



# 2025 CESM Tutorial

## Welcome, Introduction and Logistics

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*CGD, NSF NCAR*

**July 7-11, 2025**

# Welcome to the Mesa Laboratory

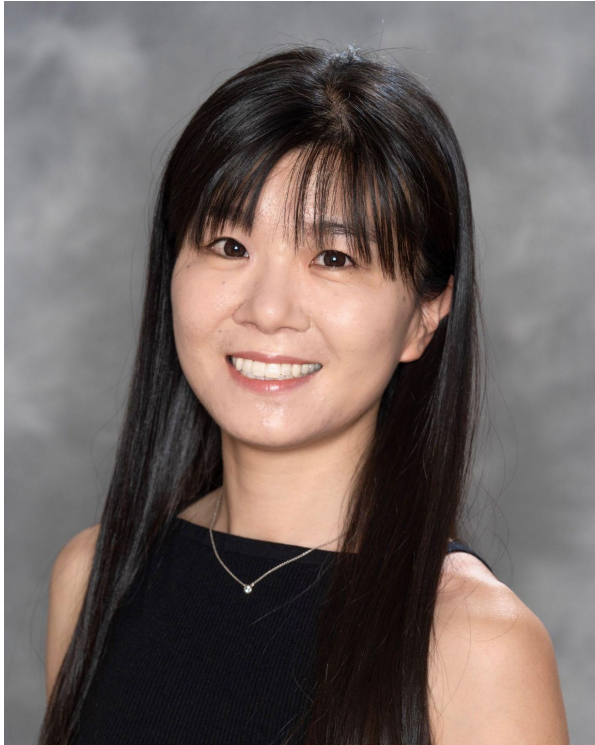


# Land Acknowledgement



We recognize the many contributions of Indigenous peoples in Colorado and acknowledge that the Mesa Laboratory is located on the traditional territories and ancestral homelands of the Cheyenne, Arapaho, Ute and many other Native American nations. It is important to recognize the history of the state, however difficult, and the histories and experiences of the Indigenous peoples who have lived in these territories for millennia. Their forced removal from these territories has caused devastating and lasting impacts. While we can never undo or rectify the devastation wrought on Indigenous peoples, we commit to improving and enhancing engagement with Indigenous peoples and issues locally and globally.

# Primary Contacts



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# Tutorial Goals

## As a result of attending the CESM Tutorial, attendees will:

- Gain a foundational scientific understanding of the core CESM components and CESM features.
- Be able to run and modify the model and use the output.
- Have opportunities to network with peers and CESM scientists.
- Attain an understanding of High Performance Computing (HPC) needed for CESM.
- Perceive the tutorials to be an inclusive learning environment.

# CESM Tutorial Website

<https://www.cesm.ucar.edu/events/tutorials/cesm>




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Community Earth System Model

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## CESM Tutorial 2025



TUTORIAL

Jul. 7 to Jul. 11, 2025  
8:00 am – 5:00 pm MDT

### Countdown to the 2025 CESM tutorial

Days	Hours	Minutes	Seconds
06	09	41	35

#### CESM TUTORIAL 2025

Logistics  
Agendas, Presentations, and Resources

#### RESOURCE LINKS


Tutorial Resources

Additional info about logistics. photos, etc

**agenda** (including slides of lectures)

**lab materials**

Lab Material :<https://ncar.github.io/CESM-Tutorial/>



Q Search

⌕ + K

Welcome to the CESM Tutorial

Introduction

Prerequisites for Success

Basics

Workspaces

CESM code

CESM Workflow

Exercise Overview

Your first CESM run

Extending your run

Examine History Files

Explore Further

Review Questions

Simple XML Modifications

Namelist Modifications

Troubleshooting runtime errors

Source Modifications

## 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-Degree Tutorial

# Tutorial Agenda

- **Lectures (Seminar Room)**

- Component Lectures (CL) → information about how the core model components work
- Specialized Lectures (SL) → Earth System Prediction, Paleoclimate, Atmosphere chemistry, variable resolution..etc

- **Lab activities (Library)**

- Days 1-3 → all participants complete same exercises
- Day 4 → example plotting and diagnostics for your chosen component(s)
- Day 5 → challenge exercises focused on your area(s) of interest

