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BRIDGING THE GAP: A MODEL FOR BUILDING TRUST AND COLLABORATION BETWEEN MARINE RESOURCE REGULATORS AND STAKEHOLDERS

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ABSTRACT: Increasing global pressure on scarce marine and fisheries resources have exacerbated the historic distrust and frustration that traditionally go hand in hand with marine resource and fishery management. Steps need to be taken to increase the degree of cooperation and collaboration between fishers, fishery scientists, and resource managers. The authors outline a model, the Marine Resource Education Project (MREP) designed to increase communication and trust between the participating stakeholders. The paper discusses the need for increased cooperation in the management of the global fisheries. It further describes the MREP project in terms of objectives and likely approaches. Curriculum and administrative considerations and methods are presented. Specific modules and components incorporated within MREP are briefly outlined, including the use of negotiation and collaboration techniques taught with case studies and discussed in breakout sessions. Other methods designed to permit participants to fully explore ways in which they can better work together in a process designed to facilitate mutual gains concepts are included. The goal of the proposed model is ultimately to break down the historical barriers to cooperation and to develop leaders in the fishing industry able to promote trust in the management process and to forge new areas of involvement of fishers in the regulatory process.
KEY TERMS: Fisheries management, collaborative research, training workshops, marine resources.

INTRODUCTION

Global fisheries are at a critical crossroads. World population currently exceeds 6 billion people and the Population Reference Bureau estimates that world population will double in a little over 50 years (Population Reference Bureau, 2001). Planning for a reduction of world hunger is made no less difficult by the ongoing shrinkage in cropland per person in developing countries (Worldwatch Institute, 2001:44). The implications for the world's oceans in general and more specifically global fisheries are ominous. Logic dictates that as traditional agriculture begins to fall behind in the effort to feed the hungry, the protein that has traditionally been found in the oceans will be harvested with increased effort in an attempt to fill the gap.

Given the present state of the earth's oceans, however, this possibility grows more remote with time. Already the decades of open-access fisheries exploitation have taken a terrible toll. According to the United Nations Food and Agriculture Organization (FAO) 11 out of 15 of the world's most important fishing areas and 70 percent of the major species, are either fully or overexploited. Landings of the most commercially valuable species, including cod, tuna and haddock are down by 25 percent since 1970 (McGinn, 1999). In Europe's North Sea, stocks of cod and haddock fell by 83 percent during 1971 – 1990; the stock of mackerel crashed fiftyfold between 1960 - 1991; and the herring fishery, closed entirely between 1977 and 1982 has not recovered to anywhere near its former levels (Meyers and Kent, 2001). As one species is depleted, other fish of lesser quality and value become the focus of efforts. As species are

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depleted in this top-down fashion, entire food chains are distorted and the biodiversity of marine ecosystems dissolves (McGinn, 1998). Clearly the ocean fisheries are becoming exhausted from the stress of overfishing. Pollution, habitat degradation, coastal development and other factors have also have taken their toll on the productivity of marine ecosystems. It might seem that governments should get together to do the obvious: reduce the number of fishers. Global fisheries, however, present a "commons" problem. There is a built-in inducement for a country, or a fishing boat, to overfish because the benefit will accrue exclusively to the overfishing entity while the cost is borne by all countries or fishers. Once a fisher or a country begins to overfish others follow suit. Each fisheries participant acquires additional and more sophisticated gear to improve the chances of landing a good catch. The situation is exacerbated by limits in the form of seasonal closures with fishers trying to grab every fish possible before time runs out. The race goes to the swift and the result is depleted stocks (Meyers and Kent, 2001).

Governments make matters worse by irresponsibly subsidizing the overcapacity and overinvestment in order to preserve the fishing industry of their own countries. These incentives take many forms, including the use of tax incentives, loan guarantees, grants, fuel-tax credits, government research and development, export promotion and the like. During 1979 – 1989 the world's fishing fleet grew at twice the rate of the global catch, until it amounted to twice the capacity needed to catch what the oceans could sustainably produce.

