**Long-term changes in seagrass distribution using a high-spatial resolution satellite image, historic aerial photography and field data**

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**Abstract**

Reported cases of seagrass loss have increased over the last 40 years, increasing the awareness of the need for assessing seagrass health and understanding its temporal and spatial dynamics. This study provides a high resolution characterization of the seagrass communities and an estimate of long-term changes in seagrass extent at Caja de Muertos Island Nature Reserve in Puerto Rico. First, a supervised classification and a manual reclassification was performed on derived seafloor reflectance and bathymetry data from a 2014 WorldView-2 satellite image which was used to conduct an object-based image analysis. A total of 164 sampling sites were used to calibrate and validate the map. The overall accuracy obtained was 82.76% and the total seagrass accuracy was 85.00%. In addition, a time series of satellite imagery and historic aerial photography from 1950 to 2014 provided data to assess long-term changes in seagrass habitat cover within the Reserve. We found an increase of 64% of seagrass extent at the study area, contrasting with the worldwide declining trend. The results of this study provide valuable information for the conservation and management of seagrass habitat in the Reserve.