CEOS WGISS Structure

John Faundeen, Chair
Ivan Petiteville, Vice-Chair
Chuang Liu Co-User Vice-Chair
Lorant Czaran Co-User Vice-Chair

Task Team: WGISS Info Infra Team – Stu Doescher

Task Teams:
- International Directory Network (IDN) – Lola Olsen
- CEOS Interoperable Catalog System (ICS) – Martin
- Data Services (DS) – Bernhard Buckl
- Archive – Stu Doescher
- EOGEO Workshop – Clive Best
- GRID – Yonsook Enloe

Paul Kopp, Chair
Dingsheng Liu, Vice-Chair

Osamu Ochiai, Chair
Pakorn Apaphant, Vice-Chair

Task Teams:
- Global Datasets – Lorant Czaran
- WTF CEOP – Osamu Ochiai
- WTF Core Test Sites – John Faundeen
- CEOS EO Data Portal Project – Czaran / Cudlip
WGISS Leadership

Chair: John Faundeen, Chair (thru Nov. 2005)
Vice Chair: Ivan Petiteville, ESA (thru Nov. 2005*)
User Vice Chair: Chuang Liu & Lorant Czaran
Secretariat: Rita Tornow (thru Nov. 2005)

Technology & Services Sub-Group
Chair: Paul Kopp, CNES
Vice-Chair: Dingsheng Liu, NRSCC

Projects and Applications Sub-Group
Chair: Osamu Ochiai, JAXA
Vice-Chair: Pakorn Apaphant

* Chair from November 2005 to November 2007.
WGISS Liaison

Open Geospatial Consortium
CCSDS
ISPRS
ISO TC211
Climate & Meteorology
Global Map
ICSU
ICSU / CODATA

Allan Doyle, NASA/Intl. Interfaces
Wyn Cudlip, BNSC/QinetiQ
Liping Di, NASA/GMU
Lorant Czaran, UN
Howard Diamond, NOAA
Osamu Ochiai, JAXA
Dave Clark, NOAA
Chuang Liu, NRSCC
- The "Catalog Interoperability Protocol" (CIP) was defined under the auspices of CEOS/WGISS as Z39.50 profile. CIP was a major effort to set up a common mechanism to describe and retrieve EO data from geographically distributed repositories. INFEO was the name of the first system implementing of CIP by the Joint Research Center of the European Union. The EO portal implemented by ESA, again under the auspices of CEOS/WGISS, is the INFEO follow-on.

- The "Directory Interchange Format" (DIF) is the best known of all metadata formats aimed at discovery of EO data. NASA on behalf of CEOS/WGISS maintains DIF. The Global Change Master Directory (GCMD) contains about 15,000 DIF metadata. The GCMD team is currently working on a convergence process to make DIF compatible with ISO 19115.
  Several CEOS/WGISS agencies are actively using the GCMD.
Several CEOS/WGISS agencies have already implemented, or are implementing, or plan to implement the ISO 19115 metadata standard, namely: CNES (prototype system), FAO (operational system), JAXA (CEOP system under development).

- CEOS/WGISS is experimenting the new concept of EO related generic services. In particular, BNSC/Qinetics and ESA have set up a system providing oil spill drift predictions based on the OGIS web mapping services (WMS) specification. WMS is now becoming an ISO standard (ISO 19128). The GCMD DIF metadata format has now a companion metadata format for high level service descriptions: the "Service Entry Resource Format" (SERF). CCRS also have extended their metadata catalog to service metadata. The JAXA CEOP system will heavily rely on generic services.
- CEOS/WGISS is analyzing the concept of "semantic" interoperability, which means that two "syntactically" different requests for some EO service but bearing the same meaning (i.e. semantically identical) should be equally agreed by service systems. For the time being, the focus is made in this field on the so called "ontology" technology (NB.: the traditional thesauri are special cases of ontologies).

- CEOS/WGISS is analyzing and testing the ways by which agencies could share resources (either hardware resources, like computers, or dematerialized resources, like services). This can already be done by interoperable systems like the EO Portal but the emphasis is here on how to do it in a "generic" sense. One of the promising paths WGISS is considering the "Grid" technology, which is now being experimented by several WGISS agencies. Security is probably the biggest challenge of this new technology.
Technology & Services Subgroup

- Organised into Task Teams
- To address technical issues associated with the:
  - acquisition
  - storage
  - processing
  - locating
  - delivery
  - of EO data and services
- Fosters the exchange of technical information
- Promotes the use of Open Standards and the development of interoperable systems
T&S Issues

- **EO-User Perspective:**
  - Locate - Directory Services
  - Search - Catalogue Services
  - Retrieve - Data Services

- **Provider Perspective (in addition to above):**
  - Archive - Hardware; Formats; Preservation Strategies
  - Processing - GRID Systems and Tools
  - Information Exchange – Guideline Documents; Workshops
Directory Services
Directory Services

- CEOS International Directory Network (IDN) and the
- Global Change Master Directory (GCMD)
  - With 4 co-ordinating notes around the world

- Registry describing over 15,000 Datasets
- Uses DIF metadata standard
  - Now compliant with ISO19115 metadata standard
- 50,000 hits per month

- Specific User Portals can be created.
- [http://gcmd.nasa.gov/](http://gcmd.nasa.gov/)
Find JAXA Data Sets by Topic:

- **Agriculture**
  - forestry, soils ...

- **Atmosphere**
  - precipitation, temperature ...

