Participant Call June 12, 2025

Participants: Laurens Ganzeveld, Paul Makar, Stefano Galmarini, Jon Pleim, Jesse Bash, Christian Hogrefe, Kenjiro Toyota

Participant updates

Jon Pleim and Jesse Bash shared that they will be leaving EPA. Jon Pleim will retire and Jesse plans to continue his research at a group in Europe later this year. Stefano, Paul, and Christian thanked them for their many contributions to the AQMEII4 activity and wished them well for their future. Anyone interested in contacting Jon and Jesse can reach out to Christian to obtain their personal email addresses.

Special issue manuscript status

Stefano will ask Copernicus to extend the submission deadline to December 31, 2025.

- **Active work:**
  - 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/)
    - This manuscript was accepted for publication on Friday, May 9. Typesetting and page proofs are expected in the coming months, but Copernicus currently has a backlog for publishing accepted articles.
  - Activity 1: Kioutsioukis, Galmarini et al. – multi-model operational, probabilistic, and diagnostic evaluation and analysis of AQMEII4 grid models (https://egusphere.copernicus.org/preprints/2025/egusphere-2025-1091/)
    - Published as preprint in EGUSphere March 19 and open for discussion until June 19.
    - Three reviewer comments have been posted. Stefano has started drafting responses and has also reached out to Iannis and Paul for help with a few items. Iannis will rework some figures for better readability.
    - One reviewer asked a clarification question on the effects of the GEM-MACH canopy scheme on NOx which prompted some group discussions of that scheme originally described in Makar et al. (2017, https://doi.org/10.1038/ncomms15243). Laurens shared that the 2024 paper by Vermeuel et al (https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2024JD042092) may also be of interest in that context.
  - 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/)
    - Revised manuscript and response to reviewer comments submitted early May, two reviewer reports for revised submission submitted to editor on May 20 and June 1, waiting for editor decision
  - 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

        - Since Jesse will be leaving EPA, there are no longer plans to complete this manuscript for submission to the special issue. Jesse may pursue related work in his new research group but the scope and timing of any potential future manuscript resulting from such work would be outside the timeline for the special issue.
    - 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.
        - No updates since the last call
    - Activity 2: Vogel et al. - error estimation analysis
        - Annika shared via email that she hopes to resume her AQMEII4 work in a month.
    - 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 shared that he is proceeding with implementing the Makar et al. canopy shading effect into the forecast model. Once the code merging is done, will perform another annual simulation and repeat the model performance evaluation
    - Activity 2: Lee, Makar et al. – physics-informed machine learning for potentially refining point model parameter values
        - No recent updates
    - 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.
    - Possibly related manuscript led by Paul and his postdoc Stefan Miller: analysis and sensitivity of SO_2 deposition.
        - A draft manuscript has been prepared. Stefan may join a future call to describe this work.
    - Activity 1: Lee, Soares, Makar, et al. – use of hierarchical cluster analysis for grid model intercomparison
        - Paul shared that this work may be performed before Colin's physics-informed machine learning manuscript, but he will check with Colin on specific plans.
    - Activity 2: Potential manuscript based on Vladislavs' and Laurens' work with the MLC-Chem model using the Borden Forest data prepared for Olivia's AQMEII4 paper.
        - See the April 2025 call notes for a description of Vladislavs' research
        - Vladislavs is currently performing an internship, after finishing it, Laurens plans to discuss with him whether to develop a manuscript from his M.Sc. thesis.
    - Activity 2: Paul shared an idea for another potential manuscript. It would deal with answering the question what the effects of particle aerosol being captured by wet dep measurements but accounted for as dry deposition in the model are when comparing modeled wet deposition to observed wet deposition.
- **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/)
- Makar et al. (2025) Critical loads ensemble manuscript (https://acp.copernicus.org/articles/25/3049/2025/

Other Grid Intercomparison (Activity 1) Updates

- Data storage updates:
    - JRC sftp server decommissioned, final gridded model data and receptor extractions to be transferred to https server

Next Call

The next call is scheduled for Thursday July 10.