



Marine Data Literacy Course

Data Harvesting and Data Harnessing

Online Data Portals

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“

Data is acquired and prepared once to be used by many.

“

You can't manage what you can't measure.

Outline

- ▶ **COPERNICUS Marine Data Portal**
 - ▶ NetCDF
 - ▶ PANOPLY
 - ▶ Matlab scripts
- ▶ **The European Space Agency (ESA) Data Hub**
 - ▶ Sentinel Application Platform (SNAP)
 - ▶ Oil spill detection
 - ▶ CHL / TSM
- ▶ **EMODnet**
 - ▶ EMODnet Bathymetry / Human-Activities / Physics / Ingestion
 - ▶ QGIS
- ▶ **World Ocean Database / EmodNET**
 - ▶ Ocean Data View (ODV)

Data

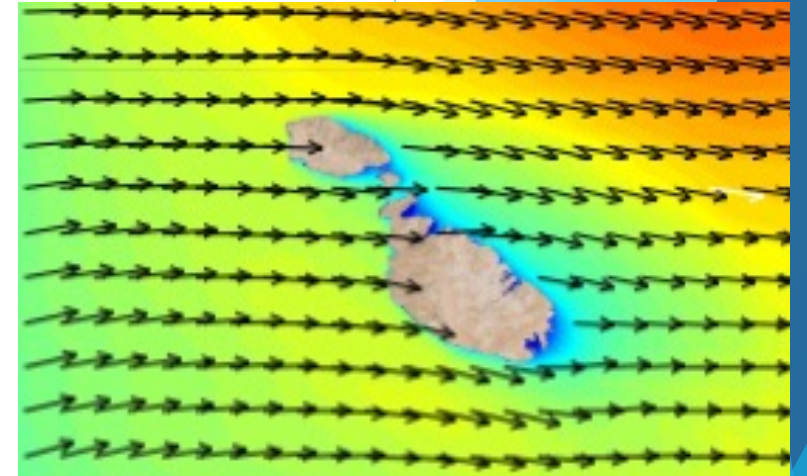
In-Situ



Remote Sensing



Models



Copernicus



Copernicus Marine Environment Monitoring Service (CMEMS)

- ▶ Integrated Service
- ▶ Open and Free
- ▶ Single Catalogue of Products
- ▶ Reliable
- ▶ Sustainable



Copernicus



Services

Opportunities

Access Data

Use Cases

User Corner

About

Copernicus Marine Service

Providing free and open marine data and services to enable marine policy implementation, support Blue growth and scientific innovation.

Access Data >

DATA

OCEAN PRODUCTS

A robust ocean data catalogue, to download or visualise data including hindcasts, nowcasts and forecasts.

EXPERTISE

OCEAN STATE REPORT

Extensive annual analysis on the state of the ocean over nearly 20 years and severe/notable annual events.

TRENDS

OCEAN MONITORING INDICATORS

Essential variables monitoring the health of the ocean over the past quarter of a century.

EXPLORATION

OCEAN VISUALISATION

Dive into our 4D digital oceans through our 3 visualisation tools for beginner, intermediate and advanced users

marine.copernicus.eu

Copernicus [Ocean State Report]



The Ocean State Report, Issue 5 has been published...

Copernicus [Ocean Monitoring Indicators]

Ocean Monitoring Indicators

The gateway to essential ocean variables to monitor the health of the ocean.

Home > Access data > Ocean Monitoring Indicators

Ocean Monitoring Indicators (OMIs) are free downloadable trends and data sets covering the past quarter of a century. These are key variables used to track the vital health signs of the ocean and changes in line with climate change.

Monitoring Indicators

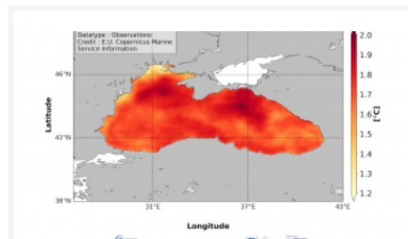
- All monitoring indicators
- Climate Variability
- Currents
- North Atlantic
- Ocean Health
- Ocean Heat Content
- Sea Ice
- Sea Level
- Sea State
- Temperature and Salinity
- Water Mass and Heat Exchange

Regions

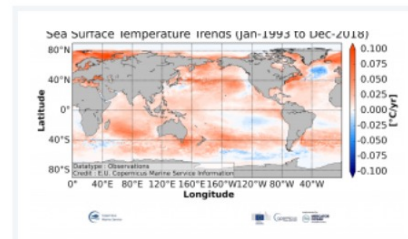
- All regions
- Antarctic Ocean
- Arctic Ocean
- Atlantic-European North West Shelf-Ocean

Search

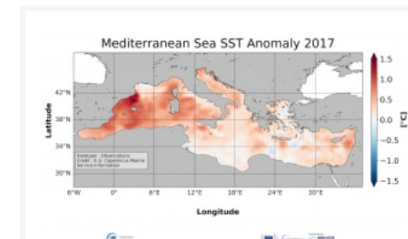
Temperature and Salinity



Black Sea Cumulative Trend Map of Sea Surface Temperature



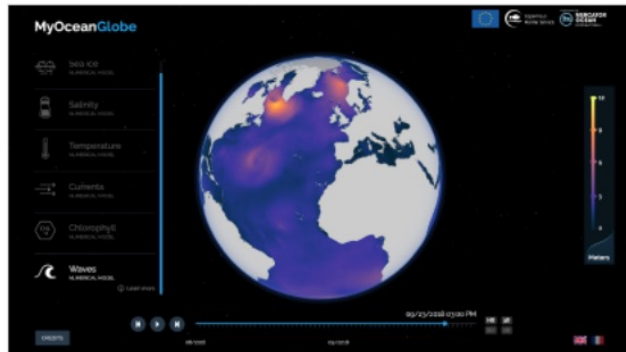
Global Ocean Trend Map of Sea Surface Temperature



Mediterranean Sea Surface Temperature Anomaly

Copernicus [Data Visualising Tools]

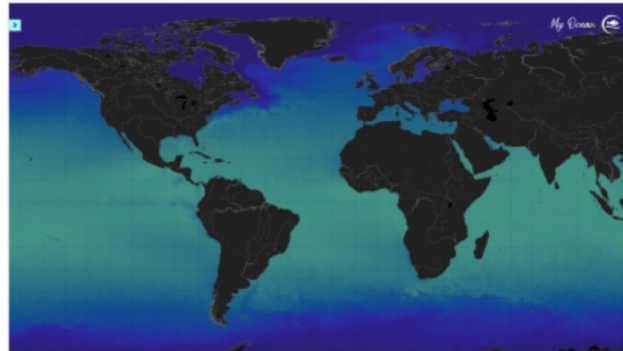
MYOCEAN LEARN (BEGINNER) GLOBE



Understand key variables

[Explore MyOcean Learn](#)

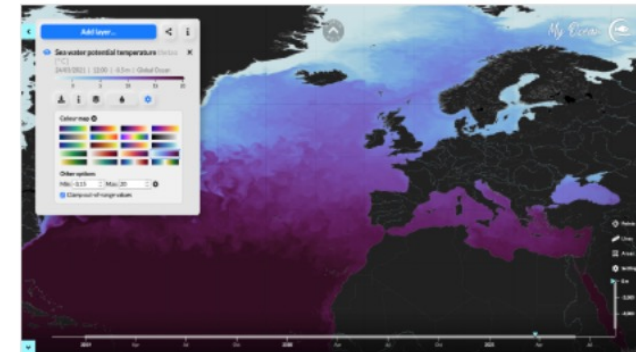
MYOCEAN LIGHT (INTERMEDIATE) PLANISPHERE



Access key variables

[Explore MyOcean Light](#)

MYOCEAN PRO (EXPERT) PLANISPHERE



Access full catalogue

[Explore MyOcean Pro](#)

Copernicus [Ocean Products]

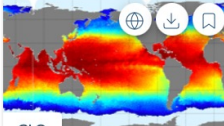
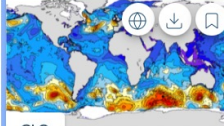
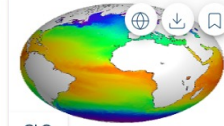
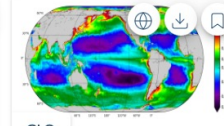
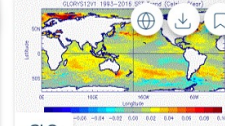
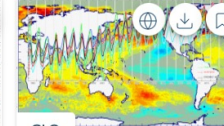
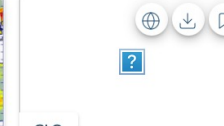
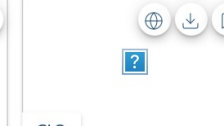
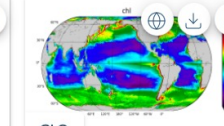
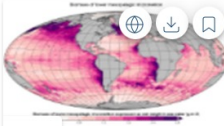
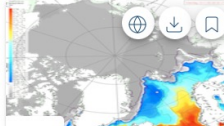
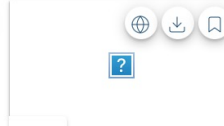
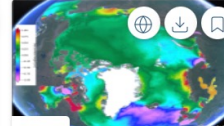


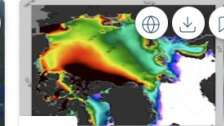


General catalogue ICE Services

Search Regional domain: All Area From: 1992-01-0 To: 2021-11-0 Parameters:

Only the whole selected time range Only with depth level

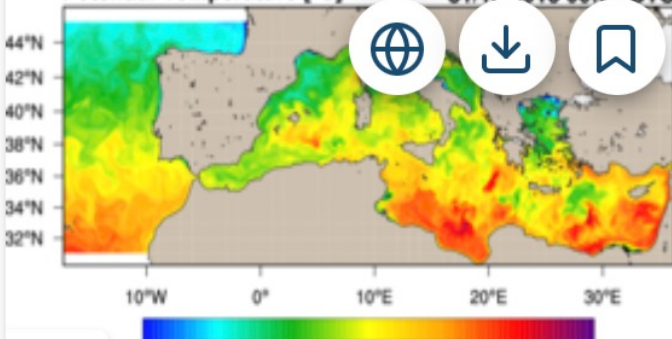
Full catalogue Ocean Monitoring Indicator catalogue

