



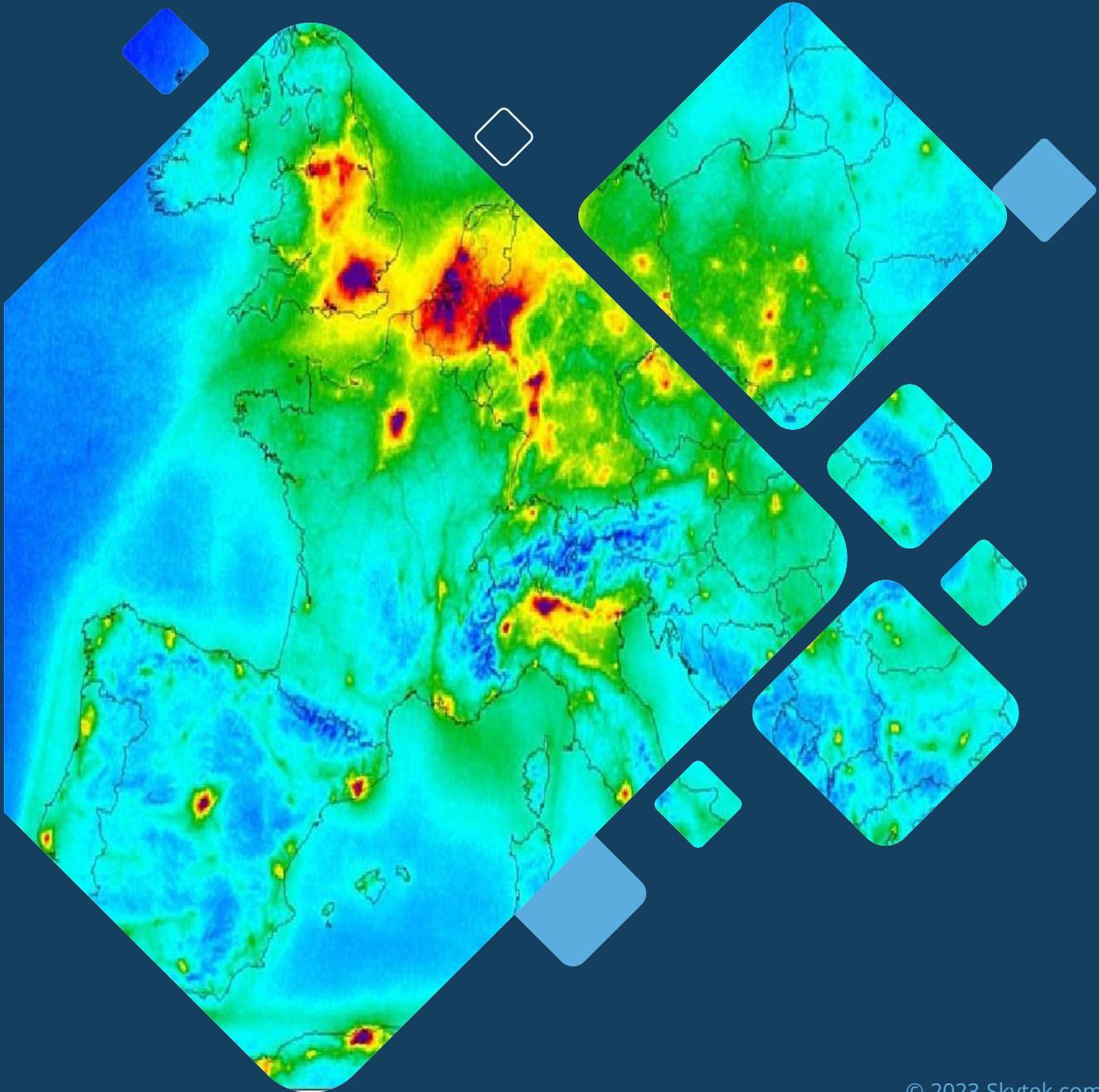
EVDC for EarthCARE



AGENDA

28/06/2023
(15:00 CET)

- 15:00 Introduction to Satellite Data Archive on EVDC
- 15:15 CIS tool interface and use case
- 15:35 ALTLID and MSI L1 tools integration to EVDC
- 16:00 5 mins break?
- 16:05 Collocation Database
- 16:25 Orbit Prediction and overpass tool
- 16:45 Q & A



Introduction to satellite archive on EVDC



EVDC – Platform Overview

ICHEC (Ireland)



Data ingestion



Search Engine / Catalogue

Satellite Data Archive



Sentinel 5P
Aeolus
MIPAS
EarthCARE



HPC
(supercomputer nodes)

Skytek (Ireland)



Ca1/Va1 data catalogue



Web UI



Web Tools



CMS with documentation



Orbit Tools

NILU (Norway)



Ca1/Va1 Database



DCIO



Ca1/Va1 data submission



data campaign support

EVDC – Satellite data archive

Available atmospheric mission data (approx 500TB)

- Sentinel 5P
- Aeolus
- MIPAS (Envisat)
- **Future EarthCARE**

Access

- <https://evdc.esa.int>
- Registration required (NILU u/p is sufficient)

The screenshot shows the 'Search Satellite Data' page of the EVDC archive. At the top, there is a navigation bar with links: Home, Search Cal/Val Data, Search Satellite Data, Upload Data, Documentation, Tools, Campaigns, and Overpass Tool. Below the navigation bar is a search bar labeled 'Search Satellite Data'. A text block below the search bar encourages users to register to search the archive and use HARP tools. The main section is the 'Satellite Search Form', which includes several fields: 'Satellite' (a dropdown menu currently showing '-----'), 'Instrument' (a dropdown menu showing '-----'), 'Timeliness' (a dropdown menu showing '-----'), 'Product Type' (a dropdown menu showing 'Aeolus', 'Sentinel-1', and 'Sentinel-2'), 'Processor Version' (a dropdown menu showing 'Envisat' and 'EarthCARE'), 'Start date' (a date field set to '01 / 01 / 2023'), 'End date' (a date field set to '23 / 06 / 2023'), 'Longitude' (a text input field), and 'Latitude' (a text input field). To the right of the form is a map of the Americas with a tooltip that reads: 'Select ESA Earth Observation Mission. Only logged in users can access full range of satellite data in our data centre and download data. See here for more information about ESA missions'. The map also has icons for home, location, and trash.

EVDC – Satellite data search engine/catalogue

- Product ingestion and indexing services
- Fast, enterprise grade search engine (Solr)
- Spatial search functionalities



```
view-source:https://space.kay.ichec.ie/search?family_name=EarthCARE
18 <os:startPage>1</os:startPage>
19 <os:itemsPerPage>25</os:itemsPerPage>
20 <os:query count="25" page="1" role="request"/>
21
22
23 <entry>
24
25   <family_short>ECA</family_short>
26
27   <ogr_valid>True</ogr_valid>
28
29   <creator>MSIL1_ECGP</creator>
30
31   <creation_time>2023-02-27T19:22:03Z</creation_time>
32
33   <acquisition_start_time>2025-06-25T00:56:46Z</acquisition_start_time>
34
35   <processor_name>MSIL1_ECGP</processor_name>
36
37   <id>ECA_EXAA_MSI_NOM_1B_20250625T005646Z_20230227T191934Z_42043E</id>
38
39   <inventory_time>2023-05-29T09:36:40Z</inventory_time>
40
41   <source>MSIL1_ECGP</source>
42
43   <platform>EarthCARE</platform>
44
45   <score>11.537365</score>
46
47   <_version_>1767217526033350656</_version_>
48
49   <processing_level>1B</processing_level>
50
51   <processor_version>4.1</processor_version>
52
53   <updated>2025-06-25T00:56:46Z</updated>
54
55   <instrument_family_short>MSI</instrument_family_short>
56
57   <georss:box>POLYGON((-161.277206 22.5000000, -161.277206 -22.5000000, -169.997162 -22.5000000, -169.997162 22.5000000, -161.277206 22.5000000))</georss:box>
58
59   <md5>c18e4be73484f8e9fca79f8e87415da9</md5>
60
61   <family_name>EarthCARE</family_name>
62
63   <product_type>M-NOM</product_type>
64
65   <acquisition_stop_time>2025-06-25T01:08:22Z</acquisition_stop_time>
66
67   <processing_facility_name>GHV</processing_facility_name>
68
69   <bytes>618466664</bytes>
70
71   <title>ECA_EXAA_MSI_NOM_1B_20250625T005646Z_20230227T191934Z_42043E</title>
72
73   <cycle_number>42043</cycle_number>
74
75   <thumbnail>https://maps.googleapis.com/maps/api/staticmap?size=200x200&format=png&center=4.74885608351,-164.763569074&path=color:0xff0000|weight:5|
76
77   <content_type := "html">&lt;img src="https://maps.googleapis.com/maps/api/staticmap?size=200x200&format=png&center=4.74885608351,-164.763569074&path=
78
79   <link href="https://s3.kay.ichec.ie/evdcearthcare/ECA_EXAA_MSI_NOM_1B_20250625T005646Z_20230227T191934Z_42043E.zip" rel="alternate"></link>
80
81 </entry>
82
```

EVDC – Satellite data search UI

Satellite Search Form

Satellite	Sentinel-5p	▼
Instrument	TROPOMI	▼
Timeliness	-----	▼
Product Type	S5P_NRTI_L2_O3___	▼
Processor Version	-----	▼
Start date	01 / 01 / 2023	📅
End date	27 / 06 / 2023	📅
Longitude	-7.107275,-5.238902,-5.249893,-7.085294	
Latitude	53.842481,53.842481,52.898631,52.739285	

★ Submit



EVDC – Satellite data search UI

Satellite Search Form

Satellite: Sentinel-5p

Instrument: TROPOMI

Timeliness: -----

Product Type: S5P_NRTI_L2_O3___

Processor Version: -----

Start date: 01 / 01 / 2023

End date: 27 / 06 / 2023

Longitude: -7.107275,-5.238902,-5.249893,-7.085294

Latitude: 53.842481,53.842481,52.898631,52.739285

[★ Submit](#)

Select Point or Polygon

The map shows Ireland with a blue polygon highlighting a region in the east, covering parts of Drogheda, Mullingar, and Dublin. The map includes labels for major cities like Drogheda, Mullingar, Dublin, Newbridge, Portlaoise, Ennis, Waterford, Wexford, Bangor, St Asaph, and Aberystwyth. The Irish Sea is also labeled. The map is powered by Leaflet, Mapbox, and OpenStreetMap.

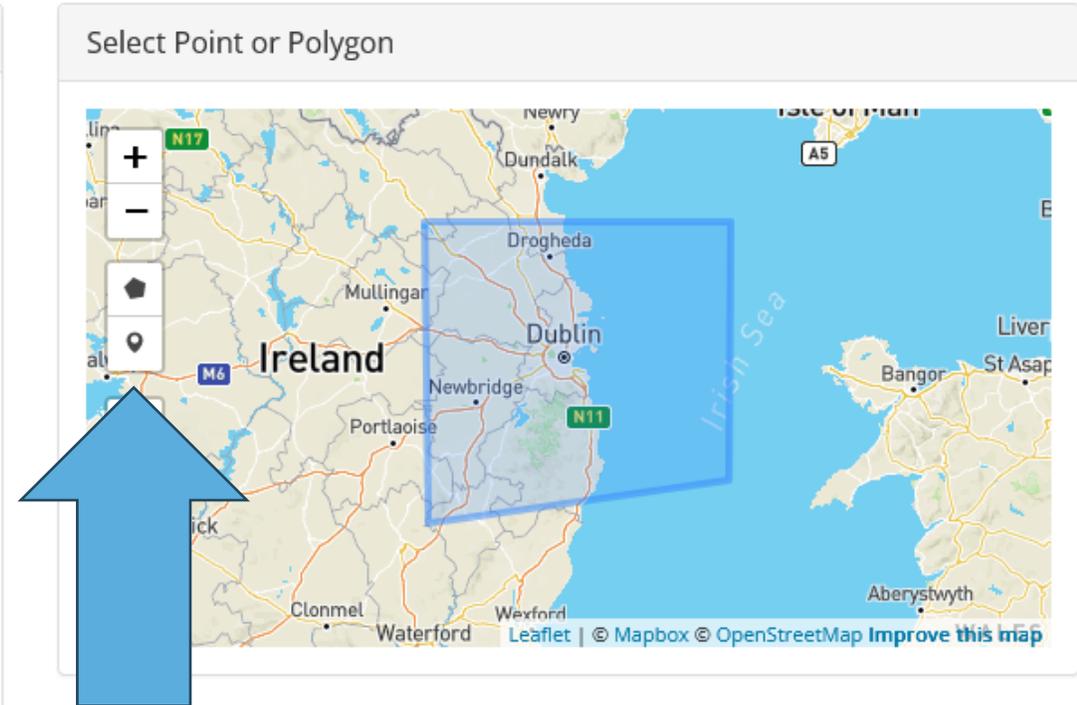
Search Terms

EVDC – Satellite data search UI

Satellite Search Form

Satellite	Sentinel-5p	▼
Instrument	TROPOMI	▼
Timeliness	-----	▼
Product Type	S5P_NRTI_L2_O3___	▼
Processor Version	-----	▼
Start date	01 / 01 / 2023	📅
End date	27 / 06 / 2023	📅
Longitude	-7.107275,-5.238902,-5.249893,-7.085294	
Latitude	53.842481,53.842481,52.898631,52.739285	

