NOAA Fisheries
Economics & Social Science Workshop

❖ April 18-20, 2006 ❖ San Francisco, CA ❖

❖ Abstract Submissions ❖

Tuesday, April 18, 2006

Best Paper Awards – Policy Analysis

Economic analysis of alternative harvest strategies for Eastern Georges Bank haddock
Eric Thunberg, Charles M. Fulcher, and Jon K.T. Brodziak, Northeast Fisheries Science Center
Doreen S.K. Liew, Fisheries and Oceans Canada

This report examines the potential economic benefits of pursuing alternative harvest strategies for the Eastern Georges Bank haddock resource. Pursuit of this line of inquiry was prompted by the potential market impacts of the size of the 2003 year class of haddock; once thought to be 900 million fish but now assessed at 365 million age-1 fish. Even at this smaller size, the 2003 year class is large enough to have a material affect on haddock markets.

Monitoring environmental justice impacts: Vietnamese-American longline fishermen adapt to the Hawaii swordfish fishery closure
Stewart Allen, Pacific Islands Fisheries Science Center
Amy Gough, Joint Institute for Marine and Atmospheric Research

This report describes the range of social and cultural impacts incurred by Vietnamese-American fishermen, households, and the associated community involved in the Hawaii-based longline fishery as a result of the 2001 prohibition on swordfishing. These findings are compared to the impacts estimated to occur in the final environmental impact statement (National Marine Fisheries Service 2001).

Best Paper Awards – Research

Learning and the adaptive management of fisheries resources
David Tomberlin, Southwest Fisheries Science Center
Teresa Ish, UC Santa Cruz

Natural resource management under uncertainty frequently raises questions of this form: is current information sufficient to support a decision, or is it preferable to defer a decision while gathering costly new information? This paper presents a framework for systematically addressing questions of this type. The partially observable Markov decision process (POMDP) is a dynamic optimization modeling approach that accounts for uncertainty regarding the system state and for the opportunity to obtain costly information on this state. The main idea of the POMDP is that information has costs and benefits—both of which may be uncertain—and that these must be considered along with other costs and benefits relevant to the decision problem. Here, we demonstrate the use of the POMDP in the context of Pacific salmon recovery efforts. Specifically, we consider the problem of a planner who must choose among three possible habitat management actions: maintaining the status quo regime, which is inexpensive but relatively high risk; implementing a monitoring program that will have no immediate habitat benefit but may help produce better decisions in the future; or launching a habitat rehabilitation program without waiting for further information. In our example, we find that it is often preferable to proceed with habitat rehabilitation projects rather than to implement habitat monitoring programs or to maintain the status quo. We stress that this result is entirely due to this particular model's parameterization and is in no way generalizable to other similar questions that arise in habitat or general fisheries management. While we believe that the POMDP is the best available modeling framework for rigorously studying information-gathering strategies in fisheries management, it confronts the researcher with serious computational challenges even for relatively simple problems such as that presented here.

Effort response, harvest, climate, and the economy in the Gulf of Mexico recreational red snapper fishery
David Carter, Southeast Fisheries Science Center
David Letson, Rosentiel School of Marine and Atmospheric Science

This paper analyzes the time series properties of recreational fishing data and examines the effects of climate activity, economic conditions, and fishery regulations. We find that head boat effort and landings are nonstationary, cointegrated series in the Gulf of Mexico red snapper fishery and estimate a structural vector error correction model to evaluate the effects of exogenous shocks. Granger-causality tests indicate that effort appears to respond to past changes in landings. However, the magnitude of shock responses is relatively small, especially in the long run. ENSO events directly affect both landings and effort, but increased hurricane activity only directly affects effort. Indices for the Bermuda High and the U.S. economy were not significant in the model. Minimum size limits also directly influence both landings and effort, whereas bag limits only directly affect landings. A key finding is that the effects of policy changes can vary depending on climate conditions.