There is 199 ocean products corresponding to your criteria

 <p>Global Ocean 1/12° Physics Analysis And Forecast GLOBAL_ANALYSIS_FORECAST_PHYSICS_FORECAST</p> <p>T bottomT S SSH UV MLD SIC SIT SIUV</p> <p>From 2019-01-01 To Present</p> <p>50 depths level hourly mean - daily mean - ...</p>	 <p>Global Ocean Waves Analysis And Forecast GLOBAL_ANALYSIS_FORECAST_WAVES_FORECAST</p> <p>SWH MWT VMDR VSDXY WW SW1 SW2</p> <p>From 2019-05-04 To Present</p> <p>Surface only 3 hourly instantaneous</p>	 <p>Global Ocean 1/4° Physics Analysis And Forecast GLOBAL_ANALYSIS_FORECAST_PHYSICS_FORECAST</p> <p>T bottomT S SSH UV MLD SIC SIT SIUV</p> <p>From 2015-12-30 To Present</p> <p>43 depths level hourly instantaneous - daily...</p>	 <p>Global Ocean Biogeochemistry Analysis And Forecast GLOBAL_ANALYSIS_FORECAST_BIOGEOCHEMISTRY_FORECAST</p> <p>CHL PHYC O2 NO3 PO4 SI FE SPCO2 PH PP</p> <p>From 2019-05-04 To Present</p> <p>50 depths level daily mean - monthly mean</p>	 <p>Global Ocean Physics Reanalysis GLOBAL_REANALYSIS_PHYSICS_REANALYSIS</p> <p>T bottomT S SSH UV MLD SIC SIT SIUV</p> <p>From 1993-01-01 To 2019-12-31</p> <p>50 depths level daily mean - monthly mean - ...</p>	 <p>Global Ocean Ensemble Physics Reanalysis GLOBAL_REANALYSIS_PHYSICS_REANALYSIS</p> <p>T S UV SIC SIT</p> <p>From 1993-01-01 To 2019-12-15</p> <p>75 depths level monthly mean</p>	 <p>Global Ocean Ensemble Physics Reanalysis GLOBAL_REANALYSIS_PHYSICS_REANALYSIS</p> <p>T S UV MLD</p> <p>From 1993-01-01 To 2019-12-31</p> <p>75 depths level daily mean - monthly mean</p>	 <p>Global Ocean Waves Reanalysis Waverys GLOBAL_REANALYSIS_WAVES_REANALYSIS</p> <p>SWH MWT VMDR VSDXY WW SW1 SW2</p> <p>From 1993-01-01 To 2019-12-31</p> <p>discrete depths level 3 hourly instantaneous</p>	 <p>Global Ocean Biogeochemistry Hindcast GLOBAL_REANALYSIS_BIOGEOCHEMISTRY_HINDCAST</p> <p>CHL PHYC O2 NO3 PO4 SI FE SPCO2 PH PP</p> <p>From 1993-01-01 To 2019-12-23</p> <p>75 depths level daily mean - monthly mean</p>
 <p>Global Ocean Low And Mid Trophic Levels Biomass Content Hindcast GLOBAL_REANALYSIS_BIOGEOCHEMISTRY_HINDCAST</p> <p>ZOOC MNKC ZEU</p> <p>From 1998-01-01 To 2019-12-31</p> <p>3 depths level daily instantaneous</p>	 <p>Arctic Ocean Physics Analysis And Forecast ARCTIC_ANALYSIS_FORECAST_PHYSICS_FORECAST</p> <p>T bottomT S UV SIC SIT SIUV SNOW SIAGE SIALB</p> <p>From 2019-05-04 To Present</p> <p>12 depths level hourly instantaneous - daily...</p>	 <p>Arctic Ocean Sea Ice Analysis And Forecast ARCTIC_ANALYSIS_FORECAST_SEA_ICE_FORECAST</p> <p>SIC SIT SIUV SNOW</p> <p>From 2018-11-01 To Present</p> <p>Surface only hourly mean</p>	 <p>Arctic Ocean Tidal Analysis And Forecast ARCTIC_ANALYSIS_FORECAST_TIDAL_FORECAST</p> <p>SWH MWT VMDR VSDXY WW SW1 SW2</p> <p>From 2017-12-19 To Present</p> <p>Surface only 15-minutes instantaneous</p>	 <p>Arctic Ocean Wave Analysis And Forecast ARCTIC_ANALYSIS_FORECAST_WAVES_FORECAST</p> <p>SWH MWT VMDR VSDXY WW SW1 SW2</p> <p>From 2017-12-03 To Present</p> <p>Surface only hourly instantaneous</p>	 <p>Arctic Ocean Biogeochemistry Analysis And Forecast ARCTIC_ANALYSIS_FORECAST_BIOGEOCHEMISTRY_FORECAST</p> <p>CHL PHYC ZOOC O2 NO3 PO4 SI SPCO2 PH DIC PP KD</p> <p>From 2019-05-04 To Present</p> <p>40 depths level daily mean</p>	 <p>Arctic Ocean Physics Reanalysis ARCTIC_REANALYSIS_PHYSICS_REANALYSIS</p> <p>T bottomT S UV SIC SIT SIUV SNOW</p> <p>From 1991-01-01 To 2019-12-31</p> <p>12 depths level daily mean - monthly mean</p>	 <p>Arctic Ocean Physics Reanalysis ARCTIC_REANALYSIS_PHYSICS_REANALYSIS</p> <p>T bottomT S SIC SIT SIUV SNOW</p> <p>From 1991-01-01 To 2012-12-31</p> <p>40 depths level monthly mean - daily mean</p>	 <p>Arctic Ocean Wave Hindcast ARCTIC_MULTIYEAR_WAVES_HINDCAST</p> <p>SIC SIT SWH MWT VMDR VSDXY WW SW1 SW2</p> <p>From 1998-01-01 To Present</p> <p>Surface only hourly instantaneous</p>

Copernicus [Ocean Products]

Potential Temperature [°C] 31/12/2016 00:00 UTC



MED

Mediterranean Sea Physics Analysis And Forecast

MEDSEA_ANALYSISFORECAST_PHY_006_013

T bottom T S SSH UV MLD ⓘ

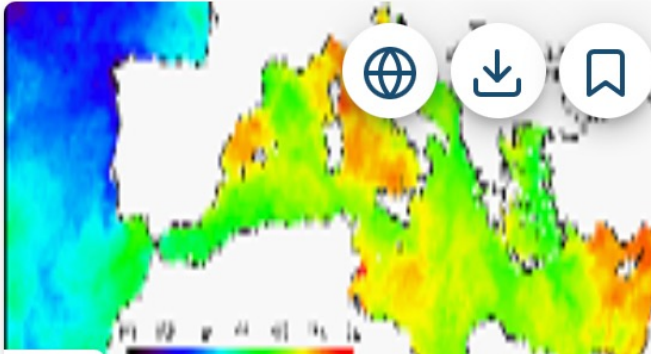
From 2019-05-04 To Present

0.042 degree x **0.042** degree

Model assimilation

● ● ●

ⓘ 141 depths level
ⓘ hourly mean - daily mean - monthly mean - 15-minutes...
Sub-setting WMS



MED

Mediterranean Sea High Resolution And Ultra High Resolution Sea Surface Temp...

SST_MED_SST_L4_NRT_OBSERVATIONS_010_004

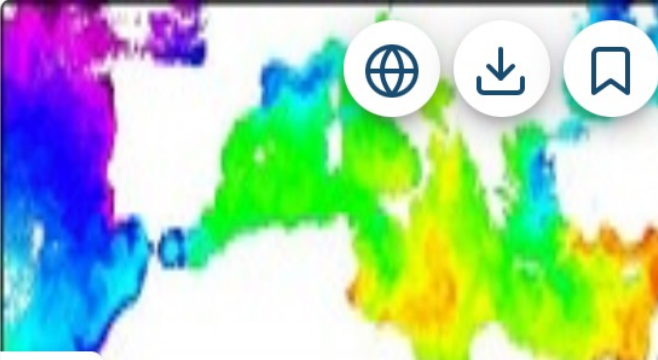
SST ⓘ

From 2008-01-01 To Present

0.01 degree x **0.01** degree

Observation
L4

Surface only
ⓘ daily mean
Sub-setting WMS



MED

Mediterranean Sea - High Resolution And Ultra High Resolution L3s Sea Surface T...

SST_MED_SST_L3S_NRT_OBSERVATIONS_010_012

SST ⓘ

From 2008-01-01 To Present

0.01 degree x **0.01** degree

Observation
L3

Surface only
ⓘ daily mean
Sub-setting WMS

Copernicus [Spatial Resolution]

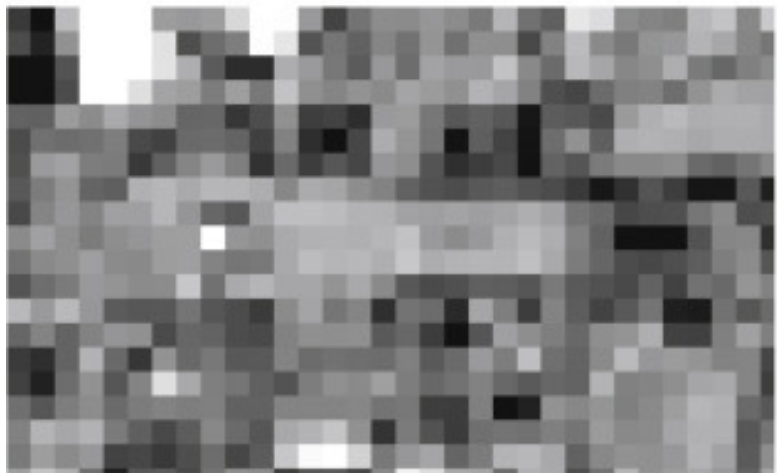
(A) 1 m



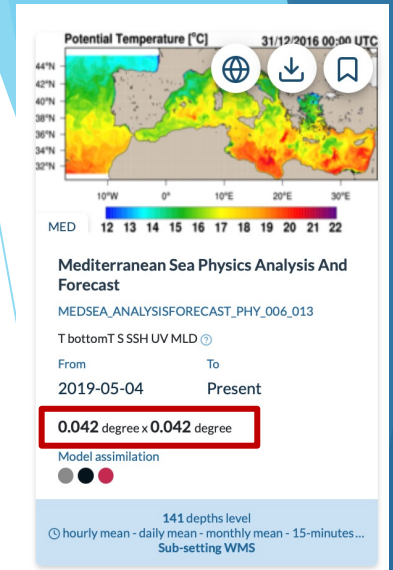
(B) 10 m



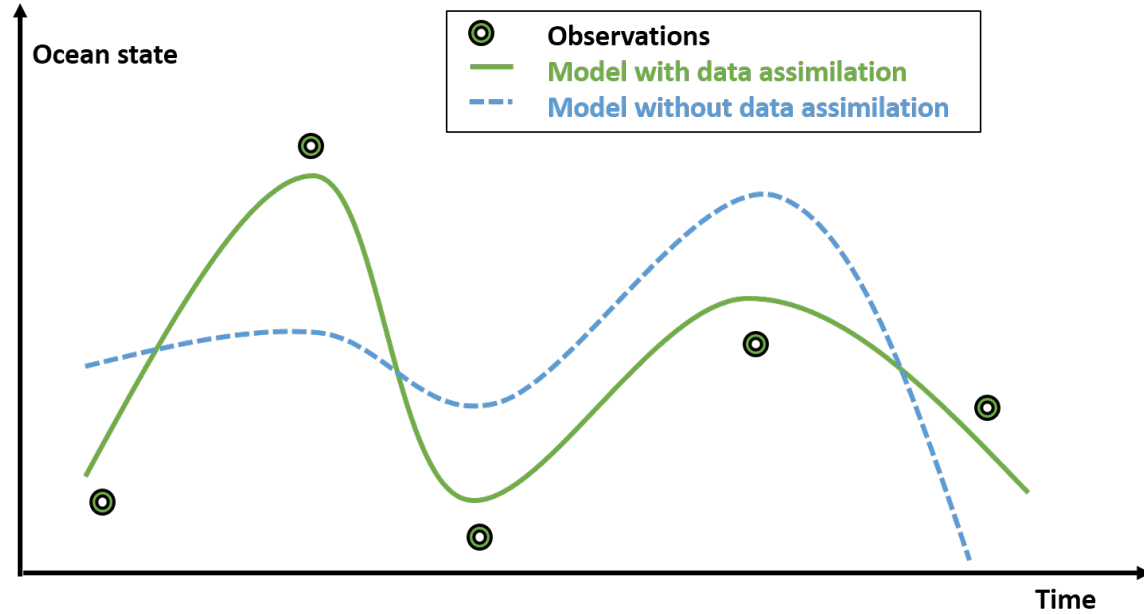
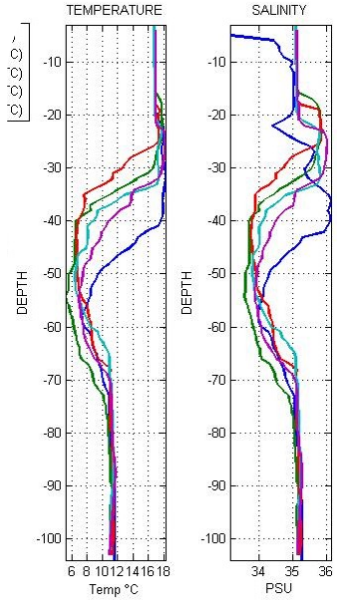
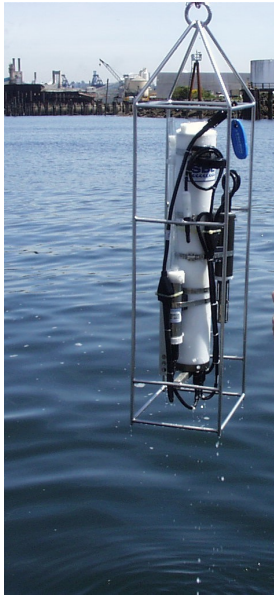
(C) 30 m



(D) 250 m



Copernicus [Data Assimilation]



