GEOSAT 1

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GEOSAT

01.   GEOSAT 1 AT A GLANCE

GEOSAT 1 is a medium resolution (up to 20m resolution) multispectral optical satellite, fully owned and operated by GEOSAT. The GEOSAT 1 end-to-end system has been designed to provide a cost-effective yet highly responsive service to customers worldwide.

1.   GEOSAT 1 AT A GLANCE

The payload is a 3-band multispectral imager featuring up to 20m resolution over a 600km swath, with 10 bits radiometric depth. Spectral bands are designed to be similar to those from Landsat series.

GEOSAT manages all uplink and downlink activities, as well as satellite control. GEOSAT 1 makes use of several ground stations located around the world to maximize redundancy and availability, and to guarantee at least one contact with the satellite at each orbit.

GEOSAT 1 on-board data storage capacity and downlink speed rate allows the generation of coverages over large areas in short time periods.

BAND	NAME	SPECTRAL RANGE (NM)	GSD (M)	STANDARD ORTHO (M)
1	NIR	770 – 900	22.0	20.0
2	Red	630 – 690	22.0	20.0
3	Green	520 – 600	22.0	20.0

GEOSAT 1 standard ortho product features a 20m resolution. The Ground Sampling Distance (GSD) is 22.0m for the Multispectral channels, considering Nadir observation conditions.

A very-wide-swath imagery allows an average revisit time of 2-3 days worldwide and 1-2 days at mid latitude. GEOSAT 1 capacity guarantees more to 3,000,000 Km2 per day, with strips of up to 600km wide and up to 1,000km long.

GEOSAT 1 has capacity for capture fractions of the swath, allowing for flexible and optimized capacity and delivery timeliness.

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02.   IMAGERY

GEOSAT 1 images are available as either individual ortho-ready scenes or ortho scenes, optionally cropped and/or masked to the area of interest. These Ortho-ready and Ortho scenes can be also obtained from the GEOSAT API.
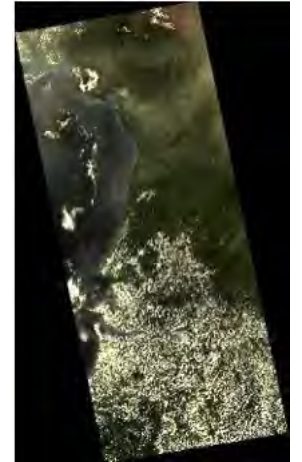
2.   IMAGERY

Different product types are available depending the user application and purpose. All products are generated at 8 bits and can be provided with 10-bit depth upon request.

Imagery may be complemented by a AI-based BLUE band to generate a RGB product that could be useful for visualization.

PS4_L1C SAMPLE   PS3_L1C SAMPLE

ID	PRODUCT TYPE	DESCRIPTION	STANDARD ORTHO (M)	BIT DEPTH
NRG	Multispectral	3-band (NIR+R+G)	20.0	10/8
RGB	Expected color	3-band (R+G+B*)	20.0	8
NRG-AC	Atmospheric Correction Multispectral	3-band (NIR+R+G)	20.0	10/8
VAP	Vegetation Indexes	1-band	20.0	10/8

GEOSAT 1 image products are available on different processing levels

ID	PROCESSING LEVEL	DESCRIPTION	INFO
L1R	OrthoReady	Calibrated and radiometrically corrected scaled ToA radiance, not resampled	RPC + TIF + metadata
L1T	Ortho	Calibrated and radiometrically corrected scaled ToA radiance, orthorectified and resampled.	TIF + metadata

VEGETATION INDEXES are an important parameter of agricultural and forestry development analytics. GEOSAT 1 provides indexes such as NDVI, GNDVI, RECI, SAVI and MSAVI, among others, are available on request.

