

## Review of the 2019 Global Carbon Budget by Han Dolman and Roxana Petrescu

The authors are once again to be complimented on their work, the sheer breadth and number of data sources used is simple outstanding. As always, this will be a very useful resource for scientists (less so for policymakers, given the content, depth of treatment and length).

### Major comments

We like the standardization of the inversions with a single a priori dataset for Fossil fuel emissions. This was much needed. The level of disagreement in the latitudinal between the inversions remains however large. The current version of the paper (as previously) however takes a rather lackluster attitude to this: unfortunately, not resolved. Given the emphasis on using inversions in the future using satellite data, it would not harm to include a few lines of thinking about this issue in the discussion.

That brings us to the discussion itself, which is very similar, almost the same as last year. It may be an idea to use the discussion to highlight the impact of changes made in this year's budget (the description of which is now hidden in the methods and results) to make it more relevant to this year's budget rather than sticking to the not so exiting repetition of last year general statements.

### Minor issues

L 303. "developing countries like China". Better to change into something like countries with strongly developing economies like China.

L 443. you could add in brackets also the names of the external datasets for peat burning..

L 497. Only 2 Gt C for peat fires over almost 60 years seems minute amount. We remember estimates of peat fires after el-Nino's of almost similar order of magnitude.

L 532-534 If BLUE uses LUH2 and H&N2017 FRA/FAO and we have OSCAR using both approaches, averaging the three model results assuming that they are independent is not necessary the best approach, ~~as clearly strictly on BLUE and H&N are independent (to some extent, even).~~

Line 702: please reference only the IPCC report you use

L 905-908. These lines could be deleted. It just tells us what you do not do. Maybe better to integrate with the next bit to keep the focus.

L 1007. You go to some length estimating the loss of additional sink capacity, but you do not use it in the budget (L1203). Can you explain?

L 1047 land use change fluxes

line 1052 Should be rewritten a bit to make it more understandable. Suggestion:

"Emissions from newly added gross sources are on average 2-3 times larger than previous net emissions (X Tg C in GCB 2018), and increased from an average of  $3.5 \pm 1.2$  GtC yr<sup>-1</sup> for the decade of the 1960s to an average of  $4.4 \pm 1.6$  GtC yr<sup>-1</sup> during 2010-2019...?"

L 1196 H&N to add 2017

L 1597. True, but the tropical areas are probably even more undersampled.

L 1541. This is not new. Undersampling of the Southern Ocean has been an issue for many years. Can you rephrase to make it sound not as you discover something novel?

- in Table 5 and 6 we would add an extra column with numbers for the projections 2020, then next year you can compare the 2020 budget to this years' projected one

- Figure 6 caption we think is wrong, explanation for a,b,c doesn't match the sub-plots and d is missing (c should be  $d=c-a$ , b is not explained)

- Figure 9: if you show cumulative changes for 1850-2018 why not show also changes for last decade instead of mean flux?