Supporting Information

Carbon stocks and accumulation rates in Red Sea seagrass meadows

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SI Table A. Results of the isotopic mixing model (IsoSource software). Proportion (25%, 50% and 75% quantiles) of autochthonous (i.e. seagrass matter) and allochthonous (i.e. mangroves plus halophytes, seaweed and seston) C_{org} to the seagrass soil C_{org} pool (top 60 cm of the cores). The seagrass species found at each core is indicated.

Core ID	Location	Seagrass species	Autochthonous contribution (%)			Allochthonous contribution (%)					
			Seagrass			Mangroves plus halophytes			Seaweed plus seston		
			25%	50%	75%	25%	50%	75%	25%	50%	75%
T1	Thuwal Island	*H. stipulacea*	15	26	38	35	39	42	20	35	50
T2	Thuwal Island	*H. stipulacea*	14	25	36	37	41	45	19	34	48
T3	Thuwal Island	*H. stipulacea*	31	41	49	31	34	36	16	26	38
EC1	Economic City	*T. hemiprichii*	25	43	61	7	12	17	23	44	66
EC2	Economic City	*T. hemiprichii*	50	62	73	6	10	12	15	28	44
EC3	Economic City	*T. hemiprichii*	63	69	74	13	15	17	9	15	24
EC4	Economic City	*E. acoroides*	44	56	69	6	9	13	18	34	50
EC5	Economic City	*E. acoroides*	33	50	63	6	10	14	22	40	61
EC6	Economic City	*E. acoroides*	51	56	63	20	22	24	14	22	29
EC7	Economic City	*E. acoroides*	62	72	80	5	8	10	11	20	32
EC8	Economic City	*T. ciliatum*	37	48	56	25	28	30	14	24	38
EC9	Economic City	*T. ciliatum*	14	28	43	23	28	32	25	44	62
EC10	Economic City	*T. ciliatum*	13	25	39	28	31	35	25	44	59
PR1	Petro Rabigh	*T. ciliatum*	9	15	20	66	67	69	11	18	25
PR2	Petro Rabigh	*T. ciliatum*	6	10	13	76	78	80	7	12	16
PR3	Petro Rabigh	*T. ciliatum*	6	10	13	76	78	80	7	12	16
PR4	Petro Rabigh	*T. ciliatum*	9	14	20	65	68	71	10	17	24

KA1	Khor Alkharar	*H. uninervis*	15	27	45	14	18	23	32	55	70
KA2	Khor Alkharar	*H. uninervis*	47	53	57	31	32	34	9	15	22
KA3	Khor Alkharar	*H. uninervis*	32	42	51	25	28	31	18	30	43
KA4	Khor Alkharar	*H. stipulacea*	45	53	59	26	29	31	11	18	29
KA5	Khor Alkharar	*H. stipulacea*	37	44	50	33	35	37	13	21	30
KA6	Khor Alkharar	*H. stipulacea*	16	27	40	28	31	35	26	42	56
KA7	Khor Alkharar	*H. stipulacea*	31	37	47	29	31	33	20	32	40
KA8	Khor Alkharar	*H. stipulacea*	48	55	59	27	29	30	10	16	24
KA9	Khor Alkharar	*H. stipulacea*	51	55	59	30	31	32	9	14	18
KA10	Khor Alkharar	*H. uninervis*	55	59	62	30	31	32	6	10	15
Mean			**32**	**41**	**50**	**30**	**32**	**35**	**16**	**27**	**38**

SI Table B. Details of the seagrass cores sampled, including the % compression during coring operations. Core length recovered (cm compressed) and core length corrected for compression (cm decompressed).

core ID	Location	Seagrass species	Water depth (m)	Latitude	Longitude	Corer type	Core length (cm compressed)	Core length (cm decompressed)	Compression (%)
T1	Thuwal Is.	*H. stipulacea*	1	22° 16.877'	39° 05.120'	Whole	120	131	8
T2	Thuwal Is.	*H. stipulacea*	1	22° 16.867'	39° 05.127'	Port	99	118	16
T3	Thuwal Is.	*H. stipulacea*	1	22° 16.856'	39° 05.108'	Port	117	136	14
EC1	E. city	*T. hemprichii*	0.5	22° 23.652'	39° 07.871'	Port	45	60	25