Potential Temperature [°C] 31/12/2016 00:00 UTC

MEDSEA_ANALYSISFORECAST_PHY_006_013

T bottom T S SSH UV MLD

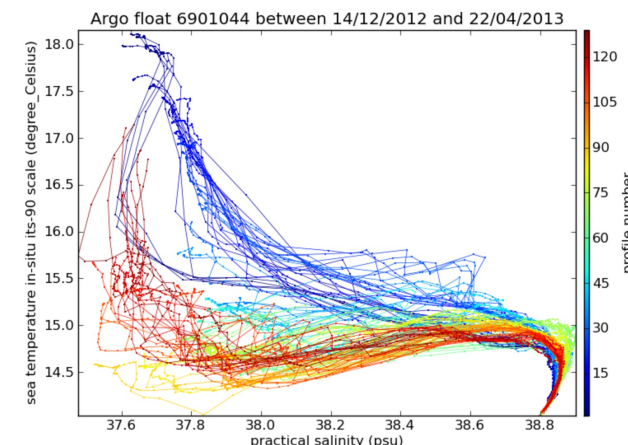
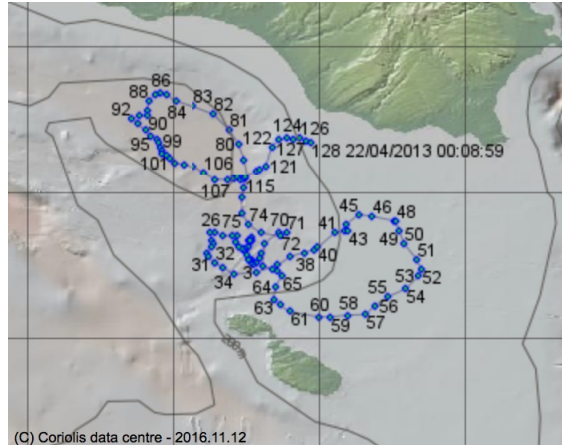
From 2019-05-04 To Present

0.042 degree x 0.042 degree

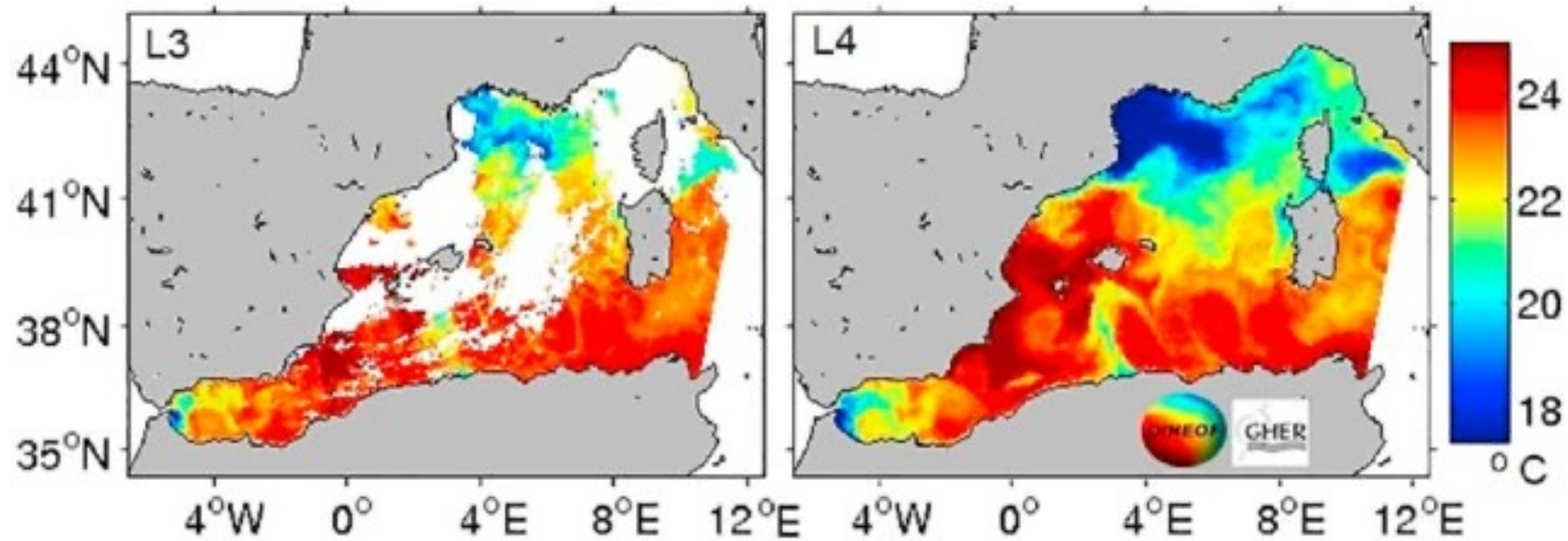
Model assimilation

141 depths level

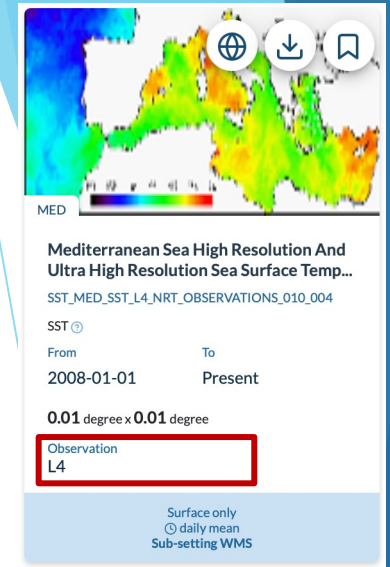
hourly mean - daily mean - monthly mean - 15-minutes...
Sub-setting WMS



Copernicus [Satellite Data Levels]



Source: Minnett, P.J., et al., 2019. Half a century of satellite remote sensing of sea-surface temperature. *Remote Sensing of Environment*, 233, p.111366.



Copernicus [Example]

- ▶ **Mediterranean Sea High Resolution and Ultra High Resolution Sea Surface Temperature Analysis**
Product identifier: SST_MED_SST_L4_NRT_OBSERVATIONS_010_004
Spatial resolution: 0.01.x 0.01
Temporal resolution: daily mean

- ▶ **Mediterranean Sea Physics Analysis and Forecast**
Product identifier: MEDSEA_ANALYSISFORECAST_PHY_006_013
Spatial resolution: 0.042.x 0.042
Temporal resolution: hourly mean

Copernicus [Example]

Data access

MEDSEA_ANALYSISFORECAST_PHY_006_013

Mediterranean Sea Physics Analysis and Forecast

Dataset selected

Geographical area

N

W  E

S

Time range

(Default = Last date available)

Select all dates

Start date

End date

Depth

(Default = Surface depth)

Select all depths

Start depth

End depth

Variables

(Default = All variables)

<input checked="" type="checkbox"/>	Name	Description	Standard name	Units
<input checked="" type="checkbox"/>	bottomT	sea floor potential temperature	sea_water_potential_temperatu re_at_sea_floor	degrees_C
<input checked="" type="checkbox"/>	thetao	potential temperature	sea_water_potential_temperatu re	degrees_C

Copernicus [Example]

Data access

SST_MED_SST_L4_NRT_OBSERVATIONS_010_004

Mediterranean Sea High Resolution and Ultra High Resolution Sea Surface Temperature Analysis

Dataset selected
SST_MED_SST_L4_NRT_OBSERVATIONS_010_004_c_V2

Geographical area

N 40



W 10

E 18

S 33

Reset geographical selection

Time range

(Default = Last date available)

Select all dates

Start date
2021-10-20 00:00:00

End date
2021-10-22 00:00:00

Variables

(Default = All variables)

<input checked="" type="checkbox"/>	Name	Description	Standard name	Units
<input checked="" type="checkbox"/>	analysed_sst	analysed sea surface temperature	sea_surface_temperature	kelvin
<input checked="" type="checkbox"/>	analysis_error	estimated error standard deviation of analysed_sst		kelvin

Panoply

<https://www.giss.nasa.gov/tools/panoply/download/>

Panoply — Sources

Create Plot Combine Plot Open Dataset Remove Remove All Hide Info

Datasets Catalogs Bookmarks

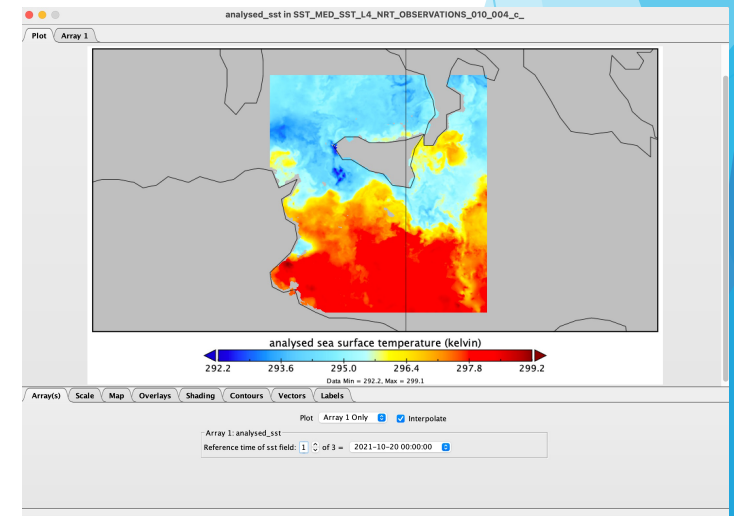
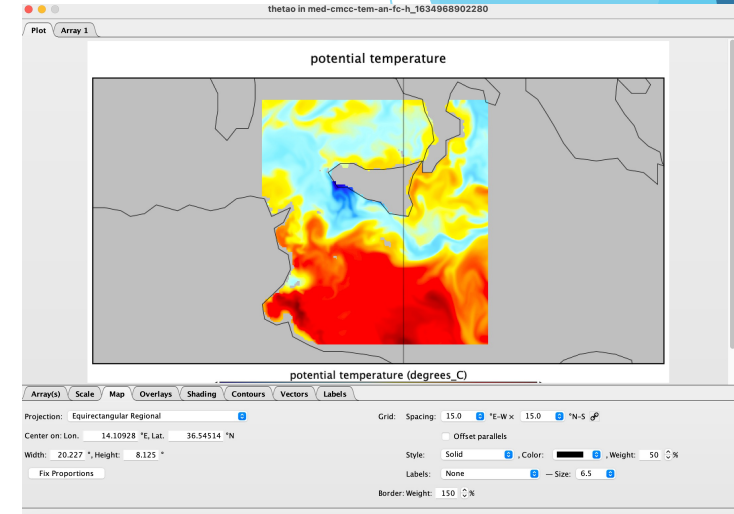
Name	Long Name	Type
med-cmcc-tem-an-fc-...	Potential Temperature (3D) - Ho...	Local File
bottomT	sea floor potential temperature	Geo2D
depth	depth	1D
lat	latitude	1D
lon	longitude	1D
thetao	potential temperature	Geo2D
time	time	1D
SST_MED_SST_L4_NRT_...	Mediterranean SST Analysis, L4, ...	Local File
analysed_sst	analysed sea surface temperature	Geo2D
analysis_error	estimated error standard deviati...	Geo2D
lat	latitude	1D
lon	longitude	1D
time	reference time of sst field	1D

Show: All variables

File
"med-cmcc-tem-an-fc-h_1634968902280.nc"
File type: NetCDF-3/CDM

```
netcdf file:/Users/adamgauci/Desktop/Marine%20Dat
dimensions:
  time = 72;
  depth = 74;
  lat = 168;
  lon = 193;
variables:
  float depth(depth=74);
    :units = "m";
    :standard_name = "depth";
    :long_name = "depth";
    :axis = "Z";
    :positive = "down";
    :ChunkSizes = 141; // int
    :_CoordinateAxisType = "Height";
    :_CoordinateZisPositive = "down";
    :valid_min = 1.0182366f; // float
    :valid_max = 1005.1355f; // float

  float thetao(time=72, depth=74, lat=168, lon=
    :_FillValue = 1.0E20f; // float
    :units = "degrees_C";
    :standard_name = "sea_water_potential_tempe
    :long_name = "potential temperature";
```