Estimating vessel efficiency using a bootstrapped data envelopment analysis model
John Walden, Northeast Fisheries Science Center

Technical efficiency, which measures how well a firm transforms inputs into outputs, gives fishery managers important information concerning the economic status of the fishing fleet, and how regulations may be impacting vessel profitability. Data envelopment analysis (DEA), and the stochastic production frontier (SPF) have emerged as preferred methods to estimate efficiency in fisheries. Although each of the approaches has strengths and weaknesses, DEA has often been criticized because it is "deterministic" and fails to account for noise in the data. This paper presents a method for examining the underlying statistical structure of DEA models using bootstrap methods, and readily available software. The approach is then applied to a case study of the U.S. mid-Atlantic sea scallop dredge fleet. Results show that the 95% confidence interval for technically efficient output is well above the maximum sustained yield (MSY) level of output.

Tuesday, April 18, 2006

General Capacity Issues

Technological changes and their impact on fishing capacity - a case study of the Hawaii-based longline fishery

Minling Pan, Pacific Islands Fisheries Science Center
Quang D. Nguyen, Joint Institute for Marine and Atmospheric Research

Fisheries regulations on fishing capacity are easily based on a nominal measurement such as limiting number of vessels of a fleet. However, the nominal measurement of fishing capacity has difficulty in capturing the actual fishing power enhanced by technological changes, and potentially leads to biased measures on fishing capacity and fisheries performance. This study identified and quantified the important variables in determining effective fishing capacity (fishing power) through an empirical study that examined the fishing technological changes and their impact on the Hawaii-based longline fishery in the past 20 years. The study also explored questions including 1) what are the key determinants of technology adoption in fishery? 2) to what extend does technology play a more important role than human capital such as fishing experience in the fishing production process; and 3) does technology play a significant role in dealing with uncertainties in fishery?

Preliminary thoughts on the implications of fishing communities and regional fishery associations in DAP programs as specified in S. 2012

Lee Anderson, University of Delaware, HQ/Office of Policy

The discussion will consider how the new DAP provisions in S2012 will likely affect privilege based FMPs. What are the real differences between FCs and RFAs? What are the differences between IFQs and LAPs. How do they address the needs on non-harvesting industry participants? Can IFQs and LAPs be used simultaneusly? Do not expect definitive answers. Comments welcome.

Tuesday, April 18, 2006

Dedicated Access Privileges

The Shape of Things to Come:
How do Dedicated Access Privileges (DAPs) affect what NMFS and Council Economists are doing – should be doing – will be doing?

Moderator: Dan Holland
Panelists: Ron Felthoven, Mark Fina, Nicole Kimball, Drew Kitts, Carl Lian

Dedicated Access Privileges (DAPs) have only been implemented in a few US fisheries, but additional programs are under evaluation and more can be expected. NMFS leadership has publicly called for more use of DAPs. Will this change what NMFS and Council economists do and the data and methodological tools they need?

During the first hour, panelists will each give short presentations that illustrate how existing or prospective DAP programs in their region affect the issues they evaluate, the data they need to evaluate, and the types of analysis they do or expect to do. The second hour is reserved for questions to all panelists and open discussion of the issues that arise.

Panelist Presentations:

Dan Holland, Gulf of Maine Research Institute
Introductory remarks (outline of panel discussion)

Dan Holland, Gulf of Maine Research Institute
New Zealand uses an individual transferable quota system to manage nearly all of their fish stocks. This includes over 93 species divided into over 700 fish stocks each with separate quota markets. Price data on quota sales and leasing is collected and is valuable to fishery managers in a number of ways. I briefly discuss some of the uses for this data as well as some of the problems with collecting and interpreting it.

Ron Felthoven, Alaska Fisheries Science Center
The North Pacific Fishery Management Council (NPFMC) has developed a program to "rationalize" the Bering Sea and Aleutian Islands (BSAI) crab fisheries. A mandatory data collection program has been implemented to assess the effects on both the harvesting and processing sectors. Monitoring the performance of these sectors before and after rationalization is a way to assess whether the program is achieving some of its objectives, and may aid the design of future rationalization programs in other AK fisheries. In this talk I will describe the data collection program and discuss various measures that may be used to monitor the impacts of rationalization programs on plant and vessel performance, and to identify the data required to adequately construct the measures. I will also discuss some hurdles that must be overcome to properly interpret and use such data.

