

Final response to referee 4

We thank the reviewer for his comments. Below you find our answers to his comments and suggestions (in bold):

This paper discussed with the input of terrestrial dissolved organic matter (DOM) to Baltic Sea from the observation data in March and August-September 2009 together with the results of Alling et al. (2008). The input of DOM from watershed to coastal region is one of important topics. The paper shows that contribution of terrestrial DOM was estimated from 43% to 83%, though substantial amounts of DOM (>50%) appear to be removed near the costal line during estuarine mixing. Figure 3 is important to understand the fate of terrestrial DOM in estuarine environments.

However, the relationship between total DOM and high molecular weight (HMW: >1 kDa) fraction is lack. This data set is very important because the HMW fraction such as humic substances is significantly precipitated at estuarine mixing zone. If the differences in percentage of HMW vary with each sampling station or sampling area, we have to discuss it carefully.

As we mentioned in the material and methods the recovery of the DOC during the ultrafiltration step ranged between 13.1 to 27.3%. Assuming only minor losses of HMW-DOC during the ultrafiltration procedure this suggests that the fraction of LMW-DOC ranged between around 73 and 87%. Because the correlation between the salinity and the DOC did not indicate any removal we don't think that we can make any statement about estuarine HMW-DOM precipitation from this data. Nevertheless we agree with the referee that DOM flocculation might be an important process of DOM removal in estuaries.

Another question is that the paper discussed with the mixture of water mass at OB site and BP-BS-BB area in Figure 2. However, the authors did not touch with the phenomena in the discussion of the DOM mixing in Figure 3. Two samples of OB sites were on the line in Figure 3a and b, but the direction of scatter from the line is difference from the OB and BP-BS-BB sites. I recommend to show us the answers above two questions.

We think that the lowest $\delta^{13}\text{C}$ value from the three Oder Bight samples reflects a higher share of terrestrial derived DOC. This station was the one closest to the coast.

Minor comments The word in figure caption and the manuscript is adjusted as Figure 3a or Figure 3A.

We will correct this in the manuscript.