

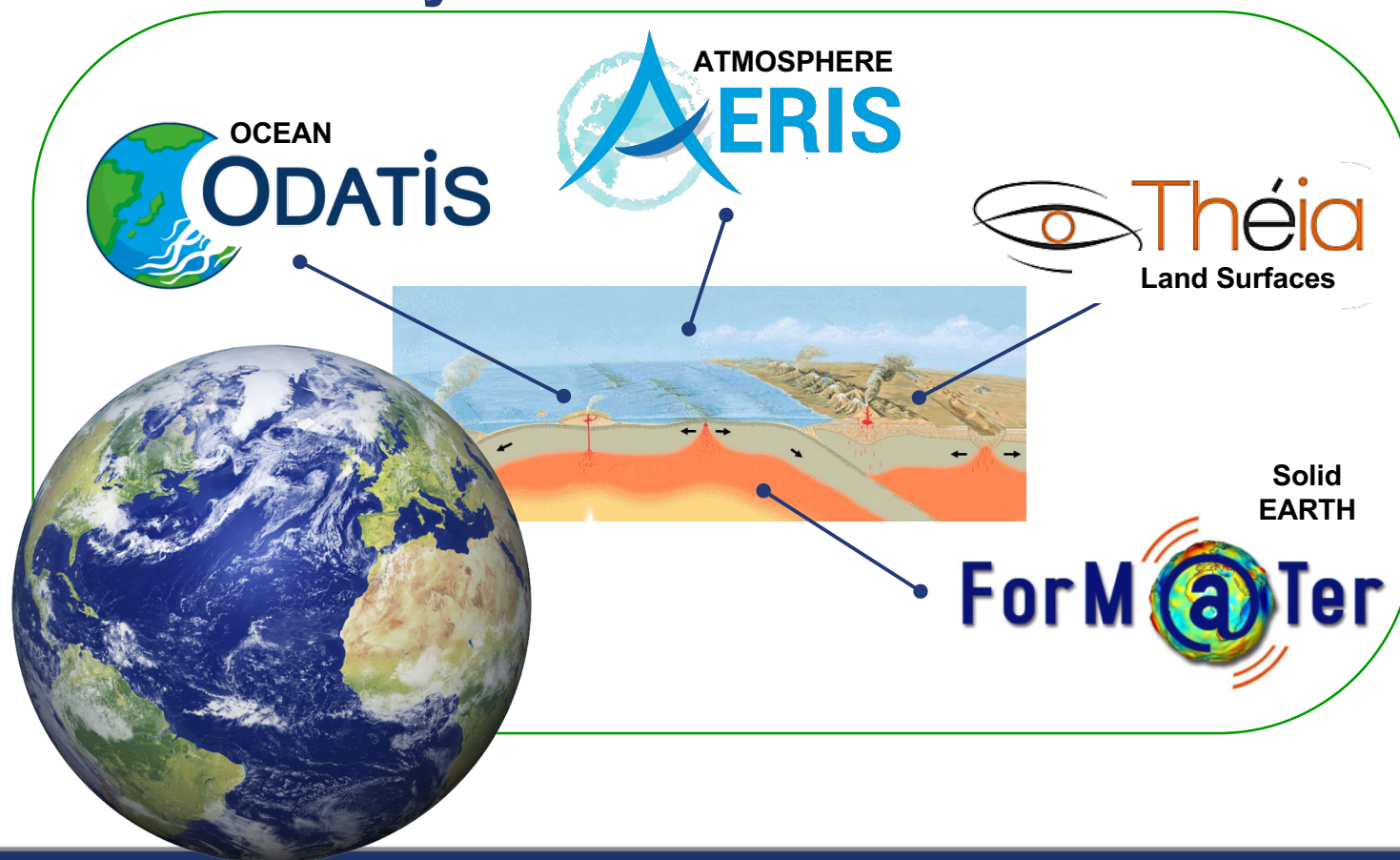


## **Access to SWOT data through French data portals**

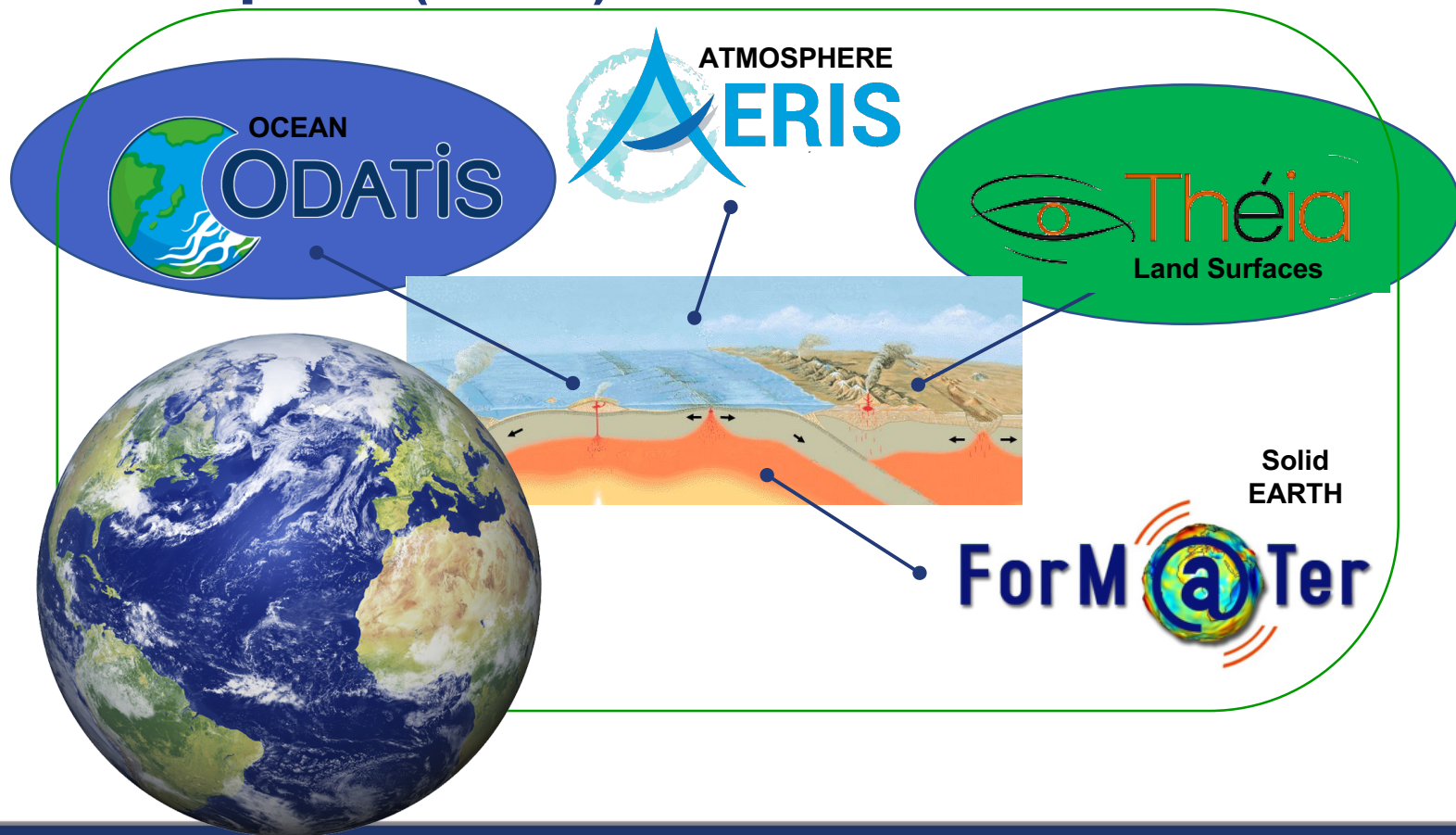
**H. Vadon, G. Dibarboure, A. Sellé**



## Four data portals have been recently set up in France, all grouped in the Earth System infrastructure



## SWOT data will be available in the ocean portal (ODATIS) and in Land Surfaces portal (THEIA)



## Data portal common Objectives :

- ❖ Promote and **ease the use of space data**, for science and public actors (L2 or higher, imagery, added value products and field data)
- ❖ Develop **added value products and services** for the science communities and national public actors
- ❖ Develop **networks** of competences
- ❖ Support French projects at **European and international** level
- ❖ Provide end users **expert support, training, ...**
- ❖ Outreach





