



## Web-based generation of post-processing components for the CMIP6 data workflow

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The Coupled Model Intercomparison Project Phase 6 [1] defines a data standard in order to facilitate data analysis across results from different models. Since the format of raw climate model output may not be compliant with this standard, post-processing is often required to convert the variables included in the CMIP6 data request (DREQ) into the standard format.

The German Federal Ministry of Education and Research (BMBF) supports the German modeling groups in this production of quality-assured standard-compliant CMIP6 data [2]. Activities are underway and as a part, the Deutsches Klimarechenzentrum (DKRZ) supplies the modeling groups with a web GUI [3] including five tools for the generation of post-processing components.

1. A custom DREQ generator based on Martin Juckes' DreqPy API [4] can be used to create a customized list of requested variables depending on the user's envisaged experiments and endorsed MIPs.
2. The volume of the above customized DREQ can be estimated taking into account the grid specification.
3. The user may specify correspondences between target variables of the request and raw model output variables for registered models. Additionally, these specifications can be extended by diagnostic algorithms. All information (variable names, units, etc.) is stored in a data base and can be downloaded as a Mapping Table (MT). This MT generator interface features simultaneous editing and input logs.
4. Two Post-processing script fragments built from the data base content are provided. A diagnostic script fragment contains commands as given in the diagnostic algorithms; another contains commands to rewrite the data in a CMIP6 compliant format. Both script fragments apply the CDO tool kit [5] developed at the Max-Planck-Institute for Meteorology. The diagnostics are formulated with the help of the expression operator (expr) while the rewriting part uses the cmor operator recently developed at DKRZ [6] and calling the CMOR3 library [7] (Climate Model Output Rewriter). These fragments can be integrated into CMIP6 data workflows.
5. In order to provide the cdo cmor operator with the required meta data, a meta data table can be created based on the project controlled vocabulary (CV) file in JSON format.

[1] Veronika Eyring et. al (2017): Overview of the Coupled Model Intercomparison Project Phase 6 (CMIP6) Experimental Design and Organization. [https://www.wcrp-climate.org/images/modelling/WGCM/CMIP/CMIP6FinalDesign\\_GMD\\_170726.pdf](https://www.wcrp-climate.org/images/modelling/WGCM/CMIP/CMIP6FinalDesign_GMD_170726.pdf), last access 1.4.2018.

[2] National CMIP6 Support Activities. <https://www.dkrz.de/c6de>, last access 1.4.2018.

[3] Martin Schupfner (2017): CMIP6 Data Request WebGUI. <https://c6dreq.dkrz.de/>, lastaccess 1.4.2018.

[4] Martin Juckes (2017): Data Request Python API. Vers. 1.00.17, draft. <http://proj.badc.rl.ac.uk/svn/exarch/CMIP6dreq/tags/latest/dreqPy/docs/dreqPy.pdf>, last access 1.4.2018.

[5] Uwe Schulzweida (2017): CDO User Guide. Climate Data Operators. Vers. 1.9.1. <https://code.mpimet.mpg.de/projects/cdo/embedded/cdo.pdf>, last access 1.4.2018.

[6] Fabian Wachsmann (2017): The cdo cmor operator. [https://code.mpimet.mpg.de/attachments/download/15822/cdo\\_cmor.pdf](https://code.mpimet.mpg.de/attachments/download/15822/cdo_cmor.pdf), last access 1.4.2018.

[7] Denis Nadeu (2017): CMOR version 3.3. <https://cmor.llnl.gov/pdf/mydoc.pdf>, last access 1.4.2018.