



**SATELLITE INFORMATION
PRODUCTS & SERVICES**



060325



YEAR 2025

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 **VENG**



WE ARE VENG

VENG is an Argentine company of services and technological developments of high added value specialized in the space activity. We offer to the space industry and the industry in general, engineering and manufacturing services for the **resolution of complex R+D+i problems**.

We are developing a satellite launcher to provide **launch services from Argentina to the world**, and thus join the small group of countries that master these capabilities and are part of the global expansion of space activity for commercial purposes.

+17
years of
experience

+420
staff of collaborators

+15
years of
ground stations operations

**Operation of the ground
station in Córdoba**

2009 - - - - - TODAY

**Tierra del Fuego ground
station operation and
maintenance**

2018 - - - - - TODAY

OUR LOCATIONS



Teófilo Tabanera Space Center



- Satellite Mission Control Center
- Ground Station operation Córdoba
- Engineering
- Metal-mechanical fabrications
- Heat treatment
- Image Processing
- Manufacturing, Integration, and Testing

Punta Indio Space Center



- Engineering
- Production of aerospace vessels
- Metal-mechanical fabrications
- Engine Testing

Manuel Belgrano Space Station Center



- Launching Base
- Engineering

Villa Elisa Auxiliary Installation



- Electronic engineering specialized in RF
- Electronic Laboratory

Ground Station of Tierra del Fuego



- Operation of ground stations

Buenos Aires City Headquarters



- General Administration
- Engineering

SATELLITE INFORMATION

We provide products and services of the highest technology using information from the **SAOCOM®** satellite constellation (L-band quadruple polarization synthetic aperture radar).

We provide solutions to governments and industries such as Mining, Oil & Gas, Agriculture, among others, favoring management based on risk assessment and decision making.

A detailed 3D rendering of a satellite is shown in the upper right, appearing to be in orbit. The satellite has a complex structure with gold-colored thermal blankets, various antennas, and solar panels. Below the satellite, a vast, rugged mountain range is visible from space, with deep valleys and snow-capped peaks under a clear blue sky. The satellite is positioned as if it is scanning the terrain below.

We offer high availability services **focused 100% on customer needs**, accelerating the process of early adoption for incorporation into business models.

L-BAND SAR TECHNOLOGY

SAOCOM® is a constellation that consists of two quadruple polarization L-band SAR satellites which observe the Earth's surface night and day, regardless of weather conditions.

By working in L Band, the satellites can obtain information by **penetrating the vegetation cover and soil, thus capturing moisture information**. Other applications include ship detection, soil moisture mapping, change detection for the Mining and Oil & Gas industries, and forecasting for wheat spike fusarium, among many others.

REVISIT TIME

8 days (1A + 1B)

BEST RESOLUTION

10 mts

QUAD POLARIZATION STRIPMAP

40 x 74 km $\approx$

TOPSAR

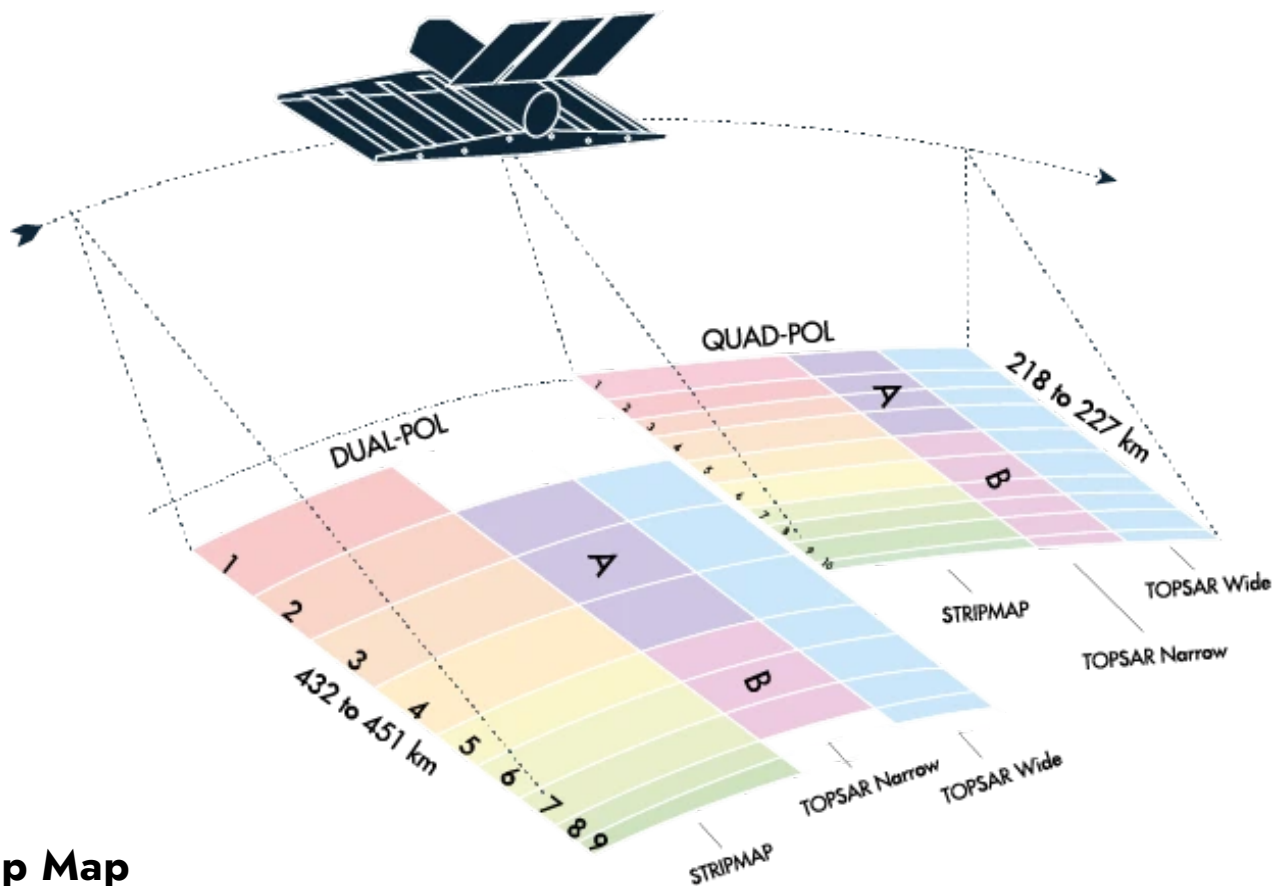
350 x 445 km $\approx$

ANGLE OF VIEW

from 20,7° to 50,2°



ACQUISITION MODES



Strip Map

Simple, Double or Quadruple Polarization

Radar points to a given fixed direction while picks up a continuous band corresponding to narrower scanings and with more space resolution.

TOPSAR Narrow

Simple, Double or Quadruple Polarization

Radar changes its pointing along the trace to pick up several bands, covering a greater scanning width with less space resolution than in the StripMap case.