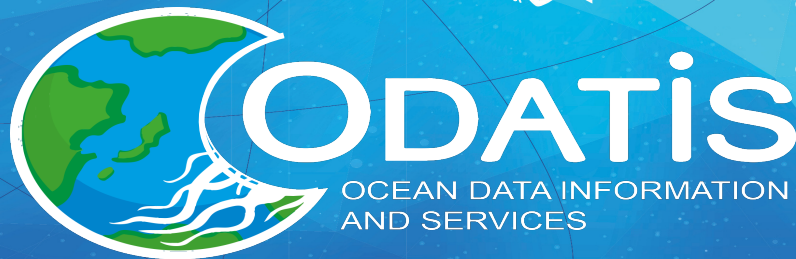
## **Access to SWOT data through French data portal ODATIS**

H. Vadon , G. Dibarboure, A. Sellé



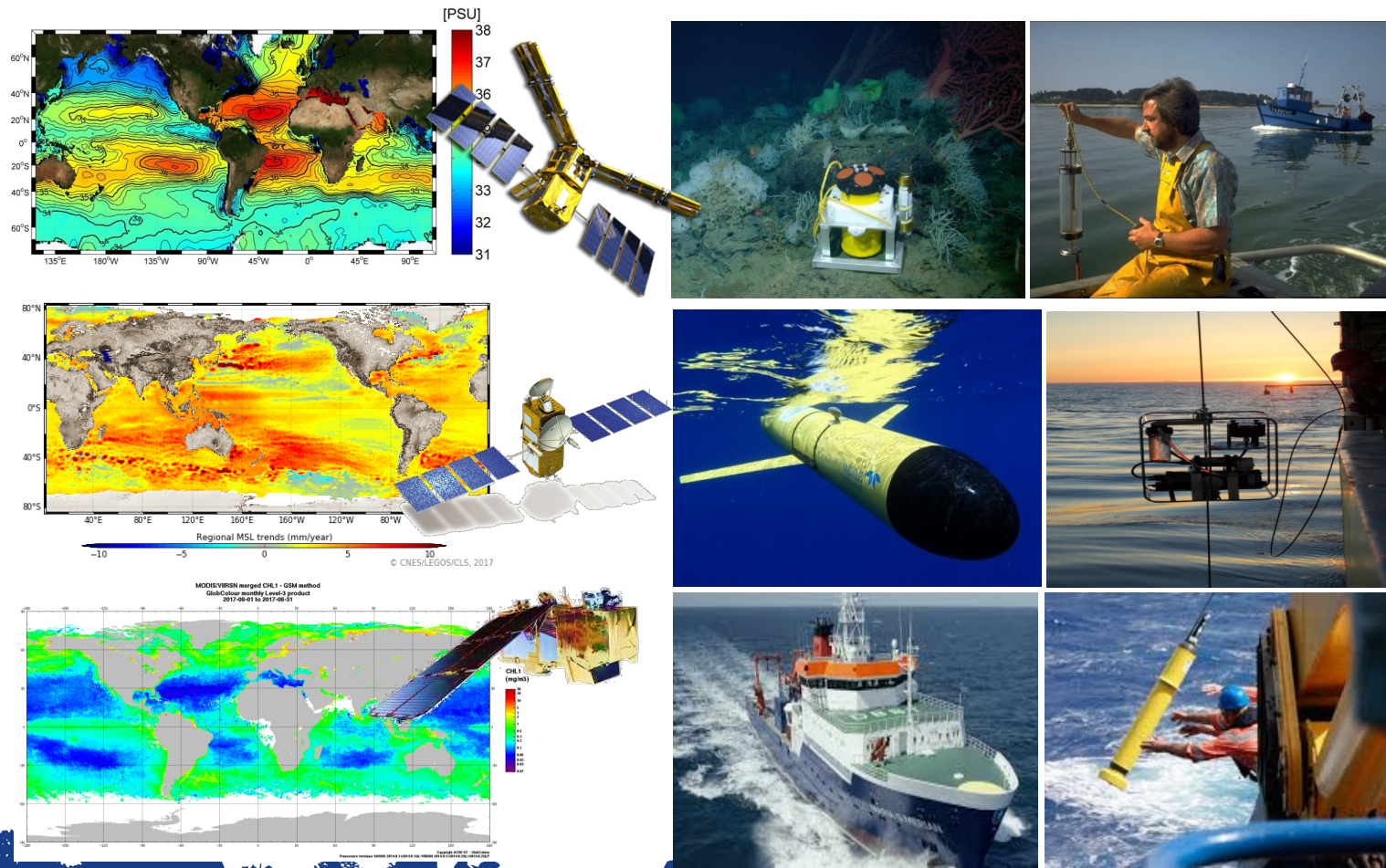
# The SWOT data distribution inside ODATIS