- **Biosphere**
  - vegetation, zoology ...

- **Climate Indicators**
  - air temperature, drought ...

- **Human Dimensions**
  - environmental impacts, land use ...

- **Hydrosphere**
  - snow & ice, water quality ...

- **Land Surface**
  - land cover, erosion ...

- **Oceans**
  - circulation, salinity ...

- **Paleoclimate**
  - tree rings, land records ...

- **Snow and Ice**
  - frost, snow cover ...

- **Solid Earth**
  - natural resources, biogeochemistry ...

- **Spectral / Engineering**
  - radar, visible imagery ...

- **Sun-Earth Interactions**
  - auroras, solar activity ...

- **Data Centers - Locations - Instruments - Platforms - Projects**
Also, can register services
Additional GCMD Services

Welcome to NASA's GCMD Learning Center

The **Learning Center** is the place to find data and information about global environmental change. NASA's Global Change Master Directory (GCMD) is an online catalog of data sets covering just about every scientific area of global change research.

**Global Change Data You Can Use.**
Ranging from simple to complex, these data are often used in global change research.

**Questions and Answers About Global Change.**
Have a question about global environmental change? Perhaps it has been asked before. Check out our commonly asked questions or send the GCMD an email.

**Links to Online Global Change Resources.**
Check out these other cool links to global change information, images, projects, education, and free learning resources.

**Educational Earth Science Services and Resources.**
You can search for Earth science educational services and resources through the GCMD data services database.
Catalogue Services
Catalogue Services

- **WGISS developed the CIP**
  - Catalogue Interoperability Protocol
  - Based on a profile of the Z39.50 protocol developed by the library community
  - Allows transfer of search and order parameters and the return of the results

- **Basis of Interoperable Catalogue System (ICS)**
  - ESA implementation called INFEO
  - Allows distributed searching of ESA and NASA catalogues
  - Other Nodes to be added

- [http://catalogues.eoportal.org](http://catalogues.eoportal.org)
Data Services
Data Services

- Working to exploit specifications emerging from the Open Geospatial Consortium (OGC)
- In particular:
  - Web Map Server – for rgb raster data
  - Web Feature Server – for point and vector data
  - Web Coverage Server – for low-level satellite data
- Allows information layers from distributed on-line servers to be combined
Near-Real-Time MODIS Display

MODIS data system

Left | Up | Down | Zoom In | Zoom Out | Right

Welcome: qinetiq_test

The images of the day are shown.

Data product: MODIS TERRA
Download Availability: any
From (00:00:00): 16-08-2004
To (23:59:59): 16-08-2004
Search

Matching records:
Select: checkboxes to view a browse image; names to download the image data if available.

De-select All Images

- 040816_1019_modis_1km.tif
- 040816_1156_modis_1km.tif

Base Mapping  Image overlays
Data Search & View System
Archiving
Archive Issues

- Archive interchange format (CEOS ICF)
- Long-term preservation strategy
- Archive hardware issues
  - Disc vs. tape
  - reliability
- Data formats in general
  - Format Guidelines Document
  - Browse Guidelines Document
- tape-data recovery activities
  - Baking recommendations
  - Assistance to Developing Countries
Disc versus Tape costs

Disk hardware costs 10X nearline tape per gigabyte

Notes:
Disk and tape are an entire market average
Tape includes library, drives and media
Tape assumes 2X compression

-35% unit price erosion rate combined with a 53% unit shipped growth rate results in flat total market revenue
Tape storage trends

Tape Trends

Areal Density Trend

- Oxide Media / Ferrite Based Heads
- MP Media / Full Thin Film
- NSIC Roadmap 1998
- NSIC Roadmap 2002
- MP Limit

(Thin Film Media / GMR)

Year


Gb/in²

0.001 0.01 0.1 1.0 10.0 100.0

Courtesy of Richard Dee

CEOS
GRID Computing
GRID Computing

- Large international investment into the development of GRID concepts and tools
- Exploitation of computational GRIDs for the benefit of EO data analysis is under investigation by CEOS WGISS.
Grid Computing Environment

Globus client system

MDS server system

Clients are programs and libraries

Globus server system
CEOS Grid Application Projects

- **Dutch Space**
  - GridAssist workflow management tools
  - Data simulation project for future missions

- **European Space Agency**
  - GridEngine cross-grid management tools
  - Data processing and product generation

- **NASA/GMU**
  - GeoTree virtual data product generation

- **NOAA/NOMADS**
  - Climate modeling and data access

- **China-SIG**
  - EO Data sharing and distribution

- **NASA/UAH**
  - EO Data mining

- **USGS EDC**
  - EO Data distribution
  - WTF CalVal data access

- **NASA ADG**
  - Grid tools for data product production
Information Exchange
Information Exchange

- At WGISS meetings – 2 per year
- Through Task Team telecons
- Preparation of Guideline Documents
- Carry out demonstrator projects
- Preparation of Lessons Learnt Documents
- Annual EOGEO Workshop
- CEOS WGISS Papers at conferences
Task Team Structure

WGISS

Current Tasks:
WGISS Infrastructure

Technology and Services Subgroup

Current Tasks:
International Directory Network
CEOS Interoperable Catalog System
Data Services Archive
EOGEO Workshop
CEOS GRID

Projects and Applications Subgroup

Current Tasks:
Global Datasets
Global Mapping Book
WTF CEOP
WTF Core Sites (WGCV)
Oil Spill Drift
CEOS EO Data Portal