
Woods Hole Oceanographic Institution
Biology Department Seminar



Thursday, July 21, 2016
Redfield Auditorium – 12:00 Noon

**Optimal bioeconomic management of
changing marine resources**

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Marine populations are increasingly subjected to changing conditions whether through harvest or through broad-scale habitat change. Historically, few models have accounted for such trends over time, and even fewer have been used to study how trends affect optimal harvests.

I developed and analyzed several models that explore, first, endogenous change caused by harvest and, second, exogenous change from factors (such as rising ocean temperatures) outside harvesters' control. In these models, I characterized the profit--or yield--maximizing strategy when harvesting damages habitat in a multispecies fishery, when harvest creates a selective pressure on dispersal, and when rising temperatures cause changes in vital rates. I explore this last case in both deterministic and stochastic environments, and also allow the harvester to learn about unknown parameters of the stock recruitment model while harvesting. I also develop an unambiguous definition of and describe a statistical test for a shift in a species' spatial distribution.

My results demonstrate that optimal harvesting strategies in a changing environment differ in important ways from optimal strategies in a constant environment.