Project: **1252**

Project title: **Abrupt Climate Shifts and Extremes over Eurasia In Response to Arctic Sea Ice Change (ACE)**

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Report period: **2023-11-01 to 2024-10-31**

During reporting period, the following simulations and tasks were performed.

1. The HR FESOM mesh was modified by enhancing resolution in High latitudes and Northern Pacific (in comparison with “old” HR mesh). After the modification 200 years ocean stand-alone spin-up and further 50 years coupled AWICM3 spin-up were performed.

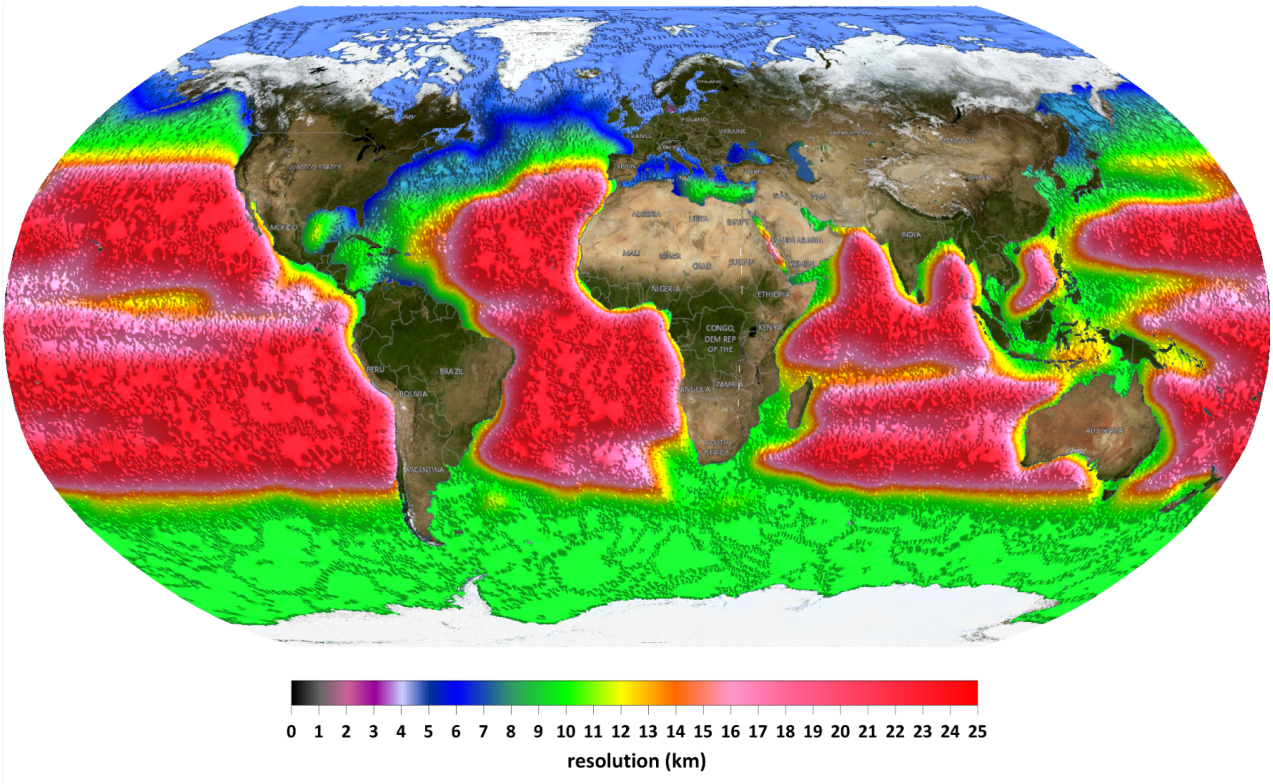

Figure 1. *New HR) resolution*

2. We focused on AWICM3-HR (FESOM-HR (Fig.1) and OpenIFS TCO319L19) and AWICM3-LR historical and ssp585 scenario simulations which were planned for the year 2024. The planned mid-Holocene simulations were postponed to the year 2025. Resuming, in addition to model spin-up we simulated historical period (1900-2014) and ssp585 (2015-2100) scenario.

3. Preparing the simulations for year 2025 we made an eddy resolving FESOM setup for Last Glacial Maximum (LGM) simulations. The resolution of new setup varies from 2 to 25 km and adopted to the 1/4 of baroclinic Rossby radius. The mesh contains 12 million surface nodes. Mesh resolution as well as preliminary results of first 30 years FESOM simulations are shown on figure 2. Note, that glacier mask is not added yet and the realistic simulations are planned for the year 2025.

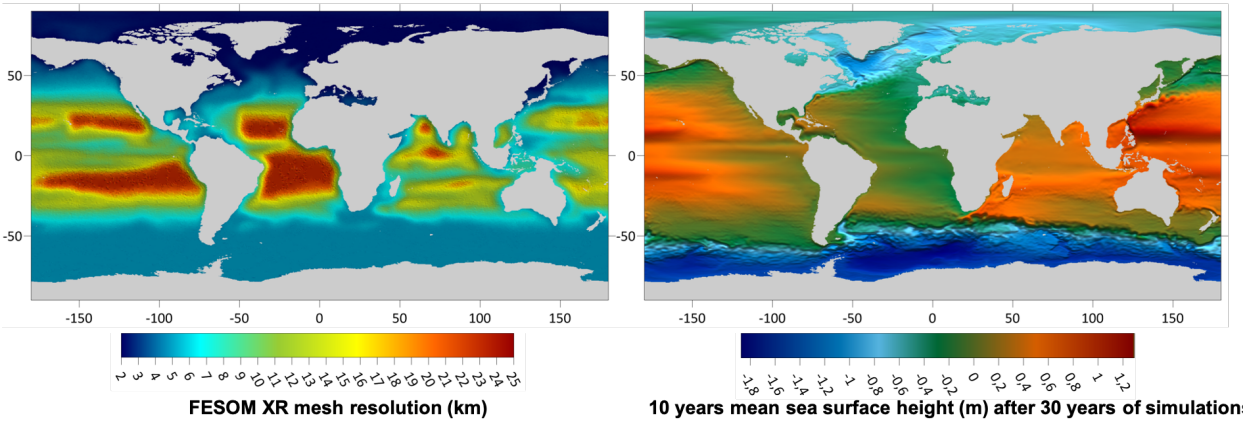

Figure 2. *FESOM XR mesh, prepared for LGM simulations (left) and simulated mean sea surface height (right)*