CEOS-ARD Accessibility and Discoverability – Progress Report

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CEOS WGISS #61, Dehradun (India)
Session 4: Data Discovery and Access, 17/03/2026

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Outline

- Introduction
- Guide to Enable Discoverability of Datasets
- Improved discoverability and accessibility (Proof of Concept)
- Conclusion

Introduction

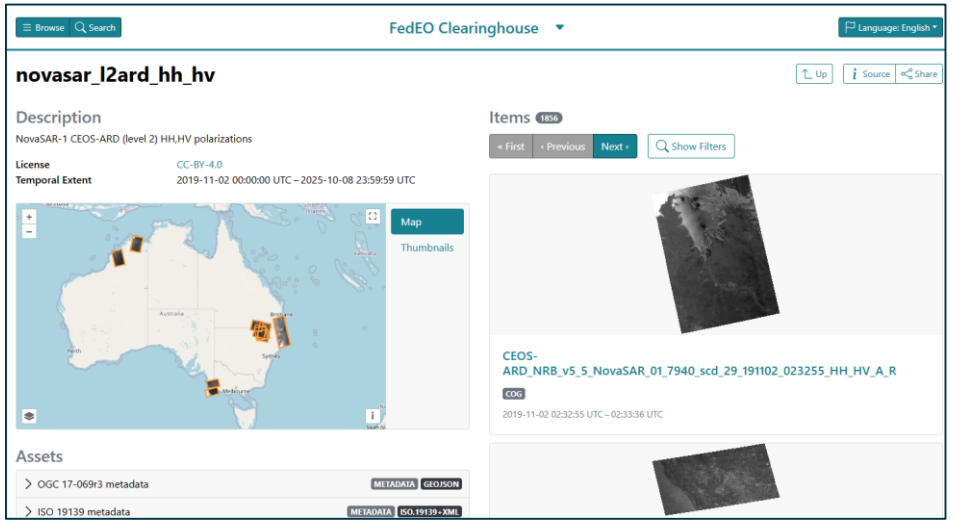
- Significant effort from member agencies to make available CEOS-ARD compliant datasets.

- Member agencies make available many datasets via the WGISS Connected Data Assets (CDA), i.e. IDN and FedEO. Number of collections/granules grows continuously. However:
  - No consistent identification of CEOS-ARD compliant datasets.
  - No support to filter/find CEOS-ARD compliant datasets

- Collaboration WGISS DAIG, CEOS Working Group on Cal/Val (WGCV) / CEOS-ARD Oversight group and SEO Team aiming to:
  - Leverage WGISS Connected Data Assets (CDA) to improve discoverability and accessibility of CEOS-ARD datasets
  - Discuss relation between CDA (STAC) collections and CEOS-ARD products and specifications
  - Ensure that the CEOS-ARD access points are consistent and interconnected (e.g. IDN, FedEO, MIM DB, ceos.org/ard datasets table)

Example CEOS-ARD datasets in FedEO (1/3)

- Example 1 – CSIRO:
  - https://radiantearth.github.io/stac-browser/#/external/geo.spacebel.be/collections/novasar_l2ard_hh_hv



CEOS Analysis-Ready Datasets

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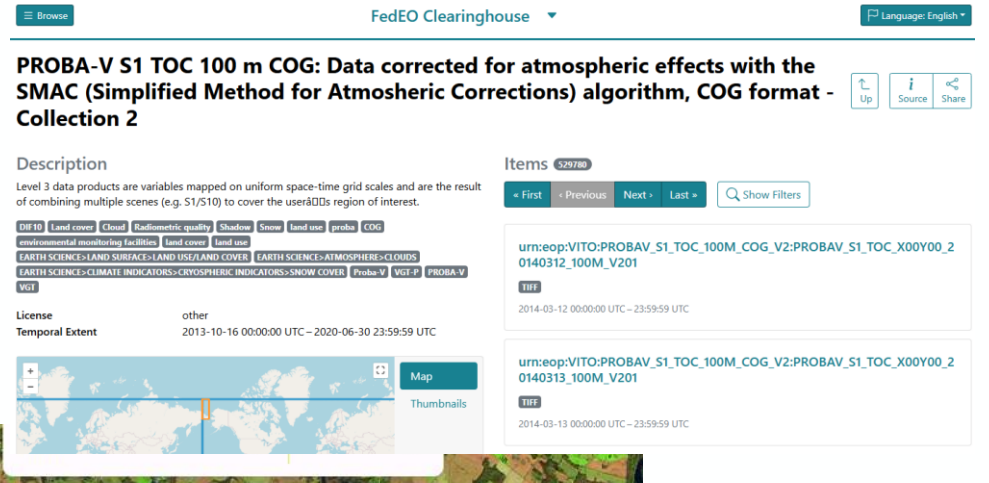
The following table summarises all of the satellite EO datasets that have been assessed as CEOS Analysis Ready Data (CEOS-ARD) or which are working towards it (either under development or at the peer review stage). DOI links are provided for access, along with links to further information, sample products, and the completed CEOS-ARD self-assessment and peer review outcome documents.

Hide fields | Filtered by Agency/Organisation | Group | Sort | ...

	Name	Status	Type	Version	Agency/Orga...	Mission / Instrument(s)
1	NovaSAR-1 RTC	CEOS-ARD	NRB	v5.5	CSIRO	NovaSAR-1

Example CEOS-ARD datasets in FedEO (2/3)

- Example 2 – VITO:
  - https://radiantearth.github.io/stac-browser/#/external/fedeo.ceos.org/collections/urn:eop:VITO:PROBAV_S1_TOC_100M_COG_V2?.language=en



CEOS Analysis-Ready Datasets

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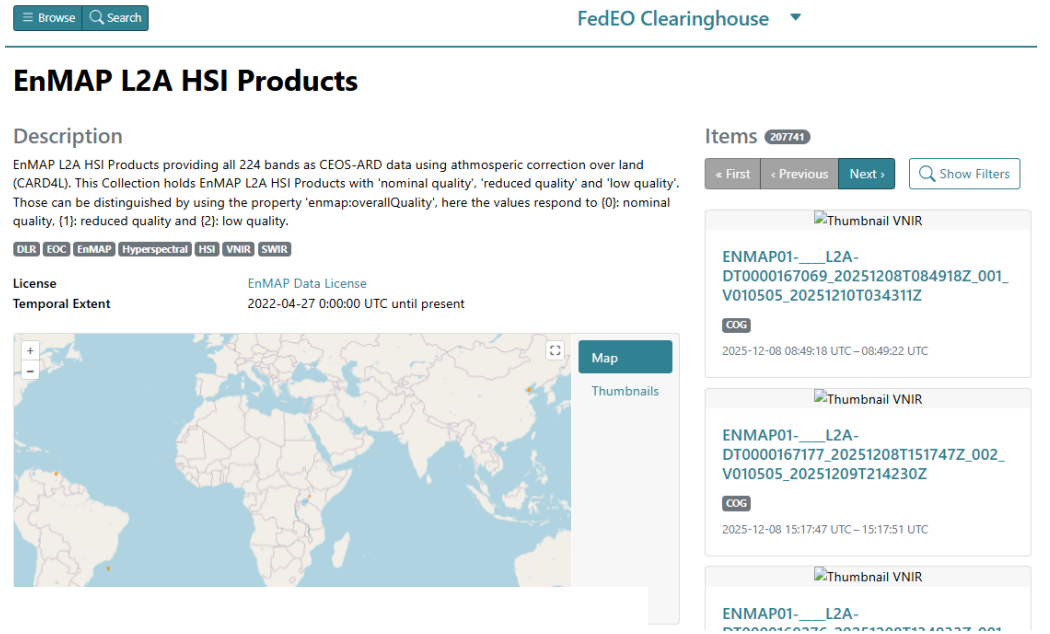
Hide fields | Filtered by Name | Group | Sort | ...

	Name	Status	Type	Version	Agency/Orga...	Mission / Instrument(s)
1	PROBA-V L3 (0.1/0.333/1 km) TOC	CEOS-ARD	Surface Reflectance	v5.0	VITO / ESA	PROBA-V

Example CEOS-ARD datasets in FedEO (3/3)

- Example 3 – DLR:
  - https://radiantearth.github.io/stac-browser/#/external/geo.spacebel.be/collections/ENMAP_HSI_L2A



CEOS Analysis-Ready Datasets

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Hide fields | Filtered by Name | Group | Sort | ...

