CLM-NorwayDoc Documentation

Versión 1.0.0

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Welcome to CLM-Norway's documentation!

Note This documentation is not meant to be static and is a collaborative effort of the total team. If you spot anything wrong or would like to add information to the documentation, please send us a pull request or file an issue in our repository.

Chapter 1

Get CTSM

That's where you should start.

NordicESMhub maintains a CTSM repository with all the configuration files for running on machines in the Nordics. For now we support:

- saga (sigma2, Norway)
- fram (sigma2, Norway)

If your machine is not in the list and you would like us to support it, please contact us.

For compatibility, load git version 2.23.0 or higher on your super computer

```
git/2.23.0-GCCcore-8.3.0
```

1.1 How to get CTSM (for users)

To get the FATES EMERALD platform version, CLONE from NordicESM hub

```
git clone -b release-clm5.0 https://github.com/NordicESMhub/ctsm.git
${HOME}/ctsm_fates_emerald
```

In this example we are checking out the release-clm5.0 tag and create a new local branch (recomended). The destination of the checkout is a directoy (e.g. ctsm_fates_emerald) in our home directory.

1.1.1 How to get a specific branch

Change into the created ctsm directory

```
cd ${HOME}/ctsm_fates_emerald
```

Check all existing branches

```
git branch --all
```

To checkout the FATES EMERALD platform (in this example release 2.0.1) into a new local branch (e.g. new_branch_name)

```
git checkout release-emerald-platform2.0.1 -b new_branch_name
```

For later reference, it is usefull to choose new_branch_name according to function and include the version and your username, e.g. username_release-emerald-platform2.0.1.

To fetch the proper externals (CIME, FATES, etc.) run

```
./manage_externals/checkout_externals
```

from the main ctsm directory (we are going to call this $CTSM_ROOT from now on). All should be set by this and you should be able to create your first case.

1.1.2 Which branch do I run?

1.2 How to get CTSM (for developers)

1.2.1 From NordicESM hub?

Follow the steps above, but checkout the fates_emerald_api instead

```
git checkout fates_emerald_api -b new_branch_name
```

For later reference, it is usefull to choose new_branch_name according to function and include the version and your username, e.g. username_fates_emerald_api. After checking out the externals, change to cime directory and create your own branch to record all your changes

```
cd externals/cime
git checkout -b username_cime
```

Change to fates directory and create your own branch to record all your changes

```
cd externals/fates
git checkout -b username_fates
```

If you do not create your own branch for «cime» and «fates», running «./manage_externals/checkout_externals», will overwrite your previous «cime» and «fates». You should be ready to create your first case.

1.2.2 From ESCOMP hub (NCAR)?

Chapter 2

Setup CTSM

2.1 Accounting

For running CTSM, you usually need to have access to a High-Performance Computer.

If you are working in Norway, you can use either saga, fram, or betzy (depending on demands on parallel computing) and need to be part of an active account:

- Notur

To check which project you can use:

```
projects
```

This will return something like:

```
nn2806k
nn1000k
```

In the example above, two projects can be used (nn2806k and nn1000k). Then make sure you choose the right project when running CTSM.

Chapter 3

Run CTSM

NB! this example is connected to project nn2806k (for your own project, change the project code. To see available projects and resources, use cost -p):

```
export CESM_ACCOUNT=nn2806k
```

3.1 Run your very first CTSM case

LOAD externals of CTSM (FATES and so on; only necessary first time), in folder ~/ctsm. If you are updating FATES go here first: (https://github.com/NordicESMhub/ctsm-dev/blob/master/Updating_FATES.md)

```
./manage_externals/checkout_externals
```

navigate to ~/ctsm/cime/scripts/

3.2 Inputdata

(only first time or whenever it disappears in your workdir i.e. 45 days)

```
cd ~/ctsm/cime/scripts
./link_dirtree $CESM_DATA /work/users/$USER/inputdata
```

3.3 Make a case

```
./create_newcase --case ~/cases/I2000Clm50BgcCruGs  --compset I2000Clm50BgcCruGs
 --res f19_g17 --machine abel --run-unsupported --project $CESM_ACCOUNT
```

navigate to ~/cases/I2000Clm50BgcCruGs

3.3.1 1) check the configuration

```
./xmlquery --l #(--l list --f file)
```

eg

```
./xmlquery STOP_OPTION
```

3.3.2 2) Change configuration

- For instance, to change the duration of a simulation to 5 days:

```
./xmlchange STOP_OPTION=ndays #(nyears, nmonths)
./xmlchange STOP_N=5 #(then 5 days)
```

or edit the xml files is another way to change these parameters (**not recommended**).

3.3.3 3) setup case

```
./case.setup  #(--reset)
```

3.3.4 4) edit user_nl_clm

add this below

```
hist_mfilt=5 #(number of output files)
hist_nhtfrq=-24 #(means daily outputs)
```

hist_mfilt allows you to specify the number of output files and *hist_nhtfrq* the frequency; here *-24* means daily outputs.

3.3.5 5) case build

```
./case.build
```

Remark: if your build fails or if you make changes and need to rebuild, make sure you clean the previous build:

```
./case.build --clean
```

3.3.6 6) run case

```
./case.submit
```

3.4 Run fates

NB! Fates is not automatically checked out with the latest version (as it is still under development), and this has to be done manually.

Follow https://github.com/NordicESMhub/ctsm-dev/blob/master/Updating_FATES (based on https://github.uio.no/huit/clm5.0_notes/issues/26 and https://github.com/ESCOMP/ctsm/wiki/Protocols-on-updating-FATES-within-CTSM)

```
./create_newcase --case ../../../ctsm_cases/fates_f19_g17 --compset
2000_DATM%GSWP3v1_CLM50%FATES_SICE_SOCN_MOSART_SGLC_SWAV --res f19_g17 --machine
abel --run-unsupported --project $CESM_ACCOUNT
```

3.5 Run a single cell case

CLM supports running using single-point or regional datasets that are customized to a particular region.

In the section below we show you how to run ready to use single-point configurations (out of the box) and then show you how to create your own dataset for any location of your choice.

3.5.1 Out of the box

To run for the Brazil test site do the following:

```
export CESM_ACCOUNT=nn2806k

./create_newcase -case ~/cases/testSPDATASET -res 1x1_brazil -compset
I2000Clm50SpGs  --machine abel --run-unsupported --project $CESM_ACCOUNT
```

Remark: make sure you set **CESM_ACCOUNT** to your project. Customized ~~~~~~~~~~~

- Step-1:
- Step-2: For atmospheric forcing (own atm forcing and surface data) (include scripts)

Change configuration

```
./xmlchange NTASKS=1 #(number of CPU's, can be increased if excitation error)
```

3.6 Run a regional case

Chapter 4

Recommended spinup routine for CTSM

4.1 Add text here

A small change

- genindex
- modindex
- search