

1 **This supplementary information includes:**

2 Figs. S1 to S2

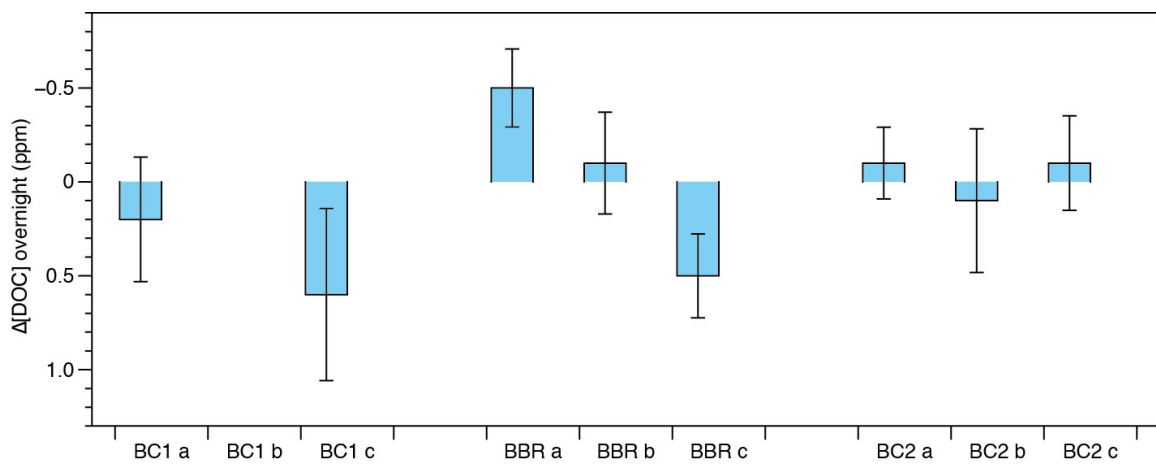
3 Tables S1 to S5

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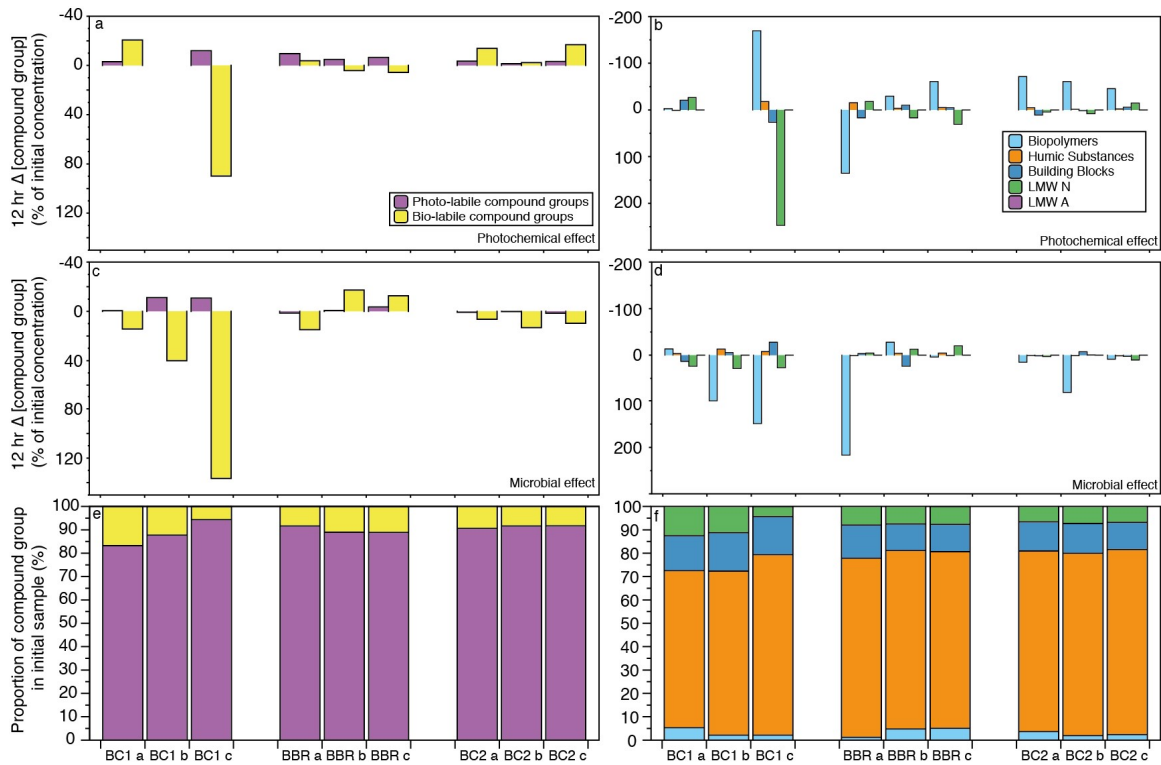
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10 **Fig. S1.** Overnight changes in photochemistry-driven DOC concentrations. Error bars show SD; note
11 inverted y axis.

