Community Earth System Model (CESM): Community Engagement

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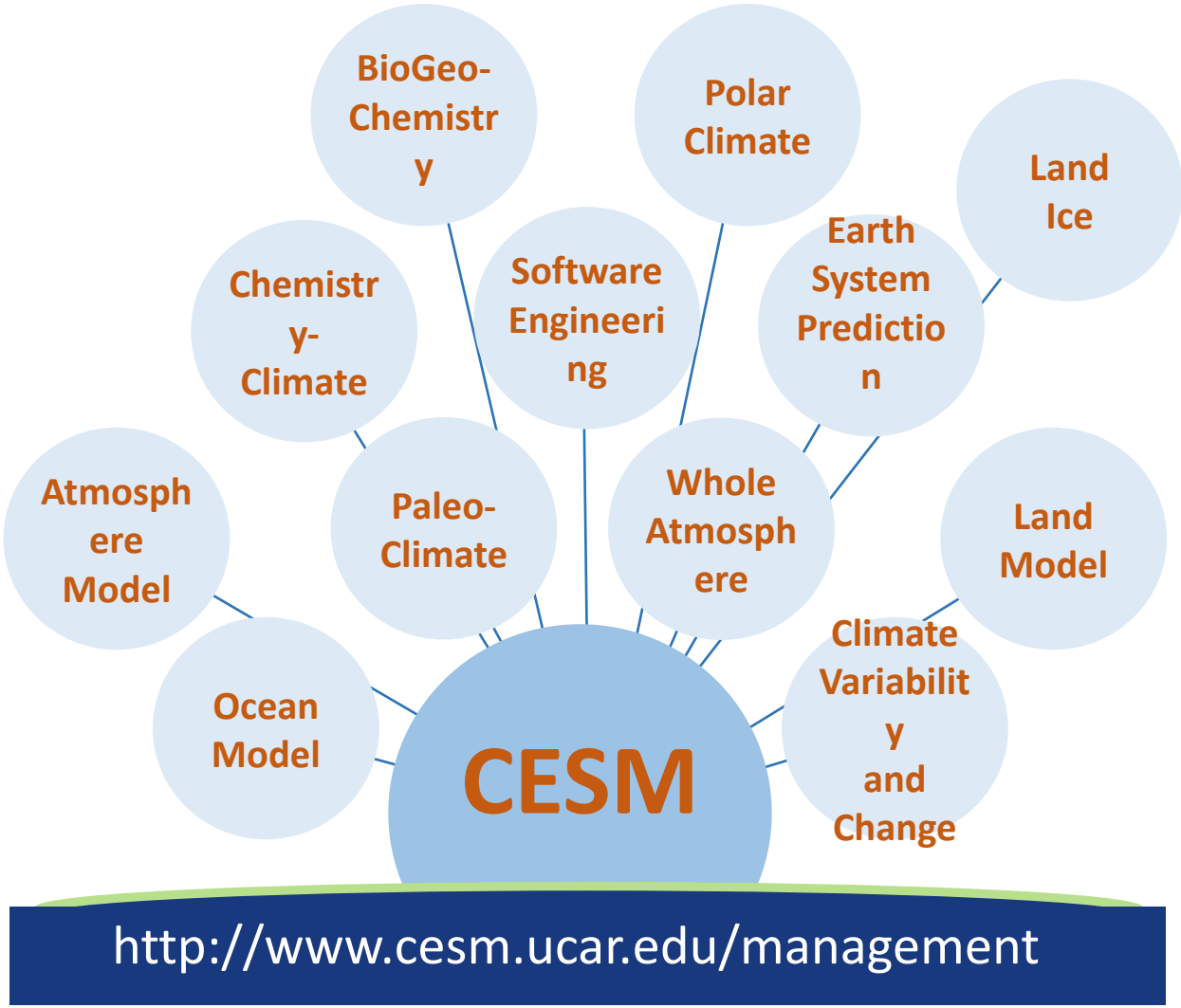
CESM Governance

CESM Advisory Board

CESM Scientific Steering Committee



Community-based governance

~30 years of model development and applications

CESM Governance

Actual work on various aspects of CESM gets done in the Working Groups (WG).

