

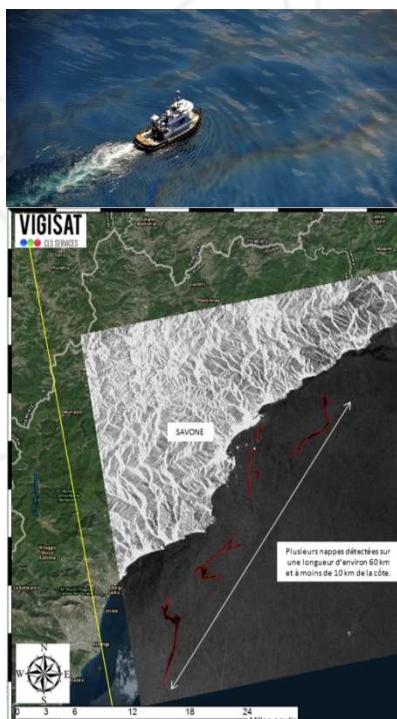
**With the successful launch of
Sentinel-1B,
on the evening of 25 April,
CLS is continuing to
watch over our planet.**

On Monday 25 April, at 23h02 (UTC), the European Sentinel 1-B satellite was placed in orbit by a Soyuz launcher from the European space port at Kourou in French Guiana. CLS, a subsidiary of CNES, ARDIAN and IFREMER, will soon be receiving its data thus enabling it to keep the planet under surveillance. It does this by detecting marine pollution and illegal fishing boats, observing sea conditions (wind and wave height) at a high resolution, detecting typhoons, icebergs which are a threat to skippers taking part in major yacht races or solo attempts to break records and monitoring ground movements to within a millimetre. CLS provides all these applications and services to its customers around the world.

RADAR EXPERTISE: USEFUL PRODUCTS AND SERVICES, DELIVERED ALL OVER THE WORLD

With almost 20 years of experience in radar observation, CLS will be using its VIGISAT station (which acquires and processes high resolution satellite radar images) as well as its satellite data processing systems to create products from the images taken by the Sentinel 1-B satellite. Starting with these raw images, CLS develops new solutions for protecting the planet, its environment, biodiversity and inhabitants.

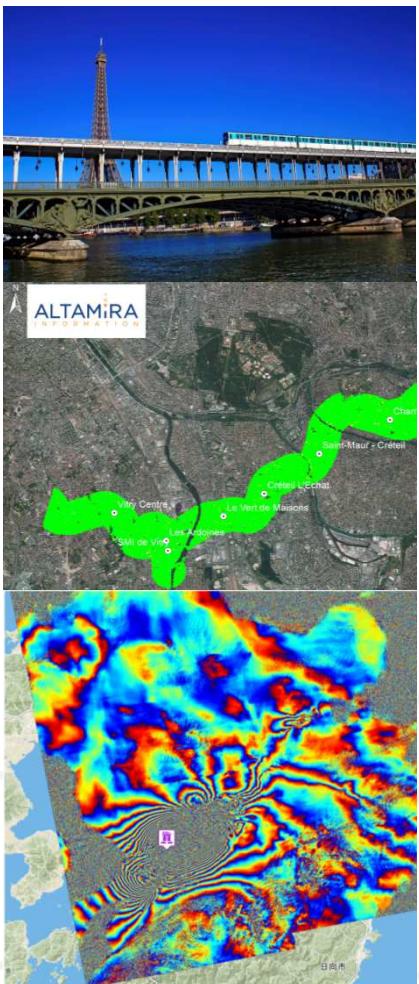
The information is then combined with that from more than 130 other satellites used by CLS to provide surveillance services to administrations and international organisations but also national, regional and local authorities and private companies in the energy sector. These include:



- POLLUTION DETECTION: CLS detects oil spills by using satellite radar images, determines the drift trajectories of oil slicks to identify polluters and the possible source of the pollution and finally, supplies the detection report. A REFERENCE: The European Maritime Safety Agency for the southern European zone.

Recent news: CLS & Sentinel 1-1 - MEDITERRANEAN

POLLUTION: On Friday 22 April 2016 at 17h17, a radar image taken by the SENTINEL A-1 satellite was acquired by operators at the CLS VIGISAT centre. Twenty minutes later, the CLS analysts, who are expert in detecting pollution, sent their report to the European Maritime Safety Agency in Lisbon, showing that several oil slicks had been detected in a zone about 60 km in length and at less than 10 km from the Italian coastline, around the port of Genoa.



