GEOS-Chem Steering Committee Telecon
March 4, 2014 10-11:30 Eastern

Attending: Daniel Jacob, Bob Yantosca, Colette Heald, Emily Fisher, Jeff Pierce, Randall Martin, Jingqiu Mao, Yuxuan Wang, Ray Nassar, Dylan Jones, Jun Wang, Hong Liao, Noelle Selin, Daven Henze, Andraea Molod, Jintai Li, Dylan Millet, Mathew Evans, Kevin Bowman, Prasad Kasibhatla

Missing: Shiliang Wu, Steven Pawson, Elsie Sunderland, Qiang Zhang, Lin Zhang

1. **GCST personnel updates (Bob, Randall, Daniel)**
    - Junwei Xu working with Randall at Dalhousie, taken over the processing of the GEOS met fields, will also work on the CH and EU emissions for nested grid

2. **Status of v9.2 (Bob)**
    - Public release yesterday!
    - Compatible with GEOS-FP met fields, including ¼ degree nested grid (thanks to the SEACR4S team for NA grid assistance), Yuxuan Wang and nested WG working on Asian nested grid
    - TOMAS microphysics package fully integrated and parallelized with GEOS-Chem (thanks to Sal Farina)
    - Public comment period went very well. Several minor fixes identified for specialty simulations.
    - Official release, so all subsequent updates will be in v10.1

3. **Updated GC narrative description (Daniel)**
    - Updates and feedback provided to Daniel from the GCSC
    - All of the developments of v9-2 are recommended for co-authorship credit
    - Narrative and co-authorship credit both updated online

4. **Implementation of GIGC and HEMCO in the GEOS DAS (Bob, Steven)**
    - Coding progressing as well as integration in GMAO
    - HEMCO (Harvard-NASA Emissions Component), is a flexible linked list structure for emissions, drastic code cleanup, allows for easily inserting new netcdf emission files and emission scaling factors. Exciting new capability for GEOS-Chem!
    - GIGC (chemistry and deposition) and HEMCO are currently running in the free-running GCM, next step is to activate this in the DAS (Christoph Keller, Mike Long)

5. **Stand-alone GIGC (Bob, Kevin)**
    - Grid-independent chemistry component and the HEMCO emissions component can now be run in a stand-alone fashion with MPI and ESMF (new driver to call this). Do not yet have transport working with this.
    - Mike Long has demonstrated that this scales beautifully on many processors (ESMF wrapper uses MPI). So very close to over-coming computational challenges with ¼ degree
    - Transport: JPL has been collaborating with Mike Long.

- Also a separate activity led by Kevin Bowman (talking to GMAO) to consider using GEOS GCM transport algorithm (rather than TPCORE). Needs to be a future discussion between Harvard, JPL and Goddard to resolve which dynamical core will be used.

6. Progress in v10.1 developments (Bob, Daniel)

- Dry dep fix for GEOS-FP (required for SEACR4S) now in v10.1a
- Working on merging UCX (stratospheric code from Barrett group at MIT) into code for v10.1b
- HEMCO will be 10.1c (this will facilitate all the emissions updates to follow)
- GEOS-Chem Support Team will continue down the Model Development Priorities list for updates. We will close this version after 9 months.
- Mat Evans delivered FlexChem, Mike Long has been working with it. Continuing efforts on FlexChem, hopefully anticipated for v10.1. Will then need to re-write the code to remove bottleneck on tracers indices (perhaps a crowd-sourced coding session).
- Discussion about how integration of HEMCO will impact on-going work on emissions (particularly in CO2) and delivery of future emissions files. WGs and developers need to be aware of the change and work with Christoph on this.

7. GMAO news (Andrea)

- Steven Pawson has taken over at the head of GMAO, CO work will be taken over by Leslie Ott, Andrea will be taking over coupled chemistry-climate work.
- MERRA 2 is just about to begin, will take a year, but there will be some output available at ½ degree along the way
- In about a month, there will be an upgrade to system running GEOS-FP

8. Working Group Reports

a. Adjoint & Data Assimilation (Dylan J., Kevin)

- Last model release in January (v35C): bug fixes, working with ISORROPIA, new version of optimization scheme
- In the pipeline: incorporation of newer emission inventories (NEI 2008, HTAP), features for automatic aggregation schemes, plus additional items listed on wiki/trello
- Revising the wiki so that the WG activities in data assimilation are well represented (as well as the adjoint)
- Starting to think about adapting to grid-independent and HEMCO, but will wait on forward model finalized
- The first area of GIGC that would be targeted in this WG would be incorporating a 3DVAR capability in GIGC (adjoint to follow later)
- Starting to see a new direction in coupling of adjoint of GEOS-Chem with an adjoint of a land model

b. Nested Model (Yuxuan, Jun, Lin)

- Lin Zhang sent results comparing the aerosol simulation at different resolutions (4x5, 2x2.5, 0.5x0.67). Overall the statistics were comparable, with slight improvement for the nested grid. Looking for better metrics to show advantage of using nested grid.
- Some interesting differences where ammonium nitrate concentrations are biased high, but deposition is biased low. Is this precipitation issue? But not seen in sulfate.

- ¼ degree nested domain over East Asia: challenges running at Tsinghua with v9-02, continue to work on this, successfully running but only with timestep of 1 min for transport, 2 min for chemistry! Diagnosing the issue with compiler challenges
- Jun Wang has some concerns with the biomass burning inventory not available after 2011. GFED3 stopped in 2011, transitioning to GFED4

c. Sources and Sinks (Jintai)
    - HEMCO is the major development, will report more in the future
d. Carbon Gases (Ray, Kevin)
    - Working on CO2 code updates, making progress on resolving the server specific issues
e. Hg and POPs (Noelle)
    - Many new Hg/POPs features in v9.2
    - A lot of work on land and ocean interaction, which may be of interest to other simulations
    - Hg/POPs offline simulations are increasingly tied to full-chemistry (bromine, BC) so this WG will be interacting more with full chemistry in the future
    - Discussion about challenges of integrating MIT GCM (ocean) online to GEOS-Chem which is of interest to this WG and carbon WG
f. Organics (Dylan M., Emily)
    - With GEOS-FP, drop in isoprene emissions: there is some concern, but it has been decided that scaling is not justified
    - Dicarbonyl simulation continues as a separate mechanism, May Fu working on a KPP version of that, Rokjin Park working on integrating this into the nested grid simulation, something to potentially integrate in FlexChem
g. Chemistry-Climate (Hong)
    - Looking forward to RT update, CO2 effect on isoprene
    - Next priority is higher resolution met fields (2x2.5) for GCAP simulations
h. Aerosols (Colette, Jeff)
    - Plans to survey aerosol model capability use in community, possibly with a future telecon
    - TOMAS fully parallelized and integrated in GEOS-Chem in v9-2
i. Chemistry (Jingqiu, Mat)
    - FlexChem development continues.
    - Recent updates on isoprene chemistry, looks like a research question, but keeping an eye on this
j. Transport (Dylan J.)
    - Nothing to report from WG.
    - Daniel met with Karen Yu about resolving the vertical transport issue when we vertically average the winds. Idea to archive the downward and upward fluxes and use these to preserve maximum fidelity with finer resolution. Will be discussed at future transport WG telecom.

9. **Reviving the GC publications page (Randall)**
    - Previous publication page too time consuming to maintain, but useful to promote awareness within and outside community.
    - Randall used ResearcherID to compile GEOS-Chem publications, H-index of 57!
    - Junwei at Dalhousie will review every few months, add updates from outside the Steering Committee