

# **Federated Earth Observation (FedEO) Status**



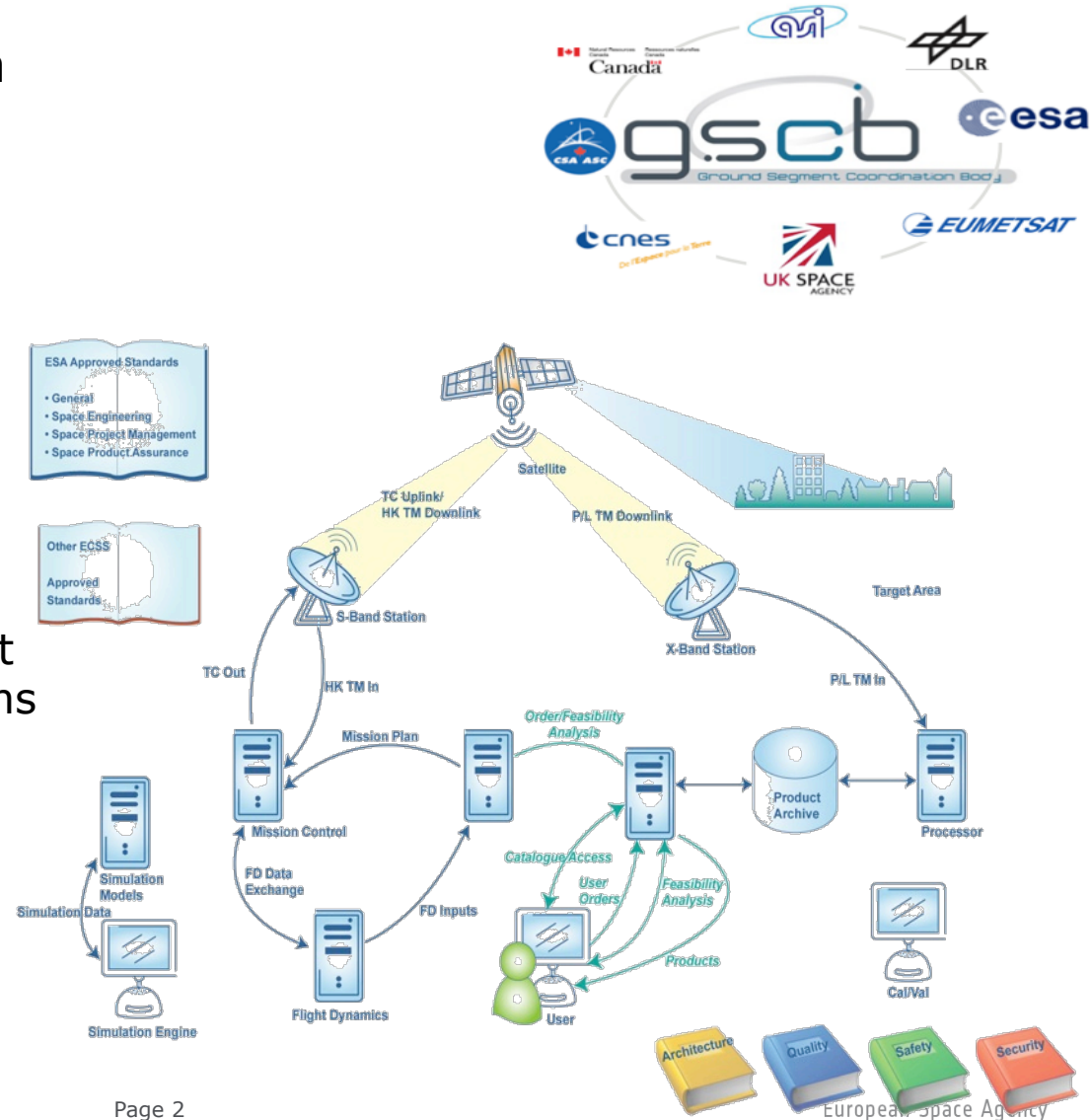
**CEOS WGISS Meeting #37  
14-18 April, 2014  
Cocoa Beach, Florida, USA  
Hosted by NASA**

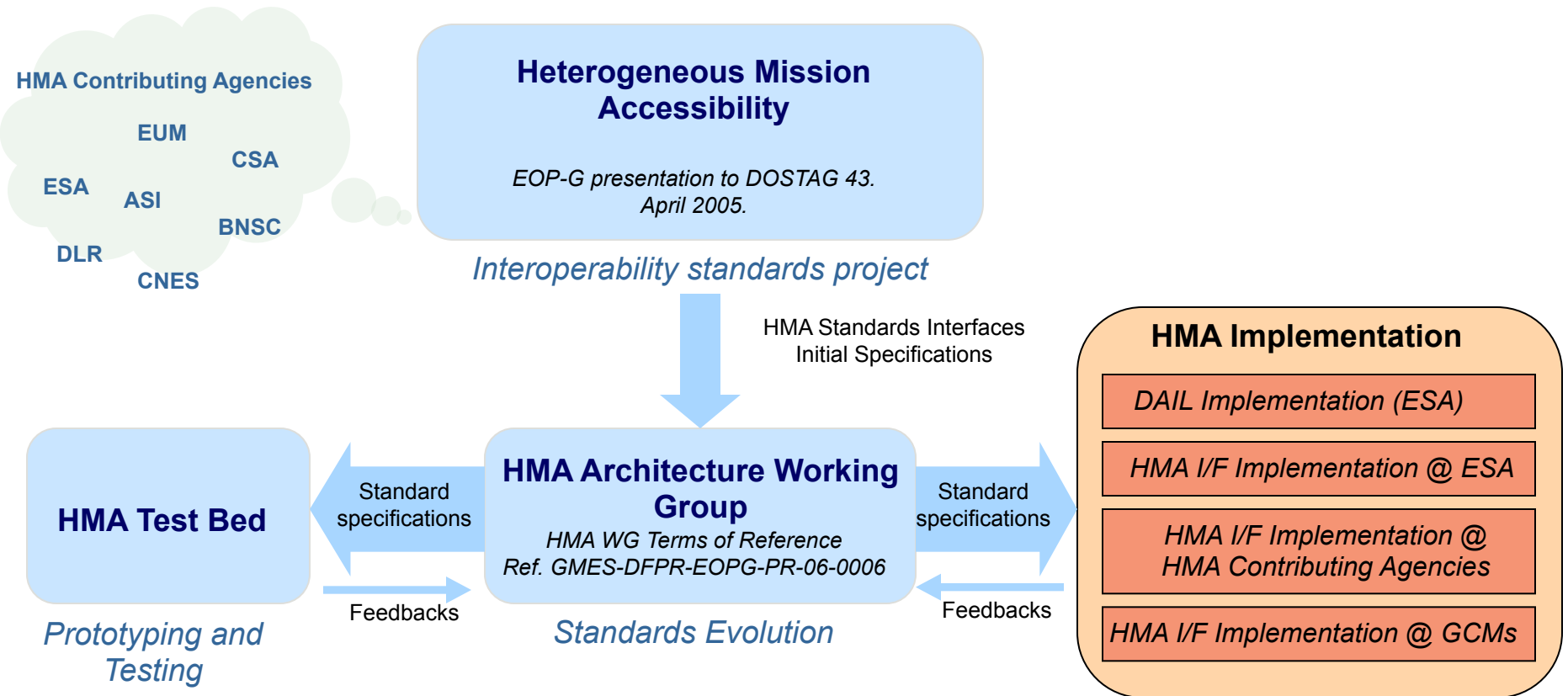
**M.Albani, P.Mougnaud, A.Della Vecchia (ESA)  
Yves Coene (Spacebel)**

# What is HMA

A collaborative project started in Europe and Canada by the Ground Segment Coordination Body (GSCB) in 2005 with the objective to:

- Guarantee a seamless and **harmonised access to heterogeneous EO datasets from multiple mission** ground segments, including national missions and ESA missions.
- **Standardise** the ground segment **interfaces** of the satellite missions for easier access to EO data.
- Provide **interoperability for coordinated data access** enabling the interactions with services or Value Adders and EO Contributing Missions.





