



Norwegian
Meteorological
Institute

New NorESM e-resources

Part II : NorESM2 documentation

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Oslo, September 21–23, 2020

NorESM2 documentation

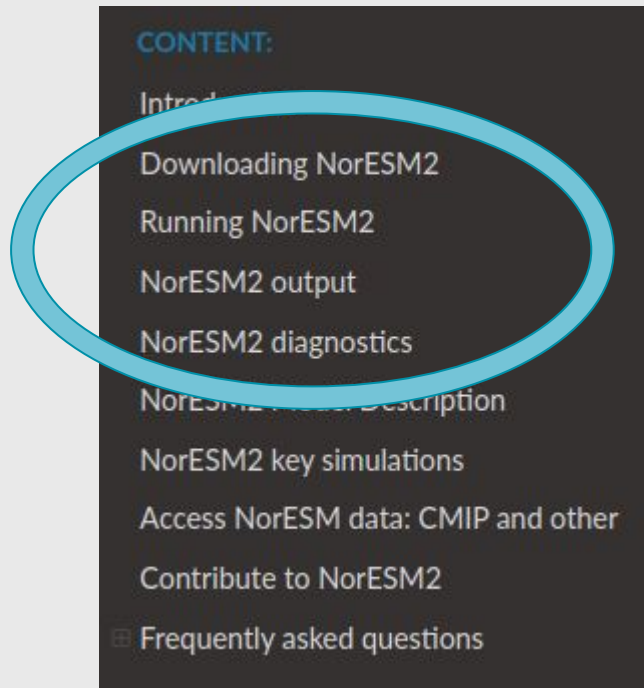
<https://noresm-docs.readthedocs.io/en/noresm2/>

Detailed descriptions on:

- How to download the code
- How to run NorEMS2
- Compsets
- Model components
- Where to find the NorESM2 specific code
- Initial conditions and restart files
- Diagnostics tools
- Existing simulations (CMIP6)
- Literature

Note! Use the documentation for **noresm2** and not latest (contains mainly a description of NorESM1)

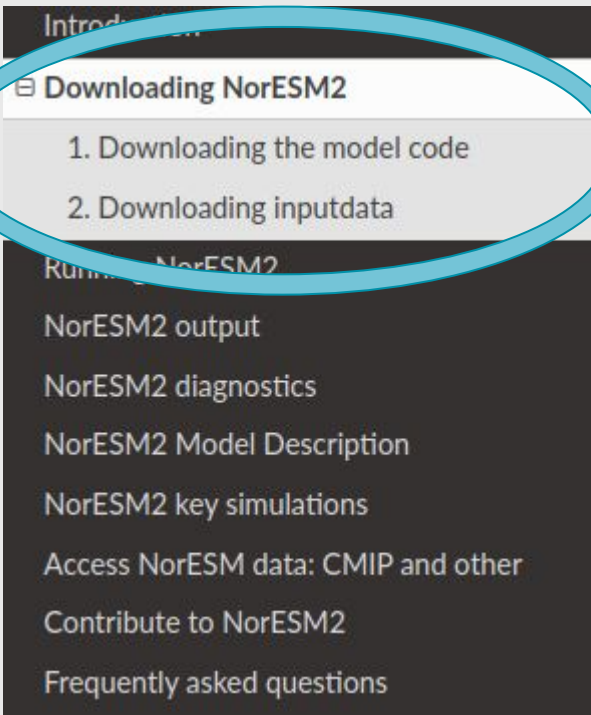
NorESM2 documentation



Most relevant for this workshop:

- Downloading NorESM2
- Running NorESM2
- Output
- Diagnostics

NorESM2 documentation - Downloading



Both the NorESM2 model code and the input data need to be downloaded in order to run NorESM2 simulations.

If you run NorESM2 on commonly used machines like FRAM, BETZY, NEBULA, TETRALITH, VILJE, the input data are already available and should not be downloaded twice.

