APN Project Inception (ARCP)

GEOSS/Asian Water Cycle Initiative/Water Cycle Integrator

（GEOSS/AWCI/WCI）

ARCP2012-16NMY-Ochiai

Osamu Ochiai, JAXA

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APN/ARCP Project overview

Osamu Ochiai

JAXA/SAPC

9th AWCI/ICG, Tokyo, Sept. 29-30, 2012

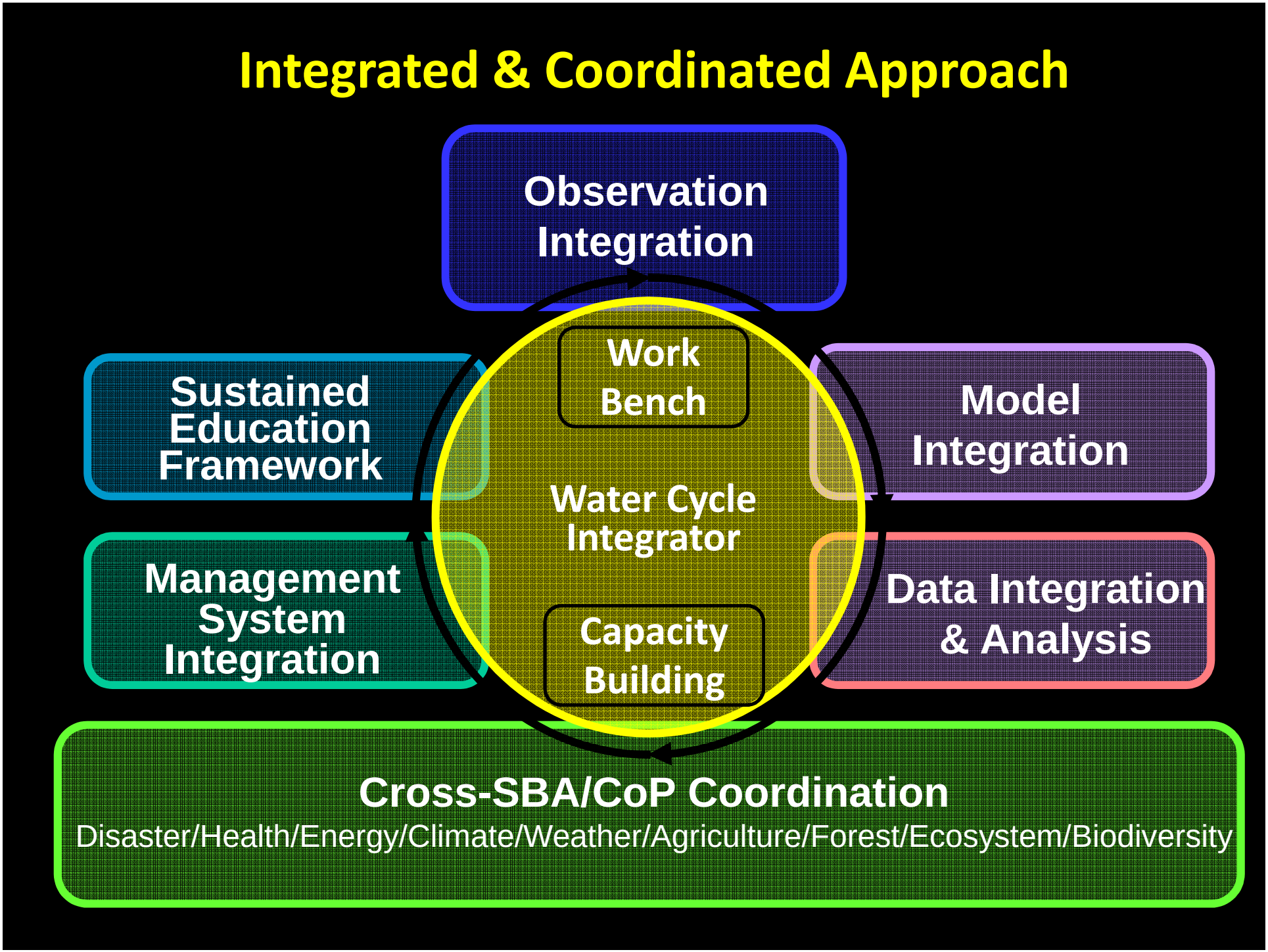
Goal

- This project implements the test of the river management system for Asian main rivers (18 rivers at present) and its capacity building by participation of research institutes and government-affiliated organizations relating to the river management of 19 Asian countries.
  - Supporting regional cooperation in global change research on issues particularly relevant to the region (Goal 1),
  - Strengthening appropriate interactions among scientists and policy-makers, and providing scientific input to policy decision-making and scientific knowledge to the public (Goal 2)
  - Improving the scientific and technical capabilities of nations in the region including the transfer of know-how and technology (Goal 3).
  - The research activities are part of establishment of the Global Earth Observation System of Systems (GEOSS) under the Group on Earth Observation (GEO), and are equal to cooperating with other global change networks and organisations (Goal 4).

Outline the activities

- To support development of a **Water Cycle Integrator (GEOSS/AWCI/WCI)** by setting up "**work benches**" where partners can share data, information and applications in an interoperability way, exchange knowledge and experiences, deepen mutual understanding and work together effectively.
  - (A work bench is a virtual geographical or phenomenological space where experts and managers work together to use information to address a problem within that space).
- To build resilience to the climate change and variability, it is important to develop effective interdisciplinary collaborations for working together based on coordinated and integrated efforts and subsequently to both mitigation and adaptation benefits.

