Participant Call February 13, 2025

Participants: Stefano Galmarini, Christian Hogrefe, Jesse Bash, Colin Lee, Jon Pleim, Kenjiro Toyota

Special issue manuscript status

- **Active work:**
  - Activity 1: Makar et al. – critical loads ensemble analysis (https://egusphere.copernicus.org/preprints/2024/egusphere-2024-2226/)
    - Manuscript accepted January 14
  - 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/), 2 reviewer comments posted, discussion period closed
    - The revised manuscript and response to reviewer comments are due February 17, Anam has sent drafts of both documents out to co-authors on February 4.
    - **If you are a co-author, please review these documents and send any edits back to Anam ASAP if you haven't done so yet.**
  - Activity 1: Kioutsioukis, Galmarini et al. – multi-model operational, probabilistic, and diagnostic evaluation and analysis of AQMEII4 grid models
    - Currently in EPA internal review, one reviewer comment received, second reviewer comment expected anytime. Christian will continue to follow up.
  - Activity 1: Hogrefe, Galmarini, Makar, Kioutsioukis et al. - multi-model analysis of ozone dry deposition diagnostics (grid-aggregated and LU-specific) and LU information
    - Manuscript finished EPA clearance and approval to cover page charges, submitted January 18
    - Published as preprint in EGUSphere February 6 https://egusphere.copernicus.org/preprints/2025/egusphere-2025-225/
  - 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
    - Simulations are completed, generating figures, organizing these at the moment. Could show some results during the next call.
  - 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.
    - Colleen was not able to join the call. No updates via email.
  - Activity 2: Vogel et al. - error estimation analysis
    - Annika was not able to join the call. No updates via email.
  - 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)

- - The evaluation of an annual 2016 GEM-MACH run implementing the dry deposition module changes is ongoing
    - Additional work is also happening to implement the canopy shading effects into the operational version of GEM-MACH, this impact on model performance will also need to be quantified
    - The ultimate goal of this ongoing work is to settle on which changes to deposition to bring into the operational GEM-MACH model.
    - Extending the submission deadline to December 31 would help in preparing a SI manuscript describing this work
  - Activity 2: Lee, Makar et al. – physics-informed machine learning for potentially refining point model parameter values
    - No new results, but actively working on the project.
  - 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.
    - Olivia was not able to join the call. No updates via email.
  - Possibly related manuscript led by Paul and his postdoc: analysis and sensitivity of SO_2 deposition. Will revisit the discussion whether it would be a good fit for the SI once the analysis has progressed further.
    - Paul was not able to the join the call. No updates on this work via email
- Potential work, currently lower priority:
  - Activity 1: Lee, Soares, Makar, et al. – use of hierarchical cluster analysis for grid model intercomparison
    - No new work since the last call
- **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/)

Other Point Intercomparison (Activity 2) Updates

- Laurens was not able to join the call but sent an email to Christian sharing that his master student performed some sensitivity analyses with MLC-Chem at Borden Forest regarding assumptions about the soil moisture content and its impact on stomatal conductance and simulated deposition velocities. Using inferred soil moisture at a depth of 1.5m instead of the values specified for the AQMEII4 simulations significantly improved performance. The method used to infer soil moisture may be tested at other sites, and Laurens and his student may present their work to this group at a future call.
- David Simpson contacted Olivia about using the flux dataset prepared for her 2023 paper for a planned analysis of dry deposition in the regional CAMS program. Olivia asked Stefano and Christian to coordinate this request by reaching out to the observational data providers and responding to David.

- To date, all data providers except the PI for Auchencorth Moss and Easter Bush have responded and agreed to have their data - as prepared for the AQMEII4 effort – to be shared with David for this CAMS effort. The data providers also confirmed that the site-specific data use policies prepared for AQMEII4 will apply for this request, and this information will also be shared with David
- In a follow-up exchange with Stefano, David also expressed interest in obtaining the dataset of estimated effective stomatal conductances Anam prepared for her paper. Christian has reached out to Anam for her consideration of this request.

Next Call

The next call is scheduled for March 13, 2025.