

Interactive comment on “Comparison of CO₂ fluxes estimated using atmospheric and oceanic inversions, and role of fluxes and their interannual variability in simulating atmospheric CO₂ concentrations” by P. K. Patra et al.

P. K. Patra et al.

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We sincerely thank the reviewer for reading our manuscript and providing us with suggestions for improving its content. As we have stated in our reply to review by R. Law, we will attempt to clarify the issues addressed here, aided by some more analysis on fluxes and their variability. We appreciate the concerns of both reviewers about our approach to validating the inverse model results. Our philosophy while preparing this article was to make all possible validations of the fluxes derived using our atmospheric-CO₂ inverse model, namely, other independent estimations, understanding the possible controls on fluxes estimates and their variabilities, and simulations of

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seasonal cycle and variabilites of atmospheric-CO₂.

The suggestions made by the reviewer are reasonable and we believe the manuscript can be suitably revised by addressing the reviewer's comments and suggestions. We agree with the reviewer that the flux estimates corresponding to different periods are not necessarily directly comparable. However, we thought this would be useful to understand the possible impacts of period of inversion on the flux estimations. Listing detailed information in Table 1 header (as suggested) would help to improve its clarity.

The reviewer's suggestions for minor revisions to the Tables and Figures will be included during revision. Fig. 3 caption should read: Comparison of CO₂ flux estimates using an ocean inversion (Mikaloff Fletcher et al., 2006a) and atmospheric inversion (Patra et al., 2005a) is depicted. The regional fluxes of higher resolution inverse models are aggregated to TransCom-3 regions (subcontinental scale). Atmospheric inversion results using other modeling frameworks are also shown: Rödenbeck et al. (2003), Gurney et al. (2004) and Baker et al. (2006) fluxes correspond to the periods 1990-1999, 1992-1996 and 1991-2000, respectively.

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