

Electronic supplementary material

Depth moderate loss of marine foundation species after an extreme marine heatwave: Could deep temperate reefs act as refuge?

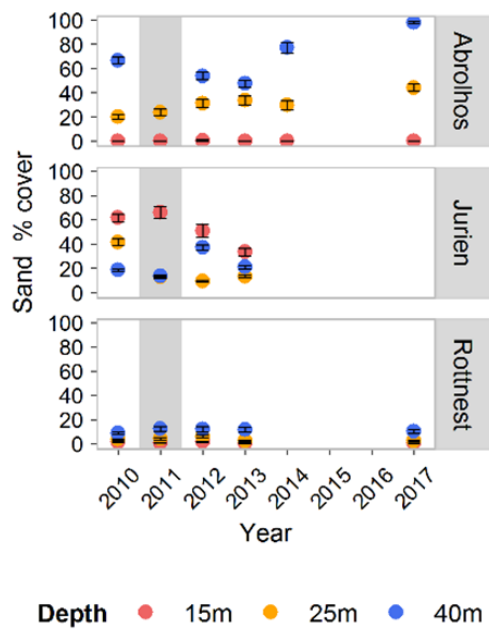
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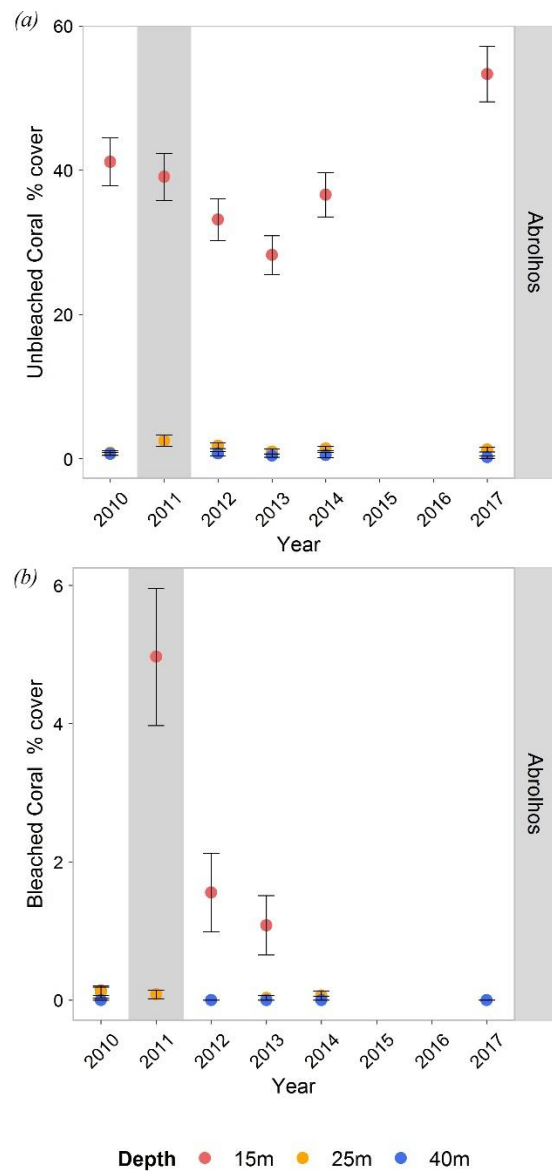
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Supplementary table S1. Number of grids surveyed and used for analyses at each year for all sites and locations (ND = No Data, sites not surveyed that year).

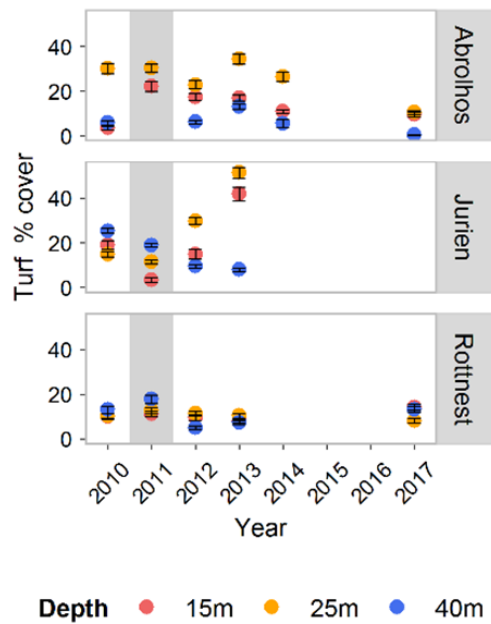
	Site	Depth	2010	2011	2012	2013	2014	2017
Abrolhos Islands	<i>Geebank</i>	<i>15 m</i>	3	3	3	3	3	3
		<i>25 m</i>	3	3	3	2	2	3
	<i>Coral Patches</i>	<i>15 m</i>	3	2	3	3	3	ND
		<i>40 m</i>	3	ND	3	3	1	3
	<i>Snapper Bank</i>	<i>25 m</i>	ND	3	3	3	3	3
Jurien Bay	<i>North</i>	<i>15 m</i>	3	2	2	3	ND	ND
		<i>25 m</i>	3	2	2	3	ND	ND
		<i>40 m</i>	3	3	3	ND	ND	ND
	<i>South</i>	<i>40 m</i>	3	3	3	3	ND	ND
	<i>New</i>	<i>25 m</i>	ND	3	3	ND	ND	ND
Rottnest Island	<i>North</i>	<i>15 m</i>	3	3	3	3	ND	3
		<i>25 m</i>	3	2	2	3	ND	3
		<i>40 m</i>	3	2	2	3	ND	3
	<i>South</i>	<i>15 m</i>	3	2	2	2	ND	3
		<i>25 m</i>	3	3	3	3	ND	3
		<i>40 m</i>	3	2	2	2	ND	2



