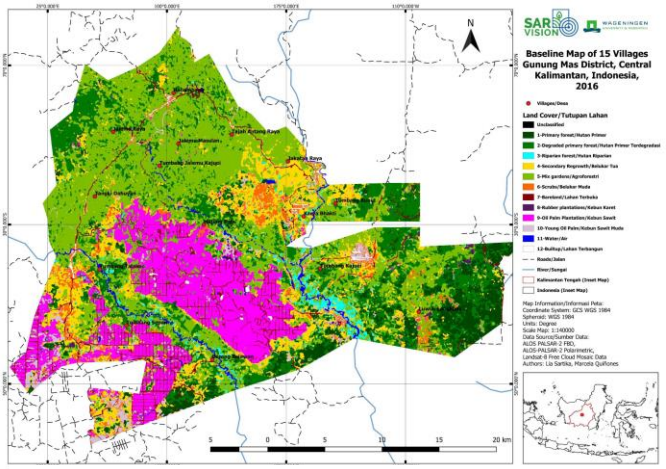
# Biomass and Carbon Mapping

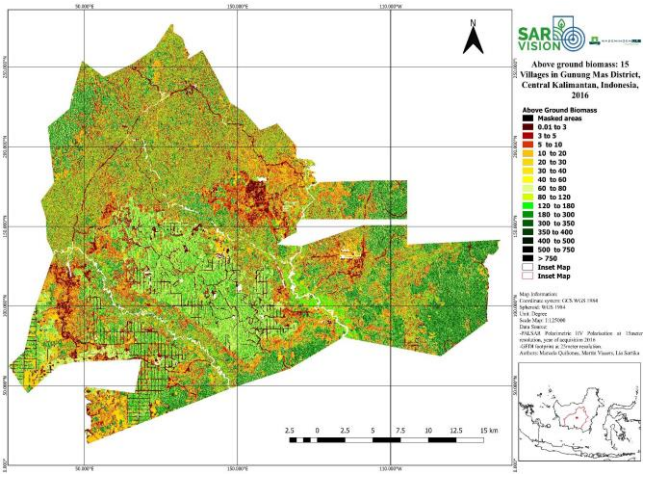
SarVision has developed a unique and accurate methodology to map biomass and carbon for large areas.

The method is based on an integration of high resolution optical, radar and lidar satellite data in combination with SarVision's advanced algorithms and in-house expertise. The information from these sensor types is complementary to each other and creates a unique database that is used for a variety of environmental analyses: monitoring crop growth, deforestation, forest degradation, forest hydrology and floods, and mapping of land cover, land use, biomass and carbon.

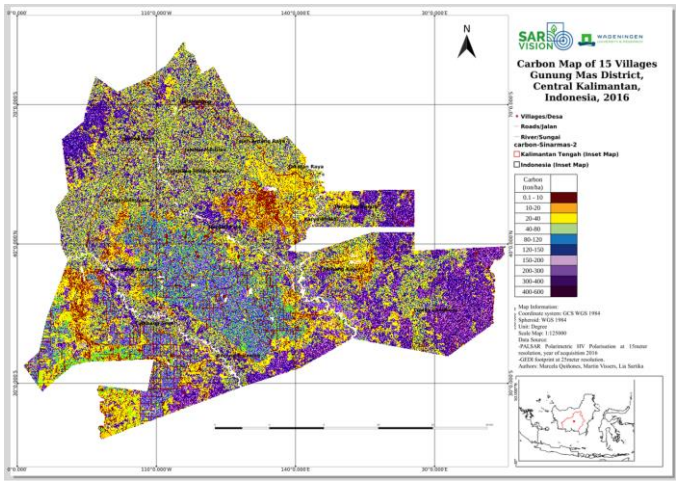
For the development of carbon maps, SarVision creates an accurate land cover map with detailed land cover and land use classes. The high-resolution maps are made according to international standards. Globally available lidar datasets are used to add detailed height information to each landcover class and forest type. This information is combined with internationally accepted transformation equations to create accurate biomass and carbon maps.