TOPSAR Wide

Simple, Double or Quadruple (complete) or Compact

Radar changes its pointing along the trace to pick up a greater number of bands, covering a greater scanning width with less space resolution than in TOPSAR Narrow case.

Simple Polarization

HH VV

The system issues and receives in the same linear polarization.

Double Polarization

HH VV VV y VH

The system issues in a linear polarization and receives in two linear polarizations simultaneously.

Quadruple Polarization

HH VV VV and VH

The system issues alternately in both linear polarization and simultaneously receives in them.

Compact Polarization / CL-POL

RIGHT-H and RIGHT-V

LEFT-H and LEFT-V

System transmits a circular polarization (right or left) and receives in two polarizations simultaneously.

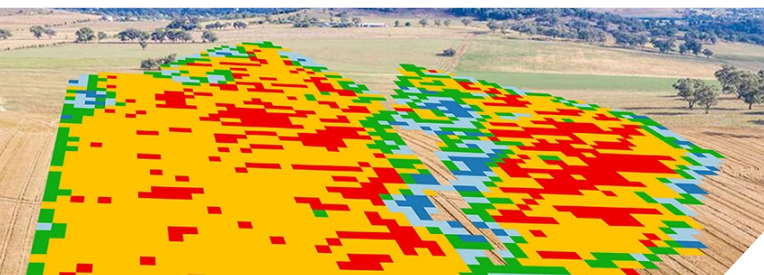
Acquisition Mode	Nominal Resolution (Rng x Az) [m]		Nominal Size of the Scene (Rng x Az) [km]	Polarizations
	Product L1A	Products L1B, L1C y L1D		
STRIPMAP SP	10 x 5	10 x 10	40 x 74	HH o VV
STRIPMAP DP	10 x 5	10 x 10	40 x 74	HH+HV o VV+ VH
STRIPMAP QP	10 x 6	10 x 10	20 x 74	HH+HV+VH+VV
TOPSAR Narrow SP	10 x 30	30 x 30	150 x 222	HH o VV
TOPSAR Narrow DP	10 x 30	30 x 30	150 x 222	HH+HV o VV+ VH
TOPSAR Narrow QP	10 x 50	50 x 50	100 x 222	HH+HV+VH+VV
TOPSAR Wide SP	10 x 50	50 x 50	350 x 445	HH o VV
TOPSAR Wide DP	10 x 50	50 x 50	350 x 445	HH+HV o VV+ VH
TOPSAR Wide QP	10 x 100	100 x 100	220 x 445	HH+HV+VH+VV

SP: Single Polarization // DP: Dual Polarization // QP: Quad Polarization

SOIL MOISTURE AMBIENT MAP

SAR scenes obtained by the SAOCOM constellation allow us to develop multiple georeferenced soil moisture products, which allow for bare soil moisture estimation.

Below you will find a sample from a mining exploitation through heap-leaching.



BENEFITS: MINING



- It will give you the confidence of having valuable information to prevent tailings dam slope failures.
- It will give you the possibility to avoid losses in your profits due to leaching failures.

PRODUCTS AND SERVICES



**SOIL MOISTURE
AMBIENT MAP**



**RELATIVE SOIL
MOISTURE
AMBIENT MAP**



**SOIL MOISTURE
TIME SERIES**

BENEFITS: AGRICULTURE



- Compare pixel-by-pixel soil moisture information from week to week.
- Detect notable changes in soil moisture at any site

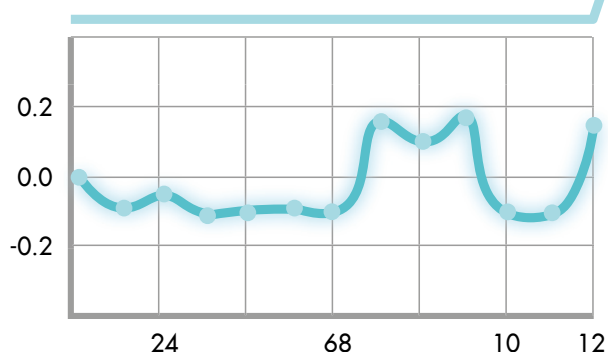
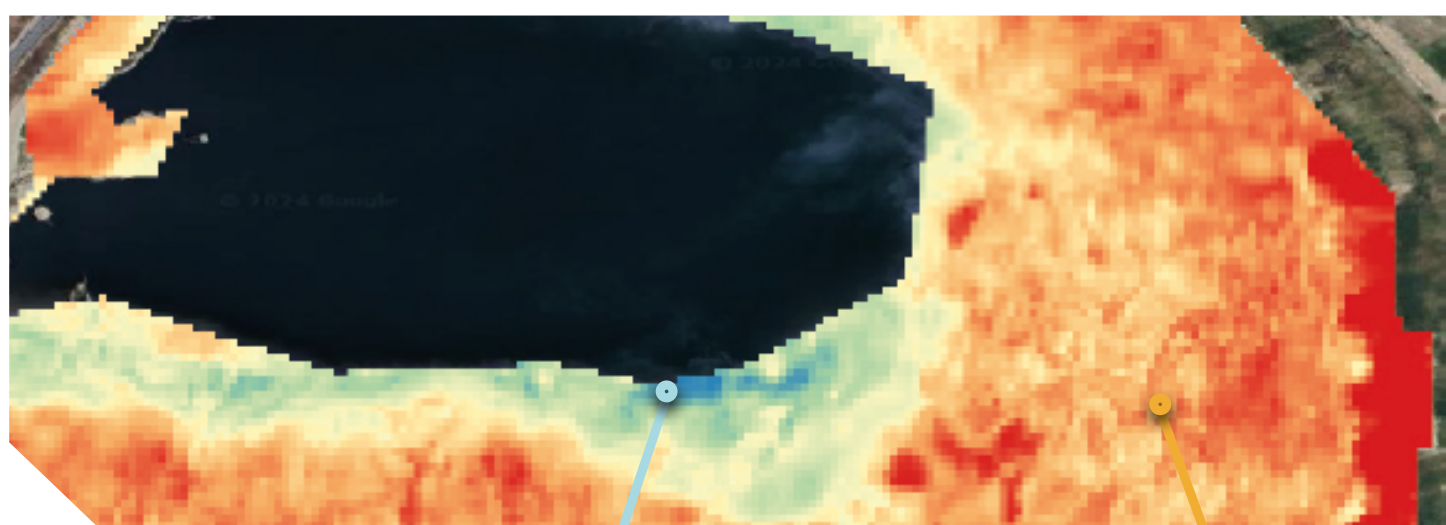
SOIL MOISTURE VARIATION DETECTION

The soil moisture variation analysis is a fundamental tool for detecting possible anomalies related to this variable in a region of interest.

Below is shown a product generated in an area where two locations were analyzed: a first zone colored in red, where a low soil moisture variation was observed, and, on the other hand, a second zone colored in blue indicating a

higher soil moisture variation. To the right, a time series analysis is presented for each zone.