*Operational Implementation Projects*

Two track approach: operational implementations and parallel "standardisation and support activities (e.g. SW development and conformance testing)"

Defined through the work of 25 companies over 10 countries and with the contribution from HMA project partners (agencies and users)

- 1. Collection and service discovery (Advertisement):** OGC's Cataloguing of ISO Metadata using the ebRIM profile of CS-W (OGC 07-038, OGC 13-084)
- 2. EO product metadata:** OGC's GML 3.1.1 Application Schema for EO Products (OGC-06-080) and EOP O&M (OGC 10-157). **EO collection metadata:** ISO 19115 Geographic Information – Metadata (OGC 11-035).
- 3. Catalogue Service:** OGC's Catalogue Services Specification 2.0 Extension Package for ebRIM Application Profile: Earth Observation Products (OGC 06-131)
- 4. Ordering from Catalogue:** OGC's Ordering Services for Earth Observation Products (OGC 06-141, OGC 13-042)
- 5. Feasibility Analysis (Programming):** OGC's Sensor Planning Service Application Profile for EO Sensors (OGC 10-135, OGC 13-039, OGC 14-012)
- 6. Web Map Service** OGC's WMS EO Extension (OGC 07-063)
- 7. Online Data Access**
  - **Web Coverage Service** OGC WCS 2.0 extension for EO (OGC 10-140)
  - **Download Service:** Download Service for EO products (OGC 13-043)
- 8. Identity (User) Management:** OGC's User Management Interfaces for Earth Observation Services (OGC 07-118)

Frozen set of standards under implementation (configuration control)

# HMA Implementations



## Agency Developments & Copernicus Contributing Missions:

- ESA
- DLR
- EUMETSAT
- CNES – Disasters Charter
- VITO
- MDA (RSAT2)
- DMCii
- Astrium GbH (TSX)
- DEIMOS
- E-GEOS
- Astrium France (spot/pleiades)
- RapidEye
- Euromap
- EUSI
- Astrium France (spot 6/7)
- Proba-V
- others

**International Charter Space and Major Disasters**  
Charter Geographic Tool

CALL ID: 187 - EARTHQUAKE in Chile  
Type: EARTHQUAKE  
Description: A 7.2-magnitude earthquake struck Antofagasta on 14 November 2007 at 12:40 local time followed by numerous aftershocks. The earthquake caused two deaths, hundreds of injuries and widespread damage, displacing about 16,000 people.  
Location: Chile  
Date: 2007-11-22T07:00:00-01:00

Search parameters  
Limit search to map view extent | Reset filters  
Disaster Date | [ Set ]  
Call ID | 187 | Change or Clear |  
Disaster Type | Cyclone Earthquake Flood Forest fire Hurricane Landslide Oil spill Radioactive pollutio  
Tornado Toxic pollution Tsunami Unknown Volcanic

Preview	Identifier	Call ID
	SPOT-ALL-SSG2J0712091452168	187
	SPOT-ALL-SSG2J0712091452165	187
	SPOT-ALL-SSG1J0612151500025	187
	SPOT-ALL-SSG1T0612151500022	187

HMA Portal - Search Process  
Catalogue and ordering service Search

Collection:  
 CBS  
 DLR  
 DMC  
 DMI  
 EUMETSAT  
 ITD  
 MDA  
 SPOT  
 VITO

Rest Dates: 01 Oct, 2011  
End Date: 04 Oct, 2012  
Acquisition Type: [ ? ]

gmes  
Catalogue Shop Cart User Set GIS Maps Downloads  
Collections: On Line Collections Datasets Missions GEMS Catalogue  
Query Mode: Standard  
Date: Choose a Date Area: Area Selection  
From: 04-Sep-2012 Center Lat/Lon (dd,mm,ss) 39.23,30 122.917  
To: 04-Oct-2012 Neighly/Width (km) 819.30 1108.91  
Step by range

Id	Sensor	Product	Status	Start	Stop	Orbit	SI
1	BAR	RAM	ARCHIVED	2012-09-09 04:37:28.90	2012-09-09 04:38:45.16	24733	63
2	BAR	RAM	ARCHIVED	2012-09-07 16:52:18.93	2012-09-07 16:52:33.13	24712	63
3	BAR	RAM	ARCHIVED	2012-09-04 05:22:14.35	2012-09-04 05:22:30.20	24662	63
4	BAR	RAM	ARCHIVED	2012-09-04 05:22:35.43	2012-09-04 05:23:18.75	24662	63
5	BAR	RAM	ARCHIVED	2012-09-07 16:52:46.02	2012-09-07 16:53:00.22	24712	63
6	BAR	RAM	ARCHIVED	2012-09-05 04:54:24.28	2012-09-05 04:54:31.46	24676	66
7	BAR	RAM	ARCHIVED	2012-09-05 04:54:17.61	2012-09-05 04:54:24.69	24676	66
8	BAR	RAM	ARCHIVED	2012-09-07 16:53:13.07	2012-09-07 16:53:27.28	24712	63
9	BAR	RAM	ARCHIVED	2012-09-08 05:04:21.05	2012-09-08 05:04:35.07	24715	63
10	BAR	RAM	ARCHIVED	2012-09-07 16:53:29.21	2012-09-07 16:54:45.57	24712	63
11	BAR	RAM	ARCHIVED	2012-09-07 16:52:32.48	2012-09-07 16:52:46.47	24712	63
12	BAR	RAM	ARCHIVED	2012-09-08 05:03:04.24	2012-09-08 05:04:08.37	24715	63
13	BAR	RAM	ARCHIVED	2012-09-10 17:04:01.76	2012-09-10 17:05:17.96	24755	63

Agency

# FedEO: Federated Earth Observation



FedEO is a prototype system providing a brokered discovery (and access) capability to European (and Canadian) EO missions data based on HMA (and other) interfaces.



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**Browse FEDEO Dataset Series**  
This distributed FEDEO dataset series metadata in the metadata for Observations & Measurement applications complying with the detailed guidelines for access:

**Order HMA-SE Datasets (OGC)**  
This distributed dataset catalogue Application schema for Earth provides access to the core OGC 06-141 protocol for:

**Browse FEDEO Dataset Series**  
This catalogue, set up as per via the OGC 13-0841 "OGC include in the future dataset external applications complying

Home Services Order List Service Requests

**FEDEO Clearinghouse OpenSearch**

Series Products

Series Filter

- PANCHROMATIC\_5m\_A (D)
- PANCHROMATIC\_5m\_B (D)
- MDA
- MDA-GSI-RSAT2\_SEGMENTS (D)
- MDA-GSI-RSAT2\_NRT (D)
- MDA-GSI-RSAT2\_NON\_NRT (D)
- CDS

