

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 L^AT_EX 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-runscripts:
<https://gitlab.dkrz.de/esm-tools/esm-runscripts/wikis/home>
- How Do I...?
- Add new topics, questions
- Coment, answer other questions



Documentation and References



GitLab Wiki

The screenshot shows a GitLab interface with the following details:

- Header:** Home · Wiki · easr-tools · easr-namscripts · GitLab · Mozilla Firefox
- Top Bar:** Home · Wiki · easr-tools · easr-namscripts · GitLab · Mozilla Firefox
- Left Sidebar:**
 - Project: easr-namscripts
 - Repository
 - Issues
 - Merge Requests
 - CI / CD
 - Wiki
 - Snippets
 - Settings
- Wiki Page Content:**
 - Home**: Last edited by Nadine Wieters a week ago. Buttons: New page, Page history, Edit.
 - General**
 - Where Do I...?**
 - Find the user manual
 - How Do I...?**
 - Add, change or remove namelist entries via namscript
 - AWI-CM**
 - How Do I...?**
 - General**
 - Run an initial model run (load start)
 - Run a simple Pre-Industrial Control simulation
 - Restart AWI-CM from an already existing run (spinup)
 - Continue a model run that has been successfully completed or that unfortunately crashed
 - Overcome numeric instability by temporarily setting enhanced diffusion ENSTDIF
 - Change AWI-CM restart frequency
 - Change AWI-CM output schedule (output data)
 - Save AWI-CM output
 - modify the postprocessing (e.g. keep daily output for selected variables, while generating monthly output for the rest of the data)
 - Paleoclimate**
- Right Sidebar:**
 - Clone repository
 - Change awicm output schedule
 - Change awicm restart frequency
 - Frequently asked questions
 - Consumption typical models
 - Easr namscript change namelist entry
 - Easr namscript continue module
 - Easr namscript initial run
 - Easr namscripts user manual
 - General_program_flow
 - Home
 - how_to
 - How to use a user-defined jobscript.ncl file
 - How to use a user-defined unit.24 file
 - Restart_awicm_from_existing_run

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-runscripts](#)
- ④ Executing the run → [esm-runscripts](#)

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AWI-CM (CMIP6)



Tasks to get and run AWI-CM (CMIP6)

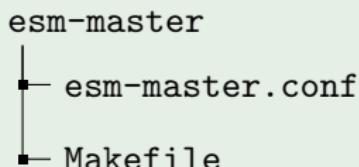
- ① Downloading the source code → [esm-master](#)
- ② Compiling the source code → [esm-master](#), [esm-environment](#)
- ③ Set up and configure an experiment → [esm-runscripts](#)
- ④ Executing the run → [esm-runscripts](#)



AWI-CM (CMIP6)

0. Getting the tools

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



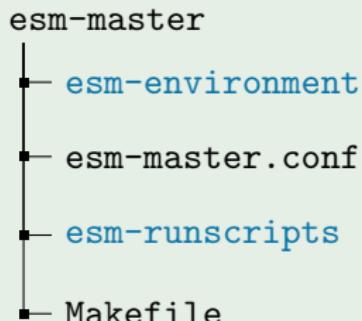
Configure esm-master: edit esm-master.conf

- 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  
...
```



1. Downloading and 2. compiling

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

```
...
```

```
esm-master
├── awicm-CMIP6
├── esm-environment
├── esm-master.conf
├── esm-runscrips
└── 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 runscript to your working directory (myexperiments)

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

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

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

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

...
export FUNCTION_PATH=${WORK}/esm-master/esm-runscrips/functions/all
export FPATH=${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 $@
```

awicm-cmip6-experiment

```
└── bin  
└── config  
└── forcing  
└── input  
└── log  
└── mon  
└── outdata  
└── restart  
└── scripts  
└── work
```

AWI-CM (CMIP6)



[Continue an experiment](#)

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

- Continuation: Change the value FINAL_DATE_awicm=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