



Supplementary Materials for

Observations of the dynamics of mixed sediments on a nourished beach in a mixed-energy environment

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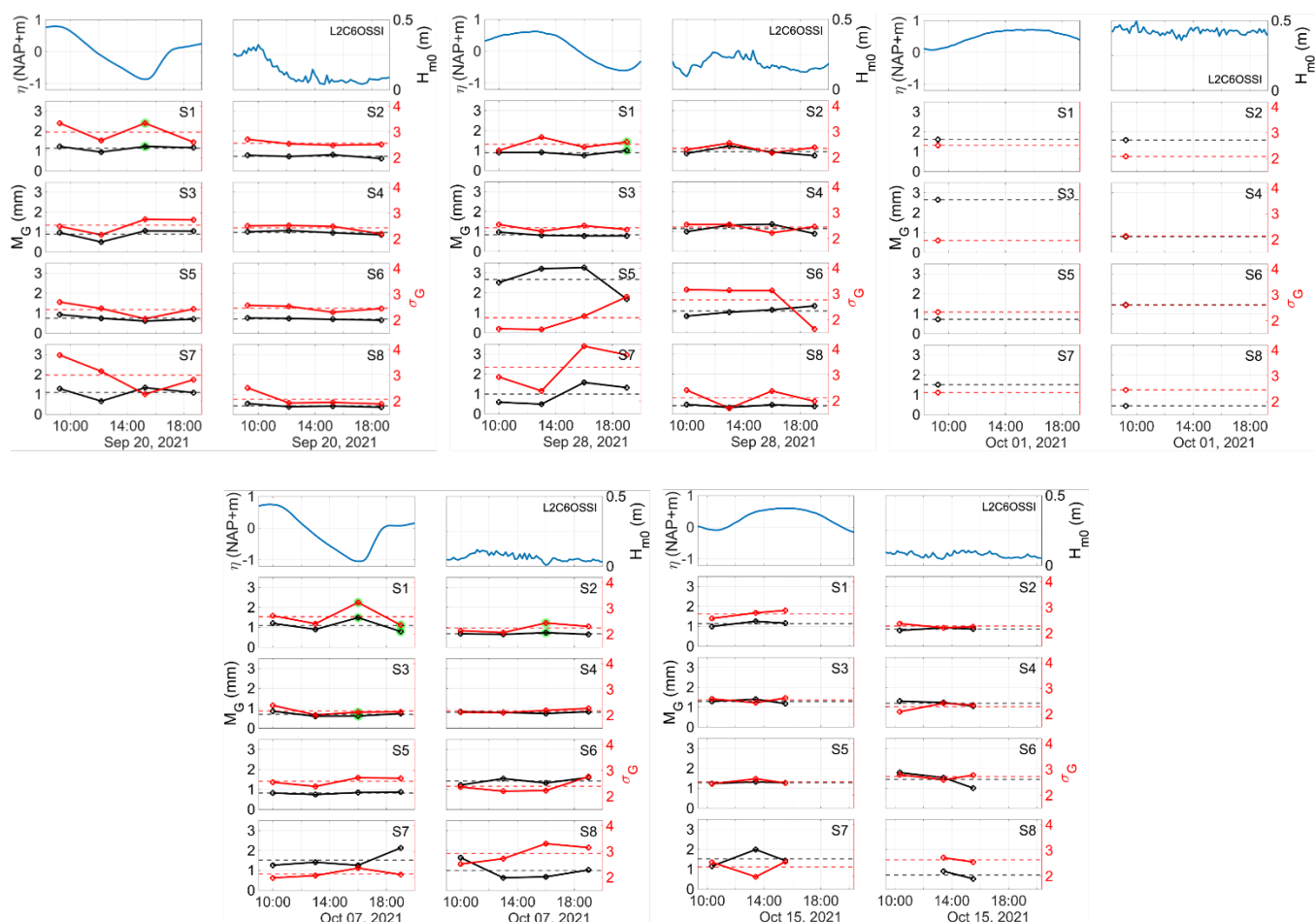
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Supplementary Figures

Figure S1.

Time evolution of bed surface composition (M_G in black, σ_G in red) during a tidal cycle at each fixed cross-shore sample location. Horizontal dashed lines indicate the tidal means. A green edge around a data point indicates that the sample location had not been submerged since the previous time step. The upper left and right subplots show the water surface elevation and wave height, respectively, measured at L2 at approximately NAP-1.2 m.





Supplementary Tables

Table S1

Mean grain size statistics of each sediment sampling location closest to an ADV station. These data were used as input for the computations of the bed surface mobility. Grain sizes are in mm, f_g is the gravel fraction.

