

Interactive comment on “Terpenoid measurements at a Northern wetland revealed a strong source of sesquiterpenes” by Heidi Hellén et al.

Anonymous Referee #2

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This study is a valuable contribution to the available observations for understanding BVOC emissions and atmospheric concentrations in northern wetlands. The manuscript is generally clear, concise and well written and the methods and uncertainties are well described.

As the authors indicate, the concentration data is difficult to interpret due to the influence of the nearby forest. It would be helpful if the authors could better describe the influence of the forest including species, expected BVOC fluxes, typical transport times of BVOC from the forest.

The title is misleading since this landscape is not a strong source of sesquiterpenes., The sesquiterpene emission factors reported for this study are similar to what model simulations (such as MEGAN) would predict for northern wetlands. Perhaps the title

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could indicate that sesquiterpenes dominate monoterpenes, which is unusual. In any case, the abstract, text and conclusions should make it clear that the unusual MT/SQT ratio is because MT (and isoprene) are lower than most other landscapes, not because SQT are higher. Comments that sesquiterpenes are “surprisingly” high should be removed and could be replaced with a statement regarding the relative MT/SQT ratio.

As is discussed in the introduction, Kramshoj et al. and related work in an Arctic landscape in Greenland reports an isoprene temperature dependence that is much higher than in temperate landscapes. In contrast, Figure 4 shows that this northern wetland vegetation has an isoprene emission response that is similar to temperate vegetation. Please discuss the similarities and differences between this site and the Kramshoj site. Any insights on why the isoprene temperature response is so different?

Table 1 (and elsewhere in the manuscript): Please use a more standard format for the dates. Alternatively explain the format in the Table header or at least label them as dates.

Page 2, line 30-33: What is known about BVOC emissions from these various species in the fen ?

Page 3, line 7-9: What were the BVOC concentrations in the chamber?

Page 3, line 10: heated to what temperature?

Page 3, line 12: what was the size (mass of adsorbents) of the cold trap?

Page 3, line 14: what was the flow rate for the offline tube samples? Did the 10 hour samples exceed breakthrough volume for these tubes?

Page 3, line 25: The temperature difference is probably not as relevant as the absolute temperature. How realistic is it for these plants to have temperatures above 40C? Discuss the implications of heat stress impacts on these results.

Page 4, line 17: California is misspelled

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Page 8, line 9: Since only frame #1 was sampled more than once, it would be clearer to show the seasonal data (i.e., the data for frame 1) and then separately show data for the other 2 frames. Otherwise it can appear all of the data are seasonal variations from the same location. All of the data could still probably go in one table or figure but just grouped differently.

Page 8, line 19: How does the temperature dependence vary for individual monoterpenes and sesquiterpenes?

Page 14, line 17-25: Which terpenes dominate the ozone uptake? This could be shown in a figure illustrating the contribution of each compound to total ozone reactivity (analogous to figure 8 for SOA).

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