Choose a queryable

Start Date: 2014-03-10

End Date: 2014-03-21

Search

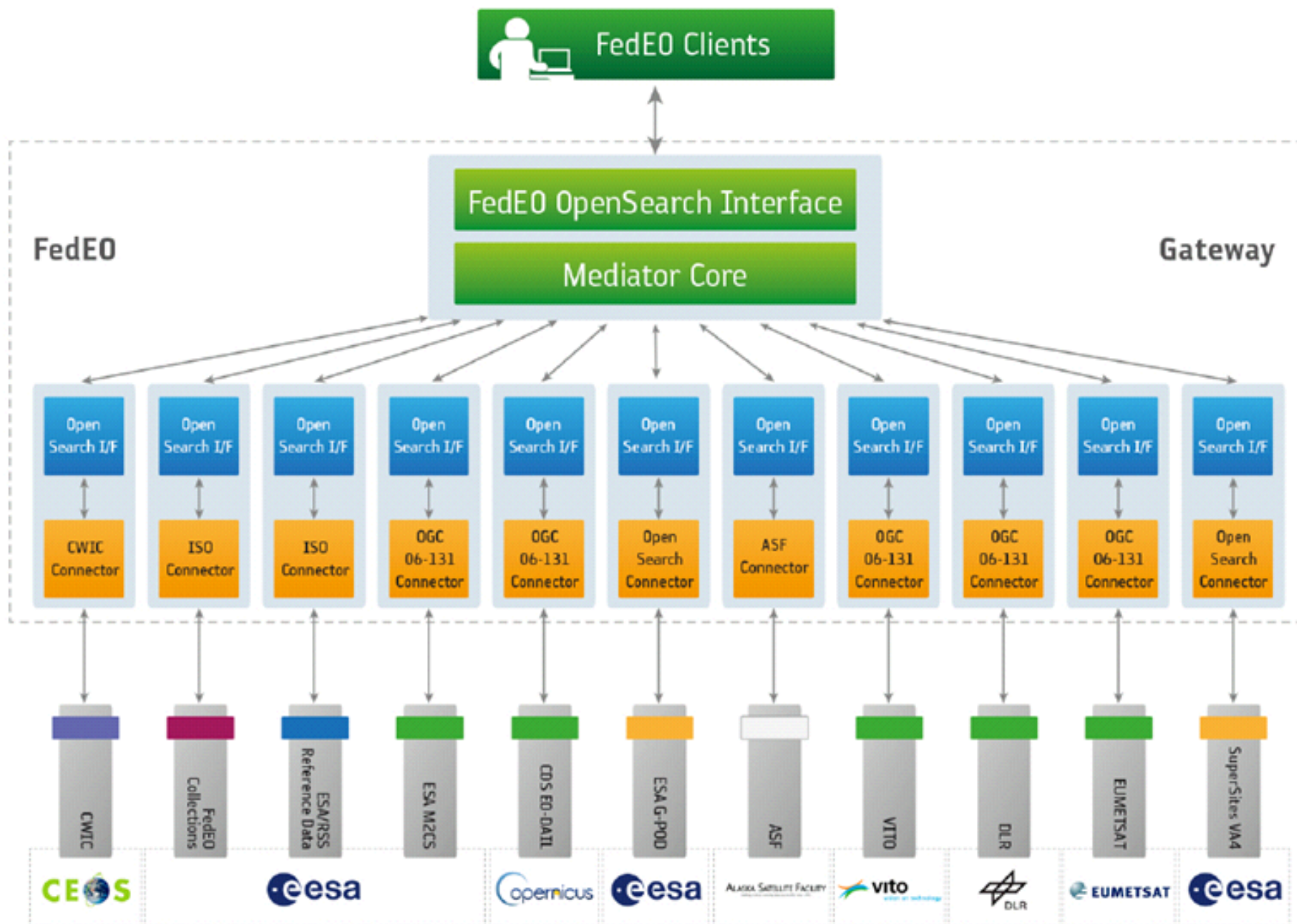
Scale = 1 : 6M 8.89883, 36.97148

Series Search Results Products Search Results

Page 1 of 2 1 2 2 Results 1 - 10 of 12

Collection Identifier	Product Information	Date	Platform Information	Sensing Information	Preview
<input type="checkbox"/> Collection Identifier: MDA-GSI-RSAT2_SEGMENTS Product Id: um:ogc:def:EOP-MDA-GSI-RSAT2_SEGMENTS.PASS.314824:1.0 Orbit Number: 32008 Orbit Direction: DESCENDING Last Orbit Number: 32008 Show metadata	MDA	Start Date: 2014-03-14T05:06:41.544 End Date: 2014-03-14T05:06:52.473	Short Name: NoName Serial Identifier: NoName Orbit Type: SAR Instrument Short Name: SAR Sensor Type: RADAR Sensor Operational Mode: Standard Sensor Resolution: 25.0 Swath Identifier: S3	Polarisation Mode: D Polarisation Channels: HH, HV Antenna Look Direction: RIGHT Minimum Incidence Angle: 33.876328	
<input checked="" type="checkbox"/> Collection Identifier: MDA-GSI-RSAT2_SEGMENTS Product Id: um:ogc:def:EOP-MDA-GSI-RSAT2_SEGMENTS.PASS.314824:1.0 Orbit Number: 32001 Orbit Direction: ASCENDING Last Orbit Number: 32001 Show metadata	MDA	Start Date: 2014-03-13T16:52:12.475 End Date: 2014-03-13T16:52:29.759	Short Name: NoName Serial Identifier: NoName Orbit Type: SAR Instrument Short Name: SAR Sensor Type: RADAR Sensor Operational Mode: Standard Sensor Resolution: 25.0 Swath Identifier: S3	Polarisation Mode: D Polarisation Channels: HH, HV Antenna Look Direction: RIGHT Minimum Incidence Angle: 33.874040	
<input type="checkbox"/> Collection Identifier: MDA-GSI-RSAT2_SEGMENTS Product Id: um:ogc:def:EOP-MDA-GSI-RSAT2_SEGMENTS.ITMA.314541:1.0 Orbit Number: 32001 Orbit Direction: ASCENDING Last Orbit Number: 32001 Show metadata	MDA	Start Date: 2014-03-17T05:18:59.087 End Date: 2014-03-17T05:20:15.268	Short Name: NoName Serial Identifier: NoName Orbit Type: SAR Instrument Short Name: SAR	Polarisation Mode: S Polarisation Channels: VV Antenna Look Direction: RIGHT Minimum Incidence Angle: 33.874040	

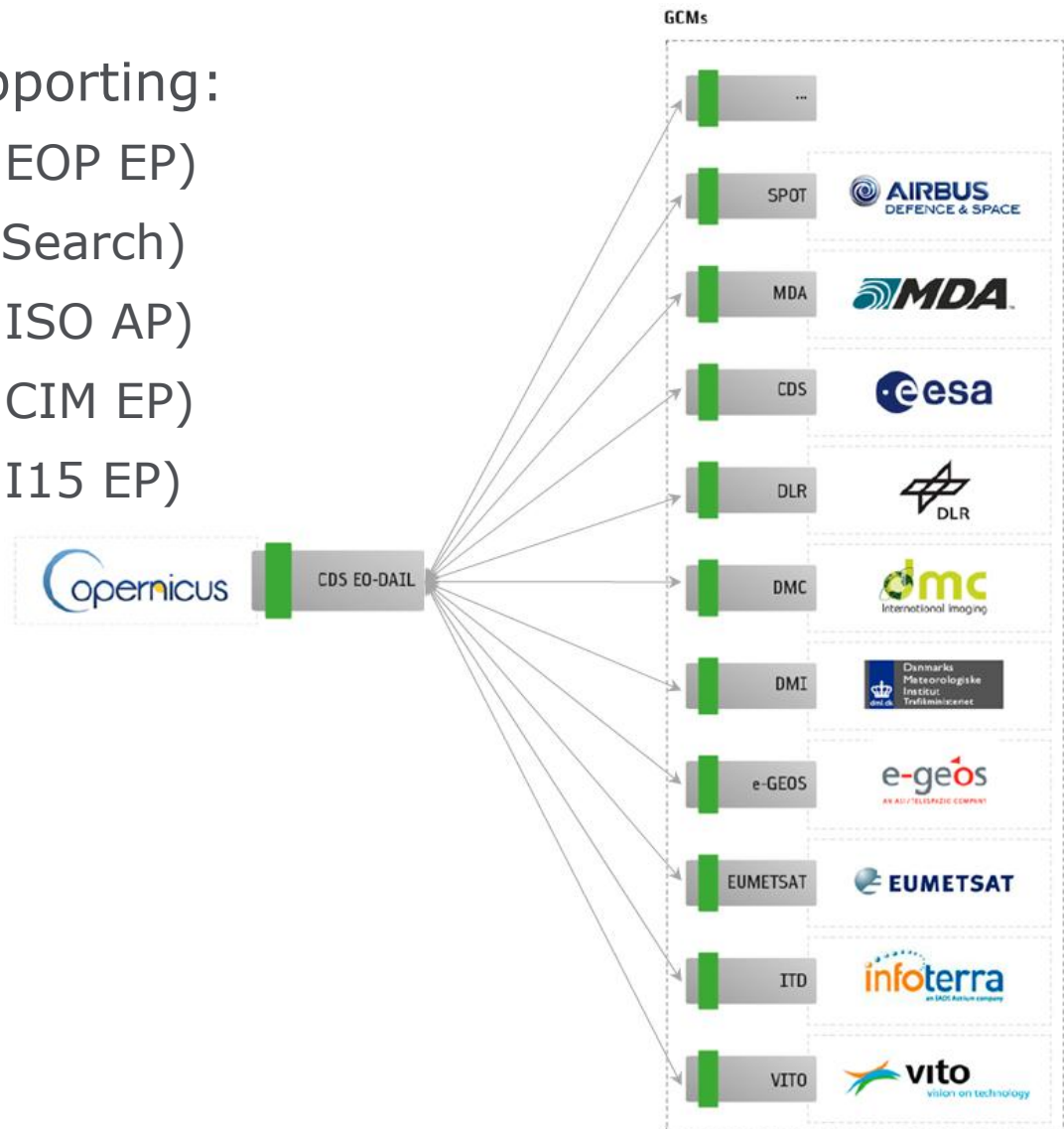
# FedEO Brokered Architecture



# FedEO Back-end Connections



- Backend Connectors supporting:
  - OGC 06-131 (CSW EOP EP)
  - OGC 10-032 (OpenSearch)
  - OGC 07-045 (CSW ISO AP)
  - OGC 07-038 (CSW CIM EP)
  - OGC 13-084 (CSW I15 EP)
  - CWIC
  - ASF





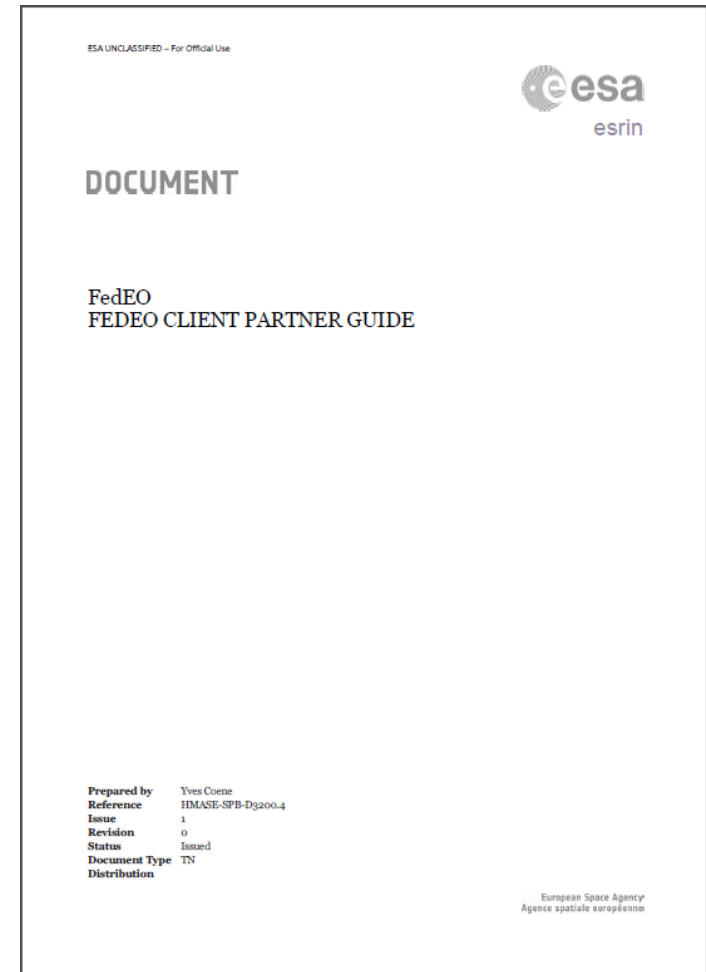
- FedEO end-point/component and demo client portal being migrated to ESRIN.
- M2M External access tests with GEO Discovery and Access Broker (DAB) started.
- Opensearch gateway available at:  
<http://geo.spacebel.be/opensearch/readme.html>
- Further catalogues interfacing ongoing within the HMA-SE project

