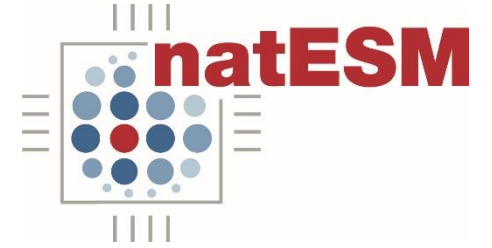


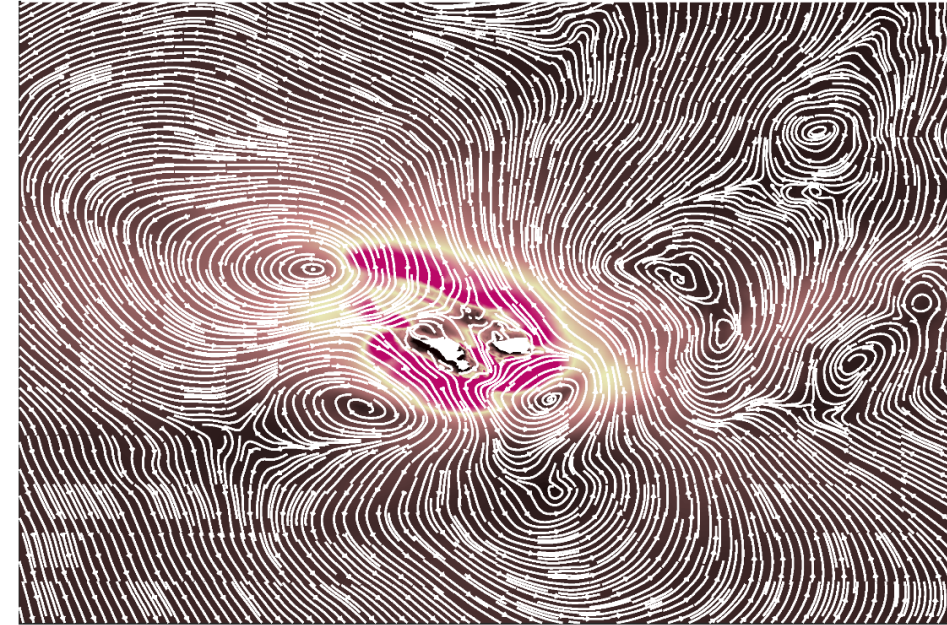
Workshop – natESM strategy

21. February 2022, virtual meeting



Implementation of the modern conceptual programming paradigms for FESOM-C (simulation)

V. Fofonova, A. Androsov, I. Kuznetsov, S. Danilov, N. Rakowsky, S. Harig,
D. Sidorenko, K.H. Wiltshire
Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research



The natESM support team is located at DKRZ and JSC. Based on a DKK initiative of the German Earth System Modelling Community, the overall goal is to build a national ESM strategy for the future.

Brief Overview of Model/Software



ESM field:



User group:



