Topic Editor Decision: Publish subject to technical corrections (09 Jun 2016) by Dr. Mario Hoppema

Non-public comments to the Author:
Dear Drs. Kikas and Lips,

Below the list with my final comments. Please note that the line numbers refer to your manuscript in the author-response version, i.e. that with the marked changes.

Response: Thank you! We accepted most of your comments. See our responses below.

L62-63 and L63 … at a depth of …
Response: Done

L64-73 I agree with the referee that this discussion is too long and not necessary. If you want to keep it in for a justification of knowledge upwelling, please use less detail and shorten (you can do that in one sentence).
Response: We deleted it. The remaining sentence is moved to the previous paragraph.

What is the precision of the salinity measurement? That of temperature is mentioned but not of salinity.
Response: The accuracy is 0.025 mS/cm or 0.0025 S/m. We added it into the text.

L156-158 "While the raw salinity is recorded in units according to the Practical Salinity Scale 1978, the results on salinity distribution and variability are given later in this paper in g kg -1 (Sections 3 and 4)." If salinity is measured on the Practical Salinity Scale, its value is dimensionless. You are using the unit g kg-1, which means you must have turned the dimensionless value into another unit. Please give more details about the calculation.

Response: It is done as suggested by TEOS-10 (www.teos-10.org) for the Baltic Sea based on Feistel et al. (2010): $S_R=S_P*(35.16504/35.000)$ and $S_A=S_R+0.087*(1-S_R/35.16504)$ [g kg^{-1}] where S_P is Practical Salinity (according to the Practical Salinity Scale), S_R is Reference Salinity and S_A is Absolute Salinity (both in g kg^{-1}). We added the corresponding reference to Feistel et al. (2010).

L197 … were only reliable from …
Response: Done

L214 usual (instead of: ordinary)?
Response: Done

L222 computed (instead of: found)?
Response: Done

L223 For clarity change (in the 20-km coastal areas) to something like:
… in the coastal areas (0-20 km offshore) as

Response: Done

L225 of (instead of: at)
Response: Done

L229 A cumulative upwelling index … (A not: The)
Response: Done

L239 that (not: those)
Response: Done

L242-244 I don't understand the sentence "An upwelling … threshold value". The word "whereas" doesn't seem to fit here. It is not clear to me what you are trying to say here. Please clarify.
Response: We changed the sentence. It is now as follows: "An upwelling event can be characterized by the cumulative upwelling index calculated for the period when the upwelling index (UI_N or UI_S) exceeded a certain threshold value."

L244-245 The threshold values is given here as 40°C. However, on line 232 it is written that CUI has units (°C *day).
Response: That is correct; threshold value for UI_N and UI_S is 40°C. The CUI is calculated as the sum of daily mean temperature deviations in the coastal areas (e.g. for the northern coast as SUM(UI_N/40)) for the period when threshold is exceeded. Thus, we attributed units [°C day] to CUI. It is similar to the cumulative wind stress that has units [N m^{-2} day] (sum of daily mean wind stress values).

L253-254 The model data point close to Kalbådagrund … Add "The" because this is essential for understanding the sentence.
Response: Done

Why do you use the modelled wind data from close to the observational data at Kalbådagrund and not the actually measured data? Measured data are definitely more reliable and more precise.
Response: It was easier to obtain HIRLAM data from that point/region, than actual measured data. According to several papers suggest that modeled and measured data in Kalbadagrund match quite good. Also its results will be easier to compare with previous works in the region i.e. Laanemets et. al 2009, Väli 2011, etc.

L268 "drag coefficient (a value of 1.2 10-3 was chosen in the present study)" Why this value, any evidence or citation?
Response: We used a constant value of drag coefficient, and the most common value for that is 1.2*10-3. We added the reference to Large and Pond (1981).

L279 course (instead of: trend)?
Response: Done. It was "course" in the original manuscript, but was changed because Reviewer2 required this change.

L283 Against the background of the seasonal course, …

Response: Done

L285 … transect, periods with … (delete: the)
Response: Done

L308-309 The seasonal course of salinity differed remarkably between the years.
Response: Done

L309-310 While usually the lowest surface layer salinity was observed in June-July, i 2008 the salinity was the lowest in May and in 2010 and 2011 it was the lowest in August. (delete several comma's for enhancing readability)
Response: Done

L323-324 "This result could be related to the coastal upwelling events." Who could do this? Did you of other scientists? Then you need a citation. If you mean that you think that this is related to coastal upwelling events, then be clearer about that.
Response: We changed the sentence. "We relate this finding to the occurrence of coastal upwelling events." The explanation follows in the next sentences.

L325 off both coasts (delete: the)
Response: Done

L325 near both coasts (delete: the)
Response: Done

L334-335 "which mostly could be related to the upwelling activity" Similar question as before: you think they are related, right? Then please write it. This is similar as later at L335 as commented by the referee.
Response: The sentence reads now as "We suggest that this high variability of temperature in the coastal areas is mostly related to the upwelling activity and, therefore, we estimated the intensity of upwelling events based on data from the 20-km wide coastal zones."

L397 As based on (not: Regarding)
Response: Done

L460 is (not: are)
Response: Done.

L472 west-south-westerly (not: westerly-south-westerly)
Response: We changed it to "westerly to southwesterly".

L487 identify (instead of: reveal)?
Response: Done.

L548-550 Change to: The correlation between the data from the two crossings on the same day must be sufficiently high; if not, the data are marked as suspicious.

Response: Done.

L560 boundary (instead of: border)
Response: Done

L613 coasts (typo)
Response: Done

L626-627 “easterly-northeasterly winds” Do you mean “east-north-easterly” winds or “easterly to northeasterly” winds? Please clarify and change accordingly. (also on line 684-685)
Response: We changed it to “easterly to northeasterly”.

L629 indices (typo)
Response: Done

L652 … near both coasts … (delete: the)
Response: Done

Figure 1, 2: please refer to/cite Ocean Data View
Response: Done. We added the reference to Schlitzer, R., 2015. Ocean Data View, odv.awi.de (it is relevant to Figs. 1, 2 and 3)

Figure 5: I think the labels at the axes are too small.
Response: We reformatted the Figures.