

COPERNICUS MARINE SERVICE FOR ENERGY INDUSTRY



Marine Monitoring

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C O P E R N I C U S I N B R I E F



Copernicus is the European Commission's flagship Earth Observation programme that freely provides governments, scientists and industry with Earth data and information to make better, evidence-based decisions.

It provides **full, free and open data**.



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M E R C A T O R O C E A N d e l i v e r s C O P E R N I C U S M A R I N E



**MERCATOR
OCEAN**
INTERNATIONAL

Mercator Ocean
is delivering a key part
of the programme, the
Copernicus Marine
Service (CMEMS)



<https://marine.copernicus.eu>



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MERCATOR OCEAN/OEE PARTNERSHIP

- Ocean Energy Europe



**A leader Trade Association
for Renewable Marine Energy**
<https://www.oceanenergy-europe.eu>

Mercator Ocean & Copernicus Marine Service



Copernicus
Marine Service



**MERCATOR
OCEAN**
INTERNATIONAL

Free Oceanic Data provider
<https://marine.copernicus.eu>



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COPERNICUS MARINE SERVICE

<http://www.marine.copernicus.eu>



One Portal 150 FREE Ocean Products

COPERNICUS MARINE ENVIRONMENT MONITORING SERVICE
Providing PRODUCTS and SERVICES for all marine applications

ABOUT US | MARKETS & BENEFITS | NEWS | SCIENCE & MONITORING | TRAINING & EDUCATION | SERVICES PORTFOLIO

ACCESS YOUR OCEAN INFORMATION
GETTING STARTED →

OCEAN PRODUCTS
Ocean product catalogue, to download or visualize data across more than 10 variables, including historic, current and forecasted data.
DATA →

OCEAN MONITORING INDICATORS
Essential variables monitoring the health of the ocean
TRENDS →

OCEAN STATE REPORT
Extensive annual analysis on the state of the ocean over nearly 20 years and severe/notable annual events
EXPERTISE →

ACCESS TO DATA & INFORMATION

Free and open access
to worldwide Ocean information
marine.copernicus.eu

• SEARCH & BROWSE	• DISCOVER & VISUALISE	• REGISTER
• DOWNLOAD	• COMPUTE	• JOIN UP



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Copernicus
Europe's eyes on Earth

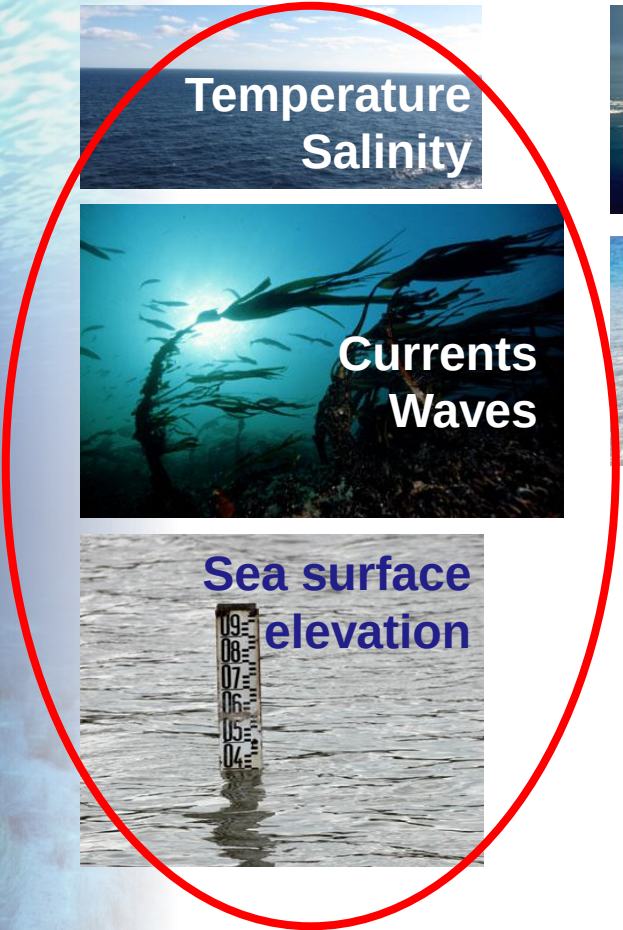
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WHICH PRODUCTS? + 15 OCEAN PARAMETERS



