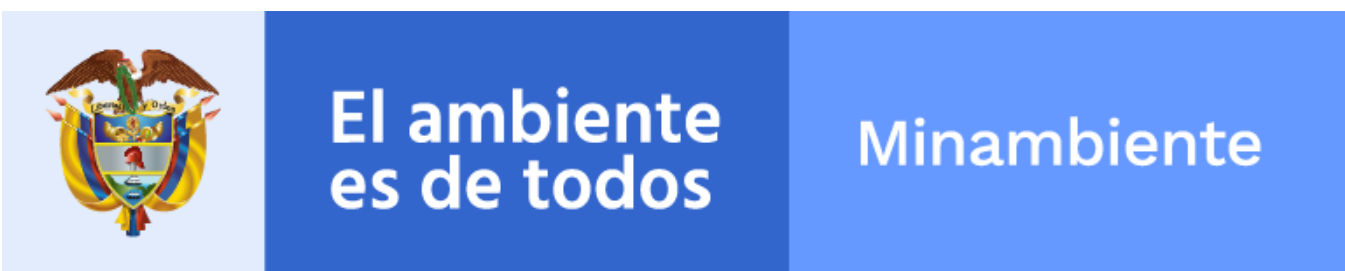


# SEMI-AUTOMATED DETECTION OF MANGROVES IN COLOMBIA USING CLOUD BASED IMAGE PROCESSING

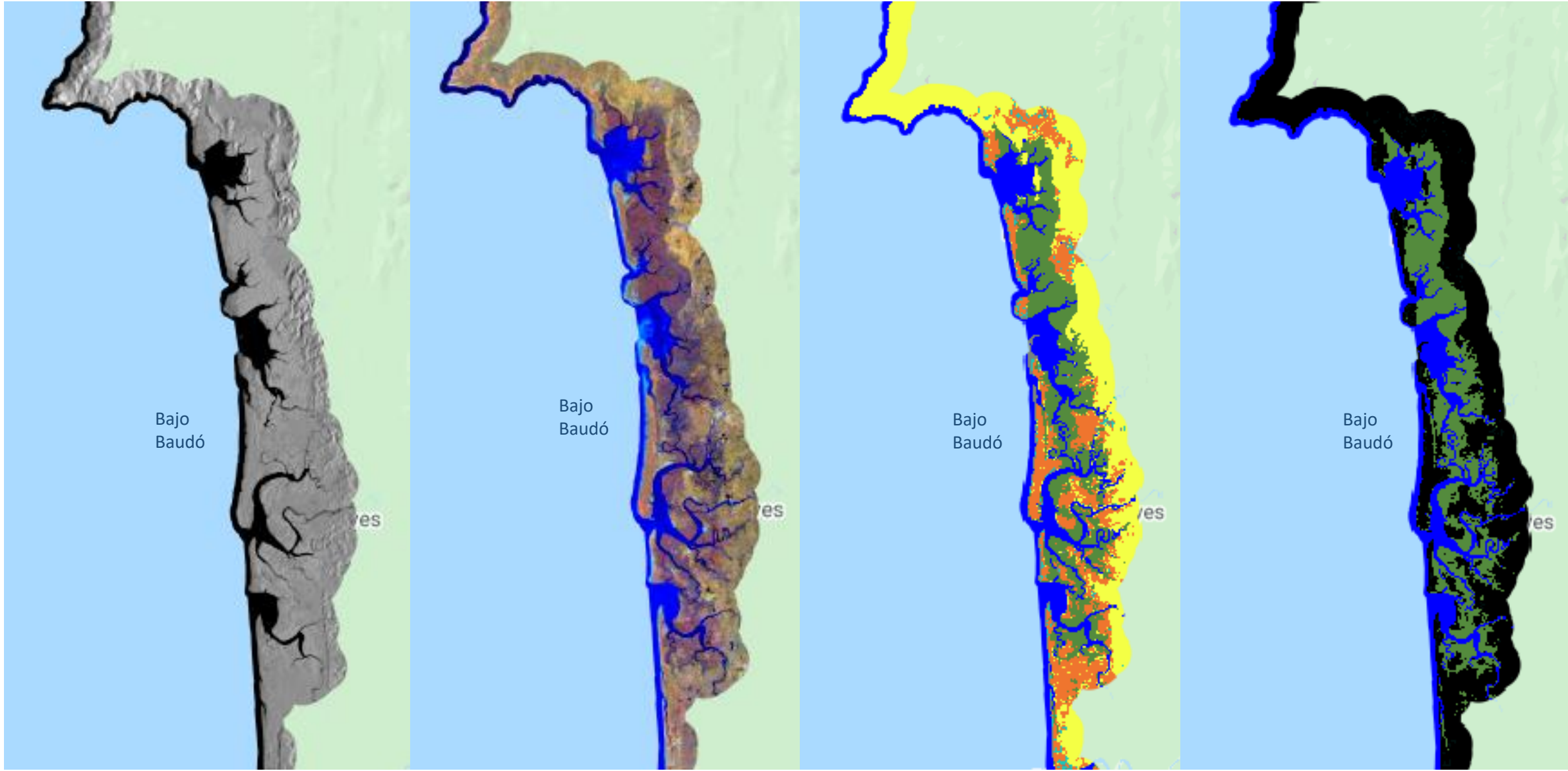


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## INTRODUCTION

Knowing the extension and distribution of mangroves is essential for decision-making related to the management of the ecosystem, which plays an important role at an economic and ecological level. Remote sensing data has been used for years as an input to generate mangrove maps. However, mapping large areas at detailed scales may require high computational capacity and processing time. The present study used the Google Earth Engine platform to process hundreds of satellite images in the cloud that would allow the identification and delimitation of mangrove forests in Colombia.

