European Maritime Safety Agency

Earth Observations services

European Maritime Safety Agency: Leveraging Earth Observation Services to Support the Combat Against Environmental Crime

Unit 2.2 Surveillance

Earth Observation Services

ESRIN/ 11 June 2024

EMSA: EU's eyes on the sea

EMSA EO services

EMSA User communities

CleanSeaNet

Maritime Surveillance

Border control

Emergencies - Coast Guard Cooperation

SATELITE MISSIONS

SAR
SENTINEL-1A
PAZ 1
TERRASAR-X
TANDEM-X
RADARSAT-2
ICEYE

OPTICAL
GEOEYE-1
PLEIADES 1A and 1B
WORLDVIEW-1, 2 and 3
SPOT 6
SENTINEL-2

SERVICE PROVIDERS

SAR
KSAT
CLS
EGEOS
EDISOFT

OPTICAL
AIRBUS/EUSI
KSAT
EDISOFT

EO DATA CENTRE

DELIVERY TO USERS VIA:
WEB PORTAL
MOBILE APP
SYSTEM TO SYSTEM
ALERTS AND NOTIFICATIONS

CleanSeaNet
Detecting Marine Pollution from Space

16 April 2007
The service became operational

CleanSeaNet is the European satellite-based oil spill monitoring and vessel detection service. It analyses images, mainly from synthetic aperture radar (SAR) but also from optical missions, to:

- detect possible oil on the sea surface, including illegal discharges of mineral oil
- identify potential polluters, and
- monitor the spread of oil during maritime emergencies.

The service was developed and is operated by EMSA, and is available to all EU member states, EFTA/EEA member states , candidate countries and ENP participating countries

