

Interactive comment on “Air–sea CO₂ fluxes in the East China Sea based on multiple-year underway observations” by X.-H. Guo et al.

Anonymous Referee #3

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The paper by Guo et al., aims at estimating the air-sea CO₂ fluxes in the East China Seas based on 24 cruises carried out between 2006 and 2011. Given the heterogeneity of the area, the authors chose to separate the ECS in 5 domains to compute the air-sea CO₂ fluxes and discuss the main drivers of their variability in each region. I think the paper is generally well written, based on a comprehensive dataset and that the choice of the 5 domains is relevant. I have only minor comments listed below. The page and line numbers below correspond to the printer-friendly version of the manuscript.

P5125, line 16: Give a reference for this statement.

P5126, line 7: Use the past in this sentence: Tseng et al., 2011 investigated. . .

P5127, lines 5 to 8: Do not end your introduction by the main results of the paper,

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rather, make a brief introduction of the content of the paper.

P5129, section 3.1: Indicate accuracies of the 2 pCO₂ instruments used.

P5132, lines 18 to 20: Rephrase sentence, unclear.

P5142, lines 19 to 24: Rephrase to facilitate the comparison of the fluxes with or without the October 2006 cruise.

Section 5.2: The main goal of this section is to discuss the intra-seasonal variability and how very specific events or cruises can impact the air-sea fluxes budgets annually. This discussion stays very focus on the ECS, it would be relevant to add some general recommendations on how to tackle this issue and take into account these special events in global estimates of air-sea CO₂ fluxes in marginal seas.

Section 6. Conclusion: The authors come out with a new estimate of -6.9 (± 4.0) mmol m⁻² d⁻¹ for the CO₂ sink of the entire ECS compared to the previous estimates of Tseng et al., 2011 and 2014. Could they also provide some comparison with the export of carbon from the shelf or to the seafloor?

Figures: Figures are generally clear and relevant, only Figure 9 needs some reprocessing for clarity: alignment and frame lines.

Tables:

Tables 3 to 7: Do not use decimals for pCO₂, Δ pCO₂ and SD, as it is related to the accuracies of your pCO₂ instruments (see above). For clarity of the table, give only 1 decimal for SST and FCO₂ as in table 8.

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