Participant Call November 21, 2024

Participants: Stefano Galmarini, Christian Hogrefe, Jesse Bash, Paul Makar, Roberto San Jose, Colleen Baublitz, Chris Holmes

Special issue manuscript status

- **Active work:**
  - Activity 1: Makar et al. – critical loads ensemble analysis
    - Manuscript submitted (https://egusphere.copernicus.org/preprints/2024/egusphere-2024-2226/), open discussion period ended with 2 reviewer comments, revised version due December 26
    - Reviewer 2 asked about the effects of the model biases on the CL exceedances (e.g. all models are biased low for wet deposition). Paul is performing a simple bias correction and will then redo the CL calculations. He will do this only for NA where we have more speciated observations. Will probably add the bias corrected CL exceedance to SI. All other comments from reviewer 1 and reviewer 2 are pretty straightforward, may move the CL background material to the SI or appendix. Jesse shared a reference for a CMAQ deposition bias correction paper that could be relevant.
  - Activity 1: Kioutsioukis, Galmarini et al. – multi-model operational, probabilistic, and diagnostic evaluation and analysis of AQMEII4 grid models
    - Draft sent to modelers 11/21, request feedback by December 6
    - EPA internal review in December, targeted for submission in January.
    - Christian, Paul, Stefano and Iannis will continue monthly coordination calls.
  - Activity 1: Hogrefe, Galmarini, Makar, Kioutsioukis et al. - multi-model analysis of ozone dry deposition diagnostics (grid-aggregated and LU-specific) and LU information
    - Draft sent to co-authors and submitted to EPA internal review at the end of September.
    - Received co-author comments and both internal EPA reviews
    - Submission in December?
    - Christian, Paul, Stefano and Iannis will continue monthly coordination calls.
  - Activity 2: Khan, Clifton, et al. – observational constraints on stomatal conductance and point model sensitivity simulations
    - Manuscript submitted (https://egusphere.copernicus.org/preprints/2024/egusphere-2024-3038/), 1 reviewer comment, discussion period extended until December 7
  - Activity 2: Bash et al. – use of AQMEII4 flux measurement for optimization of selected STAGE resistances and application of revised STAGE formulation to hemispheric CMAQ simulations
    - updates: reran the optimization with Anam's data for all sites. Using Anam's stomatal conductance estimates changed the optimization results because they were higher than the original STAGE stomatal conductance estimates. Reran the hemispheric CMAQ simulation. Hopefully have a draft in January, internal review afterwards.
  - Activity 1: Baublitz et al. - analysis of Activity 1 wet deposition fields by looking at multi-variable relationships between fluxes and meteorology / concentrations to identify communalities in spatio-temporal patterns of model spread.

        - Presented work at CMAS, now preparing AGU poster building on the CMAQ presentation.
        - Feedback received as CMAS: can this work inform the placement of potential additional monitors?
        - Potential future work : Explore whether a machine learning approach such as a neural network, previously applied to attribute intermodel differences in the hydroxyl radical for CCMI in a publication by Nicely et al. (2020), could improve upon the current correlation analysis.
        - Will potentially initiate new analysis with Min Huang (University of Maryland), exploring the use of both AQMEII4 and HTAP datasets. This might potentially involve sensitivity simulations, if feasible. Will keep the group updated on the scope and progress of any such work.
    - Activity 2: Vogel et al. - error estimation analysis
        - Annika could not join today's call
        - Olivia, Stefano, and Christian will have a call with Annika in early December to scope out the potential manuscript
    - Activity 2 + Activity 1: Toyota et al. potential updates to GEM-MACH - how can results from Activity 2 be used to check/update the representation of dry deposition in regional modeling. The goal is to address negative ozone bias in GEM-MACH forecast system, looking at potential updates to dry deposition scheme (e.g. include VPD impacts on stomatal conductance which currently isn't included)
        - Kenjiro was not able to join the call. Based on prior exchanges, work is expected to resume in the new year
    - Activity 2: Lee, Makar et al. – physics-informed machine learning for potentially refining point model parameter values
        - Colin was not able to join the call. In an email update, he shared that he has not yet resumed working on this analysis but hopes to do so soon.
    - Activity 2 + Activity 1: Olivia's work with Nichole Ruiz on analyzing observed and modeled data at Bugacpuszta is expected to lead to a draft manuscript.
        - No recent updates. Based on an earlier exchange, this manuscript is still planned but there was no recent work to report

- **Potential work, currently lower priority:**
    - Activity 1: Lee, Soares, Makar, et al. – use of hierarchical cluster analysis for grid model intercomparison
        - The underlying paper (not AQMEII4 related) needs to be published first to establish the methodology before potentially applying it to the AQMEII4 data. Colin is working on the resubmission.
    - Activity 2: Lee, Makar, et al. – use of meteorological cluster analysis for point model evaluation

- **Published articles:**
    - Galmarini et al. (2021) Activity 1 overview technical note (https://acp.copernicus.org/articles/21/15663/2021/)
    - Hogrefe et al. (2023) analysis of EPA CMAQ NA simulations (https://acp.copernicus.org/articles/23/8119/2023/)

    - Clifton et al. (2023) Activity 2 overview manuscript (https://acp.copernicus.org/articles/23/9911/2023/)

- Brief discussion on potentially extending the SI submission deadline past next summer if there is still active work. The group was open to this and will revisit the question in the spring.
- The group also discussed potentially writing a "preface" / "summary" paper that highlights key takeaways and next steps.

Other Grid Intercomparison (Activity 1) Updates

- Model data updates:
    - No updates
- Data storage updates:
    - No updates

Other Point Intercomparison (Activity 2) Updates

- Laurens was not able to join the call, but provided an email update. In this update, he wrote that the MSc student is making some nice progress working on analyzing the Borden data on moisture limitations but that it was still too early to invite him to join the meeting. Depending on how the work progresses, he may join future meetings.

Next Call

The next call is scheduled for December 12.