CleanSeaNet
Key Facts and Figures 2023

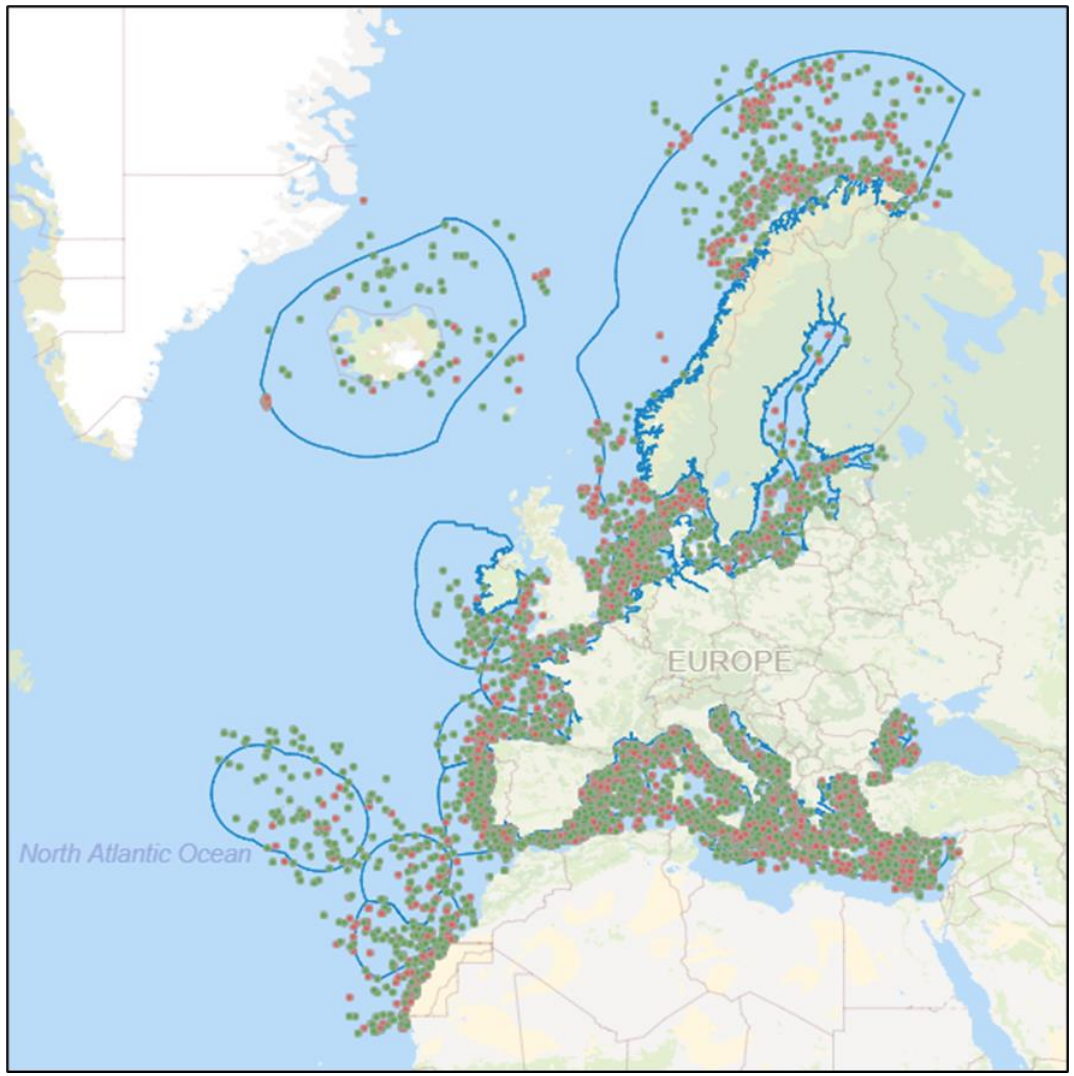
1183 MILLION KM² MONITORED IN QRT/NRT

7067 SAR IMAGES

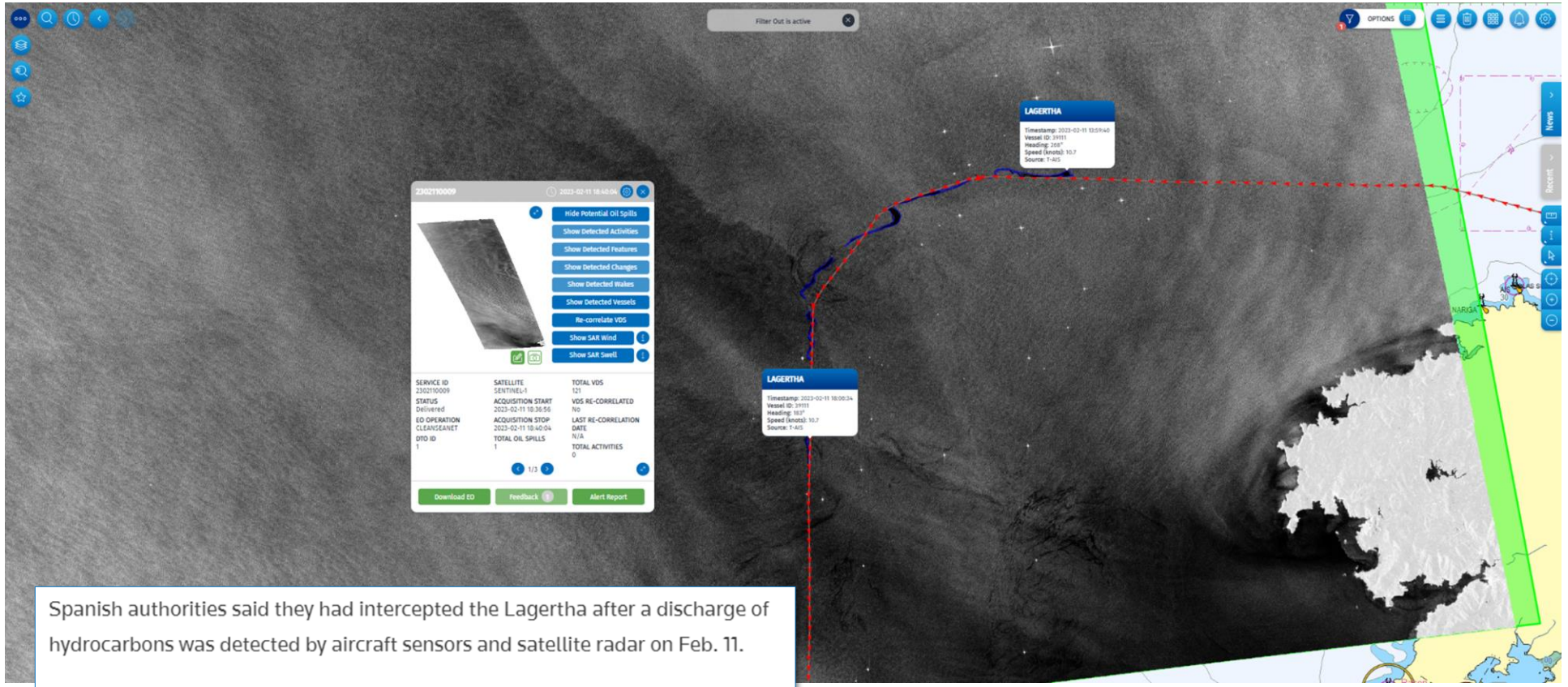
7513 POSSIBLE OIL SPILLS DETECTED

(APPROX. 6 SPILLS PER MILLION KM² MONITORED)

Distribution of possible oil spills detections within the alert areas of EU coastal States, Iceland, Norway, Turkey and Montenegro.



