



Project no. **502572**

FISBOAT

FISHERIES INDEPENDENT SURVEY-BASED OPERATIONAL ASSESSMENT TOOLS

Instrument : STREP

Thematic Priority : 8.1

POLICY IMPLEMENTATION PLAN (PIP)

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Project coordinator name : Pierre Petitgas
Project coordinator organisation name : IFREMER

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The FISBOAT project developed methods and tools to envisage assessment procedures alternative to the conventional ones using fishery-independent information. This note sketches the perspectives that the FISBOAT project has opened and suggests how alternative scientific advice for the CFP could be implemented.

Alternative assessments from single stocks to ecosystems

A long standing problem of the CFP is the poor quality of the catch statistics that are necessary to uphold one of its major tools, the TAC and quotas system. The European Court of Auditors has confirmed this recently. Since all conventional methods of fish stock assessment require a precise knowledge of catches, a side effect of uncertain catch data is to undermine the ability of scientific bodies to formulate management advice which satisfies managers' needs and is acceptable by the fishing industry. The main justification of the project was to circumvent the difficulties with the provision of advice for the CFP, through the development of alternative methods utilising fishery-independent (survey-based) data only.

Indeed there are more and more situations in which alternative assessment methods are needed. For instance, for stocks that are collapsed, the fishery might be closed thus fishery catches are unavailable or unreliable. Also, misreporting and unaccounted discards generate difficulties to convert reliably landings to effective catches at sea. Last, advice is asked for more and more stocks, and for many of them long past series of fishery catches disaggregated by age do not exist, making conventional assessments impossible. In that context, research survey-based measurements made at sea in known conditions represent an invaluable set of fishery-independent data on which to base an assessment. What type of assessment do these data lead to and how could such assessment be useful alongside existing methods ?

FISBOAT developed methods and tools (software and documentation) for carrying out diagnostics of fish stocks status as well as advice on management strategies, using only fishery-independent information from research surveys. Three categories of methods were developed: (i) assessment models, (ii) monitoring procedures based on indicators of stock attributes, (iii) simulation evaluation tools. The two first category of methods are essentially diagnostic methods that provided relative diagnostics. Simulation tools allowed to investigate the effect of management options and were complementary to the diagnostic tools.

The FISBOAT diagnostic tools constitute a fishery-independent monitoring system that can be tasked to assess whether management actions have effectively allowed the stock to go in the correct direction. This is a major shift in thinking fisheries diagnostics, by taking from the environmental monitoring approach. FISBOAT has proved that it is possible to establish robust diagnoses on the state of fish stocks, using data and indicators collected during regular programmes of scientific surveys. The approach goes further than utilising traditional indices of abundance, as it also relies on a number of indicators (e.g. of spatial behaviour) providing insights into the processes governing the development of stocks, in response to fishing and natural drivers. Thus, the diagnoses incorporate a wider basis of scientific knowledge than conventional model based approaches do. The array of indicators can be arranged in a "traffic light" system to monitor the state of stocks and also the effectiveness of management measures. They can also be included in statistical procedures to detect changes of concern to managers with specified probabilities of detection and of false alarms.

Being based on survey data only, the methods could not provide absolute estimates of stock size but tests indicated that they would provide useful indications on trends, to which managers might wish to react. The relative information could be used to support management by TAC through harvest rules that are functions of past TAC, and past and current survey indices. In principle, there is no reason why management decisions might not be based on relative estimates of stock size, vs. (allegedly) absolute estimates as in the current advisory system. This merely requires a change in customary practice, and perhaps a different division of roles between scientists (pointing out the direction of changes in catch or effort) and managers (deciding the magnitude of changes with account of biological and other considerations).

A practical advantage of survey-based assessments is that advice can be provided quickly after the completion of surveys, thus resolving the timeliness issue which frustrates managers with catch-based advice.

Where catch data are particularly problematic, the methods and procedures developed by FISBOAT can be implemented as an alternative route to providing management advice. More generally, they can be used alongside existing methods of fish stock assessment, to cross-check the results and/or to bring in more biological knowledge and make conclusions more robust.

Although FISBOAT was focused on single fish stocks, several methods developed by the project would be easily extended to handle data and indicators on ecosystems, which are also collected during surveys or provided by operational oceanography programs. Indeed, surveys are the primary sources for data on ecosystems (there is no fishery-dependent counterpart as for commercial fish stocks), and management advice will have to be formulated with non-standard procedures, for which those developed by the project may serve as prototypes. To that extent, FISBOAT may contribute to the planned integration of ecosystem considerations in the CFP. By running the old, tried and tested methods in parallel with the relatively untested indicator-based methods, experience could be gained with the new methods.

Alternative methodologies as developed by the FISBOAT project depended on the provision of survey data by research monitoring programmes and access to data bases at regional scale. Thus the science for an alternative advice for the CFP will depend on an extended DCR. The list of data could be extended to construct a wide range of indicators but also, the data could be organised in data bases at regional scale.

Implementing new tools in the fisheries advisory tool box

Fisheries management is now envisaged in an ecosystem approach where anthropogenic and climate impacts, environmental variability and spatial management are to be considered. The fisheries advisory tool box of methods is therefore expected to expand and the fishery-independent assessment methods like the ones developed in the FISBOAT project are thus expected to be in the list of new methods. FISBOAT, like other research programs has developed methods and tools with potential for a new advice that is alternative or complementary to the existing methods. A mechanism is needed to transfer into the tool box of advisory methods those new methods which will allow to deliver advice on fisheries in a wider ecosystemic context. Currently, the Commission is largely asking old questions to international advisory bodies resulting in maintaining the old system, while co-financing research the outcomes of which are kept largely outside the advisory tool box and therefore largely unused. Efforts are needed to start using alternative methods supporting an alternative advice in order to deliver advice with a different perspective. This will require to test new methods and modify the scientific foundation of the advice. ICES in its new science program has identified this need and is expected to develop coordinated research activity on the Identification of indicators, models and methods to ensure high quality advice for integrated management under the ecosystem approach. The Commission would be inspired to use its resources to make such changes effectively happen.

New methods will need to be appropriately bench-marked to enter an extended advisory tool box. Lists of criteria need be developed as well as performance metrics in order to achieve benchmarking. Setting the benchmark criterias for methods could be the subject of future research collaborative projects. Using the alternative methods along side the traditional ones could be assigned to dedicated groups for a period of time to assess effective operational performance. The methods would be applied, ranging from single stocks to regional ecosystems.