Temperature
Salinity

Currents
Waves

Sea surface
elevation

Sea ice

Transparency
Turbidity

Nutrients

Oxygen

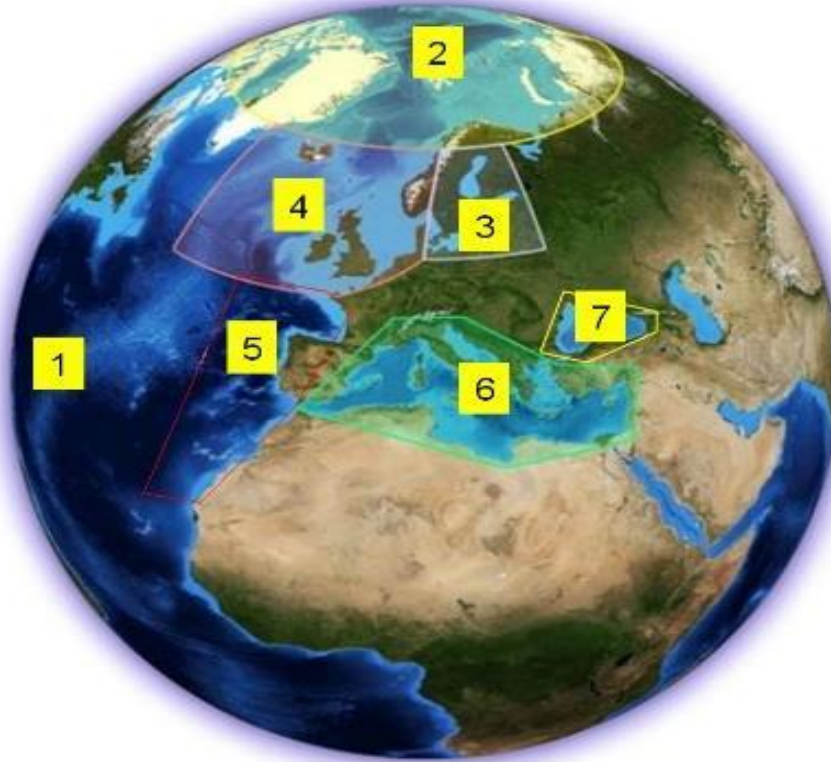
Plankton

Primary
production



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GLOBAL OCEAN AND EUROPEAN REGIONAL SEAS



- 1. Global
- 2. Arctic
- 3. Baltic
- 4. NWS
- 5. IBI
- 6. Med Sea
- 7. Black Sea



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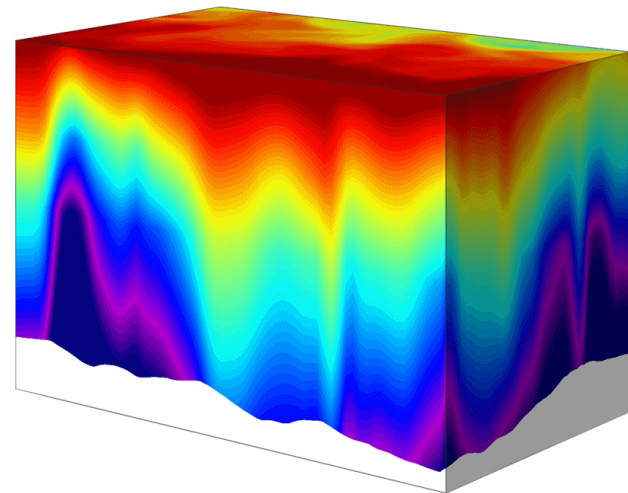
DATA FROM 3 SOURCES



**SATELLITE
OBSERVATION**



**IN SITU
OBSERVATION**



**OCEAN MODEL
COMPUTATION**



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WHERE CAN CMEMS HELP THE ENERGY SECTOR

1. Evaluation of the **available oceanic energy resources** (tidal, wave, heat, currents, salinity)
2. **Performance validation and technology certification**
3. Evaluation of oceanic and met-ocean conditions for **operations at sea**
4. Evaluation of the various **constraints applied on the sea-exposed material and machines**
5. **Environmental Impact Assessment** of farm (difference between before and after the farm implementation)