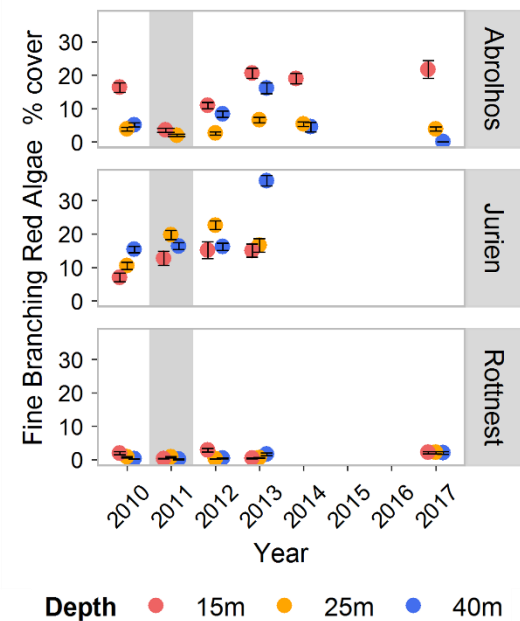
Supplementary figure S1. Mean percent cover (\pm SE) of sand at each depth and location from 2010 - 2017. The estimates of percent cover are means of ~ 90 to 180 images within each depth per year.



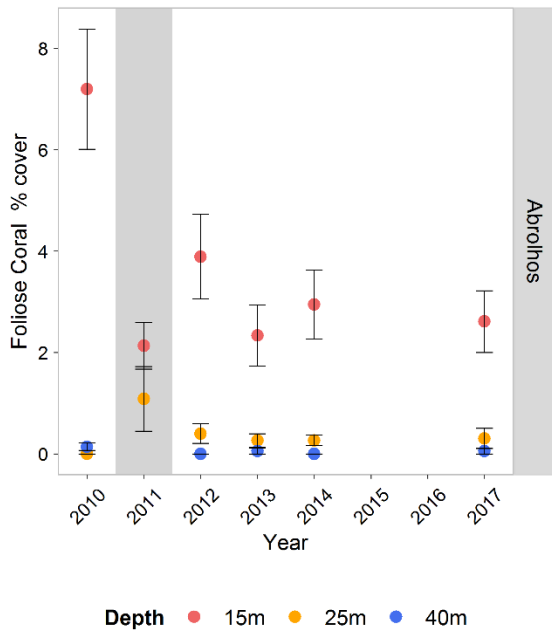
Supplementary figure S2: Mean percent cover (\pm SE) of unbleached coral (a) and bleached coral (b) at each depth at Houtman Abrolhos Islands, WA. The grey box highlights 2011, the year of the marine heatwave. The estimates of percent cover are means of ~ 90 to 180 images within each depth per year.



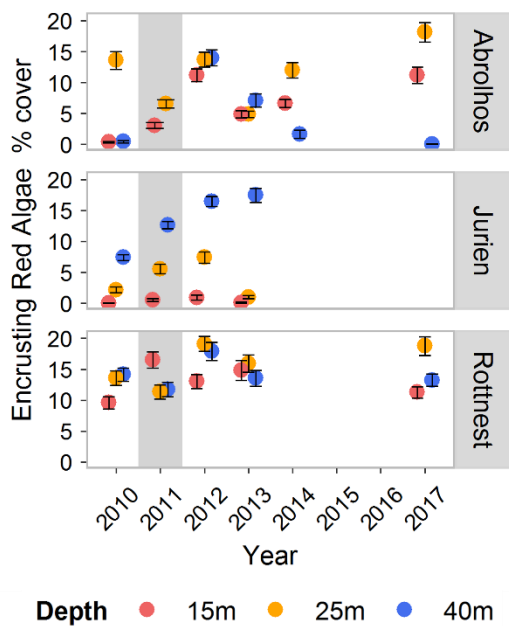
Supplementary figure S3. Mean percent cover (\pm SE) of turf at each depth and location from 2010 - 2017. The estimates of percent cover are means of ~ 90 to 180 images within each depth per year.



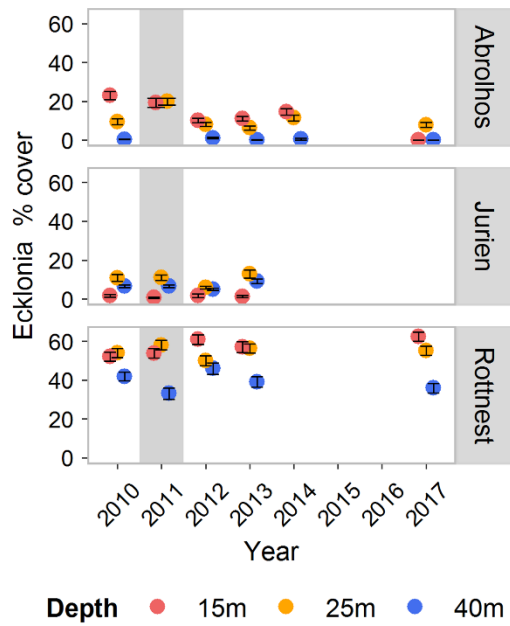
Supplementary figure S4. Mean percent cover (\pm SE) of fine branching red algae at each depth and location from 2010 - 2017. The estimates of percent cover are means of ~ 90 to 180 images within each depth per year