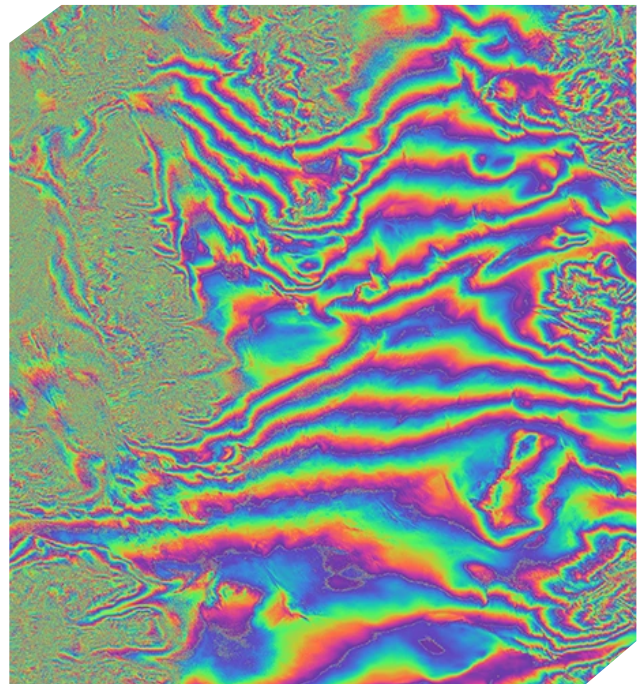
This solution uses scenes from the SAO-COM constellation to provide a detailed analysis of the temporal evolution of soil moisture in an area of interest.



SAR INTERFEROMETRIC STACKS

For interferometric studies, in-depth knowledge and powerful processing software are required. However, this is not enough; as data input, it is necessary to have series of SAR images of the target on different dates, respecting a series of very important requirements.

We provide these scene sets in compliance with the customer's requirements, delivering on time and on budget through a business model that always favors the customer, understanding the complexity of the global interferometric business.



The product consists of a set of scenes acquired under the requirements for use in SAR interferometry:

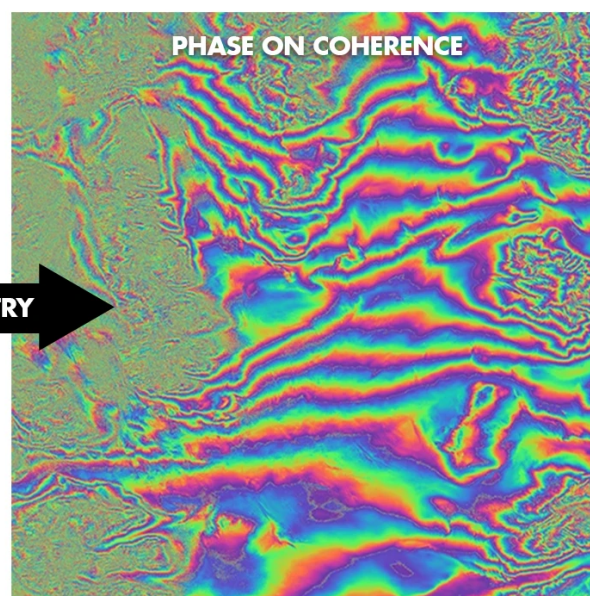
- Weekly, biweekly, monthly and annual sampling under the same observation angle
- Stripmap Scenes
- Business model oriented to VENG absorbs the risk that the baseline is not in accordance with the customer's requirement. If the baseline is not as agreed, the scene is not charged or delivered
- Great stack discounts
- Ascending and descending orbit

Example table of internal evaluation of Baseline Perpendicular for Interferogram generation:

TYPE	MASTER	SLAVE	SLAVE
Date	Apr 28, 2024	May 6, 2024	May 14, 2024
B. Temp [days]	0	8	16
B. Geom [m]	0	270,82	468,62
Bperp [m]	0	185,5	-456,19
H. Ambiguity	0	-288,28	117,22
Parallel [m]	0	19,731	-10,725
Look Angle [°]	0	32,32	32,32
Geo Coherence	0	0,982815	0,95764



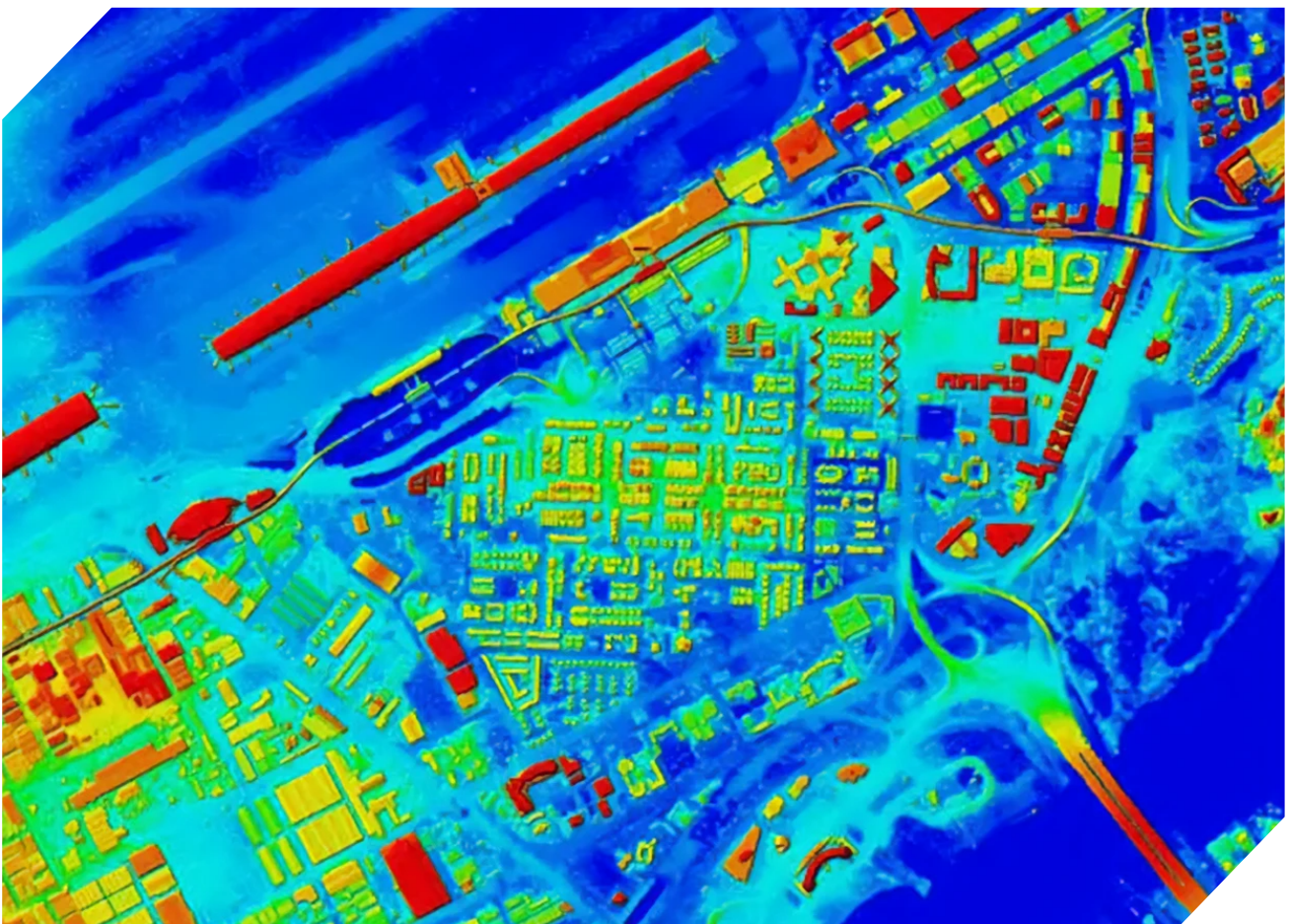
INTERFEROMETRY



SAR SCENES FOR MACHINE LEARNING

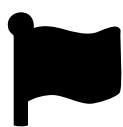
We offer our customers a service that provides **SAOCOM data** from hundreds or thousands of scenes in order to **train machine learning models**. This service allows to freely choose the targets and to balance the number of scenes desired for each target with respect to the number of temporal samples on each target.

