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Un break científico

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APPLICATION OF GOOGLE EARTH ENGINE FOR LAND COVER CLASSIFICATION IN YASUNI NATIONAL PARK, ECUADOR

PROBLEM

In recent decades, The Yasuni National Park has been affected by anthropogenic activities such as the construction of roads and infrastructure, drilling of oil wells, illegal logging, human settlements and agricultural activities ,that have altered its forest cover.

MAIN OBJECTIVE

The main objective of this study is to analyze the Yasuni National Park land cover, for the year 2019, using Google Earth Engine (GEE) and Geographic Information Systems (GIS).

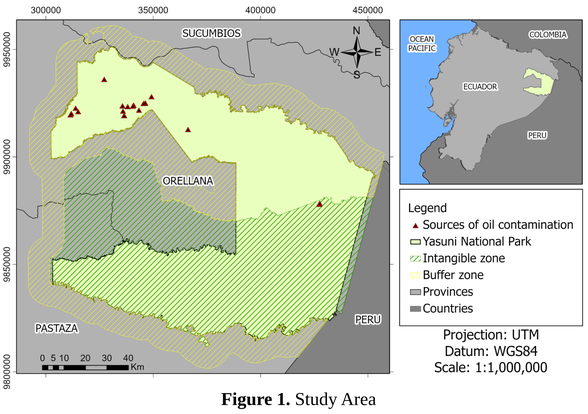

Figure 1. Study Area

PROPOSAL

The study was processed in three stages:

- The first stage corresponds to the collection and preparation of data, Sentinel-2 satellite images and the boundary polygon of the study area. Using GEE, a cloud and shadow mask was applied to the satellite images, which would later form a mosaic based on the median of each pixel.
- The second stage refers to the use of GEE for the supervised classification of land cover in the generated image, applying the Random Forest algorithm with 30 decision trees.
- And the third stage consisted of a post-processing, where the reclassification of the raster was performed, using ArcGis Pro software. This resulted in a script with the algorithm used in Google Earth Engine, a thematic land cover map and the quantification of the area of each class.

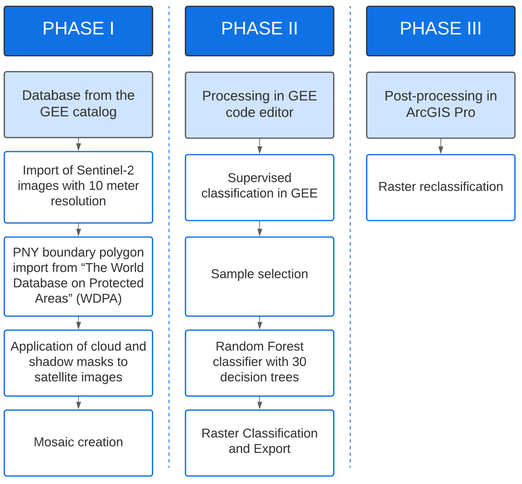

Figure 2. Methodology used in the study

RESULTS

Anthropogenic activities are concentrated to the north of the study area, being direct and indirect consequences of engineering activities. Among the direct impact, the construction of access roads and oil installations stand out; which leads to indirect impacts such as the establishment of towns around the roads and in turn the growth of agricultural activities.

Table 1. Distribution of the Areas in the Yasuni National Park

Class	*Area [ha]*	*Relative share [%]*
Forest	994829.80	97.231
Water bodies	4345.83	0.425
Bare soil	1267.37	0.124
Urban area	43.35	0.004
Anthropized area	736.09	0.072
Unidentified area	21.942.39	2.145

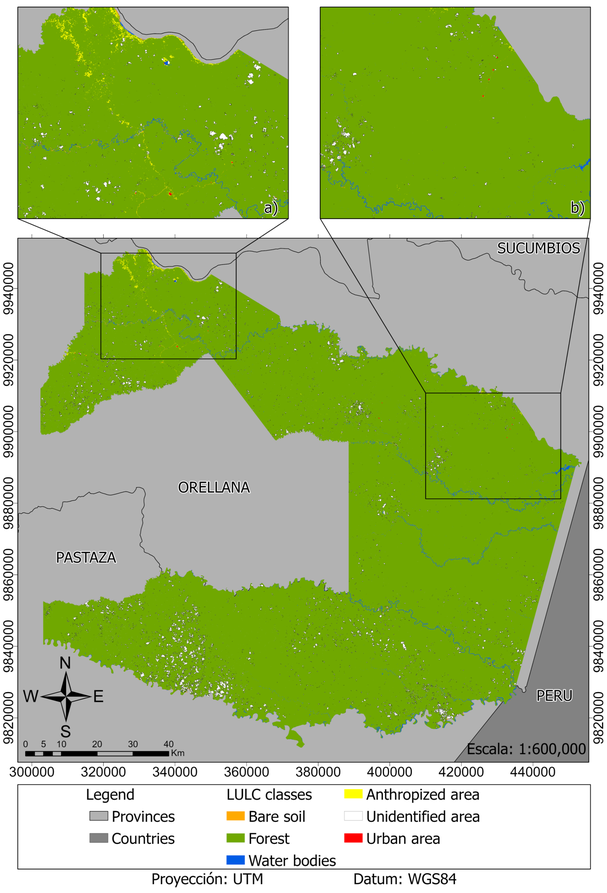

Figure 3. Thematic map of Land Cover, referring to the year 2019

CONCLUSIONS

- The results obtained allow identifying areas of human impact, which facilitates subsequent studies to measure the growth of human activities within the PNY.
- GEE proved to be an efficient and effective processing tool that allows the user to replicate the same geoprocessing in other study areas.