



EO Open Science 2.0, ESRIN, Oct. 13 2015



The Project objectives



- * The main objective of the project is to allow oceanographers experts to discover the existence and then to handle jointly, in a convenient, flexible and intuitive way, the various co-located EO datasets and related model/in-situ datasets over dedicated regions of interest with a different multifacet point of view.
- * Developed tools shall foster the emergence and prototype of new methods and products making use of the complementarity between sensors to study ocean related processes.
- * The OVL is filling the gap between Space agencies data portals that distributes specific EO data and analysis software like SNAP, IDL/ENVI or Matlab that are more suitable for in-depth analysis of a given dataset. A few GIS systems such as Google Earth are able to import several data layers but very limited interaction with data (apart for basic layer transparency) is possible.

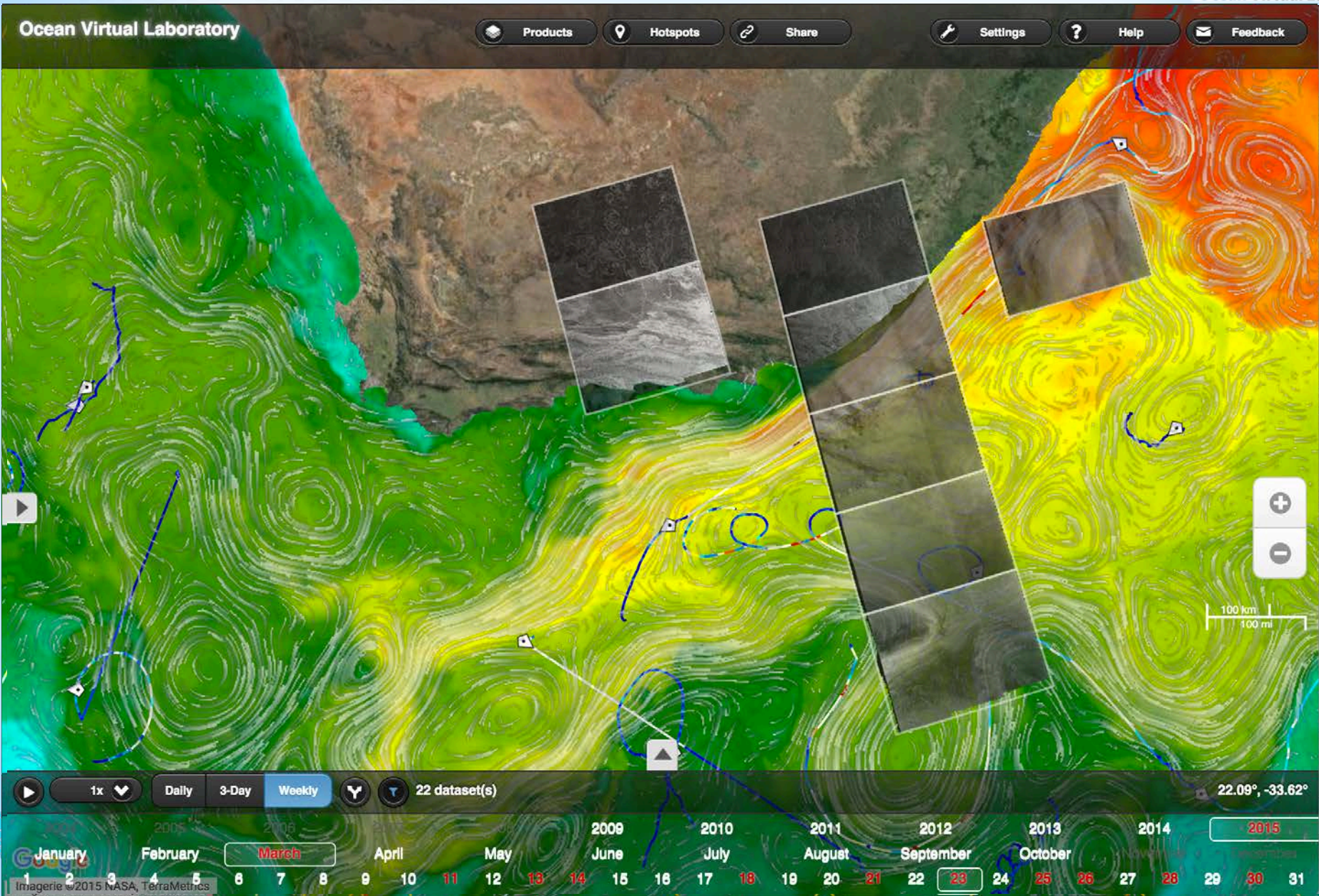


Concept and architecture

- * Open source (GIT)
- * Server : data storage and indexing, web server
- * Client : web and stand alone (under development)
- * Data analysis processing plugins on the client side.
- * Prototyping using Numpy file export from web server and Ipython notebook for processing

