

# General Flow Description

The EO4EU platform enables users to access, process, and analyse Earth observation data by integrating various data sources, automating workflows, and providing advanced visualisation tools. It supports data discovery, workflow creation, fusion algorithms, and machine learning applications to extract meaningful insights from geospatial data.

## **Steps to Use the EO4EU Platform:**

### **1. Register and Log In**

Create an account and log in to access your profile, manage applications, and configure settings (see Account).

### **2. Search for Data**

Use the Data Search tool to find relevant datasets by selecting a data source, applying filters such as area of interest and date range, and retrieving the necessary data.

### **3. Create a Workflow**

In the Workflow Creator, define a new workflow by selecting datasets and structuring the workflow. You can also upload in-situ data if needed.

### **4. Edit the Workflow**

Open the Workflow Editor to design and configure your workflow by dragging and dropping components, setting parameters, and applying processing techniques (see Fusion Functions).

### **5. Execute and Monitor the Workflow**

Save and publish the workflow to start processing. Track progress through the platform's status indicators and real-time notification system. Email notifications are also sent in case of workflow completion or failure.

### **6. Visualize and Analyse Data**

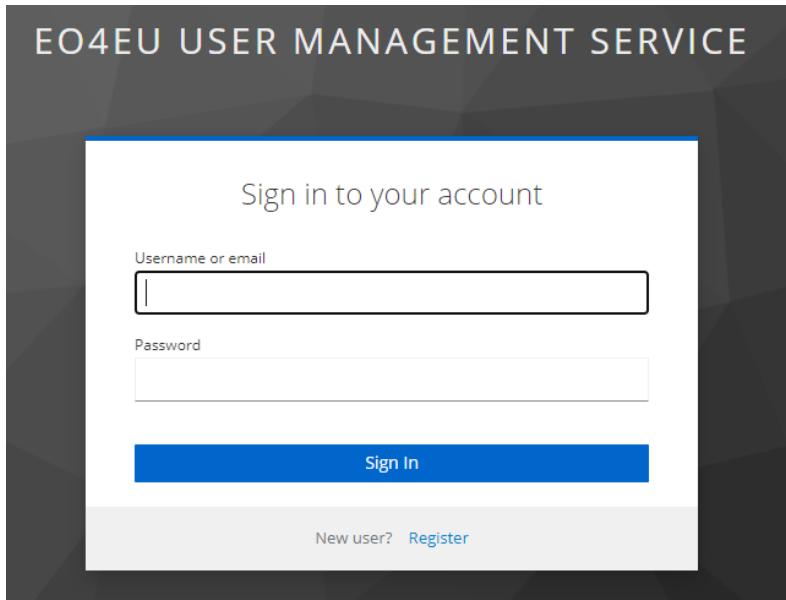
Explore processed results using Data Visualization for graphs, Map Visualization for geospatial overlays, and XR/VR Visualization for 3D analysis.

### **7. Manage Files and Track History**

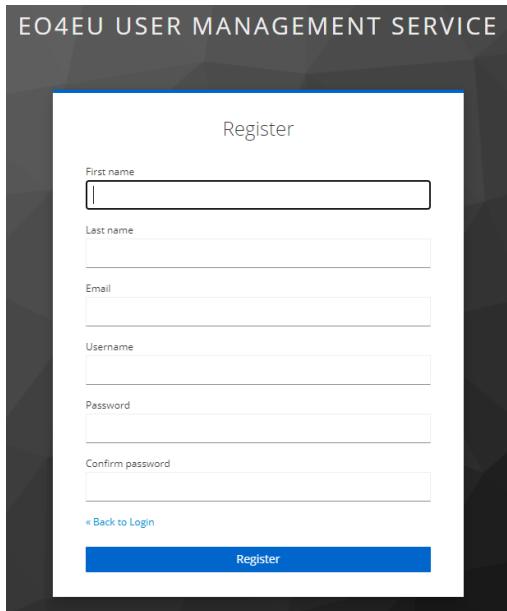
Access workflow outputs in the File Explorer, execute advanced commands in the Console, and review past workflows in the History section for tracking and iteration.

# Authentication & Account Management

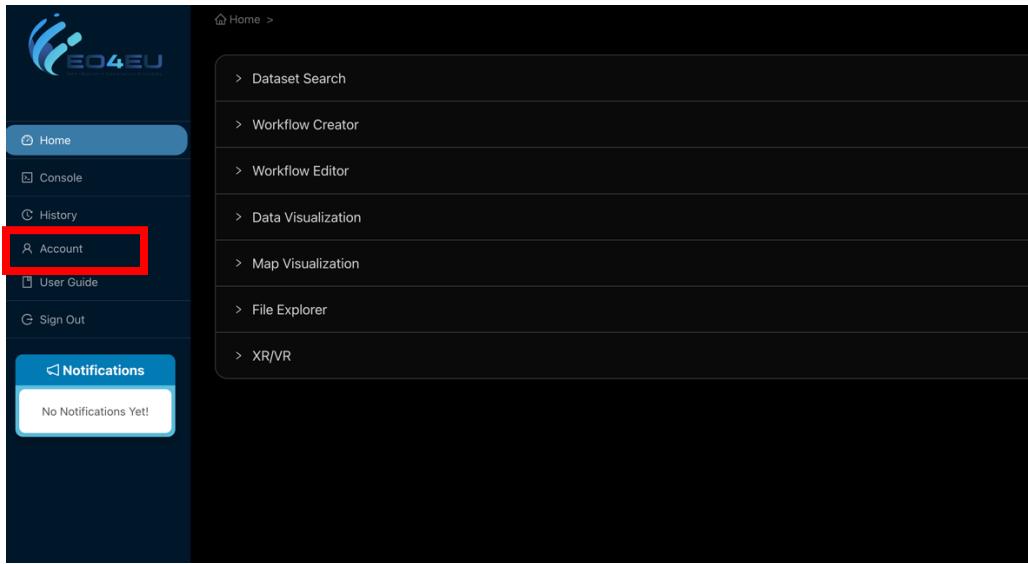
To access the EO4EU platform, the user must register to the platform. Once you access the Web Portal for the first time, you will see the sign-in screen.



As you can see, there is a register button that you can press to register yourself as a new user.



Once you have registered and you can access the Web Portal, there is a section "Account" on the left menu

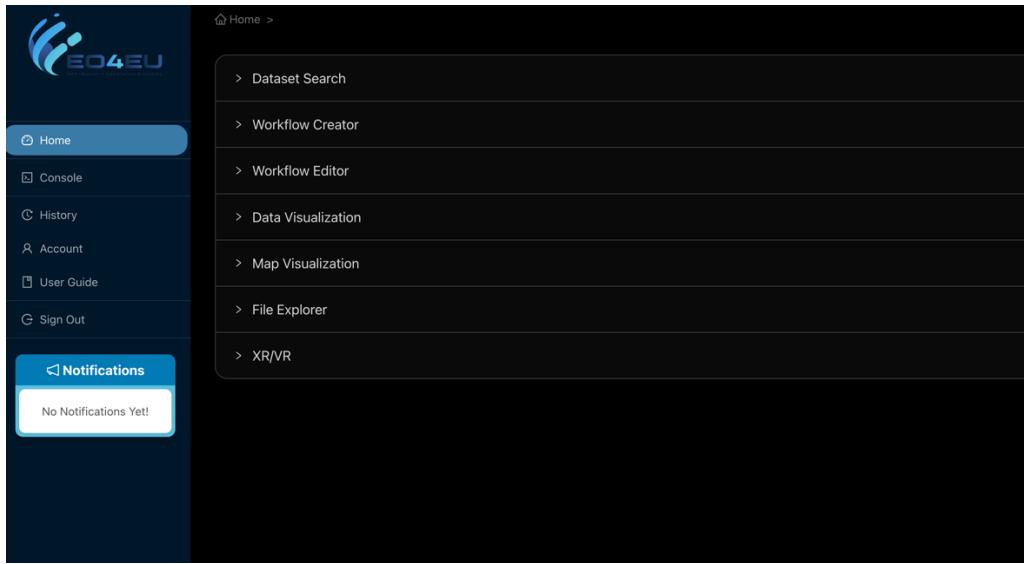


which allows you to see/edit your personal details and see the applications that you have access to.

A screenshot of the 'Personal info' edit page. The left sidebar shows 'Personal Info', 'Account security', and 'Applications'. The main content area is titled 'Personal info' with the sub-instruction 'Manage your basic information'. Under the 'General' section, there are four form fields: 'Username' (msphocleous), 'Email' (marioss@ebos.com.cy), 'First name' (Marios Sophocleous), and 'Last name' (Sophocleous). At the bottom are 'Save' and 'Cancel' buttons. A vertical 'Jump to section' menu on the right side is currently set to 'General'.

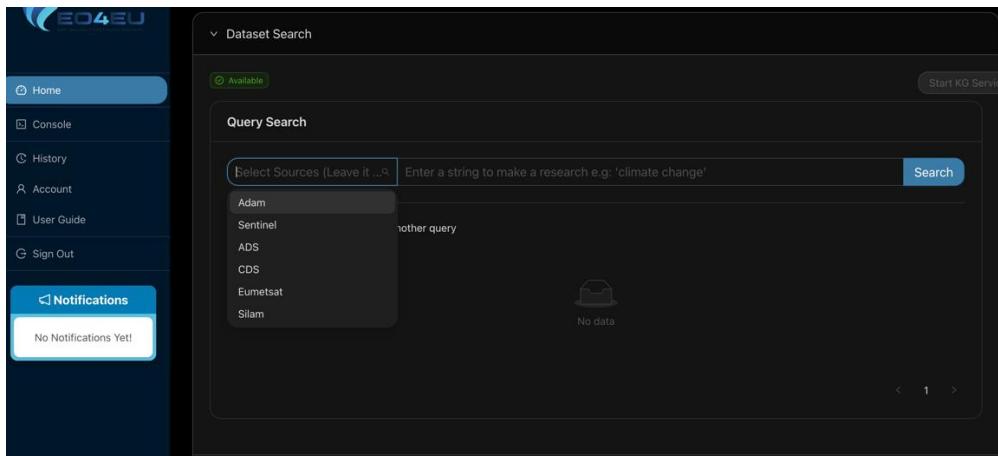
## Dashboard

The dashboard provides an overview of your data and workflows.



## Data Search

The first step in using the EO4EU platform is to search for the data needed. One of the platform's main contributions is that it allows semantic data search through various data sources, including the option to upload datasets. Once the user logs in to the portal, the first accordion section is entitled "Dataset Search", which is the tool used to search through data sources semantically. From the drop-down menu, the user can choose the data source and provide a keyword.



Once the data source and keyword are defined, the user can search using the search button on the top right and the most matching results will be shown.

Dataset Search

Available

Start KG Service

Query Search

Adam x | temperature | Search

We found a total of **43** datasets

**ERA5 Land Austria - Vapor pressure Deficit**

This dataset represents the VPD (Vapor Pressure Deficit) in Austria. Vapor pressure deficit can be defined as the amount of vapor that can still be stored in the air until reaching saturation point, under the same temperature. This variable can be calculated as the difference between the actual vapor pressure and the saturation vapor pressure.

adam | From Adam: YES

**ERA5 Land: Available Soil Water**

Volume of water in soil layer 1 (0 - 7 cm) of the ECMWF Integrated Forecasting System. The surface is at 0 cm. The volumetric soil water is associated with the soil texture (or classification), soil depth, and the underlying groundwater level.

adam | From Adam: YES

**ERA5 Land: 2m dew point temperature (hourly)**

Once the user chooses the dataset of interest, a specialised menu provides more details/options. The example for the ADAM data source includes a description of the dataset, its variables, file formats, and data types.

ERA5 Land: 2m temperature (hourly)

adam | From Adam: YES

Description

Temperature of air at 2m above the surface of land, sea or in-land waters. 2m temperature is calculated by interpolating between the lowest model level and the Earth's surface, taking account of the atmospheric conditions. Temperature measured in kelvin can be converted to degrees Celsius ( $^{\circ}\text{C}$ ) by subtracting 273.15.

File Formats

grid-strict

ADAM Advanced Filter

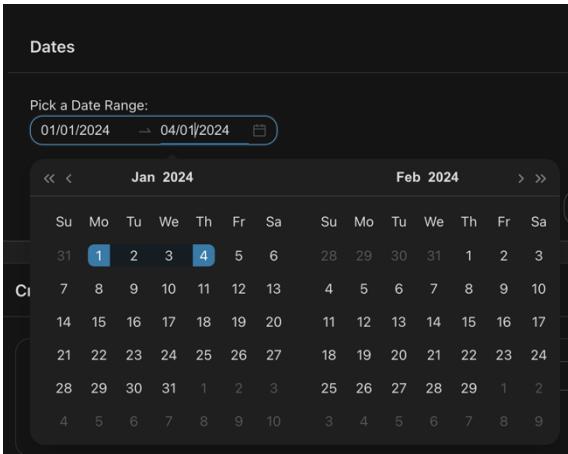
Geometry

Delete All

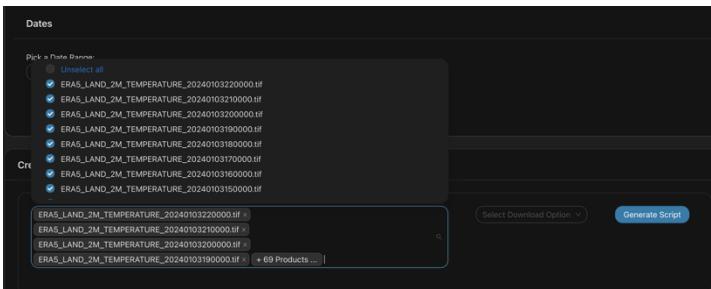
Additionally, another section of this menu is the Advanced Filter where the user can choose the area of interest on the map.



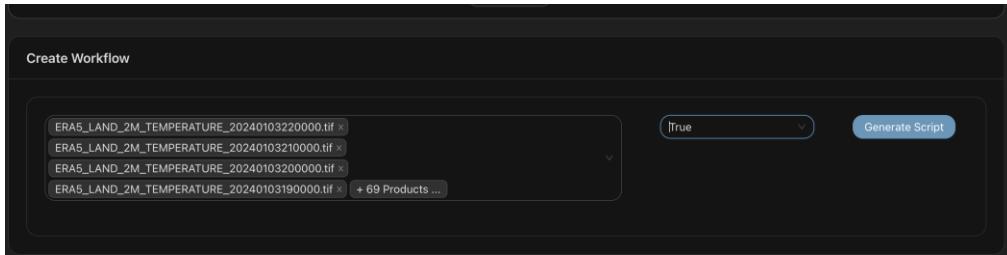
Once the area is defined, the user can choose the date ranges.



Once the date range is defined, you can filter them to identify the correct products to download and select the button “**Filter now**”.



Then, the user clicks the Generate Script button to create the Python Script and the MetalInfo JSON that will be passed to the Workflow Editor Component.



The user as a final step shall select the button “**Save WF product**”. The next step is the Workflow Creator.

Product(s)	Python Script	Meta Info (JSON)
<pre>from adamapi import Auth, Datasets, Search, GetData from datetime import datetime, timezone  ADAM_API_KEY = "29g2efz0Bdy8wI02ms0ZIfG s6ZG1z76FdMzUpDbk" ADAM_ENDPOINT_URL = "https://adam.apps.eo4eu.eu/"  a=Auth() a.setKey(ADAM_API_KEY) a.setAdamCore(ADAM_ENDPOINT_URL) a.authorize() data=GetData()  productIDs = ['ERA5_LAND_2M_TEMPERATURE_20240103220000.tif', 'ERA5_LAND_2M_TEMPERATURE_20240103220000.tif'] for productID in productIDs:     image = data.getData('631491c3f632a981d701c47:ERA5_LAND_2M_TEMPERATURE_20240103220000.tif')</pre>	<pre>[{"id": "ERA5_LAND_2M_TEMPERATURE_20240103220000.tif", "metadata": {"Geometry": {"Geometry": {"attributeName": "Geometry", "children": {"Geometry": {"attributeName": "Geometry", "children": {"Coordinates": {"attributeName": "Coordinates", "children": null, "dataType": "String"}}, "children": null, "dataType": "String"}}, "children": null, "dataType": "String"}}, "children": null, "dataType": "String"}]</pre>	

## Workflow Creator

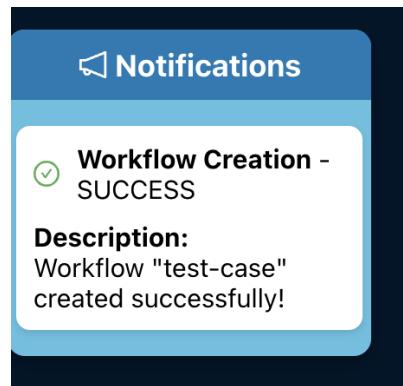
Workflow creator is the common space where a user can have an overview of all the saved workflow products in their account. In this section, a user shall type a workflow name in the respective field. Afterwards the user shall either select some workflow products to be used in this workflow or select none in order to create an empty workflow. An empty workflow can be used to upload, in the next step, in-situ data. The user, after selecting the preferred workflow products, if needed, and adding a workflow name, can press the “**Create Workflow**” button to create the workflow in the workflow editor.

