

The background features a group of diverse young people looking at a large, glowing globe of Earth. The globe is overlaid with a network of white nodes and lines, suggesting data connectivity. The globe shows various colors representing different data layers, with a prominent red and yellow area on the right side. The overall scene is set against a dark blue background with faint network patterns.

→ EARTH OBSERVATION SUMMER SCHOOL

Earth System Monitoring & Modelling

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EXPLORATION OF REMOTE SENSING DATA USING SYNTOOL AND SEASCOPE

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Start SEAScope and notebooks



- Go to directory C:\OVL\seascope
- Click on SEAScope.bat to open SEAScope, it may take some time as an index is build during the first opening (it should already have been opened once for testing before)

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In SeaScope:

- Look at all the collections using the right panel
 - Ice : AMSR concentration & Ascat roughness
 - Ocean Circulation : drifters, altimetry, globcurrent, cmems
 - Wind : ECMWF, ASCAT A/B, altimeter
 - Wave : altimeter, Sentinel-1 SAR
 - Ocean color : Chla MODIS/VIIRS, OLCI RGB
 - SST : Level2 IR MODIS/VIIRS, Level4 multimission (ODYSSEA)

In SeaScope:

- Look at the calendar and the availability using the bottom panel
- Select a collection, go to a date where the granule is available and play with the settings of the collection using the top left panel (min, max, colorbar, transparency, order of collections ...)
- For Polyline (resp. Polygon), use middle mouse button and Enter (resp. Shift+Enter) to close or end the drawing
- Look for all the functionalities in the manual: seascope.oceandatalab.com (e.g. north always up, collocation enabled , time span, ...).

Start SEAScope and notebooks



- Go to directory C:\OVL\seascope
- Download following notebooks and python modules :

[Eulerian_comparison.ipynb](#)

[constant.py](#)

[ekman.ipynb](#)

[geostrophy.ipynb](#)

[lagrangian_advection.ipynb](#)

[seascope_export.py](#)

[seascope_import.py](#)

[tools_advection.py](#)

[total.ipynb](#)

Move them into C:\OVL\seascope\notebooks



- Click on SEAScope.bat to open SEAScope
- Click on JupyterLab to open the Jupyter interface in a browser
- seascope-processor is not used today but may be useful to make transects and save extracted outputs

Interact with SEAScope using notebooks



In this session, we are going to derive geostrophic current from sea surface height.

Data are extracted from SEAScope and results are exported back to SEAScope for easy comparison

Go to the browser where jupyter has opened :

- Open the `geostrophy.ipynb` notebook and follow the instructions in the notebook:
- Select the Sea Surface Height from the CMEMS ADT collection in SEAScope
- Use *Middle button* to draw a polygon to extract data and *shift enter* to close the polygon, click on the extract button. Extracted granules are shown at the top of the collection panel.

Remember that the geostrophy hypothesis is not valid near the Equator

- Run cells in the notebooks to import SSH, compute and export geostrophic velocity into SEAScope
- Go back to SEAScope and compare the computed geostrophic velocity with the one from GlobCurrent geostrophic velocity collection (resolution, smoothness ...)

Interact with SEAScope using notebooks



In this session, we are going to derive Ekman current from the ECMWF wind.

Data are extracted from SEAScope and results are exported back to SEAScope for easy comparison

Go to the browser where jupyter has opened :

- Open the ekman.ipynb notebook and follow the instructions in the notebook:
- Select the Wind raster from the ECMWF wind raster collection in SEAScope
- Use *Middle button* to draw a polygon to extract data and *shift enter* to close the polygon, click on the extract button. Extracted granules are shown at the top of the collection panel.
- Run cells in the notebooks to import wind, play with theta and beta parameters according to Rio et al, compute and export ekman velocity into SEAScope
- Go back to SEAScope and compare the computed Ekman velocity with the one from GlobCurrent Ekman velocity collection (results may differ depending on your choice of theta and beta parameters)

Interact with SEAScope using notebooks



In this session, we are going to compute total current by adding the geostrophic and the Ekman current..

Data are extracted from SEAScope and results are exported back to SEAScope for easy comparison

Go to the browser where jupyter has opened :

- Open the total.ipynb notebook and follow the instructions in the notebook:
- Select the geostrophic current and Ekman current collections in SEAScope
- Use *Middle button* to draw a polygon to extract data and *shift enter* to close the polygon, click on the extract button. Extracted granules are shown at the top of the collection panel.
- Run cells in the notebooks to import currents,, compute and export total velocity into SEAScope
- Go back to SEAScope and compare the computed total velocity with the one from GlobCurrent total velocity collection (results may differ depending on your choice of theta and beta parameters during computation of Ekman currents)

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Interact with SEAScope using notebooks



In this session, we are going to compute Lagrangian trajectories from one week of currents.

Data are extracted from SEAScope and results are exported back to SEAScope for easy comparison

Go to the browser where jupyter has opened :

- Open the trajectory.ipynb notebook and follow the instructions in the notebook:
- Select any raster velocity collection in SEAScope (GlobCurrent total, geostrophic or your own if you have computed several days of data)
- Use *Middle button* to draw a polygon to extract data and *shift enter* to close the polygon, click on the extract button. Extracted granules are shown at the top of the collection panel.
- Select a week of time span to extract a week of data
- Run cells in the notebooks to import velocities, sort them and enter an initial position where there is a drifter in order to compute Lagrangian trajectories and export trajectories into SEAScope
- Go back to SEAScope and compare your trajectory with the one from AOML drifter collection (do they differ? why? ...)

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