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Interactive comment on "Satellite detection of multi-decadal time series of cyanobacteria accumulations in the Baltic Sea" *by* M. Kahru and R. Elmgren

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With regards to using the first or second person- I agree that it is a matter of style, but still one should not use it if not really required. It really can sound inappropriate and then it diverts from the content.

From the previous version of the article, it was not obvious that you did not include 4 km products in the analysis; but now you have specified it.

I only used MERIS as an example for sensitivity because this is the instrument I am most familiar with; the same when explaining going from one spatial resolution to another. Ocean colour sensors are much more sensitive to water, and it may still be that

MODIS and VIIRS sense suspended matter –including both cyanobacteria and non-algal particles – at much lower radiances- and therefore at an earlier stage. Cyanobacteria are always present in the open Baltic Sea with levels ranging from 2-4μg/l, even in the surface mixed layer. When the water becomes less turbulent and a seasonal stratification is established they accumulate at the surface. But, still they are present at relatively high concentrations also in the SML – at least when compared to other temperate regions. What I mean to say is that it is likely that ocean colour sensors can sense the cyanobacteria at an earlier stage of the development of a surface accumulation and that this would show up as increased turbidity. And, yes, I do feel that this can affect your results as AVHRR is not as sensitive. I still feel that this may partially explain the earlier on-set of the bloom. Sensitivity refers to level 1 and usually effects on level 1 also propagate to level 2, no matter what algorithm you use.

It is nice that you included a reference from the southern Baltic Sea, but it may be fair also to include Kratzer and Tett, 2009, which you seem to have used for some of your underlying assumptions of your analysis – i.e. that inorganic SPM is mostly found in the coastal areas and that it decreases as one goes further off-shore, and that in the open Baltic Sea, SPM can be used as a proxy for cyanobacteria blooms. At least- I have discussed these issues with Ragnar Elmgren many times in the past- and he is very aware of the study- so why not quote our paper?

You still have not addressed my comment that SPM can be found to about 100-120 km off-shore in the southern Baltic Sea, and that this may be misinterpreted as a cyanobacteria bloom by ocean colour sensors, as the SPM shows similar patterns as those of cyanobacteria – i.e. it is an indicator for the eddies and large-scale features. This does not only impact the small bays in the coastal zone, but seems to starch out a rather long belt into the actual Baltic Proper. So, this may have a significant effect on your analysis. Also, Sentinel-2 will have the appropriate spatial resolution to sense also small bays, and it will have some channels that are relevant for OC applications, so I would not completely dismiss the information in the coastal zone in the near future.

Aphanizomenon is found at deeper parts in the water column- not just 'in the water column'. The water column reaches right up to the surface, and this is where you find more Nodularia. What I meant, was that 'in the water column' does not say anything about which depth it is found at. Could also be close to the surface.

I look forward to seeing the revised version of the manuscript- it sounds like it has already improved quite a bit.

What I had forgotten to mention before is that your maps of FCA in grey-scale (Fig 13a) does not have a legend. What do the grey shades refer to? What are your steps?