Community Earth System Model (CESM) and CMIP6

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CESM2 Participation in CMIP6

Set I: Two nominal 1° model versions w/ CAM6 and WACCM6 atmospheric model components

Set II: w/ 2° versions of CAM6 and WACCM6, but otherwise identical (primarily DECK)

Diagnostic, Evaluation, and Characterization of Klima (DECK)

• Pre-industrial control
• 1%CO2
• 4xCO2
• AMIP

Eyring et al. (2016, GMD)
By the numbers ....

• ~1000 CESM2 simulations for CMIP6 have been run ..... 

• ~1.7 PB of compressed time series files have been generated 

• ~600 TB of compressed CMIP6 files (>830K files) from these simulations have been published on the ESGF 

• This data volume is ~7x the total from CESM’s CMIP5 contribution
The Community Earth System Model Version 2 (CESM2)

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http://www.cesm.ucar.edu/publications/
Ongoing engagement with CMIP science

• Continuing analysis of simulations and documenting results

• Performing several additional Tier 2 and higher simulations for several MIPs

• Identified some (minor) issues with ScenarioMIP simulations with the low-top model version; those have now been corrected, re-run, re-processed, and posted

• Participating in new MIPs, such as, AMOCMIP, CovidMIP, ....
CESM2 Large Ensemble (CESM2-LENS)

A collaboration / partnership with the Institute for Basic Science (IBS) Center for Climate Physics (ICCP) in Busan, S. Korea

• A 100-member ensemble for the 1850-2100 period, using the SSP-3.70 scenario for the future extension;
• 60 members have been completed;
• Anticipated completion date for the full ensemble is February 2021;
• Data are being transferred to NCAR and being CMORized; and will be available for use of the broader community via ESGF in late Spring 2021.
Appetite for CMIP7

Not much at the moment, however, we are moving towards the next generation CESM, CESM3, with many planned updates that include:

• A new ocean model,
• A new atmospheric dynamical core,
• Increased number of atmospheric vertical levels, ....

Also performing / pursuing:

• High-resolution simulations with 0.25° atmosphere and land coupled to 0.1° ocean and sea-ice models,
• Ultra high-resolution simulations with 5 km resolution in all its components.