- SURVEILLANCE OF GROUND MOUVEMENTS: CLS uses radar images to monitor ground shifts to within a millimetre and subsidence phenomena around oil and gas extraction fields, to detect the first signs of landslides in open pit mines and also to measure the impact of the building of major infrastructures, such as metro lines, on neighbouring structures.

PARIS METRO -Recent news on CLS & Sentinel-1A and B :

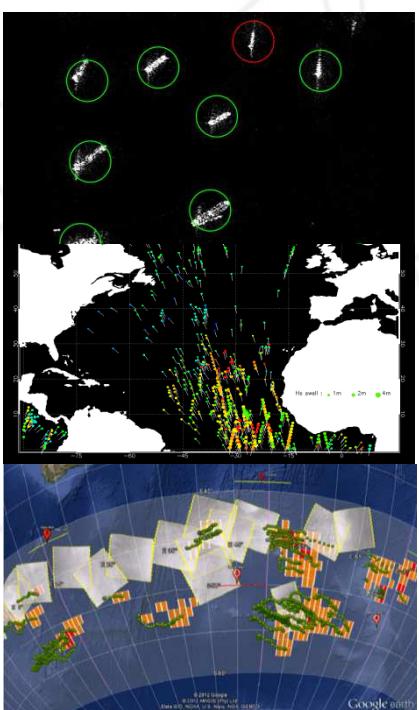
adding two hundred more kilometres of metro lines and 68 new stations requiring 15 years of work, the *Grand Paris Express* project is gigantic. On behalf of the Société du Grand Paris, TRE-ALTAMIRA, a company belonging to the CLS group, will be monitoring, the impact of the construction work along the projected line and adjoining areas to within a millimetre. It will do this using radar satellites whose technology is similar to that of Sentinel 1-A and B. This unprecedented satellite surveillance will cover a period of 35 years, including historical records.

EARTHQUAKE IN JAPAN – Recent news on CLS & Sentinel-1A: Two high magnitude earthquakes shook Japan on 14 and 15 April last causing extensive damage. The two earthquakes killed more than 40 people and destroyed innumerable infrastructures (roads, institutional buildings, homes, etc.). TRE-ALTAMIRA, a company belonging to the CLS group, processed and analysed two images from the Sentinel-1A satellite (one image taken before the events, on 8 April and a second one, taken after 20 April). Using algorithms developed by the CLS group, a map of the ground shifts was thus generated and made available on the Geohazards Exploitation Platform (GEP), created as an ESA initiative.

- DETECTION OF ILLEGAL FISHING BOATS: CLS detects illegal fishing by comparing positions of fishing boats in radar imagery with their positions as declared via the Vessel Monitoring System (VMS) for authorised fishing in a regulated fishing zone. A REFERENCE: Indonesian Ministry of Maritime Affairs and Fisheries.

- OBSERVATION OF WIND, WAVES AND TYPHOON CONDITIONS: CLS plots high-resolution calculations of wind speed and direction and produces a wind atlas. A REFERENCE: The Riso National Laboratory for Sustainable Energy, Technical University of Denmark. It also detects and observes sea swell patterns. A REFERENCE: European Space Agency. Furthermore it detects extreme weather phenomena and produces high-resolution products. A REFERENCE: research and development to date.

- DETECTION OF ICEBERGS THREATENING SKIPPERS IN MAJOR OFF-SHORE YACHT RACES: The company detects icebergs lying in wait for skippers, by means of radar and altimeter imagery, it also models iceberg drift and provides assistance to race managers to ensure safe routes for skippers. A REFERENCE: Vendée Globe, Barcelona World Race, Trophée Jules Verne.