contact@odatis-ocean.fr  
www.odatis-ocean.fr



- A global catalog of insitu, and satellite data
- Covering several scientific objectives
  - Mean Sea Level
  - Ocean circulation
  - Water cycle
  - Global warming impacts analysis,, ...
- Global coverage but could focus on dedicated zones
  - Arctic Ocean
  - Mediterranean Sea
  - Atlantic Ocean , ...
- With strong interfaces with the other data portal
  - AERIS: wind & waves, ...
  - THEIA: river discharges, river plumes, .....

## Some satellite and insitu data available inside ODATIS





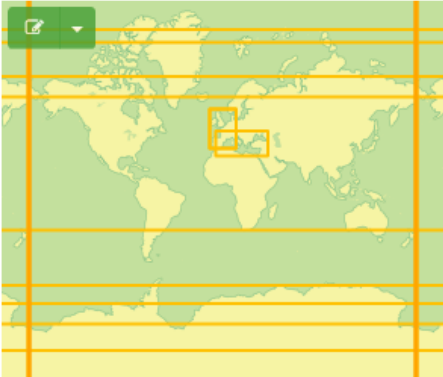
# Catalog MMI

>130 products

[CATALOG](#) [MAP](#) [MY DOWNLOADS](#)

Results 1 to 20 on 30: 20 by page

Sort by: Title



Variables

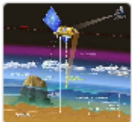
Type of datasets

- ☐ Observations in-situ
- ☐ Produits
- ☒ Télédétection (30)

Data centers and services

- ☐ CDS-SAT-Toulouse (25)
- ☐ CDS-SAT-Couleur (3)
- ☐ CDS-SAT-Brest (2)
- ☐ CDS-IS-CORIOLIS (1)

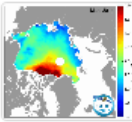
### Altimetry product GDRs - SEA SURFACE HEIGHT



Types of dataset: Monomission altimeter product.

Source: AVISO+

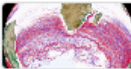
### Arctic Sea Ice Thickness



Sea Ice Thickness (only from October to April), observed from Envisat and CryoSat-2 altimetric satellite. The bias between the two missions have been corrected to provide a continuous Sea Ice Thickness all along the ...

Source: CTOH, LEGOS

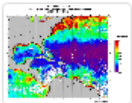
### Atlas des trajectoires de tourbillons mésoéchelles



Tourbillons détectés pour toute la période 1992- aujourd'hui (temps différé) dans les jeux de données altimétrie multimissions "deux satellites", incluant la localisation du centre du tourbillon, jour par jour, le type ...

Source: AVISO+

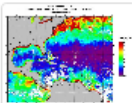
### Atmospheric Optical parameters



Atmosphere optical parameters: aerosol thickness, cloud fraction, water vapour column...

Source: Globcolour, GIS-COOC

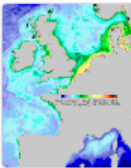
### Biological parameters



Biological parameters: Chlorophyll (several algorithms), Particulate Organic/Inorganic Carbon, Fluorescence...

