CEOS Water Portal
Status Update

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Introduction

- CEOS Water Portal is;
  - A web based portal system evolved from "Distributed Data Integration System Prototype for CEOP"
  - To provide access to a whole variety of hydrological data and water relevant data scattered over the world
  - To retrieve data from distributed data centers on-the-fly (by OPeNDAP etc.) and let users download and see rendered image/plot

- The Portal is **NOT** a system for data distribution.
- The Portal is aimed to become a system that enables data integration.
Concept

Data Integration
- Multiple types of data are available such as:
  - In-situ data
  - Satellite data
  - Model output data
- The portal provides multiple functionalities and services to perform data integration.

Portal System Concept
- Provide users “Easy to Access” service.
- Users include:
  - Scientists in hydrological domain
  - Non-researchers or operational users who are dealing with those data in their work
Problems of Current Approach

Distributed data center

- In-situ hydrological data (CEOP)
- In-situ hydrological data (AWCI)
- MODEL output (CEOP)
- MODEL output (CMIP3)
- Satellite data (CEOP, AWCI)
- Satellite data (NASA)
- Precipitation (NOAA/GPCC)
- River discharge (GRDC)

MODEL output

Useful information

Wide users

Ex: decision makers of Watershed Management

- Find data
- Convert data
- Compare with other model data
- Provide useful information to wide users

MODEL output

Hydrological drought

Metrological drought

Not easy to provide useful information

Not easy to find data and convert data

Not easy to compare with other model data

Not easy to provide useful information to wide users
Water Portal makes it easier and more efficient to settle those problems.
If you use Water Portal

Distributed data center

- In-situ hydrological data (CEOP)
- In-situ hydrological data (AWCI)
- MODEL output (CEOP)
- MODEL output (CMIP3)
- Satellite data (CEOP, AWCI)
- Satellite data (NASA)
- Precipitation (NOAA/GPCC)
- River discharge (GRDC)

Water Portal (JAXA)

DEM data

User's model (ex. WEB-DHM)

Scientists

Model output

Easy access to data like one stop shopping

Metrological drought

Hydrological drought

Agricultural drought

Useful information

input

analysis
If you use Water Portal

Distributed data center

- In-situ hydrological data (CEOP)
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- Satellite data (NASA)
- Precipitation (NOAA/GPCC)
- River discharge (GRDC)

Water Portal (JAXA)

Input:
- DEM data
- User's model (ex. WEB-DHM)
- Scientists

Analysis:
- Model output

Useful information:
- Easy to Compare with other model output data

Agricultural drought
If you use Water Portal

Distributed data center

- In-situ hydrological data (CEOP)
- In-situ hydrological data (AWCI)
- MODEL output (CEOP)
- MODEL output (CMIP3)
- Satellite data (CEOP, AWCI)
- Satellite data (NASA)
- Precipitation (NOAA/GPCC)
- River discharge (GRDC)

Water Portal (JAXA)

Get useful information easily

- DEM data
- User’s model (ex. WEB-DHM)
- Scientists
- Model output

Wide users

Ex: decision makers of Watershed Management

Feed back analyzed data

Useful information

Agricultural drought
<table>
<thead>
<tr>
<th>Distributed data center</th>
<th>Useful information</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-situ hydrological data (CEOP)</td>
<td>Cultural drought input</td>
</tr>
<tr>
<td>In-situ hydrological data (AWCI)</td>
<td>Hydrological drought</td>
</tr>
<tr>
<td>Model output (CEOP, AWCI)</td>
<td>Agricultural drought</td>
</tr>
<tr>
<td>Satellite data (NASA)</td>
<td>Useful information</td>
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<tr>
<td>Precipitation (NOAA/GPCC)</td>
<td>Ex: decision makers of Watershed Management</td>
</tr>
<tr>
<td>River discharge (GRDC)</td>
<td>Wide users</td>
</tr>
</tbody>
</table>

**Easy access & integrate data**

Communication is encouraged
## Main Features of the Portal

### Data Integration
(in-situ, satellite, and model output)

1. Data Archive Centers in remote locations are connected using standard data access protocol (OPeNDAP)
2. Single user interface
   - Spatial Data Integration
   - Temporal Data Integration
   - Consistent data variable names

### Functions to facilitate Easy Access

1. Different types of search features: Category, Map, etc.
2. Select data by
   - time range (start time / stop time)
   - CEOP Reference Site, Station name
   - height or depth
   - variable name
3. View data (plot and view values on the screen)
4. Compare MOLTS data and In-situ Data in a single chart
5. Download data (NetCDF, ascii)
System Overview

User

1. Access to the CEOS Water portal (Search, subsetting)
2. Send the request to each data center
3. Getting data from the data center (NetCDF, CSV, GRIB)
4. Converting to GIF image (NetCDF->GIF)
5. Download the data (NetCDF, CSV, GRIB)

CEOS Water Portal

- Control user I/F (CGI/perl, Ajax)
- Control Map (Google map API)
- OPeNDAP I/F
- Model output data I/F (Jblob)
- Converting to image data (Ferret)
- XML catalog DB (eXist)

CEOS/WGISS

- NOAA
  - GPCC Precipitation (NetCDF)
- NASA
  - AIRS L3 (HDF)

CEOP/AWCI

- UT
  - CEOP Satellite (BSQ) AWCI In-situ (csv)
- UCAR
  - CEOP In-situ (ascii)
- MPI
  - CEOP/MOLTS (NetCDF) AWCI/MOLTS (NetCDF)
- Jblob
  - CEOP Model output (GRIB)
Release Announcement

- Alpha version now available
With limited data and functionality, the system is now publicly available at: [http://waterportal.restec.or.jp/](http://waterportal.restec.or.jp/)

The development is ongoing.

