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TITLE: Effectiveness of *Posidonia oceanica* biotic indices for assessing the ecological status of coastal waters in Saronikos Gulf (Aegean Sea, Eastern Mediterranean)

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ABSTRACT:

Biotic indices are considered key assessment tools in most national and European policies aimed at improving the quality of coastal waters. At present, several Water Framework Directive (WFD)-compliant biotic indices based on the marine angiosperm *Posidonia oceanica* have been developed and applied in the Mediterranean Sea. In this study, we investigated the effectiveness of four different *P. oceanica* indices (POMI, PREI, Valencian CS, and BiPo) in evaluating the ecological status of coastal waters in a case study area of Greece. The evaluation, comparison, and validation of the Ecological Status Class (ESC) assessments obtained by each index were based on a set of eight common sites that encompasses the maximum range of environmental quality in the study area. Four sampling sites separated by tens of km were chosen in each of the two water bodies (WBs) studied. The spatial variations of the features of *P. oceanica* meadows were examined according to a hierarchical sampling design across four spatial scales, ranging from metres to tens of km, using independent nested analysis of variance. Except for the BiPo index, the reference values for each metric/index were defined by the dataset available for the study area. All biotic indices classified the WBs of the study area in Good ESC category. Only three of the four indices (PREI, Valencian CS, and BiPo) showed high comparability in the assessment of ESC at study site level. It is assumed that the differences found in the remaining index (POMI) are due to the different type of metrics taken into consideration and the different weighting given to them. Our findings suggest that all indices can provide an overall view of the cumulative impact of multiple environmental stressors existing in the study area, and can thus help raise awareness of ecosystem degradation.

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