



NCAR
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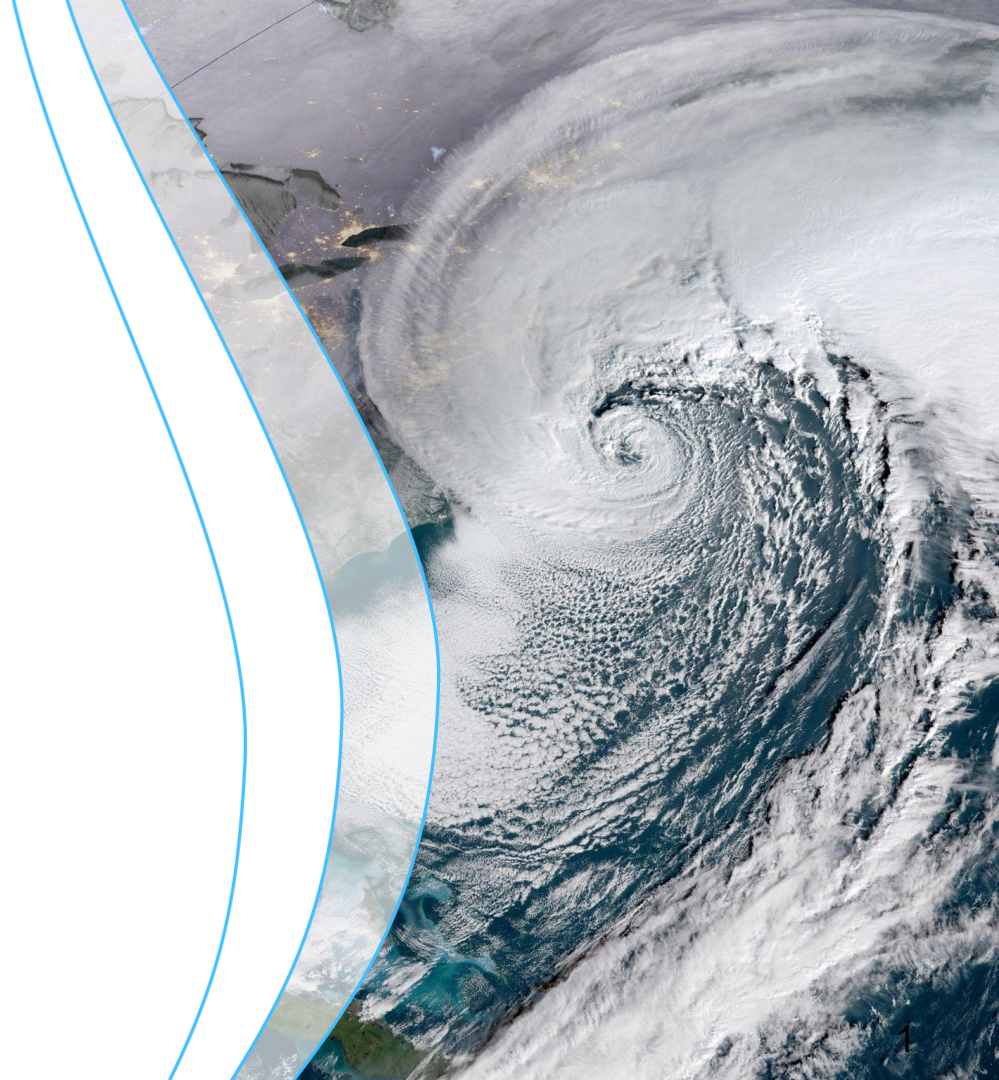
July 6, 2026

2026 CESM Tutorial

Daily lab check - in

Sophia Macarewich
NCAR CGD

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CESM Tutorial Website



NSF | NCAR Community Earth System Model
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CESM Tutorial 2026

CESM Tutorial Participants 2025

TUTORIAL

Jul. 6 to Jul. 10, 2026

8:00 am – 5:00 pm MDT

Countdown to the 2026 CESM Tutorial

Days	Hours	Minutes	Seconds

CESM TUTORIAL 2026

- Logistics
- Agendas, Presentations, and Resources

RESOURCE LINK

- Tutorial Resources

[https://www.cesm.ucar.edu/
events/tutorials/cesm](https://www.cesm.ucar.edu/events/tutorials/cesm)

OR Search “cesm tutorial 2026 ncar”

Additional info about
logistics. photos, etc

agenda (including slides
of lectures)

lab materials

Did everyone find the lab documentation?



