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SnapEarth Pilot - EarthAgriculture

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Cosmin UDROIU
CS GROUP - ROMANIA

CS GROUP – ROMANIA

ACTIVITIES AND MAIN CLIENTS

During its 30 years of market presence, CS GROUP - ROMANIA has carried on complex IT projects and has significant expertise in software development and maintenance for critical information systems

SPACE
- Earth Observation
- Flight Dynamics
- Scientific Missions
- Navigation
- Onboard Software
- Software for EGSE
- ...

AERONAUTICS
- FADEC
- Multifunctional Display
- Flight Display Systems
- Flight Warning Systems
- Air Traffic Control (ATC) controller-pilot communications
- ...

ENERGY
- Systems Integration at Control Centre levels
- SCADA and Automation Systems
- Information systems for Power Generation Management Systems
- Information Systems for Oil & Gas production

SOFTWARE OUTSOURCING
- Third Party Software Applications Maintenance
- Passenger Information Systems for public transport
- Software development and V&V for Railway Systems
- Automation Systems for Automotive Industry

DEVELOPMENT AND MAINTENANCE SOFTWARE APPLICATIONS

DEVELOPMENT, TEST AND IV&V EMBEDDED SOFTWARE

COMMAND & CONTROL SYSTEMS

MAIN CLIENTS

CS RO subcontractor for the end customers:

What Is EarthAgriculture?

- An online service for improvement of agricultural management practices
  - By providing reports and statistical analysis of the green vegetation status (corresponding to the crop vegetative development) @ 10m
  - By providing cropland masks (binary maps separating annual cropland areas from other areas) @ 10m
  - By providing crop type maps: main crop types with a minimum mapping unit of 0.01ha (or 100 Sentinel-2 pixels) @ 10m
  - By providing agricultural and EFA practices and basic markers
  - By performing the grassland growing monitoring

  Over an area of interest and a time period (season)

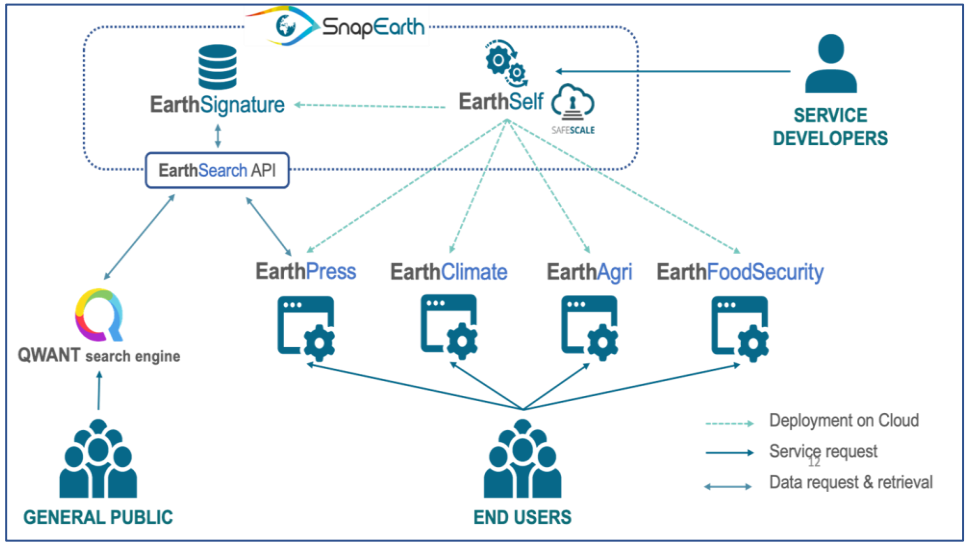
  Either **on demand** or **continuously monitoring**
- Build on the ESA Sen2-Agri (http://www.esa-sen2agri.org/) and Sen4CAP (http://esa-sen4cap.org/)

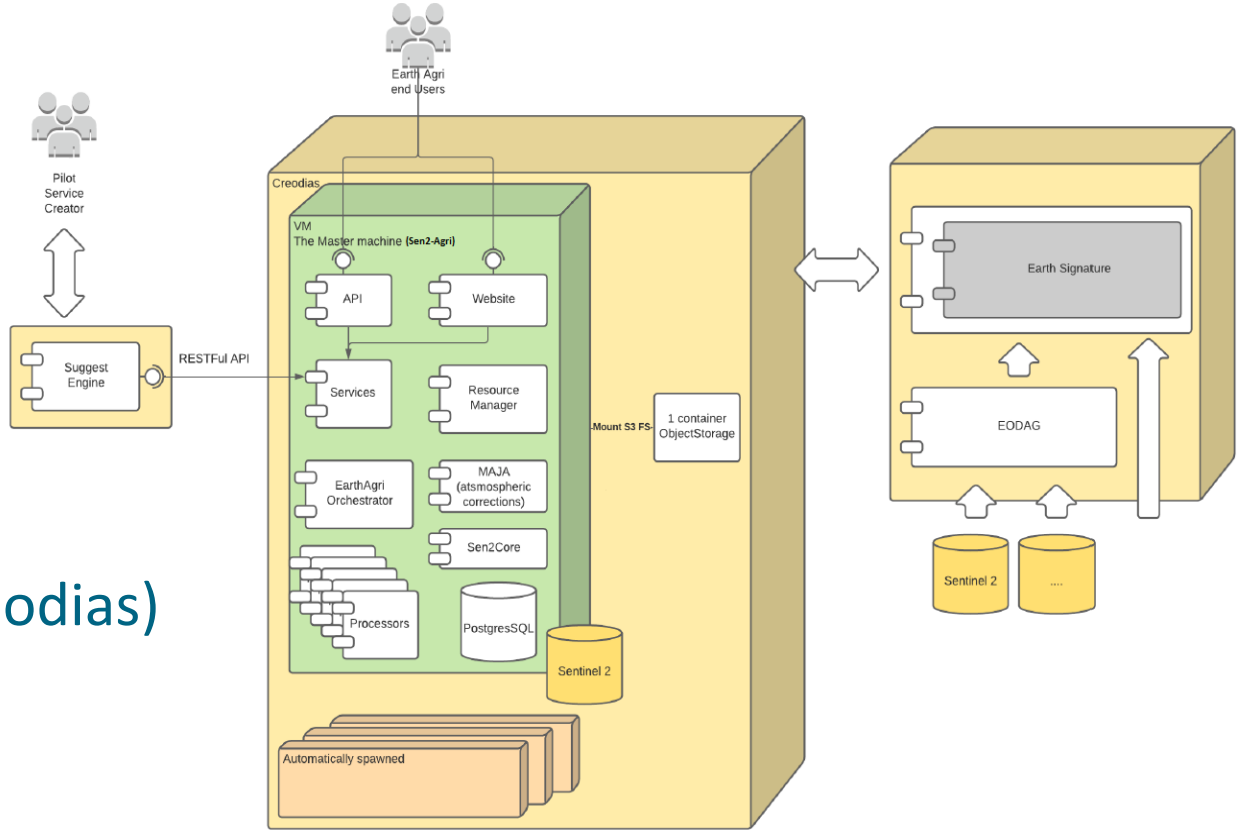
What Is EarthAgriculture?