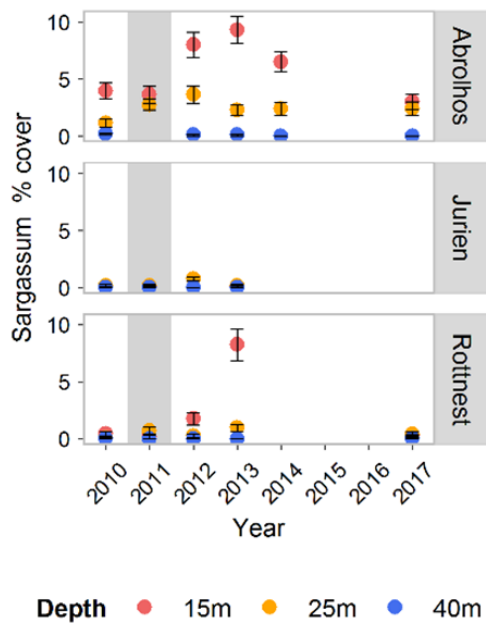
Supplementary figure S5. Mean percent cover (\pm SE) of Foliose Coral at each depth at Houtman Abrolhos Islands, WA. The estimates of percent cover are means of ~ 90 to 180 images within each depth per year.



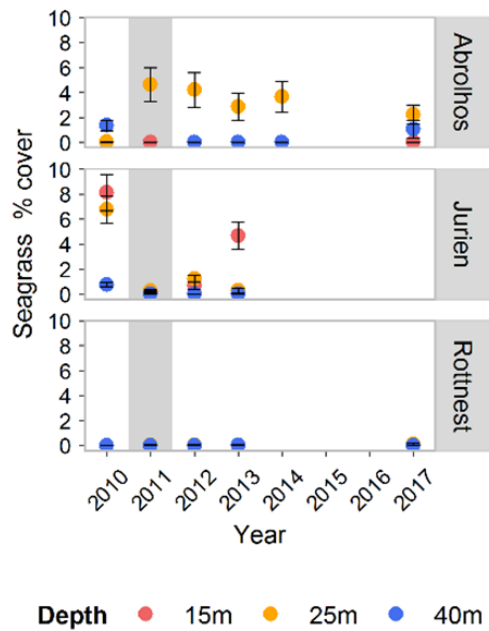
Supplementary figure S6. Mean percent cover (\pm SE) of encrusting red algae at each depth and location from 2010 - 2017. The estimates of percent cover are means of ~ 90 to 180 images within each depth per year.



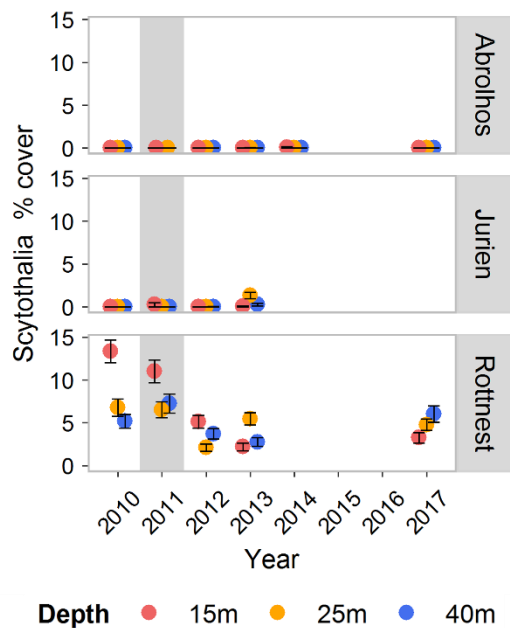
Supplementary figure S7. Mean percent cover (\pm SE) of *Ecklonia radiata* at each depth and location from 2010 - 2017. The estimates of percent cover are means of \sim 90 to 180 images within each depth per year.



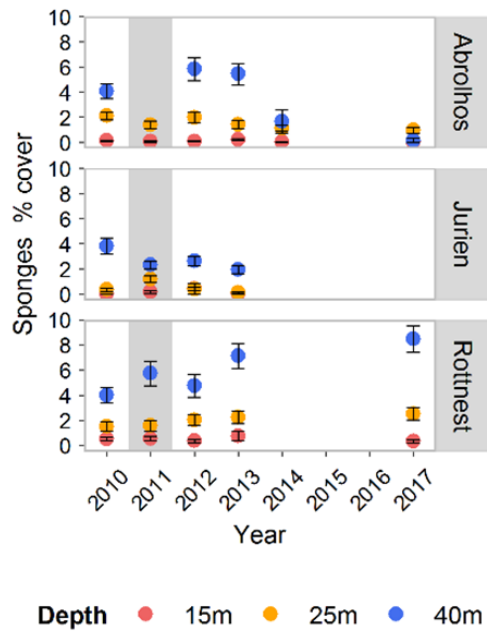
Supplementary figure S8. Mean percent cover (\pm SE) of *Sargassum sp.* at each depth and location from 2010 - 2017. The estimates of percent cover are means of \sim 90 to 180 images within each depth per year.



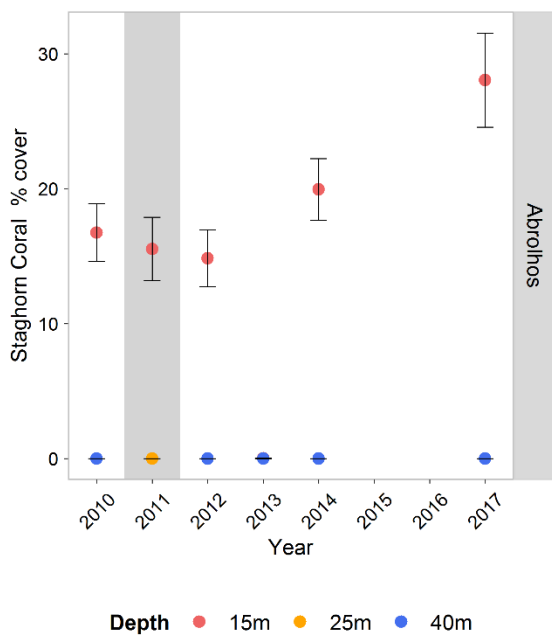
Supplementary figure S9. Mean percent cover (\pm SE) of seagrass at each depth and location from 2010 - 2017. The estimates of percent cover are means of ~ 90 to 180 images within each depth per year.



