Project: 1099

Project title: ERA-5-Extract (E5E)

Principal investigator: Hannes Thiemann

Report period: 2021-11-01 to 2022-10-31

The aim of the E5E project is to provide German climate research with easy and fast access to comprehensive ERA5 climate reanalysis data on the disk of DKRZ's HPC Levante (directory /pool/data/ERA5). ERA5 data are produced by the Copernicus C3S at ECMWF. The entire ERA5 data are stored in ECMWF's MARS archive. Retrieval of ERA5 data from this archive is slow and manpower intensive. Having direct access to the data on Levante is therefore of great benefit to many climate users.

Within the report period Nov-21 to Oct-22, the retrieval and post-processing of the ERA5 time series covering the years 1979 to mid- 2022 time-series was finalized and the data were made available to DKRZ users on Levante's /pool/data/ERA5. In total, this data makes up around 900 TiB of the 1500 TiB granted for the E5E project. Since June 2022, the data of the newly released 1959–1978 ERA5 back extension are being retrieved from MARS. By Oct-22, another 400 TiB of data were added. The remaining 200 TiB of the granted 1500 TiB will be used towards finalizing the retrieval and post-processing of the 1959–1978 ERA5 data by Dec-22.

ERA5 data are widely used as forcing fields in atmospheric models and are often the primary tool to assess the performance of climate models. ERA5 is essential to various climate research projects, including several DKRZ user projects, such as, e.g.
- project 1111: ERA5 is used to validate high-resolution regional climate model (WRF) (simulations by KIT in the framework of CORDEX)
- project 1185: ERA5 is used as input for an interactive visual data analysis to investigate extreme weather events (analysis by UHH in the framework of CLICCS)
- project 1279: ERA5 is used as nudging data in the creation of initial and boundary conditions needed for MESSy simulations (work lead by DLR)
- project 1280: ERA5 is used as initial and boundary conditions for COSMO-CLM and ICON-CLM model simulations (work done by DWD for the CLM community)
- project 1284: ERA5 is used to prepare AWI Climate Model (AWI-CM) (work done by DWD for the CLM community)

- project 1293: ERA5 is used in the creation of MPIOM model initial and boundary condition data (work done by MPIM)
- project 1300: ERA5 is used as nudging data to perform EMAC atmospheric chemistry climate simulations (simulations by UFreiburg in the framework of a H2020-EU grant "urbisphere")
- project 1301: ERA5 data is used for the creation of ECHAM nuding data (work done as a DKRZ-MPIM cooperation)
- project 1320: ERA5 data is used as input to run a a state-of-the-art forward simulator with the aim to create a consistent database from the HALO atmospheric measurements (simulations by UKöln in the framework of a community project)