

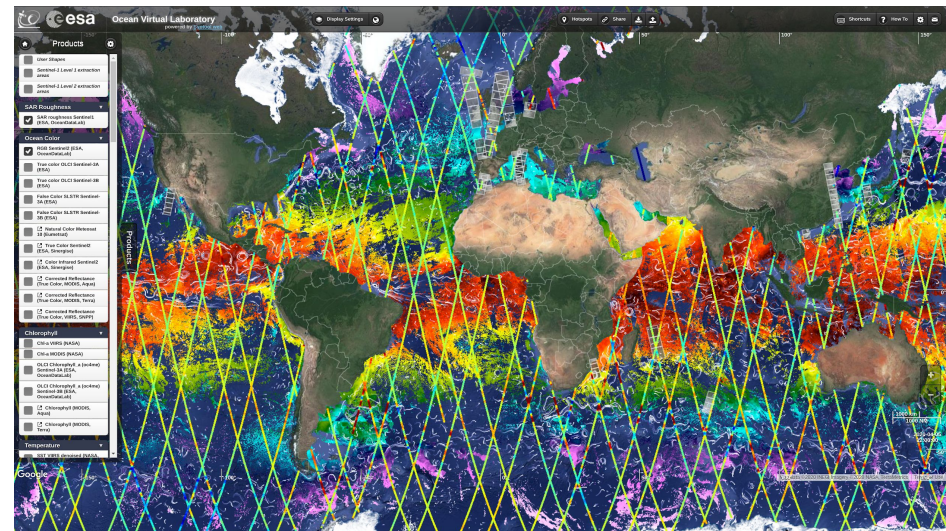
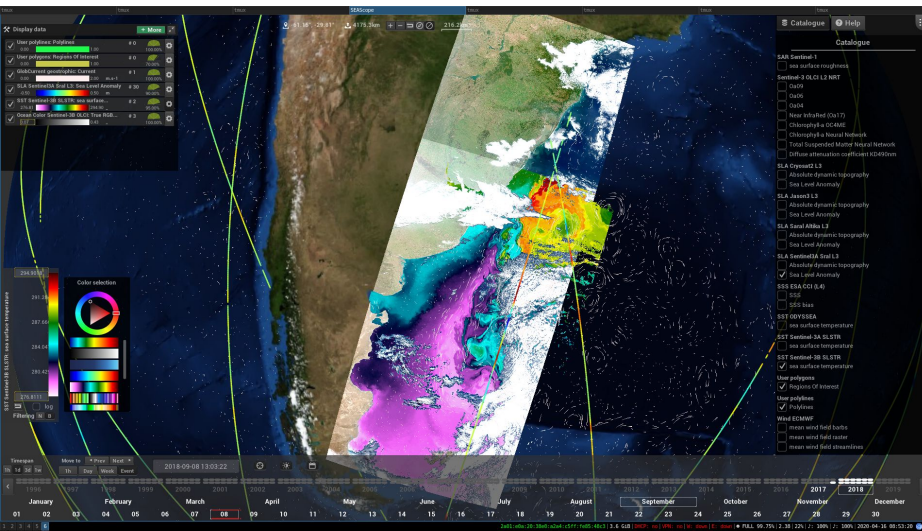
# Welcome to the Ocean Virtual Lab Workshop

Latest Ocean Virtual Laboratory tools in action, applied to ocean surface waves and currents analysis with hands-on training



OceanDataLab team

Brest, June 14-15 2022



A bit of history...

**OceanDataLab** is a private research laboratory that was established in 2013 by long time Ocean Remote Sensing and IT experts working in close collaboration with the Space Oceanography Laboratory at IFREMER (now LOPS). Our main objective is to generate added value to scientific work, but also to add visibility and provide efficient tools to enhance scientific productivity when multi-sensor or multi-modal analysis is required. ODL also has strong links with IMT Atlantique and is part of AI OceaniX Chair.

