

Supplementary Material

Table S1. Hydrodynamic data from CTD depth profiles for three casts used to collect water to initiate the 12 microcosms used in this study.

CTD cast	Depth of collection (m)	Temperature (°C)	O₂ saturation (%)	Salinity in practical salinity units (PSU)
CTD 11	1253.21	4.55	61.56	34.95
CTD 12	1253.03	4.56	61.62	34.96
CTD 13	1251.79	4.56	61.28	34.95

Table S2. Table of averaged (n = 3) maximum pit depths for CSDs. Pit depths were determined by an analysis using a Nanovea optical profiler 3-D pen. Pit depths were averaged by week and treatment to show an increase of average pit depth over time in the experiment. Standard deviation reflects the average deviation from the mean of replicates grouped to each week and treatment.

Week	Treatment	Averaged maximum pit depth (µm)	Standard deviation
2	Control	128.67	30.66
4	Control	140.33	31.34
6	Control	90.67	32.96
8	Control	105.57	25.51
10	Control	143.67	22.30
12	Control	173.33	52.62
14	Control	276.67	94.30
2	Oil	142.00	54.84
4	Oil	153.07	107.39
6	Oil	109.00	34.07
8	Oil	174.33	19.01
10	Oil	152.33	20.53
12	Oil	167.00	29.05
14	Oil	182.33	41.65
2	Dispersant	98.20	3.29
4	Dispersant	195.67	6.81
6	Dispersant	163.00	29.82
8	Dispersant	162.00	25.16
10	Dispersant	151.33	49.17
12	Dispersant	142.00	35.54
14	Dispersant	174.33	37.07
2	Dispersed Oil	139.73	63.40
4	Dispersed Oil	130.33	17.90
6	Dispersed Oil	133.00	23.00
8	Dispersed Oil	154.33	21.01
10	Dispersed Oil	162.33	46.52
12	Dispersed Oil	163.00	43.71
14	Dispersed Oil	268.33	82.78

Table S3. Descriptive statistics for 16S rRNA gene sequencing data from CSD biofilms. CM = control, OM = oil, DM = dispersant, and ODM = dispersed oil.

Treatment	Time Point	Replicate	Total sequence counts	OTUs	Shannon Diversity	Good's Coverage Index
CM	2	1	19840	31	2.10	1.00
CM	2	2	23242	45	2.08	1.00
CM	2	3	22630	52	1.40	1.00
DM	2	1	19642	46	1.82	1.00
DM	2	2	23205	50	2.21	1.00
DM	2	3	27970	58	1.96	1.00
ODM	2	1	26349	60	1.54	1.00
ODM	2	2	27362	53	1.49	1.00
ODM	2	3	23974	49	1.87	1.00
OM	2	1	19078	45	1.75	1.00
OM	2	2	21083	45	1.63	1.00
OM	2	3	13273	53	1.94	1.00
CM	4	1	31834	45	3.00	1.00
CM	4	2	25574	39	2.92	1.00
CM	4	3	25605	53	2.76	1.00
DM	4	1	23200	42	2.47	1.00
DM	4	2	31523	37	2.96	1.00
DM	4	3	29930	48	3.13	1.00
ODM	4	1	27863	44	2.59	1.00
ODM	4	2	28998	54	2.14	1.00
ODM	4	3	32473	41	3.04	1.00
OM	4	1	30768	45	3.00	1.00
OM	4	2	19808	43	2.89	1.00
OM	4	3	27999	39	2.78	1.00
CM	6	1	38987	43	2.44	1.00
CM	6	2	29699	41	2.98	1.00
CM	6	3	15625	31	3.32	1.00
DM	6	1	36448	58	2.97	1.00
DM	6	2	36397	55	3.14	1.00
DM	6	3	36805	51	3.12	1.00
ODM	6	1	28447	44	3.55	1.00
ODM	6	2	25928	48	3.07	1.00
ODM	6	3	38575	46	3.12	1.00