Source: Globcolour, GIS-COOC

### Chlorophyll 2003-2010



Monthly maps of mean chlorophyll-a achieved over the period 2003-2010. Chlorophyll-a is calculated using the OC5 algorithm developed by Ifremer.

Source: NASA, Marcoast, Myocean



## Access to SWOT data through French data portal **THEIA**

H. Vadon , G. Dibarboure, **A. Sellé**



## The SWOT data distribution inside THEIA



### THEIA, the French Land data center

- ❖ French national inter-agency organization



- ❖ Acces : <https://www.theia-land.fr/en>

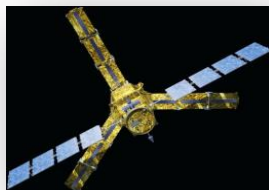
In hydrology, the SWOT data are unprecedented and will take all their value associated with other hydrological variables.

- ⇒ Development of the operational water component of the **THEIA** Land data centre = **HYDROWEB-NG**
- ❖ HYDROWEB-NG will merge products from satellites (SWOT but also other satellite), in-situ data and numerical modeling products.



# HYDROWEB-NG : a multi-sensor approach

A multi-sensor approach to support high-end applications from SWOT : System of systems (including in situ measurements)



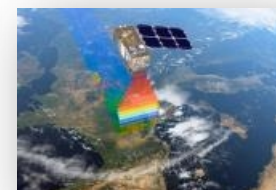
SMOS/SMAP



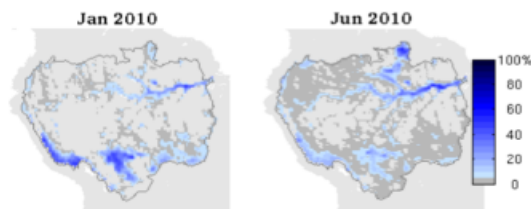
GPM/ MGT



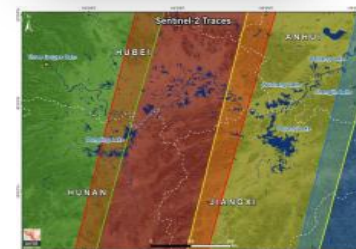
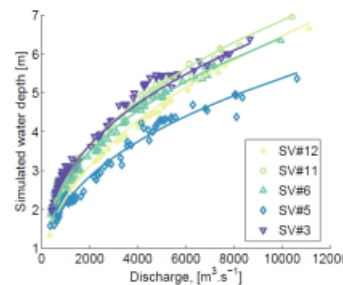
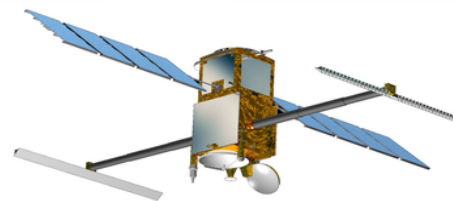
Jason/S3/S3/S6



S2/LDCM/S1...



**Dynamic wetlands surfaces and volumes**  
(credits **Cesbio / Legos**)



**Lac Poyang water balance**  
(credits: **Sertit**)

A priori-discharge db  
based on SWOT simulator  
(credits: **Legos/UFRGS**)

# HYROWEB-NG : principes

## A multi-sensors approach with suitable products and data for the hydrology community

- ❖ Water surface extent, water quality, snow extent, precipitation, water elevation and runoff, land cover, soil moisture and its underlying products (drought index, etc.)
- ❖ Global scale targeted when possible
- ❖ Appropriate spatial and temporal resolutions

