

Modeling fishing decisions with spatially explicit agent-based models

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Abstract

A fisher's decision making process is governed by some key questions that need to be answered for each fishing trip: whether or not to commence a fishing trip, where to go fishing and when to return to port. We studied these decisions on the basis of the results of questionnaire surveys administered to vessel captains and of logbook data for the Florida West Coast commercial reef fish fisheries. Binomial conditional logit models were fitted to the decisions of when to start and end a fishing trip and a multinomial mixed model for deciding fishing location. Decisions of fishermen are influenced by the fishing regulations, price of main target species, wind speed, price of fuel, the day of the week, and the previous year's pattern of fishing. Coefficients for these factors were used in a spatially explicit agent-based model of the multispecies reef fishery to evaluate management strategies, including the use of fishery dependent data for bio-economic assessments. Current research aims to extend this model to other species and evaluate the bio-economic impact of past and proposed spatial fishing closures in the Gulf of Mexico. Among the impacts to be evaluated are those resulting from fishing closures instituted in the aftermath of the Deep Water Horizon oil spill, and proposed closures of some areas of the Florida west-coast shelf to protect bio-diversity.