

ESM Tools

- Documentation and References
- How-to Guide and Examples

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Outline



1 Documentation and References

- esm-usermanual
- GitLab Wiki

2 How-to Guide and Examples

- Install and compile AWI-CM (CMIP6)
- Set up and run a new experiment
- Continue an experiment
- Continue an experiment from a spinup experiment

Documentation and References



esm-usermanual

Where can I find the esm-usermanual?



esm-tools project on GitLab

<https://gitlab.dkrz.de/esm-tools/esm-usermanual>



https://gitlab.dkrz.de/esm-tools/esm-usermanual/blob/master/esm_usermanual.pdf

How can I contribute to the esm-usermanual?

- Read the esm-usermanual and give feedback (nadine.wieters@awi.de)
- Ask questions to the esm-tools
- Make a new issue on GitLab's issue tracker
- Work on the document

Documentation and References



esm-usermanual

How can I work on the esm-usermanual document?

- Written with the \LaTeX typesetting system (using KOMA-Script)
- Create your own branch (mybranch) on GitLab
- Get a local copy of your branch on your desktop computer

```
git clone -b mybranch https://gitlab.dkrz.de/esm-tools/esm-usermanual.git
```

- Do your changes and compile the document (pdflatex)

```
git add esm_usermanual.tex esm_usermanual.pdf
git commit
git push
```

- Do a merge request for your branch on GitLab

Other file formats?

Documentation and References



GitLab Wiki

- Every esm-tool has a GitLab Wiki
- esm-master:
`https://gitlab.dkrz.de/esm-tools/esm-master/wikis/home`
- esm-runscripsts:
`https://gitlab.dkrz.de/esm-tools/esm-runscripsts/wikis/home`
- How Do I...?
- Add new topics, questions
- Coment, answer other questions

Documentation and References



GitLab Wiki

The screenshot shows a web browser displaying the GitLab Wiki page for the 'esm-runcscripts' repository. The page is titled 'Home' and was last edited by 'Nadine Wieters' a week ago. The content includes a welcome message, a note about the FAQ page, and a section for 'General' information. The 'Where Do I...?' section lists 'Find the user manual'. The 'How Do I...?' section lists 'Add, change or remove namelist entries via runcscript'. The 'AWI-CM' section has a 'How Do I...?' subsection. The 'General' section lists several tasks: running an initial model run, running a simple Pre-Industrial Control simulation, restarting AWI-CM, continuing a model run, overcoming numeric instability, changing AWI-CM restart frequency, changing AWI-CM output schedule, and switching on/off postprocessing. The 'Paleoclimate' section is also visible at the bottom.

AWI-CM (CMIP6)



Tasks to get and run AWI-CM (CMIP6)

- ① Downloading the source code → [esm-master](#)
- ② Compiling the source code → [esm-master](#), [esm-environment](#)
- ③ Set up and configure an experiment → [esm-runscrip](#)ts
- ④ Executing the run → [esm-runscrip](#)ts

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AWI-CM (CMIP6)



0. Getting the tools

```
$ git clone https://gitlab.dkrz.de/esm-tools/esm-master.git
...
$ cd esm-master
```

```
esm-master
├── esm-master.conf
└── Makefile
```

Configure esm-master: edit esm-master.conf

```
1 SWREPO-USERNAME=<your-swrepo-username>
2 DKRZ-GITLAB-USERNAME=<your-dkrz-gitlab-username>
```

AWI-CM (CMIP6)



```
$ make get-esm-environment
...
$ make get-esm-runscripts
...
```

```
esm-master
├── esm-environment
├── esm-master.conf
├── esm-runscripts
└── Makefile
```

1. Downloading and 2. compiling

```
$ make get-awicm-CMIP6
```

```
...
```

```
esm-master
```

- ├─ awicm-CMIP6
- ├─ esm-environment
- ├─ esm-master.conf
- ├─ esm-runscripsts
- └─ Makefile

```
$ make comp-awicm-CMIP6
```

```
...
```

AWI-CM (CMIP6)



Set up and run a new experiment

3. Set up an experiment and 4. execute the run

Case scenario A: Initial experiment

- Copy a default runscrip to your working directory (myexperiments)

```
$ mkdir ${WORK}/myexperiments  
$ cd ${WORK}/myexperiments  
$ cp ${WORK}/esm-runscrip ts/runscrip ts/awicm/awicm_initial.run .
```