## Integration of observations and in situ measurements

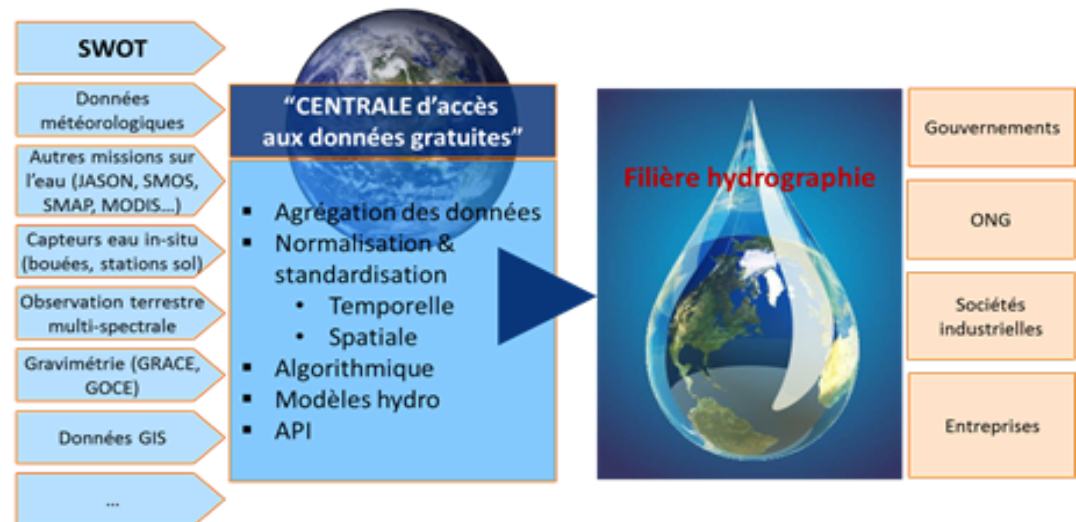
- ❖ to establish a more complete system description

## Integration of model components and assimilation techniques

- ❖ to build an earth modeling system

## Quality evaluation of different models and observation data

- ❖ To know the reliability and the application scope of the distributed data



# HYDROWEB-NG : principles

## A standardization effort to ensure interoperability and metadata harvesting

- ❖ Compliance with the INSPIRE directive, OGC and French water standards
- ❖ Homogenize the products and processing in order to have comparable data (meet the other space/non space actors)

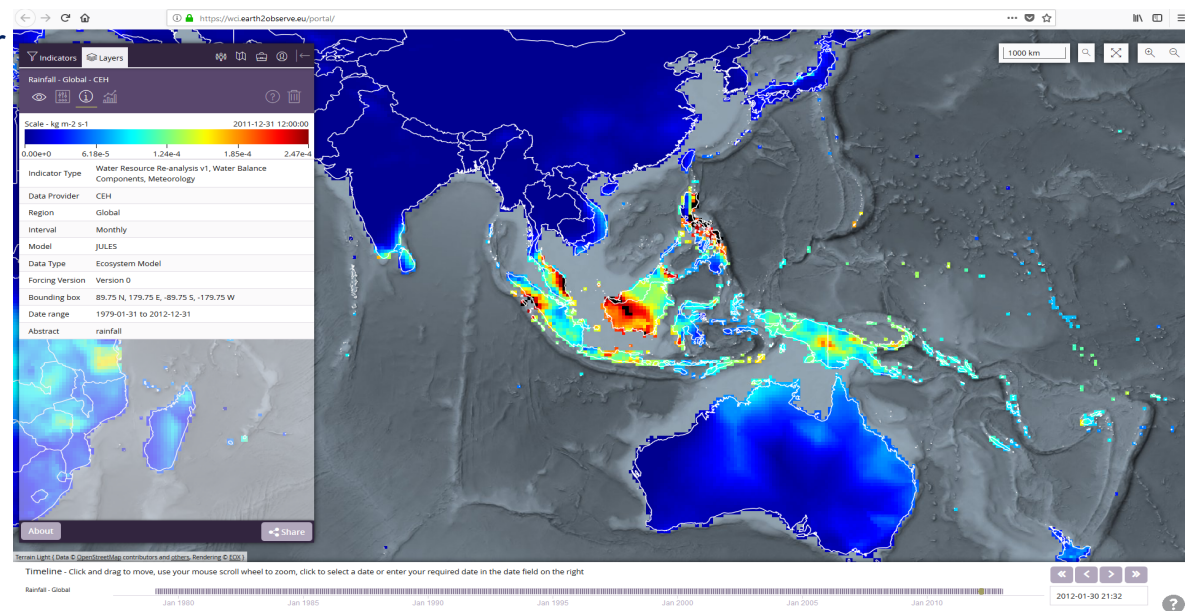
**A free access to data for all users** (except for some VHR products with specific user license)

