

“TECTAC”

The impact of fisheries management on stocks and fisheries

A common concern of fisheries managers from all over Europe is to be able to reconcile the CFP's objectives of maintaining fisheries profit whilst safeguarding the fish resources, especially when these are exploited beyond biological safe limits. For this reason, the relatively simple models used for scientific advice on fisheries management are more and more being replaced by more holistic approaches that take more parameters into consideration, like for example how regulations affect fisheries patterns. The links between management tools, fishing fleet developments and the pressure exerted on fishing communities are nevertheless still poorly understood.

The overall objective of the **TECTAC** project was to address this poor understanding, and more precisely to **supply fisheries managers with a modelling tool that would allow them to evaluate the impact of regulations (TACs, MAGPs, area and season closures, subsidies) on the dynamics of fleets (“fishing effort”), catch rates and the pressure exerted on fish stocks (“fishing mortality”).**

TECTAC investigated 30 demersal fleets from Denmark, the United Kingdom (England), the Netherlands, France and Spain (Basque Country and Galicia), operating in the Skagerrak, the North Sea, the Eastern Channel, the Celtic Sea and the Bay of Biscay. Data were brought together from existing data collection programmes (e.g. catch and effort from log-books) as well as from surveys and observations on-board, specifically made available for the TECTAC project (e.g. catch and effort collated haul by haul, vessel and gear technology, fishers' behaviour, economics).

Elements that cause changes in fishing effort

Fishing effort is traditionally estimated by combining available measurements of fishing capacity and of fishing activity. Fishing

capacity is frequently expressed as some attribute of the operating vessel (vessel length, engine power, gross tonnage), but is also dependent on other factors, such as gear technology and equipment on-board, which are generally ignored. Fishing activity is typically estimated by the time spent fishing during a fishing trip. Such a definition however does not account for the skipper effect, which can be defined as the ability of the skipper to locate high fish densities and to harvest them. Hereby a distinction can be made between fishing tactics, which is the sequence of decisions taken at sea by a skipper within a fishing trip, and fishing strategies, which are the sum of the fishing tactics over a year.

The impact of fishing effort on fishing mortality

During the project, face to face interviews were undertaken to identify the main changes in **gear and vessel technology** over the past decades. Results suggested that fishing effort descriptors which are not traditionally measured, such as gear type, length of net used per day, crew size, etc. may have a substantial impact on catch rates and fishing mortality.

Project acronym:

TECTAC

Full title of Project:

Technical developments and tactical adaptations of important EU fleets.

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Whereas shifts in **fishing tactics** could be easily explained – the more a vessel changes tactics, the less efficient it has been in finding fish aggregations –, the linkage between shifts in strategies and catch rates was of a more complex nature. In the short-term future, knowledge of fishing grounds with high stock density was shown to increase foraging efficiency.

Based on the previous results, the definition of fishing effort was adjusted, which generally led to a substantial gain in the precision of the relationship between fishing mortality and fishing effort.

Impact of regulations and economics on fishing effort

A preliminary assessment was made of the impacts of different categories of management policies (e.g. capacity reduction programmes, TAC) and economics (e.g. fish prices, operating costs) on fleet activity and fleet performance. This led to the conclusion that, in addition to management regulations, changes in the economic context in which fleets operate also affected the fleets: fleets changed their effort allocation strategies in response to changes in the relative value of the different species they could catch.

For instance, most of the fleets investigated reacted to reductions in TACs by shifts in target species. Depending on the fleets, this strategy partially or completely offset the quota reduction in terms of revenue. In addition, price increases for low quota species sometimes contributed to level up revenues.

Conclusion

The TECTAC project has allowed major improvements to be undertaken in the modelling of fishing effort and lead to the inclusion of novel modules in the TEMAS and ISIS-Fish models, two bio-economic models for fisheries advice and management, which may be exploited by fisheries advisers and decision-makers. In addition, its results are directly relevant to a “Communication on improving fishing capacity and effort indicators under the Common Fisheries Policy” (COM (2007) 39 final) that was adopted by the Commission in February 2007, and aims to open a debate on the most appropriate way to quantify fishing capacity and fishing effort in the framework of the Common Fisheries Policy.