

Table S1. Degrees of freedom (DF) and mean sum of squares (MS) for nested factor (Subsite, Site, Season, Year) effects on abiotic and biotic response variables. Total degrees of freedom (Total DF) are shown in the right-most column. A: amphipod; P: polychaete, Cr: crab; B: bivalve, C: copepod, SP: sandprawn

	Subsite		Site		Season		Year		Total DF
	DF	MS	DF	MS	DF	MS	DF	MS	
Sediment Particle Size	16	0.09	4	0.03	2	0.12	1	0.05	23
Primary Producers									
Phytoplankton (S1-S8)			28	1.32	2	2.33	1	0.27	31
Phytoplankton (ON & OS)	16	0.01	4	2.18	2	19.61	1	8.12	71
Microphytobenthos (Surface)	16	0.01	4	0.38	2	5.44	1	10.92	119
Microphytobenthos (Burrow-wall)	16	0.02	4	0.06	2	3.07	1	5.96	119
Meiofauna (Surface)									119
Richness	16	1.25	4	0.11	2	22.86	1	28.37	119
Abundance	16	0.37	4	0.03	2	6.43	1	1.55	119
Copepods	16	0.26	4	0.41	2	23.57	1	1.61	119
Bivalves	16	0.01	4	0.05	2	3.42	1	4.48	119
Nematodes	16	0.10	4	0.01	2	3.40	1	2.88	119
Foraminifera	16	0.01	4	0.08	2	13.93	1	25.52	119
Ostracods	16	0.17	4	0.02	2	0.22	1	7.76	119
Meiofauna (Burrow)									
Richness	16	0.00	4	0.00	2	1.41	1	1.03	119
Abundance	16	0.05	4	1.09	2	17.18	1	16.08	119
Copepods	16	0.60	4	0.30	2	16.19	1	8.57	119
Bivalves	16	0.09	4	0.17	2	2.01	1	3.50	119
Nematodes	16	0.03	4	1.28	2	16.48	1	17.39	119
Foraminifera	16	0.03	4	0.15	2	8.63	1	17.29	119
Ostracods	16	0.04	4	0.16	2	1.65	1	6.77	119
Macrofauna									
Richness	16	24.21	4	17.97	2	185.25	1	172.38	119
Abundance	16	0.026	4	0.097	2	0.26	1	1.12	119
<i>Urothoe grimaldii</i> (A)	16	0.01	4	1.41	2	0.10	1	2.97	119
<i>Griffithsia latipes</i> (A)	16	0.01	4	0.17	2	0.82	1	4.20	119
<i>Ampelisca palmata</i> (A)	16	1.41	4	3.36	2	1.11	1	3.69	119
<i>Maphysa elitueni</i> (P)	16	0.07	4	0.04	2	0.10	1	0.70	119
<i>Notomastus latericeus</i> (P)	16	0.01	4	1.53	2	0.11	1	0.60	119
<i>Hymenosoma orbiculare</i> (Cr)	16	0.03	4	0.39	2	4.84	1	2.39	119
<i>Tellinmya trigona</i> (B)	16	0.04	4	0.05	2	1.54	1	7.28	119
Juvenile polychaetes (P)	16	0.64	4	0.04	2	11.39	1	4.46	119
Copepods (C)	16	0.68	4	0.01	2	4.41	1	0.87	119
<i>Danielita edwardsii</i> (Cr)	16	0.10	4	0.01	2	0.90	1	0.13	119
<i>Callichirus kraussi</i> (SP)	16	0.01	4	0.06	2	5.09	1	0.62	119
Functional Groups									
Burrowing deposit feeders	16	0.01	4	0.21	2	0.12	1	0.86	119
Surface deposit feeders	16	0.01	4	0.14	2	0.38	1	5.74	119
Burrowing omnivores	16	0.45	4	0.08	2	0.01	1	1.46	119
Surface omnivores	16	0.02	4	0.07	2	4.94	1	2.50	119
Suspension feeders	16	0.45	4	0.93	2	3.99	1	5.74	119

Table S2. Mean abundance of dominant meiofaunal taxa in sediment surface and burrow wall samples. Data for Oesterwal North (ON) and South (OS) are shown for summer and winter in (A) 2015 and (B) 2016. Values in parentheses show standard error