Mark Fina, North Pacific Fisheries Management Council
A Council must address a host of issues in the development and implementation of a DAP system. In considering data and analytical needs arising under DAPs, both the regulatory analyses necessary to develop a program and post-implementation needs should be considered. This presentation will examine data and analytical needs and issues that have arisen in the development and implementation of DAP systems in North Pacific fisheries. In particular, the need for analyses of broad distributional impacts and providing timely data and analyses will be discussed.

Nicole Kimball, North Pacific Fisheries Management Council
In 2004, NMFS implemented a change to the existing halibut and sablefish individual fishing quota program (IFQ) to allow small, coastal communities to purchase quota share on the open market. Eligible communities must establish a non-profit entity to act on their behalf and lease the annual IFQ permits to community residents. This presentation provides a status report on participation in the program, and discusses data needs that are created by consideration of such a program. These issues include the determination of whether a community is fishing dependent, and establishing baseline harvest, vessel sector, and socioeconomic data for individual communities and regions. The presentation concludes with a brief outline of similar community programs being considered by the Council under a proposed Gulf of Alaska groundfish rationalization program.

Drew Kitts, Northeast Fisheries Science Center
The Northeast Region currently has two types of DAP programs in place: a surf clam/ocean quahog ITQ and a sector allocation in the multispecies fishery. Industry and fisheries managers have shown interest in applying the sector model to other fisheries in the region. The most recent attempt at forming sectors was in Amendment 1 to the Atlantic Herring Fishery Management Plan but the option was dropped at the final Council meeting. This presentation will review the issues that arose while crafting a process through which self-selecting sectors could form in the herring fishery. These, and broader issues (such as single vs. multispecies sectors) specific to sector allocations, will be discussed as they relate to research priorities and data needs.

Carl Lian, Northwest Fisheries Science Center
The Pacific Fishery Management Council is considering a multispecies individual fishing quota program for its limited entry trawl groundfish fishery. This presentation begins with an overview of the fishery, provides a status report on the Council's process for evaluating implementation of a DAP regulatory regime, and discusses key data needs that would be created by implementation of a DAP program. The discussion of data needs will focus on issues encountered in a multispecies fishery where vessels also participate in other fisheries. These issues include the role of at-sea observer data and the challenges in designing and conducting cost earnings surveys.

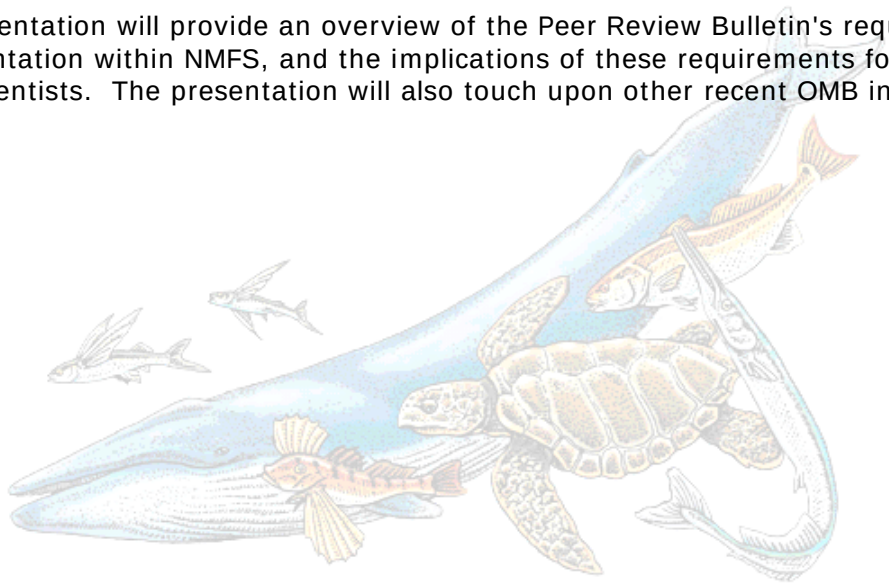
Wednesday, April 19, 2006

Fish of the Day

OMB's Peer Review Bulletin
Tom Gleason, HQ/Office of Science & Technology

In December 2004, OMB issued a Final Information Quality Bulletin for Peer Review, establishing minimum peer review standards, a transparent process for public disclosure, and opportunities for public input. The Peer Review Bulletin is implemented under the Information Quality Act (IQA) and is intended to provide public oversight on the quality of agency information, analyses, and regulatory activities. The Peer Review Bulletin applies to "influential scientific information" and "highly influential scientific assessments" disseminated by federal agencies.

