



# **CEOS WGISS: LSI Portal & Possibilities for WGCV/WGISS Collaboration**

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**Martha E. Maiden, WGISS Chair**

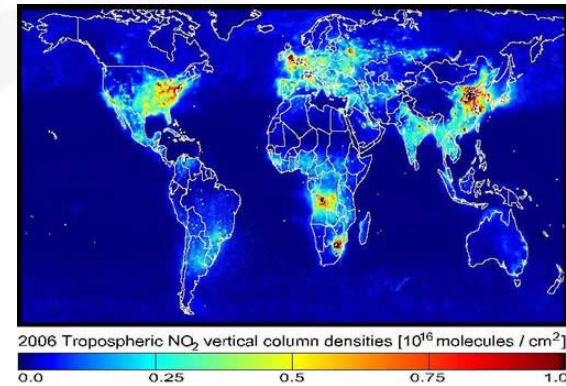
**CEOS WGCV 29th Meeting  
Avignon, France  
October 2, 2008**



# WGISS Current Focus

## Current Themes

- Provide satellite arm of GEO System of Systems
  - Innovative contributions that will persist, and can be reused
- Work closely with and support CEOS Virtual Constellations
- Work closely with and collaborate as appropriate with WGCV
- Support the CEOS Data Democracy initiative.



(Jim Gleason, USA ; Pepijn Veeffkind, KNMI)





# WGISS Structure

**WGISS**

**Interest Groups:**

WGISS Infrastructure – Ken McDonald  
Data Utilization – Czarán & Liu

**Technology  
and Services  
Subgroup**

**Applications  
Subgroup  
(External)**

**Martha Maiden, NASA, Chair**

**Pakorn Apaphant, GISTDA, Vice-Chair**

**Chuang Liu, NRSCC, Co-User Vice-Chair**

**Lorant Czarán, UN, Co-User Vice-Chair**

**Dingsheng Liu, NRSCC, Chair**

**Natalia Kussul, NSAU, Vice-Chair**

**Karen Moe, NASA, Chair**

**Satoko Miura, JAXA, Vice-Chair**

**Interest Groups:**

Web Services – Lyndon Oleson  
GRID – Li Guoqing, incoming Shelestov Andrii  
Sensor Web – Terence Van Zyl  
Data Services Interest Group (proposed)  
Standards Liaisons

**Interest Groups:**

Global Datasets – Lorant Czarán, Wyn Cudlip  
WTF CEOP (closed WGISS26) – Satoko Miura  
Land Surface Imaging – Lyndon Oleson  
Atmospheric Composition - Stefan Falke  
International Directory Network (IDN) – Lola Olsen





# WGISS WGISS-26

Boulder, September 22-26, 2008

- CEOS WGISS & GEO ADC and AIP, UIC, CBC, C4
- Joint Session with ADC
- CEOS IDN Climate Diagnostics Portal presented: well-received by CEOS Climate SBA Goldberg as reported as SIT, supports GCOS (action CL-06-02\_14).
- Of interest, WGCV:
  - Lessons Learned, WGISS Task Force WTF-CEOP
  - Feedback on DEM Cooperation
  - Sensor Web and Cal/Val
  - LSI Interest Group and Portal Project
  - First session on Precipitation Constellation
  - Atmospheric Composition Interest Group initiated

# Introduction to WTF-CEOP

## Background

Dr. Toshio Koike, lead scientist of GEWEX **C**oordinated **E**xtended **O**bservation **P**eriod, approached CEOS with a request for JAXA, NASA, ESA and EUMETSAT to contribute data to the CEOP project. In addition, Dr. Koike approached CEOS WGISS with a request for assistance providing technology to develop a distributed CEOP data integration, distribution and analysis prototype system.

## Purpose and Contribution

The purpose of the WGISS Test Facility for CEOP (WTF-CEOP) is to provide assistance to the CEOP science community in the development of data services associated with CEOP data integration. JAXA is the lead agency in development of the Distributed Data Integration System (or WTF-CEOP system). NASA contributed to WTF-CEOP through the development of an interface to allow WTF-CEOP system to access satellite data through an OGC Web Coverage Server.