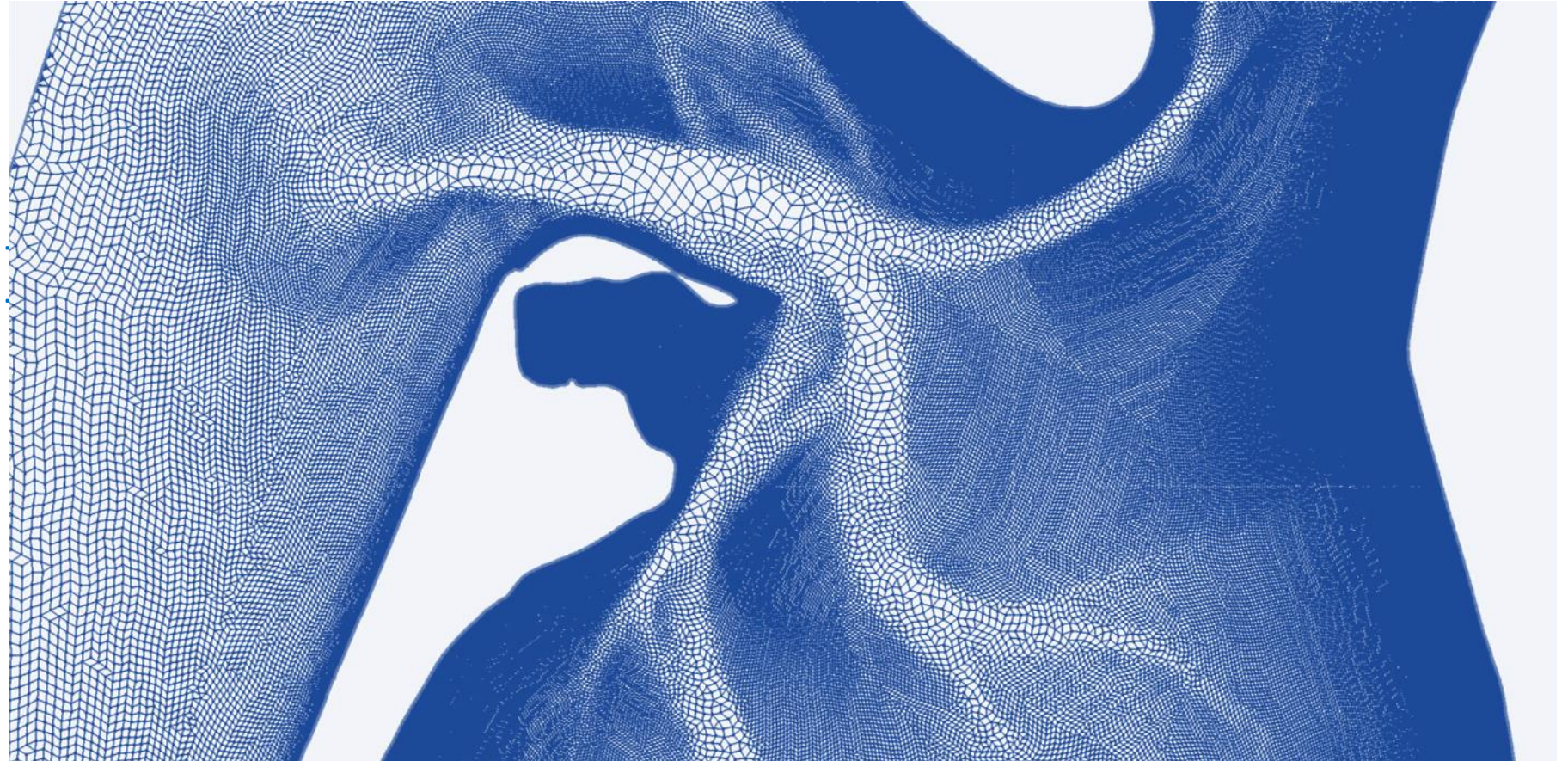
Targeted sim.:



HPC usage:



Maintenance:



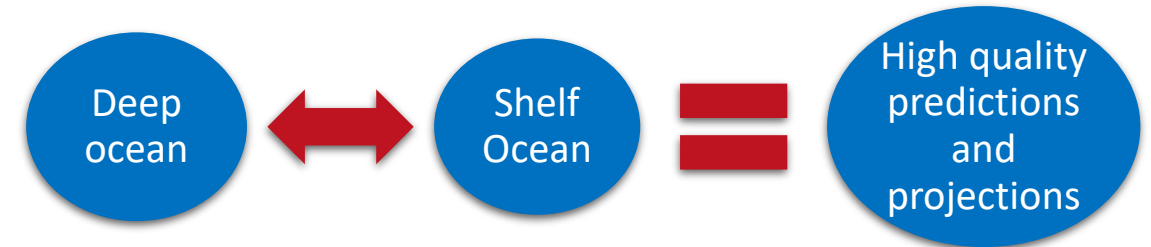
Model/Software Application Field



Scientific highlights

Tracing water masses, sea ice, biogeochemical and ecological signals from the estuaries/coastal zone to the deep Ocean/Global Ocean and vice versa.

Understanding of the multi-scale processes confluence under the climate change pressure to a new level.



Social relevance

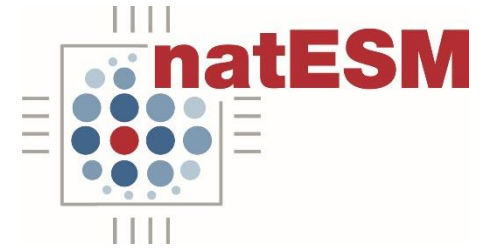
Sustainable planning of the engineering construction on the shelf; Ship navigation; Tracing pollution; Forecasting of natural hazards.



Plans for further use and dissemination

Improve models for the provision of climate services; increase confidence in climate projections; Inform major international scientific assessment reports (e.g. IPCC).

Description of Planned Work



Time step in coupled solution is defined by the coastal branch due to generally smaller cell sizes and larger velocities!



Scope of Request

MPI+OpenMP+OpenACC parallelisation for efficient use on JUWELS Booster and DKRZ systems;

Guide the modularization & refactoring (dwarf's implementation); Duration: 6m.

Criteria for fulfilment

Hybrid parallelization is done at least for several model components;

Dwarf's implementation is done at least for several model components.

Expected scientific and/or performance improvements

Developing a multi-scale modeling platform which includes appropriate coastal dynamics in the ESM context. Firstly, we will apply it to the East Siberian Shelf.

FESOM-C is a modelling component of the MGFNordsee, CREATE and CoastalFutures (BMBF) projects, dedicated to the evaluation and defense of the Marine Protected Areas in the North Sea.



Thank you!