

The Role of Economics in Fisheries Management: A Personal Perspective

Keynote Address

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As the Chief economist in the National Marine Fisheries Service, I am honored to be here addressing you today. Of course, for me to be standing here today, a great many others in National Marine Fisheries Service had to decline the offer to be a keynote speaker at the International Institute of Fisheries Economics and Trade (IIFET) biannual meeting. However, they certainly would have warmly welcomed you to IIFET 2000 had they been able to attend.

I personally have spent twenty years working in the National Marine Fisheries Service. I started working as an industry economist in Miami, Florida at the Southeast Fisheries Science Center. I later moved to St. Petersburg, Florida and worked at the Southeast Regional Office before being selected to work in the Division of Fisheries Economics and Trade as the Chief Economist. As a result, I have dealt with a variety of fishery issues including bycatch and bycatch reduction regulations such as BRDs and TEDs, fleet dynamics such as entry-exit behavior of firms, cost and earnings studies, and the application of individual transferable quotas to fishery management plans. For example, I developed the ITQ program for Wreckfish fishery with John Gauvin, when he worked for the South Atlantic Fisheries Management Council. I helped develop the Regulatory Impact Review (RIR)/Initial Regulatory Flexibility Act (IRFA) Analysis Guidelines with Theo Brainerd and contributed some of my past analyses on the shrimp fishery for the development of the Practitioners Manual for IRFA analyses by Eric Thunberg.

Most recently, I have been involved in developing the assessment of capacity in international and domestic fisheries. I played a key role in developing the International Plan of Action (IPOA) for capacity with Pamela Mace that called on Food and Agricultural Organization (FAO) member nations to develop assessments of their fish harvesting capacity. This began with an FAO Technical Working Group Meeting held in La Jolla in 1998 in which I participated to develop capacity definitions and management approaches. I then lead a national Task Force to define and develop metrics to measure domestic fishing capacity levels. This was

followed by an FAO Technical Consultation in Mexico City on the measurement of fishing capacity that adopted many of our National Task Force recommended metrics. A training manual was developed by Jim Kirkley, Dale Squires, John Walden, and me which will be used to develop quantitative capacity estimates of domestic fishing capacity. Prior to the development of quantitative estimates, we are engaged in developing qualitative estimates of long-run capacity for many of our federally managed fisheries in conjunction with the NMFS economists in the Regional Offices and Fisheries Science Centers.

These experiences working on regional and national problems for fisheries managers in NMFS have given me a perspective on the role of economics in fisheries management that I am going to share with you today. I would like to stress that this perspective is unique to me and does not reflect a stated or implicit policy of the National Marine Fisheries Service. It does reflect the evolution of my view of the role of economics in the fisheries management process.

History or Hindsight

The National Marine Fisheries Service existed prior to the Magnuson-Stevens Fisheries Conservation and Management Act, but the agency that exists today is primarily the product of that piece of legislation. Regardless of the number of times the word economics appears in the Act, NMFS is primarily an agency of biologists, by biologists, and for biologists. When I started with the National Marine Fisheries Service, there were fewer than one economist per existing laboratory of biologists. During the orientation for my first job, I was told that I would be starting on the ground floor of a new economics program in NMFS. Unfortunately, I didn't notice that the elevator was going down. Nor was I able to learn from my initial mistake since in hindsight I can say that I repeated it two more times.

By this I mean that the focus of the agency in my early years was on biological analysis. The law suites brought by fishermen's associations focused on the administrative record. A schedule existed that created a time line for when various aspects of the fishery management process had to be completed. A certain amount of time existed for public hearings to be held, the federal register announcement had to be completed and published within a certain time frame after the Fishery Management Council adopted the final rule, etc. The best available data was the basis for the fishery management regulations that set total catch levels to conserve fish stocks under the first of the National Standards contained in the MSFCMA. At one point, I was told concerning fisheries management by a lawyer that "It's the biology, stupid" and one biologist/manager that "if we take care of the stocks, the economics will take care of itself." This latter quote is unfortunately true and resulted in excess capacity in our fishing fleets and overfished stocks of fish that lead to derby fisheries.

