

# ESM Tools

- Documentation and References
- How-to Guide and Examples

**Nadine Wieters**

Climate Dynamics

**Dirk Barbi**

Climate Dynamics

Paleo-Climate Dynamics



ALFRED-WEGENER-INSTITUT  
HELMHOLTZ-ZENTRUM FÜR POLAR-  
UND MEERESFORSCHUNG

ESM Tools Workshop 18-19 June 2018

Documentation and References  
oooo

How-to Guide and Examples  
oooooooooooo

## 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](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](mailto:nadine.wieters@awi.de))
- Ask questions to the esm-tools
- Make a new issue on GitLab's issue tracker
- Work on the document

Nadine Wieters & Dirk Barbi

ESM Tools

HELMHOLTZ RESEARCH FOR GRAND CHALLENGES

ESM Tools Workshop 2018

# Documentation and References



esm-usermanual

## How can I work on the esm-usermanual document?

- Written with the L<sup>A</sup>T<sub>E</sub>X 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
- Comment, answer other questions

# Documentation and References

## GitLab Wiki



The screenshot shows a Mozilla Firefox browser window with the URL <https://gitlab.dkrz.de/esm-tools/esm-runscripts/wikis/home>. The page title is "Home - Wiki - esm-tools / esm-runscripts - GitLab - Mozilla Firefox". The main content area contains several sections: "General", "How Do I...?", and "AWI-CM". The "General" section lists items such as "Run an initial model run (cold start)", "Run a simple Pre-Industrial Control simulation", and "Overcome numeric instability by temporarily setting enhanced diffusion ENSTDIF". The "How Do I...?" section includes links to "Find the user manual" and "Add, change or remove namelist entries via runscript". The "AWI-CM" section also lists similar items. On the right side of the page, there is a sidebar with a "Clone repository" button and a list of other pages like "Change awicm output schedule", "Change awicm restart frequency", and "Restart\_awicm\_from\_existing\_run". At the bottom of the page, there is a footer with the URL <https://gitlab.dkrz.de/esm-tools/esm-runscripts/wikis/home>.

# AWI-CM (CMIP6)



## Tasks to get and run AWI-CM (CMIP6)

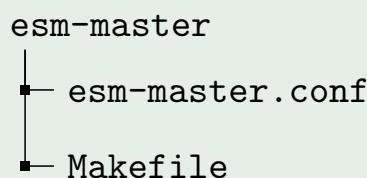
- ① Downloading the source code → [esm-master](#)
- ② Compiling the source code → [esm-master, esm-environment](#)
- ③ Set up and configure an experiment → [esm-runscripts](#)
- ④ Executing the run → [esm-runscripts](#)

# 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)

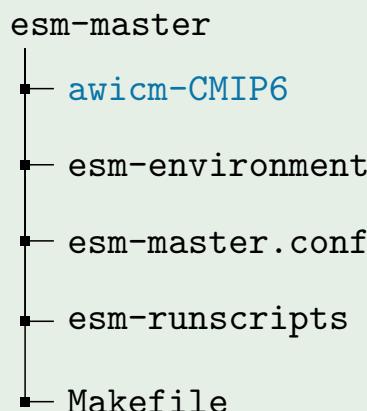


```
$ make get-esm-environment
...
$ make get-esm-runscripts
...
```



## 1. Downloading and 2. compiling

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



```
$ 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=${WORK}/esm-master/esm-runscripts/functions/all
export FPATH=${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

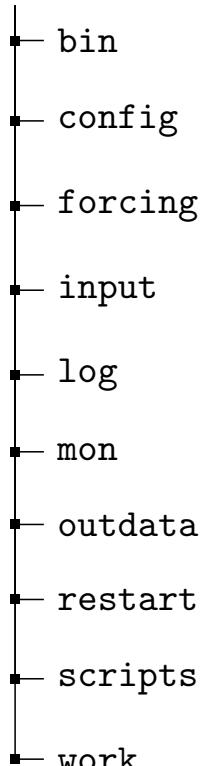
RESTART_echam=1          # Unit=month
RESTART_fesom=1           # Unit=RESTART_UNIT_fesom

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\_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 and change 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