# of discoverable and accessible collections = 477  
# of discoverable granules > 6 millions

<b>Dataset Series</b>	<b># Dataset Series</b>
ESA EO-DAIL	61
ESA G-POD	331
ESA M2CS	20
ESA <del>SuperSite</del> Virtual Archive 4	16
DLR EO Web	16
EUMETSAT Catalogue	13
VITO Catalogue	1
Alaska Satellite Facility	19
GSCDA	> 242

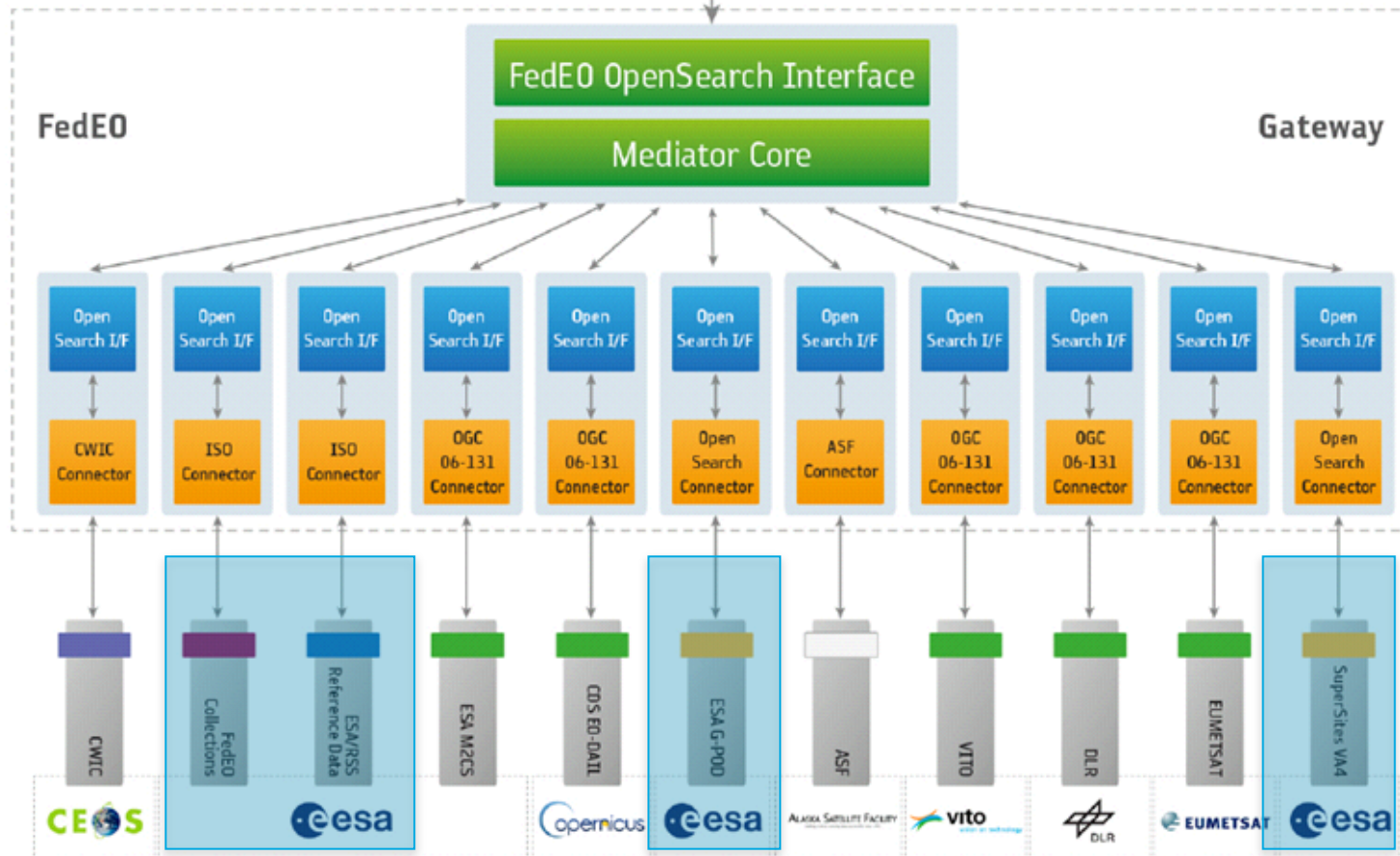
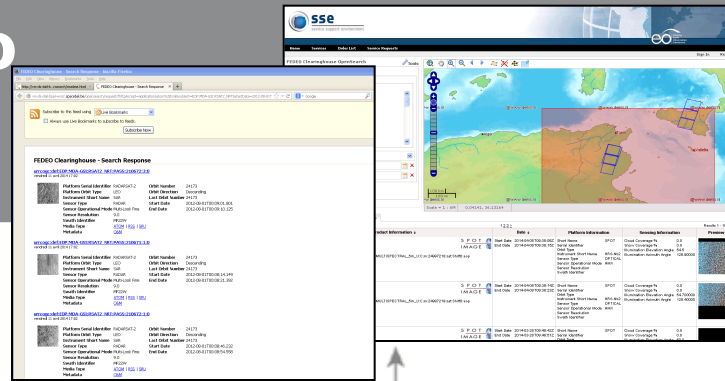
In addition CWIC collections discoverable & accessible

- General description of the FedEO environment and its relation to other systems
- Details about the FedEO query interface based on OpenSearch (e.g., principles, the search parameters, search response format, etc ...)
- Description of two cases: one starting from a dataset series catalogue, and a second one accessing immediately the dataset catalogue
- Details on the catalogue connectors and how their corresponding dataset series and dataset metadata can be discovered



- Currently OpenSearch access to:
  - HMA Catalogs supporting OGC 06-131: Atom with EOP O&M (OGC 10-157) metadata as foreign markup or atom:link.
  - CWIC catalogs: Atom with DC or ISO metadata as foreign markup or atom:link
  - Virtual Archive 4 and G-POD: Atom or RDF or ...
- Interface aligned with OASIS searchRetrieve 1.0 conventions
- Implemented:
  - OGC 10-032 Geotemporal Extension
  - OGC 13-026 Extension for Earth Observation

# FedEO Demo

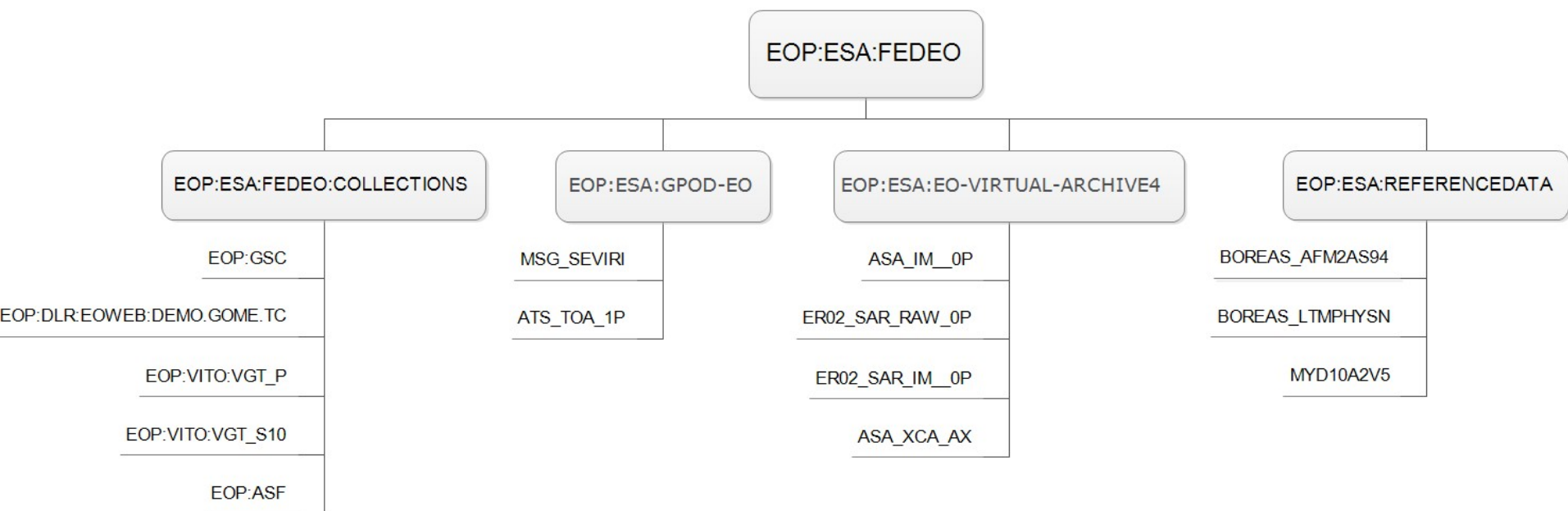


(\*)

(\*)

(\*) include series metadata

- Two step search approach:
  - Step 1: search dataset series (parallel search in 4 catalogs - see below)
  - Step 2: search datasets inside the selected dataset series..