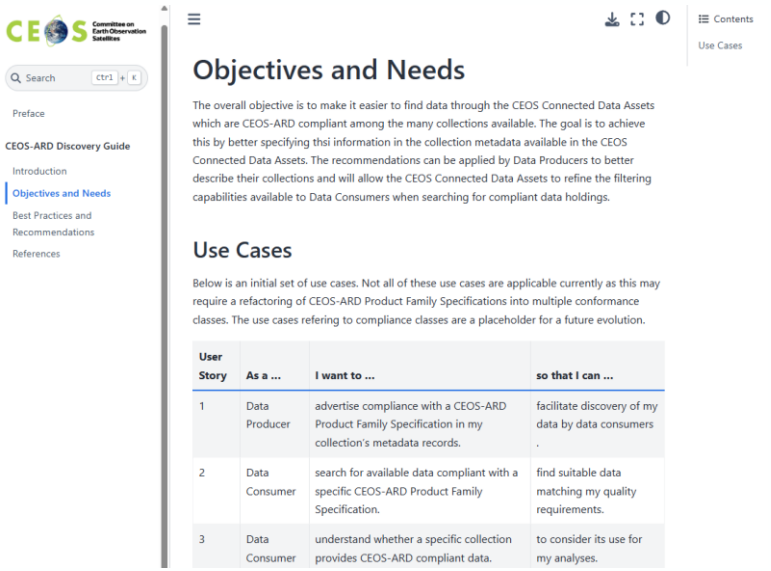
	Name	Status	Type	Version	Agency/	Self Assessment	Peer Review
1	EnMAP	CEOS-ARD	Surface Reflectance	v5.0	DLR	PDF	PDF

Collaboration and initial results

- Initial meeting 15/12/2025
  - Overview of issues to be tackled.
  - Discussion various options proposed by DAIG (slides) to improve discoverability through CDA.

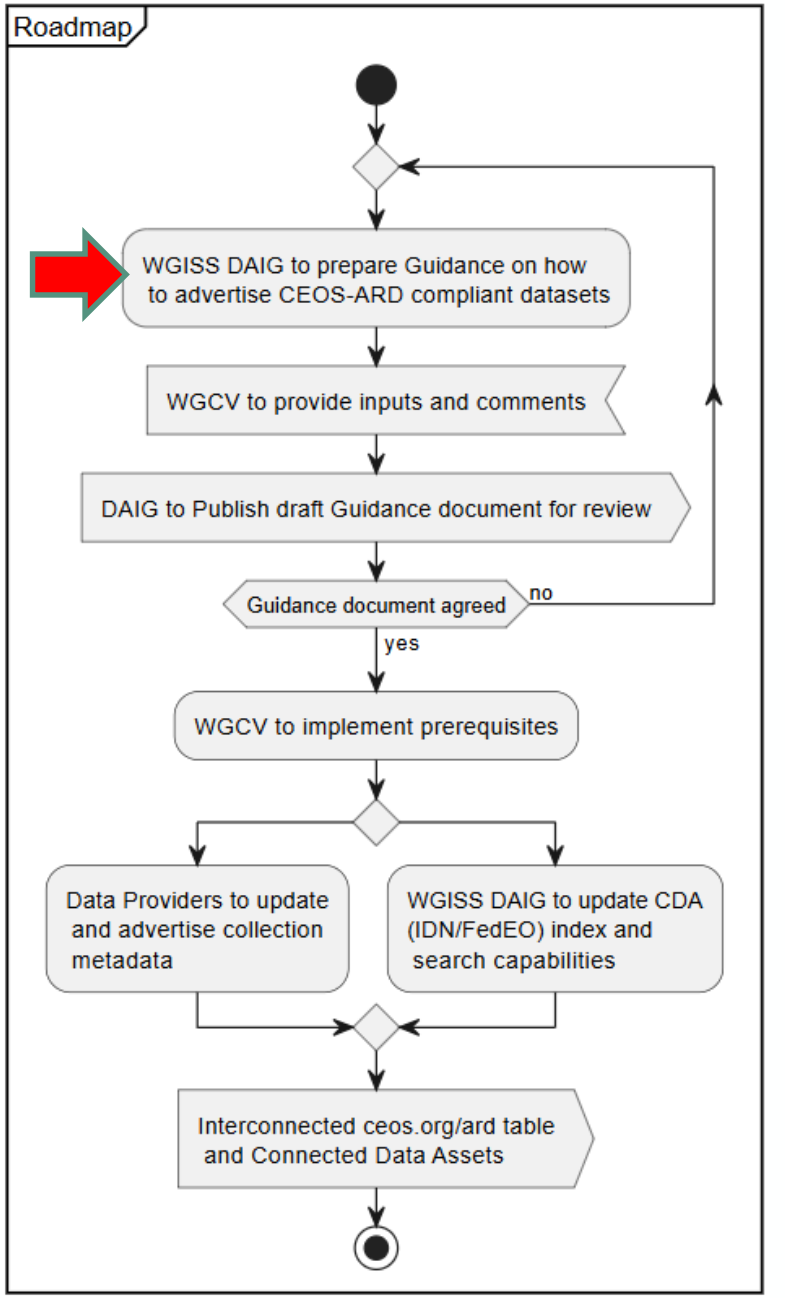
- Meeting 19/01/2026:
  - Action: DAIG to prepare Guidance document for collection-level metadata for CEOS-ARD compliance.

- Meeting 25/02/2026:
  - Explain and discuss status of Draft guidance document
  - Incomplete list of CEOS-ARD collections available via WGISS CDA
  - Action: setup GitHub “Guidance to Enable Discoverability of Specialised Datasets” to host “Guidance document”.



Stepwise approach

- (1) WGISS DAIG to make recommendations on how to advertise CEOS-ARD compliance in collection metadata.
- (2) WGISS and Working Group on Cal/Val (WGCV) to agree on recommendations
    - May require actions by SEO and WGCV (e.g. prerequisites)
- (3) Data Providers to updated their “favorite” collection metadata formats according to agreed recommendations
- (4) Connected Data Assets (IDN, FedEO) to support recommendations:
    - Include in collection metadata definition / harvesting processes
    - Provide filtering capabilities in available (STAC) API
    - Provide filtering capabilities in client applications.
- (5) Connect ceos.org/ard datasets table to CDA endpoints.



Result 1: Inventory of CEOS-ARD datasets in CDA

- Collection of information is on-going. Preliminary Google sheet shared at https://docs.google.com/spreadsheets/d/1uCgp_XvMsl_B71-wSQY3zBV2lY8lF30cXiw3mdU8oZk/edit?gid=1265398649#gid=1265398649
- To be consolidated.
- Eventually to be linked to ceos.org/ard datasets table.

CEOS-ARD Datasets vs WGISS CDA

Bestand Bewerken Bekijken Invoegen Opmaak Gegevens Extra Uitbreidingen Hulp

	A	B	C	D	E
12		VITO	urn:eop:VITO:PROBAV_S10_TOC_333M_HDF_V2	https://fedeo.ceos.org/collections/urn:eop:VITO:PROBAV_S10_TOC_333M_HDF_V2	EOP:VITO:TERRASCOPE
13		VITO	urn:eop:VITO:PROBAV_S1_TOC_1KM_COG_V2	https://fedeo.ceos.org/collections/urn:eop:VITO:PROBAV_S1_TOC_1KM_COG_V2	EOP:VITO:TERRASCOPE
		VITO	urn:eop:VITO:PROBAV_S1_TOC_333M_COG_V2	https://fedeo.ceos.org/collections/urn:eop:VITO:PROBAV_S1_TOC_333M_COG_V2	EOP:VITO:TERRASCOPE
		CDSE	sentinel-2-l2a	https://fedeo.ceos.org/collections/sentinel-2-l2a	EOP:EU:CDSE
		NRCan - is this ARD ?	RCMImageProducts	https://fedeo.ceos.org/collections/RCMImageProducts	EOP:NRCAN:EODMS
	dation Environment - geo.spacebel.be				
		CSIRO	novasar_l2ard_vv_hh	https://geo.spacebel.be/collections/novasar_l2ard_vv_hh	EOP:CSIRO::OPENDATACUBE
			novasar_l2ard_hh	https://geo.spacebel.be/collections/novasar_l2ard_hh	EOP:CSIRO::OPENDATACUBE
			novasar_l2ard_vv_hh_hv	https://geo.spacebel.be/collections/novasar_l2ard_vv_hh_hv	EOP:CSIRO::OPENDATACUBE
			ga_ls7e_ard_3	https://geo.spacebel.be/collections/ga_ls7e_ard_3	EOP:CSIRO::OPENDATACUBE
			ga_ls9c_ard_3	https://geo.spacebel.be/collections/ga_ls9c_ard_3	EOP:CSIRO::OPENDATACUBE
			novasar_l2ard_vv	https://geo.spacebel.be/collection	
			ga_ls8c_ard_3	https://geo.spacebel.be/collection	
			novasar_l2ard_hh_hv	https://geo.spacebel.be/collection_hv	
			novasar_l2ard_hv	https://geo.spacebel.be/collection	
		DLR	ENMAP_HSI_L2A	https://geo.spacebel.be/collection	
			DESIS_HSI_L2A	https://geo.spacebel.be/collection	

