

**GEOS-Chem Steering Committee Telecon
August 28, 2014 10-11:30 Eastern**

Attending: Daniel Jacob, Bob Yantosca, Jintai Lin, Emily Fisher, Jeff Pierce, Randall Martin, Jinqi Mao, Yuxuan Wang, Ray Nassar, Dylan Jones, Noelle Selin, Daven Henze, Andraea Molod, Dylan Millet, Kevin Bowman, Prasad Kasibhatla, Shiliang Wu, Lin Zhang, Jun Wang, Hong Liao

Missing: Mathew Evans, Colette Heald, Steven Pawson, Elsie Sunderland, Qiang Zhang

1. News (Daniel)

- Working on implementing HEMCO. Big project involving specialty simulations. But will be revolutionary. Several more weeks expected. Trying to hire an additional scientific programmer to accelerate. Proposed delaying release of standard model until implementation of HECMO, RRTMG, two-way nesting, and updated emissions. Agreement voiced to delay.
- Been soliciting funding for IGC7. Expect comparable level of support as for IGC6. Expect similar meeting structure.
- GIGC very close. Close to being able to run GC in stand alone in MPI using ESMF. Opens new horizons.
- Another development at GMAO, very high resolution (<25km, possibly 7km or 3.5km) global simulation of GC. These research products are exploratory and may not be appropriate for normal nested simulations.
- Working with GMAO to explore using GEOS-5 CTM structure for GC to offer seamless relation with parent GCM.

2. Update on v10.01 and GIGC (Bob)

- Progress with HEMCO going well.
- Mike Long preparing paper for GMD. GIGC scales very well. Work to implement in DAS being leveraged for other purposes. Need to remove area dependence from GC to run on cube sphere.
- Paul, Mat, and Jintai collaborating on global 0.25deg simulations.
- Discussion on use of HEMCO for CO only for demonstration and test of GIGC at high resolution. Bob notes that it should work as global tracer. Only need to setup input file a little differently. Daniel notes HEMCO already working with full chemistry.
- Prasad notes mistakes are easy to make with emissions. Bob replies that being investigated, but current results as expected. Will include in benchmarking.

3. Archiving of GEOS-FP met fields (Randall)

- Junwei Xu is continuing to prepare and archive GEOS-FP fields at 0.25x0.31deg, 2x2.5deg, 4x5deg resolution, and more recently at 0.5x0.67deg. Nested grids include North America, Europe, China, and Southeast Asia. Dalhousie upgraded storage facility to accommodate these additional fields. Data are available through our ftp site and also at Harvard.

- Junwei is also working with Bob Y. on some technical aspects of the 0.25deg simulation for China, and with Christoph Keller to prepare the European and Asian nested emissions for input into HEMCO.

4. Stratospheric benchmarking (Dylan J.)

- Document circulated contains a wish list. Some redundancy, but different perspectives. Climatologies exist through SPARC that could be used for evaluation for a large range of species. List could be shortened if desired, but value in looking carefully at vertical profiles of multiple species. Latitude/altitude cross-sections offer additional insight without needing comparison to observations. Tracer correlations can be considered to evaluate transport and would be most useful when met fields change. Discussion about choice of benchmarks. Andrea offers stratospheric fields from GMAO for comparison. Daniel notes this benchmark is expected for next release; will need to develop over the next few months. Effort needed if new observational databases are required. Dylan will lead development of benchmark process.

5. GMAO news (Andrea)

- Merra-2 half way through 4 streams. Anticipated release to public late 2014, early 2015. Forward processing (FP) system replaced with Merra-2 system.
- GEOS-5 ctm that includes cube-sphere transport handed over to Mike Long. Cube-sphere does not need pressure fixer. Guaranteed mass conservation. GEOS-5 CTM brings capability to track satellites like A-Train. GIGC development hooks in naturally. Also has passive tracer capability. Harvard will work with GMAO on this.

6. GFED-4 update (Prasad)

- Emissions for 1995-2013, ¼ deg resolution. Monthly right now. 3-hr and daily forthcoming. In conversation with GCST about implementing in HEMCO. Working on emission factors.

7. Model adjoint updates (Daven)

- Brought aerosol optics in line with forward model. In pipeline are more observational operators for OMI for NO₂ and SO₂ from Dylan J. group. Joint assimilation capability being implemented in more flexible manner. Lin Zhang has developed support for GEOS-FP at 0.25 deg resolution; expected soon.

8. Working group reports:

a) Adjoint model and data assimilation (Kevin, Dylan J.)

- Expect telecon on how to implement HEMCO into adjoint.

b) Transport (Dylan J.)

- Computationally inexpensive capability in GEOS-5.
- Daniel brings up problems in ozone vertical structure in tropics. Less convection in GEOS-FP than earlier models. Could organized vertical transport be lost in archived 3-hr winds. Can this be resolved by increasing convective mass fluxes to compensate? Discussion ensued on magnitude of effect. Discussion on effects of spatial versus temporal resolution.

c) Nested model (Yuxuan, Jun, Lin)

- Development of 0.25deg nested China simulation. Used SMVGEAR-II. Issues with KPP. No soil or lightning yet. In touch with Lee Murray on lightning. Will submit a bug fix and code update to Harvard and Dalhousie next week.
 - GEOS-FP 0.5deg nested met fields processing going for archive. 0.5deg simulation option almost ready for those who need it.
 - Jun generating NO2 profiles as prior for OMPS retrievals.
 - Andrea notes FP-IT availability at 0.5deg from 1990-onward that may be of interest.
- d) Sources and sinks (Jintai, Qiang)**
- Awaiting HEMCO capability.
- e) Chemistry-climate (Hong, Shiliang)**
- Rokjin Park's group has been working on CESM
- f) Carbon cycle (Ray, Kevin)**
- CO2 simulation updates on hold until HEMCO implemented. Ray preparing fluxes in hdf format for input.
- g) Hg and POPs (Noelle, Elsie)**
- PAH code in queue for v10. Offline coupling with ocean with MIT-GCM. Working with HEMCO for mercury emissions. Plans for spatial gridding for historical emissions.
- h) Organics (Dylan M., Emily)**
- Speciation finished for FINN as option for standard model. Working on acetone budget.
- i) Aerosols (Jeff)**
- May Fu, Eloise Marais, and Fay McNeill are updating aqueous SOA.
 - Gabrielle Curci representing GC for AEROCOM.
- j) Chemistry (Jingqiu)**
- Developed box model capability for GEOS-Chem from Barron Henderson.

9. Other Business

- Bob: new software development projects in Python under development. IDL becoming too expensive. Python software will be freely available and have capability for netcdf.
- Prasad: volatility-dependent Henry's Law constants could have 10-20% effect on SOA. Jeff will investigate.