- Go to Home page / developers page (Firefox)
  - Explain content:
    - OSDD: 3 Atom URL templates
    - Explain: mainly for list of dataset series
    - 2 tabs / 2 columns (foreign markup)
  - Click on 1st dataset series example,
    - show link to ISO metadata content by doing "view source"
    - Add query=meris to URL
  - Click on dataset example (MDA collection):
    - show EOP O&M content by doing "view source "
  - Click on example dataset (MDA Roma) (gazetteer)
    - Copy URL to Google Maps to visualise results

- Search Dataset Series Catalog (OpenSearch Step 1)
  - Find series with "vegetation" in abstract
    - Explain this involves 4 searches
  - Find series published by "vito"
  - Find series with "MERIS" in abstract. Explain they result from multiple dataset series catalogs .... Explain  button.
  - Find services (dc:type) with "FEDEO" in abstract



- Search Dataset Catalog (OpenSearch Step 2)
  - Explain search form is created on-the-fly from dataset series specific OSDD document (and Param extension info).
    - Use ASF and SPOT (1st)
  - (1) Find optical imagery (Spot ALL) over Sicily 1/1/2014-11/4/2014
    - Show metadata
  - Reduce number of values by filtering on eo:cloudCover 50]
  - (2) Find radar images (MDA) over same area
    - Show detailed metadata
  - (3) Ikonos 1/2/2007 to today
    - Name = Antwerp
    - Name = Amsterdam, radius = 10000
    - Name = Paris

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OpenSearch  
I/F details



### Browse FEDEO Dataset Series and Datasets (OGC 10-032, OGC 13-026)

This distributed FEDEO dataset series and dataset catalogue, set up as part of the HMA for Science Evolution Project, serves dataset metadata in the metadata format supported by the FEDEO backend catalogs including ISO19139 (as per OGC 11-035r1, EO Collection and Service Discovery using the eBRIM Application Profile of CSW 2.0. ). OGC 10-157r3, Earth Observation Metadata profile of Observations & Measurements , OGC 10-157r4 and Dublin Core. The OpenSearch catalogue is also accessible from external applications complying with the specification OGC 10-032 and OGC 13-026. The FEDEO Client Partner Guide (to be published) provides detailed guidelines for access by third-party clients.



### Order HMA-SE Datasets (OGC 06-131, OGC 06-141)

This distributed dataset catalogue, set up as part of the HMA for Science Evolution Project, serves dataset metadata in OGC 06-080 "Application schema for Earth Observation products" format from EUMETSAT, DLR, VITO via the OGC 06-131 protocol. The service provides access to the corresponding datasets via ordering to selected users. Datasets from the dataset series can be ordered using the OGC 06-141 protocol from external applications complying with the HMA specifications OGC 06-131, OGC 07-118 and OGC 06-141.



### Browse FEDEO Dataset Series (OGC 13-084)

This catalogue, set up as part of the HMA for Science Evolution Project, provides access to FEDEO dataset series and services metadata via the OGC 13-084r1 "OGC I15 (ISO19115 Metadata) Extension Package of CS-W eBRIM Profile" protocol. Registered services will include in the future dataset catalogues, Web map services and feasibility analysis services. The catalogue is also accessible from external applications complying with the HMA specification OGC 13-084r1.

# How to access: OpenSearch I/F



Welcome to the FEDEO Clearinghouse. This entry point is setup by the HMA-S Evolution Project and provides access to the FEDEO Clearinghouse Product and Collections Catalogs via different interfaces.

- [OpenSearch Description Document](#)
- [Explain Document](#)

The implementation of the above interfaces is based on:

- [OGC 10-157r3, Earth Observation Metadata profile of Observations & Measurements, Version 1.0](#)
- [OGC 10-032r8, OpenSearch GeoSpatial and Temporal Extensions](#)
- [OGC 13-026r3, OpenSearch Extension for Earth Observation](#)
- Relevant [OASIS searchRetrieve specifications](#).

The current interfaces are work in progress and subject to change.

Examples of two-step approach: dataset series and dataset search

The following is a list of example OpenSearch requests returning XML, JSON and RDF results:

Dataset Series	Datasets
<b>With metadata as foreign markup</b>	
<a href="#">XML</a> <a href="#">HMA with use of dc:subject parameter</a>	<a href="#">XML</a> <a href="#">HMA with use of dc:subject parameter</a>
<a href="#">XML</a> <a href="#">HMA with use of time:start and time:end parameters</a>	<a href="#">XML</a> <a href="#">HMA with use of time:start and time:end parameters</a>
<a href="#">XML</a> <a href="#">HMA with use of time:start,time:end and geo:box parameters</a>	<a href="#">XML</a> <a href="#">HMA with use of time:start,time:end and geo:box parameters</a>
<a href="#">XML</a> <a href="#">HMA with use of eop:platformShortName parameter</a>	<a href="#">XML</a> <a href="#">HMA with use of eop:platformShortName parameter</a>
<a href="#">XML</a> <a href="#">HMA with use of eop:instrumentShortName parameter</a>	<a href="#">XML</a> <a href="#">HMA with use of eop:instrumentShortName parameter</a>
<a href="#">XML</a> <a href="#">HMA with use of eop:instrumentShortName parameter</a>	<a href="#">XML</a> <a href="#">HMA with use of eop:instrumentShortName parameter</a>
<a href="#">XML</a> <a href="#">HMA with use of eop:sensorType parameter</a>	<a href="#">XML</a> <a href="#">HMA with use of eop:sensorType parameter</a>
<a href="#">XML</a> <a href="#">HMA with use of geo:uid parameter</a>	<a href="#">XML</a> <a href="#">HMA with use of geo:uid parameter</a>
<a href="#">XML</a> <a href="#">HMA MDA collection search</a>	<a href="#">XML</a> <a href="#">HMA MDA collection search</a>
<a href="#">XML</a> <a href="#">HMA MDA collection search with use of geo:name (ROMA) and geo:radius (100km)</a>	<a href="#">XML</a> <a href="#">HMA MDA collection search with use of geo:name(ROMA) and geo:radius (100</a>
<a href="#">XML</a> <a href="#">HMA MDA collection search with use of geo:lat, geo:long(ROMA) and geo:radius (100km)</a>	<a href="#">XML</a> <a href="#">HMA MDA collection search with use of geo:lat, geo:long(ROMA) and geo:radius (100km)</a>
<a href="#">XML</a> <a href="#">HMA SPOT Optical search</a>	<a href="#">XML</a> <a href="#">HMA SPOT Optical search</a>
<a href="#">XML</a> <a href="#">HMA VITO search</a>	<a href="#">XML</a> <a href="#">HMA VITO search</a>
<a href="#">XML</a> <a href="#">M2CS ENVISAT_ASA_APC_OS search with use of time:start,time:end</a>	<a href="#">XML</a> <a href="#">M2CS ENVISAT_ASA_APC_OS search with use of time:start,time:end</a>
<a href="#">XML</a> <a href="#">M2CS LANDSAT_TM_ETM_P search with use of time:start,time:end</a>	<a href="#">XML</a> <a href="#">M2CS LANDSAT_TM_ETM_P with search use of time:start,time:end</a>

# FedEO OpenSearch (Series)



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FEDEO Clearinghouse OpenSearch

