GEOS-Chem Steering Committee Telecon
September 10, 2009 14:30-16:00 GMT

Attending: Daniel Jacob, Bob Yantosca, Colette Heald, Mat Evans, Peter Adams, Randall Martin, Prasad Kasibhatla, Yuxuan Wang, Rokjin Park, Max Suarez, Daven Henze, Dylan Millet, Kevin Bowman, Steven Pawson.
Absent: Dylan Jones

General Updates (D. Jacob, R. Yantosca, R. Martin)

- New beta release v8-02-03 will come out in the next few weeks: it will include KPP (Kumaresh Singh, V Tech), ICOADS ship emissions (Chulkyu Lee, Dalhousie), GEOS-5 assimilated local O3 columns (Claire Carouge, Harvard), diagnostic fixes (Jintai Lin, Harvard), and updated methane simulation (Christopher Pickett-Heaps and Kevin Wecht, Harvard)
- Immediate development priorities beyond v8-02-03 are as follows:
  - Linoz (Dylan Jones, U. Toronto) is ready and being sent to Harvard
  - TOMAS (Win Trivitayanurak, CMU) is going through final debugging.
  - CO2 simulation (Ray Nassar, U. Toronto) is ready to go.
  - Updated MEGAN (Michael Barkley, U. Edinburgh) is ready to go.
  - Aerosol optical properties update (Colette Heald, CSU; Randall Martin, Dalhousie; Jun Wang, U. Nebraska) will soon be ready.
  - Global 1x1.25 simulation (Lok Lamsal, Dalhousie) is ready to go.
- We now have a protocol in place for users to retrieve GEOS meteorological data for any custom simulation (such as a nested simulation over choice of window). The protocol is posted on the web site. It strikes the right balance between user responsibilities and community support. It will hopefully lead to a distributed met archive as users make the met fields that they download available to the rest of the GEOS-Chem community.
- The GEOS-Chem web site has gone through a general update, changes will be visible next week.
- Column code progress to date: almost all the model code has been columnized (converted to 1-D) by Bob Yantosca with help from Philippe LeSager. Work still needs to be done on emissions. The column version without emissions is ready to interface with the GEOS system at GMAO. Max Suarez, Bob Yantosca, and other interested parties will discuss implementation at a telecom in early October.
- Dalhousie has developed an ftp site parallel to the Harvard site to host GEOS meteorological data. It has overlap with Harvard's, is not as extensive, but will have unique data sets such as 0.5x0.625 GEOS-5 data for NA and EU nested grids for 2005. A catalog will be posted on the wiki of met fields available from Dalhousie.

Regional AQ WG Report (R. Park & Y. Wang)

- The Regional AQ wiki has been established, with basic description of nested model and how to run it, along with access to the GEOS2CMAQ linking tool for interfacing GEOS-Chem to CMAQ . The linking tool can be readily adapted to other regional models.

- Version 3 of linking tool is under development for use with the latest versions of GEOS-Chem and CMAQ. It is currently being tested by Daewon Byun.
- Yuxuan Wang is collaborating with the Dept of Computer Science at Tsinghua to improve the computational performance of the nested simulation. They have achieved a 30% improvement by fixing suboptimal code in TPCORE and updating compiler options. TPCORE in the nested model is different from that in the global model after version 8-2 and therefore those improvements cannot be ported to the global model. However, the Harvard GC support group has found a 10% gain in the global simulation from using the improved compiler options.

Aerosol WG report (C. Heald w/ Peter Adams special update)

- Special update on TOMAS integration from Peter Adams: Win Trivitayanurak has been working to merge TOMAS into v8-02-01, with help from Claire Carouge. The CMU group is working to fix a bug when running with GEOS-4. TOMAS is not parallelized for now.
- Optics: Randall Martin has run Mie code for the new size distributions for soot, OC & sulfate & dust– it does substantially modify optical properties. He and Jun Wang are discussing and finalizing these results. Once they are happy, Colette Heald will do a quick benchmark to see the effect of these changes before submitting them to the GEOS-Chem support team along with updated code for online AOD calculation.
- ISORROPIA II: Havala Pye (Caltech) has debugged the code but is waiting on Thanos Nenes for feedback before she submits it to the standard code.
- Harvard is presently working on improving aerosol scavenging by cold clouds and snow (Chris Holmes, Qiaoqiao Wang).
- Colette Heald has submitted an aerosol benchmark code to the GEOS-Chem support team (IMPROVE and PM2.5 measurements only for now, room for further development for those interested). It will be used in the next 1-year benchmark run.
- Aromatic SOA: Daven will work on this following finalization of the adjoint code
- Gabriele Curci has completed GEOS-Chem simulations for the AEROCOM OA intercomparison.

