Carolin R. Löscher present synthesis of the primary production work in the Bay of Bengal. This article is quite comprehensive and utilized most of the published data. In addition, both the future simulations and geological records are presented, making this work quite unique and putting the Bay of Bengal in the context of the global ocean. It is concluded that the Bay may not be at a tipping point for becoming anoxic. My main comment is to improve the table 1 further with more studies from the Bay of Bengal as suggested below. Some minor comments are also listed:

Line 13: due their -> due to their

line 33: "carbon flux from the atmosphere into the ocean of 45- 50 Tg C per year". This flux is too low. This should be Peta-gram (Pg) per year, and even higher >90 Pg per year (Sabine et al., 2004; Sarmiento & Gruber, 2002). Longhurst et al. (1995) provided flux is Gt (giga tonnes) per year, which is same as Pg per year.

Line 47: delta -> δ

Line 47: "isotope records lastly were enriched for delta15N, indicative for nitrogen fixation". I understand what is meant here but it could mislead/misinterpreted as high $\delta^{15}N$ (enriched in 15N) would mean no nitrogen fixation.

Line 47: "enriched for delta 15N", there is a technical issue here. $\delta^{15}N$ is defined mathematically, it can be high/low, positive/negative but cannot be enriched/depleted. Reservoir may be enriched/depleted in ^{15}N. So I would just say: "enriched in ^{15}N"

Line 49: "on a geological time scale" is redundant as "geological record suggests" and "last glacial maximum" are parts of the same sentence.

Line 51: Indian ocean -> Indian Ocean

Line 54 and elsewhere: Primary production, by definition, is a rate of fixed carbon. So "rates" is redundant in "Primary production rates".

Lines 58-59: "Some of those earlier measurements were, however, likely biased as a result of trace metal contamination before trace metal clean techniques were available" Most (if not all) primary production incubations are not done in trace metal clean equipment.

Line 67: Table1 -> Table 1

Line 70: "three monsoon". winter and summer, what is the third one?

Line 73: "one to two orders of magnitude below the Arabian Sea" one sounds reasonable, two seems to be quite stretched.

Lines 111-115: seems some grammatical issue with the sentence.

Line 127: "Over the last two decades, primary production in the global ocean has decreased (Gregg et al. 2003; Behrenfeld et al. 2006)". Since the references are old, it will be helpful to mention the exact duration of the decade. Also, see this recent article by Kulk et al. (2020) that proposed a non-linear trend in productivity.

Line 179: cycles able -> cycles that are able

Table 1: Needs one more column that should include methodology of primary production measurements (such as ^{13}C, ^{14}C, ^{15}N). There are some more studies that are missing in the list, such as: Jyothibabu et al., 2004; Kumar et al., 2004; Madhu et al., 2006; Muraleedharan et al., 2007; Prasanna Kumar et al., 2002; Sarma et al., 2020; Saxena et al., 2020; Singh et al., 2015.

Table 1: Madhupratap et al. 2001 should be replaced by Madhupratap et al. 2003.

Fig. 3 caption (line 403): Is it 1 Jan to 15 Dec or whole year 1 Jan – 31 Dec? Jan date should be mentioned.

Fig. 3: 1997-98 was one of the strongest el-nino years, so could this difference in the parameters for 1998 and 2005 be due to the natural climate variability (el-nino) and not the ongoing anthropogenic climate change?

References:

Jyothibabu, R., Maheswaran, P., Madhu, N., Ashraf, T. M., Gerson, V. J., Haridas, P., et al. (2004). Differential response of winter cooling on biological production in the northeastern Arabian Sea and northwestern Bay of Bengal. *Current Science*, 783–791.

Kulk, G., Platt, T., Dingle, J., Jackson, T., Jönsson, B. F., Bouman, H. A., et al. (2020). Primary production, an index of climate change in the ocean: satellite-based estimates over two decades. *Remote Sensing*, *12*(5), 826.

Kumar, S., Ramesh, R., Sardesai, S., & Sheshshayee, M. (2004). High new production in the Bay of Bengal: Possible causes and implications. *Geophysical Research Letters*, *31*(18).

Longhurst, A., Sathyendranath, S., Platt, T., & Caverhill, C. (1995). An estimate of global primary production in the ocean from satellite radiometer data. *Journal of Plankton Research*, *17*(6), 1245–1271.

Madhu, N., Jyothibabu, R., Maheswaran, P., Gerson, V. J., Gopalakrishnan, T., & Nair, K. (2006). Lack of seasonality in phytoplankton standing stock (chlorophyll a) and production in the western Bay of Bengal. *Continental Shelf Research*, *26*(16), 1868–1883.

Muraleedharan, K., Jasmine, P., Achuthankutty, C., Revichandran, C., Kumar, P. D., Anand, P., & Rejomon, G. (2007). Influence of basin-scale and mesoscale physical processes on biological productivity in the Bay of Bengal during the summer monsoon. *Progress in Oceanography*, *72*(4), 364–383.

Prasanna Kumar, S., Muraleedharan, P., Prasad, T., Gauns, M., Ramaiah, N., De Souza, S., et al. (2002). Why is the Bay of Bengal less productive during summer monsoon compared to the Arabian Sea? *Geophysical Research Letters*, *29*(24).

Sabine, C. L., Feely, R. A., Gruber, N., Key, R. M., Lee, K., Bullister, J. L., et al. (2004). The oceanic sink for anthropogenic CO_2. *Science*, *305*(5682), 367–371.

Sarma, V., Chopra, M., Rao, D., Priya, M., Rajula, G., Lakshmi, D., & Rao, V. (2020). Role of eddies on controlling total and size-fractionated primary production in the Bay of Bengal. *Continental Shelf Research*, *204*, 104186.

Sarmiento, J. L., & Gruber, N. (2002). Sinks for anthropogenic carbon. *Physics Today*, *55*(8), 30–36.

Saxena, H., Sahoo, D., Khan, M. A., Kumar, S., Sudheer, A., & Singh, A. (2020). Dinitrogen fixation rates in the Bay of Bengal during summer monsoon. *Environmental Research Communications*, *2*, 051007. https://doi.org/10.1088/2515-7620/ab89fa

Singh, A., Gandhi, N., Ramesh, R., & Prakash, S. (2015). Role of cyclonic eddy in enhancing primary and new production in the Bay of Bengal. *Journal of Sea Research*, *97*, 5–13.