Investigating the Application of Multibeam Sonar and Remotely Operated Vehicles in Fish Population Monitoring on Artificial Reefs

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Quantifying artificial reef fish communities is considered one of the most difficult tasks in reef management due to the inherent challenges of high individual mobility and widely varying population abundances in space and time. This study aims to investigate the use of ROV video and sonar data to assess fish stocks on artificial reefs. Specifically, to 1) compare ROV video and diver visual census estimates of fish abundance and diversity; 2) estimate biomass of targeted commercial species from sonar; 3) determine whether sonar images can be used to identify fish species. Preliminary results indicate a marginal correlation (Rho = 0.498; p = 0.014) between ROV and diver abundance estimates. Species richness estimates were higher for diver surveys where greater numbers of demersal fish species were recorded including rock hind *(Epinephelus adscensionis*), cubbuyu (*Pareques umbrosus*), and seaweed blenny (*Parablennius marmoreus*). There was a strong correlation (Rho = 0.998; p < 0.001) between the standard lengths of captured fish their corresponding sonar image measurements. A PCA analysis of sonar variables (mean, max, and median reflectivity; area; length; distance from transducer; and angle in sonar field of view) failed to discriminate among 4 fish species examined.