

SEVENTH FRAMEWORK PROGRAMME THEME 7 Environment

Collaborative project (Large-scale Integrating Project)

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Project Acronym: EURO-BASIN

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

**Deliverable 7.6 Scenario-based estimation of the consequences of climate change,  
resource use and economic development**

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Project Coordinator: Michael St John, DTU Aqua

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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 7.6 Scenario-based estimation of the consequences of climate change, resource use and economic development**

is a contribution Task Task 7.2 “Predict the distribution and production of key fish stocks based on climate change projections”, and Task 7.3 “Develop a bio-economic model of fish commodities in the North Atlantic”

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Start month 1, end month 36:

**Executive Summary:**

A bio-economic model of fish commodities in the North Atlantic, using NEATS (Network Economics Approach to Trophic Systems) concept is proposed by Mullon et al. (2009). This approach allows the representation of the economics of ecosystems through a distributed model of the bio-economics of the North Atlantic basin. The model relate as entities, the primary production grounds, the main biological compartments, the main fisheries and the main fish.

We present here how this model allows defining and analysing four contrasted scenarios about the future of the North Atlantic basin. These scenarios are defined in the perspective of a regional governance of an oceanic basin. Results are obtained through the coupling of and biophysical model (representing fish populations under climate changes) and a bio economic model (representing fleets under economic globalisation): both models are fed with parameters defined according to scenarios.

Importance is placed on network equilibrium, which emphasises the variability of fisheries profit as a driver of change in the forthcoming years. We suggest that this point cannot be overemphasised in the context of ocean management.

In the present state of the model, another important driver of change for the future of the North Atlantic and the European fleets appears to be the interplay between wild fisheries and aquaculture.

The scenario experiments carried out in this report have benefited from collaboration with EURO-BASIN WP5 Dynamics of Living Resources and WP8 Ocean Management for the definition of scenarios, WP2 Biological Pump and WP6 Basin-scale Modelling for primary production data. In 2014, predictions of basin-scale production (WP6) will be used to run the scenario experiments, as well as directly involving different North Atlantic management stakeholders.

**Relevance to the project & potential policy impact:**

Recall that the overarching objectives of the EURO-BASIN initiative are to:

- Understand and predict the population structure and dynamics of broadly distributed, biogeochemically and trophically important plankton and fish species of the North Atlantic and shelf seas.
- Assess impacts of climate variability on North Atlantic marine ecosystems and their goods and services including feedbacks to the earth system.
- Develop understanding and strategies that will contribute to improve and advance management of North Atlantic marine ecosystems following the ecosystem approach.

The present deliverable is relevant mainly to the third objective.