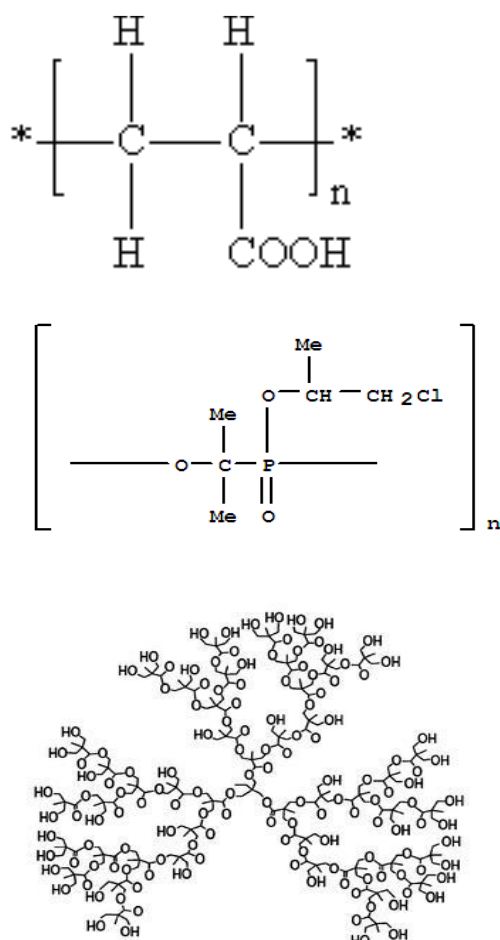
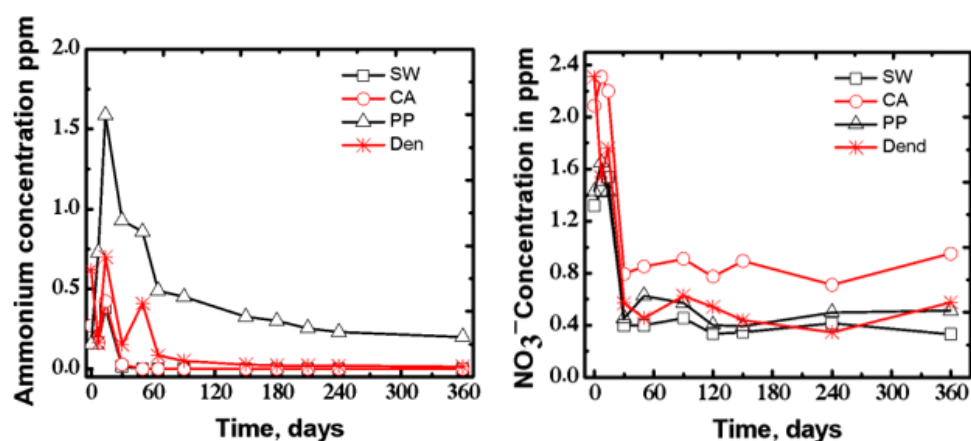




