Reviewer #1

Specific Comments:

Some of the references in this manuscript can be updated, Especially, the references early than 2014. It is important to explain the existing problems.

Good point – we have replaced several references with more recent studies. Note that some older references remain in the MS as these sources are foundational to specific methods used in the current study.

Line 456-470: For C2 fluorophore, wildfire event and road dust both contributed to its emission, as well as industry emission. How to quantify the contributions of different sources? That is to say, all three types of emission sources have an impact on C2. So how should their impact be quantified?

Good question – Certain organic compounds like levoglucosan and retene are frequently used as pyrogenic tracers, while specific metals and PACs are used as oil sands indicator species. These tracers could be used to assess the relative contribution of biomass combustion and industrial emissions to C2 fluorescence; however, we did not measure these indicator species from the TSP filter extracts. We have included a statement recommending the use of these indicator variables to determine source contributions in future studies.

Lines 467-469: "Future studies should consider using pyrogenic (retene, levoglucosan) and petrogenic (molybdenum, nickel, PACs) indicator variables to determine the relative contribution of wildfire and OS emission sources to C2 fluorescence in the AOSR."

Line 295-296: "Similar scans of unpaved road dust and sand pit materials displayed comparatively weak fluorescence (≤ 8 QSU) within these EEM regions". However, it can be obviously observed in Fig A6. Maybe, you can revise the fig A6c,d to make it more obvious. The meaning is that the scale of the color scale can be adjusted to make it more prominent.

Thank you for the clarification. We have adjusted the colour scale of the figure in question (now Figure A1c and A1d).