The screenshot shows a dark-themed user interface for managing workflows. At the top, a search bar contains the text "Workflow Name: test-case". Below it is a table with columns: ID, Name, Date & Time Created, and Actions. The table lists five items:

ID	Name	Date & Time Created	Actions
bf556069-dd07-429d-9b25-76ed502e8529	ERA5 Land: 2m temperature (hourly)		<button>Unselect</button> <button>Delete</button>
7cbae4b7-4549-40a6-9299-5e7612914830	ERA5 Land: total precipitation (hourly)		<button>Unselect</button> <button>Delete</button>
86a55d41-8c2a-438d-8146-29fede705bb5	10-daily NDVI composite from clear-sky observations performed by AVHRR/Metop	30/01/2025 12:01	<button>Select</button> <button>Delete</button>
419a6a7c-a2cf-4d13-b84c-d5bbe82ce3b8	ERA5 Land: 2m temperature (hourly)	06/02/2025 11:41	<button>Select</button> <button>Delete</button>
1670ef9d-6d1f-4ea4-99a1-8c55c6c54400	ERA5 Land: 2m temperature (hourly)	11/02/2025 12:21	<button>Select</button> <button>Delete</button>

At the bottom left, a message says "Total Selected: 2/5". On the right, there is a blue button labeled "Create Workflow".

For the specific use case, shown in the picture above, we named our use case as “test-case”, we selected 2 workflow products, and we selected the “**Create workflow**” button. A user can check if the workflow was created correctly by the notification area and the success message in the left part of the platform.



The next step is for the user to create a chain of actions (schema) in the Workflow Editor for the specific data input.

## Workflow Editor

Workflow Editor (WFE) is a component of the EO4EU platform, where a user can manage (publish, delete and save as draft) a workflow.

In the application there are two basic views. The view that the user can see and manage all the workflows that have been created, as well as their status, and the editing view.

Workflow Name	Created	Modified	Status
test-case	February 11, 2025 12:40 PM	February 11, 2025 12:40 PM	<span>draft</span>
uc7	February 10, 2025 2:35 PM	February 10, 2025 2:38 PM	<span>published</span>
uc1	February 10, 2025 2:32 PM	February 10, 2025 2:34 PM	<span>published</span>
webinar1	February 6, 2025 11:42 AM	February 6, 2025 11:42 AM	<span>draft</span>
uc6	February 5, 2025 4:37 PM	February 5, 2025 4:39 PM	<span>published</span>
uc5	February 5, 2025 4:34 PM	February 5, 2025 4:36 PM	<span>published</span>

The status of each workflow is visible in each workflow item. All possible statuses are:

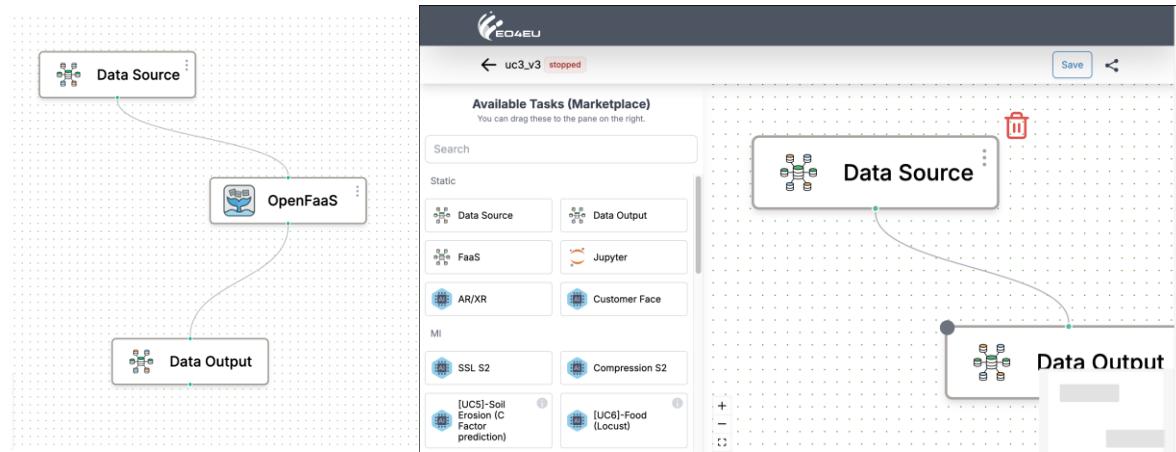
- compiling
- compiled
- publishing
- published
- stopping
- stopped
- completed
- error
- draft

With the 3-dot menu, in the top right corner of any item, a user can see publish, view or delete an item depending on its state.

Workflow Name	Created	Modified	Status
test-case	February 11, 2025 12:40 PM	February 11, 2025 12:40 PM	<span>draft</span>
uc7	February 10, 2025 2:35 PM	February 10, 2025 2:38 PM	<span>published</span>
uc3_v3	June 20, 2025 10:35 AM	September 10, 2025 10:35 PM	<span>stopped</span>
uc7_user2	September 10, 2025 10:35 AM	September 10, 2025 10:35 AM	<span>draft</span>

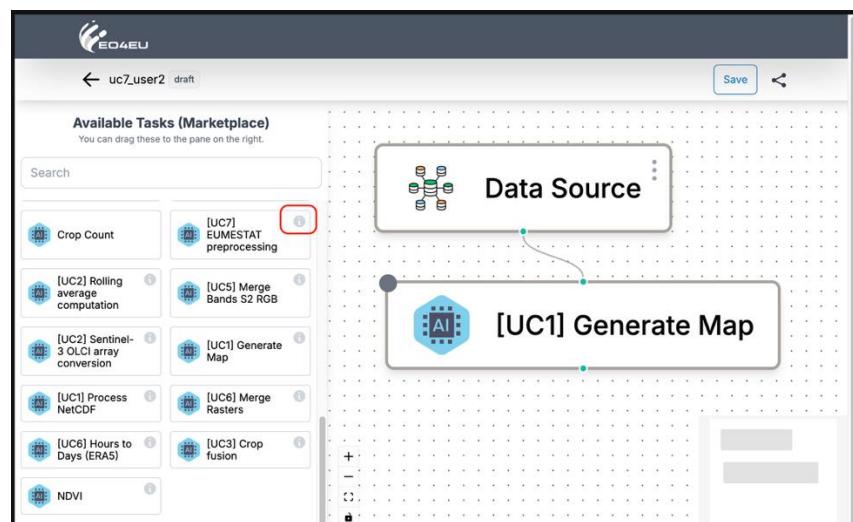
If a user selects “**View**”, the workflow editor builder opens. The editor is divided into three main sections. The top bar where the user can save his work or publish it, the editing canvas, and the marketplace of the components available on the left for insertion into the workflow. It should be noted that items in the marketplace are searchable. A user can return in the previous page by clicking the left arrow close to the workflow name.

The workflow building process is handled by dragging-and-dropping items from the marketplace to the canvas and connecting them.

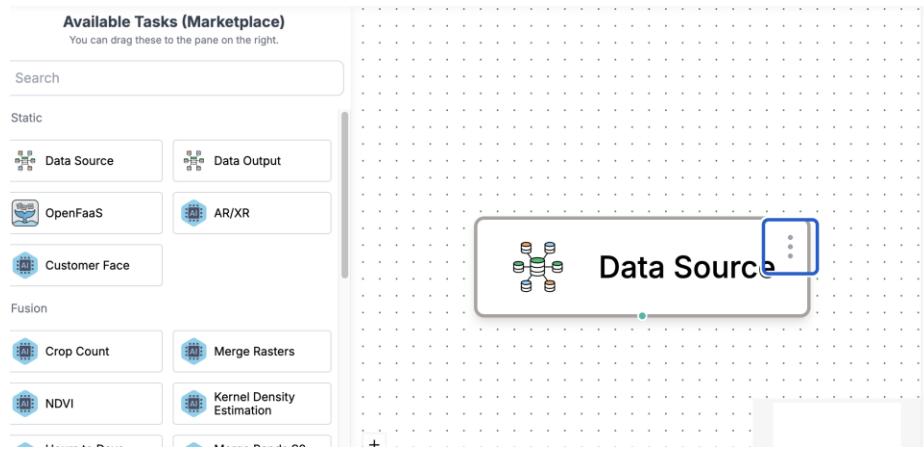


Editable items have a 3-dot menu. Clicking on it opens a new window in which the user can edit the parameters of each component. Items can be deleted if the pointer hovers at the right up corner (red trashcan symbol).

Detailed information for the use cases can be shown if you press the three dots of the components in the marketplace.



In the data source, users can upload new files and manage their files and directories.



All the in-situ data shall be registered with the same notation as that of all data sources integrated in the KG. The in-situ data can then be permantly stored in the KG as an added datasource. The new data can be characterized as a new Data Source.

### Data Source Configuration

**Title**

**Description**

**Short Title**

**Timestamp (From - To)**  
 dd/mm/yyyy   dd/mm/yyyy

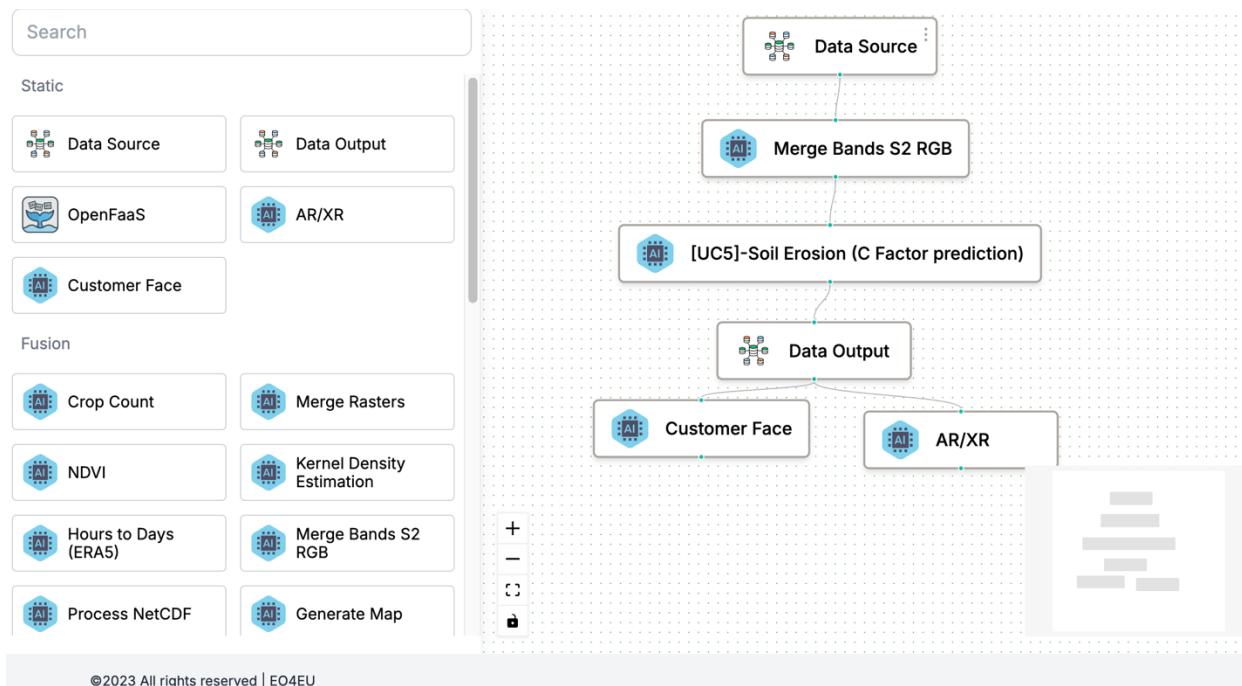
**Coordinates Selection**

A world map centered on the Atlantic Ocean. In the top-left corner, there are zoom controls: a plus sign (+) and a minus sign (-). In the top-right corner, there are three icons: a double-lined square (likely for selection), a double-lined circle (likely for centering), and a double-lined diamond (likely for rotation or dragging).

Products

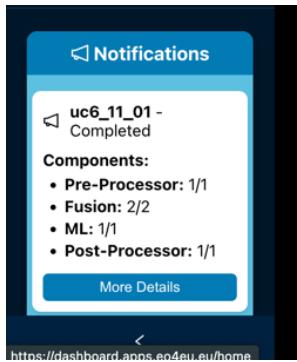
Title			
Description			
ShortTitle			
Data Type:	Select data type	File Format:	Select file format
Date From:	dd/mm/yyyy	Date To:	dd/mm/yyyy
Coordinates 			
Product Data <input type="button" value="Upload or drop a file right here"/> zip			

When the chain of the actions is completed, the user can either save the workflow or publish the workflow. Publishing means that the workflow is started immediately.



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Once the workflow has started, the progress of the workflow can be found in the notifications section of the EO4EU portal. Furthermore, email notifications are sent to the user in case of workflow completion or error. As a result, the user can step off the WFE and come back should he receive an email from the platform.



## Workflow UC5-test Status Update: Completed

Dear User,

The workflow "UC5-test" has changed its status to "Completed".

Details: Finished

Best regards

## The results of the Workflow

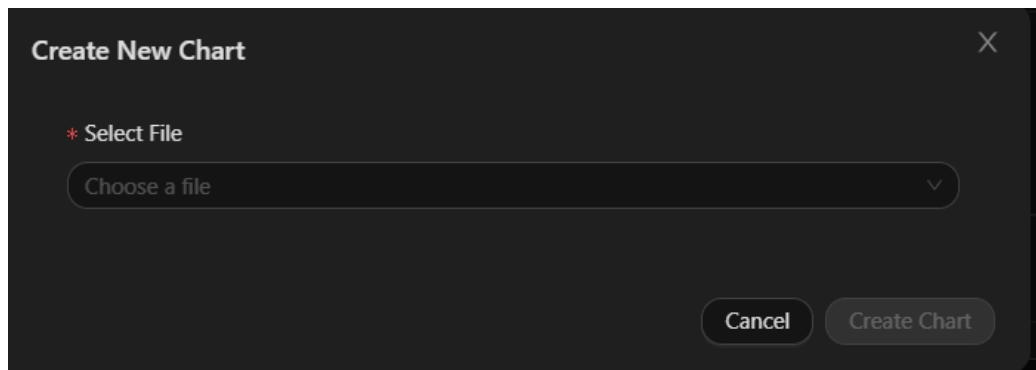
Once the workflow processing has been completed, the output files can be visualised in three ways. If the results are GeoTIFFs, they can be visualised on maps by overlaying layers in 2D through the "**Map Visualisation**" component. The results can be visualised on graphs or tables through the "**Data Visualisation**" component if the results are arithmetic data. Finally, the platform provides the option to visualise the data in a 3D mode through the "**XR/VR**" component. More details on these three components can be found in the following subsections. The files can also be accessed in the "**File Explorer**" section.