- Service that provides SAOCOM information to train Machine Learning models
- Offers hundreds or thousands of satellite scenes
- Allows to choose targets and to balance the number of scenes per target and time samples
- Very low price per scene



USES

- Training Machine Learning models in satellite Earth observation
- Combine information with other satellites



Governments

Monitoring and analysis of strategic territories



Companies

Bi-weekly monitoring/monitoring of operating areas

EXAMPLES OF USE

- Scene packages of airports, dams, nuclear power plants, mines, oil wells, ports, cities, forests, etc.
- **Example:** 12 scenes per airport distributed over time (one per month).

FEATURES

Unique service with SAR information in L-Band



Model training

Urban areas (airports, critical infrastructures, highways) and vegetation areas (forests, jungles, etc.).



Soil moisture analysis

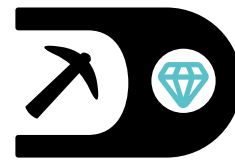
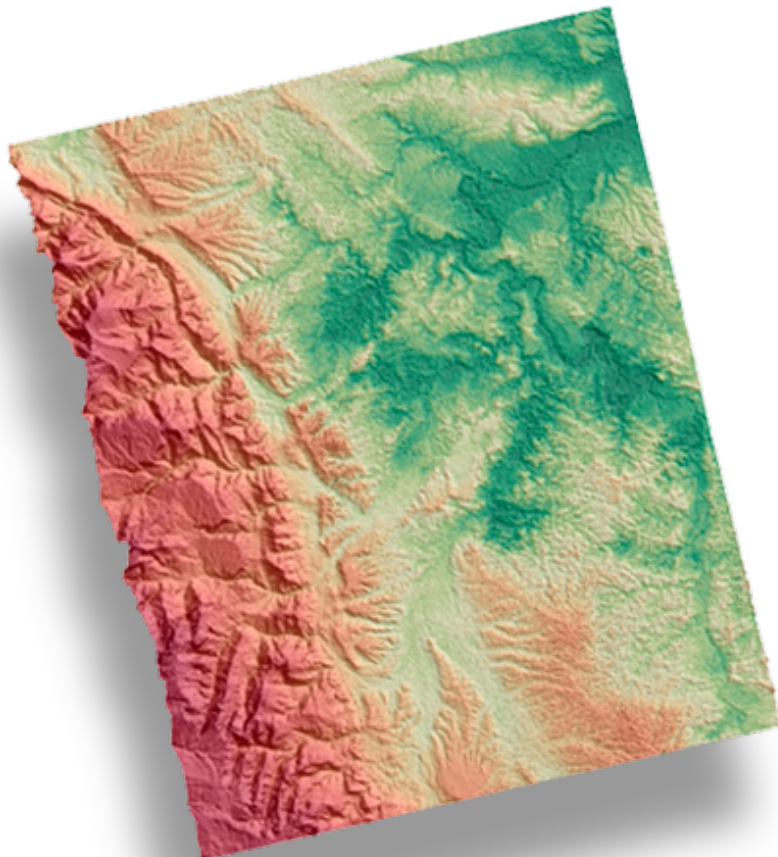
Irrigation, fire risk, biomass, etc.



DIGITAL ELEVATION MODEL (DEM)

SAOCOM® Constellation digital elevation models provide **high quality and highly representative terrain height data** due to their capacity to penetrate clouds and vegetation.

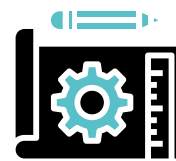
DEMs are obtained with archival as well as future **SAOCOM®** images, thus ensuring past and current models.



