

Supplementary information

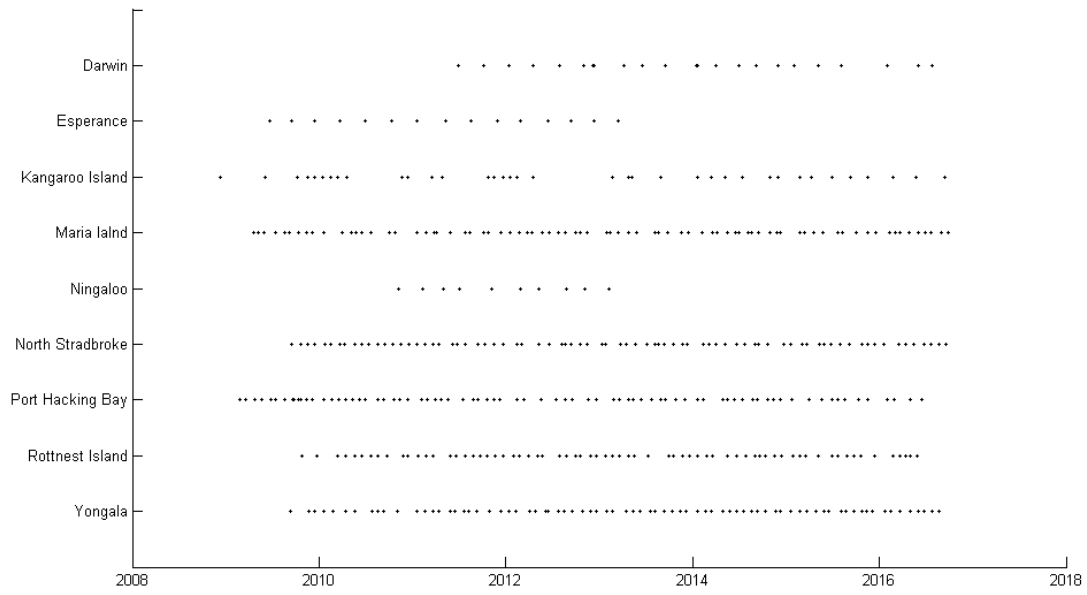


Figure S1: Sampling events for the 9 NRS used in this study.

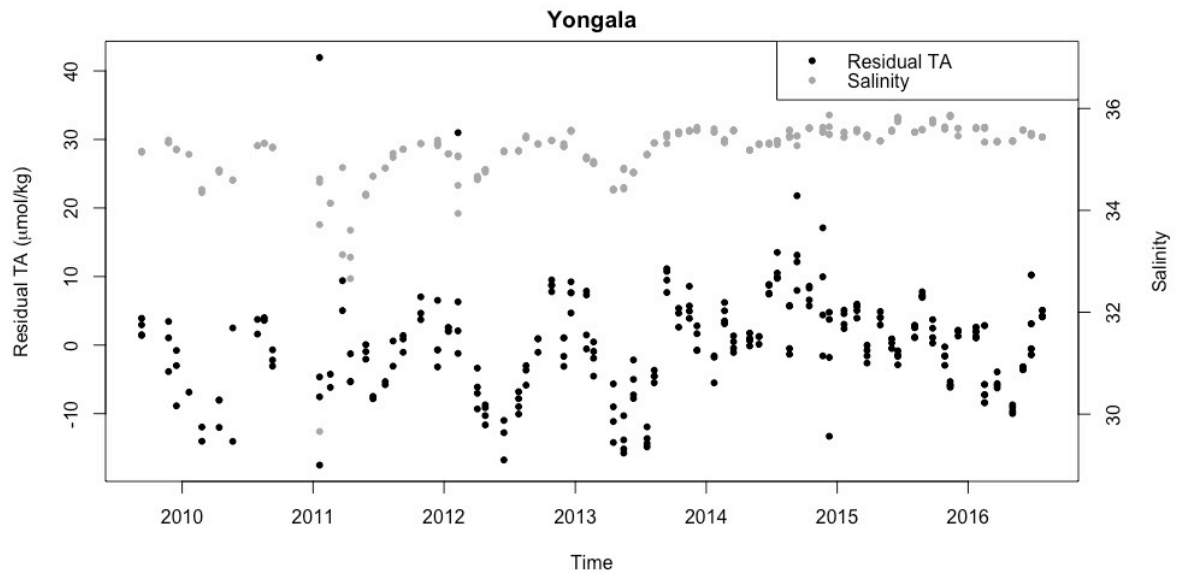


Figure S2: Time series for residual errors at the Yongala NRS for Model 3: Modelling TA with Sal, T and log(CHL)

