

The application of remote sensing to seagrass ecosystems: an overview and future research prospects

ABSTRACT

This review evaluates various methods employed to produce seagrass habitat maps using optical and acoustic remote-sensing (RS) techniques coupled with in situ sampling to highlight recent advances and to define areas where potential future research should be focused in the application of RS technologies. A critical review of 195 studies revealed that, in the past four decades, advances in the application of RS methods, notably using Landsat imagery, are identified for seagrass detection, assessment of areal coverage, distribution and abundance mapping, and the detection of extent and biomass changes, as illustrated in peer-reviewed literature. Rapid technological and methodological advances have occurred in the acquisition and interpretation of optical and acoustic data for the mapping of seagrass habitats. The methods have been tested to segment, classify, and combine RS data with biological field or ground truth sample data. There is no single technology or approach that is suitable for and capable of measuring all seagrass parameters (presence/absence, cover, species, and biomass) and assessing change. Integration of field, imagery, and mapping approaches is therefore required. Further research is required for continued improvements in understanding of theoretical and methodological aspects of seagrass RS.

Keyword: Remote sensing; Seagrass ecosystems; Research prospects