

Project: Half a degree Additional warming, Prognosis and Projected Impacts Model Intercomparison Project (HAPPI-MIP))

Project acronym for link in /pool/data: HAPPI

Principal investigator (long-term responsible contact): Karsten Peters-von Gehlen

Applicant (if not the same as above): Karsten Peters-von Gehlen

Allocation period: **2022-01-01 to 2026-12-31**

Allocation Period	2022-01-01 to 2026-12-31
Volume	2.4TB
Expected Volume Change	-
License allows usage on DKRZ resources	Yes

Project overview

The data was generated within the framework of the HAPPI-MIP initiative (<https://www.happimip.org>) and formed part of the scientific basis for IPCCs SRES1.5 report (<https://www.ipcc.ch/sr15/download/>).

The project, its aims and experiment protocols are presented by Mitchell et al. 2017 (<https://gmd.copernicus.org/articles/10/571/2017/gmd-10-571-2017.pdf>).

The data hosted at DKRZ was produced by a total of 5 institutions (CCCma (Canada), ETH Zuerich, the Japanese MIROC consortium consisting of AORI, NIES and JAMSTEC, DKRZ in collaboration with MPI-M, and the Norwegian NorESM Climate modelling Consortium).

The data are provided with different data usage licenses/restrictions:

MPI-M, ETH and MIROC: CC-BY-NC-SA 2.0 (<https://creativecommons.org/licenses/by-nc-sa/2.0/>)

CCCma: Canadian Government License involving no restrictions on data reuse (see netcdf file headers for complete license text)

NorESM: Data policies laid out in Mitchell et al. (2017, see above). This policy requires involvement of the HAPPI community in any efforts regarding data reuse.

Data content

The data are provided as globally gridded netcdf-files. The experiments provided are called All-Hist, Plus15-Future and Plus20-Future. The experiment setup is used to study the following scenarios:

- 1) All-Hist: Current decade conditions (2006 to 2015).
- 2) Plus15-Future: 1.5C warmer than pre-industrial, relevant for the 2106 to 2115 period
- 3) Plus20-Future: warmer than pre-industrial, relevant for the 2106 to 2115 period

The motivation behind these experiments is given in Mitchell et al (2017). Each of the experiments is comprised of an ensemble consisting of 40 members, amounting to 120 datasets per model (amounting to 1200 model years).

The data are global and are available as either daily or monthly means. The naming of variables, coordinates and units follows CF and CMIP conventions.

The amount of available variables depends on the temporal output.

For daily output, the following are available (variable naming follows CMIP conventions):

`hurs huss pr ps tas tasmx tasmin uas vas`

For monthly output, the following variables are available (variable naming follows CMIP conventions):

clt hfls hfss hurs hus huss pr ps psl rlds rlus rlut rsds
rsdt rsus rsut ta tas tasmx tasmin tauu tauv ts ua va zg
mrsos

References to the used models are given in the netcdf-file headers (if available).

The status of the HAPPI dataset is fixed. There will be no more datasets provided, as the project is finalised.

Range of planned scientific data usage

The data are suited for the envisaged scientific usage scenario, namely estimating the impact of policy measures aimed at limiting the increase in global near surface temperature to 1.5 or 2 degrees celsius compared to pre-industrial conditions. The data are especially suited as input for impact-related research questions, such as hydrology, agriculture and the associated socio-economic impacts.

Furthermore, the overall ensemble allows for estimating the uncertainties associated with the above-mentioned changes and understand model behaviour.

At DKRZ, the data are of particular interest to those users who are involved in impact-related research, e.g. in the framework of CLICCS and future projects focusing on interdisciplinary research questions related to policy-related climate goals.

Data Storage Usage Plan

The HAPPI dataset has a total volume of 2.4TB. As this amount will not change in the future, we request a total of 2.4TB of storage resources for provision of the HAPPI dataset to the DKRZ user community.

As the data is up to now neither available via ESGF nor via any long-term archiving option, the provision via /pool/data is the only means of making the dataset available to the community. Therefore, the data shall be made available for five years (January 2022 - December 2026).

Towards the end of that allocation period, a review of data provision needs for the HAPPI dataset will be performed. If suitable, other storage options, e.g. long-term archival, will be explored.