

Abstract

Sidescan sonar coupled with a Global Navigation Satellite System (GNSS) provides a near photographic image of features underwater for use in mapping applications. Sidescan sonar acoustic pings are drawn as raw images, spatially referenced using GNSS coordinates and then mosaiced in specialized software to produce coverage areas. The resulting two dimensional images can then be analyzed in Geographic Information Systems (GIS) for manmade or natural underwater features. This technology has a special application for mapping eelgrass extent in Southern California, which has become a focus of research for the National Oceanic and Atmospheric Agency (NOAA) and several National Marine Estuary programs. Eelgrass is a submerged aquatic flowering plant that provides critical structural environments for resident bay and estuarine species, including abundant fish and invertebrates and is often a primary diet for several grazing snails. This project demonstrates the viability of creating a low-cost Unmanned Surface Vehicle (USV) with an attached sidescan sonar sensor for scientist and researchers to use in mapping eelgrass. The remote sensing imagery collected by the USV is classified in ArcGIS to calculate the full spatial extent of the visible eelgrass beds. The results of this project show acoustic imagery collected by a USV can be used to create classified bottom composition maps through manual classification. Unsupervised classification did not produce the desired results and is still a work in progress. By demonstrating these mapping tools, researchers can conduct studies at a much lower cost and on their own time instead of relying on expensive, contracted surveys.