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TITLE: Guiding ecological principles for marine spatial planning

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ABSTRACT:

The declining health of marine ecosystems around the world is evidence that current piecemeal governance is inadequate to successfully support healthy coastal and ocean ecosystems and sustain human uses of the ocean. One proposed solution to this problem is ecosystem-based marine spatial planning (MSP), which is a process that informs the spatial distribution of activities in the ocean so that existing and emerging uses can be maintained, use conflicts reduced, and ecosystem health and services protected and sustained for future generations. Because a key goal of ecosystem-based MSP is to maintain the delivery of ecosystem services that humans want and need, it must be based on ecological principles that articulate the scientifically recognized attributes of healthy, functioning ecosystems. These principles should be incorporated into a decision-making framework with clearly defined targets for these ecological attributes. This paper identifies ecological principles for MSP based on a synthesis of previously suggested and/or operationalized principles, along with recommendations generated by a group of twenty ecologists and marine scientists with diverse backgrounds and perspectives on MSP. The proposed four main ecological principles to guide MSP?maintaining or restoring: native species diversity, habitat diversity and heterogeneity, key species, and connectivity?and two additional guidelines, the need to account for context and uncertainty, must be explicitly taken into account in the planning process. When applied in concert with social, economic, and governance principles, these ecological principles can inform the designation and siting of ocean uses and the management of activities in the ocean to maintain or restore healthy ecosystems, allow delivery of marine ecosystem services, and ensure sustainable economic and social benefits.

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