



Ocean current forecast for routing activities

Copernicus User Uptake Information Sessions
Marine Monitoring



- The objectives :
 - Catalogue of **CMEMS ocean currents products**
 - Visualize **maps of ocean currents**
 - Visualize **animation** of current prediction
 - **Download** ocean current data
 - Use a **software** to create visualization
- ***2 already existing use cases :***
 - Ship routing activities for **fuel consumption reduction**
 - Ship routing activities for **optimal activities planning**



Marine
Monitoring

The CMEMS website: Access & Registration

- CMEMS website : <http://marine.copernicus.eu>

Search & Browse



- Sentinel data
- Graphical user interface

Discover & Visualise



- Visualise/ analyse data
- Access info

Register



- Order
- Customise
- Helpdesk

Download



- Select and download
- One-off or by scripts

Compute



- Use data
- Integrate
- Merge

Join Up



- Get trained
- Get inspired
- Meet partners



CMEMS : ocean current products

- Use case : How to get information about **currents** in the Black Sea

ONLINE CATALOGUE

CATALOGUE PDF FIRST VISIT? MY CART 0 My Account

Found 152 ocean products matching your criteria. [Export results](#)

YOUR SEARCH ?

Search by keyword

REGIONAL DOMAIN ▶
All areas

PARAMETERS ▶

TEMPORAL COVERAGE
From 1992-01-01 To 2018-03-22
 If checked, the search results will only show products containing the whole selected time range

PRODUCT WITH DEPTH LEVEL

GLOBAL_ANALYSIS_FORECAST_PHY_001_024	
GLOBAL OCEAN 1/12° PHYSICS ANALYSIS AND FORECAST UPDATED DAILY	
MODEL	GLO
T bottomT S SSH UV MLD SIC SIT SIUV ⓘ	
0.083 degree x 0.083 degree (50 depth levels)	
From 2006-12-27 to Present	
monthly-mean, daily-mean, hourly-mean	
MORE INFO	ADD TO CART WMS Sub-setting

GLOBAL_ANALYSIS_FORECAST_BIO_001_014	
GLOBAL OCEAN BIOGEOCHEMISTRY ANALYSIS AND WEEKLY FORECAST	
MODEL	GLO
CHL PHYC O2 NO3 PO4 SI FE PP ⓘ	
0.5 degree x 0.5 degree (50 depth levels)	
From 2012-01-01 to Present	
weekly-mean	
MORE INFO	ADD TO CART WMS Sub-setting



Marine
Monitoring

CMEMS : ocean current forecast products : building animations

ONLINE CATALOGUE CATALOGUE PDF FIRST VISIT ? MY CART 1 My Account

BLACK SEA PHYSICS ANALYSIS AND FORECAST

Metadata provided by CMEMS
Credits: E.U. Copernicus Marine Service Information

BACK TO SEARCH

ADD TO CART

VIEW PRODUCT

DOWNLOAD PRODUCT

INFORMATION PDF XML **DOCUMENTATION** **SERVICES** **NEWS FLASH**

PRODUCT IDENTIFIER: BLKSEA_ANALYSIS_FORECAST_PHYS_D07_001

OVERVIEW

Short description:

The physical component of the Black Sea Forecasting System (BS-Currents) is a hydrodynamic model implemented over the whole Black Sea basin. The model horizontal grid resolution is $1/36^\circ$ in zonal resolution, $1/27^\circ$ in meridional resolution (ca. 3 km) and has 31 unevenly spaced vertical levels. The hydrodynamics are supplied by the Nucleus for European Modeling of the Ocean (NEMO, v3.4). The model solutions are corrected by the variational assimilation (based on a 3DVAR scheme), originally developed for the Mediterranean Sea and later extended for the global ocean. The observations assimilated in the BS-Currents includes in-situ profiles, along-track sea level anomalies (SLA) and gridded sea surface temperature (SST) provided by Copernicus TACs.

Detailed description:

The numerical ocean model for the BS-Currents covers the entire Black Sea area and the hydrodynamic code is based on NEMO (Nucleus for European Modeling of the Ocean, Madec et al., 2012). The primitive equations are discretized on a horizontal grid with $1/27^\circ$ resolution in zonal direction and $1/36^\circ$ resolution in meridional direction and a vertical grid of 31 levels with partial-steps, integrated in time using a linear free-surface formulation. The horizontal spatial resolution of $1/27^\circ \times 1/36^\circ$ is chosen in order to have the same Cartesian resolution in latitude and longitude, approximately 3 km at the model domain latitudes, which is conforming to the mesoscale eddy-resolving scale (Rossby radius of deformation in the Black Sea ~20 km). Bathymetry is based on GEBCO dataset (www.gebco.net). The BS-Currents model for analysis and forecast uses ECMWF $1/8^\circ$ spatial resolution: for forecast, 3 h time resolution fields are used for the first three days while 6 h time resolution fields are used for the remaining 7 days. In particular, the atmospheric fields used are: zonal and meridional components of 10 m wind (ms-1), total cloud cover (%)



