

PPM, aula Teórica-Prática

Portal cor do oceano

Versão 1

10 de Novembro de 2022

Vanda Brotas

- **Objetivos/Objectives:**
 - Utilização do portal.
 - Learn how to use the portal, which is very useful to know about phytoplankton spatial and temporal distribution
<https://www.oceancolour.org/portal/>
 - Training on how to use this portal
 - Learn a tool useful for your future
-
- Perceber a variabilidade espacial da Clorofila
 - Perceber a variabilidade temporal a nível sazonal e inter-anual
 - Caracterizar padrões temporais em zonas com upwelling e zonas offshore
 - Ficar com uma ferramenta que podem usar mais tarde

Projeto Ocean Colour Climate Change Initiative: <https://climate.esa.int/en/projects/ocean-colour/>

☰ 🔍 United space in Europe



This project focuses on the Ocean Colour ECV encompassing water-leaving radiance in the visible domain, derived chlorophyll and inherent optical properties and utilises data archives from Copernicus, ESA, NASA and NOAA.

ABOUT

NEWS

DATA

KEY DOCUMENTS

TEAM

PUBLICATIONS

CONTACTS

About Project

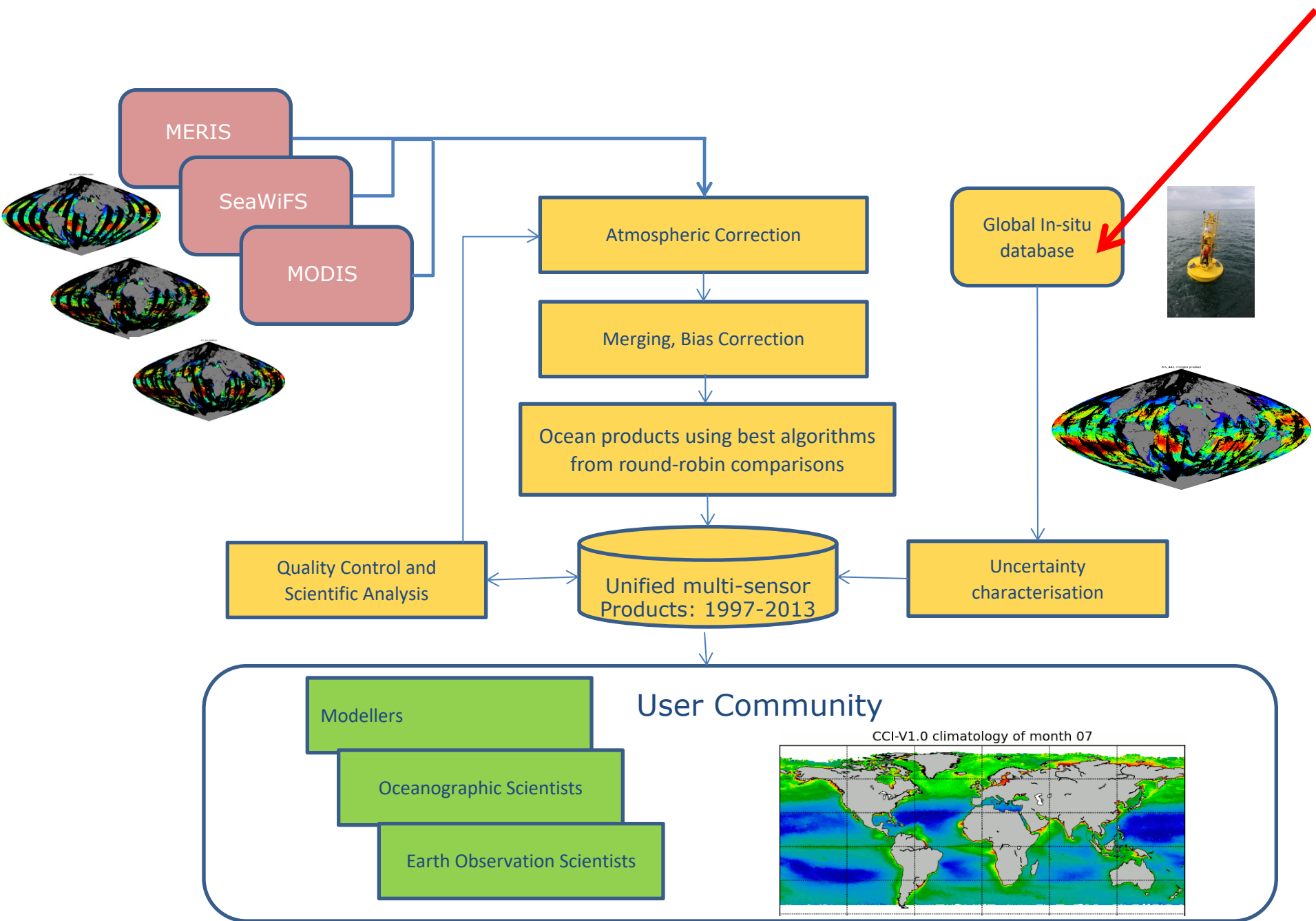
The Ocean Colour Climate Change Initiative project aims to:

- Develop and validate algorithms to meet the Ocean Colour GCOS ECV requirements for consistent, stable, error-characterised global satellite data products from multi-sensor data archives.
- Produce and validate, within an R&D context, the most complete and consistent possible time series of multi-sensor global satellite data products for climate research and modelling.
- Optimise the impact of MERIS data on climate data records
- Generate complete specifications for an operational production system.
- Strengthen inter-disciplinary cooperation between international Earth observation, climate research and modelling communities, in pursuit of scientific excellence.

[Learn more about the Ocean Colour project](#)

The Ocean Colour project is currently in its third phase which started in April 2019 and has recently released the v5.0 dataset (November 2020) to the international science community following internal quality control and analysis. This follows Phase 2 which ran from 2015-2018, and the original phase 1 project.

These are Plymouth Marine Laboratory (Science lead) (UK), Brockmann Consult (Germany), Helmholtz-Zentrum Geesthacht (Germany), Joint Research Centre (EU), HYGEOS (France), and Foundation of the Faculty of Sciences of the University of Lisbon (Portugal).



Why Ocean Colour? Climate-Change Context



Identified as essential climate variable by GCOS
(Global Climate Observing System)

Amenable to remote sensing: global perspective

Targets a key property of marine ecosystem

The Green component of the Blue Planet (the only marine ECV that probes the “Living” part of the Living Planet)



- Qual a relação entre Fitoplâncton, Clorofila e Detecção Remota de Cor do Oceano pelos satélites?
- Relembrando:
- A Clorofila a é o principal pigmento, mas não o único, que se encontra dentro das células de fitoplancton
- Fitoplancton: organismos microscópicos unicelulares, fotossintéticos.
- A concentração de Clorofila a é proporcional à biomassa das células de Fitoplâncton.
- É o índice de biomassa universalmente utilizado.
- Os sensores de cor dos satélites medem a concentração em Clorofila a, porque têm bandas no visível.

- Explicação sobre os Exercícios, com exemplos

<https://www.oceancolour.org/>

d Moodle Ciências



OceanColour-CCI



Composite Browser

Access a range of products composited in different periods. Data can be searched by time ranges, periods, products & wavelengths. Version one datasets available now.



OPeNDAP

A freely available framework that simplifies all aspects of scientific data networking, making local data available to remote locations regardless of storage format.



Web GIS Portal

View, manipulate & analyse data. Version one datasets available now.



FTP

Download large sets of data easily. Version one datasets available now.

About

This site provides satellite observations of ocean colour, focusing on the Ocean Colour Climate Change Initiative project

Useful Links

- International Ocean Colour Coordinating Group
- ESA Ocean Colour
- NASA Ocean Color

