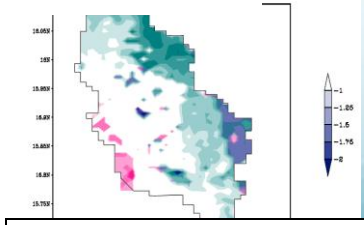
Scientists

Encourage communication within/across communities

Analysis

Model output Data

Results



e.g.
Agricultural drought
Hydrological drought
Metrological drought

Acquire input data for model easily

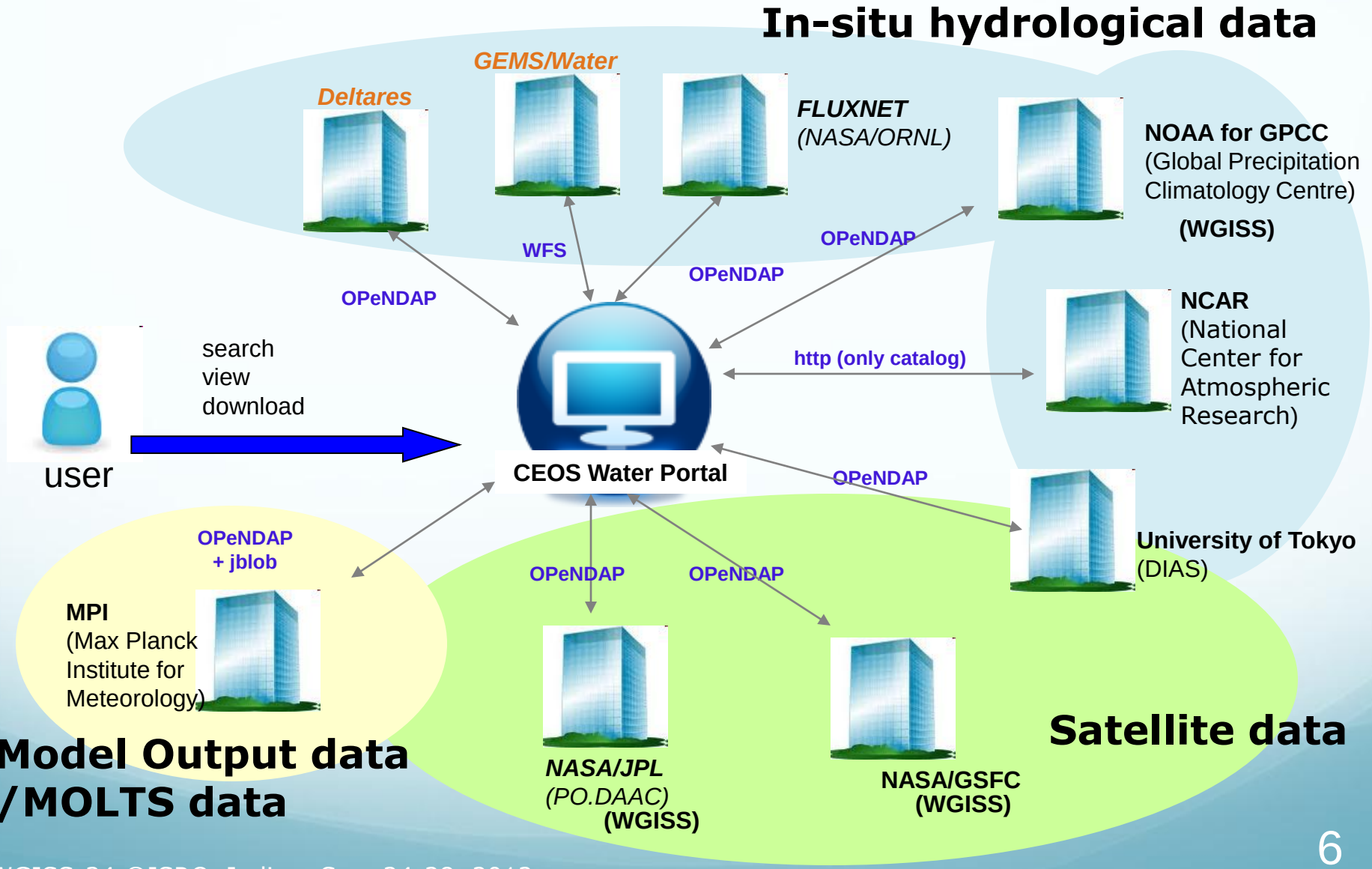
Feedback as a usecase

Enhancement of use case registration function

Features of CEOS Water Portal

Support of Data Integration	(1) Data Archive Centers in remote locations are connected using standard data access protocol (2) Single user interface to get the various type of data (in-situ, satellite, and model output)
Functions to facilitate Easy Access	(1) Different types of search features : Category and Map (2) Selected by time range, variable and station (3) View data (gif image) (4) Compare MOLTS data (5) Download data (NetCDF, ascii, GRIB (only Model output))
Registration of Use Case (Enhancement)	(1) Users can register their research results (use cases) related to hydrological area and show their research via use case page. (2) If the registered use case using the our portal data, other users can see as a reference at their data search on the portal.

