Frequency_Analysis

Vanessa Hui Fen Neo

2021-09-29

Comparison of CCI, NOAA and Coral Core SST variability in Browse Island sites

- BRS05 (-14.105, 123.5356924)
- BRS07 (-14.121, 123.5467277)

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## Warning in mask$eval_all_mutate(quo): NAs introduced by coercion
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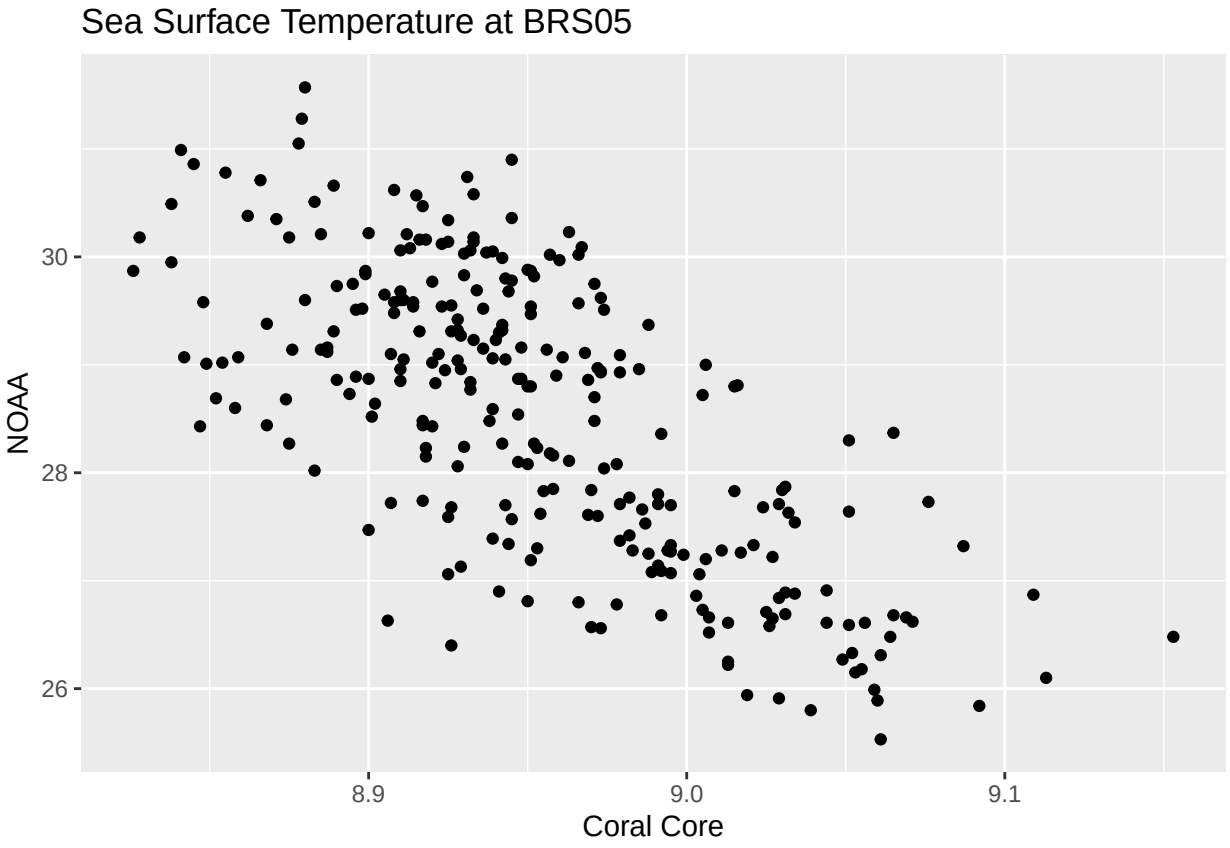
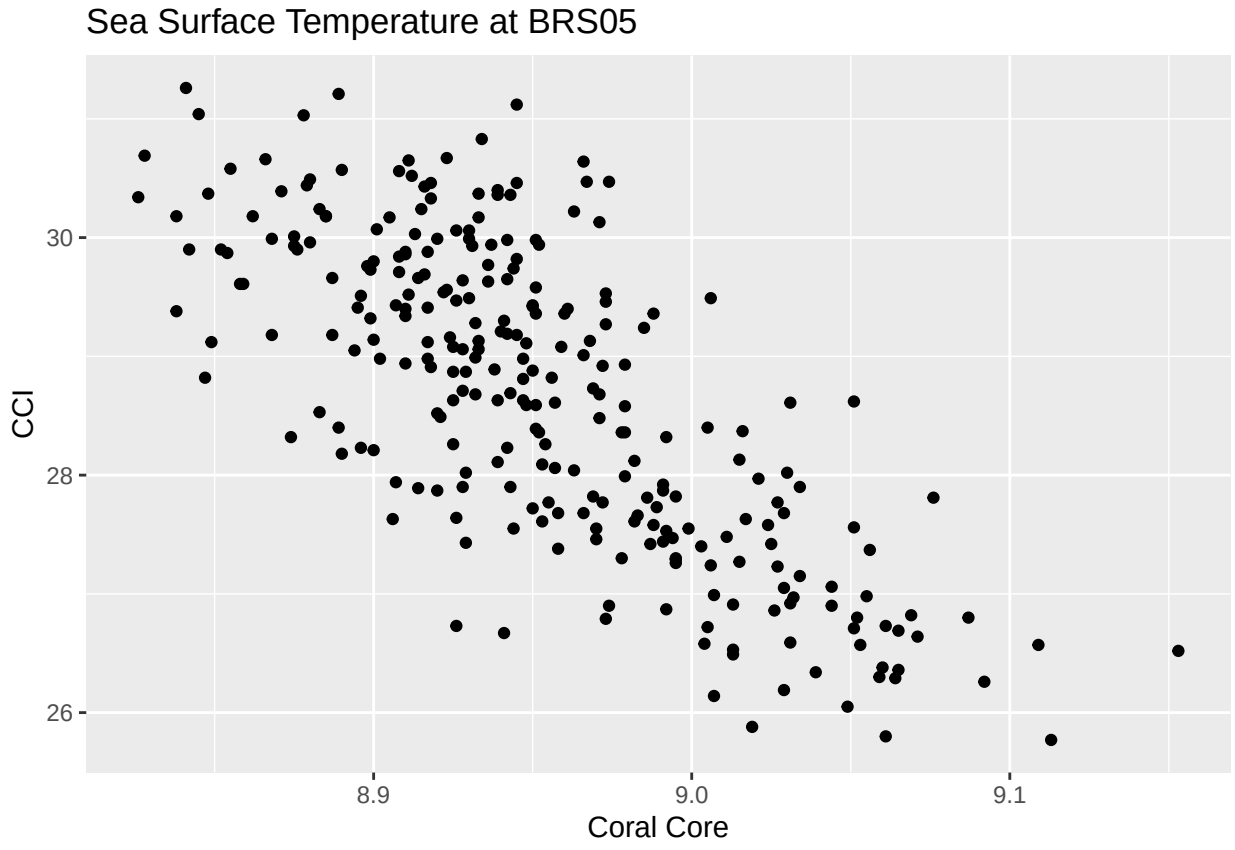


	Model 1	Model 2
(Intercept)	170.798	177.080
	(8.667)	(7.831)
browse_coral_core	−15.892	−16.577
	(0.968)	(0.875)
Num.Obs.	273	273
R2	0.499	0.570
R2 Adj.	0.497	0.568
AIC	748.8	693.4
BIC	759.6	704.3
Log.Lik.	−371.397	−343.722
F	269.544	359.197

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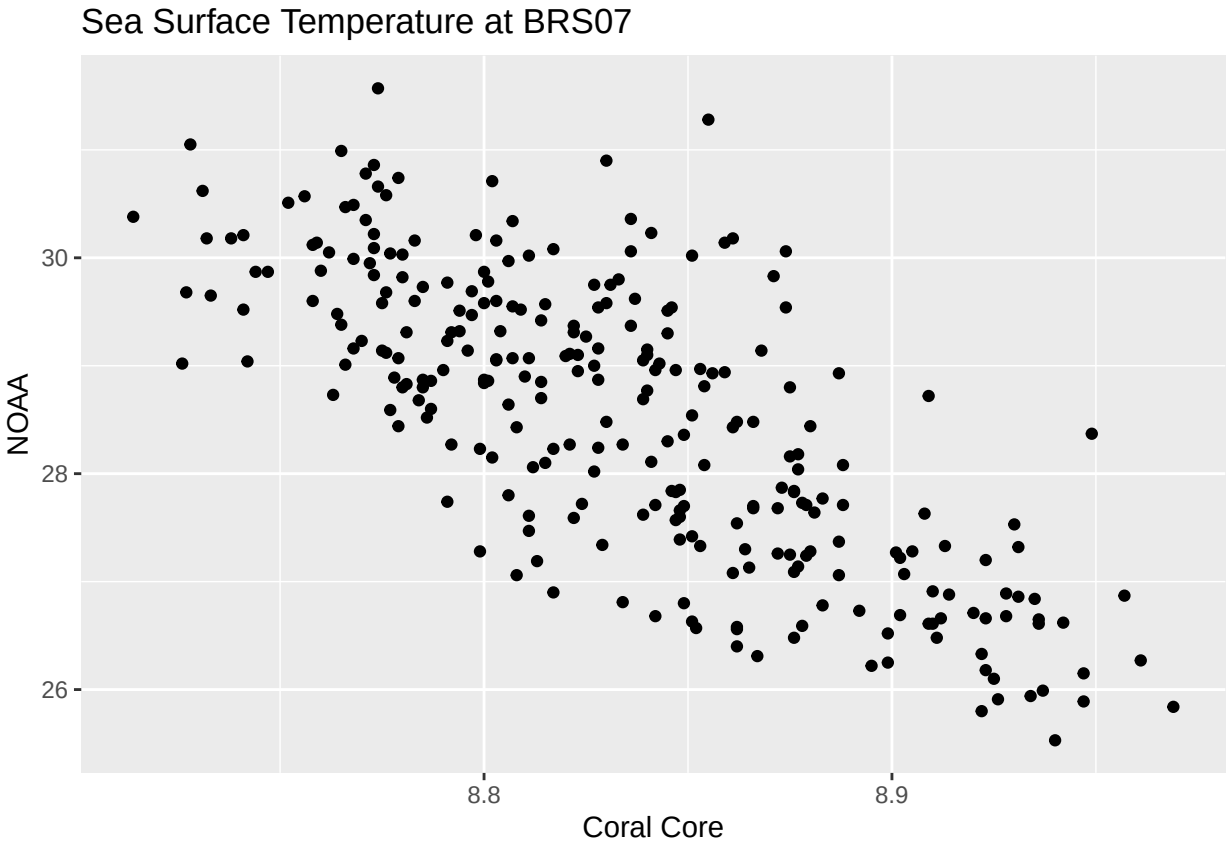
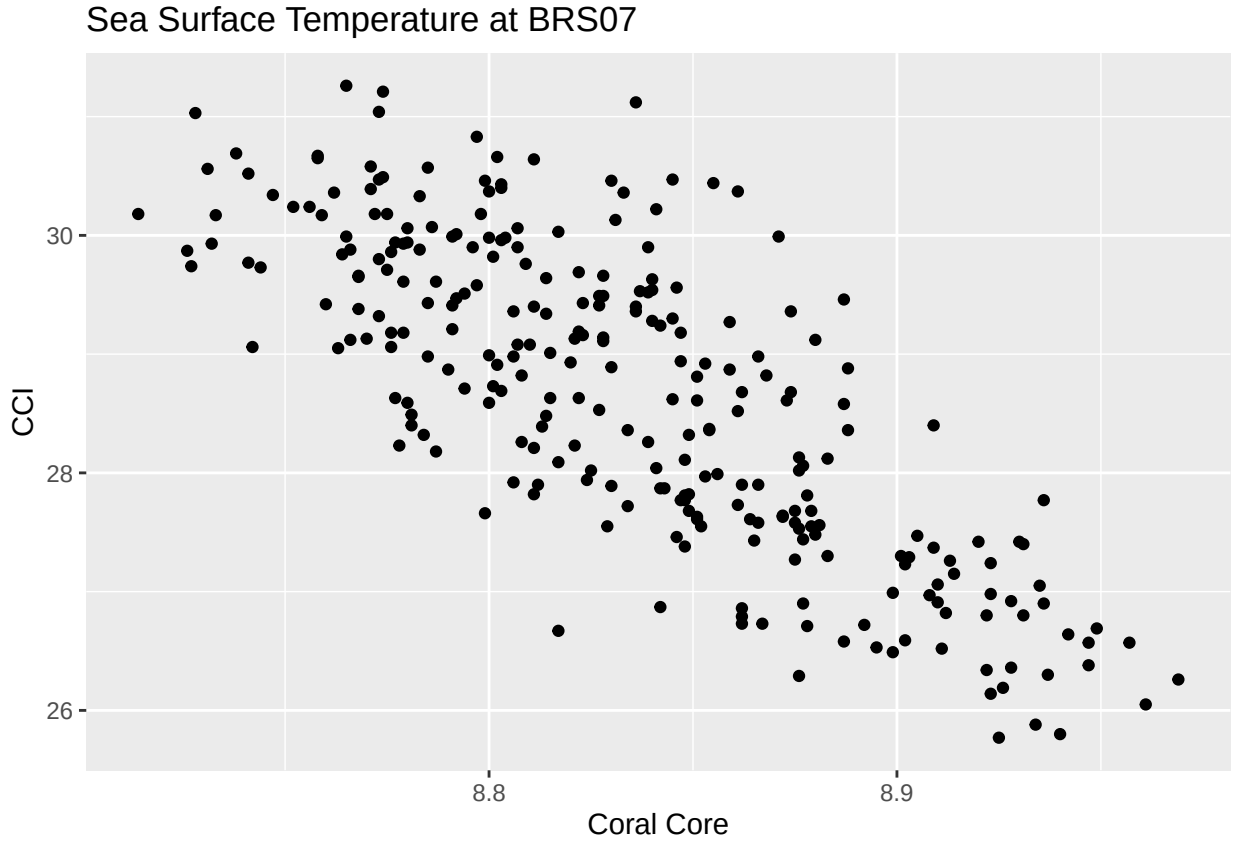

Sea Surface Temperature at BRS07
NOAA
30
28
26
8.8
8.9
Coral Core

	Model 1	Model 2
(Intercept)	191.013	−2236.820
	(8.542)	(1096.089)
browse_coral_core	−18.394	531.158
	(0.967)	(247.970)
I(browse_coral_core^2)		−31.095
		(14.024)
Num.Obs.	273	273
R2	0.572	0.624
R2 Adj.	0.570	0.622
AIC	705.7	658.5
BIC	716.6	672.9
Log.Lik.	−349.861	−325.252
F	361.923	224.423



Comparison of CCI, NOAA and Coral Core SST variability in Cocos (Keeling) Island sites

- DAR3 (-12.095, 96.8805)
- DAR Long (-12.0875, 96.875)