Day 1 (September 21, Monday)

- 9:00 - 9:30 (*Mats Bentsen, NORCE*)
[Introductions to the development of NorESM2](#)(link not available yet)
- 9:30 - 10:15 (*Dirk Olive and Ada Gjermundsen, MET*)
[Presentation on new NorESM e-resources.](#)(#)
- 10:15 - 10:30
[Coffee break](#)
- 10:30 - 12:00 (*Alok Gupta, NORCE*)
[Workflow on running NorESM2.](#)(#)
- 12:00 - 13:00 [Lunch break](#)
- 13:00 - 15:30 [Exercise 1.](#)(/INES_workshop_2020#) (Helpers)

Running NorESM2 - Newbies guide

CONTENT:

Introduction

Downloading NorESM2

☐ Running NorESM2

1. Newbies guide
2. Experiments
3. Experiment environments
4. Running on different platforms
5. Input data sets
6. Atmosphere
7. Ocean and Sea-Ice
8. Land and river run off
9. Ensemble experiments
10. Nudged experiments

NorESM2 output

NorESM2 diagnostics

NorESM2 Model Description

NorESM2 key simulations

Access NorESM data: CMIP and other

Contribute to NorESM2

Frequently asked questions

A quick-start guide on how set up and run a standard NorESM2 simulation by executing 4 steps:

- create a new case (the **create_newcase** script)
- configure case (the **case_setup** script)
- build case (the **case_build** script)
- submit case (the **case_submit** script).


Running NorESM2 - Experiments

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Frequently asked questions

- Experiments = NorESM2 model simulations
- Instructions for the more advanced users on how to set up, build and run, but also **modify** a standard NorESM2 simulation.
- Settings for **creating** a case:
 - Many of the simulation configuration settings are defined by the so called **compsets**. The compsets are used to define which model components to include.
 - Information about which **resolutions** are scientifically supported.

Running NorESM2 - Environments

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Frequently asked questions

- Machine specific environments:
 - Number of cores
 - Libraries
- Run environments
 - Length of simulation
 - Type of simulation (startup, hybrid, branch)
 - Set some NorESM2 specific code
- Username lists (user_nl_cam, user_nl_blom,++)
 - Parameter changes
 - Initial state files
 - Output
- Run and archiving time environments
 - Length of simulation
 - Archiving time

Running NorESM2 - Model components

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Contribute to NorESM2

Frequently asked questions

Detailed description for each model component:

- NorESM2 specific code
- Initial conditions
- Forcing files
- How to modify user name lists e.g. change default parameter values
- Stand alone experiments (AMIP, OMIP, LMIP)
- Code modification

NorESM2 - output

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☐ NorESM2 output

1. Standard output

2. Aerosol diagnostics and output

3. COSP output

NorESM2 diagnostics

NorESM2 Model Description

NorESM2 key simulations

Access NorESM data: CMIP and other

Contribute to NorESM2

Frequently asked questions

Standard output:

- Lists of standard output variables for each components

Aerosol diagnostics:

- NorESM2 can be run with additional aerosol output and diagnostics

COSP:

- COSP calculates model cloud diagnostics that can be directly compared with satellite observations

NorESM2 - diagnostics

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☐ NorESM2 diagnostics

1. ESMValTool

2. NorESM2 Diagnostics Package

3. Aerosol diagnostics

NorESM2 Model Description

NorESM2 key simulations

Access NorESM data: CMIP and other

Contribute to NorESM2

Frequently asked questions

Several diagnostics tools are available to perform provide a general evaluation and quick preview of the model performance

Day 2 (September 22, Tuesday)

- 9:00 - 12:00 Exercise 2.(#) (Helpers)
- 12:00 - 13:00 Lunch
- 13:00 - 14:00 (Yanchun He, NERSC)
Post-processing and diagnostics for NorESM output.(#)
- 14:00 - 14:15 Break
- 14:15 - 15:30 Exercise 3.(#) (Helpers)

CMIP6 and NorESM2 key simulations

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NorESM2 key simulations

Access NorESM data: CMIP and other

Contribute to NorESM2

Frequently asked questions

<https://noresmhub.github.io/noresm-exp/intro.html>

An overview of NorESM2 experiments including upgrades, code modifications and parameter settings.