**Category search**

**Map search**
CEOS Water portal (1/2)

1. Choose either of the two types of search

2. Choose a variable and location

Go on to next slide
3. Specify additional criteria (e.g. Band or Height) and time range

4. Choose a file (Satellite or MOLTS data only)

5. View image and download the data
Data Partners

- GRDC (Global Runoff Data Centre)
- GEMS/WATER
- NOAA for GPCC (Global Precipitation Climatology Centre)
- MPI (Max Planck Institute for Meteorology)
- UCAR (University Corporation for Atmospheric Research)
- CEOS Water Portal (JAXA)
- CEOS
- TBD
- TBD
- OPeNDAP
- OPeNDAP
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- OPeNDAP
- OPeNDAP
- OPeNDAP
- OPeNDAP
- FLUXNET (NASA/ORNL.DAAC)
- NASA/JPL (PO.DAAC) (WGISS)
- NASA GSFC (WGISS)
- University of Tokyo (DIAS)
- TBD

User search view download
Listed below is current data partners.

<table>
<thead>
<tr>
<th>Data Partners</th>
<th>Data Types</th>
<th>Server Locations</th>
<th>Interface Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEOP</td>
<td>Satellite</td>
<td>University of Tokyo (Japan)</td>
<td>OPeNDAP</td>
</tr>
<tr>
<td>Model(MOLTS)</td>
<td>MPI (Germany)</td>
<td>OPeNDAP</td>
<td></td>
</tr>
<tr>
<td>Model(Gridded)</td>
<td>MPI (Germany)</td>
<td>blob</td>
<td></td>
</tr>
<tr>
<td>In-situ</td>
<td>UCAR (USA)</td>
<td>OPeNDAP</td>
<td></td>
</tr>
<tr>
<td>AWCI</td>
<td>Model(MOLTS)</td>
<td>OPeNDAP</td>
<td></td>
</tr>
<tr>
<td>In-situ</td>
<td>University of Tokyo (Japan)</td>
<td>OPeNDAP</td>
<td></td>
</tr>
<tr>
<td>GIS</td>
<td>University of Tokyo (Japan)</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>NASA</td>
<td>Satellite</td>
<td>NASA (GSFC)</td>
<td>OPeNDAP</td>
</tr>
<tr>
<td>NOAA (GPCC)</td>
<td>In-situ</td>
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# Candidate Data Partners

Coordination with these agencies is foreseen.

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<tr>
<td>GRDC*1</td>
<td>In-situ</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>GEMS/Water*2</td>
<td>In-situ</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>NASA</td>
<td>Satellite (GRACE Level 3)</td>
<td>NASA/JPL (PO.DAAC)</td>
<td>OPeNDAP</td>
</tr>
<tr>
<td>NASA (FLUXNET)</td>
<td>In-situ (FLUX data)</td>
<td>NASA (ORNL DAAC)</td>
<td>OPeNDAP</td>
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</tbody>
</table>

*1: [http://www.bafg.de/GRDC/EN/Home/homepage__node.html](http://www.bafg.de/GRDC/EN/Home/homepage__node.html)

*2: [http://www.gemstat.org/](http://www.gemstat.org/)
Data request

We would like to cooperate with NASA to have these data incorporated to meet users request.

- GRACE Level 3 data (NASA/JPL (PO.DAAC) OPeNDAP Server)
- Flux data (NASA/ORNFL.DAAC OPeNDAP Server)
Water Cycle Integrator (Currently proposed to GEO)

Integrated & Coordinated Approach

Observation Integration

Sustained Education Framework

Work Bench

Model Integration

Management System Integration

Water Cycle Integrator

Data Integration & Analysis

Coordination

Capacity Building

Cross-SBA/CoP Coordination
Disaster/Health/Energy/Climate/Weather/Agriculture/Forest/Ecosystem/Biodiversity

Water Portal can contribute this “Coordination”.
Future Plan

1. Contribution to GEO
   - Work plan (2009-2011) Task WA-08-01 (already offered to CEO)

2. New Data vs New Functions
   - We are open to new data center collaboration (within budget!).
   - The balance to be considered, based on the coordination with data center collaboration “candidates”.
   - Adding the new function for more integrating the data and encouraging the communication among the users.

3. Collaboration with other “portal(s)"
   - CEOS Precipitation Constellation (PC) portal