

Title: Coupled Physical and Biological Models: Parameterization, Validation, and Applications (L)**Conveners: Guoqi Han (Canada), André Visser (Denmark), Andreas Moll (Germany), and Angelica Pena (Canada)**

Coupled physical and biological models (PBMs) on global, basin and regional scales have emerged as an essential tool in monitoring, studying and predicting ecosystem status, variability and changes. These coupled models include hydrodynamic models and biogeochemical models in combination with in situ and remotely sensed data to hindcast, nowcast and forecast ocean state variables (currents, temperature, salinity, biogeochemical, and plankton variables). They can be used to generate key indices that are of significance to fisheries management and ecosystem sciences.

The PBMs usually operate with trophic levels and are valid for a spatial scale of mesoscale hydrodynamic patterns. Individual-based models (IBMs), in turn, are useful for simulating micro-scale (centimeters to decimeters) processes and behaviour, and thus help to explain how carbon, energy and various substances are being transferred between species and trophic levels. However, despite the obvious link between these two types of model, their coupling has been rarely attempted.

The coupling as well as validation of both types of models is a key step for the model development and towards applications. Physical processes and individual behaviour at various time and space scales can both affect biological processes in very different ways. How do we parameterize various processes involved? How do we validate them from physical, biological, and/or ecosystem perspectives? How do we collect field data for validation purposes? How do we define effective metrics? How do processes at different temporal and spatial scales interact to produce a response at the level of populations, trophic levels, and ecosystems?

In this session we solicit papers related to parameterization and application of both PBMs and IBMs, and their possible coupling, with a particular emphasis on their validation in deep ocean basins, shelf seas and coastal domains.

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