

## Theme Session L

### **Bringing collaborative science – industry research data into stock assessment and fishery management: evaluating progress and future options**

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Many programmes of collaborative research and data collection have been initiated in the North Atlantic and elsewhere since the 1990s, often in response to crises in the fishing industry that led to deteriorating relationships between fishers and fishery scientists. The programmes have helped fishers become more involved in the fishery management process and have built progressively greater capacity in the fishing industry to collect useful data and carry out scientific studies. The programmes have already yielded substantial amounts of data from fishing gear trials, resource surveys, catch-composition studies, discarding surveys, development of CPUE series, and from interviews and questionnaires capturing fishers' knowledge of fish stocks, fishing operations and tactics. Many publications and symposia have focused on the evolution of these programmes, their benefits in empowering fishermen and fostering productive collaborations, and the development of "best practice". Relatively few have looked in detail at the nature and quality of the data that have been produced, the successes and failures in using the data for stock assessment and fishery management, and the development of new methods that can make fullest use of fishers' data that are not amenable or not yet adequate for inclusion in standard stock assessment models. This Theme Session invited contributions from collaborative science-industry programmes world-wide on the following or similar topics:

- case studies of successes and failures in using fishers' data in stock assessment models and decision-making processes;
- strengths, weaknesses and applications of the data compared with similar data from standard scientific programmes;
- evaluation of the statistical design of collaborative data collection programmes and effects of departure from "ideal" designs;
- development and testing of methods for incorporating fisher's data in assessment and management procedures when they don't fit into the standard models;
- collection, analysis and accuracy of fisher self-sampling data;
- fast-tracking fisher's data – getting early wins to maintain incentives for collaboration.

#### **Evaluating progress**

Theme Session L included nine papers given as 15-minute presentations and five posters which were also given as 5-minute presentations. The papers provided ICES with examples of collaborative science-industry

research covering a broad spectrum of data collection projects in European seas, the western and south western Atlantic and off Australia. Although contributions had been invited on a range of specific topics covering the quality of data from collaborative research, and the impact of such data on stock assessment and management advice, the presentations tended to be weighted towards descriptions of programmes and examples of data, with relatively few analyses of the impact of the data on assessment and management.

The papers in Session L covered the following general topics:

- Using commercial fishing boats as platforms for collecting data on fish biology, distribution patterns, fisheries catches and CPUE (L:02; L:06)
- Technological developments for improved data collection from commercial fishing trips (L:16)
- Designing and testing new fishing gears (L:08)
- Understanding fishers' behaviour and decision making (L:07)
- Studies addressing fishers' criticisms of ICES research vessel trawl surveys (L:11, L:03&L:15)
- Developing collaborative surveys using fishing vessels (L:05, L:09; L:10; L:14)
- Developing fishery CPUE indices using data supplied by fishers (L:12)
- Evaluating the process of information flow from collaborative research to its use in fishery management (L:04)
- Collection of ancillary data in support of the ecosystem approach (L:09)
- Evaluation of gear performance and comparison of commercial and survey gear (L:03; L:11; L:14).

Examples of collaborative programmes where the data are already being incorporated into the assessment and management process included L:05 (video camera surveys of scallops stocks off New England) and L:04 (acoustic surveys of NW Atlantic herring) and possibly L:09 (trawl surveys of squid off the Falkland Islands). Notably in this small sample of studies, there were no examples of collaborative research in European waters that have had a clear impact on the stock assessment and management process. This may indicate that in Europe, industry-science collaborative research is still in a growth phase and may take more time to mature into programmes directly supporting fisheries management.

Paper L:04 used techniques from the Social Sciences to track the pathways through which collaboratively-derived stock survey data for herring stocks off the NE coast of the USA flow into the stock assessment (science) and the FMP decision-making (management) processes. Network analysis was applied to map the communication patterns among participants in the development of a fisheries management plan. This also showed where there were key individual participants serving as bridges between informational resources, and the vulnerability of the process if these individuals are no longer available.

### **Future options**

Fisheries management in Europe is in a process of change, and the proposals for revision of the Common Fisheries Policy indicate an increasing role for individual countries and their fishing industries to develop solutions for meeting regional fishery management goals, and for the burden of proof to shift to the industry to prove their activities are sustainable. This suggests an increasing need for effective, industry-science collaborative research alongside the conventional scientific programmes. These two avenues of research and data collection need to be blended effectively. The results must be demonstrably effective in promoting more sustainable, profitable and responsible fishing.

Within ICES, one route for incorporating the results of collaborative industry-science research at the regional and stock-wide scale is through the stock assessment related expert groups and in particular the Benchmark Assessment workshops where new data series can be evaluated. Input to this process could include collaborative surveys, self-sampling data or improved CPUE data. However there are many pathways for input of collaborative research into the fishery management process, not just stock assessment, and there are different possible ways that could be developed for measuring the influence of collaborative research. For example, more applications of methods from the Social Sciences could be explored within the broader process of bringing this discipline into the study of fishery systems.

Fishers involved in collaborative research need to see the results of their efforts being used, if their interest in participating is to be sustained and if credibility is to be maintained. Effective communication is therefore vital for raising awareness amongst the fishing community of the importance of collaborative research and how it is impacting fishery management decisions. It is important to evaluate failures as well as to showcase successes if we are to make progress. As the burden of proof shifts and incentives for industry to take a more active role in research increase, advice on standards for collaborative research and on quality control/quality assurance requirements will be required. ICES is likely to be asked to respond to such requests and should be prepared to do so.