

SEVENTH FRAMEWORK PROGRAMME THEME 7 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 8.9 Evaluate indicators identified within the MSFD (or alternative indicators) to characterise GES: (Good Ecological Status)

Contributors:

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Organisation name of the lead contractor of this deliverable: University of Strathclyde

Start date of project: 31.12.2010 Duration: 48 months

Project Coordinator: Michael St John, DTU Aqua

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 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 8.9 Evaluate indicators identified within the MSFD is a contribution Task 8.2 Comparative analysis of North Atlantic marine food web structure and function

Related Milestones: 8.1-8.4; 8.11

Responsible: University of Strathclyde

Start month 1, end month 48

Executive Summary:

The EU Marine Strategy Framework Directive requires member states to propose indicators of environmental status, and set targets which will signify Good Environmental Status (GES). For some of the descriptors of environmental status listed in the Directive, it is relatively easy to envisage indicators which can be derived from available monitoring data, and to define target levels. However for others, the task is far from easy. This is especially so for the food web descriptor (D4), since the network of predator-prey relationships in the sea represents a complex system through which disturbances such as harvesting propagate as so-called trophic cascades.

Here, we use an end-to-end ecosystem model to hindcast a 47 year time-series (1960-2007) of indicators of the state of the North Sea ecosystem, comparing our simulation results with observed data wherever possible.

The results showed that for much of this period, demersal fish were exploited at harvest rates well in excess of those required to produce maximum sustainable yields, resulting in significant erosion of predator biomass from the upper trophic levels of the food web.

However, the cascading effects of this large scale impact did not penetrate deep into the lower levels of the food web, partly due to natural attenuation processes, and partly due to bottom-up driving factors such as trends in river and atmospheric nutrient inputs and fluctuations in oceanic inputs to the region, which masked any top-down effects.

The study indicates that some proposed indicators are likely to provide useful, sensitive advice on the state of the ecosystem, but simple correlative interpretations are potentially unreliable due to the interaction of top-down and bottom-up driving factors. This deliverable draws together data and model developments during the course of FP7 EURO-BASIN WorkPackages 1, 3, 4, 5, 6 and 8.

Relevance to the project & potential policy impact:

The deliverable has direct relevance to marine resources management, and in particular to the ongoing efforts to identify useful GES indicators, especially those relating to Descriptor 4 (Food webs).

Access to Data and/or model code (where relevant):

Model code is available as a package for the R statistical environment. Model driving data and output will be archived under WP1 and on the University of Strathclyde institutional repository. Contact authors for access in the meantime.