Our Differentiated Process

Space Intelligence provides the highest accuracy nature mapping data to provide greater confidence and certainty in decision making in nature-based project origination and investment.

We achieve this level of accuracy by employing processes developed by our co-founders who have a combined 30+ years of experience in remote sensing. Our senior mapping team have published more than 100 peer-reviewed publications on the use of satellite data for land cover analysis.

SAR, Optical, LiDAR

Machine Learning

Field Plots
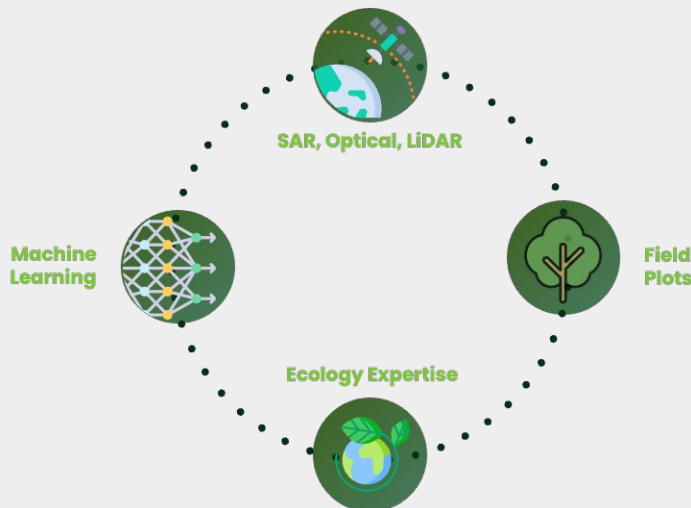
Ecology Expertise

Localised Calibration

Our remotely sensed data and ecological expertise is used in our own machine learning framework, which uses a local calibration to capture regional factors such as national forest definitions, seasonality of forests, cloud cover impact and more, to produce the most accurate results.

Granular Land Cover Insights

Our audit-grade HabitatMapper™ mapping process provides 8 land cover classes as standard to provide a comprehensive view of land cover and change, delineating natural and non-natural forest, mangroves, agriculture, and more.

Robust Accuracy Assessments

We assess the accuracy of our products and their uncertainty in a statistically rigorous way, following best practice as described in the scientific literature and following international standards and provide associated results for every map - whether at the national-level or a single AOI.

By the Numbers

>30	>100	12	>1.5bn
years of experience in remote sensing from co-founders	Peer-reviewed papers on remote sensing published by senior team	PhDs in mapping science team	hectares of land cover mapped

Technical Specifications
by Data Product

SPACE INTELLIGENCE

	Land Cover Data (Powered by HabitatMapper)	Above-ground Biomass (Powered by CarbonMapper)
Use Case	Audit-grade land cover data to support Origination, Due Diligence, Monitoring	Audit-grade Above-ground biomass data to support Origination, Due Diligence, Monitoring
Spatial Resolution	10 - 20m Resolution	20m Resolution
Aligned to National Forest Definition?	Yes	Yes
Land Cover Classes	8 classes as standard: closed forest open forest Plantation mangroves shrub grassland/pasture agriculture water bare/urban Additional granularity is possible and available on-request	N/A
Change Data	Stable Forest Stable Non-Forest Deforestation Regrowth	Change in AGB
Map Performance Assessment	Independent Accuracy Assessment and Error Matrix	We assess model performance (modelled vs observed canopy height) and provide an uncertainty estimate (95% confidence interval) derived from uncertainty in the canopy height model and the allometric equation
Inputs	Sentinel-1, Sentinel-2, Landsats 5-9, ALOS PALSAR & ALOS-2 PALSAR-2	Sentinel-1, Sentinel-2, Landsats 5-9, ALOS PALSAR & ALOS-2 PALSAR-2 GEDI, ICESAT, ICESAT-2
Delivery Methods	GEOTIFFs, Insight Reports	GEOTIFFs, Insight Report

Our Approach to Accuracy Assessments

We conduct an independent assessment of a set of isolated points, placed over the entire output map using a statistically valid sampling approach (a stratified random sample).

It's important to state that using a single metric (such as overall accuracy) is not a reliable way of describing map accuracy.

A much more interpretable and transparent way is to make use of an error matrix that shows commission and omission accuracies for each class (essentially assessing if the map is over or under-predicting certain classes).

Case Study: Cambodia National Mapping

Cambodia is a landscape where deforestation rates are high, with most clearing being small-scale for a variety of crops including tree crops such as palm oil, rubber and betel nuts. The forest is a complicated mixture of dry, moist and wet, including swamp areas and mangroves.

As a case study, we summarise below results of a 2020 land cover map that Space Intelligence did as part of a set of maps studying the land cover dynamics of the country for over 13 years. The maps show high accuracy and very little confusion between forest and non-forest, with us successfully excluding timber plantations and tree crops from the forest class.

	Commission accuracy (User's accuracy)	Omission accuracy (Producer's accuracy)	Overall Accuracy
Forest	96 ± 2 %	94 ± 2 %	-
Non-forest	96.2 ± 1.6 %	97.5 ± 1.3 %	-
-	-	-	96.1 ± 1.3 %

Table 1: Thematic accuracies for Space Intelligence's Cambodia forest baseline for 2023 as assessed independently using a probabilistic sampling design, showing high overall accuracy but also low amounts of confusion between the classes. All values include the 95th confidence interval.
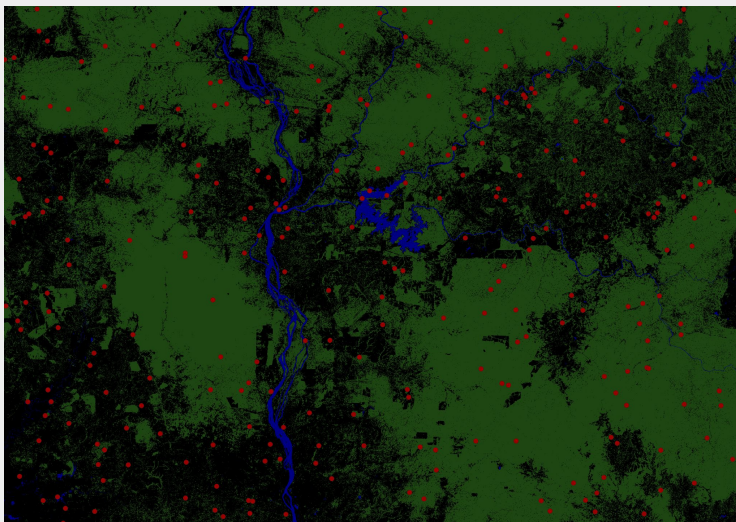

Figure 1: A subset of space intelligence's Cambodia forest baseline, showing forest in green, non-forest in black and water in blue. Red dots are some of the thousands of random accuracy assessment points used to assess the accuracy of the map.