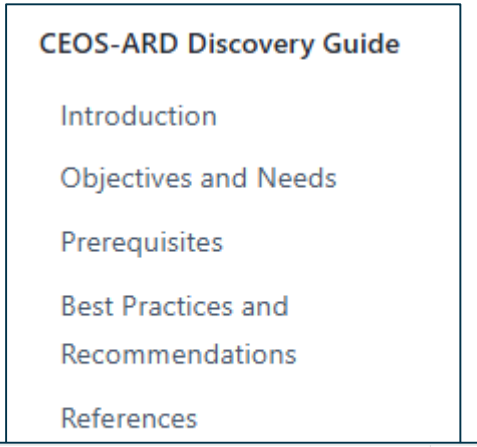
CEOS-ARD Datasets vs WGISS CDA

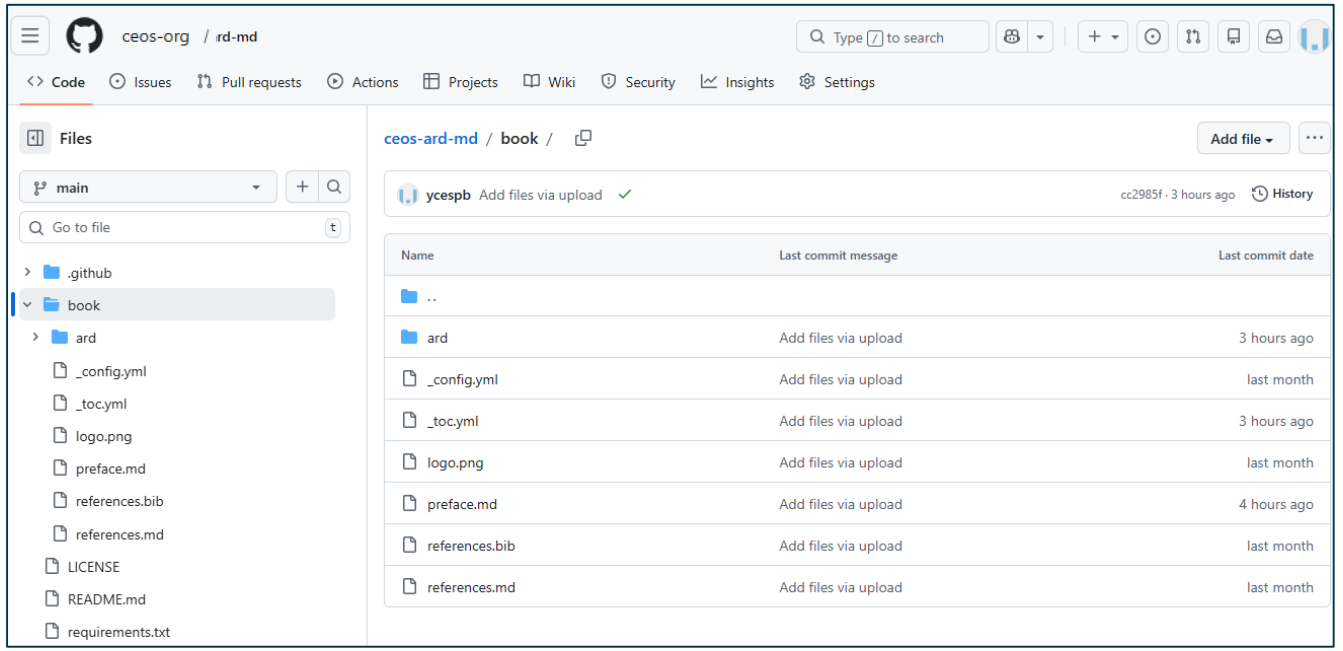
Bestand Bewerken Bekijken Invoegen Opmaak Gegevens Extra Uitbreidingen Hulp

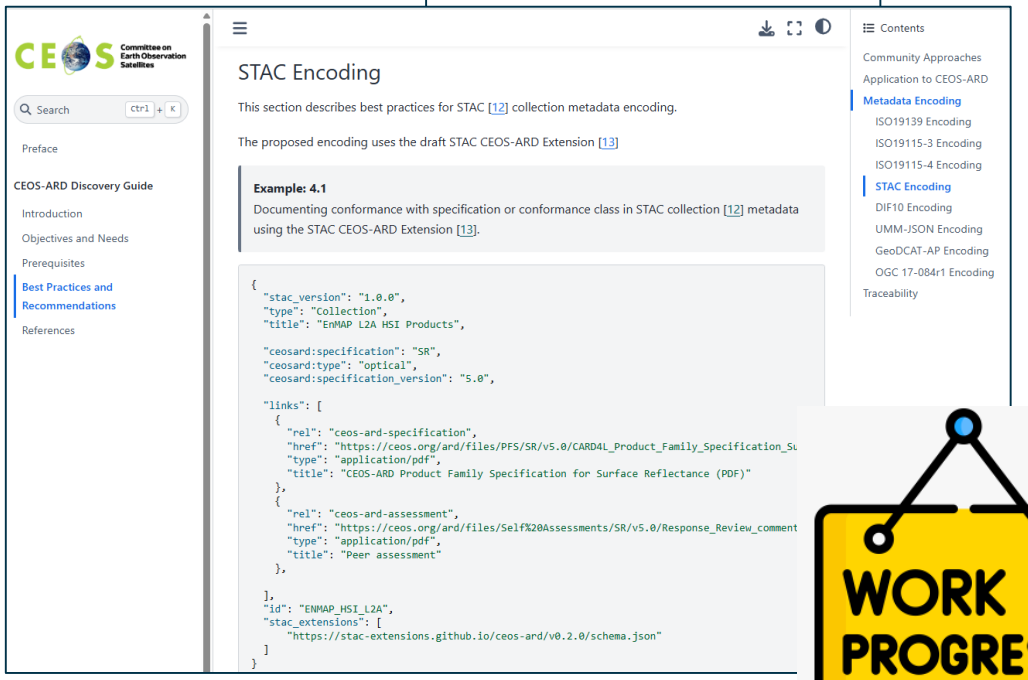
	A	B	C	D	E	F	G	H	I
1	Name	Type	Version	Agency/Organisation	Approval date	IDN Link			
2	ALOS-2 PALSAR-2 25m & 50m ScanSAR NRB	SAR-NRB	v1.0	JAXA	17 April 2024	Unclear if this is correct: https://access.earthdata.nasa.gov/collections/C3315903479-A			
3	ALOS-2 PALSAR-2 Global Mosaics (RTC)	SAR-NRB	v1.0	JAXA	17 April 2024				
4	Catalyst Sentinel-1 RTC	SAR-NRB	v1.1	Catalyst/PCI	17 October 2024				
5	Catalyst SPOT 5 HRG 2.5m	Surface Reflectance	v5.0.1	Catalyst/PCI	4 December 2024				
6	DESIS L2A	Surface Reflectance	v5.0.1	DLR	12 February 2025	https://access.earthdata.nasa.gov/collections/C2207458058-FEDEO			
7	EarthDaily Constellation	Surface Reflectance	v5.0.1	EarthDaily	7 October 2025				
8	EnMAP	Surface Reflectance	v5.0	DLR	22 January 2022	In FedEO validation environment			
9	L8 SR (Aerospace Information Research Institute)	Surface Reflectance	v5.0	AIR-CAS	6 December 2023				
10	L8 ST (Aerospace Information Research Institute)	Surface Temperature	v5.0	AIR-CAS	6 December 2023				
11	Landsat Collection 2	Surface Reflectance	v5.0	USGS	4 June 2021	https://access.earthdata.nasa.gov/collections/C3442503899-USGS_EROS			
12	Landsat Collection 2	Surface Temperature	v5.0	USGS	4 June 2021	https://access.earthdata.nasa.gov/collections/C3442506077-USGS_EROS			
13	Landsat Collection 2 U.S. ARD	Surface Reflectance	v5.0	USGS	23 May 2022				
14	Landsat Collection 2 U.S. ARD	Surface Temperature	v5.0	USGS	23 May 2022				
15	NovaSAR-1 RTC	NRB	v5.5	CSIRO	5 October 2023	In FedEO validation environment			
16	NRCan RCM NRB	SAR-NRB	v1.1	NRCan	7 February 2025	Unclear whether this is correct: https://access.earthdata.nasa.gov/collections/C220465			
17	NRCan RCM POL	SAR-POL	v1.1	NRCan	7 February 2025	Unclear whether this is correct: https://access.earthdata.nasa.gov/collections/C220465			
18	Opera RTC Sentinel-1	NRB	v5.5	NASA/JPL	22 October 2024	https://access.earthdata.nasa.gov/collections/C2777436413-ASF			
19	PROBA-V L3 (0.1/0.333/1 km) TOC	Surface Reflectance	v5.0	VITO / ESA	21 March 2023	https://access.earthdata.nasa.gov/collections/C1965336924-ESA			
20	RISAT-1A (EOS-04) NRB	SAR-NRB	v1.0	ISRO	2 April 2024				
21	RISAT-1A (EOS-04) NRB India Mosaic	SAR-NRB	v1.1	ISRO	6 January 2025				
22	Sentinel-1 NRB (Geoscience Australia)	SAR-NRB	v1.2	GA	23 September 2025				
23	Sentinel-1 OPERA InSAR Surface Displacement	SAR-INSAR	v1.2	NASA/JPL	5 January 2026	https://access.earthdata.nasa.gov/collections/C3294057315-ASF			
24	Sentinel-1 RTC	NRB	v5.5	Sinergise & Digital Earth Africa	20 May 2022				
25	Sentinel-2 Level-2A	Surface Reflectance	v5.0	ESA	22 January 2022	https://radiantearth.github.io/stac-browser/#/external/fedeo.ceos.org/collections/sentinel			

Result 2: “Guide to Enable Discoverability of Datasets”

- Approach:
  - To be hosted in a CEOS GitHub repository.
  - Rendered into HTML documentation as JB jupyter book
- Status:
  - Initial draft version to collect feedback and to be consolidated.