## Lunch activities 12:00 - 1:15 pm

- **Lunch (Mesa Lab cafeteria)**
  - Food is available in the Mesa Lab cafeteria. Vegetarian and Gluten free options are available.
  - You are responsible for paying for your own lunch.
  - Stagger lunchtime if possible
- **Meet a scientist (optional) (breakout areas)**
  - Lunch on Tuesday/Wednesday/Thursday
  - Casual conversation with a scientist with no fixed agenda
  - You need to fill the form (with your 1st/2nd/3rd choice)
  - We will **assign you to one scientist** to ensure reasonably sized groups
- **Mesa Lab Exhibit Tours (optional)**
  - Private tours on Tuesday and Thursday (sign-up sheets will be sent to you); public tours on Monday, Wednesday, Friday. Meet at 12:00pm at the front entrance.
  - You can also explore the exhibit on your own.

# Typical day

## Morning (starts at 8:25am)

Lectures (Seminar Room)

Lab (Library)

Light snacks and coffee (in front of the Main Seminar Room)

Only cups with lids allowed in the Main Seminar Room

Reduce waste and recycle whenever possible

## Lunch (12:00 - 1:15 pm)

Eat/Socialize (Cafeteria)

Meet a scientist (Various locations)

Mesa Lab exhibit tours (Hallway)

## Afternoon (ends at 4:45pm)

Lectures (Seminar Room)

Lab (Library)

Light snacks (Damon Room)

Daily check-in (Seminar Room)

# Daily check-in

At the end of each day, we will reconvene in the main seminar for the daily check-in

- we will discuss what went well and what didn't.
- you will complete the daily survey.

For each lecture:

- How relevant was the content of the class to your interests or needs?
- Was the difficulty level of the class appropriate for your skill level?
- Any additional comments or suggestions?

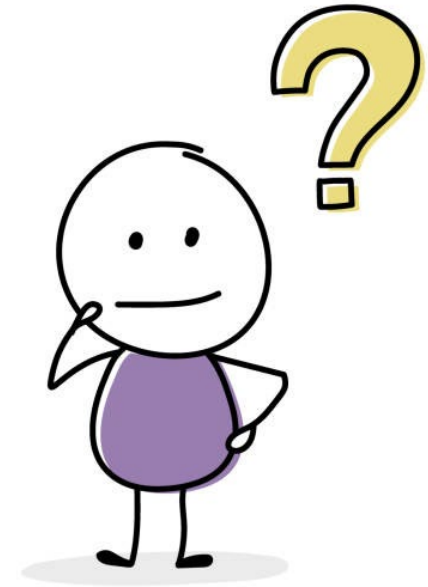
On the last day, there will be a general survey.

**These surveys are important for us to improve the content of the tutorial. Please fill out the survey. Thanks in advance.**

# Ask Freely. There are no stupid questions

We all come from different backgrounds and are here to learn. There are no stupid questions! Please do not leave still confused and with your questions unanswered.

- Ask presenters during the Q&A after their lectures or at a break.
- Ask helpers during lab sessions
- Ask clarification questions at daily check-in
- Ask questions during the meet-a-scientist lunch session
- Ask your peers
- If you are not sure who to ask, let Elizabeth know  
and she will connect you with someone on the team



- **Wireless access**

- Use the **UCAR Visitor** wifi. It is an open, unencrypted network (require registration for access).
- Use the **Eduroam** wireless only if you have it already installed on your computer / set up with your home institution

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Select connect to agree to the [terms of use](#) and gain access to the UCAR Visitor Network.

UCAR employees can use Eduroam or GlobalProtect now for encrypted access to all UCAR networks.



Questions about UCAR Visitor? Visit our FAQ page [here](#).

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- **Project account & Reservation Queues**

- We have set the **project account** as a default in the .profile or .tschrc files we instruct you to use.
- To use the **reservation queue**, you need to follow instructions in **Lab Materials**
- If you have problems using these or conflicts with other, existing project codes please let us know ASAP.