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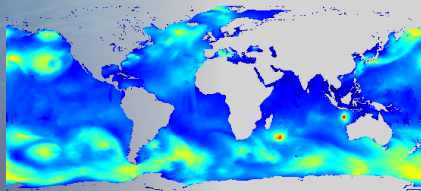




HIGH QUALITY OCEAN DATA

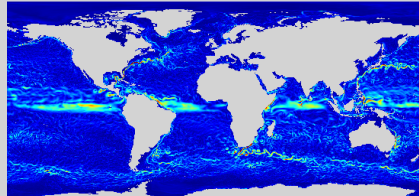
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Wave Energy



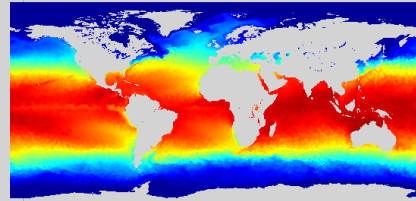
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Ocean Currents



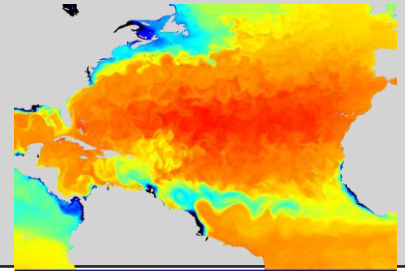
2016-01-14T12:00:00.000Z

OTEC SWAC



2018-04-07T00:20:00.000Z

Salinity Gradient



2017-09-22T12:00:00.000Z

Hourly and daily
surface ocean waves

GLO : 8km

MED: 4km

NWS: 7km

Hourly and daily 3D
ocean currents

GLO : 8km

MED: 4km

NWS: 7km

Hourly and daily 3D
ocean temperature

GLO : 8km

MED: 4km

NWS: 7km

Hourly and daily 3D
ocean salinity

GLO : 8km

MED: 4km

NWS: 7km



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OCEAN THERMAL ENERGY CONVERSION - OTEC

Ocean Thermal Energy Conversion (OTEC) exploits the difference in temperature between warm surface waters and cooler deep water.

CMEMS helps OTEC industry with:

- **OTEC Resource evaluation**
- **Securing operations at sea**
- **Assessing constraints on machines at sea**
- **Environmental impact assessment**

Example of CMEMS user



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OCEAN CURRENT ENERGY

CMEMS Ocean current products can help with:

- Ocean Currents Resource
- Securing operations at sea
- Assessing constraints

Example of CMEMS USER

NOVELTIS, contracted by ENGIE to perform met-ocean study in Med Sea wind farm offshore site.



forecast wind, wave, currents and sea level conditions for marine operations planning at BiMEP (TRL+ project).



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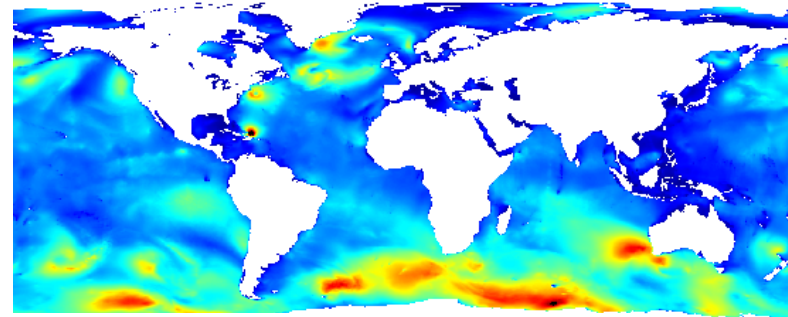
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WAVE ENERGY

Wave energy exploits wave motion to produce electricity.

CMEMS includes surface wave height and frequency from ocean models and satellite.

Example of CMEMS USER



Wave Height Evolution
during 5days in October 2017



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CONTACT US

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JOIN THE COPERNICUS MARINE SERVICE COMMUNITY



Web portal

marine.copernicus.eu

Service Desk's email

servicedesk.cmems@mercator-ocean.eu

Collaborative Forum

<http://forum.marine.copernicus.eu/>



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Linkedin CMEMS partnership Meeting place

<https://www.linkedin.com/groups/8243515>



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Tutorials on CMEMS YouTube channel

Copernicus Marine Service



<http://marine.copernicus.eu/markets/use-cases/>

<http://marine.copernicus.eu/markets/submit-your-use-case/>



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