

Sentinel-3 products for detecting EUtROphication and Harmful Algal Blooms in the French-English Channel (S-3 EUROHAB).



S-3 EUROHAB Web Alert User Guide

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Overview

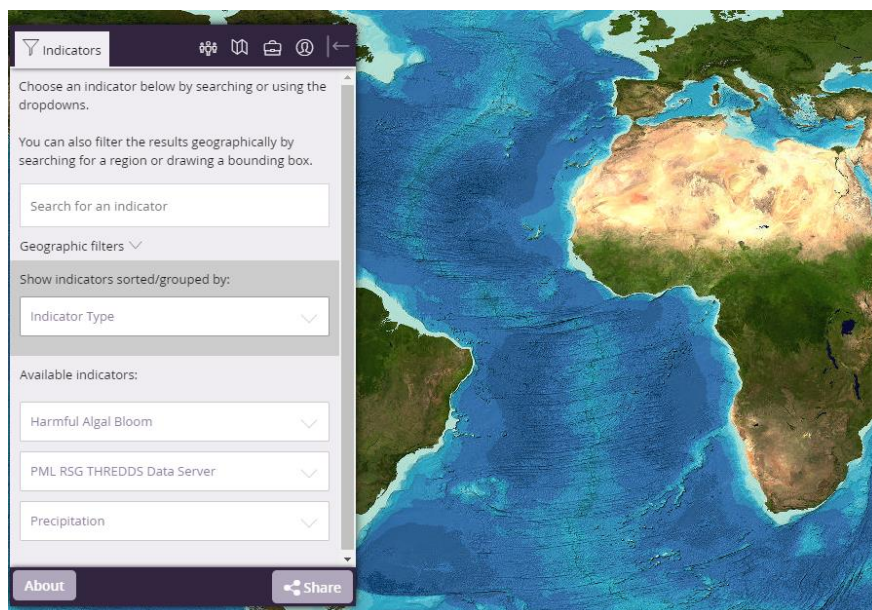
This User Guide will show you how to:

- Display HAB risk maps;
- Display HAB risk map layers;
- Display HAB risk dates;
- Change HAB risk colour settings;
- Plot HAB Risk time series;
- Upload log of boat tracks and evaluate whether you have a HAB risk along the boat track.

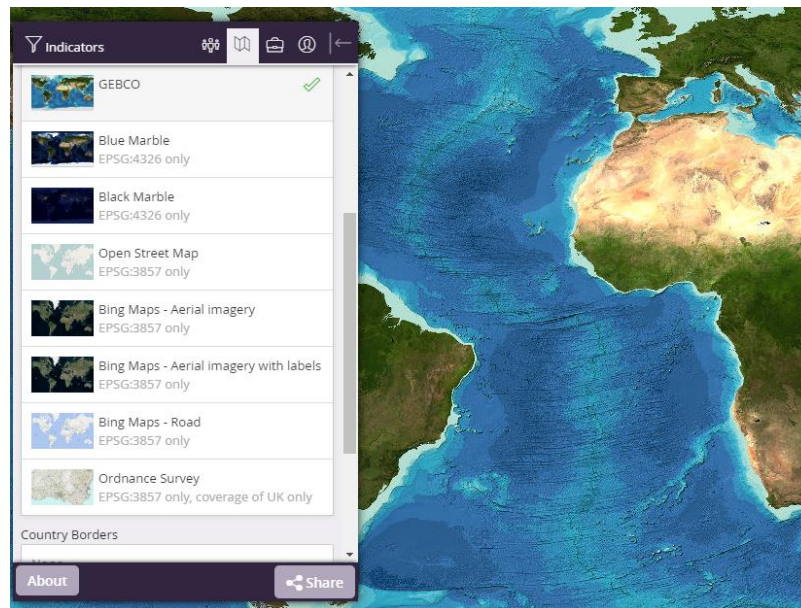
Step by Step User Guide

Starting Up

1. Bring up the web alert at the following internet site:
<https://www.s3eurohab.eu/portal/>
2. An Indicator tab will appear on the left hand side of the screen:



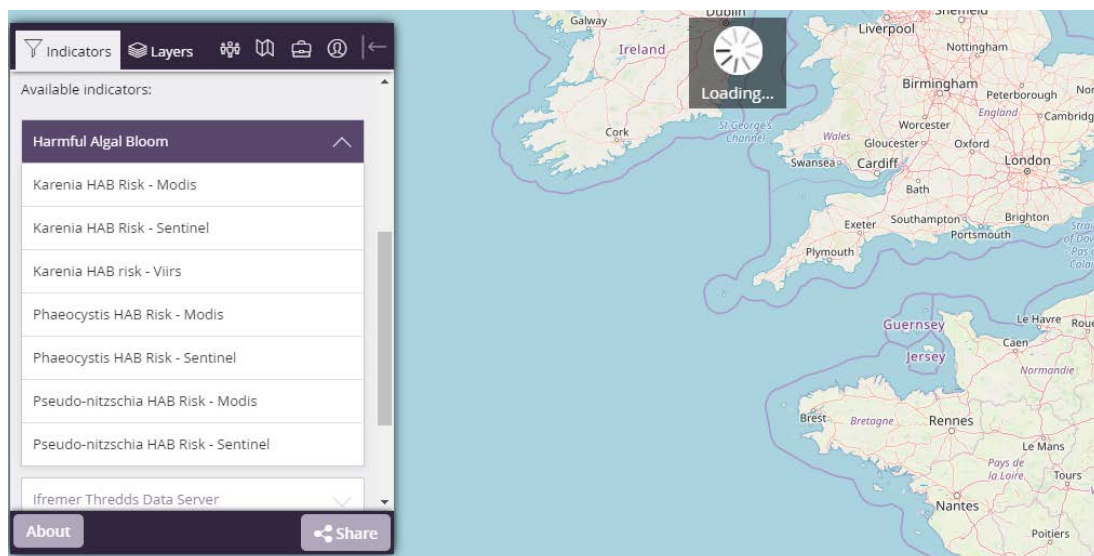
3. From the indicator tab, firstly select the display settings button to select the **type of background** that you want:



- There are a range display backgrounds available, including Open Street maps, Bing maps, Ordnance Survey (UK only), GEBCO, Sentinel-2 land imagery, etc. Select the background that you prefer or require.