EC2	E. city	*T. hemprichii*	0.5	22° 23.652'	39° 07.871'	Whole	42	64	34
EC3	E. city	*T. hemprichii*	0.5	22° 23.795'	39° 07.791'	Port	45	50	10
EC4	E. city	*E. acoroides*	0.5	22° 23.781'	39° 07.805'	Port	105	129	19
EC5	E. city	*E. acoroides*	1.5	22° 23.801'	39° 07.836'	Whole	138	158	13
EC6	E. city	*E. acoroides*	2	22° 23.801'	39° 07.836'	Whole	105	116	9
EC7	E. city	*E. acoroides*	0.5	22° 23.766'	39° 07.863'	Port	117	122	4
EC8	E. city	*T. ciliatum*	0.5	22° 22.845'	39° 07.894'	Port	39	44	11
EC9	E. city	*T. ciliatum*	0.5	22° 22.845'	39° 07.894'	Port	39	46	15
EC10	E. city	*T. ciliatum*	0.5	22° 22.845'	39° 07.894'	Whole	50	55	9
PR1	P. Rabigh	*T. ciliatum*	0.5	22° 45.211'	39° 00.681'	Whole	164	206	20
PR2	P. Rabigh	*T. ciliatum*	0.5	22° 45.274'	39° 00.603'	Port	75	113	34
PR3	P. Rabigh	*T. ciliatum*	1	22° 45.197'	39° 00.644'	Port	93	119	22
PR4	P. Rabigh	*T. ciliatum*	1	22° 45.232'	39° 00.645'	Port	87	120	27
KA1	K. Alkharar	*H. uninervis*	0.5	22° 56.025'	38° 52.814'	Whole	120	135	11
KA2	K. Alkharar	*H. uninervis*	1.5	22° 56.105'	38° 52.702'	Port	105	121	13
KA3	K. Alkharar	*H. uninervis*	1.5	22° 56.105'	38° 52.702'	Port	39	47	17
KA4	K. Alkharar	*H. stipulacea*	1.5	22° 56.105'	38° 52.702'	Port	33	47	30
KA5	K. Alkharar	*H. stipulacea*	7	22° 55.886'	38° 53.348'	Port	57	59	3
KA6	K. Alkharar	*H. stipulacea*	7	22° 55.886'	38° 53.348'	Port	51	54	6
KA7	K. Alkharar	*H. stipulacea*	7	22° 55.886'	38° 53.348'	Whole	60	62	3
KA8	K. Alkharar	*H. stipulacea*	3	22° 56.026'	38° 52.888'	Port	57	59	3
KA9	K. Alkharar	*H. stipulacea*	3	22° 56.026'	38° 52.888'	Whole	56	64	13
KA10	K. Alkharar	*H. uninervis*	3	22° 56.026'	38° 52.888'	Port	51	54	6

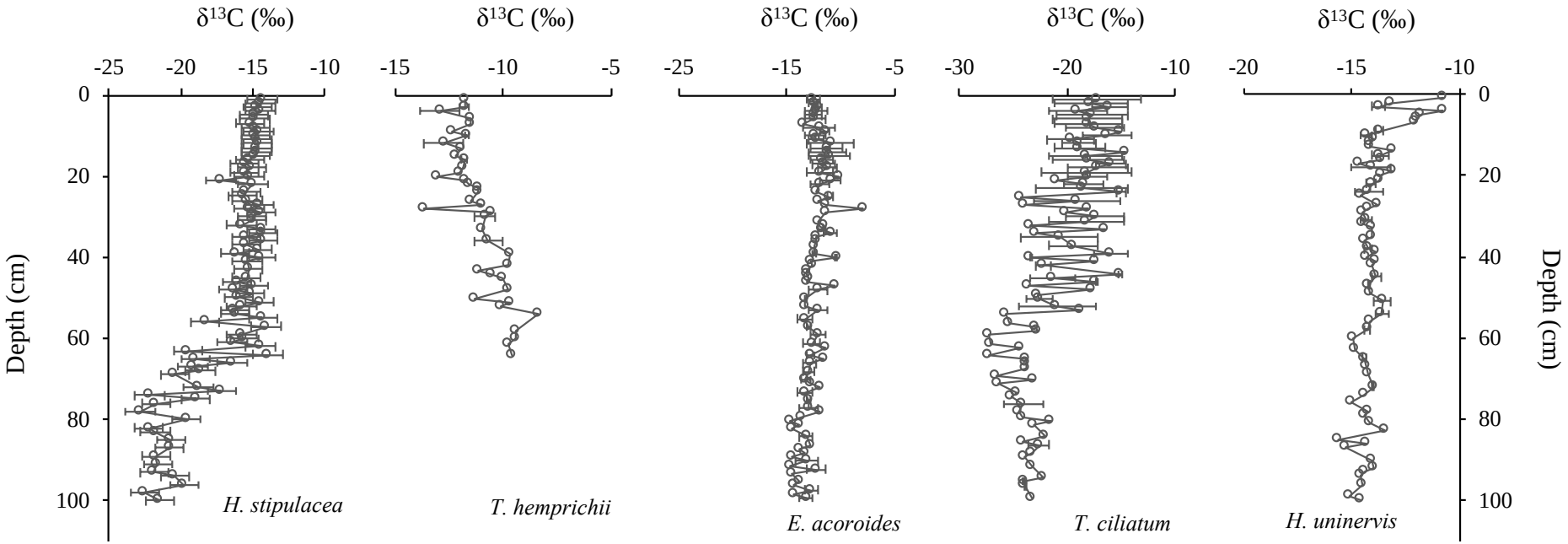
SI Table C. Radiocarbon results. Cm refers to cm decompressed. The results marked with * were not used to produce the age-depth models (i.e. reversals or modern).