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## Warning in mask$eval_all_mutate(quo): NAs introduced by coercion
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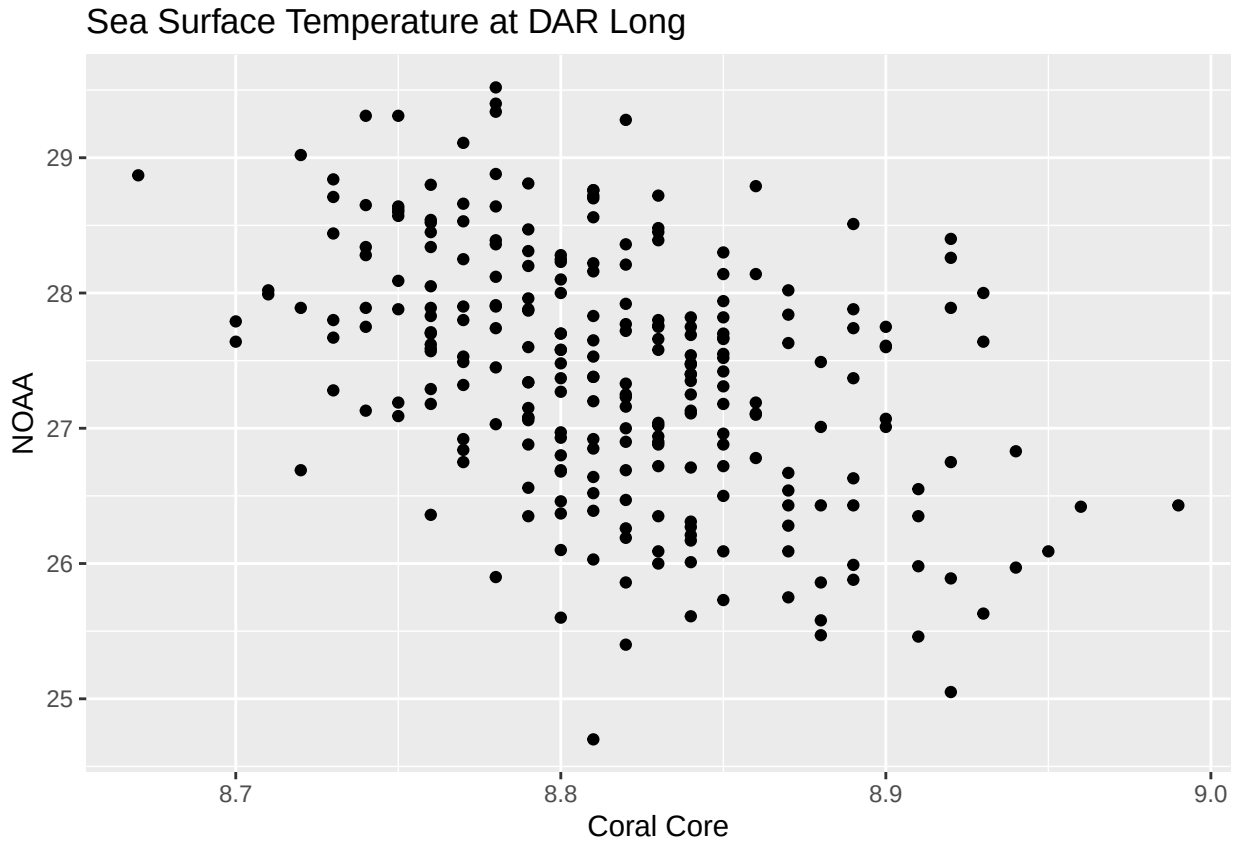
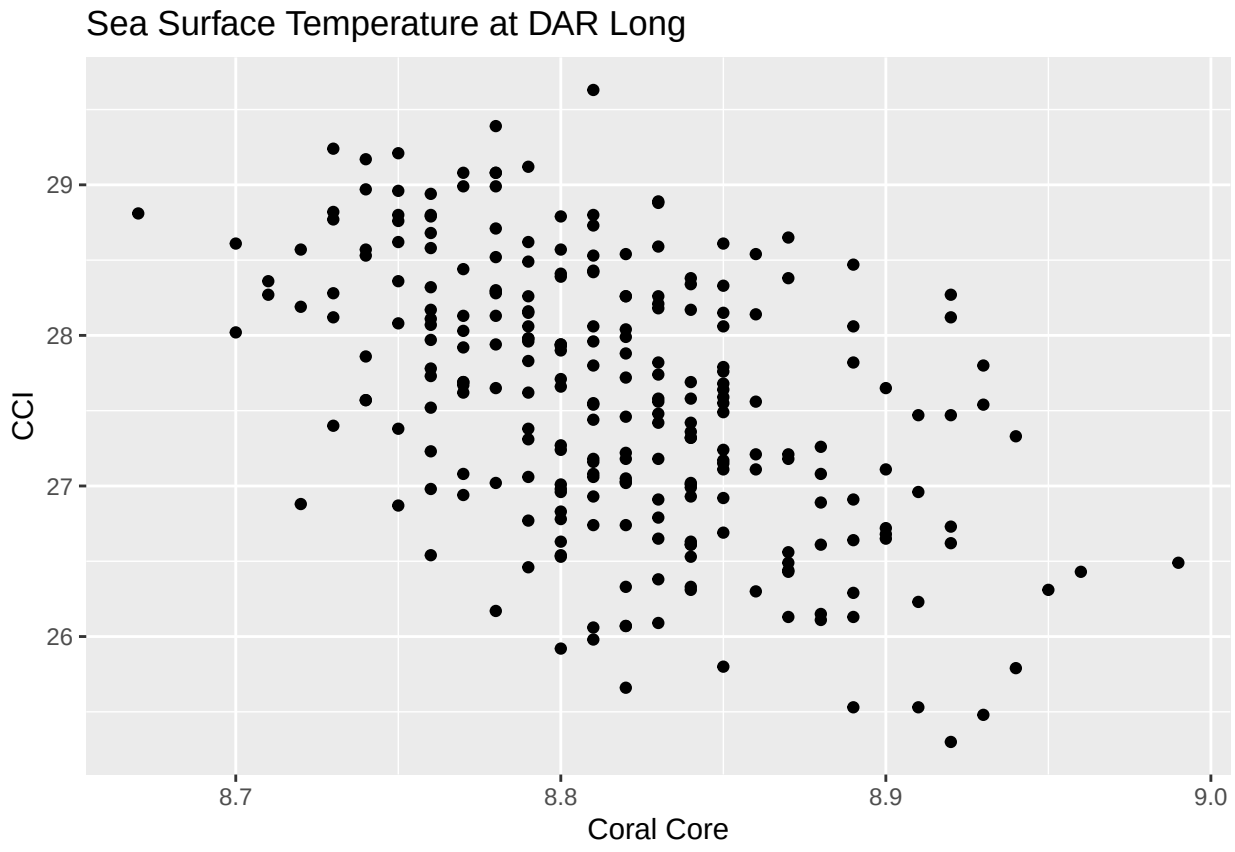


	Model 1	Model 2
(Intercept)	92.767	98.952
	(8.442)	(7.846)
Cocos_coral_core	−7.413	−8.096
	(0.957)	(0.890)
Num.Obs.	255	255
R2	0.192	0.247
R2 Adj.	0.188	0.244
AIC	632.0	594.6
BIC	642.6	605.3
Log.Lik.	−312.987	−294.314
F	59.943	82.776

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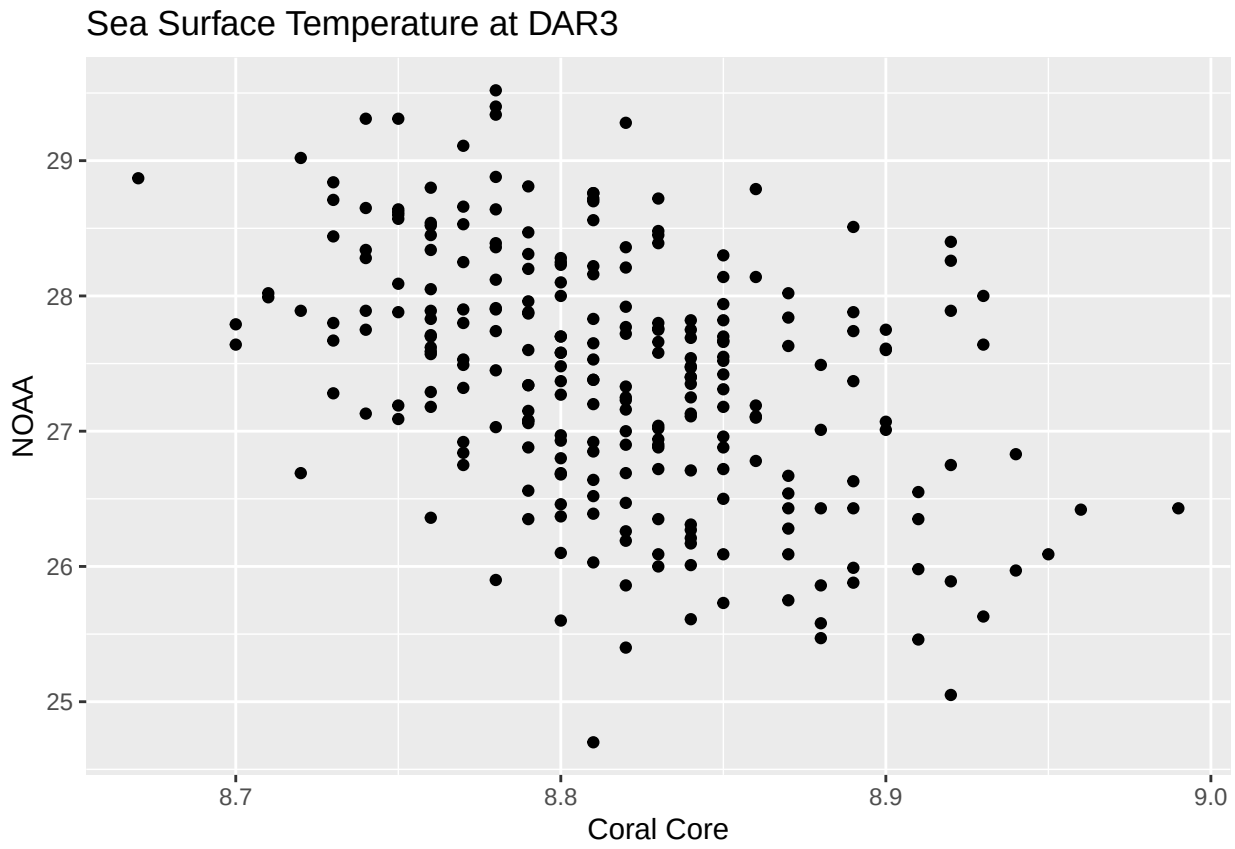
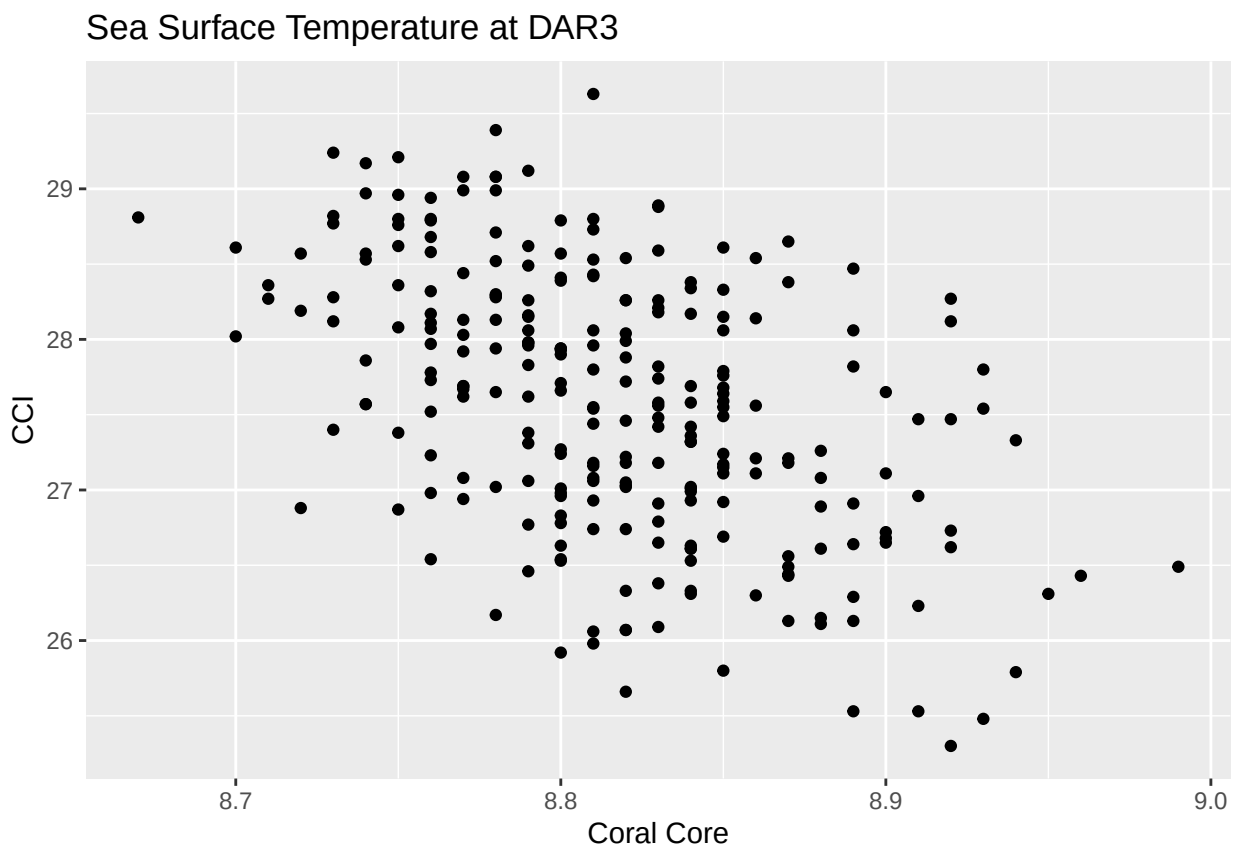

Sea Surface Temperature at DAR3
NOAA
29
28
27
26
25
8.7
8.8
8.9
9.0
Coral Core

	Model 1	Model 2
(Intercept)	92.767	98.952
	(8.442)	(7.846)
Cocos_coral_core	−7.413	−8.096
	(0.957)	(0.890)
Num.Obs.	255	255
R2	0.192	0.247
R2 Adj.	0.188	0.244
AIC	632.0	594.6
BIC	642.6	605.3
Log.Lik.	−312.987	−294.314
F	59.943	82.776



Comparison of CCI, NOAA and Coral Core SST variability in Ningaloo Reef sites

- Tantabiddi (13TNT) and Tantabiddi (08TNT) (-21.91, 113.97)
- TNT (-21.9, 113.97)
- TNT07C (-21.893, 113.963)
- Bundegi (13BND) and Bundegi (08BND) (-21.87, 114.156)
- BUN05A (-21.836, 114.178)

