Participant Call June 13, 2024

Participants: Stefano Galmarini, Jesse Bash, Ummugulsum Alyuz, Christian Hogrefe, Kenjiro Toyota, Colleen Baublitz, Colin Lee, Laurens Ganzeveld

Update on participant calls: Olivia is starting a new position starting in July. Going forward, all Activity 2 coordination will be handled during the regular overall AQMEII4 calls that cover updates from both Activity 1 and Activity 2, i.e. this series of calls. The invitation list to these calls has been expanded with all Activity 2 participants, and the main focus of these calls will be to check in on the status of manuscripts intended for the special issue. Dedicated calls for Activity 2 activity will only be scheduled on an as-needed basis.

Special issue: Stefano recently contacted Copernicus about extending the submission deadline and Copernicus granted an extension until July 31, 2025

- Active work targeted for the special issue:
    - Activity 1: Makar et al. – critical loads ensemble analysis
        - Paul send a revised draft manuscript to co-authors at the end of May. Please send comments to Paul by June 21, 2024.
        - The manuscript is also undergoing internal review at ECCC and EPA
    - Activity 1: Kioutsioukis et al. – multi-model operational evaluation and analysis of AQMEII4 grid models
        - Christian, Paul, Stefano and Iannis have monthly calls to review progress.
        - The plan is to expand upon the operational evaluation results presented at last year's ITM with an analysis of cross-variable variance (ozone concentrations, meteorology, deposition velocity, effective conductances) for selected subset of grid cells with common land use categories. This can provide a link to the manuscript on the multi-model analysis of ozone dry deposition diagnostics
        - Stefano asked Iannis for feedback on the desired paper structure so Stefano can organize the figures. Iannis is also creating some new figures for additional LU type.
        - Stefano may have a draft for co-authors by the end of July
    - Activity 1: Hogrefe, Galmarini, Makar, Kioutsioukis et al. - multi-model analysis of ozone dry deposition diagnostics (grid-scale and LU-specific) and LU information
        - Christian, Paul, Stefano and Iannis have monthly calls to review progress.
        - Christian continues writing the draft. The target for sending the draft manuscript to co-authors is August.
    - Activity 2: Khan, Clifton, et al. – observational constraints on stomatal conductance and point model sensitivity simulations
        - Anam recently defended her Ph.D. and sent a draft manuscript to Olivia.
        - After Olivia provides feedback to Anam, the goal is to revise the manuscript and then circulate a revised draft to co-authors in July.
    - Activity 2: Vogel et al. - error estimation analysis

        - During the last Activity 2 call, Annika shared that she is transitioning from her current position at Environment and Climate Change Canada to a new position in Germany in October.
        - She plans to continue working on the AQMEII4 application of her method as time permits. She will probably submit a manuscript on the methodology first before submitting the manuscript describing the application of the methodology to the AQMEII4 datasets.
    - 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
        - Jesse plans to incorporate Anam's stomatal conductance estimates into the optimization algorithm.
        - Draft manuscript late summer, plans to send initial draft to Laurens first
        - Christian will check on the status of Anam's data which she had planned to upload to the GoAnywhere site.
    - 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.
    - 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.
        - During the last Activity 2 call, Kenjiro reported that he recently worked on non-AQMEII projects but hopes to resume dry deposition work by the end of summer.
        - 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)
        - Once he resumes work on dry deposition, he will have a better sense on whether this might lead to a manuscript
    - Activity 2: Lee, Makar et al. – physics-informed machine learning for potentially refining point model parameter values
        - During the last Activity 2 call, Colin reported that he worked on other projects recently and hopes to resume his work on applying a physics-informed machine learning approach to the AQMEII4 datasets soon. He has all the data and scripts he needs for performing this analysis.
        - Once results are ready to be presented and/or published, he plans to contact contributing modeling groups and observationalists through Olivia and Christian to offer co-authorship.
    - Potential work, currently lower priority:
        - Activity 1: Lee, Soares, Makar, et al. – use of hierarchical cluster analysis for grid model intercomparison
        - 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/)

General Grid Intercomparison (Activity 1) Updates

- Model data updates:
  - 10709: Young-Hee completed reprocessing the LU-specific dry deposition diagnostic values for O3. She is now working on reprocessing the grid-scale and LU-specific diagnostics for the other three species for which diagnostics were reported by 10709, i.e. HNO3, HCHO, and SO2.
  - 10707: no updates from Richard
- Data storage updates:
  - No updates since the last call
- Colleen has started an 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. She plans to submit an abstract for the CMAS and/or AGU conference and currently aims to then expand this work into a draft manuscript intended for the special issue.

General Point Intercomparison (Activity 2) Updates

- Laurens may have a new student working on the AQMEII4 flux model dataset. Still need to define exact objectives to be complementary to other efforts, particularly Anam's work (as noted above, the current plan is for Anam's draft manuscript to be circulated to co-authors in July). Will probably focus on multi-layer canopy exchange model. May also look at potential constraints imposed by ground water. May look at this through a time scale lens (shorter-term VPD, seasonal scale soil moisture, maybe long term ground water).
- Question by Laurens: Is anyone in this group working on exploring whether there might be impacts of O3 deposition on GPP? This would be another very good use of the dataset assembled for AQMEII4. Answer: not currently. Colin offered to check with colleagues to see whether satellite products could be useful here. Laurens shared that for some previous work, reviewers were skeptical of using MODIS GPP as "observed" dataset of biomass.

The next call scheduled for July 11. The group briefly discussed whether to keep these calls monthly or move to bimonthly. It was decided to keep the call in July, skip August, and then revisit the question during the September call.