Project title [Descriptive title of data project]	Input data for icon-xpp (eXtended Predictions and Projections) configuration
Project acronym *will be used as folder name in /pool/data*	icon-xpp
Principal investigator PI [full name, affiliation, email] *Long-term contact person for this data, e.g. group leader*	Trang Van Pham, DWD, trang.pham-van@dwd.de
Applicant (if not the same as PI) [full name, affiliation]	
Allocation period [YYYY-MM-DD to YYYY-MM-DD] *Maximally a period of 5 years will be granted, but the period can be extended upon request once it is close to expire.*	2024-12-01 to 2029-11-30
Total data storage volume requested [in GB or TB] *Maximally 80 Tb can be granted for /pool/data user projects.*	80 TB
License allows data read-access [Yes or No] *The license of the data allows that all Levante users have read access to the data.*	Yes

Project overview

Provide a brief overview of the context in which the data was generated, including the creators and methods used. Include references to scientific publications, web links, or other detailed sources that describe the data, its evaluation, and its application, if available.

ICON-XPP (ICON-eXtended Predictions and Projections; Müller and Lorenz) is a newly implemented configuration of the ICON model. This global coupled model system contains the atmosphere ICON-NWP model (Zängl et al., 2015), the ocean model ICON-O (Korn, 2017, Korn et al., 2022) and the Hydrological Discharge model HD (Hagemann & Ho-Hagemann, 2021). ICON-XPP has been developed for climate predictions and climate projections. The first application of this model confuguration will be in the contribution to CMIP7 (Coupled Model Intercomparison Project 7th edition, https://wcrp-cmip.org/cmip7/).

As the German projects related to CMIP7 already started, soon the forcings data from CMIP7 website need to be downloaded. These data, however, are often provided by CMIP as lat-lon data and therefore should be interpolated onto the triangular ICON model grids (R2B5 for the atmosphere and R2B7 for the ocean).

As many of the CMIP7 model experiments will be carried out on Levante by all partners involved in CMIP7: Deutscher Wetterdienst, Max-Planck Institute for Meteorology, University Hamburg, Max-Planck Institute for Biogeochemistry, the forcings data need to be stored there as well.

The data can also be used by ICON-XPP users who want to carry experiments with our configuration.
The input data from CMIP7 is found here: https://wcrp-cmip.org/cmip7/cmip7-data-request/.
This pool is not meant just for CMIP7 but also data from the later CMIPs, therefore, we ask for a stable, long-term disk space.

Data content

Provide a brief overview of the data to be stored in /pool/data. If possible, provide information on the: (a) Kind of Data: Observational or model data, gridded or point data, (b) Coverage: Temporal and spatial range, including resolution, (c) Variables: List of variables, (d) File Formats: e.g., NetCDF, CSV, GRIB.

The data files will be in Netcdf format, mostly external forcings for a climate model like: aersosol, ozone, land use, etc. The data are global and time range will span from historical period 1850 to future scenarios 2100. The raw data from CMIP are on lat-lon grid. These data will be interpolated onto the icon grids, in our ICON-XPP configuration for CMIP7, the grids are R2B5 for the atmosphere (ca. 80 km) and R2B7 for the ocean (ca. 20 km).
The data will be later expanded following the requirement of CMIP.

Range of planned scientific data usage

Describe potential applications and target communities for the data.

These data will be applied to run the required experiments by CMIP and used to experiment with ICON-XPP for scientific purposes of understanding the model processes, biases, etc.
Target communities are research institutes, universities.

Data storage usage plan

Briefly specify the expected storage duration. Also, please note if the data volume will change over the allocation period due to new additions or updates.

CMIP7 project is supposed to last for 5 years, but later the data will be used for pre-CMIP8 and later than that other CMIPs. There will be extension and updates once we start a new CMIP cycle.

Data Licenses and Data Citation

Specify the licenses associated with the data and any usage restrictions. Additionally, outline how users must attribute the data, providing the required citation details.

To our knowledge, the CMIP7 data license is not yet officially released, but it will be published in https://wcrp-cmip.org/cmip-data-citation-and-licenses/ soon. Typically, CMIP data are made available under CC-BY-4.0. We will add the license information as soon as available. We will also add the data citation information as soon as available.

References

List here the citation you are referring to in the text above.

Hagemann, Stefan & Ho-Hagemann, Ha T.M. (2021). The Hydrological Discharge Model - a river runoff component for offline and coupled model applications (5.1.0).

Korn, P., 2017: Formulation of an unstructured grid model for global ocean dynamics. Journal of Computational Physics, 339, 525– 552, https://doi.org/10.1016/j.jcp.2017.03.009

Korn, P., and Coauthors, 2022: ICON-O: The ocean component of the ICON Earth System model—Global simulation characteristics and local telescoping capability. J. Advances in Modeling Earth Systems, 14, https://doi.org/10.1029/2021MS002952

Müller, Wolfgang; Lorenz, Stephan, 2024, "Source code and scripts for publication "The ICON-based coupled Earth System Model for Climate Predictions and Projections (ICON XPP); https://doi.org/10.17617/3.UUIIZ8, Edmond, V1

Zängl, G., D. Reinert, P. Ripodas, and M. Baldauf, 2015: The ICON (ICOsahedral Non-hydrostatic) modeling framework of DWD and MPI-M: Description of the non-hydrostatic dynamical core. Quart. J. Royal Meteorological. Soc., 141, 563–579, https://doi.org/10.1002/qj.2378