

1. Title Authors, and Affiliations

Using Performance Indicators to Evaluate U.S. Fisheries

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2. Summary

In 2012 NOAA Fisheries began a systematic collection of performance indicators for U.S. fisheries managed under catch share programs. Catch share programs are a fishery management tool that dedicates a secure share of quota allowing individual fishermen, fishing cooperatives, fishing communities, or other entities to harvest a fixed amount of fish. Catch share design varies widely across different programs and regions. These design features are tailored to accommodate the unique characteristics and management objectives for the particular fishery. The fisheries are evaluated using standardized indicators that measure the basic economic performance, regardless of catch share program design. Data collected include landings, revenue and effort data from U.S. catch share programs. Catch share fishery performance is compared to a baseline period prior to implementation of the catch share program. Overall, these programs were successful in having fishermen observe quota limits, improving overall economic benefits and efficiency, and ending the race to fish, thereby reducing pressure on fishermen to fish during unsafe conditions. Catch share programs have been effective in reducing fishing capacity. However, catch share programs have had distributional consequences as reductions in the number of active vessels may have been counterbalanced by reductions in the number of shareholders.

3. Introduction

NOAA Fisheries is the agency responsible for fisheries management in federal waters in the United States. Recently, the agency began a systematic collection of performance indicators for catch share Programs. Catch shares is a general term to describe fishery management tools that utilize transferable quota systems. Individual fishermen, cooperatives or fishing communities receive a dedicated and secure share of quota that can be used for their exclusive use. With clearly defined fishing privileges, fishermen no longer need to 'race to fish', but instead can make harvest decisions based upon market conditions, improving economic performance, and weather conditions, which improves crew safety (NOAA 2000). The ability to align fishermen's economic incentives with the long-term biological health of the fishery singularly distinguishes catch share programs from traditional fishery management strategies, i.e., trip limits, gear restrictions (National Academy of Sciences 1999).

The first transferable U.S. quota program was implemented in the Mid-Atlantic Region to harvest ocean quahogs and surf clams in 1990; currently, there are 16 federal catch share programs. Six of the eight regional Fishery Management Councils have implemented at least one program, while the most programs are in the Alaska region. Implementation dates of these programs span three decades; however, the majority was implemented within the last seven years. Catch share program design varies widely across programs and regions, reflecting unique fishery characteristics and program objectives. The most frequently stated program objectives are to meet conservation requirements, improve economic efficiency and/or flexibility, reduce excess capacity, eliminate derby fishing conditions and to improve safety at sea (Brinson and Thunberg 2013).

4. Materials and Methods

A standard set of indicators that measure the basic economic performance of catch share programs, regardless of their design, are used to evaluate catch share programs. These indicators were developed in part based upon a framework developed by social scientists at NOAA Fisheries' Northeast Science Center, but were expanded for use across the entire United States (Clay *et al.* 2013). Data collected include landings, revenue and effort data from U.S. catch share programs. Data were collected for each catch share program from its baseline period until 2012. The baseline period refers to the average of the three years immediately before the implementation of the catch share program.

5. Results and Discussion

Based on program performance of all catch share programs, a few trends emerged. Overall, the catch share programs were successful in having fishermen observe quota limits, improving overall economic benefits and efficiency, and ending the race to fish, thereby reducing pressure on fishermen to fish during unsafe conditions. Catch share programs have also been effective in reducing fishing capacity. However, these reductions have led to distributional consequences as the number of vessels actively participating declined (Brinson and Thunberg 2013).

While catch share programs tend to provide fishermen with incentives to observe quota limits, there has been no response in increased biomass (Melnuchuk *et al.* 2012). This is not a criticism of catch share program performance, but rather a realization of the fact that biomass is affected by a whole host of factors, which may include fishing pressure or environmental impacts, amongst others. However, increased biomass would translate into increased quotas in these programs, which may affect economic performance for fishermen.

Despite variability in quotas, variability in revenues is reduced within a few years after program implementation. After the initial five years, variability in all of the measures is reduced. This indicates that catch share programs can provide some stability within a changing management context and fits with others' conclusions (Hannesson 2013).

6. References

- Brinson, A., Thunberg, E.M. 2013. *The Economic Performance of U.S. Catch Share Programs*. U.S. Department of Commerce, NOAA Technical Memorandum; NMFS-F/SPO-133, 158 pp.
- Clay, P.M, Kitts, A., and Pinto da Silva, P. 2013. Measuring the social and economic performance of catch share programs: Definition and metrics and application to the U.S. Northeast Region groundfish fishery. *Marine Policy*, 44: 27-36.
- Hannesson, R. 2013. Norway's experience with ITQs: A rejoinder. *Marine Policy*, 37: 264-269.
- Melnuchuk, M.C., Essington, T.E., Branch, T.A., Heppel, S.S., Jensen, O.P., Link, J.S., Martell, S.J.D., Parma, A.M., Pope, J.G., Smith, A.D.M. 2012. Can catch share fisheries better track management targets. *Fish and Fisheries*, 13: 267-290.
- National Academy of Sciences 1999. *Sharing the fish: Toward a national policy on individual fishing quotas*. Committee to review individual fishing quotas, Ocean Science Board, National Research Council, 422 pp.
- NOAA, 2010. NOAA Catch Share Policy, available at: http://www.nmfs.noaa.gov/sfa/management/catch_shares/about/documents/noaa_cs_policy.pdf, accessed 18 August 2014.