bg-2018-4 “Export fluxes of dissolved inorganic carbon to the northern Indian Ocean from the Indian monsoonal rivers” by Krishna et al.

This paper presents a hard work from the extensive field coverage of 27 Indian monsoonal estuaries twice during the discharge period of two different years. In the growing concern of climate change when many of the biophysical and biogeochemical models are suffering from the lack of data sets from the tropical rivers, I am sure this paper once published will significantly fill that gap and heavily used by many researchers. However, the manuscript requires to provide clarity and corrections on certain issues before it is published.

The DIC concentrations and fluxes are influenced by the rainfall variability among the four regions, the discussion will be benefited if it starts with this information. From Figure 1, it is apparent that many of the east flowing rivers, especially in the central and southern regions, are sourced from the western catchments but none in the vice versa direction. This is important and highlighted because high rainfall SW regions have less discharge and DIC fluxes but much of this rainfall might be sourcing the less rain fed SE rivers and contribute to high DIC fluxes.

I strongly suggest the authors to include a Table of all rivers sampled (grouped into four regions) with details of their size-class (large and medium), catchment size, length of the river, soil organic carbon, discharge rate, mean DIC concentration, export flux, yield, etc. for better utilizing the hard work of this study by scientific community.

Many of the statements are repeated throughout the manuscript which makes it length, for example, parts of section 4.2 and 4.4 carry some common information. Restructuring of discussion by appropriately merging relevant subsections will improve the focus and clarity. Number of figures can also be minimized, for example, merge figs.4 & 5 and 6 & 7.

The manuscript requires thorough editing for English grammar for better reading.

Specific Comments:

Line 43: delete ‘about’.
Line 54: it is an obvious statement, delete.
Lines 55-57: how much increase? Specify ‘Mississippi river’.
Lines 76-81: include carbon studies from Gupta et al. (2008) in the Chilka lake, a brackish water estuarine system. Also, include Bhavya et al. (2018) for Cochin estuary.
Lines 81-82: Carbon export fluxes from the Chilka lake (Gupta et al., 2008) and Cochin estuary (Gupta et al., 2009) on east and west coast of India respectively were earlier reported.
Lines 95-102 & 120-124: Too big sentences.
Lines 132-134: Year 2011 was a normal monsoon year but 2014 was an El-Nino year. Please comment or speculate the variability in light of having used discharge data of

earlier years from the published literature. Authors may refer to Indian Annual Rainfall Statistics reports available online at www.imd.gov.in.
Lines 134-137: These are contradicting the statements made at lines 130-131.
Line 139: replace was with 'were'.
Line 174: specify the source of catchment area.
Lines 185-186: give mean±SD values.
Lines 207-208: delete 'by the Indian monsoonal rivers'.
Lines 216-17: repeated statement
Lines 250-254: Provide full details in a Table for better usage of this work by many researchers.
Line 256: Include Gupta et al., 2008 for Chilka lake. Bhavya et al. 2016 covers only dry season (postmonsoon), replace it with Bhavya et al. 2018 for all seasons.
Lines 260-262: Rather relationship with TOC (DOC+POC) is better.
Lines 282-286: It seems this ground water regional variation is following the variability of DIC in the regional estuaries. Does this mean the cause factors for DIC variation are also applicable for its variation in the ground water? Please make a statement on this.
Line 285: provide units for all the values.
Lines 286-289: Grammatically sentence not correct.
Lines 304-307: Please comment, if not speculate, on whether these soil characteristics are limited only to surface or extended to the vertical strata as well, which can give an insight into whether the source of low DIC in these surface and ground waters are same or different.
Lines 310-312: Weathering rates may be high due to highest precipitation but DIC flux from the weathering of lateritic soils to the SW estuaries (refer lines 304-307) could have been far lower than other regions.
Lines 316-318: better integrate these with statements made at lines 365-471 and attribute to intense precipitation, presence of less weathering lateritic soils and soil organic carbon.
Lines 325-330: both the statements correspond to the weathering but the contribution of $\delta 13C_{DIC}$ values were differently reported. Pls check.
Lines 352-355: Repetition of statements at lines 326-330 but with clarity here. Avoid repetition.
Lines 395-396: Are these discharge per day or year?
Line 401: Relatively higher export fluxes…….. compared to what?
Line 405: When combined…..with DIC export flux?
Lines 424-425: SW region is having highest rainfall but lowest discharge rate from smallest catchement area. If so, large amount of rainfall might be happening over the non-catchment area. What would be the fate of this? Please discuss on the possibility of its seeping into the ground water and its contribution of DIC flux to the SW coast of India, its relativity with respect to surface flux?
Lines 432-433: include -ve sign for the r2 values for having the negative relationships.
Lines 441-442: Reference to the comment for lines 424-425. Does low DIC concentration in the ground water of SW region is also due to high dilution rate and possible lateritic soil strata? Please comment on what would be the ground water discharge rate and its associated DIC export flux to the SW coastal AS compared to the other regions.
Line 469: soil organic carbon content….what is the source for this data?

Suggested Literature:

1. Bhavya, P.S., Sanjeev Kumar, Gupta, G.V.M., Sudharma, K.V., Sudheesh, V. (2018). Spatio-temporal variation in $\delta^{13}C_{DIC}$ of a tropical eutrophic estuary (Cochin estuary, India) and adjacent Arabian Sea. *Continental Shelf Research*, 153, 75-85, doi: 10.1016/j.csr.2017.12.006.
2. Gupta, G.V.M., Sarma, V.V.S.S., Robin, R.S., Raman, A.V., Jai Kumar, M., Rakesh, M. and Subramanian, B.R (2008). Influence of net ecosystem metabolism in transferring riverine organic carbon to atmospheric CO_2 in a tropical coastal lagoon (Chilka Lake, India). *Biogeochemistry,* 87: 265-285, doi:10.1007/s10533-008-9183-x.