ESM Tools

· Documentation and References
· How-to Guide and Examples

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Outline

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?

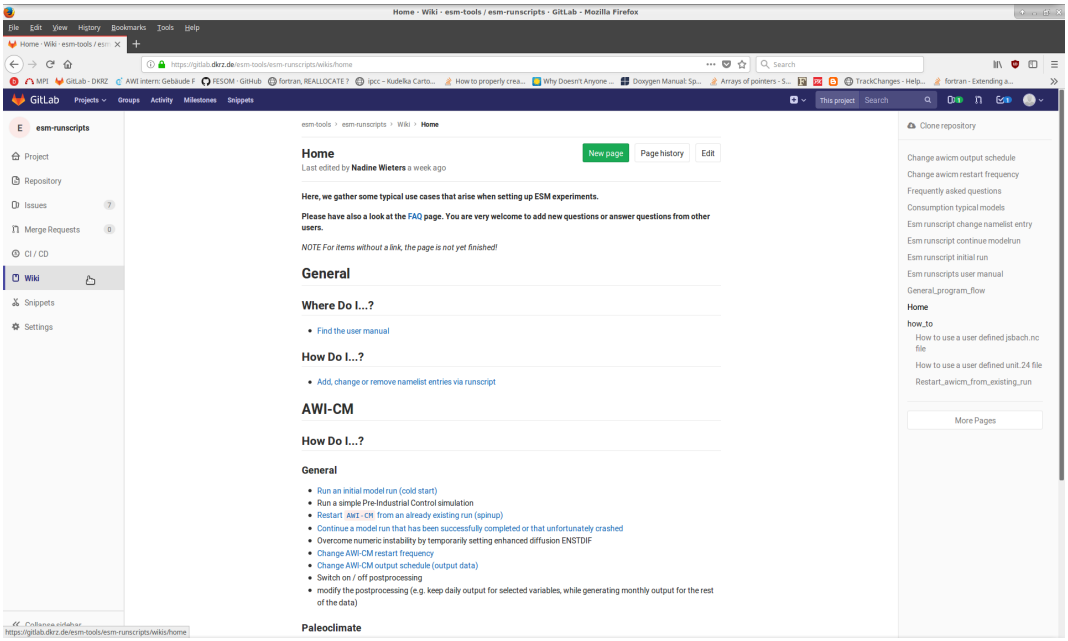
Documentation and References

GitLab Wiki

- Every esm-tool has a GitLab Wiki
- esm-master:
  `https://gitlab.dkrz.de/esm-tools/esm-master/wikis/home`
- esm-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



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
```

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



```
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 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