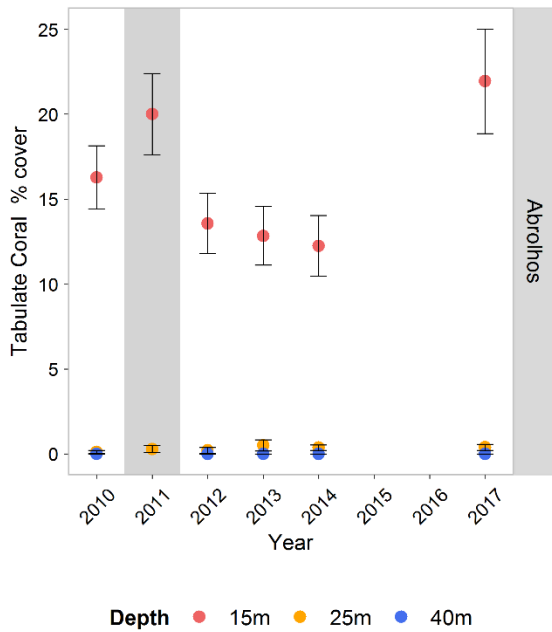
Supplementary figure S10. Mean percent cover (\pm SE) of *Scytothalia dorycarpa* at each depth and location from 2010 - 2017. The estimates of percent cover are means of ~ 90 to 180 images within each depth per year.



Supplementary figure S11. Mean percent cover (\pm SE) of sponges at each depth and location from 2010 - 2017. The estimates of percent cover are means of ~ 90 to 180 images within each depth per year.



Supplementary figure S12. Mean percent cover (\pm SE) of staghorn coral at each depth and location from 2010 – 2017. The estimates of percent cover are means of ~ 90 to 180 images within each depth per year.



Supplementary figure S13. Mean percent cover (\pm SE) of tabulate coral at each depth and location from 2010 – 2017. The estimates of percent cover are means of ~ 90 to 180 images within each depth per year.

Supplementary table S2. Summary statistics of one-way ANOVA to test for the effect of year in the percent cover of *E. radiata*, turf, encrusting red algae and *S. dorycarpa*, at each depth and location. Values in bold show significant differences between treatment plots. Values marked with * denote non-parametric tests (Kruskal-Wallis chi-squared values). Tukey tests were performed when ANOVAs were significant, and Dunn's test when Kruskal-Wallis tests were significant.

Class	Location	Depth	df	F-value	p-value	Post-hoc
<i>Ecklonia radiata</i>	Abrolhos	15 m	2	0.29732 *	0.8619	
		25 m	2	0.725	0.502	
		40 m	2	2.343	0.158	
	Jurien	15 m	2	0.45226 *	0.7976	
		25 m	2	0.023	0.978	
		40 m	2	0.0042 *	0.9979	
	Rottneest	15 m	2	1.131	0.351	

		25 m	2	0.162	0.852	
		40 m	2	0.581	0.575	
Turf	Abrolhos	15 m	2	7.637	<0.01	2010-2011 2010-2014 2011-2014
		25 m	2	1.952	0.179	
		40 m	2	0.265	0.774	
	Jurien	15 m	2	2.439	0.149	
		25 m	2	28.17	<0.001	2010-2011 2010-2013 2011-2013
		40 m	2	10.017 *	<0.01	2010-2011 2010-2013 2011-2013
	Rottneest	15 m	2	0.792	0.472	
		25 m	2	1.334	0.295	
		40 m	2	0.38	0.692	
Encrusting Red	Abrolhos	15 m	2	10.675 *	<0.01	2010-2011 2010-2014 2011-2014
		25 m	2	1.128	0.351	
		40 m	2	7.799	<0.05	2010-2012 2010-2014 2012-2014
	Jurien	15 m	2	4.6012 *	0.1002	
		25 m	2	1.996	0.186	
		40 m	2	11.26	<0.01	2010-2011 2010-2013 2011-2013
	Rottneest	15 m	2	1.583	0.24	
		25 m	2	0.884	0.435	
		40 m	2	0.47	0.636	
Scytothalia dorycarpa	Rottneest	15 m	2	4.262	<0.05	2010-2011 2010-2017 2011-2017
		25 m	2	0.241	0.789	

		40 m	2	0.279	0.761	
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Supplementary table S3. Univariate PERMANOVA to test for percent cover differences of main benthic categories between depths and years at each location. PERMANOVA derived from square root transformation and Euclidian distance similarity matrices.

