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Interactive comment on "A synthetic map of the northwest European Shelf sedimentary environment for applications in marine science" *by* Robert J. Wilson et al.

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We thank the reviewers for their helpful suggestions to improve the manuscript. Responses to reviewer 1 and reviewer 2's comments are below. Revisions have been made to the paper and we attach a pdf showing those revisions. In addition to applying revisions in response to reviewer comments we have made a minor correction to the data sets. Full details are given below.

Reviewer 1

"In Table 2 add "Data sets 12" source" This has been added.

"In page 7, line 27, the number of data (20,709) does not match with the value in Table 2) – please check". The figure in the table has now been corrected to match that in the text.

"In section 2.2.3, include the graph laser-mud vs. Sieve-mud" We thank the reviewer for this helpful suggest. We have included this figure.

"In table 3, define TOC. Before it appears as POC". The text's use of POC and TOC was inconsistent. We have now corrected it to be POC throughout.

"In page 13, line 17, include the r2 value". This sentence was misplaced. The r2 is given in the results section. We have therefore removed this sentence, as it is inappropriate to refer to results being realistic in the methods section.

"Revise the ranger of the raster of permeability in the data_files_as file" We have checked this file and the raster range seems OK, and it displayed correctly in arcGIS. Can the review please double check with the new files?

"In Figures 4,6,7,8 and 9 please include the original data to compare with the intermediate and the final results". We have added maps of the raw data for figures 4,6,8 and 9. For figure 7 the raw data was only used to create the predictive model, not interpolation.

"Mud is cohesive. How the authors have considered it in their maps of natural disturbance? The model of natural disturbance requires bed shear stress to be above a critical level for sediment to be dislodged from the seabed. This critical level is related to median grain size using an empirical relationship, and is U-shaped. So more cohesive mud has a higher critical shear stress.

"In page 18, explain why the r2 of rock classification is very low". We view this as discussion material, and it was partly discussed in the "limitations and assumptions" section of the discussion. We have now added a further two sentences to the discussion. The lower r2 values is likely an outcome of data uncertainty. We are predicting

rock cover. However, we only have estimates of whether individual locations are rocky or not. Relatively poor data density means that our r2 value is comparing a predicted rock cover with a relatively crude estimate of rock cover (in most locations it is with 1 or 2 data points). Even if we had a model that was perfect at predicting actual rock cover in a location we would end up with an r2 of something like 0.4 because in most locations all we are doing is randomly sampling 1 or 2 locations when, say, 60% of them are rocky. So in this situation r2 is probably not an ideal metric

"In Appendix A1, Ec. A4 does not match with the Sously and Smallman (1986) expression. Please revise". This typo has now been corrected.

âĂČ Reviewer 2

A sentence showing the relevance of the study to understanding coastal geomorphology has been added. We have now mentioned wave-supported sediment gravity flows currents in the limitations part of the paper's discussion.

Minor correction to data sets

A minor mistake in the analysis of the mud, sand and gravel percentages was noted during the revision stage. In the original version of the paper the regions where we interpolated mud, sand and gravel percentages did not go far west of Ireland. However there is sufficient data to interpolate in some of this region. We have therefore modified the data sets to have the mud, sand and gravel percentages interpolated in relevant regions west of Ireland.

Data sets have been updated and a new DOI has been created for the updated files.

Please also note the supplement to this comment:
https://www.earth-syst-sci-data-discuss.net/essd-2017-88/essd-2017-88-AC1-supplement.pdf

Interactive comment on Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2017-88,

2017.

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