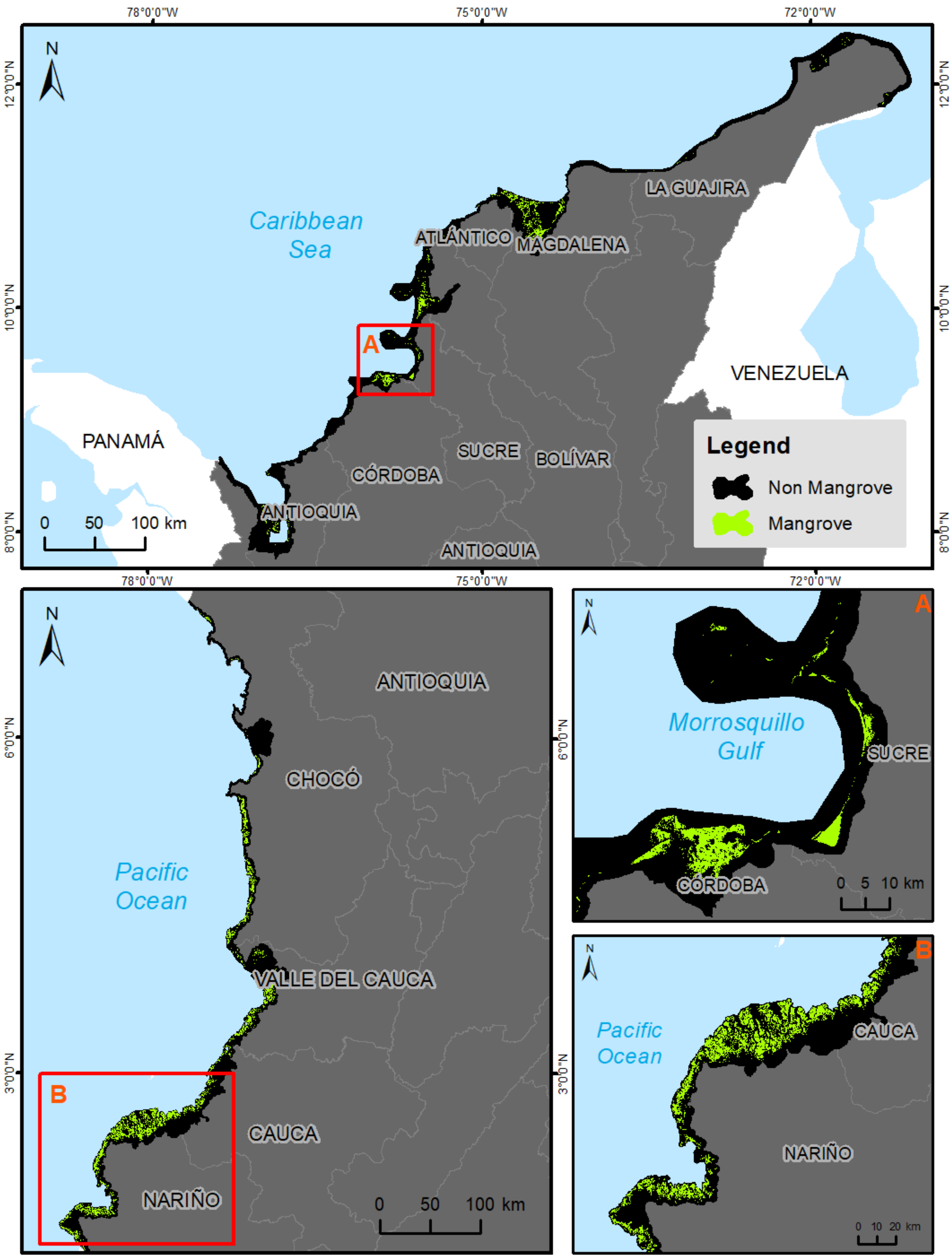


Bajo Baudó, Chocó, Colombian Pacific. (a) Sentinel 1 mosaic – VV polarisation (b) Sentinel 2 cloud free mosaic – false color composition. (c) Random Forest classification to separate mangroves from other covers. (d) Mangrove and non-mangrove covers.

## RESULTS



Final clasifcation mangrove / non-mangrove  
10 meters spatial resolution



- ✓ Map accuracy above 90%
- ✓ Use of free Access images
- ✓ Processing hundreds of images in minutes
- ✓ Alternative for periodic monitoring of mangrove extension

