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Bridging the Gap Between Economic Theory and Fisheries Management: The 10-Year MFCMA Experience

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Preface

This Special Section of the *Marine Fisheries Review* contains the edited proceedings of a symposium held 18 September 1986 at the annual meetings of the American Fisheries Society, in Providence, R.I. The symposium was sponsored by the National Marine Fisheries Service (NMFS) of the National Oceanic and Atmospheric Administration (NOAA). The aims were twofold: To provide a partial economic assessment of the effectiveness of the Magnuson Fishery Conservation and Management Act (MFCMA), enacted in 1976, and to highlight economic issues related to implementation of the Act.¹

The MFCMA extended U.S. jurisdiction over marine fisheries out to 200 miles and gave the domestic industry preferential access to stocks of fish traditionally shared with foreign fishermen. Since the Act's implementation in early 1977, U.S. activity in the 200-mile "Exclusive Economic Zone" (EEZ) has accelerated, while direct foreign fishing has declined. Foreign fishing interests, however, have maintained a presence in the EEZ through joint ventures (JV's) with U.S. operators. Under the JV's, U.S. fishermen contract to off-load their

catches at sea onto foreign processing vessels. From modest beginnings in 1979-80, JV catches grew to nearly 1 million metric tons (t) in 1985, which amounted to approximately one-fourth of total U.S. catches in the EEZ. More recently, new U.S. factory ships have been placed in service on both coasts and this can lead to a further reduction in foreign fishing operations in the EEZ.

Ten years is not an overly long period upon which to base rigorous empirical assessments of the MFCMA. The reduction in foreign fishing and other trends (e.g. increases in U.S. catches and in the number of U.S. vessels) indicate that this legislation may be having a lasting impact on resource stocks and the economic viability of the U.S. fishing industry. However, analysis of the trends and assessments of the Act's effectiveness have been limited by a lack of monitoring procedures and incomplete data. These difficulties are compounded by the stochastic nature of the processes that need to be modeled, and by the more conventional measurement and aggregation problems that hinder policy analysis. The following papers and accompanying comments recognize (and to some degree reflect) these analytical hazards. Nonetheless, we, the editors, believe the papers and comments are an insightful contribution to the literature on fisheries management, and a useful starting point for more advanced evaluations of the effectiveness of MFCMA.

In the first paper, Jon Conrad observes that there were significant increases in landings and net revenues in the 7-year

period following enactment of the MFCMA (1977-83). However, net revenues have begun to decline, and "...the industry and resources on which it is based appear headed toward a second (but now purely domestic) equilibrium." Under these conditions, "...revenues equal cost and the imputed value of the resource is driven to zero (rent dissipation)." Conrad is wary of current management policies which he believes are "ineffective in limiting catch to a target yield and controlling the entry of vessels or the level of fishing effort." New policies are required with "...the potential to encourage efficient (least cost) harvests and maintain stocks of fish and shellfish at levels producing net benefits to the industry at large." The paper goes on to discuss the merits of introducing incentive-based policies such as transferable quotas or landings taxes.

The search for a better approach to fishery management, however, can be difficult. The discussant for Conrad's paper, Ivar Strand, calls attention to some of the weakness in the NMFS data bases for testing alternative hypotheses concerning the net benefits of the MFCMA. He also cautions against drawing conclusions based on weak lines of causality. Simple "before-after" comparisons should be avoided. Measures of the difference between the value and the distribution of the gains or losses that would have occurred with the policy and without the policy are required to make more useful policy evaluations. Comparisons need to be adjusted for factors other than the exogenous policy which

¹Proceedings were dedicated to Frederick J. Prochaska, distinguished scholar and author of many works in food and resource economics and related fields. Dr. Prochaska was known especially for his contributions to knowledge and understanding of the complexities of fisheries management. His untimely death, prior to the meetings, has left a void in the fisheries and academic communities

may have affected observed gains and losses in the period since the MFCMA was enacted.

The second paper in the series, written by Lee Anderson, inquires whether the Act is adequately structured to assure "good" fishery management in terms of how well the process applies what Anderson calls "lessons to be learned from economic theory." Anderson acknowledges that criteria for good management cover broad areas in the physical and social sciences. Good management may represent a blend of approaches upon which all can agree, with emphasis on implementation, or "getting something into place." Bridging "the gap between economic theory and practical fisheries management" could produce better management decisions, but this is not likely to occur unless managers are convinced that rational economics is essential to the decision-making process.

