

## ***Interactive comment on “Fluvial organic carbon fluxes from oil palm plantations on tropical peatland” by Sarah Cook et al.***

**Anonymous Referee #2**

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### General comments

This study evaluates the fluvial carbon fluxes from oil palm plantation on tropical peat. The contribution of fluvial carbon fluxes to carbon balance in tropical peat ecosystem has not been understood yet. Thus, this study provides important and valuable information to stakeholder involvement in this field. Therefore, I recommend publication after several revisions as below.

### Major points

#### 1. Validity of the assumption of RE

The authors assume that meteorology, soil properties, and topology are similar among the plantations because they are located close to each other, and apply the same value

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of RE to all the plantations (P9 L15-18). However, bulk density was 1.8 times higher in Sebungan than in Sabaju (Table 1) possibly it is significantly different. The higher bulk density shows lower soil porosity, suggesting that different water storage and RE between SA and SE. Please add more discussion about the validity of the assumption of RE.

#### 2. Temporal variation of discharge

The authors mentioned that the temporal variation of discharge is larger than that of the DOC concentration so that the temporal change in DOC flux is strongly influenced by discharge compared with DOC concentration. I agree with this opinion. However, the author did not show the temporal variations in discharge through the temporal variations in TOC concentration was shown. Thus, I would like to recommend to show the temporal variations of discharge, too.

### Minor points

P3 L27-28: I don't know a paper that land compaction by heavy machine increase peat decomposition. But I know the opposite results, for example

\* Melling et al. (2005) Soil CO<sub>2</sub> flux from three ecosystems in tropical peatland of Sarawak, Malaysia. Tellus, 37B, 1445-1453.

\* Othman et al. (2011) Best management practices for oil palm cultivation on peat: Ground water-table maintenance in relation to peat subsidence and estimation of CO<sub>2</sub> emissions at Sessang, Sarawak. Journal of Oil Palm Research, 23, 1078-1086.

P14 L1: Is this calculated RE the mean or median of Monte Carlo simulation shown in Fig. S4?

P14 L6: Probably, "and" after 49.6 mg l<sup>-1</sup> is not necessary.

Table 3 & Fig. 7: Please explain what is SA 3.1, 3.3, and 3.6.

Fig. 3: It seems that there is no relationship between the rainfall pattern and the tempo-

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ral variations in water table depth, which is not common, possibly because the rainfall is monthly data whereas water table depth is weekly data. Please check whether there is the relationship between rainfall and water table depth, and improve the figure if the water table depth is influenced by the rainfall. If there is no relationship, please discuss why.

Supporting information: Please explain what is SA 1.4 to SA 4.4

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