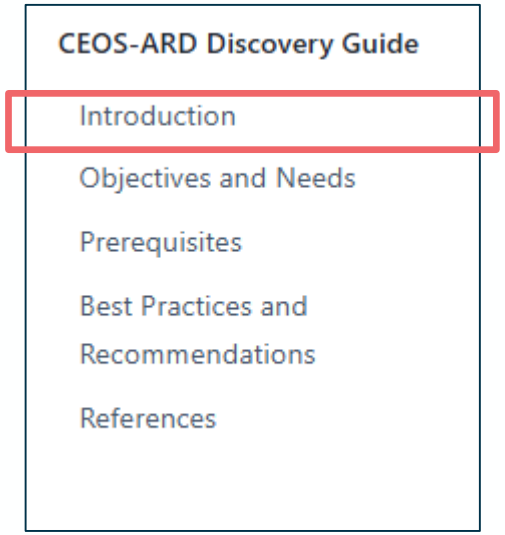




Result 2: Guide - Introduction

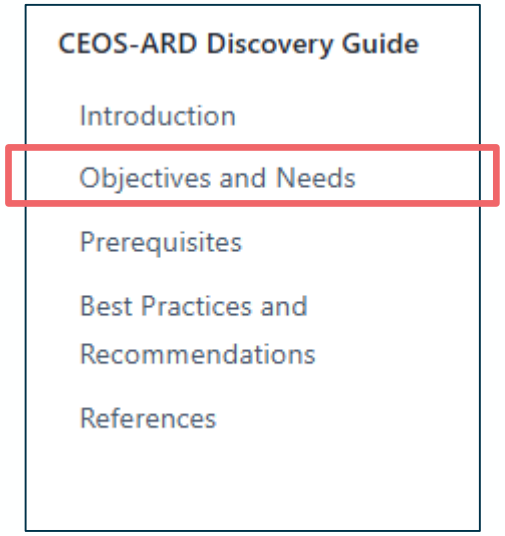
- Purpose:
  - Best Practices for the encoding of metadata for CEOS-ARD Collections to facilitate their discovery through the CEOS Connected Data Assets.

- Approach:
  - Metadata neutral. Recommendations for multiple metadata format encodings.
  - Reuse proven approaches used by other communities for expressing conformance with data specifications as part of Quality metadata:
    - INSPIRE: to express partial or conformance with respect to the INSPIRE Data Specifications e.g. “Land Cover”, “Orthoimagery”
    - DGIWG: to express partial or conformance with respect to its Data Product Specifications, e.g. “Defence Gridded Elevation Data Product”, “Defence Orthoimagery Product” or “Elevation Surface Mode”.



Guide – Objectives and Needs

- Proposed content:
  - Summery of objectives and supported use cases: Data Producer / Data Consumer
  - Some use-cases are forward-looking and not yet possible, e.g. expressing partial compliance versus conformance classes.

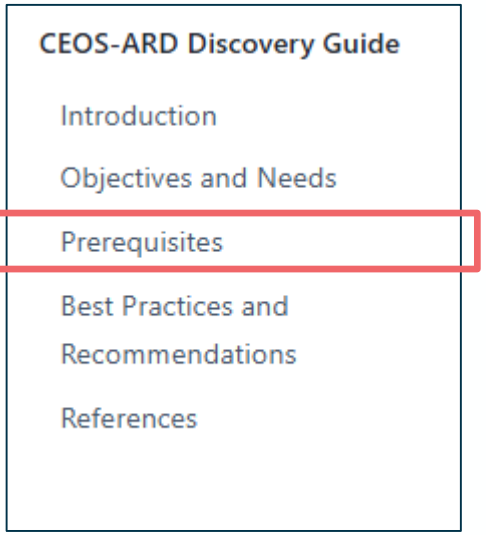


User Story	As a ...	I want to ...	so that I can ...
1	Data Producer	advertise compliance with a CEOS-ARD Product Family Specification in my collection's metadata records.	facilitate discovery of my data by data consumers .
2	Data Consumer	search for available data compliant with a specific CEOS-ARD Product Family Specification.	find suitable data matching my quality requirements.
3	Data Consumer	understand whether a specific collection provides CEOS-ARD compliant data.	to consider its use for my analyses.
4	Data Consumer	find data compliant to a specific CEOS-ARD Product Family specification.	to consider its use for my analyses.
5	Data Consumer	find data compliant to a specific version of a CEOS-ARD Product Family specification.	to consider its use for my analyses.
6	Data Consumer	find data compliant to specific conformance classes of a specific version of a CEOS-ARD Product Family specification.	to consider its use for my analyses.
1	Data Consumer	have access to evaluation method, self assessment results, peer review results.	verify evaluation method and results and compare with alternative collections of the same family.

Guide – Prerequisites

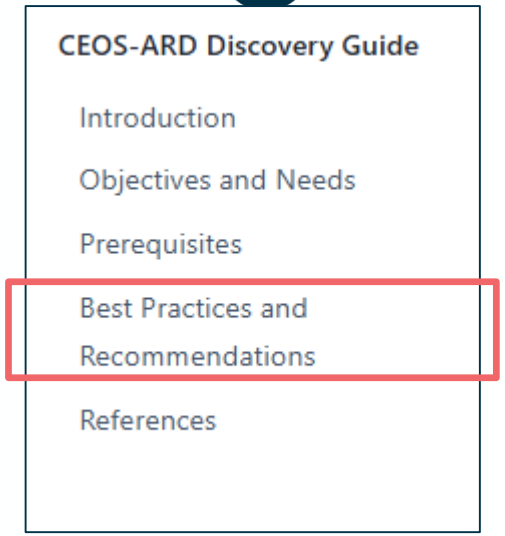
- (1) Requirements for citations – Provides examples from OGC which can be removed once CEOS-ARD equivalents are agreed/known (appear in recommendations).
    - Specification title
    - Version
    - External identifier (URI)
    - Conformance class name
    - Conformance class identifier (URI)

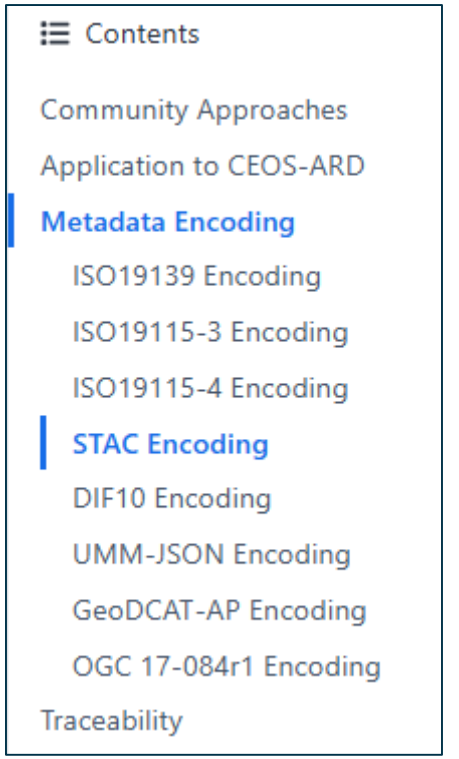
- (2) Requirements for controlled keywords (concepts) – Provides example/model used by INSPIRE (SKOS) which can be published as a single (RDF) file.
    - Keyword title (skos:prefLabel) e.g. “Surface Reflectance”
    - Keyword URI (concept URI) e.g. https://ceos.org/ard/metadata-codelists/PFS/SR
    - Scheme URI (skos:inScheme) e.g. https://ceos.org/ard/metadata-codelists/PFS



Guide – Best Practices and Recommendations

- Activity just started. Preliminary draft to be consolidated in next period.
- To cover various metadata encodings:
  - ISO 19139(-2) (XML)
  - ISO 19115-3 / ISO 19157-2 (XML)
  - ISO 19115-4 (JSON)
  - STAC (JSON)
  - OGC 17-084r1 (JSON)
  - GeoDCAT-AP
  - DIF-10
  - UMM-JSON
- Should include:
  - Inline examples
  - Requirements/ recommendations
  - Example files (for download)