With so many boats competing for so few fish, the only way to reduce the number of fish taken has been the promulgation of complicated fishery regulations designed to make fishing operations inefficient. Traditional regulatory tools like trip limits, area closures, seasonal limits and setting trawl net mesh size large enough that juveniles can escape are frequently employed to lower catch rates (Peterson, 1993). Management plans, relying upon scientific advice to different degrees depending upon the management regime, are employed in an effort to achieve a sustainable fishery for a given area or species (Rosenberg, A.A., *et al*., 1993).

Thus with tensions over fisheries increasing, demand for fish rising, and local food security at risk, the stakes are higher today than ever before. Accelerating economic and social desperation continues to drive fishers down the path of self-destruction, taking the world's fishery resources with them. If the industry and the resource are to survive, management will need to make a fundamental shift away from managing fish supplies to managing the fishers and how they fish (McGinn, 1999: 35-36).

This paper takes the position that the new-era fishery management will only be successful if it has the knowledgeable support of the fishers themselves. Any management plan forced upon fishers is doomed to failure through lack of support, poor compliance and unsatisfactory reporting. The likelihood of fishery management success is greatly improved by bringing fishers into the management decision-making process, educating scientists and fishers on their respective issues and concerns, and instilling in fishers a sense of trust in the process and stewardship over the resource. The proposed Marine Resource Education Project described by the authors is designed to foster successful management results through education and collaboration between fishers, scientists and fishery managers. While the MREP was created for application to the Gulf of Maine fishery (Northwest Atlantic), the concept may prove applicable to other issues involving renewable resources such as fresh water scarcity and forestry practices.

THE MARINE RESOURCE EDUCATION PROJECT

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Background

The Northeast Consortium is an entity funded by the United States government expressly for the development of partnerships between commercial fishermen and scientists/managers, the participation by commercial fishermen in cooperative research, and the assimilation of fishermen's information, experience and expertise into the fisheries management process. The Marine Resource Education Project (MREP) has been funded by the Northeast Consortium and is designed to lay the groundwork for all these goals by immersing fishermen, scientists and managers in an intense weeklong educational experience that will empower participants and facilitate cooperative working relationships. The project was initiated in 2001 and the first workshop is being planned for February 2002.

The need for increased cooperation between fishermen and scientists/regulators is well documented. David Dobbs, in his recent work The Great Gulf describes the "discord, doubt, and distrust" between fishermen and scientists that has made it "almost impossible to convince fishermen and regulators to curb overfishing" (Dobbs, 2000: 5). Other writers describing the demise of the Gulf of Maine fishery have noted the difficulty that the fishing community has seeing things on the water that scientists ignore, while scientists often remain skeptical of industry-generated data that may be subject to tremendous bias, either deliberate or inadvertent (Hanna *et al*., 2000: 144). These authors echo the concerns expressed by the National Academy of Science's National Research Council. In its

"Review of Northeast Fishery Stock Assessment" the Council concluded, "…stock assessment science is not the real source of contention in the management of New England groundfish fisheries." Citing the results of various public meetings, the Council wrote, "…the social and economic concerns created by strong management measures and lack of participation in the management process were the more important concerns" (National Research Council, 1998:6).

There is overwhelming consensus that the past approaches for dealing with the Gulf's fisheries have failed. Scholars persuasively argue that an alternative problem-focused consensus-based approach modeled after that used in the U.S. Great Lakes, the Mediterranean, the Baltic and elsewhere will serve to redirect efforts in more productive directions. (Prelli and Becker, 2001). Indeed, lessons learned from collaborative efforts related to Great Lakes water quality and fisheries restoration provide much of the design for this project . Such cooperation is not without precedent. As far back as 1929 when Walter H. Rich, a federal agent with the U.S. Department of Commerce, Bureau of Fisheries, surveyed a large number of fishing captains for his publication "Fishing Grounds of the Gulf of Maine," cooperation between scientists and fishermen has yielded beneficial results. More recently, scientists, fishermen and management teamed up to explore the effects of fishing gear on the ocean floor (CLF, 1998). A similar collaboration took place in 1999 when representatives from the fishing community joined scientists and managers in Montpelier, France, for a symposium sponsored by the International Council for the Exploration of the Sea (ICES) entitled "Ecosystem Effects of Fishing" (ICES, 1999). Realistic progress on collaborative problem solving is still a goal within the Gulf of Maine. The findings of lingering issues of distrust and credibility cited above by National Research Council, however, remain a troublesome reminder of the need for dialogue between regulators and fishermen in the Gulf of Maine.

