

Bugs and Updates

- [FHIST and F2000climo compsets not defined properly](#)
- [Regridding error](#)
- [Topography file error](#)
- [Advection error in SE](#)
- [CLM time-averaging bug affecting MEGAN emissions](#)
- [Chemistry mechanism bug](#)

Issues are ordered from most recent to least recent.

NOTE: The SE Advection error and CLM time-averaging errors are fixed in recent versions of CESM2.2.

FHIST and F2000climo compsets not defined properly

Date of report: December 2023

Title: Failure to build FHIST and F2000climo compsets

Issue: For CESM2.2 on Derecho, the default FHIST and F2000climo compsets are not defined properly.

Fix: Try using:

```
--compset HIST_CAM60_CLM50%SP_CICE%PRES_DOCN%DOM_MOSART_SGLC_SWAV_SIAC_SESP
```

Regridding error

Date of report: November 2023

Title: IPT NCL regridding code does not recognize ncl

Issue: Casper has problems loading modules within a script (should be fixed by Dec 1), such as https://github.com/NCAR/IPT/blob/master/Meteorological_Reanalysis_Data/Spectral_element_dycore/Gen_Data_ne0CONUSne30x8/Gen_MERRA2_ne0CONUSne30x8_mt12.csh

Model tags affected: Pre-simulation input data processing.

Fix: within a PBS script use:

```
source /etc/profile.d/z00_modules.csh
module load ncl
```

More information:

Sometimes the script crashes because it cannot find the log directory. Add the following lines to fix:

```
if( ! -d $MYLOGDIR ) then
    mkdir $MYLOGDIR
else
    echo "Directory exists"
endif
```

Topography file error

Date of report: February 2023

Title: Topography file error 2022

Issue: Regional refined topography was in the incorrect location/orientation

Model tags affected: NCAR_Topo_2_0_1 files for regional refinement. An erroneous topography file was specified for use when creating variable resolution grids between April 2022 and Jan 2023.

Model response: Gravity waves impacted, incorrect transport, chemistry fields displaced

Fix: Reprocess topography and re-run model simulations. If you created your own grid during that period please checkout the updated code at: <https://github.com/NCAR/Topo> and recreate your topography file for your grid and re-run any simulations. To check if your topography file has this error, plot ANGLL vs ANGLX. In a "good" topo-file these variables should have large differences. In a "bad" file they will be very close everywhere.

Also be sure to recreate any regridded met (GEOS or MERRA2) files that used the incorrect topo file.

More information: [AMWG Github issue 213](#)

Advection error in SE

Date of report: 2022

Title: Advection error in Spectral Element dycore

Issue: Spurious vertical transport was found over steep topography. The issue is described in this [AMWG GitHub issue #151](#).

Model tags affected: ???

Model response: ???

Fix: For CESM2.2.0 source code the correction is, in src/dynamics/se/dycore/prim_advance_mod.F90 (at l.578), replace:

```
elem(ie)%derived%dpdiss_ave(i,j,k)=elem(ie)%derived%dpdiss_ave(i,j,k)+&
    rhypervis_subcycle*eta_ave_w*elem(ie)%state%dp3d(i,j,k,nt)
```

with:

```
elem(ie)%derived%dpdiss_ave(i,j,k)=elem(ie)%derived%dpdiss_ave(i,j,k)+&
    rhypervis_subcycle*eta_ave_w*(elem(ie)%state%dp3d(i,j,k,nt)-dp3d_ref(i,j,k,ie))
```

More information: The correction for current development tags is provided in [CAM github issue #633](#).

Update Nov 1, 2022: Please see additional code fix described in [CAM github issue #678](#).

CLM time-averaging bug affecting MEGAN emissions

Date of report: 8 July 2022

Title: Incorrect calculation of MEGAN emissions

Issue: A bug has been identified in CLM that probably has affected most MUSICAv0 simulations.

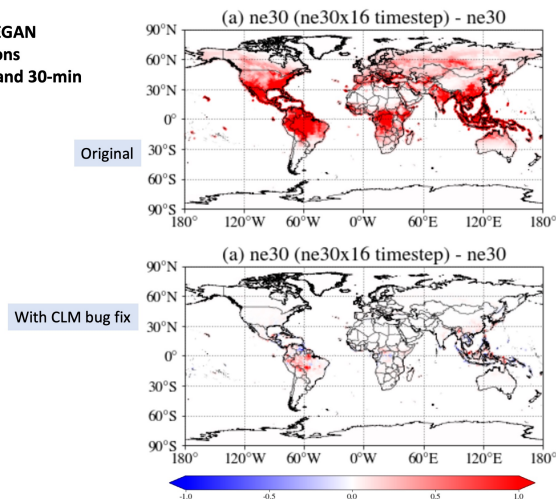
Model tags affected: MEGAN emissions, especially in regional refined simulations. MUSICAv0 simulations before July, 2022.

Model response: This bug results in erroneous calculations of the time-averaged (1-day, 10-days) temperature, photon flux, and other variables, that are used in the MEGAN biogenic emissions calculation (and elsewhere in CLM).

Fix: Added a fix to accumulation code CTSM/src/main/accumulMod.F90

In general, Isoprene emissions are reduced with the bug fix.

**Difference in MEGAN
Isoprene Emissions
Between 4-min and 30-min
model timestep**



More information: See discussion at the [CTSM GitHub issue #1789](#).

Chemistry mechanism bug

Date of report: 2021

Title: MPAN+M chemistry bug

Issue: In the TS1 and TSMLT1 chemistry mechanisms (compsets FCnudged, FCHIST, FWHIST, etc.) the MPAN+M reaction is not calculated because the user reaction refers to a reaction not in the mechanism (tag_MCO3_NO2 instead of usr_MCO3_NO2). This error does not exist in the TS2 chemical mechanisms.

Model tags affected: Not in versions CESM2.1 and prior. Found in version CESM2.2, May 2021. Fixed in version CAM6_3_019.

Model response: Missing chemistry.

Fix: Update chemical mechanism from:

```
[usr_MCO3_NO2] MCO3 + NO2 + M -> MPAN + M
```

to:

```
[tag_MCO3_NO2] MCO3 + NO2 + M -> MPAN + M. ; 9.7e-29, 5.6, 9.3e-12, 1.5, 0.6
```

More information: [CAM GitHub issue #364](#)
Contact Louisa Emmons with any questions.