Web client

<http://ovl.oceandatalab.com>



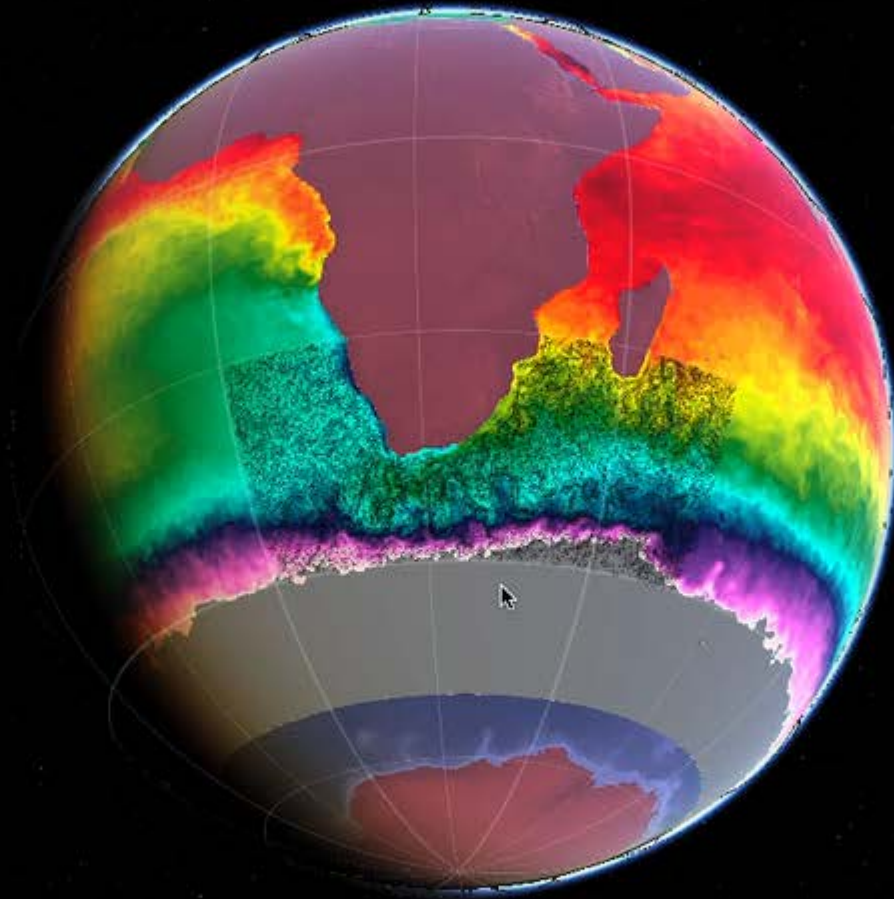
Stand Alone client



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1077
1078
1079
1080
1081
1082
1083
1084
1085
1086

Eye distance: 1.67772e+07m



Algorithm and methods

* DATA ENHANCEMENT ALGORITHMS

Sentinel1 methods : Despecklization of Sentinel 1 SAR Images

Sentinel1 methods : Sea Surface Roughness extraction

Sentinel2 methods : Filling gaps in ocean color data caused by cloud cover

Sentinel3 methods : Radiance to MSS contrast transformation

Sentinel3 methods : SST denoising

* SYNERGY ALGORITHMS

Surface current vector field

Feature detection and tracking technique

Maximum Cross Correlation

Multi-sensor data fusion

Algorithm development

[900913 ODYSSEA SAF SST-20](#)
[900913 SAR roughness-s1a-iw-c](#)