★ Submit



Select point or polygon

EVDC – Satellite data search UI

Satellite Search Form

Satellite	Sentinel-5p	▼
Instrument	TROPOMI	▼
Timeliness	-----	▼
Product Type	S5P_NRTI_L2_O3___	▼
Processor Version	-----	▼
Start date	01 / 01 / 2023	📅
End date	27 / 06 / 2023	📅
Longitude	-7.107275,-5.238902,-5.249893,-7.085294	
Latitude	53.842481,53.842481,52.898631,52.739285	

★ Submit

Select Point or Polygon



Draw

EVDC – Satellite data search UI

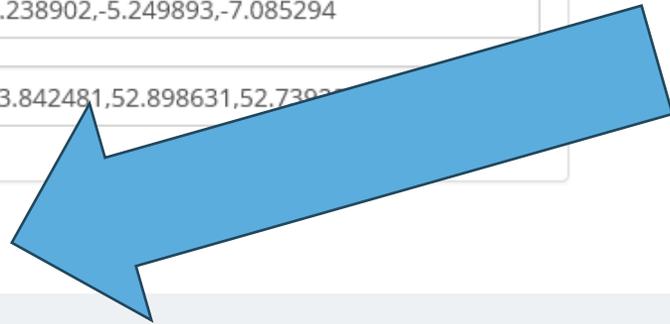
Satellite Search Form

Satellite	Sentinel-5p	▼
Instrument	TROPOMI	▼
Timeliness	-----	▼
Product Type	S5P_NRTI_L2_O3___	▼
Processor Version	-----	▼
Start date	01 / 01 / 2023	📅
End date	27 / 06 / 2023	📅
Longitude	-7.107275,-5.238902,-5.249893,-7.085294	
Latitude	53.842481,53.842481,52.898631,52.7392	

★ Submit



Submit



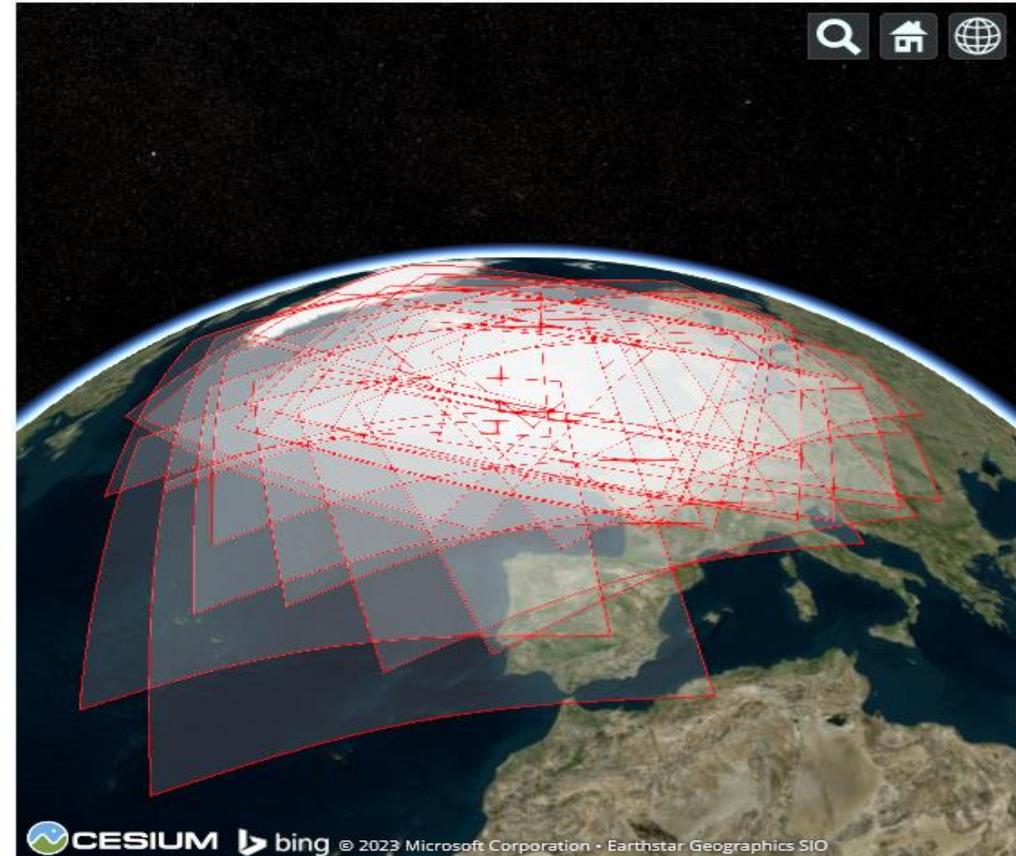
EVDC – Satellite data search UI

Search Query

Satellite	Sentinel-5p
Instrument	TROPOMI
Timeliness	
Product Type	S5P_NRTI_L2_SO2__
Processor Version	
Start date	2023-01-01
End date	2023-06-27
Longitude	-6.865494,-6.074183,-6.063193,-6.975398
Latitude	53.732141,53.719141,52.779176,52.805750

 Refine search

World View of Search Results



EVDC – Satellite data search UI

Page 1 out of 6 (132 Results)

1

Go To Page

Save Search and Process Results

Save the search results to access the data processing capabilities (subsetting, merging, viewing metadata).



<input type="checkbox"/>	Thumbnail	File Name	Size (MB)	Created	Satellite Name	Instrument
<input type="checkbox"/>		S5P_NRTI_L2_SO2___20230613T134849_20230613T135349_29356_03_02040...	112	2023-06-13T13:53:56Z	Sentinel-5p	TROPOMI
<input type="checkbox"/>		S5P_NRTI_L2_SO2___20230613T120849_20230613T121349_29355_03_02040...	111	2023-06-13T12:13:56Z	Sentinel-5p	TROPOMI
<input type="checkbox"/>		S5P_NRTI_L2_SO2___20230613T035849_20230613T040349_29350_03_02040...	29	2023-06-13T04:03:56Z	Sentinel-5p	TROPOMI

EVDC – Satellite data search UI

Page 1 out of 6 (132 Results)

1

Go To Page

Save Search and Process Results

Save the search results to access the data processing capabilities (subsetting, merging, viewing metadata).



<input type="checkbox"/>	Thumbnail	File Name	Size (MB)	Created	Satellite Name	Instrument
<input checked="" type="checkbox"/>		S5P_NRTI_L2_SO2___20230613T134849_20230613T135349_29356_03_02040...	112	2023-06-13T13:53:56Z	Sentinel-5p	TROPOMI
<input checked="" type="checkbox"/>		S5P_NRTI_L2_SO2___20230613T120849_20230613T121349_29355_03_02040...	111	2023-06-13T12:13:56Z	Sentinel-5p	TROPOMI
<input checked="" type="checkbox"/>		S5P_NRTI_L2_SO2___20230613T035849_20230613T040349_29350_03_02040...	29	2023-06-13T04:03:56Z	Sentinel-5p	TROPOMI
<input type="checkbox"/>		S5P_NRTI_L2_SO2___20230613T021849_20230613T022349_29349_03_02040...	14	2023-06-13T02:22:34Z	Sentinel-5p	TROPOMI



Click to download directly

EVDC – Satellite data search UI

Page 1 out of 6 (132 Results)

1 [Go To Page](#) [Save Search and Process Results](#) Save the search results to access the data process

<input type="checkbox"/>	Thumbnail	File Name
<input type="checkbox"/>		S5P_NRTI_L2_SO2___20230613T134849_20230613T135349_29356_03_02040...
<input type="checkbox"/>		S5P_NRTI_L2_SO2___20230613T120849_20230613T121349_29355_03_02040...
<input type="checkbox"/>		S5P_NRTI_L2_SO2___20230613T035849_20230613T040349_29350_03_02040...

S5P_NRTI_L2_SO2___20230613T134849_20230613T135349_29356_0
44s left — 44.4 of 113 MB (1.6 MB/sec) X

S5P_NRTI_L2_SO2___20230611T...03_020401_20230611T043403.nc
Completed — 11.8 MB

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51s left — 51.3 of 112 MB (1.2 MB/sec) X

S5P_NRTI_L2_SO2___20230613T...020401_20230613T040321(1).nc
Completed — 14.9 MB

S5P_NRTI_L2_SO2___20230613T...03_020401_20230613T040321.nc
Completed — 14.9 MB

[Show all downloads](#)

29	2023-06-13T04:03:56Z	Sentinel-5p	TROPOMI

EVDC – Satellite data search UI

Page 1 out of 6 (132 Results)

1

Go To Page

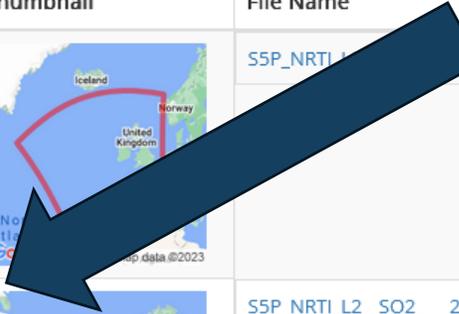
Save Search and Process Results

Save the search results to access the data processing capabilities (subsetting, merging, viewing metadata).



<input type="checkbox"/>	Thumbnail	File Name	Size (MB)	Created	Satellite Name	Instrument
<input checked="" type="checkbox"/>		S5P_NRTI_L2_SO2___20230613T1214849_20230613T135349_29356_03_02040...	112	2023-06-13T13:53:56Z	Sentinel-5p	TROPOMI
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<input checked="" type="checkbox"/>		S5P_NRTI_L2_SO2___20230613T035849_20230613T040349_29350_03_02040...	29	2023-06-13T04:03:56Z	Sentinel-5p	TROPOMI
<input type="checkbox"/>		S5P_NRTI_L2_SO2___20230613T021849_20230613T022349_29349_03_02040...	14	2023-06-13T02:22:34Z	Sentinel-5p	TROPOMI

Select products of interest



EVDC – Satellite data search UI

Page 1 out of 6 (132 Results)

1

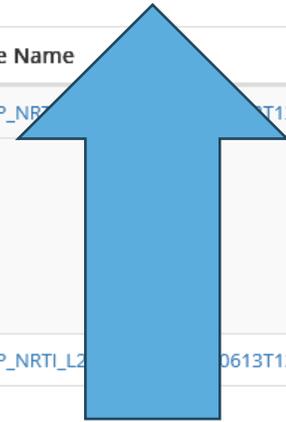
Go To Page

Save Search and Process Results

Save the search results to access the data processing capabilities (subsetting, merging, viewing metadata).



<input type="checkbox"/>	Thumbnail	File Name	Size (MB)	Created	Satellite Name	Instrument
<input checked="" type="checkbox"/>		S5P_NRTI_L2_SO2____20230613T134849_20230613T135349_29356_03_02040...	112	2023-06-13T13:53:56Z	Sentinel-5p	TROPOMI
<input checked="" type="checkbox"/>		S5P_NRTI_L2_SO2____20230613T120849_20230613T121349_29355_03_02040...	111	2023-06-13T12:13:56Z	Sentinel-5p	TROPOMI
<input checked="" type="checkbox"/>		S5P_NRTI_L2_SO2____20230613T035849_20230613T040349_29350_03_02040...	29	2023-06-13T04:03:56Z	Sentinel-5p	TROPOMI
<input type="checkbox"/>		S5P_NRTI_L2_SO2____20230613T021849_20230613T022349_29349_03_02040...	14	2023-06-13T02:22:34Z	Sentinel-5p	TROPOMI



Save

EVDC – Satellite data search UI



Home Search Cal/Val Data Search Satellite Data Upload Data Documentation ▾ Tools ▾ Campaigns ▾ Overpass Tool Contact Us / Data Policy 👤 My EVDC ▾

My Saved Searches

Page 1 of 5. [next](#)

Label	Search Date	Satellite	Instrument	Timeliness	Product Type	From	To	Location		
test	 June 27, 2023, 12:26 p.m.	Sentinel-5p	TROPOMI	Any	S5P_NRTI_L2__CO___	Jan. 1, 2023, midnight	June 27, 2023, midnight	POLYGON((21.583900 -52.676793, 12.176826 -38.609044, -3.197549 -45.642918, 1.019486 -70.261480))		
earthcare_sample	 June 14, 2023, 9:42 p.m.	EarthCARE	Any	Any	Any	Jan. 1, 2023, midnight	June 14, 2026, midnight	POLYGON((62.738631 -81.472634, 62.087434 -54.040522, 37.968459 -44.896485, 34.568104 -66.701497))		
new res	 May 23, 2023, 7:20 a.m.	Sentinel-5p	TROPOMI	Any	Any	Jan. 1, 2023, midnight	May 23, 2023, midnight	Any		

EVDC – Satellite data search UI

  esa eo validation data centre

Home Search Cal/Val Data Search Satellite Data Upload Data Documentation ▾ Tools ▾ Campaigns ▾ Overpass Tool Contact Us / Data Policy 👤 My EVDC ▾