OM	6	1	42314	45	2.45	1.00
OM	6	2	2285	21	3.13	0.98
OM	6	3	42985	45	2.37	1.00
CM	8	1	42774	54	2.88	1.00
CM	8	2	41203	53	3.48	1.00
CM	8	3	28020	47	3.96	1.00
DM	8	1	16218	57	3.83	0.99
DM	8	2	26188	52	3.16	1.00
DM	8	3	30527	46	3.51	1.00
ODM	8	1	22863	45	3.64	1.00
ODM	8	2	28189	54	3.70	1.00
ODM	8	3	37649	58	3.65	1.00
OM	8	1	44154	39	2.99	1.00
OM	8	2	22714	45	3.48	1.00
OM	8	3	23810	48	2.84	1.00
CM	10	1	28910	48	3.34	1.00
CM	10	2	29874	52	4.01	1.00
CM	10	3	19190	45	4.29	1.00
DM	10	1	26584	63	4.49	1.00
DM	10	2	39579	68	3.53	1.00
DM	10	3	25956	56	4.08	1.00
ODM	10	1	29237	49	3.91	1.00
ODM	10	2	26346	64	3.86	1.00
ODM	10	3	24524	56	3.85	1.00
OM	10	1	30555	55	3.36	1.00
OM	10	2	26813	55	4.00	1.00
OM	10	3	27329	59	3.88	1.00
CM	12	1	35148	63	3.98	1.00
CM	12	2	27986	64	4.29	1.00
CM	12	3	25045	57	4.46	1.00
DM	12	1	22184	62	4.45	1.00
DM	12	2	28469	73	3.53	1.00
DM	12	3	35335	62	4.16	1.00
ODM	12	1	29904	60	4.22	1.00
ODM	12	2	28843	68	4.03	1.00
ODM	12	3	44655	73	4.30	1.00
OM	12	1	34379	55	3.66	1.00
OM	12	2	30069	64	4.27	1.00
OM	12	3	25072	50	4.44	1.00
CM	14	1	24429	61	4.12	1.00
CM	14	2	21656	56	4.45	1.00
CM	14	3	23668	61	4.49	0.99

DM	14	1	24437	68	4.42	1.00
DM	14	2	22786	71	3.48	1.00
DM	14	3	24341	61	4.24	1.00
ODM	14	1	26866	63	4.24	1.00
ODM	14	2	24363	60	4.02	1.00
ODM	14	3	22797	62	4.52	1.00
OM	14	1	29078	60	3.69	1.00
OM	14	2	30104	62	4.37	1.00
OM	14	3	23510	60	4.97	0.99

Table S4. Averaged Shannon diversity values for taxa of 16S microcosm samples.

Week	Control	Oil	Dispersant	Dispersed Oil
2	1.86	1.77	2.00	1.63
4	2.89	2.89	2.86	2.59
6	2.91	2.65	3.08	3.24
8	3.44	3.10	3.50	3.66
10	3.88	3.75	4.03	3.87
12	4.25	4.12	4.05	4.18
14	4.36	4.34	4.04	4.26

Table S5. Results of the main test permutational analysis of variance (PERMANOVA) analysis on 16S data from biofilm samples in microcosm. PERMANOVA was run on a Bray-Curtis similarity matrix of square root transformed data, with type III sum of squares, fixed effects sum to zero for mixed terms, permutation of residuals under a reduced model, and 9999 permutations.

Source	df	SS	MS	Pseudo-F	P (perm)	Unique perms	P (MC)
Time	6	52373	8728.8	18.847	0.0001	9930	0.0001
Treatment	3	9258.3	3086.1	6.6636	0.0001	9922	0.0001
Time x Treatment	18	4817.8	267.66	0.57793	0.9996	9806	0.9991
Residual	54	25009	463.13				
Total	81	92043					

Table S6. Results of pairwise permutational analysis of variance (PERMANOVA) analysis on 16S data from biofilm samples in microcosm. Under “Groups”, numbers represent week of sample, CM = control, OM = oil, DM = dispersant, and ODM = dispersed oil.

Groups	P (perm)	Unique perms	P (MC)
2,4	0.0001	9941	0.0001
2,6	0.0001	9949	0.0001
2,8	0.0001	9941	0.0001
2,10	0.0001	9936	0.0001
2,12	0.0001	9939	0.0001
2,14	0.0001	9937	0.0001
4,6	0.0112	9944	0.0109
4,8	0.0004	9958	0.0001
4,10	0.0001	9956	0.0001
4,12	0.0001	9938	0.0001
4,14	0.0001	9939	0.0001
6,8	0.0089	9936	0.013
6,10	0.0001	9937	0.0002
6,12	0.0001	9941	0.0001
6,14	0.0001	9956	0.0001
8,10	0.1464	9948	0.1651
8,12	0.0006	9935	0.0023
8,14	0.0002	9942	0.0001
10,12	0.3051	9932	0.3082
10,14	0.0259	9930	0.0323
12,14	0.7764	9946	0.7422
CM, DM	0.0116	9947	0.0153
CM, ODM	0.0001	9942	0.0002
CM, OM	0.0285	9957	0.0346
DM, ODM	0.0002	9944	0.0001
DM, OM	0.0631	9946	0.0634
ODM, OM	0.0001	9950	0.0001

Figure S1. Average temperature of the microcosms (°C) for the duration of the experiment. CM = control, OM = oil, DM = dispersant, and ODM = dispersed oil. The temperature does not deviate beyond one degree during the experiment.