# WTF-CEOP System Overview

- Purpose : to provide user-friendly access to satellite, in-situ and global gridded model output data.
- Operational since June 2005, upgraded in March, 2008.
- Two entry points on the JAXA WTF-CEOP web site ([http://jaxa.ceos.org/wtf\\_ceop/](http://jaxa.ceos.org/wtf_ceop/)), one for the “Flood monitoring service for Hue, Vietnam” and the other for the “Distributed Data Integration Prototype System”.

# Flood monitoring service for Hue, Vietnam

- Focused on a serious flood that occurred in 2004.
- Users can acquire various information such as the area covered by water, precipitation amount, stream flow information and population density during the flood period in order to understand the damage and also estimate the risk of future floods.

# Example

**JAXA CEOS EOP**  
 Distributed Data Integration System Prototype WGISS Test Facility for CEOP project (Flood mo...)  
**Flood monitor**

- DEM
- Huu Trach basin
- Ta Trach basin
- Main Rivers
- All Rivers
- Sub-basins

[ Administrative ]

- Admin outline
- Admin areas
- Dense population
- 0-1m inundation
- 1-2m inundation
- 2-3m inundation
- 3-4m inundation
- Water areas
- Surface line
- The station of a railroad
- A trunk road and a highway
- Road network
- Building
- Reference stream flow at kim Long

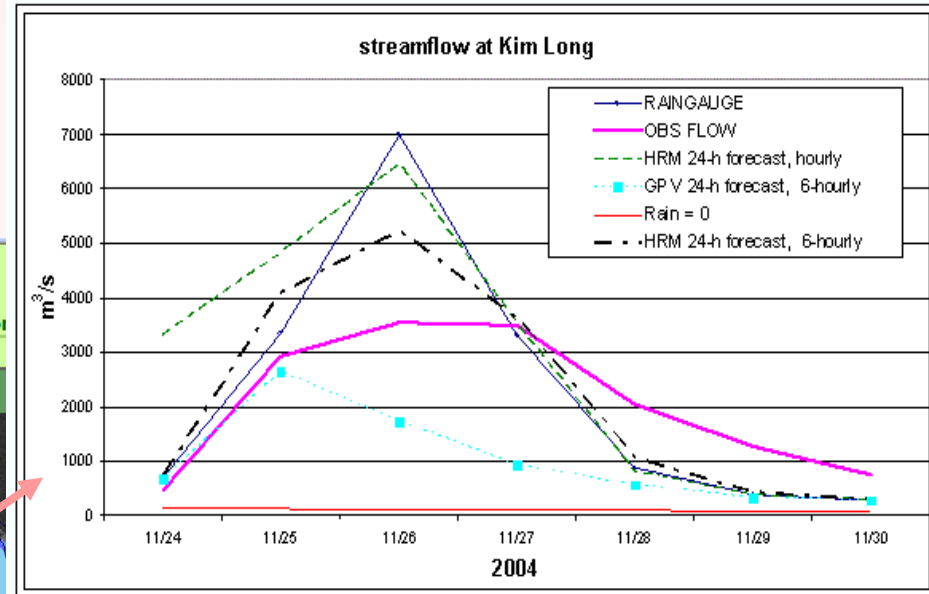
**Main Viewer**

In-situ Data Station (Kim Long)

Information

Note  
Please use the Internet Explorer browser and turn on popup windows in your browser.