MREP Objectives

As a first step in the process of establishing meaningful dialogue between fishers, scientists and managers, the primary objective of MREP is simply to bring representatives of the three disciplines together in a neutral setting where they may explore their common goals and their differences away from the pressure of the regulatory process. Using a mutual gains approach, participants will be asked to treat management problems and science issues as a multi-party negotiation with many issues. Within this context, the objective will be to get the parties to:

1. Acknowledge the concerns of the other participants.
2. Encourage joint fact finding
3. Accept responsibility, admit mistakes, and share power to the extent possible.
4. Act in a trustworthy fashion at all times.
5. Focus on building long-term relationships for the benefit of the resource. (Susskind, 1996)

The curriculum will help achieve these objectives by providing participants with a baseline of information about the marine science, ecology, and stock assessment procedures. In addition, exercises will be designed to encourage problem solving through awareness of the other sides' expectations and goals.

Participation in the MREP will also serve other important objectives. It will substantially increase the number of individuals at work in New England fisheries who are comfortable navigating the fishery data and management systems. The flip side of this is that participation will also serve to deepen the familiarity of policy and science professionals with the workings of the fishing community and to make them aware of the opportunities for marine research and technological innovation that are part and parcel of a fisher's daily life.

Finally, this program is intended primarily for experienced fishermen who wish to be more effective in the advancement of their industry, and for other individuals who have made a commitment to fisheries science and management as a career. Thus another important objective is to define a level of professionalism in commercial fisheries and to prepare individuals for leadership. Toward this end, when participants complete this course, they will be given a certificate of recognition. Given the quality of the curriculum it is anticipated that individuals will identify themselves with the program when they engage in the management process or apply for participation in research initiatives. Concomitantly, scientists and managers will recognize that fishermen who have participated in the program will be better able to successfully participate in and even refine collaborative fisheries research projects.

Methods and Approach

Project Design and Facilitation

Meeting the overall objectives of the MREP requires that the structure and process used to implement project planning, workshop design and delivery is sensitive to the needs and perspectives of the targeted participant groups.

The structure and process for implementing the project are as important as the content that is delivered. Methods presented below are designed to facilitate such an approach and lay the groundwork for engaging fisherman in cooperative scientific research and provide a basis for the entire community to apply a more problem solving approach to policy decisions and fisheries management. Our approach to recruiting, compensation, participant recognition, public information, and evaluation and follow-up is also summarized.

Planning & Coordination for Implementation

A project development and facilitation team consisting of six leaders from the fishing industry, two scientists, a fishery manager (NEFMC) and an educator have agreed to act as a ten-member Board of Directors for the project. The Board's role is to assist with planning, course design, recruitment of participants, workshop implementation and evaluation of program results. A Program Implementation Coordinator with fishery/management background, two scientist-educators from the University of New Hampshire and a Natural Resources doctoral student are working with the board to provide scientific expertise (fisheries science, management, educational training and curriculum development, consensus and conflict management skill building), assist in the design and development of the training materials, implement the training workshops, and facilitate project management and UNH institutional coordination

The Board will meet three times during Year 1 and at least twice each of the following two years. Its first two meetings will be planning-intensive. Products will include:

Board Briefing on project objectives and overall design and Board approval of specific components of the overall implementation strategy

- Approved Workshop format and agenda, including suggestions for resource persons
- Approved schedule for first three workshops
- Recommendations for resource materials to be obtained or developed for inclusion in the Training Workshop Notebook
- Recommendations on fishery "front burner" issues to guide selection and preparation of the case study(ies)
- Recommendations to guide selection of workshop participants and advice to guide revision of a draft participant recruiting and public information strategy
- Approval of a project evaluation process for tracking immediate and longer term outcomes from the training project as well as a review of an individual Training Session evaluation instrument
- A clear understanding among the Board and project support staff (Program Coordinator and UNH scientists) as to how the communications, decision making and coordination for program delivery will be implemented.