ISO19115-3 Encoding (1/4)

> **Example: 2.1**
> Documenting conformance with specification or conformance class in ISO19115-3 metadata (without citation).

```
<mdq:DQ_DomainConsistency>
    <mdq:result>
        <mdq:DQ_ConformanceResult>
            <mdq:specification xlink:href="https://ceos.org/ard/files/PFS/NRB/v5.5/CARD4L-PFS_NRB_v5.5.pdf"/>
            <mdq:explanation>
                <gco:CharacterString>See the referenced specification</gco:CharacterString>
            </mdq:explanation>
            <mdq:pass>
                <gco:Boolean>true</gco:Boolean>
            </mdq:pass>
        </mdq:DQ_ConformanceResult>
    </mdq:result>
</mdq:DQ_DomainConsistency>
```

ISO19115-3 Encoding (2/4)

Example: 2.2

Documenting conformance with specification or conformance class in ISO19115-3 metadata (with citation).

```
<mdq:DQ_ConformanceResult>
    <mdq:specification>
        <cit:CI_Citation>
            <cit:title>
                <gcx:Anchor xlink:href="https://ceos.org/ard/files/PFS/NRB/v5.5">CEOS-ARD Product Family Specification:
                Normalised Radar Backscatter</gcx:Anchor>
            </cit:title>
            <cit:date>
                <cit:CI_Date>
                    <cit:date>
                        <gco:Date>2021-10-14</gco:Date>
                    </cit:date>
                    <cit:dateType>
                        <cit:CI_DateTypeCode codeList="https://standards.iso.org/iso/19115/resources/Codelists/cat/codelists.
                        xml#CI_DateTypeCode"
                                             codeListValue="publication"/>
                    </cit:dateType>
                </cit:CI_Date>
            </cit:date>
        </cit:CI_Citation>
    </mdq:specification>
    <mdq:explanation>
        <gco:CharacterString>See the referenced specification</gco:CharacterString>
    </mdq:explanation>
    <mdq:pass>
        <gco:Boolean>true</gco:Boolean>
    </mdq:pass>
</mdq:DQ_ConformanceResult>
```

E.g. ISO19115-3 Encoding (3/4)

Example: 2.3

Documenting conformance with specification in ISO19115-3 metadata with additional information about evaluation method, self assessment, peer review etc.

```
<mdq:evaluationMethodDescription>
    <gco:CharacterString>CEOS WGCV evaluation</gco:CharacterString>
</mdq:evaluationMethodDescription>
<mdq:evaluationProcedure>
    <cit:CI_Citation>
        <cit:title>
            <gco:CharacterString>CEOS-ARD Normalised Radar Backscatter</gco:CharacterString>
        </cit:title>
        <cit:date>
            <cit:CI_Date>
                <cit:date>
                    <gco:Date>2021-10-14</gco:Date>
                </cit:date>
                <cit:dateType>
                    <cit:CI_DateTypeCode codeList="https://standards.iso.org/iso/19115/resources/Codelists/cat/codelists.
                    xml#CI_DateTypeCode"
                                         codeListValue="publication"/>
                </cit:dateType>
            </cit:CI_Date>
        </cit:date>
        <cit:edition>
            <gco:CharacterString>5.5</gco:CharacterString>
        </cit:edition>
        <cit:onlineResource>
            <cit:CI_OnlineResource>
                <cit:linkage>
                    <gco:CharacterString>https://ceos.org/ard/files/PFS/NRB/v5.5</gco:CharacterString>
                </cit:linkage>
                <cit:name>
                    <gco:CharacterString>Specification</gco:CharacterString>
                </cit:name>
                <cit:function>
                    <cit:CI_OnLineFunctionCode codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/
                    resources/codelist/ML_gmxCodelists.xml#CI_OnLineFunctionCode"
                                               codeListValue="information"/>
                </cit:function>
            </cit:CI_OnlineResource>
```

E.g. ISO19115-3 Encoding (4/4)

Example: 2.4

Documenting conformance with specification in ISO19115-3 metadata (with keywords).

International Organization for Standardization

```
<mri:descriptiveKeywords>
    <mri:MD_Keywords>
        <mri:keyword>
            <gcx:Anchor xlink:href="https://ceos.org/ard/metadata-codelists/PFS/NRB">Normalised Radar Backscatter</gcx:Anchor>
        </mri:keyword>
        <mri:thesaurusName>
            <cit:CI_Citation>
                <cit:title>
                    <gcx:Anchor xlink:href="https://ceos.org/ard/metadata-codelists/PFS">CEOS-ARD Product Family Specification</gcx:Anchor>
                </cit:title>
                <cit:date/>
            </cit:CI_Citation>
        </mri:thesaurusName>
    </mri:MD_Keywords>
</mri:descriptiveKeywords>
```

CEOS-ARDMD-REC-2010 [Recommendation]

Collection metadata records in ISO19115-3 [11] format should advertise conformance status with respect to CEOS-ARD PFS using a citation element with reference to the document URI or conformance class URI as shown in example 2.2.

Guide – Metadata Encoding

- Overview of related ISO standards: XML / JSON

Scope	UML Model (Last)	XML Encoding	JSON Encoding
Fundamentals (data and services)	ISO 19115-1 (2014) - replaces 2003/2005	ISO 19115-3 (replaces ISO 19139)	ISO/CD TR 19115-4:2025 (Partial coverage*)
Extensions (acquisition & processing)	ISO 19115-2 (2019)	ISO 19115-3 (replaces ISO 19139-2)	*Future Scope Extension Expected**
Data Quality General Requirements	ISO 19157-1 (2023)	ISO 19157-2	ISO/CD TR 19115-4:2025 (Partial coverage*)

E.g. STAC Encoding (1/1)

Example: 4.1

Documenting conformance with specification or conformance class in STAC collection [14] metadata using the STAC CEOS-ARD Extension [15].


```
{
  "stac_version": "1.0.0",
  "type": "Collection",
  "title": "EnMAP L2A HSI Products",

  "ceosard:specification": "SR",
  "ceosard:type": "optical",
  "ceosard:specification_version": "5.0",

  "links": [
    {
      "rel": "ceos-ard-specification",
      "href": "https://ceos.org/ard/files/PFS/SR/v5.0/CARD4L_Product_Family_Specification_Surface_Reflectance-v5.0.pdf",
      "type": "application/pdf",
      "title": "CEOS-ARD Product Family Specification for Surface Reflectance (PDF)"
    },
    {
      "rel": "ceos-ard-assessment",
      "href": "https://ceos.org/ard/files/Self%20Assessments/SR/v5.0/Response_Review_comments_EnMAP_CARD4L_Product_Family_Specification_Surface_Reflectance-v5.pdf",
      "type": "application/pdf",
      "title": "Peer assessment"
    },

  ],
  "id": "ENMAP_HSI_L2A",
  "stac_extensions": [
      "https://stac-extensions.github.io/ceos-ard/v0.2.0/schema.json"
  ]
}
```


CEOS-ARDMD-REC-4010 [Recommendation]

Collection metadata records in STAC [14] format should advertise conformance status with respect to CEOS-ARD PFS using the STAC CEOS-ARD Extension [15] with reference to the document URI as shown in example 4.1.

Example files: - ENMAP_HSI_L2A.json

E.g. ISO19115-4 Encoding (1/1)

- OGC Testbed-21 DQ4IPT (OGC 26-005):
  - Draft ISO19115-4, i.e. JSON encoding of ISO19157-1 and ISO19115-1 (subsets).
  - Measures from ISO19157-3 registry (OGC Rainbow)

- NovaSAR CEOS-ARD example
  - https://radiantearth.github.io/stac-browser/#/external/emc.spacebel.be/collections/novasar_l2ard_hh_hv?.asset=asset-metadata_iso_19115_4
  - Include ISO19115-4 Data Quality object inside STAC collections and STAC items via draft STAC Extensions.


```
"dataQualityInfo": [{
    "scope": {"level": "series"},
    "report": [{
        "result": [{
            "pass": true,
            "specification": {
                "date": {"publication": "2021-10-14"},
                "identifier": [{
                    "code": "https://ceos.org/ard/files/PFS/NRB/v5.5",
                    "codeSpace": "https://ceos.org/ard"
                }],
                "edition": "5.5",
                "title": "CEOS-ARD Product Family Specification: Normalised Radar Backscatter"
            },
            "type": "ConformanceResult",
            "explanation": "See the referenced specification"
        }],
        "measure": {
            "measureIdentification": {
                "code": "101",
                "authority": {
                    "alternateTitle": ["ISO"],
                    "title": "International Organization for Standardization"
                },
                "codeSpace": "https://standards.isotc211.org/19157/-3/1/dqc/content/qualityMeasure/"
            },
            "measureDescription": "Indication that all requirements in the referred data product specification are fulfilled.",
            "nameOfMeasure": ["Data product specification passed"]
        },
        "evaluationMethod": [{
            "referenceDoc": [],
            "evaluationProcedure": {
                "editionDate": "2021-10-14",
                "edition": "5.5",
                "onlineResource": [
                    {"linkage": "https://ceos.org/ard/files/PFS/NRB/v5.5/CARD4L-PFS_NRB_v5.5.pdf"},
                    {"linkage": "https://ceos.org/ard/files/Self%20Assessments/NRB/v5.5/Opera%20RTC%20Sentinel-1%20self-assessmen
                    {"linkage": "https://ceos.org/ard/files/Peer%20Reviews/NRB/v5.5/NovaSAR_WGCVEval.zip"}
                ],
                "title": "CEOS-ARD Product Family Specification: Normalised Radar Backscatter"
            },
            "type": "FullInspection",
            "evaluationMethodDescription": "This collection is conformant with the CEOS-ARD NRB Specification"
        }],
        "type": "DomainConsistency"
    }]
}],
```

