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Interactive comment on "Total suspended matter derived from MERIS data as indicator for coastal processes in the Baltic Sea" *by* D. Kyryliuk and S. Kratzer

Anonymous Referee #1

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This manuscript is very descriptive in nature. It contains many figures and tables and the manuscript is mainly arguing why the MERIS images shown contain information on the "physical extent of coastal processes". However, I found very little substance in the manuscript that explains how this methodology works and how it can be tested or validated. A proper working hypothesis is lacking and when we look at the objectives of the study (page 3, Lines 14-17) none of them is properly reached;

"1) to generally derive mean estimates of total suspended matter load of the different 15 Baltic Sea sub basins using MERIS data" The methodology to process and combine MERIS data is standard. In figure 1 a list of 25 images is presented. Then follows a very obscure selection process that removes 22 images and only 3 images in June

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Discussion paper

were selected. How this was done and why all the others (these show very different TSM distributions after processing) were troubled by cyanobacteria blooms is not clear from this paper.

"2) to investigate if MERIS data can be used to evaluate the extent of coastal processes in the Baltic Sea."

Section 2.7 gives a description of the TSM concentration threshold that marks the transition between coastal waters and non-coastal waters. Besides a reference to an “inorganic threshold of 0.05 gm-3 (Kratzer and Tett, 2009) no explanation is given why this can be translated to TSM values of 0.6 gm-3. What does it mean? What are processes? Why TSM only? What are the arguments to use the TSM value at the peak-frequency of the TSM distribution (Figure 6) as transition value. Maybe the authors have good arguments, but they are not given and the reader has no way to test or interpret these results.

"3) to compare the extent of the coastal water masses as derived from remote sensing data to the water body classification defined by SMHI, with Baltic Sea bathymetry and marine seabed sediment." It is nice that in a previous study the results of MERIS processing was extensively described and the algorithms tested and validated (Beltran et al, 2014). From this study it is clear that the typical error in TSM retrieval is at least in the order of 30% and the bias (stated on page 3, Line 11) is not the dominant error. With this uncertainty in mind, the preference for a certain analytical function to describe the TSM transect values as function of distance from the coast becomes doubtful.

Finally, the authors have provided illustrations of the seabed sediment (Fig. 13) and bathymetry (Fig 14) in order to illustrate points in the discussion. However, this information is not new and was not used in the methodology and result section.

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