Matlab

```
%reading model data
model_filename = 'med-cmcc-tem-an-fc-h_1634968902280.nc';
model_lon = ncread(model_filename, 'lon');
model_lat = ncread(model_filename, 'lat');
model_depth = ncread(model_filename, 'depth');
model_time= ncread(model_filename, 'time');
model_data = ncread(model_filename, 'thetao');

%extracting the first depth level
%for all frames
figure
for h = 1:1:size(model_data, 4)
    model_data_temp = model_data(:,:,1, h);
    pcolor(model_lon, model_lat, model_data_temp);
    box on;
    shading flat;
    title(['Hour = ', num2str(h)]);
    xlabel('Longitude (\circE)');
    ylabel('Latitude (\circN)');
    caxis([19 26]);
    colorbar;
    pause (0.1);
    drawnow;
end
```

```
%extracting all depth levels
%for the first time frame
figure
for d = 1:1:size(model_data, 3)
    model_data_temp = model_data(:,:, d, 1);
    pcolor(model_lon, model_lat, model_data_temp);
    box on;
    shading flat;
    title(['Depth = ', num2str(model_depth(d)), 'm']);
    xlabel('Longitude (\circE)');
    ylabel('Latitude (\circN)');
    colorbar;
    pause (0.1);
    drawnow;
end

%-----

%extracting surface correspondng to 21/10/2021 at 00:30
model_data_temp = model_data(:, :, 1, 25);
figure;
pcolor(model_lon, model_lat, model_data_temp);
box on;
shading flat;
title(['Model Data 21/10/2021 00:30']);
xlabel('Longitude (\circE)');
ylabel('Latitude (\circN)');
caxis([19 26]);
colorbar;
```

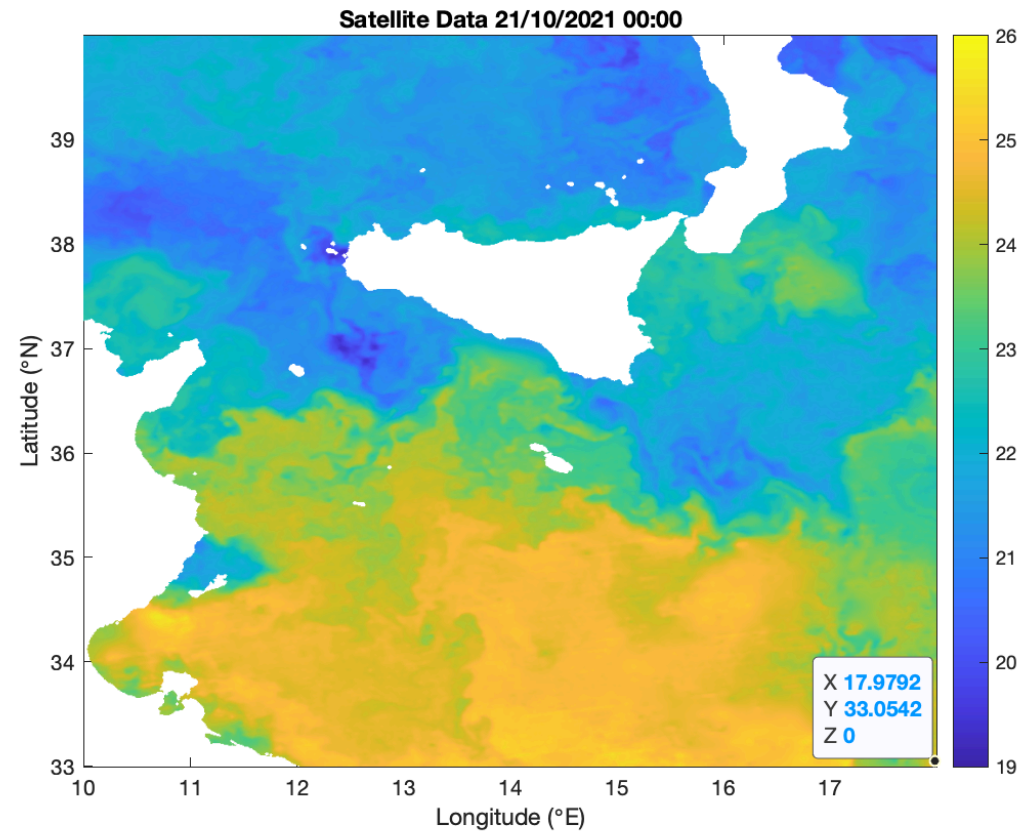
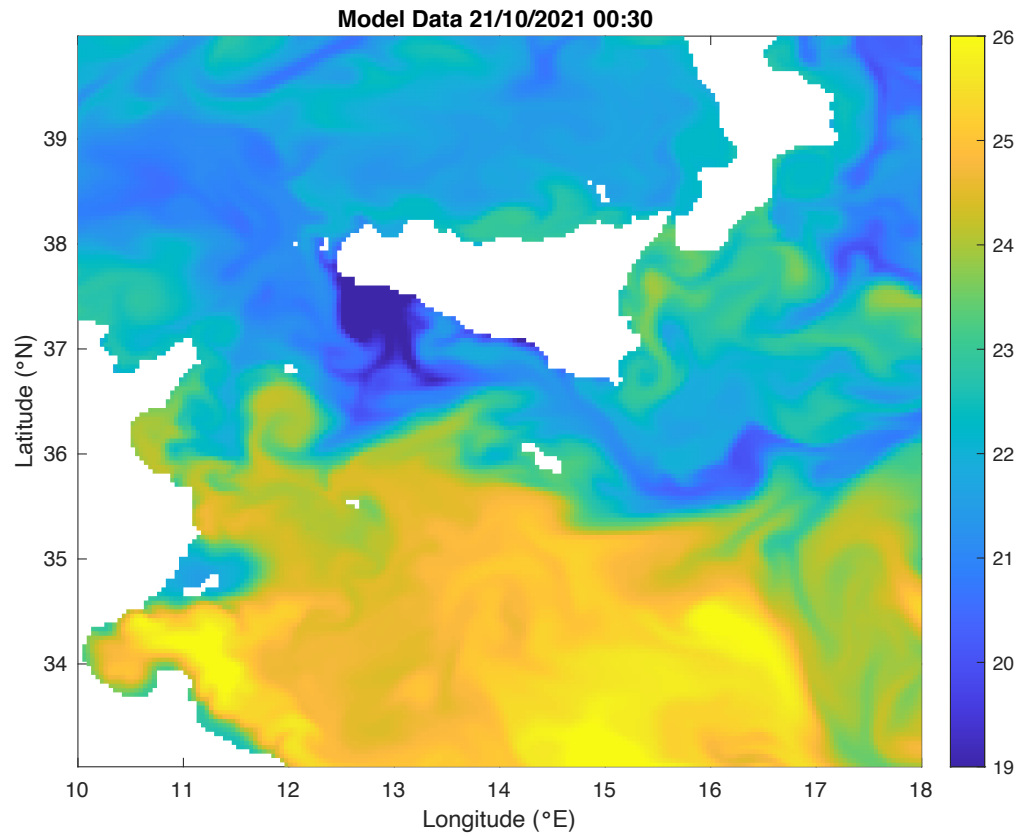
Matlab

```
reading satellite file
sat_filename = 'SST_MED_SST_L4_NRT_OBSERVATIONS_010_004_c_V2_1634969733519.nc';
sat_lon = ncread(sat_filename, 'lon');
sat_lat = ncread(sat_filename, 'lat');
sat_time = ncread(sat_filename, 'time');
sat_data = ncread(sat_filename, 'analysed_sst');
sat_data = sat_data(:,:,2) - 273.15;
figure;
pcolor(sat_lon, sat_lat, sat_data');
box on;
shading flat;
title(['Satellite Data 21/10/2021 00:00']);
xlabel('Longitude (\circE)');
ylabel('Latitude (\circN)');
caxis([19 26]);
colorbar;

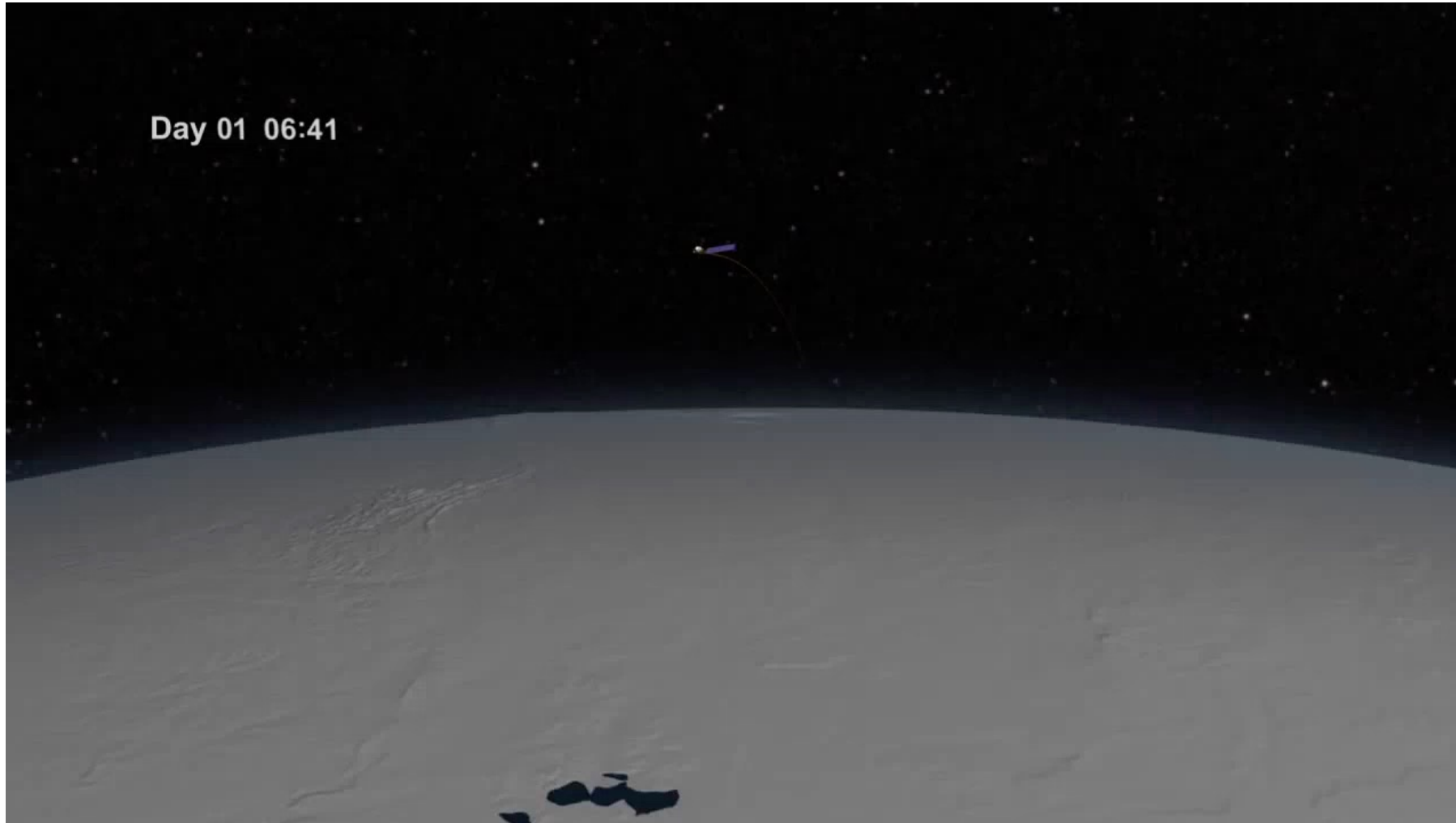
%-----

%mapping satellite data onto grid model
sat_data_interp = CommonGrid(model_lon, model_lat, model_data_temp, sat_lon,
sat_lat, sat_data);
plot(model_data_temp(:), sat_data_interp(:), '.');
axis equal;
axis tight;
xlabel('Model Data');
ylabel('Satellite Data');
axis([20 26 20 26]);
```

Matlab



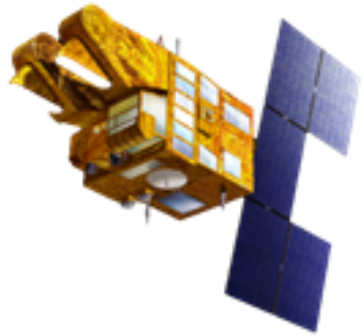
Sentinel Family



Sentinel Family



Sentinel Family



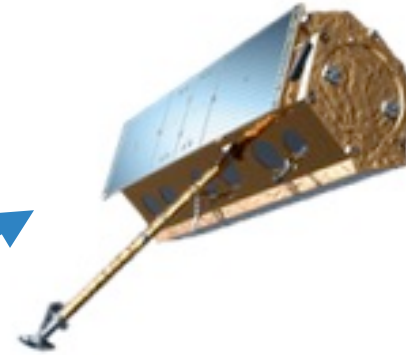
OPTICAL

The optical satellite measures the visible part of the spectrum.