OGC Testbed-21 DQ4IPT

Browse | MAAP Catalogue | Language: English

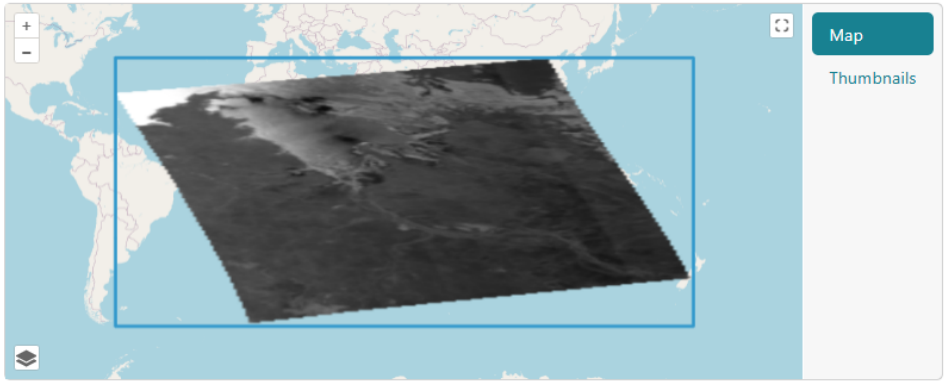
novasar_l2ard_hh_hv

Description

NovaSAR-1 CEOS-ARD (level 2) HH,HV polarizations

Normalised Radar Backscatter

License	various
Temporal Extent	2019-11-02 00:00:00 UTC – 2025-10-08 23:59:59 UTC



Assets

ISO19115-4	METADATA ISO.19115 4+JSON
ISO 19139 metadata	METADATA ISO.19139+XML
ISO 19139-2 metadata	METADATA ISO.19139 2+XML
DIF-10 metadata	METADATA DIF10+XML
ISO 19115-3 metadata	METADATA ISO.19115 3+XML
OGC 17-084r1 metadata	METADATA GEOJSON
HTML	METADATA HTML

Providers

CSIRO — PRODUCER

Metadata

General

Created	2025-10-20 0:00:00 UTC
ExternalIds	**Scheme:** www.w3.org/ns/did/v1 **Value:** did:web:emc.spacebel.be:collections:novasar_l2ard_hh_hv
Updated	2025-10-20 0:00:00 UTC

Dq

Quality

Scope:
Level: series

Report:
Result:
Pass: ✔
Specification:
Date:
Publication: 2021-10-14

Identifier:
Code: ceos.org/ard/files/PFS/NRB/v5.5
CodeSpace: ceos.org/ard

Edition: 5.5
Title: CEOS-ARD Product Family Specification: Normalised Radar Backscatter

Type: ConformanceResult
Explanation: See the referenced specification

Measure:
MeasureIdentification:
Code: 101
Authority:
AlternateTitle: ISO
Title: International Organization for Standardization

CodeSpace:
https://standards.isotc211.org/19157/-3/1/dqc/content/qualityMeasure/

MeasureDescription: Indication that all requirements in the referred data product specification are fulfilled.
NameOfMeasure: Data product specification passed

STAC

ISO International Organization for Standardization

eovoceof-eos-stac-extension v0.0.2 Extension

Valid

Outline

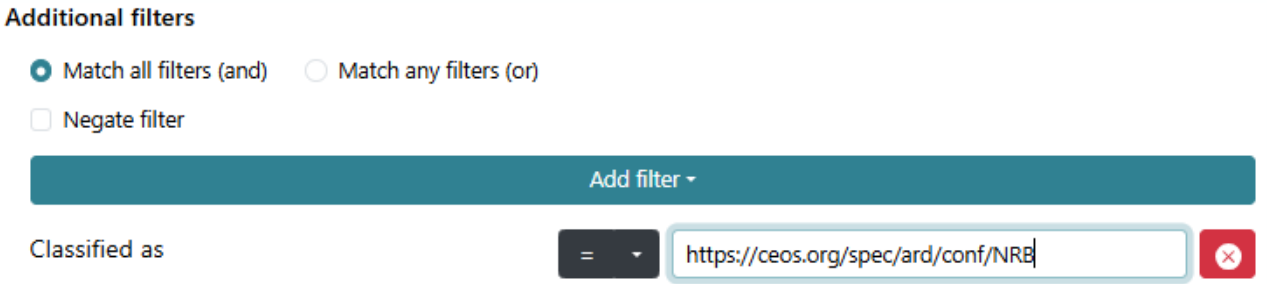
- Introduction
- Guide to Enable Discoverability of Datasets
- Improved discoverability and accessibility (Proof of Concept)
- Conclusion

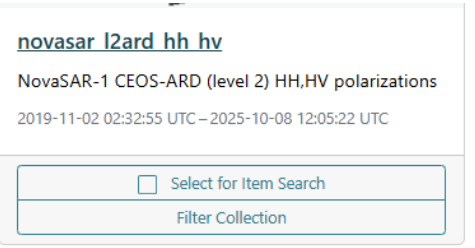
Improved description and discoverability (STAC)

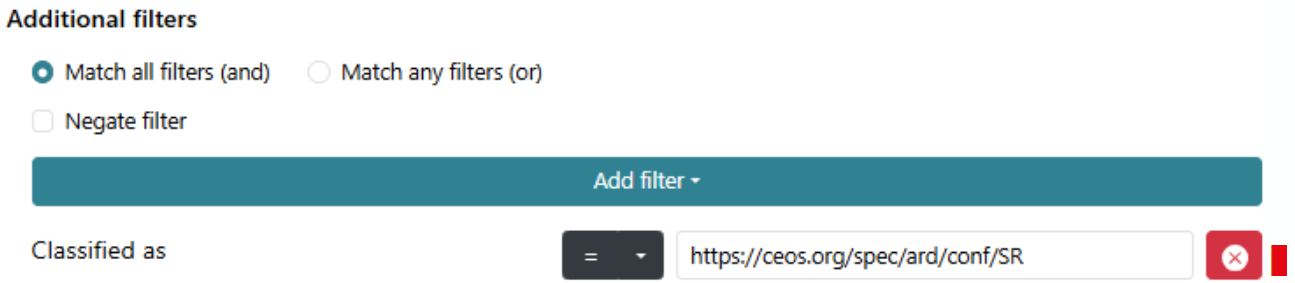
- Expected outcome:
  - Improved descriptions of CEOS-ARD compliant CDA collections in collection metadata.
  - Improved discoverability via additional search capabilities

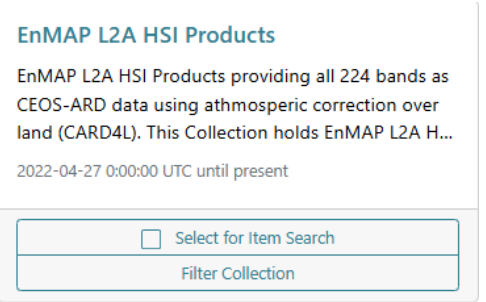
- FedEO Proof-of-Concept (STAC API, STAC Collection Search Extension):
  - Exploiting keywords (Themes STAC Extension)
  - Exploiting CEOS-ARD STAC Extension

- Collection Search v1.0.0-rc.2
- Collection Search - Filter v1.0.0-rc.2
- Collection Search - Free Text v1.0.0-rc.1