CleanSeaNet
Use Case – Illegal Discharge of mineral oil



Spanish authorities said they had intercepted the Lagertha after a discharge of hydrocarbons was detected by aircraft sensors and satellite radar on Feb. 11.

"The slick, in the stern area of the vessel, extended over an area of 12.7 square kilometres," Spain's Merchant fleet, a transport ministry department, said on Tuesday in a statement.

It said the vessel was being detained until the owners paid bail of 100,000 euros ($106,680), adding that on the basis of the evidence, authorities will begin disciplinary proceedings.

CleanSeaNet
Use Case – Illegal Discharge of mineral oil

EMSA
European Maritime Safety Agency

CleanSeaNet Alert Report

SPAIN

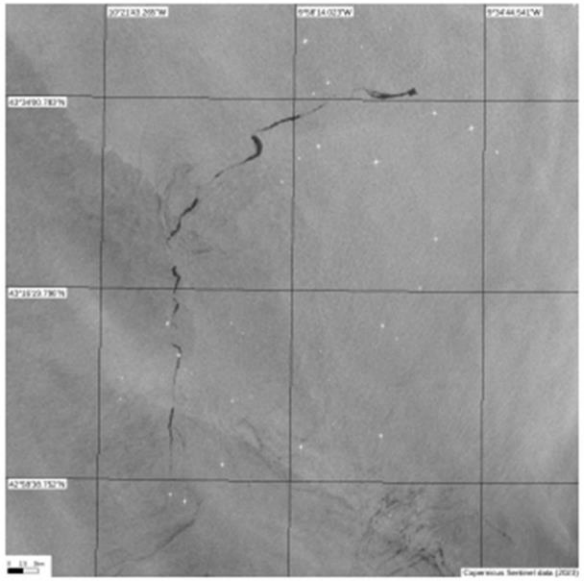
Acquisition Start Time: **2023-02-11 18:37:02 UTC**

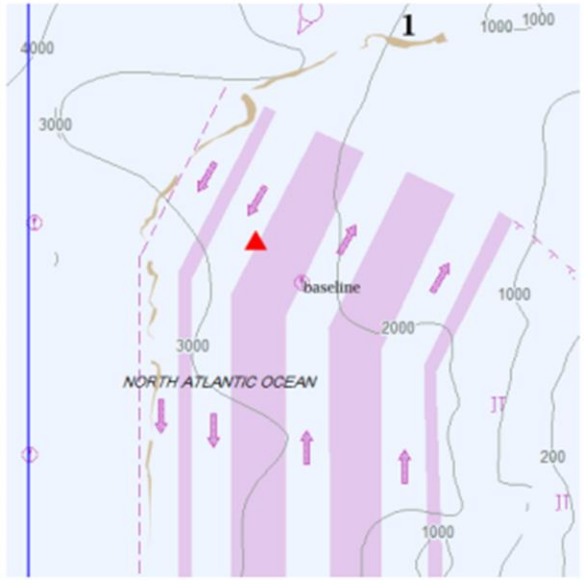
Service Identifier: **2302110009** **SENTINEL-1 - CSAR - IWS**

List of Spills | GIS Viewer

Details of possible Spill n°1 - OS_2302110009_1

Centre Position		SAR Wind at Center		Area	Length	Width	Class	Alert Level	Number of slicks	Oilspill Warning Issued
Latitude	Longitude	Direction (From)	Speed (m/s)	(km²)	(km)	(km)	(A/B)			
[redacted]	[redacted]	57.00	4.04	33.47	82.31	3.38	A	Red	7	NO





Meteorological and Ocean Data			
Sea State	N/A	Wave Height (m)	N/A
Met.Wind	Direction (from)		56
	Speed (m/s)		3.4
Current	Direction (from)		N/A
	Speed (m/s)		N/A

Note: Grey fields are parameters set as "invisible" in the Print Parameters matrix or not available