Benthic category	Location	Effects	Numerator df	Denominator df	Pseudo -F	p	Unique permutations
<i>Coral</i>	<i>Abrolhos</i>	Year	5	2413	5.09	0.0002	9963
		Depth^	2	2413	622.48	0.0001	9945
		Year x Depth	9	2413	5.98	0.0001	9939
<i>Bleached Coral</i>	<i>Abrolhos</i>	Year	5	2413	26.131	0.0001	9948
		Depth^	2	2413	33.299	0.0001	9947
		Year x Depth	9	2413	14.697	0.0001	9933
<i>Coral - Staghorn</i>	<i>Abrolhos</i>	Year	5	2413	16.13	0.0001	9941
		Depth	2	2413	335.11	0.0001	9948
		Year x Depth	9	2413	10.68	0.0001	9941
<i>Coral - Foliose</i>	<i>Abrolhos</i>	Year	5	2413	2.26	0.0443	9925
		Depth	2	2413	94.63	0.0001	9943
		Year x Depth	9	2413	4.14	0.0001	9926
<i>Coral - Tabulate</i>	<i>Abrolhos</i>	Year	5	2413	3.13	0.0072	9951
		Depth	2	2413	343.65	0.0001	9953
		Year x Depth	9	2413	3.27	0.0006	9931
<i>Macroalgae</i>	<i>Abrolhos</i>	Year	5	2413	25.329	0.0001	9840
		Depth	2	2413	116.37	0.0001	9941

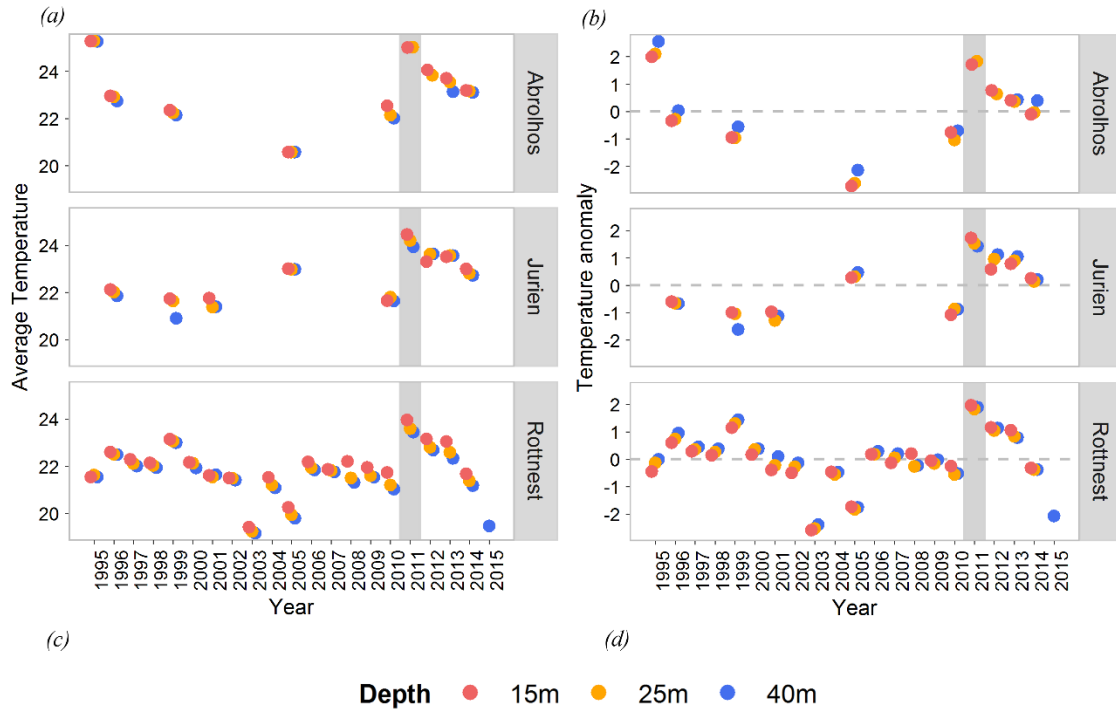
		Year x Depth	9	2413	14.87	0.0001	9838
	<i>Rottnest</i>	Year	4	2355	5.385	0.0006	9963
		Depth	2	2355	198.2	0.0001	9949
		Year x Depth	8	2355	3.013	0.0014	9935
	<i>Jurien</i>	Year	3	1548	69.04	0.0001	9936
		Depth	2	1548	159.97	0.0001	9949
		Year x Depth	6	1548	25.09	0.0001	9953
<i>Macroalgae - Ecklonia</i>	<i>Abrolhos</i>	Year	5	2413	19.808	0.0001	9952
		Depth	2	2413	62.225	0.0001	9940
		Year x Depth	9	2413	8.821	0.0001	9947
	<i>Rottnest</i>	Year	4	2355	1.2873	0.2763	9958
		Depth	2	2355	70.477	0.0001	9945
		Year x Depth	8	2355	3.355	0.001	9938
	<i>Jurien</i>	Year	3	1548	4.865	0.002	9942
		Depth	2	1548	71.479	0.0001	9943
		Year x Depth	6	1548	2.333	0.0297	9939
<i>Macroalgae - Sargassum</i>	<i>Abrolhos</i>	Year	5	2413	5.419	0.0001	9953
		Depth	2	2413	77.164	0.0001	9955
		Year x Depth	9	2413	3.820	0.0003	9948
	<i>Rottnest</i>	Year	4	2355	36.549	0.0001	9958
		Depth	2	2355	55.544	0.0001	9951
		Year x Depth	8	2355	26.901	0.0001	9952
<i>Macroalgae - Turf</i>	<i>Abrolhos</i>	Year	5	2413	34.008	0.0001	9947
		Depth	2	2413	125.68	0.0001	9954