A) 2015												
Morphotype	Oesterwal North (ON)						Oesterwal South (OS)					
	Winter			Summer			Winter			Summer		
	ON1	ON2	ON3	ON1	ON2	ON3	OS1	OS2	OS3	OS1	OS2	OS3
Morphotype-sediment surface												
Copepods	59.8 [31.5]	28.6[12.8]	158.2[32.2]	17.2[8.1]	16.0[4.6]	13.0[5.3]	110.0[29.0]	78.8 [20.0]	169.8[72.8]	14.0[4.1]	27.0[12.6]	15.6[4.8]
Bivalves	0.8[0.4]	0.2[0.2]	2.0[0.8]	0.6[0.4]	0.6[0.4]	0.2[0.2]	0.2[0.2]	0.6[0.2]	0.6[0.4]	1.6[1.4]	0.4[0.2]	1.0[1.0]
Nematodes	264.6[99.1]	97.2[36.5]	196.0[54.3]	147.6[79.4]	175.0[40.1]	190.0[77.4]	348.0[95.6]	234.8[63.2]	208.6[35.6]	117.4[42.4]	182.2[101.7]	70.[18.4]
Foraminifera	3.4[1.7]	1.4[0.7]	1.0[0.8]	10.2[4.3]	7.0[3.6]	0.4[0.4]	0.0[0.0]	10.0[5.5]	0.6[0.6]	3.4[2.2]	1.6[1.6]	4.8[1.5]
Ostracods	0.2[0.2]	0.2[0.2]	0.6[0.4]		1.8[1.0]	1.6[1.0]	0.6[0.6]	2.0[1.5]		0.4[0.4]	0.2[0.2]	5.4[3.2]
Morphotype-burrow-wall												
Copepods	15.8 [4.0]	0.8 [0.6]	2.2 [1.3]	4.6[4.1]	4.2[2.4]	1.6[1.4]	18.2 [7.4]	8.2[5.3]	9.0[7.5]		0.2[0.2]	0.8[0.8]
Bivalves	0.2[0.2]	0.2[0.2]	0.4[0.4]	0.2[0.2]	2.4[1.5]	0.6[0.6]		0.8[0.8]	0.4[0.2]			
Nematodes	113.8[46.6]	28.0[6.0]	72.6[51.4]	18.2[9.9]	2.0[0.8]	29.8[16.9]	112.2[29.9]	20.2[11.1]	42.8[36.0]	3.4[2.0]	1.2[0.6]	14.0[10.7]
Foraminifera	1.4[1.2]	0.2[0.2]	0.2[0.2]	0.2[0.2]	4.6[2.6]		0.2[0.2]	0.4[.0.2]		0.2[0.2]		1.0[1.0]
Ostracods				0.4[0.2]	5.8[3.7]	0.4[0.2]		0.2[0.2]		0.2[0.2]	0.6[0.6]	0.2[0.2]
Sediment Phi	2.0 [0]	1.8[0.08]	1.8 [0.13]	2.0 [0.04]	2.0 [0]	2.0 [0]	2.2 [0.08]	2.1[0.13]	1.9[0]	2.3[0.31]	2.1[0.24]	1.9[0]

Table S2. (continued)

