PRACTICUM- I: The CCLME Eco-GIS Viewer

How does upwelling relate to biological parameters, cloudiness, and profiles of temperature, salinity, and dissolved oxygen in the Canary Current EBUS?

Through this exercise, you will explore several functionalities available through the CCLME Eco-GIS Viewer: http://www.ideo-cclme.ieo.es/.

Download figures and use screenshots to complete your answers to the exercises proposed below.

Attention! The CCLME Eco-GIS Viewer is being improved and updated. Do not forget to "Refresh" (f5) each application every time you will access it in the future.

CCLME Upwelling index: http://www.ideo-cclme.ieo.es/Home/UpwellingIndex

1. How does the upwelling index vary along the African coast?

Click on 'Upwelling Index', select one of the reference points.
To compare sites on the same plot, just select a single year. Click 'Insert' every time to update the plot.
Click on 'Several years' to select a series for multiple years.

2. What is the month of maximum upwelling as a function of latitude?

3. Is there inter annual variability? Is there a trend?

4. What is the proposed upwelling index exactly? Click on 'About' 'Metadata' on the top tool bar to obtain further information.

Spatio-temporal data viewer: http://www.ideo-cclme.ieo.es/Home/SpatioTemporalViewer

5. Connect upwelling to chlorophyll-a and sea surface temperature.
Click on 'Monthly averaged SST and Chl-a'. We will focus on the period 2003-2008. Examine the generated figures to assess how SST and Chl-a correspond to what you have learned about the upwelling. You may need to click 'Clear' in between new graphic calls. Does it make intuitive sense?

7. What is the hydrographic structure?
Click on 'Find data'. Ship CTD data are available, more in the early years. Do not worry about finding a corresponding year to your analysis above but do try to relate the CTD profiles you find to what you learned about the upwelling previously.
What about the beam attenuation profile?

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6. What annual cycle do you infer for the cloudiness?
The Chl-a values are satellite-derived from the ocean color. The sensor requires a clear visible view of the ocean surface. When clouds obstruct, no Chl-a data are available, appearing as a white area on the map. This gives an indication of the cloud cover. You have likely identified a trend in the upwelling at some locations. Is there a corresponding trend in the cloud cover?

7. Can you explain what did it happen on 10 June 2019 in Cabo Verde?
The Click on 'Show Ortographic proyection'. In the pop-up window click on "earth', you will be redirected to the website Earth Viewer (earth.nullschool.net).
Select "particulates". On "Data", you can see that the map displays wind at the surface and dust extinction (AOT). Click on the variable AOT to know more about it.

If you have time explore some of the other options available within the viewer.

Bathymetric mapping and transects: http://www.ideo-cclme.ieo.es/Home/BathymetricTransects
Click on "Draw a profile". Add vertices by simple left click. Double click to finish.

Move your mouse over the profile to see distance from the starting point and depth at each point. You can see the point were you are with your mouse on the map as well (green cross).

Click on "Save CSV sample" to download an example of a comma-separated values file.

The csv file only needs three fields: longitude (lon), latitude (lat) and the last field (field1), for each point. The polyline will be drawn following the order of the points in the CSV file (point1, point2, point3…)

```
lat;lon;field1
42.3353535;-20.223544;"point1"
42.3453535;-20.213544;"point2"
42.3553535;-20.233544;"point3"
42.3653535;-20.283544;"point4"
```

Just "Drag and Drop" a CSV file filled with your data over the map to calculate the elevation profile.

Biological data: http://www.ideo-cclme.ieo.es/Home/BiologicalData
Click on "Save CSV sample" to download an example of a comma-separated values file.

Just "Drag and Drop" a CSV file filled with your data over the map. Try to use Graduated symbols; Symbol size is an effective way to represent differences in magnitude of a phenomenon because larger symbols are naturally associated with meaning a greater amount of something.

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