The **Ocean Virtual Laboratory** project :

Started as an ESA funded initiative with original aim to develop tools that shall foster the emergence of new methods prototypes and products making use of the complementarity between sensors to study ocean related processes. The tool shall also help the discovery of ESA/Copernicus Sentinel1/2/3/6 ... datasets

Initial Ocean Virtual Laboratory project started in October 2014, and ended in March 2017. The strong user interest then called for a subsequent OVL-NG project, running since then, to continue the tools support, maintenance and update. <https://www.oceandatalab.com/ovl>

OVL tools constant evolution is based on user feedback, including at the occasion of such trainings...

## Challenge

We have more and more satellite data available at very high resolution:

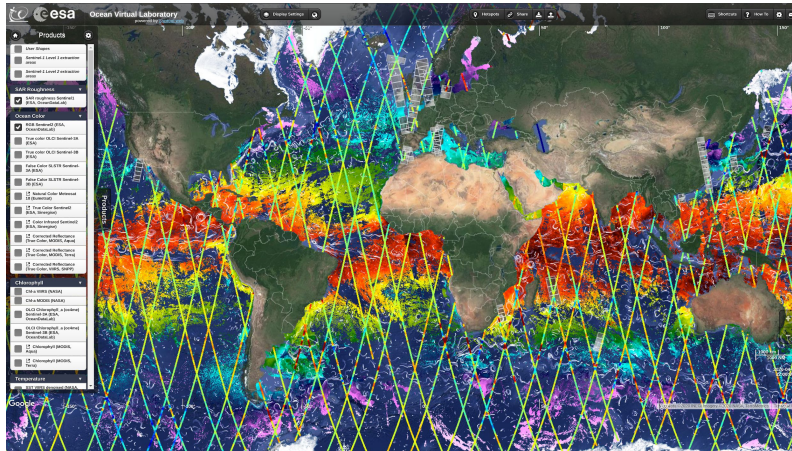
How to benefit from the synergy between ocean data products (e.g. from Sentinel 1-2-3-6 ...)?

## Solutions

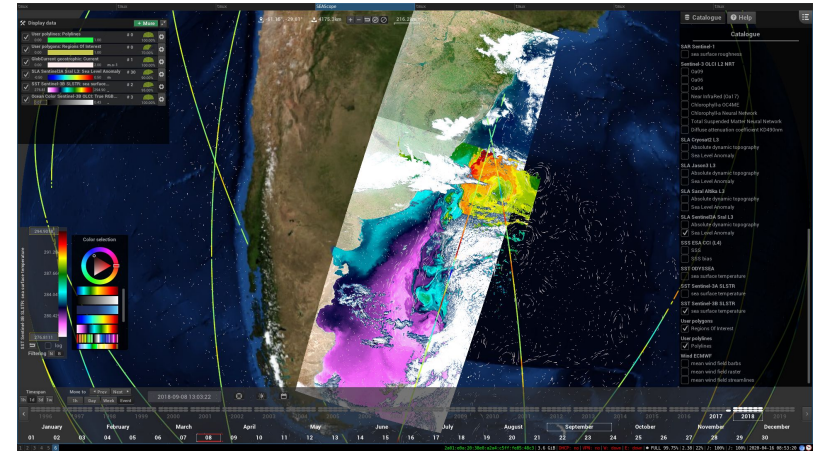
Provide a solution to easily open, visualise, overlay, intercompare and blend data collocated in space and time.

