

Interactive comment on “The Arabian Sea as a high-nutrient, low-chlorophyll region during the late Southwest Monsoon” by S. W. A. Naqvi et al.

Anonymous Referee #1

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This paper has two thrusts, the first to look at the biogeochemistry of the Arabian Sea upwelling region and the role of iron in limiting phytoplankton in the region, and the second to re-examine trends in chlorophyll in the region with respect to the results of Goes et al. and their conclusion that the monsoonal region is changing rapidly. I enjoyed the paper, and felt the additional data and reanalyses are important contributions to the study of the Arabian Sea. As a result, I suggest publication with minor revision.

Some of the conclusions and organization could be improved, and I offer a few comments to help the authors with this. 1. The summary and abstract are not completely consistent. As stated above, there are two noteworthy points: long-term changes in chl are not significant, and Fe plays a central role in the C cycle of the region. Both should be stated clearly, and in the same order, in both the abstract and summary. I'd

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encourage the satellite chlorophyll analyses to be second in both (as well as in the results section). 2. In Figure 3, what is the red line? Black line? 3. On page 33, top, it is argued that stations experienced intense upwelling. By what measure? 4. Same page – comment about getting Fe samples off a CTD rosette system may not be justified, as an intercomparison showed little difference between the MLML and UH collections. Regardless, concentrations of 1 nM certainly are enough for phytoplankton, in my experience. If you get values less than 0.3 you have a strong potential for Fe limitation. The data in Fig. 6 should be viewed as a potential for Fe limitation, given the biological variability of this ratio. The authors also talk about the addition of aerosol Fe, but don't talk about the variability in dissolution (or kinetics) in this, which would influence the temporal pattern of Fe limitation. Regardless, I think the results document what most people would argue – that Fe has a critical role in upwelling regions. 5. Another aspect that I found interesting is the spatial variability in $\Delta\text{Si}/\Delta\text{N}$ ratios as induced by Fe. I think this may be a robust tracer of Fe limitation, but some discussion on the role of Si limitation might also be justified. The spatial variability of this ratio also has parallels in the upwelling region off NW Africa. 6. Comments on atmospheric input of N are interesting but speculative, as it is unknown what form green Noctiluca uses.

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