SYMPOSIUM OP'24 ADVANCING OCEAN PREDICTION SCIENCE FOR SOCIETAL BENEFITS

NORKYST

A high resolution ocean model setup for the Norwegian coast

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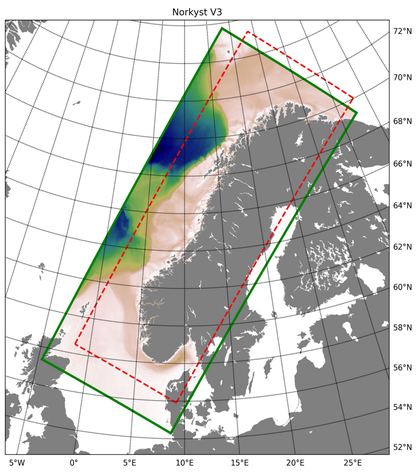
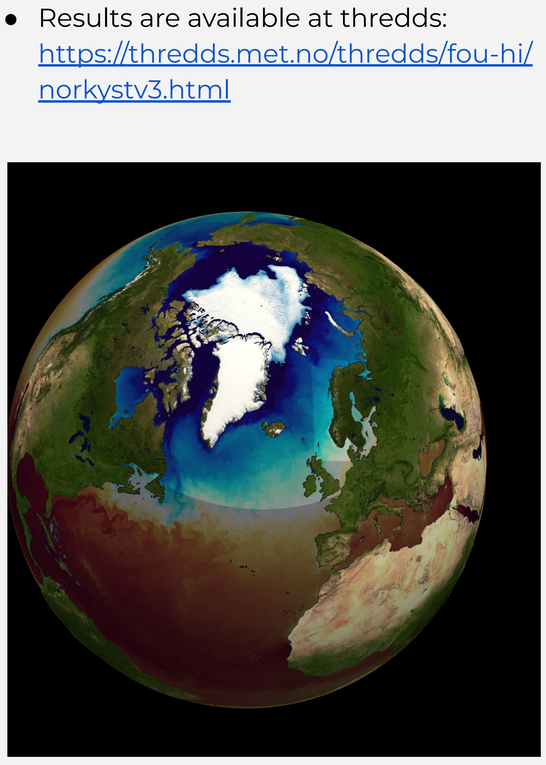
The Norwegian Meteorological institute (MET Norway) and the Institute of Marine Research (IMR) both need detailed information on the physical environment, for example to provide decision support for search-and-rescue missions and oil spill mitigation operations, or for pathogen dispersion and assessing effects of aquaculture.

The Norkyst forecasting system, which is based on ROMS, provides information with a spatial resolution of 800 m and temporal resolution of 1 h. Norkyst has jointly been developed over the last ~15 years and is now in version 3.

