



FUGRO SATANALYTICS

SatAnalytics combines optical satellite imagery with data analytics, machine learning and cloud computation to derive bathymetry, morphology, seafloor and water column properties for marine site characterisation in the coastal zones. SatAnalytics uses the satellite data to provide the insights you need for planning and change detection to support your project.

SEAMLESS HYDROGRAPHIC DATA COVERAGE

Reconnaissance data is essential for desktop and feasibility studies to help with selecting suitable route corridors and landfall locations for cable route surveys and to reduce project risks by detecting seafloor hazards early on. Reconnaissance data is also used to help optimise airborne and vessel survey planning to minimise project costs and for efficient hydrographic survey operations. SatAnalytics provides key information to model shallow-water bathymetry and insights into coastline dynamics from multispectral Earth observation satellites for shallow-water and high-risk coastal environments.

Continuous observations in short intervals of the project site helps detect short- and long-term changes for coastal zone monitoring.

INNOVATIVE HIGHLIGHTS

1. Uses cloud processing which requires minimum desktop hardware
2. Can be integrated with other digital Geo-data engagement and delivery platforms
3. Fast and safe data acquisition
4. Temporal and historical site analysis

BENEFITS

- Efficient process achieved through fast acquisition, processing and delivery of Geo-data in the coastal zone via our web-based Geo-data engagement and delivery platform
- Safe operations ensured by the use of remote solutions for high-risk coastal zones to acquire and process the data
- Global coverage enabled by the growing availability of commercial and public Earth observation satellites that allows SatAnalytics to offer extensive geographic cover, produce time series studies and combines historical data

REAL-TIME MONITORING

SatAnalytics helps monitor and analyse various satellite datasets to support decision making, such as planning and mapping for your coastal project. For example, if preliminary information of the project site is not available or limited, SatAnalytics can provide the insights needed, such as hazard detection and poorly charted areas, to help ensure safe survey operations.

Using SatAnalytics, you can also access historical data such as the water depths, morphology and seafloor class to monitor changes over time. It can also be used to detect changes after a survey has been completed. For example, the time between a cable route survey and cable lay or installation activities can consist of a time gap of more than a year. With SatAnalytics, new data can be acquired in real-time to detect any changes between the survey and installation activities.

OUR APPROACH

Cloud-computation and physics-based inversion technology are used to derive quantitative bathymetric data, water column and seafloor information in shallow waters. Multispectral images (satellite or aerial) collect the reflected sunlight from the underlying medium. The dedicated algorithms correct the images from atmospheric and other noise effects to deliver the required information, independently or with survey data input.

The quality assurance and quality control process combine automated and manual validation. Monitoring is enabled from the repetition of the process at regular times. Satellite acquisition tasking is available to collect information at a chosen time or in the best conditions.

ACCURATE AND HIGH-RESOLUTION SATELLITE DERIVED ANALYTICS

SatAnalytics combines advanced hydrographic expertise with robust satellite analytic technologies to provide high-quality shallow water data models and analysis in the coastal zone. Through integrating traditional survey sources with satellite-derived bathymetry, we deliver seamless data and actionable insights to support your hydrography, coastal resilience and environmental project requirements.

FEATURES

- Data can be acquired in shallow water environments of 1 secchi disk depth
- Satellite derived bathymetry digital terrain models at high resolution 10 m or very high resolution at 2 m or finer. Vertical accuracy of 0.5 m and 10 % water depth, up to 20 m depth in ideal conditions
- Quantitative or qualitative seabed morphology extraction for seabed change detection or coastal resilience analysis
- Shoreline dynamics (time-series analysis, determination high and low water marks)
- Optical seafloor characterisation with habitat mapping or geologic classifications (using sub-surface irradiance reflectance)
- Environmental condition analysis of water column properties for dissolved organic matter, algae bloom, secchi disk depth, water surface temperature, turbidity etc.
- On-demand survey planning assistance, such as time analysis, satellite derived bathymetry contour extractions etc.

Technical specification

General Specifications

Name	SatAnalytics
Resolution	Very High -Resolution (VHR) 1 m to 2 m High Resolution (HR): 10m
Main Satellite Providers	Commercial (VHR): Maxar worldview, Airbus Pleiades, archive or tasking Public (HR): ESA Sentinel 2
Bathymetric Ground Truth	Ground truth data is not mandatory to extract satellite-derived bathymetry When available, use of bathymetric ground truth data improves the results accuracy.

Accuracies	No Ground Control	With Good Ground Control
Vertical	0.5 m + 10 % depth absolute LE90	~0.5 m
Horizontal - VHR	5 m CE90	up to 1-2 m CE90
Horizontal – HR Sentinel 2	20 m CE90	12.5 m CE90
	For each data delivery, specific accuracies are given for the area of interest depending on the local environmental conditions.	
Achieved standard	IHO-S44 Ed.6. Ba7-Bc6-Bh9 / CATZOC C	