Comments from Service Provider

Possible source information

N.	Detected	Dist.(Km)	Identified	Type	IMO	Name	MMSI	C/S	Latitude	Longitude	Time (UTC)	Track
1	Yes	0	Yes	VESSEL	N/A	N/A	[redacted]	N/A	[redacted]	[redacted]	18:40:04Z	Yes

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CleanSeaNet
Next Service Developments

Oil Spill Volume (OSV) and Thickness estimation based on Sentinel-2 through a multispectral data analysis

- OSV Product report to include:
  - Oil Spill Volume and Thickness estimation report
  - Thickness Geographical layers
- Timeliness: up to 8 hours after Acquisition (due to the time delay in terms of Sentinel-2 image availability)

1 **Fitness for purpose**
Add Value for users' community

2 **Preliminary Market Consultation**

3 **Public Procurement**
Awarded end of 2023

4 **Deployment into operations**
Started June 2024

Copernicus Sentinel-2B over Red Sea oil spill
@ Copernicus Sentinel data 2019

EMSA: EU's eyes on the sea

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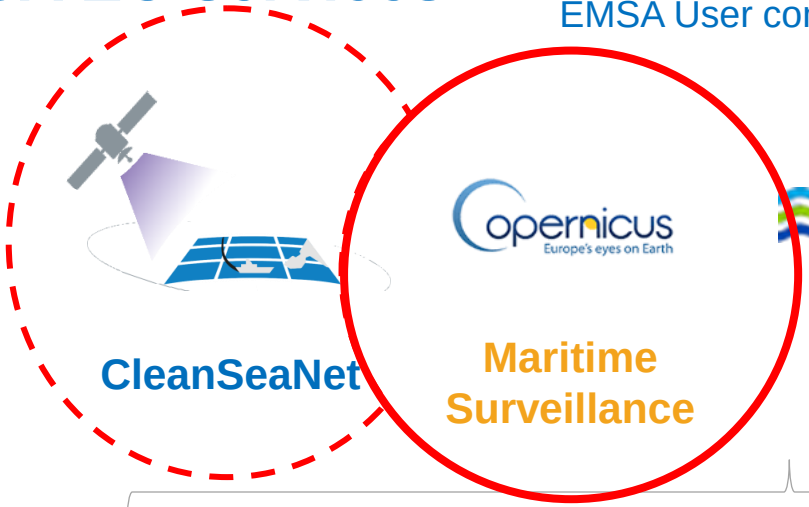

CleanSeaNet

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Marine pollution monitoring

CMS contributes to the protection and preservation of the environment, a key pillar of the EU's Arctic policy, with support being provided to Danish authorities (JACO) with dedicated monitoring over Greenland waters.

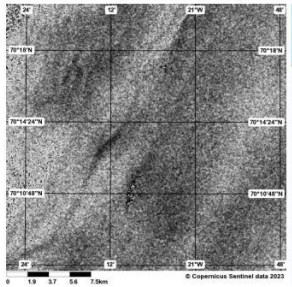
The area monitored in the arctic is, with over 2 million square kilometres in total and a coastline that's more than 44 thousand kilometres long. The ecosystem in the region is extremely vulnerable to pollution with significant environmental risks in what concerns impacts to the marine environment.

CMS provides quasi-real-time images and added value products allowing Danish authorities to swiftly monitor and assess any potential pollution incidents in the area.

Moreover, Greenland – and the Arctic as a whole – is experiencing increased ship traffic. This presents challenges for safety of navigation and search and rescue activities. EO products provided by CMS to governmental authorities bring significant value to operations, optimize surveillance efforts and leverage **EU's commitment for a peaceful, sustainable, and prosperous Arctic.**

Details of possible Spill n°1 - OS_2309160000_1

Centre Position		SAR Wind at Center		Area	Length	Width	Class	Alert Level	Number of slicks	Oilspill Warning Issued
Latitude	Longitude	Direction (From)	Speed (m/s)	(km²)	(km)	(km)	(A/B)			
70° 13' 39" N	021° 06' 47" W	N/A	N/A	1.72	13.96	1.13	A	Green	2	NO



Meteorological and Ocean Data			
Sea State	N/A	Wave Height (m)	N/A
Met.Wind		Direction (from)	188
		Speed (m/s)	3.1
Current		Direction (from)	N/A
		Speed (m/s)	N/A

Note: Grey fields are parameters set as "invisible" in the Print Parameters matrix or not available

Comments from Service Provider

Possible source information

N.	Detected	Dist.(Km)	Identified	Type	IMO	Name	MMSI	C/S	Latitude	Longitude	Time (UTC)	Track
1	Yes	34.988762	Yes	VESSEL	[redacted]				69° 51' 46" N	021° 25' 31" W	08:05:41.274Z	Yes

CMS Monitoring of Marine Protected Areas

Since 2017, CMS service supports monitoring of Marine Protected Areas (MPAs) in Azores.

