



# Copernicus Maritime Surveillance Service

Earth Observation Services  
Unit 2.2 Surveillance

15 de octubre de 2024



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## European Maritime Safety Agency

- Regulatory Agency of the European Union, ensuring a high, uniform and effective level of:
- **Maritime safety**
- **Security**
- **Prevention and response** to marine pollution caused by ships, oil and gas installations

Technical and operational support to **EFTA** countries, **EU Member States** and **Commission**

Cooperation with **Frontex** and **EFCA** in support of authorities implementing Coast Guard functions



EFCA



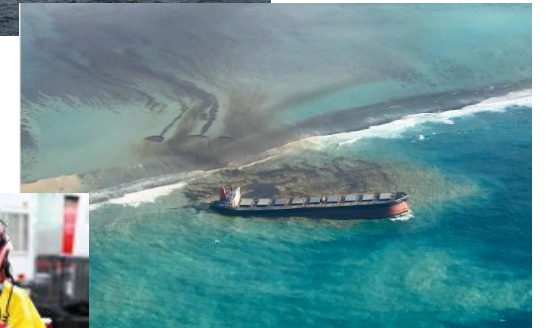
Frontex



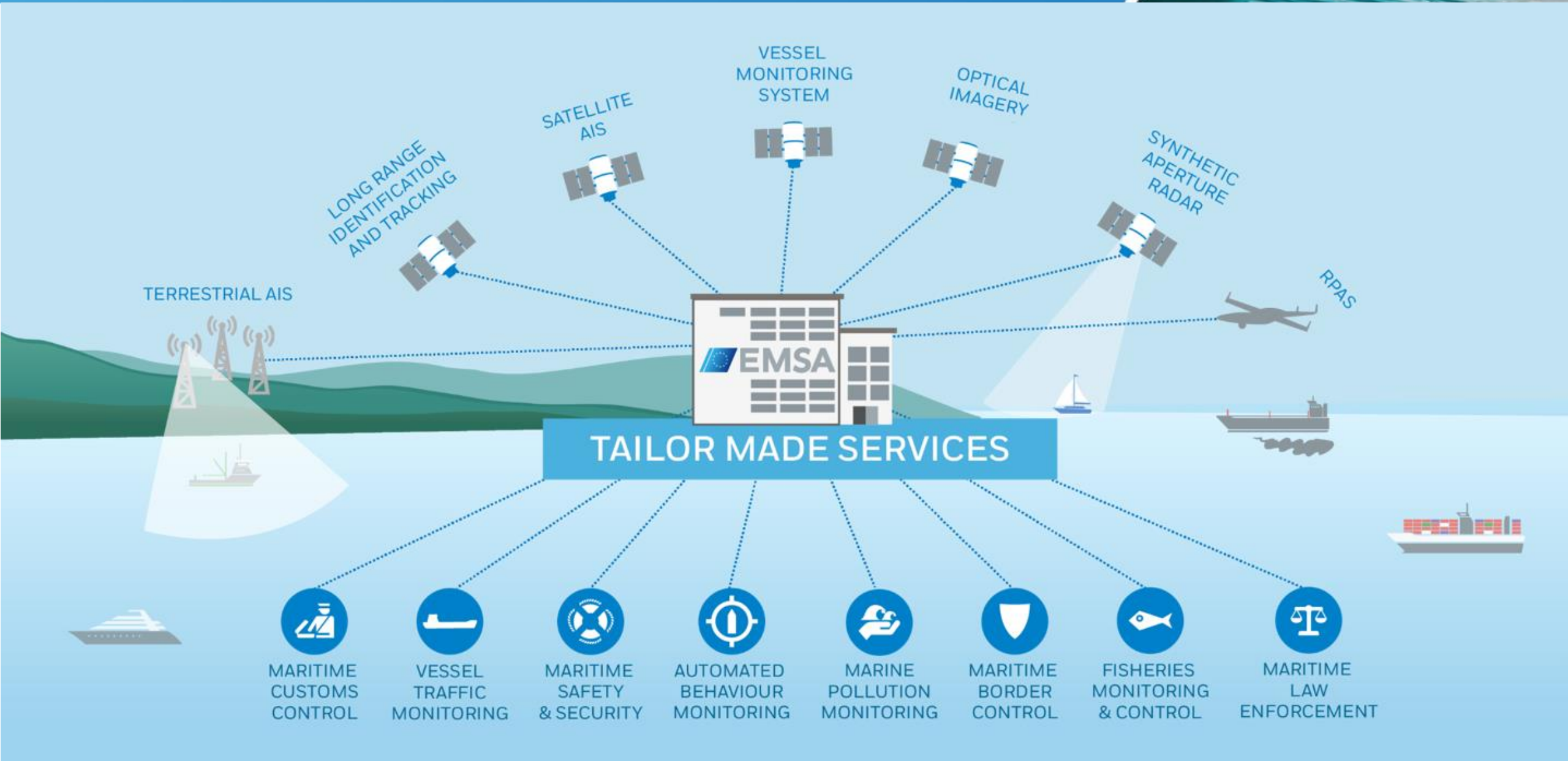
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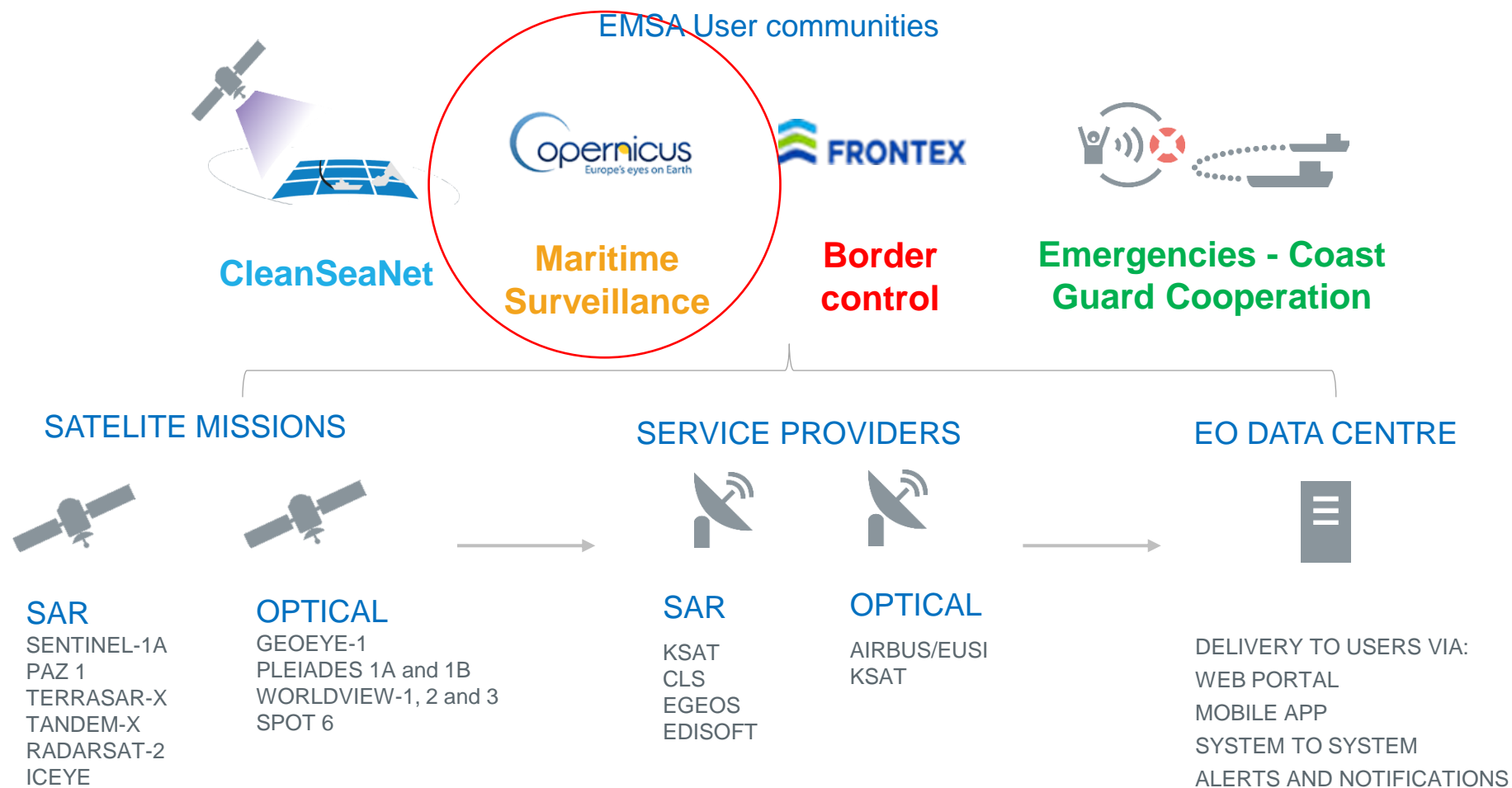
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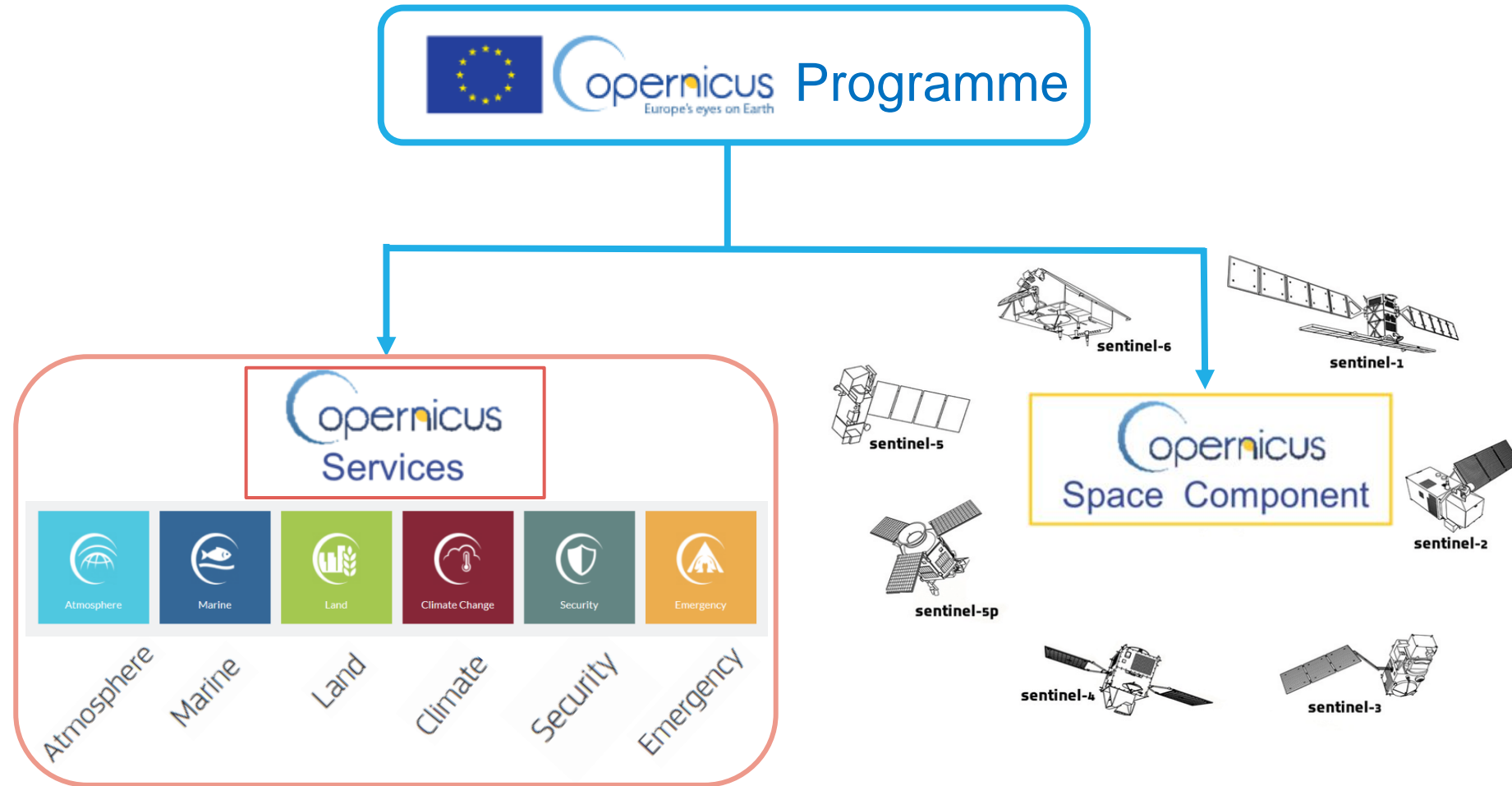
# EMSA's Integrated Maritime Services