*SarVision's land use map of the Gunung Mas District (2016)*

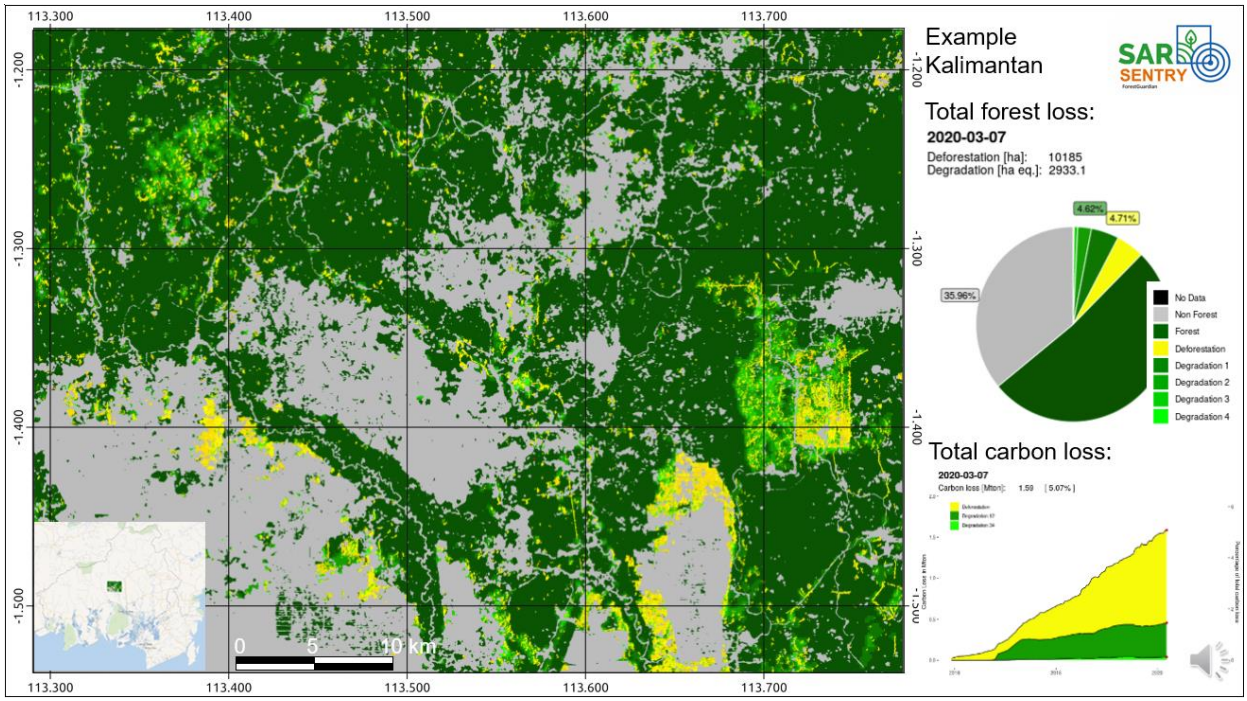



*SarVision's 2016 Biomass map of the Gunung Mas District*



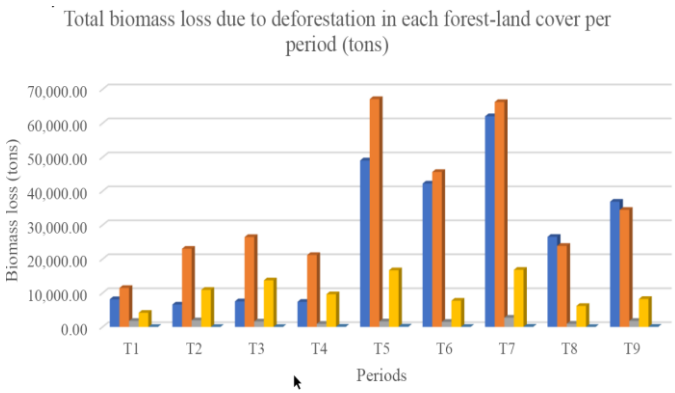

*SarVision's Carbon map of the Gunung Mas district*

*Figure below: Integration of SarVision's SarSentry forest monitoring system with the SarCarbon system in Central Kalimantan. The graph in the lower right shows the related carbon changes trough time.*

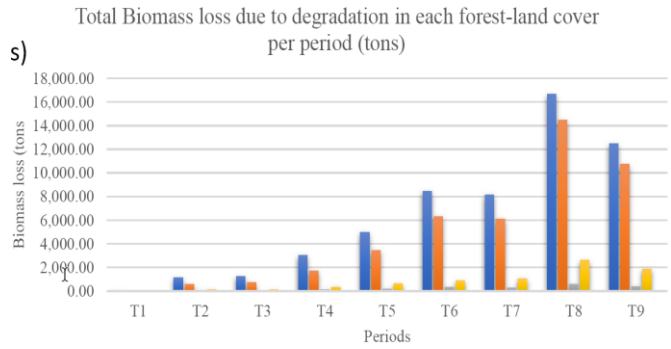


## SarCarbon and REDD+

With **SarCarbon** a detailed biomass and carbon map can be made for specific dates with an accuracy that outperforms existing Remote Sensing based carbon assessments. It not only incorporates forest loss caused by deforestation, but also the significant losses due to forest degradation. In addition, with SarCarbon it is also possible to produce accurate near real time carbon change maps which will be very relevant for REDD+ assessments!




*Loss of total biomass per ecosystem due to deforestation*




*Loss of total biomass per ecosystem due to degradation*

Carbon mapping in three steps:

1. The first product is the baseline map, created by integrating optical and radar data (Sentinel-1, Sentinel-2 and PALSAR) and the use of advanced classification algorithms. For this map vegetation structural classes are integrated with flooding conditions and land use.

2. The second product is the biomass map created by using an algorithm that fuses GEDI height range data with PALSAR backscatter distributions of the different land cover types of the baseline map. Validation is done using field biomass data. With the help of available transformation equations, biomass maps are transformed into carbon maps.

3. The third product consists of a carbon change map derived from the combined carbon map and the forest change maps based on SarVision's **SarSentry** forest monitoring system. (incl. deforestation and forest degradation). Carbon emissions due to deforestation and forest degradation can then be calculated separately.

## About SarVision

**SarVision** is a private company founded by researchers of the Wageningen University, the nr. 1 ranked agriculture university in the world. We are frontrunners in developing and implementing automated monitoring systems for natural resources management. SarVision integrates data from multiple satellite constellations with other sensors, using cutting-edge algorithms and environmental economic accounting models.

We distinguish us from other Remote Sensing companies by our large expertise in advanced radar technology that has made us a world leader in low-cost large scale operational near real time monitoring systems in areas with frequent cloud cover. Radar images are used by many, but our state-of-the-art algorithms are unparalleled. They are the core of a monitoring system and guarantee a sustained generation of quantitative information with a high accuracy.

Our automated and near real time detection of small-scale degradation is unique in the world and highly relevant as degradation is an important indicator of future deforestation and contains in general more than 20% of the total biomass loss in forests under threat.

## Our mission

Our mission is to offer continuous earth monitoring services, providing near real time analytics to customers. It is our mission to provide the best tools for efficient spatial planning, nature conservation, agriculture and sustainable land management.

## Contact

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