Project title: RESM4CORDEX (Regional Earth System Model simulations for CORDEX)

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Abstract

The CLM-Community, a global network of scientists, develops and implements regional climate models, including COSMO-CLM (also known as CCLM) and ICON-CLM. The CLM-Community will provide simulations with CCLM and ICON-CLM for EURO-CORDEX in the next years. Beside those atmosphere-only simulations, the CLM-Community also plans to provide simulations of regional Earth system models (RESMs) in which CCLM and ICON-CLM are the atmospheric model components. In this case, CCLM/ICON-CLM can be coupled to the regional ocean model NEMO (which can be run over the North Sea, the Baltic Sea, the North Atlantic, and the Mediterranean Sea); the hydrological discharge model HD (over the European domain); and the Community Land Model CLM (over the EURO-CORDEX domain).

The RESMs will be used to conduct hindcast simulations (forced by the atmospheric ERA5 reanalysis data and the ocean boundary ORAS5 reanalysis data) as well as to downscale several CMIP6 historical and scenarios simulations. For the first phase in year 2024, we request disk storage for the RESM hindcast simulations at the resolution of about 12-13 km in the atmospheric and land surface models over the EURO-CORDEX domain, and about 3.5 km in the ocean model over the above mentioned seas.

Simulations of those RESMs will be conducted separately by different CLM-Community institution members (i.e. Hereon, DWD, IOW, FZJ, GUF) using their **own** project computing resources, either on Levante or other super computing centers (e.g. JSC). The post-processed (daily) output data of the model components will be stored within this project RESM4CORDEX account to be commonly evaluated for the RESM performance.

We aim to start the long-term hindcast simulations with the RESMs for the period of 1959-2018 (FZJ from 1979-2018, see Table 1) at the beginning of 2024. However, it is not guaranteed, that all the simulations that are included in the estimate will come in 2024. The upgrade process of component model versions as well as a single evaluation process of each RESM before conducting the long-term hindcast may affect the running real time.