## Data Visualization

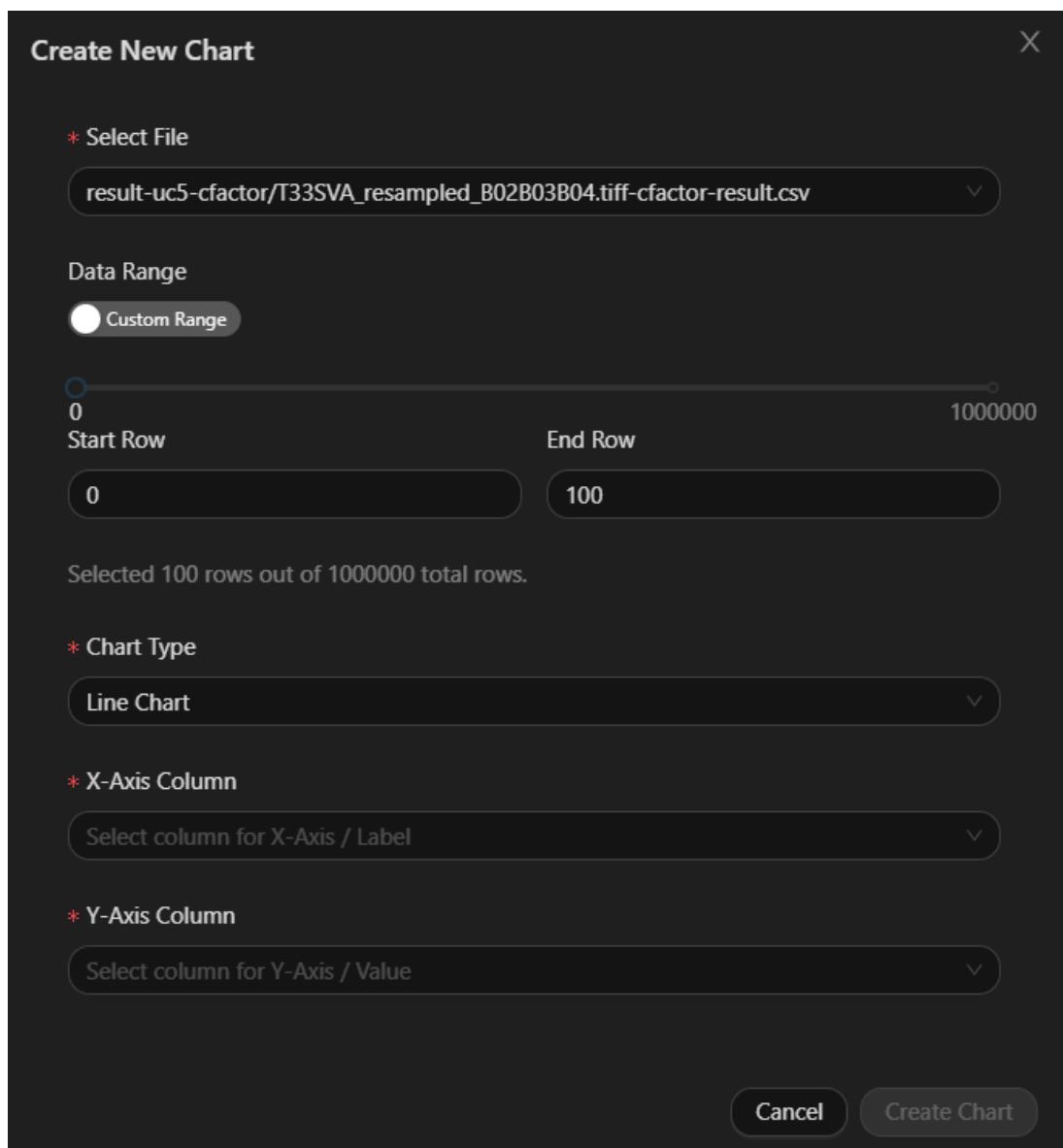
The Data Visualization tool provides various charts and graphs to help users understand and analyse their data. Users can customise their visualisations and save them for future reference. The users can choose their workflow of interest from the dropdown list and generate charts using the **Add Chart** button.

A screenshot of a "Data Visualization" interface. At the top left, there is a dropdown menu labeled "Data Visualization". Below it is a search bar with the placeholder text "\* Workflow: Select Workflow". Underneath the search bar is a blue button labeled "+ Add Chart". A large, empty rectangular area below these elements contains the text "No charts created yet. Use the \"Add Chart\" button to create a new visualization.".

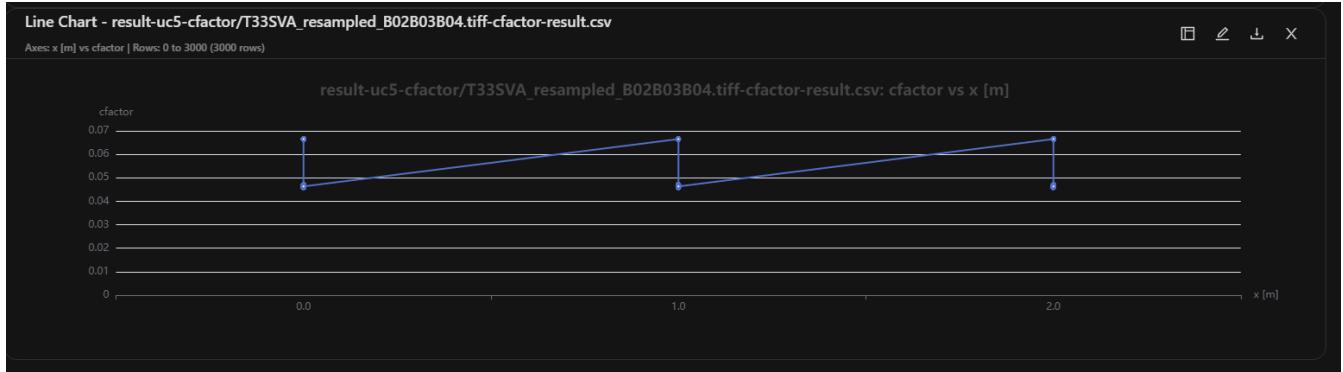
When the users press on the **Add Chart** button, the menu shown below appears to choose the file to visualise.



Once the file is chosen, another menu appears to configure what the chart will present.



When all the configurations are provided, the user will press on **Create Chart** and the chart will be created. The user can create as many charts as needed with either one or two charts per row.



## Map Visualization

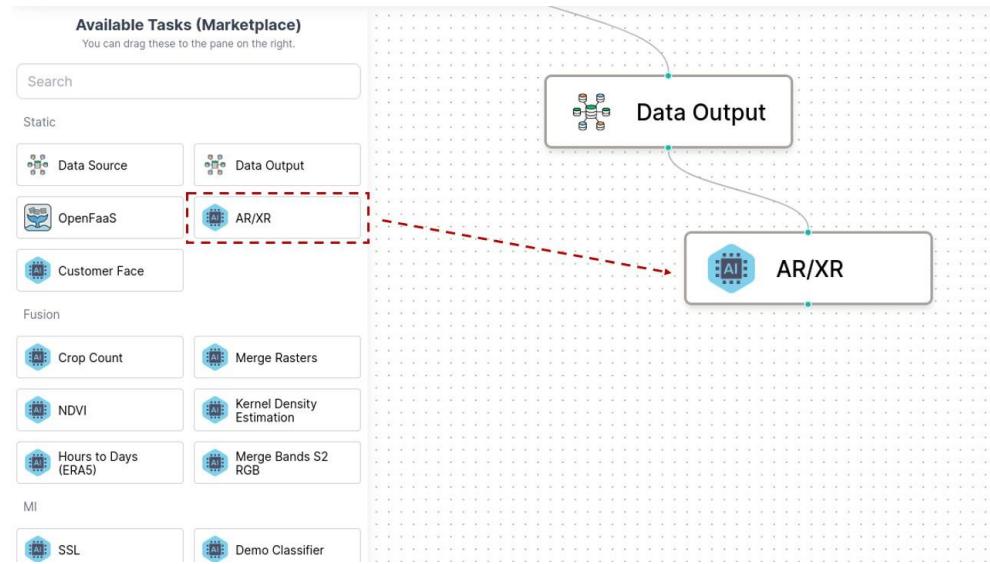
The Map Visualization tool allows users to visualise geospatial data on a map. Users can overlay different datasets and use various spatial data analysis tools. The user can choose the Workflow with available data from the Workflow dropdown menu and select the file (or multiple files) they want to visualise. The tool can visualise TIFF, NetCDF and shapefiles.

The screenshot shows the "Map Visualization" section of a software interface. A red box highlights the configuration area, which includes a "Workflow" dropdown set to "UCS" and a "Data Files" input field containing "fusion.folder/T33SVB\_resampled\_B02B03B04.tif". Below this, a note states "Only files with extensions: 'tif', 'npy', 'nc', 'zip' are allowed". The main area displays a satellite map of a rural landscape with fields and roads. A zoom control (+/-) is in the top-left corner of the map area. In the top-right corner, there is a "Map Legend" box with the text "Tiff Layer (fusion\_folder/T33SVB\_resampled\_B02B03B04.tif)" and "No metadata available".

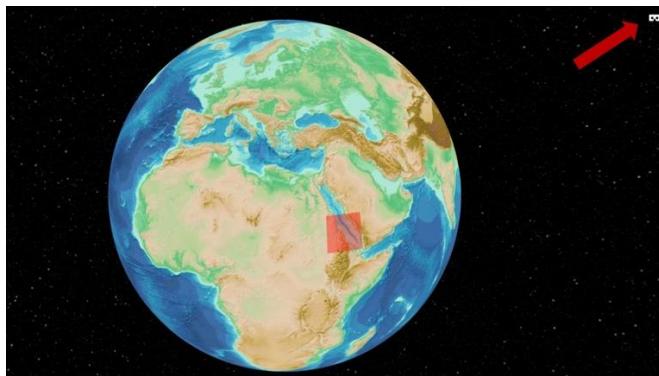
## XR/VR

This tool allows the user to explore the output data and the intermediate results of a specific workflow in an Extended Reality (XR) environment, namely Virtual Reality (VR)

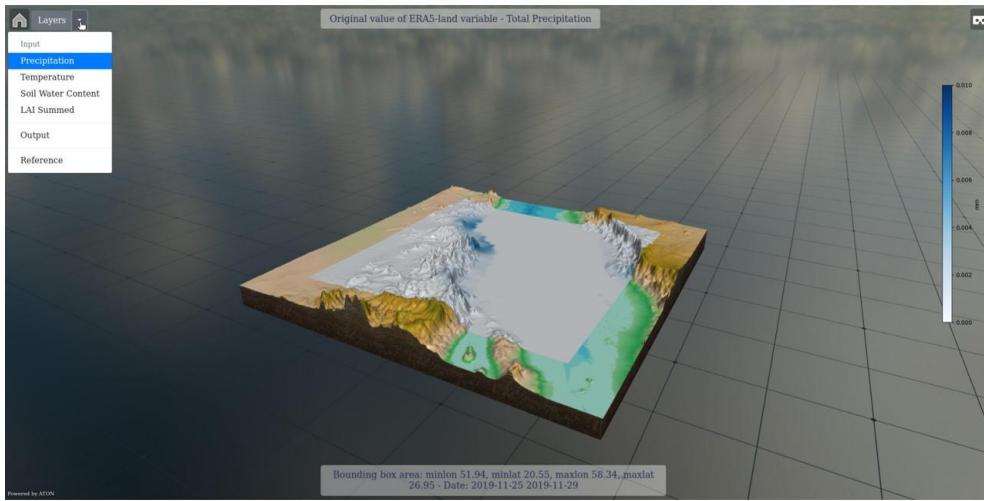
environment and Augmented Reality (AR) environment. Currently, on the dashboard it is only possible to visualize the data in a Virtual Reality environment. To enable the XR visualization on a specific workflow, during its creation within the Workflow Editor application, the AR/XR task needs to be linked to the data output task as shown in the following image:



When a specific workflow is selected using the select workflow section in the dashboard, if the XR visualization was enabled during the creation phase of the workflow, the VR visualization of its resulting data is available by opening the XR/VR tab in the dashboard's **Home** section. In the VR interface home page, all the areas covered by the data resulting from the selected workflow are displayed as selectable bounding boxes on a globe. If a device supporting VR sessions is detected, a button appears on the top-right corner of the application and can be used to start a VR session.



By selecting a specific bounding box, it is possible to visualize the data related to the selected area jointly with a basic set of metadata. During a VR session, a wrist mounted User Interface is available to navigate between the different data layers and display the metadata information.



## File Explorer

The File Explorer allows the user to browse through uploaded and generated files. The File Explorer contains a hierarchical directory structure that the user can navigate. In order to visualize the files of a particular workflow, a user shall select the name of the relevant workflow.

## Console and History

At the left part of the GUI you can also overview the Console and History tabs.

### Console

The Console provides a command-line interface for advanced users to interact with the EO4EU platform. Users can execute scripts and commands directly from the console.

```

Home > Console

Type "help" for all available commands.

clear - clears the console.
change_prompt <PROMPT> - Change the prompt of the terminal.
change_theme <THEME> - Changes the theme of the terminal. Allowed themes - light, dark, material-light, material-dark, material-ocean, matrix and dracula.
toggle_control_bar - Hides / Display the top control bar.
toggle_control_buttons - Hides / Display the top buttons on control bar.

getEOProcesses - Retrieve a list of EO processes.
getProcessorsGraph - View a list of process graphs.
getEOProcessByID <ID> - Retrieve an EO process graph by its ID.
getFileFormats - Retrieve a list of file formats.
submitEODataProcessingRequest - Submit a request for EO data processing.
manageEOJobs - Manage EO jobs.
manageEOJobByID <JOB_ID> - Manage an EO job by its ID.
estimateEOProcessingTime <JOB_ID> - Estimate processing time for a job.
getLogsForJob <JOB_ID> - Retrieve logs for a job.
manageResultsForJob - Manage results for a job.
getEOCollections - Retrieve a list of EO collections.
getEOCollectionByID - Retrieve an EO collection by its ID.
getQueryableAttributesForCollection - Retrieve queryable attributes for a collection.
getServiceTypes - Retrieve a list of service types.
manageEDServices - Manage EO services.
manageEDServiceByID - Manage an EO service by its ID.

getLogsForService - Retrieve logs for a service.
submitWorkflowToKafka - Submit a workflow to Kafka.
fetchS3Endpoint - Fetch an endpoint from S3.
manageStoreEndpoint - Manage a store endpoint.
manageGroupsEndpoint - Manage a groups endpoint.
getCountOfUsers - Get the count of users.
getCountOfResources - Get the count of resources.
account - View current account page
logout - Sign out from the console

```

## History

The User History section keeps track of all user activities and workflows. Users can view their history to review past actions and results.

Home > History		
27/06/2024, 11:16:26	GET /Users	<button>View</button>
10/06/2024, 09:11:33	GET /Groups	<button>View</button>
03/06/2024, 11:26:12	GET /Applications	<button>View</button>
31/05/2024, 13:01:58	GET /Users	<button>View</button>
31/05/2024, 12:59:30	GET /Applications	<button>View</button>
31/05/2024, 12:59:30	GET /Users/count	<button>View</button>
31/05/2024, 12:59:30	GET /Groups	<button>View</button>
31/05/2024, 11:32:00	GET /Users	<button>View</button>
27/05/2024, 09:59:20	GET /Applications	<button>View</button>
27/05/2024, 09:59:13	GET /Users	<button>View</button>
27/05/2024, 09:59:11	GET /Groups	<button>View</button>
27/05/2024, 09:59:10	GET /Groups/e558a22f-ba94-4bbc-b61c-e2957c5ddfa9	<button>View</button>
27/05/2024, 09:59:05	GET /Groups	<button>View</button>
27/05/2024, 09:59:02	GET /Applications	<button>View</button>
27/05/2024, 09:59:02	GET /Users/count	<button>View</button>
27/05/2024, 09:59:02	GET /Groups	<button>View</button>
27/05/2024, 09:59:00	GET /Users	<button>View</button>
14/05/2024, 11:18:46	GET /Users	<button>View</button>

## Use-Case Tutorials

We are providing the steps to run all the use cases in the EO4EU platform. All the insitu files can be found in the following [link](#).

### UC1

This use case will run with in-situ data. The original data are created through an API of Pasyfo.