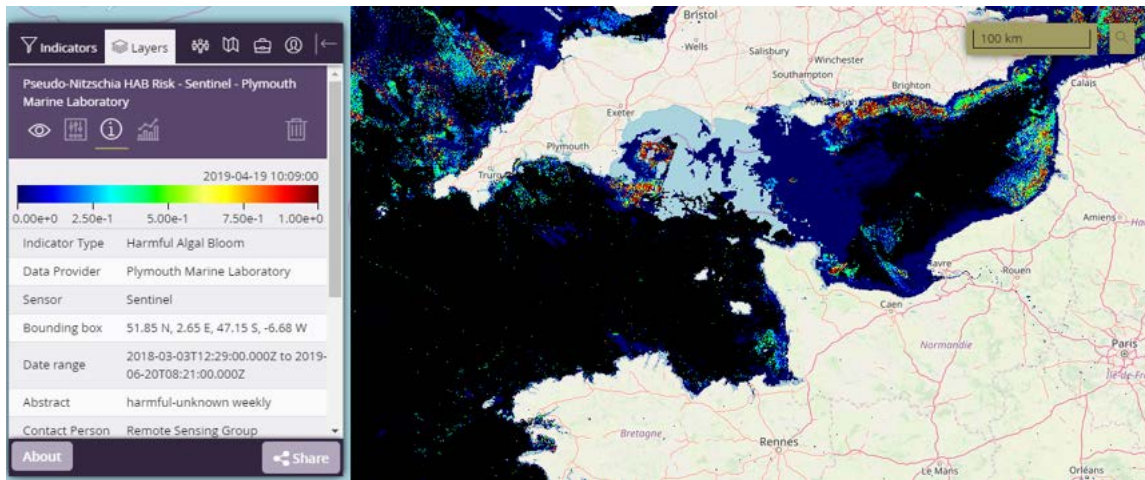
Indicators

- Then click on 'Indicators'. Under this tab, there are a range of data available including Harmful Algal bloom risk maps, Chlorophyll-a, total suspended matter, particulate inorganic carbon, Sea Surface Temperature, precipitation, etc.. Select the indicator that you require.
- Under **Harmful Algal Blooms**, there are risk maps for 3 species; *Pseudonitzschia* spp. (Amnesia Shellfish Poisoning), *Karenia* spp. (oxygen depletion), *Phaeocystis* spp. (foam producer) available from 3 ocean colour satellite sensors: Sentinel-3 (high resolution satellite at 300 m), MODIS-Aqua and VIIRS (lower resolution satellites at 1 km):



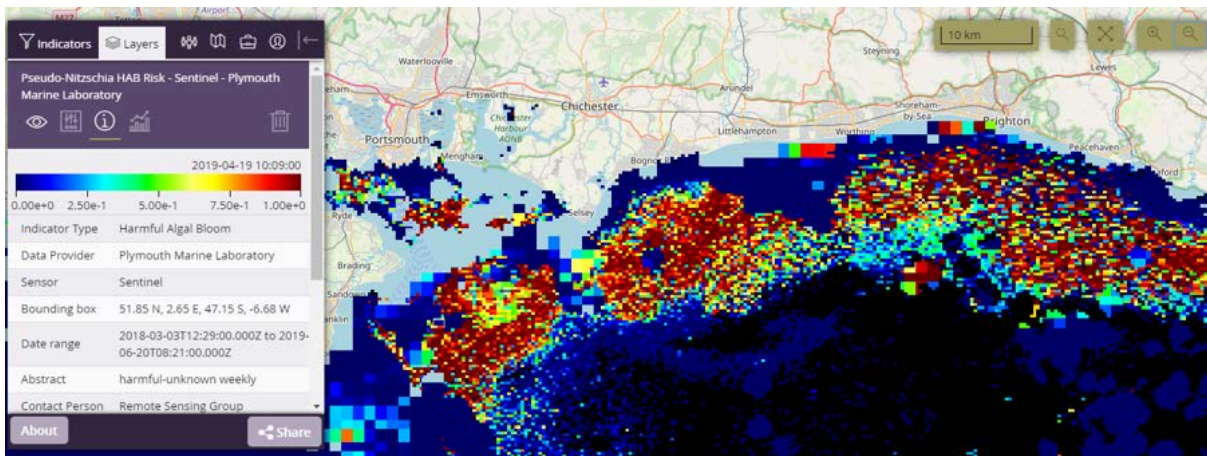
- You can select more than one indicator; e.g. Pseudo-nitzschia from Sentinel-3 and MODIS-Aqua. The data available for each field will be displayed on the time bar at

the bottom of the screen. The filled bars indicate that data are available for a particular date (e.g. given below is for 20 April 2019; red areas indicate high risk of Pseudo-nitzschia):



