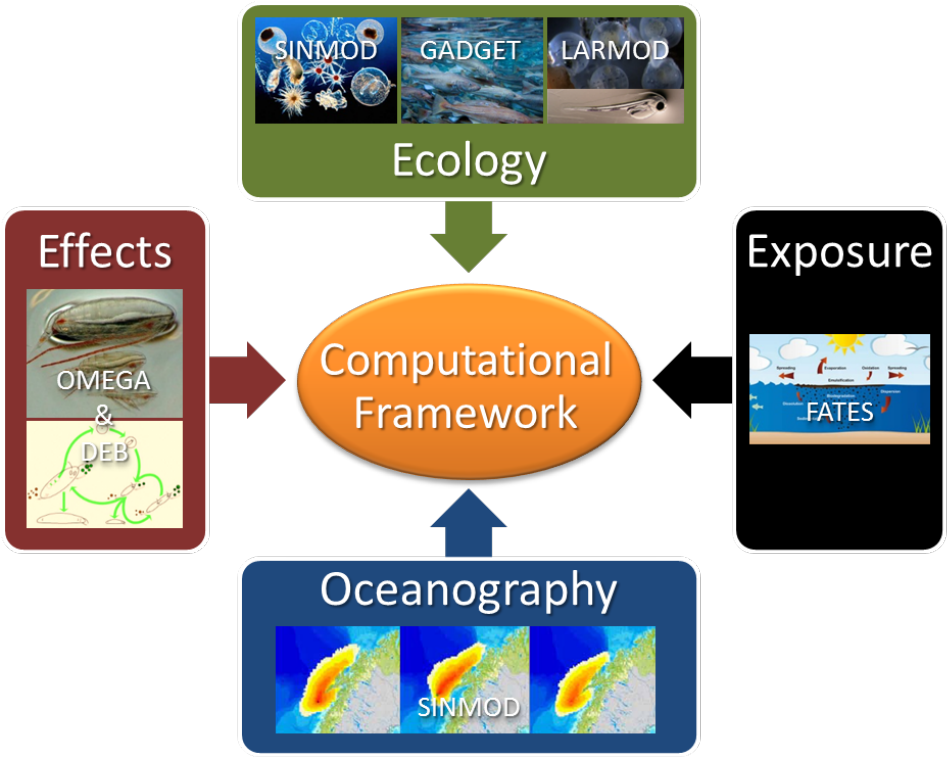
SYMBIOSES

An integrated modeling framework for decision support in marine ecosystem based management

Links different models into a single framework



Focusses on:

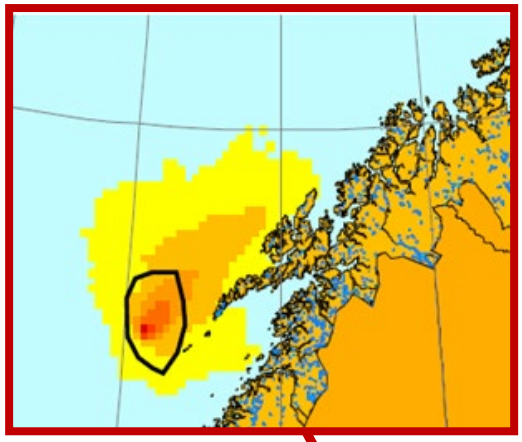
- Plankton
- Fish egg/larvae
- Fish populations

by combining exposure and effects.

Integrates models to improve impact and risk identification of fisheries and oil & gas exploration.

Runs on the Norwegian National Supercomputer (STALLO)

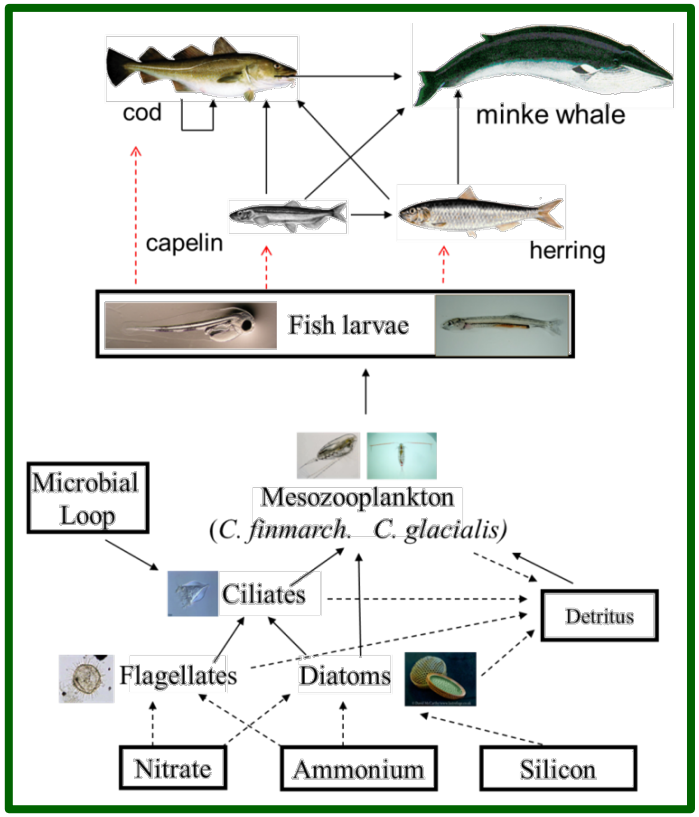
Utilizes the most recent models & data



Lofoten/Barents Sea

- **Input Data**
  - Chemical characterisation
  - Toxicity Data
  - QSAR estimates
- **Models**
  - FATES
  - OMEGA
  - DEB
- **Effects**
  - Mortality
  - Growth
  - Reproduction
  - Development

Ecosystem components



Combined with models of chemical fate & effects

Designed to help reconcile sea-based activities with environmental sustainability

A tool for:

- Impact assessment
- Risk reduction
- Planning

Improves the scientific foundation for sustainable management

Supports improvements to EIA/EIS

Assimilates new research findings

Supports stakeholder communications

Photo: Geir Morten Skeie

The initial version of SYMBIOSES will be completed in 2014

Acknowledgements

Project Lead: Akvaplan niva

Project Partners:

COWI, Research Network ARCTOS, IRIS International Research Institute of Stavanger, Universiteit Gent, Radboud University Nijmegen, UNIS, SINTEF, NIVA Norsk institutt for vannforskning, Universitetet i Tromsø, CEES Centre for Ecological and Evolutionary Synthesis, Norsk Polarinstitutt, IMARES Wageningen UR, Universitetet i Nordland, Institute of Marine Research Havforskningsinstituttet

Supported by the Norwegian Research Council PETROMAKS Program and 7 international companies:

The Research Council of Norway

Total, Shell, ConocoPhillips, Statoil, ExxonMobil, eni norge, bp