The overview includes (NorESM2-MM and NorESM2-LM):

- CMIP6 DECK simulations
- CMIP6 historical simulations
- CMIP6 scenario simulations (SSPs)
- Spin up simulation tree

☐ Access NorESM data: CMIP and other

☐ 1. CMIP6 archive of NorESM results

☐ 1.1. Data access

1.2. DECK contributions

1.3. MIPs contributions

1.4. References

2. CMIP5 archive of NorESM results

3. HAPPI and HappiEVA data

- Where to access **cmorized** CMIP6 NorESM2 data (ESGF and NIRD)
- DECK contributions
- MIPs contributions

CMIP6 and NorESM2 key simulations

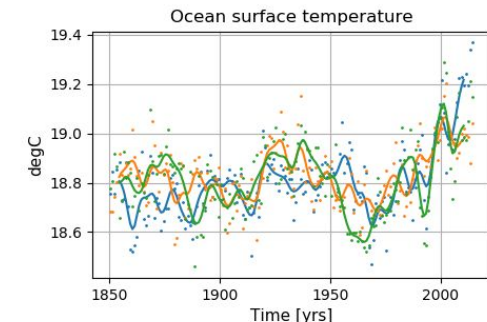
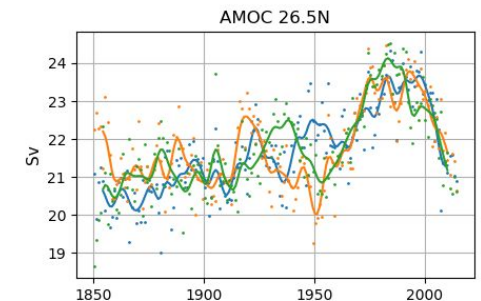
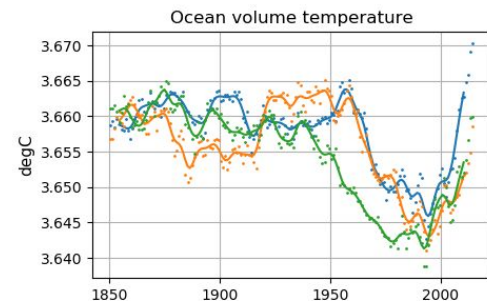
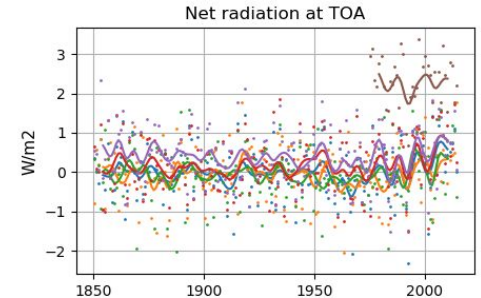
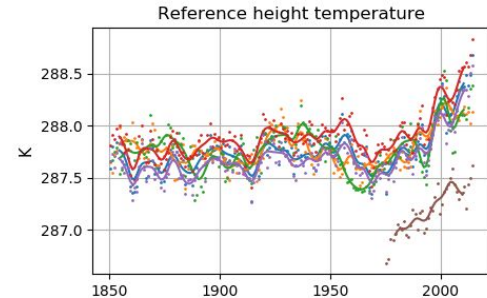
<https://noresmhub.github.io/noresm-exp/intro.html>

For selected CMIP6 NorESM2 simulations a detailed description of the simulation is provided including:

- case name and folder
(rawdata, restart files ++)
- parent
- branch time
- compset

NHIST_f19_tn14_20190625 (1850 - 1949)

CESM parent	CESM2.1.0
Parent	N1850_f19_tn14_11062019
Run type	hybrid
Branch time from parent	1600-01-01
Simulated years	01-01-1850 - 31-12-1949
Compset	HIST_CAM60%NORESM_CLM50%BGC-CROP_CICE%NORESM-CMIP6_MICOM%ECO_MOSART_SGLC_SWAV_BGC%BDRDDMS
Git branch	featureCESM2.1.0-OsloDevelopment
Git commit	6a0b992
Resolution	f19_tn14
Machine	Fram
Case folder	/cluster/projects/nn2345k/oyvinds/NorESM2_CMIP6/cases/NHIST_f19_tn14_20190625
Diagnostics	-



Feedback welcome!

We want to improve the documentation and especially the frequently asked questions section.

Please send questions, feedback and comments to **adag@met.no**