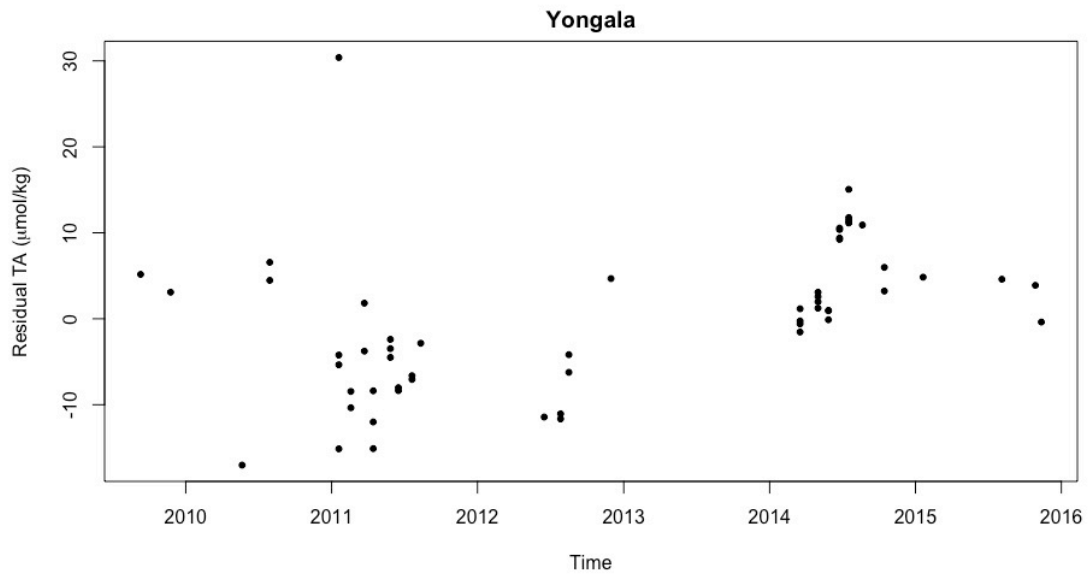


Figure S3: Time series for residual errors at the Yongala NRS for Model 4: Modelling TA with Sal, T and log(N)

Table S1: Parameters and statistics for Base Model 1: Modelling TA with S
 * low number of observations (based on 30x[number of explanatory variables])

NRS	Correlation Coefficient	Intercept	S	n	RSE	AIC
General	0.93	511.61	51.13	1851	10.71	14035.6
Darwin	0.95	348.78	56.26	149	12.88	1188.5
Esperance	0.86	50.57	64.18	60	5.43	377.3
Kangaroo Island	0.88	617.75	48.47	150	5.04	915.1
Maria Island	0.84	902.65	40.25	305	3.91	1700.5
Ningaloo	0.69	686.21	45.83	40	6.10	262.2
North Stradbroke Island	0.91	427.94	53.42	312	5.08	1903.5
Port Hacking Bay	0.95	157.34	61.15	231	2.72	1121.0
Rottneest Island	0.93	340.07	55.99	277	4.81	1660.1
Yongala	0.97	465.90	52.00	327	7.94	2287.3

Table S2: Parameters for Base Model 2: Modelling TA with S and T
 * low number of observations (based on 30x[number of explanatory variables])

NRS	Correlation Coefficient	Intercept	S	T	n	RSE	AIC
General	0.95	694.33	46.69	-1.25	1391	9.00	10066.2
Darwin	0.93	525.48	52.40	-1.6	87	13.6	706.0
Esperance	0.88	2.52	66.00	-0.93	46*	4.96	282.0
Kangaroo Island	0.89	636.76	47.74	0.42	115	5.11	706.4
Maria Island	0.86	627.74	48.40	-0.89	229	3.56	1236.0
Ningaloo	0.93	217.92	60.55	-1.67	25*	3.38	136.6
North Stradbroke Island	0.90	613.47	48.20	-0.79	263	4.82	1578.5
Port Hacking Bay	0.95	185.41	60.60	-0.46	158	2.56	750.6
Rottneest Island	0.94	325.62	56.85	-0.77	191	4.71	1138.8
Yongala	0.97	454.07	52.14	0.27	277	7.78	1927.7