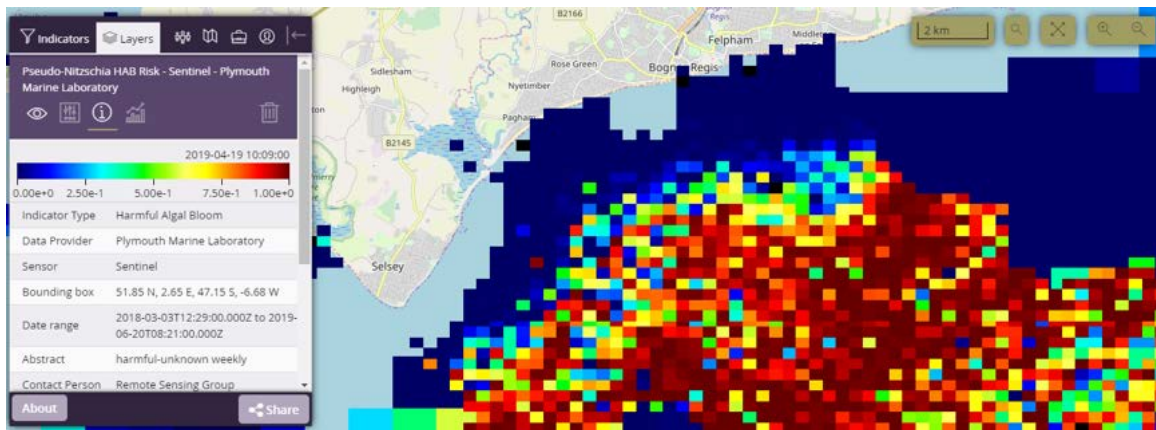
Viewing controls:

8. You can **Zoom** in using the + and - buttons on the top right of the screen:

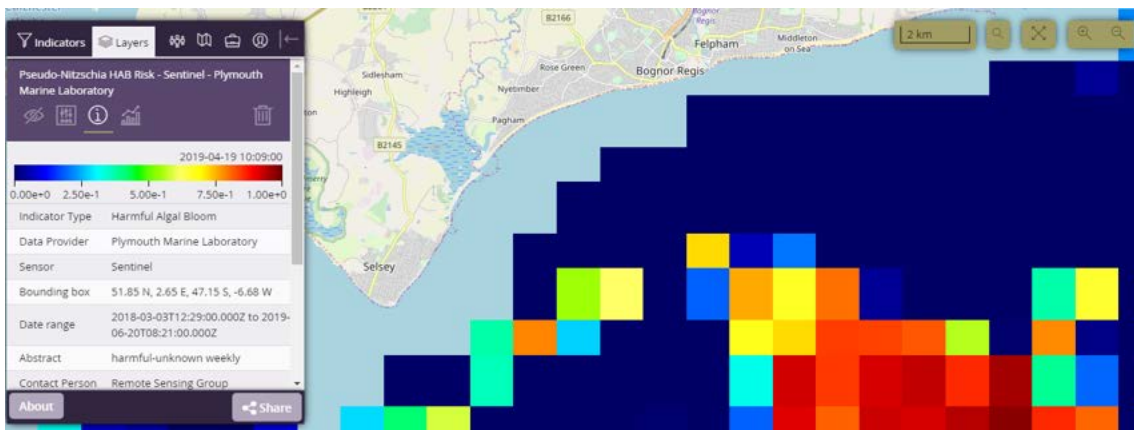


9. The **colour scale bar** provides an indication of the level of risk; any pixel (area) >0.6 indicates a potentially high risk of this particular species. You can zoom in further and then use the eye symbol to toggle between images.