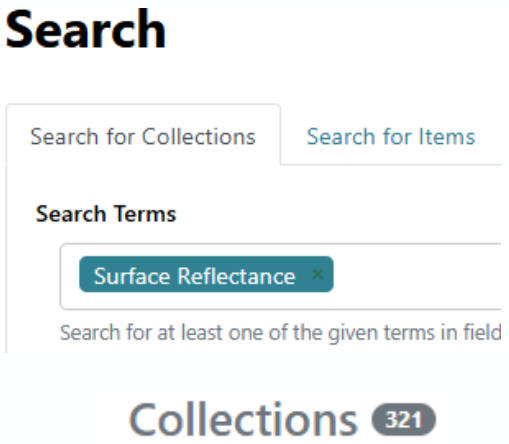


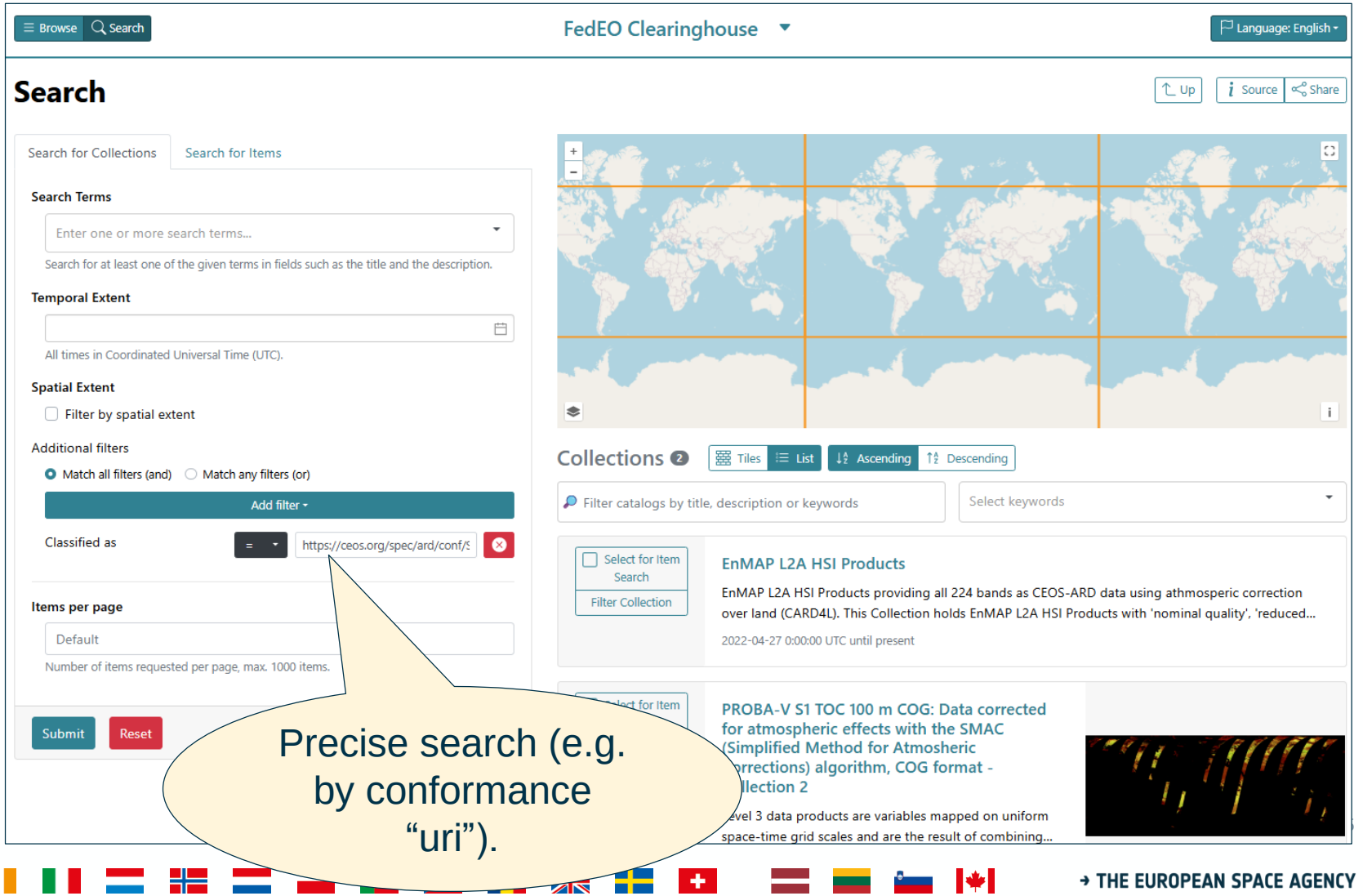


Discovery exploiting STAC “themes” extension

- FedEO STAC API – “SR” search

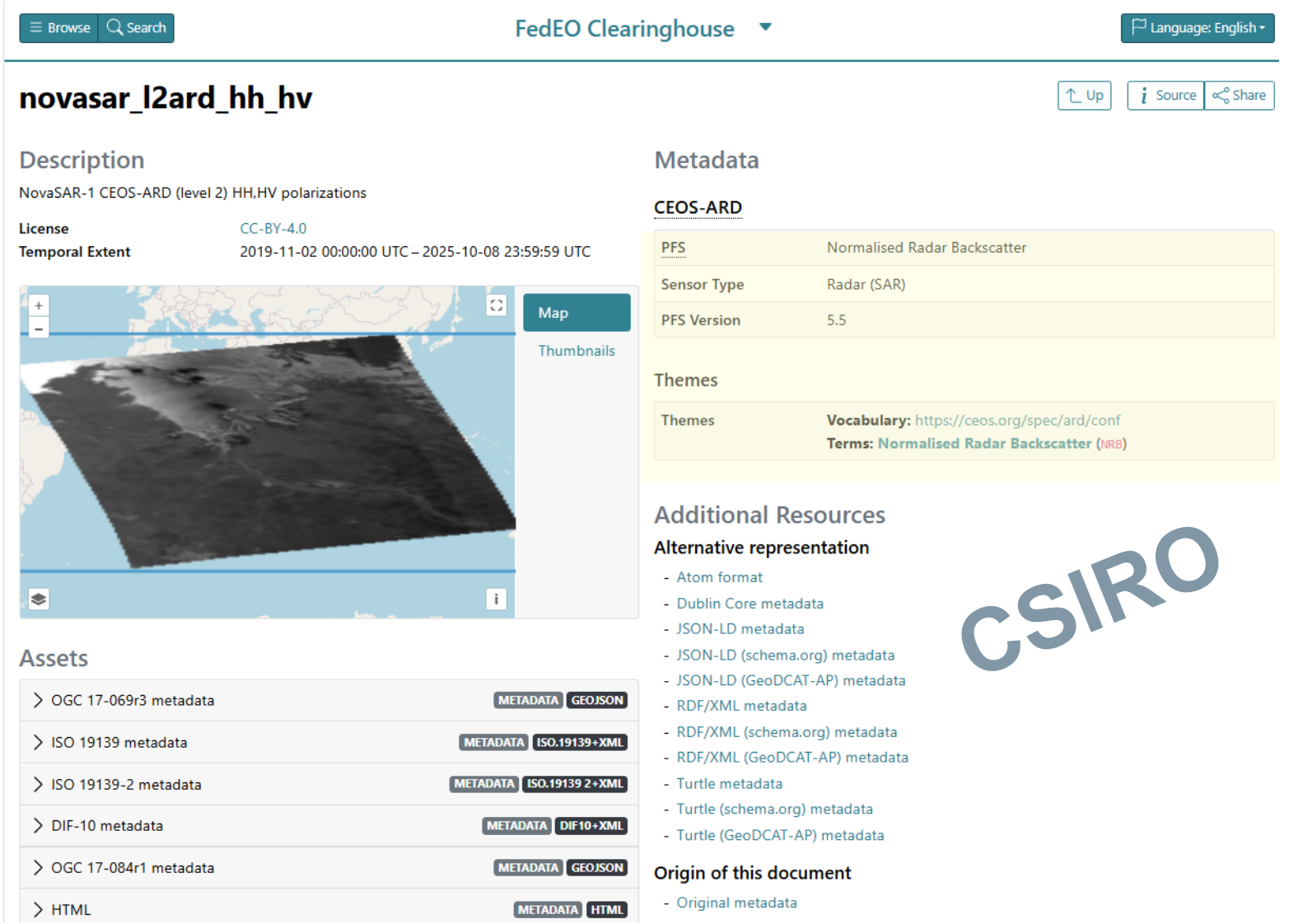
- Queryable “specification” or “theme” could be advertised as well.
- Text search does not provide accurate results





Datasets with CEOS-ARD STAC Extension

- VITO (Proba-V)
- CSIRO
- DLR



PROBA-V S1 TOC 100 m COG: Data corrected for atmospheric Atmosheric Corrections) algorithm, COG format - Collection 2

Description

Level 3 data products are variables mapped on uniform space-time grid scales and are the result of combining multiple scenes (e.g. S1/S10) to cover the userâ□□s region of interest.