## Proposed Open Source Tools

Web-based and online: **Ocean Virtual Lab Syntool**

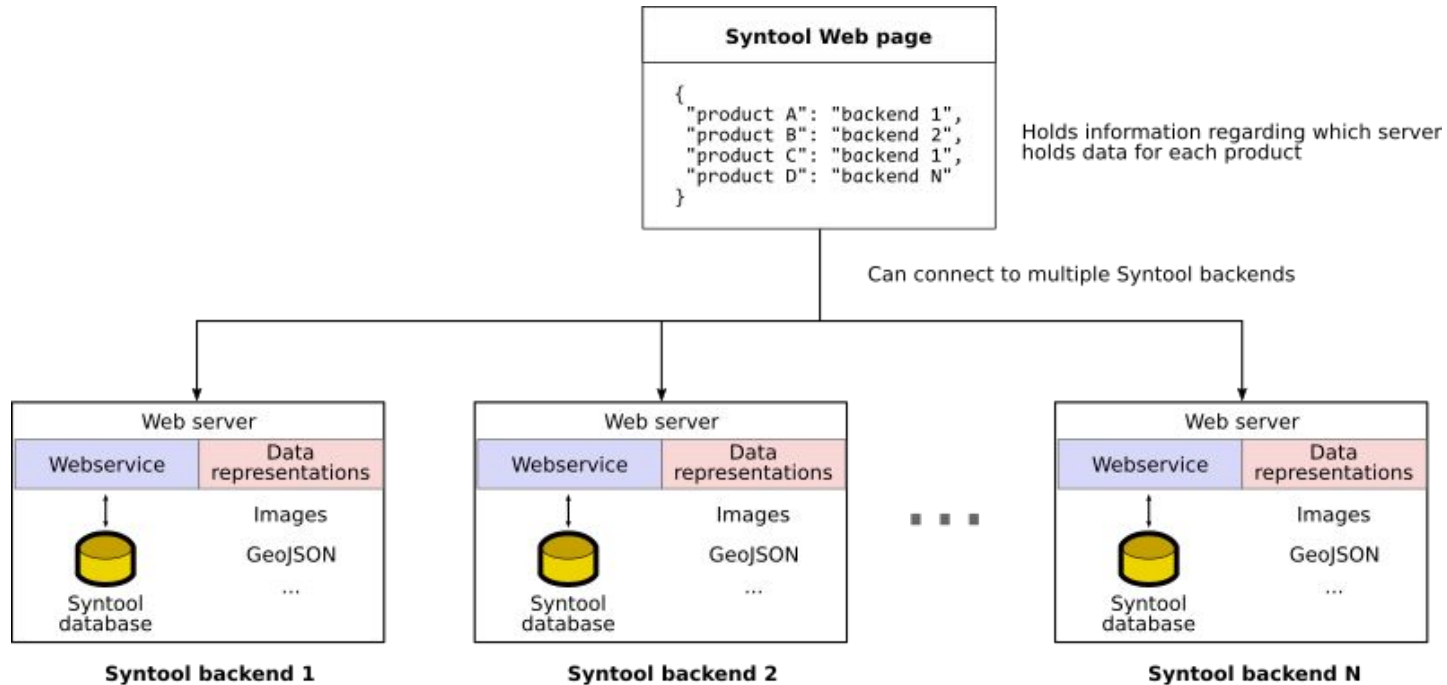


Stand-alone: **SEAScope** interactive viewer



# OVL web portal

Based on Syntool open source software developed internally at OceanDataLab

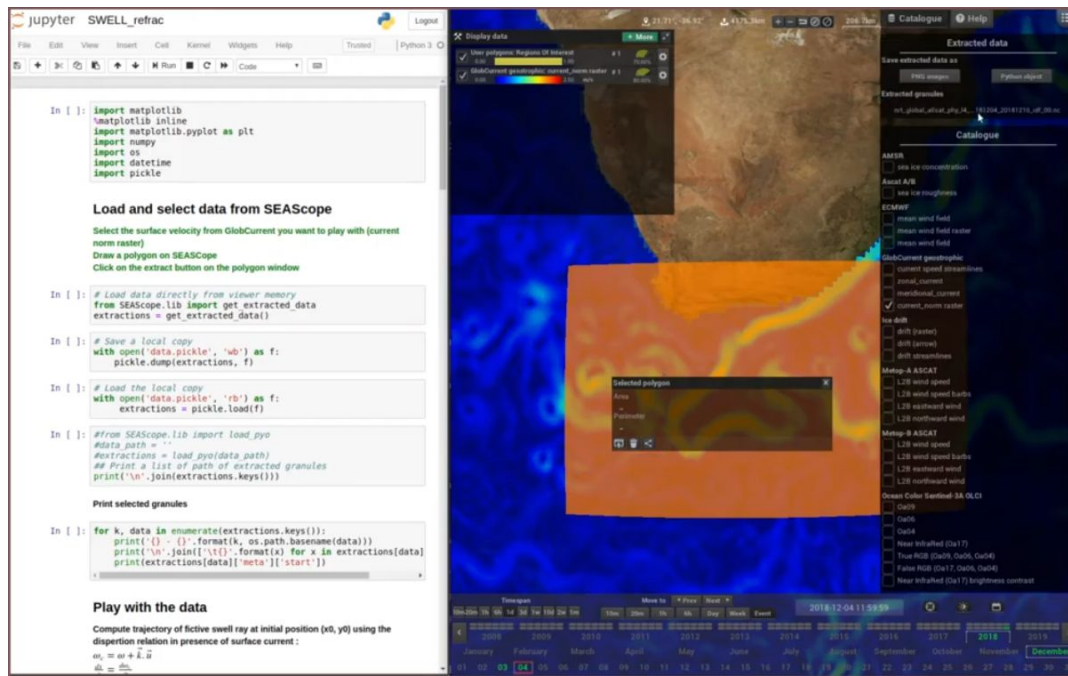


**=> Syntool portals can pick products from any known Syntool backend**

**=> Data only has to be ingested in a single Syntool backend to be available for different thematic portals**

# SEAScope interactive viewer

- Free and open source
- Works on recent Windows, macOS, Linux
- Index data on your computer: possibility to add your own data
- A python package is available to convert your own data into specific NetCDF format
- Two-ways interaction with Python: control SEAScope, extract/import data using python notebooks



## Scientific Challenge:

Analyzing and understanding the complexity of Ocean surface waves and currents together with their interactions, require the use of complementary multisensor satellite, in-situ and model output data.

## Training exercises

Using the Ocean Virtual Laboratory open source online and standalone tools developed for the last 10 years under ESA support, we will tackle the following questions:

- How do we observe currents from satellite and what do we really observe ?
- How do we observe waves from satellite and what do we really observe ?
- How do we observe wave-current interactions ?

## Agenda Tuesday morning

Time	Subject	Description
09:00	Welcome coffee	
09:30	Introduction	Agenda, brief presentation of tools and themes
09:45	Introduction to OVL portal	Discover the web portal visualisation tools
10:15	Observation of the ocean	Lecture on the observation of the ocean from space
11:00	Coffee Break	