Tools

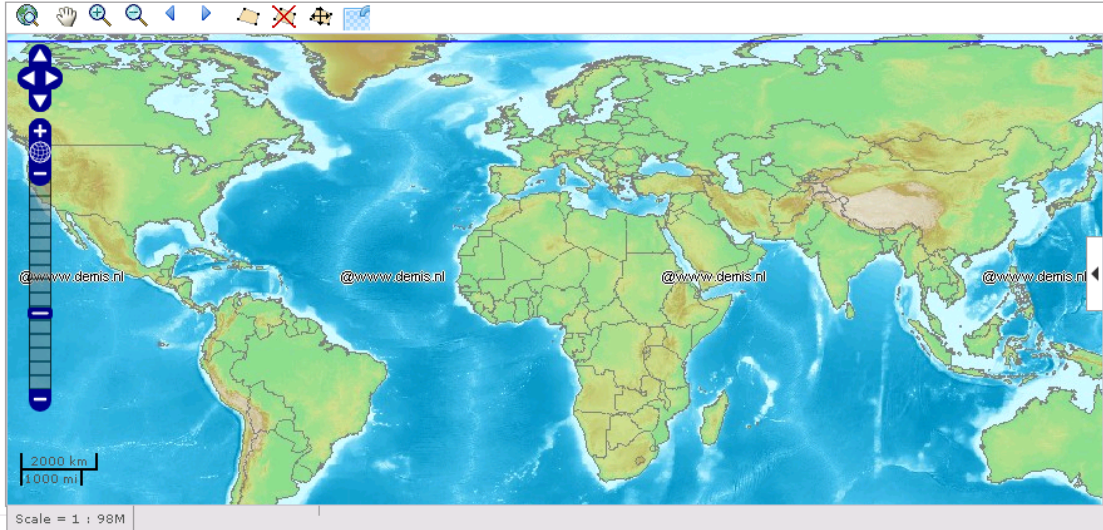
Series Datasets

Choose a queryable

Search Terms:

Organization Name:

Search



Series Search Results Datasets Search Results

Page 1 of 1

1

Results 1 - 2 of 2

Series Information		Date
<input type="checkbox"/> Identifier um:ogc:def:EOP:VITO:VGT_P Collection <ul style="list-style-type: none"> <li>Title: Physical products of SPOT VEGETATION</li> <li>Description: VGT-P (P= physical) products are adapted for scientific applications requiring highly accurate physical measurements. The data is corrected for system errors (error registration of the different channels, calibration of all the detectors along the line-array detectors for each spectral band) and resampled to predefined geographic projections chosen by the user. The pixel brightness count is the ground area's apparent reflectance as seen at the top of atmosphere (TOA). Auxiliary data supplied with the products allow users to process the original reflectance values using their own algorithms. The image products cover all or a part of a VEGETATION segment (data strip over land). The VEGETATION instrument is operational since April 1998, first with VGT1, from March 2003 onwards, with VGT2. More information is available on: <a href="http://www.vgt.vito.be/faq/faq.html">http://www.vgt.vito.be/faq/faq.html</a></li> <li>Date: /</li> <li>Media type: <a href="#">ATOM</a>   <a href="#">RSS</a>   <a href="#">SRU</a></li> <li>Metadata: <a href="#">ISO</a></li> </ul> <p>Show metadata</p>		Start End Modified 2014-04-11T11:53:28Z Published 2010-07-16
<input type="checkbox"/> Identifier um:ogc:def:EOP:VITO:VGT_S10 Collection <ul style="list-style-type: none"> <li>Title: Global 10 Days Synthesis of SPOT VEGETATION Images (VGT-S10)</li> <li>Description: The VGT-S10 are near-global, 10-daily composite images which are synthesised from the "best available" observations registered in the course of every "dekad" by the orbiting earth observation system SPOT-VEGETATION. The products provide data from all spectral bands (SWIR, NIR, RED, BLUE), the NDVI and auxiliary data on image acquisition parameters. The VEGETATION system allows operational and near real-time applications, at global, continental and regional scales, in very broad environmental and socio-economically critical fields. The VEGETATION instrument is operational since April 1998, first with VGT1,</li> </ul>		Start End Modified 2014-04-11T11:53:28Z Published 2010-07-16

# FedEO OpenSearch (Datasets Ikonos)



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## FEDEO Clearinghouse OpenSearch

Tools

Series Datasets

Series ikonos

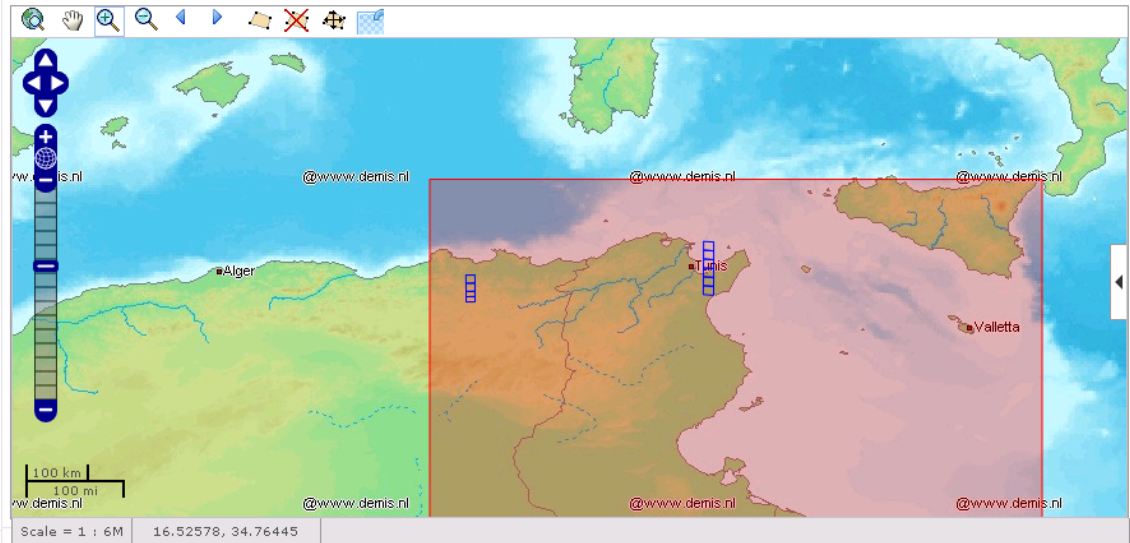
- e-GEOS
  - EGEOS:IKONOS (D)

Choose a queryable

Start Date 2013-08-01

End Date 2014-04-11

Search



Series Search Results Datasets Search Results

Page 1 of 3

1 2 3 >

Results 1 - 10 of 25

Product Information		Date	Platform Information	Sensing Information	Preview
<input type="checkbox"/>	Collection Identifier EGEOS:EGEOS#IKONOS Product Id urn:ogc:def:EOP:EGEOS:EGEOS#IKONOS:2000114439200THC:EOP Orbit Number Orbit Direction Last Orbit Number Show metadata	Start Date 2013-08-21T10:18:41.00Z End Date 2013-08-21T10:18:46.00Z	Short Name IKONOS Serial Identifier Orbit Type Instrument Short Name Sensor Type OPTICAL Sensor Operational Mode PAN/MSI Sensor Resolution 0.89 Swath Identifier	Cloud Coverage % 51.0 Illumination Elevation Angle 59.94395 Illumination Azimuth Angle 139.34042	
<input type="checkbox"/>	Collection Identifier EGEOS:EGEOS#IKONOS Product Id urn:ogc:def:EOP:EGEOS:EGEOS#IKONOS:2000114439201THC:EOP Orbit Number Orbit Direction Last Orbit Number Show metadata	Start Date 2013-08-21T10:18:41.00Z End Date 2013-08-21T10:18:46.00Z	Short Name IKONOS Serial Identifier Orbit Type Instrument Short Name Sensor Type OPTICAL Sensor Operational Mode PAN/MSI Sensor Resolution 0.89 Swath Identifier	Cloud Coverage % 41.0 Illumination Elevation Angle 59.94395 Illumination Azimuth Angle 139.34042	
<input type="checkbox"/>	Collection Identifier EGEOS:EGEOS#IKONOS Product Id urn:ogc:def:EOP:EGEOS:EGEOS#IKONOS:2000114439202THC:EOP Orbit Number Orbit Direction Last Orbit Number Show metadata	Start Date 2013-08-21T10:18:41.00Z End Date 2013-08-21T10:18:46.00Z	Short Name IKONOS Serial Identifier Orbit Type Instrument Short Name Sensor Type OPTICAL	Cloud Coverage % 33.0 Illumination Elevation Angle 59.94395 Illumination Azimuth Angle 139.34042	