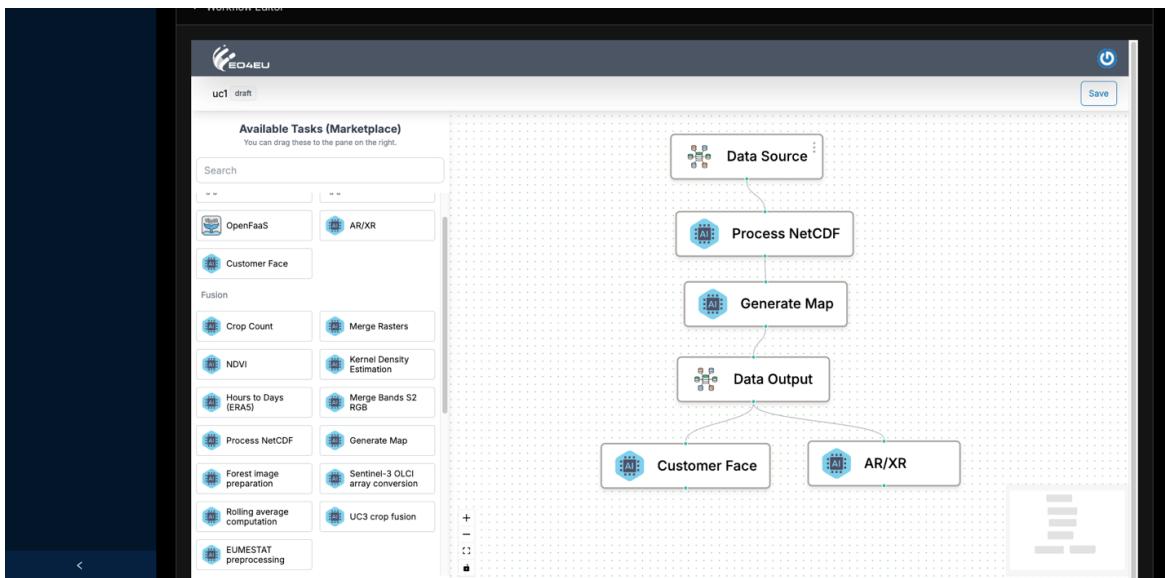
1. Create an empty workflow (named UC1 in the example below)

The screenshot shows the 'Workflow Creator' interface. At the top, there is a search bar labeled 'Workflow Name' with 'UC1' typed in. Below the search bar is a table with columns: ID, Name, Date & Time Created, and Actions. Two items are listed:

ID	Name	Date & Time Created	Actions
68e4a82c-0f1d-49c7-b93f-c4888d298f16	Sentinel-3 OLC Level 1B		<button>Select</button> <button>Delete</button>
9509e24c-8750-4efd-a7d9-622ea595c8da	10-daily NDVI composite from clear-sky observations performed by AVHRR/Metop	29/01/2025 12:58	<button>Select</button> <button>Delete</button>

At the bottom left, there is a sidebar with links: 'Workflow Editor', 'Data Visualization', 'Map Visualization', 'File Explorer', and 'XR/VR'. A footer at the bottom center says 'Copyright © EO4EU 2025'.

2. Open Workflow editor and find the draft workflow with the name of UC1
3. We add the following components and connect them as shown below



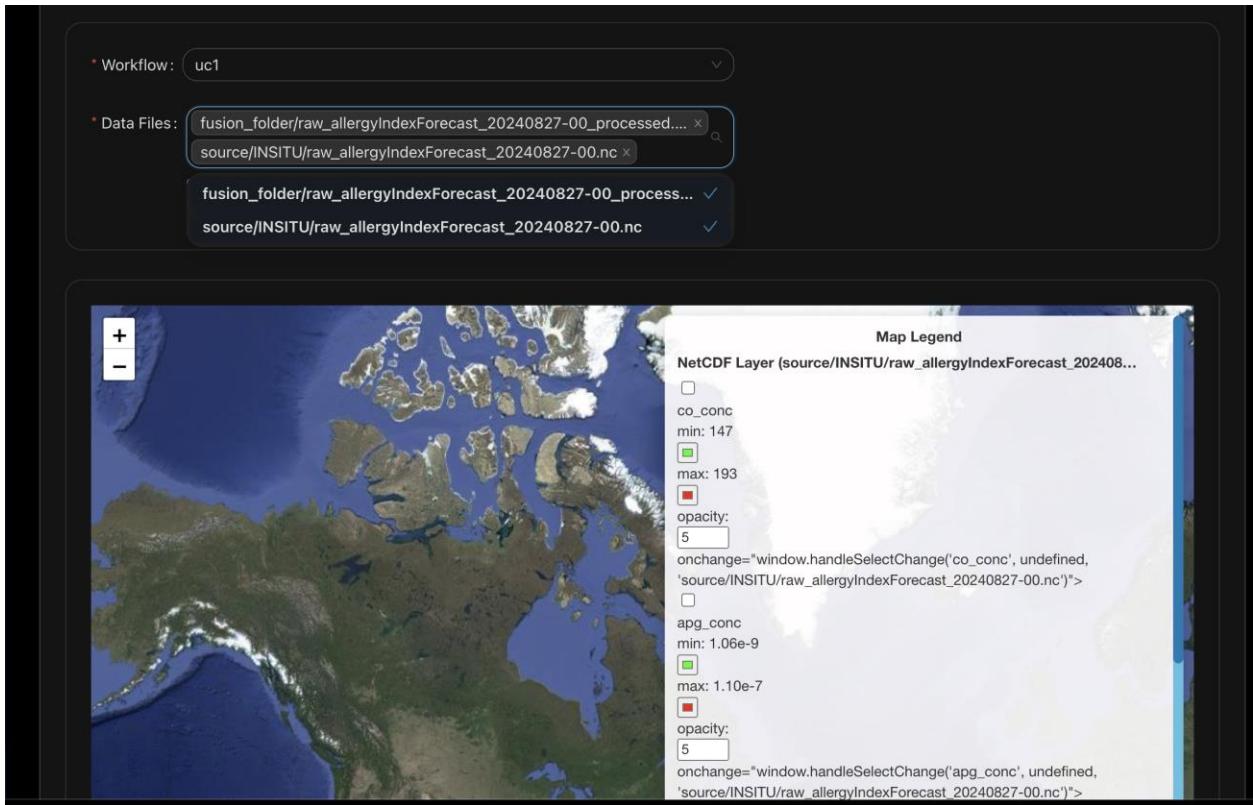
4. We select data source in order to upload the uc1.zip as in-situ data

In-Situ Data  
Choose File uc1.zip

In-Situ Metadata

Upload and go back to Editor      No file chosen

5. Save the workflow
6. Publish the workflow
7. When the workflow ends, a NetCDF is published



## UC2-a

This use case will run with in-situ data.

1. Create an empty workflow (named

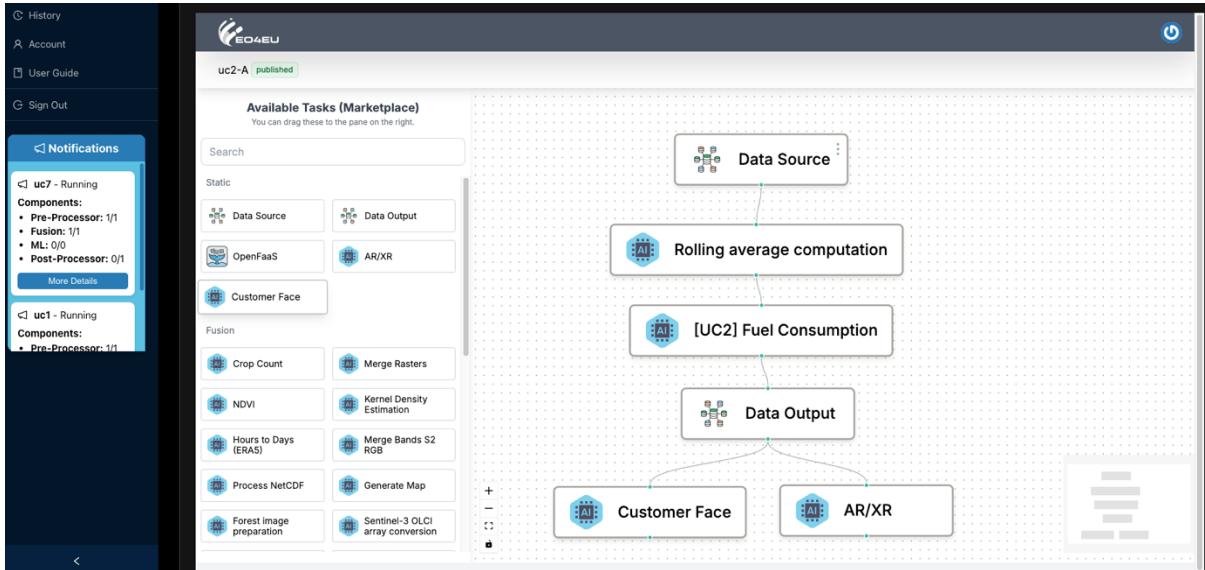
The screenshot shows the 'Workflow Creator' section of the EO4EU interface. A search bar at the top contains 'uc2-a'. Below it is a table with columns: ID, Name, Date & Time Created, and Actions. Two rows are listed:

ID	Name	Date & Time Created	Actions
65e4a82c-91fd-49c7-b93f-c4f885d29616	Sentinel-3 OLCI Level 1B		Select Delete
9509e24c-8750-467d-a7da-622ea595c8da	10-daily NDVI composite from clear-sky observations performed by AVHRR/Metop	29/01/2025 12:58	Select Delete

Total Selected: 0/2

Buttons at the bottom include 'Create Workflow' and navigation arrows.

2. Open Workflow editor and find the draft workflow with the name of uc2-a
3. We add the following components and connect as shown below



4. We select data source in order to upload the uc2(1.csv).zip as in-situ data
5. Save the workflow
6. Publish the workflow
7. When the workflow ends, Numpy Array and CSV data are published for computing the Fuel Consumption

## UC2-b

### Data search

Sentinel-3 OLCI Level 1B- (04/01/2024 - 10/01/2024) close to the area of Suez

1. Select Source: Sentinel - Data search: Sentinel-3 OLCI Level 1B)
2. Choose the following data source: Sentinel-3 OLCI Level 1B

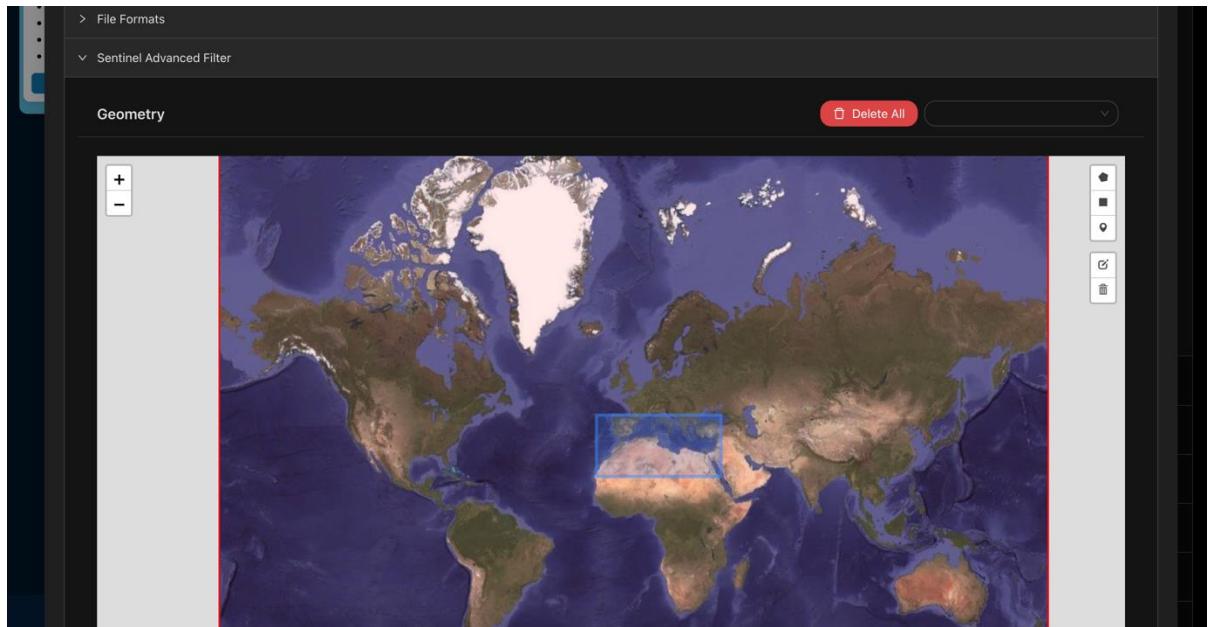
**Sentinel-1 GRD**

The Sentinel-1 dataset consists of radar imagery captured by a pair of polar-orbiting satellites, utilizing C-band synthetic aperture radar to deliver consistent, all-weather, day-and-night observations. This dataset is key for applications such as monitoring sea ice dynamics, detecting oil spills, analyzing marine winds, waves, and currents, as well as tracking land-use changes and land deformation. Additionally, it plays a crucial role in emergency response scenarios, providing critical data during floods, earthquakes, and other natural disasters.

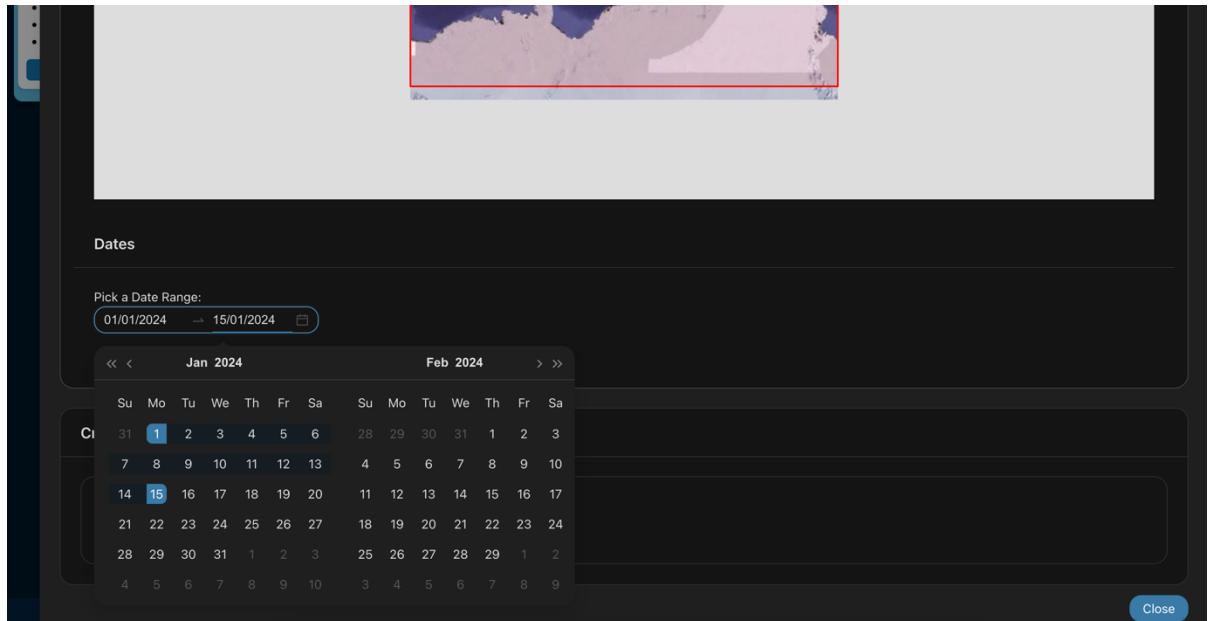
**Sentinel-3 OLCI Level 1B**

SENTINEL-3 is a European wide-swath, medium-resolution, multi-spectral imaging mission designed to monitor ocean surface topography as well as land and sea surface temperature. The satellite hosts 4 instruments: the Sea and Land Surface Temperature Radiometer (SLSTR), the Ocean and Land Colour Instrument (OLCI), a Sar Radar Altimeter (SRAL) and a Microwave Radiometer (MWR). Sentinel-3A was launched on 16 February 2016 and its twin Sentinel-3B on 25 April 2018. The OLCI instrument was designed to provide data continuity with the Medium Resolution Imaging Spectrometer