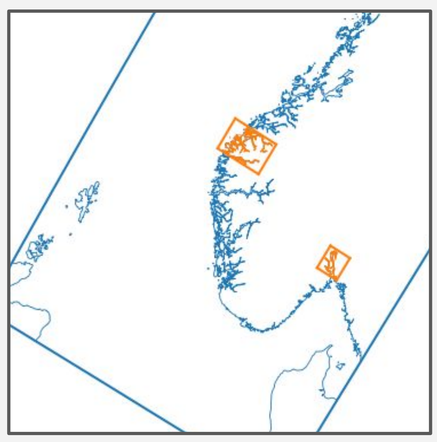


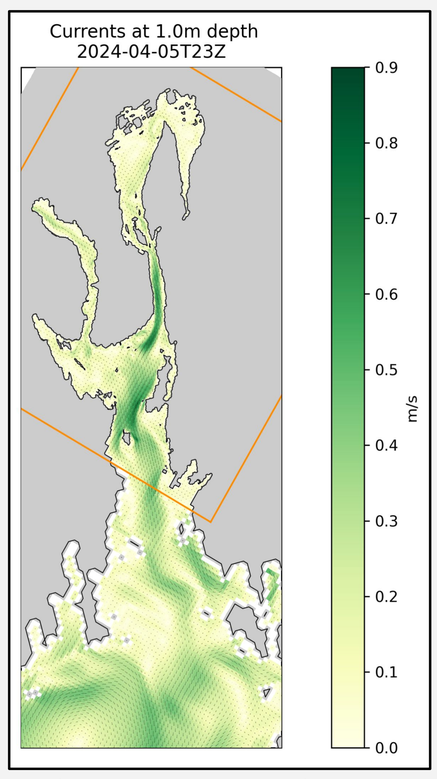
Operational setup

- Operational routine since 2024-01-01, with 120h forecast length.
- Atmospheric forcing from MET Norway (MEPS) and ECMWF weather forecast models
- Norkyst will be configured as an EPS with a members that provide high-resolution (160m) forecasts in fjords.
- Results are available at thredds: https://thredds.met.no/thredds/fou-hi/norkystv3.html



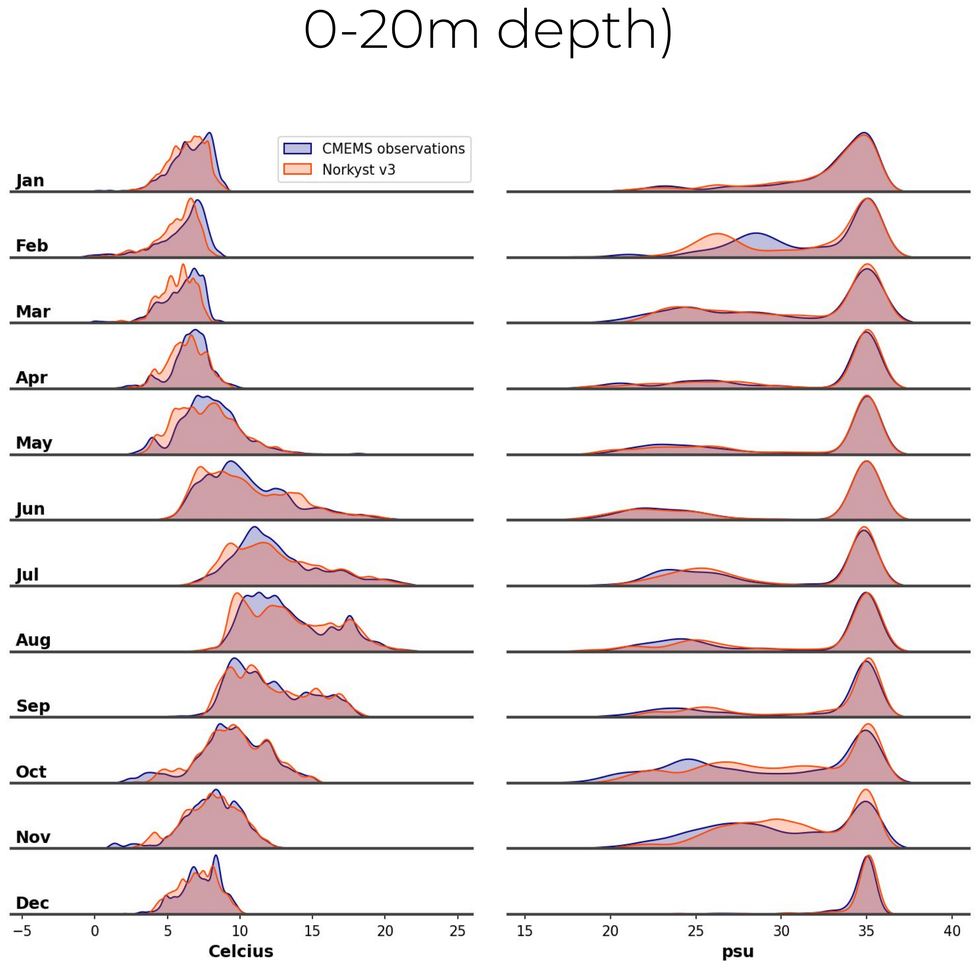
Norkyst use boundary conditions from CMEMS Arctic and Baltic models.





At the moment, two members use two-way nesting (5:1).