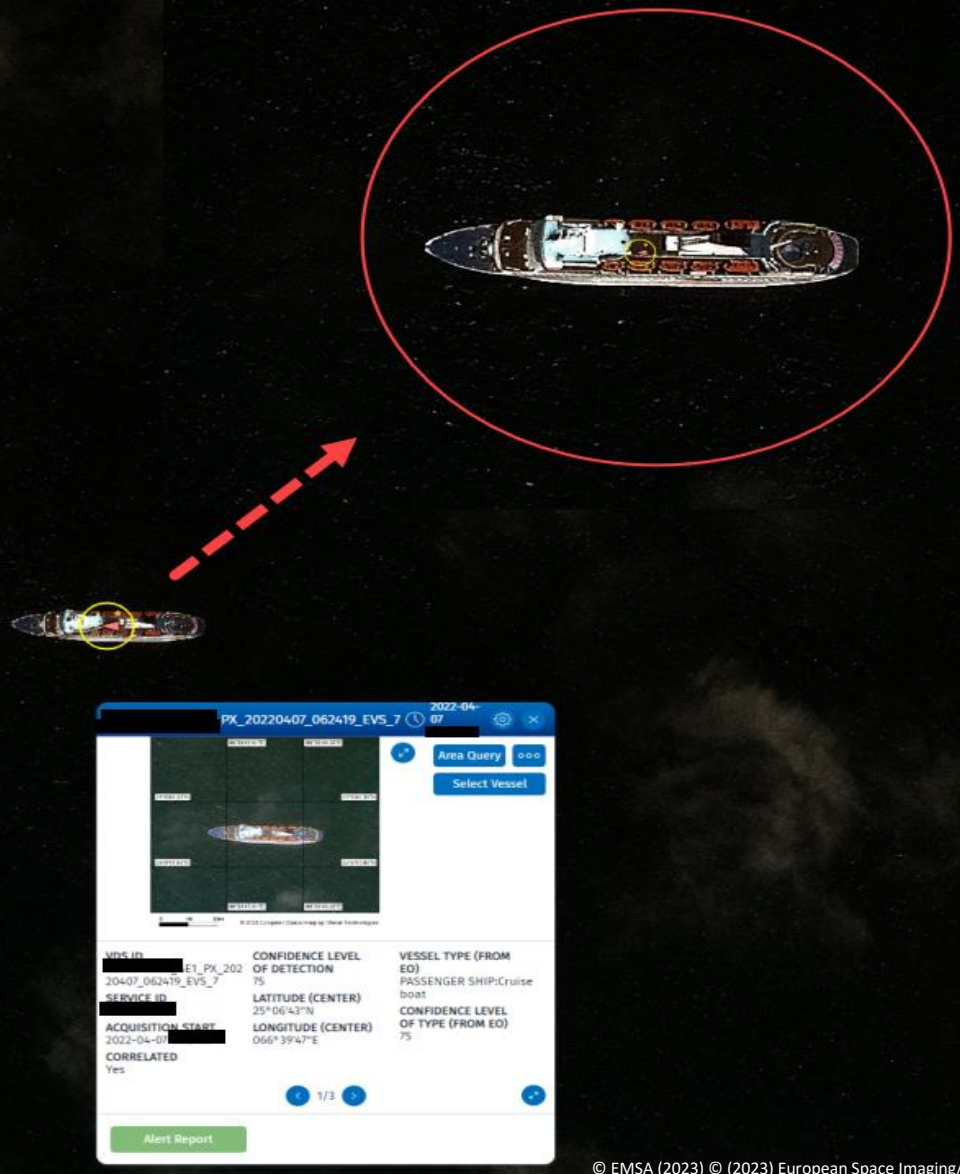
With SAR satellite images delivered in quasi-real time, non-reporting vessels are detected that are further investigated to assess their potential involvement in illegal activities.