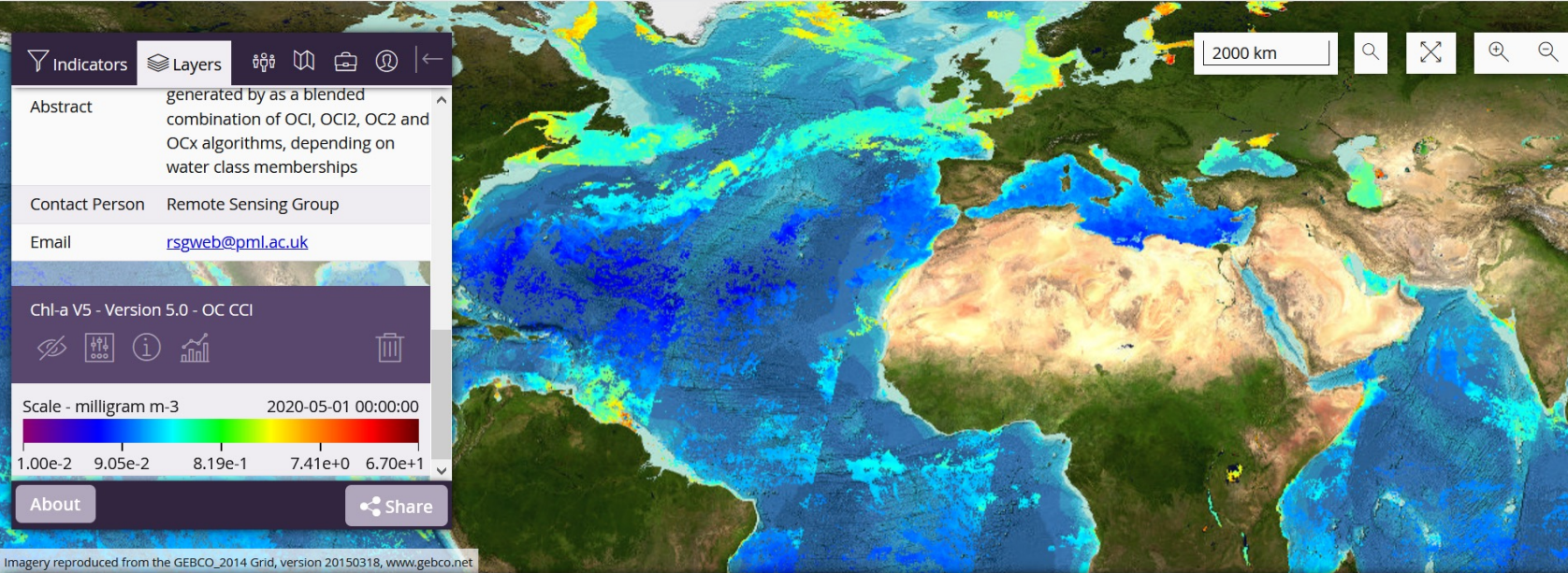
Contact Us

Contact us via: OC-CCI Processing Email

[ds/catalog-cci.html](#) but this project).



Exemplo de um imagem diária, para o dia 23-5-2020, para a versão Chl 5 km, daily .
Notem que na maior parte das regiões, não há valores de Chla, por
Não haver imagem nesse dia para essa região.



Timeline - Click and drag to move, use your mouse scroll wheel to zoom, click to select a date or enter your required date in the date field on the right



Tutorial to use the OC-CCI web gis portal

The screenshot displays the OC-CCI web GIS portal interface. The browser address bar shows the URL <https://www.oceancolour.org/portal/>. The page features a dark-themed map of the world with a 'Loading...' indicator. A sidebar on the left contains the following sections:

- Indicators**: Choose an indicator below by searching or using the dropdowns. You can also filter the results geographically by searching for a region or drawing a bounding box.
- Search for an indicator**: A text input field.
- Geographic filters**: A dropdown menu.
- Show indicators sorted/grouped by:** A dropdown menu with 'Indicator Type' selected.
- Available indicators:** A list of indicators with dropdown arrows:
 - Biological
 - CCI 4KM Testing
 - CCI Testing Data
 - Chlorophyll Indicators
 - Count of Observations
 - Inherent Optical Properties
 - PML RSG THREDDS Data Server
- About** and **Share** buttons.

A central purple dialog box contains the following text:

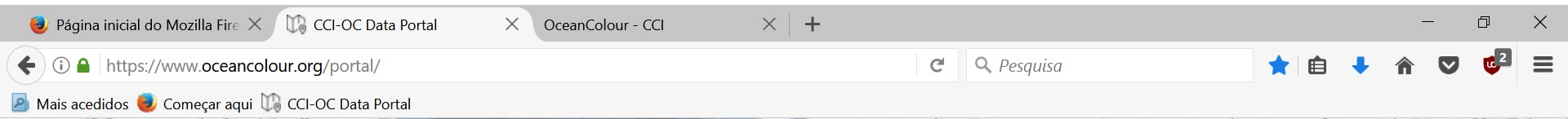
The Ocean Colour CCI web GIS portal allows you to view, manipulate and analyse data
Enter the portal now and plot data on a map, analyse it through graphs or export and share.

Below the text are two buttons: **Load your previous map** and **Start building a map**.

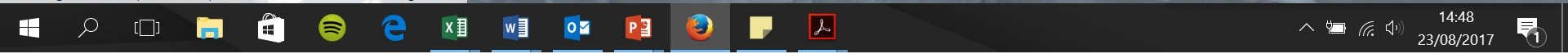
The Windows taskbar at the bottom shows the date and time as 12:15 on 29/01/2019.

Web Gis Portal **Explicação sobre os Exercícios, com exemplos**

<https://www.oceancolour.org/portal/>



The main part of the image shows the OceanColour portal interface. On the left, there is a sidebar menu with the title "Indicators". Below the title, there are instructions: "Choose an indicator below by searching or using the dropdowns." and "You can also filter the results geographically by searching for a region or drawing a bounding box." There is a search box labeled "Search for an indicator". Below that, there are "Geographic filters" and a section "Show indicators sorted/grouped by:" with a dropdown menu currently set to "Indicator Type". Under "Available indicators:", there are two dropdown menus: "Biological" and "Chlorophyll Indicators". A blue arrow points from the "Chlorophyll Indicators" dropdown to a yellow text box that says "Nos Available Indicators, escolher Chlorophyll a concentration". Another blue arrow points from the "Indicators" header to a red text box that says "Podem fazer Log in com uma conta do gmail, e terão os Vossos mapas guardados para o futuro". At the bottom of the sidebar, there are "About" and "Share" buttons. The background of the page is a satellite map of the world. In the top right corner of the map area, there is a scale bar showing "2000 km" and navigation icons for search, zoom in, zoom out, and full screen.



Início, fazer login para as imagens ficarem gravadas

https://www.oceancolour.org/portal/

Web Gis Portal

Indicators

Choose an indicator below by searching or using the dropdowns.

You can also filter the results geographically by searching for a region or drawing a bounding box.

Search for an indicator

Geographic filters

Show indicators sorted/grouped by:

Indicator Type

Available indicators:

Biological

Chlorophyll Indicators

About Share

2000 km

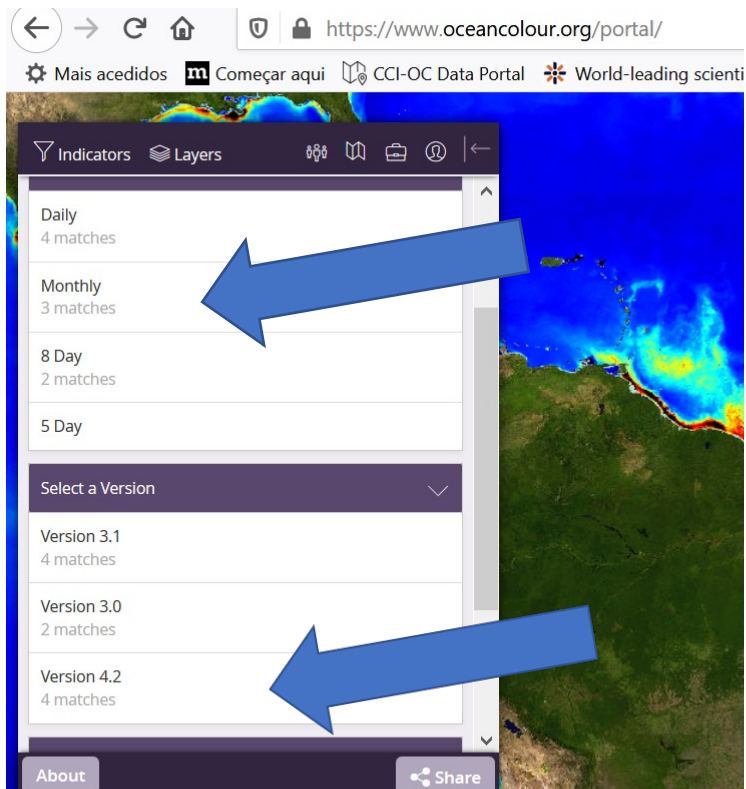
Pesquisa

Log in so that your data is saved

Nos Available Indicators, escolher Chlorophyll a concentration

Terrain Light { Data © OpenStreetMap contributors and others, Rendering © FOXX }

14:48
23/08/2017



Explicação sobre os Exercícios, com exemplos

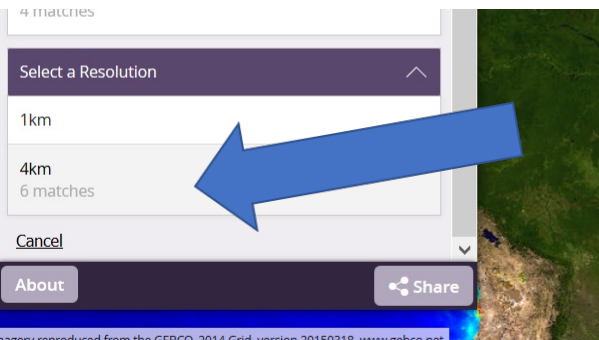
A seguir, aparecem estas opções

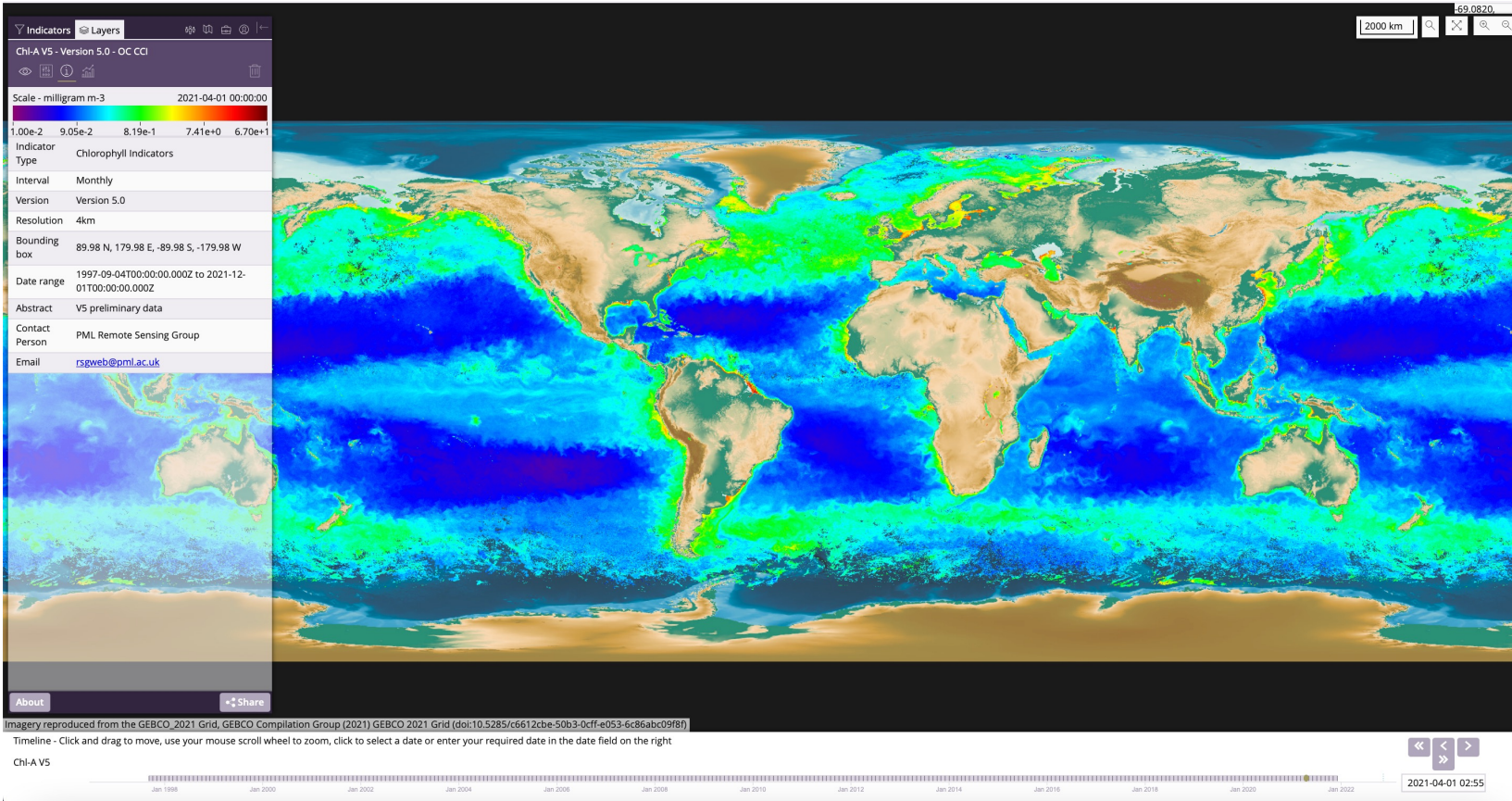
Para fazer series temporais com período superior a 1 ano,
Escolher Monthly

Têm de escolher uma versão. Escolham a ultima, **que agora é a v5!**
Nota: as várias versões correspondem a várias fases do
Projeto, em que se foram aperfeiçoando os algoritmos

Select a resolution:

Tem que ver com a resolução especial, ie, pixel de 1km, ou de 4km.
Escolham 1º 4km (dado que com resolução 1 km, é muito mais lento)





Página inicial do Mozilla Fire X CCI-OC Data Portal OceanColour - CCI

https://www.oceancolour.org/portal/ Pesquisa

Mais acedidos Começar aqui CCI-OC Data Portal

Indicators Layers

Version	Version 3.1
Bounding box	89.98 N, 179.98 E, -89.98 S, -179.98 W
Date range	1997-09-04T00:00:00.000Z to 2016-12-01T00:00:00.000Z
Abstract	Chlorophyll-a concentration in seawater (not log-transformed), generated by SeaDAS using a blended combination of OCI (OC4v6 + Hu's CI), OC3 and OC5, depending on water class memberships
Contact Person	Remote Sensing Group
Email	rsgweb@pml.ac.uk

About Share

2000 km

Zoom up to choose your region

Aparece a referencia sobre o algoritmo usado para O cálculo da Chla

Click to change date

Terrain Light { Data © OpenStreetMap contributors and others, Rendering © FOXX }

Timeline - Click and drag to move, use your mouse scroll wheel to zoom, click to select a date or enter your required date in the date field on the right

Chlorophyll-a Concentration

Jan 1998 Jan 2000 Jan 2002 Jan 2004 Jan 2006 Jan 2008 Jan 2010 Jan 2012 Jan 2014 Jan 2016

2016-12-01 00:00

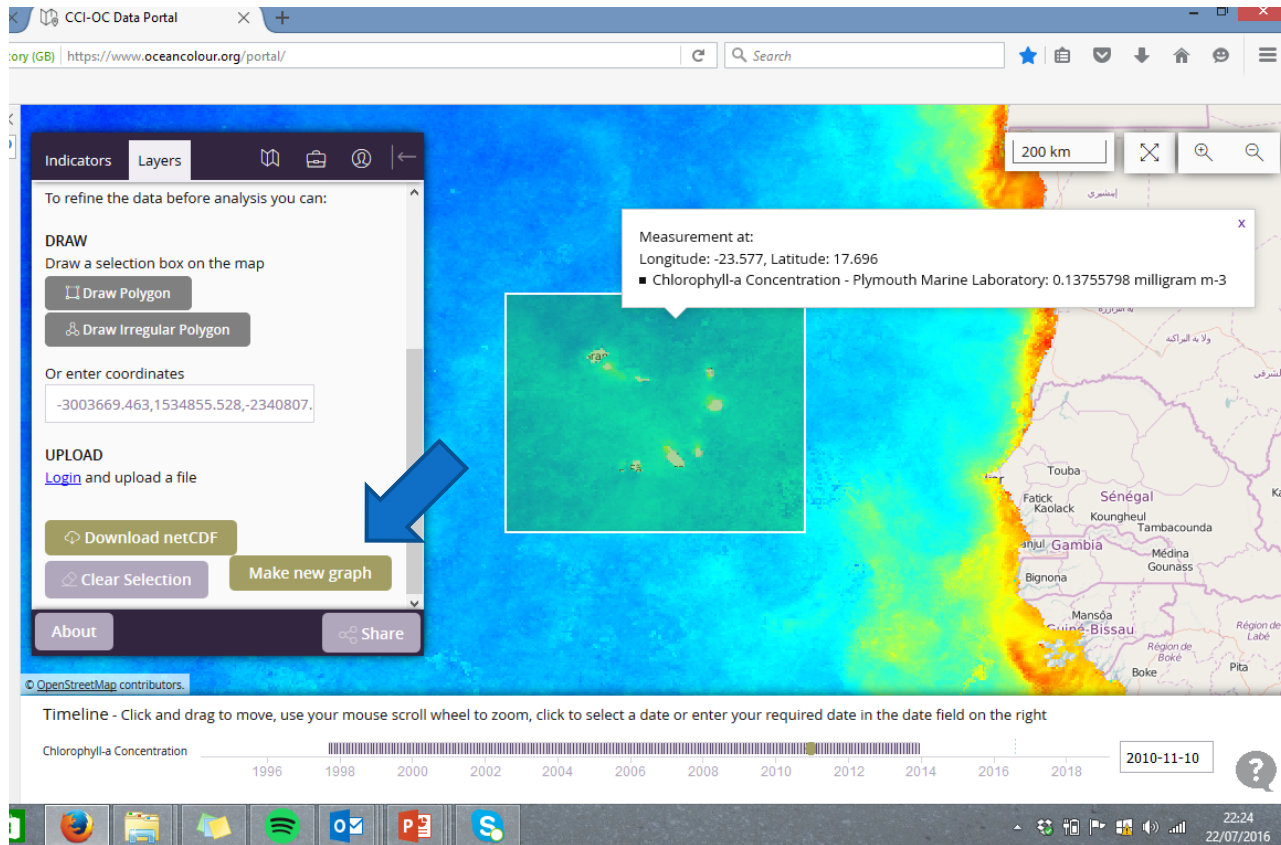
14:52 23/08/2017

1º exercício

- ▶ Clicar em 3 pontos diferentes do oceano, em condições contrastantes. Ver qual o valor de Clorofila a, ver exemplo no slide seguinte.