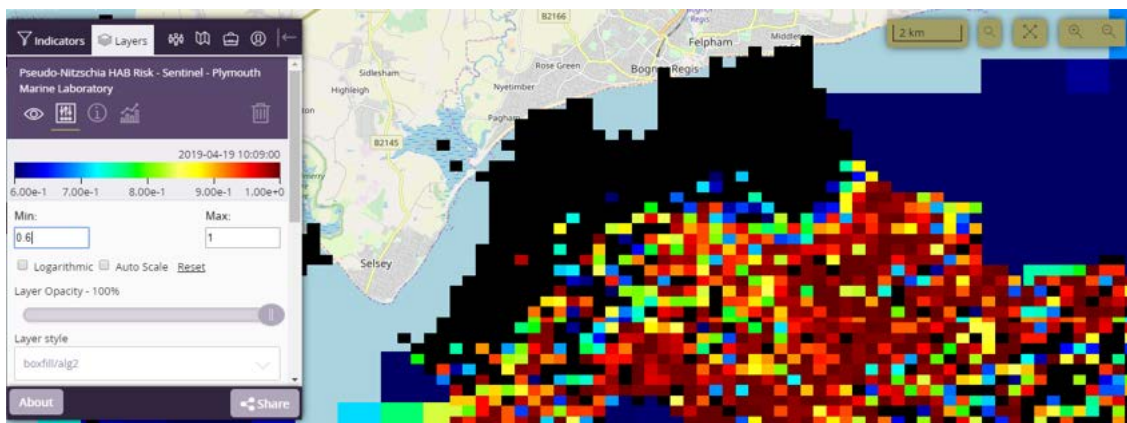
Please note: the risk value indicates how similar the ocean colour was to a training set of confirmed HABs, but does not rate the probability that the bloom was actually harmful. Also, it is possible for a bloom of a different species of algae to appear so similar that it is confused with the target HAB species, due to the limited ocean colour information from current satellite sensors. These HAB risk maps should be viewed as an indication, alongside water sample data to confirm the presence of a HAB species. This image is of Sentinel-3 (300 m) in Bognor Regis bay; the dark red pixels indicate high Pseudo-Nitzschia risk:



10. **'Toggling the visibility'** using the eye symbol allows you to change between image types (note the dash through the eye indicates you have switched between images). This image is for Pseudo-Nitzschia from MODIS-Aqua at 1 km resolution:



11. Next to the 'toggle visibility' is the **'layer settings'** button. By clicking on this you can select the scale to show only pixels that have a HAB risk >0.6:



12. The **layer opacity** can be used to fade in and out between images.

13. The colour bands can increase or decrease the number of colour bands.

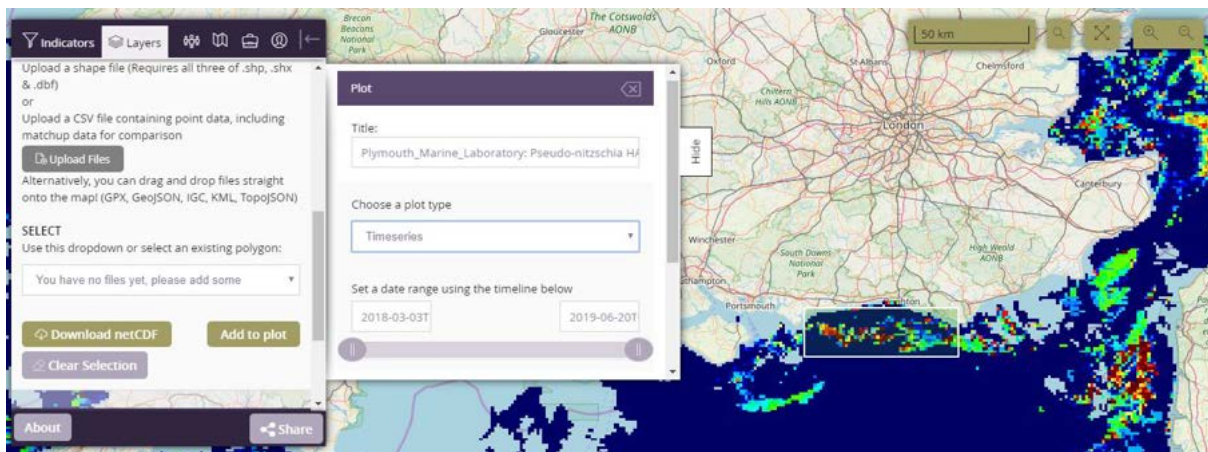
14. Clicking on the Information button, *i*, gives information on what the data product is, the GIS area or pixel selected and the time range.

