Collaborative gear research

Part I: What it takes to get projects going

by Cheryl Daigle

Collaborative research between fishermen and scientists on gear technology has gained momentum in recent years with federal funding through the Northeast Consortium (NEC) and the Cooperative Research Partners Initiative (CRPI) of the National Marine Fisheries Service (NMFS).

Gear technology research seeks solutions that reduce the mortality of regulated species and impacts to bottom habitat and, at the same time, it keeps fishermen out on the water. While an increasing number of fishermen are being recognized for their innovative work to modify gear and contribute to scientific studies, this is only a small percentage of those who stand to benefit from this type of research.

This Science Side column is the first of a two-part series reflecting on the benefits and challenges of collaborative gear research and questioning how this research is being perceived in terms of its application to fisheries management.

Part one focuses on the learning process that takes place when scientists and fishermen work together. It also looks at some of the obstacles that may hinder collaborations.

The second part, which will run in the next issue of *Commercial Fisheries News*, explores the potential value of collaborative gear research to the fishing industry and scientific and management communities. It asks the question of how this research fits into the regulatory measures taking shape with groundfish Amendment 13.

Learning process

To plan and carry out joint projects, fishermen and scientists have had to overcome differences in the way they go about their work as well as perceptions about each other that have built up over the years.

Since the funding appropriated by Congress clearly requires fishing industry's involvement, many see building trust between fishermen and scientists as one of the underlying goals of collaborative research programs. Their development of effective working relationships helps to ensure the data gathered is of benefit and credible to all the parties involved.

"Fishermen know a lot about what they're doing and to tap their expertise is essential. To work on our own in science and management without them is foolish," said Dan Schick, a scientist for the Maine Department of Marine Resources (DMR).

"Fisheries scientists and managers have lost a lot by not having fishermen involved from the get-go," he said. "Now, fishermen are coming to find out they can be involved and they can be successful."

Since 1991, Schick and his collaborators from industry have received 17 grants totaling over $2 million to develop gear that reduces bycatch.

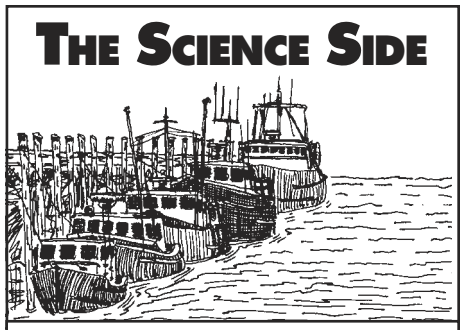
His recent emphasis has been on modifying the Nordmore grate for the shrimp industry and working with a Nordmore-style grate in a raised foot rope trawl in an effort to re-establish a whiting fishery in Maine.

Vincent Balzano, F/V North Star, of Saco, ME began working with Schick on whiting gear research this past year. Balzano is also scheduled to work with scientists from the Manomet Center for Conservation Sciences to test composite mesh codends.

The fisherman believes progress is being made, especially on the collaborative part of the projects.

"I think a lot of bugs are being worked out. Like anything else it's a learning process," Balzano said. "You have to be open-minded and flexible with research, and not get frustrated when you run into problems."

Respect on both sides for the various types of knowledge being thrown into



The Science Side, a regular feature of Commercial Fisheries News, *is provided by the Maine Sea Grant Program. For more information, contact the Maine Sea Grant office in Orono, ME, (207) 581-1441, or check the web site <www.seagrant.umaine.edu>.*

Gear scientist Pingguo He is working with Bart McNeel of the F/V Aaron and Melissa II to design and test a grid device to reduce cod bycatch.

Pingguo He photo

the mix is key to successful collaborative work.

"The scientist has to have respect for the fisherman's abilities and the fisherman has to extend the same courtesy. If you don't have faith that the scientist is there to help, then collaborative research is not going to work," Balzano said.

Many believe the scientific community has changed; fishermen have always had good ideas, now someone is listening.

"Just breaking down the wall between scientists and fishermen is huge; both had perceptions about what the others do," said Craig Pendleton, a fisherman and coordinating director of the Northwest Atlantic Marine Alliance (NAMA). "Management has finally recognized that fishermen have expertise to bring to the table just like the scientists."

Different approach

Not so long ago, collaborative research generally meant a scientist having an idea and chartering a fishing boat. A lot of fishermen had ideas but either did not have the opportunity or could not afford to test new gear. This has changed.

"Now fishermen are coming to me with ideas, saying let's get together and talk about this and see if we can make something happen. I think we're going to see the benefits for many years to come," said Chris Glass of the Manomet Center for Conservation Sciences.

He is currently working with fishermen Russell Sherman of Gloucester, MA and Lendall Alexander of Harpswell, ME on codend selectivity of various groundfish species and development of an exit grid to reduce bycatch in the cod fishery.

"Through collaborative research, we are exposing many people in the fishing industry to the benefits of what we have in the scientific community," Glass said.

The basis of his work is understanding the natural behavior patterns of fish in fishing gear. Once they know what fish do, they can begin to modify the gear to get the results they would like.

According to Glass, "The bottom line is, if we have the right background information it is possible to achieve really good things. It's a matter of spending a lot of time out on the water and with the right people."