- ▶ Escolham uma zona oligotrófica, uma zona de upwelling, uma zona de latitude elevada.

Click on a latitude/longitude to have the value for the product you want



Cape Vert
oligotrophic region

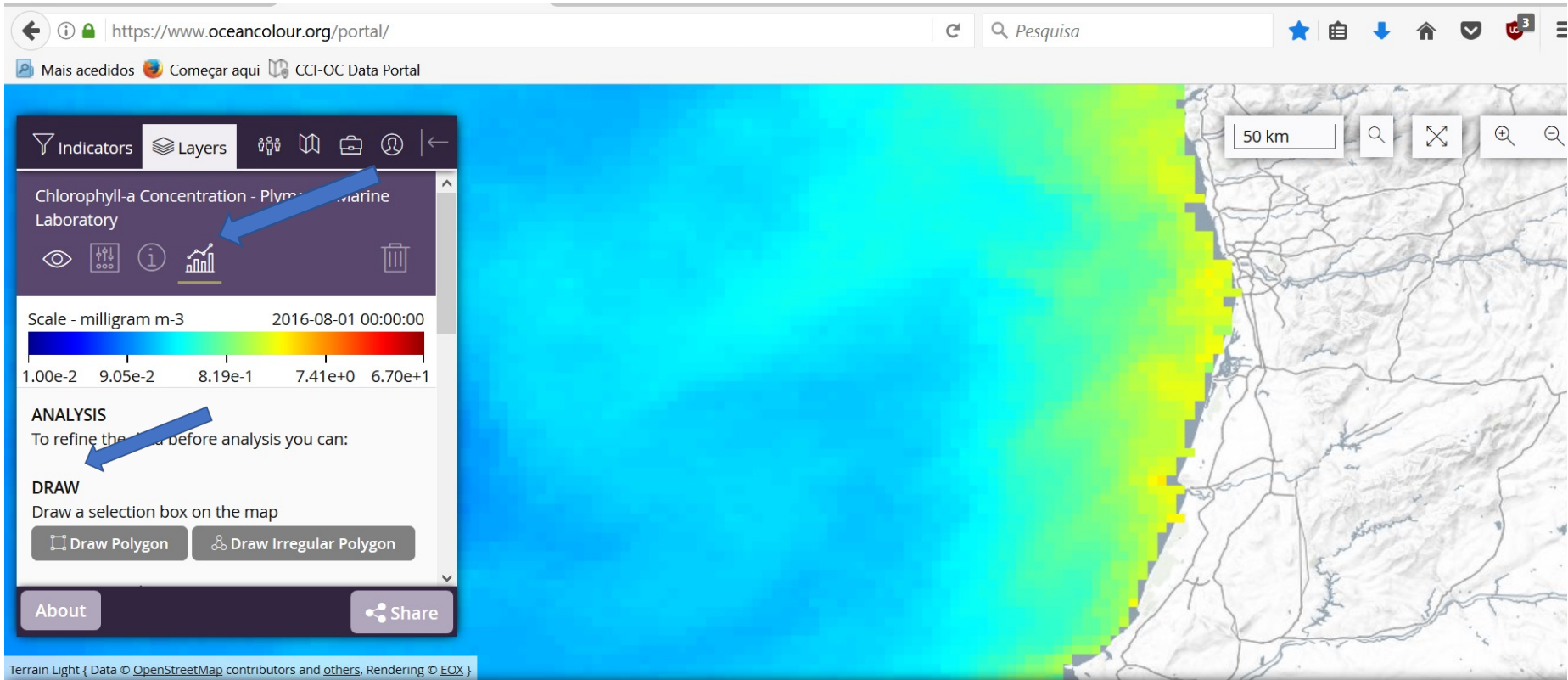
Fazer isto para 3 locais. Do the same for 3 different locations

Preparação para o 2º Exercício. How to prepare Exercise 2.

- ▶ Extrair uma série temporal de dados de Chla numa região do oceano à vossa escolha.
- ▶ Escolham uma área pequena, para o ficheiro resultante não ser demasiado pesado
- ▶ Escolham uma área apenas de oceano. Por ex: não escolham toda a região dos Açores incluindo as ilhas. O algoritmo iria interpretar as ilhas como “oceano”.
- ▶ Não escolham uma área de costa incluindo a terra, pelos mesmos motivos
- ▶ Não escolham lagos ou estuários, dado que os algoritmos foram definidos para água do oceano e não águas doces ou estuarinas

Choose a region, draw a polygon

Cliquem no icon gráfico de barras. Escolham Draw poligon



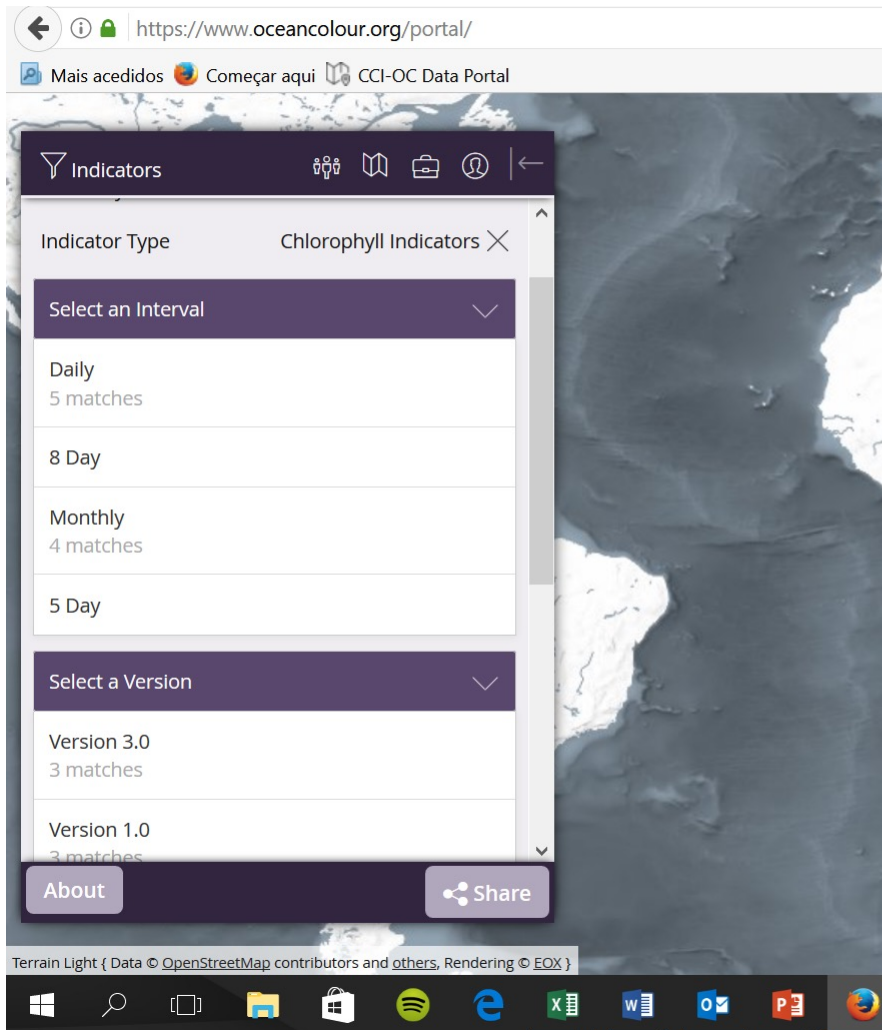
Timeline - Click and drag to move, use your mouse scroll wheel to zoom, click to select a date or enter your required date in the date field on the right

