

Figure S1 Sequencing depth in response to ASV richness for 16S rRNA data.

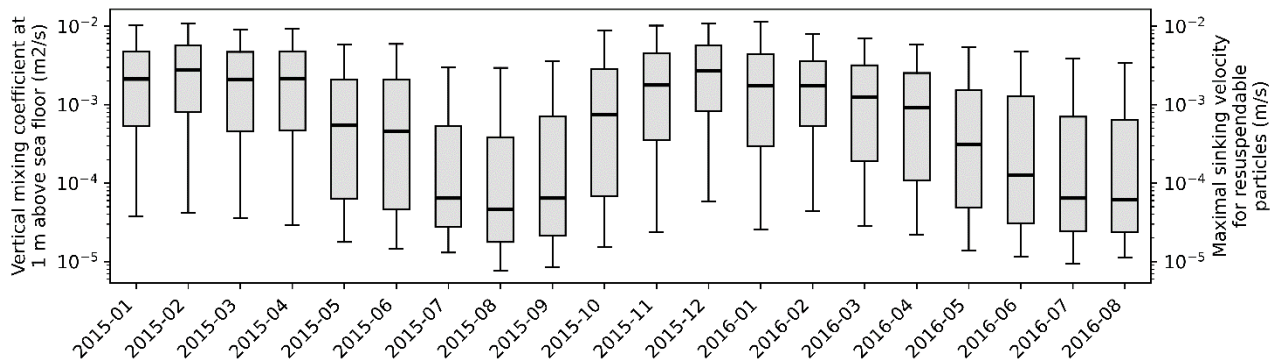


Figure S2 Modelled vertical mixing coefficient at aquaculture locations included in the simulation, 1 m above the sea floor, for each month of the simulation period. Box shows median and interquartile range and whiskers show 5 % and 95 % quantiles.

Table S1. Pairwise analysis from Adonis anova contrasting the composition of microbial communities in the two different sediment types (Natural / Impacted) at the beginning of the trial with fish feed (Food), Feces and Seawater based on a weighted-unifrac-based distance matrix. Significance of main factor (Sediment type) P = 0.0001.

Pairs	df	SS	F.Model	R <sup>2</sup>	p.value	p.adjusted	sig
1 Imp vs Nat	1	0.09837	216.0718	0.84379	1.00E-05	1.00E-04	***
2 Imp vs Feces	1	0.04967	113.0264	0.83091	0.0005	0.0051	*
3 Imp vs Seawater	1	0.04224	98.2047	0.81023	0.0004	0.0042	*
4 Imp vs Food	1	0.03341	82.2756	0.78902	0.0038	0.0384	.
5 Nat vs Feces	1	0.04566	91.3103	0.81301	6.00E-04	0.006	*
6 Nat vs Seawater	1	0.03058	62.4375	0.74831	0.0006	0.0064	*
7 Nat vs Food	1	0.02503	53.6702	0.72852	0.0041	0.0408	.
8 Feces vs Seawater	1	0.03480	63.7192	0.94093	0.1	1	
9 Feces vs Food	1	0.00646	15.8101	0.84051	0.1	1	
10 Seawater vs Food	1	0.02256	66.8462	0.95704	0.1	1	

Table S2. PERMANOVA results from adonis using weighted unifrac transformations on microbial ASV's for Natural and Impacted sediments, contrasting factors BefAft and FeceAdd, with Chamber as strata for permutations. Formula: adonis(formula = [Ordination.x] ~ FeceAdd \* BefAft, data = metadataN, strata = metadataN\$Chamber, permutations = h). Number of permutations = 9999. Terms added sequentially (first to last). Significance codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1.

	df	SS	MS	F.Model	R <sup>2</sup>	Pr(>F)	
<b>A) Natural</b>							
FeceAdd	1	0.0013945	0.00139451	2.5841	0.05913	0.0001	***
BefAft	1	0.0016008	0.00160077	2.9663	0.06787	0.0001	***
FeceAdd:BefAft	1	0.0011620	0.00116204	2.1533	0.04927	0.0017	**
Residuals	36	0.0194275	0.00053965	0.82373			
Total	39	0.0235848	1.00000				
<b>B) Impacted</b>							
FeceAdd	1	0.0013664	0.0013664	3.0142	0.05872	0.0001	***
BefAft	1	0.0032764	0.0032764	7.2275	0.14080	0.0001	***
FeceAdd:BefAft	1	0.0009477	0.0009477	2.0905	0.04073	0.0359	*
Residuals	39	0.0176798	0.0004533	0.75976			
Total	42	0.0232703	1.00000				

Table S3. Contrasting pairwise contrasts for above models using Treat\_b4Aft as factor to incorporate both B4Aft and FeceAdd. Transformation: Weighted Unifrac

**A) Natural**

pairs	df	SS	F.Model	R2	p.value	p.adjusted	sig
1	Nat_B4 vs Nat_F_B4	1	0.000963	2.079619	0.103569	0.00455	0.0273 .
2	Nat_B4 vs Nat_Aft	1	0.001054	2.270954	0.11203	2.00E-04	0.0012 *
3	Nat_B4 vs Nat_F_Aft	1	0.0022	3.647621	0.1685	1.00E-05	<0.0001 ***
4	Nat_F_B4 vs Nat_Aft	1	0.000796	1.670495	0.084924	0.02564	0.1538
5	Nat_F_B4 vs Nat_F_Aft	1	0.001709	2.777708	0.133687	0.00031	0.0018 *
6	Nat_Aft vs Nat_F_Aft	1	0.001593	2.586089	0.125623	0.00083	0.0049 *

**B) Impacted**

1	Imp_F_B4 vs Imp_B4	1	0.000833	2.064252	0.093556	0.0249	0.1494
2	Imp_F_B4 vs Imp_Aft	1	0.002172	4.997726	0.199927	1.00E-05	<0.0001 ***
3	Imp_F_B4 vs Imp_F_Aft	1	0.002294	4.912463	0.224186	0.00045	0.0027 *
4	Imp_B4 vs Imp_Aft	1	0.00193	4.359212	0.165377	0.00047	0.0028 *
5	Imp_B4 vs Imp_F_Aft	1	0.002529	5.347401	0.219629	4.00E-05	0.0002 **
6	Imp_Aft vs Imp_F_Aft	1	0.001488	2.943136	0.134126	0.00306	0.0183 .