The energy scattered off the leaf is dependent on the greenness of the leaf as a function of the amount of chlorophyll, which absorbs the energy that is needed for photosynthesis



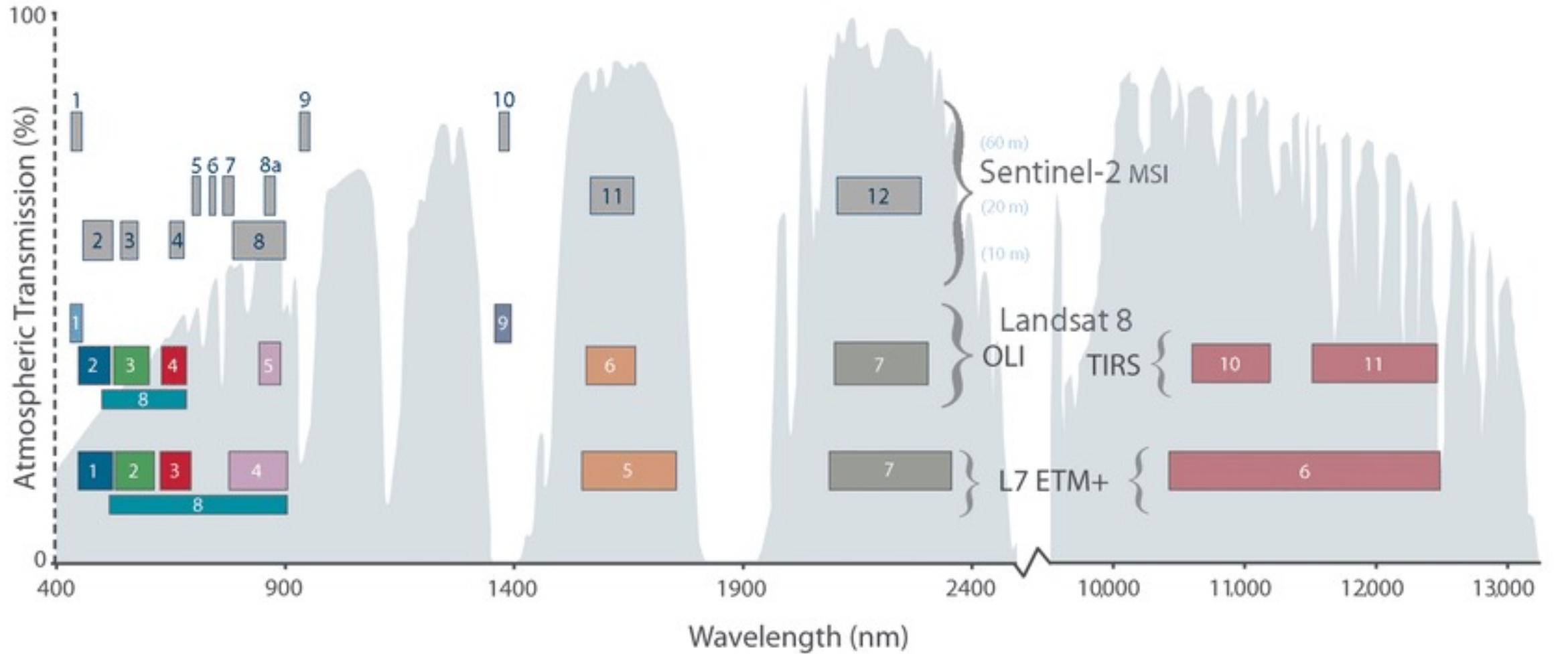
RADAR



The radar satellite will measure the microwave part of the spectrum.

The energy scattered off the leaf is dependent on the size, shape, orientation and dielectric properties.

Sentinel Family [Optical]

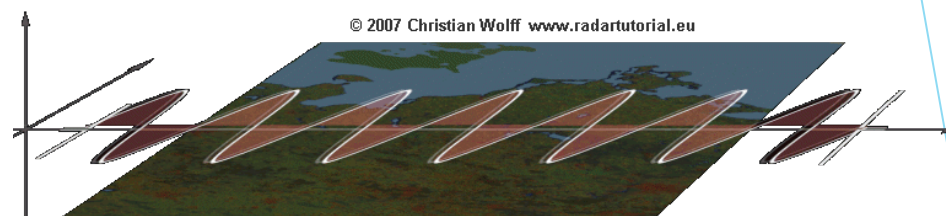
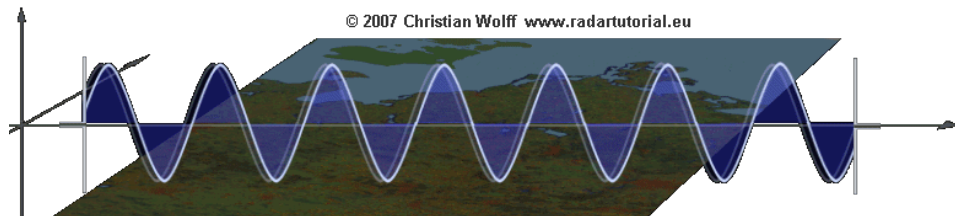


Sentinel Family [Optical]

- ▶ SENTINEL-1 has a single C-band SAR instrument operating at a centre frequency of 5.405 GHz.

Sentinel-2 Bands	Central Wavelength (μm)	Resolution (m)
Band 1 - Coastal aerosol	0.443	60
Band 2 - Blue	0.490	10
Band 3 - Green	0.560	10
Band 4 - Red	0.665	10
Band 5 - Vegetation Red Edge	0.705	20
Band 6 - Vegetation Red Edge	0.740	20
Band 7 - Vegetation Red Edge	0.783	20
Band 8 - NIR	0.842	10
Band 8A - Vegetation Red Edge	0.865	20
Band 9 - Water vapour	0.945	60
Band 10 - SWIR - Cirrus	1.375	60
Band 11 - SWIR	1.610	20
Band 12 - SWIR	2.190	20

Sentinel Family [SAR]



Single-polarimetric SAR mode

VV

HH

Dual-polarimetric coherent mode

HH - HV

VV - VH

Full-polarimetric mode

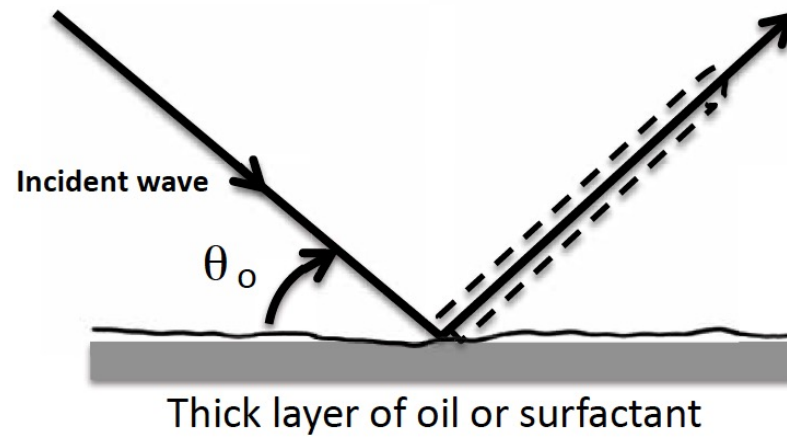
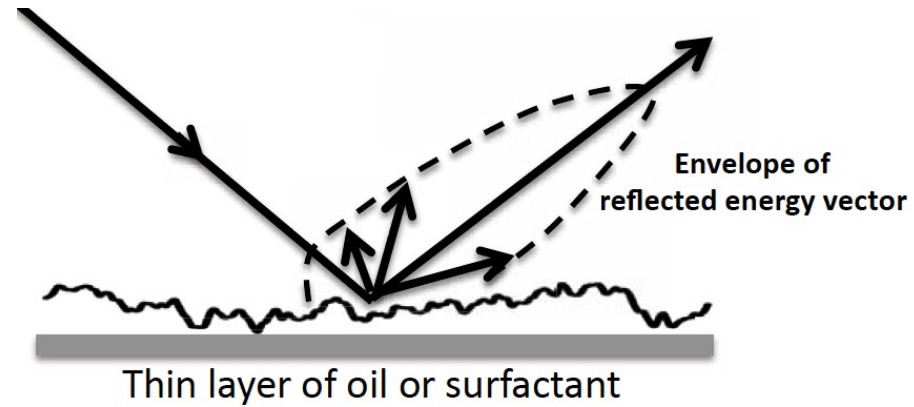
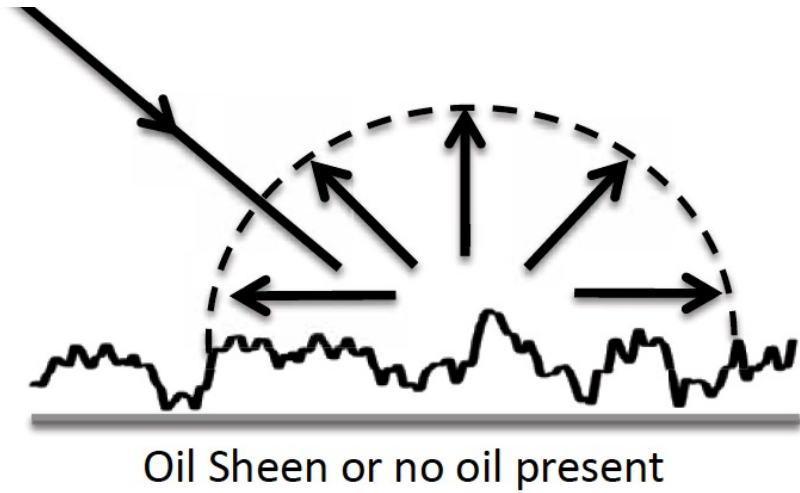
VV

VH

HV

HH

Sentinel Family [SAR]



ESA Data Hub

The screenshot shows the Copernicus Open Access Hub website. At the top, there are logos for Copernicus, ESA, and the European Commission. The main header reads "Copernicus Open Access Hub". Below this, a dark blue banner says "Welcome to the Copernicus Open Access Hub". The main content area contains a welcome message, a link to a User Guide, and a contact email. On the right, a "Reports & Stats" section displays "38,892 prod. published in the last 24h" and "338,550 downloads in the last 24h". Below this is a "Resources" section with a link to the "DHUS Open Source Portal". At the bottom, there are four buttons: "Open Hub", "API Hub", "S-5P Pre-Ops", and "POD Hub".

Welcome to the Copernicus Open Access Hub

The Copernicus Open Access Hub (previously known as Sentinels Scientific Data Hub) provides complete, free and open access to [Sentinel-1](#), [Sentinel-2](#), [Sentinel-3](#) and [Sentinel-5P](#) user products, starting from the In-Orbit Commissioning Review (IOCR).

Sentinel Data are also available via the Copernicus Data and Information Access Services (DIAS) through several [platforms](#).

Please visit our [User Guide](#) for getting started with the Data Hub Interface. Discover how to use the APIs and create scripts for automatic search and download of Sentinels' data, with synchronous access to the latest data and asynchronous access to historic data via the API and GUI.

For further details or requests of support please send an e-mail to eosupport@copernicus.esa.int

Reports & Stats
Data updated hourly

38,892
prod. published in the last 24h

338,550
downloads in the last 24h

Reports

Resources

DHUS Open Source Portal

Open Hub **API Hub** **S-5P Pre-Ops** **POD Hub**

<https://scihub.copernicus.eu>

ESA Data Hub

The screenshot displays the Copernicus Open Access Hub interface. At the top, the ESA and Copernicus logos are visible on the left, and the title "Copernicus Open Access Hub" is centered. On the right, there are icons for user profile, help, and home. Below the header, a search bar contains the text "Insert search criteria...".

The main content area is divided into two sections. On the left is an "Advanced Search" panel with the following options:

- Sort By:** Ingestion Date (dropdown)
- Order By:** Descending (dropdown)
- Sensing period:** Two empty date range input fields with calendar icons.
- Ingestion period:** Two empty date range input fields with calendar icons.
- Mission: Sentinel-1** (selected):
 - Satellite Platform: dropdown menu
 - Polarisation: dropdown menu
 - Relative Orbit Number (from 1 to 175): input field
- Mission: Sentinel-2** (unselected):
 - Satellite Platform: dropdown menu
 - Product Type: dropdown menu

On the right is a map of the Mediterranean region, including parts of Italy, Greece, Tunisia, Algeria, Libya, and Egypt. The island of Malta is highlighted with a brown rectangular box. The map includes various city labels and navigation controls on the right side.