DirectAMS code	Core ID	Depth (cm)	Material	Radiocarbon age BP	1 sigma error
D-AMS 009445	T1	44	Pooled shells	481	20
D-AMS 009446	T1	124	Pooled shells	867	24
*D-AMS 009447	T2	31	Pooled shells	610	25
*D-AMS 009448	T2	104	Pooled shells	530	24
D-AMS 009449	T3	23	Bulk sediment	281	26
D-AMS 009450	T3	135	Bulk sediment	1528	30
*D-AMS 009463	EC1	35	Pooled shells	42	23
D-AMS 009464	EC1	59	Pooled shells	583	25
D-AMS 009477	EC2	30	Pooled shells	895	22
D-AMS 009478	EC2	62	Pooled shells	916	23
*D-AMS 009471	EC3	22	Pooled shells	Modern	
D-AMS 009472	EC3	49	Pooled shells	918	31
D-AMS 009465	EC4	25	Pooled shells	779	26
D-AMS 009466	EC4	128	Pooled shells	1659	25
D-AMS 009555	EC5	23	Pooled shells	662	24
D-AMS 009509	EC5	46	Pooled shells	1222	24
D-AMS 009556	EC5	69	Pooled shells	1743	23
D-AMS 009557	EC5	92	Pooled shells	2006	35
D-AMS 009510	EC5	137	Pooled shells	5458	29
D-AMS 009481	EC6	44	Pooled shells	1239	27
D-AMS 009482	EC6	116	Pooled shells	2730	25

D-AMS 009469	EC7	27	Pooled shells	565	25
D-AMS 009470	EC7	121	Pooled shells	2043	30
D-AMS 009473	EC8	23	Pooled shells	830	22
D-AMS 009474	EC8	43	Pooled shells	1641	23
D-AMS 009475	EC9	24	Pooled shells	979	31
D-AMS 009476	EC9	45	Pooled shells	981	24
D-AMS 009455	EC10	22	Pooled shells	742	26
D-AMS 009456	EC10	54	Pooled shells	799	24
*D-AMS 009526	PR1	50	Pooled shells	2636	25
*D-AMS 009525	PR1	176	Pooled shells	1062	28
*D-AMS 009513	PR2	30	Pooled shells	651	26
*D-AMS 009514	PR2	75		Modern	
*D-AMS 009539	PR3	26	Bulk sediment	Modern	
D-AMS 009540	PR3	118	Pooled shells	253	24
D-AMS 009541	PR4	28	Pooled shells	110	22
D-AMS 009542	PR4	119	Pooled shells	156	25
D-AMS 009521	KA1	45	Pooled shells	1207	21
D-AMS 009522	KA1	135	Pooled shells	1541	25
D-AMS 009497	KA2	23	Pooled shells	1215	25
D-AMS 009498	KA2	120	Pooled shells	1683	27
*D-AMS 009487	KA3	46	Pooled shells	2399	25
*D-AMS 009488	KA3	72	Pooled shells	Modern	
*D-AMS 009485	KA4	28	Pooled shells	Modern	
D-AMS 009486	KA4	46	Pooled shells	1240	24
*D-AMS 009489	KA5	21	Pooled shells	Modern	
D-AMS 009490	KA5	58	Pooled shells	1292	26
*D-AMS 009492	KA6	21	Pooled shells	1089	25
*D-AMS 009491	KA6	53	Pooled shells	715	22

D-AMS 009531	KA7	21	Pooled shells	395	21
D-AMS 009581	KA7	35	Pooled shells	592	35
D-AMS 009532	KA7	61	Pooled shells	806	26
D-AMS 009493	KA8	21	Pooled shells	612	31
D-AMS 009494	KA8	58	Pooled shells	669	24
D-AMS 009527	KA9	23	Pooled shells	490	24
D-AMS 009544	KA9	46	Pooled shells	542	31
D-AMS 009528	KA9	64	Pooled shells	905	22
*D-AMS 009495	KA10	28	Pooled shells	Modern	
D-AMS 009496	KA10	47	Pooled shells	888	24

SI Figure A. Changes in $\delta^{13}C$ values (‰) along soil depth in the *H. stipulacea*, *T. hemprichii*, *E. acoroides*, *T. ciliatum* and *H. uninervis* cores from the Red Sea (average±SE).



SI Figure B. Relationship between extrapolated and measured C_{org} stocks (a) from 44 cm to 100 cm in seagrass soil cores ≥ 1 m depth.