

# LONG-TERM MONITORING OF SEAGRASSES USING A WV-2 SATELLITE IMAGE, HISTORICAL AERIAL PHOTOGRAPHY AND FIELD DATA

*Mariana C. León-Pérez<sup>1</sup>, William J. Hernández<sup>2</sup> and Roy A. Armstrong<sup>3</sup>*

<sup>1,2,3</sup>NOAA CREST, Marine Science Department, University of Puerto Rico, Mayagüez Campus

m\_careli@hotmail.com

Reported cases of seagrass loss have increased over the last 40 years, increasing the awareness of the need for assessing seagrass health. *In situ* monitoring has been the main method to assess spatial and temporal changes in seagrass ecosystem. Although remote sensing techniques with multispectral imagery have been recently used for these purposes, long-term analysis is limited to the sensor's mission life. The objective of this project is to evaluate long-term changes in seagrass habitat cover at Caja de Muertos Island Nature Reserve, by combining in-situ data with a satellite image and historical aerial photography. A current satellite imagery of the WorldView-2 sensor was used to generate a 2014 benthic habitat map for the study area. The multispectral image was pre-processed using: conversion of digital numbers to radiance, and atmospheric and water column corrections. Object-based image analysis will be used to segment the image into polygons representing different benthic habitats and to classify those habitats according to the classification scheme developed for this project. The scheme will include the following benthic habitat categories: seagrass (sparse, dense and very dense), colonized hard bottom (sparse, dense and very dense), sand and mix algae on unconsolidated sediments. During April and June of 2015, a total of 155 sites were sampled to be used for calibration and validation of the 2014 benthic habitat map. In addition, a time series of satellite imagery and historical aerial photography from 1950 to 2014 will provide data to assess long-term changes in seagrass habitat cover within the Reserve. The results of this study will provide valuable information for the conservation and management of seagrass habitat in the Caja de Muertos Island Nature Reserve.