Marine
Monitoring

CMEMS : ocean current forecast

How to download data

- Use case : get information about **currents** in the area of Gibraltar for the next 5 days :
 - download of data
 - visualization of data using Panoply

ONLINE CATALOGUE

CATALOGUE PDF FIRST VISIT? MY CART LOGOUT

ATLANTIC-IBERIAN BISCAY IRISH-OCEAN PHYSICS ANALYSIS AND FORECAST

Metadata provided by CMEMS
Credits: E.U. Copernicus Marine Service Information

BACK TO SEARCH

ADD TO CART

VIEW PRODUCT

DOWNLOAD PRODUCT

INFORMATION DOCUMENTATION SERVICES

PRODUCT IDENTIFIER: IBI_ANALYSIS_FORECAST_PHY5_005_001_h

OVERVIEW

The operational IBI (Iberian Biscay Irish) Ocean Analysis and Forecasting system, daily run by Puertos del Estado provides a 5-day hydrodynamic forecast including high frequency processes of paramount importance to characteristic regional scale marine processes (i.e. tidal forcing, surges and high frequency atmospheric forcing, fresh water river discharge, etc.). A weekly update of IBI downscaled analysis is also delivered as historic IBI best estimates. The system is based on a (tidy-resolving) NEMO model application run at 1/30° horizontal resolution.

FULL OVERVIEW

VARIABLES

- eastward_sea_water_velocity
- northward_sea_water_velocity
- sea_surface_height_above_sea_level
- sea_water_potential_temperature
- sea_water_salinity

GEOGRAPHICAL COVERAGE: 56 AREA: Iberian-biscay-irish-seas

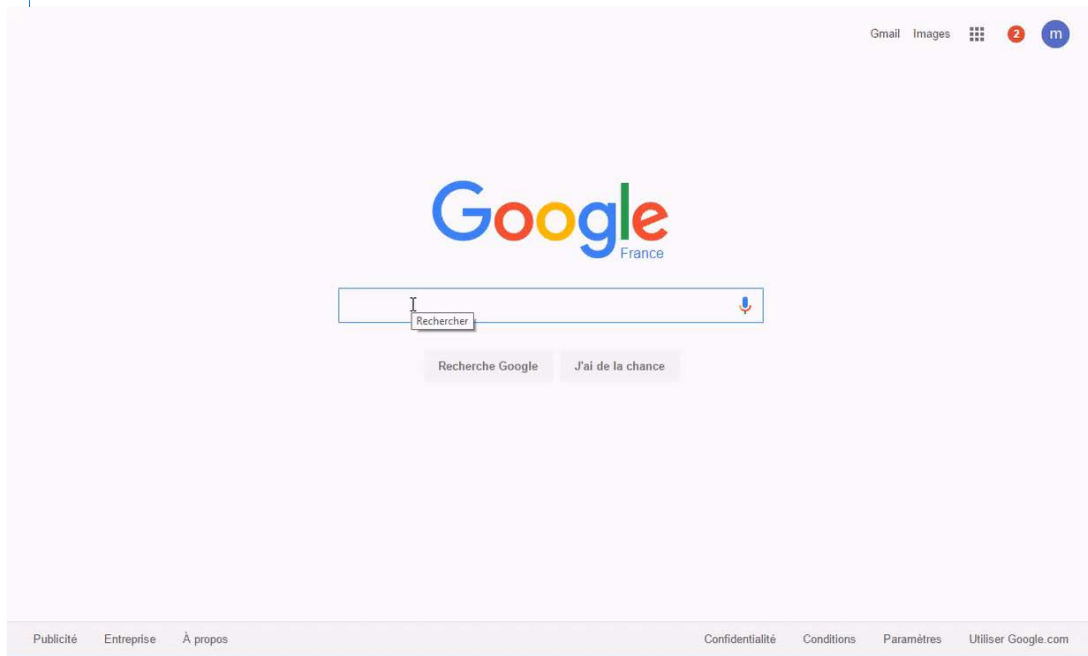
Partners by the European Union Copernicus

ABOUT US PARTNERS & STAKEHOLDERS BENEFITS

ANY QUESTIONS? Get help from the Service Desk



- Download Panoply free software for visualization of NetCDF files





Marine
Monitoring

USE CASE: INDUSTRIAL SHIP ROUTING TO SAVE FUEL & REDUCE CO2 EMISSIONS

- **WHO** : The CMA CGM, leading worldwide container shipping group
- **WHERE** : All around the world
- **WHY** : 1). Adaptation of the course and the speed of the ship to arrived at the desired time in the port
2). Reduction in fuel consumption
3). Reduction of cost
4). Reduction of carbon footprint



CMEMS products in use :

CMEMS Analysis and Forecast models (7-days forecast updated daily).
=> Provides ocean current information relevant to ship routing in the ocean.





USE CASE: SUPPORTING SHIP ROUTING IN THE BLACK SEA

- **WHO** : "Dunarea de Jos" University of Galati, Romania.
- **WHERE** : Black Sea.
- **WHY** : To improve the knowledge of the areas that are the most affected by extreme events

CMEMS product in use :
CMEMS satellite significant wave height product in the Black Sea.

