

Interactive comment on “Monitoring ocean heat content from the current generation of global ocean observing systems” by K. von Schuckmann et al.

Anonymous Referee #2

Received and published: 12 August 2013

Review of the manuscript “Monitoring ocean heat content from the current generation of global ocean observing systems” by K. von Schuckmann et al.

The paper is devoted to the important issue of the climate change detection in the Global Ocean. The paper is well structured and presents new interesting results. However, some major revisions are still needed before the paper can be recommended for the publication.

1. It should be made clear in the Abstract that the inter-comparison of the three observation systems has been made from the Argo perspective. It should be also stressed that the Argo system permits the estimation of the halo-steric Sea Level change com-

C415

ponent only.

2. The introduction should be re-worked substantially. At several places here the authors should explicitly tell WHAT is meant. For instance, the second sentence should directly indicate (A) which time series are meant and (B) what is meant by “integrated” time series (integrated spatially, or vertically, or both??) Therefore it remains completely unclear for the reader what the Global Ocean Indicators are. This is an important point: the GOI are discussed throughout the paper and a proper definition of them must be given at the beginning of the paper.

It is not easy to understand the sense of the sentence starting at line 4, p. 927. I suggest to delete the sentence or to re-word it.

3. Data section. “The GOIs associated to OHC and SSL are evaluated ...”. Please, be more specific here: how many GOIs are available for OHC&SSL? Just two time series or more?? It is not necessary clear for the people who are not involved in this issue. I would suggest to put description of each data type (ARGO, GRACE, AVISO) into separate subsections (2.1, 2.2, 2.3)

4. The reported strong impact of the Indonesian Archipelago area on the SL time series is an important issue and should be described in more details. I also found some inconsistencies on the map showing SL steric trends (Fig. 4b). The authors say that almost no Argo measurements exist in this area. On the other hand, the Fig. 4b does show not-dummy trend values in the Indonesian box. Do these not-dummy values come from the excessive spatial interpolation? Were other (non-ARGO) hydrographic data used for the analysis?? - This needs explanation. Further inspection of the Fig. 4b (which was not easy as the figure is rather small) revealed further “puzzles”. The non-dummy SL-trend values are found in the Yellow Sea, Caspian Sea, Azov Sea, Baltic Sea, Hudson Bay, Persian Gulf. ALL these areas correspond to shallow regions which are NOT covered with ARGO observations. Do these areas also have impact on the global trends? Were they accounted for or not? Why the trend estimates were still

C416

possible (according to Fig 4b) in these areas???

Minor comments Line 22: change “it does shows up” to “it does show up”

Section 4: I am not sure if the word “sector” is a proper one when such zonal subdivision of the Global Ocean is made. Please, ask British or American colleagues.

I suggest to stress the independence of the three observing systems from each other both in the introduction and in the Discussion sections.

Figs 4a and 4b are interesting. I suggest to increase the size of the maps, and to carefully mask Review of the manuscript “Monitoring ocean heat content from the current generation of global ocean observing systems” by K. von Schuckmann et al.

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5. Fig 6b. The , units for the OHC here are obviously wrong. The figure shows OHC values PER UNIT DEPTH. Respectively, Jm-2 should be changed to Jm-1. (The unit Jm-2 is relevant for the OHC value integrated over a certain depth range).

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C418

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Interactive comment on Ocean Sci. Discuss., 10, 923, 2013.