Chlorophyll-a Concentration

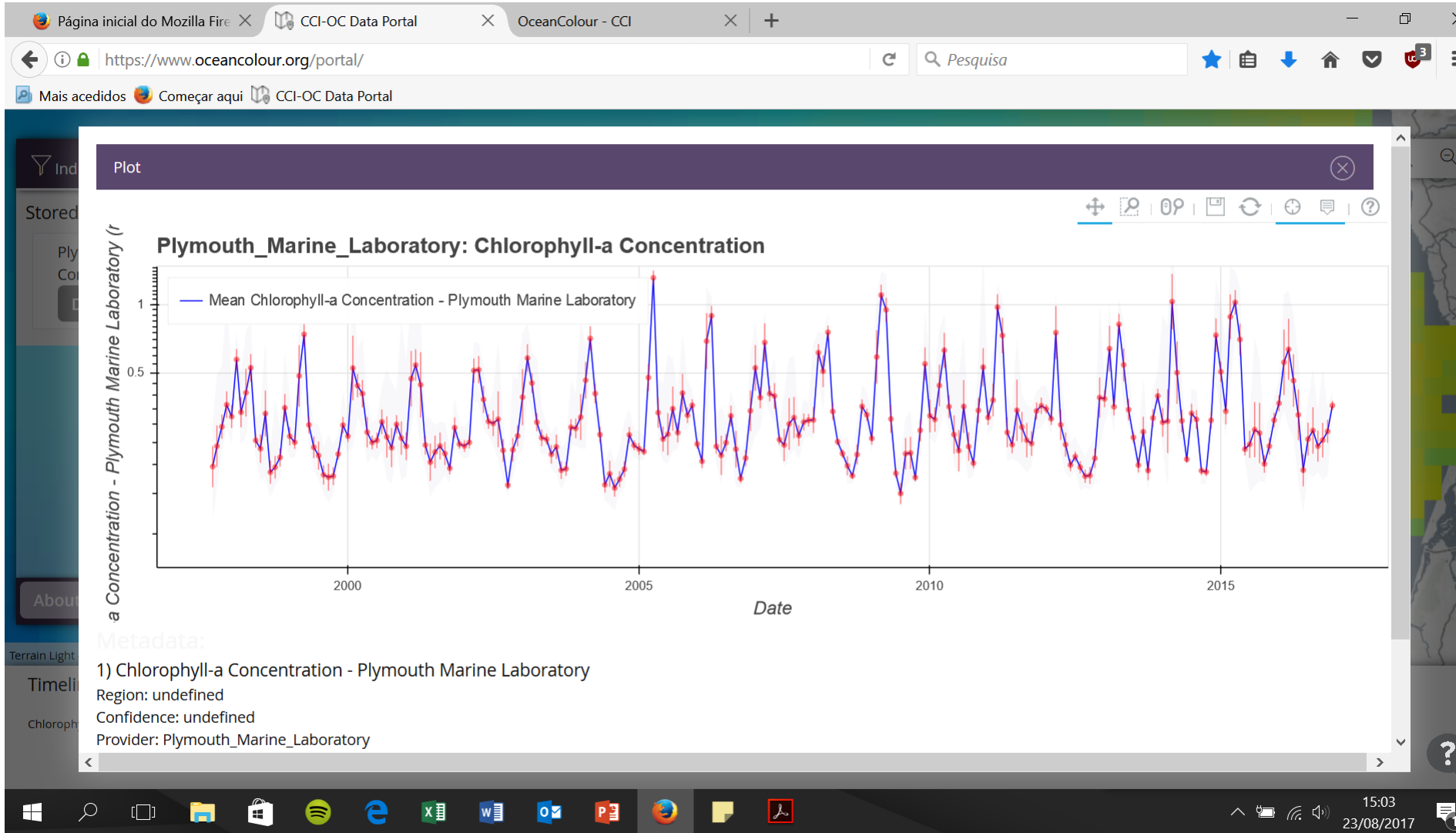


2016-08-25 19:30





Aparece o menu para:
Select the interval
Select which version
(there are several versions. You should use the most recent one.)
Select the spatial resolution

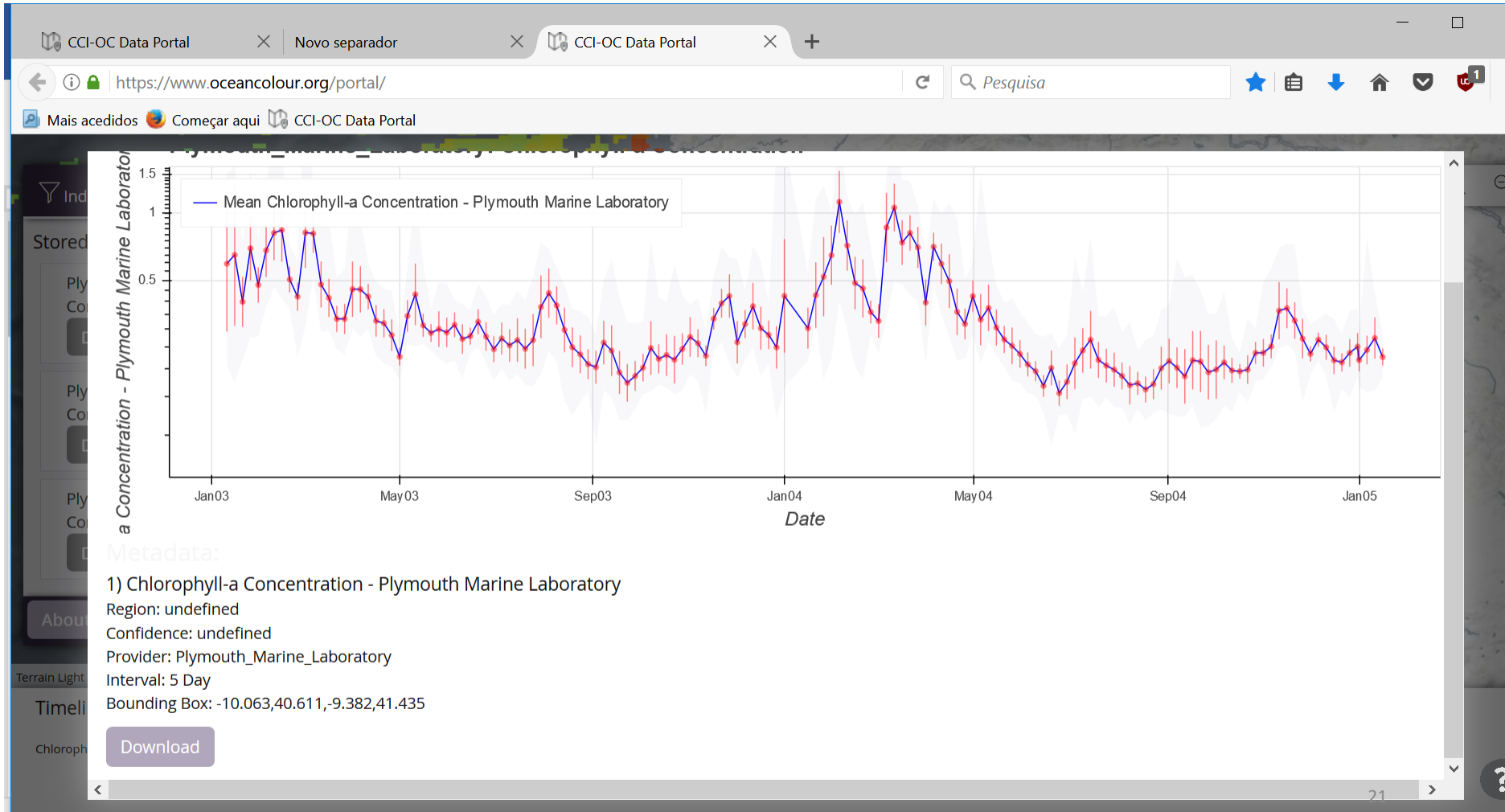


With a better temporal resolution

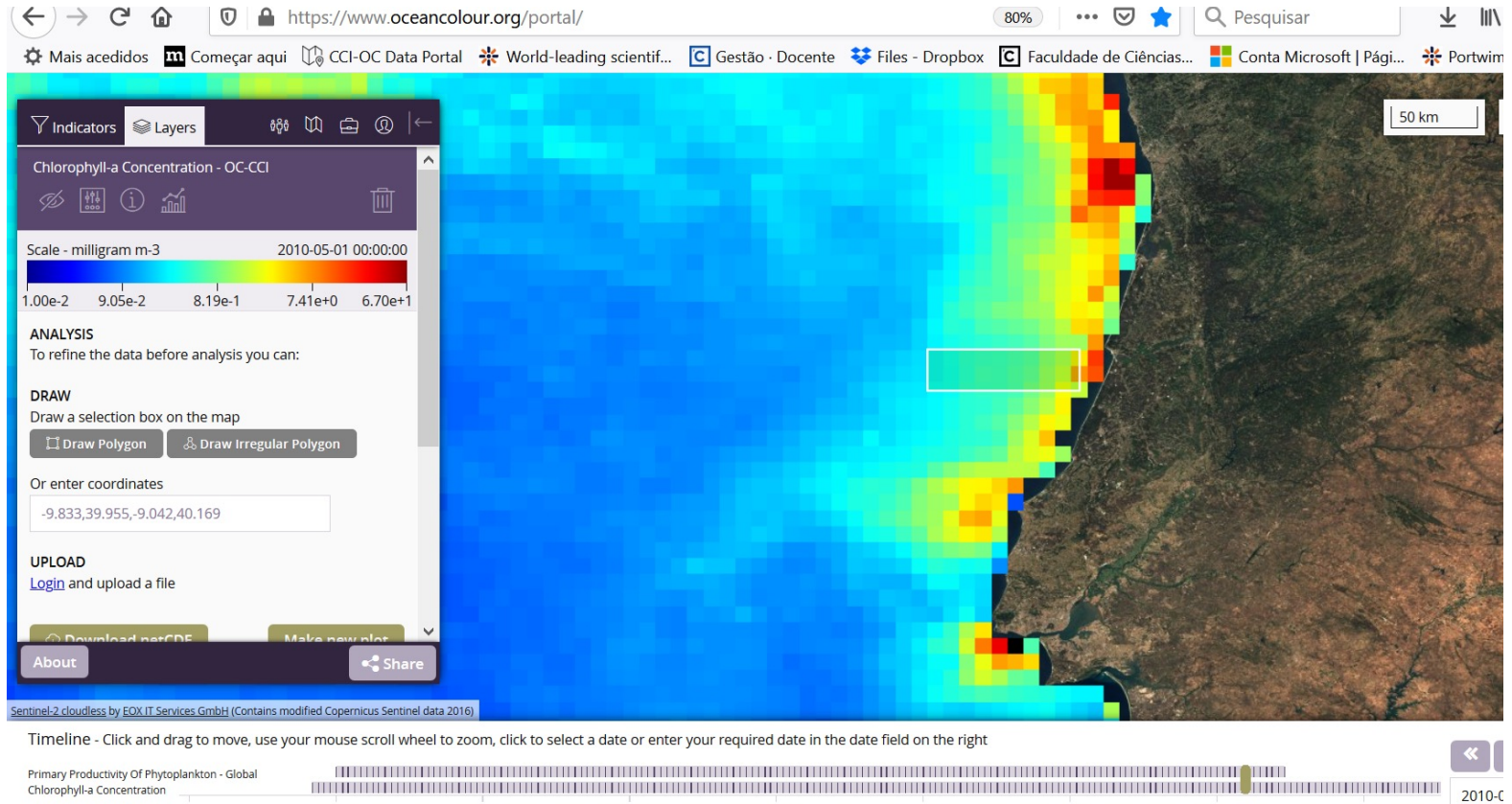
Escala de 5 dias: atenção escolher um período curto (alguns meses), para não ficar muito pesado e muito lento