DIF10 Land cover Cloud Radiometric quality Shadow Snow land use proba COG environmental monitoring facilities land cover land use
EARTH SCIENCE>LAND SURFACE>LAND USE/LAND COVER EARTH SCIENCE>ATMOSPHERE>CLOUDS
EARTH SCIENCE>CLIMATE INDICATORS>CRYOSPHERIC INDICATORS>SNOW COVER Proba-V VGT-P Surface Reflectance PROBA-V VGT

License	other
Temporal Extent	2013-10-16 00:00:00 UTC – 2020-06-30 23:59:59 UTC

Metadata

General

Updated	2014-09-04 14:33:18 UTC
Instruments	VGT
Platform	PROBA-V

CEOS-ARD

PFS	Surface Reflectance
Sensor Type	Optical
PFS Version	5.0

VITO

Scientific

Citation	doi.org/10.5270/PRV-7dte3c2

Themes

Themes	**Vocabulary:** https://ceos.org/spec/ard/conf **Terms:** Surface Reflectance (SR)

EnMAP L2A HSI Products

Description

EnMAP L2A HSI Products providing all 224 bands as CEOS-ARD data using athmosperic correction over land (CARD4L). This Collection holds EnMAP L2A HSI Products with 'nominal quality', 'reduced quality' and 'low quality'. Those can be distinguished by using the property 'enmap:overallQuality', here the values respond to {0}: nominal quality, {1}: reduced quality and {2}: low quality.

DLR EOC EnMAP Hyperspectral HSI VNIR SWIR

License	EnMAP Data License
Temporal Extent	2022-04-27 0:00:00 UTC until present

Providers

- DLR/EOC Geoservice — HOST
- DLR/EOC Photogrammetry and Image Analysis — PROCESSOR

Metadata

General

CRS	OGC/1.3/CRS84

CEOS-ARD

PFS	Surface Reflectance
Sensor Type	Optical
PFS Version	5.0

DLR

Data Cube

Dimensions

Id	Type	Axis	Extent	Reference System
x	spatial	x	-180 – 180	4326
y	spatial	y	-90 – 90	4326
time	temporal	*n/a*	> 2022-04-27T00:00:00.000+00:00	*n/a*

Themes

Themes	**Vocabulary:** https://ceos.org/spec/ard/conf **Terms:** Surface Reflectance (SR)

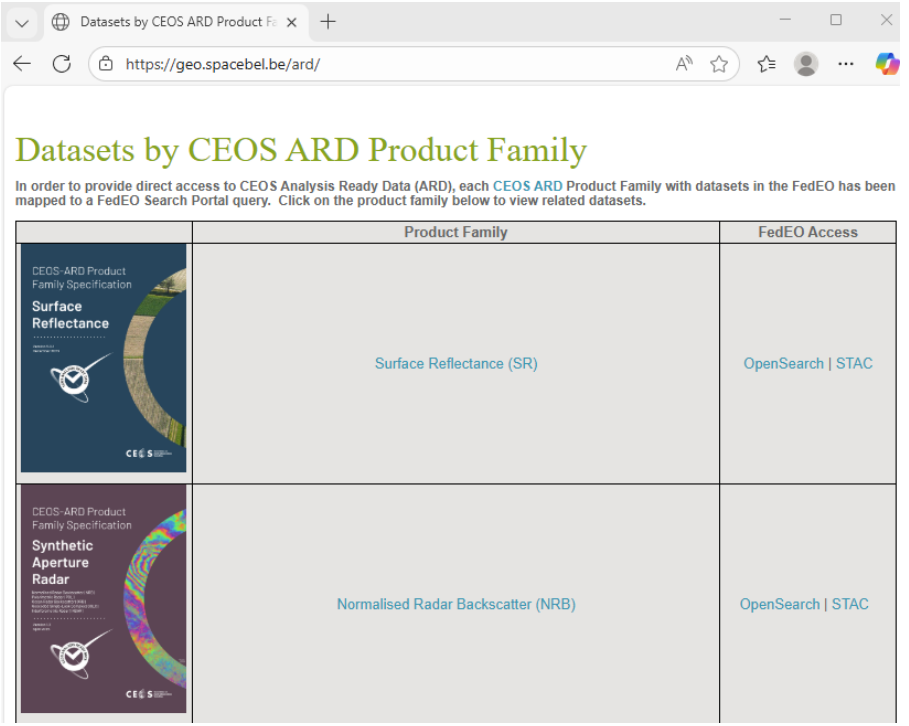
Consistent and interconnected CEOS-ARD access points

- Connect access points to ceos.org/ard dataset table
  - Deep links available to individual collections (See current spreadsheet) can be added to current ceos.org/ard dataset table.
  - Overview page can open list of collections of a CEOS-ARD Product Family (similar to collections per Agency)

Datasets by CEOS Agencies

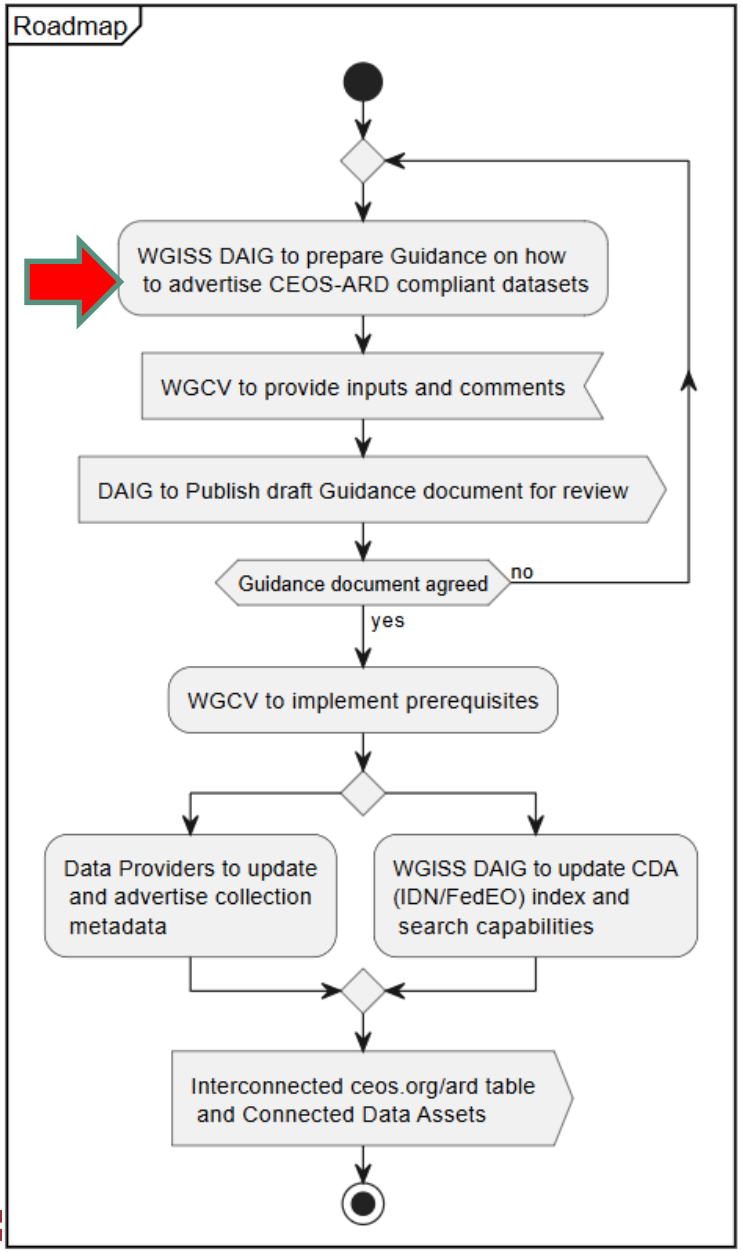
In order to provide direct access to these data, each CEOS Agency with datasets in FedEO and/or IDN has been mapped to FedEO Search Portal query and/or IDN Search Portal query in Earthdata Search. Click on the relevant links associated with each agency below to view related datasets.

Logo	Agency	FedEO Access	IDN Access
belspo	**BELSPO (Belgian Science Policy Office)** *Belgium*	OpenSearch | STAC	IDN
cnes CENTRE NATIONAL D'ÉTUDES SPATIALES	**CNES (Centre National d'Etudes Spatiales)** *France*	OpenSearch | STAC	IDN
CONAE La Agencia Espacial Argentina	**CONAE (Comisión Nacional de Actividades Espaciales)** *Argentina*		IDN
CSIRO Australia's National Science Agency	**CSIRO (Commonwealth Scientific and Industrial Research Organisation)** *Australia*		IDN
DLR	**DLR (Deutsches Zentrum für Luft-und Raumfahrt)** *Germany*	OpenSearch | STAC	IDN



Conclusion

- Collaboration WGISS DAIG, CEOS Working Group on Cal/Val (WGCV) / CEOS-ARD Oversight group and SEO Team ongoing.
- Roadmap proposed.
- Preliminary version of “Guide to Enable Discoverability of Datasets” expected to be available on CEOS WGISS GitHub to facilitate its elaboration. Contributions / feedback are welcome.
- Once agreed, Data Providers and Connected Data Assets (CDA) can be updated accordingly to achieve consistent endpoints and interconnect the ceos.org/ard dataset table and CDA endpoints



QUESTIONS?
WHEN?
WHERE?
WHAT?
WHO?
HOW?
Where?
What?
When?
Why?