## EMSA Earth Observation services



# Copernicus – main components



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# Copernicus Service Component

All services are free of charge to the users

-  Land Monitoring
-  Marine Environment Monitoring
-  Atmosphere Monitoring
-  Emergency Management
-  Climate Change

**Full and open access**  
data accessible to all;  
mostly available online

 Security

Border Surveillance



External Action



Maritime Surveillance



**Restricted access**  
specific conditions;  
delivered directly and  
securely to user



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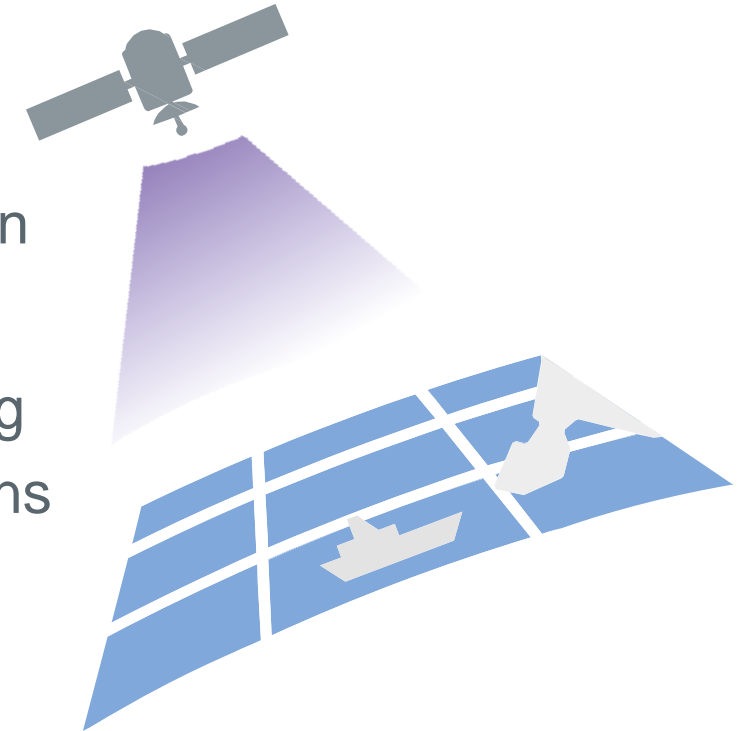


