

Interactive comment on “Tidal and seasonal carbon and nutrients dynamics of the Guadalquivir Estuary and the Bay of Cádiz (SW Iberian Peninsula)” by M. Ribas-Ribas et al.

Anonymous Referee #1

Received and published: 3 January 2013

General comments

The paper describes the results from a number of cruises in the Gulf of Cadiz (Iberian peninsula), detailing the carbon and nutrient fluxes from in situ data.

Generally speaking, the paper reads well and documents the results from a number of cruises. Unfortunately a number of the conclusions do not appear to have any basis other than subjective viewing of the plotted data. As a result the conclusions appear to be based purely on subjective viewing of the plotted data (e.g. there are instances of phrases including 'trends', 'trend' and 'significant differences' with no statistical evidence to support them). The authors suggest that a number of variables appear to

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co-vary with the tidal cycle. However, no statistical evidence of this covariation is given (e.g. Pearson correlation coefficient would provide evidence to support such a statement). I was also puzzled as to why the work was submitted to a special issue of Biogeosciences on Earth observation, when the study makes no use (or even mentions) Earth observation data.

I would suggest re-submitting an updated manuscript to the main Biogeosciences journal rather than this special issue. The updated manuscript should include additional evidence for the conclusions (ie statistical analyses).

Specific comments:

1. the abstract doesn't really give an overview of the main results. It would help if some of the statements were substantiated with values e.g. values of exported nutrients and carbon and correlation statistics with respect to the tidal cycle comment. For instance, some of these values appear on page 14546.
2. line 14, page 14545, where is the evidence for the statement 'mainly due to biological activity and daily variation' ? The evidence presented appears to be subjective and via a reference to a journal paper about a study on the UK shelf.
3. section 3.3. I would suggest adding some supporting statistics for the statements of 'trends' and 'significant differences' e.g. correlation co-efficients, p-values, slopes etc.
4. page 14546, line 4. do the authors mean the response is non-linear ? (rather than a deviation from linearity?). The Bay of Cadiz plot appears to show a bell shaped response with minimum of $F(TDN)$ at $x=0$ ($F_{salt} = 0$).
5. section 2.3. - how was the accuracy estimate of $\pm 2 \mu\text{mol kg}^{-1}$ determined ? was this experimentally determined or is this from another publication ? If so, please add the reference.
6. line 10, page 14541, how was the error in DIC determined ? or is this a value from another publication ? If so, please add the reference.

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7. line 17, page 14541, The atmospheric fCO₂ data are from the Azores. This is quite some distance from the study site. The Azores location is considered an open ocean site. Whereas, the study sites are coastal and so are likely influenced by anthropogenic sources of CO₂ (dependent upon the wind direction). It would be helpful if the authors justify the use an open ocean fCO₂ estimate ? and/or discuss how such an assumption would effect their estimates of the flux.

Interactive comment on Biogeosciences Discuss., 9, 14537, 2012.

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