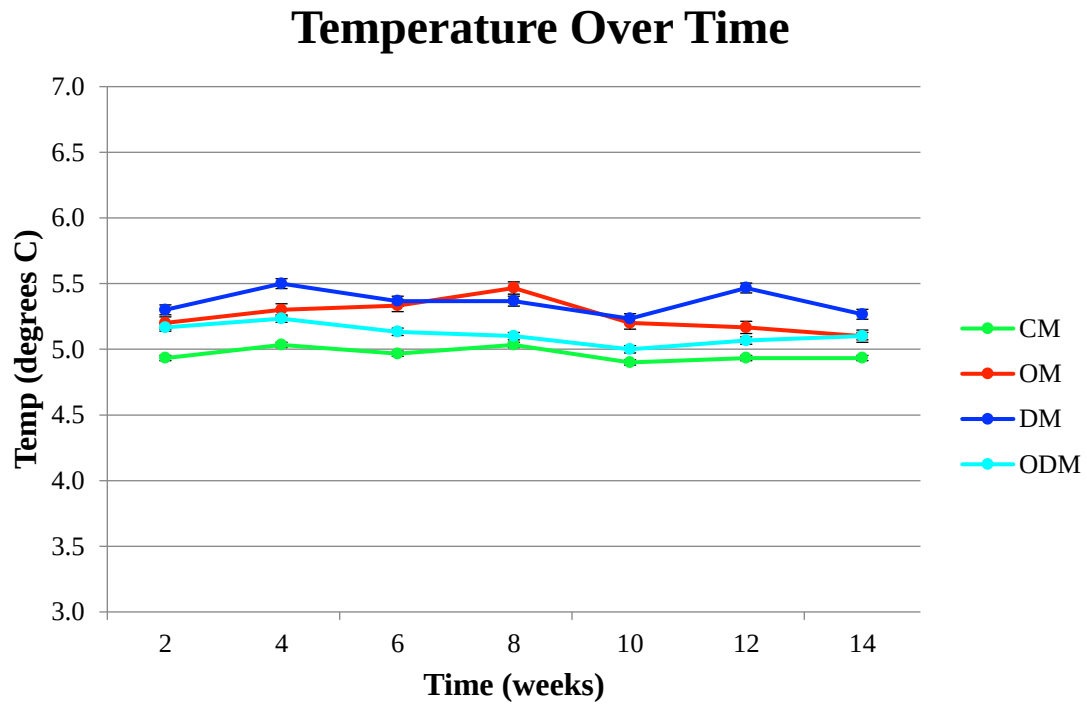


Figure S2. Average fluorescence in relative fluorescence units (RFUs) of the treatments in the microcosm tanks for the duration of the experiment. CM = control, OM = oil, DM = dispersant, and ODM = dispersed oil. The HEWAF in the oil tanks degrade quickly from week 2 to week 4.