		Year x Depth	9	2413	12.888	0.0001	9828
	<i>Rottne</i>	Year	4	2355	7.973	0.0001	9954
		Depth	2	2355	0.580	0.5566	9950
		Year x Depth	8	2355	4.956	0.0001	9926
	<i>Jurien</i>	Year	3	1548	64.997	0.0001	9940
		Depth	2	1548	49.855	0.0001	9944
		Year x Depth	6	1548	83.203	0.0001	9943
<i>Macroalgae – Fine branching red</i>	<i>Abrolhos</i>	Year	5	2413	46.374	0.0001	9948
		Depth	2	2413	182.78	0.0001	9949
		Year x Depth	9	2413	16.015	0.0001	9941
	<i>Rottne</i>	Year	4	2355	18.362	0.0001	9957
		Depth	2	2355	8.238	0.0002	9947
		Year x Depth	8	2355	8.959	0.0001	9940
	<i>Jurien</i>	Year	3	1548	39.354	0.0001	9952
		Depth	2	1548	67.283	0.0001	9954
		Year x Depth	6	1548	17.338	0.0001	9935
<i>Macroalgae – Encrusting red</i>	<i>Abrolhos</i>	Year	5	2413	45.266	0.0001	9956
		Depth	2	2413	70.205	0.0001	9946
		Year x Depth	9	2413	21.739	0.0001	9919
	<i>Rottne</i>	Year	4	2355	7.499	0.0001	9933
		Depth	2	2355	5.726	0.0034	9948
		Year x Depth	8	2355	4.596	0.0001	9935
	<i>Jurien</i>	Year	3	1548	39.292	0.0001	9954

		Depth	2	1548	643.85	0.0001	9960
		Year x Depth	6	1548	14.646	0.0001	9936
Macroalgae - Scytothalia	<i>Rottneest</i>	Year	4	2355	18.688	0.0001	9943
		Depth	2	2355	5.664	0.037	9955
		Year x Depth	8	2355	8.291	0.0001	9942
Macroalgae – Canopy	<i>Abrolhos</i>	Year	5	2413	11.552	0.0001	9949
		Depth	2	2413	88.42	0.0001	9953
		Year x Depth	9	2413	7.085	0.0001	9947
	<i>Rottneest</i>	Year	4	2355	0.365	0.8378	9944
		Depth	2	2355	78.439	0.0001	9945
		Year x Depth	8	2355	2.499	0.0097	9940
	<i>Jurien</i>	Year	3	1548	6.587	0.0003	9948
		Depth	2	1548	45.515	0.0001	9940
		Year x Depth	6	1548	5.488	0.0001	9936
Seagrass	<i>Abrolhos</i>	Year	5	2413	0.688	0.6219	9945
		Depth	2	2413	31.811	0.0001	9959
		Year x Depth	9	2413	3.675	0.0003	9940
	<i>Jurien</i>	Year	3	1548	33.929	0.0001	9949
		Depth	2	1548	22.252	0.0001	9952
		Year x Depth	6	1548	6.687	0.0001	9945
Sponges	<i>Abrolhos</i>	Year	5	2413	20.268	0.0001	9933
		Depth	2	2413	108.89	0.0001	9964
		Year x Depth	9	2413	11.53	0.0001	9931
	<i>Rottneest</i>	Year	4	2355	4.562	0.0012	9952
		Depth	2	2355	129.99	0.0001	9954

		Year x Depth	8	2355	2.774	0.0040	9927
	<i>Jurien</i>	Year	3	1548	1.292	0.2752	9952
		Depth	2	1548	93.322	0.0001	9951
		Year x Depth	6	1548	1.566	0.1512	9949
<i>Sand</i>	<i>Abrolhos</i>	Year	5	2413	19.23	0.0001	9944
		Depth	2	2413	1067.2	0.0001	9949
		Year x Depth	9	2413	7.921	0.0001	9929
	<i>Rottne</i>	Year	4	2355	5.36	0.0002	9956
		Depth	2	2355	172.58	0.0001	9951
		Year x Depth	8	2355	1.122	0.3452	9925
	<i>Jurien</i>	Year	3	1548	17.509	0.0001	9953
		Depth	2	1548	147.03	0.0001	9953
		Year x Depth	6	1548	32.323	0.0001	9935

Supplementary figure S14. Temperature data series (in degrees Celsius) for the yearly summer (December – April) averages (a), and yearly anomalies (b) at each location and for average depth of 10 m (5 -15 m range), 30 m (25 – 35 m depth range) and 40 m (35 – 45 m depth range). Anomalies calculated over the 20-year period averages. The grey line highlights 2011, the year of the marine heatwave. Temperature data was used to identify the temperature signal of the marine heatwave at each of the locations and across the three target depths. Data was gathered from the Australian Shelf Temperature Data Atlas which groups temperature data collected from 1995 to 2014 from a range of sources including AUV deployments, Argo profiles, glider deployments, moorings, and CTD casts (Integrated Marine Observing System, 2015). Data within a 30 km radius from the study locations was selected for the analysis (see electronic supplementary tables S4-S6 for details of temperature data). The average temperature for the summer months (December – April) was calculated for each year (1995-2014) at each location and depth. Temperature data was not available for all years and months for Abrolhos and Jurien Bay, yet, the average summer temperature was calculated over the 20-year period and temperature anomalies were calculated over this average.



Supplementary table S4. Summer average temperatures in degrees Celsius (\pm standard error) for each location at three depth bins 10, 30 and 40 m from 1995 to 2015 (Integrated Marine Observing System, 2015). Depth bins group data from a range of depths so that 10 m bin include 5-15 m, the 30 m bin include 25-35 m and the 40 m bin includes 35-45 m of depth. Summer months included the temperatures from December to April. The standard error of some temperatures was not calculated due to lack of data (one or 2 observations only). ND indicates that there is no data available for that location and depth.