B) 2016												
Morphotype	Oosterwal North (ON)						Oosterwal South (OS)					
	Winter			Summer			Winter			Summer		
	ON1	ON2	ON3	ON1	ON2	ON3	OS1	OS2	OS3	OS1	OS2	OS3
Morphotype-sediment surface												
Copepods	171.4[16.3]	61.4[15.1]	271.0[21. 7]	7.6[6.4]	9.6[5.4]	8.6 [2.4]	248.8[72. 3]	261.0[93. 0]	65.6[12.0]	16.6[4.6]	14.0[5.6]	34.6[17.1]
Bivalves	6.4[1.7]	10.8[1.1]	4.0[0.8]	2.0[1.8]		1.0 [0.5]	4.4[0.8]	4.4[0.9]	5.4[0.4]	2.0[1.8]	0.4[0.2]	0.2[0.2]
Nematodes	335.6[21.2]	575.2[61.8]	352.6[91. 7]	188.6[136. 5]	155.8[46. 2]	260.4[68. 4]	383.8[41. 7]	347.8[52. 5]	349.2[49. 3]	183.2[45. 4]	82.4[17.7]	132.0[24. 0]
Foraminifera	26.8[7.2]	41.8[4.4]	45.4[7.7]			0.2[0.2]	40.2[4.5]	53.4[4.5]	55.2[9.0]	0.2[0.2]		0.4[0.4]
Ostracods	9.8[2.4]	5.2[1.2]	6.8[1.7]	3.0[2.0]	1.8[0.4]	1.8[0.5]	5.0[1.1]	7.2[1.7]	6.0[0.9]	1.0[1.0]	2.0[0.8]	3.6[1.7]
Morphotype-burrow-wall												
Copepods	33.2[17.2]	10.6[2.0]	24.2[6.0]	1.0[0.8]	0.2[0.2]	0.4[0.2]	54.6[21.2]	58.2[26.6]	27.6[3.2]	1,8[0.6]	0.4[0.4]	1.8[1.9]
Bivalves	2.6[0.6]	6.6[1.7]	4.0[1.5]		0.2[0.2]	0.2[0.2]	2.2[0.9]	2.4[0.4]	2.8[0.5]			0.2[0.2]
Nematodes	266.2[36.1]	214.8[10.5]	237.8[12. 4]	16.6[9.8]	24.6[10.2]	46.4[25.0]	142.0[18. 3]	112.2[12. 6]	173.0[24. 0]	22.6[9.8]	21.8[8.6]	24.6[10.0]
Foraminifera	13.6[1.2]	17.2[2.7]	25.4[2.5]				9.4[2.1]	10.4[3.5]	17.8[1.6]			
Ostracods	2.3[0.5]	4.2[0.8]	48.2[43.7]				3.0[0.3]	3.8[0.9]	2.2[0.4]	0.2[0.2]	0.2[0.2]	1.2[0.9]
Sediment Phi	2.0[0.03]	2.0[0.04]	2.0[0.01]	1.9[0]	2.0[0]	2.0[0.01]	2.0[0]	2.0[0]	2.0[0]	2.0[0.01]	2.0[0.03]	2.0[0.1]

Table S3. Mean abundance of dominant macrofaunal taxa in sediment surface samples. Data for Oesterwal North (ON) and South (OS) are shown for summer and winter in (A) 2015 and (B) 2016. Values in parentheses show standard error. A: amphipod; P: polychaete, Cr: crab; B: bivalve, C: copepod, SP: sandprawn

A) 2015												
Species/ Morphotype	Oesterwal North (ON)						Oesterwal South (OS)					
	Winter			Summer			Winter			Summer		
	ON1	ON2	ON3	ON1	ON2	ON3	OS1	OS2	OS3	OS1	OS2	OS3
<i>Urothoe grimaldii</i> (A)	31.0[7.6]	45.8[10.4]	55.8[11.8]	27.4[7.9]	24.8[3.2]	53.4[7.9]	137.2[9.5]	95.2[5.6]	73.8[31.4]	53.0[19.8]	32.6[5.1]	50.6[9.2]
<i>Griffithsia latipes</i> (A)	3.4[1.1]	2.0[0.7]	4.0[0.5]		0.8[0.8]	0.4[0.4]	3.4[0.9]	5.0[2.1]	2.4[1.1]		0.4[0.4]	
<i>Ampelisca palmata</i> (A)	12.6[1.1]	4.4[2.2]	6.8[2.1]	2.2[1.1]	1.6[0.7]	2.6[1.9]	4.0[0.8]	9.4[1.2]	0.8[0.6]	6.8[4.9]	2.0[0.5]	1.2[0.4]
<i>Paratyloidiplax edwardsi</i> (Cr)	1.6[0.5]	0.4[0.4]		2.6[1.0]	2.0[1.3]	0.6[0.4]	0.6[0.4]	0.2[0.2]	0.4[0.4]	0.2[0.2]	0.6[0.4]	1.2[0.4]
<i>Maphysa elitueni</i> (P)	2.4[0.7]	2.6[0.9]	1.4[0.7]	1.6[0.6]	1.6[0.4]	1.6[0.5]	2.4[1.0]	2.0[0.9]	2.4[0.5]	1.8[0.9]	1.2[0.6]	1.4[0.6]
<i>Notomastus latericeus</i> (P)	1.4[0.5]	4.0[1.9]	7.0[2.4]	5.0[2.4]	9.8[5.3]	2.0[1.4]	8.0[2.8]	8.8[3.5]	3.8[1.8]	5.4[3.2]	7.8[1.5]	12.8[1.7]
<i>Hymenosoma orbiculare</i> (Cr)	2.4[0.9]	1.6[0.4]	2.6[1.4]	0.2[0.2]	0.2[0.2]		11.0[1.6]	11.2[1.7]	8.0[2.7]			0.4[0.2]
<i>Tellimya trigona</i> (B)			0.2[0.2]	0.8[0.8]	0.4[0.2]	0.8[0.6]					0.2[0.2]	1.0[0.5]
Juvenile polychaetes (P)	7.2[6.7]	10.6[6.9]	4.6[2.3]				3.6[2.2]	2.2[2.2]	3.6[2.9]			
Copepods (C)	2.4[1.1]	1.4[0.9]	11.6[7.4]				8.4[6.2]	1.8[1.6]	4.0[2.8]			