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15 **Fig. S2.** Photochemistry-induced changes in a) photo-labile and bio-labile compound groups and a) DOM
 16 compound groups as a percentage of initial concentrations; microbial-induced changes in c) photo-labile
 17 and bio-labile compound groups and d) DOM compound groups as a percentage of initial concentrations;
 18 and initial proportions of e) photo-labile and bio-labile compound groups and e) DOM compound groups.
 19 Note inverted y axes.

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21 **Table S1: sampling intervals; initial (t₀), ambient (A), and dark (D) [DOC]; and A and D values for**
 22 **[UV₂₅₄] and turbidity.**

Incubation	Sampling Start Date	[UV ₂₅₄] (cm ⁻¹)		Turbidity (NTU)		[DOC] (ppm)		
		A	D	A	D	t ₀	A	D
BC1a	06/05/2019	1.13	1.19	1.23 ± 0.01	1.43 ± 0.06	22.4 ± 0.2	21.6 ± 0.2	22.9 ± 0.2
BC1b	08/05/2019	0.96	1.18	1.8 ± 0.10	0.98 ± 0.07	24.6 ± 0.2	-	23.4 ± 0.2
BC1c	09/05/2019	1.21	1.25	1.17 ± 0.02	1.48 ± 0.09	24.9 ± 0.2	23.0 ± 0.3	24.3 ± 0.1
BBR-a	22/05/2019	0.86	0.87	2.86 ± 0.01	2.53 ± 0.05	17.3 ± 0.2	16.7 ± 0.1	17.7 ± 0.2
BBR-b	25/05/2019	0.88	0.89	2.68 ± 0.02	2.64 ± 0.05	17.5 ± 0.2	16.5 ± 0.1	17.1 ± 0.2
BBR-c	27/05/2019	0.84	0.87	3.59 ± 0.03	3.02 ± 0.01	17.5 ± 0.2	15.8 ± 0.1	16.7 ± 0.1
BC2-a	02/06/2019	0.90	0.93	0.49 ± 0.02	0.6 ± 0.04	17.0 ± 0.1	16.5 ± 0.1	17.2 ± 0.1
BC2-b	04/06/2019	0.98	0.95	0.95 ± 0.06	0.76 ± 0.02	18.0 ± 0.1	18.0 ± 0.3	18.2 ± 0.1
BC2-c	05/06/2019	1.01	1.02	0.63 ± 0.05	0.85 ± 0.02	19.0 ± 0.1	18.7 ± 0.1	19.4 ± 0.1

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24 **Table S2: initial (t₀), ambient (A), and dark (D) concentrations of DOM compound groups.**