# FedEO OpenSearch (Datasets SPOT)



Home Services Order List Service Requests

Sign In Register

## FEDED Clearinghouse OpenSearch

Tools

Series Datasets

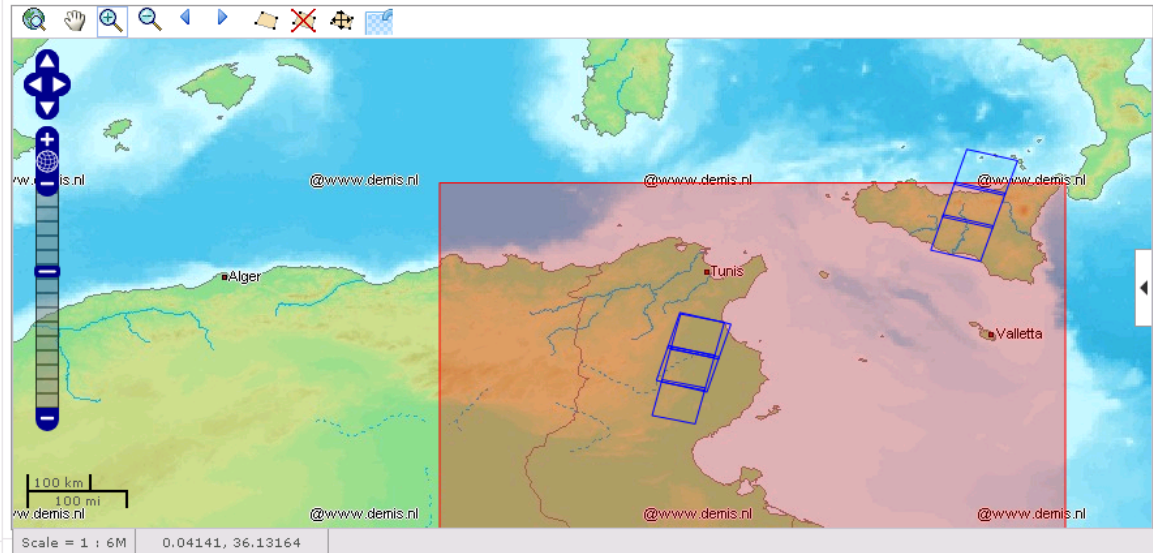
Series spot

- DLR-HMA-SE
  - TSX-1.SAR.L1b-Staring-Spotlight
- SPOT
  - ALL (D)
  - MULTISPECTRAL (D)
  - MULTISPECTRAL\_10m (D)
  - MULTISPECTRAL\_10m\_J (D)

Choose a queryable

Start Date

End Date



Series Search Results Datasets Search Results

Page 1 of 3

1 2 3 >

Results 1 - 10 of 21

Product Information	Date	Platform Information	Sensing Information	Preview
<input type="checkbox"/> <p>Collection Identifier SPOT:ALL Product Id urn:ogc:def:EOP:SPOT:MULTISPECTRAL_5m_U:C:sn:24997218:sat:Shif0:eop Orbit Number 14 Orbit Direction DESCENDING Last Orbit Number 14</p> <p><input type="button" value="Show metadata"/></p>	<p>Start Date 2014-04-08T09:38:06Z End Date 2014-04-08T09:38:15Z</p>	<p>Short Name SPOT Serial Identifier Orbit Type Instrument Short Name HRG-Nb2 Sensor Type OPTICAL Sensor Operational Mode HMX Sensor Resolution Swath Identifier</p>	<p>Cloud Coverage % 0.0 Snow Coverage % 0.0 Illumination Elevation Angle 54.5 Illumination Azimuth Angle 125.90000</p>	
<input type="checkbox"/> <p>Collection Identifier SPOT:ALL Product Id urn:ogc:def:EOP:SPOT:MULTISPECTRAL_5m_U:C:sn:24997219:sat:Shif0:eop Orbit Number 14 Orbit Direction DESCENDING Last Orbit Number 14</p> <p><input type="button" value="Show metadata"/></p>	<p>Start Date 2014-04-08T09:38:14Z End Date 2014-04-08T09:38:23Z</p>	<p>Short Name SPOT Serial Identifier Orbit Type Instrument Short Name HRG-Nb2 Sensor Type OPTICAL Sensor Operational Mode HMX Sensor Resolution Swath Identifier</p>	<p>Cloud Coverage % 0.0 Snow Coverage % 0.0 Illumination Elevation Angle 54.700000 Illumination Azimuth Angle 125.40000</p>	
<input type="checkbox"/> <p>Collection Identifier SPOT:ALL Product Id urn:ogc:def:EOP:SPOT:MULTISPECTRAL_5m_U:C:sn:24997219:sat:Shif0:eop Orbit Number 14 Orbit Direction DESCENDING Last Orbit Number 14</p> <p><input type="button" value="Show metadata"/></p>	<p>Start Date 2014-03-28T09:48:42Z End Date 2014-03-28T09:48:51Z</p>	<p>Short Name SPOT Serial Identifier Orbit Type</p>	<p>Cloud Coverage % 0.0 Snow Coverage % 0.0 Illumination Elevation Angle 54.0</p>	

# OpenSearch (Datasets CWIC)



**FEDEO Clearinghouse OpenSearch**

**Series** **Datasets**

Series Filter

- V&T\_P
- V&T\_S10
- V&T\_D10
- ASF
- ASF
- CWIC
- MYD10A2V5

Choose a queryable

Start Date: 1999-03-17

End Date: 2014-04-11

Scale = 1 : 12M -6.05625, 34.78789

Product Information		Date		Platform Information		Distribution Information	
<input type="checkbox"/>	<b>Product Id</b> MYD10A2V5:G182641840-NSIDC_ECS <b>Title</b> SC:MYD10A2.005:28308063 <b>Abstract</b> Data granule returned from NASA's Earth Observing System Clearinghouse (ECHO) <input type="button" value="Show metadata"/>	<b>Start Date</b> 2002-07-20T00:00:00Z <b>End Date</b> 2002-07-27T23:59:59Z	<b>Short Name</b> Aqua <b>Instrument Short Name</b> MODIS	<b>Format</b> application/x-hdfEOS <b>Size</b> 0.0722895 <b>Resource</b> <a href="#">G182641840-NSIDC_ECS</a> <a href="#">G182641840-NSIDC_ECS</a> <a href="#">G182641840-NSIDC_ECS</a>			
<input type="checkbox"/>	<b>Product Id</b> MYD10A2V5:G182641843-NSIDC_ECS <b>Title</b> SC:MYD10A2.005:28308071 <b>Abstract</b> Data granule returned from NASA's Earth Observing System Clearinghouse (ECHO) <input type="button" value="Show metadata"/>	<b>Start Date</b> 2002-07-20T00:00:00Z <b>End Date</b> 2002-07-27T23:59:59Z	<b>Short Name</b> Aqua <b>Instrument Short Name</b> MODIS	<b>Format</b> application/x-hdfEOS <b>Size</b> 0.0918093 <b>Resource</b> <a href="#">G182641843-NSIDC_ECS</a> <a href="#">G182641843-NSIDC_ECS</a> <a href="#">G182641843-NSIDC_ECS</a>			
<input type="checkbox"/>	<b>Product Id</b> MYD10A2V5:G136602439-NSIDC_ECS <b>Title</b> SC:MYD10A2.005:15899369 <b>Abstract</b> Data granule returned from NASA's Earth Observing System Clearinghouse (ECHO) <input type="button" value="Show metadata"/>	<b>Start Date</b> 2002-07-12T00:00:00Z <b>End Date</b> 2002-07-19T23:59:59Z	<b>Short Name</b> Aqua <b>Instrument Short Name</b> MODIS	<b>Format</b> application/x-hdfEOS <b>Size</b> 0.071603 <b>Resource</b> <a href="#">G136602439-NSIDC_ECS</a> <a href="#">G136602439-NSIDC_ECS</a> <a href="#">G136602439-NSIDC_ECS</a>			
<input type="checkbox"/>	<b>Product Id</b> MYD10A2V5:G136602444-NSIDC_ECS <b>Title</b> SC:MYD10A2.005:15899368 <b>Abstract</b> Data granule returned from NASA's Earth Observing System Clearinghouse (ECHO) <input type="button" value="Show metadata"/>	<b>Start Date</b> 2002-07-12T00:00:00Z <b>End Date</b> 2002-07-19T23:59:59Z	<b>Short Name</b> Aqua <b>Instrument Short Name</b> MODIS	<b>Format</b> application/x-hdfEOS <b>Size</b> 0.071589 <b>Resource</b> <a href="#">G136602444-NSIDC_ECS</a> <a href="#">G136602444-NSIDC_ECS</a> <a href="#">G136602444-NSIDC_ECS</a>			

# OpenSearch (Datasets Radarsat2)



Home Services Order List Service Requests

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## FEDED Clearinghouse OpenSearch