This management approach of recovering overfished stocks of fish using regulations designed to control total catch levels has been generally successful. However, the fisheries based on these stocks have decline. The Gulf of Mexico shrimp fishery is an example of the economic complexity of fisheries management. On its face, it is a fishery with an estimated value of about \$1.9 billion, but could be worth approximately \$4 billion with economically rational management. Bycatch in this shrimp fishery has greatly reduced the harvest of about a dozen commercial and recreationally valuable species of fish with the commercial red snapper fishery almost closed in the southeast region because of it. Bycatch in the shrimp fishery was a major factor considered in the closure of the commercial marine turtle fishery under the Endangered Species Act. So while the regulations designed to restore the stock sizes of the overfished and even endangered species of fish have been successful for red snapper and marine turtles, the costs of these regulations have been borne by the commercial and recreational fishermen.

However, over time, things have changed. With the reauthorization of the Magnuson Stevens Act, new national standards were established on bycatch and communities and language was included that called for regulations that would increase the benefits generated by fisheries. In addition, the Regulatory Flexibility Act became subject to judicial review. This means, simplistically, that the content and scope of an economic analysis to address the impacts of a proposed fishery management regulation could be reviewed in federal court. And court cases did develop as a result of this change in the management institution. Shark, summer flounder, and shrimp were such cases. In

the shark and summer flounder cases, NMFS proposed regulations were delayed or overturned by federal court judges on the basis of the quality of the economic analysis as it related to the standards in the Regulatory Flexibility Act. The shrimp case, which upheld the agency's proposed regulation, deemed the economic analysis to be adequate in the opinion of the judge. The shrimp analysis was conducted in conjunction with five academic economists with different specialties in fisheries economics over a ten-year time period and reviewed by a National Panel of experts as part of a Congressionally mandated review of management in the reef fish fisheries. Since it was only adequate, this court decision implies a much higher standard for economic analysis than applied in the past.

A New Role

The implication of all this hindsight, is that economics has a new role to play in fisheries management. The development of the Initial Regulatory Flexibility Act Guidelines by NMFS¹ stresses the need for an adequate qualitative or quantitative assessment of a proposed fishery management regulation's impact on a fishery. This document is a significant step forward in advancing the use of fisheries economics and other social sciences in the fishery management process. It also establishes a threshold that can be used to evaluate analyses in the fishery management review process that occurs prior to implementation of a regulation.

However, all is not perfect. Economics, biology, and sociology remain separate sciences in the fishery management process. That is, when an analysis of a proposed fishery management regulation is conducted, the economic, biological, and sociological assessments are conducted independently. The fishery managers have to integrate these separate analyses themselves to determine if a proposed regulation will achieve their stated management goals and objectives. This integration is difficult because these analyses are often based on different sets of assumptions that indicate different trends in the fishery.

What is needed is a multi-disciplinary approach to fisheries management that integrates all the physical and social sciences into a single framework to address fishery management problems. This is not a new idea since the

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Since this presentation was made in July 2000, the Small Business Administration that is responsible for oversight of the Regulatory Flexibility Act has commended NMFS on the development of the IRFA Guidelines.

bioeconomic theory of fisheries already exists. The theory of the firm and welfare theory have been combined with population dynamics to provide a basis for assessing impacts on fish stocks and fishermen from management of a fishery. Additionally, theoretical and applied analyses exist that continue this integration by combining sociological and demographic factors that influence behavior explicitly into these analyses; e.g., education levels, ethnic origin, etc.

Adopting this approach to policy analysis for fisheries management will require some changes. Combining the social and physical sciences in a meaningful way also requires the integration of the data collection programs that support these sciences. Scientists have to work together to determine the models necessary to answer the management question posed for a particular fishery, the variables that are important in that model, and the most cost effective and statistically valid approach for collecting the required data for those variables.

The results from this multi-disciplinary analysis of a fishery will provide fishery managers with a set of results that are consistent, unbiased, and objective since they are based on the same set of underlying assumptions. The information provided to fishery managers from this integrated framework will be greater than the sum of the information had it been provided by independent and separate analyses.

Finally:

Obviously, economics and social sciences have evolved substantially over the two decades I have been associated with the National Marine Fisheries Service. Many, if not all, of the topics to be discussed over the next three days at this IIFET conference such as “Restoring Ecosystems” and “Ecology and Theology” indicate how far economics has come in its role of providing information to the fishery management process and will indicate how far it still has to go. I am particularly pleased to be co-hosting the “Innovations in Fisheries Management: Sustainable Mandates - Devolving Institutions” session that involves presentations by industry leaders as well as participation in other sessions of this IIFET conference. This session is meant to be a discussion of new approaches to fisheries management that have been tried in fisheries around the world or proposed by fishery managers. I encourage those planning to participate in this session to bring with them their own experiences and ideas gleaned from other IIFET session to enhance this discussion.