Note: Asterisks and/or bold p-values denote significance ($\alpha = 0.05$ for all). Treatments: LW = lagoon water, OW = oyster water, SO = stormwater outfall water, OF = oyster feces, and OP = oyster pseudofeces.

Table S1. Differences in temperature and salinity between seasons. Results of a Mann-Whitney U test and corresponding summary statistics based on raw data.

Mann-Whitney U Test

Factor	U	Standardized U	Expected Value	Variance (U)	p-value
Temperature (°C) *	0	-5.563	220.5	1564.116	<**0.0001**
Salinity (ppt)	202.5	0	210.0	1462.573	0.852

Summary Statistics: Temperature (°C)

Variable	Observations	Minimum	Maximum	Mean	SD
January	21	13.0	24.0	17.4	3.1
July	21	28.0	32.0	29.4	1.1

Summary Statistics: Salinity (ppt)

Variable	Observations	Minimum	Maximum	Mean	SD
January	20	0.0	37.0	22.7	12.1
July	21	0.0	35.0	24.7	8.5

Table S2. Differences in PPM relative abundance and richness between groups. Results of two-way mixed ANOVAs on trimmed means (*bwtrim*) and subsequent post-hoc tests (*mcp2atm*) based on raw data.

Two-way Mixed ANOVA on Trimmed Means: Relative Abundance

Factor	Value	DF1	DF2	p-value	Significant
Season	0.0574	1	21.3362	0.8130	
Treatment	58.9892	4	18.8867	<**0.0001**	*
Season:Treatment	0.1372	4	18.8867	0.9665	

Post-hoc Test p-values: Relative Abundance

	LW	OW	SO	OF	OP
LW	1				
OW	0.1108	1			
SO	0.1745	0.5259	1		
OF	<**0.0001**	<**0.0001**	<**0.0001**	1	
OP	<**0.0001**	<**0.0001**	<**0.0001**	0.6101	1

Two-way Mixed ANOVA on Trimmed Means: Richness

Factor	Value	DF1	DF2	p-value	Significant
Season	2.7552	1	25.9996	0.1090	
Treatment	127.5732	4	19.4692	<**0.0001**	*
Season:Treatment	2.4369	4	19.4692	0.0817	

Post-hoc Test p-values: Richness

	LW	OW	SO	OF	OP
LW	1				
OW	0.0537	1			
SO	0.0635	0.9732	1		
OF	<**0.0001**	<**0.0001**	<**0.0001**	1	
OP	<**0.0001**	<**0.0001**	<**0.0001**	0.4230	1

Table S3. Differences in PPM community composition between groups. Results of a two-way crossed analysis of similarities (ANOSIM) based on Bray-Curtis similarities of square root transformed PPM proportions with unordered factors. Differences were deemed significant when both $R \geq 0.2$ and $p < 0.05$.

Global Test

Factor	Average R	p-value	No. Permutations	No. ≥ Observed
Season *	**0.734**	**0.001**	999	0
Treatment *	**0.443**	**0.001**	999	0

Pairwise Tests: Treatments

Comparison	Average R	p-value	No. Permutations	No. ≥ Observed
LW, SO	0.048	**0.023**	999	22
LW, OF *	**0.737**	**0.001**	999	0
LW, OP *	**0.824**	**0.001**	999	0
LW, OW	0.038	0.112	999	111
SO, OF *	**0.727**	**0.001**	999	0
SO, OP *	**0.791**	**0.001**	999	0
SO, OW	0.139	**0.004**	999	3
OF, OP	0.065	**0.003**	999	2
OF, OW *	**0.494**	**0.001**	999	0
OP, OW *	**0.568**	**0.001**	999	0

Table S4. Effects of temperature and salinity on PPM community composition. Distance based linear model (DistLM) marginal test results based on Bray-Curtis similarities of square root transformed PPM proportions and raw environmental data. Pseudo-F is a multivariate analog to the Fisher's F test.