My Saved Searches

Click to add label

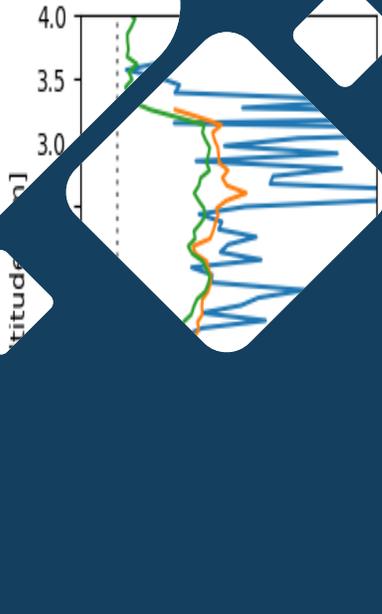
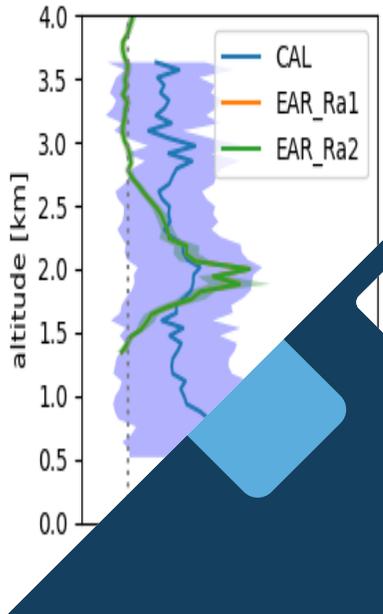
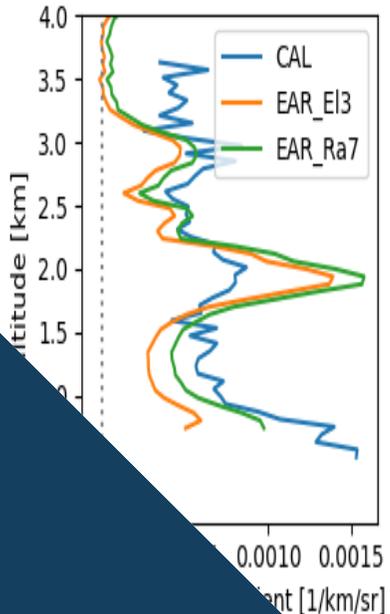
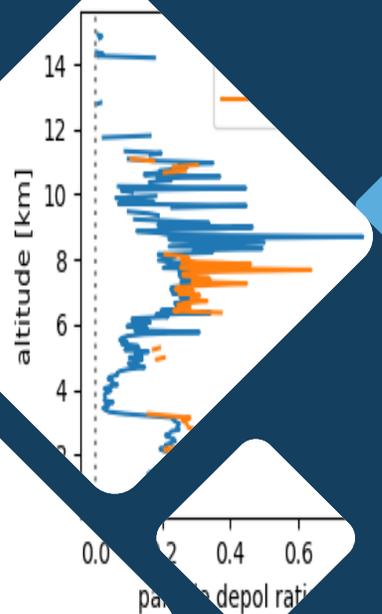
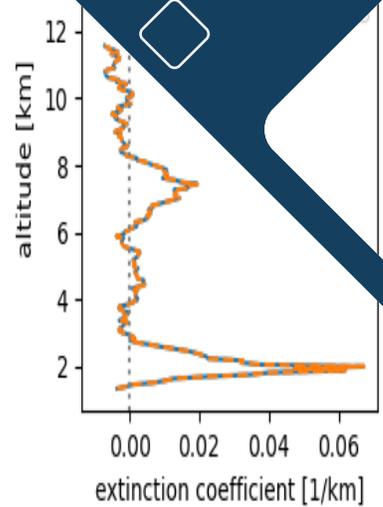
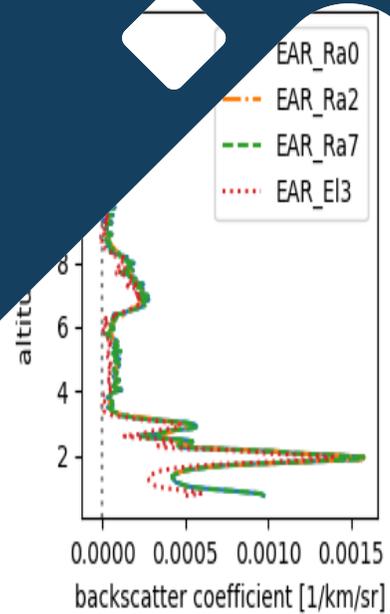
Page 1 of 5. [next](#)

Label	Search Date	Satellite	Instrument	Timeliness	Product Type	From	To	Location		
test	 June 27, 2023, 12:26 p.m.	Sentinel-5p	TROPOMI	Any	S5P_NRTI_L2__CO___	Jan. 1, 2023, midnight	June 27, 2023, midnight	POLYGON((21.583900 -52.676793, 12.176826 -38.609044, -3.197549 -45.642918, 1.019486 -70.261480))		
earthcare_sample	 June 14, 2023, 9:42 p.m.	EarthCARE	Any	Any	Any	Jan. 1, 2023, midnight	June 14, 2026, midnight	POLYGON((62.738631 -81.472634, 62.087434 -54.040522, 37.968459 -44.896485, 34.568104 -66.701497))		
new res	 May 23, 2023, 7:20 a.m.	Sentinel-5p	TROPOMI	Any	Any	Jan. 1, 2023, midnight	May 23, 2023, midnight	Any		

EVDC. Saving Satellite Data and Staging Satellite Data

- **Saving files** – a simple mechanism for grouping and tagging the files for further processing.
- For EarthCARE saving will also mean **staging files** for processing
- Because of the nature of staging mechanism there will be restrictions and quotas on how much data user can stage
- We envisage allowing big data processing tasks on request
- In the long term the ESA's strategy of single data source will be followed and so the files will be staged from the primary source (DIAS etc.)
- In the initial phase after launch we envisage to store everything and serve as early access point for catalogued EarthCare data fronted by the search engine

<input type="checkbox"/>		ECA_EXOA_AUX_JSG_1D_20241231T223802Z_20160222T091641Z_39319A.zip	24	2024-12-31T22:49:37Z	EarthCARE	
<input type="checkbox"/>		ECA_EXAA_BMA_FLX_2B_20241231T223802Z_20210929T141544Z_39316D.zip	3	2024-12-31T22:49:37Z	EarthCARE	
<input type="checkbox"/>		ECA_EXAA_BM_RAD_2B_20241231T223802Z_20210923T164500Z_39316D.zip	7	2024-12-31T22:49:37Z	EarthCARE	
<input type="checkbox"/>		ECA_EXAA_BMA_FLX_2B_20241231T223802Z_20210929T141544Z_39316D.zip	3	2024-12-31T22:49:37Z	EarthCARE	
<input type="checkbox"/>		ECA_EXAA_BM_RAD_2B_20241231T223802Z_20210923T164500Z_39316D.zip	7	2024-12-31T22:49:37Z	EarthCARE	



CIS, CLM, MSI tools and use cases

EVDC Processing System and CWL

- New processing system is based on CWL
- CWL – standard way to describe analysis pipelines to make them **portable** and **reusable**.
- CWL is designed to meet the needs of data-intensive science, such as Bioinformatics, Medical Imaging, Astronomy, High Energy Physics, and Machine Learning.
- Adopted by EO community, recommended by OGC, included in EOEPKA

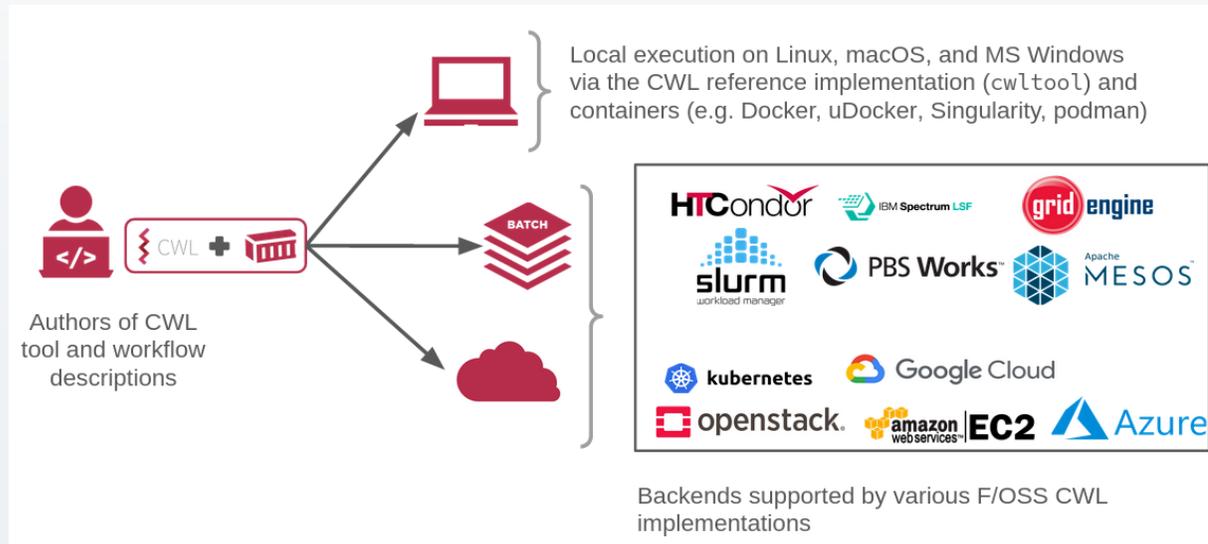


COMMON
WORKFLOW
LANGUAGE

EVDC Processing System and CWL

CWL Goals

- To express every possible analytic workflow as a graph of command line tools invocations
- To handle passing the files and values between workflows
- To be able to run identical workflows on many different environments using special runners (local machine, AWS,



```
#!/usr/bin/env cwl-runner

cwlVersion: v1.2
# This CommandLineTool executes the linux "harpmerge" command-line tool.

class: CommandLineTool
baseCommand: harpmerge

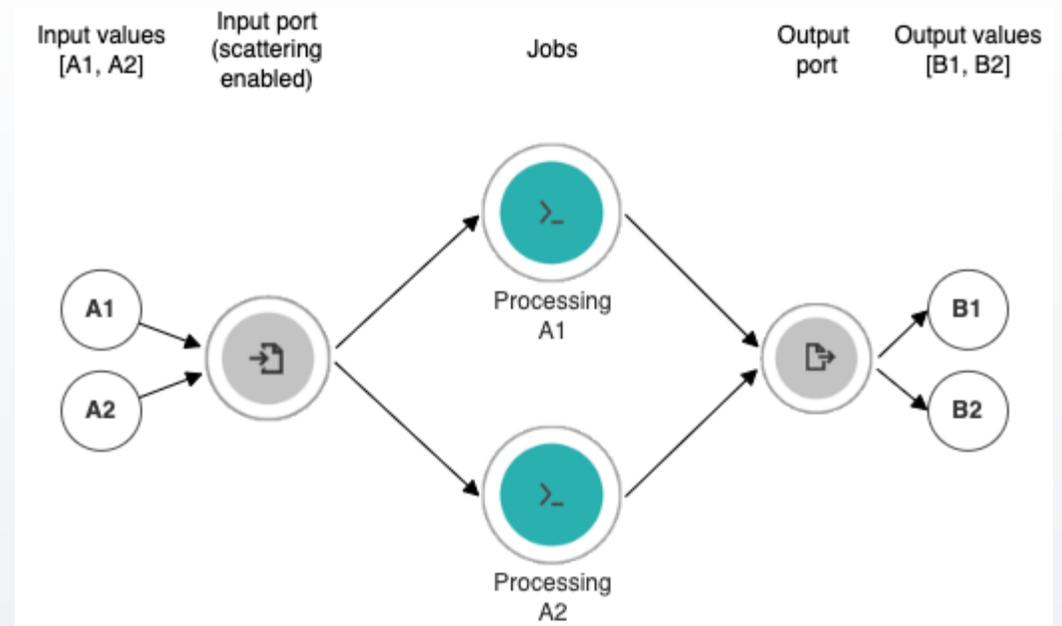
inputs:
  in1:
    type: File
    inputBinding:
      position: 1
  in2:
    type: File
    inputBinding:
      position: 2
  out:
    type: string
    inputBinding:
      position: 3
outputs:
  results:
    outputBinding:
      glob: '*.nc'
    outputEval: $(self.path.replace(/.nc$/, '/output.nc'))
    type: File
hints:
  DockerRequirement:
    dockerPull: evdc2harp
requirements:
  EnvVarRequirement:
    envDef:
      PATH: usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin
  ResourceRequirement: {}
  InlineJavascriptRequirement: {}

stdout: output/files/output.txt
```

EVDC Processing System and CWL

Parallelization and scaling

- To express every possible analytic workflow as a graph of command line tools invocations
- To handle passing the files and values between workflows
- To be able to run identical workflows on many different environments using special runners (local machine, AWS,



EVDC Processing System and CWL

- CWL is powerful but how to make CWL more accessible?
- How to make it more reusable between researchers
- How to hide some of its complexities and provide good defaults for generic cases

```
#!/usr/bin/env cwl-runner

cwlVersion: v1.2
# This CommandLineTool executes the linux "harpmerge" command-line
tool.

class: CommandLineTool
baseCommand: harpmerge

inputs:
  in1:
    type: File
    inputBinding:
      position: 1
  in2:
    type: File
    inputBinding:
      position: 2
  out:
    type: string
    inputBinding:
      position: 3
outputs:
  results:
    outputBinding:
      glob: '*.nc'
      outputEval: ${self.path.replace(/.nc$/, '/output.nc')}
    type: File
hints:
  DockerRequirement:
    dockerPull: evdc2harp
requirements:
  EnvVarRequirement:
    envDef:
      PATH:
usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin
ResourceRequirement: {}
InlineJavascriptRequirement: {}

stdout: output/files/output.txt
```

EVDC Processing System and CWL

harpmerge file1.nc file2.nc output.nc

```
#!/usr/bin/env cwl-runner

cwlVersion: v1.2
# This CommandLineTool executes the linux "harpmerge" command-line
tool.

class: CommandLineTool
baseCommand: harpmerge

inputs:
  in1:
    type: File
    inputBinding:
      position: 1
  in2:
    type: File
    inputBinding:
      position: 2
  out:
    type: string
    inputBinding:
      position: 3
outputs:
  results:
    outputBinding:
      glob: '*.nc'
      outputEval: ${self.path.replace(/.nc$/, '/output.nc')}
    type: File
hints:
  DockerRequirement:
    dockerPull: evdc2harp
requirements:
  EnvVarRequirement:
    envDef:
      PATH:
        /usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin
  ResourceRequirement: {}
  InlineJavascriptRequirement: {}

stdout: output/files/output.txt
```

