

# **ASSESSING AND REFINING OPTIMAL PRACTICES FOR DRONE MISSION PLANNING IN MARINE ENVIRONMENTS**

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Satellite remote sensing, while providing broad geographic coverage, faces limitations in spatial resolution for detailed benthic characterization, especially in coastal regions like Puerto Rico. Small unmanned aerial vehicles (drones) offer a promising solution due to their ability to capture high-resolution imagery with flexibility. However, challenges arise in optimizing flight parameters to mitigate errors introduced by marine environments, such as sun glint and lack of reference points. This study investigates optimal flight parameters for generating precise Ortho mosaics over water environments, focusing on coastal and shallow water characterization. Experiments conducted in Cayo La Gata and Cayo Caracoles involved varying flight heights, overlaps, times, and angles to minimize sun glint and maximize image quality. Results suggest that flying drones along the solar azimuth angle, with a height of 120 meters, 85% overlap, and flying 2-3 hours away from solar noon, reduces sun glint and enhances mosaic quality. However, challenges persist, including the need for reference points in uniform areas. Recommendations include further testing in diverse environments and consideration of solar noon flights. Overall, this research provides valuable insights into future drone-based benthic mapping efforts, facilitating better environmental monitoring and management of marine areas of interest.