BENTHIC HABITAT MAPPING AND BIO-OPTICAL CHARACTERIZATION FOR LA PARGUERA MARINE RESERVE USING PASSIVE AND ACTIVE REMOTE SENSING DATA.

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Coral ecosystems around the world, including those located in La Parguera Natural Reserve in southwestern Puerto Rico are among the most vulnerable in the world, because of the strong anthropogenic impacts and extreme weather events (i.e. hurricanes). The potential effects of climate change not only could affect the coastal and marine ecosystems, but also the communities that depend on these resources. Mapping marine habitats and associated species distributions is fundamental in determining the potential for protection, assisting in resource management and assessing impacts. Remote Sensing with active and passive sensors is being used to overcome limitations of studying coral reefs present in optically deep waters. The fusion of these data sources coupled with *insitu* bio-optical data will provide information for image processing including atmospheric and water column corrections, water quality parameters, and bio-optical characterization of the water from La Parguera Reserve. The use of this technology will provide products that include a high resolution bathymetric map and important analysis of the temporal variations of *insitu* and image derived inherent/apparent optical properties (IOP/AOP) of the waters in the reserve. Also using high resolution satellite imagery, a detailed benthic habitat maps for La Parguera Reserve will be developed based on techniques that include supervised classification and feature extraction methods to evaluate marine communities and their distribution. The knowledge of these benthic habitats and their spatial distribution is vital for understanding complex coral reefs systems, assessing patterns, identifying area of habitat diversity and determining management strategies.