

Comment on acp-2022-588

Anonymous Referee #2

Referee comment on "High emission rates and strong temperature response make boreal wetlands a large source of isoprene and terpenes" by Lejish Vettikkat et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2022-588-RC2>, 2022

The manuscript of "High emission rates and strong temperature response make boreal wetlands a large source of terpenes" by Vettikkat et al. measured terpenes flux by ecosystem-scale eddy covariance (EC) and Vocus-PTR from a wetland in southern Finland. The localized EF of isoprene, MTs and SQTs were obtained and compared with the MEGAN model. The research suggested that high-latitude ecosystems can be a significant source of terpenes to the atmosphere, and anthropogenic global warming could induce much higher BVOC emissions from wetlands. This manuscript is well written and recommend to be accepted after a minor revision.

- Line 47-48, "Terpenes, except isoprene, have a huge variety of structures. They contain one or more double bonds making them highly reactive". Here "they" refers to "Terpenes" or "Terpenes, except isoprene", please rephrase clearly or combine into one sentence.
- Line 56-58, The ecological roles of BVOCs should be better phrased. For example, the related ecological interactions were missing here.
- Line 59, It may be easy to cause confusion if you include isoprene into terpenes. Here, temperature and light intensity are the main environmental drivers of isoprene emissions; as for MTs, the light-dependence may be more complex and highly dependent on species. The information on SQTs and DTs are even scarce. Their cases are largely different and may cause confusion when regarded as "terpene emissions".
- Line 93-94, references should be added here.
- Line 100-104, could you provide some references regarding DTs here?
- Line 110-113, would you like to show some hypotheses here?
- Line 273-276, here better to combine the sentences and use suitable conjunctions to flow better.
- Line 300, what LoD stands for?
- Line 277, "3.2 Fluxes of terpenes from Siikaneva", this part I expect to see more links of your study with other studies, not only the descriptions of your study and previous

studies in separate sentences.

- Line 368, "3.3.1 Emission factors of terpenes", some symbols in the equations better be italic, the R^2 better be italic.
- Line 486, here you had some good discussion, maybe better appear in the above sections. Here it can be a concise conclusion section.