

**GEOS-Chem Steering Committee Telecon  
February 15, 2012 15:00 GMT**

**Attending: Daniel Jacob, Bob Yantosca, Randall Martin, Colette Heald, Prasad Kasibhatla, Jun Wang, Daven Henze, Jingqui Mao, Loretta Mickley, Dylan Jones, Steven Pawson, Hong Liao, Dylan Millet, Noelle Selin, Paul Palmer, Ray Nassar, Kevin Bowman**

**Absent: Mathew Evans, Yuxuan Wang, Jeff Pierce, Lyatt Jaegle**

**Progress of v 9.1.3 (D. Jacob)**

- going relatively smoothly, small delay apparent bug in PARANOX code, waiting for Mike Long's return from China to put grid-independent model updates in before other large changes
- anticipate will be delivered by next telecon

**Grid-independent model, GEOS-5.7.2, netCDF, retiring GEOS-3 (R. Yantosca)**

- Mike Long in Beijing attempting to interface grid-independent version of GC with their GCM (a version of CAM). He has been able to get the model running in this framework (grid not hard-wired, but re-gridding overhaul still required for full flexible coupling) but has put together a laundry list of issues to resolve going forward. Next step will be implementing ESMF wrapping for delivery to GEOS-5. Timescale of months.
- GEOS5.7.2 now operational data product (0.25x0.3125 with same vertical grid and time res as MERRA). Many modifications follow previous MERRA updates so in good shape. Processing code finalized and GC code updating underway. SEAC4RS team will be the first customers of the product. Met data saved out will be netCDF (advantages for grid-independent work & parallelization). Met products saved at Harvard: 2x2.5, 4x5 and gridded SEAC4RS, others by request or locally for other groups. Randall will discuss with his group & Bob strategy for nested grid for NA.

**MERRA 2x.25 archive, regridding algorithm (R. Martin)**

- Matt Cooper finished 2x2.5 MERRA processing for 1979-2010, on Dal ftp site (~20 Tb on site)
- Matt Cooper continuing to work on re-gridding on the fly algorithm. Reasonably mature but verifying effectiveness for all conditions. Likely release by next telecon.

**Model adjoint updates (D. Henze)**

- Updates: support for new simulations (CH4, offline aerosols, full-chemistry nested – very memory intensive so using US domain), strat-trop fluxes updated from Lee Murray and many observational operators
- Substantial code release this week (last release ~a year ago). Trying to track changes a bit better, updating the wiki, match forward model procedures.
- Nicolas Bousseres @ University of Colorado: part-time adjoint model support. Hope to smooth process of updating and release. Nicolas will get involved with GCST.

- Version numbering is tricky: this adjoint release is based on v8.02 of the forward model + all relevant patches/fixes through v9
- Need to communicate which new developments in the forward model are not adopted in the adjoint, so that older code can be maintained.

### **Benchmarking the nested model (J. Wang)**

- Have been burned by not benchmarking beyond full-chemistry: update to v9.1.1 in standard model was buggy in the nested model. Speaks to a need to benchmark at least the nested model for major releases.
- Plan for nested grid: focus first on NA nested grid (lots of good observational datasets). Jun's group will put this together. Follow structure of global benchmarks, and will request to have nested BC saved out from these, so that nested grid benchmark will simply follow. Main question is whether full year is necessary (TBD). Code will not be released until nested code is approved.

## **WORKING GROUP REPORTS**

### **Model adjoint and data assimilation (K. Bowman, D. Jones)**

- Lots of work across group (O3, CH4, CO, etc.), suite of new bottom up inventories for CO2 (ocean/terrestrial), on data assimilation side work on off-diagonals and Hessian

### **Chemistry (J. Mao)**

- Update on HO2 uptake (from Jingqiu) makes a big difference to CO, OH, O3 and PAN (all in right direction), but remains hypothetical, so decision will need to be made on whether this should be integrated in standard code. Circulate paper from Jingqiu after submission.
- Plans for evaluation of mechanism as we move to higher res? Currently ad-hoc (eg. transporting organic peroxides at Harvard, but not yet in standard code). No obvious issues have become apparent with nested grid. Grassroots approach to this.