The WGs consist of scientists, researchers, programmers, etc. who come together to work on topics on which they share common interests.

Initial pitches for ideas, science projects, etc. occur at the WG meetings.

After discussions, with buy-in of the broader WG, some are slated to be pursued.

Interest level as well as funding and personnel challenges are considered during prioritization.

Big projects, especially the ones that cut across multiple WGs, are discussed at the Scientific Steering Committee level.

Each WG has 2-3 cochairs: At least one from NCAR and at least one external;

Each WG ideally has one science and one software engineer community liaison.

CESM Governance

The Scientific Steering Committee (SSC) provides scientific leadership for the CESM project, including oversight of activities of WGs, coordination of model experiments, decision making on model definition and development.

10 of 12 members are external to NCAR.

Usually meets 3-4 times per year.

The CESM Advisory Board (CAB) serves as an advisory committee reporting to the CESM SSC, NSF Program Director, NCAR Director, and UCAR President.

Membership in the CAB comes from university faculty and staff, and staff members of laboratories, both national and international.

Meets once per year.

Community Approach to Software Development

CESM is an open-source community model available via GitHub. This has been a game changer in terms of the community being able to access and contribute to the latest development code bases, providing transparency in several key areas:

- When a community member wants to contribute code to a component, issues and discussions related to that code contribution are public. There is no longer the perception that code contributions ‘go into a black hole’.
- Development priorities and bug tracking are completely available for the community to access as well as to comment on.

Controlled access required software engineering resources to determine and enable access permissions to various component code bases as well as have releases be open. This cost has been eliminated with the move to open source.

Community Approach to Software Development

Vetting / Validation

Each component has a different set of requirements that are documented in various GitHub places.

There is a preliminary testing requirement that a contributor must do.

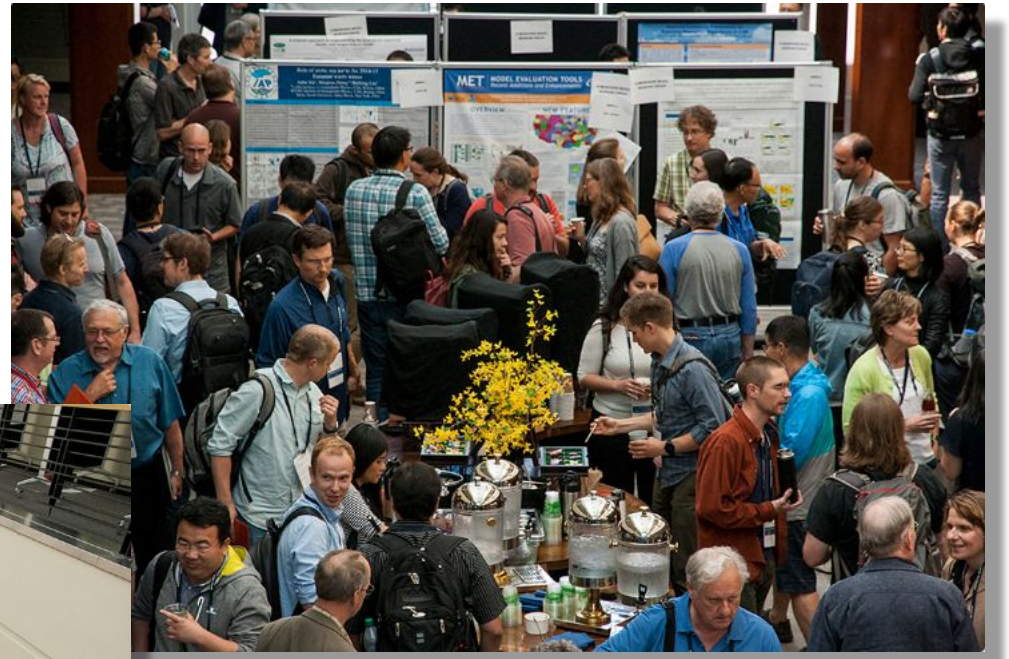
When a pull request (PR) is submitted to GitHub, a contributor asks for reviewers of their contributions.