RADAR EXPERTISE: A FIELD IN WHICH CLS EXCELS



CLS, VIGISAT
station,
acquisition of
high-resolution
satellite radar

Part of the Sentinel-1 adventure, the VIGISAT receiving and processing station at Brest, developed, operated and owned by CLS, became the first operational Sentinel-1 collaborative station in the world on the 1st July 2015: CLS is consequently authorised to receive the data from these new satellites. France's capacity for acquiring, processing and marketing of satellite radar data has thus increased considerably. Vincent Kerbaol, director of radar applications at CLS says: "With VIGISAT we are able to receive data from the Sentinel 1-A satellites directly and process it almost in real-time, and very soon the same will be true for

Sentinel 1-B as well. With this new source of data we'll be able to improve our service offer and capitalize on our R&D". CLS was already very involved in the Sentinel 1-A mission. The company helped develop the S-1 processor and was assigned the job of monitoring the operational performance of the sensor instrument and its products as part of the "Sentinel-1 Mission Performance Centre" (MPC-S1), housed at CLS Brest. CLS teams have thus been working intensively on this mission for more than six years!

"The fact that we are able to intervene at all levels of the operations (from the instrument through to added-value products) and that we are able to make the necessary investments, bears witness to CLS's outstanding level of excellence and operational capability" comments Guillaume Hajduch, in charge of innovation and expertise at the CLS radar applications directorate.

ABOUT CLS

CLS, a subsidiary of CNES, ARDIAN and IFREMER, has a workforce of 600 and is active in 5 strategic sectors: the sustainable management of marine resources, environmental monitoring, maritime safety, support for onshore and offshore oil operations and monitoring of transport on land. The company provides satellite services based on the location and collection of environmental data (data from 40,000 transmitters are processed each month), from drifting buoys, animals, fishing and merchant ships, etc.). It also observes oceans and inland waters (more than 20 instruments send information on the world's seas and oceans to CLS on a daily basis), and monitors terrestrial and maritime activities (CLS processes more than 10,000 radar images each year) and geolocates mobiles on land (50,000 vehicles were tracked by Novacom Services (a subsidiary of the CLS Group), in 2015. The CLS Group had a turnover of 108 million euros in 2015 and plans to increase it to more than 120 million in 2016. The group, which has been achieving strong growth these last few years, has set ambitious goals to take advantage of the opening-up of new markets.

www.cls.fr

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CLS monitoring centre in Toulouse
operational around the clock, 365 days a year

ABOUT CNES

The French Space Agency (CNES), a public establishment of an industrial and commercial nature, is responsible for helping the French government determine and implement space policy within Europe. As such it 'invents' space systems for the future, masters all space techniques and ensures that France has autonomous access to space. A major player in European space, CNES puts forward proposals for ensuring that France and Europe stay among the leaders in worldwide space competition. CNES also represents France within the European Space Agency (ESA). It collaborates with scientific and industrial partners with whom it carries out the space programmes it has designed. It is involved in several international projects which are fundamental for any far-reaching space policy.

www.cnes.fr

ABOUT ARDIAN

Ardian, which was founded in 1996 and is run by Dominique Senequier, is a leading independent investment company which manages and/or acts as consultant for 50 billion dollars of assets in Europe, North America and Asia. The company has always based its strategy on the entrepreneurial spirit and offers its international investors a better return on investment while contributing to the growth of companies throughout the world. Aridian's investment philosophy is based on three principles,: excellence, loyalty and the entrepreneurial spirit. Aridian's employees make up the biggest group of shareholders. Indeed 80% of them have chosen to invest in the company, thus expressing their confidence in the strategy implemented by its executive board.

Ardian draws on a substantial international network, with more than 350 employees working in ten offices in Beijing, Frankfurt, Jersey, London, Luxembourg, Milan, New York, Paris, Singapore and Zurich. The company offers its 350 investors a diversified portfolio of funds covering all categories of assets, with Direct Funds including Infrastructure, Mid Cap Buyout, Expansion, Aridian joint investment, the Fund of Funds (primary, early secondary and secondary) and Private Debt.

www.ardian-investment.com

ABOUT IFREMER

Ifremer, the French research institute for exploitation of the sea, contributes through its work and expertise to our knowledge of the oceans and their resources, monitoring of the marine and coastal environments, and sustainable development of maritime activities. In pursuit of its goals, it designs and implements tools for observation, experimenting and monitoring and manages oceanographic data bases. It also runs a significant part of the oceanographic fleet, including all of the submarine activities and heavy mobile equipment (seismic instruments, penetrometers, etc.). Founded in 1984, Ifremer is a public establishment of an industrial and commercial nature (EPIC) placed under the joint supervision of the Ministries of Higher Education and Research and of Ecology, Sustainable development and Energy.

www.ifremer.fr