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## Warning in mask$eval_all_mutate(quo): NAs introduced by coercion
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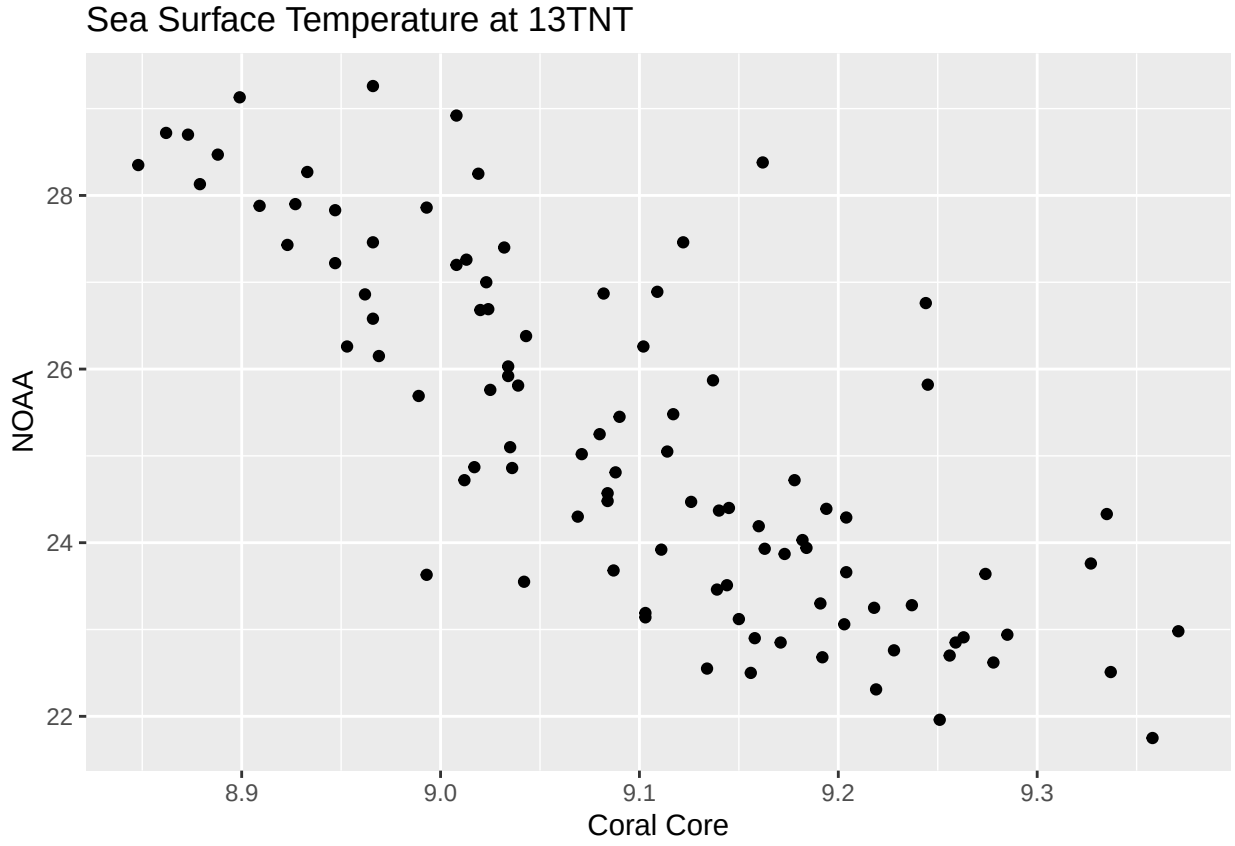
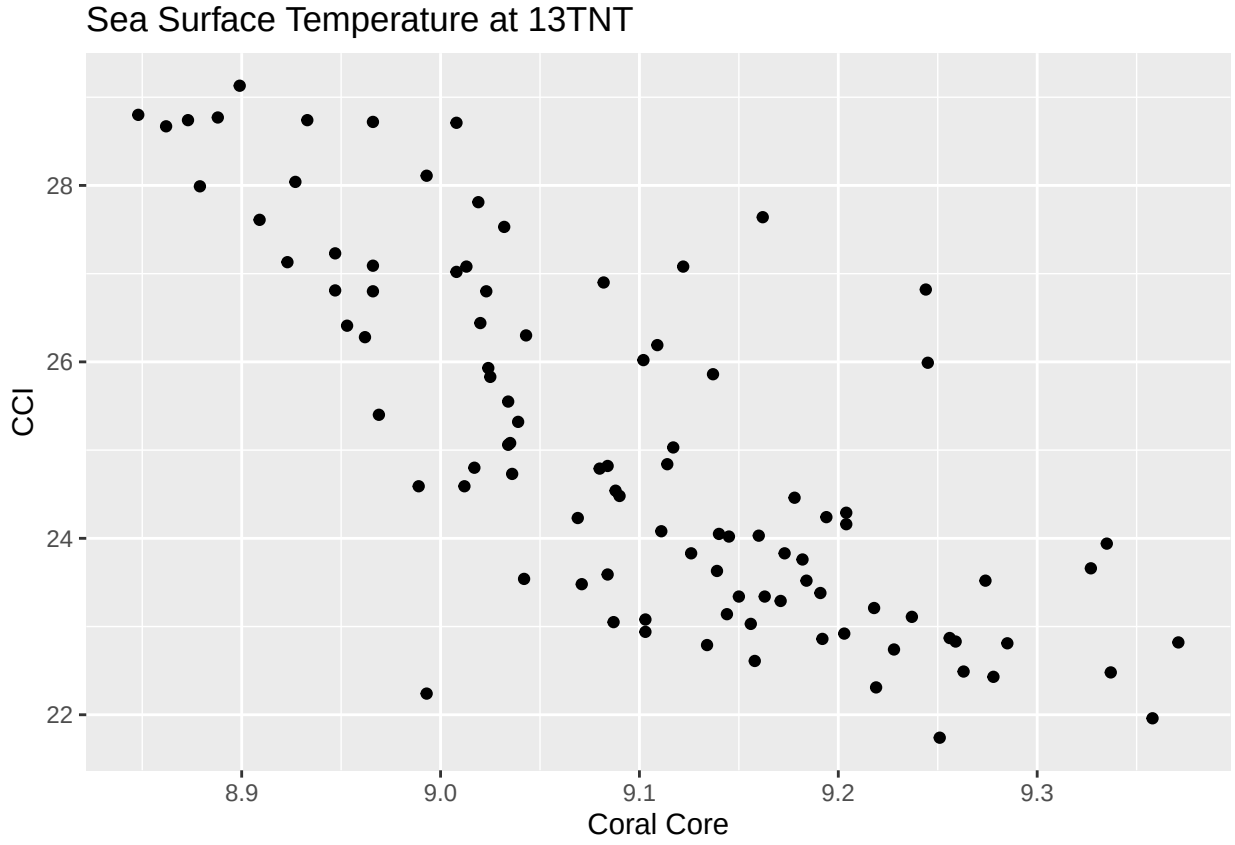


	Model 1	Model 2
(Intercept)	1649.093	2061.773
	(587.966)	(596.788)
ningaloo_coral_core	−344.021	−435.076
	(129.197)	(131.135)
I(ningaloo_coral_core^2)	18.191	23.210
	(7.096)	(7.203)
Num.Obs.	98	98
R2	0.639	0.626
R2 Adj.	0.631	0.618
AIC	321.9	324.8
BIC	332.3	335.2
Log.Lik.	−156.955	−158.415
F	83.924	79.575

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## Warning in mask$eval_all_mutate(quo): NAs introduced by coercion
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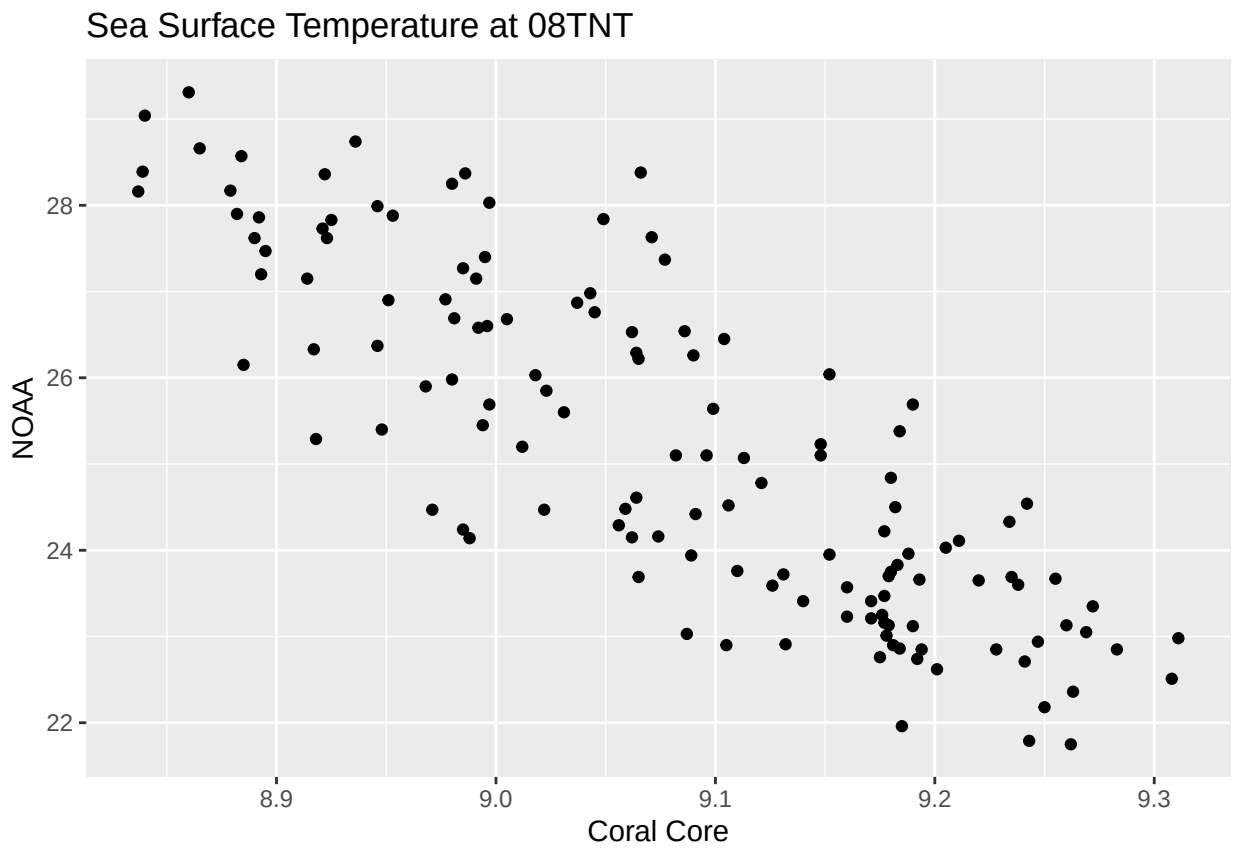
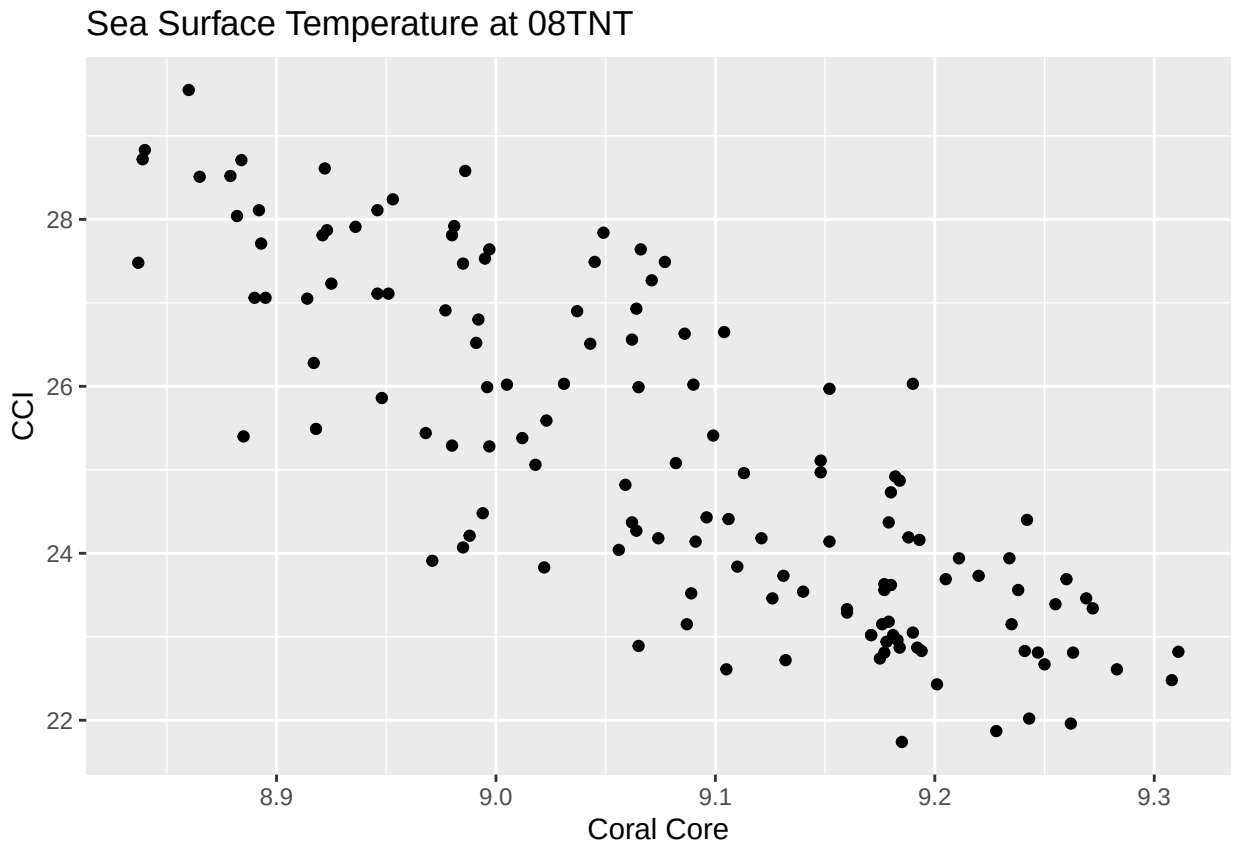

Sea Surface Temperature at 08TNT
NOAA
28
26
24
22
8.9
9.0
9.1
9.2
9.3
Coral Core

	Model 1	Model 2
(Intercept)	147.763	146.786
	(6.924)	(7.397)
ningaloo_coral_core	−13.498	−13.400
	(0.762)	(0.815)
Num.Obs.	135	135
R2	0.702	0.671
R2 Adj.	0.700	0.668
AIC	406.1	424.0
BIC	414.8	432.7
Log.Lik.	−200.056	−208.992
F	313.514	270.644

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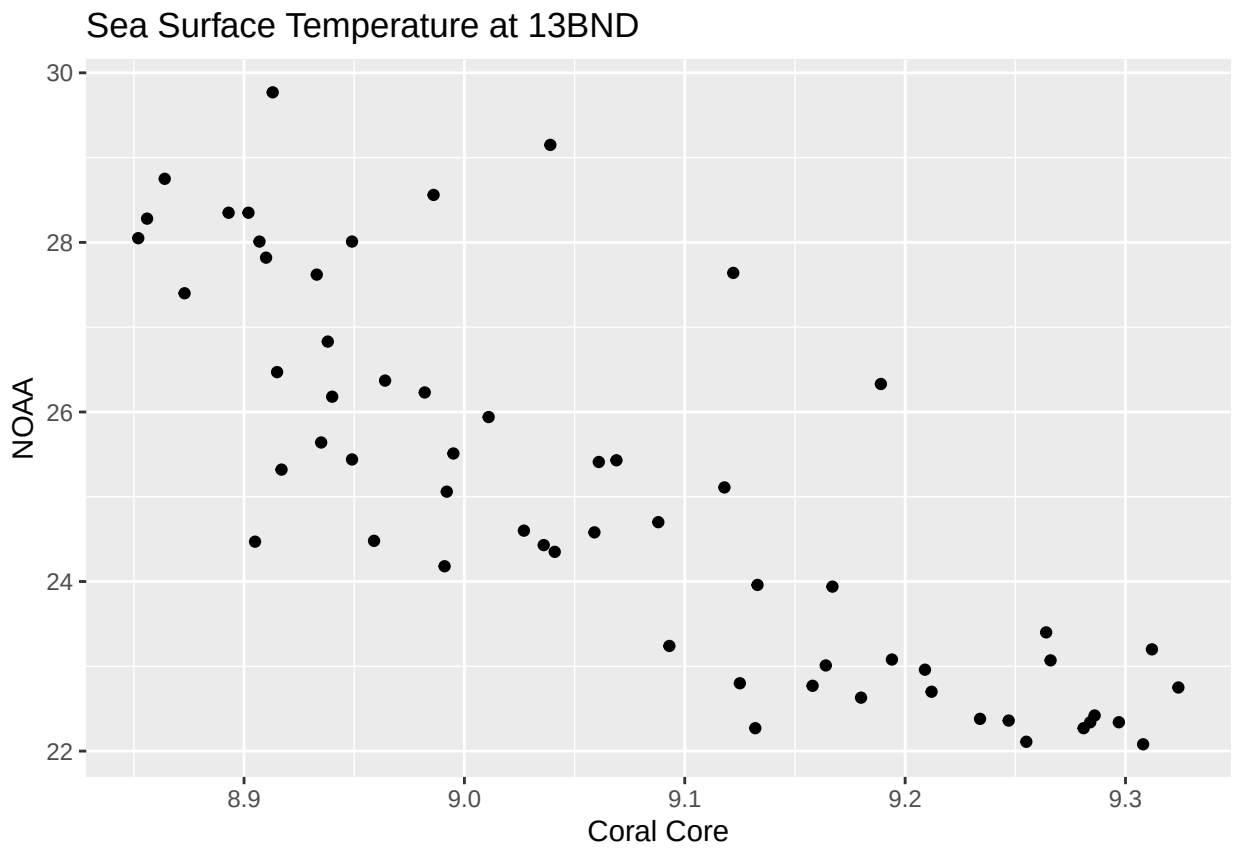
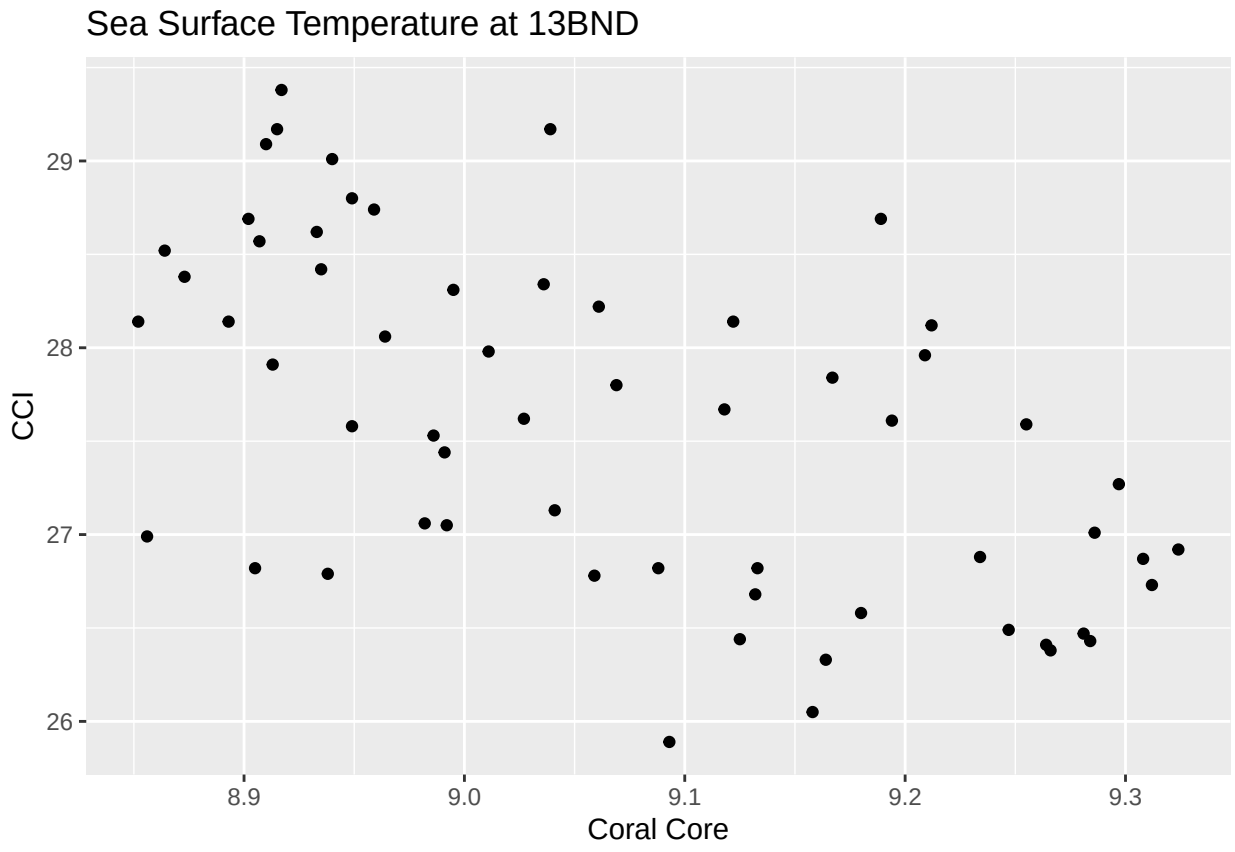