Table S3: Parameters for Base Model 3: Modelling TA with Sal, T and log(CHL)
 * low number of observations (based on 30x[number of explanatory variables])

NRS	Correlation Coefficient	Intercept	S	T	logCHL	n	RSE	AIC
General	0.95	604.44	49.23	-1.13	2.47	1277	8.45	9079.6
Darwin	0.94	393.81	56.03	-1.42	-2.37	74*	11.74	580.4
Esperance	0.89	-7.40	66.42	-1.03	3.12	46*	4.87	282.0
Kangaroo Island	0.89	672.91	46.81	0.23	0.28	99	5.16	611.8
Maria Island	0.88	517.73	51.59	-1.04	0.74	211	3.45	1127.6
Ningaloo	0.94	207.48	60.95	-1.64	3.58	25*	3.24	135.4
North Stradbroke Island	0.95	349.04	56.07	-0.61	0.65	231	3.49	1239.5
Port Hacking Bay	0.95	157.50	61.30	-0.27	0.98	135	2.50	636.3
Rottneest Island	0.93	221.61	59.79	-0.77	0.24	183	4.64	1087.0
Yongala	0.97	464.33	51.42	0.58	-4.54	273	7.30	1866.3

Table S4: Parameters for Base Model 4: Modelling TA with Sal, T and log(N)
 * low number of observations (based on 30x[number of explanatory variables])

NRS	Correlation Coefficient	Intercept	S	T	logN	n	RSE	AIC
General	0.96	671.40	47.14	-0.86	0.33	826	8.20	5840.3
Darwin	0.93	417.00	59.52	-2.33	7.12	55*	15.06	460.2
Esperance	0.90	33.57	65.60	-1.07	6.36	37*	5.15	232.1
Kangaroo Island	0.94	451.09	53.02	0.24	0.46	60*	3.81	336.6
Maria Island	0.89	530.27	51.26	-1.14	-0.47	195	3.23	1016.9
Ningaloo	0.95	382.73	55.68	-1.40	2.12	18*	3.422	100.84
North Stradbroke Island	0.80	1018.88	37.21	-0.68	0.95	130	5.24	817.7
Port Hacking Bay	0.93	161.94	61.41	-0.74	-0.51	134	2.59	641.27
Rottneest Island	0.93	344.91	56.27	-0.72	-0.00	141	4.99	859.2
Yongala	0.98	587.67	48.83	-0.21	2.68	56*	9.02	411.1

Table S5: p-values for KS tests. KS test is a two-sided test so if pvalue < 0.025 then null hypothesis is rejected then significantly different result at the 95% confidence level.

NRS	Base Model 1		Base Model 2		Base Model 3		Base Model 4		Lee et al. (2006)
	Regional	General	Regional	General	Regional	General	Regional	General	
Darwin	0.773	0.000	0.435	0.009	0.485	0.001	0.198	0.015	0.003
Esperance	0.167	0.01	0.223	0.120	0.291	0.126	0.476	0.066	0.019
Kangaroo Island	0.579	0.000	0.644	0.000	0.884	0.000	0.343	0.000	0.870
Maria Island	0.035	0.000	0.226	0.071	0.475	0.158	0.062	0.162	0.00
Ningaloo	0.895	0.000	0.877	0.063	0.884	0.257	0.712	0.055	0.266
North Stradbroke Island	0.001	0.018	0.119	0.011	0.548	0.032	0.130	0.087	0.000
Port Hacking Bay	0.822	0.001	0.810	0.364	0.736	0.136	0.980	0.169	0.000
Rottneest Island	0.635	0.084	0.669	0.015	0.885	0.008	0.558	0.091	0.000
Yongala	0.000	0.000	0.002	0.000	0.029	0.000	0.440	0.006	0.000

Table S6: Relative probabilities of minimising information loss for all four base models

NRS	BM1	BM2	BM3	BM4	
1	0.000	0.000		0.000	1
2	0.000	0.000		0.000	1
3	0.000	0.000		0.000	1
4	0.000	0.000		0.000	1
5	0.000	0.000		0.000	1
6	0.000	0.000		0.000	1
7	0.000	0.000		0.000	1
8	0.000	0.000		1	0.0837
9	0.000	0.000		0.000	1
10	0.000	0.000		0.000	1