Total sum of squares (SS) = 7.76 x 10^5

Variable	Sum of Squares (SS)	Pseudo-F	p-value	% Variation Explained
Temperature (°C) *	1.54 x 10^5	55.51	**0.001**	19.8
Salinity (ppt) *	3.19 x 10^4	9.64	**0.001**	4.1

Table S5. Key PPM taxa defining each group. Two-way similarity percentage analysis (SIMPER) results based on Bray-Curtis similarities of square root transformed PPM proportions. Key taxa are defined as those contributing ≥ 10% to the overall similarity between replicate samples.

Group: January | Average similarity: 41.41%

ESV	Avg. Abundance	Avg. Similarity	Sim/SD	% Contribution	Cumulative %
ESV_069904 (Vibrionaceae, *Vibrio* sp.)	4.17	19.29	1.01	46.58	46.58
ESV_033709 (Pseudoalteromonadaceae, *Pseudoalteromonas* sp.)	1.26	4.27	0.84	10.31	56.89
ESV_010267 (Pseudoalteromonadaceae, *Pseudoalteromonas* sp.)	1.26	4.19	0.76	10.13	67.02

Group: July | Average similarity: 53.80%

ESV	Avg. Abundance	Avg. Similarity	Sim/SD	% Contribution	Cumulative %
ESV_010681 (Vibrionaceae, *Vibrio* sp.)	6.61	30.79	1.22	57.24	57.24
ESV_008978 (Pseudoalteromonadaceae, *Pseudoalteromonas* sp.)	2.69	8.14	0.95	15.14	72.37

Group: LW | Average similarity: 26.69%

ESV	Avg. Abundance	Avg. Similarity	Sim/SD	% Contribution	Cumulative %
ESV_010681 (Vibrionaceae, *Vibrio* sp.)	2.99	24.79	0.82	92.90	92.90

Group: OW | Average similarity: 33.42%

ESV	Avg. Abundance	Avg. Similarity	Sim/SD	% Contribution	Cumulative %
ESV_010681 (Vibrionaceae, *Vibrio* sp.)	4.01	25.48	0.75	76.25	76.25
ESV_069904 (Vibrionaceae, *Vibrio* sp.)	1.76	5.42	0.28	16.21	92.46

Group: SO | Average similarity: 19.69%

ESV	Avg. Abundance	Avg. Similarity	Sim/SD	% Contribution	Cumulative %
ESV_010681 (Vibrionaceae, *Vibrio* sp.)	2.90	15.15	0.50	76.95	76.95

Group: OF | Average similarity: 61.24%

ESV	Avg. Abundance	Avg. Similarity	Sim/SD	% Contribution	Cumulative %
ESV_010681 (Vibrionaceae, *Vibrio* sp.)	3.96	14.35	1.31	23.43	23.43
ESV_069904 (Vibrionaceae, *Vibrio* sp.)	3.75	13.98	0.87	22.82	46.25
ESV_008978 (Pseudoalteromonadaceae, *Pseudoalteromonas* sp.)	3.01	8.84	1.07	14.43	60.69
ESV_010267 (Pseudoalteromonadaceae, *Pseudoalteromonas* sp.)	2.42	6.22	1.31	10.16	70.85

Group: OP | Average similarity: 66.55%

ESV	Avg. Abundance	Avg. Similarity	Sim/SD	% Contribution	Cumulative %
ESV_010681 (Vibrionaceae, *Vibrio* sp.)	4.11	14.33	1.43	21.54	21.54
ESV_069904 (Vibrionaceae, *Vibrio* sp.)	3.40	11.48	0.82	17.26	38.80
ESV_008978 (Pseudoalteromonadaceae, *Pseudoalteromonas* sp.)	3.23	10.68	2.02	16.05	54.84
ESV_010267 (Pseudoalteromonadaceae, *Pseudoalteromonas* sp.)	2.59	7.13	1.59	10.71	65.55