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Case Study 4

Inclusion of ecosystem information in U.S. fish stock assessments: progress toward ecosystem-based fisheries management?

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ABSTRACT

The appetite for ecosystem-based fisheries management (EBFM) approaches continues to grow, and the perception persists that implementation is slow. Here, I synthesize a snapshot of one potential avenue for EBFM in the U.S.: expanding fish stock assessments to include ecosystem considerations and interactions between species, fleets, and sectors. I will give an overview of a synthesis where co-authors and I reviewed over 200 stock assessment reports from U.S. federal waters during 2004-2014 and assessed how the reports included information about system influences on the assessed stock. Our goals were to quantify whether and how assessments incorporated broader system-level considerations and to explore factors that might contribute to the use of system-level information. Interactions among fishing fleets (technical interactions) were more commonly included than biophysical interactions (species, habitat, climate). Interactions within the physical environment (habitat, climate) were included twice as often as interactions among species (predation). Many assessment reports included ecological interactions only as background or qualitative considerations, rather than incorporating them in the assessment model. Our analyses suggested that ecosystem characteristics are more likely to be included when the species was overfished, the assessment is conducted at a science center with a longstanding stomach contents analysis program, and/or the species life history characteristics suggest it is likely to be influenced by the physical environment, habitat, or predation mortality. I will reflect on what this snapshot of stock assessments implies about progress on EBFM the U.S. and on what may have changed in more recent years. The future implications of the diversity of ways that assessments have taken into account ecosystem considerations for managing fisheries in a changing ecosystem will also be discussed.