Advantages using a service rather the standalone implementation

- **Service-oriented**
- **No installation** (cloud service)
- **Dynamic scaling** of resources
- User-provided in-situ data or **EarthSignature** land cover for Crop Type classification
- **Enhanced** user interface

EarthAgriculture architecture

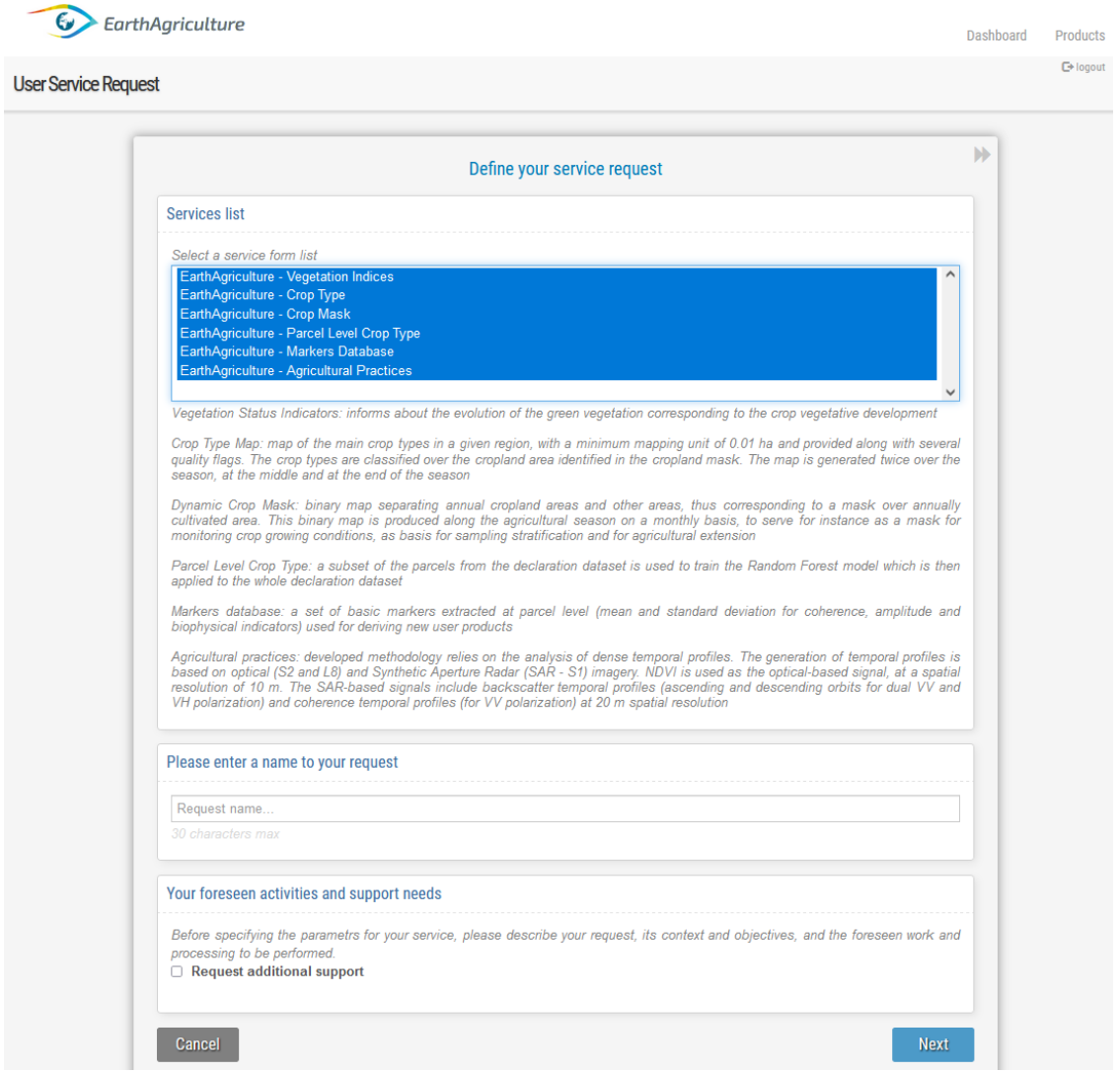




- Deployed on a machine in cloud (Creodias)
  - 16 vCPU
  - 128 GB RAM
  - 400 GB HDD
  - 1 TB Object Storage

