

# GEOS-Chem Steering Committee Telecon

## 24 August 2021

### Attending/Missing:

**Amos Tai, Andrea Molod, Andrew Schuh**, Barron Henderson, Becky Alexander, **Bob Yantosca, Chris Holmes, Christoph Keller, Daniel Jacob, Daven Henze**, Dylan Jones, **Dylan Millet, Eloise Marais**, Emily Fischer, **Fangqun Yu**, Hong Liao, Jeff Geddes, Jeff Pierce, **Jenny Fisher, Jingqiu Mao**, Jintai Lin, Jun Wang, **Kevin Bowman, Lee Murray, Liam Bindle, Lin Zhang, Lizzie Lundgren, Lu Hu, Lucas Estrada**, Mathew Evans, **Tzung-May Fu, Melissa Sulprizio**, Prasad Kasibhatla, **Pam Wales, Randall Martin, Sebastian Eastham, Yanxu Zhang, Yuxuan Wang**

### 1. General updates (Daniel)

- Thanks to Colette Heald (stepping down as Aerosols WG co-chair)
- Welcome to Lucas Estrada, new member of the GCST

### 2. Version 13.2.0 status (Melissa)

- 1yr benchmarks for tracer transport and fullchem were run and helped identify several issues that were fixed. Benchmark with Luo scavenging option is still in progress after a bug was fixed.
- Due to the delayed release version 13.2.1 will immediately follow version 13.2.0 with some bug fixes

### 3. Frequency of standard version releases (Lizzie)

- Now on to regular release cadence of every 3 months for X.Y versions
- Code freezes 7 weeks prior to GCSC meeting, with benchmarks to GCSC 3 weeks prior to meeting
- Scheduled freeze date of 13.3.0 is 2nd week of October

### 4. Plans for version 13.3.0 (Daniel)

- New layout of model development priorities tables identifies features being actively worked on for next update, queued features slotted for development, and other features not yet prioritized and in different stages of readiness.
- A new table will be added to identify features in continuous rolling update (such as GCHP adjoint)
- WG Chairs are tasked with updating the priorities tables with input from their WGs.

### 5. Updating offline emissions when algorithms change (Randall)

- When emission algorithms dependent on meteorological/environmental data are updated, the GCST at WashU will regenerate the full records of offline emission archives.
- Older emissions archives will be archived for a year

### 6. Problem with tropchem simulation (Melissa)

- The tropchem simulation appears to be broken, returns very low OH concentrations

- This is not due to 47L vs 72L because the two are consistent in troposphere when using full chemistry.
- Tropchem provides no performance advantage over 47L with full chemistry
- GCSC consensus is to decide to retire tropchem option, will be implemented in 13.2.0.
- Benchmark of 47L vs. 72L with full chemistry will be distributed to GCSC to confirm that there is no problem with 47L.
- Nested grid issues
  - Slowdown in performance of nested model noted in version 13.0 and beyond.
  - Problems near boundaries may reflect insufficient buffer grid cells.
  - Does TOMAS work with the current nested model?
  - Do current nested users use tropchem? That could cause trouble.
  - GCST will follow up on these issues.

## 7. Working Group updates & perspectives:

- **Mercury and POPs (Jenny, Chris, Yanxu)**
  - Updated Hg chemistry from Viral Shah to go into 13.3.0
  - Hg isotope model was developed by Yanxu Zhang's group with 7 isotopes as tracers, paper will be submitted soon
  - New scheme for Hg uptake by vegetation being developed by Noelle Selin's group at MIT.
- **Chemistry-Ecosystems-Climate (Amos, Lee)**
  - New GC-YIBS model allows full coupling with carbon cycle, developed and distributed by Xu Yue's group at NUIST
  - Simpler ecophysiology module developed by Amos Tai's group, does not include coupling to C cycle
  - GCAP 2.0 released, GISS future-climate met data for running GCAP and ICECAP served from U. Rochester for different climate scenarios.
  - GEOS-Chem simulation coupled to GISS GCM (GISS-GC) now working at U. Rochester including GEOS-Chem 13.1.0.
  - Future-climate ammonia emissions based on MASAGE available from Amos Tai's group

## 8. Advertising GEOS-Chem publications (Eloise)

- Need more visibility for our GEOS-Chem publications page so users keep track of what others are doing.
- Publications list is presently maintained by hand by Gongda Lu at UCL by bringing in new publications from ISI, Google Scholar doesn't have capability right now to recognize GEOS-Chem string for automatic updates.
- This is why users can't sign up to get Google Scholar updates when a new GEOS-Chem paper comes out.
- Eloise Marais will send lists of new publications to Bob Yantosca for inclusion in Newsletter to increase visibility.

- Users who do not see their publications show up in the Google Scholar page should contact Gongda Lu.

#### **9. SF6 transport problem (Andrea, Andrew)**

- GEOS-CTM has problematic SF<sub>6</sub> simulation, could be a pressure fixer issue or convection.
- Does GCHP have same problem? What about when using air mass fluxes instead of winds? GCST, Seb, and Transport WG will investigate. Get SF<sub>6</sub> protocol from Andrea and Andrew.

#### **10. Modularization of GEOS-Chem code (Lizzie)**

- Working on abstracting FAST-JX code to facilitate use in other models
- Will result in the capability of having multiple instances running in parallel (like HEMCO)
- Bob: Streamline and modularize KPP in the same spirit

#### **11. GEOS-Chem data portal at WashU (Liam, Randall)**

- New GEOS data portal at WashU is live and working
- Should be faster than Compute Canada
- Need users to test it - might be a few kinks with file permissions and missing files

#### **12. GCHP update (Randall, Seb)**

- Liam is conducting timing test with 2000 cores, achieves excellent scalability
- Doing tracer transport tests at c720 (12km) resolution
- Now an increasing number of groups using GCHP

#### **13. WRF-GC update (May)**

- New 2-way version of WRF-GC is now available.
- Will include APM microphysics in near future.
- Working on urban scale simulations down to a few hundred meters
- Using Version 3.9 WRF for now
- 

#### **14. CESM-GC update (Seb)**

- Is in beta and looking for beta-testers

#### **15. GMAO update (Andrea, Christoph)**

- GEOS-IT is getting rolled out to replace MERRA-2, has same resolution but new physics, scheduled to produce data archive from 1999 to present.

#### **16. GEOS-Chem website update (Lizzie)**

- Web designer at Harvard is redesigning the website and it's going live this week
- Send comments, ideas, or aspirations for the new website to Lucas Estrada

#### **17. GEOS-Chem fall tutorials (Bob)**

- Planning to have a fall tutorial for new GC users in late September.