Data Partners



List of data partners/variables(1/2)

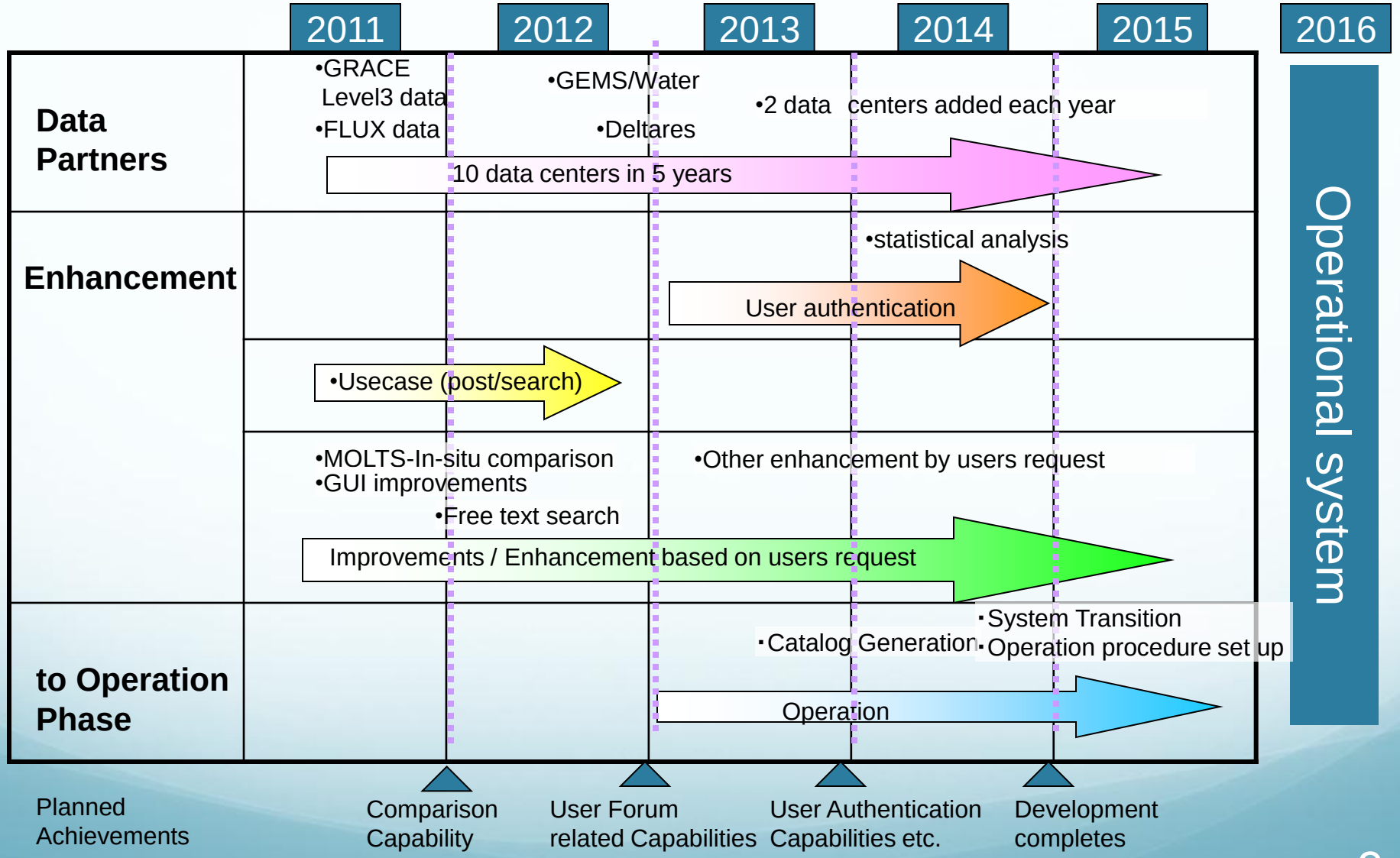
Data Partners	Data Types	Variables	Server Locations
CEOP	Satellite	PR, TMI, AMSR, AMSR-E, MODIS,GLI, SSMI, VISSR	University of Tokyo (Japan)
	Model (MOLTS)	surface pressure, skin temperature, precipitation amount in hour, brightness temperature surface, specific humidity, u-component of wind, v-component of wind, etc	MPI (Germany)
	Model(Gridded)	Air pressure, surface air pressure, air temperature, precipitation rate, snowfall amount, etc	MPI (Germany)
	In-situ (Only Catalog)	Surface Meteorological and Radiation Data Set Flux Data Set Soil Temperature and Soil Moisture Data Set Meteorological Tower Data Set	NCAR (USA)
AWCI	Model(MOLTS)	surface pressure, skin temperature, precipitation amount in hour, brightness temperature surface, specific humidity, u-component of wind, v-component of wind, etc	MPI (Germany)
	In-situ	Precipitation amount, River discharge, River water level, etc	University of Tokyo (Japan)