### **Aerosols (C. Heald)**

- Call attention to the changes in v9.1.3 related to deposition updates which result in local increases/decreases in all aerosols. Encourage people to look at 1 year benchmark plots.
- Becky Alexander has a cloud pH calculation that improves agreement with sulfate isotopes. She has passed off to Tom Breider at Harvard to test against additional sulfate obs (does appear to improve summertime sulfate in Arctic). Pending this analysis will be submitted to standard code.

### **Hg & POPs (L. Jaegle and N. Selin)**

- Instituted a benchmarking simulation, publicly available with link on wiki. Noelle will be the primary contact for this.
- POPs simulation from Noelle's group is mature, waiting on paper before submission to standard code

### **Chemistry-Climate (H. Liao and L. Mickley)**

- Making progress ModelE 2x2.5 version to generate GCAP met fields later this spring
- RF calculation for SL species offline
- RF options:
  1. AER: currently offline, not with GC yet, plan to put AER online in GC (Colette working with Matt Alvarado to fund this)
  2. SUNY SW scheme in development
  3. Collaborating with Jun Wang (proprietary)
  4. Use monthly mean GC fields into GISS to calculate forcing (disadvantage: mismatch in met)
  5. Version with LIDORT online with adjoint (SW), but no LW. Also this is Rob Spurr's code and we can't distribute it to GC (ok for adjoint b/c Rob involved – Daven will discuss this with Rob).

### **Carbon gases and organics (D. Millet and R. Nassar)**

- CO2 nested grid for NA in pipeline for v9.1.3
- FF emissions inventories: CDIAC updates to be submitted soon, CO2 temporal resolution improvement probably by March-April, CO2 ocean/terrestrial fluxes (JPL), Wennberg group also working on alternate version of fluxes.

### **Nested Model (J. Wang)**

- No other updates

### **Sources and Sinks (R. Martin and P. Palmer)**

- Update from Tsinghua: EDGAR v4.1 (globally @ 0.1 1970-2005), tested 1 year and with nested, SO2, CO, NOx (no OVOCs). Expect to complete testing in period of months. Express GCSC interest in expanding this to other species.
- Tsinghua also working on pre-processor for Asian emissions in development (retain sectors)
- Geert : bug fixes ship emissions and Asian emissions
- Discussion of OVOC dry dep: doesn't make a big difference to O3, but ~30% differences to OVOCs (v9.1.3c benchmark)

### **GMAO news (S. Pawson)**

- GEOS5.7.2 turned on in August, includes an aerosol assimilation
- Efforts to resolve vertical motion have not progressed (resource backlog): when re-grid to lower resolution, missing vertical transport of trace gases, need to develop a parameterization. Since Bob is working on v5.7.2 would be good to know what to archive if GMAO knows what kind of parameterization they will implement. Will iterate with Bob in the next couple weeks.

### **Benchmarking simulations other than full-chem (P. Kasibhatla and D. Henze)**

- CO2 benchmarking need has been discussed, but haven't developed a plan for this yet.
- Add field to general benchmarking procedure: which simulations affected by that update. Not necessarily prompt a benchmark each time, but at least improve communication to that WG.

#### **Daily and hourly GFED3 emissions (P. Kashibhatla)**

- Sent an email to GCSC with details (daily/hourly available 2003-2010). Has completed 3-hrly and monthly runs, things look ok, there will be changes to input.geos. Has tested this with re-gridding, but not nested grid simulations. Discuss offline how to test the emissions for the nested grid. Will supply updated data files & patch to Support Team, will be part of v9.1.3. Will also make available on ftp site if anyone wants it sooner. Recommends removing option for GFED2 out of v9.1.3. Email to be sent to user list to warn on this.

#### **Options for maintaining up-to-date LAIs in the model (D. Millet)**

- Mike Barkley added capability to use year-specific MODIS LAI when updated MEGAN. Those fields are no longer being produced, so beyond 2008 will use a climatology. Possible options: go back to AVHRR datasets or else reproduce processing of MODIS LAI. Jim Collatz a possible resource for this. GEOS5 LAI is a static climatology, work on interactive terrestrial model (DGVM from CLM) in development (years scale).

#### **Improved guidelines for submission of code to standard model (R. Martin)**

- Randall draft text on guidelines for when to submit code and to incentivize submission. Welcomes suggestions and modifications on the text.

#### **GEOS grid (All)**

- GEOS-Chem grid: several groups have volunteered storage to Jack but there are additional software requirement. Have not developed interface yet. Real clamour for data distribution system was from China, but that has been resolved. Discuss this further at next meeting.