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Ocean Science Discussions

Interactive comment on "Present-climate trends and variability in thermohaline properties of the northern Adriatic shelf" *by* Ivica Vilibić et al.

Anonymous Referee #2

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General Comments:

In this study, the authors present the thermohaline properties derived from six shallow stations in the northern Adriatic shelf, over the last four decades. The study focuses mainly on the trends and on the interannual to decadal variability of the water column structure, across an observational network spanning the area from the Croatian to the Italian coast.

The study follows previous published work from the authors, to the point that it is hard for the reader to follow what is new in this work. I would advise the authors to make more clear the added value and the new components of this work, instead of providing a long list of references in the Introduction section. Other than that, the manuscript is clear, concise and well written, and provides a detailed description of the thermohaline

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properties of the region and the changes observed over the years. This is a dense water formation area and therefore an important area for the thermohaline properties and the circulation of the eastern Mediterranean. I have found that the analysis of results for the interannual variability and the trends is valid though too descriptive, and what is missing from the manuscript is a proper attribution to physics governing the dynamics of the area. In most cases this attribution is very general and in some cases the assumptions are far-fetched.

Overall, I find the manuscript worthy of publication in Ocean Science, after a major revision. Please find below a list of comments, that I would like the authors to address in the revised manuscript.

Specific comments:

1) The Figs. 3, 6, 8, 9 appearing as "Distance from RV001 (km)" are confusing in terms of east-west direction and should be reversed in the x-axis.

2) In the Data and Methods section the authors discuss that an annual and semi-annual filter is applied to a monthly/bimonthly timeseries, producing a residual timeseries that in my understanding does not have seasonal variability. Yet, later in the text they discuss the seasonal cycle (e.g. section 3.1, Fig. 4) and present monthly trends (e.g. section 3.3, Figs. 9, 10). How is this possible, what do I have missed here? Clarify in the text.

3) Page 5, line 13-14: "...indicating the dominance of...and salinity variability". This is a good example of what I mean when I say the authors give very general explanations regarding the dynamics of the area. Can you make a fair assumption why is this observed? Clarify in the text or remove such expressions.

4) Page 5, line 15: "...hemispheric patterns...". You mean teleconnections? Is this part of an explanation to the previous phrase? Clarify in the text. 5) Page 5, line 28-29: "It looks like...BiOS reversals". The authors provide no such proofs in the text between

the link of salinity and BiOS (also elsewhere in the text). This is not a naturally pertinent argument derived from the findings of this work. The authors should remove the BiOS assumptions from the Results section and from Fig. 7, since there are not results of their work. Providing a reference in the Result section (as in page 6 line 2) does not change the fact that this is a rather forced claim here. Near the end of Section 4, the authors discuss again the possible influence of the regions dynamics with respect to BiOS. I guess in the Discussion and Conclusion section this is relevant, as long as it is clearly stated that it is not proven yet and further research is needed (which is indeed the case in the text).

6) Section 3.3 discussing the thermohaline trends is very carefully written and it is a nice addition to the manuscript, with the only exception the monthly trends that need to be clarified (see comment 2).

7) In the beginning of Section 4, there are numbered conclusions, which although seem logical and valid, some of them are a bit vague (e.g. page 8, lines 17-18"...acting on...their variability"). Can the authors be more specific?

Best regards.

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