

## **Integrating observations and models to improve predictions of ecosystem response to physical variability (B)**

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Working Group on Modelling Physical-Biological Interactions and Working Group on Oceanic Hydrography, Oceanography Committee

New insights into the functioning of marine ecosystems and causes of fisheries recruitment variability have grown out of investigations using 3D coupled bio-physical models. These investigations have revealed a fundamental dependency of biological predictions on the skill of hydrodynamic models. Physical processes including small-scale turbulence, location, and intensity of the pycnocline, as well as internal waves remain challenges for hydrodynamic models, but are critical for accurate prediction of biological processes such as larval fish feeding success, timing of the onset of spring blooms, and phytoplankton and zooplankton production. In order to improve our understanding of ecosystem dynamics, a better understanding of the processes and mechanisms that link changes in the physical environment to biological variability is critical and will support ecosystem-based management.

We solicit contributions from all disciplines on:

- Observations of processes and mechanisms that drive spatial and temporal variability in the physical environment that have relevance for improving hydrodynamic models;
- Understanding the skills (strengths and weaknesses) of existing models through model-observation validation studies. Proposals for standard validation statistics that can be used to determine appropriateness of hydrodynamic models for simulating biological processes of interest are encouraged;
- Sensitivity of biological processes on hydrodynamic model predictions that highlight the physical processes that are important for modeling biological variability;
- Integration of field observations and numerical modelling approaches to test hypotheses related to ecosystem response to physical variability from tidal to interannual time scales;
- Presentation of the critical observations needed for model validation.

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