Emissions WG Report (R. Martin)

- Aaron van Donkelaar and Lok Lamsal (Dalhousie) have been preparing nested grid emissions for North America, including updates of US emissions to NEI 2005 which will be available for both the nested and global grids.
- Rynda Hudman has been updating soil NOX emissions in GEOS-Chem, following the work of Neil Moore at Dalhousie.
- GFED3 biomass burning emissions are still in the works. Prasad Kasibhatla is the point of contact.

Carbon Gases & Organics WG Report (D. Millet)

- LINOZ code is ready to go (Dylan Jones, U. Toronto)
- CO2 simulation by Ray Nassar (U. Toronto) will be ready to go in the standard code by end of September

- The U. of Edinburgh group (Paul Palmer) will be contributing GEOS-Chem results to the TRANSCOM intercomparisons for CO2 & CH4
- Mike Barkley (U. Edinbugh) has implemented an improved version of MEGAN that is in line with the current official release from Alex Guenther (v2.4), and includes improved LAI from MODIS. Global emissions for isoprene change by 20% - regional emissions can change more.
- There is an interest in conducting nested CO_2 simulations (Yuxuan Wang). Should be no problem with the nested code but hasn't yet been done.

Chemistry & Oxidants WG Report (M. Evans)

- Still considerable uncertainty regarding isoprene chemistry at low NOx. Nothing in the literature offers a convincing solution.
- Mat Evans will organize an isoprene chemistry telecon soon to decide on the way forward.
- Global mean OH increased in 8-02-01 and is now on the high side of the observational constraints, but there's nothing immediate that we should do about it.

Adjoint & Assimilation WG report (D. Henze, K. Bowman)

- We have made significant progress updating and merging the adjoint model. Will release a version to a user subgroup in the next few days to test it out. Only process not implemented in adjoint is wet deposition. An adjoint of Linoz (self-adjoint) will also be constructed. No plan to move away from reverse winds for the adjoint of advection – it works fine.
- One issue is how to give credit. Construction of the adjoint has involved very collaborative, unpublished work. We are working on a protocol for code release that will ensure proper credit. Will pass it by the Steering Committee for approval.

GMAO Developments (M. Suarez and S. Pawson)

- MERRA GEOS-5 reanalysis with 0.5x0.625 resolution is now complete (1979- mid 2006) and available on disk
- The GEOS-5 operational system plans to transition to 0.25 resolution by the end of the year.
- Longer-term plan is to increase resolution to 1/8 degree on the cubed sphere by end of 2010. This would be GEOS-6. The code for transport on the cubed sphere will be an ESMF component usable both on-line and off-line (GEOS-Chem). Alternatively, GEOS-Chem may want to interpolate the cubed-sphere data on its current lat-lon grid – it shouldn't be bad and regridding code will be available for that.

Ensuring Proper Credit for Developers (general discussion)

- General GEOS-Chem use policy has tried to balance offering free access to the code and ensuring proper credit for code developers. This has worked well so far by maintaining the spirit of community among GEOS-Chem users. The feeling of the Steering Committee is that developers have generally received appropriate credit for their work and that proper incentives are in place for developers to share their code with the community through the standard model. However, as

the model and its history become more complicated, and as the user community grows and becomes more diverse, it is useful to offer “best practices” guidelines for giving credit.

- The protocol for giving credit is simple when the code leads to a publication. In that case, co-authorship to the developer is warranted if the code was accessed prior to publication; beyond that, citation is appropriate and sufficient. The protocol is trickier when the development is for a general facility that doesn’t lead to specific publication (such as upgrade to GEOS-5, development of adjoint).

- Developers should be encouraged to publish their work so that it can be properly documented and cited, even when the development is not of scientific interest per se. There are journals that will accept such papers and the reward is clarity in credit and a lot of citations.

- It was agreed that having a list of recent standard model developments for which co-authorship offers to developers is recommended should be posted on the web/wiki. This list could be prefaced by a statement of general protocol and it could be reviewed and updated by the SC on a 3-month basis. Daniel Jacob and Daven Henze will produce a draft for review by the SC.

- We need to make new users sensitive to the good practice of offering co-authorship credit to critical GEOS-Chem developers. This has to be reinforced periodically, but one way to make new users aware is with a README message that must be accepted before downloading the code. Daniel Jacob will produce a draft for review by the SC.