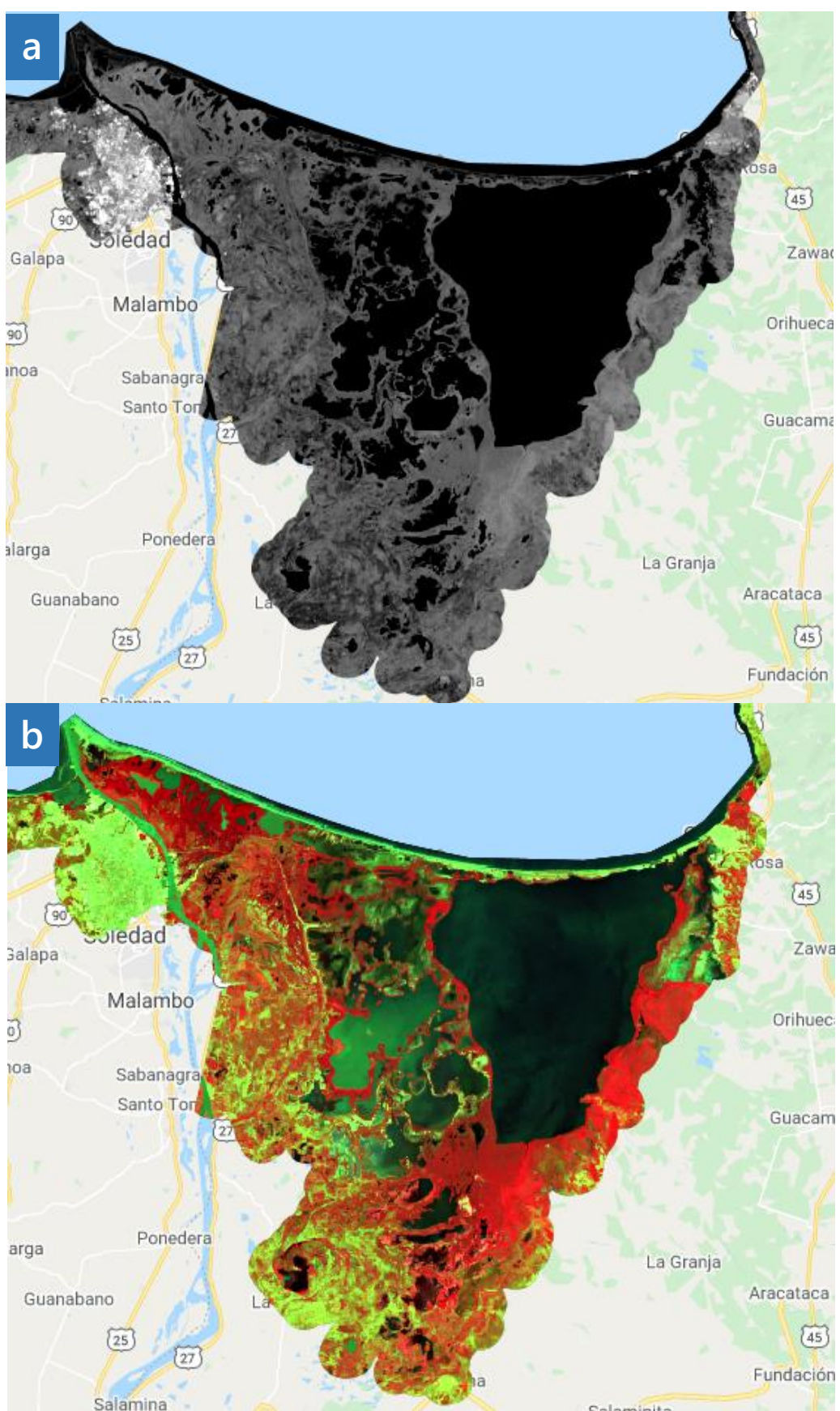


	Caribbean	Pacific
Overall accuracy	90%	96%
Kappa	0,85	0,95

The digital processing cloud-based alternatives offer advantages to detect large mangrove extensions, due to the ability they provide to apply advanced remote sensing techniques to robust satellite data sets, which allows to exploit the potential of the images and minimizes processing time. The foregoing is of primary importance in the generation of accurate and timely information for decision makers.