<https://ncar.github.io/CESM-Tutorial/README.html>

Rough guidelines for the lab

Day 1: Basics

Day 2: Simple xml modifications

Day 3: Namelist, Troubleshooting, Source Mods

Day 4: Challenge exercises

Day 5: Diagnostics

BUT

This is a **self - paced lab**.

We all come from different backgrounds. Some people will move faster, and some will move slower. It's completely okay.

The screenshot shows the NCAR CESM Tutorial README page. The header includes the NCAR logo and a search bar. The left sidebar contains a table of contents with links to Introduction, Prerequisites for Success, Basics, Simple XML Modifications, Namelist Modifications, Troubleshooting runtime errors, Source Modifications, Challenge Exercises, Diagnostics, and Resources. The main content area is titled 'Welcome to the CESM Tutorial' and contains text about the history of the CESM model, its goals, and project funding. A 'Contents' sidebar on the right lists 'Goals of This Tutorial', 'Yearly In-Person Tutorials', 'CESM Project Funding', and 'Acknowledgements'.

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Q Search

Welcome to the CESM Tutorial

- Introduction
- Prerequisites for Success
- Basics
- Simple XML Modifications
- Namelist Modifications
- Troubleshooting runtime errors
- Source Modifications
- Challenge Exercises
- Diagnostics
- Resources

Welcome to the CESM Tutorial

In 1983 NCAR created the *Community Climate Model* (CCM) as a freely available global atmosphere model for use by the climate research community. The scope of CCM development continued to expand and in 1994 NCAR scientists released the *Climate System Model* (CSM), a global model that included component models for the atmosphere, land surface, ocean, and sea-ice, communicating through a central coupler component. To recognize the broad community of users and sponsors contributing to this effort, the CSM was renamed the *Community Climate System Model* (CCSM). The CCSM model evolved to include ice sheet and biogeochemical modeling and was renamed the *Community Earth System Model* (CESM) in 2013.

This repository includes materials designed to be an introduction to running the CESM. The materials were developed to support the CESM tutorial and serve as reference documentation for all CESM users.

Goals of This Tutorial

Through this online tutorial you will learn how to run the CESM model, modify the model experiments, and use the model output. These tutorial materials are designed for the CESM version 2 (CESM2)

Yearly In-Person Tutorials

The CESM tutorial was started in 2010 and is typically offered as an in-person summer workshop. If you are interested in attending the tutorial, please see the [CESM webpage](#) for the most up to date information about when the tutorial will next be offered in Boulder, Colorado and the timeline for applying.

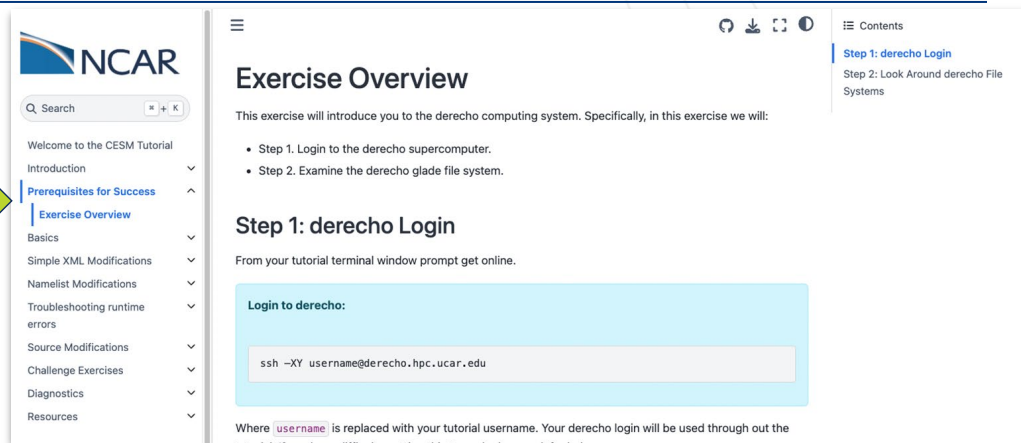
CESM Project Funding

This material is based upon work supported by the National Center for Atmospheric Research (NCAR), which is a major facility sponsored by the National Science Foundation (NSF) under Cooperative Agreement No. 1852977. Staff time on this project was also supported by the Climate and Global Dynamics (CGD) laboratory.

