

Paleoclimate Working Group Updates and Plans for 2021-2022

*Presenter: Esther Brady,
NCAR, co-chair*

Arne Winguth, co-chair, UTX/Arlington and Bette Otto-Bliesner, Lead, Paleoclimate Group, NCAR



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Paleoclimate Working Group Activities and Accomplishments

Completed CMIP6/PMIP4 Tier 1 simulations with CESM2

FV1x1: Available now on ESGF in CMIP6 formatted variables:

midHolocene

lig127k

midPliocene-eoi400

To be made available:

FV2x1: past1000 & 850CE control with CESM2-WACCM6

Publications in CESM2 AGU Special issue

Feng, R., et al.. JAMES, 2020 (PlioMIP2 CESM2, CESM1.2, CCSM4 simulations)

Otto-Bliesner B., et al. PP, 2020. (CMIP6/PMIP4 CESM2 midHolocene & lig127k)

Zhu, J., et al. GRL, 2021 (CESM2-CAM6 & CAM5 PMIP4 LGM)

Contributions to PMIP4 Special Issue in *Climates of the Past*

(lig127k: Otto-Bliesner et al. CP, 2020; midHolocene, midPliocene, AMOC, ENSO, ...)

PlioMIP2 simulations with CCSM4 and CESM1.2

Feng et al., JAMES, 2020. -Available on NCAR's Climate Data Gateway now

<https://www.earthsystemgrid.org/dataset/ucar.cgd.cesm4.pliomip2.html>

Further WG Activities

iTRACE project (Transient climate evolution from 20ka-11ka, w/iCESM1.3 at FV2x1)

He, C., Liu, Z. et al., Sci. Advances, 2021.

Transient ice sheet-climate evolution over the LIG (127ka-119ka) with CESM2-CISM2

Sommers et al, 2021, in prep. (see Joint LIWG/PWG session Feb. 5th 2021)

CESM2-CAM-SOM (1x, 2x, 4x, 8x CO₂) to explore state dependence of ECS

Zhu and Poulsen, GRL, 2020.

CESM2 DeepMIP Eocene simulations

Zhu, Poulsen, & Tierney, Sci. Advances, 2019; Zhu, Poulsen, & Otto-Bliesner, NCC, 2020.

In progress: applying new CESM configurations for multi-millennial Transient Holocene:

CESM2-CAMCHEM (response to volcanic aerosol emissions, ghg, LULC change, orbital)

CESM2-CISM2 (Transient climate-ice sheet evolution to ghg, orbital, vegetation)

2020-2022 CSL Allocation

- **Expanding capabilities for paleoclimate applications**
 - Test FV2x1 resolution CESM2-CISM2 coupled climate-ice sheet for long transient simulations, acceleration, spinups, etc.
 - Investigate the state dependence of cloud feedbacks in the CAM parameter space and make use of paleoclimate constraints to help guide choice of model parameters, with AMWG
 - Enable/test suite of geotracers (water & carbon isotopes) in all components of CESM2, and continued development into CESM3
 - Test development version of CESM2.2+ w/MOM6 for paleoclimates—LGM targeted
- **New Science & High-Value Community Simulations**
 - High-resolution CAM paleoclimate simulations (LGM, Extreme Warm past climates)
 - Proxy data comparisons, weather extremes, atmospheric rivers, tropical cyclones, ...
 - CESM2-WACCM6 for two paleoclimates: LGM+ midPliocene
 - Two transient multi-millennial simulations with CESM2-CISM2 for periods of major ice-sheet retreat and regrowth, (LIG→ glacial inception, Transient Holocene)
 - Investigating potential tipping points in the Earth system: response and feedbacks to meltwater during abrupt cold events of past climate reconstructions: the HS11 and 8.2ka events.

In Progress... updating www.cesm.ucar.edu/working_groups/Paleo

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PALEOCLIMATE WORKING GROUP **PWG**

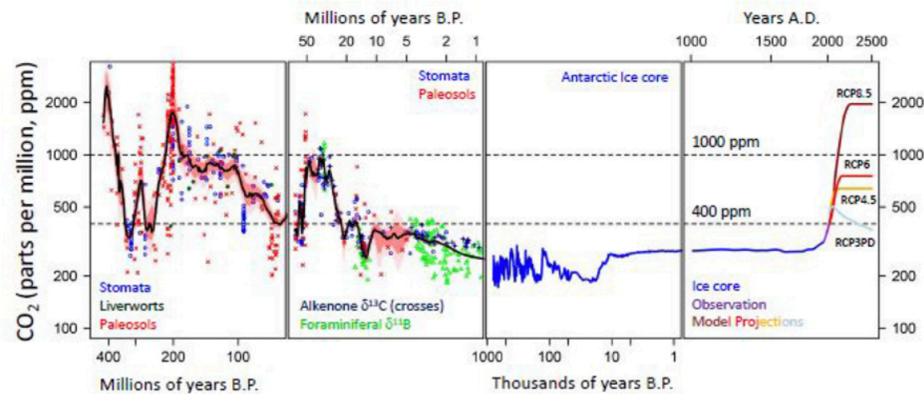
Overview

The Paleoclimate Working Group (PWG) is a consortium of scientists interested in modeling and understanding past Earth climates, allowing a long-term perspective on the nature of Earth-system change.

Members include participants from universities and laboratories worldwide, with interests ranging from early Earth to the recent millennium. Individually and as a community, we conduct scientific modeling experiments to establish relationships between forcings and feedbacks for specific time periods, and to explore the transient nature of these responses.

Comparing model results to observational data is an important component of the PWG efforts. We also test model components developed by other CESM working groups in a paleoclimate context and develop new capabilities that allow better assessment of model simulations against data. PWG workshops and meetings are open to the science community interested in knowledge obtained from past states of the Earth system; if you wish to attend future PWG meetings or stay connected with our activities, please subscribe to the [Paleoclimate mailing list](#).

One of the goals of the Paleoclimate Working Group is to allow the community to address scientific questions about past climates in Earth history using the CESM model. Refer to the online [Paleo resources](#) for background on the CESM code and dataset modifications that may be necessary for paleoclimate simulations.



PALEOCLIMATE WORKING GROUP INFORMATION

Overview

Priorities

Developers Guidelines

CESM1 Experiments

CCSM4 Experiments

CCSM3 Experiments

TraCE 21ka BP to Present

Last Glacial Maximum CCSM4

Last Millennium CCSM4 (CAM4)

Last Millennium Ensemble CESM1 (CAM5)

Paleo Resources

PALEOCLIMATE WORKING GROUP COMMUNICATION

Email: Members

Subscribe to Mailing List

Paleoclimate User Forums - DiscussCESM

WORKING GROUP INFORMATION

Overview

Co-Chairs

Co-Chairs Terms of Reference

Email Co-Chairs

NCAR Simulations

Recent/Notable

Past simulations (by model version)

Other (PlioMIP2 multi-version ensemble)

Contributed University Simulations

Paleo Resources

www.cesm.ucar.edu/working_groups/Paleo/resources.html

Setup and analysis tools and recipes, other codes, and compsets

CSL Proposals

CESM Publications

Co-chair information

Questions?

Thank You for listening!