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## What does the Copernicus Maritime Surveillance (CMS) service provide?

- Provides EO images and value-added services in QRT to support end-user's maritime operations by monitoring human activity at sea
- Provides a comprehensive maritime surface picture assisting end-user's decision-making processes in everyday operations
  - EU programme managed by EU COM
  - EMSA is the entrusted entity to implement the Maritime Surveillance activity, under Copernicus Security Service

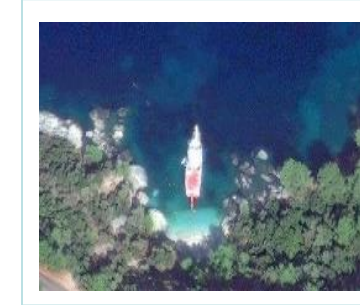
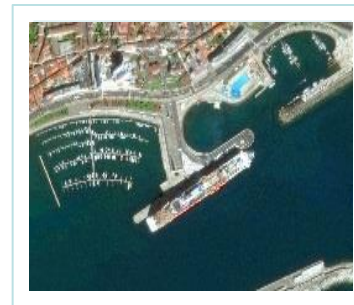
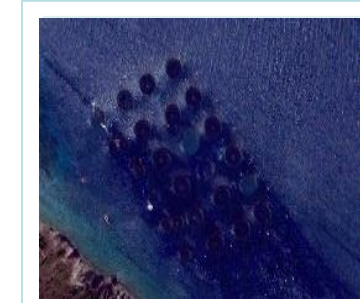


# Copernicus Maritime Surveillance - overview

## 7 Function areas

- Maritime Safety
- Maritime Security
- Fisheries Control
- Law Enforcement
- Customs
- Marine Pollution Monitoring
- International Cooperation

Global coverage of areas of European interest



**Maritime  
Surveillance**



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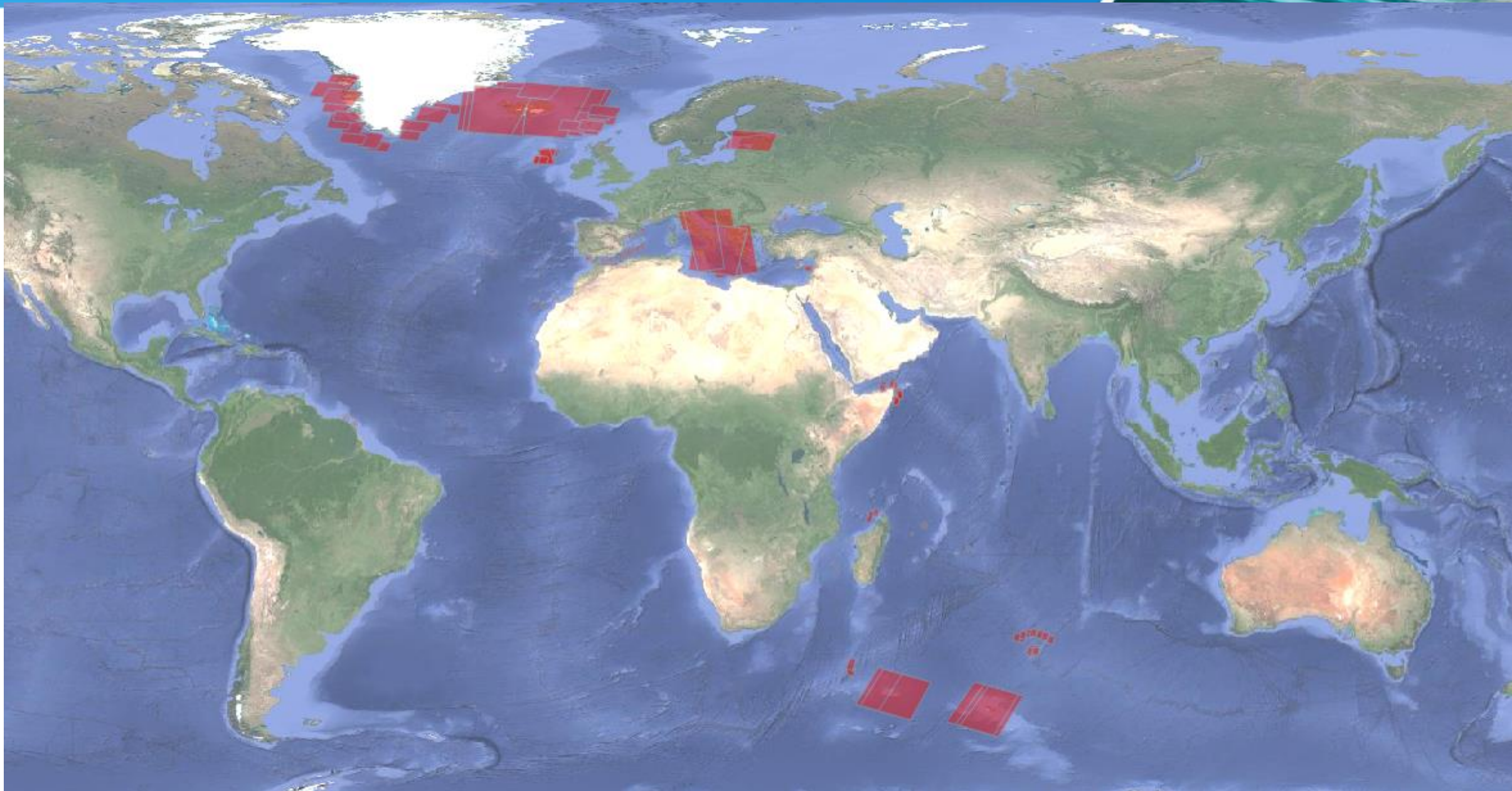