A third meeting will follow the first workshop to evaluate the its results, respond to recommendations, determine the need for revising either materials or workshop delivery processes, and to plan the second workshop and recruiting strategy. Each of the two succeeding years will follow this consultative format: workshop pre-planning and then evaluation and adaptation. The project staff will provide draft materials, technical support and ensure ongoing communication to achieve project goals.

Training Workshops: Design and Delivery

Training workshops are designed to involve twenty participants, fifteen from the fishing community and five scientists and others from marine related science programs. Senior scientists and policy makers have volunteered to participate as well, and also to serve as resources for particular course modules. Products will include one workshop during year one and five during subsequent years for a total of six over a three-year period to train a minimum of 120 individuals involved in the New England fishery. Based upon consultation with fishermen representative of the variety of fisheries, these will be scheduled during the "off fishing" seasons.

The project plan calls for five-day (weeklong) intensive training workshops. Workshop design is modular, with each training workshop offering a proposed 9-course module. The curriculum content and delivery will be designed to provide participants with grounding in the fundamentals of commercial fisheries science. The course will also provide participants opportunity to examine how the use of information technology, remote sensing and telemetry in modern fisheries can enable to fishermen to participate in future research projects with fisheries scientists utilizing such technology. Other course modules will include training in consensus building and negotiation and the use of case studies to foster problem solving approaches to inform fisheries management decisions. The workshop

structure and process as conducted by professional facilitators will serve as a model, and participants will have ample opportunity to use newly obtained consensus-building skills to approach real fisheries problems as they engage in their case study.

The curriculum will be designed, in consultation with the Board of Directors to cover topic areas as indicated below. Trainers/instructors will include academic presenters, federal scientists or staff of the New England Fishery Management Council and fishers. Content of the workshop will be designed and training module materials will be delivered to ensure that participants will gain:

1. Grounding in the fundamentals of commercial fisheries science (1/2day).
2. A one-half day module to introduce the basic tools of analysis used in stock assessment, how the stock survey is conducted, and how the stock assessment process generates models. Since fishermen are being invited to participate directly in the assessment process, the focus should especially be on areas where fishermen may lend their specialized knowledge to the modeling.
3. A one-half day module will provide a synopsis of the history of regional fisheries. This might look at the available time-series abundance estimates for various stocks, and records of distribution patterns taken from source documents.
4. A thorough description of the processes surrounding fishery management, how the fishery management and regulatory process works.
5. A one-half day training program in negotiation skills, with emphasis on being effective when carrying forward issues and how to effectively participate in group decision-making will equip participants to engage in further discussion and to tackle their case study assignment. Also this training would focus on the existing regulatory process under the NEFMC, including how fishermen can better prepare and effectively participate in this process.
6. A full day will be devoted to a case analysis to engage participants in trying to address a recognized problem: "the lack of basic knowledge by managers of the workings of the range of fisheries under their review". Case materials will be prepared in advance and a process selected for joint consideration.
7. An examination of the use of information technology, remote sensing technology, GIS and telemetry in modern fisheries will require one-half day.
8. An exercise to define a level of professionalism that is consistent for scientists, fishermen or managers. Examine and describe the ethical expectation for each group – i.e., fisherman, scientists, managers. This will be a component of the workshop wrap up and recommendations for follow-up during the closing ½ day module.
9. Workshop evaluation (component of closing module)

To ensure that all course participants have the opportunity to develop skills in joint problem solving that will enable them to address problems on which they have very different perspectives and where their interests differ, methods for course delivery employ conflict management processes and skill building. Experts in conflict resolution will assist participants in developing basic conflict resolution skills. Trained facilitators will lead group discussions as well as provide training in facilitation to workshop participants. For example, it is proposed that participants will learn how to employ the nominal (small) group process to implement a joint problem solving approach to the discussion of contentious issues. Alternative models for conflict management and resolution, including mediation and negotiated rule making will be illustrated.

In addition to formal presentations designed to ensure that participants have command of particular information to serve as a foundation for the training program, course work will employ case histories where appropriate. The case studies will be designed to examine real resource conditions and recent management challenges for pertinent lessons. Real world examples of past fisheries management decisions will be designed to engage participants in developing an understanding of how the end results evolved and to engage them in proposing alternative scenarios based on different assumptions and/or data which they believe would result in more effective approaches to fishery issues.

