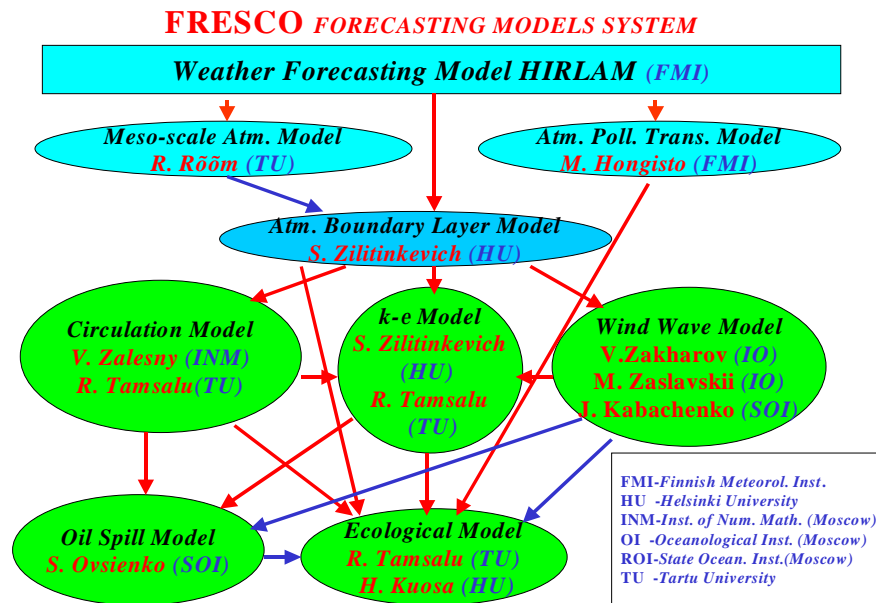


Atmosphere-Sea Hydrodynamic-Ecosystem model study in the sea

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The environmental sciences are very much related to daily life. Management tasks require answers to concrete questions concerning the response of nature to both natural and anthropogenic changes in environmental forcing factors and loads.

The atmosphere-marine system modelling is a superior way of formalizing and testing knowledge about the complex hydrodynamic-ecological systems and of solving the problem of how the rational management of aquatic resources should be organized. The development of modelling shows that quality of forecasting models is determined by the completeness of the description of physical and ecological processes and by spatial resolution of numerical schemes. More simple models can be used in research studies or in preliminary estimation stage, while the final water resources management requires the most complete and close to reality complex three-dimensional models. Developments in hydro-ecological science modelling show that the models can be very complex in a common sense. The coupled atmosphere-marine system model are used to study the influence of different ecosystem processes in the sea. The air pollution transport model HILATAR linked with the operational weather forecast model HIRLAM are coupled on-line and off-line to the marine system model FRESCO to compose the operational forecasting system for the end-users. The structure of the FRESCO(Finnish-Russian-Estonian COoperation) are given in the next picture.



- The influence of the wind waves on the baroclinic circulation and sea-ecosystem are presented.
- The climate change impact on the blooms of blue-green algae is presented using the FRESCO system.