"RECLAIM"

How will global warming have an impact on fisheries resources?

Global warming, fuelled by the increase in atmospheric CO_2 concentrations, will have a large impact on the marine climate via ocean-atmosphere coupling, and will affect both fisheries resources and overall trophodynamic structure and functioning of marine ecosystems. Such climate-induced changes in the productivity and geographic distribution of fish and shellfish stocks will have marked consequences for the fishing industry and coastal communities. Knowledge on these effects is of paramount importance for the European Union's ability to adopt management measures that achieve sustainable use of marine living resources and conservation of marine biodiversity and ecosystem integrity.

Climate change will affect certain types of fisheries negatively, but will also enable the development of new viable fisheries on stocks that increase production and those expanding their distributional range. Climate change will thus affect the management objectives currently in place. Insight in the occurring changes and affected processes that impact on the production and distribution of fish and shellfish stocks is therefore highly relevant to enable the design of appropriate and effective management decisions.

RECLAIM is a scientific research project funded by the European Union that will **summarise current knowledge, test process understanding, improve predictive capacity and formulate future research hypotheses about the impact of climate change on North-East Atlantic fish stocks.** Target species represent different commercially important resources, ecosystem components (pelagics, demersals), and play key trophic roles (wasp-waist, apex predators) within NE-Atlantic ecosystems.

A conceptual framework is being developed to distinguish between processes acting on the level of the individual (physiology, behaviour), the population (predation, competition) and the ecosystem (physical habitat qualities, biological productivity, trophic coupling). The framework supports a literature review that is looking to detect gaps in knowledge on the key drivers of climate change and, where possible, distinguishes between climate and anthropogenic influences.

In addition, long term data sets are being compiled and analysed to quantify climate variability and changes in distribution and productivity of

- individual species,
- selected fish and shellfish communities, and
- ecosystem structure and functioning.

Changes in ecosystem structure and functioning are being analysed from fisheries and scientific survey data including planktonic, benthic and fish production and consumption in relation to climate forcing and fishing. Relevant spatial and temporal scales of climate change and variability are being explored using time series analyses, spatial statistics and coupled 3-D hydrodynamic ecosystem models.

Finally, using a variety of approaches, RECLAIM will both hindcast as well as forecast the effects of climate change on the productivity and distribution of

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RECLAIM

Full title of Project:
Resolving climatic impacts on fish stocks.

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"RECLAIM WILL BOTH HINDCAST AS WELL AS FORECAST THE EFFECTS OF CLIMATE CHANGE ON THE PRODUCTIVITY AND DISTRIBUTION OF FISH AND SHELLFISH STOCKS TO FORMULATE HYPOTHESES AND RESEARCH NEEDS TO BE ADDRESSED IN FUTURE EU RESEARCH"

fish and shellfish stocks to formulate hypotheses and research needs to be addressed in future EU research.

The information and results obtained in the project will be disseminated to a wide audience including the scientific community, agencies and policymakers that give advice in the field of marine ecosystem and fisheries management, stakeholders and the wider public. Dissemination will be done by means of participation in national and international working groups (e.g. ICES, EU) and workshops, the production of reports to the EU as well as to ICES, the development and maintenance of the RECLAIM website, and the production of articles in scientific journals and public printed media. A final workshop on the impact of climate change on fish and fisheries will also be organised.

This way, RECLAIM aims to **contribute to the development of holistic and integrated strategies to ecosystem-based management** that were identified as a major research priority for the EU and supported at the highest political levels. Furthermore, the EU is now committed to the contents of the Johannesburg World Summit on Sustainable Development plan of implementation, including targets to restore depleted fish stocks by 2015. To this end, RECLAIM advances the state-of-the-art in development of medium- to long-term strategic fisheries management by attempting to **disentangle the impact of climate change, fisheries and other anthropogenic activities on marine living resources**.

RECLAIM will also provide information for an evaluation of management and recovery plans as a tool for fisheries management, in accordance with commitments given in the 2002 review of the Common Fisheries Policy (Council Regulation 2371/2002). In this insight, RECLAIM will derive insights into the effectiveness of currently implemented (Regulations 423/2004 and 811/2004) and planned recovery plans (e.g. Baltic cod) and by this, the rationale for actions taken by EU member states, in the context of EU and international regulations, establishing new recovery plans in different regions of the Union that include the potential contribution of climate change impacts.