Prospecting
and exploration



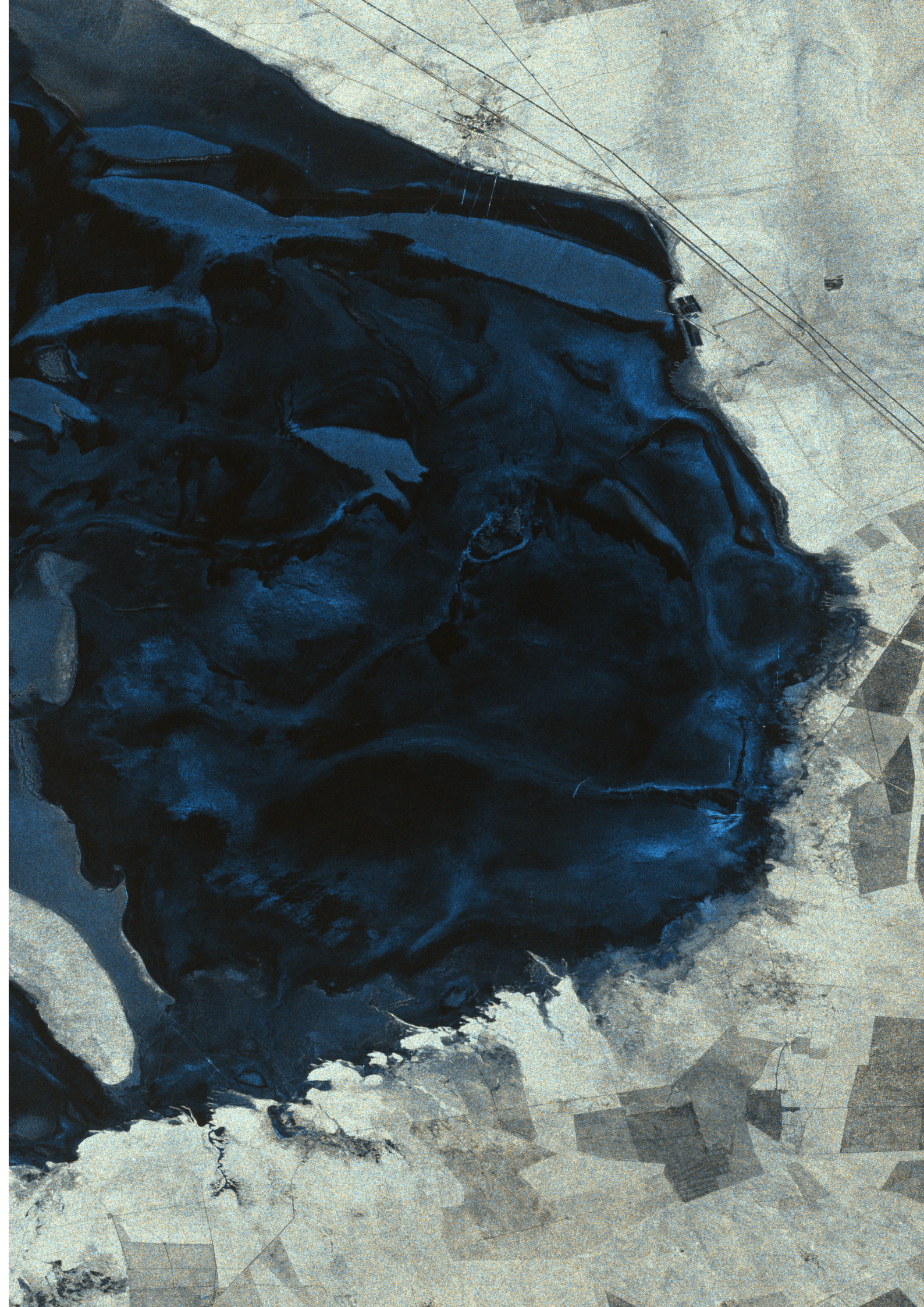
Watershed
modeling



Infrastructure
projects

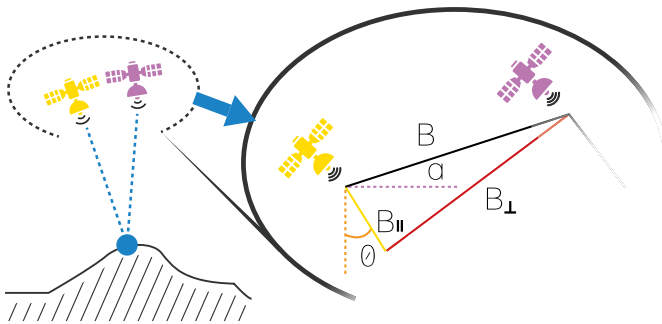


Water and
geological risk
identification



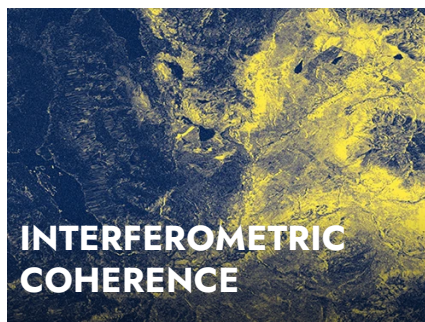
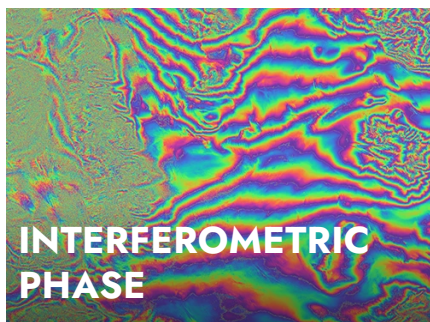
INTERFEROMETRY

Interferometry is a technique that, from two or more **SAR (Synthetic Aperture Radar)** satellite images, makes it possible to obtain **highly accurate** ground displacement measurements.



PRODUCTS & SERVICES

We offer quantification and qualification service of ground displacement services for monitoring and **early warning**. The study is carried out within a certain period of time and the differential interferometry technique is used for this purpose.

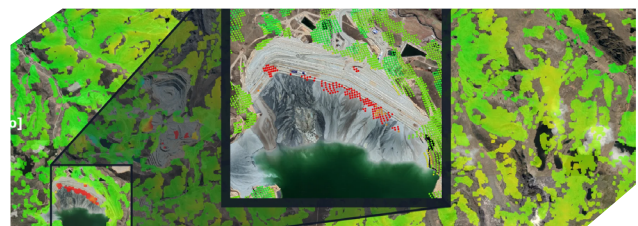


DIGITAL ELEVATION MODEL (DEM)

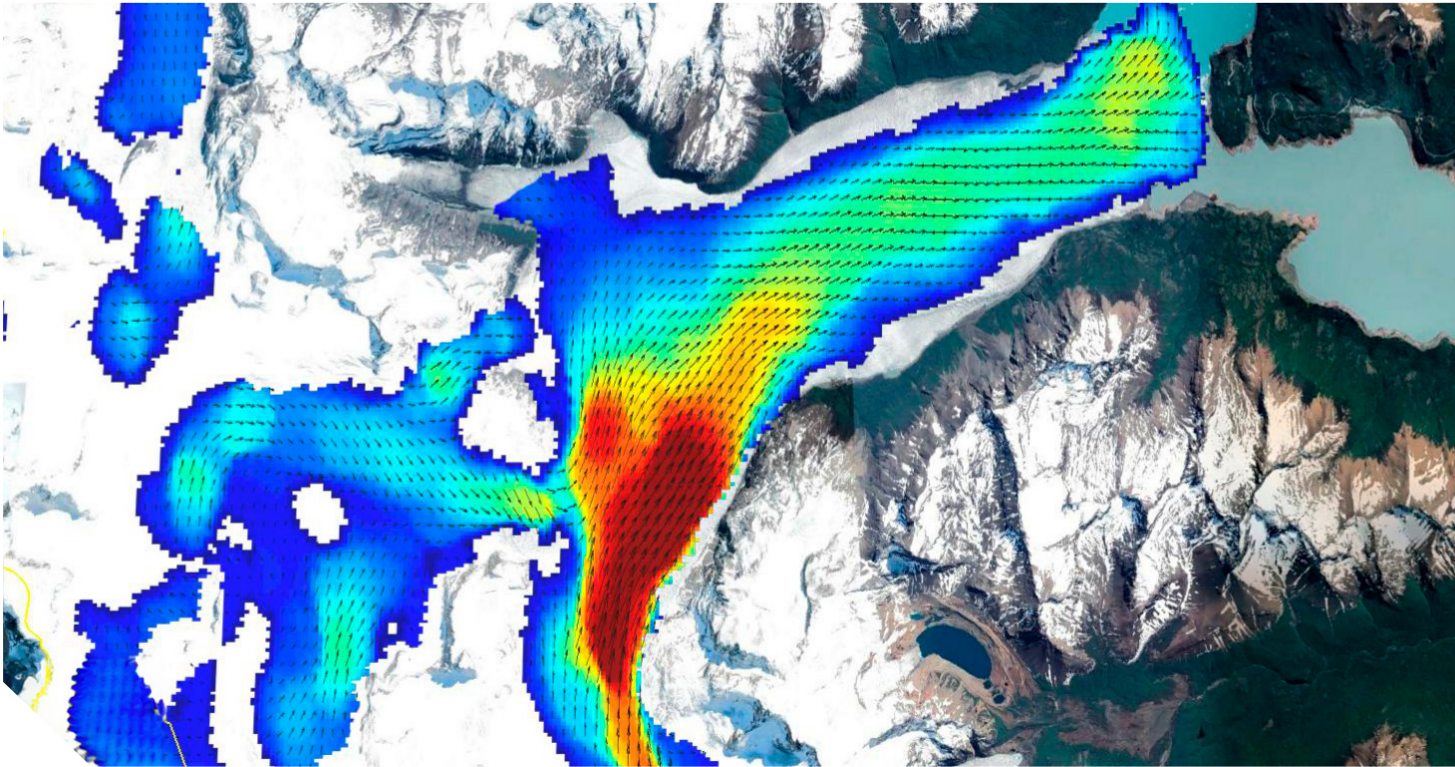


- Prospecting and Exploration
- Watershed Modeling
- Infrastructure Projects
- Water and Geological Risk Identification

