hydroweb.next

hydroweb-ng@cnes.fr

Theia

cnes
CENTRE NATIONAL D'ÉTUDES SPATIALES

AVISO+
Satellite Altimetry Data

3 pillars around the hydrology and the SWOT cal/val

THEIA Production Center

Every day at a continental scale :
Water surface and synthesis, snow cover and synthesis, water quality (temperature and color)

01

Diffusion

Distribution + visualisation

SWOT HR, hydro products generated by THEIA, External product (hydroweb, GSWE,…)

02

Supervision

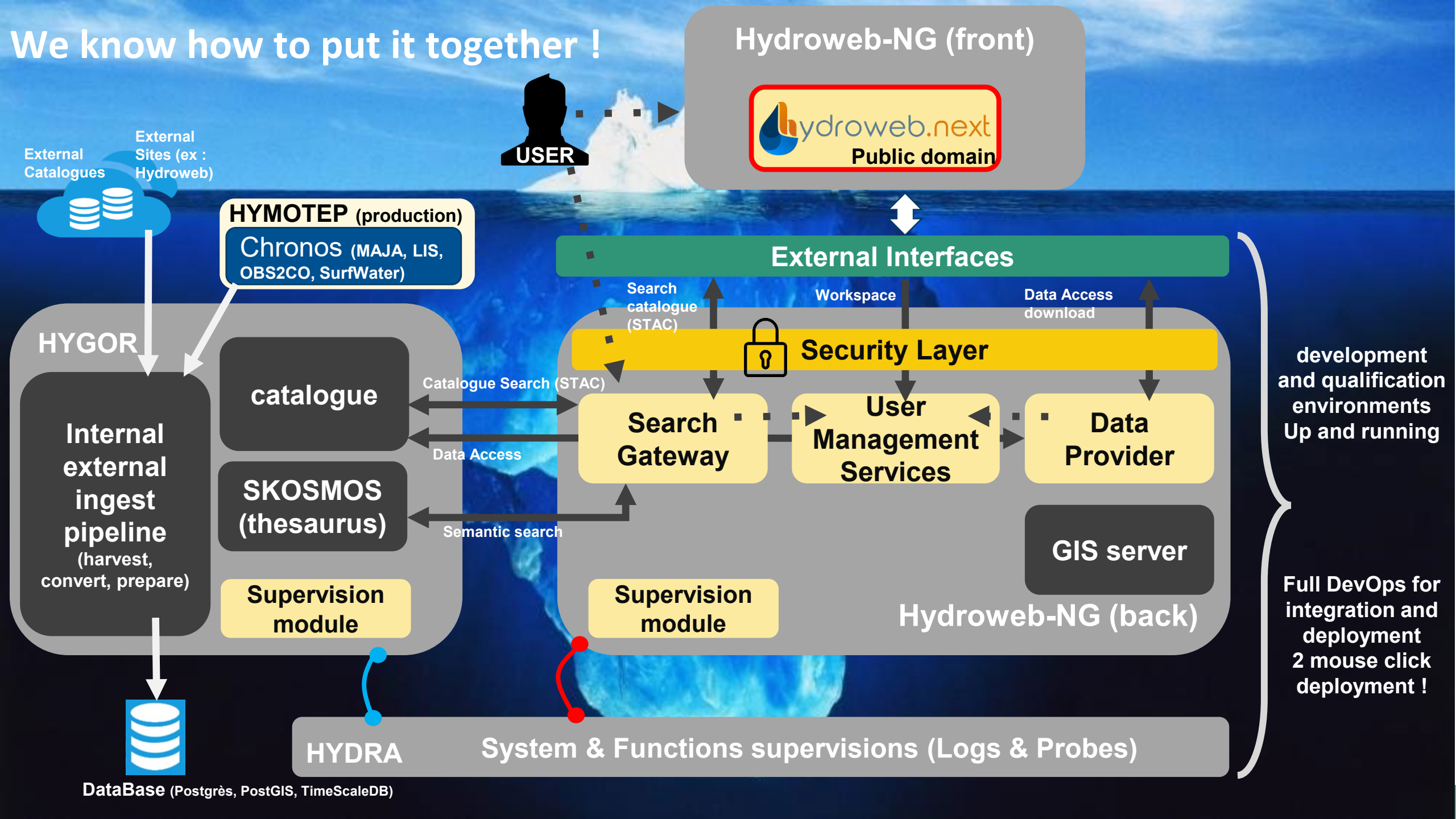
Infrastructure, system and functionalities status