Plotting time series:

15. **Plotting time series:** Click on the layer analysis button and you will be given a range of options to create time series.
16. You can **draw polygons** over an area (either regular or irregular). Click on draw polygon and click on an area to draw a box or irregular box over an area. In this example, a polygon is drawn around the Brighton coast to extract data for Pseudo-Nitzschia HAB risk from MODIS-Aqua:



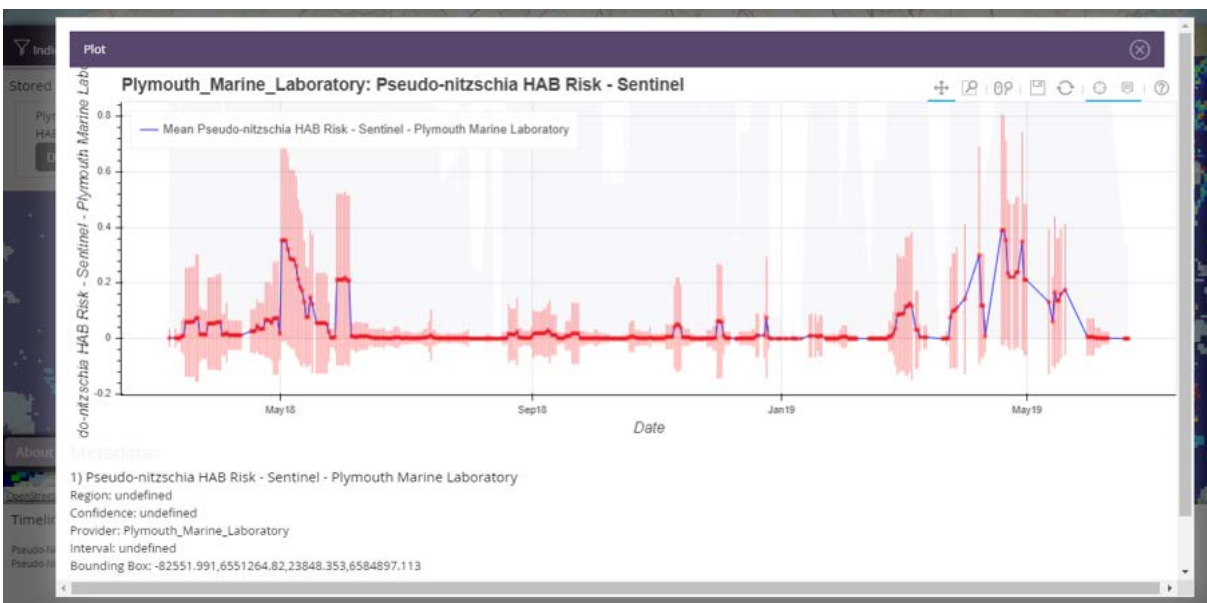
17. Scroll down the layer box and click on '**make new plot**'. This will bring up another dialogue box called 'Plot'. From this dialogue box, you can give the plot a title, choose a plot type (including time series, Hovmöller plots, scatter plots and video animation), set a date range for the plot:



18. Scroll down, then click '**Create Plot**'. Once the plot has been created, you have the option of deleting, editing or opening it:

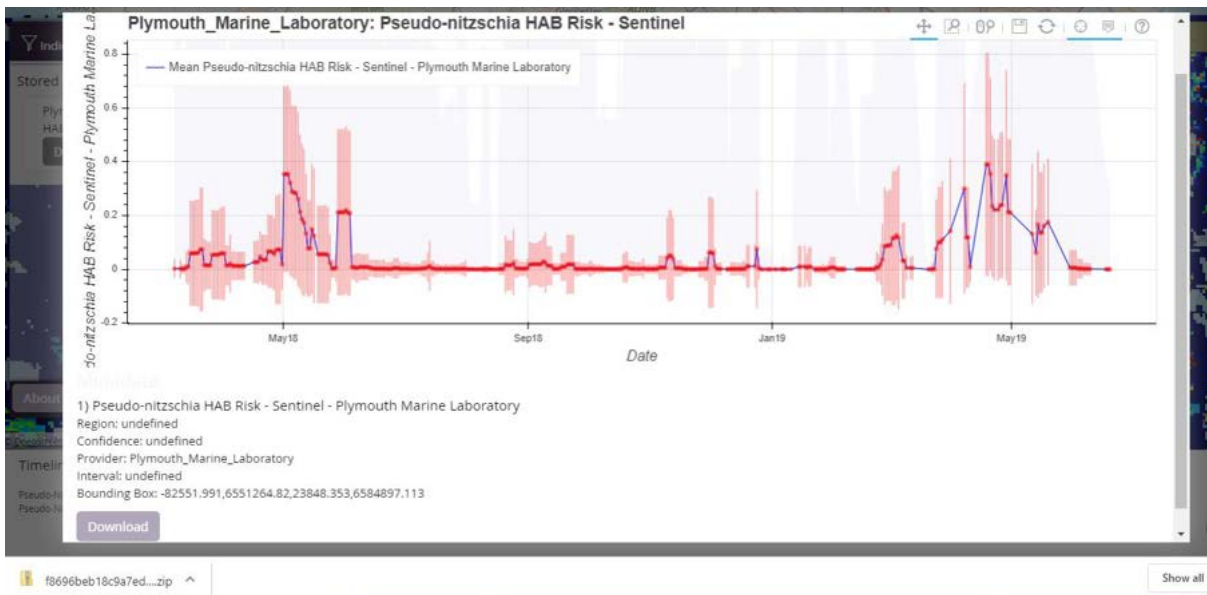


19. Click on 'open' to display the plot:



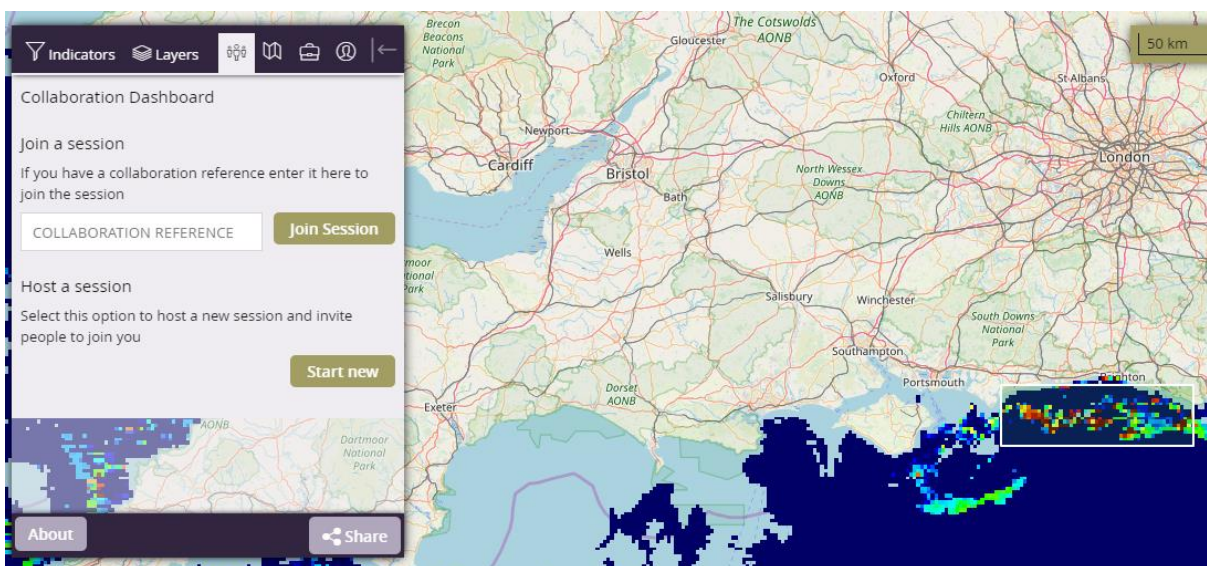
20. The red points and blue line are the mean *Pseudo-nitzschia* HAB risk for the selected area. The pink lines are the minimum and maximum *Pseudo-nitzschia* HAB risk for the selected area. The grey lines represent the standard deviation of the pixels sampled from the box, which gives the full range of risk values within the area. From the time series plot of this area, you can see that there was a high HAB risk of *Pseudo-nitzschia* spp., in May 2018 and April 2019. You can use the cursor to select when (both date and GPS latitude and longitude coordinates) the highest HAB risk was.