Contents

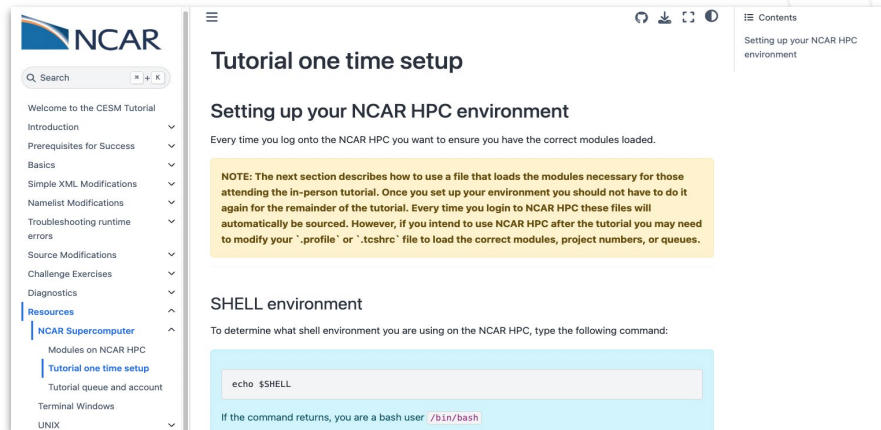
- Goals of This Tutorial
- Yearly In-Person Tutorials
- CESM Project Funding
- Acknowledgements

1. Prerequisites for success



The screenshot shows the 'Exercise Overview' page of the NCAR tutorial. The left sidebar contains a table of contents with 'Prerequisites for Success' and 'Exercise Overview' highlighted. The main content area has the title 'Exercise Overview' and a description: 'This exercise will introduce you to the derecho computing system. Specifically, in this exercise we will:'. Below this is a list of steps: 'Step 1. Login to the derecho supercomputer.' and 'Step 2. Examine the derecho glade file system.' The next section is 'Step 1: derecho Login', which instructs the user to 'From your tutorial terminal window prompt get online.' and provides a code block for the login command: `ssh -XY username@derecho.hpc.ucar.edu`. A note below the code block states: 'Where `username` is replaced with your tutorial username. Your derecho login will be used through out the'.

2. Tutorial one - time setup



The screenshot shows the 'Tutorial one time setup' page of the NCAR tutorial. The left sidebar contains a table of contents with 'Resources' and 'NCAR Supercomputer' highlighted. The main content area has the title 'Tutorial one time setup' and a subtitle 'Setting up your NCAR HPC environment'. Below this is a note: 'NOTE: The next section describes how to use a file that loads the modules necessary for those attending the in-person tutorial. Once you set up your environment you should not have to do it again for the remainder of the tutorial. Every time you login to NCAR HPC these files will automatically be sourced. However, if you intend to use NCAR HPC after the tutorial you may need to modify your `~/.profile` or `~/.tcshrc` file to load the correct modules, project numbers, or queues.' The next section is 'SHELL environment', which instructs the user to 'To determine what shell environment you are using on the NCAR HPC, type the following command:'. Below this is a code block for the command: `echo $SHELL`. A note below the code block states: 'If the command returns, you are a bash user `/bin/bash`'.

Project account and reservation queues



As a **full time participant**, you should have access to

- account number: **UESM0016**
- reservation queue: **tutorial**

Instructions how to
use these are here:



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Namelist Modifications

Troubleshooting runtime errors

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Diagnostics

Resources

NCAR Supercomputer

Modules on NCAR HPC

Tutorial one time setup

Tutorial queue and account

Terminal Windows

UNIX

Contents

Tutorial Project Account

Special Queues

Compiling in the Special Queue

Tutorial queue and account

Tutorial Project Account

You should have access to project account **UESM0013** and use this for your simulations.