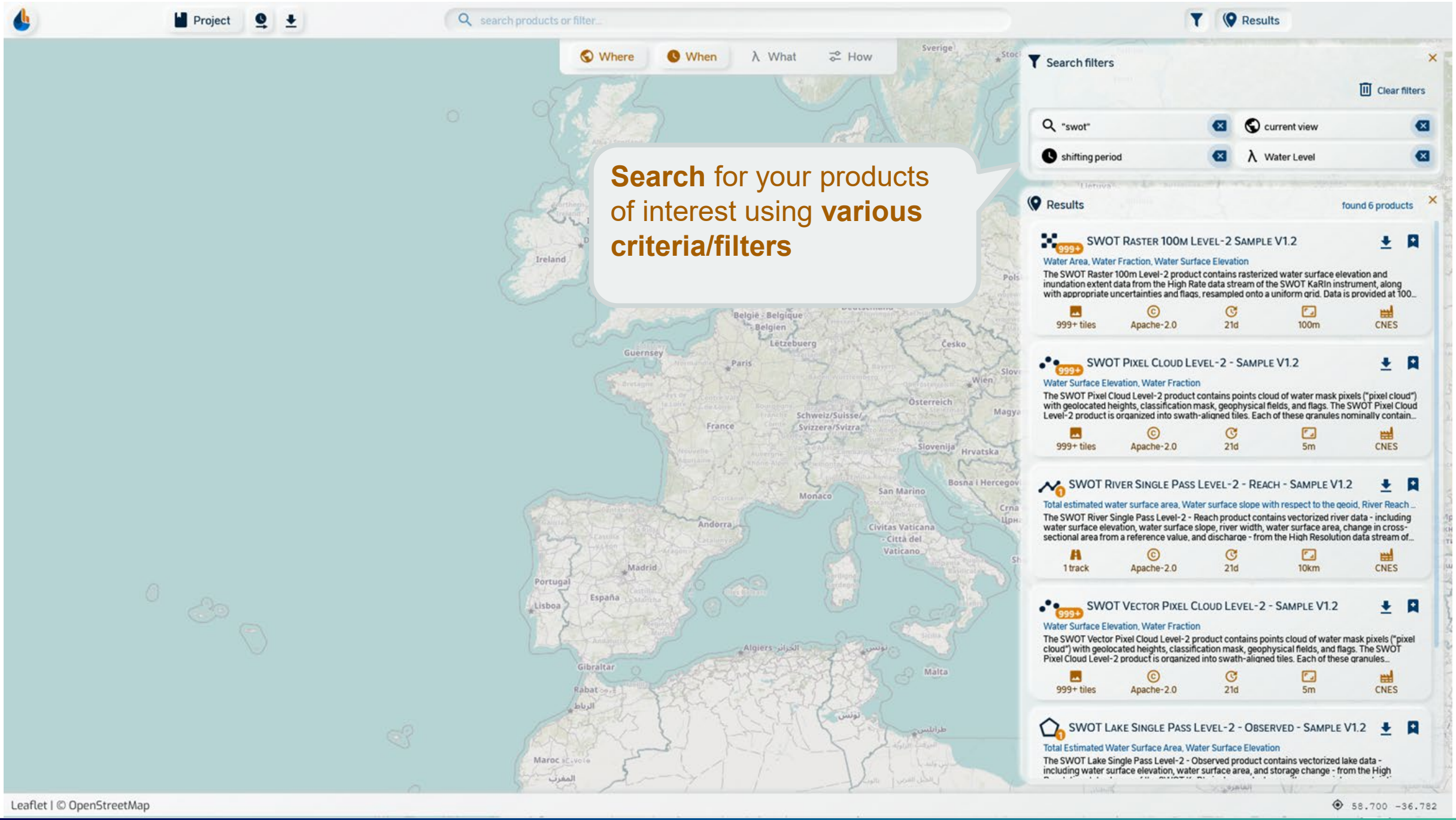
03

© cnes

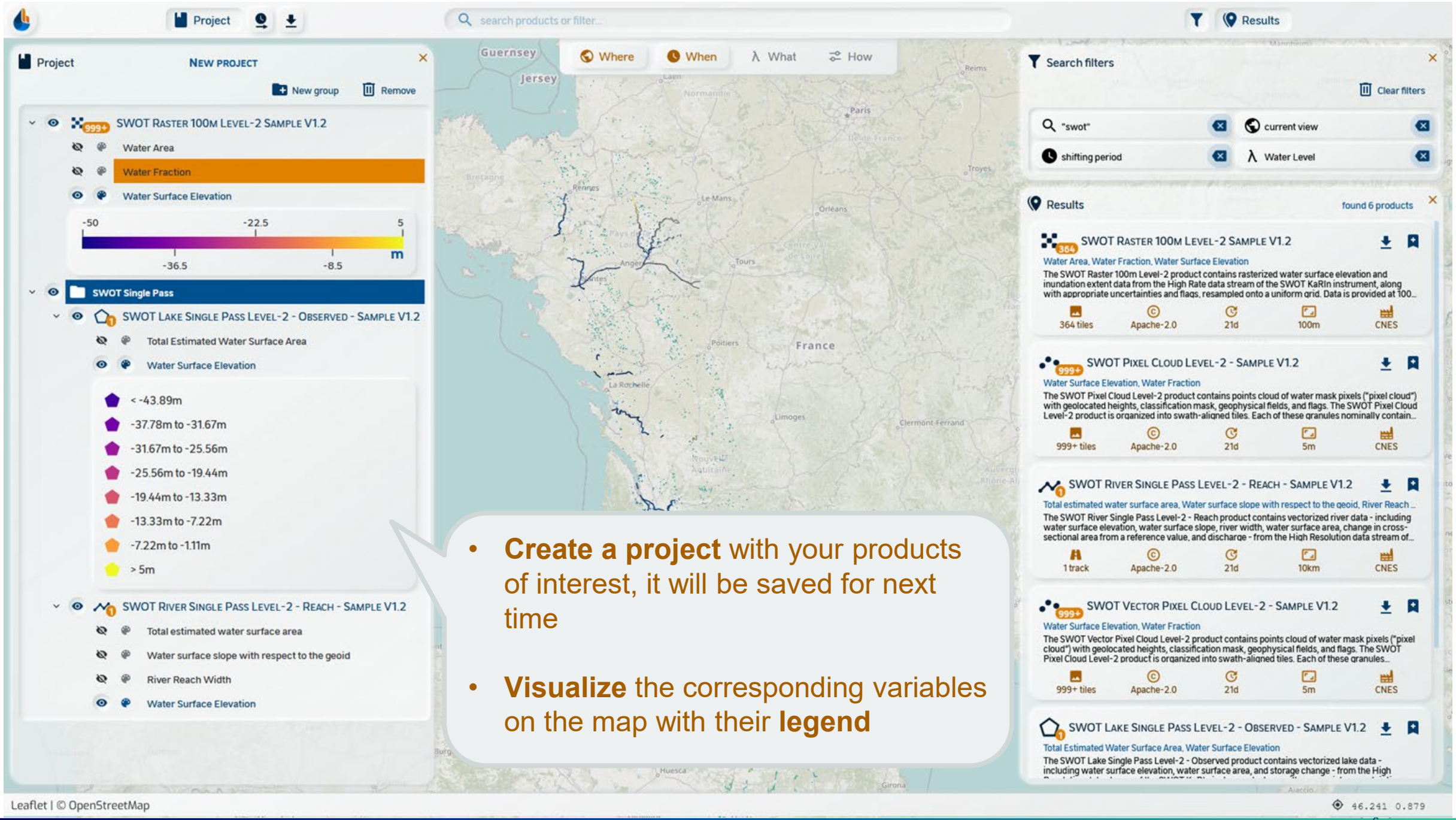
hydroweb.next
Datalake S3
SWOT HR
Golden data
SWOT LR
Workspace
Data Access download
Qualification Environment
REGARDS
HYGOR
Security Layer
catalogue (STAC)
LIS
Search Gateway
User Management Services
Data Provider
External Interfaces
Catalogue
SKOSMOS (thesaurus)
hydroweb.next (front)
GIS server
Supervision module
Logs & Probes
/gpfs
HYDRA
Interoperabilit
Staging Environment
Chronos
Production Environment

We know how to put it together !