EVDC Processing System and CWL

harpmerge file1.nc file2.nc output.nc

```
#!/usr/bin/env cwl-runner

cwlVersion: v1.2
# This CommandLineTool executes the linux "harpmerge" command-line
tool.

class: CommandLineTool
baseCommand: harpmerge

inputs:
  in1:
    type: File
    inputBinding:
      position: 1
  in2:
    type: File
    inputBinding:
      position: 2
  out:
    type: string
    inputBinding:
      position: 3
outputs:
  results:
    outputBinding:
      glob: '*.nc'
      outputEval: ${self.path.replace(/.nc$/, '/output.nc')}
    type: File
hints:
  DockerRequirement:
    dockerPull: evdc2harp
requirements:
  EnvVarRequirement:
    envDef:
      PATH:
        /usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin
  ResourceRequirement: {}
  InlineJavascriptRequirement: {}

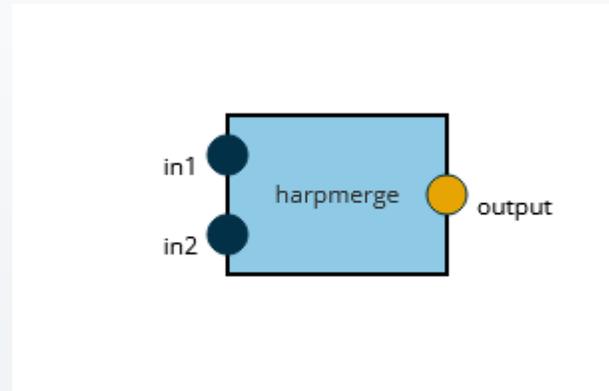
stdout: output/files/output.txt
```



EVDC Processing System and CWL

Visual representation of arbitrary command line tool

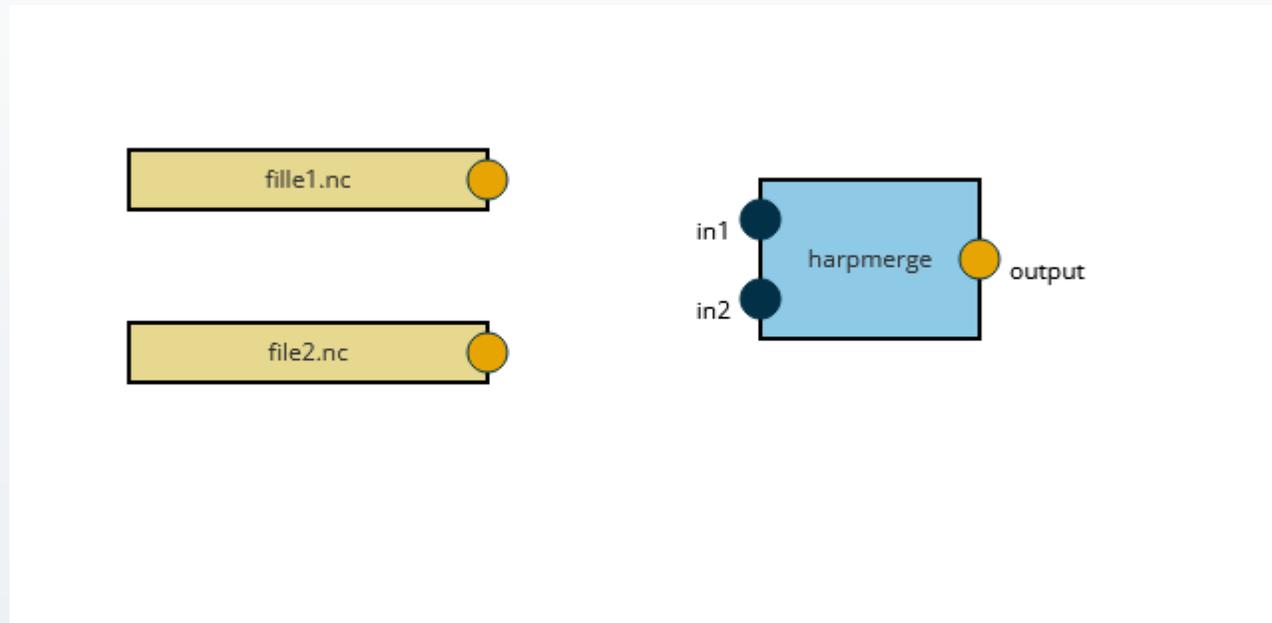
```
harpmerge file1.nc file2.nc output.nc
```



EVDC Processing System and CWL

Adding input files

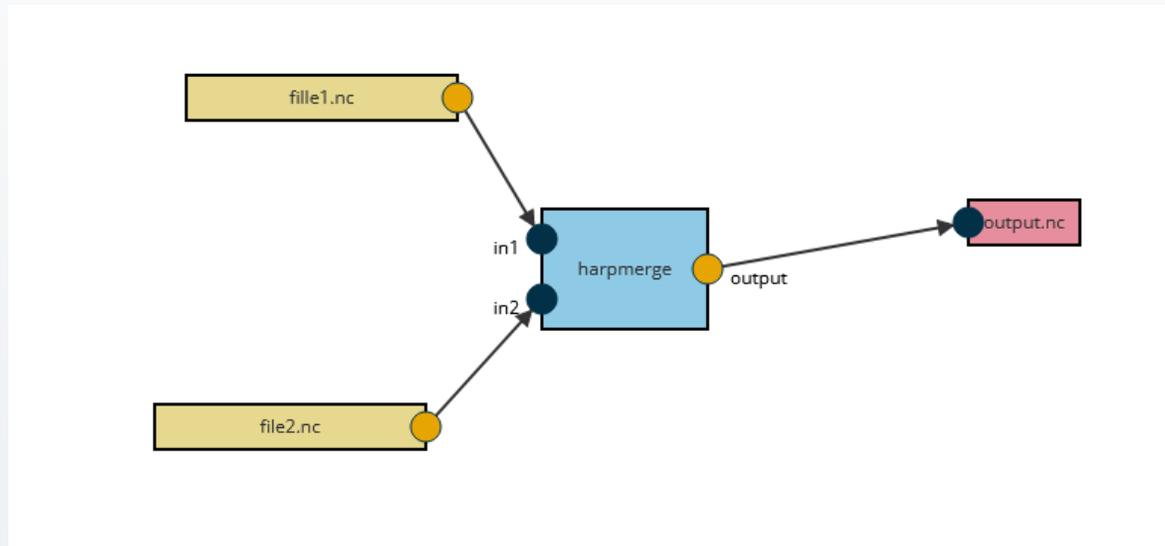
```
harpmerge file1.nc file2.nc output.nc
```



EVDC Processing System and CWL

Graph representing simple command line tool invocation

```
harpmerge file1.nc file2.nc output.nc
```



EVDC Processing System and CWL



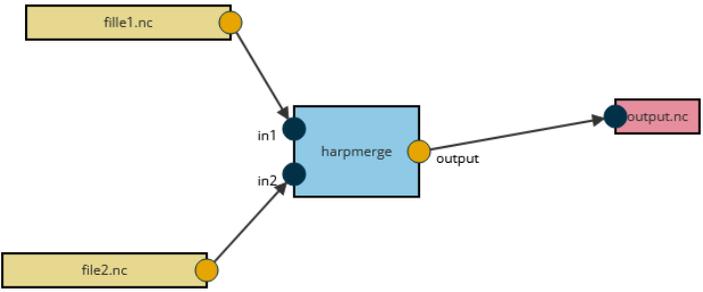
Home Search Cal/Val Data Search Satellite Data Upload Data Documentation Tools Campaigns Overpass Tool Contact Us / Data Policy My EVDC

Workflow Elements and Tools

Add Input Data + Add Workflow Step + Add Value + Add Output +

file2.nc Select Tool define value... output.nc

Workflow: harp merge



```
graph LR; file1[file1.nc] --> in1((in1)); file2[file2.nc] --> in2((in2)); in1 --> harpmerge[harpmerge]; in2 --> harpmerge; harpmerge --> output((output)); output --> output_file[output.nc];
```

Save Workflow Execute

Support

EVDC Processing System and CWL

Admin tools – defining commands, inputs and outputs

Jobs administration

JOBS	
Base commands	+ Add ✎ Change
Containers	+ Add ✎ Change
Executions	+ Add ✎ Change
Inputs	+ Add ✎ Change
Outputs	+ Add ✎ Change
Step ins	+ Add ✎ Change
Step outs	+ Add ✎ Change
Steps	+ Add ✎ Change
Workflow inputs	+ Add ✎ Change
Workflow outputs	+ Add ✎ Change
Workflows	+ Add ✎ Change

Home > Jobs > Base commands > Add base command

Add base command

Invocation:

Container: [✎](#) [+](#)

Stdout:

Stdin:

Stderr:

Home > Jobs > Inputs > Input object

Change input

Command: [✎](#) [+](#)

Name:

Value type:

Binding:

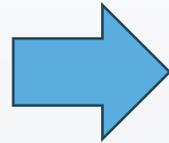
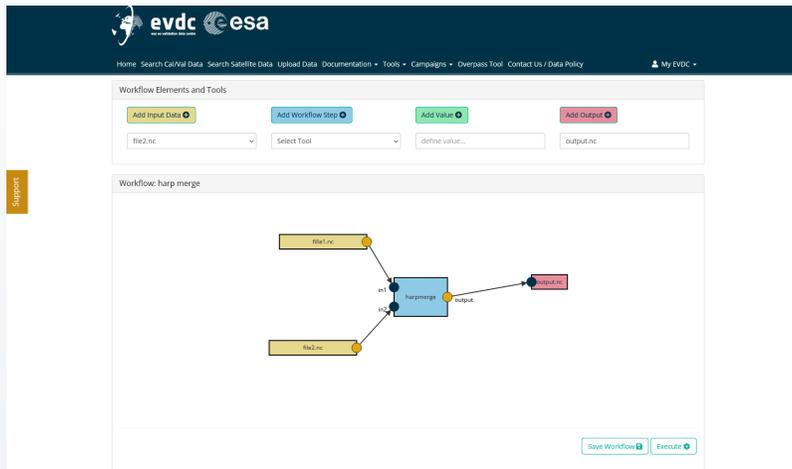
Position:

Prefix:

Separate

CIS EVDC Processing System and CIS

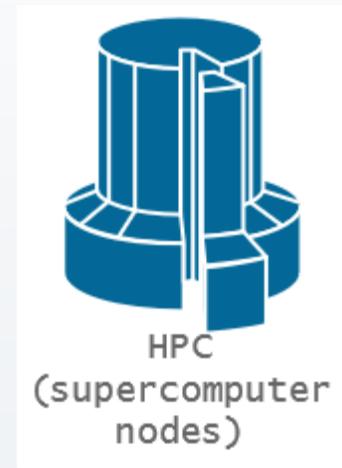
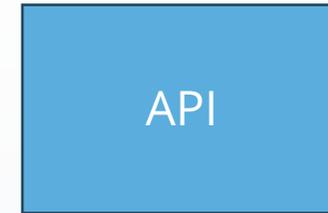
Processing infrastructure



```
#!/usr/bin/env cwl-runner
cwlVersion: v1.2
# This CommandLineTool executes the linux
# "harpmerge" command-line tool.
class: CommandLineTool
baseCommand: harpmerge

inputs:
  in1:
    type: File
    inputBinding:
      position: 1
  in2:
    type: File
    inputBinding:
      position: 2
  out:
    type: string
    inputBinding:
      position: 3
outputs:
  results:
    outputBinding:
      glob: '*.nc'
    outputEval: $(self.path.replace(/.nc$/,
'/output.nc'))
    type: File
hints:
  DockerRequirement:
    dockerPull: evdc2harp
requirements:
  EnvVarRequirement:
    envDef:
      PATH:
        usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/
sbin:/bin
  ResourceRequirement: {}
  InlineJavascriptRequirement: {}
stdout: output/files/output.txt
```