ADV	Samples	M_G	D_{10}	D_{50}	D_{90}	f_g
L1	L0	0.58	0.22	0.49	2.91	0.12
L2	L2	0.87	0.29	0.85	3.07	0.20
L3	L3.5	1.04	0.41	1.00	3.01	0.21
L4	L4	1.07	0.37	0.95	3.85	0.24
L5	Tmb	0.49	0.26	0.47	1.13	0.04
L6	L6	0.46	0.20	0.42	1.70	0.07





Table S2

Percentage of time in which a (combination of) hydrodynamic driver(s) was responsible for exceeding the mobility thresholds of **(a)** the three local grain size percentiles and **(b)** the local M_G and two global size fractions. Abbreviations stand for no motion (nM), current-only (cO), current-dominated (cD), wave-dominated (wD) and wave-only (wO). Note that only the periods at which all ADVs were fully submerged are considered here.

(a)	D ₁₀					D ₅₀					D ₉₀				
	nM	cO	cD	wD	wO	nM	cO	cD	wD	wO	nM	cO	cD	wD	wO
L1	17	9	38	23	13	24	13	31	20	13	46	18	14	12	11
L2	51	3	9	18	20	69	2	4	11	13	83	1	1	6	10
L3	41	5	16	18	20	55	6	9	12	18	72	5	3	6	14
L4	32	8	26	16	18	46	11	15	11	16	70	9	5	6	11
L5	44	11	16	14	16	53	11	11	11	14	69	8	5	7	11
L6	69	3	3	5	20	77	2	1	3	17	89	0	0	1	10
mean	42	6	18	16	18	54	7	12	11	15	71	7	5	6	11

(b)	M_G					0.25 mm					2.00 mm				
	nM	cO	cD	wD	wO	nM	cO	cD	wD	wO	nM	cO	cD	wD	wO
L1	26	13	29	19	12	18	9	37	22	13	40	18	17	13	11
L2	70	2	4	11	13	49	3	10	18	21	80	1	2	7	10
L3	56	6	9	12	18	34	4	20	21	21	67	5	5	8	15
L4	48	11	14	11	15	27	6	29	18	20	59	11	9	8	13
L5	54	11	10	10	14	43	11	16	14	16	76	7	2	5	10
L6	78	2	1	3	17	72	3	2	5	19	89	0	0	0	10
mean	55	7	11	11	15	40	6	19	16	18	69	7	6	7	12





Table S3

Percentage of the total time during the (a) full deployment, and (b) stormy and (c) calm periods in which the combined wave-current-induced BSS exceeded the local mean mobility thresholds for four local (M_G to D_{90} and two global (0.25 mm and 2.00 mm) grain size fractions. Measurements were only included for times when all ADVs were operational, leaving 42% of the total deployment time. Of this, the stormy and calm periods constitute 21% and 79%, respectively.

(a)	M_G	D_{10}	D_{50}	D_{90}	0.25 mm	2.00 mm	mean
L1	73	81	75	51	81	58	70
L2	30	50	31	18	52	21	34
L3	45	62	45	27	68	33	47
L4	47	65	49	25	71	35	48
L5	40	52	41	28	52	21	39
L6	23	33	25	14	31	12	23
mean	43	57	44	27	59	30	43

(b)	M_G	D_{10}	D_{50}	D_{90}	0.25 mm	2.00 mm	mean
L1	82	89	82	59	89	64	77
L2	55	75	55	45	77	48	59
L3	62	70	62	48	75	52	62
L4	65	81	67	49	87	57	68
L5	58	68	59	52	69	45	59
L6	47	55	48	37	53	35	46
mean	61	73	62	48	75	50	62

(c)	M_G	D_{10}	D_{50}	D_{90}	0.25 mm	2.00 mm	mean
L1	70	79	73	49	79	56	68
L2	22	42	22	9	44	12	25
L3	39	59	40	20	66	27	42
L4	40	59	42	17	65	28	42
L5	34	46	35	20	47	13	32
L6	15	25	17	6	23	5	15
mean	37	52	38	20	54	23	37



Table S4

Cross-shore (S1–S8) low-tide mean and standard deviation of M_G and σ_G .

	$\overline{M}_G$ (mm)	σ_{M_G} (mm)	$\overline{\sigma}_G$	σ_{σ_G}
20/09/2021	0.94	0.24	2.83	0.48
28/09/2021	1.02	0.63	2.48	0.45
01/10/2021	1.34	0.69	2.31	0.22
07/10/2021	1.06	0.32	2.35	0.25
15/10/2021	1.32	0.35	2.48	0.27
mean	1.14	0.45	2.49	0.33

