

SATELLITE-BASED MARITIME SURVEILLANCE SERVICES IN EUROPE

Since its creation, the operational VIGISAT centre has kept reinventing maritime surveillance by satellite.

The challenge

The Region of Brittany is very sensitive to the oil spills at sea, considering its geographical unique location and past traumatic experience of oil spill disasters such as Amoco Cadiz (1978), Erika (1999) and Prestige (2002) to mention only the most important. In 2010, VIGISAT, the unique French ground receiving station of satellite radar high resolution images, was selected as one of the service provider for CleanSeaNet, the pan-European oil spill detection service implemented by EMSA. Since then, VIGISAT has kept becoming a major player of this service, not only to detect pollution, but also to identify potential source of pollution. More recently, VIGISAT also supported FRONTEX through its mission of maritime borders surveillance. Eventually, VIGISAT has extended the scope of its activities in supporting EMSA in the implementation of maritime surveillance, one of the key element of the Copernicus Security Service. In addition to the European services, VIGISAT took the lead in pioneer services such as icebergs detection in the southern seas. All these challenges turned into achievements that contributed to consolidate the strategic positioning of the regional and local authorities in the domain of marine science and technology.

The space based solution

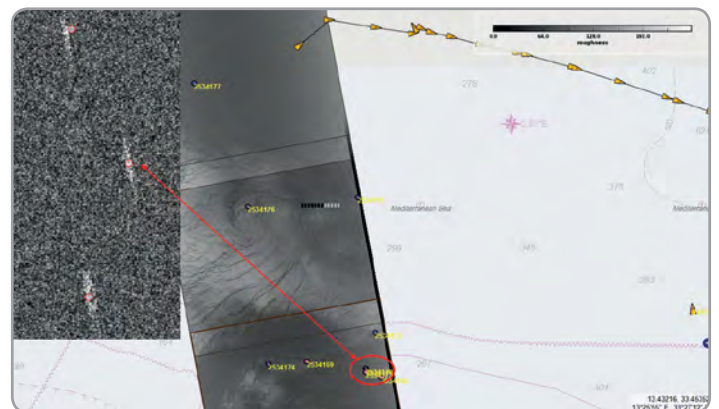
The VIGISAT satellite ground receiving station was officially opened in Brest by CLS, a French private company. Two regional projects successively supported this initiative: VIGISAT and VIGISAT-2. These projects are led by IMT Atlantique, a French Elite Graduate School specialized in digital technology, energy and environment, and supported by Europe and local authorities from the Brittany Region. They both aim at stimulating science and education activities at regional level.

In parallel, CLS was engaged in positioning the VIGISAT infrastructure in the European network of ground stations involved in operational near real time services. VIGISAT can rely on its capacity to acquire directly the European Sentinel-1 constellation as well as the Canadian SAR (Synthetic Aperture Radar) mission Radarsat-2. In addition, most of the operational SAR missions such as TerraSAR-X, COSMO-SkyMed and some optical missions (e.g. Sentinel-2) can be processed and analysed at VIGISAT.

Benefits to Citizens

It was a great achievement when, on February 25, 2012, VIGISAT acquired, processed and analysed the first case in Europe in a maritime pollution prosecution using SAR imagery. The satellite SAR image was used as primary evidence to demonstrate that the pollution was actually released by the culprit vessel within the UK's 12 nautical mile territorial sea.

Another activity of great significance for the city of Brest is related to sailing races and the world tour records attempts the start of which is given off Brest. Since 2008, VIGISAT has developed and



On 06/10/2015, VIGISAT supported FRONTEX EUROSUR services. A SAR image acquired, processed and analysed by VIGISAT enabled to relocate and rescue 370 people aboard three rubber boats off Lybian Coast (source FRONTEX)

Thematic Area



TRANSPORTS,
CIVIL
INFRASTRUCTURE
AND SAFETY

Region of Application



EUROPEAN
MARITIME
AREAS

Sentinel mission used



S1

Copernicus Service used



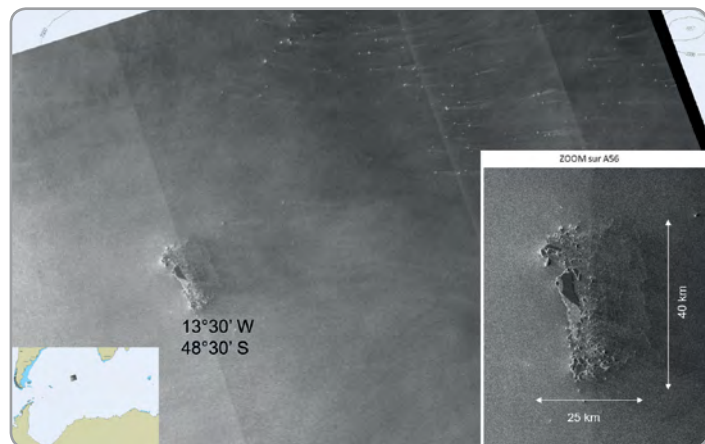
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Usage Maturity Level



5

kept improving a unique iceberg detection and tracking service, that has been provided to the main round-the-world sailing races (Vendée Globe, Barcelona World Race, Volvo Ocean Race). Most of the sailors attempting since then to beat the world tour records both solo and crewed have used VIGISAT services (Coville, Cammas, Joyon, Guichard, Gabart). The benefit is not only for the sailing community but also the scientific community as VIGISAT has developed a unique knowledge of icebergs generation mechanisms.



The giant tabular iceberg A56 such as captured by the European Copernicus Sentinel-1 satellite on 14/11/2016, after it broke up in the southern Atlantic Ocean.

Credit: Contains modified Copernicus Sentinel data [2016]

“Forests are our planet's green lung, but oceans are its blue heart. It is now up to all of us to keep this blue heart beating.”

Karmenu Vella, European Commissioner for Environment, Maritime Affairs and Fisheries

Outlook to the future

In the future, maritime surveillance services should include new applications such as the monitoring of massive stranding of sargassum algae or new technologies such as drones, big data and analytics.

Acknowledgements

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ABOUT COPERNICUS4REGIONS

This Copernicus User Story is extracted from the publication “**The Ever Growing use of Copernicus across Europe's Regions: a selection of 99 user stories by local and regional authorities**”, 2018, Edited by NEREUS, the European Space Agency and the European Commission.

The model cases focus on local and regional authorities who successfully applied Copernicus data in 8 major public policy domains. The views expressed in the Copernicus User Stories are those of the Authors and can in no way be taken to reflect the official opinion of the European Space Agency or of the European Commission.

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