



Adapting Fisheries Management to a Changing Ecosystem
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Case Study 12

Toward dynamic harvest allocation rules for shifting species: a case study of three stocks in the Northeast U.S.

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ABSTRACT

Management of fish stocks that cross management jurisdictions, known as shared stocks, is challenged by the shifting of those stocks with respect to management boundaries. Transitioning to dynamic rules in spatial allocation of quota across management jurisdictions has been suggested as a solution to this issue, however, in many cases spatial boundaries are not clearly drawn. Here, we use black sea bass (*Centropristis striata*), summer flounder (*Paralichthys dentatus*) and scup (*Stenotomus chrysops*) as case studies to explore different approaches to designing spatial regulatory areas to facilitate the adaptation of fisheries management to shared-stocks shifting distributions. First, we determine the yearly distribution of each stock within the U.S. Exclusive Economic Zone from two trawl surveys: the NEFSC Fall and Spring surveys. Second, we explore two approaches for drawing regulatory areas within federal waters: one based on geographic expansion of state waters and another based on spatial buffering from ports with high historical landings of the species in question. Finally, we estimate each state's proportion of the stock's distribution and compare historical and recent values. We show that the distribution of all three stocks has changed relative to the years currently used to determine the current quota allocation, with an overall gain for center-northern states at the expense of the southernmost states. In terms of the distribution of allocation, we find that while seasonal differences exist, the biggest differences in state-quota come from the method for designing regulatory areas. Other regions will likely face similar challenges in determining a fair and broadly acceptable method of defining shifting fish distributions with respect to the individual states harvesting shared stocks.