Sea Surface Temperature at 13BND
30
28
26
24
22
NOAA
8.9
9.0
9.1
9.2
9.3
Coral Core

	Model 1	Model 2
(Intercept)	139.828	60.731
	(10.616)	(6.185)
ningaloo_coral_core	−12.655	−3.654
	(1.170)	(0.682)
Num.Obs.	60	60
R2	0.668	0.331
R2 Adj.	0.663	0.320
AIC	204.6	139.8
BIC	210.9	146.1
Log.Lik.	−99.313	−66.897
F	116.921	28.720

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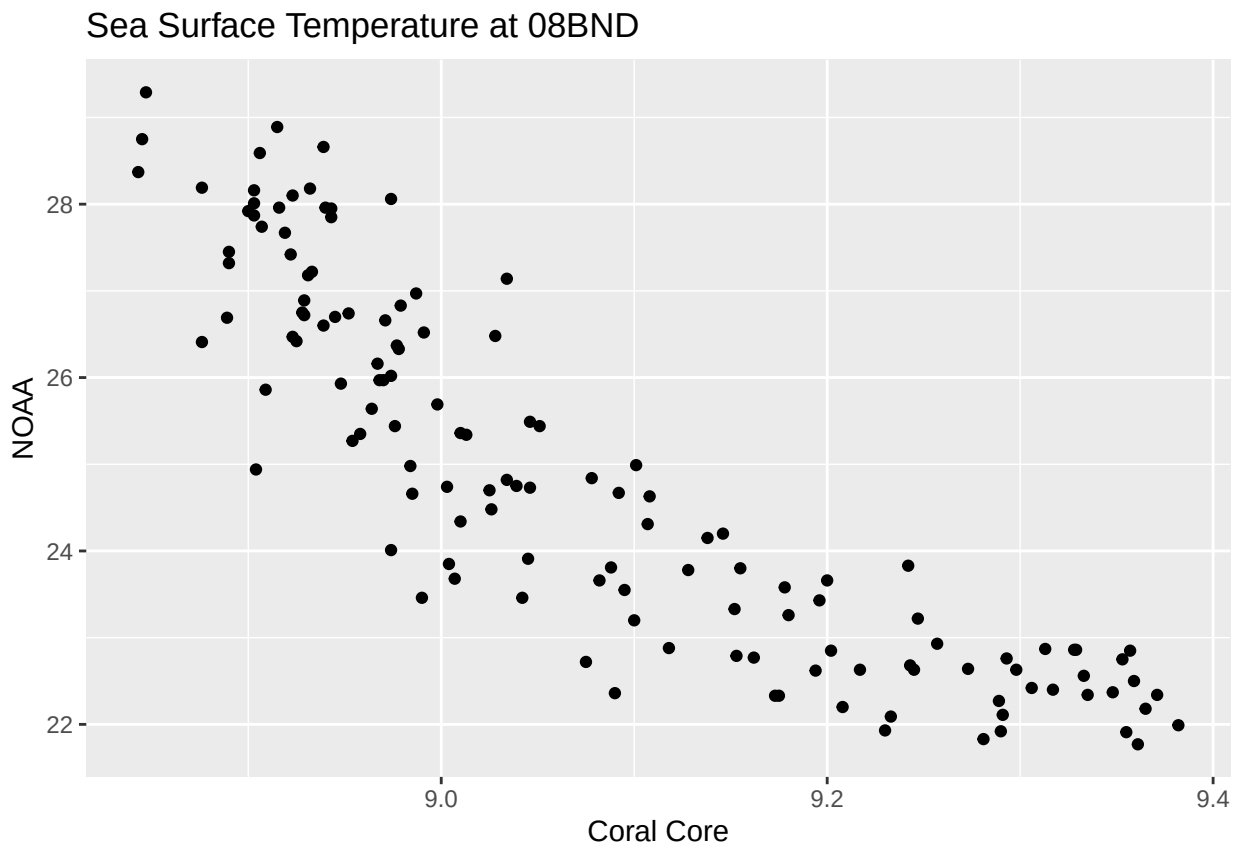
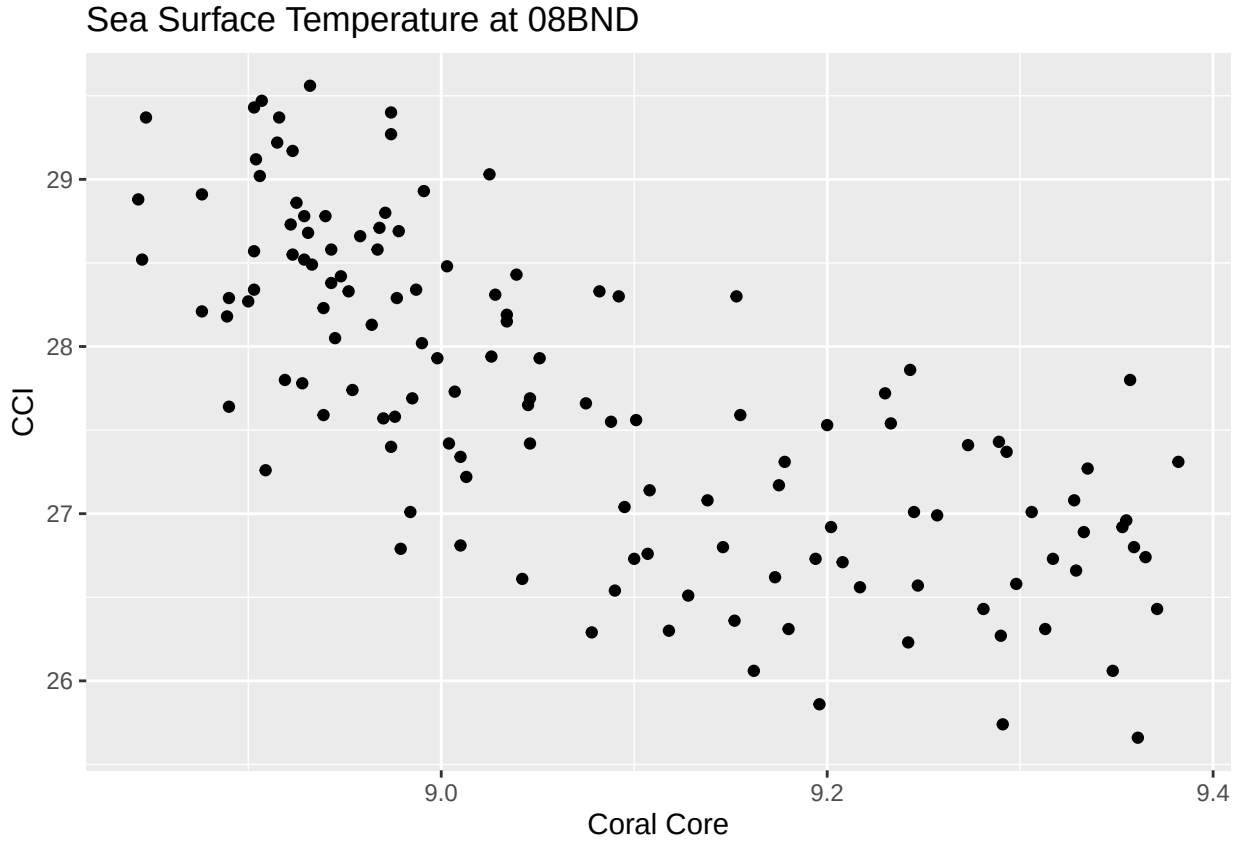

Sea Surface Temperature at 08BND
NOAA
28
26
24
22
9.0
9.2
9.4
Coral Core

	Model 1	Model 2
(Intercept)	2368.444	894.520
	(310.709)	(226.123)
ningaloo_coral_core	−502.398	−185.807
	(68.200)	(49.633)
I(ningaloo_coral_core^2)	26.896	9.946
	(3.741)	(2.723)
Num.Obs.	133	133
R2	0.842	0.580
R2 Adj.	0.839	0.574
AIC	338.5	253.9
BIC	350.0	265.5
Log.Lik.	−165.237	−122.973
F	345.103	89.877

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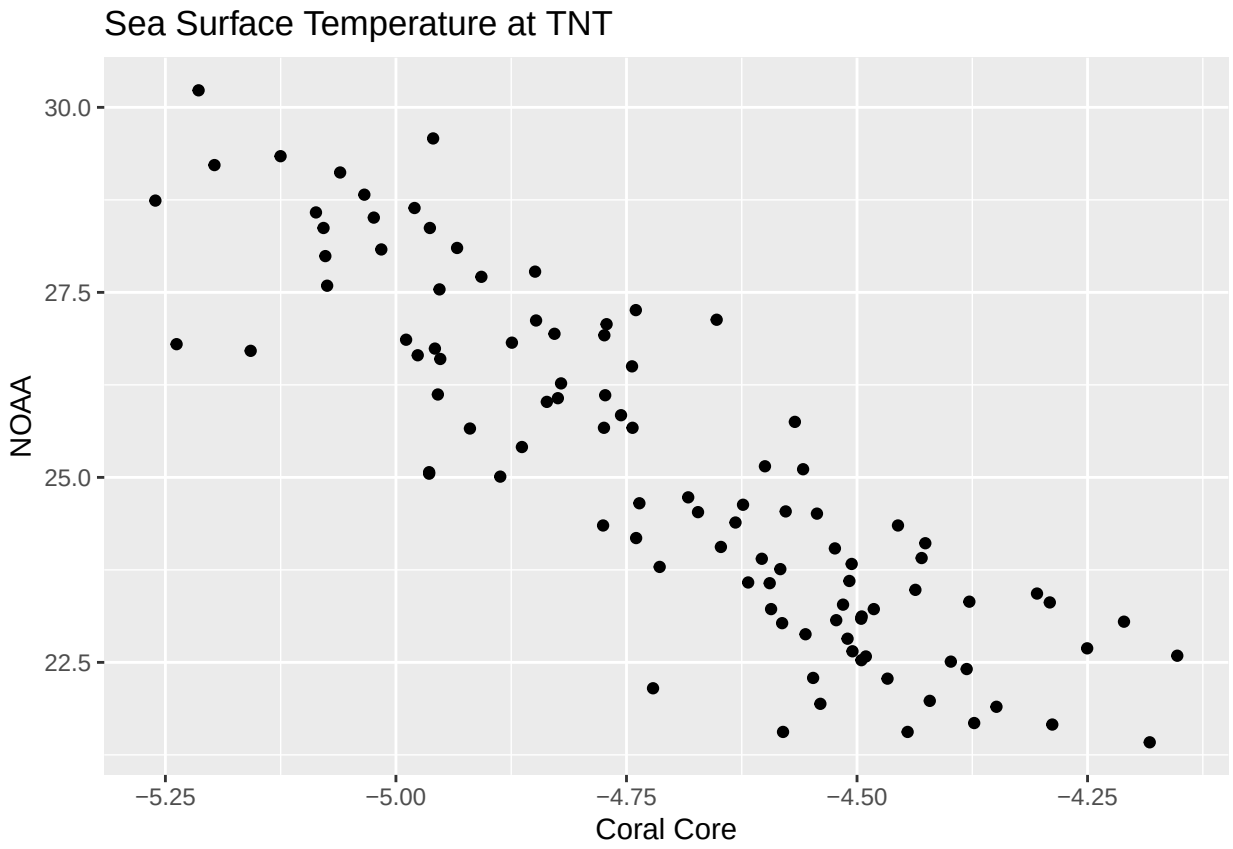
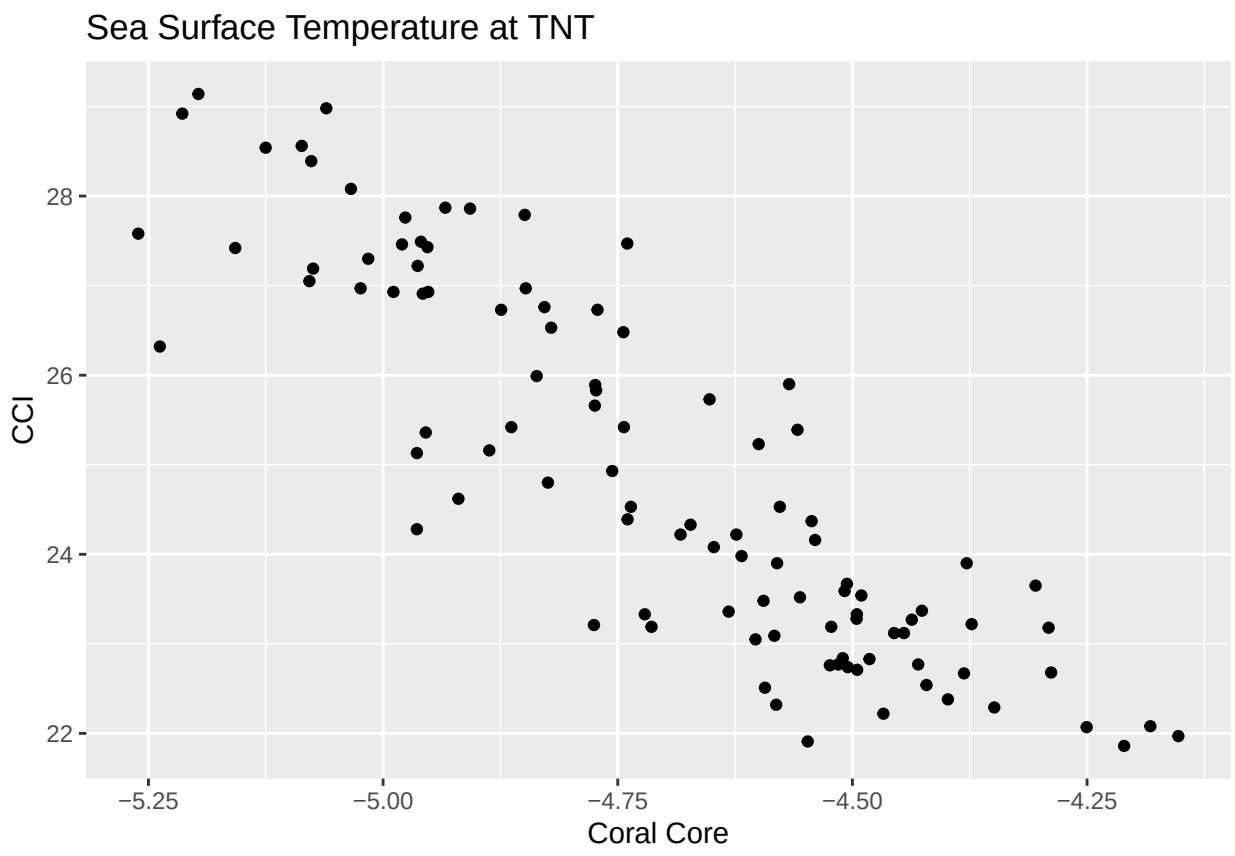

