GEOS-Chem Steering Committee Telecon
September 17, 2013 10-11:30 Eastern

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

Excused: Mat Evans, Jingqui Mao, Elsie Sunderland

1. **Status of v9.2 (Daniel)**
    - V9-2 release has been delayed a bit with many major updates
    - Two big ticket items remaining: acid uptake on dust (code was old, so taking some time to merge with current version), compatibility with GEOS FP
    - Note that Harvard group (with help of Dalhousie) has been running at ¼ degree during SEAC4RS, and FP seems to be working fine, but will take some work to put it in the standard code. Will perhaps incur a bit of a delay in v9-2 release, but an important update
    - V9-02q just approved

2. **Model Development Priority Updates (Daniel)**
    - V9-2 will be released by next telecon and we can discuss prioritization for v9-3 then

3. **GC Unit Tester (Bob)**
    - Wish-list discussion item from software engineering group during IGC6: desire to have a standard way to compile/debug GEOS-Chem with set of debugging traps.
    - Bob has put together an external package (can download from git, info on wiki) which can be used to specify types of runs to test, and will run everything with debugging flags and also once with single processor and then on multiple processors. This will be a more rigourous test for software updates which can be used by both the user community (before submitting updates) and for the Support Team.

4. **Status of GIGC (Bob)**
    - Mike and Christoph went to NASA in August. Christoph's emissions component was successfully implemented in GEOS GCM with a small set of input fields. Development on this front continuing.
    - Mike is cleaning up the build system
    - With regard to developing a stand-alone GIGC for MPI implementation: Chemistry, emissions components now working, interface with netcdf working. Have not yet started on the offline transport.

5. **GMAO news (Steven, Andrea)**
    - About to start MERRA2: replacement for MERRA, will be ½ degree resolution, will start with 2005 onwards, and then eventually go backwards. Issue is that NOAA satellites that are currently being using in MERRA are failing so need to bring in new data streams (IASI and others). Will build on the FP stream GMAO is working on. Will be a few changes in the output files from MERRA, but these changes will be compatible with the FP stream.

- GMAO production has all changed to the cube sphere grid, but they are mapping to lat-lon for users (mass conserving)

6. Benchmarking the nested model (Jun)

- Working on benchmark for nested grid and preparing a publication on this. Currently focusing on North American nested grid. Great progress on benchmarking!
- Jun provided presentation slides with results. In summary: sulfate simulation much improved (compared to 4x5) in nested grid (better correlation with IMPROVE observations), but little improvement in nitrate, the overall bias is reduced for BC & OC, surface O3 (from sondes) variability better captured as well.
- Some suggestions to add more surface data (O3, dust) to demonstrate the improvements with the nested grid.
- Some surprise at how poorly the 4x5 simulation performs for aerosols, particularly for sulfate. Lin Zhang looked at 4x5 last year and didn't see such a low bias. Jun and Lin will follow up.
- Dylan Jones & Daven Henze seeing problems with LINOZ in nested grid (negative STT values in the upper stratosphere): recommendation if using nested adjoint should use GMI chemistry, not LINOZ. The GCST will follow up on this problem.

7. **Model Adjoint Updates (Daven, Dylan J.)**

- Latest version released publicly has a few updates: allows for cost functions based on deposition, support for NEI2008
- In pipeline: updates for NEI2008 emissions, updates to the control vectoring, capability to do BC/IC optimization simultaneously, correction of bugs in ship emissions
- In development: implementation of HTAP emissions, ensemble Kalman filter for 4DVAR and 3DVAR code to be made available to the community (toolkit for CO2 simulation made available by Edinburgh group)
- Nested grid adjoint model is fully functional (other than issue with LINOZ), has been part of the standard release for some time.

8. Working Group Reports

a. Nested Model (Yuxuan, Jun, Lin)
    - Some compiler issues with nested code 0.25 degree over Asia, lagging behind the NA nested grid development, but continuing to work on resolving issues.
    - Currently verifying emissions code in nested grid, will be added to Jun's benchmark
    - Harvard group has prepared some movies at 0.25 degrees that show very nice structure; Daniel will send these to the Steering Committee
    - From SEAC4RS Havard group has identified some research problems: ammonia emissions too high over the US, issues with Criegee biradicals for SO2 oxidation. Big issue is the slow down: 6 hours for 1 day for NA grid!

b. Sources and Sinks (Jintai, Qiang)
    - Asian emissions being updated for years 2008 and 2010 at ¼ degree resolution

c. Chemistry-Climate (Hong, Shiliang)

- RF calculations in GEOS-Chem: Fangqun Yu has implemented his version of RT code (shotwave only) and sent it to Support Group. RRTMG version (longwave and shortwave) also implemented for standard simulation by MIT (Ridley/Heald), to be integrated in v9-3. Possibly need to harmonize these code updates, Hong will follow up.
- High resolution meteorology for GCAP simulation: GISS3, GISSE, CESM. To be available in Fall this year.

d. Aerosols (Colette, Jeff)
    - Two updates coming soon: SOA VBS (Rokjin Park), RH sub-grid variability effects on AOD (May Fu)

e. Chemistry (email from Jingqiu)
    - Barron Henderson wiki page on how GC concentrations change in response to individual reactions or processes; will be linked from GC website.
    - Update to linear stratospheric chemistry to include new species
    - Isoprene chemistry now published from Jingqiu, there is a wiki page. Paul Wennberg thinks that there are some updates that are critical (esp for nighttime chemistry), Harvard will be working with them. Related question about whether peroxy radical chemistry with nitrate that Emily has included in her PAN simulation should be included in updates. To be discussed with Mat.

f. Carbon Gases (Ray, Kevin)
    - In the pipeline: Tagged CO updates (consider for v9-3), CO2 simulation updates including new options for ocean flux, FF emissions and biosphere (have been having problems integrating this code with v9-2)

g. Hg and POPs (Noelle, Elsie)
    - Ran NRT Hg for NOMADS campaign and identified some issues with NRT met fields. Will be conveyed to SEAC4RS groups.
    - Nested grid Hg is now broken for current meteorology (GEOS5.2 was shut off in the middle of the NOMADS campaign). Need to run with FP and therefore modify simulation for this purpose. This is a priority item for WG.
    - Issues revealed in benchmarks for Hg/POPs: very sensitive to changes in deposition in the code, so may need more frequent benchmarks, under discussion in WG
    - Ocean chemistry (Hg/POPs) being put in MIT GCM, and eventually couple this into GEOS-Chem. This has already been done at JPL for CO2.

h. Organics (Dylan M., Emily)
    - 3-D VOC source for tagged CO runs
    - Major update in v9-3 on aromatics & PAN chemistry

i. Transport (Dylan J., Steven)
    - Intend to get this WG going by next telecon

9. Support Team (Randall)
    - Sajeev Philip finishing up at Dalhousie, so Randall soliciting applicants to join the Support Team at Dalhousie.