CMS: Illegal Shipbreaking

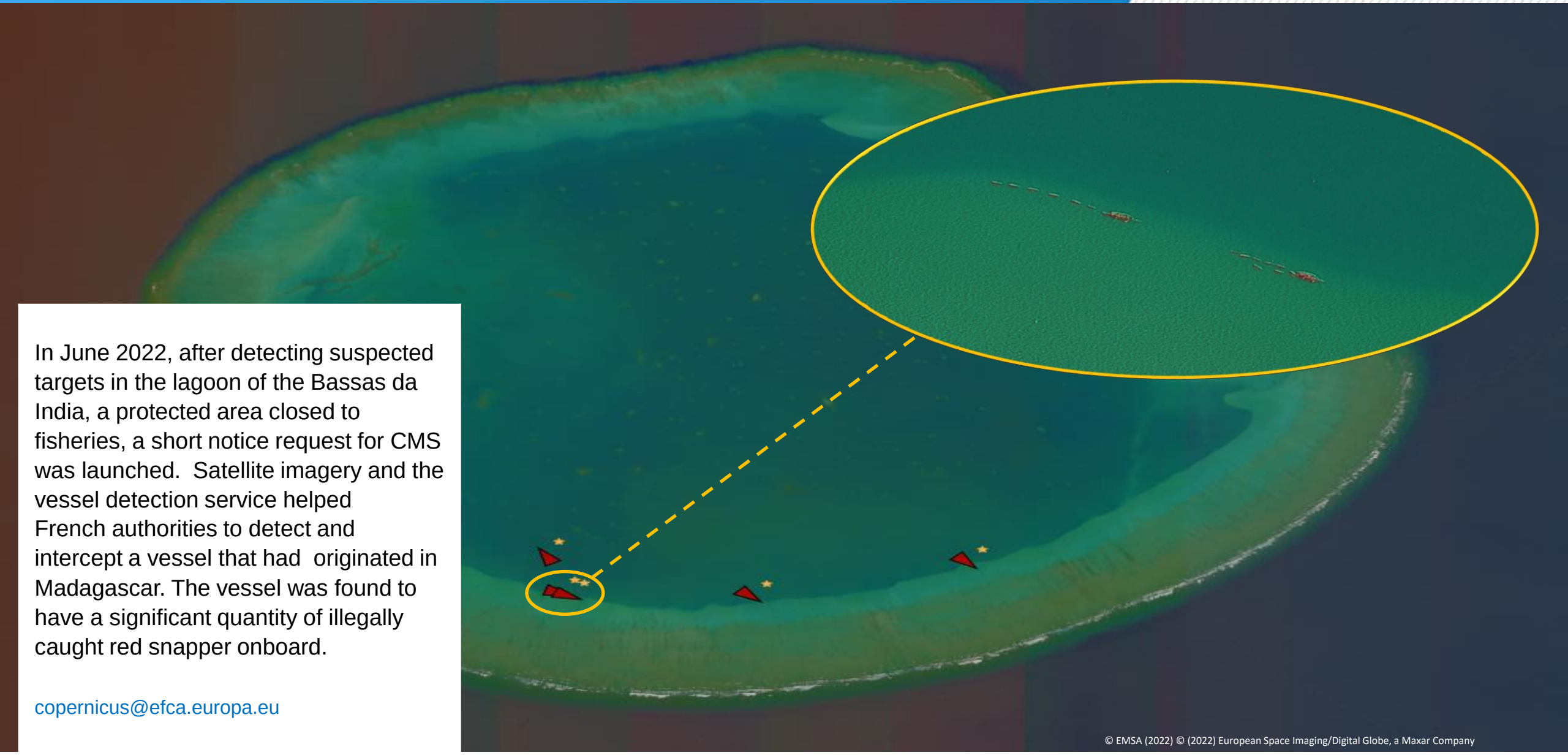
Investigation over a suspicion of shipbreaking of a cruise ship, near the beach of Gadani (Pakistan).

Support to the German Waterways Police in March 2022, to track the ship since it left the port of Limassol (Cyprus) and stopped transmitting AIS signal, changing ship data.

Optical CMS satellite images covered the area between the last transmitted AIS by the vessel and the shore (Gadani). The ship was detected and identified, allowing for a criminal investigation and procedure, to be conducted.



CMS: Fisheries control



In June 2022, after detecting suspected targets in the lagoon of the Bassas da India, a protected area closed to fisheries, a short notice request for CMS was launched. Satellite imagery and the vessel detection service helped French authorities to detect and intercept a vessel that had originated in Madagascar. The vessel was found to have a significant quantity of illegally caught red snapper onboard.

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