A. Beta Diversity Changes in coral communities at Punta Maroma. Pair-wise comparisons of Distance-based test for homogeneity of multivariate dispersions (PERMDISP) on Jaccard Similarity matrix as a measurement of changes in beta diversity after transforming Abundance data to presence /absence. RF: Reef front or accretionary zone; HG: Coral hard ground or non-accretionary zone in both periods of time (before the 1990s and 2019). P(perm): P-values obtained using permutations. SE: standard error of means listed by average for each group.

Name: Jaccard matrix
Data type: Similarity
Selection: All
Transform: Presence/absence
Resemblance: S7 Jaccard

Group factor: Temporal
Number of permutations: 9999
Number of groups: 4
Number of samples: 38

DEVIATIONS FROM CENTROID
F: 4.4716 df1: 3 df2: 34
P(perm): 0.0213

PERMDISP JACCARD PAIRWISE COMPARISONS

Groups	t	P(perm)
(RF_before 1990,HG_before 1990)	1.863	0.1039
(RF_before 1990,HG_2019)	1.4109	0.1905
(RF_before 1990,RF_2019)	0.96334	0.3814
(HG_before 1990,HG_2019)	4.3492	0.0006
(HG_before 1990,RF_2019)	0.92391	0.4239
(HG_2019,RF_2019)	2.8027	0.013

MEANS AND STANDARD ERRORS

Group	Size	Average	SE
RF_before 1990	9	34.605	3.5082
HG_before 1990	9	42.723	2.5849
HG_2019	10	29.194	1.8201
RF_2019	10	39.025	2.9985

B. Results of two-way permutational MANOVA (PERMANOVA) with two contrast analyses for year-factor and pair-wise tests for PERMANOVA of zone in time term (Year x Zone) for pair of levels of factor Zone. RF: Reef front or accretionary zone; HG: Coral hard ground or non-accretionary zone in both periods of time (before the 1990s and 2019). P(perm): P-values obtained using permutations. P(MC): Monte Carlo p-values

PERMANOVA PAIRWISE COMPARISONS

Source	df	SS	MS	Pseudo-F	P(perm)	perms	P(MC)
Year**	2	30442	15221	15.38	0.0001*	9918	0.0001*
C1 (1979) and (1985)	1	2885.6	2885.6	2.1232	0.0425	9942	0.0705
C2 (1979,1985) and (2019)	1	27556	27556	25.91	0.0001*	9931	0.0001*
Zone**	1	18470	18470	18.662	0.0001*	9941	0.0001*
Year x Zone*	2	6613.8	3306.9	3.3414	0.0001*	9926	0.0003*
C1 x Zone	1	1605.1	1605.1	1.181	0.3362	9921	0.3309
C2 x Zone	1	5008.6	5008.6	4.7095	0.0001	9951	0.0002
Res	32	31669	989.66				
Total	37	85382					

*PAIR-WISE TESTS (*Term 'Year x Zone' for pairs of levels of factor 'Zone')
Within level '1979' of factor 'Year'

Groups	t	P(perm)	Unique perms	P(MC)
RF, HG	2.9509	0.0083	126	0.0008

Average Similarity between/within groups

	RF	HG
RF	64.12	
HG	21.49	40.977

Within level '1985' of factor 'Year'

Groups	t	P(perm)	Unique perms	P(MC)
RF, HG	2.1159	0.0288	35	0.0198

Average Similarity between/within groups

	RF	HG
RF	43.257	
HG	25.607	51.182

Within level '2019' of factor 'Year'

Groups	t	P(perm)	Unique perms	P(MC)
RF, HG	2.8437	0.0001	9426	0.0003

Average Similarity between/within groups

	RF	HG
RF	58.352	
HG	52.591	70.702

C. Pair-wise comparisons of Distance-based test for homogeneity of multivariate dispersions (PERMDISP) on Bray-Curtis Similarity matrix of transformed square-root matrix abundance data. RF: Reef front or accretionary zone; HG: Coral hard ground or non-accretionary zone in both periods of time (before the 1990s and 2019); P(perm): P-values obtained using permutations. SE: standard error of means listed by average for each group.

PERMDISP BRAY-CURTIS PAIRWISE COMPARISONS

Groups	t	P(perm)
(RF_before 1990, HG_before 1990)	1.5525	0.1822
(RF_before 1990, HG_2019)	2.6637	0.0147
(RF_before 1990, RF_2019)	0.59302	0.5981
(HG_before 1990, HG_2019)	5.9682	0.0001*
(HG_before 1990, RF_2019)	2.4735	0.0365
(HG_2019, RF_2019)	2.2626	0.0454

MEANS AND STANDARD ERRORS

Group	Size	Average	SE
RF_before 1990	9	30.692	4.0483
HG_before 1990	9	38.395	2.8688
HG_2019	10	19.662	1.4937
RF_2019	10	27.661	3.2042
RF_before 1990	9	30.692	4.0483
HG_before 1990	9	38.395	2.8688