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Interactive comment on “Pigment signatures of phytoplankton communities in the Beaufort Sea” by P. Coupel et al.

Anonymous Referee #2

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Overview This paper describes the use of pigment signatures and microscopy to identify phytoplankton communities and link distribution to water column characteristics in the Beaufort Sea. The authors use HPLC pigments and microscopy to develop pigment ratios with which to initialize the CHEMTAX program. The outcome of the research was the identification of 4 clusters of phytoplankton communities described in the first order by nutrient availability. I appreciate the authors discussing the impacts of differences in phytoplankton type on carbon cycling (sinking etc). Overall this work provides the community with localized CHEMTAX tuning for the Beaufort Sea. I would like the authors to provide a threshold value for changes in starting pigment ratios.

Abstract: Line 15: Spelling, “Microscopic count” replace with counts.

Introduction: 14492 Line 5: Grammar replace “allows to characterize” with “allows for

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the characterization of" 14493 Line8 thr 11: Last sentence is not a very good end to this section. Why is CHEMTAX critical? Why not use microscopy, HPLC is also time consuming and expensive. I would like the authors to try harder to convince me that I should care about CHEMTAX results.

Methods 14497 Line 7: First use of Pras, please use the full spelling first i.e Prasinox-anthin (Pras) 14497 Line10: Lut same issue as above 14497 Line 12: "two matrix ratio" replace with "ratios"

Results 14500 Line 4: Grammar, "was twice higher" replace with "was twice as high" 14500: I appreciate the authors attempts to discuss the impact of differences in starting ratios, more useful here would be a threshold over which changes in starting ratios would render the CHEMTAX output significantly wrong. How big of a deviation in ratios can the method take?

14501: Looking at Table 4, the conditions of cluster 1 and 2 don't appear to be different, some statistical testing here would be informative. 14501 Line 25-28: chlorophytes are not just a freshwater species, at PSU 24 to 26 the freshwater term doesn't make sense. The discussion here about the phytoplankton present is not well described.

14504 Line 22: Fig 9 is referenced before Fig 8. 14506 Line 17: (Brugel et al 2009) should be Brugel et al (2009)

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