<https://scihub.copernicus.eu>

SNAP [Oil Spill Exercise]

- ▶ Tunisian tanker carrying trucks rammed into an anchored Cypriot container ship north of Corsica in the morning on Sunday 7th October 2018.
- ▶ Huge hole in the hull of one of the ships caused the fuel spill into the marine reserve created just two years ago.
- ▶ Spill created a trail of pollution 12 miles long and several hundred meters wide, heading away from Corsica towards the French and Italian mainland. The spill was pushed by the wind and started to break up.
- ▶ An estimated 40 to 200 cubic metres of oil leaked.
- ▶ Not clear why crash in clear conditions happened but most likely cause was human error. No-one was injured in the collision.
- ▶ Inflatable booms were deployed to stop the spread of a slick.

SNAP [Oil Spill Exercise]



SNAP [Oil Spill Exercise]



SNAP [Oil Spill Exercise]



SNAP [Oil Spill Exercise]



SNAP [Oil Spill Exercise]



© Associated Press Photo

SNAP [Oil Spill Exercise]

The screenshot displays the SNAP (Sentinel Application Platform) interface. The main window shows a SAR intensity image of a coastal area, with a dark, textured background and a bright, irregular shape representing an oil spill. The interface includes a Product Explorer on the left, a Navigation pane at the bottom left, and a histogram window in the bottom left corner.

Product Explorer:

- [1] S1A_IW_GRDH_1SDV_20181008T052757_20181008T052...
- Abstracted_Metadata
- Original_Product_Metadata
 - pins
 - ground_control_points
 - latitude
 - longitude
 - incident_angle
 - elevation_angle
 - slant_range_time
 - Quicklook
 - Amplitude_VH
 - Intensity_VH
 - Amplitude_VV
 - Intensity_VV

Navigation pane:

- Navigation - ...
- Colour M...
- Uncertainty ...
- World View

Editor:

- Basic
- Sliders
- Table

Histogram:

- Name: Intensity_VV
- Unit: intensity_VV
- Min: 121.0
- Max: 2.016908E7

Coordinates:

- 969.56
- 37048.26
- 12221004.

World View:

The World View window shows a satellite image of the same coastal area, with the oil spill visible as a bright, irregular shape on the dark blue water. The land is green and brown, and the sea is dark blue.

ESA Data Hub [CHL]

- ▶ Storm on 3rd October 2021
- ▶ Sentinel 2 data on 4th October 2021



ESA Data Hub [CHL]

S2A_MSIL1C_20211004T095031_N0301_R079_T33SVV_20211004T105111

[https://scihub.copernicus.eu/dhus/odata/v1/Products\('18d5015e-97c0-427a-8c66-fc5f8de7f689'\)/\\$value](https://scihub.copernicus.eu/dhus/odata/v1/Products('18d5015e-97c0-427a-8c66-fc5f8de7f689')/$value)

[Download TCI](#)

Footprint



Attributes

Summary

Quicklook

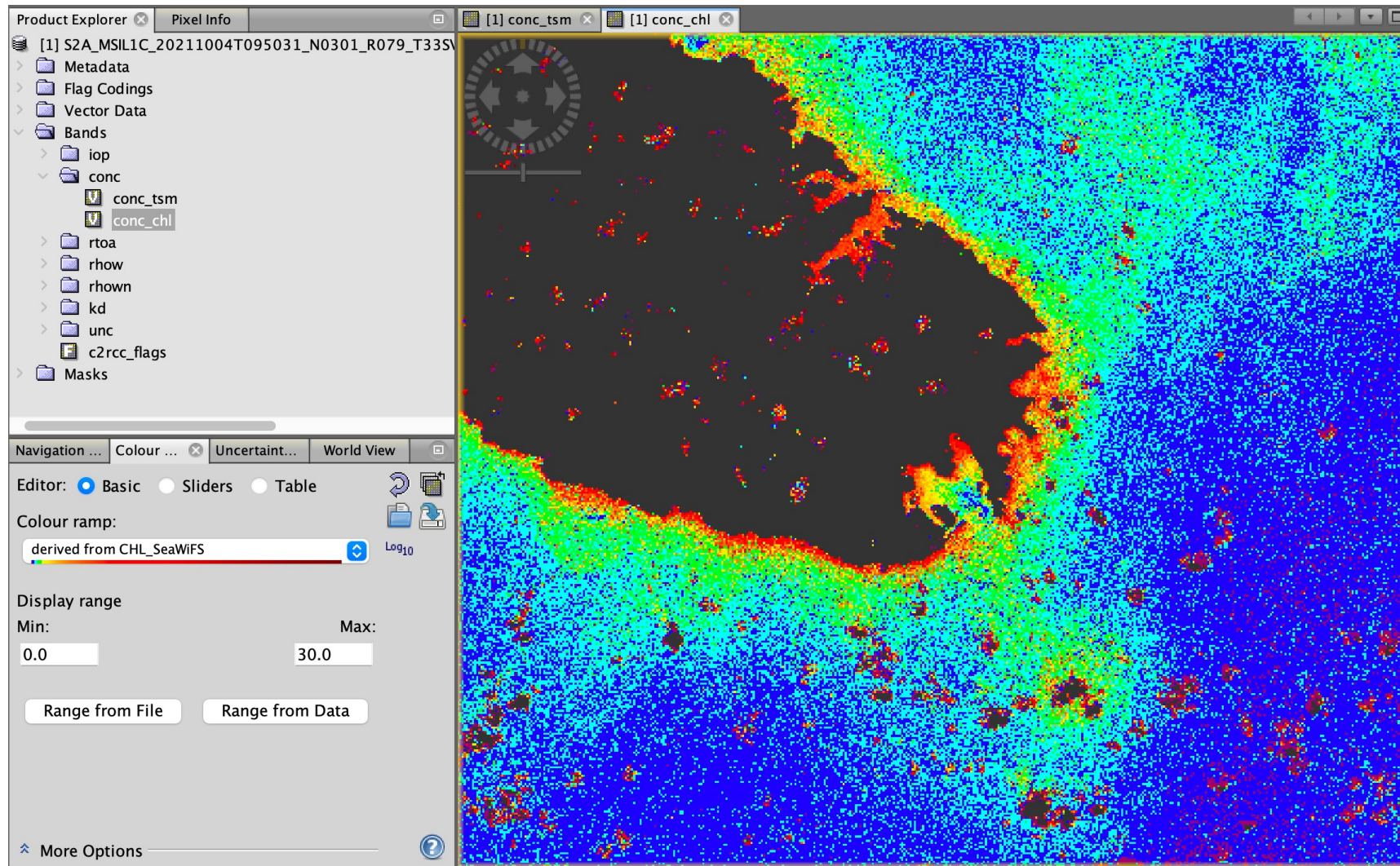


Inspector

S2A_MSIL1C_20211004T095031_N03_079_T33SVV_20211004T105111_SAFE



ESA Data Hub [CHL]



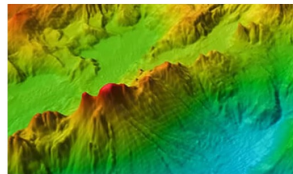
EMODnet

<https://emodnet.ec.europa.eu/en/portals>

European Marine Observation and Data Network (EMODnet)

[About](#) [Data Portals](#) [Data Services](#) [Solutions](#) [News & Events](#) [Atlas of the Seas](#) [EU-China](#)

[Home](#) > [Data Portals](#) > [Data Portals Overview](#)



Bathymetry

Data on bathymetry (water depth), coastlines, and geographical location of underwater features: wrecks.



Biology

Data on temporal and spatial distribution of species abundance and biomass from several taxa.



Chemistry

Data on the concentration of nutrients, organic matter, pesticides, heavy metals, radionuclides and antifoulants in water, sediment and biota.



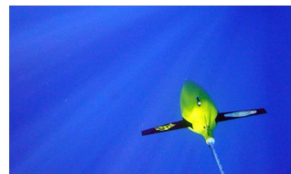
Geology

Data on seabed substrate, sea-floor geology, coastal behaviour, geological events, and minerals.



Human activities

Data on the intensity and spatial extent of human activities at sea.



Physics

Data on salinity, temperature, waves, currents, sea-level, light attenuation, and FerryBoxes.

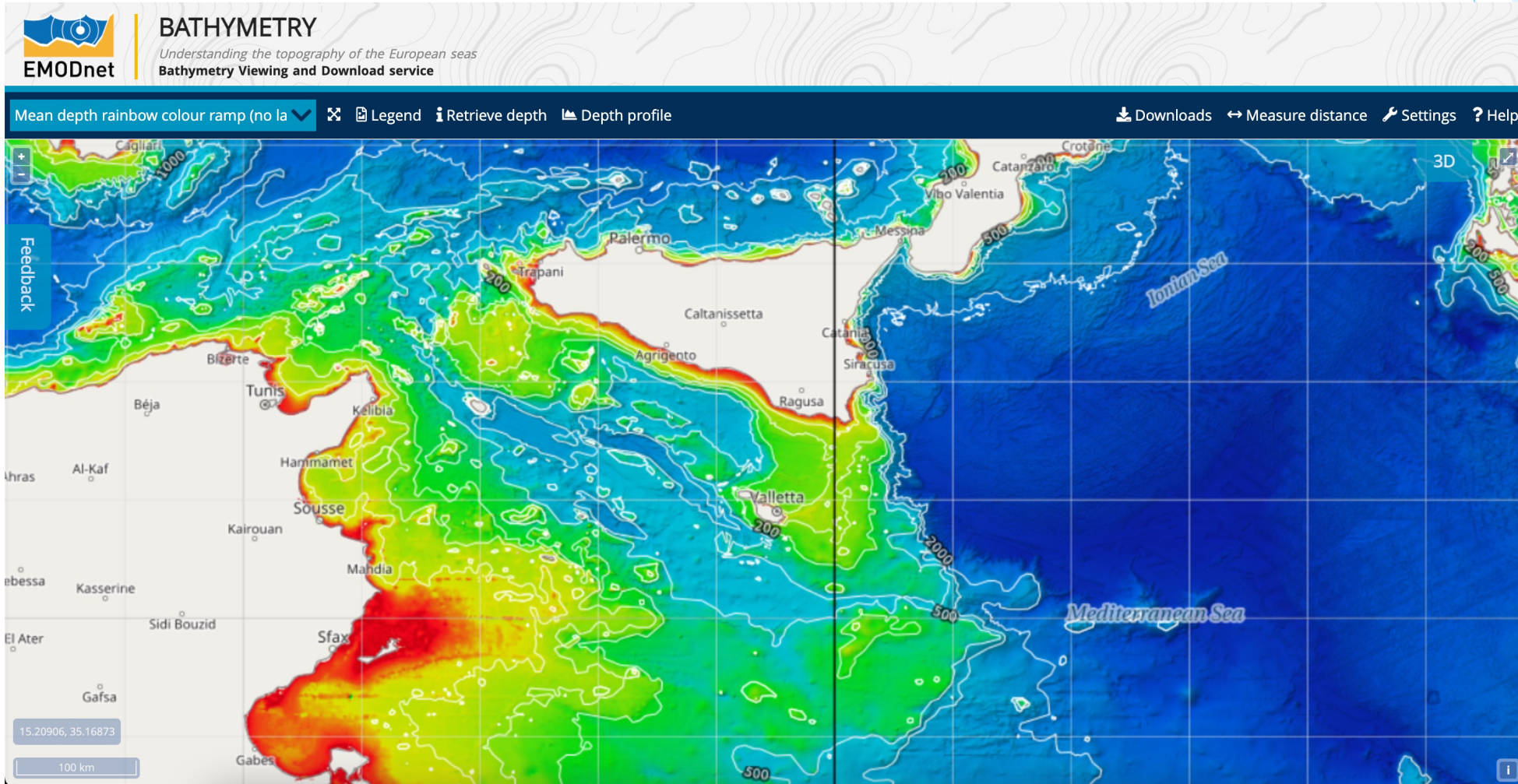


Seabed habitats

Data, maps and models on the spatial distribution and extent of seabed habitats and communities.

