

Supplementary Information:

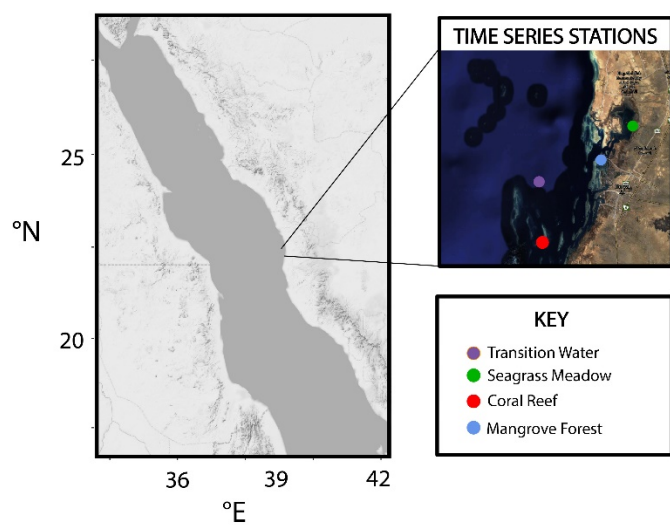


Figure S1: Positions of the four time series stations

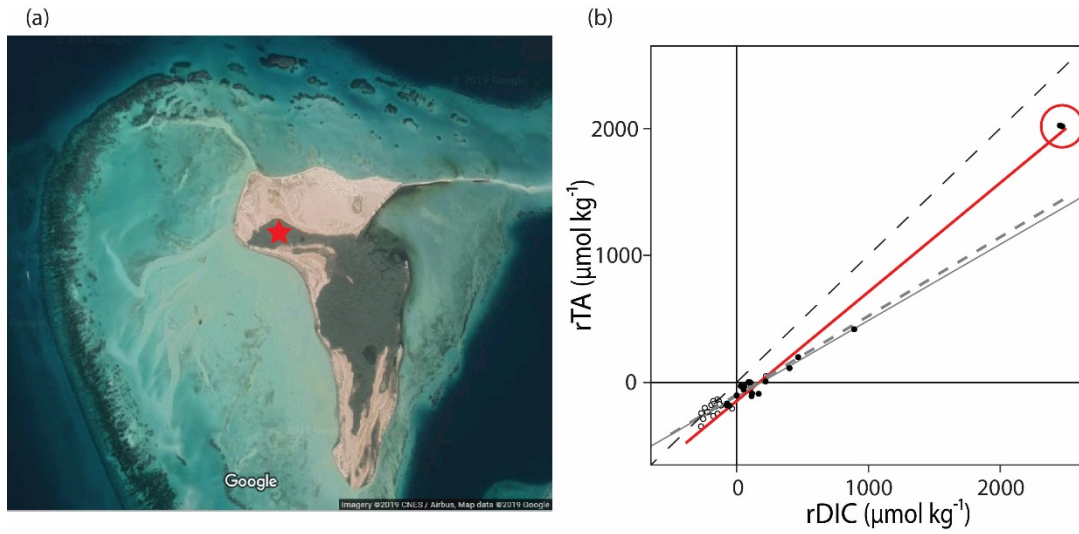


Figure S2: Panel (a) shows a satellite view of the inland-mangrove stand referred to in the text. The picture was taken using Google Maps satellite view and the red marker indicates the approximate location the two samples were taken. Panel (b) shows the rTA and rDIC at this mangrove forest site (circled red) against other mangrove forests, in an expanded plot of Figure 8e. The red line indicates the fit of the spatial regression line if this mangrove site is used. All other lines are those displayed in Figure 8e.