COMMON WORKFLOW LANGUAGE

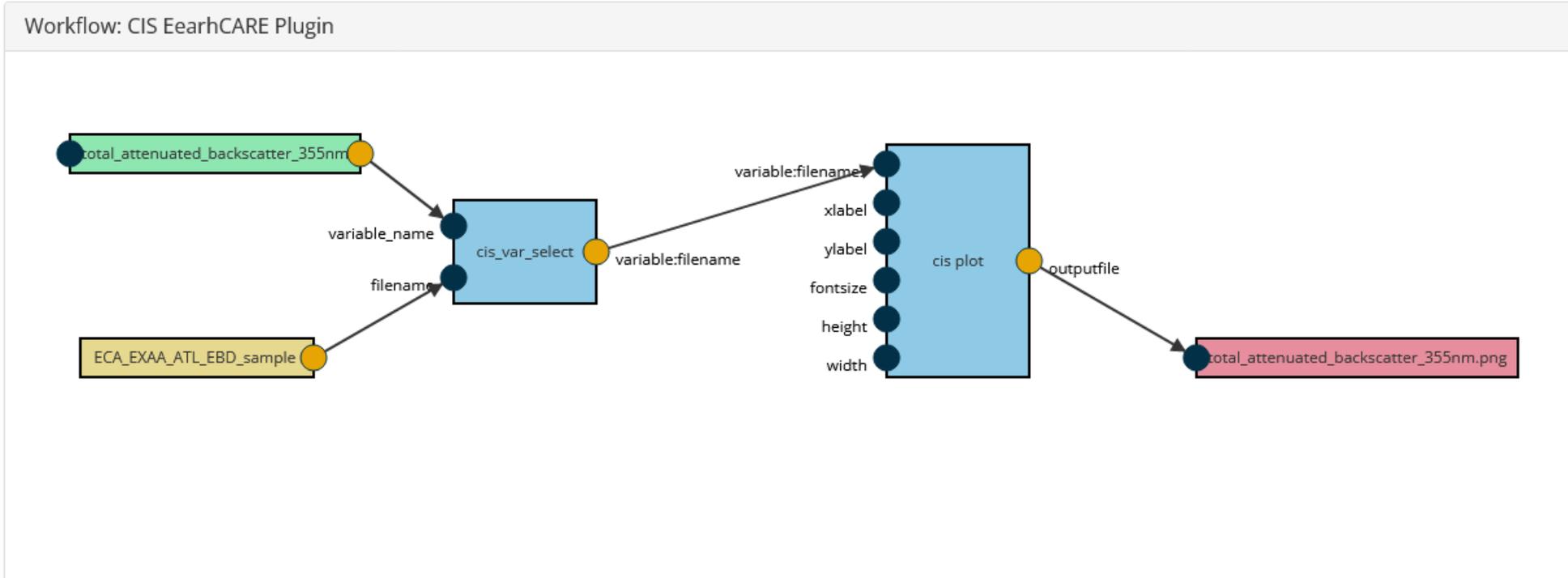


CIS Tool. EarthCARE plugin (reader)

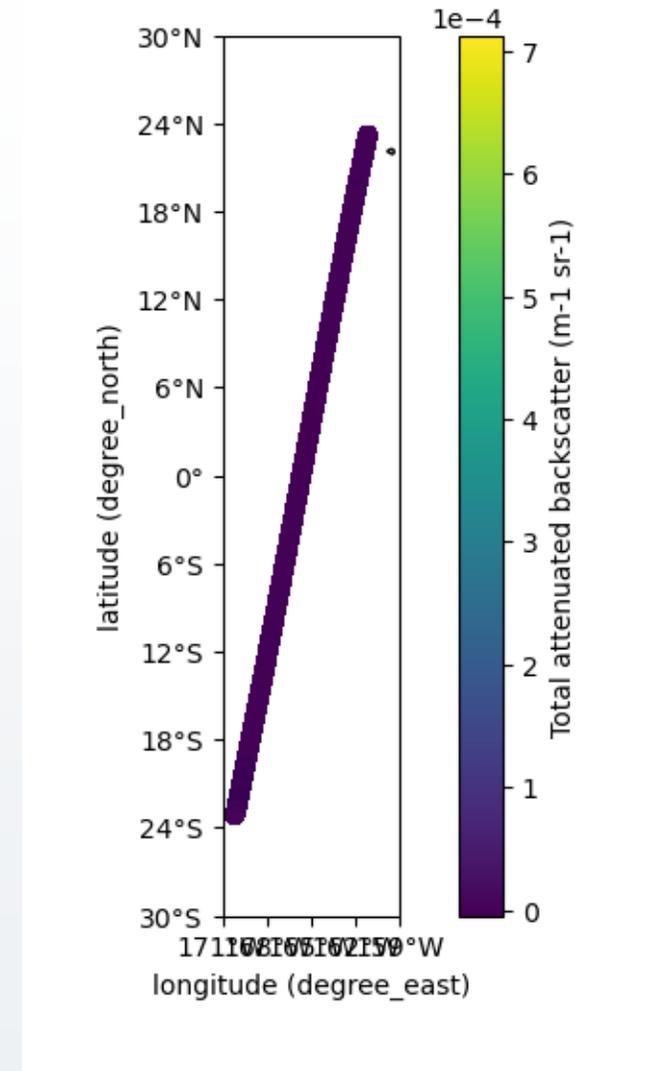
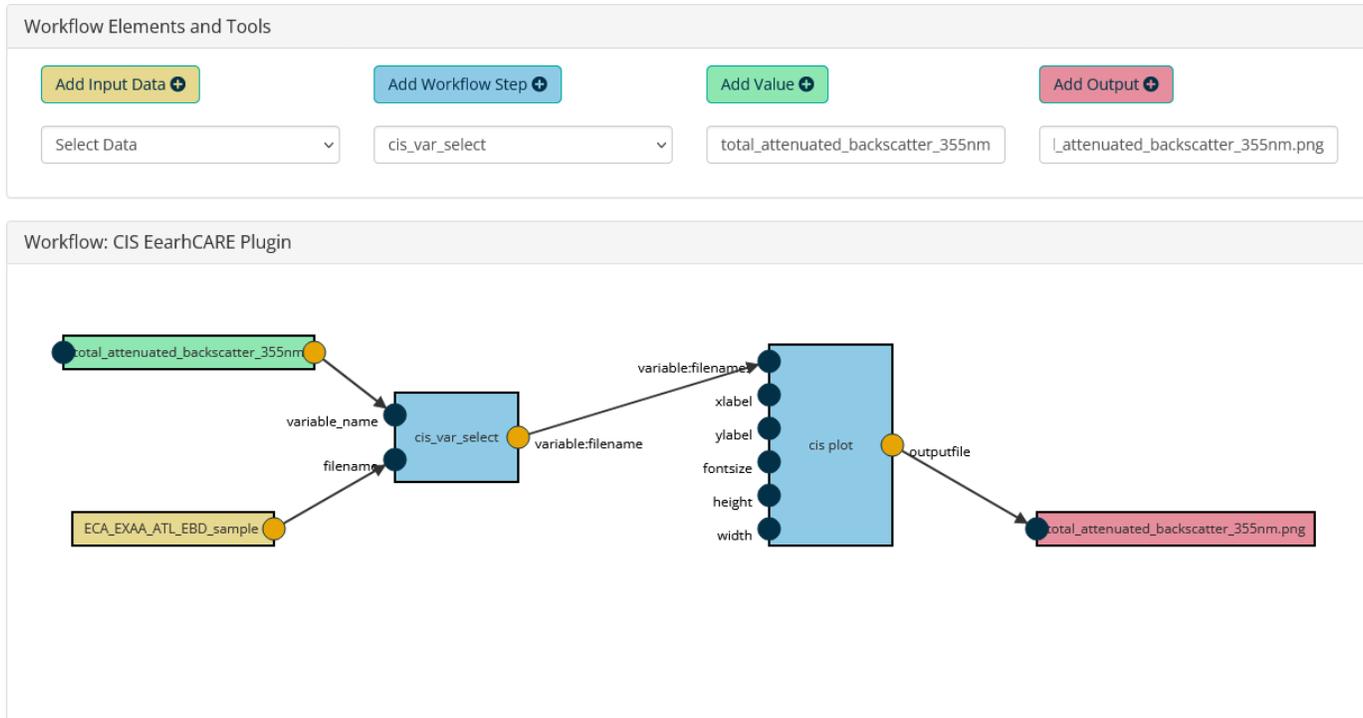
Workflow Elements and Tools

Add Input Data + Add Workflow Step + Add Value + Add Output +

Select Data cis_var_select total_attenuated_backscatter_355nm _attenuated_backscatter_355nm.png



CIS Tool. EarthCARE plugin (reader)



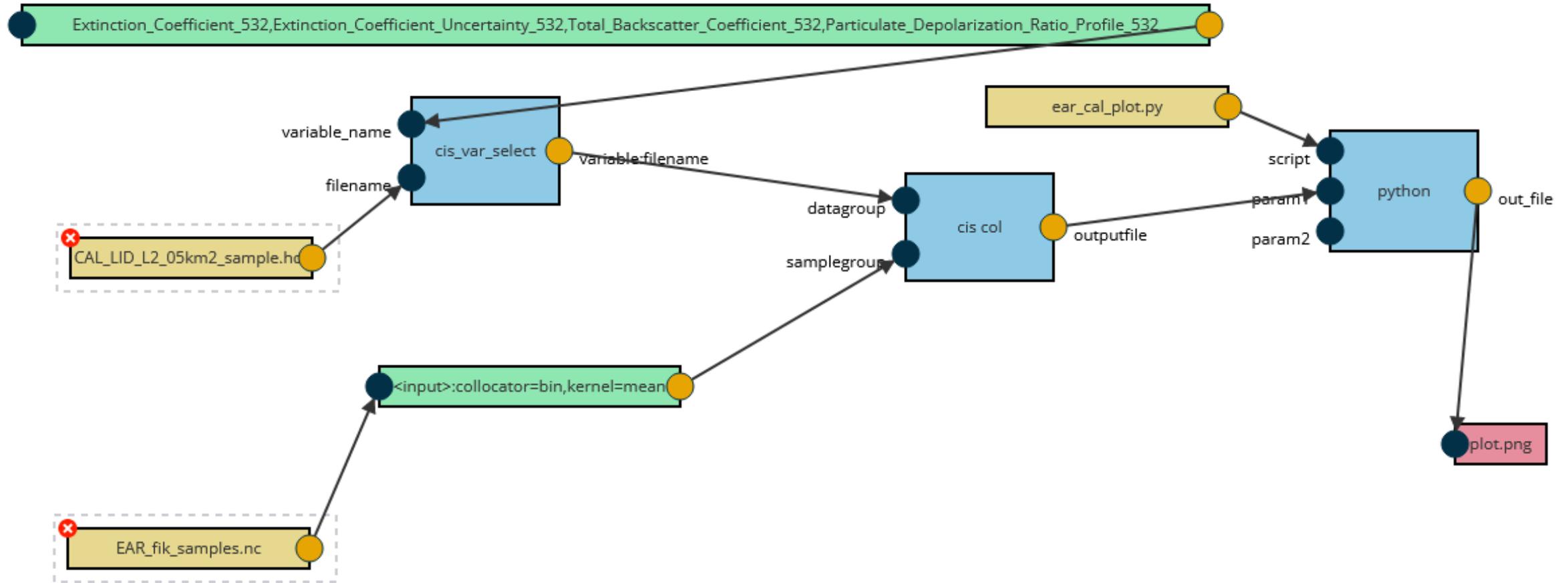
CIS Tool. EarthCARE plugin (reader)

The Plugin Status:

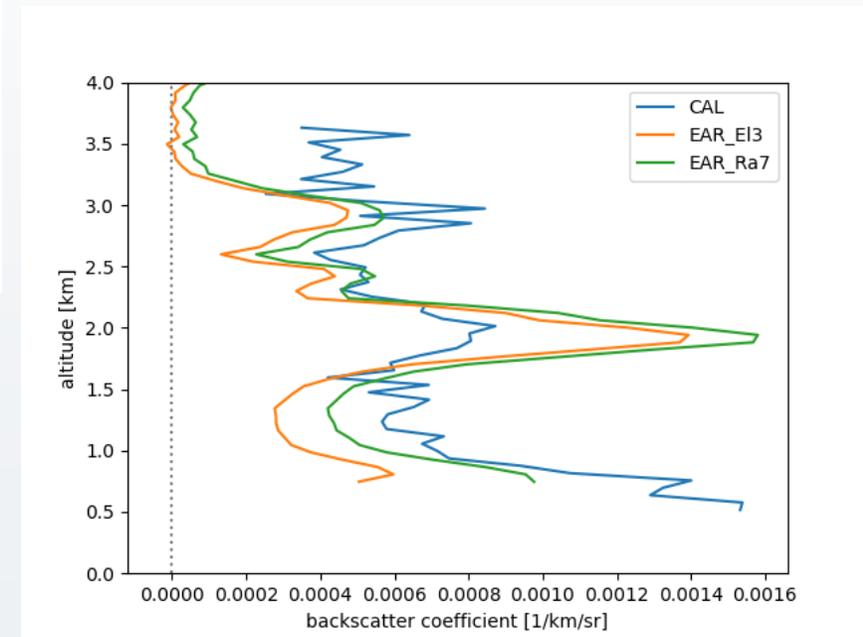
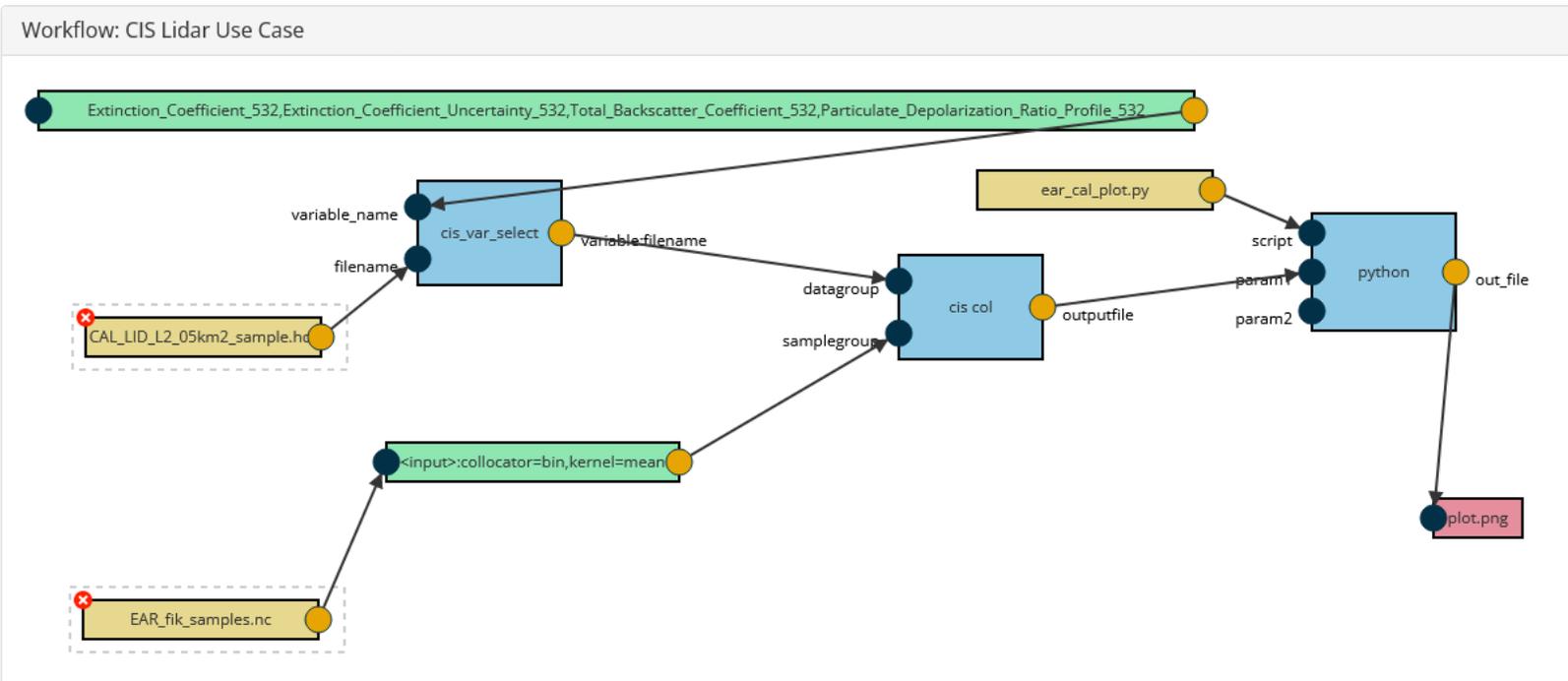
- Plugin is currently written for ALT and MSI products (with some exclusions)
- Automated test script for generating default plots of all possible variables of all test products
- Some product types generate errors from underlying NetCDF library
- Issue currently investigated
- Once fixed plugin to be pushed to the main CIS repository

