Participant Call October 10, 2024

Participants: Stefano Galmarini, Christian Hogrefe, Jesse Bash, Paul Makar, Ummugulsum Alyuz

Special issue manuscript status

- **Active work:**
  - Activity 1: Makar et al. – critical loads ensemble analysis
    - Manuscript submitted and in open discussion (https://egusphere.copernicus.org/preprints/2024/egusphere-2024-2226/), 1 reviewer comment received, review comment extended, no second reviewer identified yet.
  - Activity 1: Kioutsioukis et al. – multi-model operational, probabilistic, and diagnostic evaluation and analysis of AQMEII4 grid models
    - After Iannis updated the figures using the revised nomenclature discussed during the last fall, Stefano updated the text.
    - Iannis also added new analysis for variance decomposition of effective fluxes. For two of the WRF/Chem simulations, the sum of the effective flux variances is less than the variance of the total flux. Iannis is double checking these calculations. Follow-up with the UPM and NCAR groups on the ozone effective flux calculations may be required.
    - Stefano also added new figures provided by Christian comparing the land use distributions at receptor locations to those across all grid cells in the common domain.
    - Christian, Paul, Stefano and Iannis will continue monthly coordination calls.
  - Activity 1: Hogrefe, Galmarini, Makar, Kioutsioukis et al. - multi-model analysis of ozone dry deposition diagnostics (grid-scale and LU-specific) and LU information
    - A draft manuscript was sent to co-authors and submitted to EPA internal review at the end of September. Co-author were asked to send comments by the end of October. Christian will work on revisions in late October and early November and potentially target November for submission.
    - Christian, Paul, Stefano and Iannis will continue monthly coordination calls.
  - Activity 2: Khan, Clifton, et al. – observational constraints on stomatal conductance and point model sensitivity simulations
    - Manuscript submitted and in open discussion (https://egusphere.copernicus.org/preprints/2024/egusphere-2024-3038/), discussion period until November 20.
    - Anam also shared her flux-based stomatal effective conductance estimates via the project's GoAnywhere site, and they are available for anyone to use considering the following note about offering co-authorship to Anam, her PhD advisor, AQMEII4 participants, and/or site PIs as appropriate. Anyone with further questions is asked to reach out to Anam.

      "My flux-based egs estimates along with the CO2 flux (and GPP, Reco fields) are in the GoAnywhere directory. They are available for anyone in the activity to use for publications or other projects that do not lead to publications. I just request that a

publication that uses the egs or gs estimates offer co-authorship to me and my PhD advisor, Paul Stoy, in addition to anyone else involved in AQMEII4 that needs to be a co-author. The CO2 flux data was provided by site PIs, and many sites are public data providers. I don't need to be involved for the use of the CO2 data in publications as a co-author (the non-public site PIs would need to be offered co-authorship though). The author contributions part of Olivia's paper and my paper lists site PIs to contact.

My GPP, Reco, gs, and egs estimates were all calculated using previously published methods. If someone wants to use those methods to re-calculate these quantities from the data, then obviously I don't need to be involved as a co-author. I would only ask to offer co-authorship to me and my advisor if someone didn't necessarily want to get into re-calculating the quantities and wants to use my estimates.

On GoAnywhere, all egs and CO2 flux/NEE data (joined to original AQMEII4 flux data) is here: / (Home)>AQMEII4>ec_conductance

The NEE data was public for some sites. Some sites gave CO2 flux data with the original AQMEII4 flux data. Ramat Hanadiv is the only site that gave me CO2 data that is neither in the original AQMEII4 flux data nor public. I have updated the "fluxegs_colnames" table to include information about CO2 data availability for sites. The table also shows which sites I personally partitioned the CO2 flux and where GPP was provided by site PI. The table is in the ec_conductance folder on GoAnywhere.

No one requested additional co-authors for the CO2 flux data (although anyone using it might want to reach out to site PIs again to see if they have updated this)."

- Activity 2: Vogel et al. - error estimation analysis
    - Annika was not able to join the call, but shared via email that she just started her new position in Cologne, Germany. She also noted that while she didn't work on AQMEII during the last month, she hopes to spend some time on that during the next months, and would also reach out to Stefano, Olivia, and Christian about having a call to recap the results obtained so far and discuss what additional work may be needed.
- 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 has started incorporating Anam's stomatal effective flux estimates into his STAGE parameter optimization work. After determining the set of optimal parameters, he then plans to rerun the hemispheric CMAQ simulation using the updated parameters in the STAGE dry deposition calculations.
- 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. In an email exchange with Christian following the previous call, Olivia shared that there was no recent change in status and that she hopes to return to this analysis soon.
    - 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 was not able to join the call. In a follow-up email exchange with Paul after the previous call, Kenjiro shared that he would likely not start working on this before the end of the year.
    - 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. During the previous call, he shared that he has not worked on this project in the last few months but hopes to return to it soon.
    - Activity 1: Baublitz et al. - 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.
        - Colleen was not able to join the call. In an email after the call, she shared that she recently started performing seasonal model evaluation in the context of analyzing seasonal and spatial intermodel variability. The intent is to include this new analysis in the CMAS presentation which will be shared with co-authors during the week of October 14.

- **Potential work, currently lower priority:**
    - Activity 1: Lee, Soares, Makar, et al. – use of hierarchical cluster analysis for grid model intercomparison
        - When Stefano noted that this analysis sounds very interesting and that it would be nice if it could become part of the special issue, Paul explained that the underlying paper (not AQMEII4 related) in which the method and its parallelized computational implementation was described needs to be resubmitted first before potentially applying it to the AQMEII4 data.
    - 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/)

Other Grid Intercomparison (Activity 1) Updates

- Model data updates:

    - No updates
- Data storage updates:
    - No updates

Other Point Intercomparison (Activity 2) Updates

- No updates.

Next Call

The next call original scheduled for November 14 will be rescheduled for November 21.