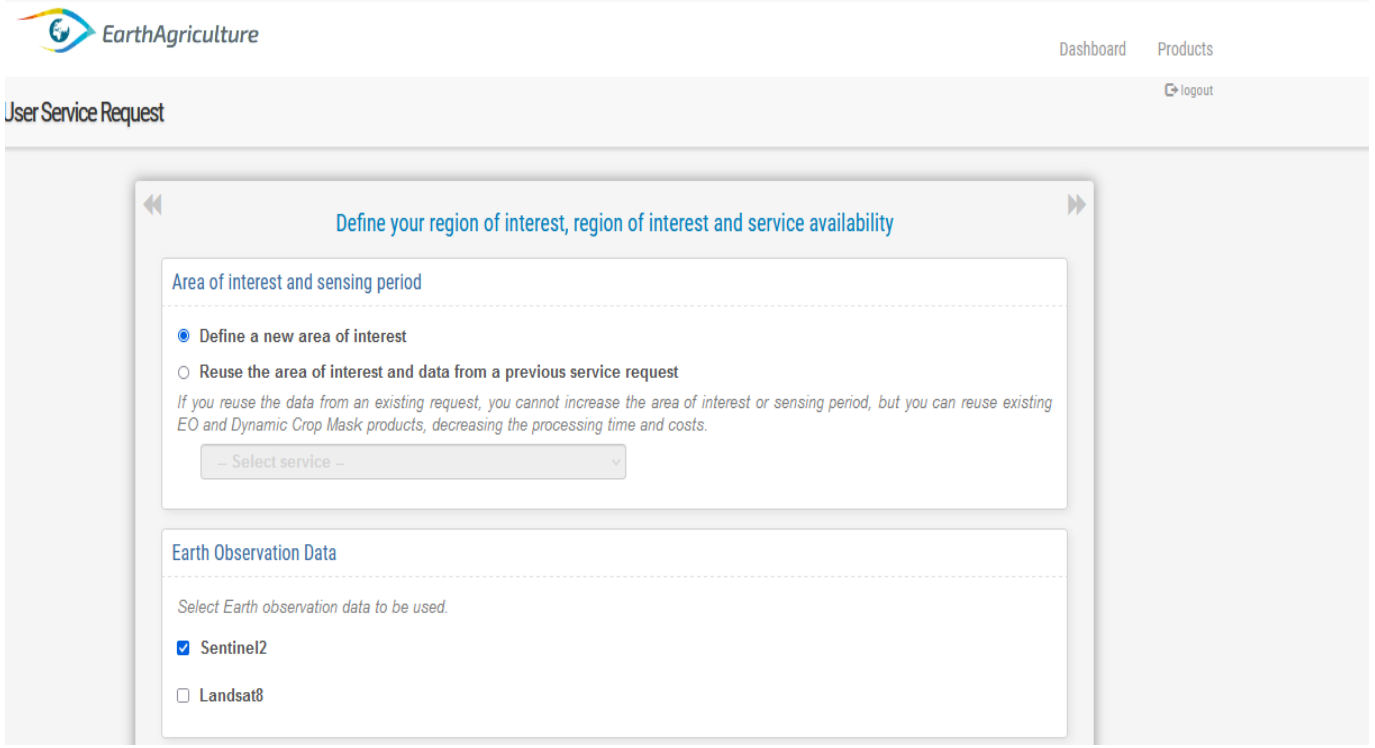
User's Dashboard – Define request

- Web based (wizard like) service to create orders for generating EO derived data products
- Create service orders
  - ✓ Vegetation indices
  - ✓ Crop Mask
  - ✓ Crop Type
  - ✓ Parcel level crop type
  - ✓ Agricultural practices
  - ✓ Markers database
- A name is provided to identify easily the request in the dashboard
- User can specify if he needs additional support



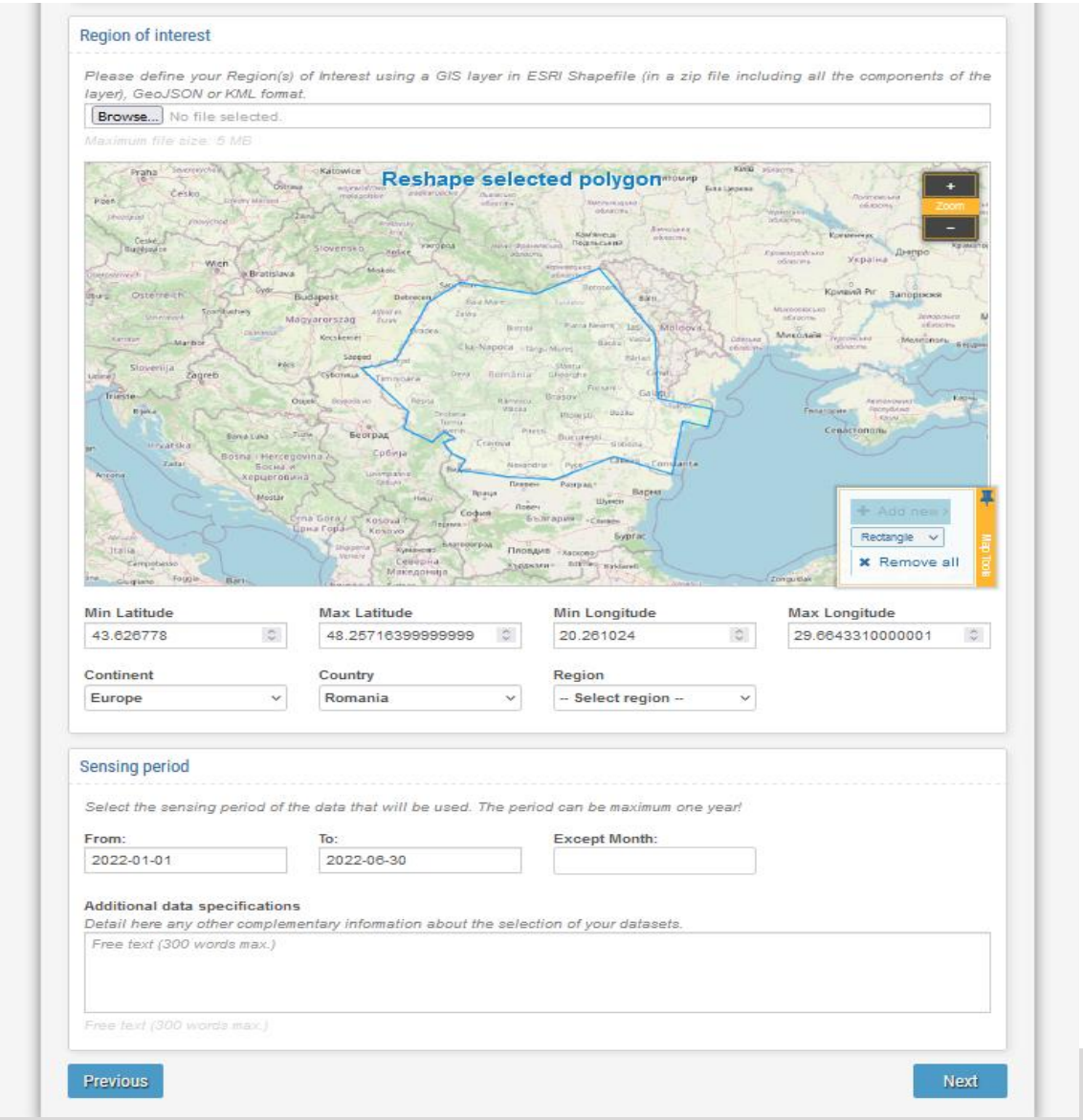
User's Dashboard – AOI and interval selection (1)

