

## ***Interactive comment on “Carbon Dioxide and Methane Emissions from Red Sea Mangrove Sediments” by Mallory A. Sea et al.***

### **Anonymous Referee #2**

Received and published: 11 April 2018

The manuscript “Carbon dioxide and methane emissions from Red Sea mangrove sediments” details the spatial and diel flux of CO<sub>2</sub> and CH<sub>4</sub> from mangrove sediments in the understudied Red Sea region. The study uses carbon isotopes to differentiate the source of the gasses from sources other than mangrove tissue alone. The manuscript is well written and the data closes a key knowledge gap in global mangrove carbon cycling by providing the first estimate of sediment fluxes for the Red Sea.

Minor comments are listed below.

Line 134 For cores S1 and S1, you need to factor in the equilibration time of the membrane equilibrator as this would affect your rate calculations (Webb 2016 L&O). By not accounting for equilibration time the flux estimates would underestimate emission rates.

C1

Line 46 Should be 12%

Line 198 Using the data in Table 1, I calculate a mean CO<sub>2</sub> flux of  $1358 \pm 1195$   $\mu\text{mol m}^{-2} \text{day}^{-1}$

Line 201 You do not include the negative flux numbers in the reported range. I find the variability of the source/sink behaviour of CO<sub>2</sub> at the different sites to be one of the most interesting findings of the paper and there is limited speculation or use of the literature to suggest why that may be. I would suggest a deeper interpretation is necessary. Factors including the disturbance of sediments during coring may be particularly relevant as crab burrows would no doubt be affected and coring through mangrove roots may disturb the entire sediment matrix.

Line 202 It was 5 out of the 7 sites where daytime uptake and night time production was seen.

Line 203 the units should be  $\mu\text{mol CO}_2 \text{ m}^{-2} \text{ hr}^{-1}$

Line 231 Averages and standard errors would be useful in Table 2

Line 231 Including a supplementary map of each field site would help delineate potential differences between the sites.

Line 263 Fix reference

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Interactive comment on Biogeosciences Discuss., https://doi.org/10.5194/bg-2018-37, 2018.

C2