Sea Surface Temperature at TNT
30.0
27.5
25.0
22.5
NOAA
−5.25
−5.00
−4.75
−4.50
−4.25
Coral Core

	Model 1	Model 2
(Intercept)	−10.513	−7.134
	(2.022)	(1.802)
ningaloo_coral_core	−7.569	−6.812
	(0.429)	(0.383)
Num.Obs.	102	102
R2	0.757	0.760
R2 Adj.	0.754	0.758
AIC	318.0	294.6
BIC	325.9	302.5
Log.Lik.	−156.000	−144.289
F	310.888	316.848

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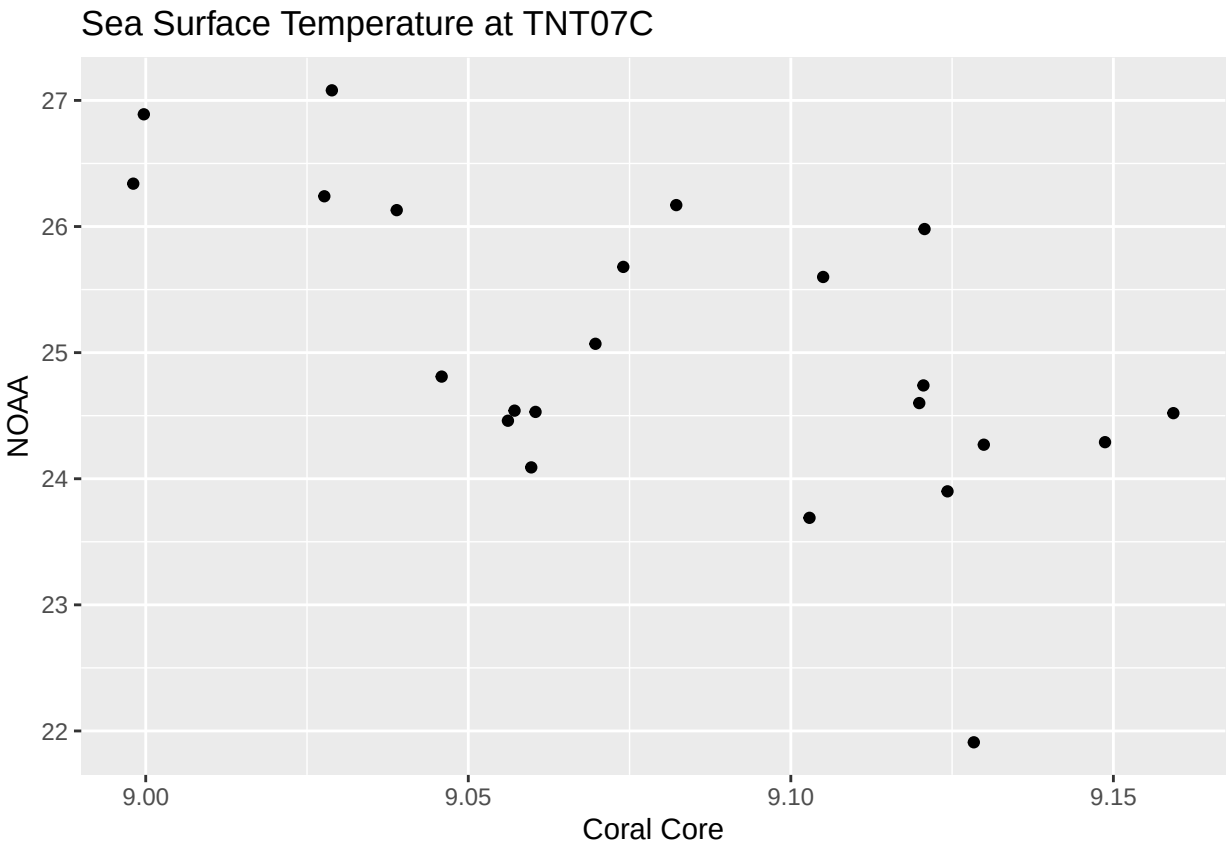
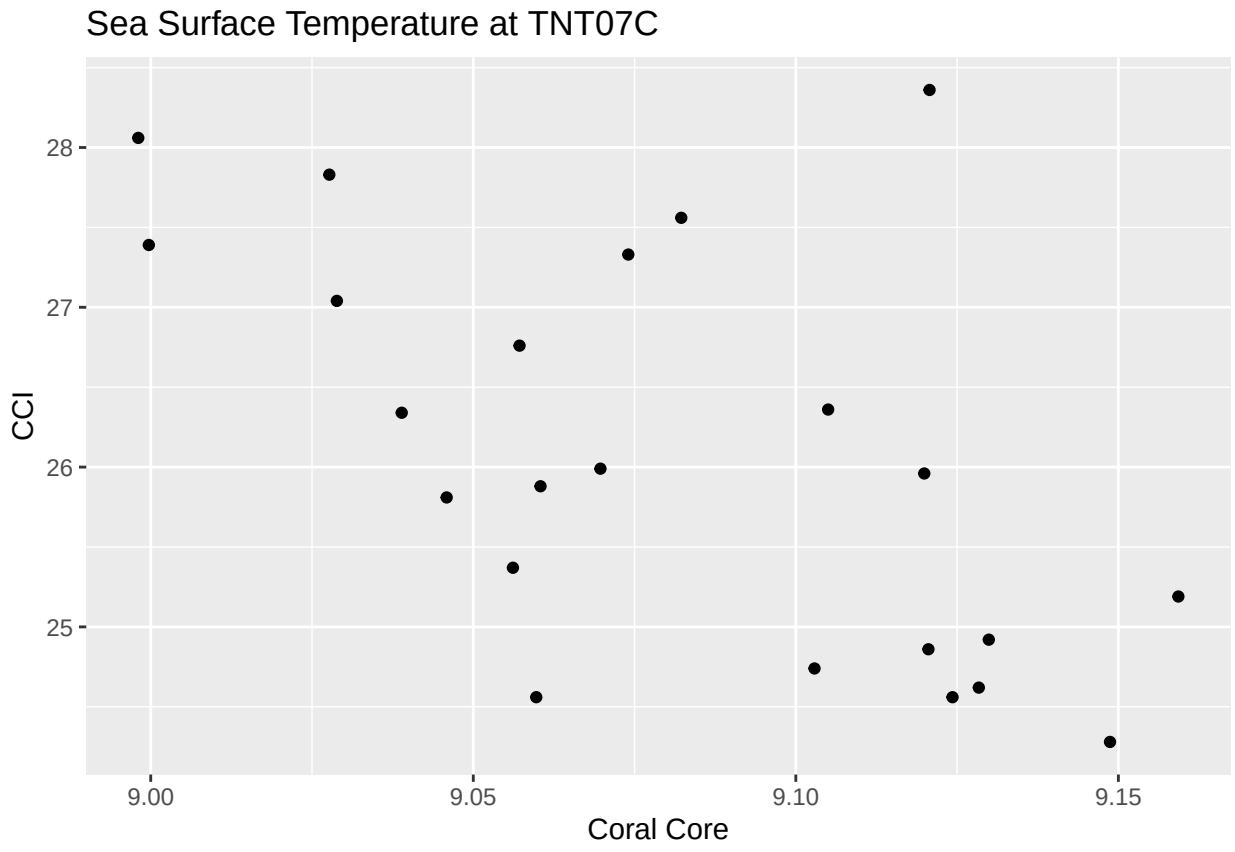

Sea Surface Temperature at TNT07C
NOAA
27
26
25
24
23
22
9.00
9.05
9.10
9.15
Coral Core

	Model 1	Model 2
(Intercept)	168.726	170.627
	(40.147)	(43.985)
ningaloo_coral_core	−15.825	−15.918
	(4.421)	(4.844)
Num.Obs.	23	23
R2	0.379	0.340
R2 Adj.	0.349	0.308
AIC	67.3	71.5
BIC	70.7	74.9
Log.Lik.	−30.669	−32.768
F	12.812	10.800

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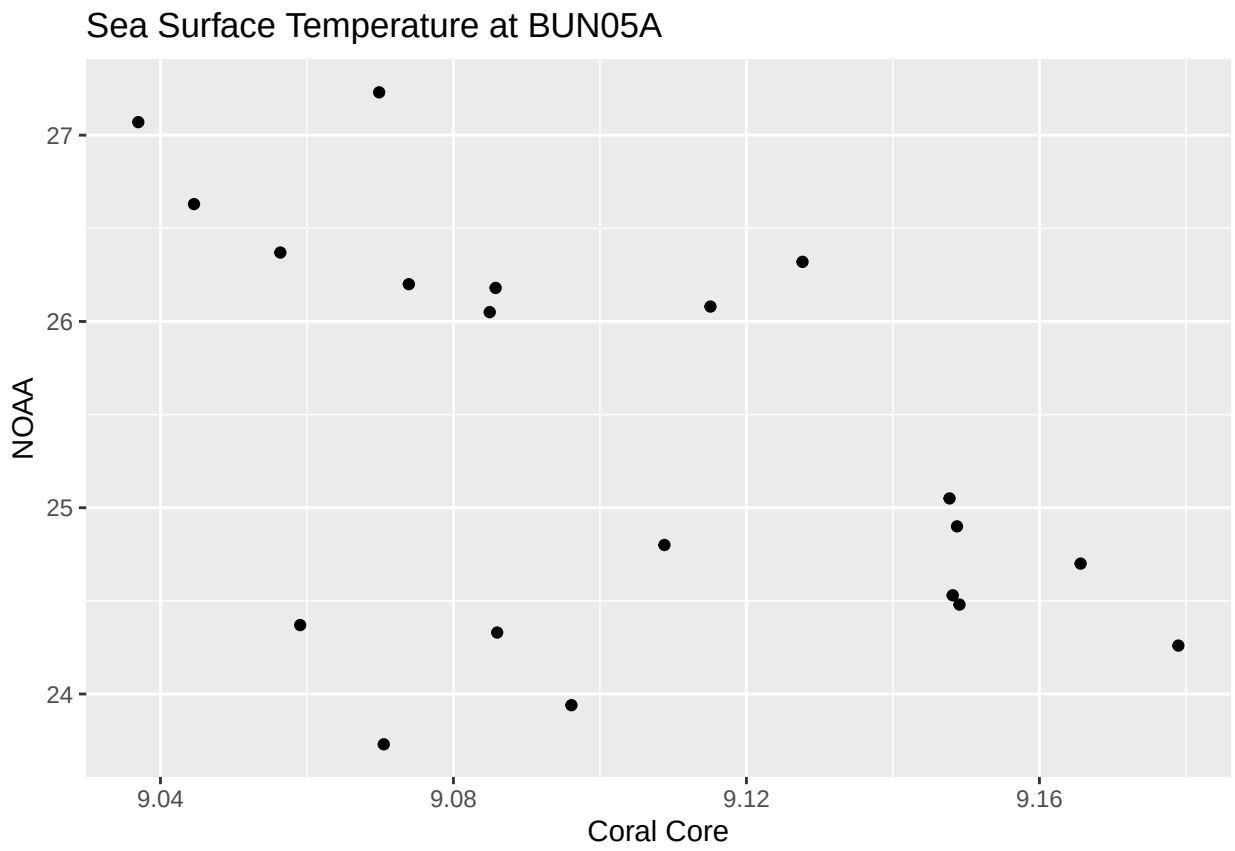
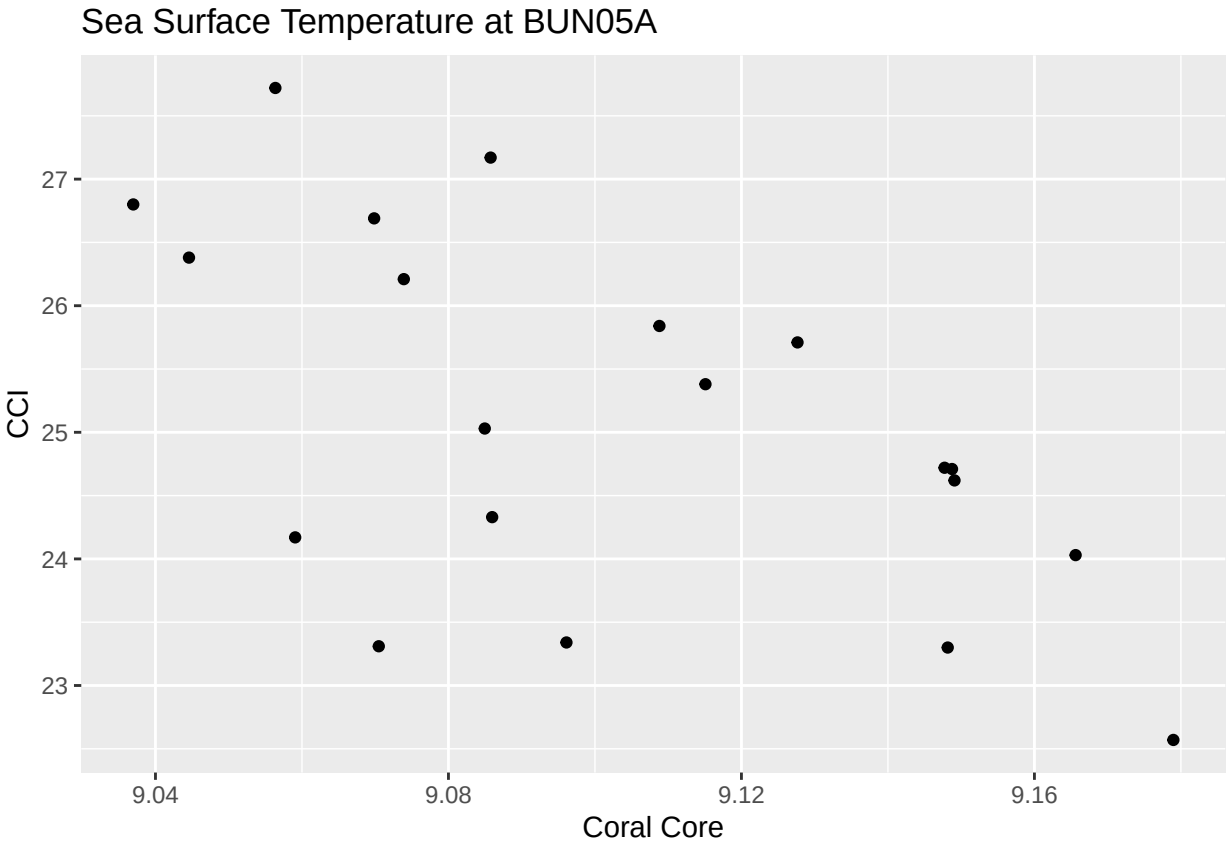

Sea Surface Temperature at BUN05A
NOAA
27
26
25
24
9.04
9.08
9.12
9.16
Coral Core

	Model 1	Model 2
(Intercept)	139.124	203.879
	(48.119)	(59.033)
ningaloo_coral_core	−12.498	−19.640
	(5.286)	(6.485)
Num.Obs.	20	20
R2	0.237	0.338
R2 Adj.	0.195	0.301
AIC	60.0	68.1
BIC	63.0	71.1
Log.Lik.	−26.981	−31.070
F	5.590	9.172



Comparison of CCI, NOAA and Coral Core SST variability in Houtman Abrolhos Island sites

- Wallabi Island (-28.28, 113.46)
- HAB10A (-28.4589, 113.749)
- HAB05B (-28.4609, 113.772)