- Adapt the runscrip to your experiment set up
- Execute the runscrip with option for experiment id

```
$ ./awicm-CMIP6.run -e awicm-cmip6-experiment
```

```

#!/usr/bin/ksh -l
set -e

...

export FUNCTION_PATH=${WORK}/esm-master/esm-runscripsts/functions/all
export FPATH=${FUNCTION_PATH}:$FPATH

machine_name="ollie"
setup_name="awicm"
#check=1

compute_time="00:25:00"
#####

INITIAL_DATE_awicm=2000-01-01      # Initial exp. date
FINAL_DATE_awicm=2000-04-01      # Final date of the experiment
CURRENT_DATE_awicm=date_file     # Final date of the experiment

awicm_VERSION="1.1"
fesom_BRANCH='CMIP6'
SCENARIO_awicm=1850

RES_fesom=CORE2

runctl__dt_start__nml_entry="2000,01,01,0,0,0"
runctl__dt_start__nml_file="namelist.echam"

MODEL_DIR_awicm=${WORK}/esm-master/awicm-CMIP6/

ADJUNCT_FILES_DIR_echam=${MODEL_DIR_awicm}/echam-6.3.04p1/

BIN_DIR_echam=${MODEL_DIR_awicm}/build/echam-6.3.04p1/src/echam/
BIN_DIR_fesom=${MODEL_DIR_awicm}/build/fesom_cpl/
EXE_fesom=fesom

```



```

BASE_DIR=${WORK}/myexperiments/

POOL_DIR_awicm=/work/ollie/dsidoren/input/
POOL_DIR_echam=/work/ollie/pool/

MESH_DIR_fesom=/work/ollie/pool/FESOM/meshes_default/core/

mesh_def___part_format___nml_entry="REMOVE_FROM_NAMELIST"
mesh_def___part_format___nml_file="namelist.config "

NYEAR_awicm=0           # Number of years per run
NMONTH_awicm=1          # Number of months per run

LRESUME_echam=0          # Initial run
LRESUME_fesom=0          # Initial run
LRESUME_oasis3mct=0     # Initial run

RESTART_echam=1          # Unit=month
RESTART_fesom=1          # Unit=RESTART_UNIT_fesom

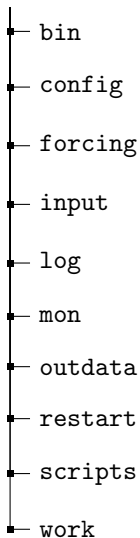
RESTART_RATE_fesom=1
RESTART_FIRST_fesom=1
RESTART_UNIT_fesom='m'

...

#####
load_all_functions
general_do_it_all $0

```

awicm-cmip6-experiment



AWI-CM (CMIP6)



Continue an experiment

Case scenario B: Continue an experiment (that has successfully completed or crashed)

- Continuation: Change the value `FINAL_DATE_awi_cm=2000-04-01` in your runscript
- Resubmit your runscript with the same experiment id

```
$ ./awicm-CMIP6.run -e awicm-cmip6-experiment
```

- The esm-runscripts will automatically recognize that it is a restart experiment

AWI-CM (CMIP6)



Continue an experiment from a spinup experiment

Case scenario C: Continue an experiment from a spinup experiment

- Spinup files are of a different experiment
- Add the following lines to your runscript (awicm_spinup.run)

```
LRESUME_echam=1
INI_RESTART_DIR_echam=/testspinupdir/restart/echam/
INI_PARENT_DATE_echam=20091231234500
INI_PARENT_EXP_ID_echam=spinup_expid

LRESUME_fesom=1
SPINUP_DIR_fesom=/testspinupdir/restart/fesom/
SPINUP_YEAR_fesom=2009

LRESUME_oasis3mct=1
INI_RESTART_DIR_oasis3mct=/testspinupdir/restart/oasis3mct/
INI_PARENT_DATE_oasis3mct=20091231

LRESUME_hdmodel=1
INI_RESTART_DIR_hdmodel=/testspinupdir/restart/hdmodel/
INI_PARENT_DATE_hdmodel=20091231
INI_PARENT_EXP_ID_hdmodel=spinup_expid

LRESUME_jsbach=1
INI_RESTART_DIR_jsbach=/testspinupdir/restart/jsbach/
INI_PARENT_DATE_jsbach=20091231
INI_PARENT_EXP_ID_jsbach=spinup_expid
```

Thank you for your attention