Integrated & Coordinated Approach



Multitude of contributing systems

Scientific Contribution of each Participating Country

AWCI member countries have been tremendously contributing to the AWCI implementation since 2007 and will contribute for WCI implementation in following overall scientific and framework building works.

1. Participate in the GEOSS/AWCI four working groups: Flood, Drought, Water quality, Climate change, and conduct the activities per agenda of these groups.
2. Participate in the series of planned meetings and share the country needs of "observation convergence, data integration, information sharing" and "capacity building" and develop plans of the demonstration project in each river basin following the WCI principles.
3. Collect in-situ data in each river basin, check the quality of data, develop metadata and send the data and metadata to Data Integration and Analysis System (DIAS).
4. Collaborate on development of river basin model in their countries.
5. Conduct demonstration analysis and integration using satellite, in-situ and model data.
6. Report the progress and outcome at AWCI ICG meetings and Project Workshops.

Capacity Building for Global Change Research

- The specific objectives of the program are to develop capacities of the Asian countries including:
  - Techniques for downscaling regional and global information to basin scale and to improve accuracy required by operational water management applications through a combination of numerical forecasting and fusion of local observations;
  - Reliable and efficient tools for conversion of the available observations and data to useful information for flood management employing data transformations, interpolation, classification, and estimation algorithms
  - Methodologies for conversion of information to water resources management applications, both for operational use and scenario based assessments for planning purposes
- These trainings will be conducted either at dedicated training courses organized in collaboration with AWCI partners (e.g. UNU) or by inviting experts to a country for training the local practitioners.

Relevance to Policy Processes and Sustainable Development

- GEOSS/AWCI is a challenge to lead in the solution of the water-related problems. It has begun with small-scale projects and showed early success stories to stakeholders. As the first step, one river basin was selected from each participating country as a target of a demonstration project (DP). Currently, 18 river basins have been selected and being conducted each demonstration theme and those have been reported yearly GEOSS Asia-Pacific regional Symposium for each country policy maker recognition and also GEO Plenary.
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- This project will adopt similar strategy for developing the work benches, showing their benefits and potential through the river basin developments and comprehensive analyses in demonstration basins. As a part of the GEOSS AWCI activities, the outcomes of this project will be integrated into GEOSS AWCI, which is a long-term initiative that has already demonstrated its sustainability under the GEO framework.

Project Methodologies

- This project provides financial supports such as travel expenses and daily allowances for researchers, data experts and representatives of government organizations from Asian developing countries to participate in a series of meetings of GEOSS/AWCI International Coordination Group (ICG) and workshops for developing GEOSS/AWCI/WCI.
  - Japan Aerospace Exploration Agency (JAXA):

    Co-organize the GEOSS/AWCI ICG meeting and associated workshop twice a year. Invite the AWCI member country's researcher, data management representative, and representative of each governmental agency to participate the AWCI/ICG and workshop.
  - University of Tokyo:

    Support the GEOSS/AWCI member country's researcher, data management representative, and representative of each governmental agency to establish GEOSS/AWCI/WCI by using the Data Integration and Analysis System (DIAS).

GEOSS/AWCI/WCI “Water Nexus”

Prof. Toshio Koike

WCI key role “CEOS Water Portal”

Osamu Ochiai

Concept of CEOS Water Portal

- CEOS Water Portal is aimed;
  - To Provide “Easy to Access” service to users
  - To provide access to a whole variety of hydrological data and water relevant data scattered over the world
  - To become a system that supports data integration.

- Multiple types of data are available such as;
  - In-situ data
  - Satellite data
  - Model output data

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)
- …

Water Portal (JAXA)

Acquire Data, Usecase easily

Wide Range of Users

River administrators etc.