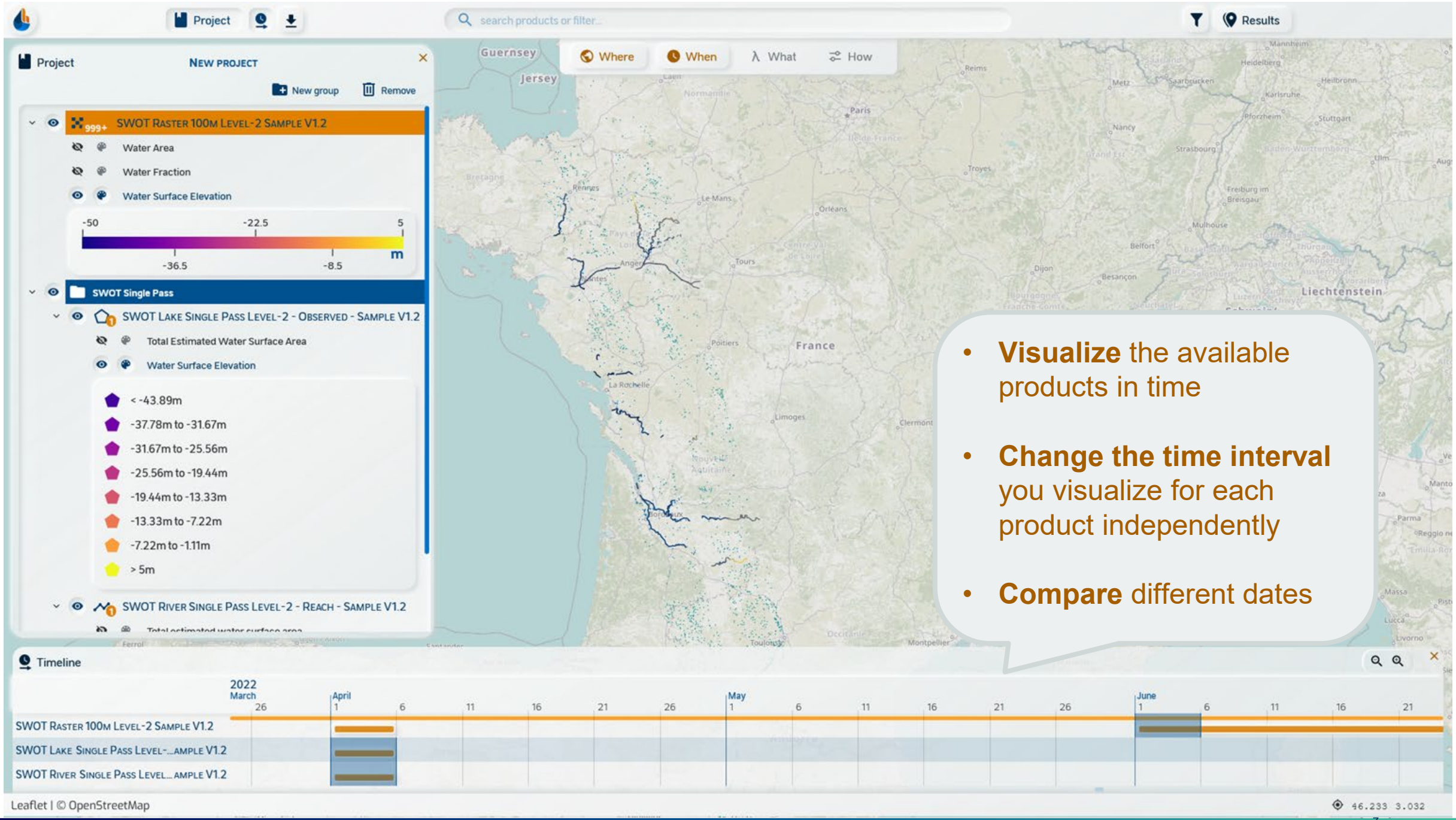

Project
search products or filter...
Results
Where
When
What
How
Search filters
Clear filters
"swot"
current view
shifting period
Water Level
Results
found 6 products
SWOT Raster 100m Level-2 Sample V1.2
Water Area, Water Fraction, Water Surface Elevation
The SWOT Raster 100m Level-2 product contains rasterized water surface elevation and inundation extent data from the High Rate data stream of the SWOT KaRIn instrument, along with appropriate uncertainties and flags, resampled onto a uniform grid. Data is provided at 100...
999+ tiles
Apache-2.0
21d
100m
CNES
SWOT Pixel Cloud Level-2 - Sample V1.2
Water Surface Elevation, Water Fraction
The SWOT Pixel Cloud Level-2 product contains points cloud of water mask pixels ("pixel cloud") with geolocated heights, classification mask, geophysical fields, and flags. The SWOT Pixel Cloud Level-2 product is organized into swath-aligned tiles. Each of these granules nominally contain...
999+ tiles
Apache-2.0
21d
5m
CNES
SWOT River Single Pass Level-2 - Reach - Sample V1.2
Total estimated water surface area, Water surface slope with respect to the geoid, River Reach ...
The SWOT River Single Pass Level-2 - Reach product contains vectorized river data - including water surface elevation, water surface slope, river width, water surface area, change in cross-sectional area from a reference value, and discharge - from the High Resolution data stream of...
1 track
Apache-2.0
21d
10km
CNES
SWOT Vector Pixel Cloud Level-2 - Sample V1.2
Water Surface Elevation, Water Fraction
The SWOT Vector Pixel Cloud Level-2 product contains points cloud of water mask pixels ("pixel cloud") with geolocated heights, classification mask, geophysical fields, and flags. The SWOT Pixel Cloud Level-2 product is organized into swath-aligned tiles. Each of these granules...
999+ tiles
Apache-2.0
21d
5m
CNES
SWOT Lake Single Pass Level-2 - Observed - Sample V1.2
Total Estimated Water Surface Area, Water Surface Elevation
The SWOT Lake Single Pass Level-2 - Observed product contains vectorized lake data - including water surface elevation, water surface area, and storage change - from the High
Search for your products of interest using various criteria/filters
Leaflet | © OpenStreetMap
58.700 -36.782