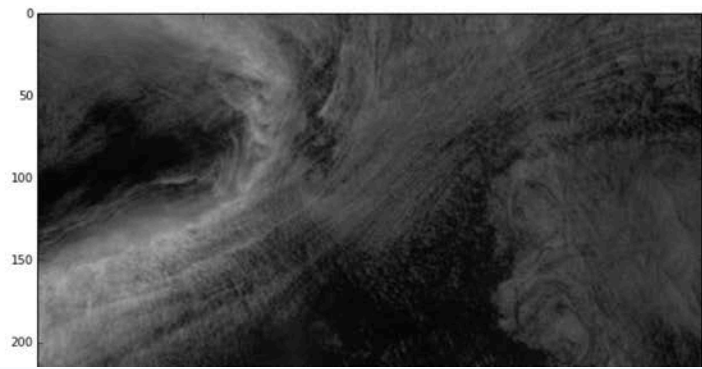
```
In [3]: %matplotlib inline
import os
import requests
import tempfile
import matplotlib.pyplot as plt
import numpy
import scipy

r = requests.get('http://syntooldata.oceandatalab.com/download/tmpC3tAFP/900913_SAR_roughness-s1a-iw-grd-vv-20150323t1...')
if r.ok:

    # Create unique file
    fd, path = tempfile.mkstemp(dir='/tmp')
    os.close(fd)

    with open(path, 'wb') as f:
        f.write(r.content)
    with open(path, 'rb') as f:
        d = numpy.load(f)
    os.unlink(path)

fig = plt.figure(figsize = (10,7))
imgplot = plt.imshow(d)
imgplot.set_cmap('gray')
```



Development approach

* Short cycle development

Short cycle development approach very close to the scientific user needs. Regular scientific beta users shall be engaged to work with the OVL and provide feedback on a regular basis. open source project with an open repository where the main OVL platform code is hosted.

* Data processing API

The processing plugins for pre- or postprocessing are part of the open repository and a clear and well documented API. This will facilitate both the integration of the required analysis and processing plugins by the project team but also the international external expert contributions as it will be made available to the open source community to let anyone add his own innovative processing plugins or new input dataset type ingestion.

* Implementation approach

The implementation of the main OVL platform and data analysis plugins is designed to favour easy learning and setup of new OVL, new data type ingestion or new analysis and processing plugins development by international community.

* Dynamic collocation plugins

An important first step of any synergy exploitation is the search for collocated datasets over the area of interest within a given time lap. The OVL will be able to dynamically call for collocation between any of the ingested datasets. The search will be possible from the following constraints :

- Within a given time difference relative to given product
- Within a given time and space mismatch relative to a given trajectory
- Within a given time and space window.

* Future acquisitions lookup

The OVL will be able to dynamically call for potential collocation between sensors in future acquisitions in particular amongst the Sentinel sensors. Likely based on external service CEOS COVE.

Synergy methods to combine Sentinels data

- * Sentinel1/3 synergy surface current vector field

Combination of direction from SLSTR or OLCI radiance gradients and across track velocity from SRAL and SAR Doppler to produce a vector field shall be implemented.

- * Sentinel3 synergy MCC

Estimation of horizontal advection using the MCC method shall be implemented. This shall be able to take as input high resolution SST and ocean color fields from multiple set of sensors.

- * Sentinel3 synergy Feature tracking

Estimation of horizontal advection using feature tracking method will be implemented. This shall be able to take as input high resolution SST and ocean color fields from multiple set of sensors but also SAR or Sun glitter derived MSS.

- * Multi-spectral data fusion

Fusion of Sentinel2/MSI (or ASTER) and Sentinel3/OLCI (or MODIS Terra) data for increased spatial and spectral resolution will be implemented.

OVL Trainings

* Summer schools and ESA training schools

In order to specifically target young scientists, the project participates actively in the organization of Ocean Remote Sensing Synergy Summer School and in the participation to ESA ocean remote sensing training course with practical sessions that make use of the developed OVL.

- A precursor Ocean Remote Sensing Synergy Summer School was organized by members of the consortium in Brest from June 30 to July 4, 2014.
- A second one was organized in July 2015.
- SAR and sensor synergy practicals in Brest Sept. 2015 during ESA Ocean training course
- Next training to come in **Sopot, POLAND, Nov. 17 2015, registration still open**

Find out more on <http://ovl-project.oceandatalab.com>

FP7 SWARP : Swell in the MIZ



* [swarp portal](#)

* [APL cruise in the Arctic](#)

