

Adaptive fishery management strategies under climate change

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Climate change is altering ocean conditions and is significantly impacting fisheries and marine ecosystems worldwide. Sea surface temperature change, in particular, is likely to play a primary role in influencing how species fare in the future. Available information indicates that climate change has the potential to influence the carrying capacity of marine ecosystems and the productivity of fish stocks within them. These changes will challenge fishery management systems that do not incorporate changing environmental factors. Managers will need to be forward looking and be able to make necessary adjustments in a timely and effective manner. Here we use a climate-driven bio-economic model designed to investigate future biomass, harvest, and profit trajectories under different management reform scenarios. We use this model to explore the effects of climate change on the design of harvest control rules and fishing allocations. We find that the economic benefits from fishery managers adapting perfectly to climate change effects are only slightly better than those under a harvest control rule designed to optimize economic return for the fishery under present conditions. These results suggest that significant improvements in the ability of fishery managers to cope with climate change can be made without perfect knowledge of how climate change will affect stocks in the future.

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