© cnes



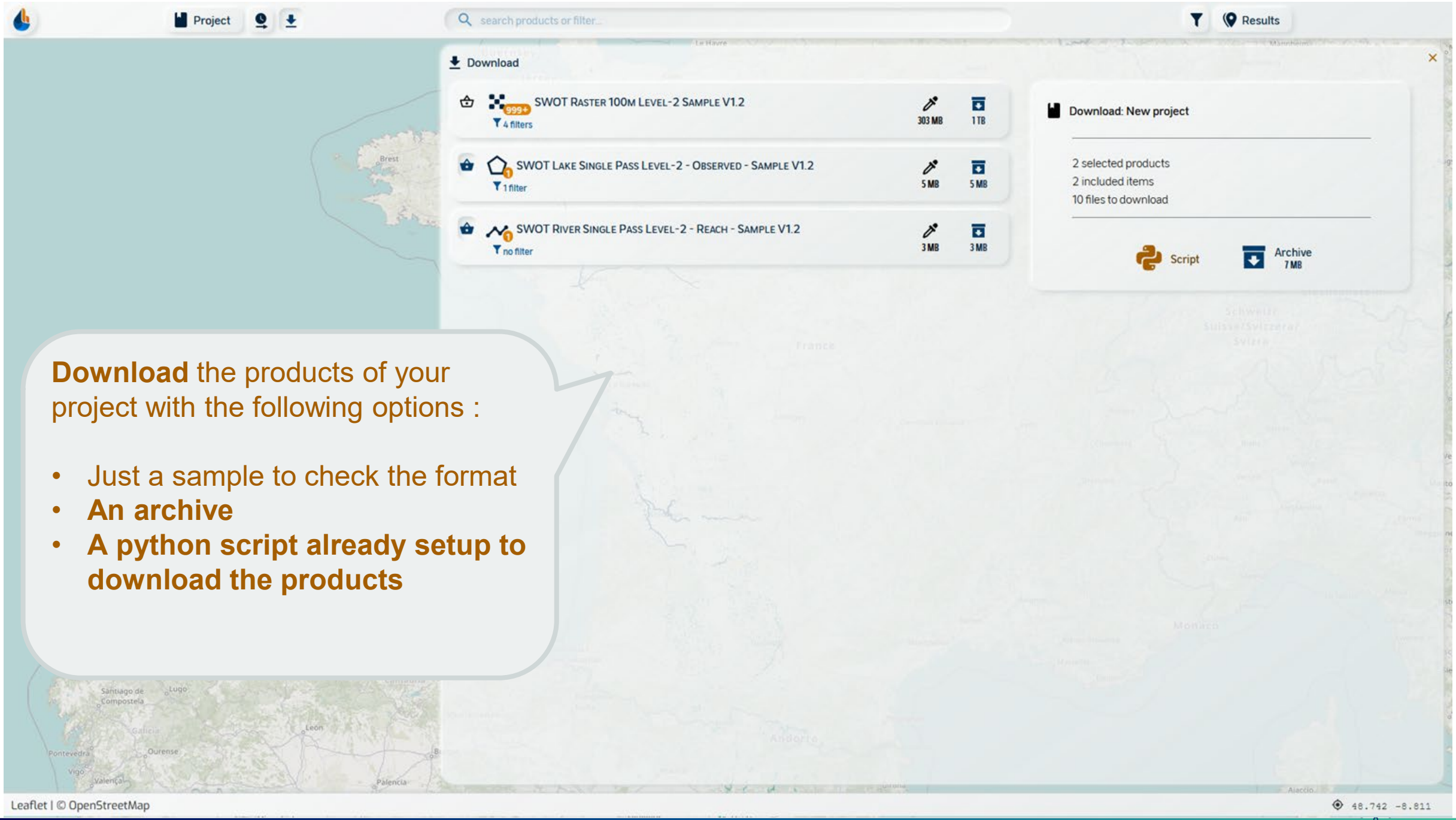
- **Create a project** with your products of interest, it will be saved for next time
- **Visualize** the corresponding variables on the map with their **legend**

© cnes



- **Visualize** the available products in time
- **Change the time interval** you visualize for each product independently
- **Compare** different dates

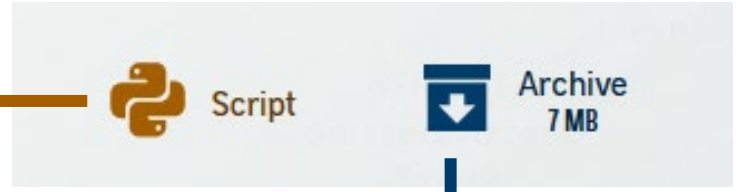
© cnes



Download the products of your project with the following options :

- Just a sample to check the format
- **An archive**
- **A python script already setup to download the products**

© cnes



[1]:
```
from eodag import EODataAccessGateway, SearchResult, setup_logging

setup_logging(1)  # 0: nothing, 1: only progress bars, 2: INFO, 3: DEBUG

dag = EODataAccessGateway()
```

Use this code-block to define your search criteria. It defines a list of query-arguments dictionnaries. Each query-arguments dictionnary will be used to perform a distinct search, whose results will then be contatenated.

