

**Table S5.** Assignments of the samples to the various categories used to test for significant trends (see Fig. 1 and Table 1).

Sample#	Date	Analysis Factor					
		Ice Extent	Geography	Year	Season	PAR <sup>a</sup>	Chl <i>a</i> Distribution <sup>b</sup>
1	Oct.2003	<2007	Open Ocean	2003	Fall	Low	Shared
2	Nov.2003	<2007	Franklin Bay	2003	Fall	Low	Shared
3	July 2004	<2007	Franklin Bay	2004	Summer	Med	Shared
4	Aug.2004	<2007	Franklin Bay	2004	Summer	High	Nano
5	Sep.2005	<2007	Open Ocean	2005	Summer	High	Nano
6	Oct.2006	<2007	Open Ocean	2006	Fall	Med	Nano
7	Nov.2007	>2007	Open Ocean	2007	Fall	Low	Nano
8	July 2008	>2007	Open Ocean	2008	Summer	Med	Pico
9	Aug.2009	>2007	Open Ocean	2009	Summer	High	Pico
10	Oct.2009	>2007	Open Ocean	2009	Fall	Low	Pico
11	Oct.2010	>2007	Open Ocean	2010	Fall	Low	Nano

<sup>a</sup> Low-light was considered as  $<0.1 \mu\text{E m}^{-2} \text{s}^{-1}$ , medium-light as  $0.1\text{-}1.0 \mu\text{E m}^{-2} \text{s}^{-1}$  and high-light as  $>1.0 \mu\text{E m}^{-2} \text{s}^{-1}$  PAR (Photosynthetically-Active Radiation) as measured at the depth sampled (see Fig.1).

<sup>b</sup> The percent distribution of Chlorophyll *a* in the small ( $<3 \mu\text{m}$ ) vs. large ( $>3 \mu\text{m}$ ) fractions was taken as a proxy for successional stage. Communities were binned as  $>60\%$  (Nano-dominated),  $40\text{-}60\%$  (shared), or  $<40\%$  (Pico-dominated) in the large fraction as measured at the depth sampled (see Fig.1).