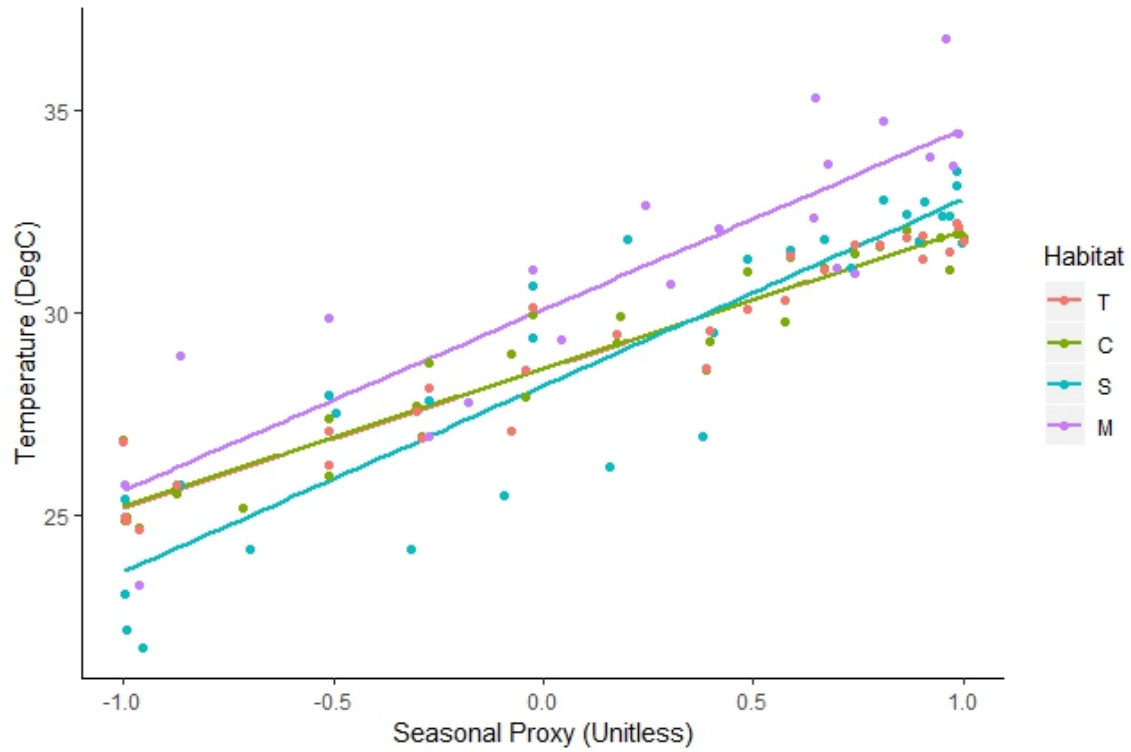


Figure S3: Interaction plot between the seasonal proxy and habitat type for Temperature for the four coastal time series stations. The four lines indicate linear trends calculates for transition station (T), coral reef station (C), seagrass meadow station (S) and mangrove forest station (M)