Tools

Series Datasets

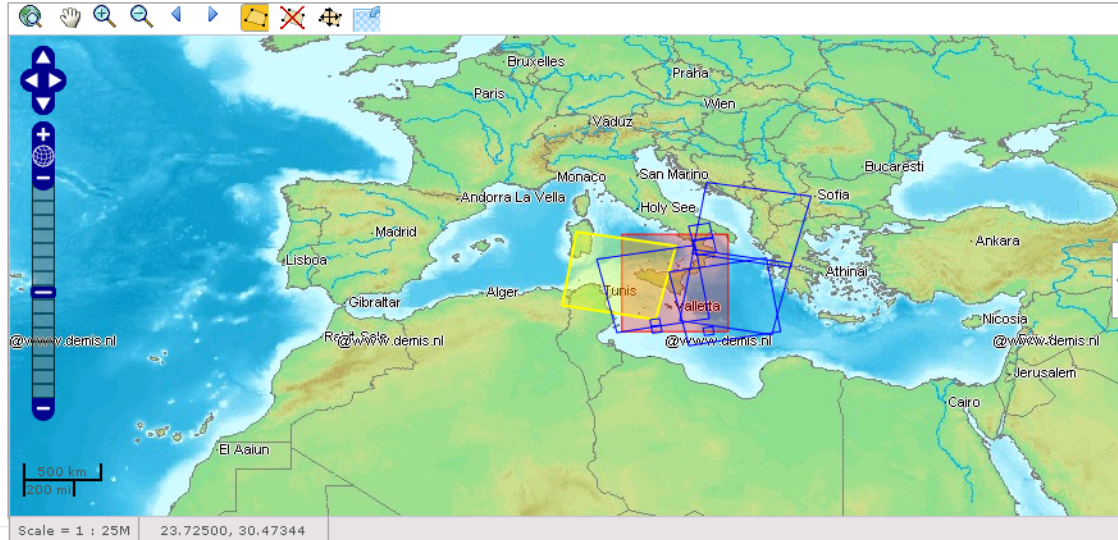
Series

- MDA
  - MDA-GSI:RSAT2\_SEGMENTS (D)
  - MDA-GSI:RSAT2\_NRT (D)
  - MDA-GSI:RSAT2\_NON\_NRT (D)

Choose a queryable

Start Date

End Date



Series Search Results Datasets Search Results

Page 1 of 22

1 2 3 4 5 >

Results 1 - 10 of 212

Product Information	Date	Platform Information	Sensing Information	Preview
<input checked="" type="checkbox"/> <p>Collection Identifier MDA-GSI:RSAT2_SEGMENTS</p> <p>Product Id urn:ogc:def:EDP:MDA-GSI:RSAT2_SEGMENTS:ITMA:311407:1:0</p> <p>Orbit Number 32308</p> <p>Orbit Direction DESCENDING</p> <p>Last Orbit Number 32308</p> <p><input type="button" value="Show metadata"/></p>	<p>Start Date 2014-02-21T05:18:59.445</p> <p>End Date 2014-02-21T05:20:15.906</p>	<p>Short Name NoName</p> <p>Serial Identifier</p> <p>Orbit Type</p> <p>Instrument Short Name SAR</p> <p>Sensor Type RADAR</p> <p>Sensor Operational Mode ScanSAR Wide</p> <p>Sensor Resolution 100.0</p> <p>Swath Identifier SCWA</p>	<p>Polarisation Mode S</p> <p>Polarisation Channels VV</p> <p>Antenna Look Direction RIGHT</p> <p>Minimum Incidence Angle 36.569565</p>	
<input type="checkbox"/> <p>Collection Identifier MDA-GSI:RSAT2_SEGMENTS</p> <p>Product Id urn:ogc:def:EDP:MDA-GSI:RSAT2_SEGMENTS:ITMA:311319:1:0</p> <p>Orbit Number 32301</p> <p>Orbit Direction ASCENDING</p> <p>Last Orbit Number 32301</p> <p><input type="button" value="Show metadata"/></p>	<p>Start Date 2014-02-20T17:03:39.745</p> <p>End Date 2014-02-20T17:03:47.635</p>	<p>Short Name NoName</p> <p>Serial Identifier</p> <p>Orbit Type</p> <p>Instrument Short Name SAR</p> <p>Sensor Type RADAR</p> <p>Sensor Operational Mode Multi-Look Fine</p> <p>Sensor Resolution 9.0</p> <p>Swath Identifier MF6F</p>	<p>Polarisation Mode S</p> <p>Polarisation Channels HH</p> <p>Antenna Look Direction RIGHT</p> <p>Minimum Incidence Angle 49.718533</p>	



# OpenSearch (Example Gazetteer)



- [http://geo.spacebel.be/opensearch/request/?httpAccept=application/atom%2Bxml&subject=EOP:MDA-GSI:RSAT2\\_NRT&startDate=2012-10-31T00:00:00Z&endDate=2013-10-31T00:00:00Z&name=Roma&radius=100000&recordSchema=om](http://geo.spacebel.be/opensearch/request/?httpAccept=application/atom%2Bxml&subject=EOP:MDA-GSI:RSAT2_NRT&startDate=2012-10-31T00:00:00Z&endDate=2013-10-31T00:00:00Z&name=Roma&radius=100000&recordSchema=om)

Displaying content from [geo.spacebel.be](http://geo.spacebel.be). The content displayed below and overlaid onto this map is provided by a third party, and Google is not responsible for it. Information you enter below may become available to the third party.

FEDEO Clearinghouse - Search Response

- um:ogc:def:EOP:MDA-GSI:RSAT2\_NRT:GATN:235519:1:0  
Platform Serial Identifier RADARSAT-2 Platform Orbit Type LEO
- um:ogc:def:EOP:MDA-GSI:RSAT2\_NRT:GATN:231456:1:0  
Platform Serial Identifier RADARSAT-2 Platform Orbit Type LEO
- um:ogc:def:EOP:MDA-GSI:RSAT2\_NRT:GATN:255172:1:0  
Platform Serial Identifier RADARSAT-2 Platform Orbit Type LEO
- um:ogc:def:EOP:MDA-GSI:RSAT2\_NRT:GATN:235519:2:0  
Platform Serial Identifier RADARSAT-2 Platform Orbit Type LEO
- um:ogc:def:EOP:MDA-GSI:RSAT2\_NRT:GATN:231456:2:0  
Platform Serial Identifier RADARSAT-2 Platform Orbit Type LEO
- um:ogc:def:EOP:MDA-GSI:RSAT2\_NRT:GATN:233155:1:0  
Platform Serial Identifier RADARSAT-2 Platform Orbit Type LEO
- um:ogc:def:EOP:MDA-GSI:RSAT2\_NRT:GATN:227221:1:0  
Platform Serial Identifier RADARSAT-2 Platform Orbit Type LEO
- um:ogc:def:EOP:MDA-GSI:RSAT2\_NRT:GATN:230267:1:0  
Platform Serial Identifier RADARSAT-2 Platform Orbit Type LEO
- um:ogc:def:EOP:MDA-GSI:RSAT2\_NRT:GATN:228967:1:0  
Platform Serial Identifier RADARSAT-2 Platform Orbit Type LEO
- um:ogc:def:EOP:MDA-GSI:RSAT2\_NRT:GATN:227221:2:0  
Platform Serial Identifier RADARSAT-2 Platform Orbit Type LEO

**urn:ogc:def:EOP:MDA-GSI:RSAT2\_NRT:GATN:230267:1:0**

FEDEO Clearinghouse	RADARSAT-2	Orbit	25784
Platform	Serial	Number	
Identifier	Identifier	Orbit	Ascending
Platform	LEO	Direction	
Orbit Type		Last	25784
Instrument	SAR	Orbit	
Short Name		Number	
Sensor	RADAR	Start	2012-11-21T17:05:57.271
Type		Date	
Operational	Standard	End Date	2012-11-21T17:06:11.658
Mode			
Sensor	25.0		
Resolution			
Swath	S3		
Identifier			
Media Type	ATOM   RSS		
Metadata	SRU		
	O&M		

- Complete FedEO platform installation at ESA/ESRIN
- Populate dataset series catalogue with dataset series metadata for all available series. Currently, not all dataset series have ISO19139 metadata
- Integrate additional back-ends
- Add RESTful interface in addition to SRU-style interface
- Support content negotiation (via HTTP header)
  - Alternative to httpAccept parameter
- Support metadata translation
  - E.g. OGC 10-157r3 to r4 or vice-versa
- Support W3C RDF responses
  - Using W3C DCAT and W3C LDP 1.0
- Support sru:recordSchema for ISO metadata as well

- Align with CEOS Best Practice
  - Add “icon” link for thumbnails
  - Simple GEORSS instead of georss:where
  - Support more queryables (e.g. startPage)

- Seamless and harmonised access to heterogeneous EO datasets from multiple mission ground segments is an operational reality in Europe and Canada
  - HMA is the European model and contribution to interoperability in the Earth Observation domain
- FedEO Prototype System:
  - Allows to provide brokered discovery (and access) capability for (European and Canadian) EO data through HMA standard interfaces
  - Implements the OpenSearch OGC interfaces for an increased number of discoverable and accessible EO data collections, and for interfacing with CEOS Community Catalogues and Clients

*HMA standards and related activities/projects, test suites and SW developments:* <http://wiki.services.eoportal.org/tiki-index.php?page=HMA%20Wiki>

*Standards configuration management table and download*  
<http://wiki.services.eoportal.org/tiki-index.php?page=HMA+Configuration+Management+Table>

*FedEO:* <http://geo.spacebel.be/opensearch/readme.html>

**Thank you !**  
**Any question ?**

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  - Coordination, GSCB, CEOS and GEO