DISPLACEMENT VELOCITY MAPS SERVICE (DVMS)



- Monitoring of basin exploitation by fracking
- Pipeline health monitoring due to subsidence or crumbling
- Infrastructure monitoring



PIPELINE MONITORING



Pipelines, used to transport oil, gas, and water, are works of great linear extension that reach thousands of kilometers. Along this path, they pass through different type of soils such as sand, mud, clay or different types of sedimentary, metamorphic or igneous rocks. In addition to that, changes in aquifers and reservoirs produce movements on ground over which pipelines are laid down.

Differential interferometry (DInSAR) allows monitoring at centimetric and sub-centimetric levels with a temporal **periodicity of 8 days** in the case of the **SAOCOM®** satellites. Thus, it is possible to identify areas where changes in the ground may represent a risk of pipeline damage.

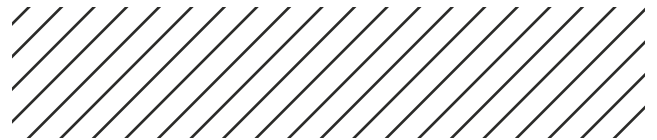
OIL&GAS BASIN MONITORING



Fluid injection/extraction operations generate volumetric variations in the basins and, therefore, changes in the height of the surface cover. These changes can be difficult to measure due to the large surface area of the basins in which the operations take place. However, differential interferometric techniques (DInSAR) makes possible to measure surface height variations with centimetre and sub-centimetre precision.

In this way, it is possible to estimate volumetric changes in the basin and associate

them with fluid extraction and injection processes. These data are of interest to monitor the infrastructure of the operations in order to prevent higher structural damages and to contrast injection/extraction values with volume changes in the basin to lower environmental risks. By means of the SAOCOM® constellation, it is possible to carry out these studies with a periodicity of 8 days.



SUBSIDENCE IN CIVIL WORKS ANALYSIS



High-rise buildings, bridges, tunnels, dams, routes, among others, are construction works that are settled on the ground. Extraction of fluids or solids in sub ground layers pro-

duces settlements which eventually lead to changes in upper layers of the land cover where the aforementioned construction works are located. Therefore, even foreseeing

all the construction factors, it is necessary to analyze sudden or high-value changes to safeguard infrastructure avoiding both human and economic losses.

The displacement measured by interferometric techniques achieves centimetric and sub-centimetric precision over large remotely observed areas. Measurements that, in the case of the SAOCOM® satellites are

possible at 8 days intervals. Therefore, by means of SAR measurements and the differential interferometry technique, it can be performed a continuous temporary analysis of ground movements and works that settle on it. Thus, it is possible to anticipate potential risks of damage to the structures.

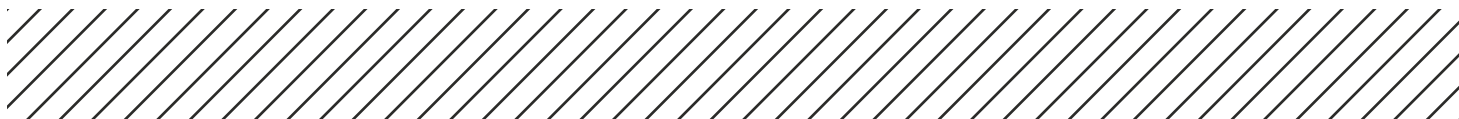
SLOPE STABILITY MONITORING



Mining activities are related to several anthropic and geophysical phenomena which tend to modify ground stability, such as changes in rocks due to the mining activity itself, heavy vehicles traffic, tensions of the faults and slopes wash in tailings dams, among others.

All of these, lead to the necessity of **on-going monitoring to set early warnings** in order to prevent possible accidents which may be a risk for people, environment and mining operation.

Nevertheless, high-precision measurements over time, result expensive and, in some cases, logistically difficult to obtain. However, **differential interferometry (DInSAR)** is an excellent alternative which allows to measure ground displacement with centimetric and sub-centimetric Precision at 8 days intervals in the case of the **SAOCOM®** satellite constellation.



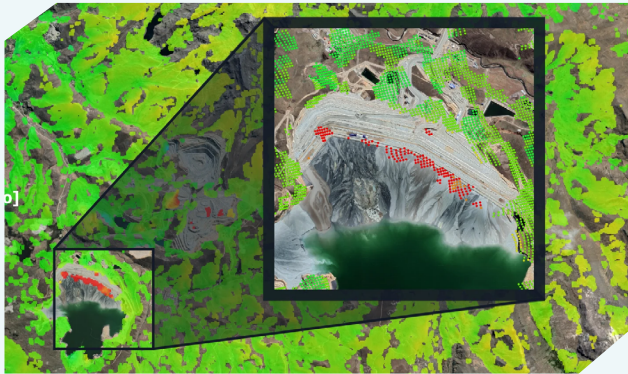
MONITORING OF POTENTIAL LANDSLIDE AREAS

Landslides represent a major risk for human settlements. Examples are the tragedies in Italy in 1963 and Sierra Leone in 2017, where thousands of human lives were lost. It is important to consider that landslides increase their probability of occurrence due to rainfall and earthquakes. Therefore, it is essential to monitor critical areas where geological and environmental risk factors are combined to generate early warnings.



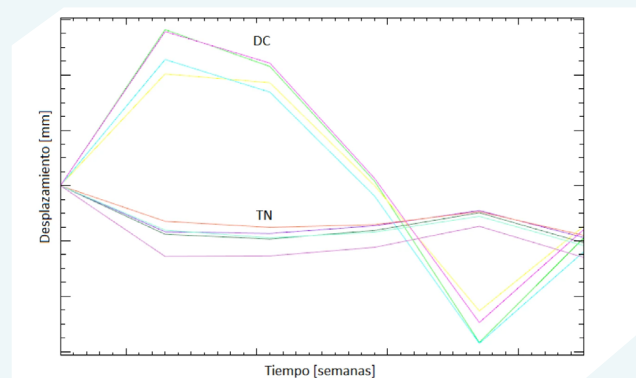
In this sense, monitoring by **Differential Interferometry or DInSAR**, allows to obtain **periodic ground displacement data** in centimeter and sub centimeter order with which **potential risks can be estimated** and thus generate **early warnings**. The **SAOCOM®** Constellation sensors can take samples every 8 days over a study area and represent a great advantage for displacement monitoring since, in addition, they have **greater penetration capacity** over vegetation than other sensors.