DEM Data

Input

Model Calculation (eg) WEB-DHM

Input

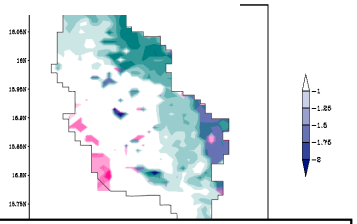
Scientists

Encourage communication within/across communities

Analysis

Model output Data

Results



e.g.
Agricultural drought
Hydrological drought
Metrological drought

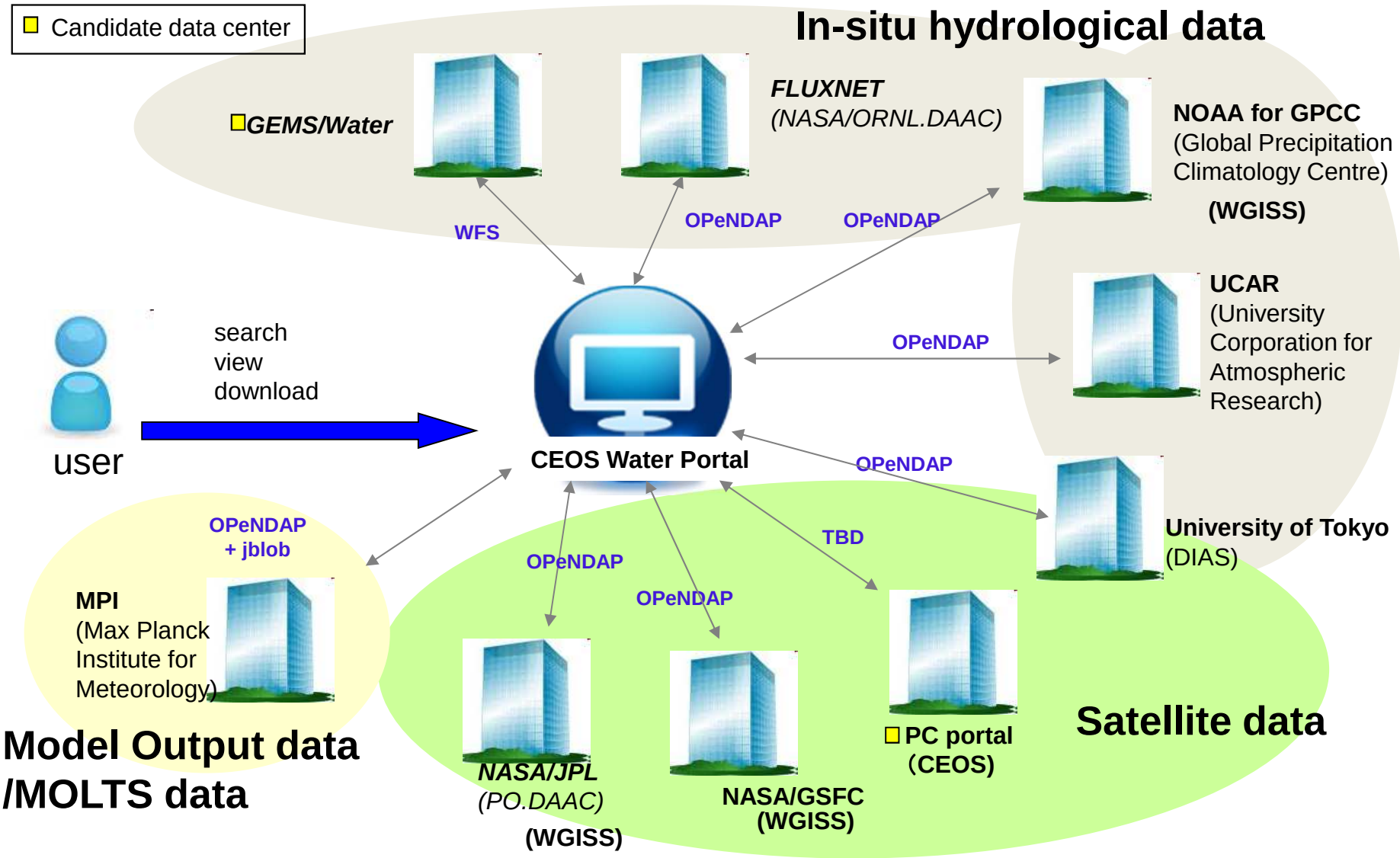
Acquire input data for model easily

Feedback as a usecase

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)Download data (NetCDF, ascii, GRIB (only Model output))
Registration of Use Case	(1) Users can register their research results (use cases) obtained by using data via our portal, which then becomes available for other users to 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	Surface Meteorological and Radiation Data Set Flux Data Set Soil Temperature and Soil Moisture Data Set Meteorological Tower Data Set	UCAR (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)

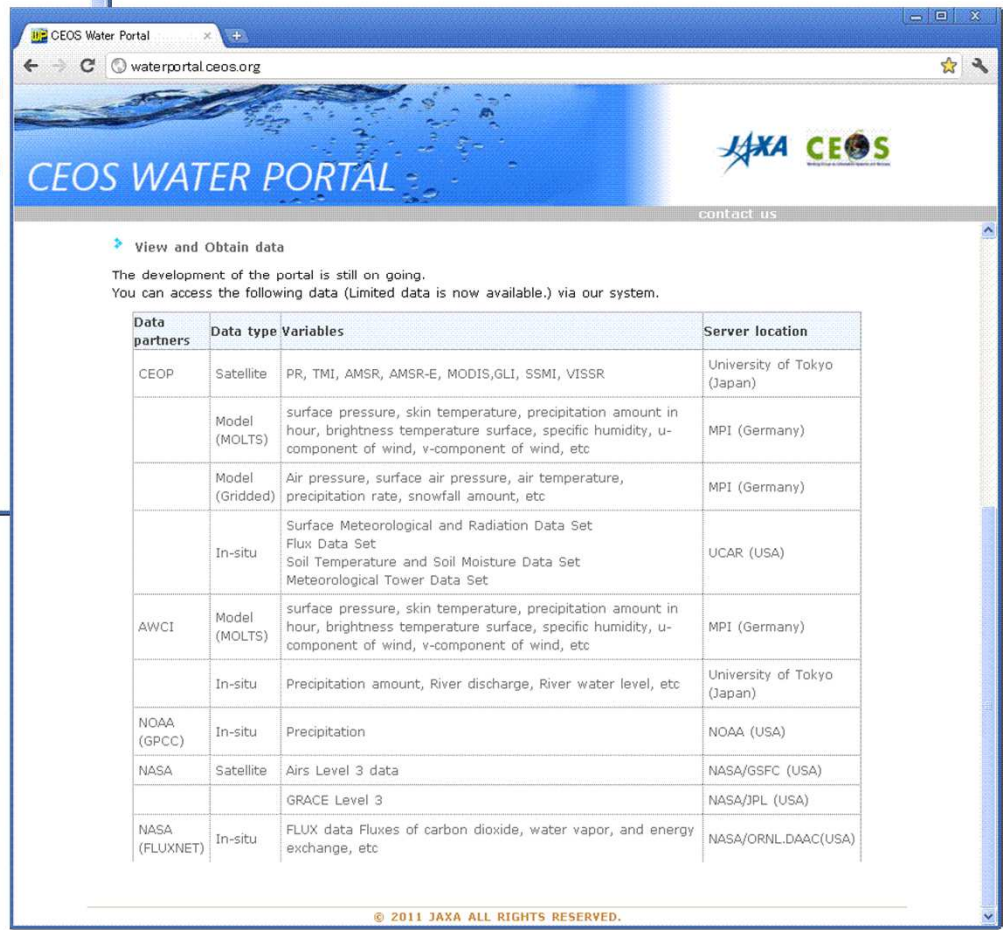
Data Partners	Data Types	Variables	Server Locations
NASA	Satellite	Airs level 3 data	NASA (GSFC)
NOAA (GPCC)	In-situ	Precipitation data	NOAA (USA)
NASA	Satellite	GRACE Level 3	NASA/JPL(PO.DACC)
NASA (FLUXNET)	In-situ	FLUX data Fluxes of carbon dioxide, water vapor, and energy exchange, etc	NASA (ORNL DAAC)
GEMS/Water (Planned)	In-situ	Instantaneous Discharge , Dissolved Oxygen , Temperature, etc	GMES/Water (CANADA)
PC portal (Planned)	Satellite	Precipitation data	CEOS（JAXA ,NASA）

