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Interactive comment on "Bottom-up and top-down controls on picoplankton in the East China Sea" *by* C. Guo et al.

Anonymous Referee #1

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General comments: The authors present a very interesting dataset looking at the growth and grazing dynamics of picoplankton in the East China Sea. That being said, the manuscript is substantially weakened, by a discussion that lacks focus and clear 'take home messages' and throughout by the abundance of typographical and grammatical errors. I would highly recommend the authors restructure their discussion to make it clear and concise what they think is driving the relationships. Also, the authors should have someone fluent in English proofread the manuscript for typographical and grammatical errors. My other general concern is that throughout the manuscript there are discussions of bottom up controls and specific controls are given attribution for distribution of picoplankton (e.g., temperature) but I don't see anywhere the evaluation of the covariance of the bottom up drivers to ensure the proper variable is being credited. There will be a strong covariance given the nature of the study (seasonal) and the sys-

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tem (river plume to ocean current) in variables as temperature, salinity nutrients. I think this in part leads to some of the lack of focus in the discussion but also greatly weakens the manuscript and should be addressed. In terms of the manuscript's scientific importance, it is important as it will increase the knowledge base on grazing on and growth of phytoplankton in a region where we don't have a lot of data. It doesn't present any intellectual breakthroughs, but that is OK. In terms of the manuscript's scientific quality, parts of it appear fine, although hard to fully evaluate without the presentation of actual experimental data, and the questions regarding ability to resolve Prochlorococcus. The manuscript references other work as appropriate and there is in general a good balance in the presentation, but as mentioned previously the presentation in general is unfocused. In terms of presentation quality the manuscript needs significant help primarily in typographical and grammatical errors, but also in the presentation quality of the figures which differs greatly between them.

Specific comments by section: Methods: No mention of how Peuks were defined, are they operationally defined? What size cut-off do they represent, etc. more detail is needed, particularly on how well the FACSCaliber did at observing potentially dim Prochlorococcus. More information on error in the dilution experiment details. Did all the experiments show a significant relationship between change in algal abundance and fraction of seawater? Were they all equally good or were some relationships potentially skewed by weak relationships? It is well known that photoacclimation is a real problem, in this case particularly with the ability to resolve Prochlorococcus. It already appears that there are fewer grazing estimates for Prochlorococcus, not entirely attributed to their lack of presence in the coastal ocean.

Results The authors need to show as a figure a set of actual dilution experiment data, not just the reduced coefficients/surface plots. This relates back to the evaluation of error in a prior comment. In section 3.2, the depth averaged cell abundance values over the upper 150m is presented. First, there needs to be some mention of how this is done, moreso than stating the trapezoid rule as there are many stations that don't go

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to 150m. Second, does presenting the data in this way have any meaning given that 1) surface populations, particularly of Pro are very dim, 2) that there is clear structure in the vertical profile of abundance, and 3) for Euks which are likely to be operationally defined you are not only averaging over depth but very likely over different populations comprised of cells of different sizes, nutrient requirements, etc. Table 4: it looks like the ratio for Prochlorococcus in summer, in the Kuroshio Current stations, is inverted. For Syn, winter, plume there is a decimal place error. Please carefully go through the tables and look for other errors. Figure 1: 'labellbed' is a typo Figure 6: this should be split into two figures as there are some many panels that I can't read the axes even when blown up to 400% scale. Figure 7: missing the (C) to reference that panel. Figure 8A: missing 'r=..' Discussion: P8217 L20- bottom up controls are generally viewed as positive relationships. I don't think that the negative relationship of nutrients and Pro abundance is a direct bottom up control, rather that Pro doesn't grow in the coastal environment and that is where the nutrients are highest. The genome streamlining is a response to chronic nutrient limitation, so would not be an explanation for low abundance in the coastal regime. P8218 L13 – Syn has also been shown to grow in response to nanomolar additions of nitrate (Glover et al. 2007). Thus the separation of the two cyanobacteria lineages is not purely driven by nutrients. P8219-8221 – discussion of top-down control. There are a lot of ideas being mentioned and it seems like the authors are trying to mention everything that might control rates rather than what does appear to control grazing rates. This section is hard to follow and come away with a take home message. For example, at the end of P8221/beginning of 8222, it is suggest, I think, that Pro and Syn are actually controlled by bottom up processes. P8223 L5-10 – "Microzooplankton consumed an average of âĹij60 %, 69 % and 65 % biomass production of Pro, Syn and peuk, respectively, in ECS, and the proportion of m / μ was higher in summer than that in winter due to a steeper decrease in grazing than in growth, suggesting a stronger top-down control eïňĂect in summer." I don't understand this sentence, how does a stronger decrease in grazing than growth lead to a higher m/u?

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