Reflectance values obtained after application of **ATMOSPHERIC CORRECTION** models such as 6S, based on radiative transfer theory, provides results that offer a better understanding of crop conditions at the bottom of the atmosphere (BOA).
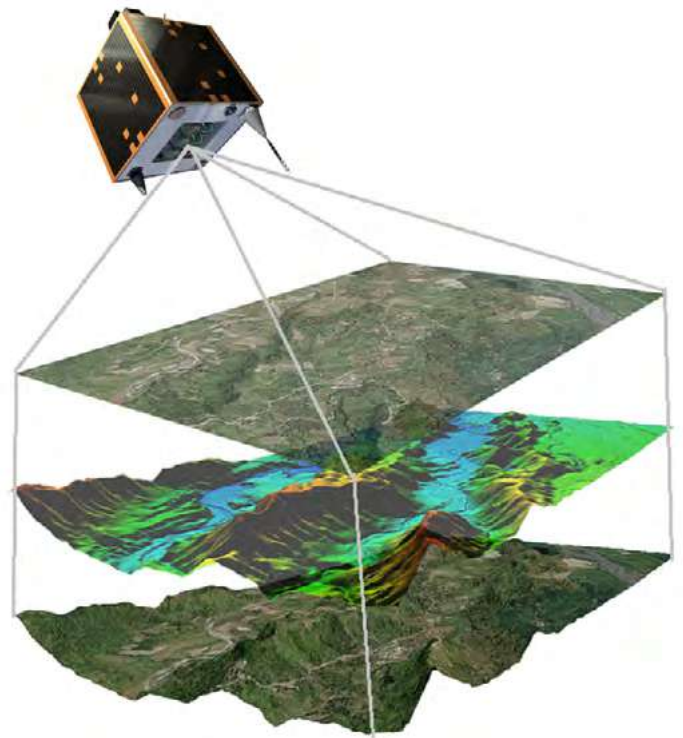
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2.1   GEOSAT 1 PROCESSING

RADIOMETRIC CALIBRATION is performed on periodically using CEOS pseudo-invariant calibration sites and optical sensor references. This process, together with an extract band registration, allows the generation of calibrated and radiometrically corrected GEOSAT 1 L1R products, with TOA radiances are being scaled to 10-bit unsigned integer values. Gain and bias coefficients defined for each band in the metadata could be applied to retrieve again those TOA radiance values.

$$Radiance = DN/Gain + Bias$$

ORTHORECTIFICATION process is accomplished throughout three steps: ground reference, rectification and validation. Collection of ground points (GCP) over configurable reference dataset (REF) + digital elevation model (DEM) refine the sensor model coefficients, correcting image distortions due to the Earth's topography and providing a rigorous sensor model that would be used for rectification. Final validation is performed by assessing the geometric error obtained.

QUALITY ASSURANCE AND MONITORING are of prime importance for GEOSAT. Orthorectification process generates the L1T product rectified to the desired projection and resampled resolution. GEOSAT provides to customers fully customization in terms of reference datasets, DEM, accuracy (RMSE), projection (EPSG), resampling and product formatting. By default,

PROJECTION	UTM WGS84
RESAMPLING	Cubic convolution
RESOLUTION	20m / 22m
REFERENCE DATASET DEM	Sentinel-2, Landsat SRTM

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3   **PRODUCT**

GEOSAT is fully dedicated to deliver high quality information products & services for actionable insights on time and on specification. Our services are tailored to customer needs. Let us know your goals and a targeted solution would be proposed considering suitable EO data.

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3.   PRODUCT

HR IMAGERY
Provision of scientific level data with 20m resolution on each Multi-spectral band.

EXTENSIVE ARCHIVE
GEOSAT 1 has 15+ year archive that provides you the perfect dataset to monitor development over time in any area in the world.
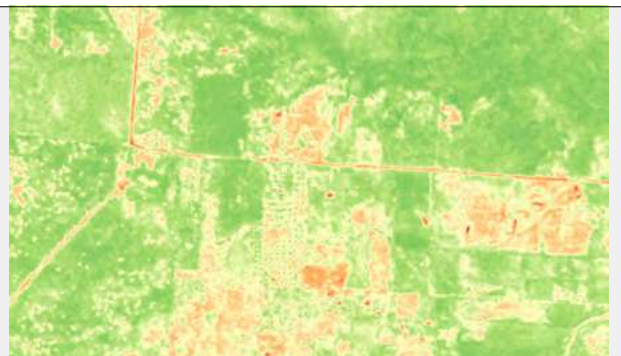

QRT | NRT TASKING & DELIVERY
Our 24/7 service provides rapid response to events. Intelligence information is possible for emergencies through effective solutions

ANALYSIS READY DATA
Our 15+ experienced team validates the data quality and ensures the delivery of reliable solution that accelerate decision-making in a great variety of fields and applications.

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3.   PRODUCT

CHANGE DETECTION

Our sensors feature a great capacity for multitemporal revisits in a short period of time and provide high quality, multi-source, multiresolution satellite imagery.

ANALYTICS

Through machine learning we support the detection and classification of elements with measured confidence and tailored outputs based on the application (urban, forestry, maritime, raw materials, logistic, etc.)

