

Presentation Information

Presenter	Daniel Holland
Title	Managing Coupled Fishery Systems: The Case of a Bait-Dependent Fishery
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Abstract:

Despite a growing call for ecosystem-based fishery management, most fisheries are managed independently with little attention paid to linkages such as competition for resources and predator-prey relationships. As the predator-prey modeling literature has shown, such linkages can substantially alter the outcomes of management strategies from those predicted by models naive to these linkages. In this paper we explore the implications of a linkage between fisheries due to an artificial predator-prey relationship; the use of one species as the source of bait for another “primary” fishery. If bait is a constraining input, this man-made linkage between the fisheries can dramatically alter both the open-access equilibrium and optimal equilibrium harvest of the primary fishery. Shifts in economic, technical or biological parameters of either fishery can alter the bioeconomic equilibrium in ways diametrically opposed to those predicted by a traditional single-species model. The use of large amounts of bait can also impact the productivity of the primary fishery creating a growth subsidy that must be accounted for in predicting the bioeconomic equilibrium and in designing optimal management policy. We use simple bioeconomic models of a coupled primary and bait fishery to explore how the dependence of the primary fishery on another fishery for bait and a related growth subsidy influence outcomes in open access and how optimal management policies are affected. The modeling is motivated by the lobster and herring fisheries in the Gulf of Maine, however a more general model is developed to provide insights that may be applicable to other fishery systems with similar characteristics.