Review Paper on title "Evolution of cyclonic eddies and biogenic fluxes in the northern Bay of Bengal"
By Somkiat Khokiattiwong

General Comments:

1. There are quit number of the content in the text are not correct as in the mention

2. It is the good concept to try to understand the processes of formation of eddy and resulting to biogenic flux (downward). But when the authors try to explain the relation of the western boundary current. It may not clear much to the reader who is not familiar with BOB. If authors could provide a diagram (figure) of circulation of the current in the figure will be better.

3. In the page 4 line 15-18, the purpose of this study would like to understand the link between the production of organic matter in the upper ocean and its transportation into mid-depths in the BOB. But it is not clear that the results could show any about the production in the upper layer and its linkage to its flux into deeper water. This might need more information about the sediment property (biogeochemistry property) which might be in the reference of the data use in the study such as total sedimentation or organic content. As the origin of eddies sources could have different property of suspended such as from north-western and north-eastern part of BOB. This information might help to explanation more on the organic production and sedimentation.

4. Could authors get some more satellite information of chlorophylls (ocean color) during the period of study? If you could have it then it might help a lot on organic flux, especially on productivity and its linkage to cyclonic eddies.

5. The cyclonic and anticyclonic is cause of upwelling and downing respectively. As the wind control the SLH (sea level height) in the BOB. There are some recently study show that the tropical Equatorial Indian Ocean wind effect to the SLH along the coast of BOB (related to Figure 9). In the low SLH are should be the upwelling area (compensation of deep water to the surface) and vice versa in high SLH (down welling). As the data of our buoy in Andaman Sea, we found that during the weak cyclonic pass by the buoy. There was the water at the depth of about 100-120 m move upward. I therefore do not think that the biogenic flux as refer in this study came from the upper layer and directly related to production in the surface layer. It could be from the deeper water surrounding the cyclonic eddy, which high accumulate organic material (below thermocline), move to compensate in the deep water under cyclonic area that move upward. This could bring high organic material with this water mass and resulting high sedimentation in the deep part under cyclonic area and cloud be high sedimentation. If the author could find more information in the study area may could explain more and may explain on the difference of production in upper layer of Arabian Sea (high production) and BOB (low production) but have the same biogenic flux in the mid depth. The author could explain this process in the northern part of BOB by using data of RAMA buoy programme and select the period when the cyclonic eddies part the buoy.

6. Finally I think the author might need to the writing in the introduction part to be well organized and some in sentient talking about the same thing but it is just in different wording.

Principal Criteria	**Excellent (1)**	**Good (2)**	**Fair (3)**	**Poor (4)**
Scientific Significance: Does the manuscript represent a substantial contribution to scientific progress within the scope of Biogeosciences (substantial new concepts, ideas, methods, or data)?			Fair	
Scientific Quality: Are the scientific approach and applied methods valid? Are the results discussed in an appropriate and balanced way (consideration of related work, including appropriate references)?			Fair	
Presentation Quality: Are the scientific results and conclusions presented in a clear, concise, and well-structured way (number and quality of figures/tables, appropriate use of English language)?			Fair	

PAGE 3

Line 12: intermonsoon, which is generally ologotrophic in the northern ~~Indian Ocean northern~~

Bay of Bengal (if not BOB, is it North Arabian Sea)

Line 15-17: "……..A comparison of the surface as well as column integrated chlorophyll a in the BOB with that of the AS during summer monsoon showed that it was 1/4th and 1/8th respectively of the AS values"

I am not understand….what is it mean??

PAGE 6

Line 7-9: "……..For example, during 1994 the peak anomalies were 40 and 50mg m^{-2} d^{-1} respectively, while in 1996 it was 45mg m^{-2} d^{-1}. Similarly, in 1997 and 1998 it was 95 and 40mg m^{-2} d^{-1} respectively."

The description in these line show the value of each peak anomalies do not response to the figure 2 (green line). It might be something wrong in figure or text.

Line 10-11: " Also note that the peak biogenic fluxes during the above four years were one-and-half to two-and-half times higher than the annual mean flux……."

There are no annual mean flux line show in the figure 2 that make difficult to see the results

Line 24-25: "….This Kelvin wave is the upwelling Kelvin wave that propagates 25 along the rim of the BOB during January–March (Rao et al., 2010; Srinivas et al.,2012)…… "

I could not see that how can this paragraph support upwelling Kelvin wave in Figure 3. As it was different period. The Figure 3 is during March-June 1994 but in the reference was January-March (did not mention about year)

PAGE 7

Line 1: "first week of April the eddy moved offshore and the positive SLA anomaly ~~west~~ (*it should be east not west*) of it began to dissipate…."

Line 6: "…while the eddy was undergoing an eastward translation…."

What is translation?

Line 12-14: "Note that CE2-1994 was located in the close proximity of NBBT during August and by September it started moving slowly north-westward, finally merging with CE1-1994…"

CE2-1994 is not finally merge with CE1-1994. But CE!-1994 move away on southwest direction/dissipate (14 Sep)

Page 8

Line 5: "was associated with the presence of cyclonic eddy (CE1-1998) (~~Fig. 8~~). The cyclonic.."

Figure 8.: the correct one is Fig.7

Line 20-22: Two of the cyclonic eddy CE1-1994 and CE1-1996 were formed in the ~~northern and~~ north-western BOB ~~respectively~~, while CE1-1997 and CE1-1998 was formed in the north-eastern BOB.

the cyclonic eddy CE1-1994 and CE1-1996 were formed in the north-western BOB,…….

Line 26-27: One source is the ~~northern and~~ north-western boundary of the BOBand another one is the eastern boundary. In the north-western boundary cyclonic eddies…..

The sources of cyclonic eddies should came from only two sources as north-western and eastern BOB. (see line 20-22). If look on the figure 9. The cyclonic of both years locate on the distance of 3000-4000 km. That is north-western of BOB.

Page 11

Line 1: in ~~summer monsoon~~ winter monsoon in case of CE1-1994, whereas for CE1-1996 maximum biogenic

Feb.-Mar. is winter monsoon period (not summer monsoon)

Line 4-6: Time-latitude plots of SLA in the northern Bay of Bengal showed that formation of these eddies and its subsequent southward translation occurs almost every year….

I do not think that it is a good idea to use data of time-latitude of 2005-2009 to explain of situation in 1994-1998 . As how can you know that the climate and ocean condition in 2005-2009 was same period of 1994-1998 in your study.

Line 9-11 and 12-13: The present study reiterates the importance of meso-scale cyclonic eddies in the production and subsequent downward transfer of carbon to mesopelagic layer in the Bay of Bengal (9-11)…….. it is not known whether this eddies would be biologically productive throughout their life span and how much would they contribute towards carbon sequestration of the basin.(12-13).

I feel there is some conflict of conclusion of these two sentences.

Figures:

1. The maps of Fig.3 & 5 should use the same scale of fig.4&6. It will be easily for comparison of the locate of eddies.
2. The fig.8 did not show the longitude of data. It could not see that the data came from with side of BOB.