SUPPLEMENTARY MATERIAL

Table 1S. Annual trace element concentration (μg g^{-1} dry wt), incorporation and loss rates (μg dry wt m^{-2} yr^{-1}) and release rate through decomposition (k value; yr^{-1}) in the compartments of *Posidonia oceanica* (leaves, rhizomes, roots and epiphytes) and its detritus during the studied time (mean ± SD). The annual trace element budget (μg m^{-2} yr^{-1}) is represented as the accumulation excess. For the trace elements that *Posidonia oceanica* acts as a sink or source, the value of the accumulation excess budget is either positive or negative, respectively.

	Ag	As	Ba	Bi	Cd	Co	Cr
Leaves							
Element concentration	0.18 ± 0.07	1.08 ± 0.3	0.93 ± 0.26	0.006 ± 0.001	1.19 ± 0.19	1.24 ± 0.3	5.46 ± 2.47
Element incorporation	59.5 ± 18.9	292 ± 107	269 ± 136	0.99 ± 0.24	287 ± 43.7	247 ± 136	2396 ± 2565
Element loss (through shedding)	52.3 ± 12.9	491 ± 385	415 ± 330	3.04 ± 2.84	498 ± 329	601 ± 401	2013 ± 793
Element loss (through grazing and mechanical breakage)	1.9 ± 54.2	105 ± 415	106 ± 303	0.56 ± 1.86	62.86 ± 343	120 ± 395	254 ± 1682
Rhizomes							
Element concentration	1 ± 0.34	3.16 ± 1.31	2.19 ± 1.08	0.011 ± 0.007	0.53 ± 0.07	0.47 ± 0.2	5.93 ± 2.04
Element incorporation	55.7	175	122	0.6	29.5	26.3	329
Roots							
Element concentration	0.43 ± 0.12	8.56 ± 3.34	2.65 ± 0.92	0.029 ± 0.013	0.74 ± 0.12	1.02 ± 0.22	5.52 ± 2.66
Element incorporation	11.1	221	68	0.74	19.2	26.4	143
Epiphytes							
Element concentration	0.21 ± 0.15	14.2 ± 5	13.5 ± 4	0.09 ± 0.021	0.48 ± 0.18	1.9 ± 0.73	15.7 ± 3.4
Detritus							
Element release (through decomposition)	0.00019 ± 0.00005	0.0005 ± 0.0004	0.00002 ± 0.00002	0.0000004 ± 0.0000004	0.17 ± 0.11	0.0008 ± 0.0005	0.0008 ± 0.0003
Shoots							
Element incorporation	126.3	688	459	2.33	335.7	299.7	2868
Element loss (through grazing and mechanical breakage)	1.9	105	106	0.56	62.86	120	254
Element loss (through shedding)	52.3	491	415	3.04	498	601	2013
Accumulation excess	72.1	91.8	-61.5	-1.27	-225	-421	601

	Cs	Cu	Fe	Ga	Li	Mn	Ni
Leaves							
Element concentration	0.009 ± 0.004	10.9 ± 2	105 ± 35	0.03 ± 0.02	0.92 ± 0.12	27.5 ± 8.7	24.5 ± 14
Element incorporation	1.75 ± 1.68	3377 ± 488	29911 ± 14794	7.61 ± 6.29	297 ± 139	6759 ± 3440	10269 ± 6224
Element loss (through shedding)	1.79 ± 1.73	4016 ± 3851	38975 ± 29080	15.71 ± 10.48	378 ± 299	15487 ± 14608	7008 ± 4191
Element loss (through grazing and mechanical breakage)	0.85 ± 2.93	815 ± 3376	4104 ± 31777	3.77 ± 10.49	77 ± 302	4204 ± 10799	1331 ± 6880
Rhizomes							
Element concentration	0.023 ± 0.015	5.1 ± 1	411 ± 209	0.09 ± 0.05	0.58 ± 0.21	9.1 ± 5	23 ± 6.4
Element incorporation	1.54	282	22808	4.78	32.1	504	1276
Roots							
Element concentration	0.032 ± 0.01	10.5 ± 1.6	1092 ± 444	0.1 ± 0.03	0.54 ± 0.13	26.4 ± 11.6	11.2 ± 9.2
Element incorporation	0.83	270	28175	2.59	14	682	289
Epiphytes							
Element concentration	0.2 ± 0.05	17.3 ± 7.6	2000 ± 484	0.41 ± 0.1	2.57 ± 0.36	181 ± 97	15.8 ± 4.5
Detritus							
Element release (through decomposition)	0.0000002 ± 0.0000002	0.0025 ± 0.0024	0.0128 ± 0.0095	0.000003 ± 0.000002	0.0023 ± 0.0018	0.0015 ± 0.0014	0.016 ± 0.010
Shoots							
Element incorporation	4.12	3929	80894	14.98	343.1	7945	11834
Element loss (through grazing and mechanical breakage)	0.85	815	4104	3.77	77	4204	1331
Element loss (through shedding)	1.79	4016	38975	15.71	378	15487	7008
Accumulation excess	1.48	-902	37815	-4.5	-112	-11746	3495

	Pb	Rb	Sr	Tl	V	Zn
Leaves						
Element concentration	6.12 ± 1.6	7.59 ± 0.66	271 ± 15	0.008 ± 0.002	2.35 ± 0.59	133 ± 38
Element incorporation	1269 ± 381	2656 ± 1211	83052 ± 29266	1.97 ± 1.07	560 ± 347	64538 ± 57807
Element loss (through shedding)	2848 ± 2192	3006 ± 2512	118077 ± 89108	3.32 ± 2.82	1425 ± 1211	81917 ± 64662
Element loss (through grazing and mechanical breakage)	530 ± 1990	523 ± 2488	20895 ± 88635	0.68 ± 2.54	297 ± 955	16530 ± 49439
Rhizomes						
Element concentration	15.2 ± 7.5	4.93 ± 1.18	227 ± 39	0.017 ± 0.013	4.37 ± 1.91	59 ± 12
Element incorporation	841	274	12617	0.94	242	3299
Roots						
Element concentration	43.1 ± 14.7	8.3 ± 2.34	319 ± 137	0.019 ± 0.01	5.81 ± 1.28	55 ± 33
Element incorporation	1111	214	8222	0.5	150	1423
Epiphytes						
Element concentration	123 ± 29	3.64 ± 1.13	2321 ± 650	0.047 ± 0.027	19.6 ± 6.6	123 ± 53
Detritus						
Element release (through decomposition)	0.0006 ± 0.0004	0.13 ± 0.11	0.16 ± 0.12	0.0000002 ± 0.0000002	0.029 ± 0.025	1.11 ± 0.88
Shoots						
Element incorporation	3221	3144	103891	3.41	952	69260
Element loss (through grazing and mechanical breakage)	530	523	20895	0.68	297	16530
Element loss (through shedding)	2848	3006	118077	3.32	1425	81917
Accumulation excess	-157	-385	-35081	-0.59	-770	-29187