Basin-scale Analysis, Synthesis, and INtegration (BASIN) of oceanographic and climate-related processes and the dynamics of plankton and fish populations in the North Atlantic Ocean

A Workshop to be held in March 2005 in Reykjavik, Iceland

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Abstract

Integration of data sets and modeling efforts are needed at the basin-scale if the mechanisms responsible for observed changes in physical and biological ocean properties in the North Atlantic Ocean are to be understood and used to predict consequences of climate and environmental change. The dominant physical forcing across the North Atlantic basin is the large-scale atmospheric circulation and the associated coupled air-sea interactions. As a result, spatial scales of biological events are often larger than national or regional waters, and require an international effort to understand physical-biological coupling at functionally-relevant scales.

To launch this new effort, a workshop will be held in March 2005 in Reykjavik, Iceland to:

1) Plan for synthesis of biological and physical data sets;
2) Identify primary drivers of basin-wide population dynamics of zooplankton and fish;
3) Create an action plan for development of basin-scale coupled biological/physical and ecosystem models for the North Atlantic, including the shelf seas;
4) Encourage and facilitate trans-Atlantic exchange, collaboration, and team building between scientific investigators and ecosystem/fisheries managers.

Objectives

The specific objectives of the BASIN workshop include:

• To develop a plan for the synthesis of data sets including: occurrence, abundance, and distribution of target species (e.g. early life stages of cod and haddock and the copepods *Calanus finmarchicus* and *Pseudocalanus* spp. and others) and processes that regulate the occurrence, abundance and distribution of target species, with the ultimate goal of producing a document that describes the effects of climate variability and climate change on the distribution, abundance, and production of the target organisms.

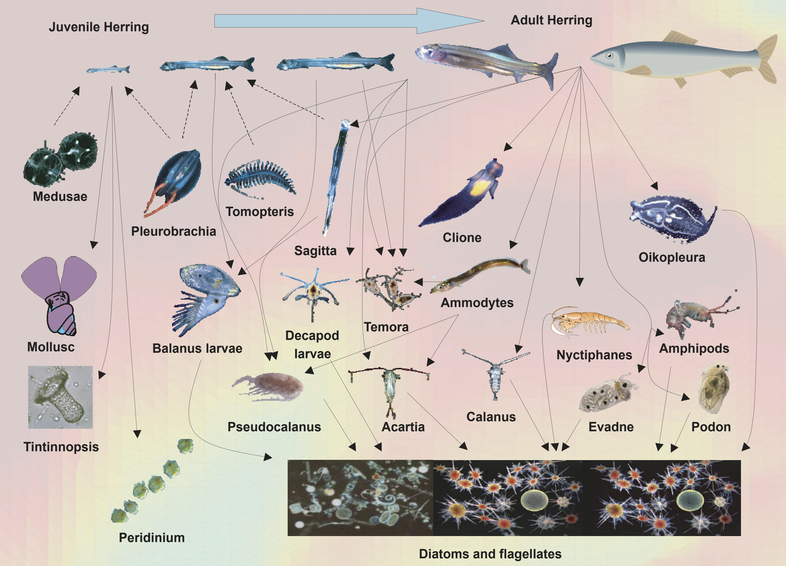
• To develop a plan for the implementation of physical/biological models of the North Atlantic Ocean that are basin-scale and include the shelf seas, recognizing that basin scale modeling is key to providing the insight, understanding, and predictive capability of the patterns distribution of key species and their links to the fisheries resources,

• To design the architecture required for development of a basin-scale ecosystem model including key components of food web structure to simulate the biophysical coupling with zooplankton and the determination of their abundance and distribution over the North Atlantic.

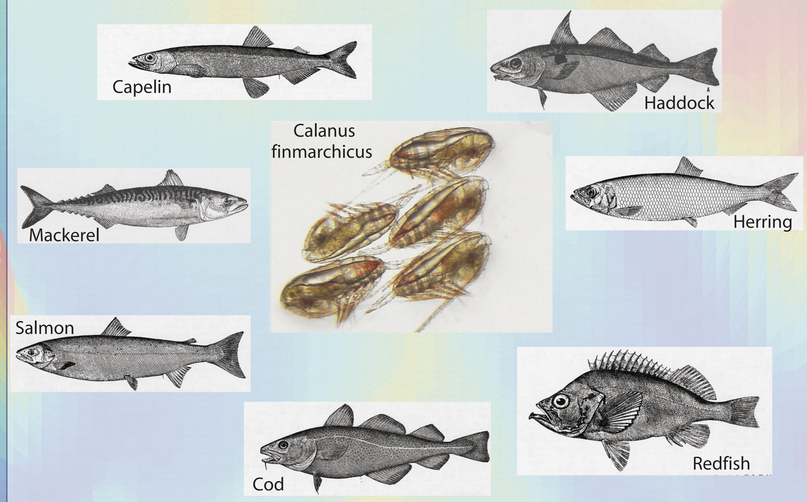
• To develop strategies to investigate the relationships between climate-indices and trends in biological components in order to design scientific ecosystem-based approaches to conservation of natural resources; coastal zone management; fisheries stock assessment, management, and regulation; and maintenance of ecosystem health .

• To create an implementation plan for a North Atlantic BASIN Program.

A North Sea food web schematic illustrating its complexity



Some important fish species that depend upon *Calanus finmarchicus* in some parts of the North Atlantic



Products

- Background documents supporting the need for basin-scale studies
- Implementation Plan for a North Atlantic BASIN Program.
- Lay groundwork for understanding impacts of global change on ocean ecosystems at large scales.
- New conceptual and numerical models that can realistically and accurately predict these phenomena on time and space scales that have both research and practical (management) applications.
- New predictive capabilities to anticipate and perhaps ameliorate the consequences of global change for ocean ecosystems.

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