Navigation  
Welcome to Vietnam Flood monitoring prototype system.  
The purpose of this system is to provide access to the various types of data related flood





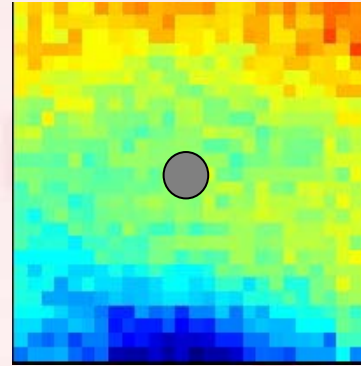
# Distributed Data Integration Prototype System

- Handles satellite data, in-situ data, model output data and MOLTS data.
- Basic functions
  - Access data from distributed archive sites
  - Select data type, location (Reference Site, Station name), variable name, by height or depth, by time range (start / stop time)
  - “See the data” (plot, animation and view values on the screen)
  - Download data (NetCDF, csv format)
  - Compare in-situ data and MOLTS data
  - Registration (to satisfy CEOP data policy)
- Tutorial videos and user’s manuals are available on the web site.

# Available Data

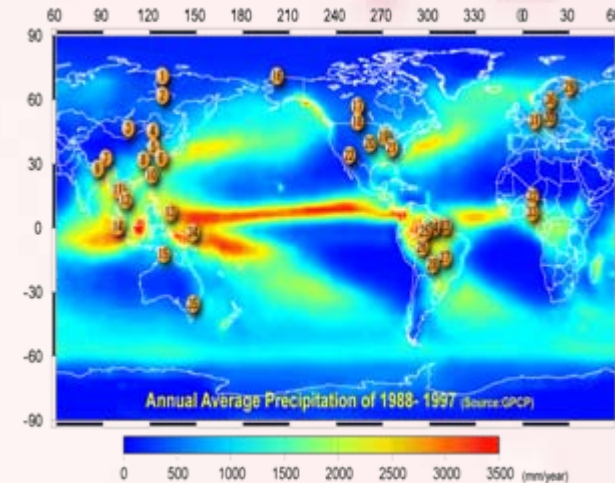
## (i) Satellite Data

- 250 km x 250 km subset scenes, regridded to Lat/Lon grid, centered over the 35 in-situ data sites
- Band selection, period selection and download multiple scenes available



## (ii) In situ Data

- Four types of CEOP in-situ data from 35 Reference Sites
  - Surface (19 variables), Tower (9 variables),*
  - Soil (temperature, moisture),*
  - Flux (Sensible Heat, Latent Heat, CO<sub>2</sub>, Soil Heat Flux)*
- Download of QC flags available



## (iii) Model Output Data

- MOLTS – Model Output Location Time Series (time series at model grid point nearest center of in-situ data sites)
- Gridded Model Output – 2D/3D time series.
- Model Output , convert from GRIB to NetCDF



# WGISS Highlights for WGCV, cont

- WTF-CEOP Interest Group - (closed at WGISS-26)
  - Four lessons learned documents to be posted on WGISS web site
    - JAXA prototype lessons learned
    - Data provenance lessons learned (NASA prototype)
  - Experience with Data Quality in JAXA Prototype
    - For Satellite Data, only “good quality” data is registered and used, referring its original meta data. >>> Original metadata should include “correct” data quality information !
    - For In-Situ Data, in many cases, no Quality information is included in data, no metadata is prepared.
  - Experience with Data Quality in NASA Prototype
    - The NASA prototype used L2 AIRS data. Data quality screening is product specific. Many AIRS variables have different quality levels (good & best) and different users may have different criteria.
      - Example variable surface temperature “TSurfStd” "good" means error < 1.0K for ocean surface at latitude higher than -40 degree, while "best" means error < 0.8K.
    - Prototype performed quality screening at the server side and did not provide QC data to the client. This was transparent to the user. >>> User feedback is needed to determine quality levels needed and how to provide that information to the client.





# WGISS Highlights for WGCV, cont

## ■ Global Datasets Interest Group and DEM

- Reviewed "Recommendations and Actions for Space Agencies" coming from the GEO DEM Interoperability Task DA-07-01.
- WGISS recognizes role in the GEO Task, however, would like an opportunity to work with Task lead to refine requirements.
- While requirements are refined, WGISS to maintain internal and external discussion under the auspices of Global Datasets Interest Group.
- Of interest: Lorant Czarán to head UN-SPIDER office in Bonn.