Resources ^

NCAR Supercomputer ^

Modules on NCAR HPC

Tutorial one time setup

Tutorial queue and  
account

# Social Time

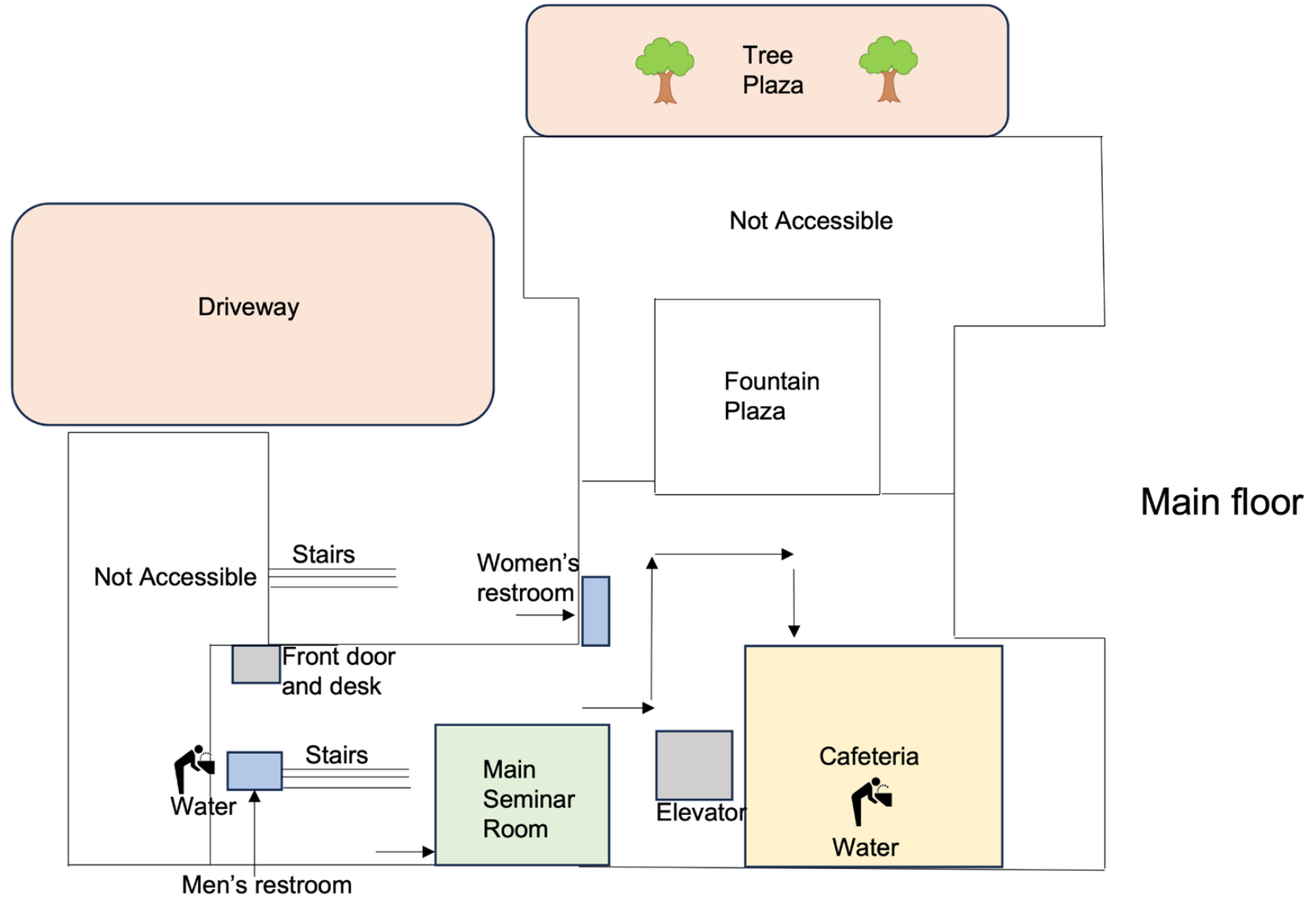
- **Slack Channel**

We have created a slack channel for the 2025 CESM tutorial participants. Elizabeth sent an email with the link to join the slack channel. Once here you can start coordinating with other participants to socialize and network. (Auditors are welcome to join as well)