- Define new AOI
- Reuse from existing requests
- Select EO to be used



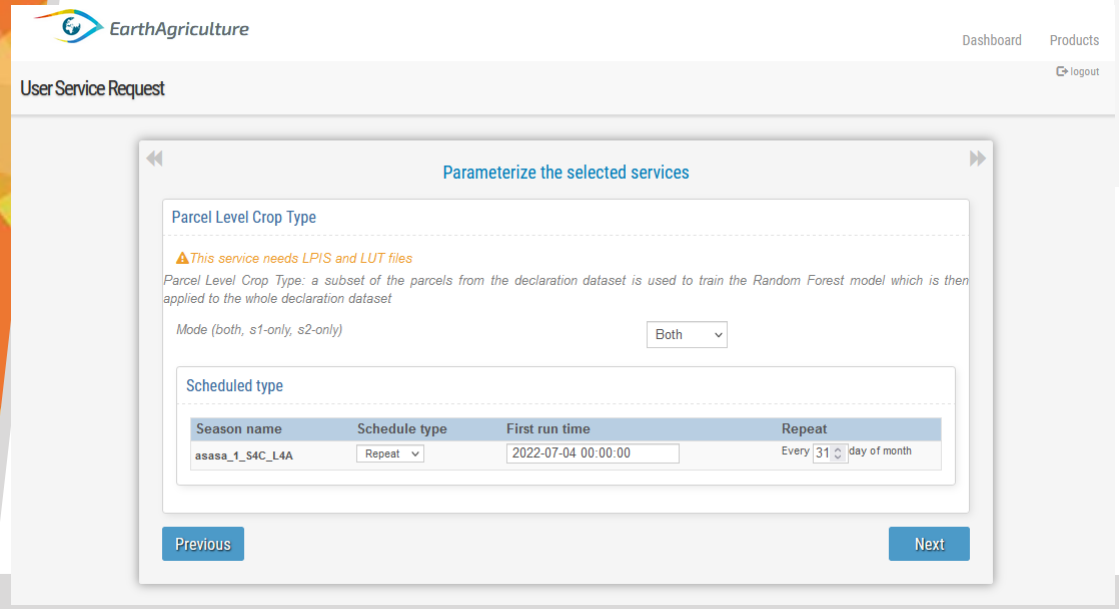
User's Dashboard – AOI and interval selection (2)

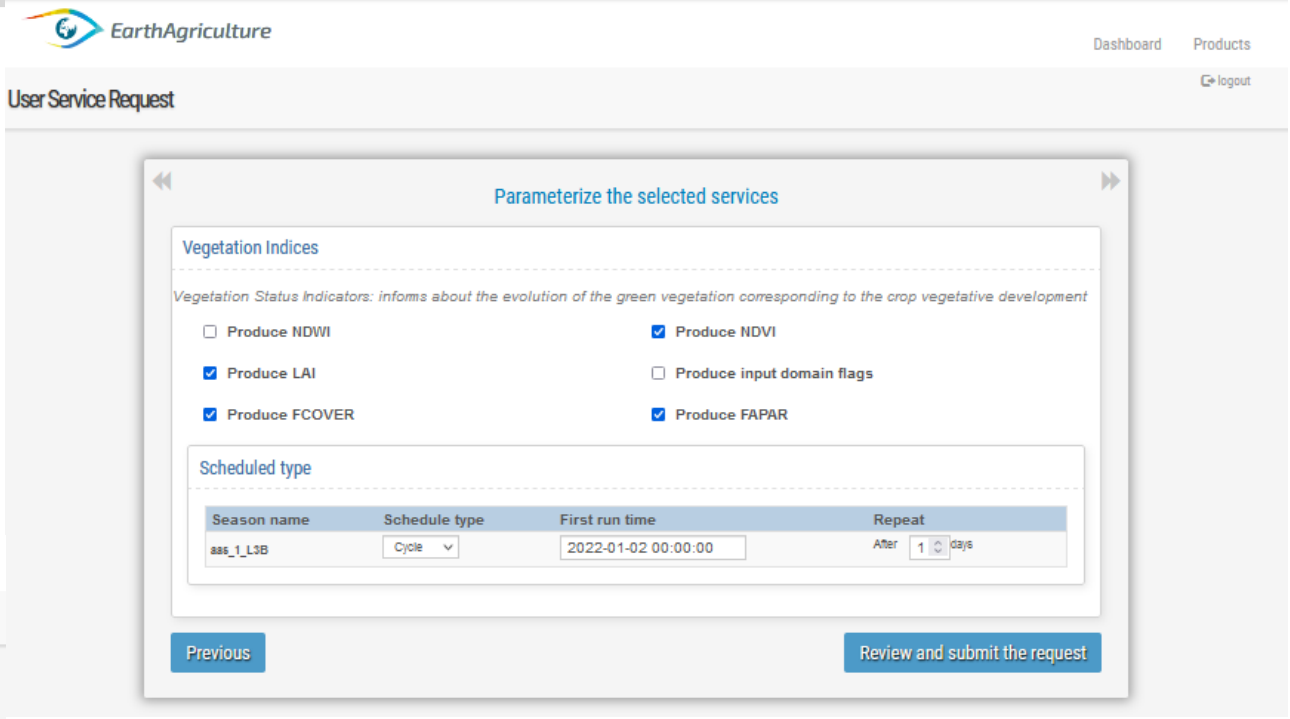
- Choose the area of interest. The user can define AOI by:
  - o Selecting a polygon on map
  - o Providing a shapefile
  - o Selecting from a list of NUTS
- The user can define season, excluding month(s)