Participant Recruiting and Compensation of Participants

The Board of Directors plays the pivotal role in attracting quality participants from a range of backgrounds, sectors, and communities. Initially, a priority has been set to enroll fishermen, scientists, managers and students of marine resource use who have demonstrated willingness to engage in the management process. Recruiting strategies are designed to engage participation of individuals from targeted communities and sectors and include both formal and informal means. For example, a letter of application may be requested. Participation by "social units", e.g., of a captain and crewman, are encouraged. Enrollees are required to commit to attend for the full five days of the course. Fishing industry participants are offered compensation for "lost opportunity" costs as well as having their travel costs reimbursed.

Assessment and Ongoing Evaluation

The Board is assisting in the design and assessment of workshop evaluation instruments. Participants for each training session will be asked to complete an evaluation of the workshop. Following each training workshop, project coordinators will prepare a report describing course results, difficulties encountered and recommended changes. This will be presented to the Board of Directors to guide decisions regarding any needed adaptations in workshop content or delivery prior to the subsequent workshops and as a component of the routine implementation assessment. The Board and the coordinators will review these results and adapt the design or delivery as warranted.

Lessons from the case study negotiations will be assessed. The results of these exercises will be written up, revised as necessary, and submitted to the Board of Directors. Additional issues will be identified to serve as a basis for future workshop cases. Future research will be designed to track whether workshop trainees' approach scientific collaboration and the regulatory process differently after attending training.

REFERENCES

Becker, Mimi. 1993. The International Joint Commission and Public Participation: Past Experiences, Present Challenges, Future Tasks. *N. Res. J.* 33:235

Dobbs, David The Great Gulf: Fishermen, Scientists and the Struggle to Revive the Worlds Greatest Fishery, Island Press/Shearwater Books, Washington, D.C. 2000.

Dorsey, Eleanor and Pederson, Judith, editors, Effects of Fishing Gear on the Sea Floor of New England, Conservation Law Foundation, Boston. 1998.

International Council for the Exploration of the Sea, ICES Journal of Marine Science: Ecosystem Effects of Fishing, Academic Press, Montpelier, France. 2000

Hanna, Susan, H. Blugh, R. Allen, S. Iudicello, G. Matlock, B. McCay,. 2000.Fishing Grounds: Defining a New Era for American Fisheries Management, Island Press, Washington, D.C.

McGinn, A.P. 1998. Rocking the Boat: Conserving Fisheries and Protecting Jobs. Worldwatch Institute. Washington, D.C.

McGinn, A.P. 1999. Safeguarding the Health of Oceans. Worldwatch Institute. Washington, D.C.

Myers, N. and J. Kent. 2001. Perverse Subsidies. Island Press. Washington, D.C.

National Resource Council 1998. Review of Northeast Fishery Stock Assessments, National Academy Press. Washington D.C.

Peterson, M.J., 1993. International Fisheries Management, in Institutions for the Earth: Sources of Effective International Environmental Protection.. Edited by Haas, Peter M. *et al*. The MIT Press. Cambridge, Mass.

Population Reference Bureau. 2000 World Population Data Sheet. 2001. http://www.prb.org/wpds2000_Population-Populationprojected.html (June 5, 2001).

Prelli, L and Larsen-Becker, M. 2001. Learning From The Limits Of An Adjudicatory Strategy for Resolving United States – Canada Fisheries Conflicts: Lessons from the Gulf of Maine. In Print: *Nat Res. J.*

Rosenberg, A.A., M.J. Fogarty, M.P. Sissenwine, J.R. Beddington, J.G. Shepherd. 1993. Achieving Sustainable Use of Renewable Resources. Science. 262: 828 – 829.

Susskind, L. and P. Field. 1996. Dealing With An Angry Public: The Mutual Gains Approach to Resolving Disputes. The Free Press. New York.

World Resources Institute, The United Nations Environment Programme, the United Nations Development

Programme, The World Bank. 1998. World Resources *1998-99.* Oxford University Press. New York.
Worldwatch Institute. 2001. State of the World 2001. W.W. Norton & Company, Ltd. New York.