EMODnet [Bathymetry]

<https://www.emodnet-bathymetry.eu/>



EMODnet [Bathymetry Download]

<https://www.emodnet-bathymetry.eu/>

The image shows a screenshot of the EMODnet Bathymetry web application. The top left features the EMODnet logo and the text "BATHYMETRY Understanding the topography of the European seas Bathymetry Viewing and Download service". Below this is a navigation bar with options like "High resolution bathymetry", "Legend", "Retrieve depth", and "Depth profile". The main area is a bathymetric map of the Mediterranean Sea, with a specific tile labeled "F6" highlighted. On the right, there are controls for "Dataset type" (DTM Tiles, High resolution areas, Area of interest) and "DTM version". A red box highlights a "Download" button and a confirmation email. The email text reads: "Dear Adam, Your requested data files from the EMODnet DTM are now ready for downloading. The download links expire in 12 hours". Below the email is a table with columns "Tile" and "Format", showing "F6" and "ESRI ASCII" respectively, with a "Download now" link.

EMODnet | **BATHYMETRY**
Understanding the topography of the European seas
Bathymetry Viewing and Download service

High resolution bathymetry | Legend | Retrieve depth | Depth profile | Downloads | Measure distance | Settings | Help

Dataset type
DTM Tiles | High resolution areas | Area of interest
DTM version

Download

Dear Adam,

Your requested data files from the EMODnet DTM are now ready for downloading. The download links expire in 12 hours

Tile	Format
F6	ESRI ASCII

[Download now](#)

EMODnet [Human Activities]

<https://www.emodnet-humanactivities.eu/>

The screenshot displays the EMODnet Human Activities web application interface. At the top, a dark blue navigation bar contains the following menu items: HOME, ABOUT, DATA SERVICES, PUBLICATIONS, BLOG, HELPDESK, and CENTRAL PORTAL. Below the navigation bar, a breadcrumb trail reads "Home » Data Services » View Data".

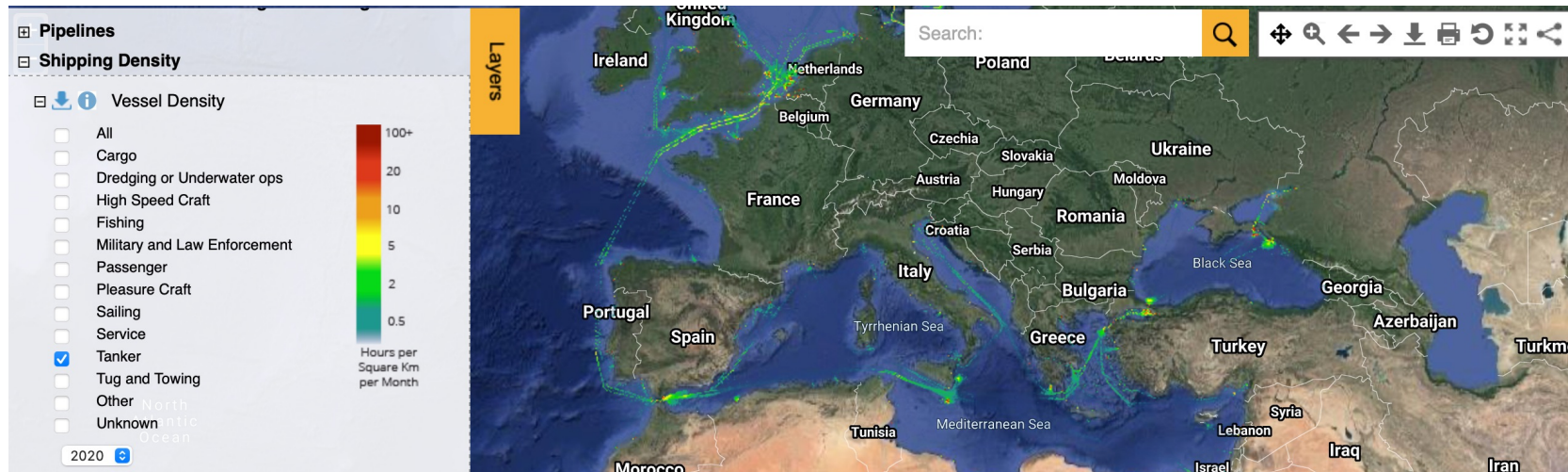
The main content area features a map of the Mediterranean region and surrounding areas, including parts of Europe, North Africa, and the Middle East. The map is overlaid with various data layers, which are listed in a sidebar on the left under the heading "Layers". The layers include:

- Aggregate Extraction
- Algae Production
- Aquaculture
- Cables
- Cultural Heritage
- Dredging
- Environment
- Fisheries
- Main Ports
- Maritime Spatial Planning (MSP)
- Military Areas
- Nuclear Power Plants
- Ocean Energy Facilities
- Oil and Gas
- Other Forms of Area Management/Designation
- Pipelines
- Shipping Density
- Waste Disposal
- Wind Farms

The map interface includes a search bar at the top center, a search icon, and a toolbar with various map controls such as zoom in, zoom out, pan, and download. A small inset map in the top right corner shows the location of the main map area within a larger geographical context.

EMODnet [Human Activities - Vessel Density]

<https://www.emodnet-humanactivities.eu/>



- All - All types
- 00 - Other
- 01 - Fishing
- 02 - Service
- 03 - Dredging or underwater ops
- 04 - Sailing
- 05 - Pleasure Craft
- 06 - High speed craft
- 07 - Tug and towing
- 08 - Passenger
- 09 - Cargo
- 10 - Tanker
- 11 - Military and Law Enforcement
- 12 - Unknown

EMODnet [Physics]

<https://map.emodnet-physics.eu/>

PHYSICS
Oceans at your fingertips

Search ...

[CONTACT US](#) [SUBMIT DATA](#)

[HOME](#) [MAP VIEWER](#) [CATALOGUE](#) [TERM OF USE](#) [SUBMIT DATA](#) [HELPDESK](#) [CENTRAL PORTAL](#)

WAVES
WATER TEMPERATURE
WATER SALINITY
CURRENTS
OPTICAL PROPERTIES
SEA LEVEL
ATMOSPHERIC
WATER CONDUCTIVITY
WINDS
RIVER
UNDERWATER NOISE

In Collaboration With

EMODnet [Ingestion]

EMODnet Data Ingestion

WAKE UP YOUR DATA

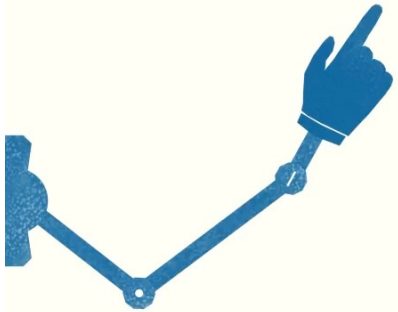
Set them free for Blue Society

The **Data Ingestion Portal** facilitates submitting marine datasets for further processing, Open Data publishing and contributing to applications for society.

emodnet-ingestion.eu

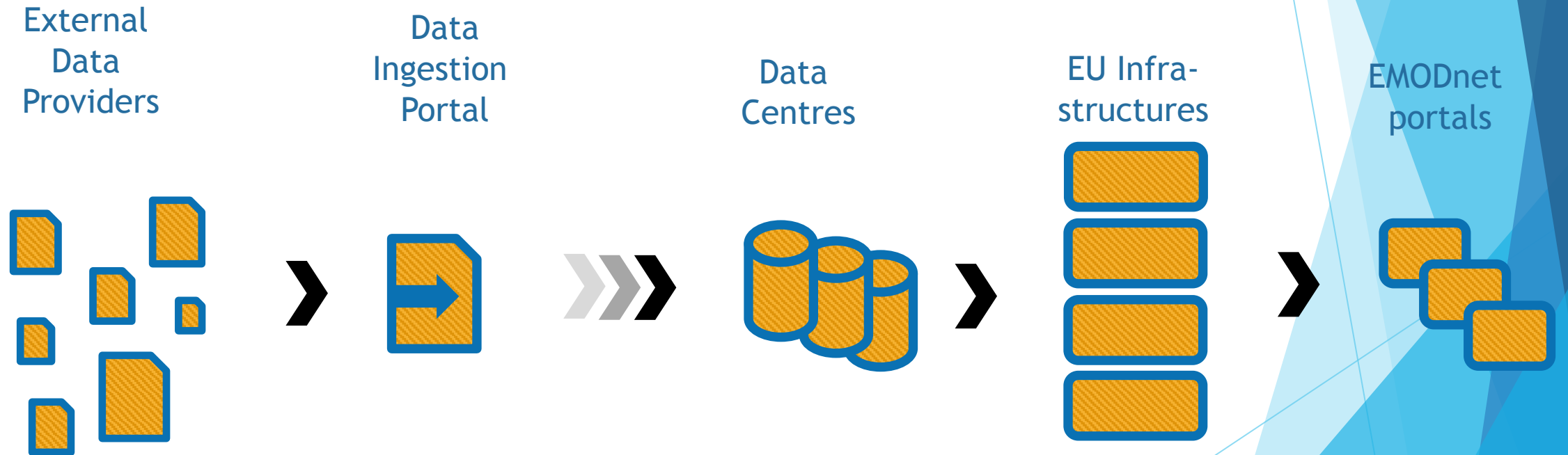


EMODnet [Ingestion]



EMODnet [Ingestion]


The EMODnet Ingestion services will serve all EMODnet thematic portals for streamlining incoming data sets



For more info, please visit www.emodnet-ingestion.eu

QGIS

<https://qgis.org/en/site/>

 3.20.3
3.16.11 LTR

[DISCOVER QGIS](#) [FOR USERS](#) [GET INVOLVED](#) [DOCUMENTATION](#)

English ▼

QGIS

A Free and Open Source Geographic Information System



QGIS 3.20 Odense
has been released!

20!
[or packages](#) for your Operating System and read the [changelog](#).

QGIS Community
Find out more about

Create, edit, visualise, analyse and publish geospatial information on Windows, Mac, Linux, BSD and mobile devices

For your desktop, server, in your web browser and as developer libraries

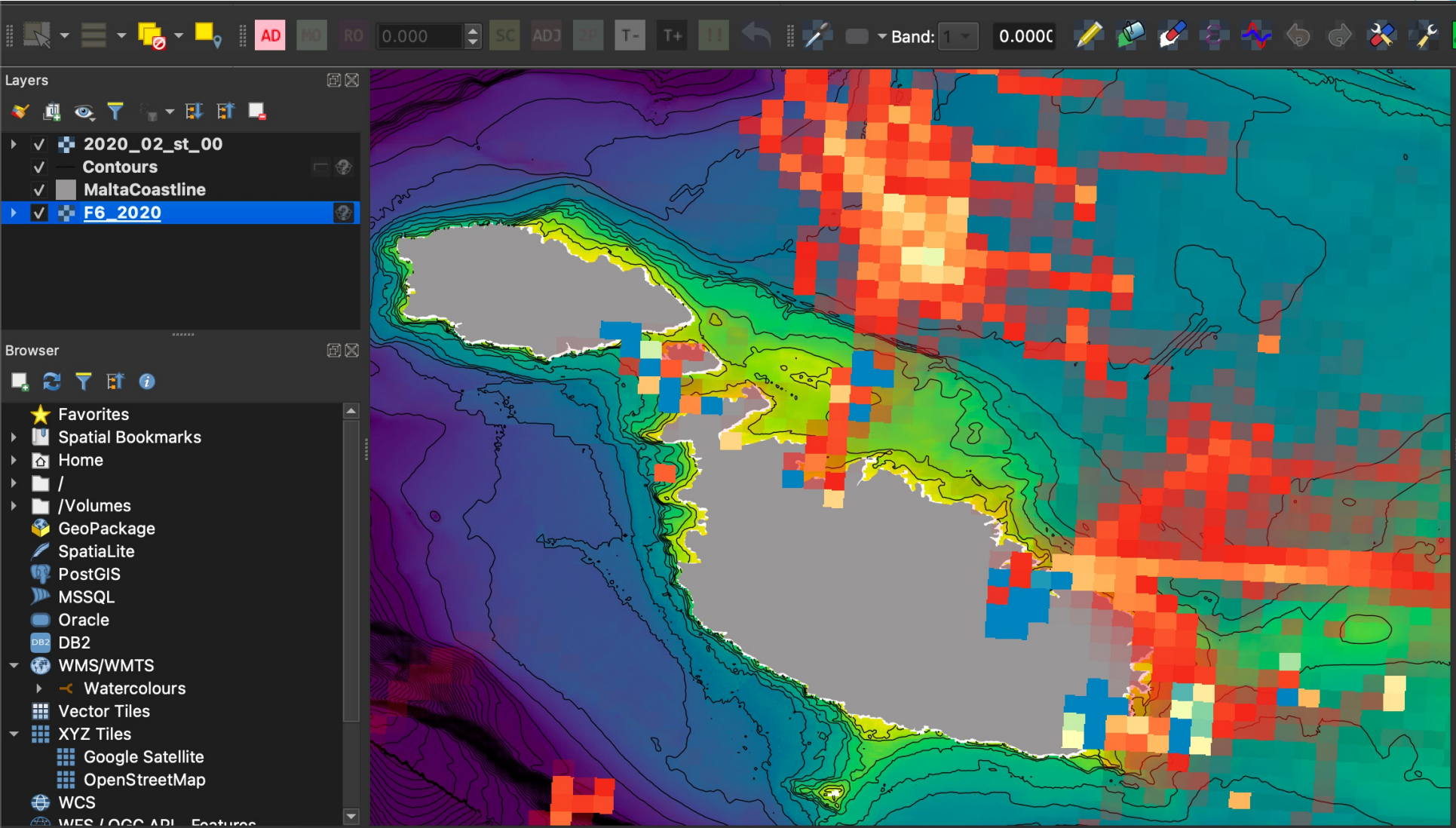
[Download Now](#)

Version 3.20.3
Version 3.16.11 LTR

[Support QGIS](#)

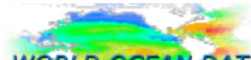
Donate now!