- add/remove collections using the `productType` key (one per query-arguments dictionnary)
- add time restrictions using the `start` and `end` keys (e.g. "start": "2020-05-01" , "end": "2020-05-10T00:00:00Z", UTC ISO8601 format)(one per collection/dictionnary)
- add spatial restrictions using the "geom" key (e.g. "geom": "POLYGON ((1 43, 2 43, 2 44, 1 44, 1 43))" WKT string, a bounding-box list [lonmin, latmin, lonmax, latmax] can also be passed)(one per collection/dictionnary)
- more query arguments can be used, see https://eodag.readthedocs.io/en/stable/notebooks/api_user_guide/4_search.html?#Search-parameters

[*]:
```
project_query_args = [
    {
        "productType":"HYDROWEB_RIVERS_OPE",
        "start":"2022-03-31T22:00:00Z",
        "end":"2022-05-01T21:59:59.999Z",
        "geom":"POLYGON ((-13.22 39.46,14.91 39.46,14.91 49.51,-13.22 49.51,-13.22 39.46))"
    },
    {
        "productType":"SWOT_L2_HR_RASTER_100M_SAMPLE_V1_2",
        "start":"2022-03-31T22:00:00Z",
        "end":"2022-05-01T21:59:59.999Z",
        "geom":"POLYGON ((-13.22 39.46,14.91 39.46,14.91 49.51,-13.22 49.51,-13.22 39.46))"
    }
]

project_search_results = SearchResult([])
for query_args in project_query_args:
    project_search_results.extend(dag.search_all(**query_args))
## This command actually downloads the matching products
downloaded_paths = dag.download_all(project_search_results)
```

Downloaded products: 47%

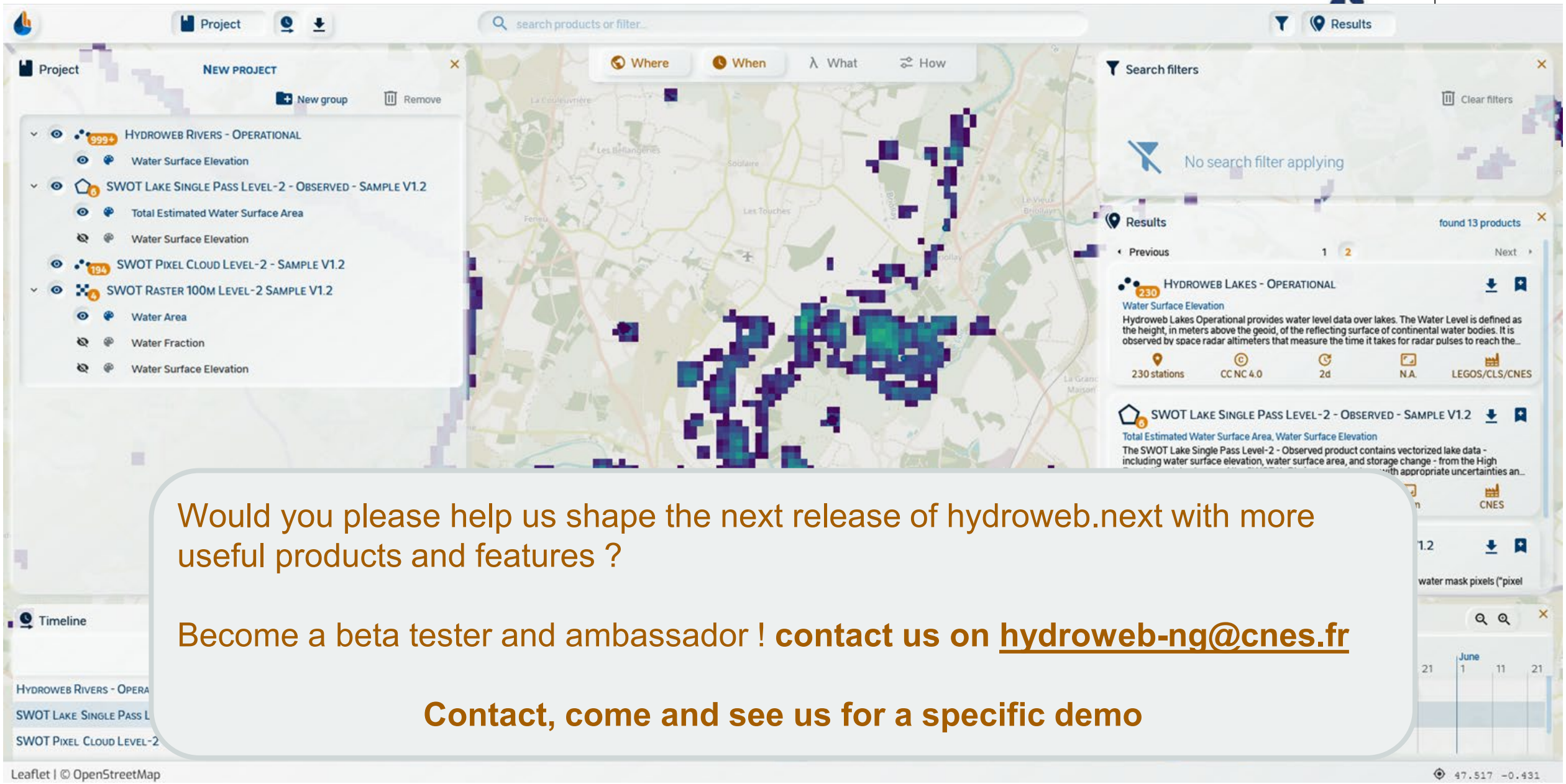
The python script is easy to use, easy to modify