This presentation will provide an overview of the Peer Review Bulletin's requirements, its implementation within NMFS, and the implications of these requirements for NMFS' economists and social scientists. The presentation will also touch upon other recent OMB initiatives that may impact NMFS.



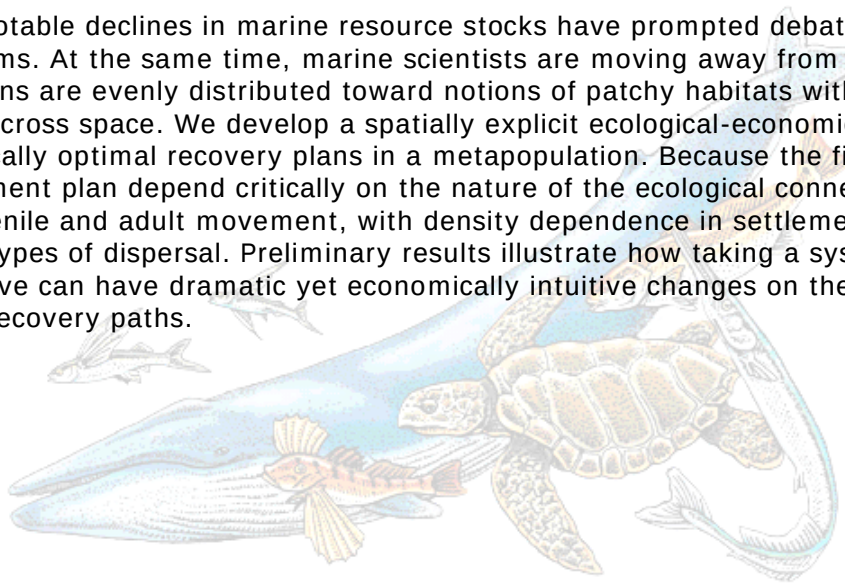
Bioeconomics Joint Session with the National Stock Assessment Workshop (NSAW)

Fisher behavior with area closures and economic rationalization
Alan Haynie, Alaska Fisheries Science Center

This talk will focus upon the discrete choice models that economists use to predict how fishers make location choices. With references to other fisheries, the talk will focus upon the Steller Sea Lion Conservation Area in the Bering Sea and consider the impact of the interaction of rationalization and marine reserves.

Optimal recovery paths in a metapopulation: some preliminary analysis
James N. Sanchirico, Senior Fellow, Resources for the Future (www.rff.org)

Recent notable declines in marine resource stocks have prompted debate over how to restore ocean ecosystems. At the same time, marine scientists are moving away from the assumptions that marine populations are evenly distributed toward notions of patchy habitats with population abundances varying across space. We develop a spatially explicit ecological-economic model to investigate economically optimal recovery plans in a metapopulation. Because the fishery effects of any spatial management plan depend critically on the nature of the ecological connectivity, our model includes both juvenile and adult movement, with density dependence in settlement differentiating between the two types of dispersal. Preliminary results illustrate how taking a system-wide vs. single patch perspective can have dramatic yet economically intuitive changes on the qualitative nature of the optimal recovery paths.



Thursday, April 20, 2006

Fish of the Day

A review of regional economic models for fisheries management in the U.S.
Chang K. Seung, Alaska Fisheries Science Center, and Edward C. Waters

This paper provides an overview of regional economic models available for estimating economic impacts of fisheries, reviews studies that have been conducted for U.S. fisheries using these models, and identifies data and modeling issues associated with regional economic analysis of fisheries in the U.S.

Economics 101: survey results -- a.k.a. Economics and social science lessons for marine policy makers
Alan Haynie, Alaska Fisheries Science Center

This talk will briefly present results from an informal survey of NMFS Social Scientists and consider opportunities for conveying economic and social scientific knowledge to marine policy makers.