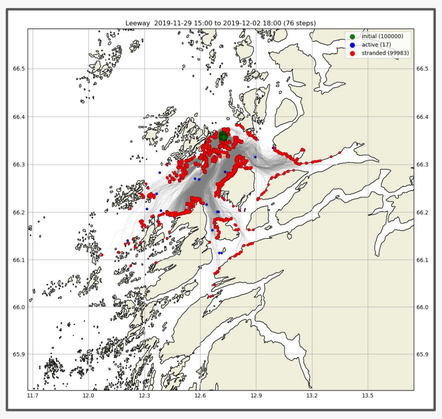
Validation (free run/no DA, 0-20m depth)



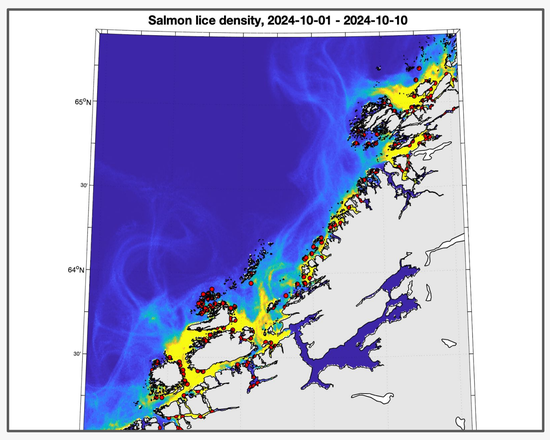
The figure shows a comparison of the temperature and salinity distributions in the upper 20 m between a hindcast of Norkyst v.3 and *insitu* observations from Copernicus Marine Service. The period is 2015-2022.

Applications

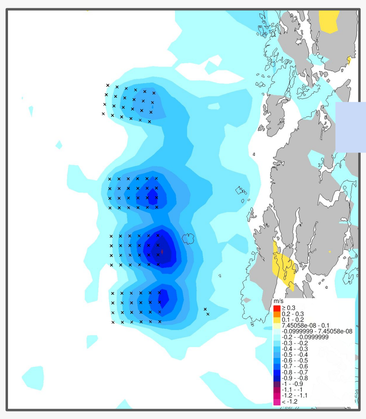
- Panel (a) shows an example of leeway modeling (person-in-water).
- Panel (b) shows the modelled distribution of infective salmon lice larvae (here from seafarms in mid-Norway).
- Panel (c) shows modelled wind speed reduction at hub height for planned offshore wind farm installations.



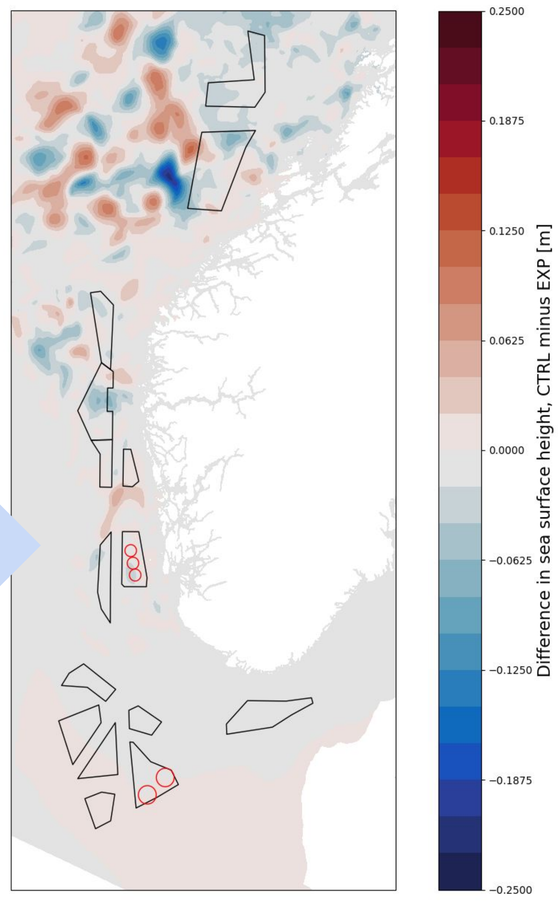
(a) Drift modeling.



(b) Salmon lice dispersion.



(c) Offshore wind (courtesy of Rolf Myhre).



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