Biogeosciences Discuss.,
doi:10.5194/bg-2016-4-RC2, 2016

Biogeosciences Discussions

Interactive comment on "Nitrous oxide and methane in two tropical estuaries in a peat-dominated region of North-western Borneo" *by* D. Müller et al.

Anonymous Referee #2

Received and published: 24 February 2016

This paper presents new information on seasonal differences in N2O and CH4 fluxes in mangrove environments. It furthers our understanding of the role of natural factors such as salinity, DO and DOC on greenhouse gas production in a generally sparsely-sampled region. There are a few minor issues to address:

Spelling/Grammar: This paper is very well written, there were only a few issues that I could find.

1. Page 8, line 10: "N2O was correlated with DOC (Fig. 2a), whereas this correlation was strong..." I think this should be "N2O was correlated with DOC (Fig. 2a), *and* this correlation was strong..." or just "N2O was correlated with DOC (Fig. 2a); this correlation was strong..."

2. Page 9, like 17: "...the Lupar and Saribas rivers are no blackwater rivers..." Is this meant to say "...are *not* blackwater rivers..." It's technically correct either way, but the first phrasing sounds more colloquial.

3. Page 10, line 15: "Either, a source of N2O exists on the continental shelf..." This comma is unnecessary.

Other Comments:

1. This paper refers to k-value calculations derived from floating chamber experiments (covered in an earlier paper, Müller et al., 2015). It might be a good idea to make it clear in the methods section that these k values are from floating chambers, to distinguish this k calculation from the more common technique of estimating k-values from equations well-known in the literature.

2. On a related point, gas transfer velocities can be temporally and spatially heterogeneous. Were the floating chamber measurements made near the field site? Were they made upstream, downstream, or along the length of the estuaries? A brief mention of the location or timing of the floating chamber measurements might give a better idea of the precision of this approach to k-value calculation.

3. The authors thoroughly document the source of the atmospheric mixing ratios of N2O and CH4 (which are needed in order to calculate water-to-air fluxes). However, from what I understand, the N2O flux totals are likely going to be much more sensitive to the choice of k-value. Is there some reason why the k-value would be particularly sensitive to the atmospheric mixing value (say if it were 325.25 ppb rather than 325.15 ppb)? Considering that the local air mixing ratio could be slightly greater or less than the Mauna Loa value, it might be good to mention that this isn't a large source of error in the calculation.

Interactive comment on Biogeosciences Discuss., doi:10.5194/bg-2016-4, 2016.