### 3. Define area of interest



### 4. Define Date range (4/01/24-10/01/24)



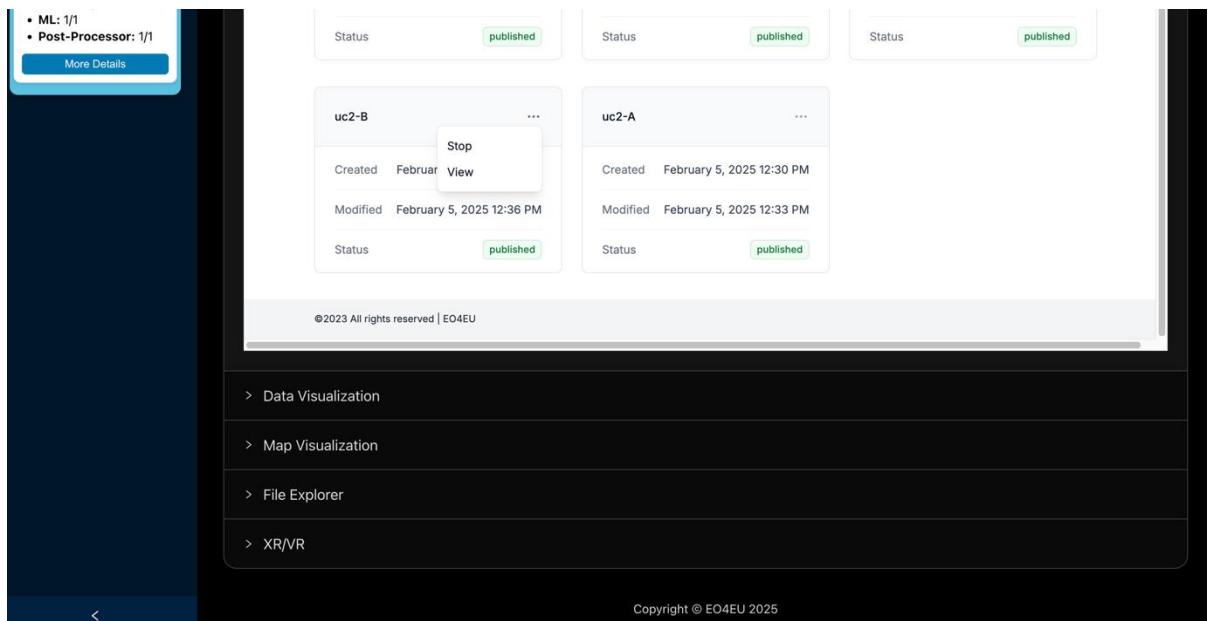
### 5. Generate Script and Save WF product

6. Workflow Creator: Create a workflow named uc2-b with the product Sentinel-3 OLCI Level 1B selected

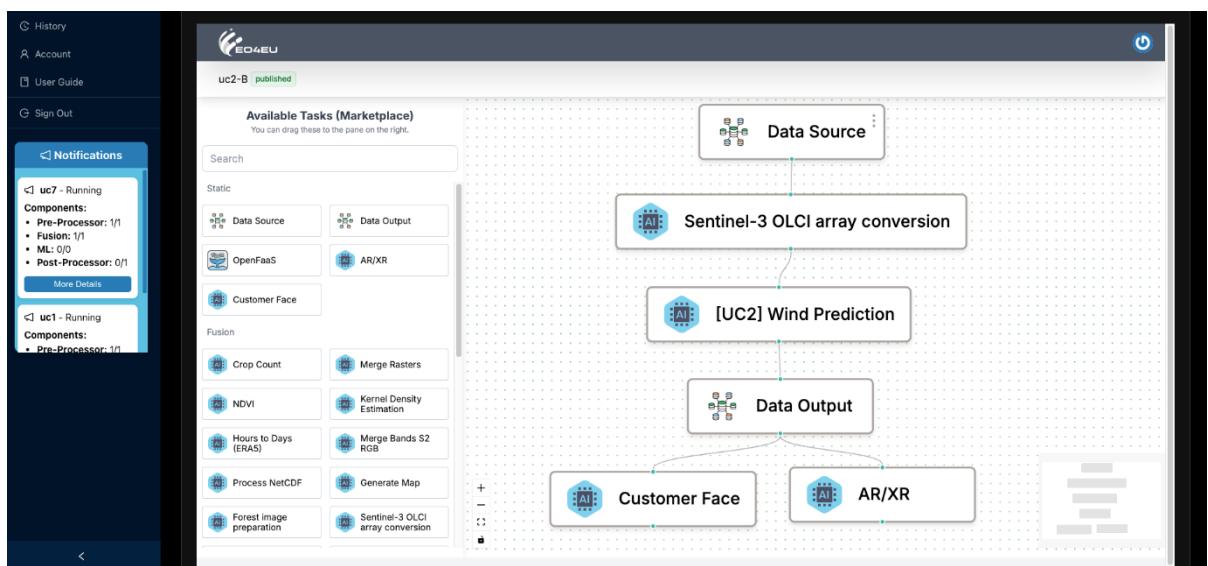
The screenshot shows the EO4EU platform interface. The left sidebar has a blue header "Home" and links for "Console", "History", "Account", "User Guide", and "Sign Out". Below this is a "Notifications" section with a card for "uc6\_11\_01 - Completed" and a list of components: Pre-Processor (1/1), Fusion (2/2), ML (1/1), and Post-Processor (1/1). A "More Details" button is at the bottom. The main content area has a breadcrumb "Home > Dataset Search" and a dropdown "Workflow Creator". A search bar contains "Workflow Name: uc2-b". Below is a table with columns ID, Name, Date & Time Created, and Actions. Two rows are shown: one for Sentinel-3 OLCI Level 1B and another for 10-daily NDVI composite from clear-sky observations performed by AVHRR/Metop. Each row has "Unselect" and "Delete" buttons. At the bottom, it says "Total Selected: 1/2" and has "Create Workflow" and navigation buttons (< 1 >).

ID	Name	Date & Time Created	Actions
65e4a82c-91fd-49c7-b93f-c4f885d29616	Sentinel-3 OLCI Level 1B	29/01/2025 12:58	<button>Unselect</button> <button>Delete</button>
9509e24c-8750-467d-a7da-622ea595c8da	10-daily NDVI composite from clear-sky observations performed by AVHRR/Metop	29/01/2025 12:58	<button>Select</button> <button>Delete</button>

7. Open Workflow editor and find the draft workflow with the name of uc2-b. In the menu on the top right corner click view.



## 8. Add the following components and connect as described below



## 9. Save the workflow

## 10. Publish the workflow

## 11. When the workflow ends, a Numpy Array and a CSV are published to identify the wind prediction

## UC3

This use case will run with in-situ data.

## 1. Create an empty workflow named uc3

The screenshot shows the EO4EU platform's Workflow Creator interface. On the left, a sidebar includes links for Home, Console, History, Account, User Guide, and Sign Out. A Notifications section displays a completed workflow named 'uc6\_11\_01'. The main area is titled 'Dataset Search' and 'Workflow Creator'. A search bar contains the text 'Workflow Name: uc3'. Below it is a table with columns for ID, Name, Date & Time Created, and Actions. Two rows are listed:

ID	Name	Date & Time Created	Actions
65e4a82c-91fd-49c7-b93f-c4f885d29616	Sentinel-3 OLCI Level 1B		Select Delete
9509e24c-8750-467d-a7da-622ea595c8da	10-daily NDVI composite from clear-sky observations performed by AVHRR/Metop	29/01/2025 12:58	Select Delete

Total Selected: 0/2 and a 'Create Workflow' button are at the bottom right. Navigation arrows are at the very bottom.

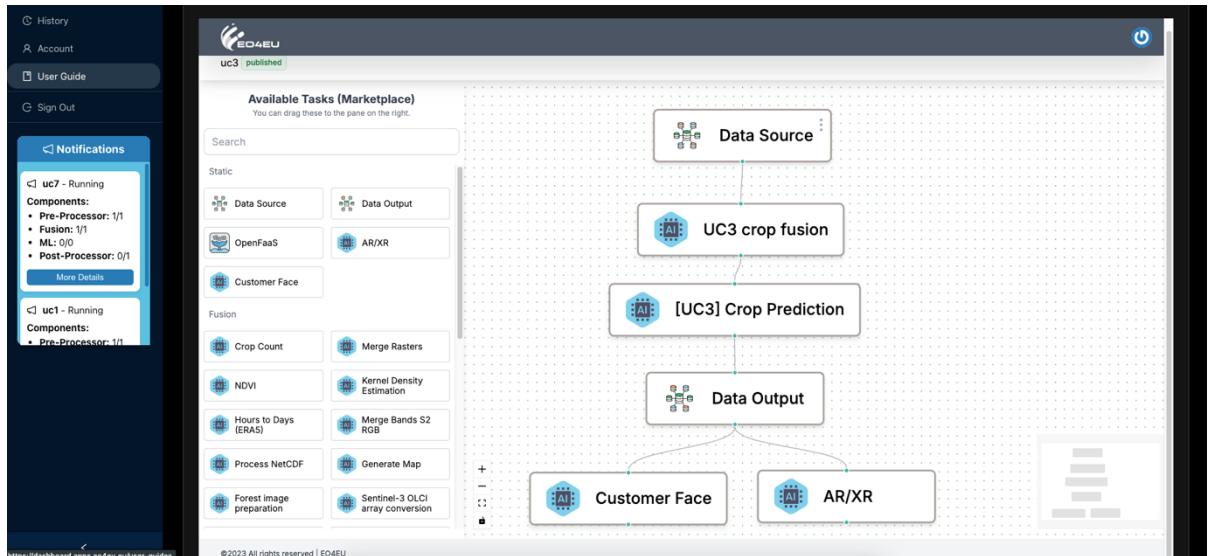
2. Open Workflow editor and find the draft workflow with the name uc3. Click view.

The screenshot shows the EO4EU platform's Workflow Editor interface. The sidebar and notifications section are identical to the previous screenshot. The main area is titled 'Dataset Search' and 'Workflow Creator', then 'Workflow Editor'. It displays a grid of workflow cards:

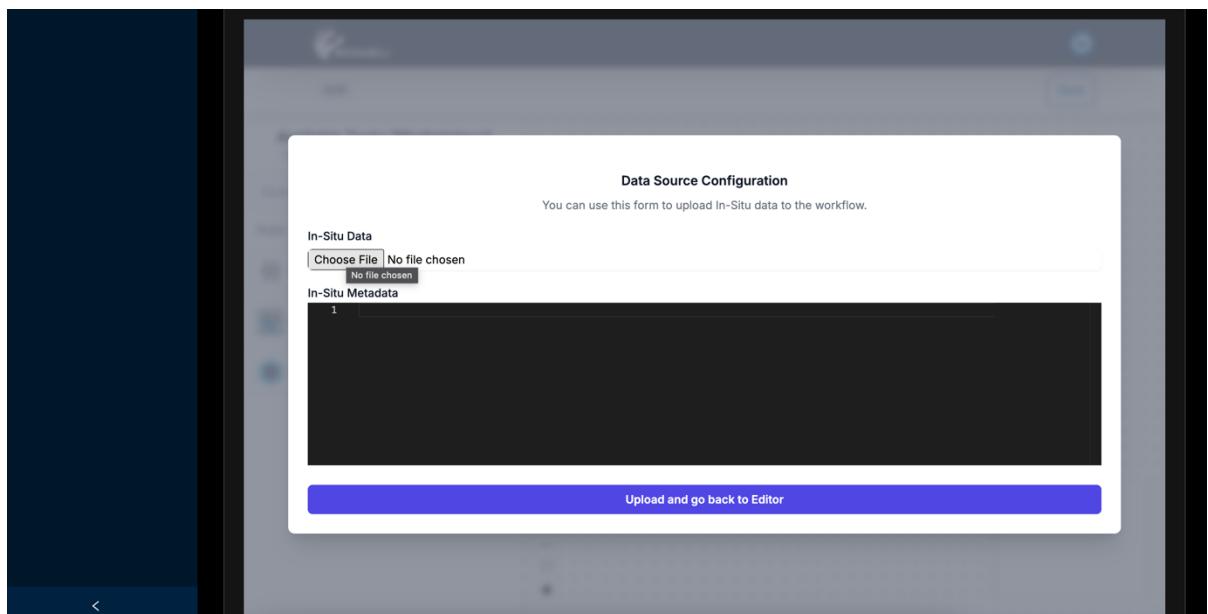
uc5	uc4-2	uc3
Created: February 5, 2025 4:34 PM	Created: February 5, 2025 1:03 PM	Created: February 5, 2025 12:42 PM
Modified: February 5, 2025 4:36 PM	Modified: February 5, 2025 1:06 PM	Modified: February 5, 2025 4:39 PM
Status: published	Status: draft	Status: published

Below the grid are cards for 'uc2-R' and 'uc2-A'. A power icon and a 'Stop' button are visible above the uc3 card. The URL 'https://dashboard.apps.eo4eu.eu/home' is at the bottom left.

3. We add the following components and connect them as shown below



4. We select data source in order to upload the UC3\_INSITU.zip as in-situ data



5. Save the workflow
6. Publish the workflow
7. When the workflow ends, a numpy array and a csv are published

## UC4

Hint: UC4 is for forest recognition, so we need at least an area of land.

Data search - Sentinel-1 GRD - (02/01/2018 - 31/12/2018) an area inside Austria

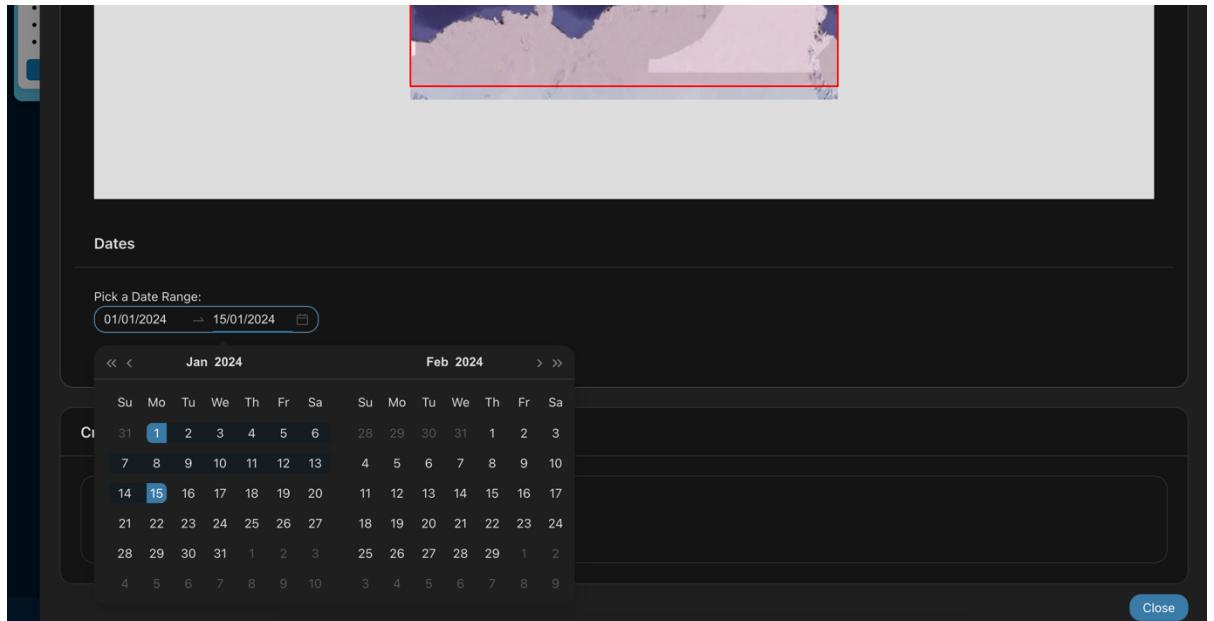
1. Select Source: Adam or Sentinel - Data search: Sentinel-1 GRD

The screenshot shows the EO4EU dataset search interface. On the left, a sidebar includes links for Home, Console, History, Account, User Guide, and Sign Out. A notifications section displays a workflow creation status: "Workflow Creation - SUCCESS". The main area is titled "Dataset Search" and shows a query search bar with "Available" selected. The search term "Sentinel-1 GRD" is entered, and a "Search" button is visible. Below the search bar, it says "We found a total of 20 datasets". A detailed description for "Sentinel-1 GRD" is provided, mentioning it's a Level-1 Ground Range Detected (GRD) product. At the bottom of the search results, there's a note about "adam | From Adam: YES".

2. Choose the following data source: Sentinel-1 GRD
3. Define area of interest

The screenshot shows the EO4EU map interface. The left sidebar has sections for File Formats and Sentinel Advanced Filter. The main area is titled "Geometry" and features a world map. A blue rectangular box highlights a specific region in Europe and Africa. On the right side of the map, there are various icons for zooming, panning, and saving.