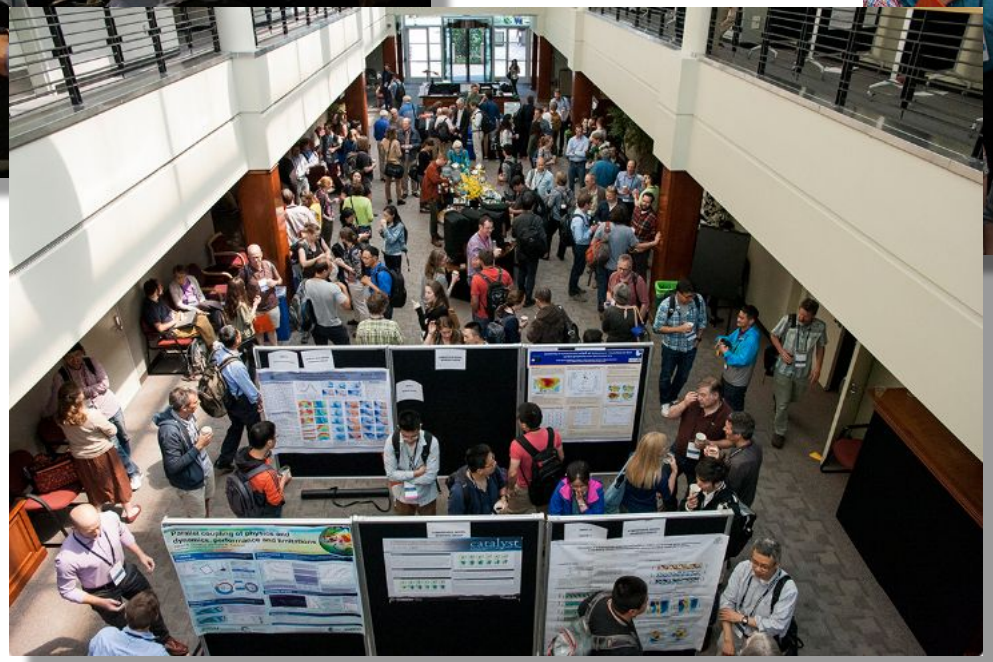
GitHub provides a very user-friendly access to the differences introduced by the code along with the ability for reviewers to point out concerns and ask for changes in specific locations of the code base.

All discussions related to the PR are documented in the PR request page.

The related science is reviewed by the relevant WG and the SSC – the latter when needed.