CIS Tool. More practical use case

Workflow: CIS Lidar Use Case

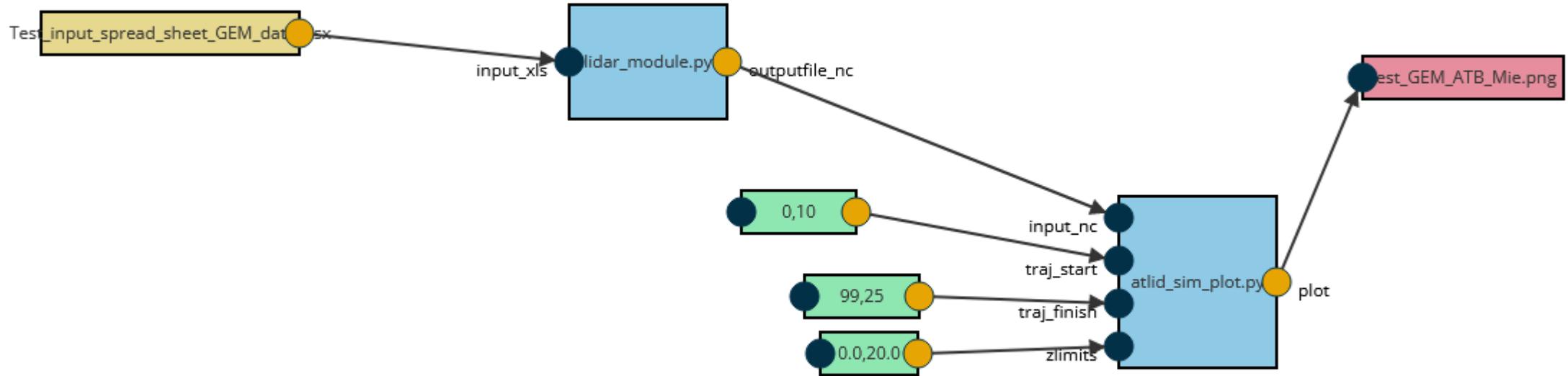


CIS Tool. More practical use case

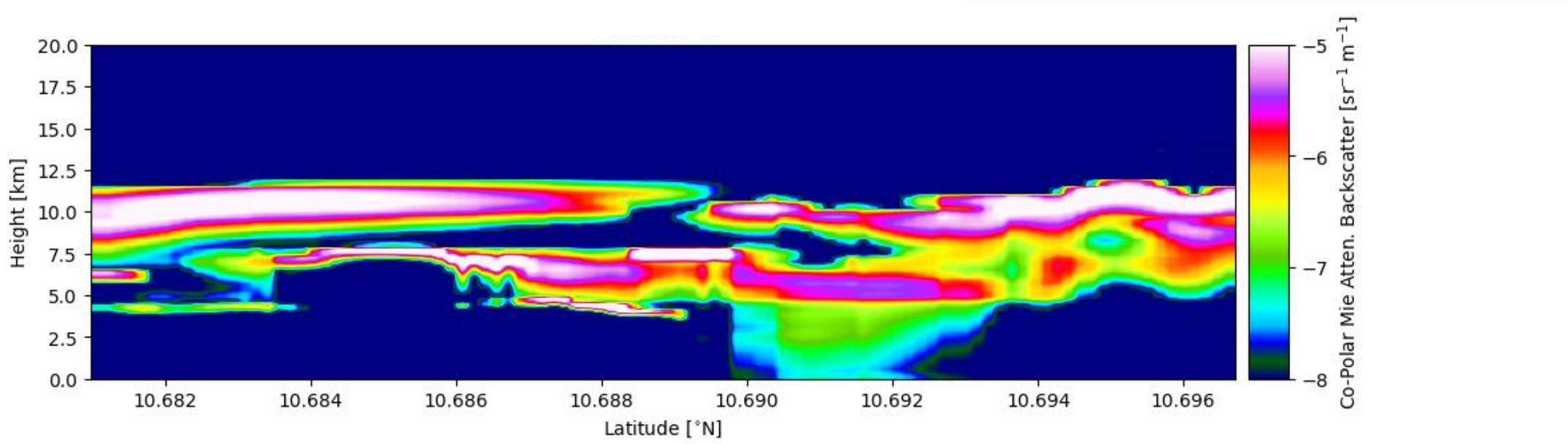
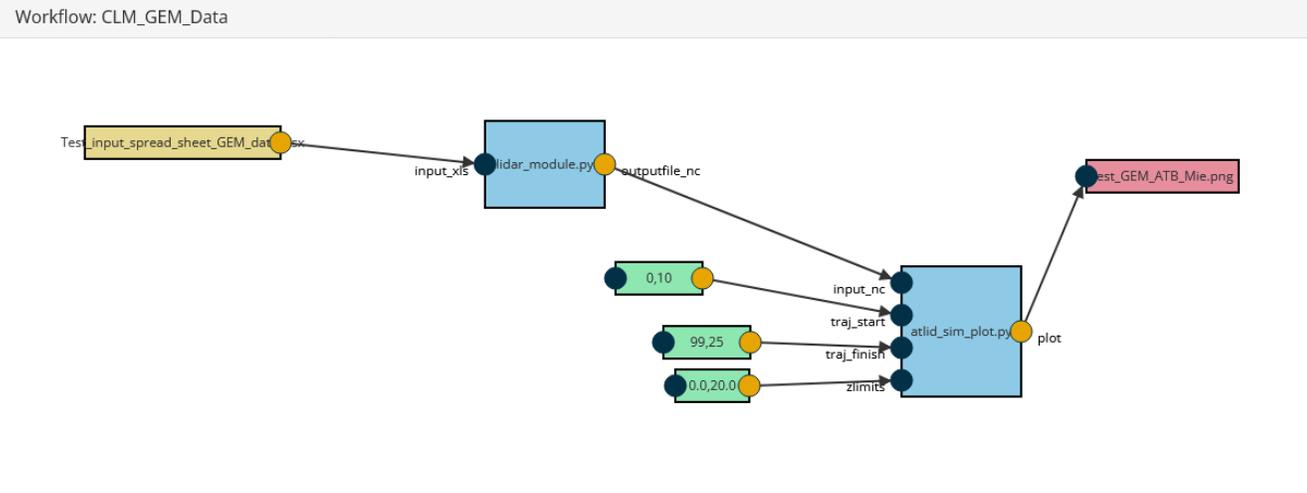


CLM. Lidar Tool Example

Workflow: CLM_GEM_Data



CLM. Lidar Tool Example



MSI Tool Example

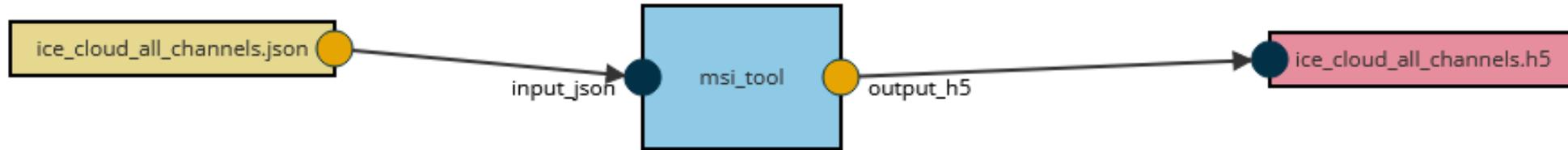
```
msi_tool -i ice_cloud_all_channels.json
```

📄 ice_cloud_all_channels.json 13.65 KiB

```
1  {
2    "solar_zenith": 37.1,
3    "solar_azimuth": 258.7,
4    "viewing_zenith": 5.0,
5    "viewing_azimuth": 70.0,
6    "day_of_year": 190,
7    "day_of_year_description": "needed for solar irradiance scaling",
8    "longitude": 14.118,
9    "latitude": 52.208,
10   "skin_temperature": 284.54520088,
11   "horizontal_windspeed_at_10m": 7.37,
12   "salinity": 0.0,
13   "pressure": [
14     202.76731597,
15     219.47257877,
16     237.40117436,
17     256.47258073,
18     276.68542352,
19     298.07732275,
20     320.73312408,
21     344.61804026,
22     369.78265096,
23     396.44831337,
24     424.57194697,
25     454.19212153,
26     485.52054838,
27     518.57862233,
28     553.40350353,
29     590.2343628.
```

MSI Tool Example

Workflow: MSI_Tool



MSI Tool Example

HDFView 3.1.1

File Window Tools Help

Recent Files: C:\Users\jarek\projects\cis\ecodata\ice_cloud_all_channels.h5

ice_cloud_all_channels.h5

- ScienceData
 - VNS_band
 - across_track
 - along_track
 - band
 - land_flag
 - latitude
 - longitude
 - pixel_values
 - sensor_azimuth_angle
 - sensor_elevation_angle
 - solar_azimuth_angle
 - solar_elevation_angle
 - solar_spectral_irradiance
 - surface_elevation
 - time

Object Attribute Info: General Object Info

Attribute Creation Order: Creation Order Tracked and Indexed

Number of attributes = 5

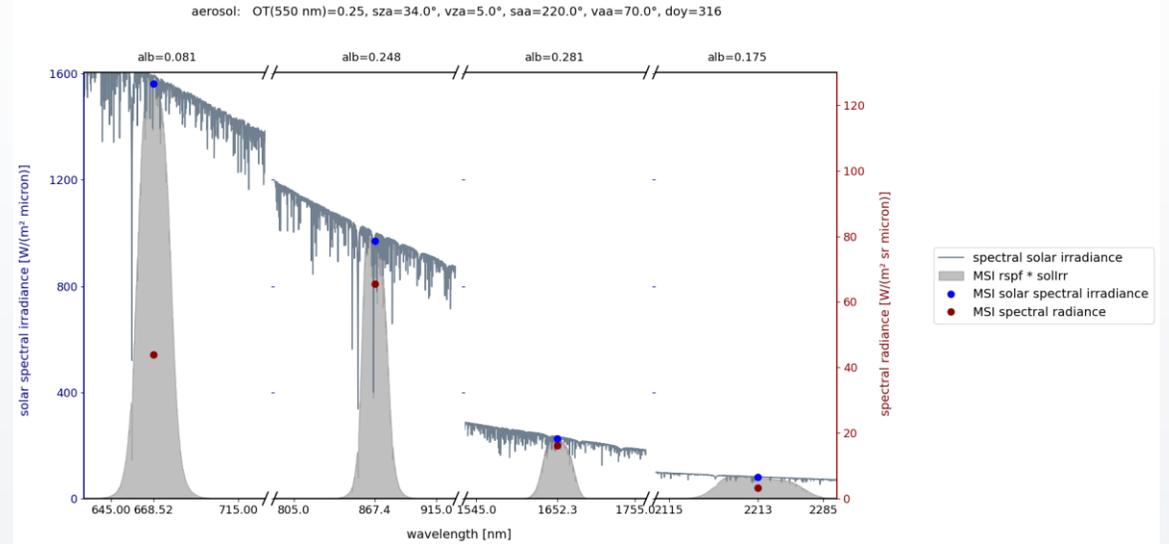
Name	Type	Array
DIMENSION_LIST	Variable-length of Object reference	3
_Netcdf4Coordinates	32-bit integer	3
description	String, length = 133, padding = H5T_STR_NULLTERM, cset = H5T_CSET_ASCII	Scale
long_name	String, length = 68, padding = H5T_STR_NULLTERM, cset = H5T_CSET_ASCII	Scale
units	String, length = 41, padding = H5T_STR_NULLTERM, cset = H5T_CSET_ASCII	Scale

pixel_values at /ScienceData/[ice_cloud_all_channels.h5 in C:\Users\jarek\projects\cis\ecodata]