## A friendly user web-interface

- ❖ Easy data/products download,
- ❖ Execute user's queries

## A user service support, forum and blog

- ❖ To share research findings and records
- ❖ To build a “water from space” scholarly ecosystem





## Access to SWOT data through French data portal **THEIA backup slides**

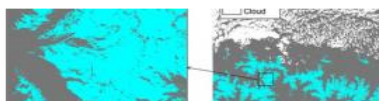
H. Vadon , G. Dibarboure, **A. Sellé**



# Hydroweb-NG products

❖ Products already available on THEIA web portal <https://www.theia-land.fr/en> that will be in HYDROWEB-NG

## Snow



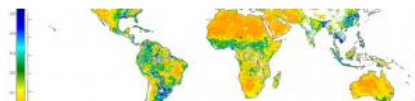
Zone: Alps, Pyrenees, High Atlas

Period: July 2016 - present

Access: All users

[theia.cnes.fr](https://theia.cnes.fr)

## Soil moisture



Zone: Global

Period: 2002 - present

Access: All users

[ftp.ifremer.fr](https://ftp.ifremer.fr)

## Soil moisture in the root zone



Zone: Global

Period: 2010 - present

Access: All users

[ftp.ifremer.fr](https://ftp.ifremer.fr)

## Drought index



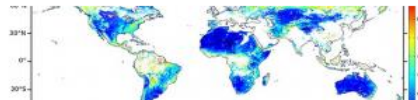
Zone: Global

Period: 2010 - 2017

Access: All users

[ftp.ifremer.fr](https://ftp.ifremer.fr)

## Surface roughness



Zone: Global

Period: 2010 - présent

Access: All users

[ftp.ifremer.fr](https://ftp.ifremer.fr)

## Soil moisture map with very high spatial resolution



Zone: Occitanie

Period: Sept. 2016 à mai 2017

Access: All users

[ids.equipex-geosud.fr](https://ids.equipex-geosud.fr)

## Water levels of rivers and lakes (Hydroweb)



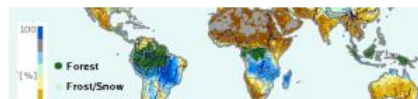
Zone: Global

Period:

Access: All users

[hydroweb.theia-land.fr](https://hydroweb.theia-land.fr)

## Water cycle variables (Postel)



Zone: Continental to Global

Period: 1992-2005

Access: All users

[theia-landsat.cnes.fr](https://theia-landsat.cnes.fr)

## Land cover map



Zone: Metropolitan France

Period: 2016

Access: All users

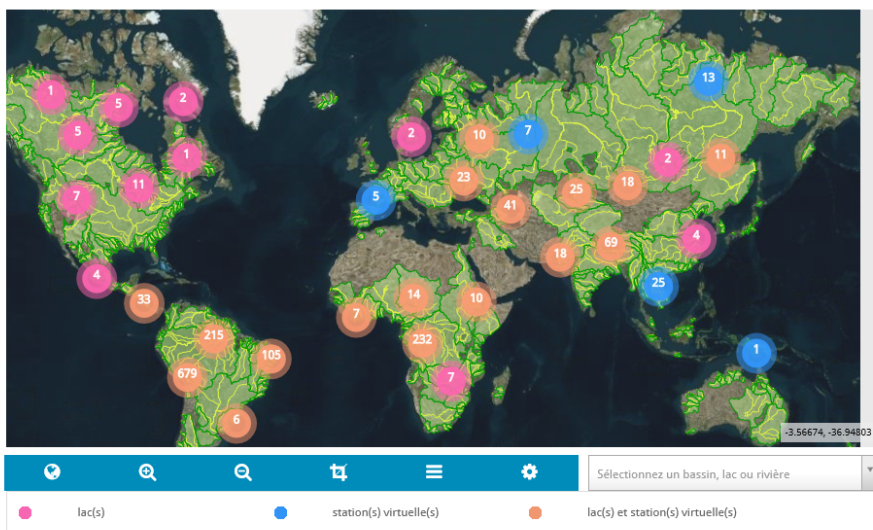
[osr-cesbio.ups-tlse.fr](https://osr-cesbio.ups-tlse.fr)