You just need to install the *eodag* library once (available on github or with pip, conda).

It is all explained in the script

It also gives you access to all eodag features (other catalogs, useful tools)

© cnes



Would you please help us shape the next release of hydroweb.next with more useful products and features ?

Become a beta tester and ambassador ! **contact us on hydroweb-ng@cnes.fr**

Contact, come and see us for a specific demo

© cnes

Roadmap (backlog) and ambitions

T3 2022

- Authentification (SSO) and access restrictions (end of SWOT HR distribution requirements)
- hydroweb.next « grand » opening
- More products on the catalogue
- Better service and supervision
- System test before SWOT launch

2023

- We will implement what you want and what you really need : hydrological object search, specific products, on demand production (raster), …

End 2022 – SWOT Launch

- More hydroweb.next functionnalities : time series of variable, export your project (QGIS)
- More products on the catalogue
- First Users and ambassadors feedback

© cnes

SWOT data access in AVISO (1/2): the way of the past

❖ Product downloads

- ➢ Classical AVISO channels: Catalogues, DOI, Thredds, Https, DAP, etc
- ➢ Additional technical solutions to improve the interoperability of the web portal & datasets
- ➢ Any specific need or request from the Science Team?

❖ Old protocols and scriptable data access: ST inputs needed

- ➢ FTP is no longer compatible with most browsers
- ➢ Progressively replaced by sFTP and/or scriptable protocols
- ➢ Any guidance from the ST would be helpful to AVISO

Point of contact:
aviso@altimetry.fr
(or G.Dibarboure)

❖ Web visualization and online data exploration

- ➢ AVISO viz' (from Ocean Data Lab) is being decommissioned in 2023
- ➢ New web data explorer : beta release next Fall, ready for SWOT, and upgrades in 2023
- ➢ Will feature SWOT LR and most AVISO products (e.g. nadir profiles, CFOSAT spectra)
- ➢ Question to the ST: should we add external data? (e.g. from NASA or Copernicus sources)

© cnes

SWOT data access in AVISO (2/2): the way of the future

- **Even « Low Resolution » ocean products might be a bit large**
  - 1 GB/day for Basic SSH, same volume for Wind & Waves
  - 3 GB/day for the Expert SSH
  - 40 GB/day for the Unsmoothed 250/500m
  - 1 TB/day for L1B (not distributed by default)

- **Science Team Projects can be hosted on the CNES HPC/Cloud (nicknamed HAL)**
  - Already effective for some SWOT PIs (experience feedback is usually quite positive)
  - What would you get?
    - A copy of SWOT data will be on HAL (incl. a lightning fast ZARR interface)
    - Jupyter notebooks (python/R/gis in browser) and Virtual Research Environment (e.g. virtual desktop)
    - Technical support and helpdesk (from basic HPC/Cloud to experts in ZARR/DASK)
    - A handful of external datasets used for CNES CalVal (e.g. AVISO, Sentinel1/2/3…)
    - More datasets, libraries, and tools upon request
  - Free of charge for ST users
  - But within the resources allocated to the ST (requests must be justified & reasonable)
  - Ongoing discussions with WEkEO (Copernicus Cloud) and others to smooth Project transfers

Point of contact:
aviso@altimetry.fr
(or G.Dibarboure)

© cnes