

Earth Syst. Sci. Data Discuss., referee comment RC1
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Comment on **essd-2021-45**

Anonymous Referee #1

Referee comment on "An integrated marine data collection for the German Bight – Part 2: Tides, salinity, and waves (1996–2015)" by Robert Hagen et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-45-RC1>, 2021

The manuscript provides a thorough and detailed overview of the process of collection and generation of a large data set of tides, salinity and waves for the German Bight. The efforts towards systematization, validation and gridding of the data set are substantial and professional, and have led to a multi-purpose data base that can be used for a variety of different tasks. The time interval (20 years) is shorter than the time period used for quantification of the climate (30 years) but hopefully the data set will be extended to fully cover at least one classic climatological time period (e.g., 1991–2020).

I am in favour of publication of this paper and only recommend adding a few remarks and adjusting several minor items.

While the data about tides and salinity match the relevant measurements well, the deviations of the measured wave properties from the hindcast ones are fairly large. Some shortages (in particular, part of the systematic mismatch of hindcast and measured wave periods) seem to stem from model-specific properties.

As the K-model does not involve nonlinear interactions of waves, it is natural that it underestimates the wave periods in some occasions. It is essentially a coastal model and works well in situations where most of the wave fields are relatively young windseas.

The inability of the SWAN model to capture some wave periods is somewhat more intriguing and should be commented separately. I guess that this feature is unavoidable as swells generated by storms between Norway and Island may easily reach the German Bight, and they are not captured by the particular model set-up.

The discussed feature does not diminish the value of the paper and the underlying data sets but I would still recommend to make clear in the Conclusions that the quality of some parts of the data set of wave properties is lower than that of the majority of this pool of data, and to indicate the reasons.

Minor issues:

Generally, all abbreviations should be explained at their first appearance.

Line 35: consider saying "spatially varying tidal range" instead of "spatially varying increase and decrease in tidal range".

Line 45: probably ERA-40 is meant.

Line 68: explain FES.

Line 90: it is better to explain also CSV.

Line 91: explain THREDDS or give a link address.

Line 97: TM1 and TM2 are probably the same quantities as described on page 11, line 254. Please unify.

Line 135: explain BAW.

Line 228-229 and elsewhere: perhaps it makes sense to use g/kg instead of ppt or at least say that g/kg is today a standard unit.

Line 265: "The annually, tidally averaged salinity" sounds strange; please clarify.

Line 294: the last symbol in UnTRIM2 should be a superscript; also on lines 443, 498, 499.

Line 315, caption to Table 1: it is recommended to use "degrees" instead of the degree sign

Line 423: here it is only UnTRIM, with no "2" at all; please unify.

Line 448: "Differences >12 s between the observed peak periods are present..." is ambiguous; please specify whether peak periods over 12 s are meant or is the difference between the observed and modelled peak periods that exceeds 12 s. This may of course happen for extremely long-period swells that are not resolved by the model.

Line 461: simply "in ASCII format".

Line 533: "squared" would render the resulting value of the Pearson correlation coefficient into the range [0, 1] and make perfect and antagonistic correlations indistinguishable; is this what you mean? Anyway, I guess something is wrong with Eq. (5) as the expression under the square root can easily be negative and the entire right hand side of this equation expresses square root of the Pearson correlation coefficient. Also, Eq. (4) is missing.

References

Some titles are fully capitalized, some not. Several references are incomplete. For example, volume number is missing in (Battjes and Janssen), Jänicke et al. (2020) seems incomplete, Janssen et al. (1999) is distorted, the number of pages of (Kösters et al., 2014) and especially (Plüss, 2003) is surprising, Müller (2011) misses some data, it should be "height" in van Rijn et al. (2000), and Winter (2011) is incomplete.