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[\*\*A global synthesis of ecosystem services records and their associations with marine and coastal habitats\*\*](#)

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Abstract: Marine and coastal ecosystems are rapidly degrading, compromising the supply of ecosystem services critical to human well-being. Addressing this crisis requires understanding how marine and coastal ecosystems underpin these services. However, marine and coastal ecosystems remain underrepresented in ecosystem services research, with available information fragmented and scattered. We conducted a systematic literature review on marine and coastal ecosystem services and their association with habitats, following the Common International Classification of Ecosystem Services (CICES). We analysed 3316 records from 139 countries, spanning 21 classes of regulating and maintenance (1323), provisioning (1153) and cultural (840) services. Research on marine ecosystem services has surged since 2008, with most records from Asia (29%), North America (21%) and Europe (15%). Provisioning services focused on seafood provision (wild: 66%, aquaculture: 24%), whereas regulating services were predominantly related to waste removal and storage (35%), coastal protection (30%) and lifecycle maintenance (20%). Cultural services centred on recreation and tourism (71%). Approximately half of the records linked ecosystem services with specific habitats. Mangroves, seagrasses and coral reefs were the most studied (31–14%) and were associated with nearly all services (19–17 classes). Other habitats, including pelagic zones, kelp forests, continental shelves, intertidal mudflats, deep sea and sea ice, were underrepresented (6–1%), and generally linked to fewer services (10–6). Knowledge gaps persist in the Southern Hemisphere, and mainly for services such as energy provision, sediment regulation and biological control. Addressing these gaps, and expanding research on understudied habitats, ecosystem disservices, service interactions and habitat condition, is urgent to inform marine and coastal conservation and management.

Keywords: Cultural services, Ecosystem functioning, Marine ecosystems, Provisioning services,

Regulating services