Gear scientist Pingguo He of New Hampshire Sea Grant is enthusiastic about his work with Bart McNeel of the F/V Aaron and Melissa II. They are designing and testing a grid device to reduce cod bycatch.

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Peter K. Prybot photo

"I've had very good experiences working closely with fishermen," He said. "This research is much more than chartering a boat, it's more like an equal partnership as to what needs to be done next."

With the fishermen's skills and tools, they are able to modify gear at sea, saving a tremendous amount of time and expense. One goal of their work is to come up with devices that can be easily implemented into existing gear.

Last winter, He organized a workshop in Newfoundland at the Center for Sustainable Aquatic Resources (CSAR) that tested newly developed gear in a flume tank. The success of that opportunity for scientists and fishermen to see the gear they've worked on in action and to exchange ideas led to a second workshop being planned for this coming winter.

'Scientific method'

The work of fishing and the work of science normally happens on different time scales.

Fishermen succeed because they can make adjustments, often fast. They know inherently what to do with nets and if the gear doesn't work quite right after a tow or two, they change something.

Scientists, on the other hand, will take the gear and test it repeatedly against a control for statistical purposes.

One of the challenges in collaborative research is building an understanding among fishermen about how the basic "scientific method" works and why it is important. While their day-to-day experience out on the water and making observations is invaluable, unless their observations are structured in a scientific way, their information cannot be integrated into the management process.

"It is vital that we have scientists and fishermen working together from the start so we can sit down at the table and develop a study design that satisfies the scientists' need to control bias and satisfies the fishermen's need to show what they know about a particular area," said Earl Meredith, marine biologist for NMFS. Meredith is responsible for administering CRPI, writing contracts with fishermen and scientists who get funded, and specifying how the results will be reviewed.

In order to be accepted by management and, perhaps, ultimately by the courts, research projects need to be designed to be repeatable, with a hypothesis and analysis designed up front. Problems arise when the research team strays from the original study design or if they do not articulate well from the beginning what the question is that they are trying to answer.

"A lot of people say the science is not good because they don't understand how it's done," Meredith said.

"The most important thing in cooperative research is communicating that kind of information. We have to rely on data and valid science to come to conclusions and make a management decision that is going to affect entire groundfish populations and fishing communities," he said.

However, marine systems are so complex that designing a research project also requires a working knowledge of the "at sea" variables to consider, such as local weather patterns, where and when fish are known to congregate, the intricacies of the currents, or where the mistakes are in the nautical charts. This type of knowledge is critical to the process of how fishermen work.

Combining elements of science with the day-to-day efforts of fishermen is integral to successful research. In recognition of this, the goal of improving information exchange between fishermen and scientists is written in to many of the project proposals.

"The point is to develop a research project that has a maximum likelihood of success, and a maximum likelihood that it will be accepted by both sides," Meredith said. "We don't want parallel sciences; we want it to be complimentary."

Shortage of gear scientists

But the fact is there are not enough scientists around who have the engineering experience and the time to work with fishermen on gear technology research.

"One of the real challenges we are facing now is there are lots of fishermen who have ideas, but there is a shortage of gear scientists for them to partner with," said Mike Pol, conservation engineering scientist for the Massachusetts Division of Marine Fisheries. "We just don't have time to work with everyone, and the fishermen don't get the assistance they might need to prepare a proposal."

Laura Taylor Singer of the Gulf of Maine Aquarium (GoMA) explained, "The hurdles are not in terms of how many fishermen want to get involved in collaborative research; the bottleneck is on the science side. There are not as many scientists around that are uncommitted and willing to focus on a project with fisheries and fisheries management."

Those projects require greater commitment to communications and extra time to overcome cultural differences.

Singer says, "It takes special fishermen and scientists willing to take the time to figure out what the heart of the question is and willing to go through the process to get answers."

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—Dan Schick

Peter K. Prybot photo

With 75% of the funding in the NEC programs going to fishermen, it is often difficult for the scientist to cover research costs. Singer comments, "On every single GoMA project we have had to supplement the science side."

There are also drawbacks in the way payment is made to fishermen. While fishermen are used to being paid when they bring in a catch, getting paid for research work often takes time. According to Singer, sometimes the most important role GoMA plays is to reimburse vessels when they come in from a research project or soon after.

Credibility

Of the many collaborative research efforts under way, gear technology studies most directly address the bycatch and discard concerns of fishery managers and environmentalists and provide hope of workable solutions for fishermen.

If regulations require changes in gear to reduce bycatch and discard, fishermen have to know the gear is going to do what the scientists and managers say it will, and result in the intended conservation benefit.

"We need to be willing to hold up science to be judged by the fishing community," Dan Schick said. "We can't ask for more in management of a population than to have fishermen buy into what's being said by the scientists."

Having scientists and fishermen work together can provide a checking system against each others biases, and, ultimately, can reach credible findings. Other fishermen need to know that good work is being done. They need this assurance to believe it is legitimate.

And, encouraging more scientists to get involved in gear technology research is another critical hurdle to get the most out of the time and money being invested to make this research count. ■