11:15	Data synergy on OVL	Presentation of SEAShot and how to save and share interesting test cases
11:45	Install SEAScope	Brief Presentation of SEAScope analyses and Visualisation tool, Installation and add data
12:15	Lunch Break	

## Agenda Tuesday afternoon

Time	Subject	Description
13:45	Observe currents	Lecture on the observability of ocean surface current
14:20	Retrieve currents from SSH and wind	Learn to use SEAScope and perform analyses. Compute geostrophic and Ekman current using a python notebook and SEAScope
15:15	Coffee Break	
15:30	Observe waves	Lecture on the observability of waves
16:00	Wave spectrum computation	Compute wave spectrum using remote sensing observation. Test case will use SEAScope and python notebooks
17:30	End of day	

## Agenda Wednesday morning

Time	Subject	Description
09:00	Synoptic analyses using OVL and SEAScope	Draw a synoptic chart on OVL, retrieve automatically frontal structures using python notebooks and SEAScope
10:00	Convert into SEAScope data format	Presentation of SEAScope data converter and installation
10:30	Coffee break	
10:45	Wave Current Interaction	Learn the basics of wave current interaction and simulate wave rays propagation in the presence of current using python notebooks and SEAScope
11:45	Conclusion and Discussion	Feedbacks on the Visualisation and Analysis tools used during the workshop
12:30	End of Workshop	

## About the OVL online portal (based on Syntool)

Website: <https://ovl.oceandatalab.com>

By email: [syntool@oceandatalab.com](mailto:syntool@oceandatalab.com)

Forum: <https://forum.oceandatalab.com/syntool>

## About SEAScope

Website: <https://seascope.oceandatalab.com>

By email: [seascope@oceandatalab.com](mailto:seascope@oceandatalab.com)

Forum: <https://forum.oceandatalab.com/seascope>

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