

Interactive comment on “Global carbon budget 2014” by C. Le Quéré et al.

Anonymous Referee #1

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Overall excellent compilation and very well presented. One of the best constructed and most useful excel spreadsheets I have encountered. A few comments, mostly with respect to text, below, but with one substantial question about data in Figure 8.

Page 525

Line 23 - I wonder if this sentence should more properly read “We compare mean land and ocean fluxes and their variability to estimates . . .”?

Page 526

Line 9 - “changes in carbon intensity of the <global> economy” or changes in carbon intensity of <national> economies?

Page 528

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The paragraph starting line 5 finishing line 19 gives qualitative and quantitative justification for why Eq 1 does not account for lateral fluxes (estuarine etc.) but omits a similar quantitative assessment of not including the oxidative processes (e.g. CH₄ to CO₂). Similarly small? Mention the omission begs an explanation? Explanation given later, section 2.7.1, shows only minor impact. Mention that here?

Line 26 - “Global Carbon Project . . . who has” who have? which has?

Page 529

Line 3 - “. . . et al., 2014). Where the carbon budget year . . .” comma rather than full stop? Rather: . . . et al., 2014), where the carbon budget year refers to budget calculations based on emissions data recorded through the end of the prior year (e.g. the 2013 budget covered emission data through 2012 and this 2014 update covers emissions through 2013). We read this more explicitly later, at the middle of page 7, but the explanation also seems useful here following the dated list of prior budgets.

Line 7 - again this question of the global economy or of national economies?

Page 530

Line 3 - we already defined IPCC and AR5 on page 529 in lines 15 and 16?

Line 11, 12 - applaud this!

Page 535

Line 25 - Should the parenthetical phrase read (2013 in this budget)??

Page 555

Line 10, 11 - An informed reader will know the assimilation tools 4D Var and Ensemble Kalman filtering but should we define these terms for all readers? Sufficient to point to the references, referring back to 3 citations at the start of this paragraph?

Line 18 - “to set these.” What? The total EFF terms?

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Line 25 - perhaps 'In this first application of inverse models to the carbon budget we focus ...'

Page 556

Line 1 - singular/plural, land fluxes correlate or land flux correlates?

Interactive Comment

Page 560 Line 14, 15 - "... diffusion in ocean models, though as data-products also support ..." Rather, '... diffusion in ocean models, although as the data products also support a lower mean CO₂ sink' this discrepancy may suggest a need to reassess the mean <oceanic> carbon sinks?

Page 561

Line 10 - (Table 7)

Line 13 - IAV? Interannual variability?

Line 15 - ensembles compare well or ensemble compares well?

Page 562

Line 2 - 'This region also shows the largest variability?

Line 7 - again IAV?

Line 17 - have we explicitly defined IFF prior to this point? I do not remember seeing it.

Page 567

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Line 20 - R_Egional?

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Page 571

Line 11 - Supplement. I see the list of ocean CO₂ data included in the supplement and understand why the authors did not want to include such a long list as a table in the text. But I understand ESSD or Copernicus does not archive supplemental materials? This list will get lost after publication? Could the supplement go on the CDIAC site?

Interactive Discussion

Table 8 - If a reader wants to follow the 'anchored' decade (e.g. 1970-1979, 2000-2009) pattern with individual years of the current decade starting from 2010, they have to look back into prior versions to find annual data from 2010, 2011, 2012? Thinking from a graphical point of view, those individual year data for the most recent years might prove more useful than data from the most recent 'sliding' decade (e.g. 2004-2013)?

Figure 1 - Very interesting with seasonal cycles removed.

Figure 8 - Very hard to imagine a slight increase (?) of the southern latitudes CO₂ sink (as in text on page 561) from this figure? 1.3 to 1.6 GtC yr-1 from the text, but doesn't seem consistent with lower panel?

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