User's Dashboard – Services parametrization

- Parametrize selected services
  - ✓ Configure particular parameters of the servce
  - ✓ Choose the execution schedule type :
    - Once, at a given date
    - Cyclic, after X days, starting from a given date
    - Repeat, at a specific day of month, starting from an initial date

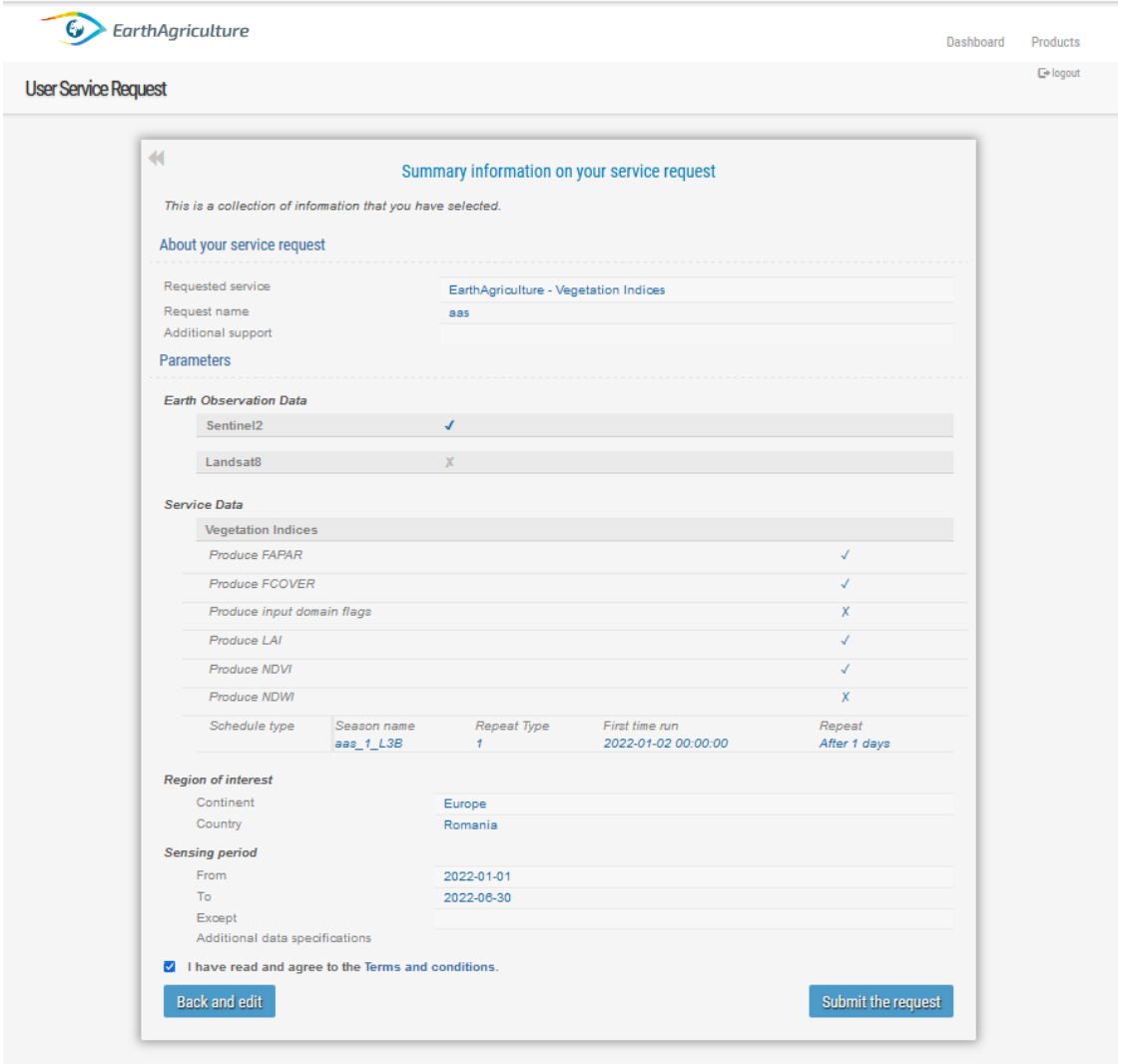




- If the processor is requiring additional data (LPIS, in-situ data, other configuration files), you will be informed about this