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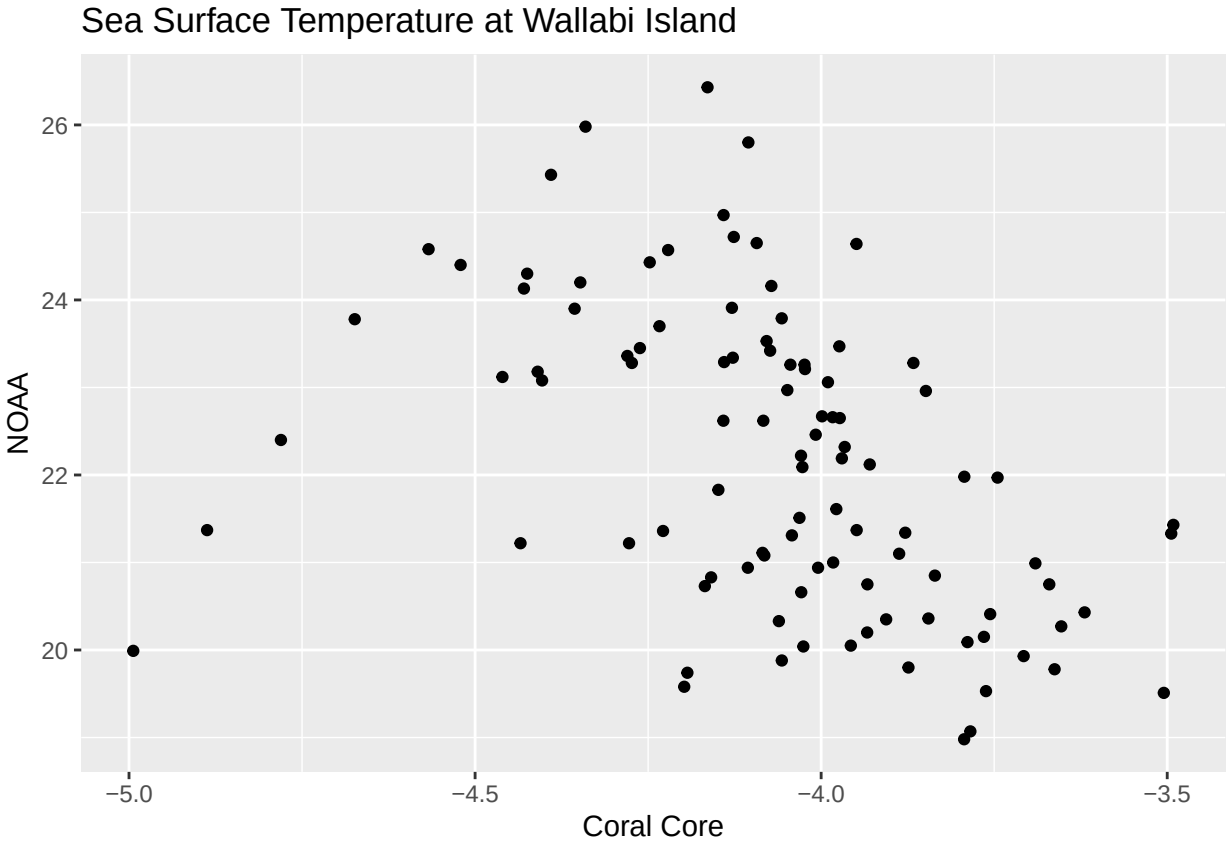
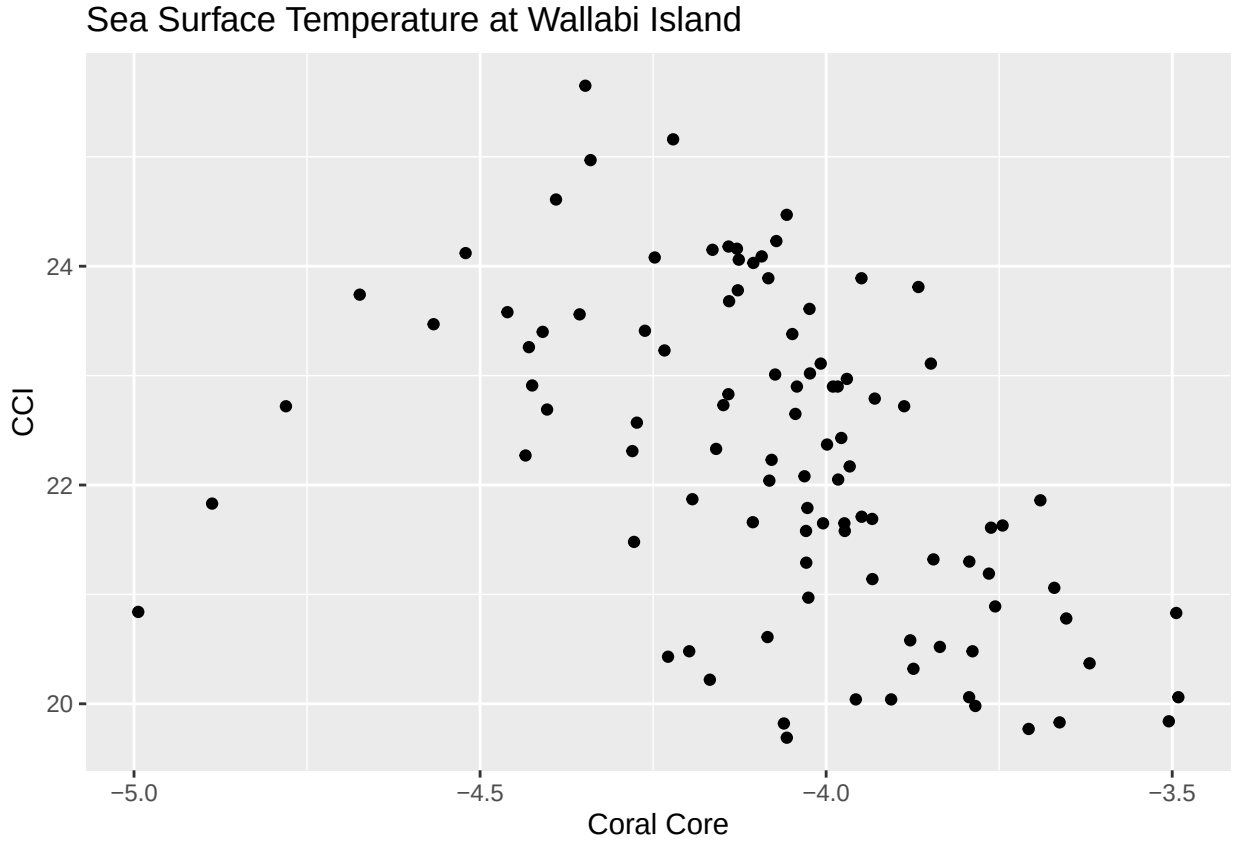


	Model 1	Model 2
(Intercept)	−66.247	−58.788
	(20.347)	(16.317)
HAbrol_coral_core	−40.056	−36.775
	(9.792)	(7.852)
I(HAbrol_coral_core^2)	−4.484	−4.124
	(1.176)	(0.943)
Num.Obs.	100	100
R2	0.297	0.349
R2 Adj.	0.282	0.336
AIC	366.4	322.3
BIC	376.8	332.7
Log.Lik.	−179.208	−157.133
F	20.454	26.037

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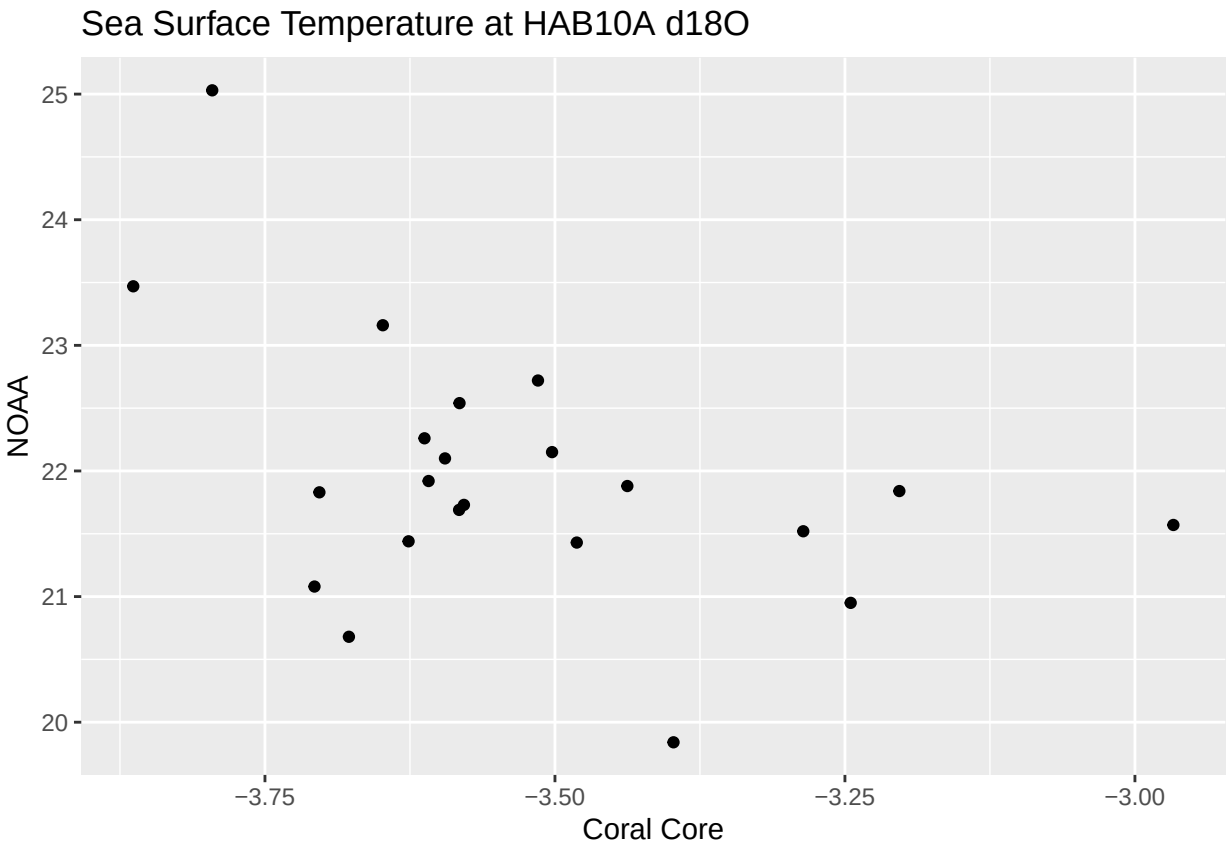
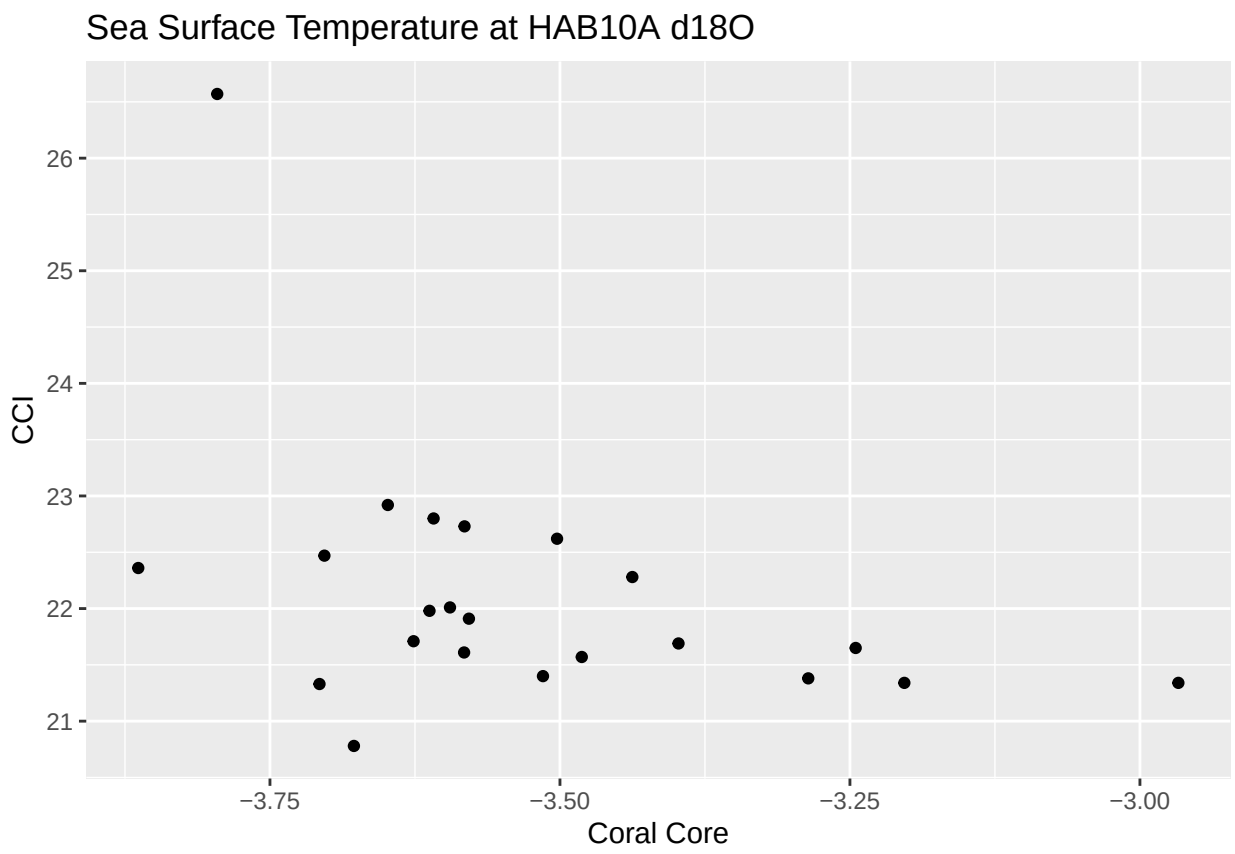

Sea Surface Temperature at HAB10A d18O
NOAA
25
24
23
22
21
20
−3.75
−3.50
−3.25
−3.00
Coral Core

	Model 1	Model 2
(Intercept)	14.058	13.776
	(3.583)	(3.942)
HAbrol_coral_core	−2.236	−2.363
	(1.014)	(1.115)
Num.Obs.	22	22
R2	0.196	0.183
R2 Adj.	0.155	0.142
AIC	64.8	69.0
BIC	68.1	72.3
Log.Lik.	−29.402	−31.503
F	4.864	4.487

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## Warning in mask$eval_all_mutate(quo): NAs introduced by coercion

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## Warning in mask$eval_all_mutate(quo): NAs introduced by coercion
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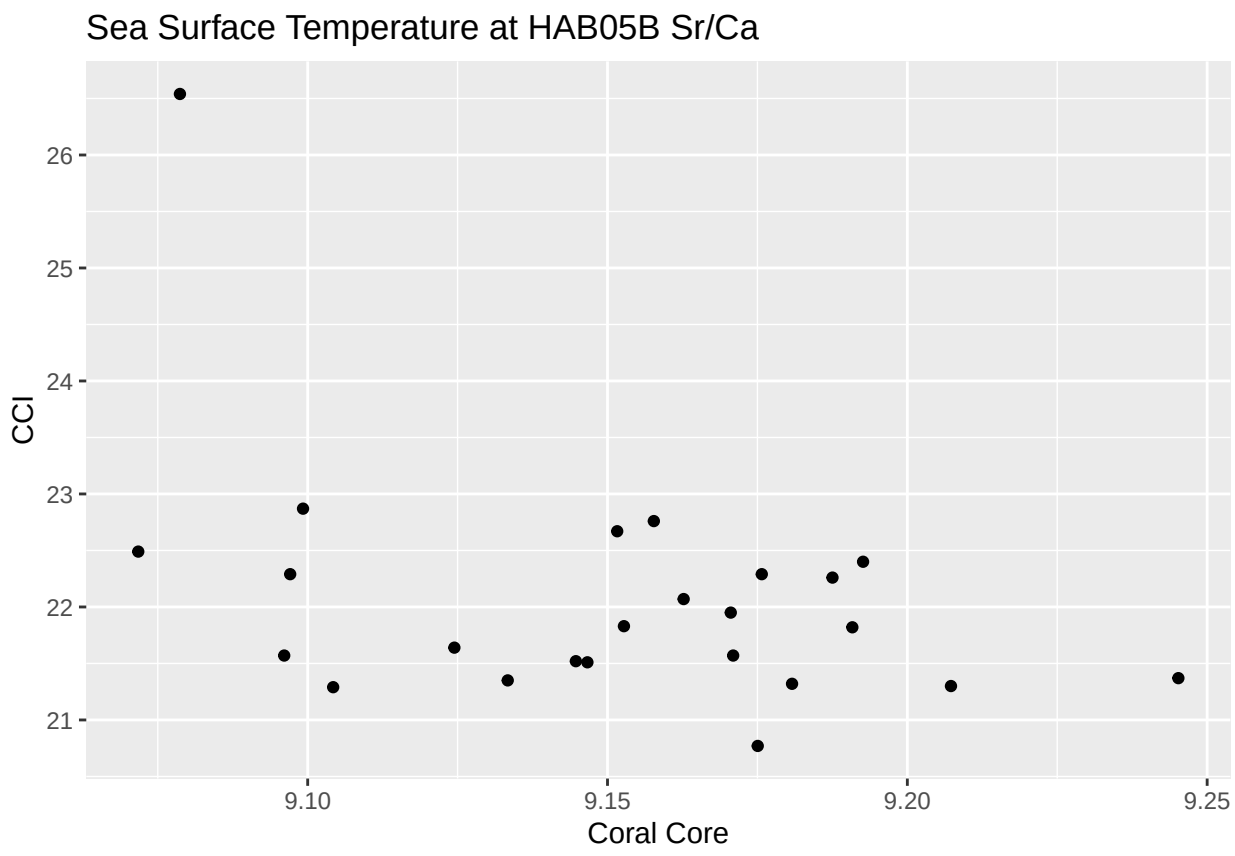
	Model 1
(Intercept)	121.911
	(44.710)
HAbrol_coral_core	−10.912
	(4.886)
Num.Obs.	24
R2	0.185
R2 Adj.	0.148
AIC	72.7
BIC	76.2
Log.Lik.	−33.354
F	4.988

