

SEVENTH FRAMEWORK PROGRAMME THEME 6 Environment

Collaborative project (Large-scale Integrating Project)

Project no: 246 933

Project Acronym: EURO-BASIN

Project title: European Basin-scale Analysis, Synthesis and Integration

**Deliverable 7.1 Hindcast estimation of potential and net economic benefits and
 and
 D7.2 Scenarios for economic vs ecological optimisation in the future use of N. Atlantic fisheries**

NB: Both deliverables are highly linked. Therefore an “Executive Summary” and “Relevance to the project & potential policy impact” section is presented for each deliverable. However, a single report section is presented including all the aspects of the interlinked work to accomplish both deliverables.

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Due date of deliverable: Oct 2013

Actual submission date: Oct 2013

Organisation name of the lead contractor of this deliverable:

Start date of project: 31.12.2010 Duration: 48 months

Project Coordinator: Michael St John, DTU Aqua

Project co-funded by the European Commission within the Seventh Framework Programme, Theme 6 Environment

Dissemination Level		
PU	Public	
PP	Restricted to other programme participants (including the Commission)	X
RE	Restricted to a group specified by the consortium (including the Commission)	
CO	Confidential, only for members of the consortium (including the Commission)	

Deliverable 7.1 “Hindcast estimation of potential and net economic benefits of N. Atlantic fisheries”

is a contribution to

Task 7.1 “Estimating the economic loss of sub-optimal fisheries management in the North Atlantic”

Responsible: Gorka Merino
Start month 1, end month 24

1. Executive Summary:

It is accepted that world's fisheries are not generally exploited at their biological or their economic optimum. Most of fisheries assessments focus on the biological capacity of fish stocks to respond to harvesting and few have attempted to estimate the economic efficiency at which ecosystems are exploited. The latter is important as fisheries contribute considerably to the economics of many coastal communities. Here we estimate the overall potential economic rent for the fishing industry in the North Atlantic to be B€ 12.85, compared to current estimated profits of B€ 0.63. The difference between the potential and the net profits obtained from North Atlantic fisheries is therefore B€ 12.22. In order to increase profits of NA fisheries to a maximum, total fish biomass would have to be rebuilt to 108 Mt (2.4 times more than current) by reducing the total fishing effort to 47% of current. Stochastic simulations were undertaken to estimate the uncertainty associated with the aggregate bioeconomic model that we use and we estimate the economic loss NA fisheries in a range of 2.5 and 32 billion of euro. We provide economic justification for maintaining or restoring fish stocks to above their MSY biomass level despite the significant uncertainty in estimates and necessary simplifications made to produce our numeric results. This conclusion aligns with other global scale studies.

2. Relevance to the project & potential policy impact:

There is consensus that marine fisheries food production potential is not achieved. Traditionally, the efficiency of biomass production has been the basis of fisheries management. Therefore, different regulations have aimed to maintain fish stocks at levels at which they could produce their Maximum Sustainable Yield (MSY), i.e. the exploitation rate where the response of the stocks to fishing through individual growth and recruitment operates at its maximum capacity. However, there is many species for which there is no MSY assessment. In addition it is ecologically impossible to simultaneously maximize sustainable yield for all species in a multiple species fishery, therefore, the productivity of marine ecosystems is expected to be lower than predicted by the sum of single stocks' MSY. Therefore, global studies like this are needed to have holistic view of what can be the objectives to reach by policy makers if we wish to turn European fisheries into profitable. This work it is also useful for the rest of project in terms of defining economic and exploitation scenarios.

Deliverable 7.2 “Scenarios for economic vs ecological optimisation in the future use of N. Atlantic fisheries”

is a contribution to

Task 7.1 “Estimating the economic loss of sub-optimal fisheries management in the North Atlantic”

Responsible: Gorka Merino
Start month 1, end month 24

1. Executive Summary:

The ecosystems potential to generate equilibrium economic profits (MEY) and fish production (MSY) has been estimated based on published biological and economic Parameters. The analysis employed has been used at the global level by the World Bank and is useful to understand the potential losses of a sub-optimal management. We estimate that in 2010, the difference between the potential and the net profits obtained from North Atlantic fisheries was B€ 12.2 at MEY level. The management scenarios that would maximize the catch and economic profit of North Atlantic fisheries are based on the significant fishing effort reductions necessary to achieve MSY and MEY at current conditions. According to our calculations, fishing effort would have to be reduced to 61% of current levels of effort to achieve MSY and further to 47% to achieve MEY. However, these numbers has to be considered with caution given the high uncertainty in the models. The sensibility analysis determines that these estimated numbers could be a 15% higher or lower.

2. Relevance to the project & potential policy impact:

Traditionally, the efficiency of biomass production has been the basis of fisheries management. Therefore, different regulations have aimed to maintain fish stocks at levels at which they could produce their Maximum Sustainable Yield (MSY), i.e. the exploitation rate where the response of the stocks to fishing through individual growth and recruitment operates at its maximum capacity. In reality, it is ecologically impossible to simultaneously maximize sustainable yield for all species in a multiple species fishery, therefore, the productivity of marine ecosystems is expected to be lower than predicted by the sum of single stocks' MSY. In addition, other disciplines beyond ecology should be considered in fisheries assessment. For example, the concept of Maximum Economic Yield (MEY), the bioeconomic reference point at which the economic profits of a fishery are maximized. Therefore, the Scenarios for economic vs. ecological optimisation in the future use of N. Atlantic fisheries presented here are of relevance to policy makers and other scientists in the project, in particular, to the scenarios definition in WP7.3 and the use of them for WP5.