List of data partners/variables(2/2)

Data Partners	Data Types	Variables	Server Locations
NASA	Satellite	Airs level 3 data	NASA (GSFC)
NOAA (GPCC)	In-situ	Precipitation data	NOAA (USA)
NASA	Satellite	GRACE Level 3 data	NASA/JPL(PO.DACC)
FLUXNET	In-situ	FLUX data Fluxes of carbon dioxide, water vapor, and energy exchange, etc	NASA (ORNL DAAC)
GEMS/Water (On-going)	In-situ	Instantaneous Discharge , Dissolved Oxygen , Temperature, etc	GEMS/Water (CANADA)
Deltares (On-going)	In-situ	Precipitation, Air temperature	Deltares (Netherland)
IGWCO community (under negotiation)	In-situ	Hydrological and Water cycle Data	

We are planning to add 2 data centers per each year

Milestone


2011
2012
2013
2014
2015
2016
Data Partners
•GRACE Level3 data
•FLUX data
•GEMS/Water
•Deltares
•2 data centers added each year
10 data centers in 5 years
Enhancement
•statistical analysis
User authentication
•Usecase (post/search)
•MOLTS-In-situ comparison
•GUI improvements
•Free text search
•Other enhancement by users request
Improvements / Enhancement based on users request
to Operation Phase
・System Transition
・Catalog Generation
・Operation procedure set up
Operation
Operational system
Planned Achievements
Comparison Capability
User Forum related Capabilities
User Authentication Capabilities etc.
Development completes

Our web site & Contact us

CEOS water portal is available at :

http://waterportal.ceos.org/

Contact (“*at*” = @) :

Project leader: miura.satoko *at* jaxa.jp
System support: rd *at* restec.or.jp