Interactive comment on "Photosynthetic parameters in the Beaufort Sea in relation to the phytoplankton community structure" *by* Y. Huot et al.

Anonymous Referee #1

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Overview This paper describes the photosynthetic parameters measured during a cruise in the Beaufort Sea. It provides a unique data set to add to the current understanding of photosynthesis in the Arctic and was compared to the MEL data set. The paper is missing a discussion on the data in regards to a changing Arctic (less ice, more light etc), which the authors refer to in the introduction. I would also liked to have understood where the large celled communities were in the water column, the 50m split of the data seems arbitrary and is not explained. This data set is an important addition to our understanding, and this paper represents a good description of the data.

Abstract Line 4: Add "s" to photosynthetic parameter, so it reads parameters. Line

6 to 8. This sentence is a bit awkward to read, I suggest "Such measurements and their relationship to environmental variables will be required to improve the accuracy of remotely sensed estimates of phytoplankton primary production and our ability to predict future changes"

Introduction Page 2, paragraph 1. "ice free summer in the Arctic Ocean is predicted to occur sooner" – sooner than what? This sentence needs a reference to when we initially thought this would happen 2050? 2100? Page 2, paragraph 2. Increased light will increase primary production, however in Hill et al 2012 Progress in Oceanography they also state that the Arctic is nutrient limited so light alone will not dramatically increase PP. Page 2, paragraph 2. In situ should be italized, throughout the paper. Page 2, paragraph 3. Sentence fragment, time of incubation is repeated in the second sentence of this paragraph.

Methods PvsE curves. Why did the authors use a Sf factor of 0.5, when their absorption spectra whould indicate using 0.35? Community size and taxonomy. I would like more detail on which pigments were used to identify size fractions.

Results Fig 1C. There is no subK in the axis titles. Page 6, paragraph 6. Earlier in the text it was mentioned that a subsurface Chl a max was found along the cruise track. In reference to Fig 2, at what depth did that occur? Was there a difference in community? This paragraph confused me, are shallower waters referring to the total water depth? Or the surface mixed layer? How did you choose the 50m split seen in figure 2. Page 10. I do not see a reference to Fig 8B or 8C. In figure 8 C it does not appear that the predicted αChl had the same dynamic range as the measured values.

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