Supporting Information

Orellana et al. 10.1073/pnas.1102457108

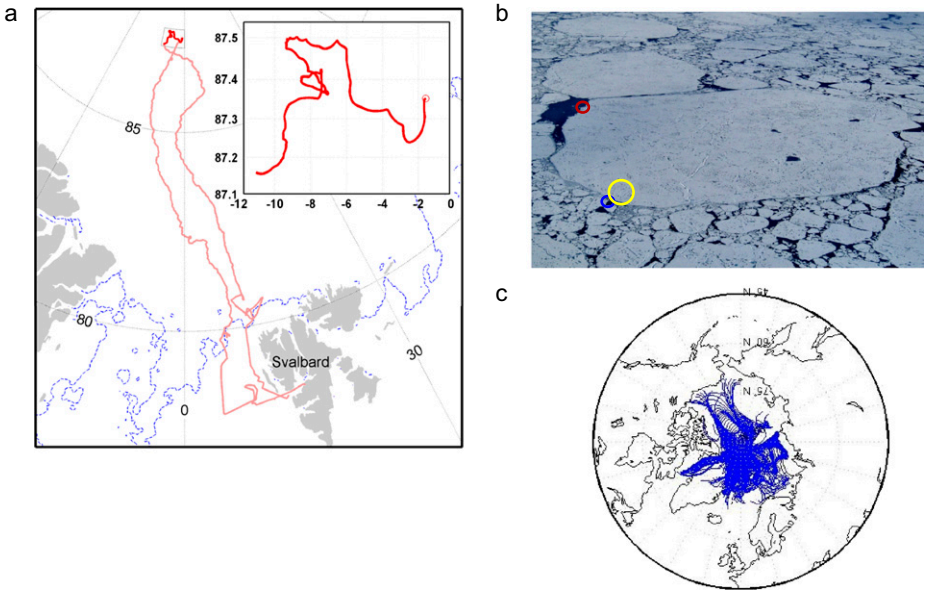

Fig. S1. Study area. (*A*) Map of the cruise track (pink) during the ASCOS expedition (08-2008, at 87–88° N, 2–10° W), with ice-drift period highlighted (red, and inset area indicated) and (inset) shown in detail with the start of the drift marked by the circle. The ice edge (blue line) is shown for the start of the drift period on 12 August 2008. The drift area was within air with a minimal influence by man-made sources. (*B*) Aerial photograph of the ice floe used for the 3-wk drift taken from a helicopter where the blue circle indicates the location of the Icebreaker Oden, the yellow circle is the location of the meteorological sampling camp, and the red circle shows the location of lead sampled. (*C*) Air mass trajectories with an arrival height of 100 m at the position of the icebreaker.

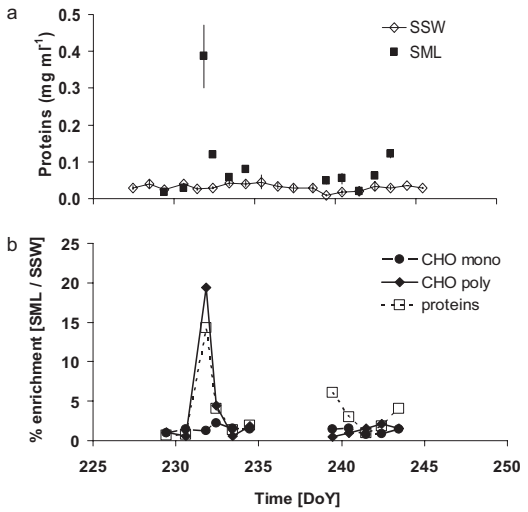

Fig. S2. Partial characterization of DOM in SML and SSW waters. (*A*) Protein concentration (fraction >0.7 μm) in SSW and SML waters. (*B*) Dissolved poly- and monosaccharide as well as particulate protein enrichment; proteins and polysaccharides were enriched in the SML immediately after cold periods.