BENEFITS



Ground displacement velocity at particular measurement points

Temporal evolution of displacement on individual points at tailings dam and natural terrain



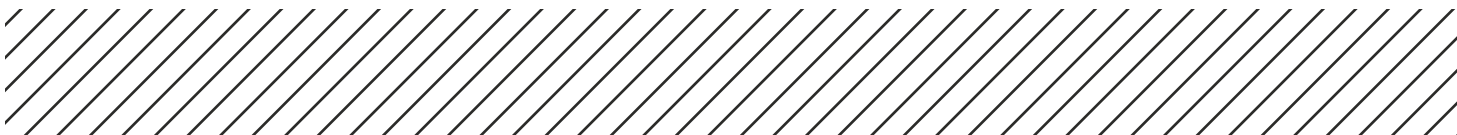
MONITORING OF POTENTIAL LANDSLIDE ZONES



Infrastructure
monitoring



Tailings dam
monitoring

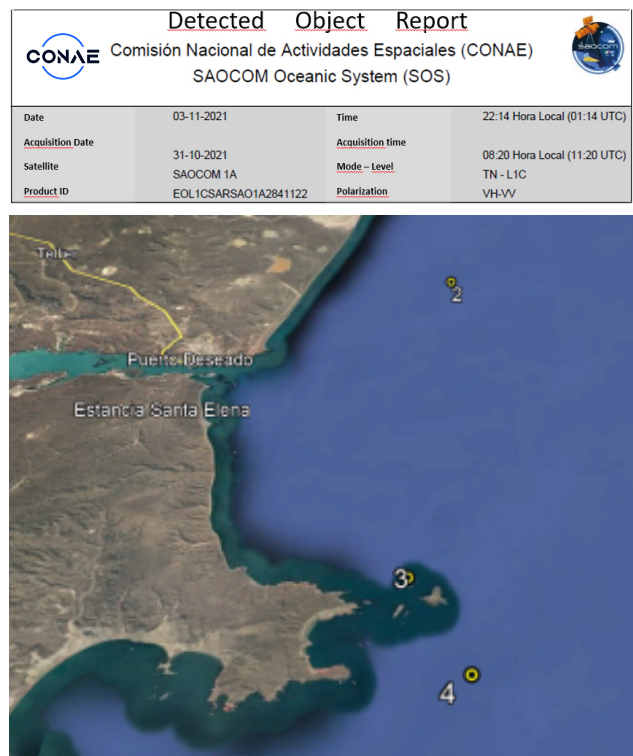
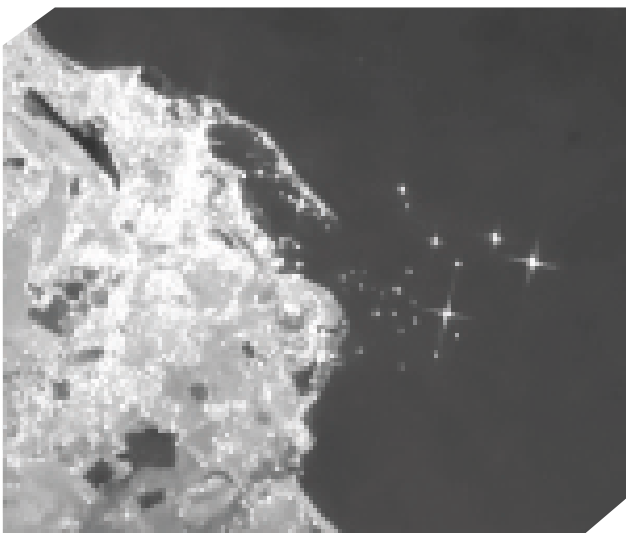


SHIP DETECTION

We provide, in an area chosen by the client, a report that shows all detected vessels with their respective geo reference (lat / long). In addition, this report includes a thumbnail image of the detected vessel's profile that assists in the identification of the type of vessel.

This report can be generated within hours of satellite acquisition, facilitating its use for cross-checking data with the **Automatic Identification System (AIS)** that all ships with a declared position have. If a ship without **AIS** data is detected by **SAOCOM®**, it is known to be an undeclared ship.

We prepare the report in different formats at the client's request, **covering areas as extensive as the client requires.**



RAPID MONITORING OPTION

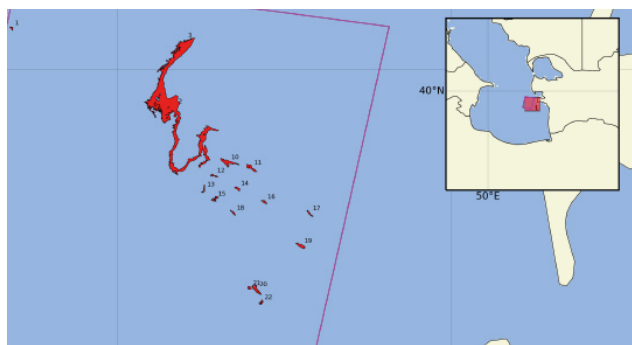
- **Delivery time**
 3 hours after acquisition
- **Frequency of acquisition**
 2 products per day
- **Delivery method**
 FTP + email
- **Satellite inputs**
 SAOCOM1A & SAOCOM1B

OIL SPILL DETECTION

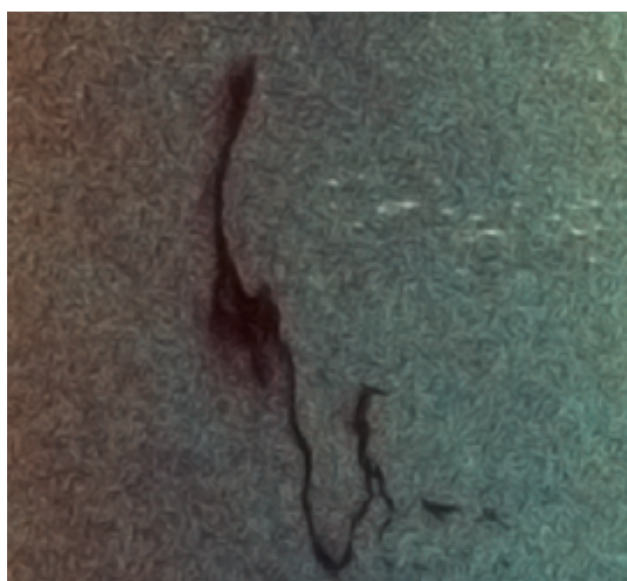
The oil spill detection service provides, in an area chosen by the client, **a report that shows all the oil spills detected** with their respective geo-reference (lat/long). In addition, this report includes a thumbnail image of the oil slick profile, assisting in the evaluation of the **potential environmental impact**.

This report can be generated within hours of satellite acquisition, facilitating its use for monitoring the spill, **especially to detect its origin, morphology and course depending on ocean flows**. Generally, based on the area detected, an estimate of the volume of oil spilled can be made (this estimation is not part of the report).

