

Interactive comment on “High resolution bed level change and synchronized biophysical data from 10 tidal flats in northwestern Europe” by Zhan Hu et al.

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This paper presents a dataset containing high-resolution, short term measurements of bed-level changes and synchronized biophysical data (water level, water velocity, sediment grain-size, chl-a, wave height) in coupled tidal-flat and salt-marshes systems across northern Europe. Bed-level change data were retrieved from newly-developed SED sensors. These sensors were deployed for time-spans ranging between 9 to 20 months from 2013 to 2017.

The article is clear and well structured. Figures and tables are of good quality and appropriate to support the text. The dataset presented is most certainly new (even

C1

though some subsets of these data were already employed for individual studies on specific study-case), and I believe it has a strong potential for being useful in the future (also because the authors intend to further expand the dataset by adding new study cases and data).

Methods and material are described in sufficient detail (with some minor exceptions that I've listed here below), and the cited literature is appropriate in my view.

I encountered no issues in accessing the dataset, which I found is complete and well organized. I've only highlighted in my comments one minor suggestion regarding the format of geographic coordinates to improve data consistency throughout the dataset. Data are easy to read and ready-to-use.

However, I share the concern of Referee 1 (see RC1 comments n.5 and n.7) regarding the reported low values of significant wave height (H_s) equal to 0.1 and 0.08 cm (text line 173). The authors refer to the work of Tucker and Pitt (2001) for the calculation of H_s and wave period from dynamic wave pressure signals. I believe the text should be briefly expanded to provide an explanation regarding this procedure, which are the potential sources of error, and what is the physical limit – if any – below which the derived H_s values should be disregarded due to (e.g.) instrument accuracy.

DETAILED COMMENTS

I.1: the wording chosen for the title is a bit strange, because it seems that “high-resolution” is referred to bed level (hyphenation is missing, by the way). I would suggest changing it to “High-resolution synchronized data of bed-level changes and biophysical data from...”, or something similar. Reading the abstract it becomes clear that the focus of the paper is also (if not mostly) on salt marshes, so I find the choice of using “tidal flats” in the title a bit odd. My impression is that making explicitly clear that the paper aims to investigate the dynamics of both tidal flats and marshes would be much better.

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I.53-54: “The evaluation of . . .”, there’s something strange in this sentence. Perhaps “Evaluating the impact of changing sea level and increasing storminess on these valuable coastal ecosystems is of socioeconomic importance” is more clear.

I.118-120: how was the low-tide defined/measured? Directly by the SED sensor (if so, how) or rather by coupling SEDs with a pressure gauge to measure water elevation? Later in the text (I.133) it is specified that “we deployed pressure sensors 0.05 m 0.10 m above the bed in the vicinity of the SED-sensors at some of the sites (see Table 1)”. I think the use of pressure sensors should be mentioned in I.118-120 too.

I.105-115: it would be nice to add some information here (or in Fig.2) regarding the size (i.e., total length) of the SED sensors.

DATA: in the “profile_all_Mar_2020.xlsx” file, the coordinates (LAT, LON) for all sites are reported in decimal degrees except for sites 9 and 10. I believe it’d be better to keep the decimal degree format throughout the whole dataset. This should be an easy fix. Also, I’ve noticed that coordinates for site 10 are reported in red: is there a specific reason behind this color choice or is it just a misprint?

FIGURE: Figure 1: the use of blue color to highlight (some) land cover makes the figure a bit confusing I think. It would be probably better to lose such a color-code in favor of a much clearer one with gray=land and white=sea.

MINOR COMMENTS

I.31: “instrument cost” → “costly instruments” is perhaps better.

I.33: “salt marsh sites”->”salt-marsh sites”.

I.34-35: “bed level changes”->”bed-level changes” (please add hyphen throughout the whole manuscript).

I.36: D50->D₅₀ (use subscript throughout the whole manuscript)

I.36: “some sites”, please specify how many.

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I.46: “with”-> ”of” global importance.

I.61: a semicolon is missing after “(Bouma et al., 2016)”.

I.82: “the current”-> ”such”

I.84: lose “current”

I.94: “in 2013-2017” -> “in the period 2013-2017”; also “from 9-20 months”->”from 9 to 20 months”

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