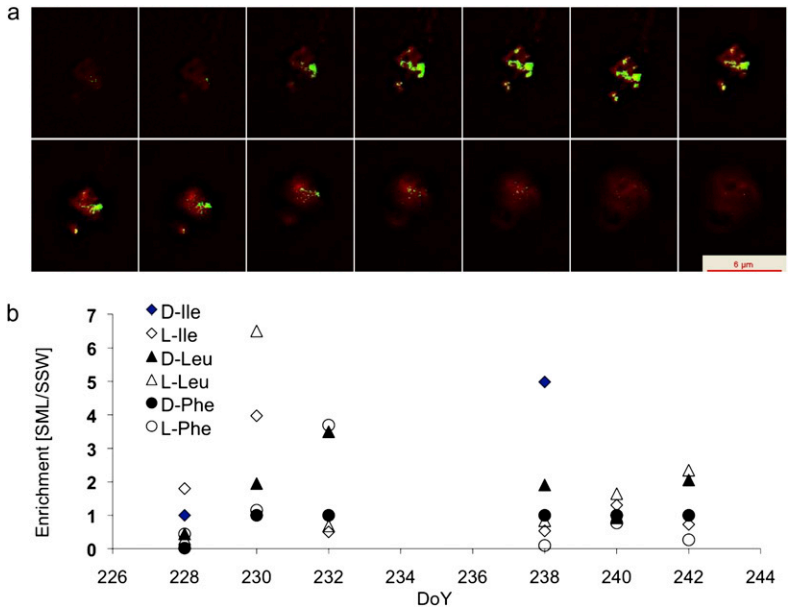

Fig. S3. Hydrophobic moieties in microgels. (*A*) Cloud water microgels stained with Red Nile indicate the presence of hydrophobic moeities, with green corresponding to nonhydrophobic moeities. (*B*) Enrichment of dissolved hydrophobic amino acids (leucine, isoleucine, phenylalanine, and cysteine) in SML with respect to SSW waters.

