Community MUSICAv0 Simulation

The Community MUSICAv0 CONUS simulations have been produced using the Community Earth System Model Release Version 2.2.0 with comprehensive tropospheric and stratospheric TS1 chemistry, using the spectral element (SE) dynamical core, with regional refinement over the contiguous U.S., having a grid mesh with approximately 1-degree horizontal grid spacing over most of the globe that refines to 1/8 degree (~14 km) over the U.S. Currently results are available for 2012-2013.

These results are available on the **NCAR Geoscience Data Exchange (GDEX).**

DOI: https://doi.org/10.5065/tgbj-yv18

We will also provide a model simulation without the regional refinement (ne30 resolution) for comparison.

Simulation details

This simulation included a few updates from the CESM2.2.0 code:

- Tagged CO tracers added to the standard MOZART-TS1 troposphere-stratosphere chemistry
- Corrected bug in MPAN chemistry (see Bugs and Updates)
- Add diagnostic output to CLM to allow for calculation of surface ozone from lowest model layer ozone
- Updated lightning and dust tuning
- Lower boundary conditions use SSP5-8.5 for 2015 onward
- Meteorology nudging uses 10% nudging (based on Davis et al., 2022, https://acp.copernicus.org/articles/22/197/2022/)
- Anthropogenic emissions: CAMSv5.1, available for 2000-2021
- Biomass burning emissions: QFED with FINN emission factors, available for 2010-2020
- DMS ocean emissions from OASISS
- Sea surface temperature file updated with data through 2021

Feedback

Please provide feedback on these simulations and requests for additional results with **this feedback form**.

Output variables

The chemical species provided in the output are defined and described in Table S1 of Emmons et al., JAMES, doi:10.1029/2019MS001882, 2020.

Additional variables are defined in these tables.

Definitions of saved variables

The file names of the archived results:
.cam.h0.nc files are monthly mean output fields on the 0.9x1.25 degrees regular horizontal grid;
.cam.h1.nc files are monthly mean output fields on the native grid;
.cam.h2.nc files are daily mean output fields on the native grid.

Variables in h0 files:

h0_output_varlist.txt

Variables in h1 files:

h1_output_varlist.txt

Variables in h2 files:

h2_output_varlist.txt