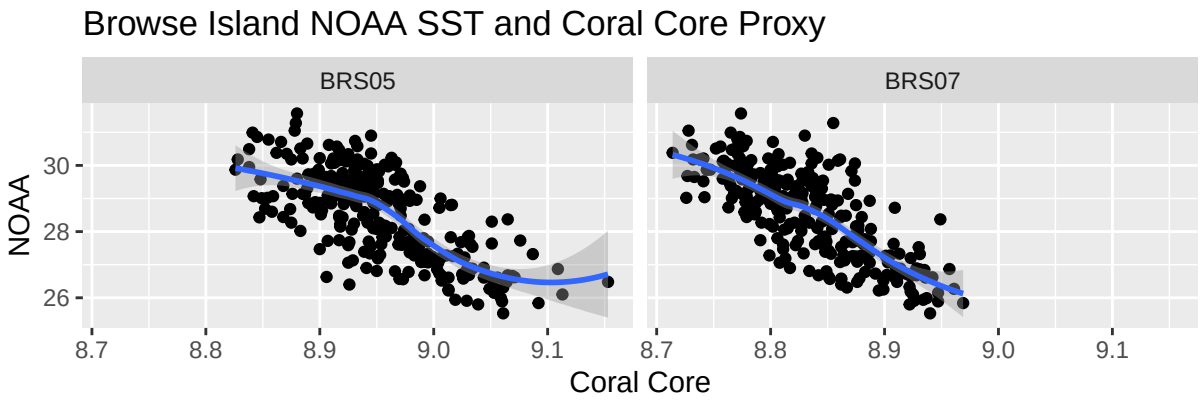


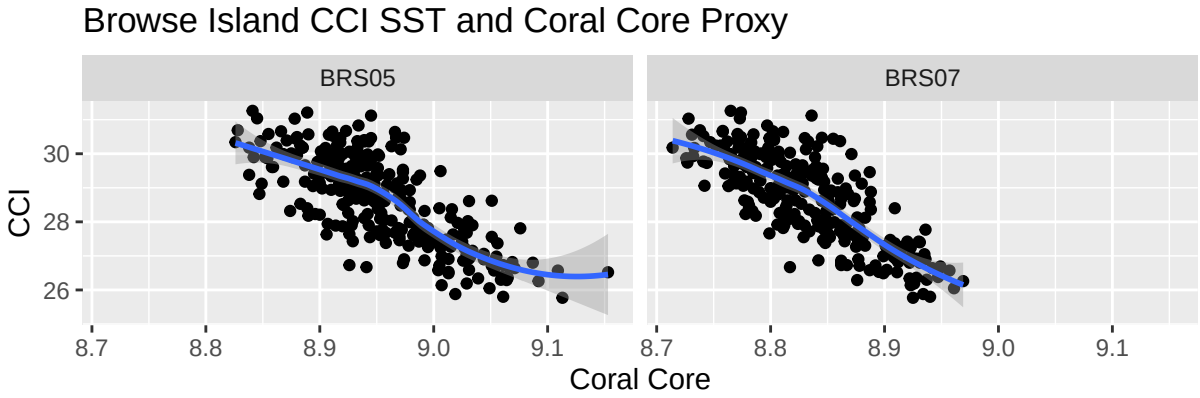
No Coral Core Data for Scott Reef

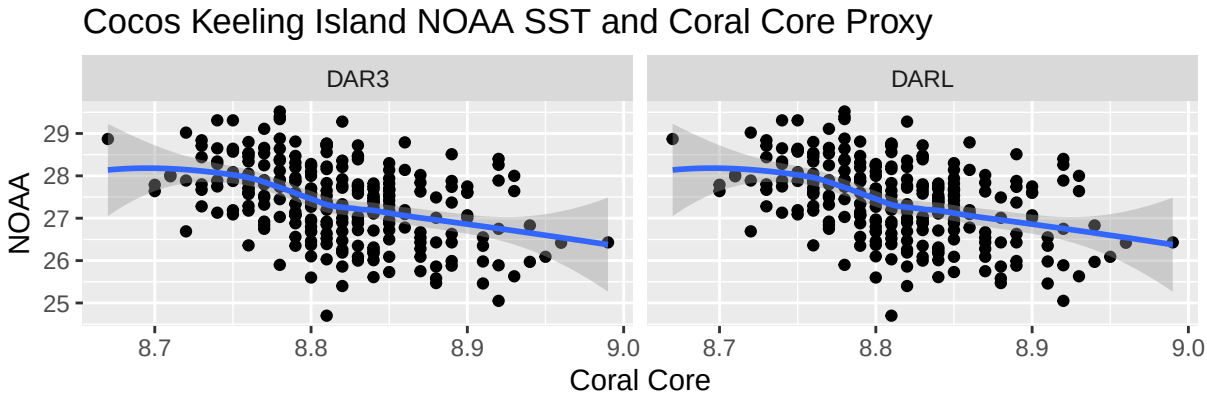
Linear Relationship between Coral Core and CCI, Coral Core and NOAA, was found to be insignificant in HAB10A_SrCa and HAB05B_d18O

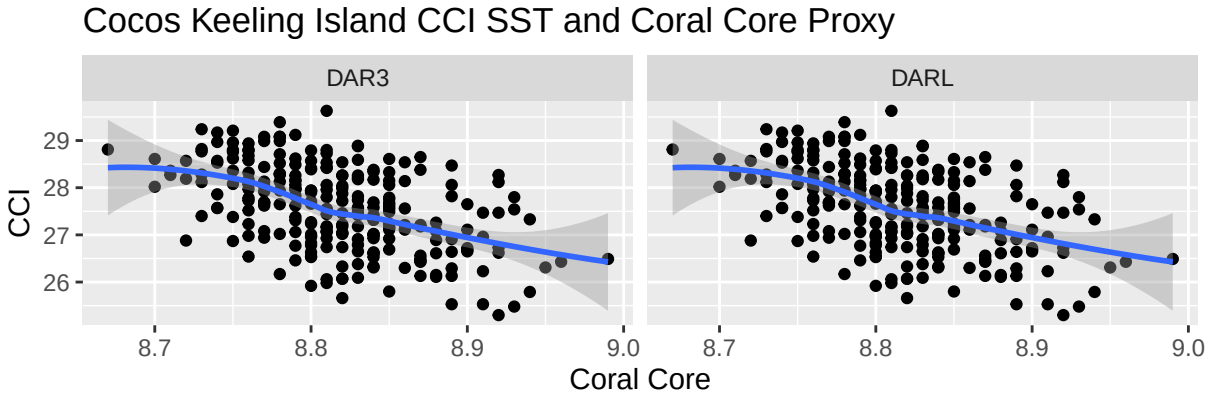
Linear Relationship between Coral Core and NOAA was found to be insignificant in HAB05B_SrCa (Significant for Coral Core and CCI in this site)

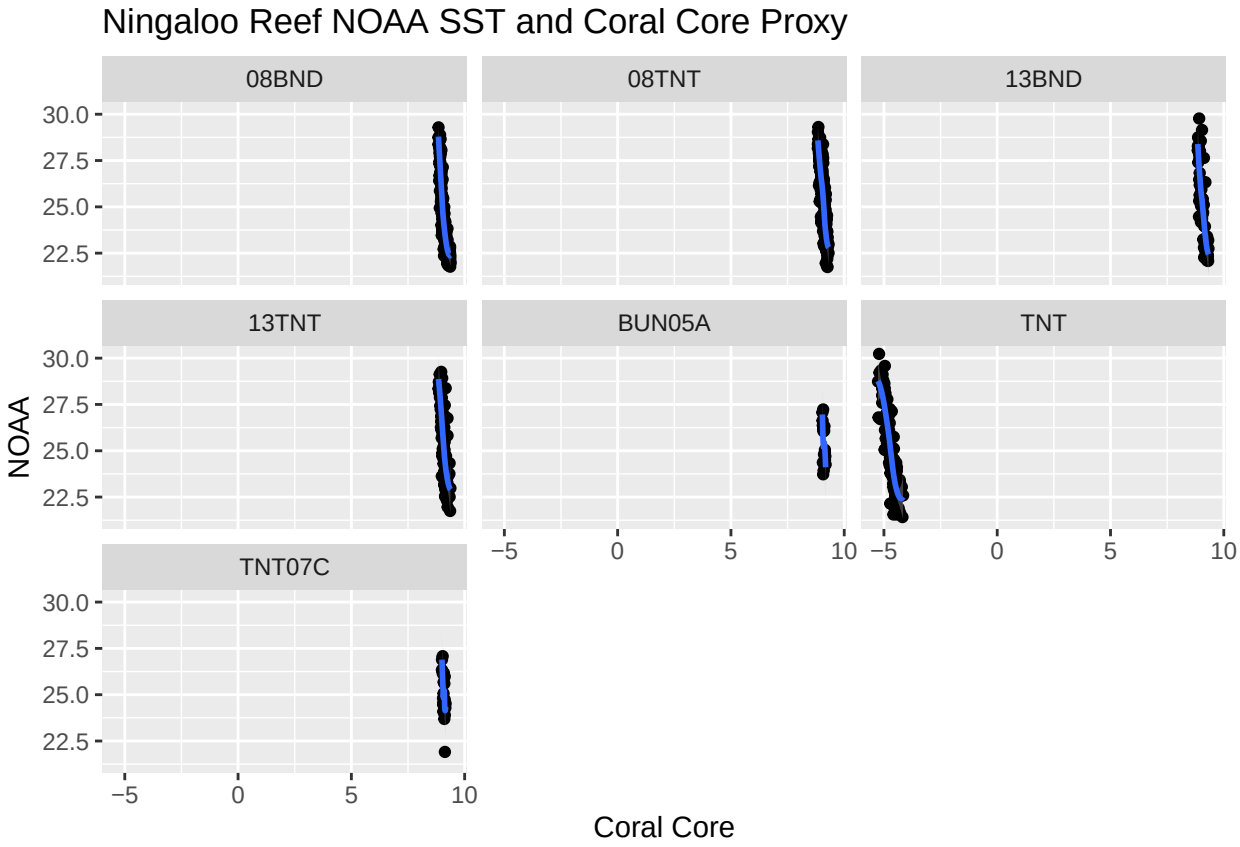
Too many missing gaps in Logger Data for comparison

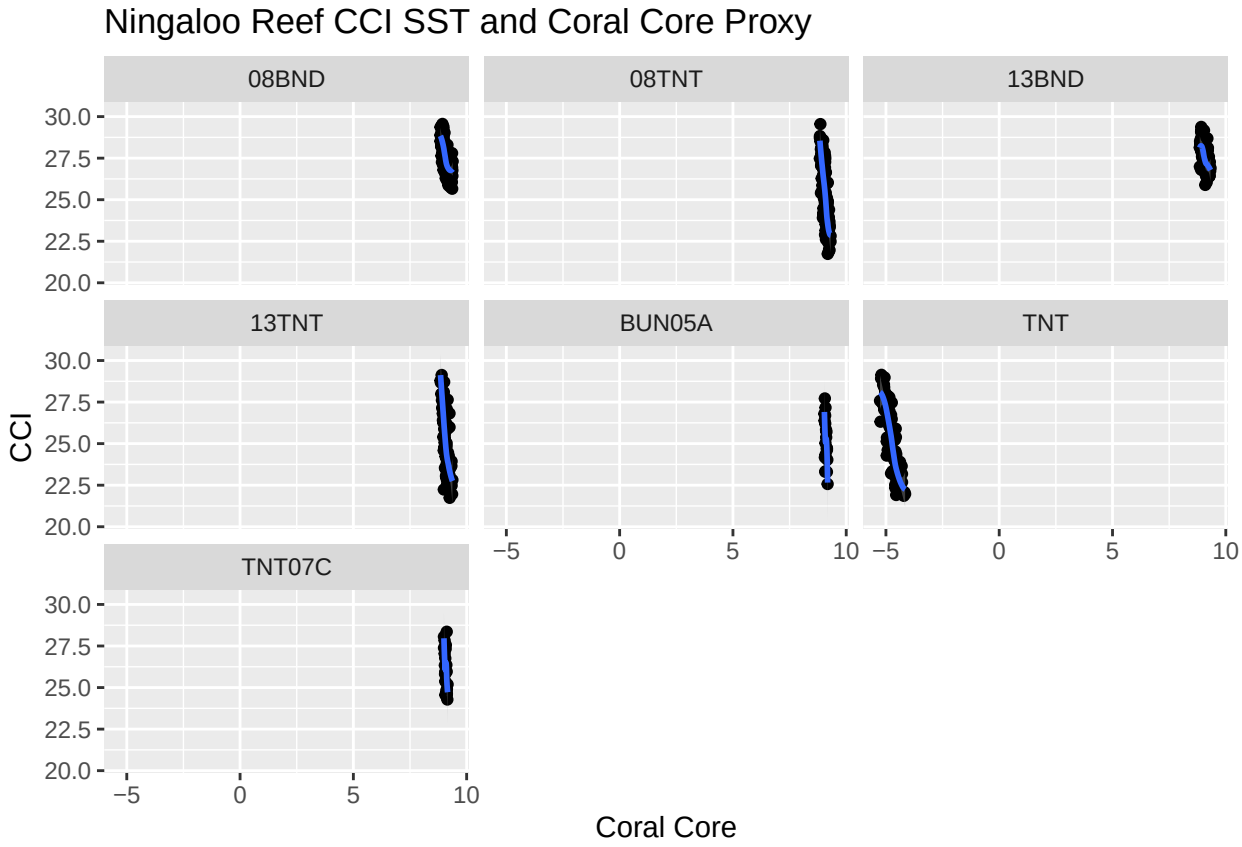

Browse Island NOAA SST and Coral Core Proxy
BRS05
BRS07
NOAA
30
28
26
8.7
8.8
8.9
9.0
9.1
Coral Core

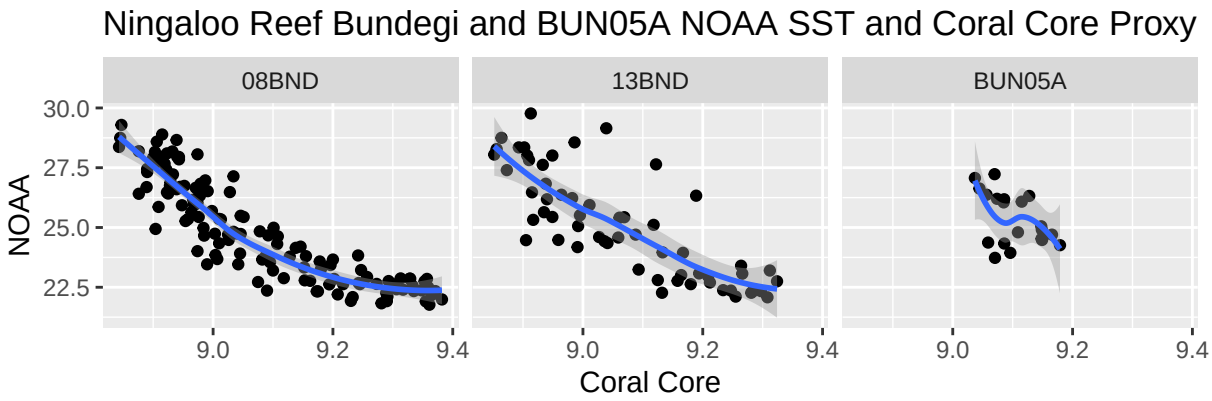

Browse Island CCI SST and Coral Core Proxy
BRS05
BRS07
CCI
30
28
26
8.7
8.8
8.9
9.0
9.1
Coral Core