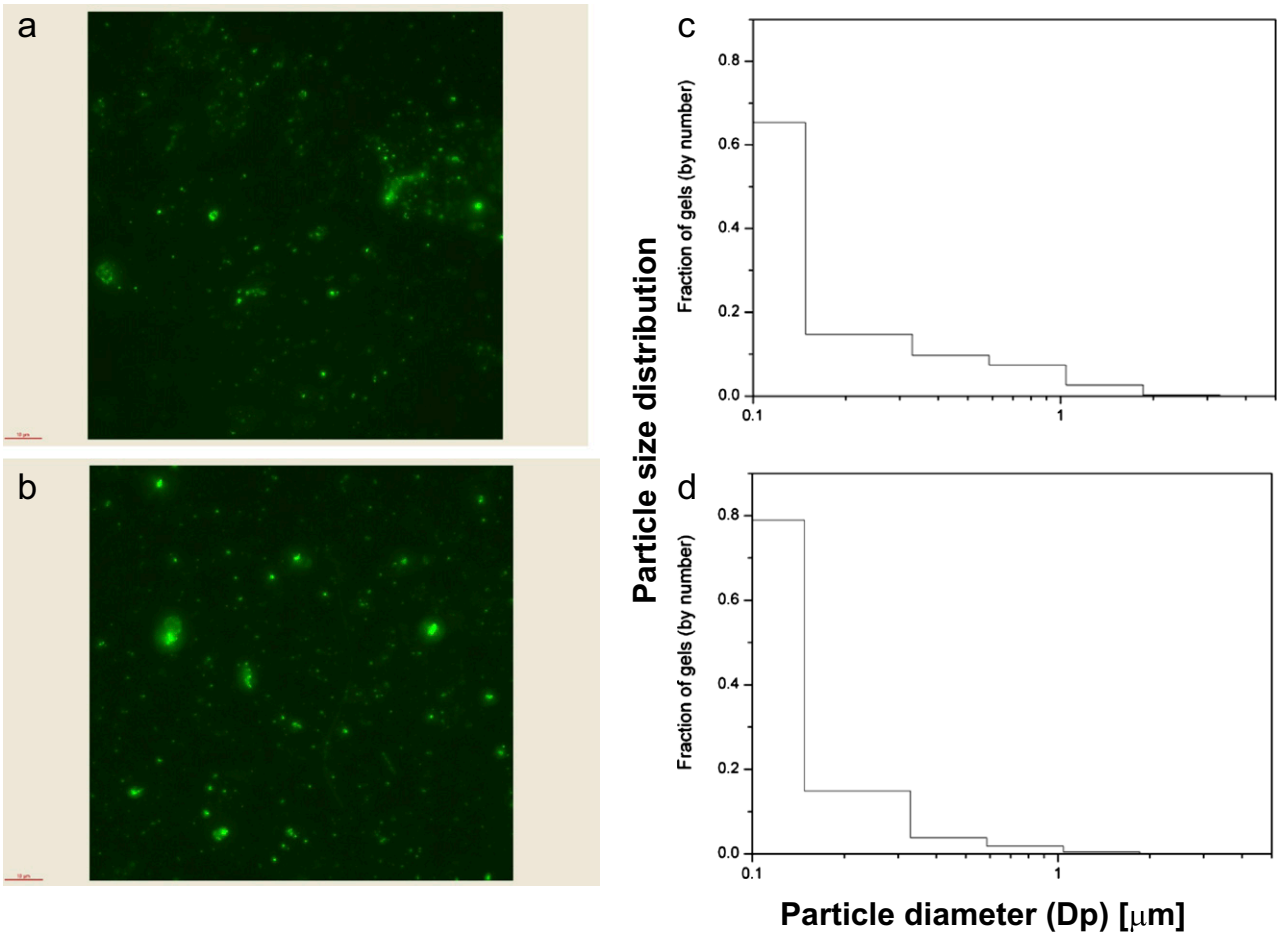

Fig. S4. Microgels in fogs and aerosols. (*A*) Fog and (*B*) airborne aerosol nano and microgels immunostained with an antibody probe against material toward surface ocean waters from 87 to 88°N, 2–10°W. Relative frequency of Np [dNp/log(dDp): delta of Np/log delta Dp] in a specific size range for immunostained gels observed with confocal microscopy shows that 80% of the gels are in the smaller nanometer size range for both (*C*) fog and (*D*) airborne aerosol particles.

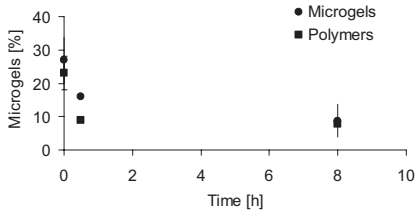

Fig. S5. Cleavage of microgels irradiated with environmental levels of UV at 87°N. Environmental levels of UV irradiation on spontaneously assembled microgels from the SSW DOM resulted in a factor of three reduction of the microgel yield indicating dispersion of microgels and cleavage of biopolymers.

Table S1. Cross reactivity of antibody to DOM from selected phytoplankton species kept in culture and field samples

No.*	Class	Genus	Species	Reactivity
327	Cryptophyceae	*Guillardia*	*theta*	—
334	Coscinodiscophyceae	*Cyclotella*	*meneghiniana*	—
336	Coscinodiscophyceae	*Cyclotella*	*meneghiniana*	—
338	Coscinodiscophyceae	*Cyclotella*	*meneghiniana*	—
419	Dinophyceae	*Protodinium*	sp.	—
425	Dinophyceae	*Gymnodinium*	sp.	—
440	Cryptophyceae	*Hemiselmis*	*rufescens*	—
452	Raphidophyceae	*Heterosigma*	*akashiwo*	—
525	Eustigmatophyceae	*Nannochloropsis*	*oculata*	—
689	Dinophyceae	*Prorocentrum*	*micans*	—
702	Dinophyceae	*Prorocentrum*	sp.	—
703	Dinophyceae	*Prorocentrum*	sp.	—
1178	Cryptophyceae	*Rhodomonas*	*abbreviata_cf*	—
1322	Dinophyceae	*Heterocapsa*	*pygmaea*	—
1577	Coscinodiscophyceae	*Cyclotella*	*striata_cf*	—
1594	Euglenophyceae	*Eutreptiella*	*gymnastica_cf*	—
1595	Raphidophyceae	*Heterosigma*	*akashiwo*	—
1647	Coscinodiscophyceae	*Thalassiosira*	*rotula*	—
2283	Prymnesiophyceae	*Emiliania*	*huxleyi*	—
2715	Cryptophyceae	*Proteomonas*	sp.	—
2948	Dinophyceae	*Symbiodinium*	sp.	—
3162	Bacillariophyceae	*Surirella*	sp.	—
3171	Prasinophyceae	unid	sp.	—
3194	Rhodophyceae	*Bostrychia*	*calliptera*	—
1013	Coscinodiscophyceae	*Thalassiosira*	*pseudonana*	—
ASCOS	Coscinodiscophyceae	*Melosira*	*artica*	+
	Phytoplankton from Puget Sound			—

The antibody was generated against seawater DOM collected during ASCOS (08-2008, 87° N, 2–10° W). A negative sign indicates no immuno reactivity, whereas a positive sign indicates reactivity.
*Culture Center for Marine Phytoplankton, Bigelow Laboratory for Ocean Sciences