SUPPORT TO SATELLITE MISSIONS

All capabilities at your fingertips. 15+ years of experience operating satellites, processing images and performing quality analysis.

TAILORED EO SOLUTIONS

A wide range of customizable products & services benefit customers and partners around the world, giving them solutions that help them improve their businesses and thus our planet.

3.1   DEDICATED SERVICES

Based on specific requirements and characteristics defined by each market, dedicated solutions have been envisioned to provide a successful support aimed at customer satisfaction.

DEFENSE, SECURITY & EMERGENCY RESPONSE

Measuring and monitoring human activity is a topic of major and increasing interest. For humanitarian or defense purposes, efforts are expended – by governmental as well as commercial actors – to remain aware of what is going on. GEOSAT provides 24/7 services to support this task, anywhere and anytime.
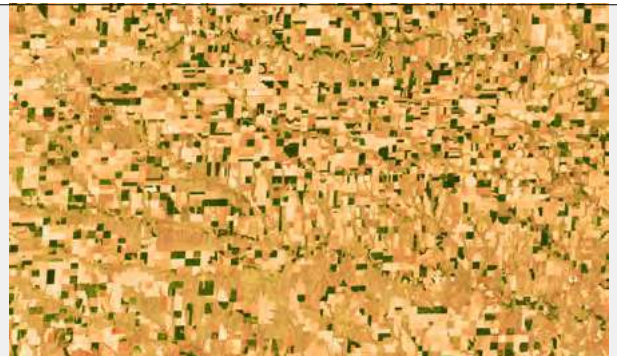

FINANCE & INSURANCE

Satellite Imagery & Remote Sensing are a key source of information to monitor finance and insurance activities. Geosat helps companies in faster and better decision making through personalized EO services with analytic reports & studies, insurance processing support, food security and environmental impact assessment.

AGRICULTURE GEOSAT

Gives you a global geographical scope and enhanced range of scientific-quality agricultural Very High Resolution (1.6m) data and information with a variety of resolutions, spectral bands and sensor types. We also offer value-added products which allow you to calculate crops health indexes, such as NDVI, EVI, CVI and GNDVI.

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3.1   DEDICATED SERVICES

ENERGY & NATURAL RESOURCES GEOSAT

can reveal actionable insights for various energy and mining applications. Identification mining and processing projects as input to evaluation of investment needs and related financing opportunities for critical raw materials. Services provide also monitoring of environmental impact and increasing safety.

LAND & INFRASTRUCTURE MANAGEMENT

We supply geo-information to support satellite mapping and urban planning. Offering a wide range of high-quality land administration and mapping data. In addition to imagery, GEOSAT has a broad portfolio of value-added products, such as change detection, 3D models and Digital Elevation Models (DEM)

ENVIRONMENT & CLIMATE CHANGE

Only when measured, actions could be taken if needed. Continuously monitoring our natural resources makes sustainable management possible and it's the best way to protect our environment for the future. We provide reliable, regular monitoring for a wide range of environmental pressures such as deforestation, land degradation, desertification and illegal logging.

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4   CATALOGUE & ORDER

GEOSAT catalogue is available as web interface or API. Searching in the GEOSAT catalog may consider filters for location, time, collections, metadata properties, or scene identifiers. GEOSAT 1 scenes returned can be subsequently ordered by specifying the desired product type and processing parameters.

4.   CATALOGUE & ORDER

Following STAC specifications, API defines a JSON-based interface to browse and query from GEOSAT 1 collections any scene that may match customer preferences, i.e. certain date range or cloudiness conditions. Ordering and Download capabilities allows to request any products identified at GEOSAT Catalog by means of friendly interface and to visualize or download them from a direct link.

In case there is not suitable data fulfilling the selected criteria, or new data is preferred, a request for tasking could be submitted through the API. First, a feasibility study will be performed based on the requirements provided by the customer. Once a set of collection opportunities confirmed by GEOSAT, the mission will be tasked to perform those finally selected by the customer.

Based on OGC standards, different web services are available at GEOSAT for visualization and catalogue browsing such as WMS, WMTS and WFS.

Further to these interfaces, GEOSAT provides a Customer Service Desk available
        For standard orders, during working days (8 – 18 UTC)
        For emergency orders, working 24/7/365.

Deliveries terms are agreed with customers based on their preference. By default, for once-off deliveries a direct link to the product is provided, whereas cumulative deliveries of products within a campaign are located at a dedicated SFTP account.

Please contact INFO@GEOSAT.SPACE for further information.

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