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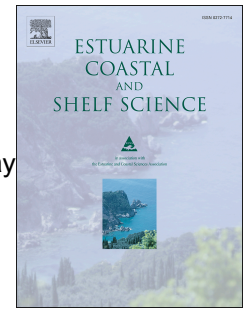

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Evaluation of effects of shellfish aquaculture and capture fishery on a semi-closed bay ecosystem

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Abstract

Coastal waters in the world are suffering from multiple anthropogenic disturbances, including capture fisheries and aquaculture. Ignoring possible interactions between multiple disturbances may cause serious consequences in our understanding of ecosystem dynamics. This study simulates individual and combined effects of fishing activities and shellfish cultivation on a semi-closed bay ecosystem using Ecopath with Ecosim (EwE). The changes of biomass and ecosystem structure were examined for three scenarios of having fishing alone, shellfish cultivation alone and both fishing and aquaculture. We found considerable impacts of shellfish aquaculture but minor impacts from fishing, suggesting shellfish aquaculture had dominated impacts on the study ecosystem. In addition, the effects of fishing and shellfish aquaculture were not additive on species biomass, rather showing a combined effect with synergy. Given the same loss in fisheries yield, controlling fishing and shellfish aquaculture simultaneously was more efficient for increasing nekton biomass compared to the control of either activity. We highlight the necessity