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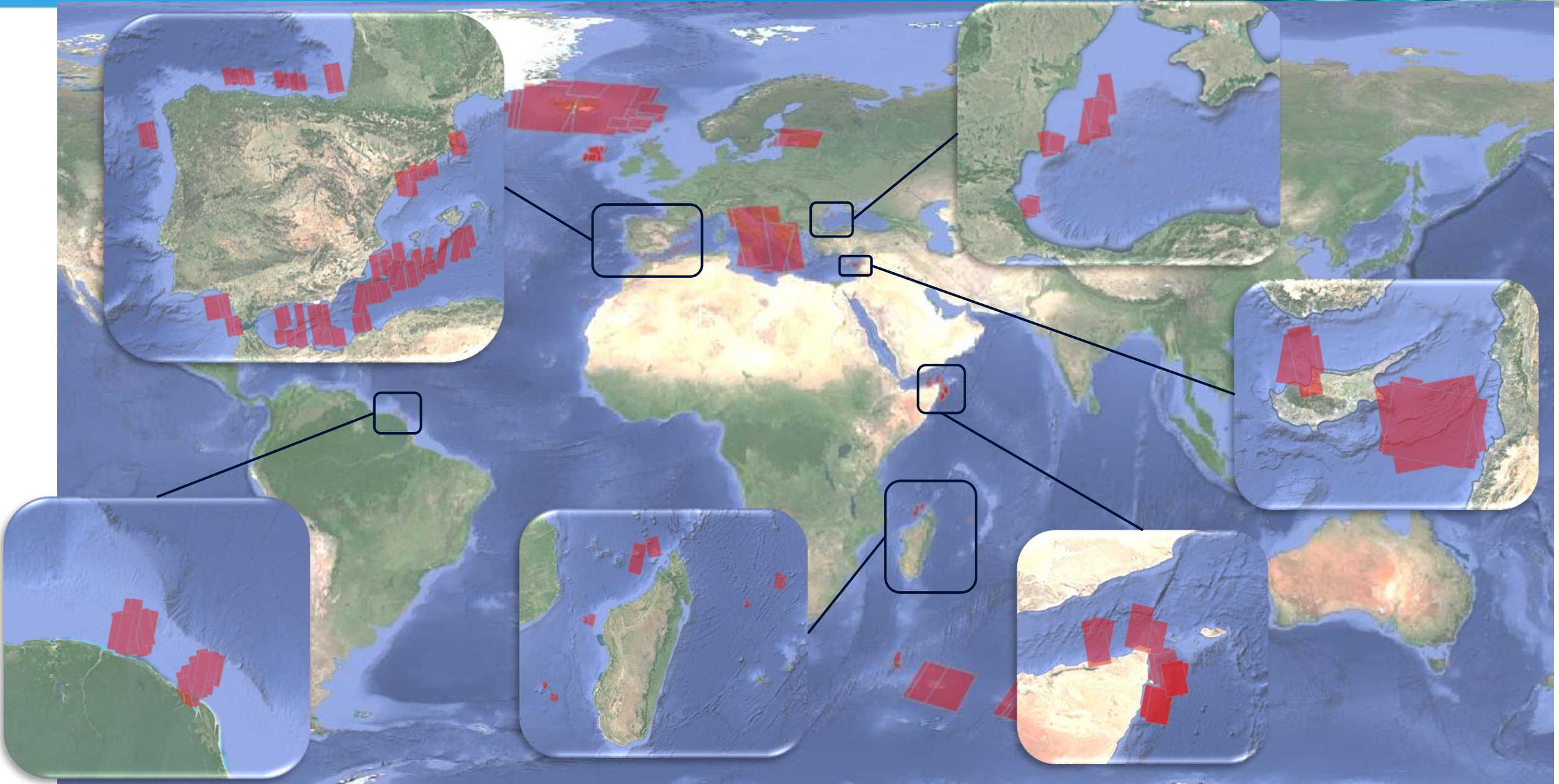