4. Define Date range (02/01/24-10/01/24)

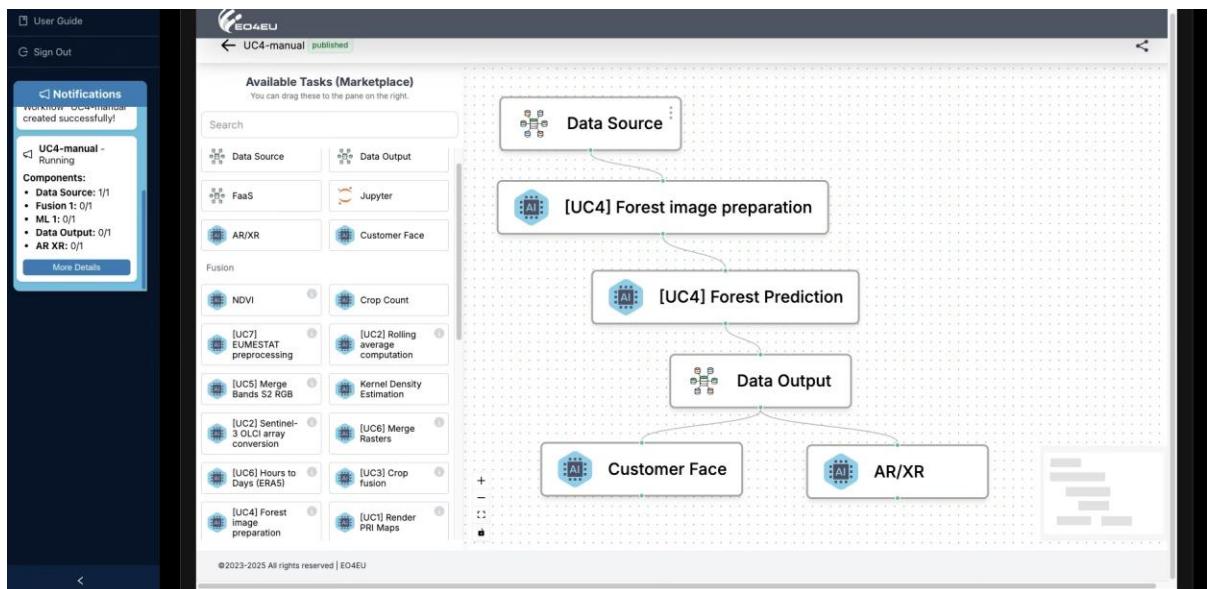


5. Generate Script and Save WF product
6. Workflow Creator: Create a workflow named uc4 with the product Sentinel-1 GRD selected

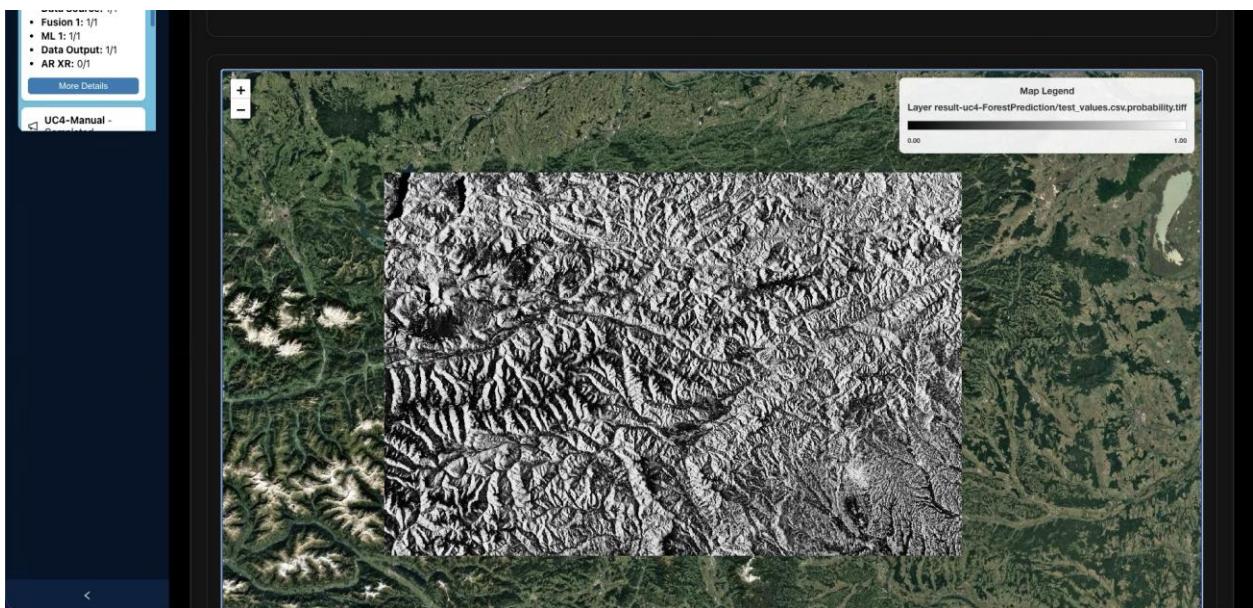
ID	Name	Actions
33741a72-63e1-4593-bd56-e6a8134ca373	Sentinel-1 GRD	<button>Unselect</button> <button>Delete</button>
35496f7d-2842-4e0f-98f1-f16d35802e48	Sentinel-3 OLCI Level 1B	<button>Select</button> <button>Delete</button>
aa3d823d-4f6d-4f2f-9eea-1a16c13fe21e	Sentinel-2 L2A: Band 2 (10m)	<button>Select</button> <button>Delete</button>
2595c777-4156-4535-9871-7b95f421caf8	Sentinel-1 GRD	<button>Select</button> <button>Delete</button>

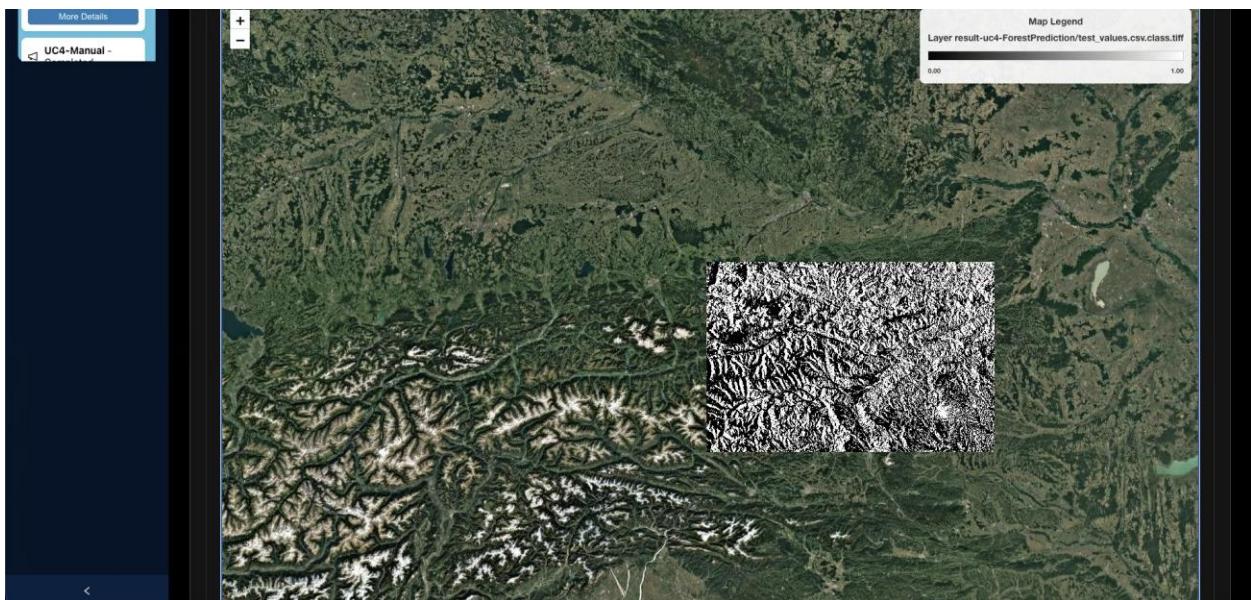
Total Selected: 1/4 Create Workflow

7. Open Workflow editor and find the draft workflow with the name of uc4. Click view.
8. Add the following components and connect them as shown below

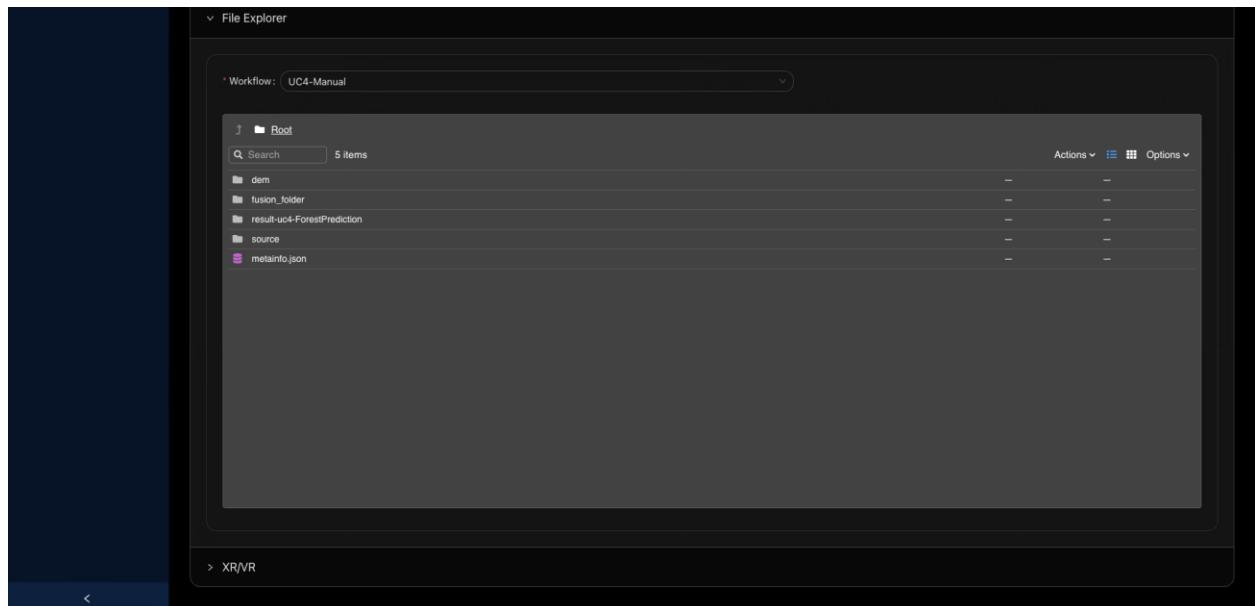


9. Save the workflow
10. Publish the workflow
11. When the workflow ends, TIFFs of the prediction of a specific area identified as forest are published
12. Map visualization

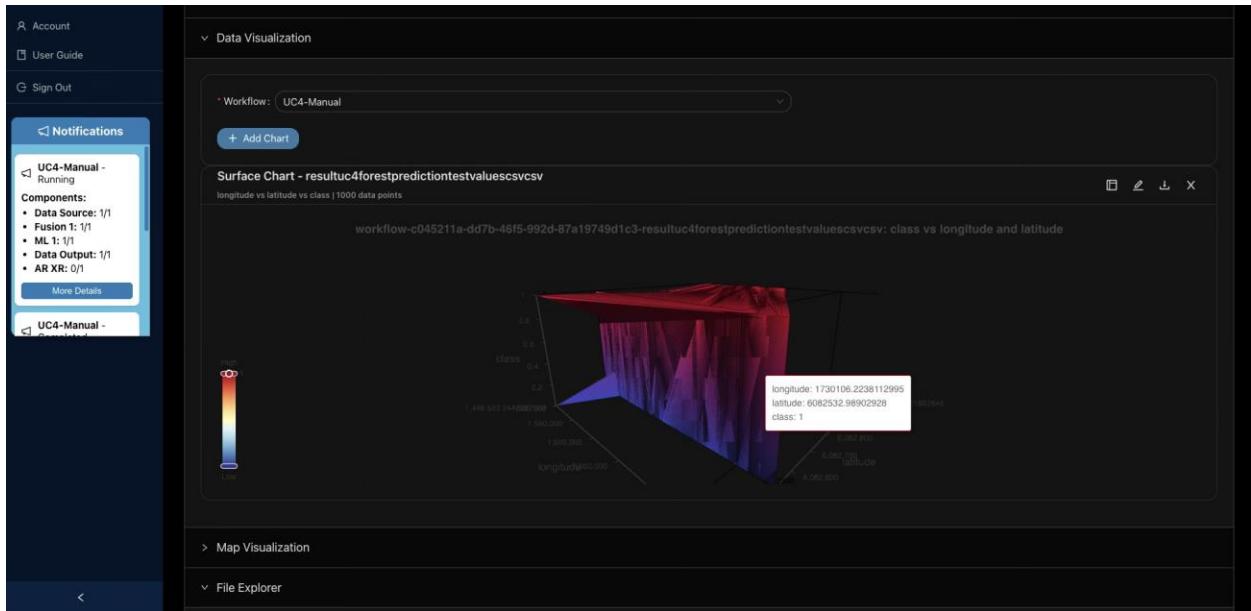




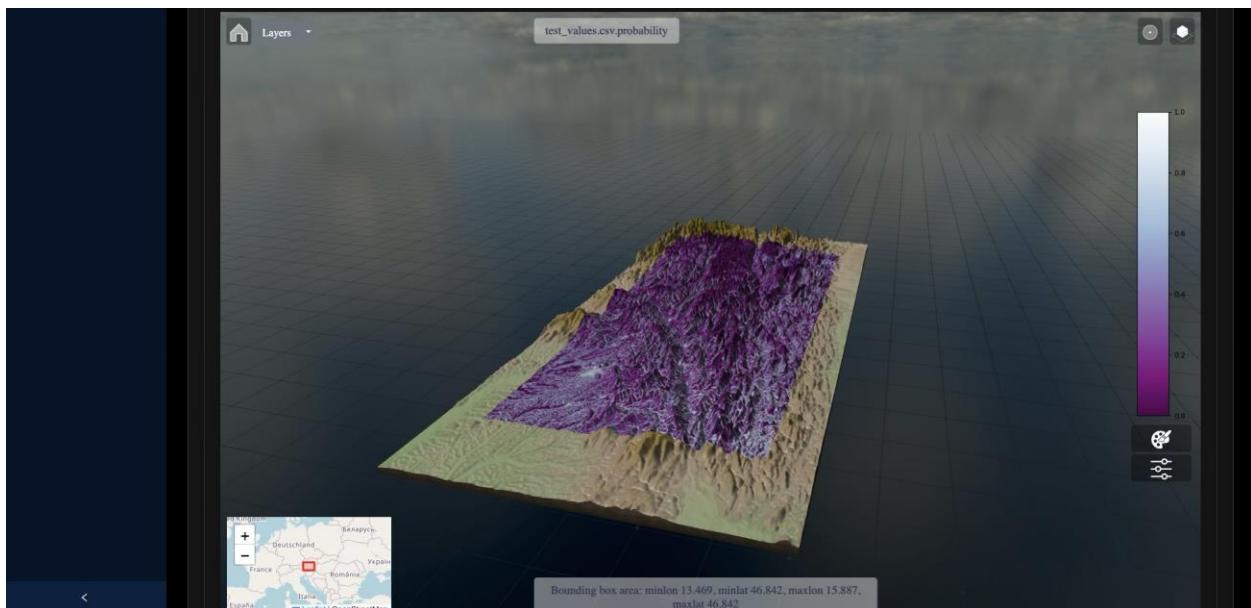
13. File explorer

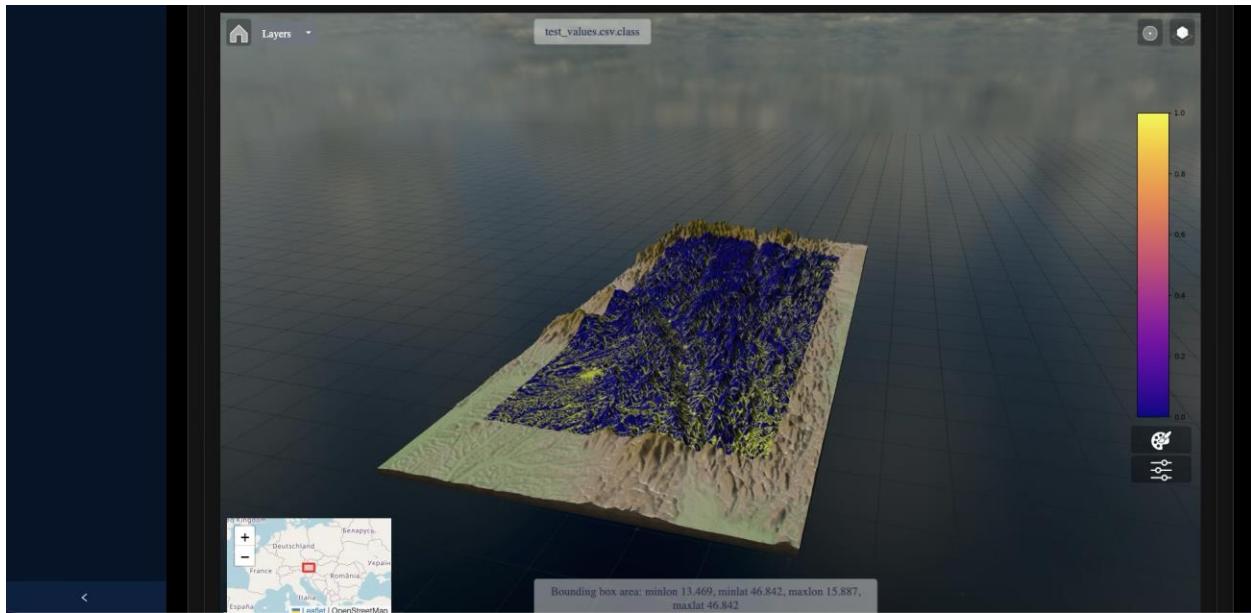


14. Data visualization



## 15. AR/XR





## UC5

### 1. Data search: Sentinel-2 L2A Bands 2, 3, 4, 8, 11, 12.

For each dataset:

Define area of interest

Define date range

Push Filter now and select all products

**EO4EU Portal**

<https://dashboard.apps.eo4eu.eu/home>

but phased at 180°, is designed to give a high revisit frequency of 5 days at the Equator. SENTINEL-2 carries an optical instrument payload that samples 13 spectral bands: four bands at 10 m, six bands at 20 m and three bands at 60 m spatial resolution. The orbital swath width is 290 km. The objectives for SENTINEL-2 are set out in the Mission Requirements Document and consist in providing: systematic global acquisitions of high-resolution, multispectral images allied to a high revisit frequency continuity of multi-spectral imagery provided by the SPOT series of satellites and the USGS LANDSAT Thematic Mapper instrument observation data for the next generation of operational products, such as land-cover maps, land-change detection maps and geophysical variables. These high-level objectives, determined after consultation with users, will ensure that SENTINEL-2 makes a significant contribution to Copernicus themes such as climate change, land monitoring, emergency management, and security. With its 13 spectral bands, 290 km swath width and high revisit frequency, SENTINEL-2's MSI instrument supports a wide range of land studies and programmes, and reduces the time required to build a European cloud-free image archive. It also provides valuable data for land cover/change classification, atmospheric correction and cloud/snow masks.

adam | From Adam: YES

**Sentinel-2 L2A: Band 2 (10m)**

SENTINEL-2 is a European wide-swath, high-resolution, multi-spectral imaging mission. The full mission specification of the twin satellites flying in the same orbit but phased at 180°, is designed to give a high revisit frequency of 5 days at the Equator. SENTINEL-2 carries an optical instrument payload that samples 13 spectral bands: four bands at 10 m, six bands at 20 m and three bands at 60 m spatial resolution. The orbital swath width is 290 km. The objectives for SENTINEL-2 are set out in the Mission Requirements Document and consist in providing: systematic global acquisitions of high-resolution, multispectral images allied to a high revisit frequency continuity of multi-spectral imagery provided by the SPOT series of satellites and the USGS LANDSAT Thematic Mapper instrument observation data for the next generation of operational products, such as land-cover maps, land-change detection maps and geophysical variables. These high-level objectives, determined after consultation with users, will ensure that SENTINEL-2 makes a significant contribution to Copernicus themes such as climate change, land monitoring, emergency management, and security. With its 13 spectral bands, 290 km swath width and high revisit frequency, SENTINEL-2's MSI instrument supports a wide range of land studies and programmes, and reduces the time required to build a European cloud-free image archive. It also provides valuable data for land cover/change classification, atmospheric correction and cloud/snow masks.

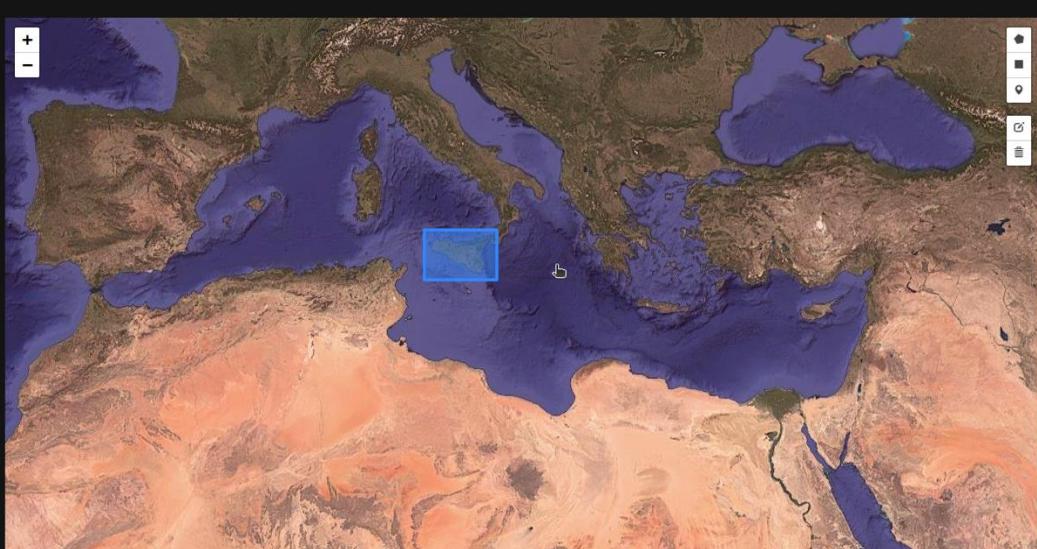
adam | From Adam: YES

**Sentinel-2 L2A: Band 3 (10m)**

SENTINEL-2 is a European wide-swath, high-resolution, multi-spectral imaging mission. The full mission specification of the twin satellites flying in the same orbit but phased at 180°, is designed to give a high revisit frequency of 5 days at the Equator. SENTINEL-2 carries an optical instrument payload that samples 13 spectral bands: four bands at 10 m, six bands at 20 m and three bands at 60 m spatial resolution. The orbital swath width is 290 km. The objectives for SENTINEL-2 are set out in the Mission Requirements Document and consist in providing: systematic global acquisitions of high-resolution, multispectral images allied to a high revisit frequency continuity of multi-spectral imagery provided by the SPOT series of satellites and the USGS LANDSAT Thematic Mapper instrument observation data for the next generation of operational products, such as land-cover maps, land-change detection maps and geophysical variables.

**Geometry**

Delete All Sentinel-2 L2A: Band 2 (10m)



The screenshot shows two windows of the EO4EU Portal. The top window displays a satellite map of a desert landscape with a blue river or canal running through it. Below the map is a 'Dates' section with a date range selector from 04/01/2024 to 12/01/2024 and a 'Filter Now!' button. The bottom window is titled 'Create Workflow' and shows a list of six products: T32SQG\_20240110T100309\_B02\_10m.jp2, T33SUB\_20240110T100309\_B02\_10m.jp2, T33STC\_20240110T100309\_B02\_10m.jp2, T33SUC\_20240110T100309\_B02\_10m.jp2, and '+ 40 Products ...'. To the right of the products are dropdown menus for 'True' and 'Generate Script'. The bottom window is expanded to show the 'Python Script' and 'Meta Info (JSON)' tabs. The Python Script tab contains the following code:

```

from adamapi import Auth, Datasets, Search, GetData
from datetime import datetime, timezone

ADAM_API_KEY = "29q2efzBdv8W0l02ms0ZlhFG_s6ZG1z76FdMzUpdBk"
ADAM_ENDPOINT_URL = "https://adam.apps.eo4eu.eu/"

a=Auth()
a.setKey(ADAM_API_KEY)
a.setAdamCore(ADAM_ENDPOINT_URL)
a.authorize()
data=GetData(a)

productIDs = ['T32SQG_20240110T100309_B02_10m.jp2', 'T33SUB_20240110T100309_B02_10m.jp2']
for productID in productIDs:
    image = data.getData('62a10eclace861e190565fe:S2_MSIL2A_B02_10m','GetFi')

```

The 'Meta Info (JSON)' tab displays the following JSON structure:

```

[
  {
    "id": "T32SQG_20240110T100309_B02_10m.jp2",
    "metadata": {
      "Geometry": [
        {
          "attributeName": "Geometry",
          "children": {
            "Coordinates": [
              {
                "attributeName": "Coordinate",
                "children": null,
                "dataType": "String",
                "values": [
                  "[[11.27507346075699, 37."
                ]
              }
            }
          }
        }
      }
    }
]

```

At the bottom of the expanded window are 'Save WF Product' and 'Close' buttons.

2. In the workflow creator, select the six products, name the workflow UC5-test, and select Create Workflow

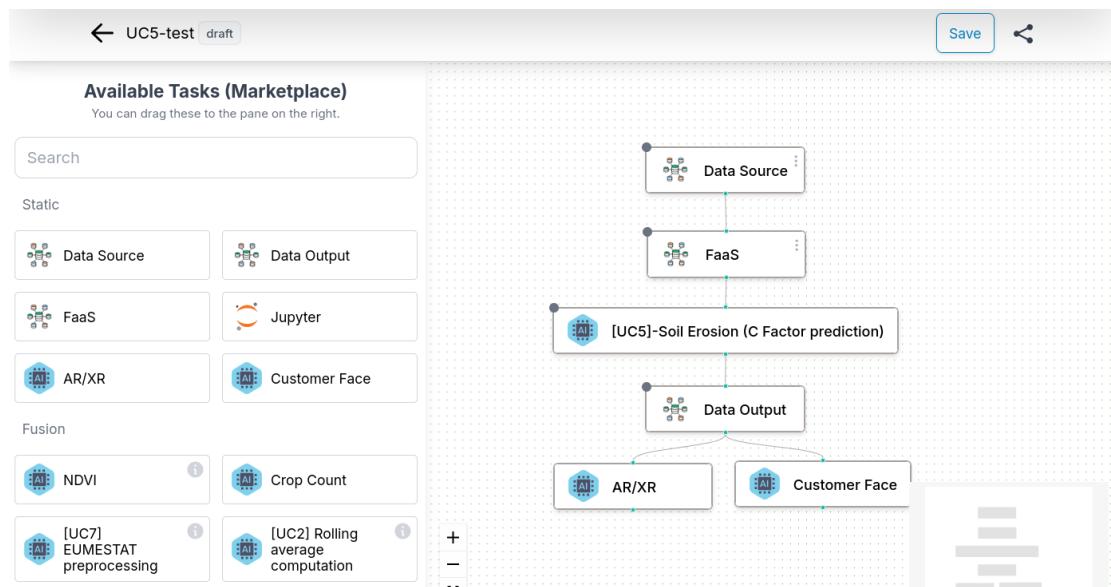
Workflow Name : UC5-test

ID	Name	Date & Time Created	Actions
12cf687-fa7d-4b97-91e0-9144af20661b	Sentinel-2 L2A: Band 2 (10m)	02/02/2026 12:55	<button>Unselect</button> <button>Delete</button>
5ed5171a-64c2-4c51-a79e-e0b541552080	Sentinel-2 L2A: Band 3 (10m)	02/02/2026 12:55	<button>Unselect</button> <button>Delete</button>
75694316-9a53-48e4-92be-ae483f42e5e8	Sentinel-2 L2A: Band 4 (10m)	02/02/2026 12:56	<button>Unselect</button> <button>Delete</button>
5bbba7e6-8a2b-49d6-8b32-96ab90235bc7	Sentinel-2 L2A: Band 8 (10m)	02/02/2026 12:57	<button>Unselect</button> <button>Delete</button>
baa68bea-8c5d-4165-b6fa-a4cd652eb1fb	Sentinel-2 L2A: Band 11 (20m)	02/02/2026 12:57	<button>Unselect</button> <button>Delete</button>
aa05abf7-7966-47e0-b3e0-f671e2d621d1	Sentinel-2 L2A: Band 12 (20m)	02/02/2026 13:01	<button>Unselect</button> <button>Delete</button>

Total Selected: 6/6

Create Workflow

- In the Workflow editor, use the workflow schema as shown in the picture below. Click the three dots on the FaaS node and provide a [python script](#) (crop images) and the needed requirements. Finally, save and publish the workflow.



**FaaS Configuration**

You can use the editor to create your own script.

Select Language

Python3

Script (Python3)

```

1  from pathlib import Path
2
3  import rasterio
4  from rasterio.windows import from_bounds
5  from rasterio.windows import transform as window_transform
6  from pyproj import Transformer
7
8  EO4EU_FAAS_OPTIONS = {
9      "group_by_path": "source./+([0-9,A-Z]+)_.*.jp2",
10     "number_of_jobs": 3,
11 }
12
13 def bounds_to_tuple(b):
14     return (b.left, b.bottom, b.right, b.top)
15
16
17 def intersect_bounds(a, b):
18     l = max(a[0], b[0])
19     btm = max(a[1], b[1])
20     r = min(a[2], b[2])
21     t = min(a[3], b[3])
22     if (r <= l) or (t <= btm):
23         return None
24     return (l, btm, r, t)
25
26