Fishery management plans and regulations reflect the interplay of various forces that often are in conflict. Resource users (the fishermen) continually interact with resource managers, and the behavior of both is constrained by the biology of the fish stocks. This system, according to Anderson, is further constrained by an institutional framework within which users and regulators operate. Anderson's paper discusses how institutional constraints influence fishery management decisions. He calls his analysis a "political bioregonomics approach" which expands upon the bioeconomic model by adding to it the institutional structure which develops fishery management and development policy."

James Kirkley, in commenting on Anderson's paper, agrees that nonrational management is a distinct possibility under MFCMA. Kirkley believes the fault lies not so much with MFCMA per se, but with elements of the infrastructure that is responsible for implementing the legislation. Neither the Regional Councils (which are the primary developers of management plans and regulations) nor NMFS (which develops the scientific and technical information that supports plan development and monitors the regulation process) appear to place adequate emphasis on the importance of economic analysis.

James Easley and Fred Prochaska are coauthors of the next paper which addresses problems in the allocation of al-

lowable harvests among user groups. They point out that fishery managers are reluctant to use available economic methodology to help resolve conflicts between competing groups. Economists, for example, have made considerable headway in devising ways to estimate the economic value of recreational fishing where no direct market transactions for the fish occur. This methodology is directly applicable to the resolution of conflicts between recreational and commercial fishermen, but fisheries managers remain skeptical. The authors cite reasons why the managers resist economic methodology, among which is poor communication between economists and managers. Ways to improve communications are suggested.

In discussing the Easley and Prochaska paper, James Anderson draws upon his own experience with recreational-commercial conflicts in the salmon fishery. He underscores the need for more rigorous modeling of the objectives and behavior of user groups in the regulated climate by drawing parallels to the research conducted by industrial organization economists and game theorists.

The fourth paper, written by Jon Sutinen, examines the pattern of expenditures on enforcement of MFCMA regulations and the efficiency of enforcement programs. Enforcement of marine fisheries regulations cost the Federal government more than \$130 million annually. The paper provides an overview of existing enforcement policy and programs and describes a framework for benefit-cost evaluation. A model is presented for measuring the effects of regulatory and enforcement policies on compliance and benefits.

Sutinen's paper also points out that shortcomings in existing data constitute a major deterrent to more complete benefit-cost evaluations of the federal enforcement effort. Adequate data exist only for an analysis of expenditures on enforcement of foreign fishing regulations. Foreign vessels are assessed fees for the privilege of fishing in the EEZ. Sutinen examines the foreign fee structure and concludes that the amount collected from the foreign fishing operators does not fully compensate for the amount spent on enforcement of foreign fishing regulations. Higher fees or a lower level of enforcement may be needed to balance outlays against income. The accompany-

ing comments by Louis Goodreau call further attention to inadequacies in MFCMA enforcement. Goodreau suggests that an independent enforcement entity may be less costly than existing arrangements with the U.S. Coast Guard.

In the last paper in the series, Richard Johnston and James Wilson identify and discuss the linkages between fisheries management, fisheries development, and fisheries trade. The paper examines the effects of extended fisheries jurisdiction on world trade. The authors demonstrate that macroeconomic factors such as exchange rates and the overall performance of the economy are the predominant factors determining patterns of trade. They also point out that extended jurisdiction may influence trade patterns through its impact on the structure of property rights. The United States, for example, sanctions joint ventures and supports a "counter trading" strategy (known as "fish and chips") which links harvest allocations to trade concessions.

In his comments on the Johnston and Wilson paper, Douglas Lipton calls attention to the impact that protectionist import policies and export development have on domestic fisheries. Given the nature of the ownership rights and interplay of a varied set of government policies, it is not clear that the neoclassical relation between output prices and quantities supplied hold; that is, the quantity supplied may fall in response to an output price rise if the fishery is operating on the backward bending portion of the long-run supply curve.

The papers and discussants' comments, as a whole, leave a clear impression that the authors believe a "gap" does indeed exist between economic theory and fisheries management, as the title of the symposium suggests. Although the dimensions of the gap are only partially defined, enough is presented to make a case for more extensive use of economic analysis in the management process, prior to decisions and as a monitoring device to evaluate the impacts of the decisions. It is the hope of editors that these proceedings will encourage further empirical analysis of MFCMA, in the interest of effective fishery management.

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