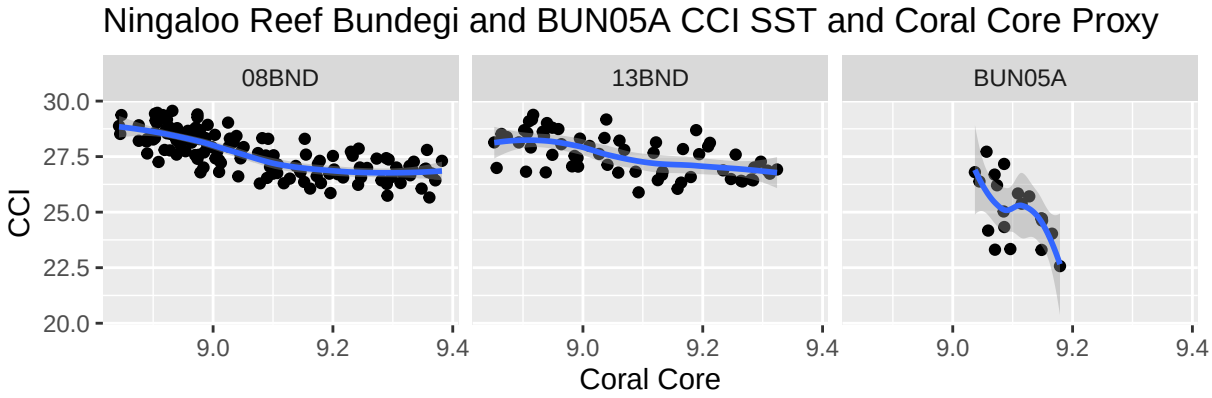

Cocos Keeling Island NOAA SST and Coral Core Proxy
DAR3
DARL
NOAA
29
28
27
26
25
8.7
8.8
8.9
9.0
Coral Core

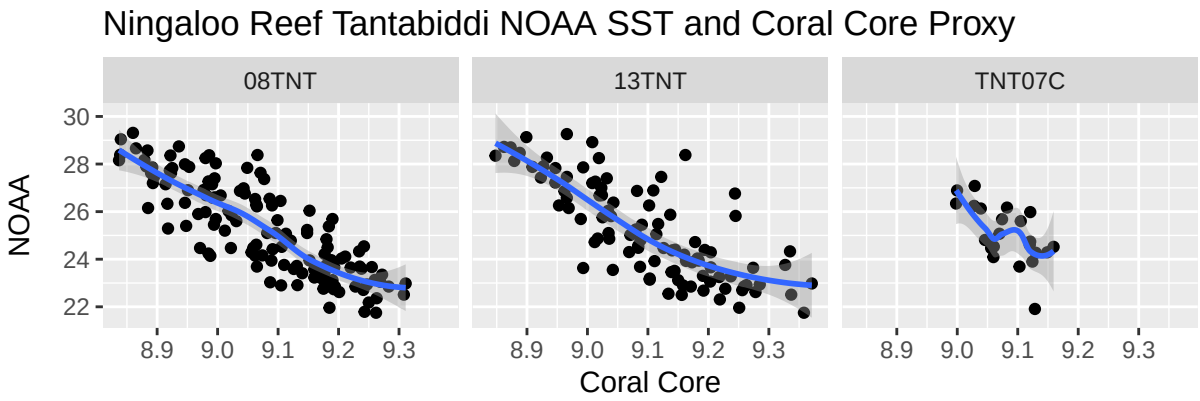

Cocos Keeling Island CCI SST and Coral Core Proxy
DAR3
DARL
CCI
29
28
27
26
8.7
8.8
8.9
9.0
Coral Core

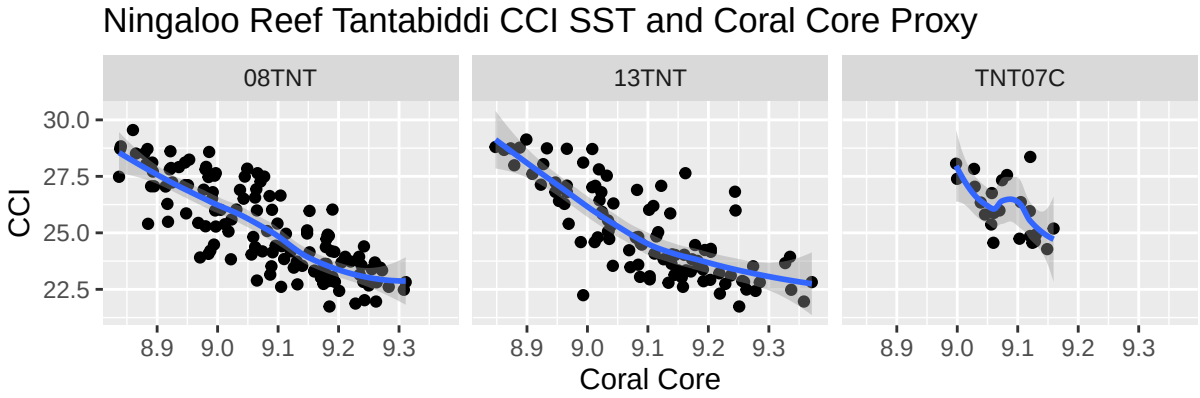

Ningaloo Reef NOAA SST and Coral Core Proxy
08BND
08TNT
13BND
13TNT
BUN05A
TNT
TNT07C
NOAA
30.0
27.5
25.0
22.5
−5
0
5
10
Coral Core

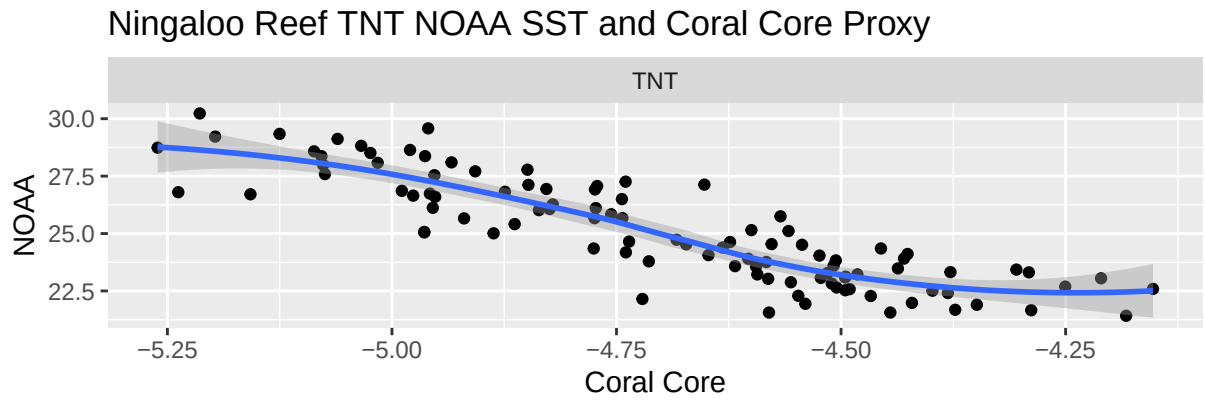

Ningaloo Reef CCI SST and Coral Core Proxy
08BND
08TNT
13BND
13TNT
BUN05A
TNT
TNT07C
CCI
Coral Core
30.0
27.5
25.0
22.5
20.0
−5
0
5
10

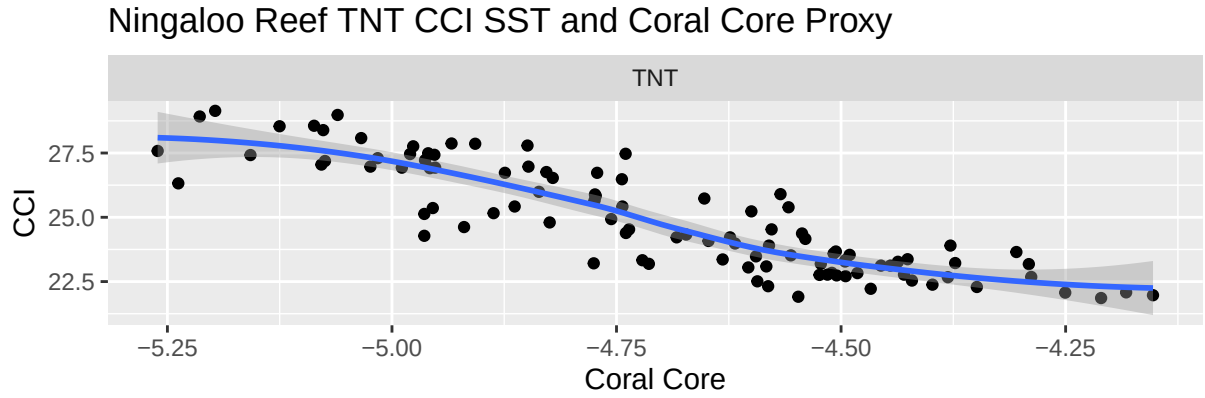

Ningaloo Reef Bundegi and BUN05A NOAA SST and Coral Core Proxy
08BND
13BND
BUN05A
NOAA
30.0
27.5
25.0
22.5
9.0
9.2
9.4
Coral Core

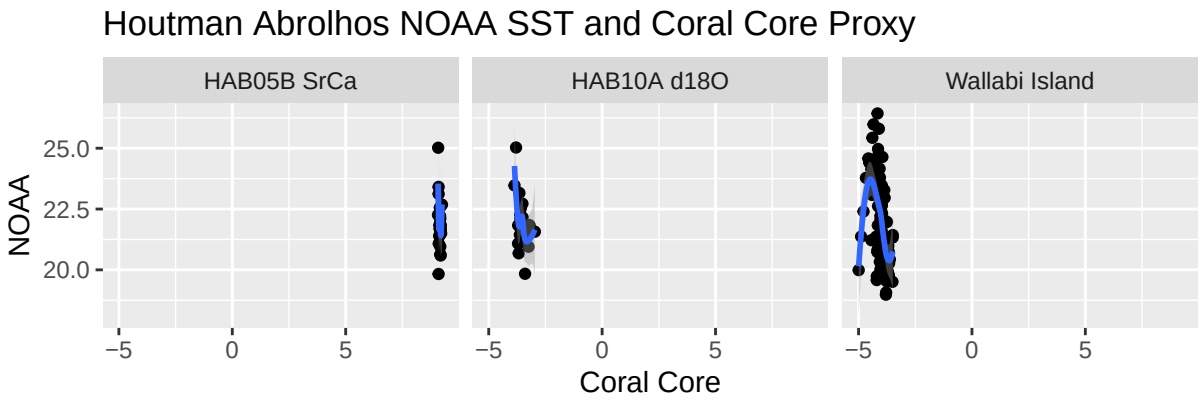

Ningaloo Reef Bundegi and BUN05A CCI SST and Coral Core Proxy
08BND
13BND
BUN05A
CCI
30.0
27.5
25.0
22.5
20.0
9.0
9.2
9.4
Coral Core


Ningaloo Reef Tantabiddi NOAA SST and Coral Core Proxy
08TNT
13TNT
TNT07C
NOAA
30
28
26
24
22
8.9
9.0
9.1
9.2
9.3
Coral Core


Ningaloo Reef Tantabiddi CCI SST and Coral Core Proxy
08TNT
13TNT
TNT07C
CCI
30.0
27.5
25.0
22.5
8.9
9.0
9.1
9.2
9.3
Coral Core


Ningaloo Reef TNT NOAA SST and Coral Core Proxy
TNT
NOAA
30.0
27.5
25.0
22.5
−5.25
−5.00
−4.75
−4.50
−4.25
Coral Core


Ningaloo Reef TNT CCI SST and Coral Core Proxy
TNT
CCI
27.5
25.0
22.5
−5.25
−5.00
−4.75
−4.50
−4.25
Coral Core


Houtman Abrolhos NOAA SST and Coral Core Proxy
HAB05B SrCa
HAB10A d18O
Wallabi Island
NOAA
25.0
22.5
20.0
−5
0
5
Coral Core

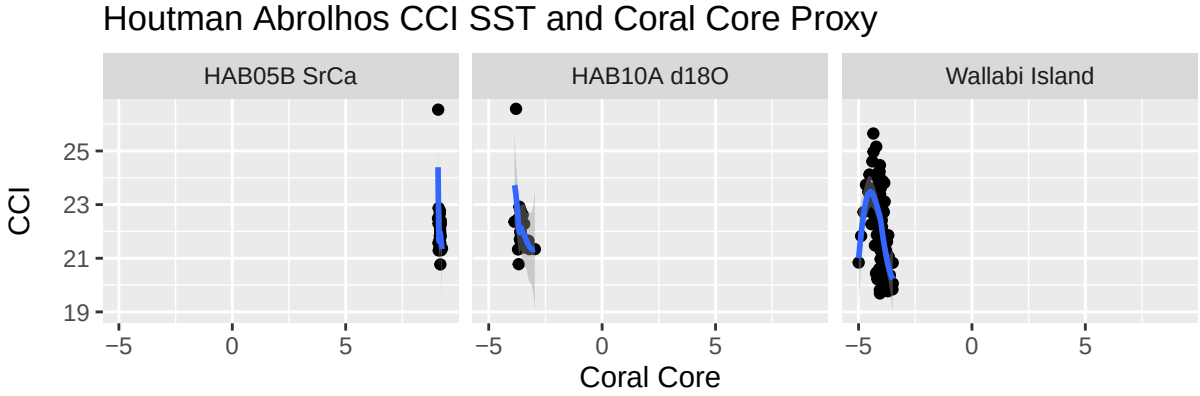

Houtman Abrolhos CCI SST and Coral Core Proxy
HAB05B SrCa
HAB10A d18O
Wallabi Island
CCI
25
23
21
19
−5
0
5
Coral Core

Table 1: NOAA

	Browse		Cocos Keeling		Ningaloo							Houtman Abrolhos	
	BRS05	BRS07	DARL	DAR3	13TNT	08TNT	TNT	TNT07C	13BND	08BND	BUN05A	Wallabi Island	HAB10A d18O
L_Browse	−15.892	−18.394											
	(0.968)	(0.967)											
L_Cocos			−7.413	−7.413									
			(0.957)	(0.957)									
L_Ningaloo					−344.021	−13.498	−7.569	−15.825	−12.655	−502.398	−12.498		
					(129.197)	(0.762)	(0.429)	(4.421)	(1.170)	(68.200)	(5.286)		
Q_Ningaloo					18.191					26.896			
					(7.096)					(3.741)			
L_HAbrol												−40.056	−2.236
												(9.792)	(1.014)
Q_HAbrol												−4.484	
												(1.176)	
Num.Obs.	273	273	255	255	98	135	102	23	60	133	20	100	22
R2	0.499	0.572	0.192	0.192	0.639	0.702	0.757	0.379	0.668	0.842	0.237	0.297	0.196
R2 Adj.	0.497	0.570	0.188	0.188	0.631	0.700	0.754	0.349	0.663	0.839	0.195	0.282	0.155
AIC	748.8	705.7	632.0	632.0	321.9	406.1	318.0	67.3	204.6	338.5	60.0	366.4	64.8

Table 2: CCI

	Browse		Cocos Keeling		Ningaloo							Houtman Abrolhos		
	BRS05	BRS07	DARL	DAR3	13TNT	08TNT	TNT	TNT07C	13BND	08BND	BUN05A	Wallabi Island	HAB10A d18O	HAB05B SrCa
L_Browse	−16.577	531.158												
	(0.875)	(247.970)												
Q_Browse		−31.095												
		(14.024)												
L_Cocos			−8.096	−8.096										
			(0.890)	(0.890)										
L_Ningaloo					−435.076	−13.400	−6.812	−15.918	−3.654	−185.807	−19.640			
					(131.135)	(0.815)	(0.383)	(4.844)	(0.682)	(49.633)	(6.485)			
Q_Ningaloo					23.210					9.946				
					(7.203)					(2.723)				
L_HAbrol												−36.775	−2.363	−10.912
												(7.852)	(1.115)	(4.886)
Q_HAbrol												−4.124		
												(0.943)		
Num.Obs.	273	273	255	255	98	135	102	23	60	133	20	100	22	24
R2	0.570	0.624	0.247	0.247	0.626	0.671	0.760	0.340	0.331	0.580	0.338	0.349	0.183	0.185
R2 Adj.	0.568	0.622	0.244	0.244	0.618	0.668	0.758	0.308	0.320	0.574	0.301	0.336	0.142	0.148
AIC	693.4	658.5	594.6	594.6	324.8	424.0	294.6	71.5	139.8	253.9	68.1	322.3	69.0	72.7