# Copernicus Maritime Surveillance – global coverage



# Copernicus Maritime Surveillance – global coverage



# Copernicus Maritime Surveillance – User Community

- National authorities of the EU member states or EFTA countries with responsibilities at sea
- EU institutions or bodies
- International organizations, if authorised by DG-DEFIS and EEAS



**Maritime  
Surveillance**



DG-DEFIS – Directorate-General for Defence Industry and Space

EFTA – European Free Trade Association

EEAS – European Union External Action Service



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## Key facts about CMS

- **Global** coverage
- **74** registered organisations
- Access to a wider range of SAR and optical missions
- **344 million km2** monitored\*
- **6713** image products delivered\*
- **20 minutes** after satellite acquisition information is delivered to the CMS users via secured web interface



\* Statistics for year 2023

# Earth Observation Products – Satellite Images



## SAR DATA

QUASI REAL TIME\* DELIVERY (20') TO USERS



Barcelona, Spain - TSX ST © DLR e.V. 2019, Distribution Airbus Defence and Space GmbH

## OPTICAL DATA

QUASI REAL TIME\* DELIVERY (30') TO USERS



Ponta Delgada - Azores, Portugal - WV2 © 2018 European Space Imaging/DigitalGlobe, a MAXAR company



(\*) Depending on acquisition size and value added products



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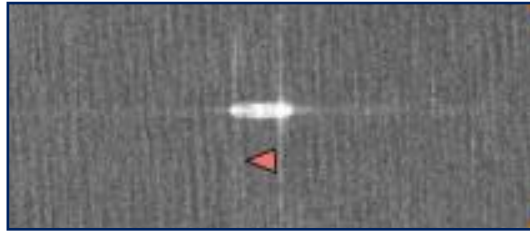