21. If you scroll down, you can also **download** the time series data:

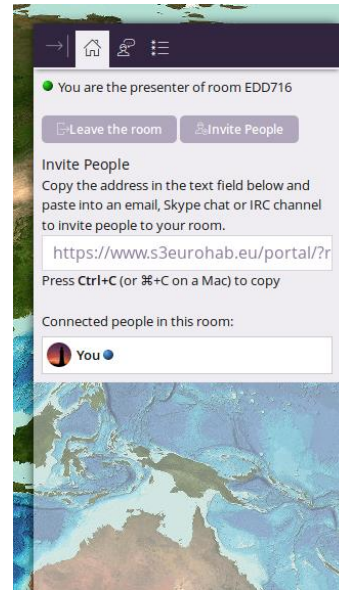
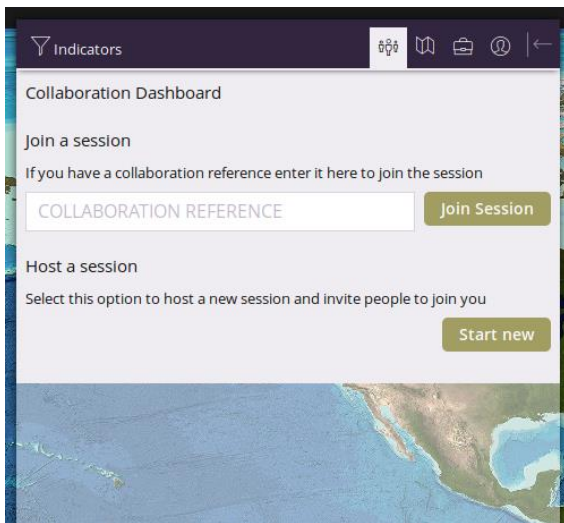


22. Using the power buttons on the top right of the plot, you can: pan in and out, zoom in and out either using the mouse or wheel key, save the plot, reset the fields, produce a cross-hair to gain date or GPS location.

23. In the box on the left hand side, there is also a collaboration tool which allows you to share the screen or web link with a colleague in real time, so they can also see what you are seeing on your screen.



24. You can start a new collaborative session and then invite your colleague(s) to join the session using the link that is generated when the user that initiated the collaborative session clicks the **'Invite People'** button. The code that is included in the link can be entered manually in the collaboration panel on the left.



It is also possible to **share a copy of your portal**. This is made possible by the share button (found in the bottom left of the screen). The link that is generated can be sent to a colleague. When they click it the portal will load up the exact data as you had. This allows the sharing of interesting data or a particular feature.

Closing remarks

25. **Plots are stored** during your session on the portal. This allows you generate many plots in one session. To keep plots after a session on the portal, it is recommended that the save button is used. This will generate a static image of the plot that can be saved on your local computer for use in reports or publications.
26. The system allows the upload of certain location data that can then be used as a selection during analysis. A Comma Separated Variable (CSV) file can be uploaded using the '**Upload Files**' button. The option to upload requires that a user logs in using a google account. A snippet of an example file is below.

Latitude,Longitude,Date

36.785,-6.426,01/09/2015 12:00:00

28.367,-14.403,01/09/2015 12:00:00

17.77,-20.303,01/10/2015 12:00:00

-23.092,-43.077,01/12/2015 12:00:00

-35.942,-56.162,01/01/2016 12:00:00