Year	Location	10 m	30 m	40 m
1995	<i>Abrolhos</i>	25.286 ± 0.064	25.298 ± 0.052	25.267 ± 0.033
1996	<i>Abrolhos</i>	22.96 ± 0.257	22.916 ± 0.286	22.739 ± 0.361
1997	<i>Abrolhos</i>	ND	ND	ND
1998	<i>Abrolhos</i>	ND	ND	ND
1999	<i>Abrolhos</i>	22.346	22.237	22.147
2000	<i>Abrolhos</i>	ND	ND	ND
2001	<i>Abrolhos</i>	ND	ND	ND
2002	<i>Abrolhos</i>	ND	ND	ND
2003	<i>Abrolhos</i>	ND	ND	ND
2004	<i>Abrolhos</i>	ND	ND	ND
2005	<i>Abrolhos</i>	20.574	20.575	20.569
2006	<i>Abrolhos</i>	ND	ND	ND
2007	<i>Abrolhos</i>	ND	ND	ND

2008	<i>Abrolhos</i>	ND	ND	ND
2009	<i>Abrolhos</i>	ND	ND	ND
2010	<i>Abrolhos</i>	22.537	22.151	22.007
2011	<i>Abrolhos</i>	25.008	25.024	ND
2012	<i>Abrolhos</i>	24.067	23.833	ND
2013	<i>Abrolhos</i>	23.705	23.551	23.138
2014	<i>Abrolhos</i>	23.193 \pm 0.09	23.16 \pm 0.074	23.106 \pm 0.064
1995	<i>Jurien</i>	ND	ND	ND
1996	<i>Jurien</i>	22.127 \pm 0.199	22.014 \pm 0.22	21.847 \pm 0.278
1997	<i>Jurien</i>	ND	ND	ND
1998	<i>Jurien</i>	ND	ND	ND
1999	<i>Jurien</i>	21.734	21.629	20.905
2000	<i>Jurien</i>	ND	ND	ND
2001	<i>Jurien</i>	21.762	21.38	21.388
2002	<i>Jurien</i>	ND	ND	ND
2003	<i>Jurien</i>	ND	ND	ND
2004	<i>Jurien</i>	ND	ND	ND
2005	<i>Jurien</i>	23.011	22.984	22.976
2006	<i>Jurien</i>	ND	ND	ND
2007	<i>Jurien</i>	ND	ND	ND
2008	<i>Jurien</i>	ND	ND	ND
2009	<i>Jurien</i>	ND	ND	ND
2010	<i>Jurien</i>	21.653 \pm 0.695	21.801 \pm 0.12	21.632 \pm 0.31
2011	<i>Jurien</i>	24.459 \pm 0.342	24.201 \pm 0.333	23.934 \pm 0.181
2012	<i>Jurien</i>	23.31 \pm 0.23	23.622 \pm 0.151	23.63 \pm 0.166
2013	<i>Jurien</i>	23.507 \pm 0.21	23.562 \pm 0.219	23.557 \pm 0.136
2014	<i>Jurien</i>	22.986 \pm 0.247	22.802 \pm 0.255	22.717 \pm 0.298
1995	<i>Rottne</i>	21.547 \pm 0.418	21.626 \pm 0.422	21.537 \pm 0.416
1996	<i>Rottne</i>	22.599 \pm 0.245	22.502 \pm 0.239	22.498 \pm 0.245
1997	<i>Rottne</i>	22.288 \pm 0.413	22.114 \pm 0.42	22 \pm 0.469
1998	<i>Rottne</i>	22.142 \pm 0.25	22.026 \pm 0.275	21.931 \pm 0.288
1999	<i>Rottne</i>	23.141 \pm 0.287	23.064 \pm 0.298	22.994 \pm 0.296
2000	<i>Rottne</i>	22.165 \pm 0.402	22.121 \pm 0.455	21.928 \pm 0.515
2001	<i>Rottne</i>	21.609 \pm 0.169	21.537 \pm 0.159	21.642 \pm 0.195
2002	<i>Rottne</i>	21.505	21.486	21.409
2003	<i>Rottne</i>	19.413 \pm 0.167	19.238 \pm 0.282	19.162 \pm 0.36
2004	<i>Rottne</i>	21.53 \pm 0.272	21.202 \pm 0.167	21.078 \pm 0.139
2005	<i>Rottne</i>	20.258 \pm 0.366	19.937 \pm 0.275	19.792 \pm 0.223
2006	<i>Rottne</i>	22.177 \pm 0.407	21.937 \pm 0.343	21.838 \pm 0.305
2007	<i>Rottne</i>	21.865	21.813	21.754
2008	<i>Rottne</i>	22.201 \pm 0.845	21.497 \pm 0.81	21.314 \pm 0.835
2009	<i>Rottne</i>	21.95 \pm 0.114	21.603 \pm 0.162	21.528 \pm 0.174
2010	<i>Rottne</i>	21.74 \pm 0.211	21.207 \pm 0.221	21.023 \pm 0.243
2011	<i>Rottne</i>	23.961 \pm 0.184	23.585 \pm 0.225	23.447 \pm 0.232
2012	<i>Rottne</i>	23.159 \pm 0.28	22.807 \pm 0.254	22.685 \pm 0.255
2013	<i>Rottne</i>	23.05 \pm 0.144	22.594 \pm 0.173	22.332 \pm 0.2
2014	<i>Rottne</i>	21.681 \pm 0.3	21.382 \pm 0.314	21.171 \pm 0.331
2015	<i>Rottne</i>	ND	ND	19.473

Supplementary table S5. Summer temperatures anomalies in degrees Celsius for each location at three depth bins 10, 30 and 40 m from 1995 to 2015 (Integrated Marine Observing System, 2015). Depth bins group data from a range of depths so that 10 m bin include 5-15 m, the 30 m bin include 25-35 m and the 40 m bin includes 35-45 m of depth. Summer months included the temperatures from December to April. ND indicates that there is no data available for that location and depth.