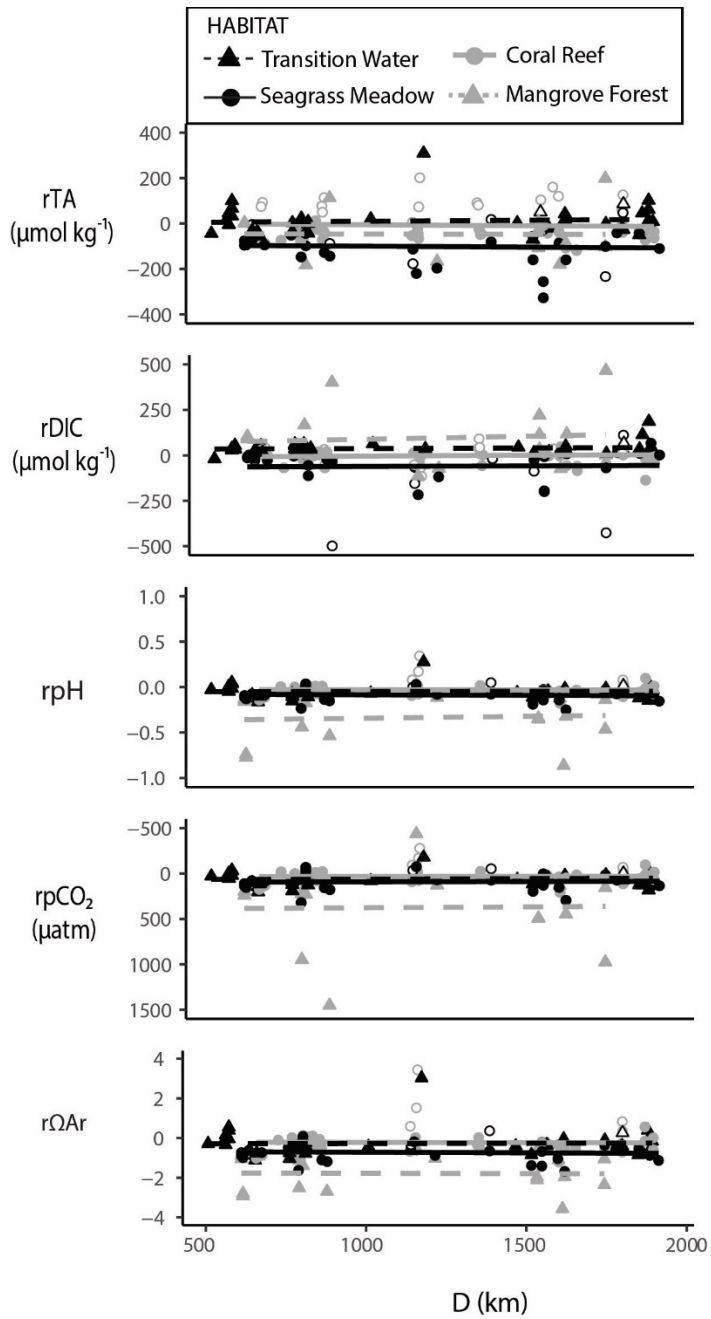


Figure S4. Residual carbon variables observed in the four coastal habitats are presented against distance along the south-north central axis (D). Linear regressions for all combinations of variables are drawn as lines (although none are significant), with associated statistics reported in Table S3. Note that not all coastal observations are displayed. Hollow symbols indicate summer observations.

Table S1. Summary of the observations used in this study. Presented is the cruise code, the source of the data, the month and year in which observations were collected and the number of observations that were collected offshore (O), in transition waters (T) or at coral reefs (C), seagrass meadows (S) and mangrove forests (M).

Cruise	Source	Month	Year	O	T	C	S	M
CSM16	This study	Jan-Apr	2016	13	20	9	11	8
CSM17	This study	Mar	2017	1	5	11	12	9
CCF1	This study	Jan-Mar	2017	0	6	22	5	0
CCF2	This study	Sep-Aug	2017	0	2	17	7	0
CRE	This study	May	2017	1	0	10	2	2
BPC	This study	April	2017	9	6	0	0	0
VOS Pacific Celebes	Hydes et al. (2012)	Nov-Sep	2007-2009	7	1	0	0	0
TARA	Picheral et al (2014)	Jan	2010	3	0	0	0	0
WHOI	This study	March	2010	53	0	0	0	0
WHOI	This Study	Sep	2011	14	0	0	0	0
Total				101	71	101	69	42

Table S2: Defining statistics of the normal error for residual carbon variable estimates, as calculated from offshore observations

	Residual mean	Residual standard deviation	Lower 99% P.I. bound*	Upper 99% P.I. bound**	% offshore observations outside the 99% P.I. (excluding/incl uding outliers)
rTA	0	16.79	-43.25	43.25	1.1/5.9
rDIC	0	23.33	-60.09	60.09	2.2/5.9
rpH	-5×10^{-4}	2.69×10^{-2}	-6.97×10^{-2}	6.87×10^{-2}	4.3/6.9
rpCO ₂	0.10	30.20	-77.69	77.90	4.3/7.9
rΩ _{Ar}	0.0006	0.1879	-0.4833	0.4845	4.3/6.9

* Residual mean – 2.576*Residual standard deviation

** Residual mean + 2.576*Residual standard deviation

Table S3. By habitat group statistics for regressions of different variables against D constructed with observations from offshore waters and the four habitat types. Pearson's correlation coefficient (r^2), the test statistic (F) and p-value (p) are reported for each individual test.

Table S4. By Habitat descriptive statistics for carbon variable habitat groups for all coastal observations. The number of observations (n), mean, median, standard deviation, maximum values (max) and minimum value (min) are presented for each habitat group and variable combination.

Table S5. Results from one-way WR-ANOVA and corresponding boot-strapped post-hoc t-tests to identify performed between differences in medians between habitat groups ; Offshore (O), Transition waters (T), Coral reefs (C), Seagrass meadows (S) and Mangrove Forests (M). Tests statistics (F for WR-ANOVA and Ψ_{hat} for post-hoc) and p-values (p) are reported for each individual test.

Table S6. Statistics for regressions of different variables against the seasonal proxy (SP) at the four time series stations. Pearsons correlation coefficient (r^2), the test statistic (F) and p-value (p) are reported for each individual test.

Table S7. Descriptive statistics for studied variables at the four time series stations. The number of observations (n), mean, median, standard deviation, maximum values (max) and minimum value (min) are presented for each time series station and variable combination.

Table S8. Results from one-way WR-ANOVA and corresponding boot-strapped post-hoc t-tests to identify differences in medians between the four time series stations ; Transition (T), Coral reef (C), Seagrass meadow (S) and Mangrove Forest (M). Tests statistics (F for WR-ANOVA and Ψ_{hat} for post-hoc) and p-values (p) are reported for each individual test.

Supplementary R Code: WRS2_post_hoc.R

This code contains 1) the med1way.crit function which is an internal function of the WRS2 package (source: <https://github.com/cran/WRS2/blob/master/R/med1way.crit.R>) and 2) an adapted version of the mcppb20 function, which is contained in the WRS2 package (source: <https://github.com/cran/WRS2/blob/master/R/mcppb20.R>), that performs bootstrapped t-tests for differences in medians.