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TITLE: An ecosystem?based approach to marine risk assessment

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ABSTRACT:

Abstract Risk assessments quantify the probability of undesirable events along with their consequences. They are used to prioritize management interventions and assess tradeoffs, serving as an essential component of ecosystem?based management (). A central objective of most risk assessments for conservation and management is to characterize uncertainty and impacts associated with one or more pressures of interest. Risk assessments have been used in marine resource management to help evaluate the risk of environmental, ecological, and anthropogenic pressures on species or habitats including for data?poor fisheries management (e.g., toxicity, probability of extinction, habitat alteration impacts). Traditionally, marine risk assessments focused on singular pressure?response relationships, but recent advancements have included use of risk assessments in an context, providing a method for evaluating the cumulative impacts of multiple pressures on multiple ecosystem components. Here, we describe a conceptual framework for ecosystem risk assessment (), highlighting its role in operationalizing , with specific attention to ocean management considerations. This framework builds on the ecotoxicological and conservation literature on risk assessment and includes recent advances that focus on risks posed by fishing to marine ecosystems. We review how examples of s from the United States fit into this framework, explore the variety of analytical approaches that have been used to conduct s, and assess the challenges and data gaps that remain. This review discusses future prospects for s as decision?support tools, their expanded role in integrated ecosystem assessments, and the development of next?generation risk assessments for coupled natural?human systems.

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