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## Value-added products

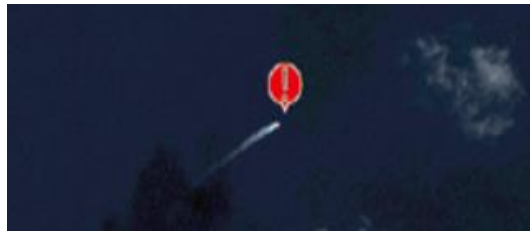
Vessel detection



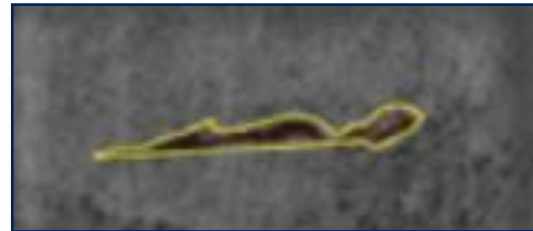
Feature detection



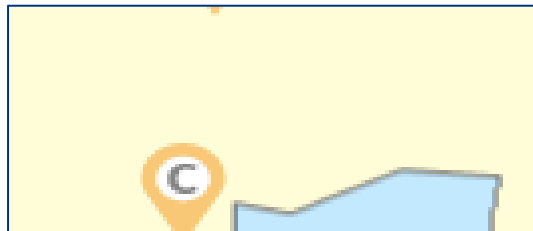
Activity detection



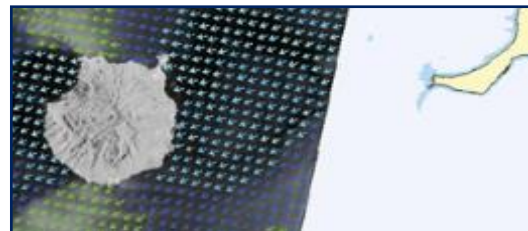
Oil spill detection



Change detection



Wind and wave

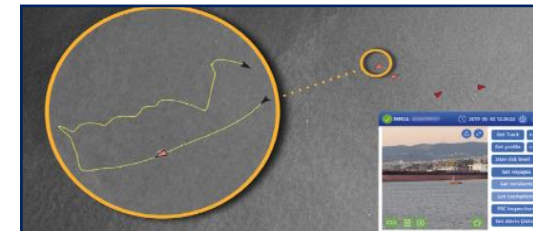


## Fusion products

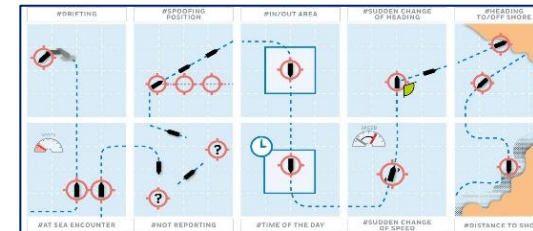
Oil spill notifications



Correlation with vessel reporting information

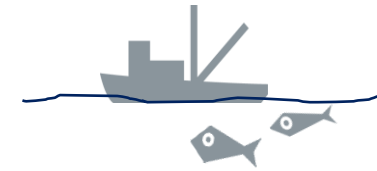


Automated Behaviour Monitoring

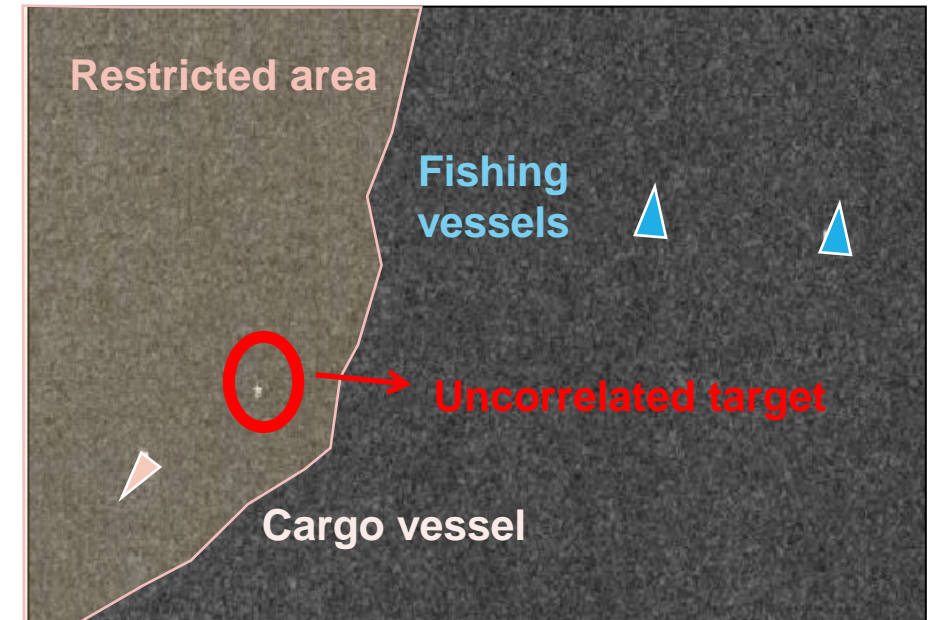


## Support Fisheries Control activities

- Monitoring of fishing grounds
- Monitoring of fish cages / farms
- Monitoring of fishing ports
- Monitoring of restricted fishing areas
- Monitoring of towing operations
- Detection of vessel of interest

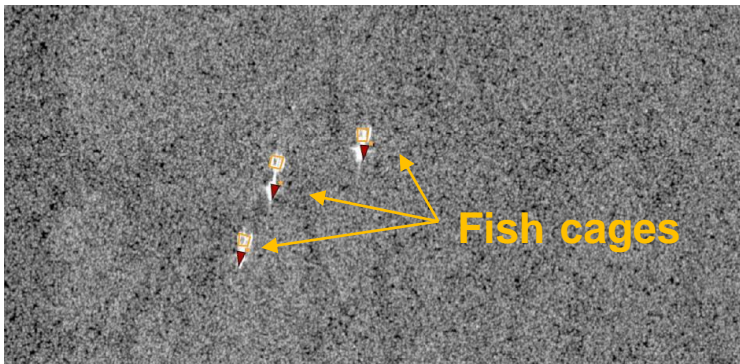


## Monitoring restricted areas



RADARSAT-2 Data and Products: © MDA Geospatial Services Inc. 2015]- All Rights Reserved" and "RADARSAT is an official mark of the Canadian Space Agency"

## Vessel towing fish cages



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# Copernicus Maritime Surveillance - Fisheries Control





## CMS Maritime Security – main functions:

- Support to maritime security
- Support to the protection of critical infrastructures
- Persistent monitoring of coastal and littoral remote regions
- Monitoring for security of European vessels and European interests
- Early warning/identification of suspicious or threatening activities
- Support to enforcement operations
- Support to naval exercises for capacity building purposes



