

# Participant Call January 16, 2025

Participants: Paul Makar, Stefano Galmarini, Christian Hogrefe, Jesse Bash, Colin Lee, Jon Pleim, Kenjiro Toyota, Aura Lupascu

## Special issue manuscript status

- **Active work:**
  - Activity 1: Makar et al. – critical loads ensemble analysis (<https://egusphere.copernicus.org/preprints/2024/egusphere-2024-2226/>)
    - Revised manuscript submitted December 19, manuscript accepted January 14.
  - Activity 1: Kioutsioukis, Galmarini et al. – multi-model operational, probabilistic, and diagnostic evaluation and analysis of AQMEII4 grid models
    - Currently in EPA internal review, comments expected by January 29.
  - 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, expect to submit January 17 or 20, alerted Joshua to the upcoming submission.
  - 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 will send drafts of both documents out to co-authors 1-2 weeks ahead of time
  - 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
    - There was a units error for ozone concentrations and fluxes in the header of the Bugacpuszta files that affected Jesse's original optimization work and he redid this analysis after accounting for this units error
    - Specifically, the actual ozone concentrations are in nmol/m<sup>3</sup> and the ozone fluxes are in nmol/m<sup>2</sup>/s as documented in Horvath et al. 2018 (<https://doi.org/10.1007/s10546-017-0310-x>) rather than the ppb and ppb m/2 units stated in the AQMEII4 files and documentation shared for this site. The site PI files show these units of nmol/m<sup>3</sup> and nmol/m<sup>2</sup>/s. During the reformatting of the data files provided by the site PI to the files distributed by AQMEII4, the units for the files distributed by AQMEII4 were hard-coded to ppb and ppb m/2, but no unit conversion was actually applied. No unit issue exists for the dry deposition velocities.
    - Jesse plans to work on the manuscript during January and February.
  - 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. Colleen was not able to join the call.
  - Activity 2: Vogel et al. - error estimation analysis
    - No updates. Annika was not able to join the call.

- 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 source code changes made in the research version were transferred to the operational testbed, will perform an annual simulation for 2016 with that testbed, analysis is ongoing. There may be some compensating effects on overall ozone forecast performance. Next updates will be to incorporate moisture dependencies into the scheme.
- Activity 2: Lee, Makar et al. – physics-informed machine learning for potentially refining point model parameter values
  - No new results, but updated the machine learning computational framework from TensorFlow to PyTorch, will proceed with this new framework, may have new results by the next meeting.
- 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 but shared via email that she still plans to pursue this paper.
- **Potential work, currently lower priority:**
  - Activity 1: Lee, Soares, Makar, et al. – use of hierarchical cluster analysis for grid model intercomparison
    - Colin has started to look at the gridded data (all data is archived at <https://jeodpp.jrc.ec.europa.eu/ftp/jrc-opendata/ENSEMBLE/data/model-data/>)
    - Christian shared the data dictionary.
  - 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/>)
- **Introduction / Preface Article:**
  - The group briefly discussed that it would be good to write a preface article summarizing key results and highlighting the contribution of each article in the SI. This would happen after the list of submitted and published articles is final.

#### **Other Point Intercomparison (Activity 2) Updates**

- Laurens was not able to join the call.

**Next Call**

The next call is scheduled for February 13, 2025.