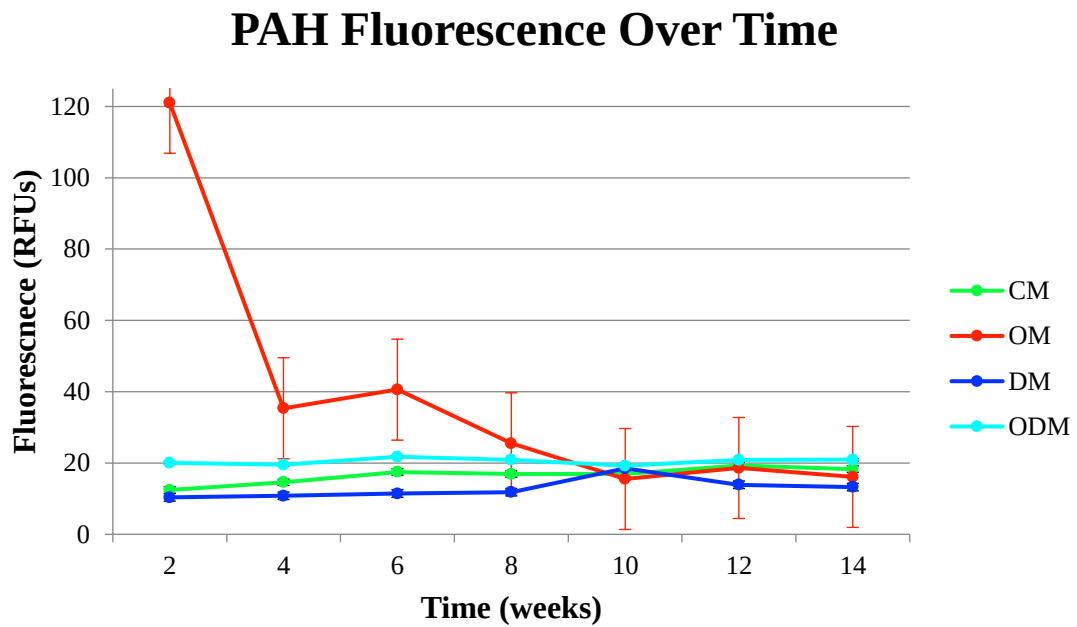


Figure S3. Average sample biomass in grams of the corrosion product and biofilm material scraped from the CSDs prior to DNA extraction. CSDs are from microcosm tanks over the duration of the experiment. CM = control, OM = oil, DM = dispersant, and ODM = dispersed oil. Overall, the sample biomass increases over time in all treatments, with the oil samples having the greatest biomass by week 14, and dispersant samples having the least.

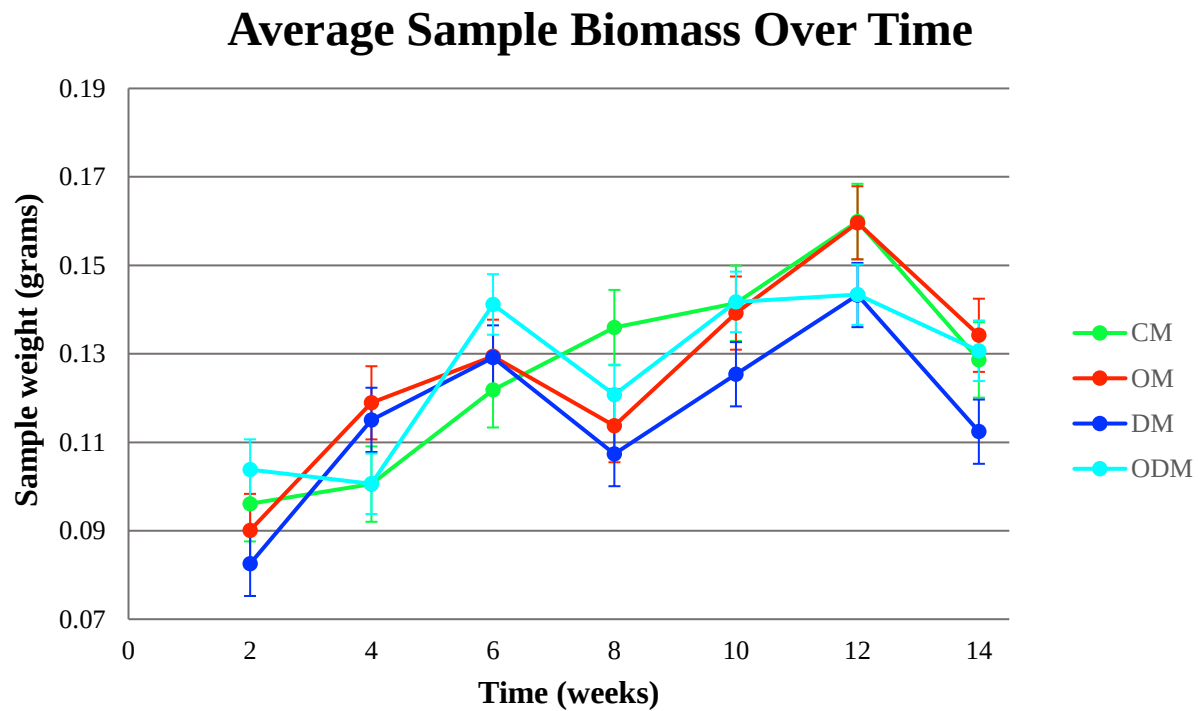


Figure S4. Average sample concentration in ng/ μ L of the extracted DNA samples from the microcosm tanks over the duration of the experiment. CM = control, OM = oil, DM = dispersant, and ODM = dispersed oil. The concentration of DNA increases over time in all treatments, with the oil samples having the greatest DNA concentration by week 14, and dispersant samples having the least.

