DICAD Workshop on CMIP6 Post-processing

Aim:

Learn how to produce CMIP6 conform data with the help of test model output for the piControl experiment and by using the **c6dreq WebGUI** and **cdo cmor**.

WebGUI: https://c6dreq.dkrz.de
https://c6dreq.dkrz.de/info/workshop_dicad_tools.php

Day 1:

Reenact the post processing (aggregation, diagnostic, cmor-rewrite) for one year of the simulation historical_r1i1p1f1-LR

Day 2:

Customize data request *(Tab: RequestedVariables / VolumeEstimate)*
Configure cdo cmor *(Tab: InfoTables)*
Map model output variables to CMOR variables *(Tab: VariableMapping)*
Create Post-processing script fragments *(Tab: PostProcessing)*
Further configure and execute the Post-processing script

cdo cmor: https://code.mpimet.mpg.de/projects/cdo/wiki/CDO_CMOR_Operator
- Rewrite data in CMIP6 compliant format

Day 1 Exercises: /work/bm0021/workshopcmip6pp2019/

(Only on 9th and 10th October 2019: The QOS **training** is available for SLURM-Jobs)

1) Login to mistral with one of the temporary workshop accounts.
2) Copy the following folder to your work or scratch directory: /work/bm0021/workshopcmip6pp2019/to_copy/historical_r1i1p1f1-LR
3) At first, adapt the paths in the aggregation script (historical_r1i1p1f1-LR.postagg) and submit it for the year 1850. Check if any errors occured (./errors_agg/*).
4) Now adapt the paths in the post processing script (historical_r1i1p1f1-LR.runpp) as well as the paths in the submit post processing script (historical_r1i1p1f1-LR.submit_runpp).
   Then submit the post processing script for the year 1850 by running historical_r1i1p1f1-LR.submit_runpp.
   See if all variables have been processed properly (./errors/*).
5) Merge all cmorized variables into one DRS tree.
6) Run the add_bounds.sh and overwrite_comments.sh scripts after adapting the path to fix the bounds and overwrite comments automatically set by CMOR that do not apply for MPI-ESM1-2.
7) Adapt the paths in historical_r1i1p1f1-LR.runpp_clim. Add a climatology from 1850-1854 for all variables in the MIP table Oclim in ./conf/CMIP6_requested_vars_AllExp_clim.conf (requested_vars configuration file).

Day 2 Exercises: /work/bm0021/workshopcmip6pp2019/

1) Login to mistral and reserve a node using salloc:
   salloc --nodes 1 --partition=compute,compute2 -A <project> -t 08:00:00 \ --mem=128G
   -- /bin/bash -c 'ssh -X $SLURM_JOB_NODELIST' [--qos=<qos>]
   On 9th and 10th October you need to use bk0988 as <project> and you can use
   "--qos=training" for a higher priority of your allocation request.
   Copy the directory **/work/bm0021/workshopcmip6pp2019/to_copy/testsim** to your
   work or scratch directory.

2) Use your browser to login to the WebGUI (https://c6dreq.dkrz.de) and select your
   model with submodel "Atm" in the "CMIP6 Workshop" project for editing.
   Get familiar with the options and fill in the mapping information for ps-Amon and
   tas-Amon of the table on the next page.
   Collect the missing mapping information of that table "by all means" and fill all
   mapping information into the mapping table of the corresponding submodel in the GUI.

3) Use your browser to login to the WebGUI and select the PostProcessing tab.
   Create the script fragments for the variables in the provided table. You can mask other
   variables using the Black-/Whitelist or you mask them later via the requested vars user
   configuration.
   Download and extract the script fragments in your ./testsim/scripts directory

4) Take a look into the scripts and configuration files and perform all necessary changes.
   In the requested variables configuration file (./conf/), add a timeslice for Oclim
   variables for 1850 to 1859. Set the processing for variables to "False" that are not in
   the output (if you did not use the Black-/Whitelist when creating the script fragments).
   Run it interactively: ksh Wrapper_example.ksh

Sub-model	Frequency	Aggregation	CMOR/ short name	Name/Code in Model	Diagnostic (formula)	Unique filename pattern of the input files	Model output units	Variable Comment	Special Setting
Oce	Monthly	Climatology	difvho			*_ocean_3d_mm_DATE*	m2 s-1	Reported on ocean half levels.	
Oce	Decadal	Mean	hfbasin	global_hfbasin, atlantic_hfbasin, indopacific_hfbasin		*_ocean_moc_mm_DATE*	W		Decadal bounds (???9), define character axis basin in cdocmorinfo
Oce	fx		deptho			*_ocean_fx.nc			
Oce	Annual	Mean	co3			*_ocean_3d_ym_DATE*	mol m-3		Vertical Bounds (gridinfo)
Atm	Monthly	Mean	tas	167		*_atmos_2d_mm_DATE*	K		
Atm	Monthly	Mean	ps	134		*_atmos_2d_mm_DATE*	Pa		
Atm	Monthly	Mean	pr	142,143	var142+var143		kg m-2 s-1		
Atm	Daily	Zonal Mean	va	132 out of cdo afterburner (requires codes 129, 152, 138, 155)		*_atmos_3d_dm_plev19_zon_DATE*	m s-1		Aggregation (cdo zonmean) and cdo after call (pl interpolation and va-calculation) needed.
Atm	Monthly	Mean	cli	154 (and 134/ps)	var154;ps=var134	*_atmos_3d_mm_DATE* (and *_atmos_2d_mm_DATE* for 134/ps)	kg kg-1		Surface Pressure needed as auxiliary coordinate.
Srf	Monthly	Mean	landCoverFrac		*CUSTOM*		%		
Srf	Monthly	Mean	mrsol	84	1000*var84	*_land_3d_mm_DATE*	kg m-2		Vertical Bounds (gridinfo)