QGIS



World Ocean Database

<https://www.ncei.noaa.gov/products/world-ocean-database>



WORLD OCEAN DATABASE SELECT AND SEARCH

Note: At this time, World Ocean Database 2018 (WOD18) contains [prereleased](#) data and flags for the WOA18.

The WOD18 is an NCEI product and an [IODE](#) (International Oceanographic Data and Information Exchange) project.

The WODselect retrieval system allows a user to search *World Ocean Database* and new (quarterly updated/added) data using a user-specified search criteria. A distribution map and cast count of these search criteria will give the user the option to have the data extracted and placed on the NODC FTP site in the *WOD* native, 'csv', and netCDF data formats.

To build a user defined search query:

1. Place check mark in front of any number of criteria.
2. Press the "Build a query" button.

(If any criteria below are not checked, the default will apply).

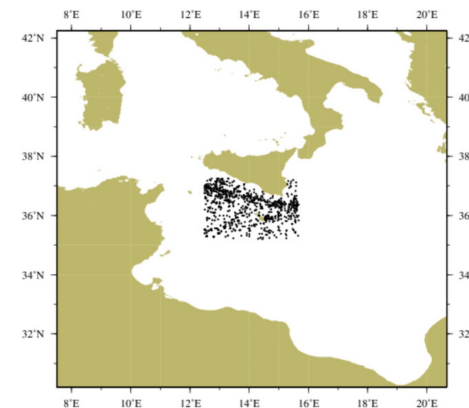
SEARCH CRITERIA: (definitions)

- Geographic Coordinates
- Observation Dates - e.g., Year(s), Month(s), Day(s)
- Dataset - e.g., OSD, CTD, XBT
- Measured Variables - e.g., Temperature, Salinity, Nutrients
- Biology - e.g., Phytoplankton, Zooplankton
- Deepest Measurement
- Country
- Ship/Platform
- Cruise
- Accession #
- Project
- Institute
- Data Exclusion Using WOD Quality Control Flags
- Data Additions

DEFAULT:

- whole world
- all years/months/days
- all datasets
- all available variables
- all available plankton
- all depths
- all countries
- all ships/platforms
- all cruises
- all accessions
- all projects
- all institutes
- no exclusion
- WOD18 released data

Northern Edge	37.25 °N
Southern Edge	35.20 °N
Western Edge	12.50 °E
Eastern Edge	15.60 °E



Ocean Data View

1. Go to: <https://odv.awi.de/software/download/> and click on 'register here for the non-commercial version'.

The screenshot shows the Ocean Data View website interface. At the top, there is a dark blue header with the site name "Ocean Data View" on the left and navigation links "Contact | Impressum | Search | Data protection" and a language selector "English" on the right. Below the header is a lighter blue navigation bar with a home icon and links for "Data", "Software", "Documentation", "Presentations", "Links", and "ODV Forum". The main content area has a breadcrumb trail "Home > Software > Download" and a sub-header "Software Download Login". The main text explains that registered users can download software, and non-members should register. A red box highlights the link "register here for the non-commercial version" in the first bullet point. To the right, there is a "User login" section with fields for "Username:" and "Password:", a "Login" button, and a link "Forgot your password?".

Download

[Home](#) > [Software](#) > [Download](#)

[Known Issues](#)

Software Download Login

Registered ODV users may download any of the available ODV software versions and optional packages. If you are not a member of the ODV users group yet, please register now:

- For scientific and non-commercial usage, [please register here for the non-commercial version.](#)
- If you are planning on using the software for commercial or military purposes, please [apply for a commercial account here.](#)

You can have a look at the [license agreement here.](#)

Thank you!

Note that cookies must be enabled.

User login
Enter your username and password here in order to log in on the website:
Login
Username:

Password:

[Forgot your password?](#)

Ocean Data View

2. Fill in your details and **create an account**. If successful, you'll be directed to the **Software Download** page.

Register (non-commercial license)

Please complete the information for your membership.

Please complete all required fields *

Usage *	<input type="text" value="Non-Commercial"/>
Password *	<input type="password"/>
Repeat Password *	<input type="password"/>
First name *	<input type="text"/>
Last name *	<input type="text"/>
E-mail *	<input type="text"/>
Institution	<input type="text"/>
Street *	<input type="text"/>
City *	<input type="text"/>
Country *	<input type="text" value="Germany"/>
ZIP / Postal Code *	<input type="text"/>
Telephone	<input type="text"/>
Fax	<input type="text"/>
Accept License Agreement	<input type="checkbox"/> → Click here to see the terms.
	<input type="button" value="Create account"/>

Ocean Data View

3. Click on **ODV_Application**. Click on **Latest_Version**.
Select your **Operating System** (Linux, MacOS, or Windows).
For Windows, download and install the **64-bit, odv_5.3.0_w64.exe** file.
For MacOS, download and install the **64-bit, odv_5.3.0_macx_64bit.dmg** file.

The screenshot shows the 'Ocean Data View' website with a navigation bar containing 'Data', 'Software', 'Documentation', 'Presentations', 'Links', 'ODV Forum', and 'User Profile'. The main content area is titled 'Download' and 'Known Issues'. Below this, the breadcrumb path is 'Home > Software > Download'. The section is titled 'ODV Application' and displays five folder icons labeled '1_ODV_Application', '2_ODVAPI', '3_Optional_Packages', '4_User_Contributions', and '5_Sample_Files'.

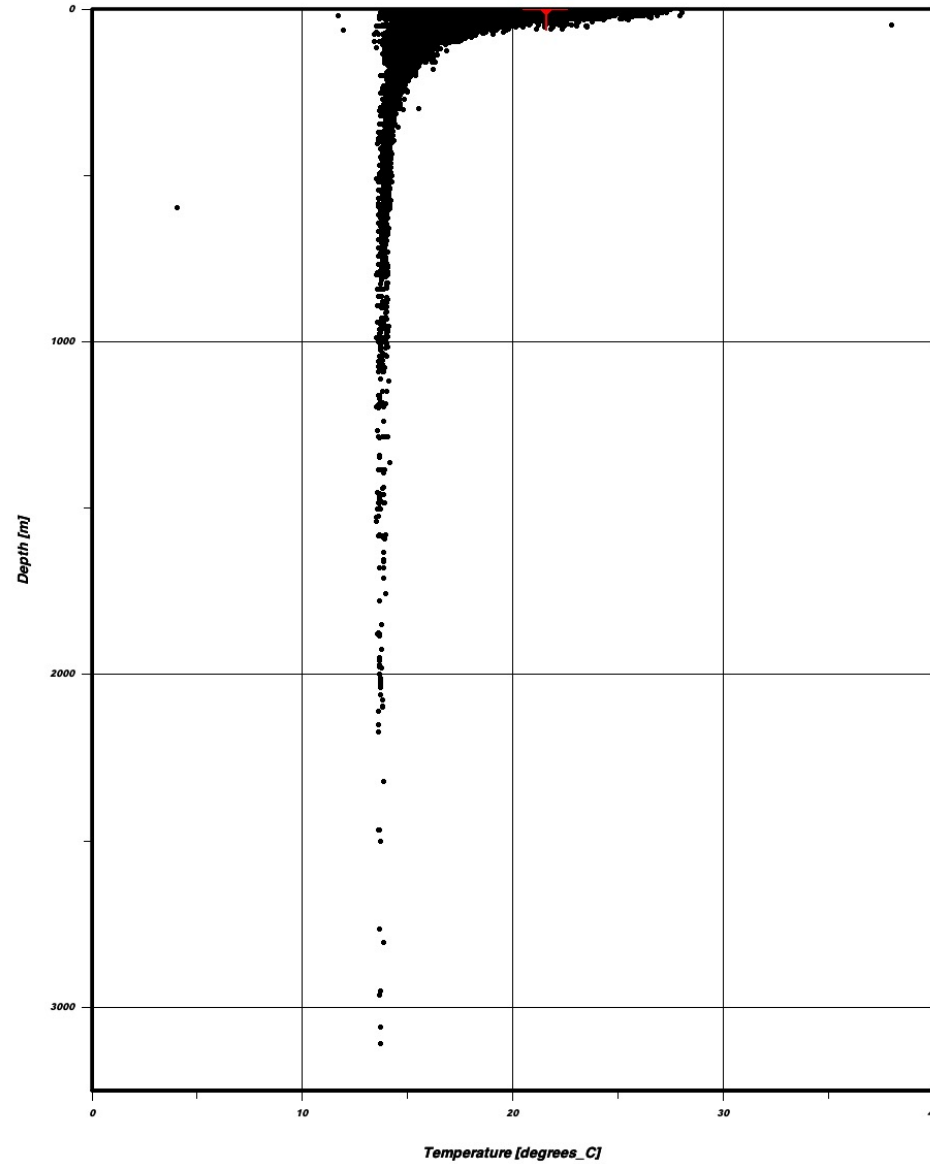
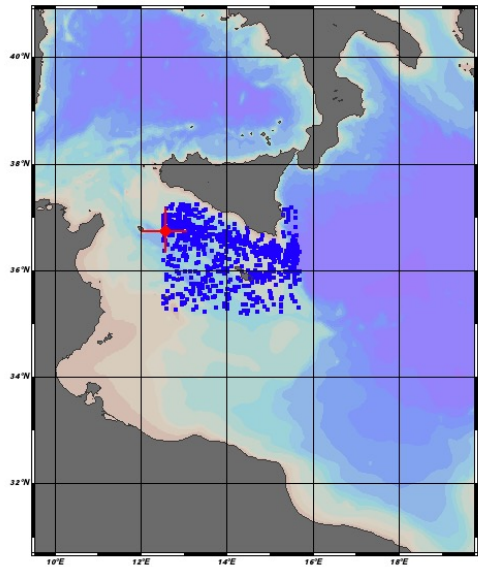
This screenshot shows the 'Ocean Data View' website with the breadcrumb path 'Home > Software > Download'. The '1_ODV_Application' folder is selected, and the page displays three options: a back arrow icon labeled '..', a folder icon labeled 'Latest_Version', and another folder icon labeled 'Previous_Versions'.

This screenshot shows the 'Ocean Data View' website with the breadcrumb path 'Home > Software > Download'. The 'Latest_Version' folder is selected, and the page displays four options: a back arrow icon labeled '..', and three folder icons labeled 'Linux', 'MacOS', and 'Windows'. At the bottom, there are two document icons labeled 'CHANGES.txt' and 'KNOWN_ISSUES_ALL_PLATFORMS.txt'.

This screenshot shows the 'Ocean Data View' website with the breadcrumb path 'Home > Software > Download'. The 'Latest_Version' folder is selected, and the 'Windows' operating system is chosen. The page displays two options: a back arrow icon labeled '..' and a folder icon labeled '64_bit'.

This screenshot shows the 'Ocean Data View' website with the breadcrumb path 'Home > Software > Download'. The 'Latest_Version' folder is selected, and the 'MacOS' operating system is chosen. The page displays two options: a back arrow icon labeled '..' and a folder icon labeled '64_bit'.

Ocean Data View



Ocean Data View