## ■ GDIG recommendations for WGISS

- Work with WGCV, and external Users, to identify a number of Test Sites around the world to be used for calibration and validation of DEM data.
- Encourage Agencies to provide DEM data (in-situ, satellite) for Test Sites.
- Work with WGCV, ISPRS to agree on DEM format and display standards.
- Develop DEM Cal/Val Portal aimed at facilitating DEM Cal/Val activities and recording DEM quality information.
- Make recommendations to optimize on-line delivery of DEM Data (ftp, WCS, mirror sites etc.)
- Encourage Agencies to provide improved access to DEM data (including Bathymetry) in support of CEOS Data Democracy.



# WGISS Highlights for WGCV, cont

- Sensor Web Interest Group - multiple projects underway
  - Contributes to Data Democracy
  - Rapidly respond to events
  - Provide timely calibration/validation of sensor data
  - Enable cross mission, multi-sensor products: “Data on Demand”. Autonomous data production can improve data accuracy and have been shown to reduce model uncertainties (error bar checking)
  - Challenges include data provenance and quality in dynamically configured sensor webs, and secure web services



# WGISS Accomplishments, cont

## ■ Land Surface Imaging Interest Group

- In support of LSI Constellation, LSI Portal in spiral development working with LSI Study Team Lead Bryan Bailey. Initial demo version still under construction, to be demo'd at CEOS Plenary and GEO Plenary in November
- Currently, Dr. Bailey has requests in to LSI Constellation Study Team members with mid-resolution optical LSI systems for current information to include in the portal demo.
- Timely responses to that request would be helpful.
- IGOL has requested establishing QA and cloud cover metadata - possible joint activity with WGCV

## ■ Precipitation Constellation - initial presentation NASA/JAXA

- Initiated liaison for ground system activities communication: PC's GPM Data Working Group (GDaWG)
- PC contributions of data to Sensor Webs under consideration



# WGISS Accomplishments, cont

- ACC - New Interest Group initiated led by Stefan Falke
  - WGISS participating in the ACC Workshop GISS, NYC, Oct 15-17
  - ACC IG to collaborate with the ACC team to draft recommendations for a 'value-added' ACC portal
  - Presentation of AIP Air Quality Prototype led by Stephan Falke
    - ACC aligned with GEO SBAs, one focus is Air Quality
    - Air Quality Community needs to know data product lineage, assumptions, and limitations for air quality applications (workshop at EPA looking at OMI NO2 had scientists wishing users to look at quality, and were pointed to “read me” files that were lengthy for that info)
    - ESIP Federation Air Quality Cluster requested by GEO UIC to serve as or transform itself into the GEO Air Quality Community of Practice
  - ACC IG to collaborate with the ACC team to evaluate extensions of AIP Air Quality Prototype led by Stephan Falke for a Smoke Monitoring Sensor Web prototype proposal



# Possibilities WGISS/WGCV Cooperation

- Cooperation on Land Portal
  - First step is for agency participants in LSI with current mid-resolution instruments to provide information to LSI Study Team to include
  - Next iterations could include joint activities with WGCV, one example suggestion by IGOL to establish QA and cloud cover metadata
- Cooperation on Data Quality and QA4EO: WGISS brings experience
  - Lessons Learned: WTF-CEOP
    - Quality metadata varies or not present, provider, tool must customize
  - Lessons Learned: Air Quality
    - Air Quality Community needs to know data product lineage, assumptions, limitations for air applications (workshop at EPA looking at OMI NO2 had scientists wishing users to look at quality, and were pointed to “read me” files that were lengthy for that info)
  - Challenge: Sensor Web, Service Oriented Architecture (Web Services)
    - Providing data provenance, quality in dynamically configured sensor webs is area for prototyping and research
- Cooperation on Global DEM in the near-term - any WGCV priorities?
- Are there other areas for WGISS and WGCV to cooperate, or to investigate establishing joint activities?