

# **HIGH RESOLUTION DRONE-BASED AERIAL IMAGERY FOR REMOTE SENSING OF TEMPORAL CHANGES ON SEAGRASS MEADOWS IN CAYO CARACOLES, LA PARGUERA, PUERTO RICO**

*Omar Lopez Fernandez*

Department of Marine Sciences  
University of Puerto Rico, Mayaguez Campus  
Mayaguez, Puerto Rico  
omar.lopez2@upr.edu

Seagrass covers about 0.1-0.2% of the global ocean and are highly productive ecosystems that fulfil key roles in coastal ecosystems. The loss of seagrass habitats results from direct human impact, including mechanical damage, as well as from natural causes like hurricanes. La Parguera is a natural reserve located on the southwestern coast of Puerto Rico and is known for the diverse marine and coastal ecosystems. Over the decades La Parguera has become a popular tourist hotspot for recreational fishing, diving and boating. Seagrass grows in shallow benthic habitats making them highly susceptible against recreational boating activities such as human interaction, anchoring and boat propeller scaring. This study focuses on using remote sensing from Unmanned Aerial Vehicles (UAV) to obtain ultra-high resolution imagery for mapping seagrass beds around Cayo Caracoles, currently the most popular tourist area on the Natural Reserve. The UAS high-resolution imagery provides a rapid synoptic detection of changes in seagrass habitats. Two different optical sensors are being used that provides multispectral and RGB imagery. These sensors are mounted on two different UAV platforms developed by the DJI company. Multispectral imagery was acquired using a modified Phantom 3 Pro with an integrated MicaSense RedEdge camera that consists of five bands: blue (Band1, 460–510 nm), green (Band2, 545–575 nm), red (Band3, 630–690 nm), NIR (Band4, 820–860 nm) and red-edge (Band5, 712–722 nm). Anthropogenic impact was calculated in square meters using ESRI ArcGIS 10.5 software iso cluster classification and polygon tool. Preliminary results show that a total of 2,182m<sup>2</sup> of seagrass was damaged during one weekend of high human activity on Cayo Caracoles.