GEOS-Chem Steering Committee Telecon
December 5, 2014 10-11:30 Eastern

Attending: Daniel Jacob, Bob Yantosca, Colette Heald, Randall Martin, Daven Henze, Jingqiu Mao, Noelle Selin, Jeff Pierce, Dylan Millet, Emily Fisher, Ray Nassar, Shiliang Wu, Steven Pawson, Yuxuan Wang, Lin Zhang, Kevin Bowman, Jun Wang, Qiang Zhang

Missing: Mathew Evans, Prasad Kasibhatla, Hong Liao, Dylan Jones, Andraea Molod, Jintai Lin, Elsie Sunderland

1. **News(Daniel)**
    - Hired two new scientific programmers who will be full time on Support Team: Matt Yannetti and Lizzie Lundgren. Great to have additional staff to work on issues with improving legacy code, etc. as the model becomes more complex.
    - IGC7: aim to send out a registration email before Christmas. All funds committed for the meeting (Harvard, MIT, York all pitching in on logistics). Also aim to address some of the comments from IGC6 (see below).

2. **Model standard version update (Daniel)**
    - V10.1e released with HEMCO. Major project for Melissa, Bob, and Christoph. Good news is the process revealed some bugs.
    - RRTMG, emissions updates and 2-way coupling are next. Public release anticipated for early in 2015.
    - Good news that the major updates committed to at IGC6 will be implemented by IGC7
    - Now have a seamless code that works both with OpenMP and MPI, and can be implemented within an Earth System Model

3. **High performance computing with GEOS-Chem (Bob)**
    - Good progress on high performance code: ESMF, MAPL, FVdycore can now be compiled in a single step (specify HPC in the make). Currently running on Odyssey (Harvard supercomputer) and will be testing on Discover (NASA supercomputer). Soon available for beta testing (contact GCST if interested in testing). May need to plan for a WG to discuss this.
    - Also working on flexible precision (allows for compile with REAL4 or REAL8) which improves interface with GCM. Targeted for v10.0.1f
    - Request from Daven to also consider flexible declaration to COMPLEX which would facilitate sensitivity calculations. Seems there could be broad interest, but challenging to implement and would significantly increase memory usage. Would need to be implemented as a switch. Will be explored further.

4. **GMAO news (Steven)**
    - Now testing a hybrid assimilation system (3D variational system, ensembles), planning to integrate operationally in early 2015. First step towards a 4D system.

- MERRA-2 is filling up. Expect by end of February will have continuous timeseries from 1979-present. Then will phase out MERRA-1 which is rapidly running out of observations to assimilate.
    - MERRA-2 is ½ degree x 5/8 degree horizontal resolution. Includes aerosol assimilation which feeds back on climate.
- In about 2 years will do another re-analysis which will have major advances: ¼ degree, coupling to ocean and land.etc
- Excited about testing of grid-independent code with GCM

5. IGC7 planning (Randall)

- Updates: plan to have a meeting photo this year; scheduling of WGs in parallel is always a challenge, this year we will survey at registration to minimize conflict; guidance on WG sessions will be circulated; cap attendees 150-200 (120 is room capacity + we have overflow room), everyone ok with that, discuss again after we have pre-registration numbers
- Discussion: concerns about packed agenda but don't want to lengthen the meeting (balance of poster v oral), consensus to stick with plenary format (avoid parallel sessions); perhaps adding a HPC clinic, also a GMAO clinic; possibility of moving new user clinics etc. to a different day (earlier or later); poster sessions need better organization (numbering, more space, multiple sessions) so asking for poster session chair volunteers (Dylan M. and Lin volunteered).

6. GCSC nomination process (Daniel)

- Currently 25 members on GCSC, currently we have 10 WG, 8 members whose terms are ending at IGC7. If SC members chose to step down as WG chairs, can still stay as members at-large.
- Daniel will send an email to the community in February asking for interest to serve on the Steering Committee. And this can be discussed at next telecon
- Next telecon: also discuss whether we have the right WGs and whether any should be retired or modified in response to evolution of science & needs of community.