Off Porto - Bounding Box: -10,063,40,611,-9,382,41,435

Interval 5 days, v2, 1 jan 2003 till 1 jan 2005



Outro exemplo, Canhão da Nazaré: Bounding box, longitude, latitude, longitude, latitude
-9.833,39.955,-9.042,40.169



Indicators **Layers**

To refine the data before analysis you can:

DRAW
 Draw a selection box on the map

Or enter coordinates

UPLOAD
[Login](#) and upload a file

Primary Productivity Of Phytoplankton - Global - Plymouth Marine Laboratory

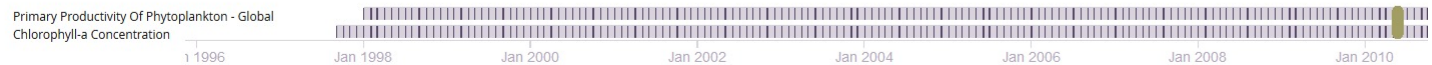
Choose a plot type

Set a date range using the timeline below

Indicator: Chlorophyll-a Concentration - OC-CCI
BBox: -9.833,39.955,-...
Axis Label: Chlorophyll-a Concentration - OC-CCI

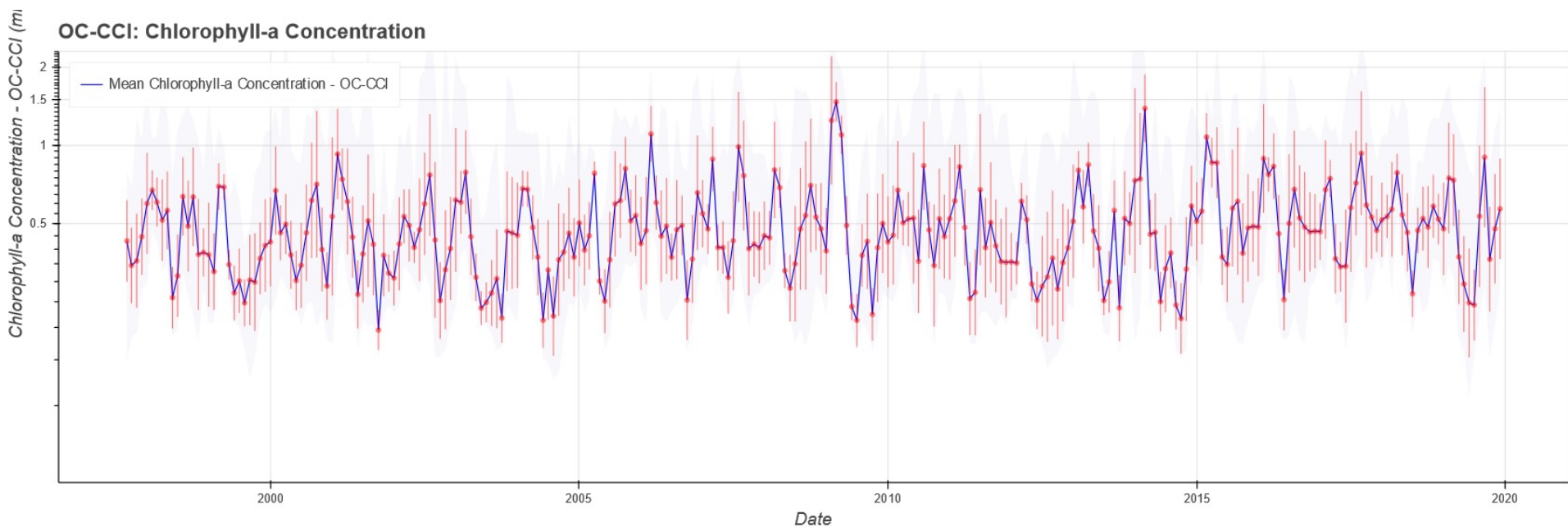
Sentinel-2 cloudless by EOX IT Services GmbH (Contains modified Copernicus Sentinel data 2016)

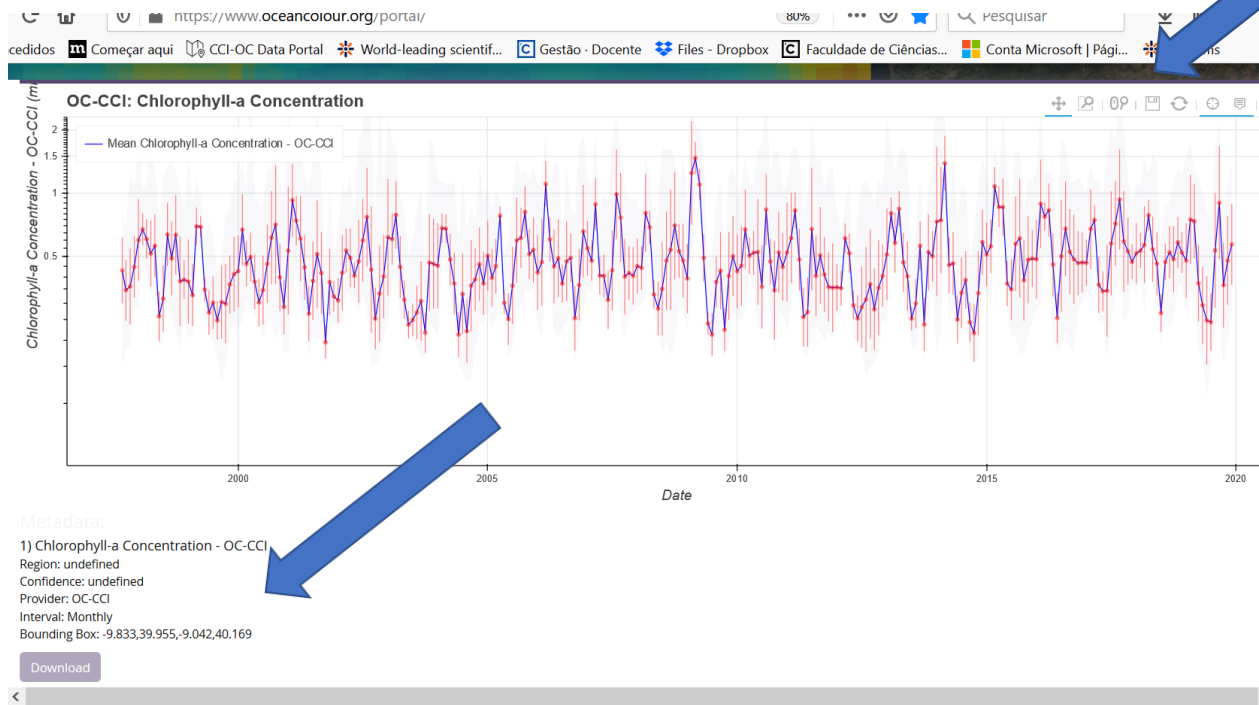
Timeline - Click and drag to move, use your mouse scroll wheel to zoom, click to select a date or enter your required date in the date field on the right



Copiar a imagem obtida para o vosso ppt.

