

Biogeosciences Discuss., author comment AC2
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Reply on CC2

Aileen B. Baird et al.

Author comment on "Mass concentration measurements of autumn bioaerosol using low-cost sensors in a mature temperate woodland free-air carbon dioxide enrichment (FACE) experiment: investigating the role of meteorology and carbon dioxide levels" by Aileen B. Baird et al., Biogeosciences Discuss., <https://doi.org/10.5194/bg-2021-162-AC2>, 2021

Thank you to all the reviewers for your comments and feedback on "Mass concentrations of autumn bioaerosol in a mature temperate woodland Free Air Carbon Dioxide Enrichment (FACE) experiment: investigating the role of meteorology and carbon dioxide levels". In addition to our earlier response to RC1, we address each of the comments in turn below.

In the short comment (CC2), the reviewer raises a concern that PM data cannot be used as a proxy for bioaerosols (or fungal spores), as both organic and inorganic particles will be present in the air. As noted in our earlier response to reviewer 1, it is correct that the optical particle counters do not explicitly discriminate between bioaerosols and other aerosol types, however we believe that due to the size of particles we are investigating (1-10 μm), the location of the measurements that are within a woodland, the timing of the measurement period, as well as the low hygroscopicity of the particles measured, it is very likely we are predominantly measuring a biological source. Whilst we do believe that the dominant source of particles in the PM₁₀-PM₁ size fraction is composed of bioaerosols, any non-biological aerosols in the PM₁₀-PM₁ fraction should be very similar between each pair of experimental plots due to their close proximity to each other (<100 m).

In response to the earlier comment from Reviewer 1 who also expressed concern regarding the possibility of dust inclusions during the measurement period, we compared our PM data with the CAMS global reanalysis (EAC4) and there was no correlation present, and this is therefore unlikely to be a confounding factor.

We will adjust the text to highlight our responses to above points.

This study was designed to investigate the possibilities of using low-cost sensors to measure bioaerosols, with the hope of opening up the field to enable use of such sensors in a wider variety of environments by a wider range of researchers. We hope that the study will lead to further research using a variety of concurrent measurement instruments, so that the ability to use PM as a proxy for either anthropogenic emissions or bioaerosols can be further assessed.