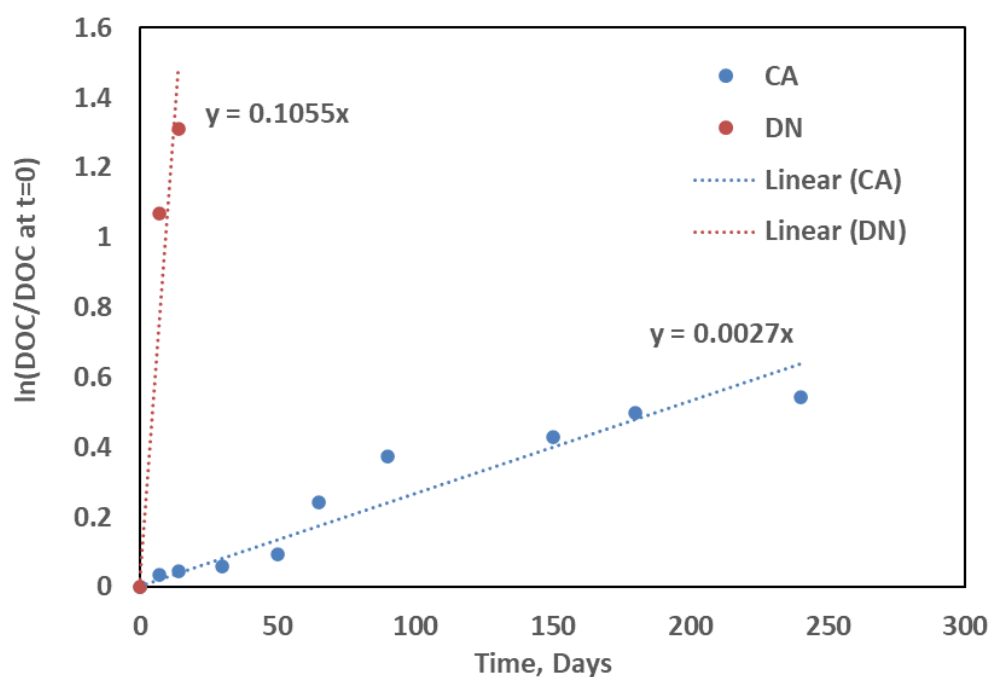
## Supplementary Materials



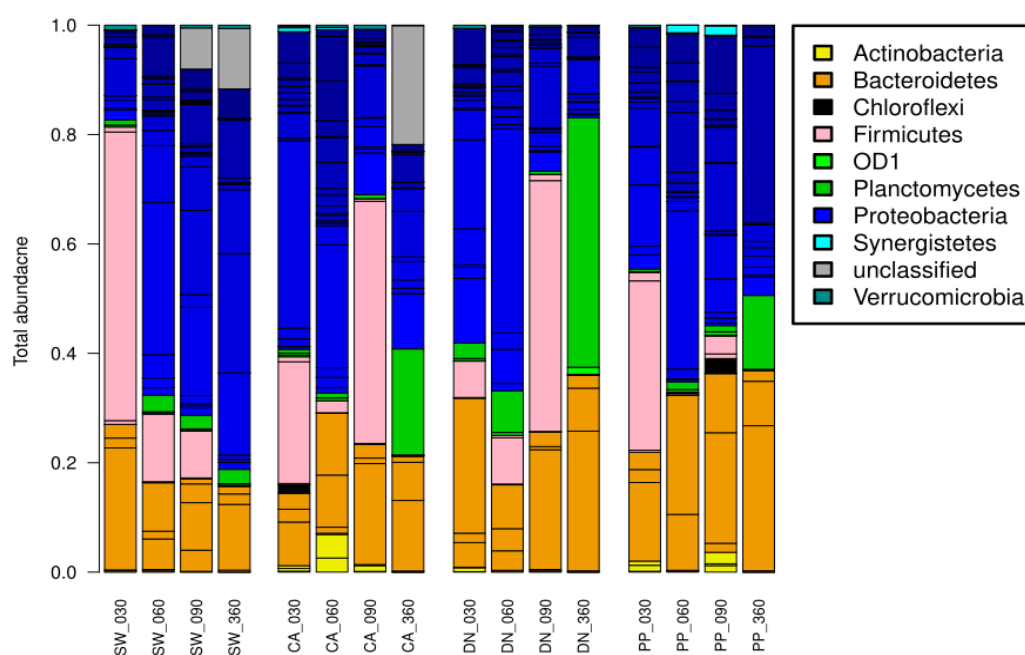
**Figure S1.** The active antiscalant polymers content in the commercial antiscalants used in this study, from top to bottom: Polyacrylic-acid; Polyphosphonate; and Carboxylated dendrimeric polymer.



**Figure S2.** N-ammonium (right) and N-NO<sub>3</sub><sup>-</sup> (left) concentration of the incubated seawater in the presence and absence of 100 mg/L polyacrylic acid- (CA), polyphosphonate- (PP), and carboxylated dendrimeric- (Den) based antiscalants.



**Figure S3.** DOC degradation kinetics of 100 mg/L polyacrylic acid- (CA) and carboxylated dendritic- (DN) based antisclerants..



**Figure S4.** Phyla relative abundance in each treatment following different incubation periods. Shades of the same color represent the different bacterial order in each phylum.

**Table S1.** A number of high-quality sequences, Good's coverage, Chao1, and Shannon–Wiener Index for all studied treatment and different time points.

Days	Index	SW	CA	PP	Den
30 days	Sequences	6,628	10,184	11,187	21,150
	ESC	97.6	97.6	98.1	98.8
	Chao1	659	856	936	1065

60 days	Shannon–Wiener	4.48	4.38	4.62	4.33
	Sequences	12,402	28,176	51,858	21,184
	ESC	98.1	98.6	98.9	98.7
	Chao1	957	1,939	2,413	1,217
90 days	Shannon–Wiener	4.00	4.00	3.47	3.68
	Sequences	8,337	8,332	33,267	7,117
	ESC	97.7	97.3	98.8	95.4
	Chao1	814	1,704	1,722	829
360 days	Shannon–Wiener	4.62	4.56	4.20	4.31
	Sequences	54,678	51,084	54,696	36,790
	ESC	98.8	98.9	98.7	98.1
	Chao1	750	1,514	1,502	730
	Shannon–Wiener	4.72	4.21	4.31	4.55

Table S2. adonis significance based on Bray–Curtis distance matrix.

Df	SumsOfSqs	MeanSqs	F.Model	R2
Pr(>F)				
map\$antiscalant		3	0.4560	
0.15202		0.6855		0.11877
0.754				
map\$day			1	1.2287
	1.22870		5.5411	
0.31999		0.001 **		
map\$antiscal- ant:map\$day	3	0.3811		0.12704
	0.5729		0.09925	
0.934				
Residuals			8	1.7739
	0.22174			
0.46199				
Total				15
3.8398				
1.00000				

Table S3. ANOVA analysis of Adjusted R2 for RDA analysis showing different variables and chemical analysis significance and percent of the variation.

DF	Variance	F	Pr(>F)		
Day		3	0.049184115	4.9018000	0.009 **
AS		3	0.012401975	0.9838548	0.429
DOC		1	0.007890386	1.8778446	0.160
TP		1	0.004889729	1.1637138	0.333
PO4		1	0.006653914	1.5835748	0.242
TDN		1	0.003962983	0.9431562	0.459
NH4		1	0.003121739	0.7429473	0.567
NO3		1	0.005428124	1.2918473	0.277
Residual	3	0.012605494	NA		NA