		15 m	25 m	40 m
<i>Year</i>	<i>Location</i>	<i>Anomaly</i>	<i>Anomaly</i>	<i>Anomaly</i>
1995	Abrolhos	1.989	2.104	2.557
1996	Abrolhos	-0.338	-0.278	0.029
1997	Abrolhos	ND	ND	ND
1998	Abrolhos	ND	ND	ND
1999	Abrolhos	-0.952	-0.957	-0.563
2000	Abrolhos	ND	ND	ND
2001	Abrolhos	ND	ND	ND
2002	Abrolhos	ND	ND	ND
2003	Abrolhos	ND	ND	ND
2004	Abrolhos	ND	ND	ND
2005	Abrolhos	-2.723	-2.619	-2.142
2006	Abrolhos	ND	ND	ND
2007	Abrolhos	ND	ND	ND
2008	Abrolhos	ND	ND	ND
2009	Abrolhos	ND	ND	ND
2010	Abrolhos	-0.760	-1.043	-0.703
2011	Abrolhos	1.710	1.830	ND
2012	Abrolhos	0.769	0.639	ND
2013	Abrolhos	0.408	0.357	0.427
2014	Abrolhos	-0.104	-0.034	0.395
1995	Jurien	ND	ND	ND
1996	Jurien	-0.600	-0.652	-0.662
1997	Jurien	ND	ND	ND
1998	Jurien	ND	ND	ND
1999	Jurien	-0.994	-1.038	-1.605
2000	Jurien	ND	ND	ND
2001	Jurien	-0.966	-1.287	-1.121
2002	Jurien	ND	ND	ND
2003	Jurien	ND	ND	ND
2004	Jurien	ND	ND	ND
2005	Jurien	0.283	0.318	0.467
2006	Jurien	ND	ND	ND
2007	Jurien	ND	ND	ND
2008	Jurien	ND	ND	ND
2009	Jurien	ND	ND	ND
2010	Jurien	-1.074	-0.865	-0.878
2011	Jurien	1.731	1.535	1.424

2012	<i>Jurien</i>	0.582	0.956	1.120
2013	<i>Jurien</i>	0.780	0.895	1.047
2014	<i>Jurien</i>	0.258	0.136	0.207
1995	<i>Rottnest</i>	-0.452	-0.138	-0.013
1996	<i>Rottnest</i>	0.600	0.738	0.949
1997	<i>Rottnest</i>	0.289	0.350	0.451
1998	<i>Rottnest</i>	0.144	0.262	0.382
1999	<i>Rottnest</i>	1.142	1.300	1.444
2000	<i>Rottnest</i>	0.166	0.357	0.378
2001	<i>Rottnest</i>	-0.390	-0.227	0.093
2002	<i>Rottnest</i>	-0.494	-0.278	-0.141
2003	<i>Rottnest</i>	-2.586	-2.526	-2.388
2004	<i>Rottnest</i>	-0.469	-0.562	-0.471
2005	<i>Rottnest</i>	-1.741	-1.827	-1.757
2006	<i>Rottnest</i>	0.178	0.173	0.289
2007	<i>Rottnest</i>	-0.134	0.049	0.205
2008	<i>Rottnest</i>	0.202	-0.267	-0.236
2009	<i>Rottnest</i>	-0.049	-0.161	-0.021
2010	<i>Rottnest</i>	-0.259	-0.557	-0.527
2011	<i>Rottnest</i>	1.962	1.821	1.898
2012	<i>Rottnest</i>	1.160	1.043	1.136
2013	<i>Rottnest</i>	1.051	0.830	0.783
2014	<i>Rottnest</i>	-0.318	-0.382	-0.378
2015	<i>Rottnest</i>	ND	ND	-2.076

Supplementary table S6. Number of data points obtained to calculated averages, and anomalies of temperature at each year location and depth.

<i>Depth</i>	<i>Year</i>	<i>Abrolhos</i>	<i>Jurien</i>	<i>Rottnest</i>
15 m	1995	2	0	10
	1996	7	8	13
	1997	0	0	8
	1998	0	0	14
	1999	1	1	11
	2000	1	1	15
	2001	0	1	12
	2002	0	1	2
	2003	0	0	9
	2004	0	0	9
	2005	1	1	9
	2006	0	0	11
	2007	0	0	5
	2008	0	0	8
	2009	0	0	22
	2010	1	3	16
	2011	1	3	20

25 m	2012	1	4	16
	2013	1	3	15
	2014	4	4	14
	2015	0	0	0
	1995	2	0	9
	1996	7	8	13
	1997	0	0	8
	1998	0	0	14
	1999	1	1	11
	2000	1	1	15
	2001	0	1	12
	2002	0	1	2
	2003	0	0	8
	2004	0	0	9
	2005	1	1	9
	2006	0	0	11
	2007	0	0	5
	2008	0	0	9
	2009	0	0	24
	2010	1	4	19
	2011	1	3	27
	2012	1	3	20
	2013	1	2	22
	2014	4	4	16
	2015	0	0	0
40 m	1995	2	0	9
	1996	6	8	12
	1997	0	0	8
	1998	0	0	13
	1999	1	1	11
	2000	1	1	15
	2001	0	1	12
	2002	0	1	2
	2003	0	0	7
	2004	0	0	9
	2005	1	1	9
	2006	0	0	11
	2007	0	0	5
	2008	0	0	9
	2009	0	0	24
	2010	1	3	19
	2011	0	2	27
	2012	0	2	20
	2013	1	3	22
	2014	3	4	18

References

Integrated Marine Observing System (2015), MARVL3 - Australian shelf temperature data atlas. f9b50e93-df47-4317-8f1f-f3ed2fed7093. Data accessed at (<https://portal.aodn.org.au/>)