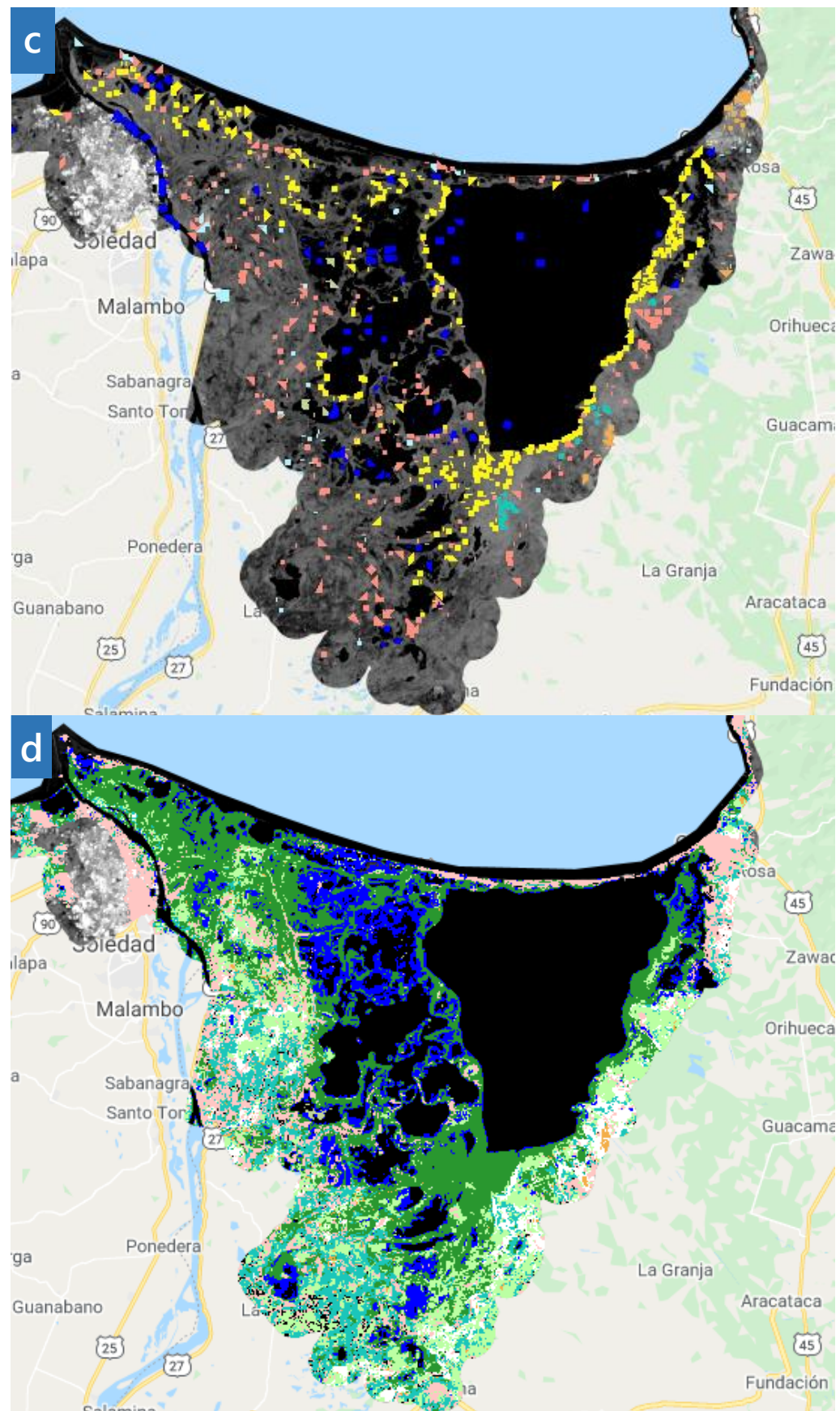
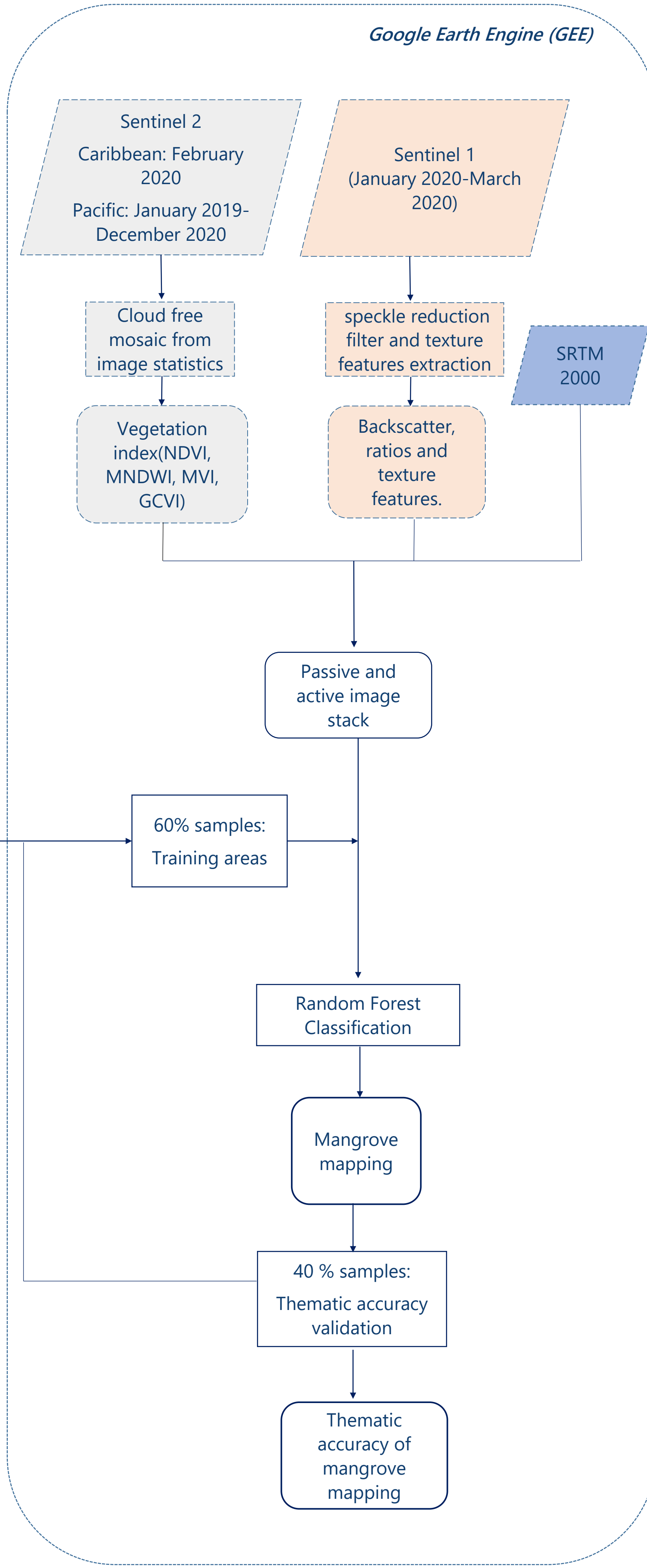
Thanks to MinAmbiente, regional autonomous corporations and other organizations that supported the project.

## DATA AND METHOD



Satellite images mosaics of Ciénaga Grande de Santa Marta, Colombian Caribbean. (a) Sentinel 1 mosaic – VV polarisation (b) Sentinel 2 mosaic – false color composition.

Samples: Field data, Sentinel-2 2020 images, high resolution passive images



Ciénaga Grande de Santa Marta, Colombian Caribbean. (c) Training and test samples. (d) Random Forest Classification to separate mangroves from other covers.