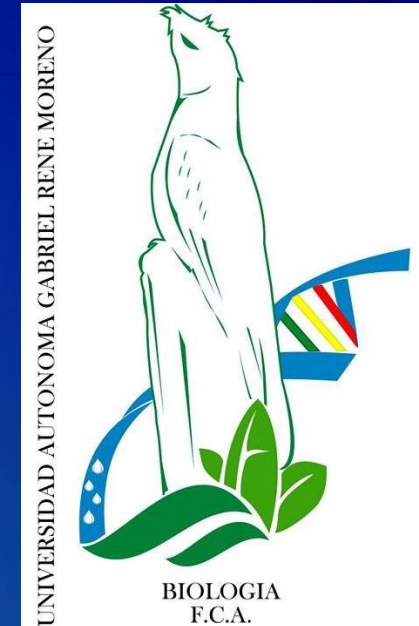


UNIVERSIDAD AUTONOMA GABRIEL RENE MORENO

Mario Alberto Guzmán Soza
Biology undergraduate student





USE CASE Canopy Cover Fraction and Land Cover Classification in the Chiquitano Dry Forest of Santa Cruz-Bolivia, Through Pleiades Neo and GEDI Data Fusion

Application: Forest Monitoring

Location: Santa Cruz, Bolivia

Products: Pleiades Neo

Parque Nacional Noel Kempff Mercado

AIRBUS



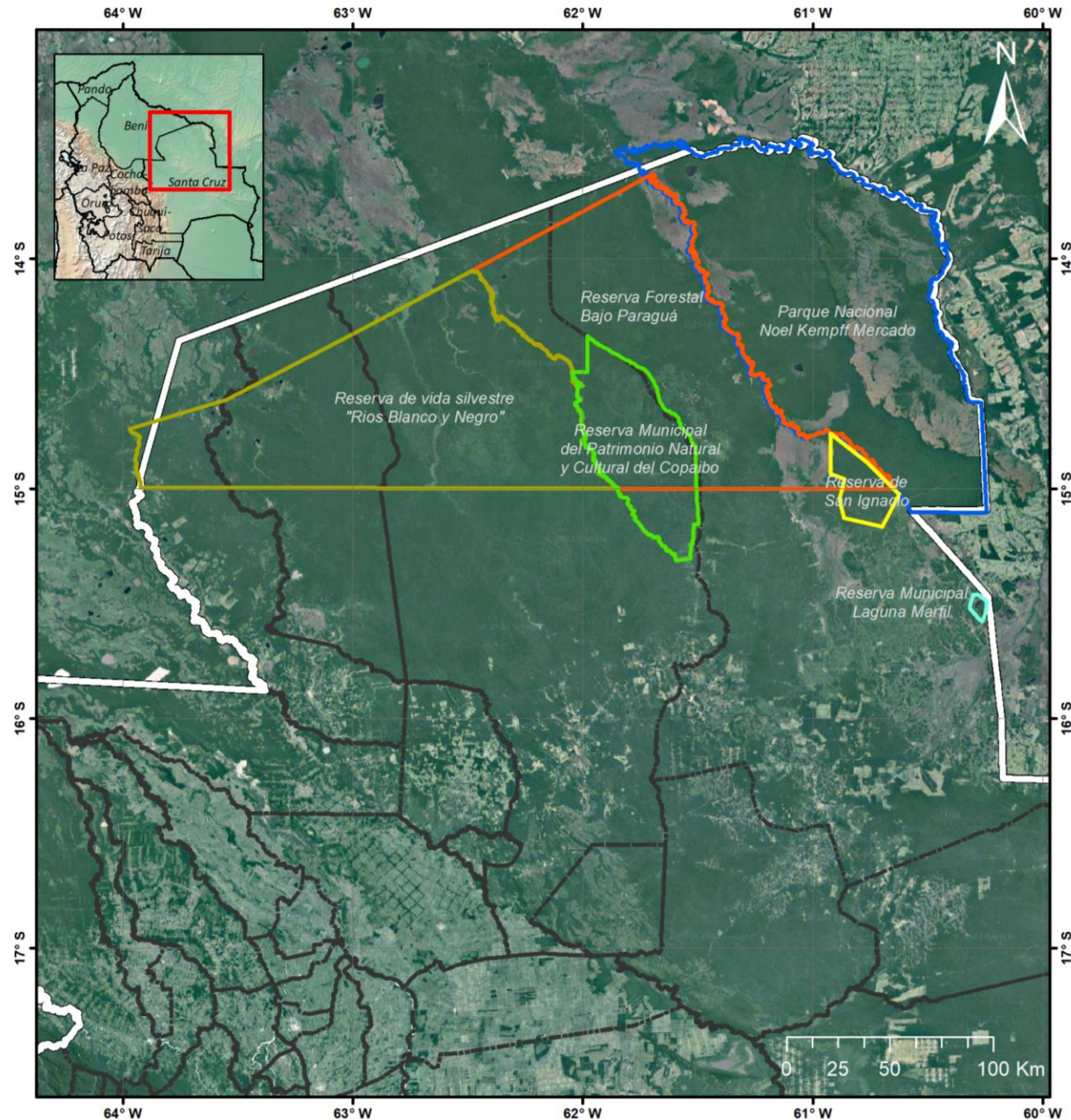
Challenge

The north of the department of Santa Cruz is dominated by extensive regions of Chiquitano dry forest, covers 24 million hectares, it is found almost exclusively in Bolivia and is located between the transition of the Amazonian forest and the Gran Chaco.

- It is a vast forested region, that is almost inaccessible in some places, such as the Noel Kempff Mercado National Park.
- Maps of the vegetation structure (canopy height) are only available up to 2020 and at a coarse resolution.
- The classification of the burned areas, available from the *Sentinel 2 classification layer product*, has a low resolution (20 m).

Wildfire events:

- The Chiquitano forest ecosystem has been disturbed by forest fires in 2020, 2021 and 2022, It must be monitored.
- There is also a need for accurate detection of fire scars in remote areas.