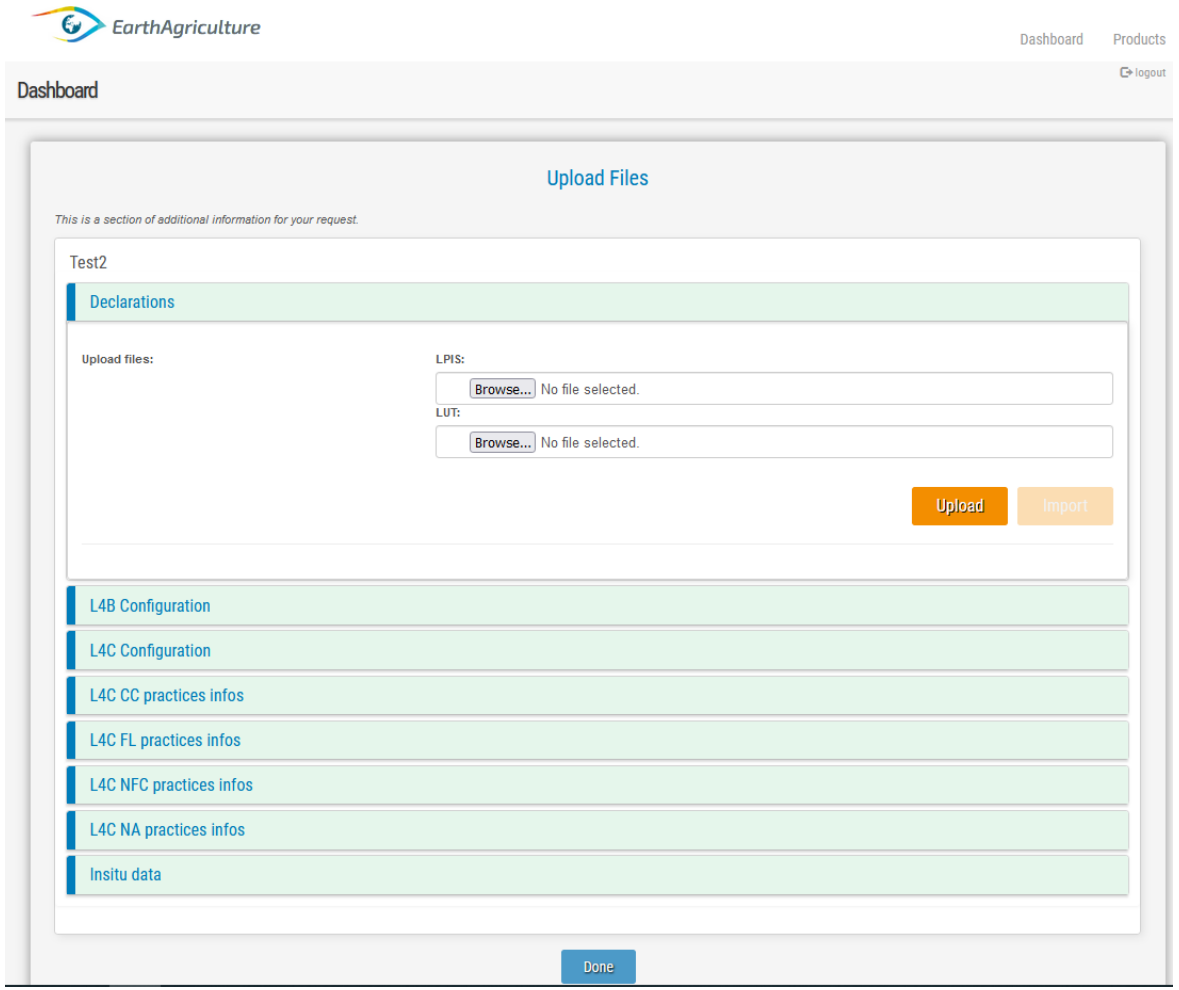
User's Dashboard – Review request before submit

- Review the request before submitting it
- Accept terms and conditions
- Can go back and change some parameters, if needed



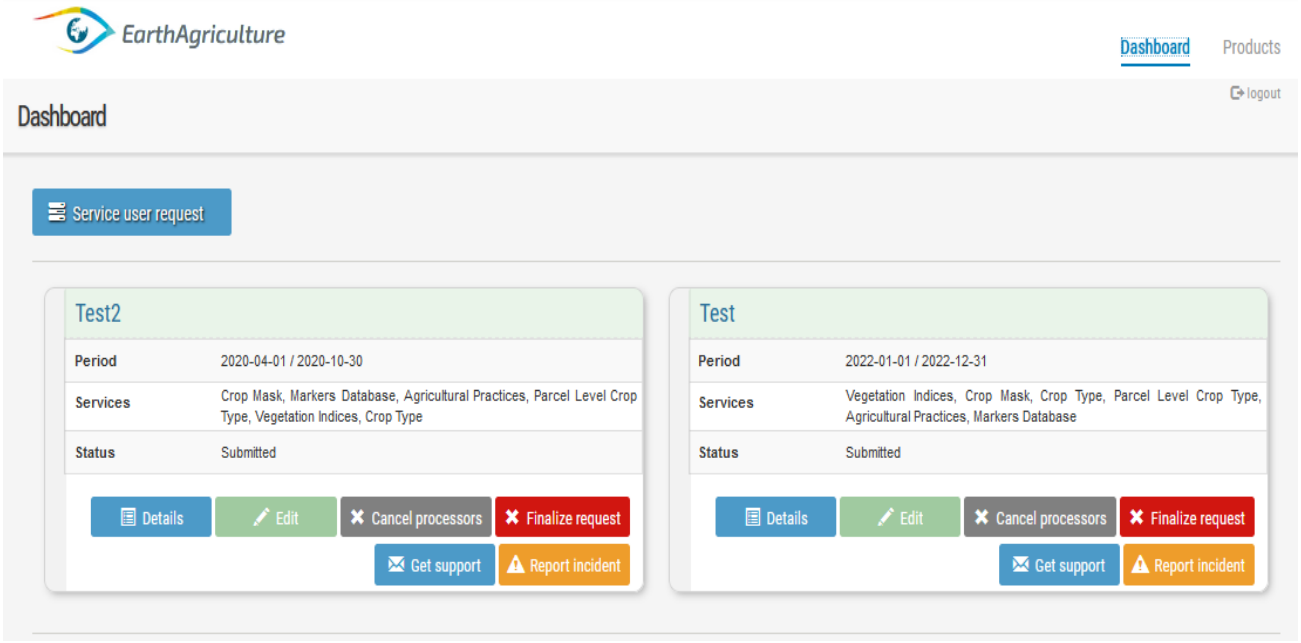
User's Dashboard – Upload necessary user files