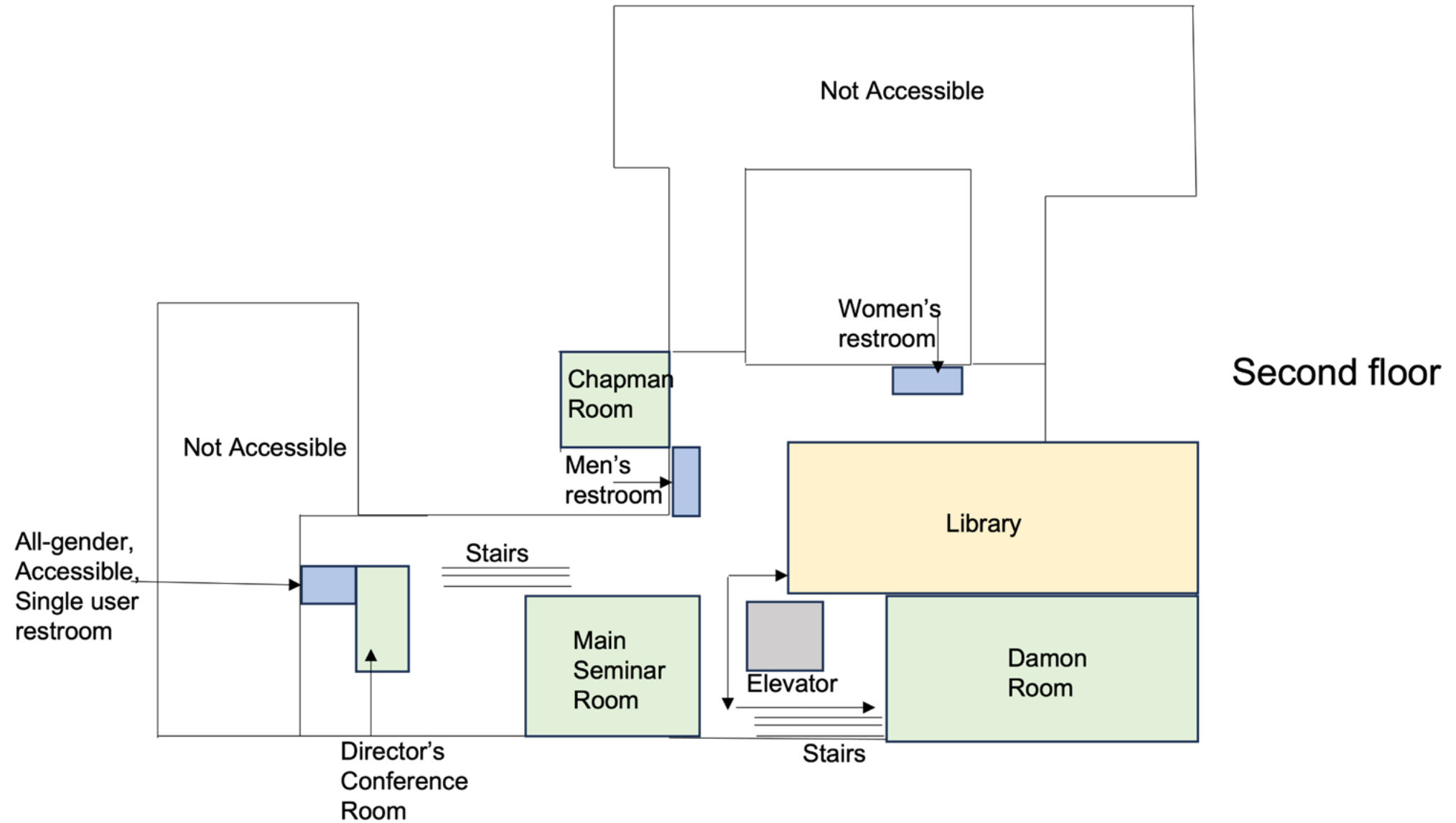
- **Special CESM Cafe**

On Thursday, from 9:45am - 10:15 am, CGD staff , visitors, and guests from across NCAR will join us for a special CESM Cafe. Use this opportunity to meet with other staff members, ask questions, network etc.

# Maps



# Maps



# Need a break: Quiet Spaces

QUIET ROOM



Outdoor Seating



Walking Path



Check with our admin team for available rooms.

Questions ?

Hui Li