Série temporal canhão da Nazaré, valores mensais





Salvar como imagem
E colocar no vosso ppt

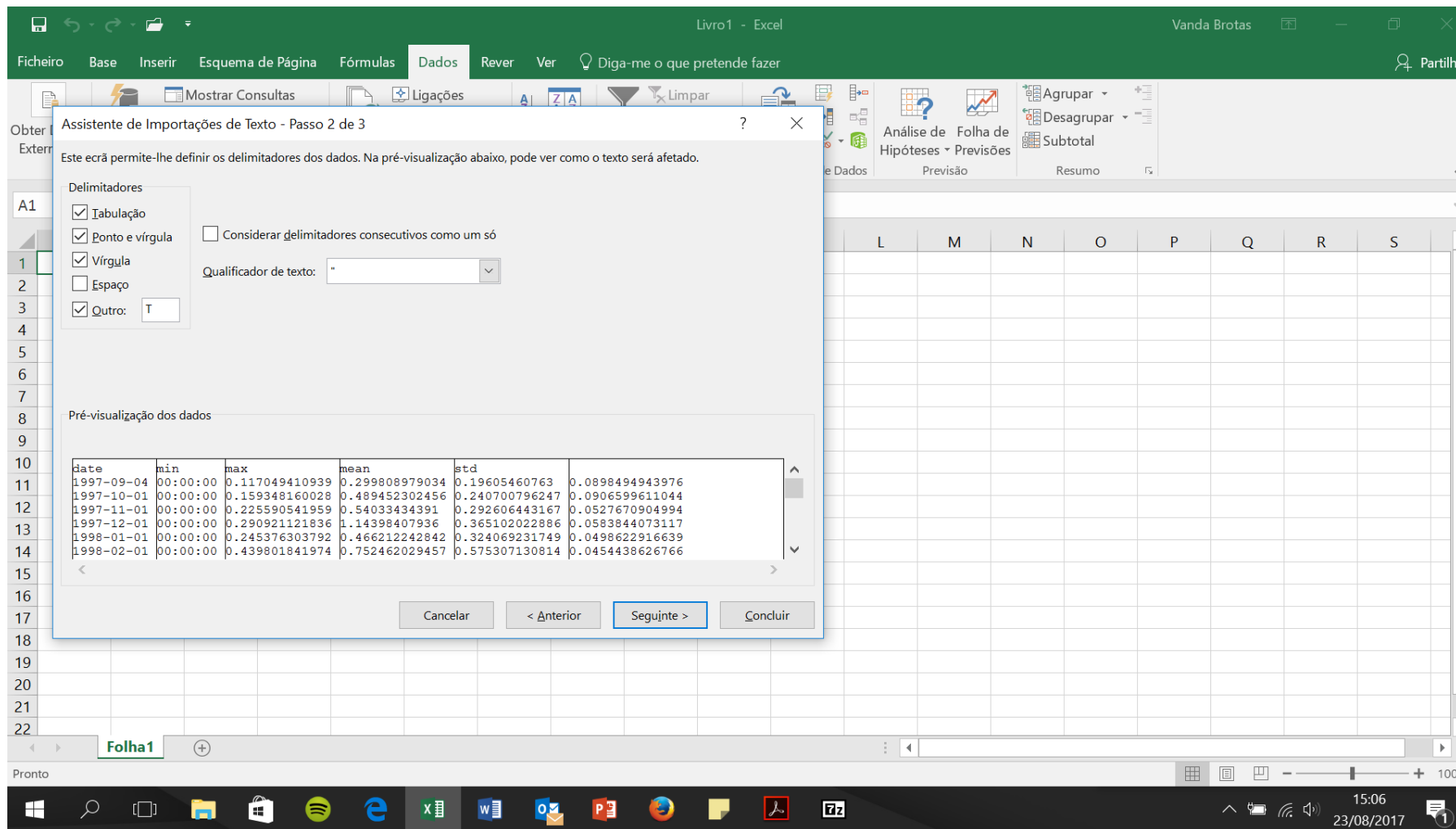
Tomar nota das coordenadas
Da bounding box.
Fazer download: é um ficheiro csv

Passar para o excel se quiserem

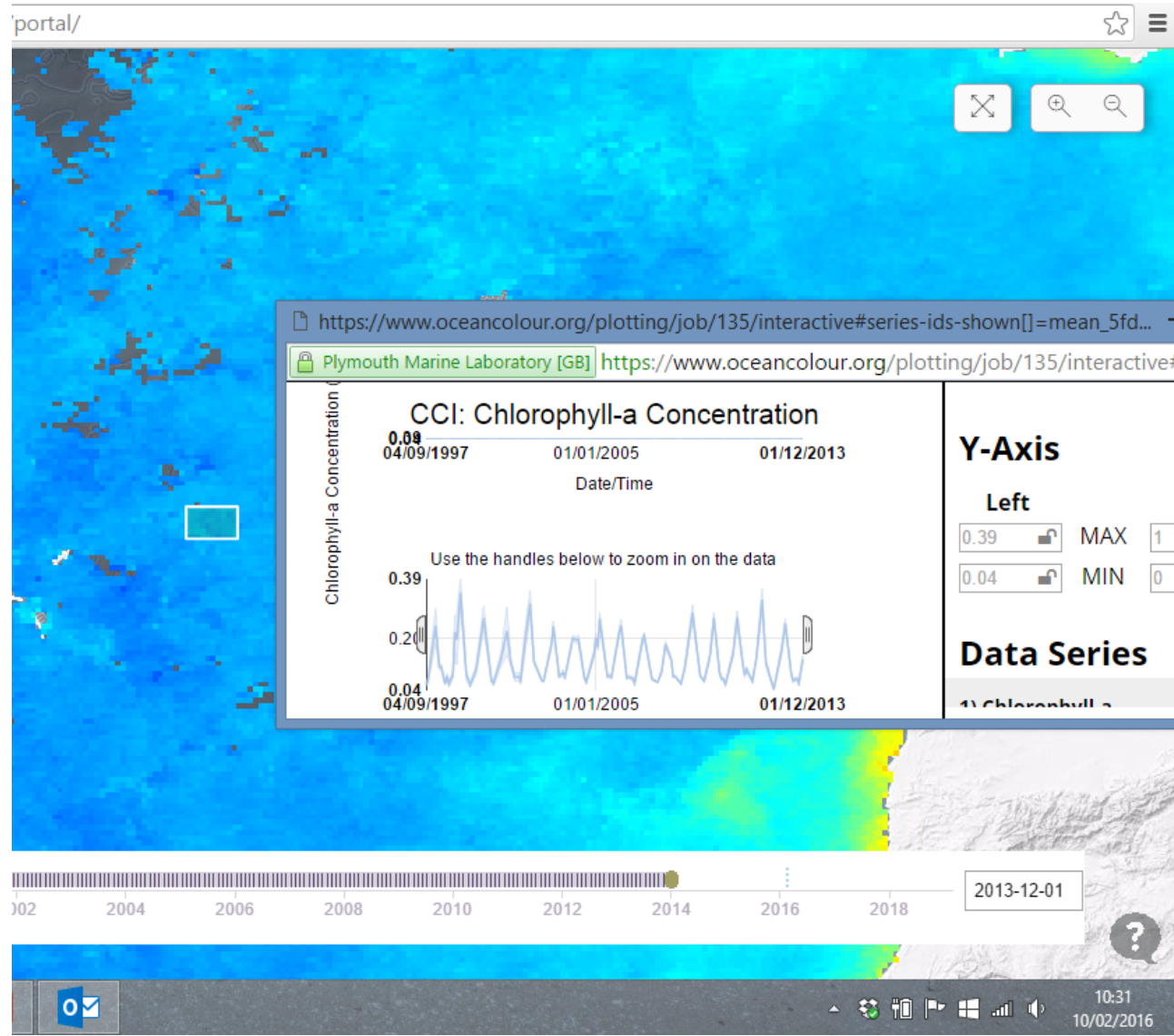
- No download aparece: ficheiro csv, metadata e ficheiros png
- Abrir o excel, importar os dados
- Abrir metadata. Copiar as coordenadas

SE depois quiserem importar os dados para excel:

Para importar o ficheiro csv para excel. Não podem abrir o ficheiro no excel diretamente. Fazer Data, import data, e depois Defenir os intervalos para os dados virem arrumados em colunas. O menu dependa das versões do excel.