# Copernicus Maritime Surveillance – Maritime Security



Port activities

Vessel of interest

Rendez- vous at sea

# Use case – Spanish Customs



Copernicus Maritime Surveillance: Spanish customs



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# CMS catalogue and use cases

## More info

- Copernicus Maritime Surveillance (CMS): <http://www.emsa.europa.eu/copernicus.html>
- [CMS - Product Catalogue](#)
- [CMS Use cases](#)

**COPERNICUS MARITIME SURVEILLANCE MARITIME SAFETY**

**USE CASE**

**JRC CYPRUS - SEARCH AND RESCUE**

The Joint Rescue Coordination Centre (JRCC) Larnaca (Cyprus) uses Copernicus Maritime Surveillance (CMS) products to enhance safety of life at sea focusing on some of the most high-risk areas of its search and rescue region, characterized by very heavy maritime traffic and transport of people and goods.

CMS products support operations in a variety of scenarios, by helping them to detect and identify vessels of interest, results not reporting their whereabouts, ship positions or track timing events.

On 31 March 2022, CMS monitoring allowed JRCC to confirm the presence of several dark vessels and processed the surveillance over the search area of the Republic of Cyprus.

One of the dark vessels was detected in the north off the Cyprus Eastern coast (Cyprus Coast) with a speed of 10 knots. The vessel was successfully rescued.

**COPERNICUS MARITIME SURVEILLANCE CUSTOMS ACTIVITIES**

**USE CASE**

**SPANISH CUSTOMS - DRUG SMUGGLING**

The Spanish Customs regularly place service requests to Copernicus Maritime Surveillance (CMS) service with the aim of performing maritime surveillance of transported goods, provide law enforcement in cases of detected illegal activity and gather intelligence data.

In December 2020, the Spanish authorities launched the operation 'Super' focusing on a suspected drug smuggling along the coast of Moroccan Sahara. The Spanish Customs service short notice requesting CMS to provide support for the operation, using optical services.

The optical satellite imagery and vessel detection service allowed the visual identification of the transponder of a ship with a fishing boat, which enabled the duty officers to subsequently detect the suspected vessels. The operation was successfully concluded through the seizure of 134 tons of fish, and the arrest of 4 people.

The CMS service reinforces the Spanish Customs capacity to detect and intervene in suspected criminal activities, and to create an intelligence product.

**COPERNICUS MARITIME SURVEILLANCE LAW ENFORCEMENT**

**USE CASE**

**GERMAN WATERWAYS POLICE - SUPPORT TO INVESTIGATIONS ON ILEGAL SHIP BREAK**

German Waterways Police (DWA) acts as the law enforcement body of the Joint Emergency Reporting and Command Centre for the Sea, which forms part of the law Safety and Security Centre of the German Federal network and the Coastal States.

In April 2022, an investigation was conducted by an EU Member State (as an incident), a cruise ship left an EU port stopped transmitting its AIS signal. DWA's onboard investigation related to potential violations of EU's fishing gearing vessel alignments (DWA/2022) and targeting (DWA/2022).

In an investigation ship data (name, flag, MMSI number, IMO number) and using CMS optical products and the vessel traffic data, DWA's vessel traffic data revealed the vessel's course (its initial departure point within the EU to the sea area where (DWA/2022), approximately 100 nautical miles in a ship's heading search, where it stopped transmitting its AIS signal.

The ship was located for further investigation in the area of the DWA's jurisdiction.

The ship was changed to a different vessel name after the investigation.

**COPERNICUS MARITIME SURVEILLANCE MARITIME SECURITY**

**USE CASE**

**EUNAVFOR ATALANTA - PIRACY AND ARMED ROBBERY**

EUNAVFOR ATALANTA plays a vital role in the European Union's (EU) Common Security and Defence Policy & the EU's Naval Force for the Indian Pacific. Since 2008, it is supporting the Coastal States in a combined effort for peace, stability and maritime security.

EU's Earth Observation services are used by EUNAVFOR ATALANTA for routine services requested to ensure freedom of navigation and protect vessels of the World Food Programme (WFP) and other vulnerable shipping. It also contributes to detect and identify activities related to illegal, unreported and unregulated fishing vessels.

Products from the Copernicus Maritime Surveillance satellite serve as a crucial resource for EUNAVFOR ATALANTA, helping it to accumulate valuable data about its areas of interest. As a result, there has been a significant increase in requests for Earth Observation images.

CMS optical images and the vessel detection service (VDS) support EUNAVFOR in detecting vessels and activities of interest in their area of operation.

**COPERNICUS MARITIME SURVEILLANCE PRODUCT CATALOGUE**

European Maritime Safety Agency

**COPERNICUS MARITIME SURVEILLANCE PRODUCT CATALOGUE**

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Copernicus Europe's eyes on Earth


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¡Gracias!

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