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A time-integrated approach to evaluating fishery management performance

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Fisheries management in the United States has been relatively successful at maintaining healthy stocks and rebuilding overfished stocks relative to biological reference points (e.g., B_{MSY}, F_{MSY}, or their proxies). As of 2015, only 9% of U.S. federally managed fish stocks were estimated to be experiencing overfishing, and only 16% were considered overfished. As a result, U.S. fisheries support millions of jobs and generate hundreds of billions of dollars in sales each year. Thus, there is strong evidence to suggest that fisheries management in the U.S. is effective overall. However, the use of biological reference points essentially provides a binary snapshot of stock status at a particular time (i.e., overfished or not overfished). We sought to take an alternative view of fisheries management performance, independent of biological reference points, by evaluating time series of biological responses (changing stock size) as related to management actions. This provides a more integrated view of the relationship between fisheries management and stock status. In cases where stocks did not respond to management actions as anticipated, we investigated potential causes, such as the need to include additional ecosystem factors that may have improved the scientific advice provided to managers. These analyses offer an alternative view of fisheries management performance and identify priority stocks that may benefit from an ecosystem approach to fisheries management.

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