Participant Call March 13, 2025

Participants: Paul Makar, Jesse Bash, Stefano Galmarini, Christian Hogrefe, Rohit Mathur, Kenjiro Toyota, Colleen Baublitz

Special issue manuscript status

- **Active work:**
  - Activity 1: Makar et al. – critical loads ensemble analysis (https://egusphere.copernicus.org/preprints/2024/egusphere-2024-2226/)
    - Page proofs were received and processed, several iterations occurred to update references and the code and data availability statements
  - Activity 2: Khan, Clifton, et al. – observational constraints on stomatal conductance and point model sensitivity simulations (https://egusphere.copernicus.org/preprints/2024/egusphere-2024-3038/)
    - Revised manuscript submitted.
  - Activity 1: Kioutsioukis, Galmarini et al. – multi-model operational, probabilistic, and diagnostic evaluation and analysis of AQMEII4 grid models
    - Manuscript submitted and picked up by a handling editor.
  - Activity 1: Hogrefe, Galmarini, Makar, Kioutsioukis et al. - multi-model analysis of ozone dry deposition diagnostics (grid-aggregated and LU-specific) and LU information (https://egusphere.copernicus.org/preprints/2025/egusphere-2025-225/)
    - Published as preprint in EGUSphere February 6, one reviewer comment posted
  - 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
    - Focused on this manuscript over the past month.
    - Found a units issue with the Ispra soil moisture input data, rerunning now, likely won't have a huge impact (the soil moisture data was documented as volumetric concentration but was actually fractional and needed to be multiplied by the saturation soil moisture to obtain volumetric concentration)
    - Refined the optimization technique and the approach to separate the data between training and validation datasets, this results in smaller confidence intervals for the optimized results. The optimization focuses on soil and cuticular resistance.
    - Plans to finish all simulations by next week and then write after that.
    - Jesse shared slides showing his work.
  - 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.
    - Started to break down the analysis into different regions: northern Mexico, California, Alberta, Midwestern U.S., Gulf coast
    - Will update the analysis code to include HSO_3^- when analyzing sulfate
    - May explore precipitation bias adjustment
      - Paul had a high-level look at precipitation performance for his manuscript and it did not seem to be major driver of performance for wet deposition

        - Christian will share the location of the matched observation / model pairs for hourly precipitation at met stations, daily precipitation at CAPMoN sites, and weekly precipitation at NADP sites
    - Colleen aims to have draft manuscript in late spring / early summer.
- Activity 2: Vogel et al. - error estimation analysis
    - Annika was not able to join the call, but provided an update via email that she was working on other projects over the past few months. She plans to resume AQMEII4 analysis by May and noted that she may still be able to contribute a manuscript if the special issue deadline is extended to the end of the year (as it will be).
- 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 showed results from several reruns of GEM-MACH for 2016 with updated cuticular resistance and in-canopy aerodynamic resistance. The new simulations showed some improved ozone performance compared to the base configuration
    - As a next step, Kenjiro may try to implement an updated canopy code soon
    - Kenjiro will coordinate with Paul and other colleagues on whether this work can lead to a manuscript before the end of the year when the SI will close. Will assess this by summer. Kenjiro expects to spend 10-20% of this time on this through the summer
- 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, no updates via email
- 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's postdoc may join a future meeting to provide an overview of his work.

- Potential work, currently lower priority:
    - Activity 1: Lee, Soares, Makar, et al. – use of hierarchical cluster analysis for grid model intercomparison
        - Colin was not able to join the call, no updates via email
- **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 that he may be able to join the April call.
- Stefano and Christian shared the flux dataset prepared for Olivia's paper and the effective stomatal conductance dataset prepared for Anam's manuscript with David Simpson after coordinating with Olivia, Anam, and the observational data providers.

Next Call

Currently no further calls were scheduled beyond March. Christian proposed and the group agreed to extend the calls through the end of the year, continuing with the second Thursday of each month. Therefore, the next call will be on Thursday April 10 and an updated calendar invite will be sent out.