



## Web-based post processing workflow composition for CMIP6

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CMIP6 defines a data standard as well as a data request (DReq) in order to facilitate analysis across results from different models. For most model output, post-processing is required to make it CMIP6 compliant. The German Federal Ministry of Education and Research (BMBF) is funding a project [1] providing services which help with the production of quality-assured CMIP6 compliant data according to the DReq.

In that project a web-based GUI [2] has been developed which guides the modelers through the different steps of the data post-processing workflow. The website provides several functionalities:

1. A DReq generator, based on Martin Juckes' DreqPy API [3], can be used to tailor the DReq according to the envisaged experiments and supported MIPs.
2. A volume estimator can be applied to the tailored DReq taking into account the grid dimensions of the model to be used.
3. The mapping between variables of the DReq and of the raw model output can be specified. These specifications (model variables, units, etc.) may include diagnostic algorithms and are stored in a database. The mapping information can be downloaded as a Mapping Table (MT) or in form of two post-processing script fragments. One of the fragments contains processing commands based on the diagnostic algorithms entered into the mapping GUI, whereas the other rewrites the (diagnosed) data in a CMIP6 compliant format. Both script fragments use the CDO tool kit [4] developed at the Max Planck Institute for Meteorology, namely the CDO expr and cmor [5] operators. The latter makes use of the CMOR3 library [6] and parses the MT. It was developed in the above mentioned BMBF funded project at the DKRZ. The script fragments are meant to be integrated into CMIP6 data workflows or scripts.
4. User specific metadata tables can be generated, which supply the CDO cmor operator with the required and correct metadata as specified in the CMIP6 controlled vocabulary (CV).

[1] National CMIP6 Support Activities. <https://www.dkrz.de/c6de> , last access 9.1.2019.

[2] Martin Schupfner (2018): CMIP6 Data Request WebGUI. <https://c6dreq.dkrz.de/> , last access 9.1.2019.

[3] Martin Juckes (2018): Data Request Python API. Vers. 01.00.28. <http://proj.badc.rl.ac.uk/svn/exarch/CMIP6dreq/tags/latest/dreqPy/docs/dreqPy.pdf> , last access 9.1.2019.

[4] Uwe Schulzweida (2018): CDO User Guide. Climate Data Operators. Vers. 1.9.5. <https://code.mpimet.mpg.de/projects/cdo/embedded/cdo.pdf> , last access 9.1.2019.

[5] 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 9.1.2019.

[6] Denis Nadeau (2018): CMOR version 3.3. <https://cmor.llnl.gov/pdf/mydoc.pdf> , last access 9.1.2019.