

The paper by Krishna et al. provides a very large and almost complete data set on DIC concentrations in the estuaries of Indian rivers and the  $\delta^{13}\text{C}_{\text{DIC}}$ . The authors use the data to calculate DIC discharge to the Arabian Sea and Bay of Bengal and DIC yields from the catchments. It is a very important and valuable data set collected in 2011 and 2014 and should be published and made available also in the light of ongoing global change affecting the amount and sources of riverine DIC discharged to the ocean basins.

In the methods section the authors state that they have done multiple sampling in the estuaries. The standard deviation should be given in Figure 2.

In the methods the authors indicate that they have DO and chl a data which they present only in a summarized form in Figures of the paper. These also need to be made available in an attachment.

The interpretation of the data is rather convoluted and therefore difficult to follow. It needs restructuring and would benefit from one or more tables. Furthermore, an introduction to the use of  $\delta^{13}\text{C}_{\text{DIC}}$  as an indicator of DIC source is missing. Such information is given in lines 320-337. This could fit into the introduction.

Generally chapters 4.1 and 4.2 may be merged if the discussion is organized differently, may be as suggested below. Now some aspects of the  $\delta^{13}\text{C}_{\text{DIC}}$  results are mentioned in 4.1 and 4.2 repeats some of the earlier arguments.

In order to better organize the discussion a Table would help showing the average rainfall in the four regions, the volume of discharge per m<sup>2</sup> and soil OC (lines 308 ff). To my mind the last paragraph of chapter 4.1. may rather be the starting point of the discussion.

In general I would suggest to follow a clear structure in the discussion (Chapter 4.1.), discussing consecutively (for example). (Most of these points are already mentioned in lines 237-245):

- dilution effects and mixing effects with sea water (this point may well be discussed in the beginning to exclude certain samples from detailed source discussions using  $\delta^{13}\text{C}_{\text{DIC}}$ )
- The impact of rock weathering: carbonate vs. silicates, which rock types dominate the catchment?
- The impact of soil organic matter

In Schulte et al. I found a very good sketch of the contrasting impacts of these two mechanisms on  $\delta^{13}\text{C}_{\text{DIC}}$  which may provide a helpful concept

- Primary production and respiration in the river/catchment
- possible anthropogenic impacts.
- More points..?

The following collections of data could be given as Tables:

lines 225-233: Table of DIC concentrations selected rivers;

lines 390-396: Table of DIC discharge and

lines 415-418: Table of DIC yields of various regions/rivers.

Detailed comments:

Line 109ff: the studied rivers are perennial so that there is most probably some discharge during the non-monsoonal months and some of the river catchments may even receive winter rains so that these sentences have to be formulated a bit differently. The term "monsoonal rivers" is OK but the discharge during the other seasons may be stated as "small".

Lines 177/178: delete sentence

Lines 238-245: this is part of an introduction.

Lines 247 ff: the groups of rivers with high, intermediate and small discharges may be indicated.

Lines 255-260: this part is redundant, shorten.

Lines 320-337: introduction, see above. This part and the entire chapter have to be carefully checked. Atmospheric CO<sub>2</sub> has a value of -7 to -8 ‰ but dissolved in water

Line 323: this is not clear: CO<sub>2</sub> has a  $\delta^{13}\text{C}$  of -7 to -8 ‰ but when dissolved in water it is around 0 ‰ if the main anion is HCO<sub>3</sub><sup>-</sup>.

Chapter 4.4 may be substantially shortened and I would suggest to shift the discussion on the source of DIC to the earlier chapter 4.1..

Lines 440ff is this contradicting the earlier discussion that groundwater is low in the SW and that this substantially is responsible for low concentrations?

Lines 450ff: the whole discussion on lithology could also be better in chapter 4.1.

May be a shorter discussion on the reason for the different yields (sediment/rock types and elevation; dams) would be sufficient.

The authors promise to send the data on request by E Mail. However, they should be made available in a data bank or as an attachment to the paper.

The abstract is quite good and may be retained even after changing the discussion. Likewise, changes of the summary would be also rather small after a revision.

#### Suggested Reference

Schulte, P., van Geldern, R., Freitag, H., Karim, A., Négrel, P., Petelet-Giraud, E., Probst, A., Probst, J.-L., Telmer, K., Veizer, J., and Barth, J. A. C.: Applications of stable water and carbon isotopes in watershed research: Weathering, carbon cycling, and water balances, *Earth-Science Reviews*, 109, 20-31, 2011.