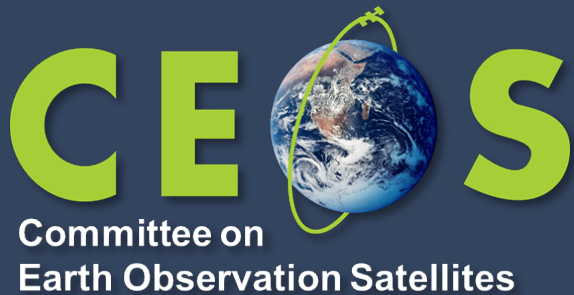


WGISS

WG on Information Systems and Services Report



Dr. Makoto NATSUISAKA, JAXA

WGDisaster-20

6th September 2023

What is WGISS?



Working Group on Information Systems and Services

- WGISS promotes collaboration in the development of systems and services that manage and supply Earth observation data as a working group of CEOS.
- The activities and expertise of WGISS span **the information life cycle;**
 - **data preservation and stewardship,**
 - **discovery and access,**
 - **interoperability and use,**
 - **explore cutting-edge technologies.**

WGISS Structure



WGISS Principals

AEM: Adrian Guzman
CAS/AIR: Ziyang Li
CAS/NRSCC: Chuang Liu
CSA: Paul Briand
CNES: Richard Moreno
CONAE: Homero Lozza
CSIRO: Matt Paget ← welcome back!
DLR: Katrin Molch
EC: Astrid Koch
ESA: Mirko Albani
EUMETSAT: Michael Schick
GA: Simon Oliver
GISTDA: Panu Srestasathien
INPE: Lubia Vinhas
ISRO: Nitant Dube
JAXA: Makoto Natsuisaka
NASA: Dana Ostrenga
NOAA: Kenneth Casey
ROSCOSMOS: Tamara Ganina
UKSA: Esther Conway
USGS: Tom Sohre
VSNC: Vu Anh Tuan

Chair Makoto Natsuisaka, JAXA
Vice-Chair Tom Sohre, USGS
Secretariat Michelle Piepgrass, JAXA

Data Preservation and Stewardship Interest Group: Mirko Albani, ESA

Data Interoperability and Use Interest Group: Tom Sohre, USGS ←

interoperability
framework!

Data Discovery and Access Interest Group: Damiano Guerrucci, ESA

- **IDN** Michael Morahan, NASA
- **FedEO** Damiano Guerrucci, ESA
- **CWIC** Minnie Wong, NASA

Technology Exploration Interest Group: Yousuke Ikehata, JAXA,
Richard Moreno, CNES

- **Jupyter Notebooks** Esther Conway, UKSA-NCEO
- **AI/ML** Yousuke Ikehata, JAXA

- WGISS-55 and WGISS-WGDisasters Joint Symposium were successfully held in Córdoba, Argentina, hosted by CONAE on April 18-20, 2023.



Thanks, Laura-san and CONAE!

- *from the notes*; discussion on **machine learning** for EO applied to Disasters and other topics

WGISS-56



- WGISS-56 will be held in Paris, France, hosted by CNES on October 24th – 27th.

<https://ceos.org/meetings/wgiss-56/>

Data Preservation and Stewardship

Led by Mirko Albani (ESA).

- Published guidelines for **Preservation** Workflow, EO **Data Stewardship** Glossary, EO **Data Preservation** Guidelines, EO Data Set Consolidation Process, Preserved Data Set Content, **Persistent Identifiers** Best Practice, **Data Purge** Alert White Paper, CEOS Technical Content and Associated **Information Preservation** Best Practices, WGISS **Data Management and Stewardship** Maturity Matrix White Paper, Measuring EO **Data Usage**, **Data Stewardship** Reference Model White Paper, CEOS **OpenSearch** Best Practice, CEOS **Service Discovery** Best Practice

Data Preservation and Stewardship

- “WGISS Data Management and Stewardship **Maturity Matrix** White Paper” attracts attentions from other groups, WGCV, CGMS (Working Group-1V), CEOS New Space Task Team.
- Information exchange on how to give “**Data Integrity and Authenticity**” to the cloud data archives considering a trend that data replications in the clouds are increasing.

Updates after the last report...