We are planning to add 2 data centers per each year

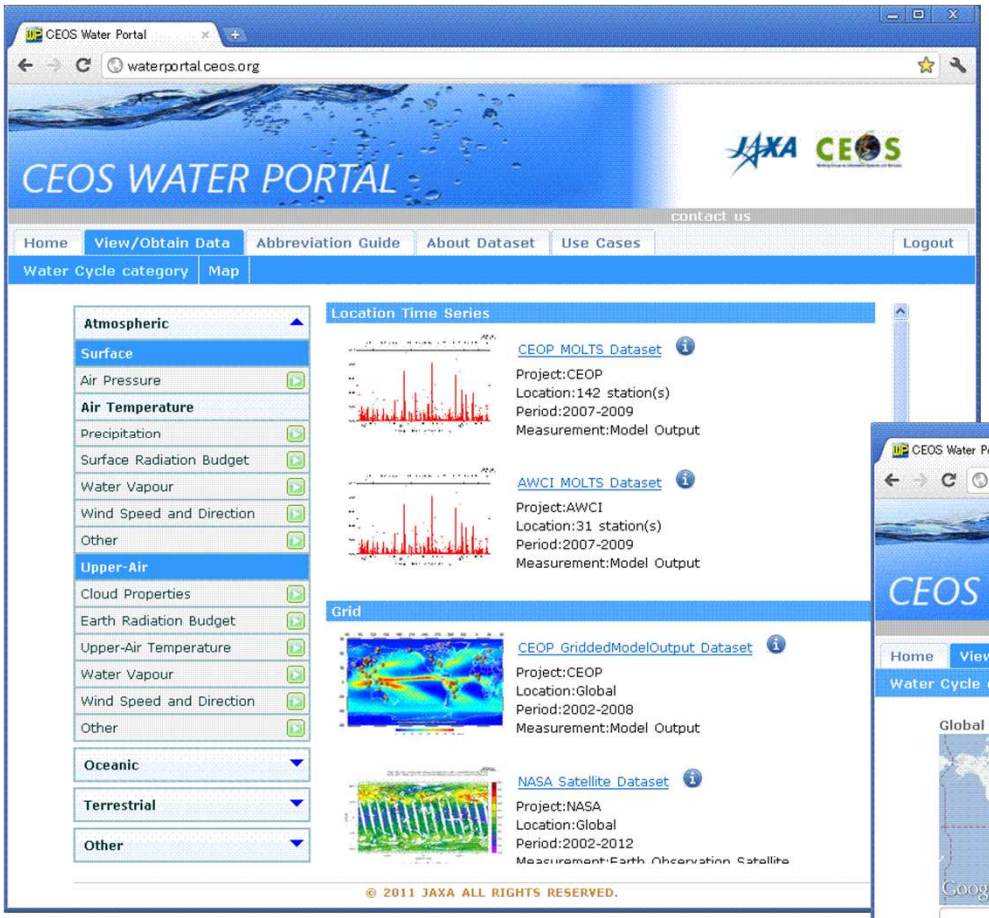
CEOS Water portal Top page

Top page

Table of data list

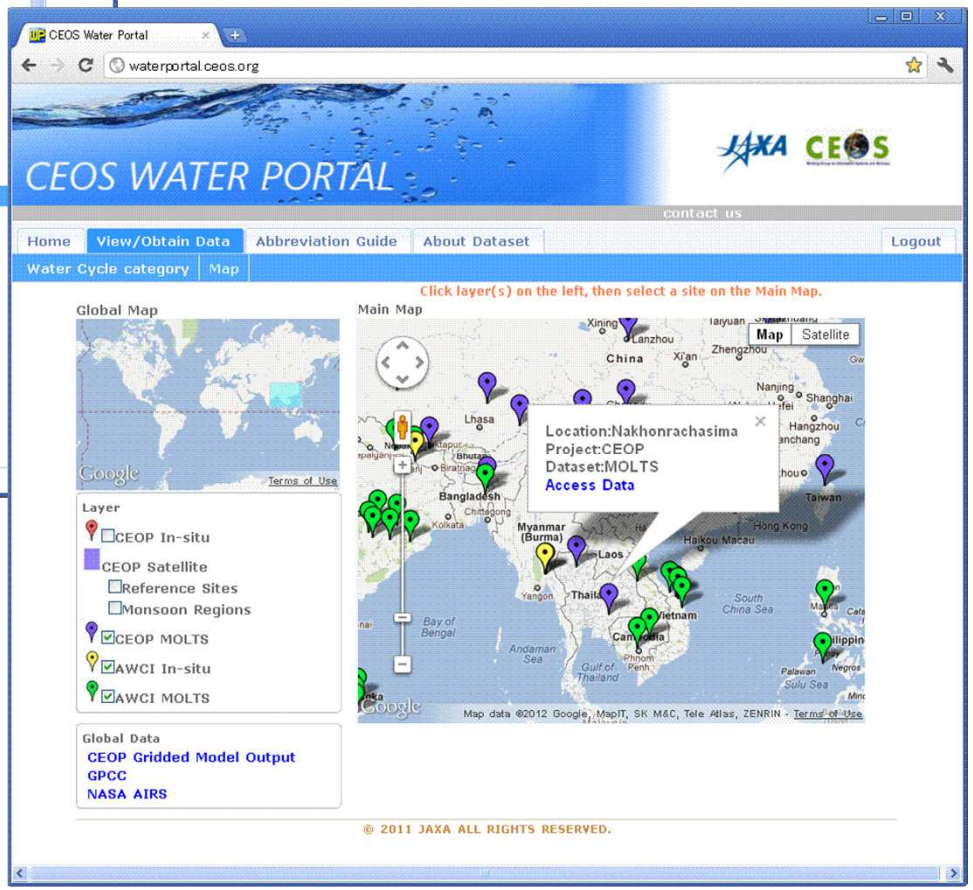


Two ways of data search