You can change the account in your case directory using the following command:

```
./xmlchange PROJECT=UESM0013
```

Special Queues

Schedule for Tutorial Reservation Queues

- We have a special queue **tutorial** during the lab sessions to ensure you get through the derecho queues quickly and get your jobs run. This queue are only active during our lab sessions.
- Outside the lab sessions, you should use the queue **cpu** to run cesm.

If you need to change the value for a run, you can change the reservation queue in your case directory using

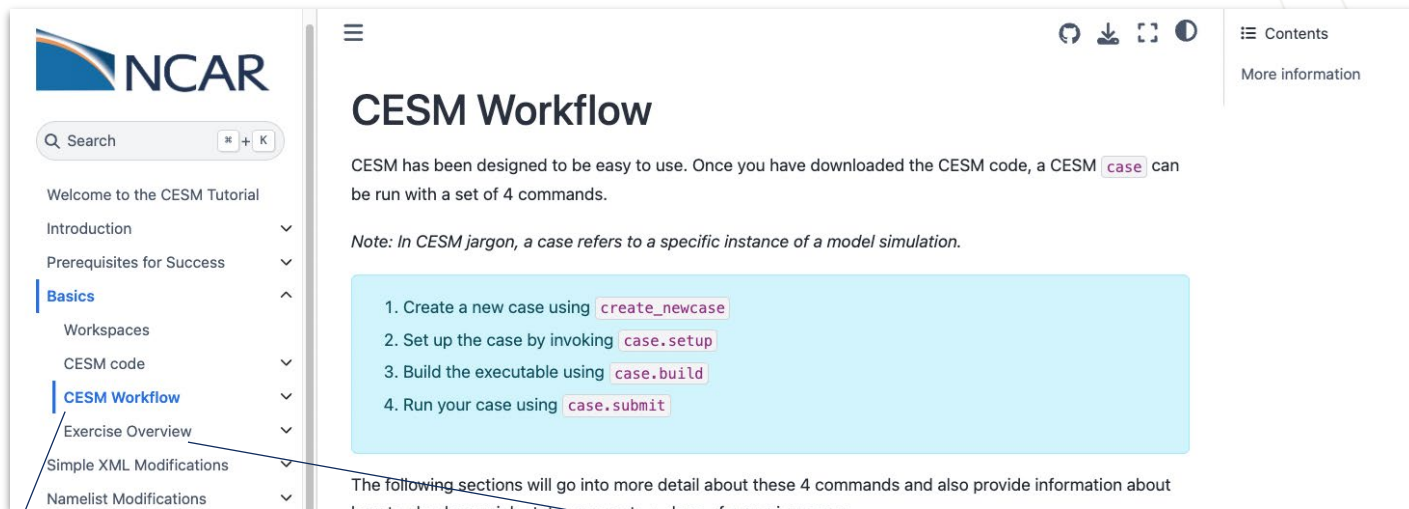
I've access to these (Sorry!)

The tutorial queue



Before submitting the jobs, change the queue to the 'tutorial' queue:

```
./xmlchange JOB_QUEUE=tutorial -- force
```

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Search

Welcome to the CESM Tutorial

Introduction

Prerequisites for Success

Basics

Workspaces

CESM code

CESM Workflow

Exercise Overview

Simple XML Modifications

Namelist Modifications

CESM Workflow

CESM has been designed to be easy to use. Once you have downloaded the CESM code, a CESM `case` can be run with a set of 4 commands.

Note: In CESM jargon, a case refers to a specific instance of a model simulation.

1. Create a new case using `create_newcase`
2. Set up the case by invoking `case.setup`
3. Build the executable using `case.build`
4. Run your case using `case.submit`

The following sections will go into more detail about these 4 commands and also provide information about how to check out the code, create a new case, and more.

CESM workflow doesn't expect you to enter command

Example of basic `./create_newcase` syntax:

```
./create_newcase --case /glade/u/home/$USER/cases/CASE --res RES --compset COMPSET
```

NOTE: Do not enter the example above at the command line. You will create your first case in the Exercise at the end of this section.

▼ [Click here for the solution](#)

Create a new case **b1850.basics** with the command:

```
cd /glade/u/home/$USER/code/my_cesm_code/cime/scripts
./create_newcase --case /glade/u/home/$USER/cases/b1850.basics --res f19_g17 --compset E
```