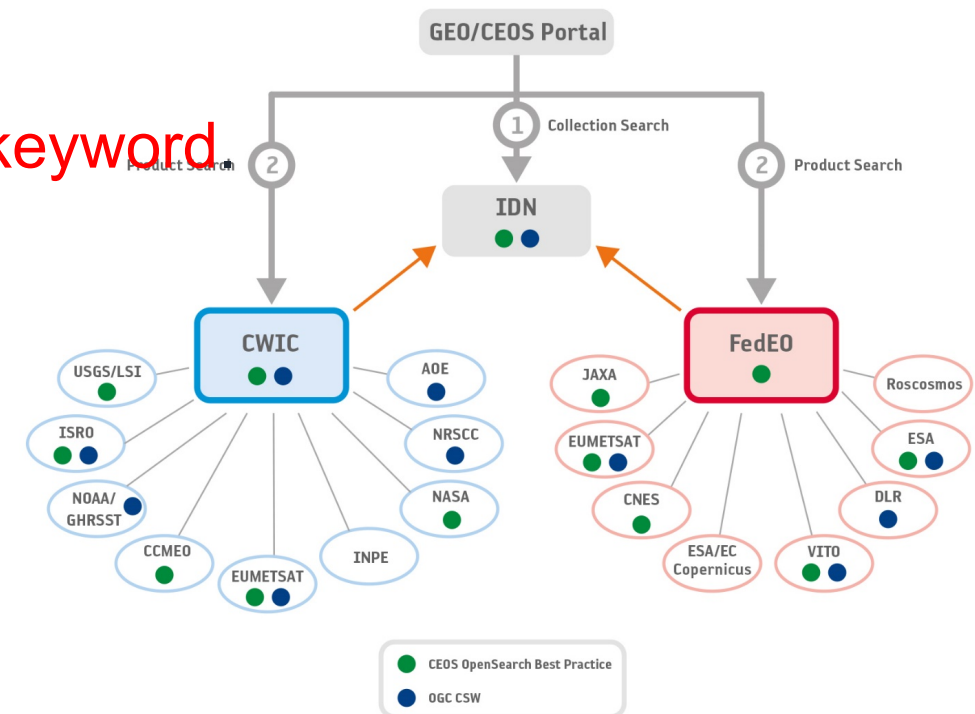
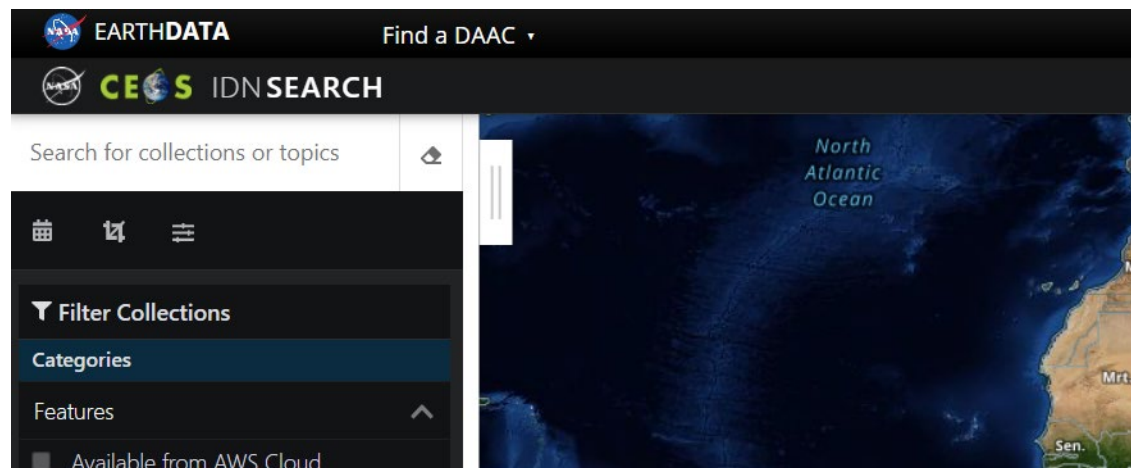
- DSIG Guidelines has been updated.

<https://ceos.org/ourwork/workinggroups/wgiss/documents/>

- The leader joined the CEOS interoperability framework.
- Jointly collaboration with CGMS-IV for Data Stewardship Maturity Matrix has been going well. Cloud Use Best Practices developed by CGMS will be introduced at WGISS-56 (Oct. 24th - 27th). Investigation on commercial cloud by SEO will be shared at WGISS-56.

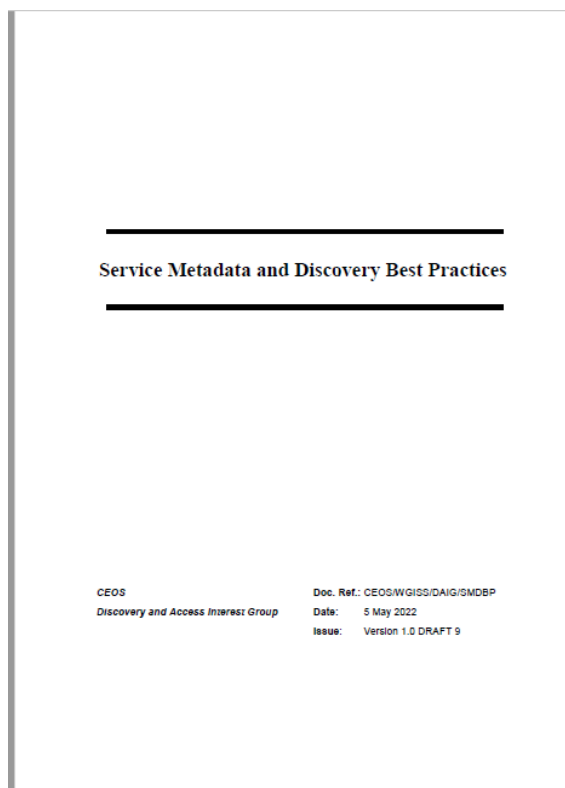
Led by Damiano Guerrucci (ESA).