```

Requirements

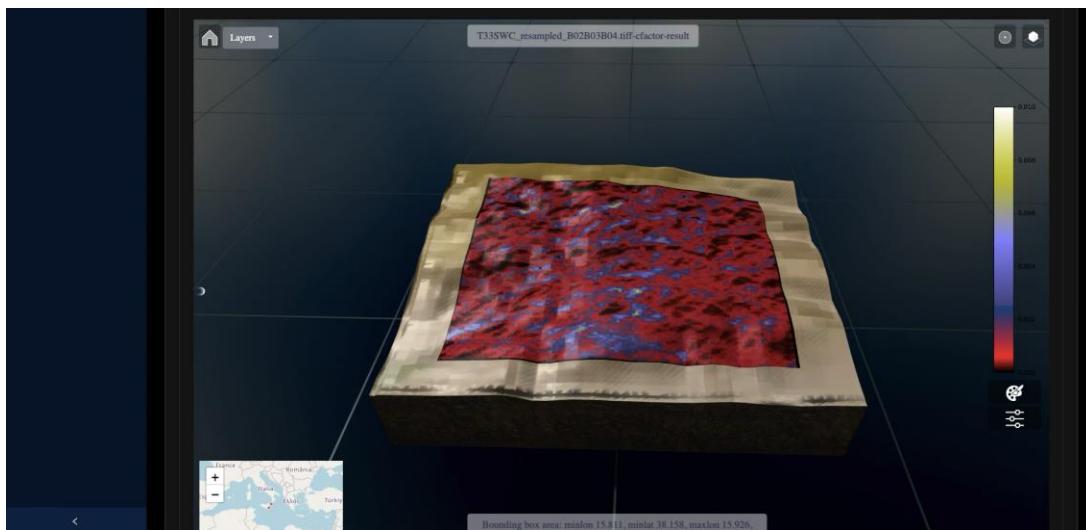
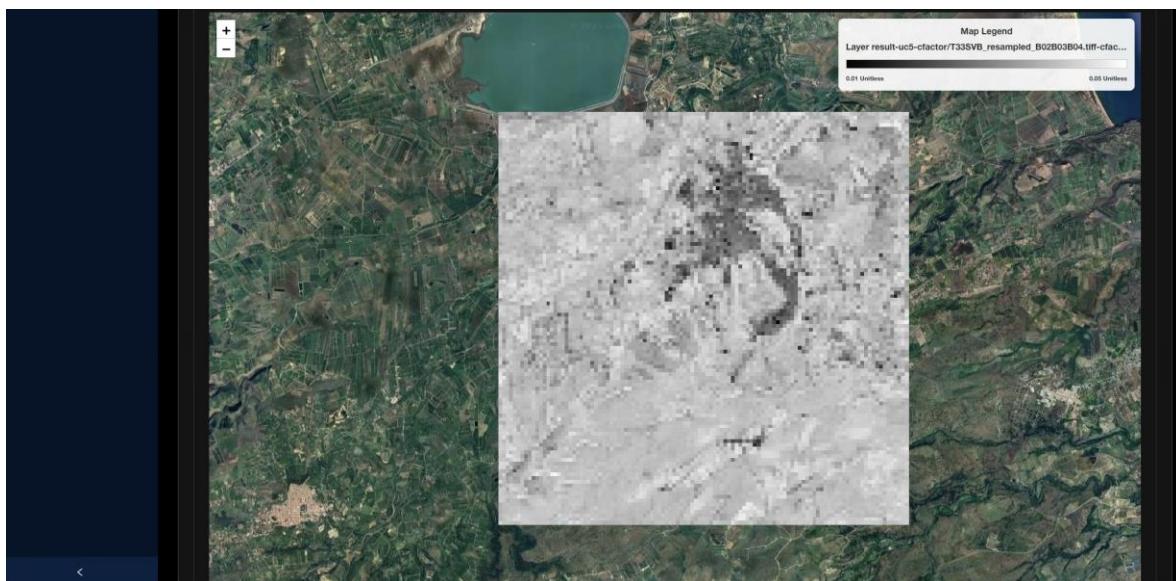
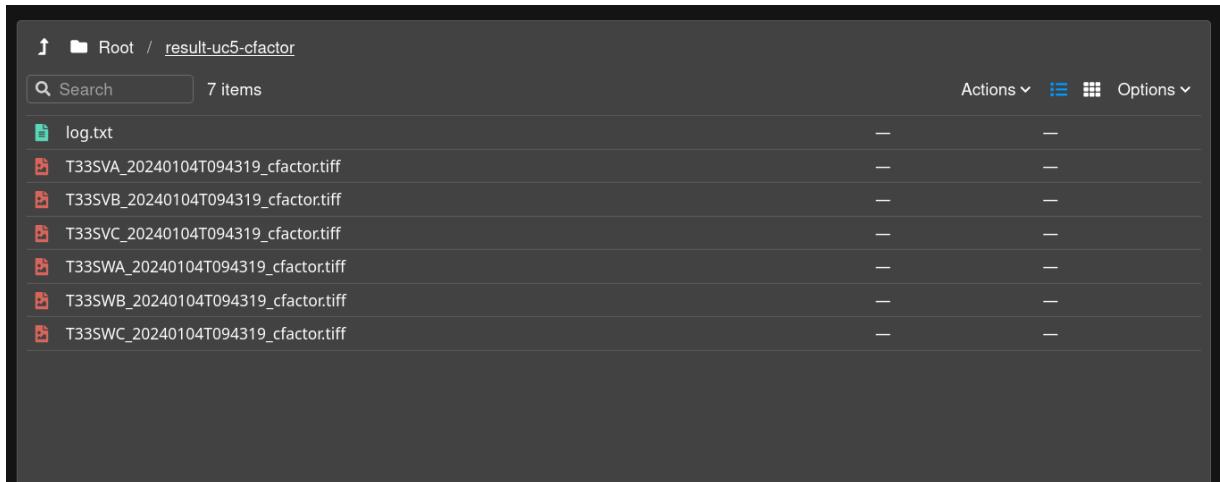
```

1  rasterio==1.3.10
2  pyproj

```

[Update and go back to Editor](#)

- When the workflow completes, TIFFs are published (use File Explorer tab to view all data related to the workflow). Now, the map visualization, data visualization and AR/XR tabs can be used.



## UC6

### 1. Data search: ERA5 insitu data

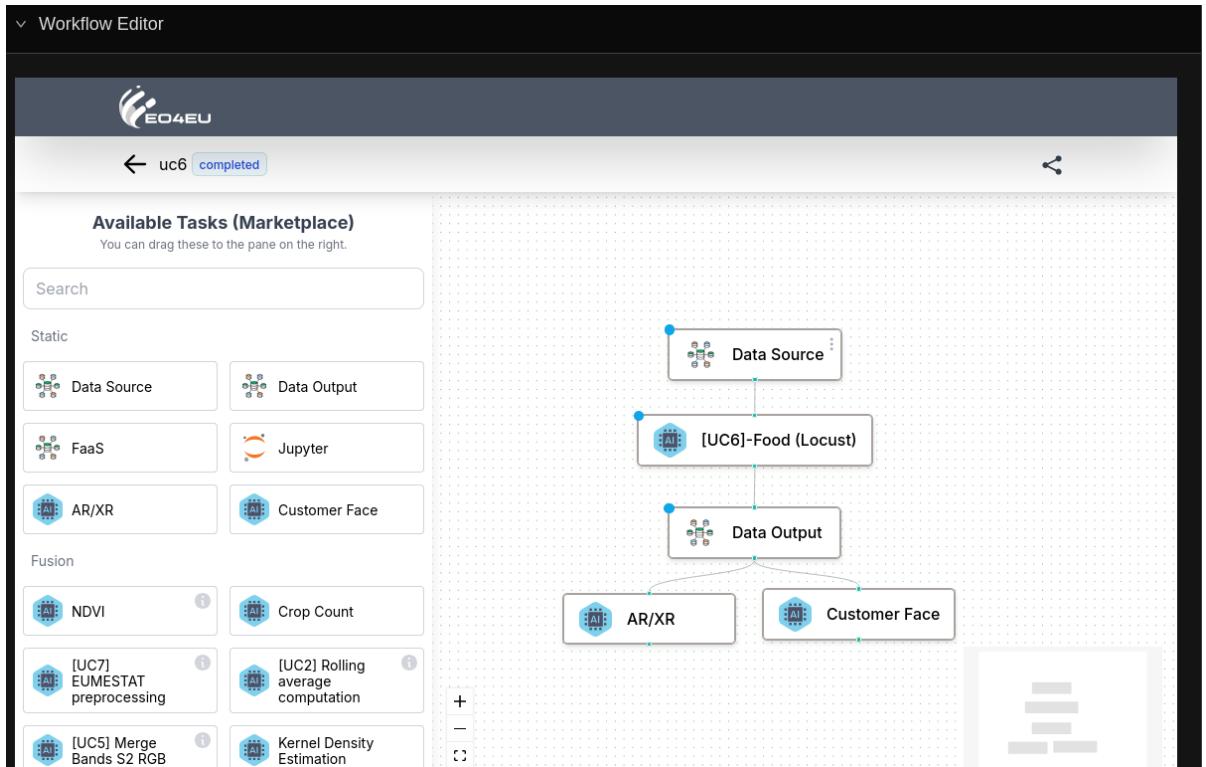
The screenshot shows a search interface for datasets. At the top, there's a button labeled 'Available'. Below it is a 'Query Search' bar containing the text 'InSitu' and 'era 5'. A 'Search' button is to the right of the search bar. The main area displays a message: 'We found a total of 2 datasets'. Below this, a card for 'Soil water content layer 1 (ERA5-Land)' is shown. The card includes a brief description of the dataset, a status bar with 'InSitu' and 'From Adam: NO', and a small preview image.

### 2. Generate Script and Save WF product

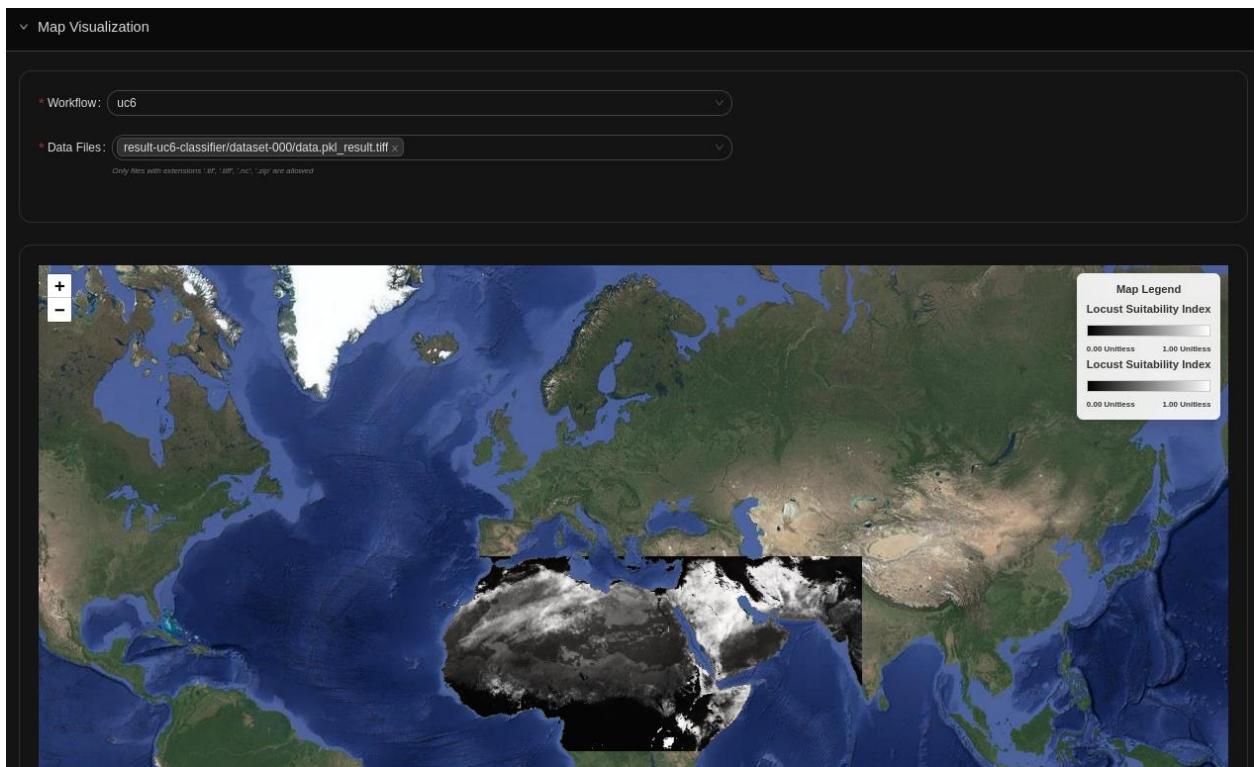
3. In the workflow creator, select the dataset, name the workflow uc6, and select Create Workflow

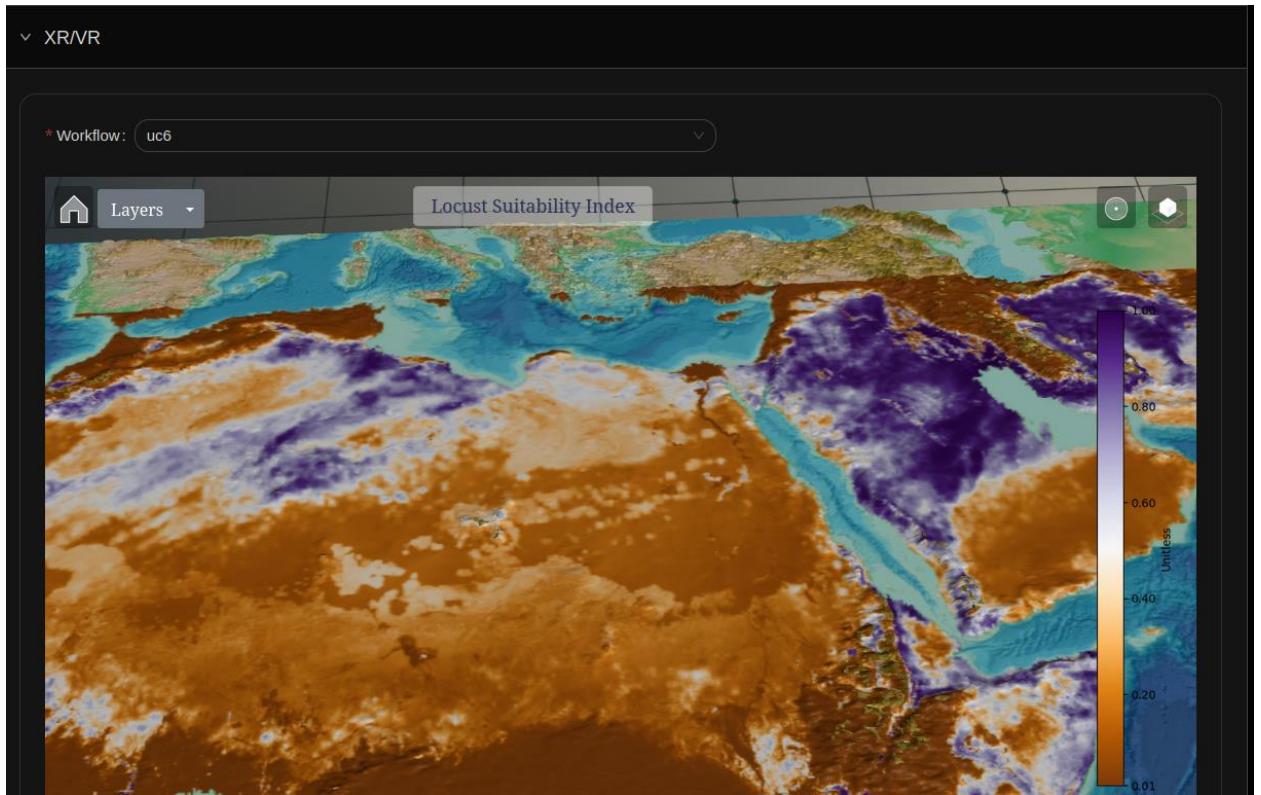
The screenshot shows the 'Workflow Creator' interface. It has a 'Workflow Name:' input field set to 'uc6'. Below it is a table listing datasets. The first dataset in the list is 'Soil water content layer 1 (ERA5-Land)'. The table has columns for 'ID', 'Name', 'Date & Time Created', and 'Actions'. The 'Actions' column contains buttons for 'Unselect' and 'Delete'. At the bottom left, it says 'Total Selected: 1/1'. On the right, there are 'Create Workflow' and navigation buttons (<, 1, >).

4. In the Workflow editor, use the schema as shown in the picture below, save and publish the workflow



- Once the workflow completes, the map visualization and AR/XR tabs can be used to visualize the use case results





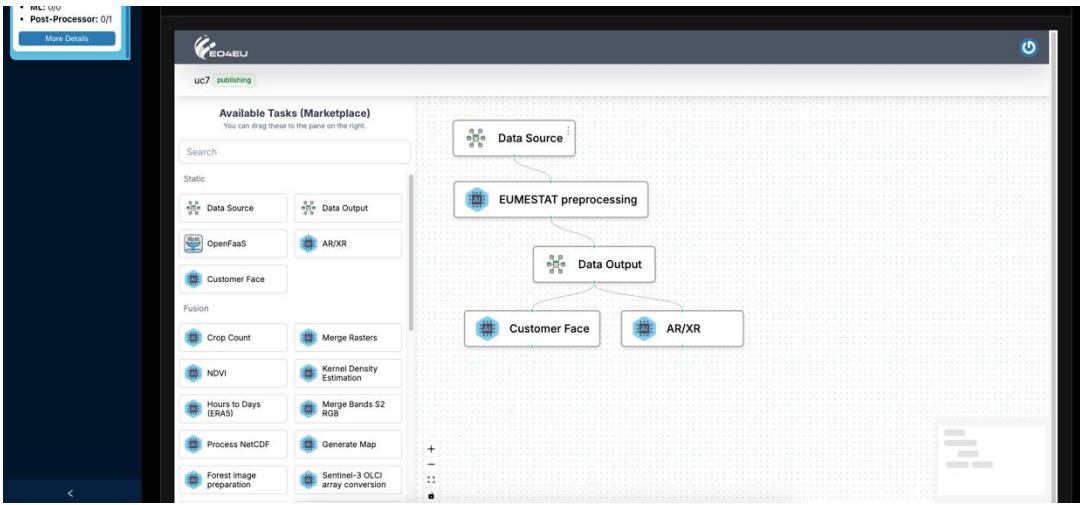
## UC7

This use case will run with in-situ data.

1. Create an empty workflow as in UC1 or UC2

ID	Name	Date & Time Created	Actions
65e4a82c-91fd-49c7-b93f-c4f885d29616	Sentinel-3 OLCI Level 1B		Select Delete
9509e24c-8750-467d-a7da-622ea595c8da	10-daily NDVI composite from clear-sky observations performed by AVHRR/Metop	29/01/2025 12:58	Select Delete

2. Open Workflow editor and find the draft workflow with the name of uc7
3. Add the following components and connect them as shown below



4. Select data source in order to upload the uc7.zip as in-situ data
5. Save and publish the workflow
6. When the workflow ends, a TIFF is published going to jixel app

