

“COMMIT”

A framework for evaluating management strategies in fisheries

Fishery management is largely based on annual fish stock assessments. Owing to the uncertainty inherent in annual estimates of the stock size, fish quotas set on such a basis will be variable. This makes planning for the future difficult. A multi-annual strategy is needed and, to be effective, this requires the commitment of managers and compliance of stakeholders with the agreed strategy. Multi-annual assessments that incorporate biological and socio-economic considerations will help improve the decision-making process for medium- to long-term planning and will provide a better basis for fishers to plan their activities.



The EU-funded FP6-project **COMMIT** aimed to **provide the scientific basis for the long-term sustainable planning of fishery management, while identifying any short-term biological and socio-economic consequences**. A main objective of COMMIT was to develop a comprehensive testing system or **Management Strategy Evaluation (MSE)** framework that would allow the development of multi-annual management plans in support of the Common Fisheries Policy by the International Council for the Exploration of the Sea (ICES) and the Scientific, Technical and Economic Committee for Fisheries (STECF).

Such an MSE approach allows the testing of stock assessment models and management strategies and often reveals surprising limitations of longstanding fisheries advice. Under the MSE approach the objective is no longer to come up with “the answer”, i.e. one strategy giving the best assessment – as was done in traditional fisheries advice – but to evaluate the consequences of a strategy to alternative assumptions about stock dynamics, i.e. its robustness. This allows alternative strategies to be proposed and evaluated for a range of management objectives of relevance to stakeholders and trade-offs between them. Designing such a comprehensive testing system and developing all

the required standards for it could not, however, be done by one person or institute alone. It had to be a collective effort that spanned organisations and disciplines before it would be recognised as adequate. COMMIT thus developed a **generic open source framework for MSE** by playing a major role in the development of the **FLR framework** in collaboration with a variety of EU projects. FLR, Fisheries Library in R, is a development effort to build a framework for the evaluation of fisheries management strategies designed to facilitate collaboration within and across (biological ecological, statistical, mathematical, economic, and social) disciplines; and to ensure that new modelling methods and software are more easily validated and evaluated, as well as becoming widely available once developed.

COMMIT combined real data with the FLR simulation framework to simulate scenarios for testing management strategies using the following case studies:

1. North Sea Flatfish

This case study developed a model describing the dynamics of North Sea plaice and sole stocks. The model allowed the evaluation of several proposals for management strategies from both the EU and the North Sea Regional Advisory Council (RAC). An important aspect of this work

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“THE WORK OF COMMIT AND THE DEVELOPMENT OF THE FLR FRAMEWORK HAVE BEEN A MAJOR STEP FORWARD IN DEVELOPING A SHARED LANGUAGE FOR SCIENTISTS THAT CAN MAKE A SIGNIFICANT CONTRIBUTION TO CLARIFYING COMMUNICATIONS ACROSS THE SCIENCE BOUNDARY WITH AND AMONG STAKEHOLDERS “

was to ensure the robustness of the management plans with respect to uncertainty about the discarding behaviour of major fishing fleets in response to management. The work of COMMIT indicated that strong fishing effort reductions would improve the sustainability of the two flatfish species, while the current TAC system with quotas for the individual species is less effective because of discarding of over quota catches.

2. Northern Hake

In this case study, the robustness of management decisions for Northern Hake was evaluated for different management plans including the economic performance of the fleets and their response to different economical scenarios. This allowed taking a closer look at potential cost savings and the economic impacts of different management options. The results of this work were used by the STECF to evaluate long-term harvest plans for Northern Hake (June 2007).

3. Baltic salmon

The Baltic salmon case study applied an explicit way of modelling implementation uncertainty and commitment to alternative management approaches. This was based on a three-step procedure: first and expert interview was conducted to understand the mechanisms, then a mail questionnaire was sent around to a large number of stakeholders and finally a new interview of key persons was

conducted, based on previous results. Bayesian models were applied allowing for the incorporation of this expert knowledge. This way, the likely future response of the stakeholder groups was estimated also for those management actions that have never been applied and cannot be studied by usual empirical methods.

The work of COMMIT and the development of the FLR framework have been a major step forward in developing a shared language that can be used amongst scientists and then can make a significant contribution to clarifying communications across the science boundary with and among stakeholders. There is a clear demand from stakeholders to be more involved in the decision-making process including a demand for increased transparency and understanding, both of the knowledge base of advice and of the criteria entering the management decision process. Therefore, the scientific framework developed during COMMIT will be applied in the FP7-funded JAKFISH project that will work together with stakeholders so as to allow for management plans to be developed in collaboration with stakeholders.