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Interactive comment on “Spatial and temporal CO₂ exchanges measured by Eddy Correlation over a temperate intertidal flat and their relationships to net ecosystem production” by P. Polensaere et al.

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We are very grateful to Professor Cai for his positive comment about the submitted manuscript. We agree to the need to do such carbon study at the ecosystem scale as allowed particularly by the Eddy Covariance technique. It will be better to include water pCO₂ and DIC measurements to have both vertical CO₂ fluxes and horizontal carbon export. Some 24h cycles have been realized in the middle of the tidal flat at different seasons, and water carbon data at each time are available. The first analyses show that the carbon water mass dynamic (river inputs and export of carbon to the ocean . . .) is not straightforward. To present a more accurate carbon budget of the Arcachon

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flat, we plan to combine in another paper in preparation all these data with those from the Eddy Covariance technique presented here. Also using a 3D hydrodynamic model (Plus et al. 2009, Continental Shelf Research, 29, 1008-1013) applied on our dataset it will permit to take into account the complicated scheme of the advection of water body masses in particular the export of carbon from the flat in its budget. Thus, the carbon budget of Arcachon will be shortened and discussed briefly in the revised manuscript. The relevant cited references will be added in the revised manuscript.

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