Table S3. (continued)

B) 2016												
Species/ Morphotype	Oosterwal North (ON)						Oosterwal South (OS)					
	Winter			Summer			Winter			Summer		
	ON1	ON2	ON3	ON1	ON2	ON3	OS1	OS2	OS3	OS1	OS2	OS3
<i>Urothoe</i>												
<i>grimaldii</i> (A)	49.8[16.5]	65.0[16.4]	50.6[16.3]	44.2[8.3]	38.0[3.7]	52.0[7.0]	69.6[15.4]	63.2[17.6]	33.0[12.0]	73.2[24.5]	77.4[15.0]	118.8[27.7]
<i>Griffithsia</i>												
<i>latipes</i> (A)	4.2[1.9]	3.6[1.6]	4.6[2.2]	4.6[2.0]	3.0[1.0]	3.4[1.0]	2.8[1.4]	1.8[0.4]	1.8[1.8]	4.0[1.2]	3.6[1.6]	5.2[1.5]
<i>Ampelisca</i>												
<i>palmata</i> (A)	26.2[3.7]	20.2[8.2]	24.6[16.8]	16.6[5.9]	14.8[3.8]	8.8[1.6]	2.0[0.9]	6.0[2.5]	3.2[1.6]	6.0[2.1]	3.2[1.5]	1.0[1.0]
<i>Paratyloidiplax</i>												
<i>edwardsi</i> (Cr)	0.6[0.4]	0.8[0.4]	0.2[0.2]	1.6[0.8]	0.2[0.2]	2.0[1.3]	0.2[0.2]	0.2[0.2]	0,0	1.8[0.9]	1.2[0.5]	1.6[0.5]
<i>Maphysa elitueni</i>												
(P)	1.6[0.4]	1.6[0.5]	1.4[0.4]	5.4[0.8]	3.2[1.0]	2.6[0.7]	1.4[0.7]	1.0[0.3]	1.0[0.4]	1.6[0.5]	4.4[1.0]	1.8[0.7]
<i>Notomastus</i>												
<i>latericeus</i> (P)	0.8[0.8]	8.4[2.2]	2.2[0.7]	14.4[6.0]	3.6[1.9]	5.0[2.6]	12.0[4.3]	10.8[4.5]	7.6[2.4]	8.4[3.2]	6.2[2.7]	19.4[12.8]
<i>Hymenosoma</i>												
<i>orbiculare</i> (Cr)	2.2[0.4]	2.0[0.0]	1.8[0.9]	0.2[0.2]	2.0[1.3]	2.8[1.0]	1.4[0.7]	6.4[4.0]	2.6[0.7]	4.6[1.0]	1.2[0.7]	0.2[0.2]
<i>Tellimya trigona</i>												
(B)	2.2[0.9]	1.2[0.7]	2.8[1.2]	7.6[4.8]	15.0[4.6]	4.4[2.5]	3.2[1.3]	2.2[2.0]	3.6[1.3]	7.2[2.1]	8.8[3.2]	10.8[4.2]
Juvenile												
polychaetes (P)	43.4[19.8]	58.2[17.0]	1.6[1.6]	7.8[4.5]		0.6[0.4]	29.6[14.2]	27.8[12.1]	45.4[24.4]			
Copepods (C)	21.2[12.5]	3.0[2.5]	1.0[1.0]	3.0[1.9]	0.8[0.8]	0.4[0.2]	17.4[7.7]	3.0[1.5]	9.0[5.0]	10.4[9.2]	0.2[0.2]	

