SEO Activities

• GEO Infrastructure Development Task Team (GIDTT)
  • Space-based data, Data Cubes, Cloud providers

• ODC Community Engagement
  • Digital Earth Africa
  • Digital Earth Pacific

• COVE
  • New commercial missions
  • STAC data access
EAG Option 2

Data Cubes
- Digital Earth Americas
- Digital Earth Africa
- Digital Earth Pacific
- Brazilian Data Cube
- Euro Data Cube
- Armenian Data Cube

EO Data, Products and Services

ARD

+ Commercial Companies (VHR)

Regional / National In Situ

EAG Option 3

Users

ExCom60-2.2

@GEOSEC2025
www.earthobservations.org
COVE Data Policy

About the Portal

The COVE System Engineering Office (COVE) interacts with the CEOS Working Group on Observation Systems and Standards (WGSO) to gather and organize key information on data policies, data access portals and interoperability protocols.

WGSO is currently producing and planning business or joint observation standards. The interoperability component of the standard is focused on the efficiency and effectiveness of using information to support many global activities with user societal impact.

SEO Sponsor

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Data Accessibility

Across the globe, 40 agencies from 32 countries have access to supported Earth observatory datasets. Open (green), mission (red) and instrument (blue) data are supported by COVE.

Active Missions

Mission: ADEOS
Agency: JAXA, MITI, MOE (Japan), NASA, CNES
Launch Date: 1996-08-17
Mission Status: Decommissioned
Instrument: IASI
Instrument Agency: JAXA, MOE (Japan)
Access: Restricted
Features:
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SEO Activities

• CEOS ARD
  • Standards / Community Engagement
  • Nighttime Lights Occlusion Analysis

• AI/ML
  • Generative Pre-trained Transformer (GPT)
  • WGISS Tech Exploration White Paper

• New Space Task Team
  • Commercial data ODC integration
  • Interoperability with CEOS datasets
Initiated in April 2020 as a CEOS WGISS / SEO initiative, EAIL was a data and analytics platform that used AWS Cloud and Open Data Cube. Its advantages included Jupyter Hub, Dask scaling, customized ARD pipelines and GPU processing.

Situation

A significant number of CEOS activities are now engaged in the CEOS ARD and FDA strategies and in Integrated Earth observation data analysis (COAST, SDG, WClimate, LSI-VC, WGDisasters, GEO Aquawatch and GEOGLAM). There is strong collaboration between groups with both WGISS and SEO being sought for technical advice and coordination on issues related to interoperability of all kinds including data standards, formats, analytics and discovery services.
Built using the Open Data Cube software and CSIRO’s Earth Analytics, Science and Innovation platform

Powered by Open Data Cube and the Python data science ecosystem
Additional capabilities

- **OWS service layer ready for implementation**
  - WMS, WMTS and WCS services
  - Exposes data cube layers to the outside world
  - Supports multiple styling options, band combinations and index generation

- **Terriamap web visualization tool**
  - Connects directly to WMS services above
  - Supports over 30 data and services type including time-series data and processing services (WPS)
New & potential analytics capabilities

- GPU processing with AWS GPU nodes
- Additional scientific programming options with R
- New machine learning capabilities
CEOS
Analytics Lab

Empowering exploration and scalable analysis of Earth observation data

The CEOS Analytics Lab is a multiuser gateway for spatial data science powered by EASI. Every user is provided a customized JupyterLab environment to easily load EO data products and seamlessly scale to additional computational nodes through the Dask Gateway.

Support

We are here to help the CEOS community succeed. If you have a potential application or need a platform for EO data analysis we would like to hear from you. Please be aware that the CEOS Analytics Lab is still undergoing changes and we are interested in gathering your feedback.

- Currently, GPU enabled machine learning instances are not available by default. These can usually be enabled by request. Please get in touch if your analysis requires machine learning.
- Support Requests: If you need to submit a support request you can find the form in the Services menu at the top right of the page.
- Account Creation: Accounts can be created by filing a service request to access our platform and its features.
- Collaboration with CEOS Working Groups: We are open to collaborating with CEOS working groups to address specific requirements and ensure seamless integration.
- Training Opportunities: Take advantage of our training sessions designed to help you make the most of our platform and its capabilities.
- Scalability Options: Requests for larger instances will be accommodated to meet your evolving needs. Submit a service request for additional resources if you are reaching the limits of the provided options.

ceos.org/cal
Goal: Conduct an ARD interoperability test using the CEOS Analytics Lab (CAL) as a contribution to the CEOS “New Space” initiative.

ARD Interoperability: Evaluate how ARD datasets from CEOS can be used interoperably with datasets from the commercial space providers.

- What are the issues using these datasets together?
- Can CEOS provide any tools or utilities that would improve the interoperability?
- Can CEOS make any recommendations to the commercial space providers that would improve the use of their data and its marketability?

CEOS Analytics Lab (CAL): Use the cloud-based CAL tool to conduct the test. This will enable participation across SEO-funded partners and take advantage of the CSIRO Jupyter Python environment and Open Data Cube (ODC) utilities.

CEOS New Space initiative: The CEOS organization is searching for tangible tasks that can demonstrate improved connections between CEOS data and commercial data.
The proposed analysis plan

• Test Case #1: Optical Data Comparison
  • Area of Interest: Hampton, Virginia and the Chesapeake Bay
  • CEOS Datasets: Landsat 8/9, Sentinel-2A/2B, Sentinel-1A
  • Commercial Datasets: Planet Lab, Maxar (from NASA CSDA contract)

• Test Case #2: Radar Data Comparison
  • Area of Interest: Southeast Asia (small rice fields – Mekong or Malaysia ??)
  • CEOS Datasets: Sentinel-1A, ALOS-2 ScanSAR, SAOCOM-1A/1B
  • Commercial Datasets: Umbra ???, ICEYE and Capella (from NASA CSDA contract)

• Interoperability questions
  • CEOS ARD compliance? Dataset formats and metadata parameters.
  • Georectification consistency .. What are alignment errors?
  • Spectral/Radiometric consistency … What are the differences?

• WGCV and WGISS collaboration … Can we work with other CEOS groups define the tasks?
LSI-VC-14-23: SEO to work with WGISS and WGCV to define plans for a “New Space” ARD interoperability project using the CEOS Analytics Lab, based on Interoperability Factors.

How should we jointly frame the New Space task to support Interoperability Framework? Demo?

Can/should CEOS COVE Data Policy Portal be refreshed in coordination with WGISS to support Interoperability Framework?

CEOS ARD OG working with Radiant Earth / Cloud Native Geospatial Foundation addressing CEOS-ARD STAC extension/repo updates based on PFS / OGC ARD SWG progress.

Can Interoperability Framework integrate these and other efforts in context of persistent questions:

Commercial cloud provider vendor lock in? Addressing egress costs?

Authoritative traceability across multiple cloud environments?