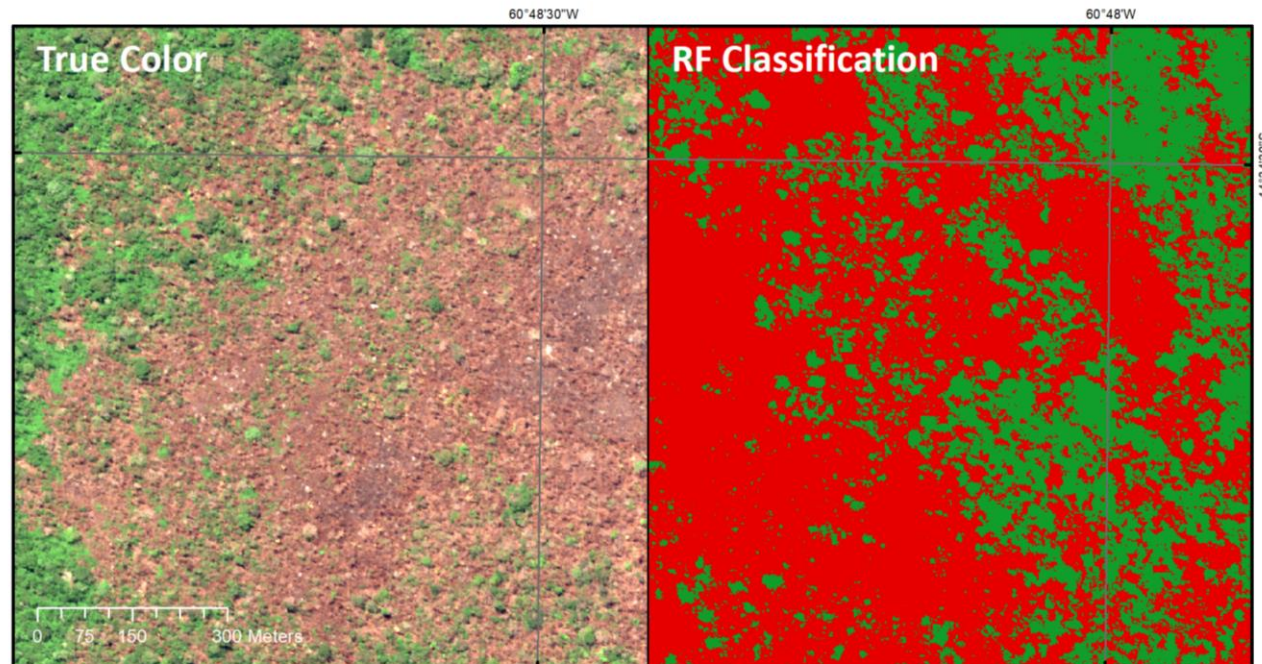
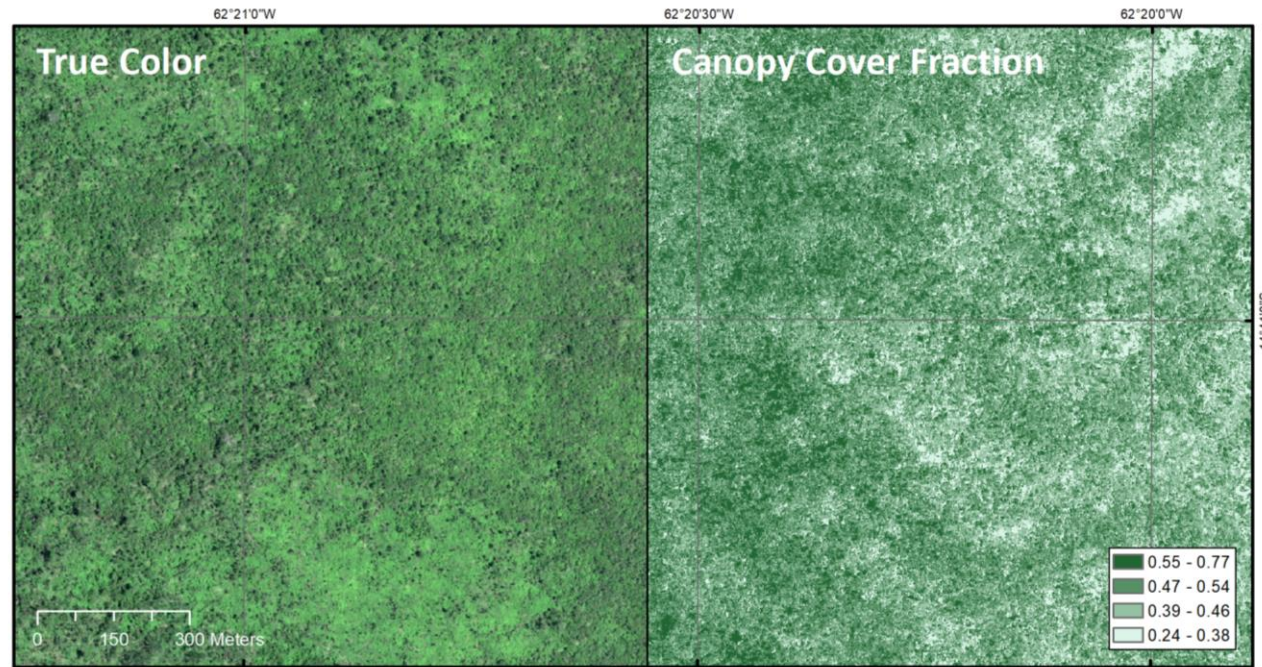


Solution & Results

- Image subsets have been selected based on the availability of LiDAR GEDI data.
- 11 variables were used: Green, Red, Red Edge and Infrared bands, 4 spectral indices and 3 texture measures calculated from the panchromatic band.
- About 4000 LiDAR GEDI shots with canopy cover fraction data were used in 16 image subsets.
- Machine learning algorithms were used to develop the regression and classification, to calculate the percentage of canopy cover and to classify the burned areas.

Pléiades Neo Imagery helped to:

- Produce high resolution maps of canopy cover (1.2 m) in sampled areas
- Classification of burned areas based on machine learning algorithms. High accuracy and precision compared to existing products.





Benefits

- Vegetation structure maps are useful for monitoring changes over time in ecosystems affected by forest fires in the Chiquitano dry forest in Santa Cruz, Bolivia.
- The classification and characterization of fire scars in remote and inaccessible areas, such as protected areas, will help the authorities responsible for these areas to accurately and quickly assess the damage caused by forest fires.

2020
Pre-wildfire



2022

