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Posidonia oceanica ecosystem services assessment in the Northern Tyrrhenian Sea, Italy

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The evaluation of ecosystem services and benefits provided by biological communities is of pivotal importance for the understanding of the effects of anthropic activities on marine biodiversity. This work is focused on the assessment of the ecosystem services of Posidonia oceanica meadows, one of the most important marine ecosystems in the Mediterranean Sea. P. oceanica forms a climax community and is recognised to be a major benefit provider in the Northern Tyrrhenian coastal areas. Although Posidonia meadows are considered a priority habitat under the EU Habitat Directive, there are currently no actual management plans to support their conservation in the area. At now the ecological status of the meadows is affected by aggressive coastal development with a result of a progressive regression. To face this issue a provisional economic evaluation per hectare was performed by integrating both literature and original data in the coastal context of Civitavecchia. The presented approach refers to the ecosystem services identification method proposed by Costanza et al. with adaptation to the specific characteristics of the study area, splitting what we consider services or processes and quantifiable benefits. Results show that the value of carbon sequestration was evaluated as 4.8 €hectare year, the value of oxygen production was estimated at around 507 €hectare year, the value of food production amounts to about 4391 €hectare year, and the value of bioremediation amounts to around 1887 €hectare. The value of protection from coastal erosion is estimated at around 8950 €hectare year. The total value of the benefits analysed adds up to 15,740 € per hectare per year which is in line with other literature results.