

Evaluation of climate change impacts and adaptation responses for marine activities (CLIMAR)

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Phase 2: 01/01/2009 – 31/01/2011

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Keywords: Climate change impact, adaptation, socio-economic activities, marine ecosystem, evaluation tool

Context

Based on the recommendations of the IPCC, Kyoto-Protocol and relevant national strategic documents, scientific research is needed to assess the impact of climate change, specifically on the vulnerable marine ecosystem and its users. While preventive source measures such as cutting greenhouse gas emissions are necessary to tackle the problem at long term, meanwhile adaptive measures are necessary to cope with the primary and secondary impacts of climate change in the North Sea. Furthermore, instruments are needed that can evaluate the adaptation measures on their sustainability, their impact on marine activities and their relation with preventive measures and sectoral policies.

Project description

Project objectives & Methodology

The main object of the project is the elaboration of an evaluation framework for adaptation scenario's/measures as a response to climate induced impacts, and this for the total North Sea environment (e.g. ecological, social and economical).

Research and modelling will be carried out to differentiate the primary impacts of climate change from the natural evolution at the North Sea scale. These primary impacts include sea level rise, increased storminess, possible increased rainfall, erosion, temperature changes, salinity, etc.

Then secondary impacts of climate change both on the ecological system of the North Sea as well as on social-economic activities (fisheries, transport & harbour, dredging, risk for flooding, wind energy, etc.) will be assessed. Two extensive case-studies (coastal flooding, fisheries sector) have high extrapolation potential towards the global North Sea environment. Adaptive measures will be formulated both for the ecosystem as well as for the other marine activities.

Based on in-depth application for the two above mentioned case-studies, an evaluation tool will be developed to assess the impact of these measures according to the principles of sustainable development. This evaluation framework will be developed to assess the value of the scenarios for each specific marine sector. The evaluation tool scores both economical, ecological and social merits and drawbacks of the adaptation strategy. Hence the adaptation strategies have to undergo a sustainability test. Adaptation measures against climate change are rarely "stand-alone" environmental measures and therefore the involvement of several other policy sectors on different levels is often required. Hence the adaptive measures will be confronted with the global policy and legal picture (adaptive versus preventive climate change measures, adaptive measures versus sectoral policy plans, etc.). As for many measures related to sustainable development, the success of the implementation of adaptive strategies will depend on the understanding by the civil society and private organizations of the importance of these

strategies, establishing the need to take this aspect into account during the study from the beginning.

Based on both case studies on the one hand and the parallel integrated assessment and policy & legal evaluation on the other hand, recommendations will be formulated towards North Sea future policy and its different socio-economical activities. It is clear that this project will provide a valuable output for climate change policy for the North Sea. This output will consist both of practical tools (modelling, assessment) as well as quantified results and applications.

Interaction between the different partners

A close co-operation between the different partners will be necessary, although a clear division of tasks is apparent.

MUMM will be responsible for the determination of the primary impacts, the determination of the increased sea-level rise and storminess and its effects on the hydrodynamic climate, the erosion/sedimentation patterns, the temperature and salinity. Starting from these results, ECOLAS will be working on the determination of the secondary impacts on the marine ecosystem and the other socio-economic activities and on the identification of adaptation responses in general. While FHR is focussing on the first case study, the effect of the climate change on the risks for coastal flooding and the related activities, ILVO will work on the second case study, the effect of climate change on fish species and fisheries. The results of these case studies will be of course of great importance for the general conclusions. MI finally will study the existing sustainability tools and evaluate the policy and legal framework for the adaptive strategies.

Expected results/products

The expected products consist of a series of reports, discussing the different work packages, defined in the project. These include the deduction of primary and secondary impacts of climate change at the North Sea scale, both on the marine ecosystem as well as on other socio-economic activities, and the identification and evaluation of adaptation responses. Modelling results on currents, water elevation and waves will be produced. A general "sustainable evaluation tool" for adaptive strategies of all marine sectors will be produced, taken into account the lessons learned from the case-studies on coastal flooding and the fisheries sector.

For the valorisation and dissemination of the research results a project website will be set up. It is the intention that results will be presented at workshops and conferences and will be published in peer-reviewed international publications. Two project workshops will be organised.

Partners

Partner 1: The Management Unit of the North Sea Mathematical Models (MUMM) is a department concerned with the protection of the marine environment and is an expert in numerical modelling.

Partner 2: ECOLAS NV is an environmental consulting company, specialised in integrated coastal zone management and environmental economics.

Partner 3: The Maritime Institute (MI) is a multidisciplinary unit, combining lawyers, social scientists, biologists, economics and physicists, working on environmental topics.

Partner 4: Flanders Hydraulic Research (FHR) is a research unit, specialised in hydraulic and maritime engineering, including the modelling of coastal flooding and associated consequences.

Partner 5: ILVO-Fisheries is a multidisciplinary institute involved in research on the rational and sustainable exploitation of living marine resources and the quality control and assurance of fishery products.

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