- Files needed from user can be uploaded:
  - LPIS
  - LUT
  - Processors specific configuration files
  - Insitu data
- Not necessary to be uploaded during request creation
  - Can be uploaded later (when available), in Dashboard, by editing request



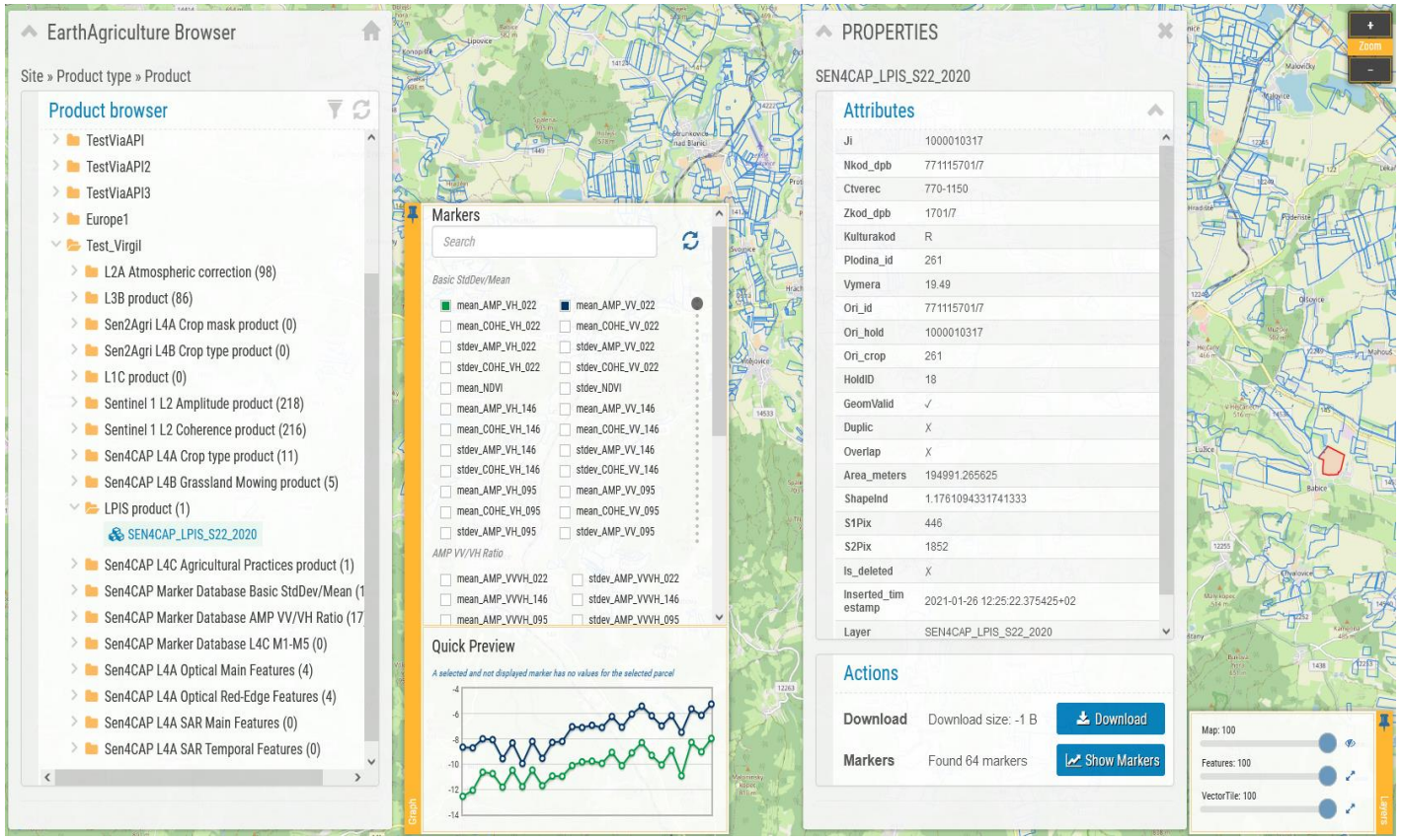
User's Dashboard – View the submitted requests

- View submitted requests in dashboard and their statuses
- View details for each request (similar with summary before submit + storage used and costs, finished or canceled processes, estimated time to finish)
- Cancel one, several or all services in the order
- Get support or report an incident
- Finalize the request (free the resources, delete all products for this request)