- The interest group makes the CEOS partner's data to be findable and accessible based on “CEOS **OpenSearch** Best Practice” and through “**WGISS Data Assets**”.
- IDN and FedEO are well communicated.
- **NASA recently introduced AI/ML as a GCMD keyword.**



- CEOS **Service** Discovery Best Practice has been newly developed.

ref. CEOS OpenSearch Best Practice (Discover **EO Collection, Granules**)



- Scenario 1: Online machine to machine interfaces (API)
- Scenario 2: Downloadable tools
 - Source code, binaries, Jupyter Notebooks, Docker images, ...
 - Download from repository (GitHub, Zenodo, ..) or registry (e.g. DockerHub, ...)
- Scenario 3: Web GUI tools
 - Software as a Service (SaaS)
 - E.g. Jupyter Notebook on Google Colaboratory, Binder
- Scenario 4: Application Package
- Scenario 5: Coupled Services

Survey of applicable metadata models/elements

- ISO19115-1:2014 Annex F.3 “Metadata for discovery of services”
- NASA ESDIS UMM-S, UMM-T
- INSPIRE Technical Guidance (Metadata),
- DataCite Metadata Schema Documentation, ...

- **OGC STAC implementation for CMR** was proposed and a volunteer from CWIC provider was solicited.
- **STAC Best Practice** is to be developed.

Updates after the last report...

- The leader joined the CEOS interoperability framework and will take a leadership for accessibility.
- STAC specifications for the EO data (Items & APIs) will be considered and documented into a best practices. STAC is a key element for the CEOS interoperability framework.

Led by ... (Tom Sohre)

- Leads “CEOS Interoperability Framework” by cooperating with LSI-VC, CEOS ARD OG, WGCV, and SEO.
- The framework considers how to realize “**interoperability data and use**” for EO data provided by CEOS members.

Updates after the last report...

- In terms of CEOS interoperability framework, factor definition was made by avoiding duplication of topics and by reviewing the list of “included” and “excluded”. ①Vocabulary (Semantics), ②Architecture, ③Interfacing (Accessibility), ④Quality, ⑤Policy.
- Associated group & POC for the work plan activities was also assigned.
- The roadmap will be input to SIT-TW and request endorsement at Plenary.

Led by Yosuke Ikehata (JAXA) and Richard Moreno (CNES)

- **Jupyter Notebook initiative** as a collaboration with SEO and WGCapD has been going on.
- **AI/ML initiative** has been going on. Use cases, technologies, platforms, etc., focusing on the Earth observations by CEOS partners, will be surveyed. The results will be summarized to an AI/ML white paper.

Updates after the last report...

“**Jupyter Notebooks** as a shareable resource for CEOS” is planned on October 26th-27th.

Organizer: Esther Conway (NCEO/UKSA)

Expected participants: UKSA/NCEO, ESA, CNES, EUMETSAT, SEO, NASA Develop, UN, CSIRO Chile, University of Alaska Fairbanks , JAXA, Mexican Space Agency (others are expected)

Objective:

The purpose of the workshop will be to explore key aspects of the Jupyter Notebook technology. The technology has raised the promise of a centralised resource for a broad more inclusive range of CEOS agencies.

However, this also poses some specific technical/policy challenges which, to this end we plan to address the following in this workshop.

Timetable: Afternoon Thursday 26th Oct – Morning Friday 27th October

Updates after the last report...

1. Purpose of this document

(new version. 2023.6.30)

This document introduces use cases for analysis of earth observation data using computational and data science methods such as machine learning (ML) and artificial intelligence (AI) that various CEOS agencies have conducted to date.

In addition, this document provides information for researchers who wish to conduct similar analysis.

Need volunteers and use cases!

CEOS ML/DL/AI White Paper
CEOS.WGISS.xxx.xxx Issue 0.3 Jan 2023

CEOS

Working Group on Information Systems and Services
Technology Exploration Interest Group

CEOS ML/DL/AI White Paper
(draft)

Author

Ref. EAIL (Earth Analytics Interoperability Lab.)

An EAIL specialist Matt Paget, CSIRO has come back to WGISS!



Powered by Open Data Cube and the Python data science ecosystem

- EAIL is operated by CSIRO Chile with significant support from the Chilean Data Observatory, a public-private-academic partnership founded by the Chilean Government (Ministry of Science, Ministry of Economy), Adolfo Ibáñez University and AWS.
- Landsat-5, 7, 8, 9, Sentinel 1, 2, NASA DEM, Copernicus DEM on AWS