Annual CESM Workshops and Winter Working Group Meetings





Attendance

In-person: 300-400

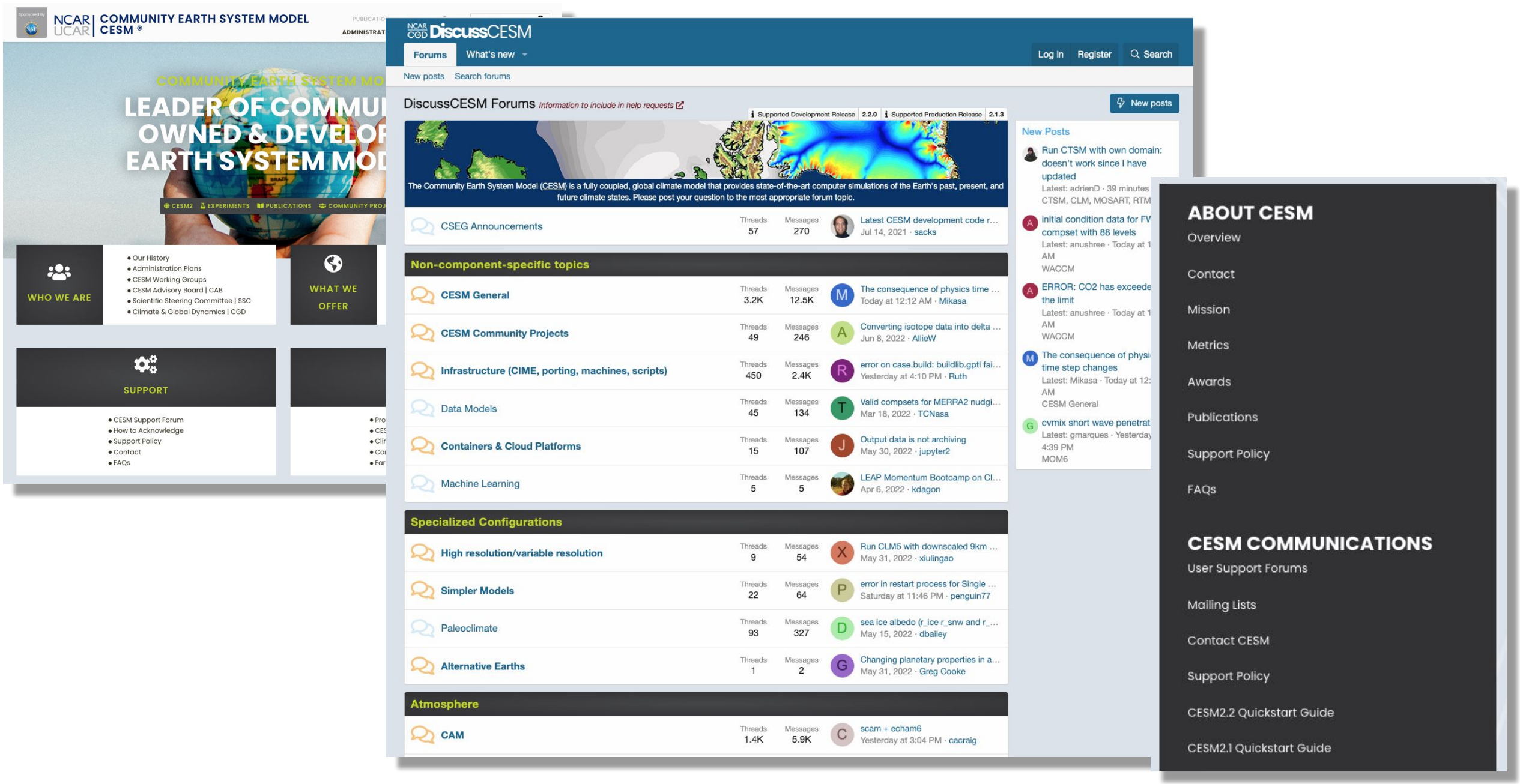
Virtual: 700+

CESM Distance Learning Course

Free lectures & practical sessions on simulating the climate system and running CESM on your desktop

Based on the CESM Tutorial held annually at NCAR in Boulder, Colorado. This course
lectures and 4 practical sessions on simulating the climate system and practical s
running CESM, modifying components, and analyzing data.