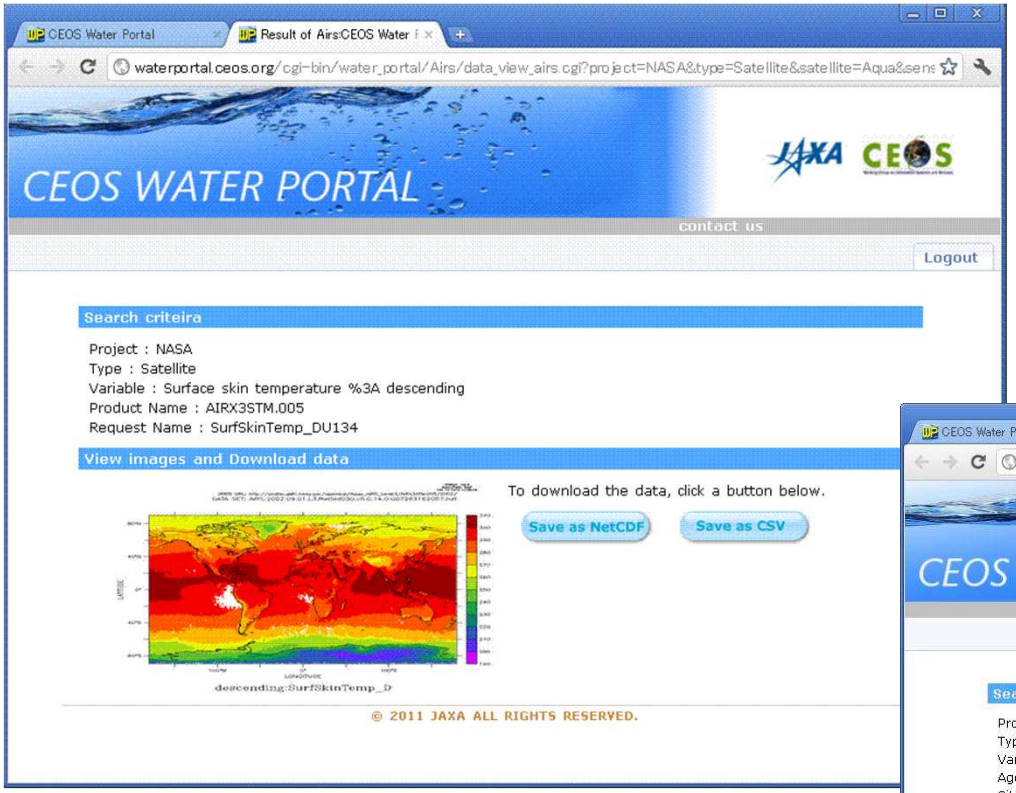


Category search

Map Search

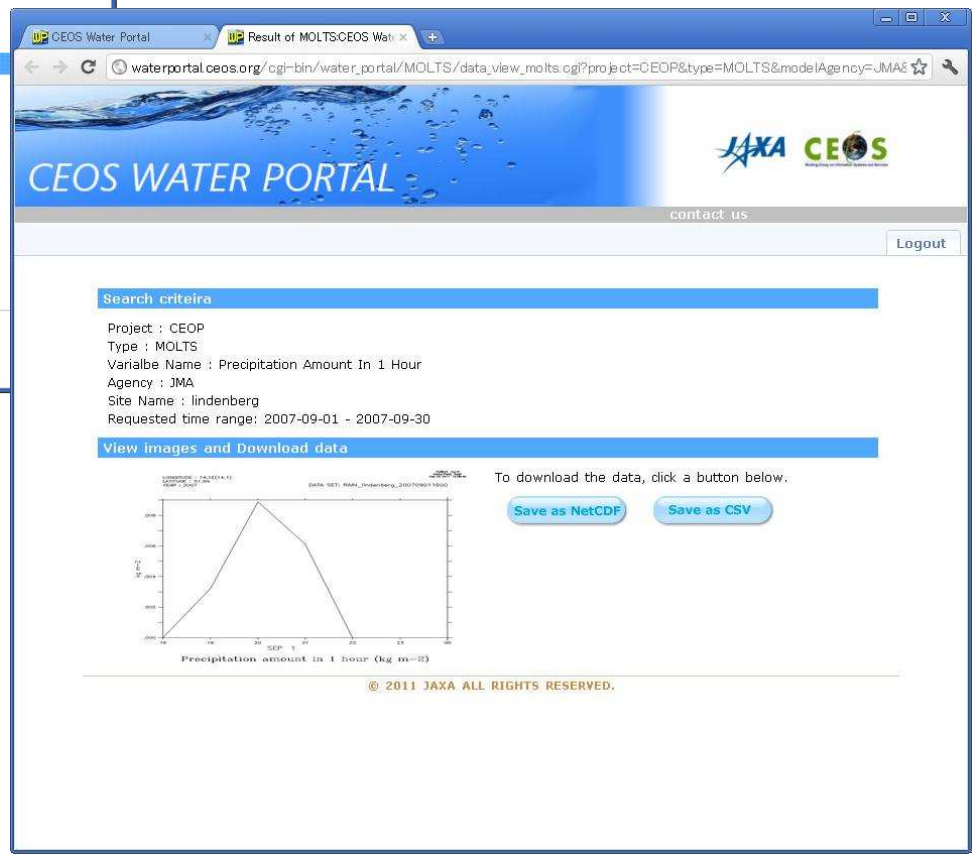


Examples of View image

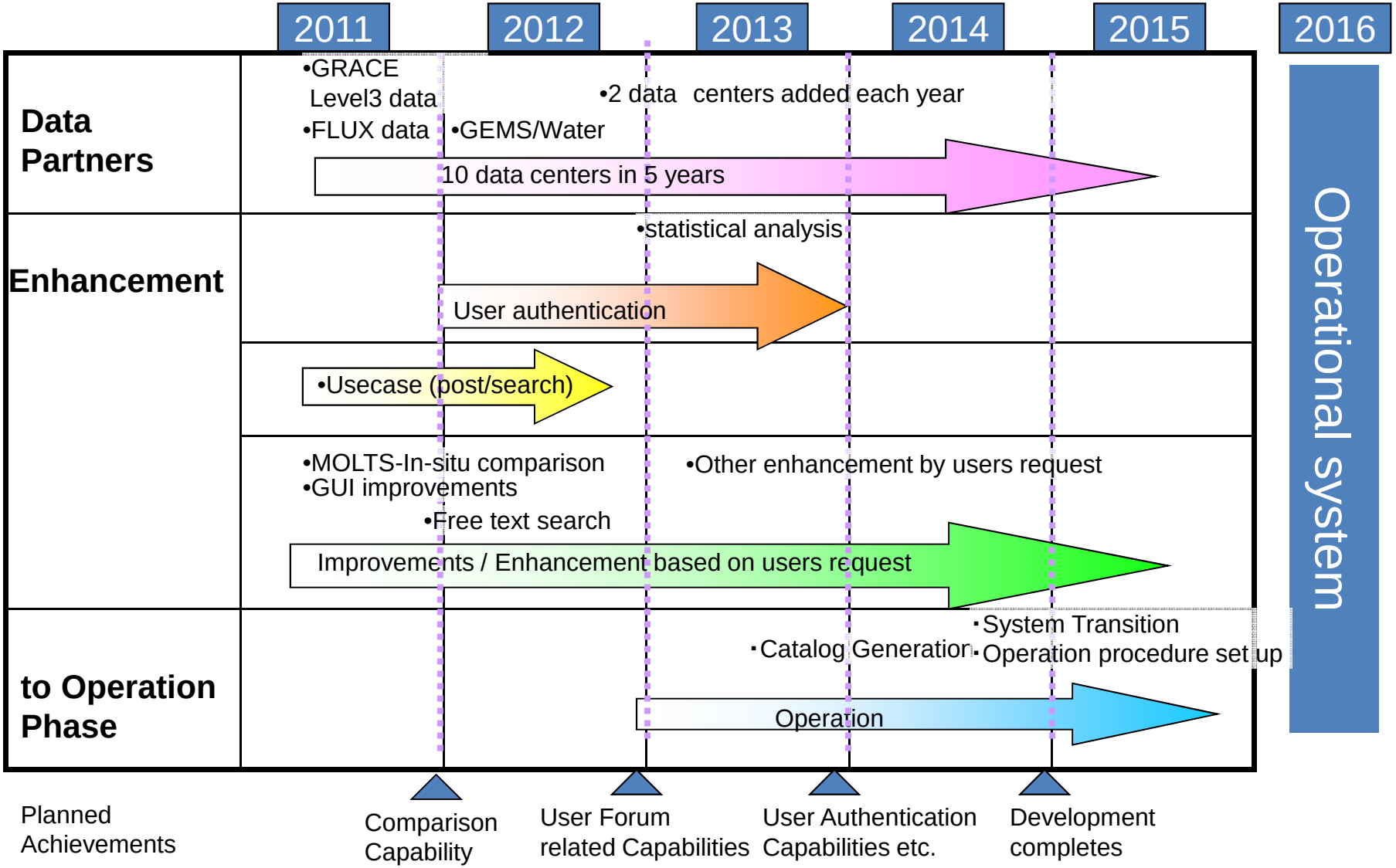


Airs level3:
surface skin temperature

MOLTS:
Precipitation amount in 1 hour



Milestone


2011
2012
2013
2014
2015
2016
Data Partners
•GRACE Level3 data
•FLUX data
•GEMS/Water
•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 :

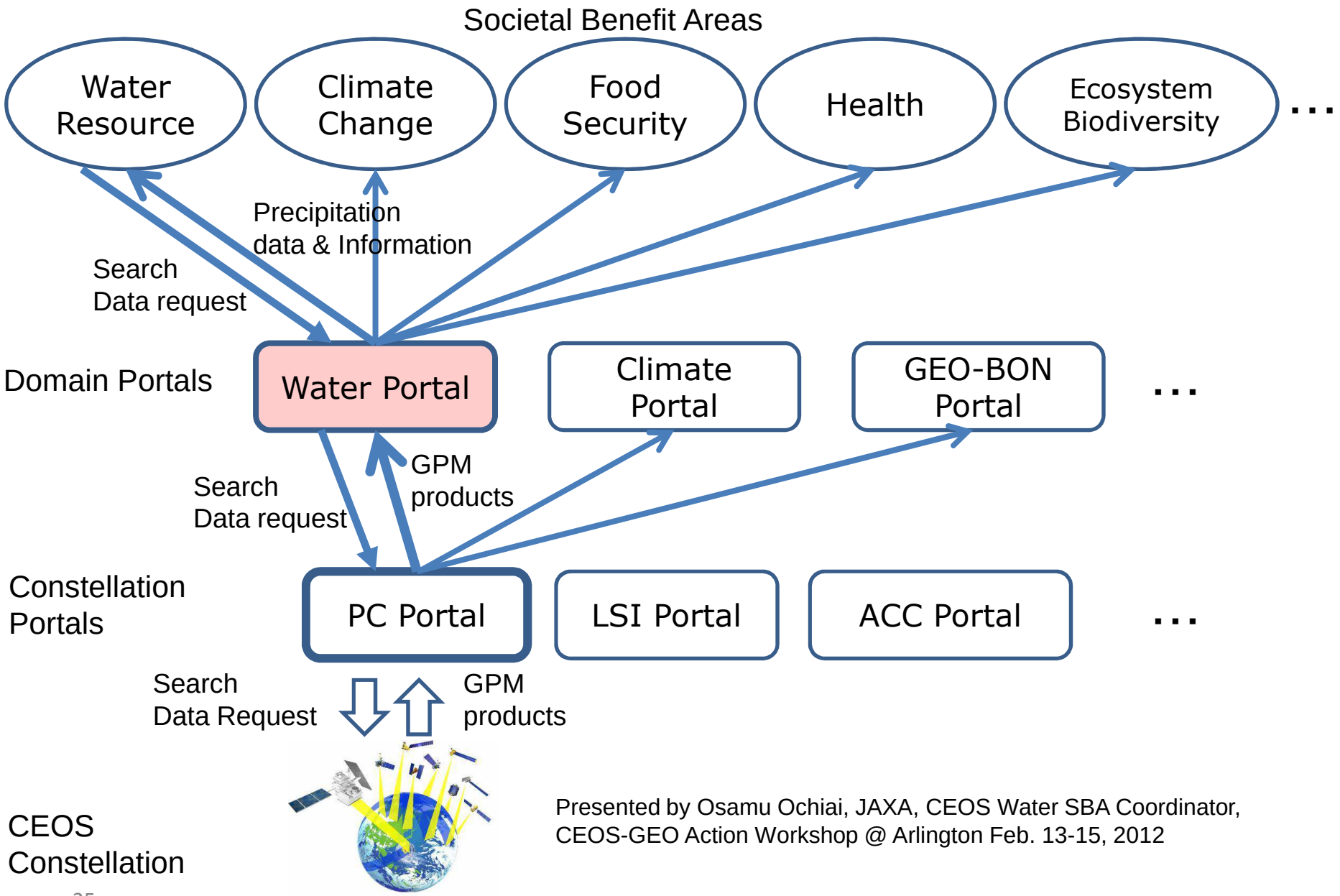
http://waterportal.ceos.org/

Contact ("*at*" = @) :

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

We would like to request IGWCO members to consider the possibility of collaboration with this portal.