Table Import/Export Data Data Display

0-based

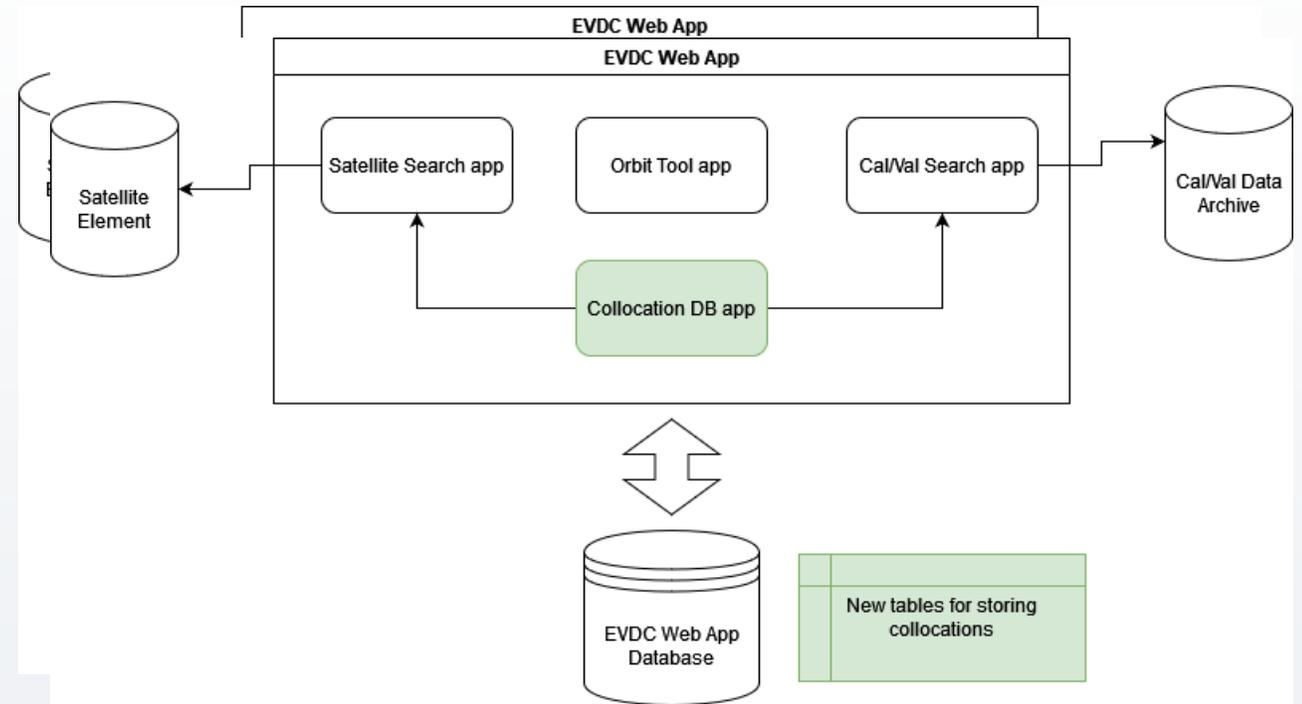
	0
0	48.66898
1	55.644764
2	9.967486
3	2.445909
4	260.76666
5	260.3266
6	259.44354



EVDC Collocation Database

The Goal:

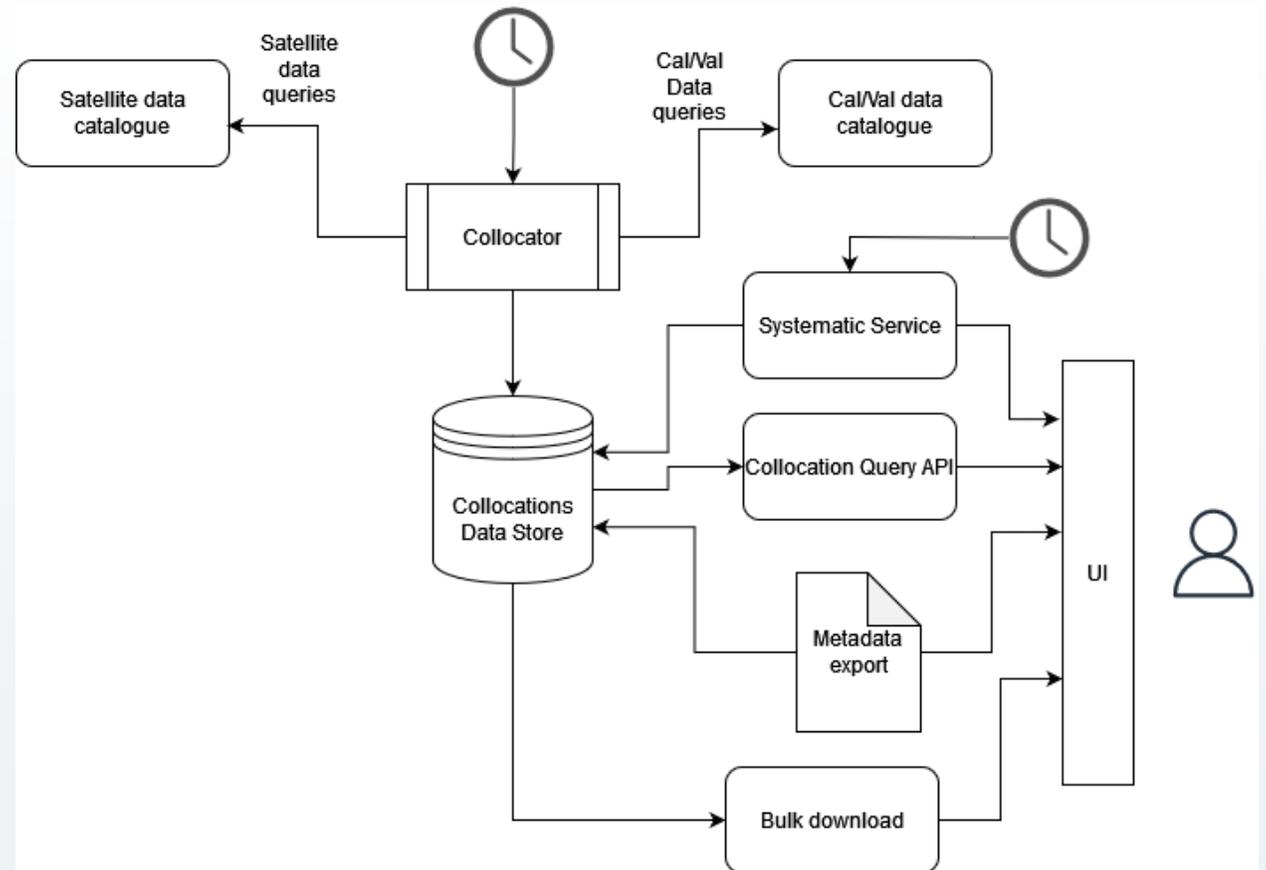
- Automate the collection of broad collocations between satellite and correlative products
- Provide users with tools to interact with the archive of pre-located data
- Allow automated data deliveries based on custom (narrower) collocation criteria



EVDC Collocation Database

Architecture

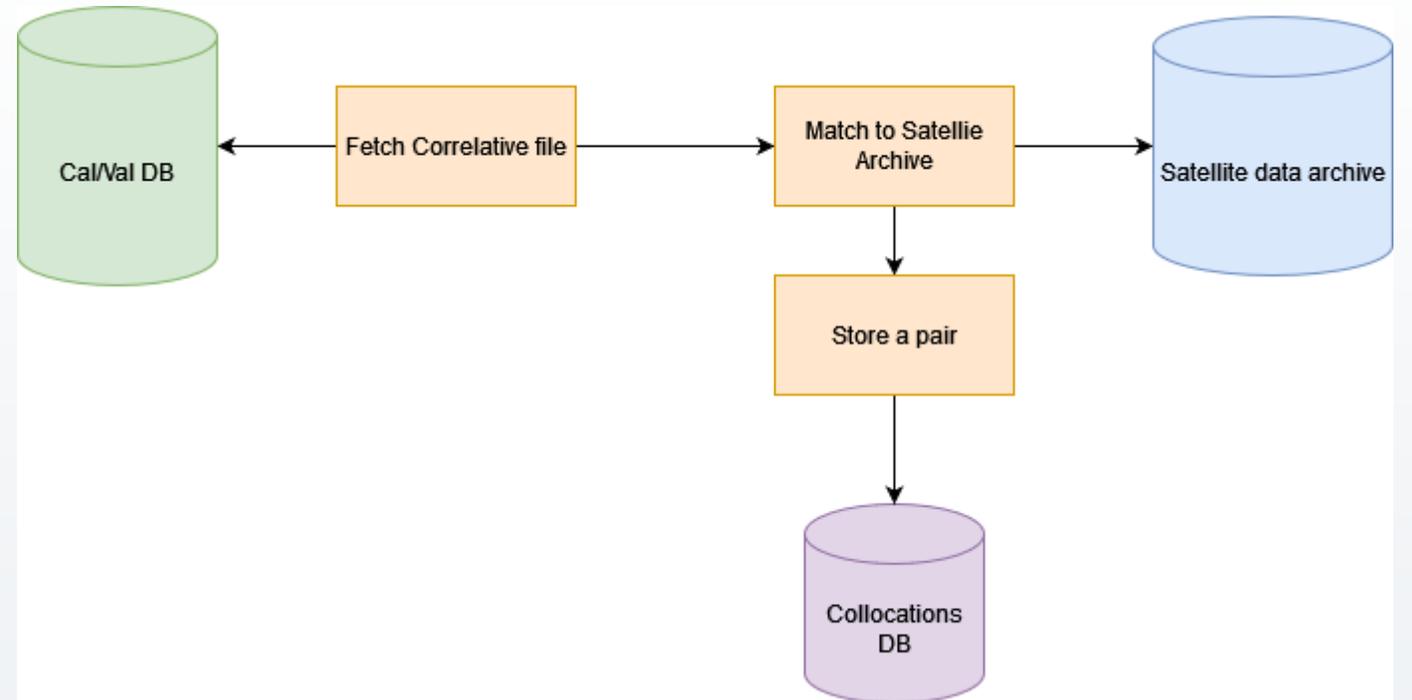
- Collocator as a scheduled service searching for new collocations daily
- Data store holding indexed metadata fields of both files (single entry represents 1:1 relation between sat and cal/val file)
- Query service for interacting with collocation data store



EVDC Collocation Database

Data Collection approach

- For each correlative file a single satellite product match is found Data store holding indexed metadata fields of both files (single entry represents 1:1 relation between sat and cal/val file)
- Reverse search then possible via the query service



EVDC Collocation Database

Configuration. Variable mapping

- Manual config for referencing satellite product variables to correlative variables
- Common naming (preferred standard?)
- Possible to configure more detailed mapping details (units, scaling, conversion formulas

COLLOCATIONS	
Collocations	+ Add Change
Criteria	+ Add Change
Product mappings	+ Add Change
Queries	+ Add Change
User collocations	+ Add Change

Home › Collocations › Product mappings

Select product mapping to change ADD PRODUCT MAPPING +

Action: 0 of 3 selected

<input type="checkbox"/>	ID	CREATED	UPDATED	SATELLITE PARAMETER	CORRELATIVE PARAMETER	COMMON NAME	SP UNIT	SP SCALING	CP UNIT	CP SCALING	SP NODATA VALUE	CP NODATA VALUE	CONVERSION FORMULA
<input type="checkbox"/>	3	June 25, 2023, 6:36 p.m.	June 25, 2023, 6:36 p.m.	S5P_*_L2_HCHO	H2CO.COLUMN	Formaldehyde	-	-	-	-	-	-	-
<input type="checkbox"/>	2	June 25, 2023, 6:35 p.m.	June 25, 2023, 6:35 p.m.	S5P_*_L2_O3___	O3.COLUMN	Ozone	-	-	-	-	-	-	-
<input type="checkbox"/>	1	June 25, 2023, 6:33 p.m.	June 25, 2023, 6:33 p.m.	S5P_*_L2_SO2___	SO2.COLUMN	Sulphur Dioxide	-	-	-	-	-	-	-

3 product mappings

EVDC Collocation Database

Basic Query Form:

- Simple search based on spatiotemporal criteria and collocated variable selection
- Advanced search will also be provided (detail metadata fields, calculated statistics etc)

Home Search Cal/Val Data Search Satellite Data Upload Data Documentation Tools Campaigns Overpass Tool Contact Us / Data Policy

Search Collocations

[Register](#) to search and download collocated file bundles from EVDC Collocations Database.

Find Collocations

Product Type Sulphur Dioxide
This field is required.

Start date 01 / 01 / 2023
This field is required.

End date 15 / 06 / 2023
This field is required.

Area of interest wkt POLYGON((-57.263379 60.396494, 45.431192 42.785732, -19.280455 9.414389, -98.76324 5.231008, -57.263379 60.396494))
This field is required.