7. Model adjoint updates (Daven)

- Major update: Lin Zhang has developed the support for GEOS-FP in the adjoint. Already tested for global resolution, soon to test for nested grid, and hope to release that shortly.
- In the pipeline: Updates to observation operators (MOPITT, OMI), N2O simulation, updated isoprene chemistry in adjoint, porting UCX and HEMCO into the adjoint likely starting in January 2015.
- Some question about the status of FlexChem and whether this can be used with UCX. Bob mentioned that testing with Kappa solver (sp?) may lead to significant code speed-ups. Mike Long is motivated to work on this so likely to be implemented in early 2015.

8. Working Group Reports

a. Adjoint & Data Assimilation (Kevin)
    - Discussion of how additional set of tools not directly related to adjoint (e.g. error calculations) can be distributed across community.

b. Nested Model (Yuxuan, Jun, Lin)
    - Working on getting ¼ degree nested East Asia simulation working → update submitted to GCST. Encountered a lot of platform related errors (e.g. parallelization), missing

diurnal variability of emissions, Lee Murray helped get lightning NOx parameters for domain, missing scaling factors for dust emissions for domain. All these issues being addressed.

- Lin Zhang has been working on the capability to run ¼ degree simulation over more limited domain (to save on memory/time) within nested grid. Showed an example for Northern China.
- Interest from 2 groups in nested domain over Africa: Mat Evans and Harvard
- Jun Wang will be working on implementing ½ degree nested (from ¼ degree met fields). Dalhousie has processed met fields for all the domains forward in time (and Nested WG will go backward in time). Also waiting for HEMCO to be available to do this so don't have to re-grid emissions files manually.
- Working on implementing FINN in nested grid.
- Jintai emailed two issues in nested grid: (1) Over the eastern U.S., dry deposition velocity of O3 appears to be consistently (in space) lower than that in the global model. We are still diagnosing the issue. We don't see similar problems over Europe or Asia., (2) STE seems not be to optimized and is 2 times (or so) as high as STE simulated by the global model (in the respective regions). This issue appears to occur at all nested simulations. We are working to fix the high STE bias.

c. Sources and Sinks (Jintai, Qiang)
    - Prasad working on incorporating GFED4 into HEMCO. Early January target date. Q: on whether people would like to retain GFED3 functionality. Ray Nassar indicated that it would be ideal to keep GFED3.
    - After HEMCO released, will be adding new emissions fields: HTAP v2 (0.1 degree globally), EDGAR v4., Asian emissions from Qiang's group.
d. Chemistry-Climate (Hong, Shiliang)
    - New version of GCAP driven by GISS ModelE (at 2x2.5), still in process of evaluating
e. Carbon Gases (Ray, Kevin)
    - Testing HEMCO for CO2 and have found minor bugs that should all be addressed in this release.
f. Hg and POPs (Noelle, Elsie)
    - Atmosphere-ocean integration is going forward, anticipated that it will be operational by next telecon. Current code couples at the monthly timescale (for POPs). Kevin Bowman interested in higher temporal coupling; to be discussed.
g. Organics (Dylan M., Emily)
    - V10 shows a large increase in photolysis of acetone which degrades comparison with acetone obs, large potential impact on HOx. Emily working on this.
    - A student in Dylan Millet's group is working on porting several offline VOC (methanol, ethanol, carboxylic acids) simulations to the standard code.
h. Aerosols (Colette, Jeff)
    - Plan for discussion of BC aging at IGC7.

- Request that folks at Harvard/MIT working on implementing MOSAIC speak to Aerosol WG chairs about evaluating this before retiring ISORROPIA (as suggested is likely by Model Engineer's report).

i. Chemistry (Jingqiu, Mat)
   - Jinqiu will attend chemical mechanisms meeting at Davis and will report back on what learned about future directions.

j. Transport (Daniel)
   - Christoph Keller has been running Rn simulations online with GEOS DAS code vs. other versions of offline and online. Generally looks very good, no red flags about 2x2.5 transport.