



EGUsphere, referee comment RC2
<https://doi.org/10.5194/egusphere-2022-821-RC2>, 2022
© Author(s) 2022. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on egusphere-2022-821

Anonymous Referee #2

Referee comment on "Fortnightly variability of Chl *a* in the Indonesian seas" by Edward D. Zaron et al., EGU sphere, <https://doi.org/10.5194/egusphere-2022-821-RC2>, 2022

The authors performed a harmonic analysis of 20 years of MODIS chl data in the Indonesian Seas and concluded that "in some regions chl is phase locked with the spring-neap cycle, peaking around 6-7 days after the local maximum of tidal currents". It is an interesting topic, but in my assessment the paper needs much more work before it is publishable.

As the authors clearly state, the time series of chl only has data at most 50% of the time due to cloud coverage, and in many regions it is as low as 7-14%. I am not convinced that this is sufficient temporal coverage to support the finding of a fortnightly signal. The authors state this it is sufficient but present little actual analysis to back this up. Given this is a region strongly impacted by monsoons (which is not mentioned in the paper) I imagine that there could be quite long periods with no data. They need to do a better job of assessing the gaps in the data and convincing the reader that it is not problematic to answer the question posed here.

I was curious why they used the GlobColour MODIS product rather than their merged product. The GlobColour project merges satellite data from different sensors which should result in a product with slightly better spatial coverage. Additionally, there are known issues with recent data from the MODIS sensor, which is 15 years past its design life. Using a merged product like GlobColour or the ESA OC-CCI product would mitigate the impact of the declining data quality of the MODIS data.

They need to do a better job of introducing the study area and describing what is already known about tidal variability in this area, and what big questions still need to be answered. They don't even mention the study area in the abstract except for in the last sentence. Reading just the abstract one might assume this was a global analysis that happened to highlight dynamics in the Indonesian Seas. Additionally, the conclusion cited above came from the Conclusion section, the abstract was much more vague on the actual results of the paper.

There are a lot of details about the data analysis or their results that are glossed over or are vague:

- Lines 34-35. *"We have found that least-squares harmonic analysis is adequate to quantify variability"*
How was this assessed? What is their definition of "adequate"? What would be inadequate?

- Lines 65-67. They state that the noise of the harmonic constants was compared to the amplitude at "fake" tidal frequencies and found to agree well.
What is meant by the "amplitude estimated at "fake" tidal frequencies"? Compared how? What is their definition of "agree well"?
- Lines 79-80 *"it is evident that the seasonal variation of chl-a is 50% or more of the mean in many coastal areas"*. I'm afraid this is not evident to me. Is this from a comparison of the mapped values in Fig3a and 3b? The two panels have different color scales which makes comparisons between them more difficult.
- Lines 114-115 *"The harmonic analysis... appears to provide more consistent classification..."*
Based on what? What is meant by "consistent classification"?
- They frequently make comparisons to their results and those of others that require some degree of graphical representation, ie lines 117-119, 128-129, 114-115.
- Line 121. "The fortnightly Chl maximum lags the spring tide... for the examples cited in the Results Section"
They need to be more specific about what results (or areas) they are referring to.
- Lines 157-158. "in some regions chl is phase locked with the spring-neap cycle, peaking around 6-7 days after the local maximum of tidal currents". Where is this shown? What figure?

Figure 1. Convert the values shown to percentages.

Fig 4, 5 and 6. It would be easier for readers to interpret the maps if the colorbar legends for phase were expressed as months rather than radians.