★ Submit

Select Point or Polygon

Leaflet | © Mapbox © OpenStreetMap Improve t

EVDC Collocation Database

Example search

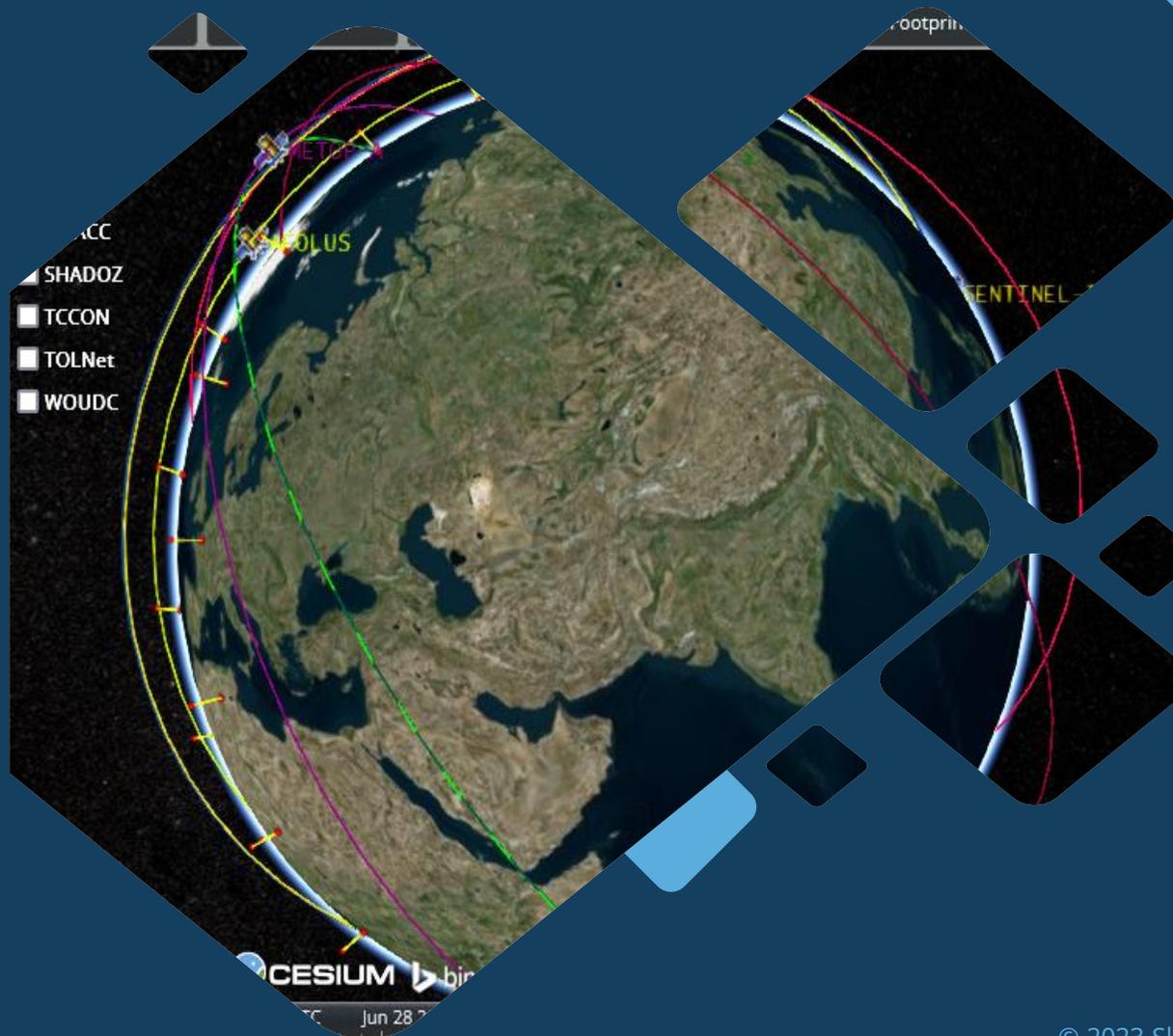
results



Home Search Cal/Val Data Search Satellite Data Upload Data Documentation Tools Campaigns Overpass Tool Contact Us / Data Policy My EVDC

Collocations of Sulphur Dioxide

FileNames	Max Time Difference (HH:MM)
<div style="display: flex; justify-content: space-between;"> <div style="font-size: 0.8em;"> Sat S5P_NRTI_L2_SO2___20230502T183922_20230502T184422_28763_03_020401_20230502T203400 Corr groundbased_uvvis.doas.directsun.so2_epa134_rd.rsus1.1.8_bristol.pa_20230501t155237z_20230501t203919z_001.h5 </div> <div style="text-align: right;">26:46</div> </div>	26:46
<div style="display: flex; justify-content: space-between;"> <div style="font-size: 0.8em;"> Sat S5P_NRTI_L2_SO2___20230502T183422_20230502T183922_28763_03_020401_20230502T191202 Corr groundbased_uvvis.doas.directsun.so2_epa134_rd.rsus1.1.8_bristol.pa_20230501t155237z_20230501t203919z_001.h5 </div> <div style="text-align: right;">26:41</div> </div>	26:41
<div style="display: flex; justify-content: space-between;"> <div style="font-size: 0.8em;"> Sat S5P_NRTI_L2_SO2___20230502T165922_20230502T170422_28762_03_020401_20230502T173603 Corr groundbased_uvvis.doas.directsun.so2_epa134_rd.rsus1.1.8_bristol.pa_20230501t155237z_20230501t203919z_001.h5 </div> <div style="text-align: right;">25:6</div> </div>	25:6
<div style="display: flex; justify-content: space-between;"> <div style="font-size: 0.8em;"> Sat S5P_NRTI_L2_SO2___20230106T180905_20230106T181405_27117_03_020401_20230106T184825 Corr groundbased_uvvis.doas.directsun.so2_epa166_rd.rsus1.1.8_philadelphia.new.pa_20230106t172728z_20230106t202914z_001.h5 </div> <div style="text-align: right;">2:15</div> </div>	2:15
<div style="display: flex; justify-content: space-between;"> <div style="font-size: 0.8em;"> Sat S5P_NRTI_L2_SO2___20230102T110405_20230102T110905_27056_03_020401_20230102T114922 Corr groundbased_uvvis.doas.directsun.so2_nasa.gsfc030_rd.rsus1.1.8_juelich_20230101t095127z_20230101t120232z_001.h5 </div> <div style="text-align: right;">25:12</div> </div>	25:12
<div style="display: flex; justify-content: space-between;"> <div style="font-size: 0.8em;"> Sat S5P_NRTI_L2_SO2___20230105T182905_20230105T183405_27103_03_020401_20230105T190700 Corr groundbased_uvvis.doas.directsun.so2_epa166_rd.rsus1.1.8_philadelphia.new.pa_20230106t172728z_20230106t202914z_001.h5 </div> <div style="text-align: right;">25:55</div> </div>	25:55
<div style="display: flex; justify-content: space-between;"> <div style="font-size: 0.8em;"> Sat S5P_NRTI_L2_SO2___20230101T130405_20230101T130905_27043_03_020401_20230101T134433 Corr groundbased_uvvis.doas.directsun.so2_nasa.gsfc030_rd.rsus1.1.8_juelich_20230101t095127z_20230101t120232z_001.h5 </div> <div style="text-align: right;">3:12</div> </div>	3:12
<div style="display: flex; justify-content: space-between;"> <div style="font-size: 0.8em;"> Sat S5P_NRTI_L2_SO2___20230101T112405_20230101T112905_27042_03_020401_20230101T120654 Corr groundbased_uvvis.doas.directsun.so2_nasa.gsfc030_rd.rsus1.1.8_juelich_20230101t095127z_20230101t120232z_001.h5 </div> <div style="text-align: right;">1:32</div> </div>	1:32
<div style="display: flex; justify-content: space-between;"> <div style="font-size: 0.8em;"> Sat S5P_OFFL_L2_SO2___20230102T095319_20230102T113449_27056_03_020401_20230104T075255 Corr groundbased_uvvis.doas.directsun.so2_nasa.gsfc030_rd.rsus1.1.8_juelich_20230101t095127z_20230101t120232z_001.h5 </div> <div style="text-align: right;">24:23</div> </div>	24:23
<div style="display: flex; justify-content: space-between;"> <div style="font-size: 0.8em;"> Sat S5P_NRTI_L2_SO2___20230120T102306_20230120T102806_27311_03_020401_20230120T122749 Corr groundbased_uvvis.doas.directsun.so2_noa119_rd.rsus1.1.8_athens.noath_20230119t062859z_20230119t145405z_001.h5 </div> <div style="text-align: right;">27:54</div> </div>	27:54
<div style="display: flex; justify-content: space-between;"> <div style="font-size: 0.8em;"> Sat S5P_NRTI_L2_SO2___20230119T104306_20230119T104806_27297_03_020401_20230119T124718 Corr groundbased_uvvis.doas.directsun.so2_noa119_rd.rsus1.1.8_athens.noath_20230119t062859z_20230119t145405z_001.h5 </div> <div style="text-align: right;">4:14</div> </div>	4:14



EVDC Orbit Tools

EVDC Orbit Tools

Functionalities:

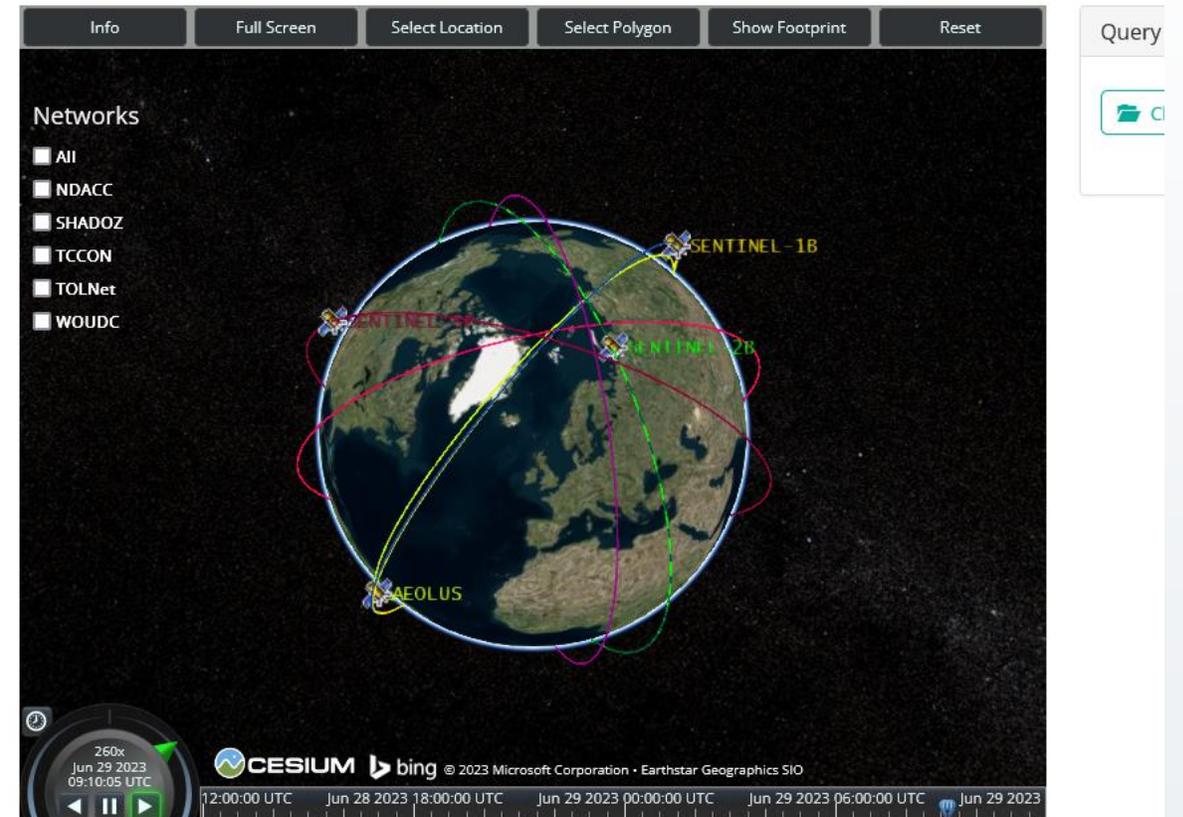
- Orbit Prediction and Visualisation
- Finding Overpasses over AOIs
- Cal/Val Networks overlay and info
- Satellite footprint visualisation
- Overpass data download

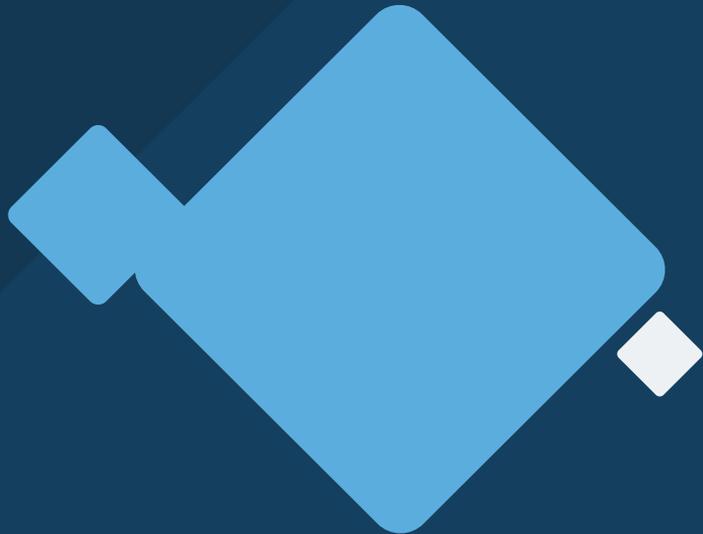
Operation Summary

Predict Orbits from 2023-6-28 to 2023-6-29

Selected Satellites: AEOLUS, CALIPSO, SENTINEL-1A, SENTINEL-1B, SENTINEL-2A, SENTINEL-2B, SENTINEL-5P, METOP-A

Selected Instruments: Aladin, IIR, IASI, C-SAR, C-SAR, MSI, MSI, TROPOMI





THANK YOU!