

Interactive comment on “Reactive Organic Carbon Emissions from Volatile Chemical Products” by Karl M. Seltzer et al.

Anonymous Referee #1

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The authors describe a new framework to model organic emissions from VCPs; including spatial allocation. This approach is novel in the fact that product volatilization is a function of the characteristic evaporation timescale of individual components physiochemical properties. National VCP emissions for 2016 were estimated to be 2.68 – 3.60 Tg (1.81 – 2.42 TgC) which was comparable to 2017 NEI values. The study highlights uncertainty from estimated product usage, product composition and indoor/outdoor settings. The article is well structured and clear. Given the importance of this sector and the need to resolve differences among various inventories it should be considered for publication with minor revisions.

Comments/Questions

1.) One of the main conclusions the authors make is that this new framework includes
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spatial allocation to regional and local scales. Have you compared this to current surrogates provided with the 2017 NEI, CARB surrogates or published work such as “Improving spatial surrogates for area source emissions inventories in California” by Li et al. 2020? How do the regional and local distributions vary with this approach? What is the level of resolution the census data is applied to? County/census block? Possibly adding a difference plot comparing to current estimates would be helpful.

2.) Figure 5c shows a high amount of emissions per capita in Colusa, CA – what is the driver behind this in a relatively small county?

3.) Since observed data is available to do comparison, it would be beneficial to show a range of predicted VCP emissions for LA county of the 30 reported species. It is noted that the observed total is 0.259 g while the inventory total is 0.226g; can you add uncertainty to the inventory value based on the discussions from section 3.6 and 4?

4.) In Section 5. on line 562 “The 95% confidence interval for the national level emissions from the complete sector for 2016 is 2.68 – 3.60 Tg (1.81 – 2.42 TgC). This is consistent with the 2017 National Emission Inventory and half the emissions magnitude reported elsewhere (McDonald et al., 2018).” Can the authors provide the 2017 NEI values that are being compared? It would also be helpful to add a national difference plot showing the variability between this new method and 2017 NEI totals for the three panels on figure 5 (state, county, county/capita).

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