Table S4. Mean abundance of macrofaunal functional groups in sediment surface samples. Data for Oesterwal North (ON) and South (OS) are shown for summer and winter in (A) 2015 and (B) 2016. Values in parentheses show standard error

A) 2015												
Functional Group	Oesterwal North [ON]						Oesterwal South [OS]					
	Winter 2015			Summer 2015			Winter 2015			Summer 2015		
	ON1	ON2	ON3	ON1	ON2	ON3	OS1	OS2	OS3	OS1	OS2	OS3
Burrowing deposit feeders	42.2[7.5]	59.0[12.3]	71.6[13.1]	47.4[8.4]	44.0[6.0]	64.2[7.7]	153.4[9.8]	118.4[5.0]	84.2[33.6]	68.6[23.0]	51.2[5.0]	72.4[10.6]
Surface deposit feeders	6.6[1.5]	2.4[1.0]	2.2[0.4]	1.2[0.8]	1.6[0.9]	2.8[0.7]	5.0[1.8]	5.8[1.9]	1.4[0.5]		0.2[0.2]	1.8[0.7]
Burrowing deposit feeders and predators	2.4[0.7]	3.2[1.2]	3.2[0.9]	2.4[0.8]	1.6[0.4]	1.6[0.5]	3.2[0.9]	2.8[0.8]	3.4[0.6]	1.8[0.9]	1.2[0.6]	1.4[0.6]
Surface deposit feeders and predators	2.8[0.9]	2.2[0.4]	6.4[3.0]	0.4[0.2]	0.8[0.2]	0.4[0.2]	11.4[1.6]	13.4[2.0]	9.0[2.5]	0.2[0.2]	0.2[0.2]	0.6[0.2]
Suspension feeders	24.4[6.3]	6.0[2.1]	11.6[2.4]	3.0[1.0]	1.8[0.7]	3.4[1.8]	11.2[3.3]	16.8[2.6]	7.0[3.4]	8.0[4.9]	2.2[0.5]	1.8[0.7]
B) 2016												
Species/ Morphotype	Oesterwal North [ON]						Oesterwal South [OS]					
	Winter 2016			Summer 2016			Winter 2016			Summer 2016		
	ON1	ON2	ON3	ON1	ON2	ON3	OS1	OS2	OS3	OS1	OS2	OS3
Burrowing deposit feeders	62.8[17.7]	85.2[17.4]	62.4[16.1]	71.4[15.5]	54.4[4.6]	77.8[10.4]	88.2[21.3]	82.8[23.3]	46.2[13.9]	99.2[28.2]	100.6[16.1]	158.2[43.1]
Surface deposit feeders	4.0[1.3]	2.2[0.7]	4.6[2.0]	12.0[5.3]	21.0[5.2]	8.0[3.1]	4.2[1.8]	3.2[2.2]	5.0[2.1]	10.2[2.0]	13.2[4.2]	10.8[4.2]
Burrowing deposit feeders and predators	1.6[0.4]	1.6[0.5]	1.4[0.4]	5.6[0.8]	3.6[0.8]	2.8[0.9]	1.6[0.8]	1.0[0.3]	1.0[0.4]	2.0[0.5]	4.4[1.0]	2.0[0.6]
Surface deposit feeders and predators	3.0[0.5]	2.6[0.6]	2.2[0.9]	1.0[0.4]	2.4[1.3]	3.6[1.3]	1.4[0.7]	6.6[3.9]	2.8[0.9]	4.8[1.0]	1.2[0.7]	0.4[0.2]
Suspension feeders	59.6[13.2]	28.8[9.3]	37.4[15.4]	19.8[6.8]	17.4[3.3]	13.8[2.9]	9.0[5.3]	24.4[3.6]	13.2[5.3]	11.6[2.9]	9.8[3.6]	7.0[2.4]