# HYDROWEB-NG products

The current Hydroweb-Hysope portal : the operational database of water levels time series since 1992

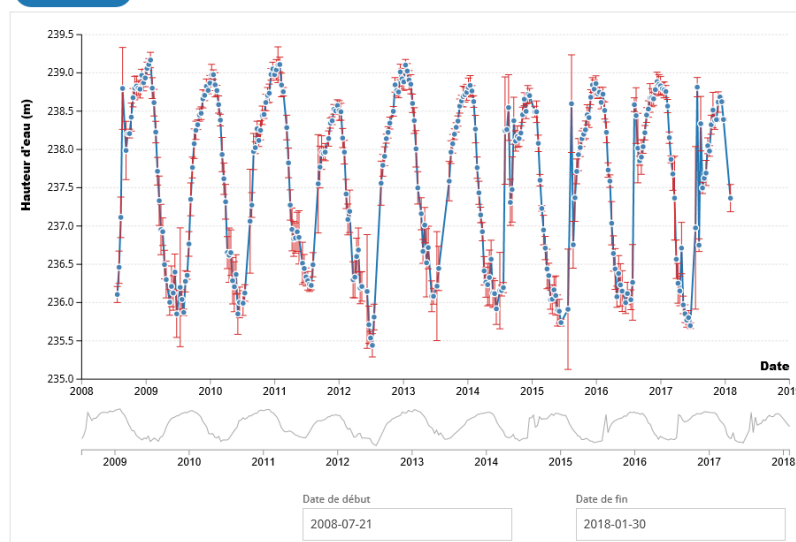
<http://hydroweb.theia-land.fr>



Accueil » r\_nig\_nig\_jas\_0237\_01

Rivière Niger

Hauteur d'eau (m)





## On-going work



### HYDROWEB-Hysope :

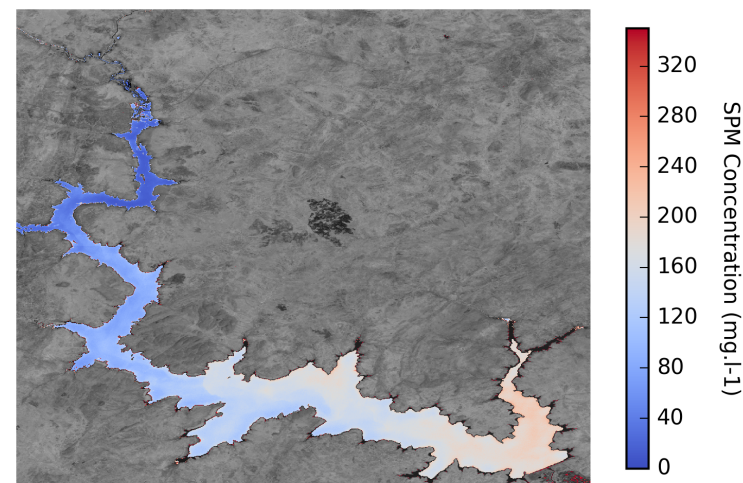
- ❖ ongoing work to massively increase the number of Virtual Stations – using Jason-3, S3A and S3B in the future
- ❖ we expect to include **several thousands** of virtual stations worldwide.

### Water quality :

- ❖ Distribution of the first water quality products (SPM suspended particulate matter) in 2018 through THEIA
- ❖ We expect to cover the 30 foremost watershed (in terms of discharge) and 20 lakes in the world

### SurfWater : water extent with Sentinel 1 and 2 in NRT and with monthly synthesis.

- ❖ First distribution foreseen by the end of 2019



**SPM in the Bagré reservoir in Burkina Faso**

Source : J-M. Martinez

## On-going work

### Development, operationalization and production of the other layers of HYDROWEB-NG:

- ❖ snow surface, landcover, DEM, soil moisture and derived products (drought index, root zone soil moisture, water fraction, etc.), refined discharge.

### Definition of basic needs, requirements, concepts and architecture of HYDROWEB-NG

### Implementation of HYDROWEB-NG as a component of THEIA