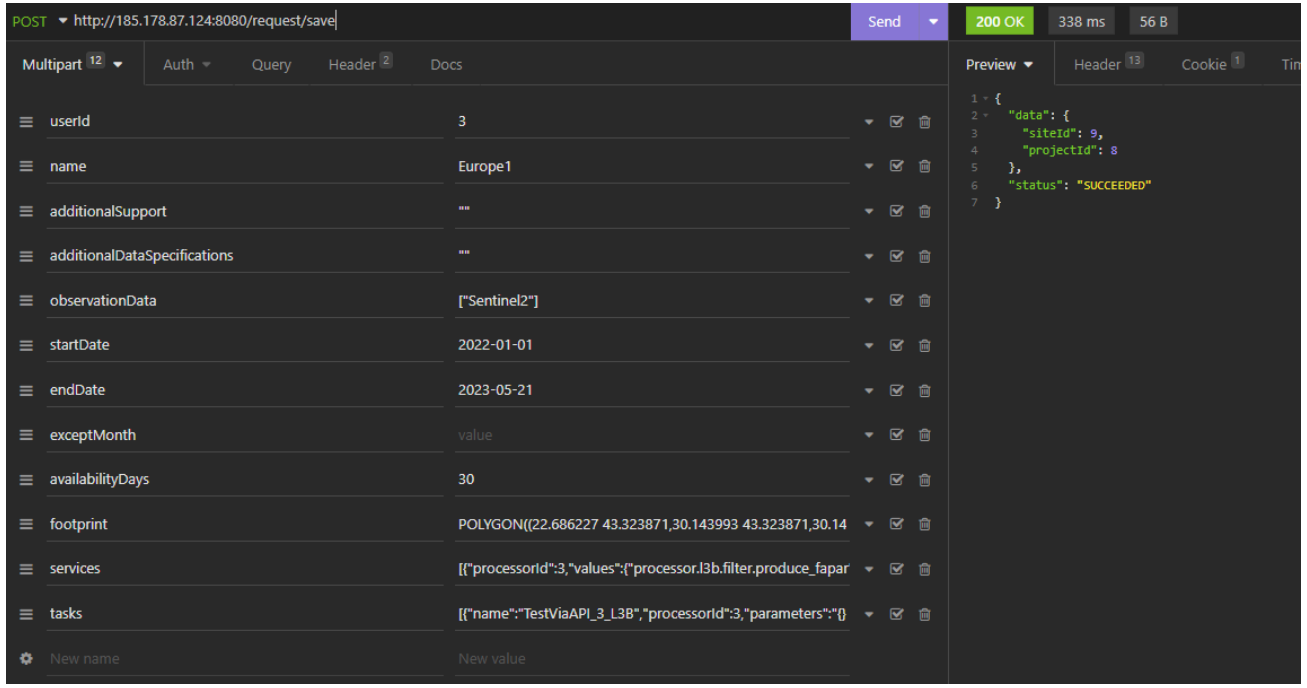
User's Dashboard – Product Browser

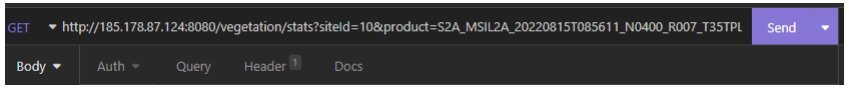
- View product attributes
- Full resolution products visualization on map
- Apply transparency to map or raster layers
- Download products as ZIP files

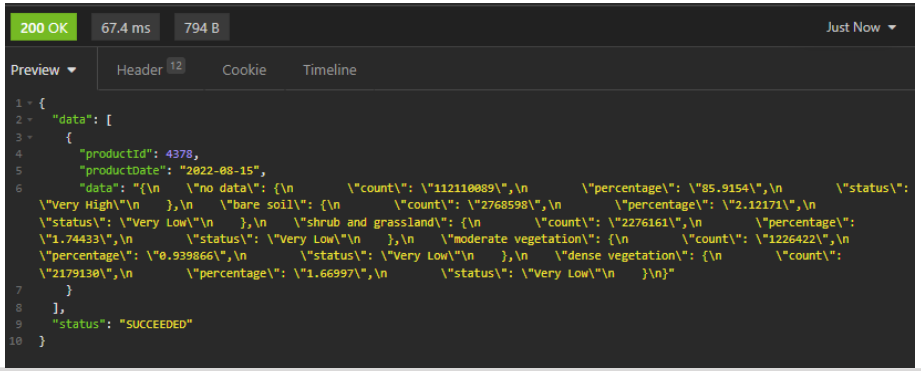


Accessing EarthAgriculture via REST API

- Many operations available from website are also available via a REST API:
  - Login
  - Create request
  - Retrieve execution information
  - Retrieve product information and data





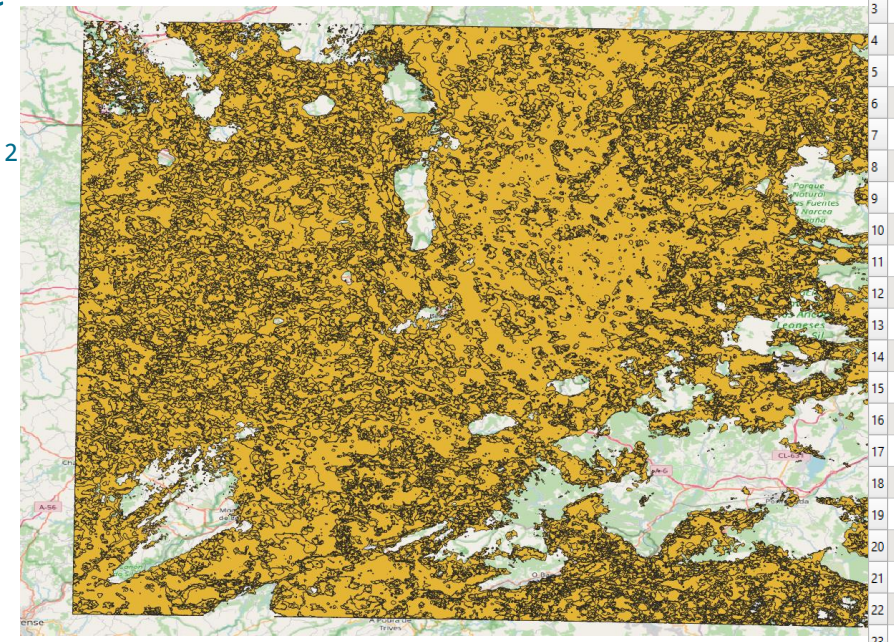


How EarthSignature is used in EarthAgriculture

- Before executing CropMask or CropType, requests are made to EarthSignature:

```
earthsignature.py -s <site_id> -b <start_date> -w <working_dir> -o <out_shp> -a 2
```

- Request is performed for all S2 tiles covering the site
- The results are merged in a final shapefile
- The resulted shapefile is used as in-situ data for the Crop Mask and Crop Type processors



	CODE	CROP
1	412	0
2	313	0
3	223	1
4	331	0
5	322	0
6	312	0
7	411	0
8	222	1
9	213	1
10	211	1
11	421	0
12	321	0
13	142	0
14	244	1
15	311	0
16	221	1
17	335	0
18	332	0
19	334	0
20	122	0
21	323	0
22	133	0
23	324	0
24	422	0
25	523	0
26	132	0
27	131	0
28	512	0
29	511	0
30	521	0
31	522	0

Contact

- Website: https://snapearth.eu/
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  - LinkedIn: https://www.linkedin.com/showcase/snapearth/
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  - EarthSignature & EarthSearch:
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Thank you

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