

Water Depth, Seagrass, Algae, and Bottom Type Mapped with Airborne Multi-spectral Imagery in Tampa Bay

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Abstract

The use of multi-spectral imagery shows improvement over aerial photography in the delineation of submerged habitats in Perico Bayou, Tampa Bay, Florida. The Perico Bayou area is popular with recreational fishermen and includes a variety of benthic habitats. CASI (Compact Airborne Spectrographic Imager) data was evaluated for use in the identification and mapping of shallow and near shore benthic habitats. Fourteen submerged classes were identified including distinctions among bottom type, water depth to ± 0.3 m, submerged aquatic vegetation (SAV), and algae. Some confusion between epiphytized seagrass and benthic algae remains to be resolved. Field determination of habitat spectral ranges and the subsequent refinement of band selection will extend the accuracy and efficacy of this application.

Besides providing enhanced distinctions among critical habitats, multi-spectral imagery offers other advantages over the traditional use of aerial photography in mapping submerged habitats. Traditional mapping requires the physical outlining of features, dependent on the presence of visual clues and subject to operator expertise. The digital multi-spectral data offers enhanced optical clarity of features in multiple bands, the selection of habitat thresholds within the bands, the option of automating portions of the process, and a reduction in operator error. Spectral differences in a time series also provides a new opportunity to identify rates and trends in biomass, gradual shifts in habitat quality or succession, and the quantification of change beyond the limited constructs of categories.