Synoptic View: Water Portal and Precipitation Constellation Portal



Presented by Osamu Ochiai, JAXA, CEOS Water SBA Coordinator,
CEOS-GEO Action Workshop @ Arlington Feb. 13-15, 2012

Summary and Wayforward

Osamu Ochiai

Work Plan

- WP1-1: Invite selected 5-10 people from the AWCI member country's researcher, data management representative, and representative of each governmental agency to participate the meeting.
- WP1-2: Organize the program of the meetings in order to confirm the progress of the accomplishments following by discuss the issues and next steps.
- WP1-3: Support the GEOSS/AWCI member country to conduct the daily activities by using the Data Integration and Analysis System (DIAS).
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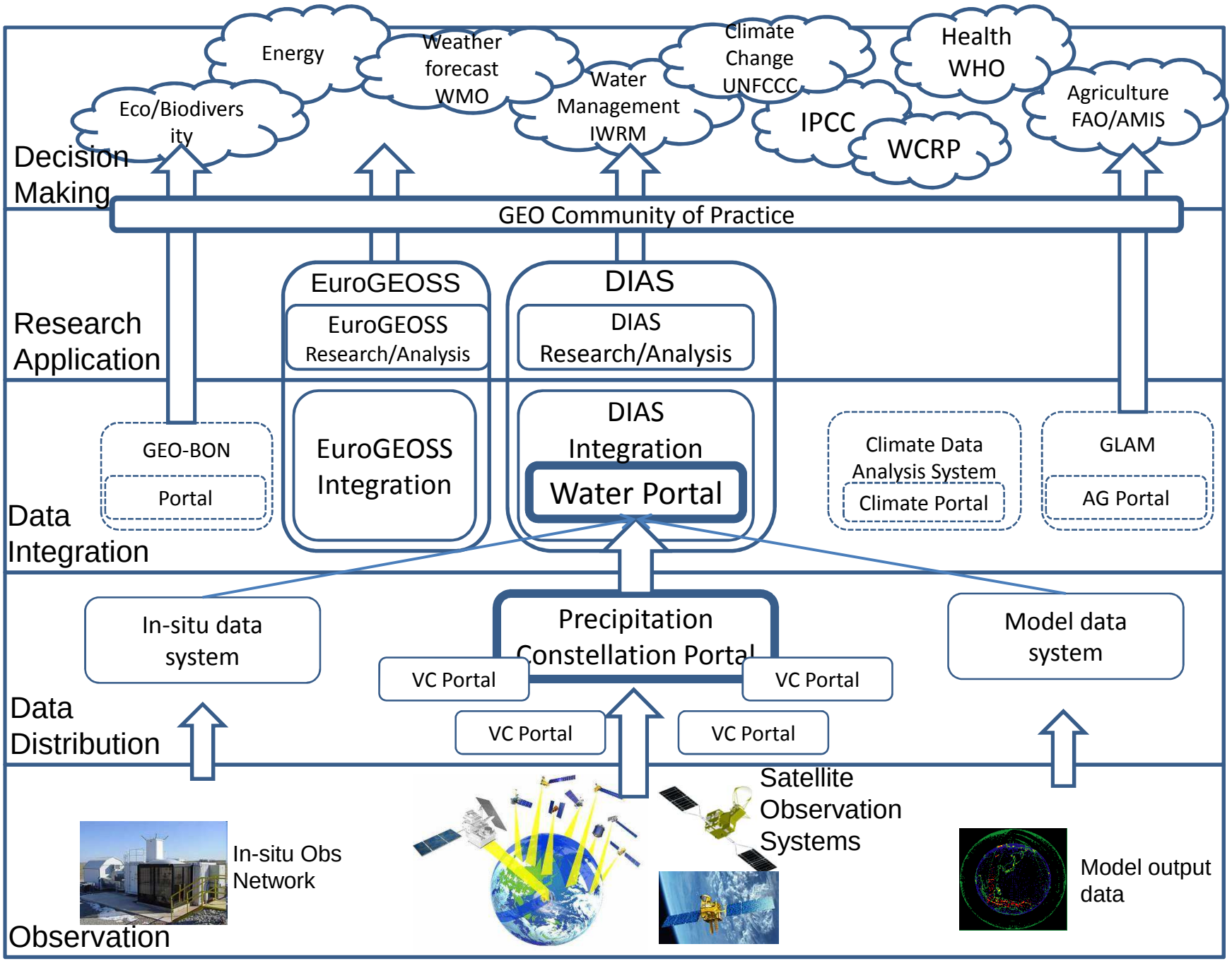
Expected Accomplishments, 2012

- Event Timing: AWCI ICG meeting (Tokyo, October 2012)
- Accomplishment 1: Begin work bench prototyping and demonstration work bench performances – building up on existing functions and capabilities of AWCI and collaborating bodies
- Accomplishment 2: Continue data collection from AWCI demonstration river basins (process that has been initiated by AWCI earlier), quality check, metadata development
- Accomplishment 3: Continue river basin model development in these basins – by experts in collaboration with local practitioners

Expected Accomplishments, 2013

- Event Timing: Project workshop (February/March 2013) and AWCI ICG meeting (October 2013)
- Accomplishment 1: Complete work bench prototyping and continue demonstration work bench performances at the selected basins
- Accomplishment 2: Complete data collection, quality check, metadata development
- Accomplishment 3: Continue river basin model development in AWCI demonstration basins
-

Expected Accomplishments, 2014

- Event Timing: Project workshop (February 2014) and Final report to APN
- Accomplishment 1: Complete demonstration work bench performances
- Accomplishment 2: Complete river basin model development in AWCI demonstration basins -> publications, presentations and demonstration to the policy- and decision- makers in participating countries
- Accomplishment 3: Preparation for shifting to more-operational phase

From Observation to inform decision making