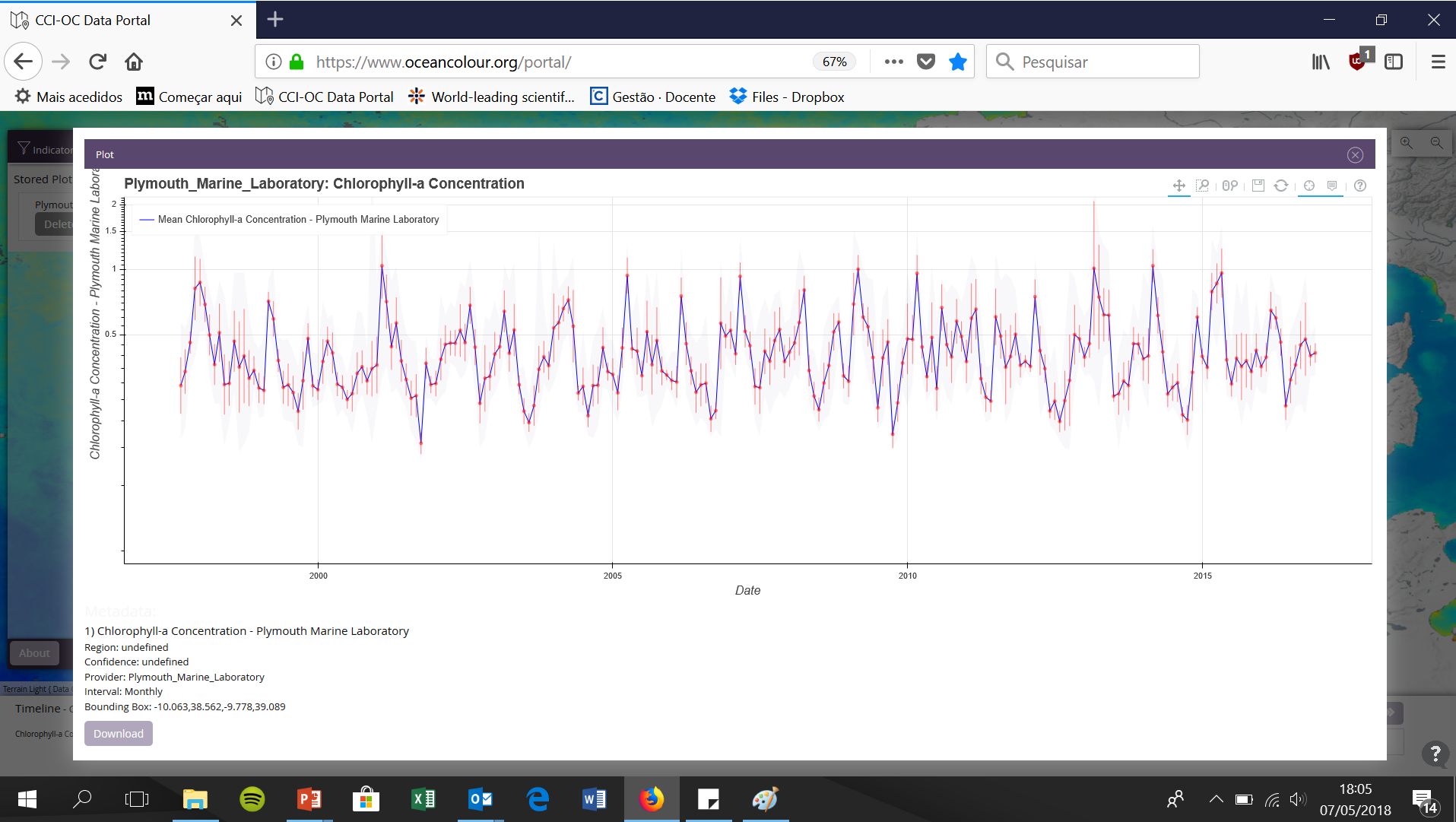
Faça o mesmo para uma área perto da Madeira, comparar os valores máximos de Clorofila, assim como a sazonalidade
Choose an area near Madeira or Azores, far from the islands



This tool is useful to study Chla patterns. Ex for Portuguese Coast.
Escolher uma área, fazer vários tipos de gráficos

The screenshot displays the CCI-OC Data Portal interface. At the top, the browser address bar shows the URL <https://www.oceancolour.org/portal/>. The main content area features a map of the Portuguese coast overlaid with a heatmap representing Chlorophyll-a concentration. A white rectangular box on the map indicates the selected area of interest. To the left of the map, a sidebar contains a 'Stored Plots' section with the entry 'Plymouth_Marine_Laboratory: Chlorophyll-a Concentration' and buttons for 'Delete', 'Copy/Edit', and 'Open'. Below this, there are 'About' and 'Share' buttons. The bottom of the interface includes a 'Timeline' section with a horizontal axis labeled 'Chlorophyll-a Concentration' ranging from 1996 to 2018. A date field on the right of the timeline is set to '2016-05-20 15:00'. The Windows taskbar at the bottom shows various application icons and the system clock indicating 18:04 on 07/05/2018.

Série temporal, mensal, 1997 até 2016

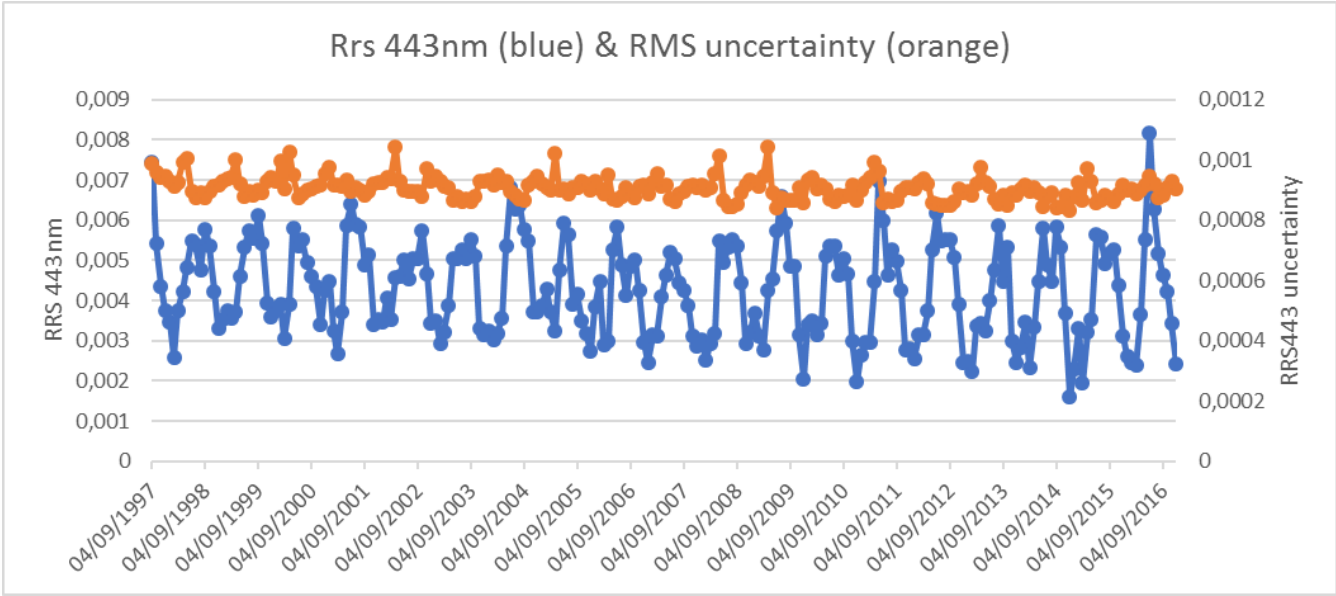


Other products

- Remote sensing reflectance at 443nm

Off Porto - Bounding Box: -10,063,40,611,-9,382,41,435
Monthly data

Remote sensing reflectance at 443nm and its uncertainty



Tutorial to use the OC-CCI web gis

- Site projeto SOPHIA: https://www.sophia-mar.pt/pt/recursos_pedagogicos/1
- Tutorial 5, em video: https://youtu.be/O4eOvK_vCRI

- No Fenix in Portuguese:

PORTAL EO4SD – GUIA RÁPIDO

<https://eo4sd.eofrom.space>

and English: **EO4SD MARINE PORTAL – QUICK START GUIDE**

- <https://eo4sd.eofrom.space>



Bibliografia

- Site projeto SOPHIA: https://www.sophia-mar.pt/pt/recursos_pedagogicos/1
- Tutorial 5, em video: https://youtu.be/O4eOvK_vCRI
- https://www.sophia-mar.pt/pt/recursos_pedagogicos/1 - Guias pedagógicos
- Sutcliffe, A., Brito, A.C., Sá, C., Sousa, F., Boutov, D., Brotas, V. 2016. Observação da Terra: Uso de imagens de temperatura da superfície do mar e cor do oceano para a monitorização de águas costeiras e oceânicas. DGRM, Lisboa, Portugal. E-book disponível em www.sophia-mar.pt. Cap 3
- Site projeto SOPHIA: https://www.sophia-mar.pt/pt/recursos_pedagogicos/1
- Tutorial 5, em video: https://youtu.be/O4eOvK_vCRI

•No Fenix in Portuguese:

PORTAL EO4SD – GUIA RÁPIDO

<https://eo4sd.eofrom.space>

and English: **EO4SD MARINE PORTAL – QUICK START GUIDE**

- <https://eo4sd.eofrom.space>