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Discussions

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

Anonymous Referee #1

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The paper describes the analysis of a 38 year long time series in the northern Adriatic Sea which consists of 6 stations extending from the Croatian to the Italian coastline. The analysis examines seasonal to decadal variability and trends of the hydrographic parameters, Âňtemperature, salinity and density. The data and analysis is described well in the paper and the discussion and the conclusions can be well understood from the described analyses and the figures. The northern Adriatic is only a small sea area but it is extremely important for the Mediterranean Sea as a supplier of the dense bottom water AdDW. The discussion about long term changes (variability) of the deep water characteristics coming from the northern Adriatic is however only short. Nevertheless, I consider the paper to be relevant to Mediterranean research in this sense. The further results achieved are not new in the narrower sense (the authors have al-

ready published a number of publications on the time series here), but a consistent continuation of their work. Changes of decadal time scales require long observation periods, therefore I consider the continued analysis of this time series to be scientifically relevant. However, there remain some inaccuracies and questions about the text. These are specified below. All in all, I consider the paper to be suitable for publication after major revisions.

Here some more detailed comments, questions and corrections: 1: In the abstract I would avoid making innuendos like "indicating different mechanisms which govern their variability" (which?, line 13) or "indicate substantial changes in the thermohaline circulation" (which, line 17). 2: page 3, line 7: if you use abbreviations, please define them beforehand (ERA) 3: page 4, line 4: a winter, change just to winter 4.: page 4, line 5 and 6: through "the" rest of the year / when "the" thermocline is / increasing again "the" stability 5: page 4, line 8: what means in this context "vertical mixing prevails to the buoyancy"? (stratification is less?) 6: page 4, line 32: what are the "overall temperature changes"? Changes in the original time series? 7: page 5, line 4: "the" variance of "the" salinity seasonal series 8: page 5, line 5/6: "as well transient changes occurring over a few month" how can they dominate in the series? I thought, they were filtered out? 9: page 5, line 11: there is a discrepancy between fig. 7 and the text (SJ101 and SJ108?), so I can therefore not really understand what is said. 10: page 5, line 13: change to: bottom layer everywhere except at station RV001 11: page 5, line 21 and 25: "the" residual salinity series / to affect "the" southern and middle . . . 12: page 5, line 28: are lagging a few years: Did you investigate this further? How many years? How big is the range of lag? 13: page 5, line 31/32: I don't get what is said in brackets and why do I know that interannual to decadal changes are dominantly affected by salinity? 14: page 6, line 8: "indicating a weakening of stratification" why? The gradient could have been remained. 15: page 6, line 18/19: I can't follow the example (i.e. . . .) from the text or the figures. 16: page 6 line 24, 26, 28 and 31: "the" central part . . . and at station SJ108 / "The" salinity trend follows "the" temperature trend / "have more complex spatial structure" / "the"

central and eastern parts of the transect / “The salinity trend in July” 17: page 7, line 1-10: I really do not understand this! How can you discuss seasonal changes from your residual time series? Seasonal changes were removed, weren’t they? Was the filter not effective? 18: page 7, line 11: differ more OR differ a lot 19: page 7, line 15-17: I don’t understand this conclusion from what is said before. 20: page 7, line 23-24: Out of context. What’s that sentence supposed to say to me here? 21: page 8, 3-11: Why are the gaps mirrored and not chosen arbitrary to see the effect of gaps in the analysis? 22: page 8, conclusion 2: very general, which different dominant mechanisms are meant? 23: page 8, conclusion 5: what does this mean for the circulation of the northern Adriatic? 24: page 8, line 28: “Our” observed temperature trends (because otherwise it is misleading) 25: page 9, line 7-16: what is meant by reflection of variability? The conclusion ii) confuses me, I don’t really get what the authors want to say. Please reformulate. 26: page 9, line 20: “the” middle and 27: page 9, line 28: “which differs from trend” (skip from them) 28: page 10, line 2: one of “the” processes for weakening the Western . . . 29: figure 3, 6, 8 and 9: Please rotate the x-axes. West should be on the left and east on the right side as usual 30: figure 7: Hardly to distinguish the different periods. Perhaps you can enlarge the figure.

Please also note the supplement to this comment:
https://www.ocean-sci-discuss.net/os-2019-10/os-2019-10-RC1-supplement.pdf

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