Title: **Bidder Learning in Sequential License Buyback Auctions: A Model of the Texas Shrimp License Buyback Program**

Authors: Aaron Mamula, NOAA, National Marine Fisheries Service (USA)
Richard Woodward, Texas A&M University (USA)

Abstract: In this paper we develop a bidding model for fishermen participating in a sequential permit buyback auction. A key feature of the model is a Bayesian updating process, which allows bidders to use information gained from past participation in future bid selection decisions. Our auction model was based on the structure of the Texas Shrimp License Buyback Program, a buyback auction which retired commercial shrimp license from fishermen in Texass bay system. The fishermans decisions regarding whether to participate and how much to bid are formulated as a dynamic optimization problem. State variables of the model include distributional parameters defining the fishermans probability of success in the auction. These parameters are initially unknown to the fisherman but, with each observed outcome, he receives an additional piece of information regarding the true values of the distributional parameters. This framework allows us to explore the role of information and uncertainty in sequential buyback auctions. Auctions have played an important role in fisheries management, as evidenced by the numerous buyback programs implemented within the last decade. Recently, we have also seen auction mechanisms used to implement aquatic habitat restoration programs such as the Klamath Water Bank, which uses a sequential sealed bid auction to purchase water for instream flow to benefit anadromous fish. Our results contribute to a greater overall understanding of the sequential auction mechanism. The model also provides a methodological contribution by presenting a feasible procedure for incorporating agent-specific learning in a model of sequential auction bidding.