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Incubation	[Biopolymers] (ppb)			[HS] (ppb)			[Building Blocks] (ppb)			[LMW Neutrals] (ppb)			[LMW Acids] (ppb)		
	t ₀	A	D	t ₀	A	D	t ₀	A	D	t ₀	A	D	t ₀	A	D
BC1a	1180	990	1021	15065	14700	14567	3341	3125	3778	2812	2782	3480	0	0	0
BC1b	519	-	1038	17285	-	14989	4033	-	3803	2776	-	3561	0	-	0
BC1c	498	442	1240	17665	13300	16274	3732	3623	2691	995	3592	1264	0	0	833
BBR-a	202	815.8	640	13241	12071	13364	2457	2642	2377	1368	1150	1306	0	0	0
BBR-b	837	369.5	604	13390	12429	12863	1985	2266	2456	1318	1364	1152	0	19	14
BBR-c	895	391	929	13247	11995	12669	2049	1967	2061	1338	1475	1070	0	0	0
BC2-a	614	266	705	13154	12628	13218	2122	2380	2150	1113	1194	1144	0	0	0
BC2-b	347	441	631	14027	13964	14152	2286	2149	2115	1305	1392	1297	0	0	0
BC2-c	442	314	480	15068	14999	15260	2205	2151	2254	1295	1269	1426	0	0	0

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30 **Table S3: initial (t₀), ambient (A), and dark (D) values for molecularity and aromaticity of HS**
 31 **compound group.**

Incubation	Aromaticity – SAC/OC (L mg ⁻¹ m ⁻¹)			Molecular weight (g/mol)		
	t ₀	A	D	t ₀	A	D
BC1a	9.34	8.69	8.68	875	999	658
BC1b	8.24	7.83	8.33	883	952	775
BC1c	6.27	7.97	7.07	1179	1196	746
BBR-a	5.94	5.79	6.22	1167	1161	1099
BBR-b	6.06	6.05	6.23	1136	1227	900
BBR-c	6.22	6.13	6.07	1094	1064	934
BC2-a	6.77	6.881	6.83	1357	1432	1213
BC2-b	6.64	6.74	6.56	1357	1260	1202
BC2-c	6.59	6.66	6.58	1339	1335	1194

40 **Table S4: initial (t₀), ambient (A), and dark (D) [DON] and C/N ratios in biopolymer and HS**
 41 **components, and [DIN].**

Incubation	[DIN] (ppb)						[DON] Biopol. (ppb)			[DON] HS (ppb)			Biopol. C/N ratio			HS C/N ratio		
	Nitrate			Ammonium			t ₀	A	D	t ₀	A	D	t ₀	A	D	t ₀	A	D
	t ₀	A	D	t ₀	A	D												
BC1a	55	47	50	79	24	15	23	68	60	124	351	401	52	15	17	122	42	36
BC1b	59	46	49	87	69	32	82	70	65	372	307	377	6	-	16	47	-	40
BC1c	47	36	45	42	0	17	76	75	56	385	368	423	7	6	22	46	36	39
BBR-a	90	68	59	36	7	15	40	67	58	386	317	278	5	12	11	34	38	48
BBR-b	49	63	80	16	17	15	50	40	46	240	260	383	17	9	13	56	48	34
BBR-c	41	73	95	42	17	16	43	42	97	185	273	357	21	9	10	72	44	36
BC2-a	42	49	44	0	14	0	50	37	57	300	305	331	12	7	12	44	41	40
BC2-b	43	47	47	26	0	0	57	53	64	327	308	328	6	8	10	43	45	43
BC2-c	42	37	44	0	0	0	56	39	23	354	192	111	8	8	21	43	78	138

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46 **Table S5: ambient (A) and dark (D) [DOC] and photo labile and biolabile DOM compound groups**
 47 **after 22 hr incubation.**

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Incubation	[DOC] (ppm)		[Photolabile DOM compound groups] (ppb)	[Biolabile DOM compound groups] (ppb)
	A	D		
BC1a	21.9 ± 0.2	23.0 ± 0.1	18479	3416
BC1b	23.0 ± 0.1	23.6 ± 0.1	20171	2826
BC1c	23.7 ± 0.3	24.5 ± 0.2	18992	4746
BBR-a	16.5 ± 0.1	18.0 ± 0.1	14630	1850
BBR-b	16.3 ± 0.15	17.0 ± 0.1	14921	1326
BBR-c	16.3 ± 0.1	16.7 ± 0.2	14504	1824
BC2-a	16.6 ± 0.1	17.4 ± 0.1	15131	1439
BC2-b	17.7 ± 0.2	17.9 ± 0.1	15918	1826
BC2-c	18.4 ± 0.2	19.2 ± 0.1	16908	1526