Annual CESM Tutorials and Tutorials at AMS & AGU Meetings

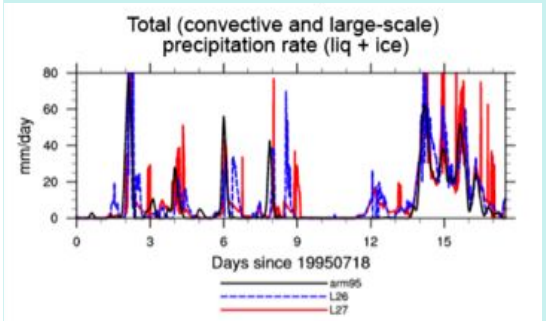

NCAR | UCAR COMMUNITY EARTH SYSTEM MODEL CESM ®
LEADER OF COMMU
OWNED & DEVELOP
EARTH SYSTEM MOD
CESM2 EXPERIMENTS PUBLICATIONS COMMUNITY PROJ
WHO WE ARE
• Our History
• Administration Plans
• CESM Working Groups
• CESM Advisory Board | CAB
• Scientific Steering Committee | SSC
• Climate & Global Dynamics | CGD
WHAT WE OFFER
SUPPORT
• CESM Support Forum
• How to Acknowledge
• Support Policy
• Contact
• FAQs
NCAR CGD DiscussCESM
Forums
What's new
Log in
Register
Search
New posts
Search forums
DiscussCESM Forums Information to include in help requests
New posts
Supported Development Release 2.2.0
Supported Production Release 2.1.3
The Community Earth System Model (CESM) is a fully coupled, global climate model that provides state-of-the-art computer simulations of the Earth's past, present, and future climate states. Please post your question to the most appropriate forum topic.
CSEG Announcements
Threads 57
Messages 270
Latest CESM development code r…
Jul 14, 2021 · sacks
Non-component-specific topics
CESM General
Threads 3.2K
Messages 12.5K
The consequence of physics time …
Today at 12:12 AM · Mikasa
CESM Community Projects
Threads 49
Messages 246
Converting isotope data into delta …
Jun 8, 2022 · AllieW
Infrastructure (CIME, porting, machines, scripts)
Threads 450
Messages 2.4K
error on case.build: buildlib.gptl fai…
Yesterday at 4:10 PM · Ruth
Data Models
Threads 45
Messages 134
Valid compsets for MERRA2 nudgi…
Mar 18, 2022 · TCNasa
Containers & Cloud Platforms
Threads 15
Messages 107
Output data is not archiving
May 30, 2022 · jupyter2
Machine Learning
Threads 5
Messages 5
LEAP Momentum Bootcamp on Cl…
Apr 6, 2022 · kdagon
Specialized Configurations
High resolution/variable resolution
Threads 9
Messages 54
Run CLM5 with downscaled 9km …
May 31, 2022 · xiulingao
Simpler Models
Threads 22
Messages 64
error in restart process for Single …
Saturday at 11:46 PM · penguin77
Paleoclimate
Threads 93
Messages 327
sea ice albedo (r_ice r_snw and r_…
May 15, 2022 · dbailey
Alternative Earths
Threads 1
Messages 2
Changing planetary properties in a…
May 31, 2022 · Greg Cooke
Atmosphere
CAM
Threads 1.4K
Messages 5.9K
scam + echam6
Yesterday at 3:04 PM · cacraig
New Posts
Run CTSM with own domain: doesn't work since I have updated
Latest: adrienD · 39 minutes
CTSM, CLM, MOSART, RTM
initial condition data for FV compset with 88 levels
Latest: anushree · Today at 1 AM
WACCM
ERROR: CO2 has exceede the limit
Latest: anushree · Today at 1 AM
WACCM
The consequence of physi time step changes
Latest: Mikasa · Today at 12: AM
CESM General
cvmix short wave penetrat
Latest: gmarques · Yesterday 4:39 PM
MOM6
ABOUT CESM
Overview
Contact
Mission
Metrics
Awards
Publications
Support Policy
FAQs
CESM COMMUNICATIONS
User Support Forums
Mailing Lists
Contact CESM
Support Policy
CESM2.2 Quickstart Guide
CESM2.1 Quickstart Guide

CESM supports a range of climate science goals through a single model code base

Containerized (cloud) configurations are also available.

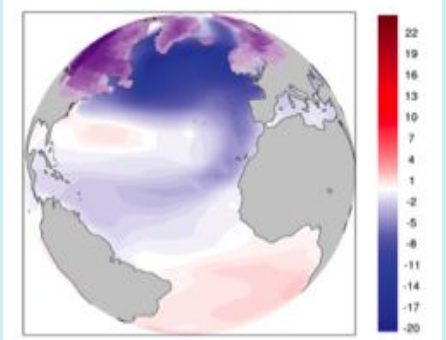
Desktop

Single column/
Coarse resolution:
Physics development



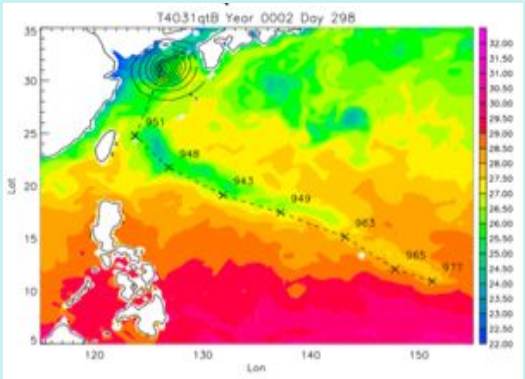
Small cluster

Low resolution:
Paleo applications,
University research



HPC

Medium & (Ultra)High Resolution:
CMIP, Large Ensembles,
New Frontiers



A few additional points ….

Have a good model w/ capabilities and community will come

Joint proposals and projects

CESM Awards: Distinguished Achievement and Graduate Student

Diversity is a key element!

Thank You!