We shape the spring in different formats at the customer's request, **covering areas as large as the customer requires**.



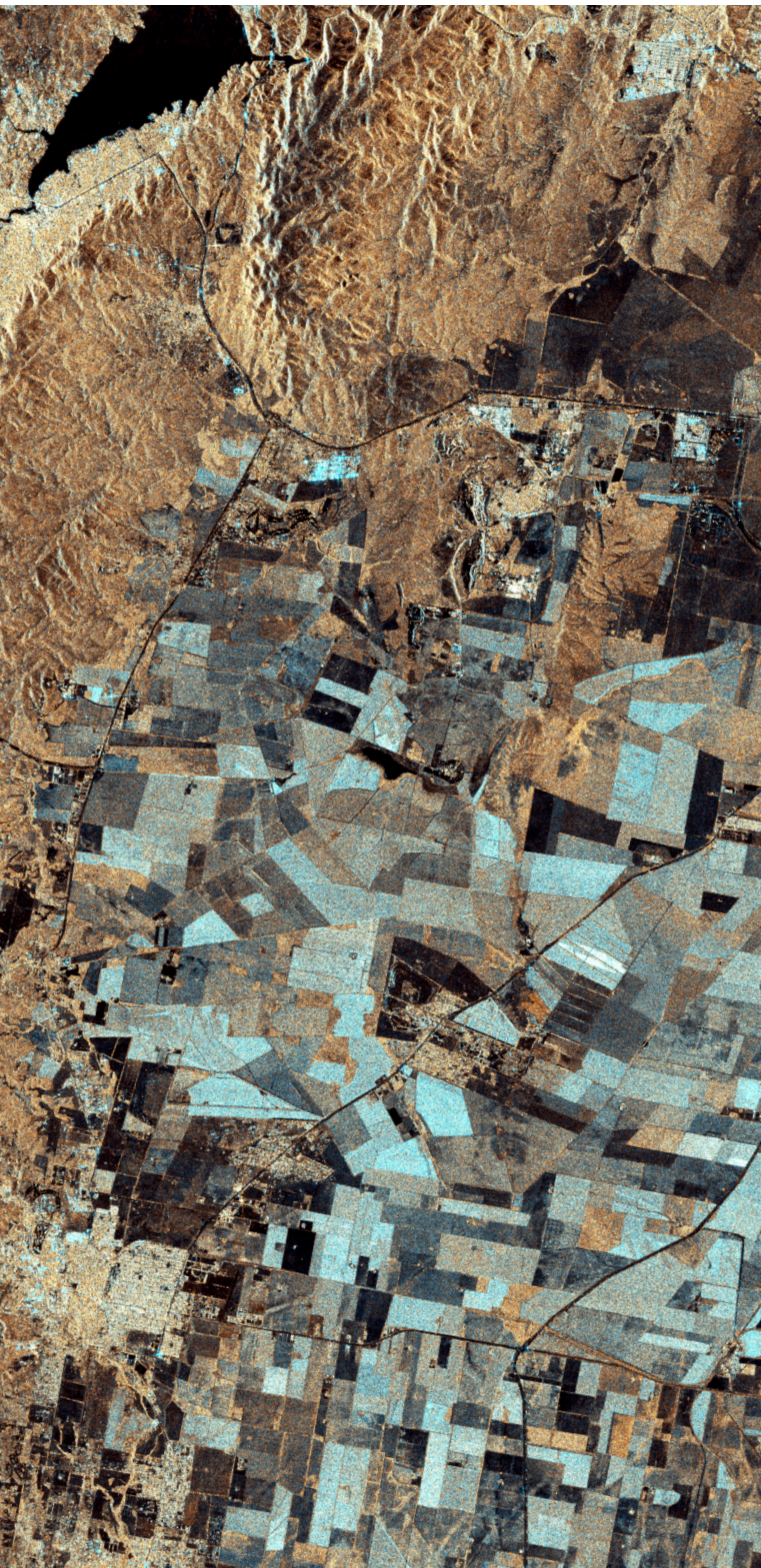
Report Date:	05-08-2022	Report Time:	18:17 UTC
Acquisition Date:	01-06-2022	Acquisition Time:	14:27 UTC
Satellite:	SAOCOM 1B	Mod - Proc.Level:	SM - L1D
ID Product:	EOL1DSARSAO1B4632858		



RAPID MONITORING OPTION

- **Delivery time**
3 hours after acquisition
- **Frequency of acquisition**
2 products per day
- **Delivery method**
FTP + email
- **Satellite inputs**
SAOCOM1A & SAOCOM1B

RAPID MONITORING OPTION



➤ The Rapid Monitoring Service offers the possibility of activating desired acquisition windows.

➤ Each acquisition window, which can be requested with at least 24 hours of anticipation, has a 5-day activity term. The maximum number of acquisitions per window is 12.

➤ The service has a fixed monthly fee, which includes 1 (one) activation window and the possibility of activating more windows (by request).

➤ If the customer wishes to activate more windows in the same period, he/she can request it.

MORE APPLICATIONS

➤ Mining, Oil & Gas Monitoring

➤ Drinkable Water Urban Leakage Detection

➤ Flood & Drought Monitoring

➤ Agricultural Data Monitoring

CUSTOMER ORIENTED OFFICE

2

calendar days prior to the date and time of purchase

24

hours of monitoring to obtain a new acquisition

24

hours from receipt of order to deliver catalog orders



SAOCOM SEARCH AND QUOTATION PLATFORM



EASY-TO-USE



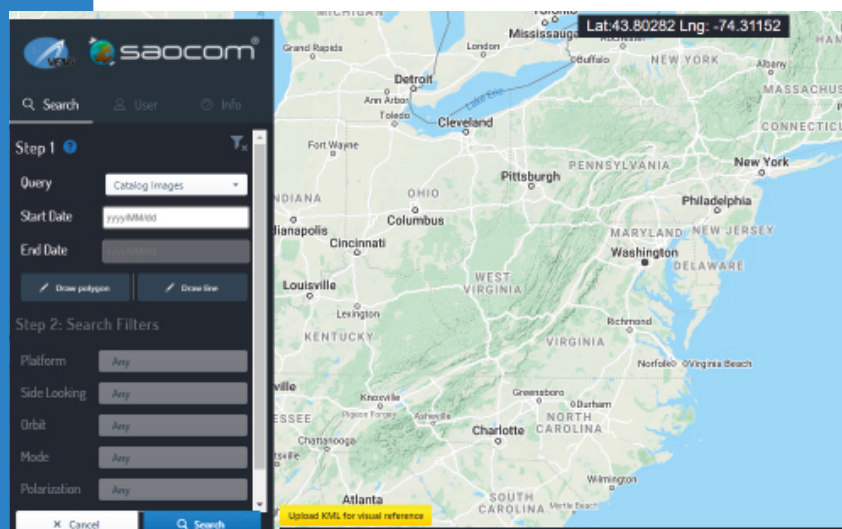
CATALOG IMAGES



FUTURE IMAGES



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