2017 NOAA Restore Act Science Program: A decision-support tool for evaluating the impacts of short- and long-term management decisions on the Gulf of Mexico red snapper resource

Objectives

The objective of this project is to develop a decision-support tool for the Gulf of Mexico (GoM) red snapper resource. The main deliverable of this project will be a customized decision-support tool presented within a graphical user interface.

In Stage One, an operating model which includes the intricacies of the current stock assessment and various aspects of snapper management, will be developed and serve as the foundation for the decision-support tool. The operating model will simulate the complex population dynamics, fishery processes, management procedures, and various sources of uncertainty.

Following model development and validation, extensive simulations will be conducted in Stage Two to evaluate the performance of alternative management strategies. Specifically, the decision-support tool will have the following functions: 1) evaluating the efficacy of alternate long-term management strategies such as harvest control rules, 2) assessing the usefulness of short-term regulations such as size limits, and 3) examining the robustness of the management strategies and regulations to uncertainty resulting from process error, observation error, assessment error, and implementation error. Because the OM is spatially structured, sub-stock dynamics will be simulated and regional management can be explored.

Stage Three will involve outreach and promotion of the decision-support tool including the development of the graphical user interface, which will be easily manipulated by stakeholders to explore the implications of alternative management scenarios.

The ultimate goal of this project is to improve our understanding of the GoM red snapper fishery and optimize utilization of the resource. Although designed for red snapper, the MSE framework developed in this project will be easily adaptable to other GoM reef fish resources, and could be further modified as an ecosystem-based management tool for the entire reef fish complex.